4/2014/1

Central European Regional Policy and Human Geography

University of Debrecen
Department of Social Geography and Regional Development Planning

Central European Regional Policy and Human Geography

Central European Regional Policy and Human Geography is a peer-reviewed scientific publication, with an international status. The Journal is issued under the aegis of the University of Debrecen, Department of Social Geography and Regional Development Planning. The printable format (2 issues per year) is supported by the on-line version with materials published with an abstract and the full version free of charge.

The journal aims to publish relevant contributions especially in Central European regional policy and human geography nevertheless it also welcomes high quality papers from other subject areas. An important objective is to promote academic and applied research based on interdisciplinarity with a complex local and global approach.

The content of the publication is intended for a heterogeneous community made of students, teaching staff and practitioners who have deeper interest in the processes taking place in Central Europe and would like to understand the context of the events.

Editorial address:
Department of Social Geography and Regional Development Planning,
University of Debrecen
4032 Debrecen, Egyetem tér 1. Hungary
kozma.gabor@science.unideb.hu

HU ISSN 2062-8870 (Print)
HU ISSN 2062-8889 (Online)
www.cerphg.unideb.hu

Central European Regional Policy and Human Geography
HU ISSN 2062-8870, HU E-ISSN 2062-8889
Year IV, no. 1, **2014**,

C O N T E N T S

Konstantin NIEMETS – Lydmila NIEMETS – Pavel KOBYLIN
Theoretical and methodological features of the socio-geographical studies of the region's social infrastructure 7
(Art#2014-1) .....

Alexander V. GLADKEY – Victoria GLIBOVETS
Socio-geographical research on the industrial agglomerations in Ukraine
(Art#2014-2) 17

Anikó KHADEMI-VIDRA
Consumer habits from the perspective of the global economic crises in East-Central Europe
(Art#2014-3) 39

János PÉNZES
Competitiveness of Hungarian towns after the change of regime
(Art#2014-4) 51

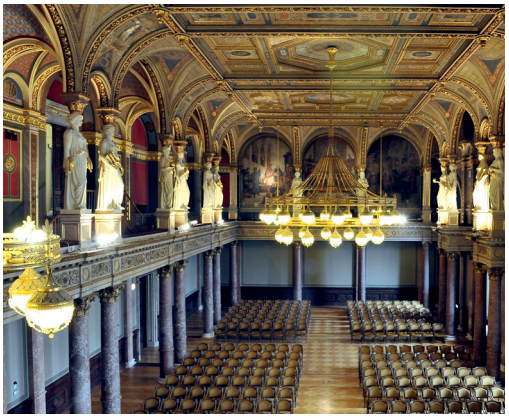
EUGEO
BUDAPEST
2015

CONVERGENCES AND DIVERGENCES OF GEOGRAPHY IN EUROPE

Fifth EUGEO Congress on the Geography of Europe

30 August – 2 September 2015

BUDAPEST, Eötvös Loránd University



The programme will include keynote lectures, oral sessions, poster sessions, thematic panels, scientific and social events. Researchers and experts from all over the world are invited to submit proposals to: info@eugeo2015.com

The aim is to facilitate the exchange of new ideas and to offer opportunities for networking within an informal atmosphere. The Congress venues are centrally located and well connected by public transport.

PhD students and early career researchers are encouraged to actively participate and will be offered a reduced fee.

HUNGARIAN GEOGRAPHICAL SOCIETY

Further information and online registration:
www.eugeo2015.com – info@eugeo2015.com

Central European Regional Policy and Human Geography	Year IV, no. 1, **2014**, pp. 7-16.
HU ISSN 2062-8870, HU E-ISSN 2062-8889	Article no. 2014-1

THEORETICAL AND METHODICAL FEATURES OF THE SOCIO-GEOGRAPHICAL STUDIES OF THE REGION'S SOCIAL INFRASTRUCTURE

Konstantin NIEMETS
Professor, Department for Social and Economic Geography and Regional Studies,
V.N. Karazin Kharkiv National University, Ukraine, E-mail: kon.nemets@yandex.ru

Lydmila NIEMETS
Chair of the Department for Social and Economic Geography and Regional Studies,
V.N. Karazin Kharkiv National University, Ukraine, E-mail: L.N.Niemets@gmail.com

Pavel KOBYLIN
PhD student, Department for Social and Economic Geography and Regional Studies,
V.N. Karazin Kharkiv National University, Ukraine, E-mail: kobilin3@rambler.ru

Abstract: The article deals with analysis of the theoretical basis and methods of the socio-geographical studies of the region's social infrastructure. The object and subject of geography of service industry have been identified; the conceptual apparatus of the geography of service industry has been analyzed. The own definition of the term "social infrastructure" from the perspective of the system approach, and socio-geographical system concept was given, components of the social infrastructure were defined, factors influencing the formation and development of the region's social infrastructure were found out. Sectoral, territorial and administrative structures of a region were considered by various authors, the methodological approaches, research methods of the social infrastructure have been characterized, features of typing of the regions' administrative districts, application of quantitative methods were analyzed, and methods to be conducted in future studies have been studied – the graph-analytical method for multidimensional classification of the socio-geographical objects and modeling the trajectory of the socio-geographical objects development.

Key words: social infrastructure, socio- geographical system, geography of service sector, territorial structure

* * * * * * *

INTRODUCTION

Socio-geographical studies of the social infrastructure development are relevant and timely, since the transformation processes in the economy, and regional development of Ukraine cause the role enhancement of its social component. The social infrastructure plays an important role, because it provides conditions of the social production, and functioning of the society , formation of physical and mental human development, creates optimal housing and living conditions for the population, promotes longevity and health maintaining, rational

usage of leisure time, creates conditions for rest and raise the cultural level of the population; guarantees social security and safety of all people, including youth, seniors, disabilities; satisfies the needs in goods or services in case of increasing the population solvency level. Thus, the social infrastructure provides optimization of the social development, comprehensive personal development, society lifestyle improvement.

Issues of the social infrastructure development are studied by various sciences, including sociology, regional economy, etc. The important place among these sciences takes place human geography, since it examines "... geospatial (territorial) organization of the society or its separate components: population, production, social, political, spiritual or natural resource sectors (or certain types of vital activity)," as A.G. Topchiyev said (Topchiyev, 2009, p. 14); it investigates natural and socio-economic factors influencing the development of the region's social infrastructure. Theoretical aspects of human geography were developed in the works of ukrainian and foreign scientists such as O.I. Shabliy (2003), A.G Topchiyev (2009), M.D. Pistun (1996), E.B. Alaev (1983), M.D. Sharygin (2007), P.Y. Baklanov (1986), J.G. Saushkyn (1983), J. Fellmann et al. (2003), Gerald R. Pitzl (2004) and others, who defined the object, subject of human geography, classified research methods of human geography, improved the concept of the society territorial organization, etc. Such direction of human geography as geography of service industry (geography of social infrastructure) studies territorial features of the social infrastructure development (service industry of the population) within a region (territoty). The most outstanding experts in this area of human geography are such scholars as A.I Alekseev, A.I. Tkachenko, S.A. Kovalev (1991), V. Pokshyshevskyy (1972), L.A. Merkusheva (1989), B. Warf (2006), A.C. Vias (2009), and scientists engaged in applied aspects of human-geographical studies of the social infrastructure: S.M. Zhovnir (2008), O.G. Kornus (2009), I.V. Zapototska (2007), Z.B. Tsutsieva (2012), N.G. Lukyanova (2011), L.G. Kalashnikova (2006), S.A. Chernyshev (2008), D.V. Troshev (2004), J.M. Zelenyuk (2006), V.V. Sulzhenko (1994), M.O. Baranovskiy (1992), V.A. Donskoy (1994) and others. An important aspect of the research of geography of service industry is theory and technique of the study, cause they constitute the foundation of any research. Features of geography of service industry, conceptual apparatus, understanding the structure of the social infrastructure, methodological approaches, application of the methods for the research of territorial features of the social infrastructure will be discussed in this article.

THEORETICAL ASPECTS OF THE SOCIAL INFRASTRUCTURE RESEARCH

As we noted above, the social infrastructure in terms of human geography is studied by geography of service industry. According to D.V. Troshev, "... geography of service of the population studies a set of heterogeneous types of services representing the organically connected whole, they are functionally combined with necessity to satisfy physiological, physical and spiritual needs of people at a certain stage of social development" (Troshev, 2004, p. 8). S.M. Zhovnir considered that geography of service industry is "... the direction of human geography studying a territorial aspect of the social and economic organization of the service industry" (Zhovnir, 2008, p. 5). According to her, the subject of the study of service geography is territorial organization of service sector (TOSS), and in the information society it is virtual TOSS.

It is worth discussing the issue on the conceptual apparatus of geography of service industry. It includes such definitions as "a service", service sector of the population", "social sphere", "social infrastructure". According to S.M. Zhovnir, "a service is purposeful activity aimed at satisfying needs" (Zhovnir, 2008, p. 5). O.G. Kornus considered the term "service industry of the population", which she understands as «...an integrated, complex, and

dynamic socio-geographical system characterized by component, administrative and territorial structures, its function is aimed at satisfying material and spiritual needs of the population" (Kornus, 2009, p. 7). I.V. Zapototska defined "social sphere" as "...a system of the economy industries, the main function of them is satisfying social needs of the population, providing favorable conditions of people's vital activity, physical and spiritual improvement of a person, increasing efficiency of the social production" (Zapototska, 2008, p. 6). The purpose of the social sphere is providing services. N.G. Lukyanova studied the social infrastructure which she defines as "...a complicated, mosaic, hierarchical system, including sectors of the varying development degree and functional purpose, the main aim of them is satisfying population's needs in different types of services" (Lukyanova, 2011, p.5). As we can see, terms given above are not differed from one another; the purpose of their activity is satisfying population's needs in different types of services. Since the article is devoted to the social infrastructure, we have been highlighted 4 approaches to its definition from the point of view functions, based on analysis of literary sources: the first approach regards to creation conditions for employed population in industry, the second one is providing normal conditions of people, the third one is based on satisfying population's needs, the forth approach is aimed at satisfying population's needs by services. From the point of view material foundation, the social infrastructure is understood as a physical infrastructure, a set of institutions, enterprises or the set of economy industries.

In our opinion, the social infrastructure should be considered in terms of system approach and in accordance to the definition "socio-geographical system" which is "...a heterogeneous system containing social elements or subsystems by different levels of generalization and hierarchy, as well as man-made, abiotic and biogenic elements (subsystems), interacting with each other through flows of matter, energy and information in geographical space-time continuum". The term was entered by L.M. Niemets (Niemets, 2004, p.11). Based on this term we suggest the own interpretation of this concept. "The social infrastructure is a part of the structure of the regional socio-geographical system aimed at providing normal conditions of people's vital activity, its needs in services (subsystems of education, health care, culture, housing and communal service, transport and communications, consumer service of the population, retail trade, restaurant business, physical culture and sports, social welfare, recreational industry) connected through flows of matter, energy, and information in geographical space-time continuum". Besides subsystems of the social infrastructure mentioned above, some scholars also include financial institutions, public safety and order, public administration, NGOs, media, science, conservation measures of environment. There is not clear understanding the place of the social infrastructure in the economy. One approach is based on division of the infrastructure on productive and social ones, in accordance to other views, institutional infrastructure is added to this group. According to the general understanding, the infrastructure is a component of the economy like industry and agriculture. Such approaches were formed in the Soviet Union. During the independence of the post-soviet countries the structure of the infrastructure has been becoming more detailed – for example, environmental, social, technological (in fact, production), institutional, organizational, financial infrastructure were being added (Efremov, 2009; Gritsay, 2011).

Studying the territorial features of the region's social infrastructure development, one of the most important aspects of the research is analysis factors of formation and social infrastructure development in a region. Scholars highlight a different set of factors due to features of natural and socio-economic conditions of regions, but most of geographers identify the following ones: demographic, settlement, economic, transport, historical, geographical, natural and geographical. Some researchers noted a consumer factor (Chernyshev, 2008; Zhovnir, 2008), an ecological one (Zapototska, 2007).

Functional and sectoral, territorial and administrative structures of the social infrastructure are often considered in geographers' works. For instance, the functional and sectoral structure has synonyms: sectoral, functional and component, component structure. According to Baranovskiy (1992), its elements are mobile service vehicles with different functions. Zapototska (2007) highlighted socio-cultural and socio-domestic industries, according to Zhovnir (2008) the functional and sectoral structure is presented by an intersectoral complex of services integrating production and types of activities which are engaged in creation of a specific product – services. According to O.G. Kornus (2009), elements of the component structure are subsystems of the service sector of the population (housing and communal service, consumer service of the population, educational services, health care, culture, transport, and communications, etc.).

Territorial structure is presented by different ways. Its idea were formed based on the theory of central places by Christaller. Baranovskiy (1992) considered that elements of the functional and territorial structure are centers of various ranks (local, multiple, regional, inter-regional centers) and territorial service systems formed around them, Zelenyuk (2006) told about the chain – the regional center – a district center – an intereconomic center – an intraeconomic center, Zapototska told about hierarchical structure of centres: local elements (point, center, node) to provide services to residents of different villages and regional elements (socio-geographical sub-districts), Kornus (2009) identified service centers (SC) of different ranks (they are 5) that conduct organizational and economic, cultural and domestic connections between each other (from the regional center to a village).

"Functional and administrative structure of the region's social sphere is a set of organizational forms and management bodies hierarchically interrelated and ensuring focused and coordinated development of all social sphere components of a territory" (by Zapototska, 2008, p. 6). These are central departments of regional administrations, commissions of regional councils, subordinated district administrations with corresponding departments, local councils of cities of regional subordination and district councils, committees and commissions. At the grassroots level the social infrastructure is governed by committees and commissions of local (city, town and village) councils. Administrative structure also was explored by Baranovskiy (1992) and Kornus (2009).

METHODOLOGICAL APPROACHES AND SOCIO-GEOGRAPHICAL METHODS OF THE SOCIAL INFRASTRUCTURE RESEARCH

A socio-geographical study of the social infrastructure is based on geographical, system, synergistic, informational and historical approaches.

The essence of the ***geographical approach*** in human geography is to consider a certain object from the point of view complexity, and in spatial aspects. The complexity is achieved taking into account a large number of attributes (parameters) of the selected study object due to its complexity and heterogeneity. Studying the social infrastructure it is necessary to take into account not only indicators defining results of its activity, and certain demographic, economic indicators to show more integrated situation on the place of the social infrastructure in the regional socio-geographical system. (Niemets and Niemets, 2013).

System approach is "...a study of geographical objects, treated as complex, and (or) large systems" (Shabliy, 2003, p. 408). According to A.G. Topchiyev, a system is «...a number of interrelated objects (elements of systems) creating a certain unity, a new object" (Topchiyev, 2009, c. 109). Each system is characterized by such characteristics: 1) it consists of a number of elements (N), each of them is further indivisible; 2) a system has a variety of system-created relations (S) between elements and their interrelated groups; 3) the system is

characterized by emergence: the system is not just the sum of elements and sybsystem, but their unity characterized by certain integrality and new traits of unity ; 4) geographical systems have equipotential features: each geographical object might be explored as a geographical system composed multiplicity of elements, and at the same time as one of the components of the more general (embracing) geographical system (Topchiyev, 2009).

Synergetic approach. Synergy is defined as a science about interaction elements in systems and about system self-organization (Haken, 1980). First of all, the synergetic approach provides consideration of internal interaction in a system, internal resources and mechanisms caused by evolutionary potential of the system. It encourages counting as much as possible number of operating factors and processes to cover functional environment as wide as possible where studied processes and phenomena occur. Cause the the term "social infrastructure" is heterogeneous and complex, the given object is necessary to investigate in terms of interdisciplinary positions, from different perspectives.

The information approach provides the research of information exchange features in the system and between systems. The approach is actual because information is a universal substance circulating in all channels of connections of the socio-geographical system, and providing mutual adaptation of elements and subsystems, development and functionality of the system as a united formation.

The idea of information exchange in social systems has the following points. A large number of various information is generated, transferred and received during speaking (information exchange) between separate people and society aimed at achievement of different purposes, e.g. expected results of the information exchange. The purpose defines character of the information generated, a way of its transfer, preparation and transformation of the information, as well as the final result. Transformation of the information is conducted in such way: structural – monitoring – operational – managing – structural information (Niemets and Niemets, 2013).

The historical approach involves the study of geographical features in development. The essence of this approach is the following: all phenomena and events are considered as processes – in time and space. This allows identifying the effect of factors in time and the object of the study is presented not as a time slice process in a fixed time , and as a highlighted stage of the process in respect of which background is known and might be predicted a possible variant of the developments in the future, to make a prediction. According to the modern synergistic ideas any events have information "germs" in the past. The approach has been applied in the analysis of the dynamic of indicators determining activity of the service sector enterprises (Niemets and Niemets, 2013).

The technique of the social and geographical studies of the social infrastructure has different characteristics. Thus, V.V. Sulzhenko (1994) developed the research technique of the population demand on services consumption for Chita region (Russia). A formula for calculating changes in consumption of certain goods and services has been worked out, based on the volume of services and goods consumption for the previous period, elasticity of consumption depending on changes in prices, supply, demand factors, as well as for prediction consumption volumes. V.A. Donskoy (1994) using statistical data identified a group of the grassroots service centers in each administrative district of Krasnoyarsk Territory (Russia), which had a maximally truncated set of the daily demand services. It was about towns with populations of 50-200 people, where there were retail outlets, health posts (any health care institution) and a school, but not together in all three species. D. Sokolowski (2005) studied the changes in the structure of services in the Polish cities during the system transformation. The study was conducted according to the general industrial classification of economic activities within Europe and in Poland by category containing indicators of employment in each sector from 1993 to 2001. Using the method of localized coefficients it was estimated whether a certain type of a service covers, or some kind of service only in a

city, the section of cities, or larger territory. Y.M. Zelenyuk (2006) in her works conducted a comprehensive analysis of the formation and development of the territorial organization of social infrastructure of the Cheremhovsky-Irkutsk district (Russia) with the discovery of relationships with current demographic and socio-economic processes. She was also clarified that the territorial system of cultural, health care and education of this district were formed by the classical scheme of mutual occurrence of different settlements by hierarchy into a united system of the resettlement and service. The B. Dale and P. Sjoholt's (2007) paper dealt with the changes in the system of central places in the county Trøndelag, Norway, where the aim was to find central places in the region in 1964, 1984 and 2002. According to the author's definition, the central place of the city was a city that had 10 different services within the near distance. These were public, semi-public and private companies in 200 activities. The matrix of central places was built ranged horizontally by size and vertically by frequency of the service functions (activities). The matrix showed central places where each kind of the services activity and the number of units in each type has been found.

An important aspect of the social infrastructure research is typing of the region's administrative units. But each scholar highlights groups of districts by various methods. Thus, M.O. Baranovskiy (1992) identified five types of Chernihiv region's administrative districts by different conditions for the organization of mobile services based on cluster analysis. He has been also estimated optimality of the existing service centers hierarchy using the theory of central places. Y.M. Zelenyuk (2006) defined 3 districts and 3 zones of Cheremhovsky-Irkutsk region using the method of integrating heterogeneous values: indicators characterizing activity of the social infrastructure enterprises were divided into appropriate baseline value (the average indicators for Irkutsk region and a district of the study). L.G. Kalashnikova developed typization of the administrative districts of the Republic of Mordovia, based on integrated assessment of the level of health care, rural education system, housing and communal service. Having conducted multidimensional, combined statistical and cluster analysis she highlighted four levels of the development separately for health care, education and housing and communal service in the Republic of Mordovia, as in previous cases: from low to high ones. I.V. Zapototska (2008) carried out clustering of the Cherkasy region's administrative districts (Ukraine) by the development level of socio-cultural and socio-domestic spheres using integrated scoring to have allowed highlighting 5 clusters of districts (from the highest to the lowest level of social sphere).

S.M. Zhovnir (2008) using the theory of central places carried out typization and ranking of the service centers (SC) of Vinnytsia region (Ukraine) based on results grouping of settlements by number of population, administrative status, functional types, complex assessment of the factors were determined the nature and range of services provided in service centers of each rank. She indicated 7 ranks (they correspond to the settlements hierarchy – from the capital (the city of Kyiv), the regional center to small villages). The O.G. Kornus' paper (2009) dealt with the grouping of Sumy region's districts with help of cluster analysis, and she was identified two types of districts, and subtypes of districts by the features of service sector development. Having conducted ranking of districts by indexes and ratings (using the method of linear scaling) the author identified five groups of districts within each subsystem (housing and communal service, consumer service of the population, educational services, medical service, hotel, restaurant and trade service, transport service and communication, social and cultural service).

Quantitative methods are applied actively in socio-geographical studies. J.N. Zelenyuk (2006) calculated the indicators of the average accessibility to a district center and concentration of the population around it. V.V. Sulzhenko estimated level of the population service, gave estimates of the accessibility of the social infrastructure facilities using relative indicators of the providing the population with services and social infrastructure facilities as indexes showing the ratio of formed potential of an industry with population needs in

services. Indexes system also was used by O.G. Kornus (2009), she established the ratio of the state of service industry between different districts of Sumy region. As well as she was defined the integral level of the service sector of the population development in a district by comparing the value of an indicator with the baseline level (the average or total regional indicator). The similar technique was applied by J.M. Zelenyuk (2006), and S.A. Chernyshev (2008). Kornus O.G. (2009) also has been calculated the index of territorial concentration of service institutions as the ratio of a number of the district's institutions to the area of territory.

Being studied the region's social infrastructure, sociologic surveys were used in some works to have been conducted with the aim to assess services accessibility of the population; factors affecting the services consumption; evaluation of the service producers activity, their quality; consumers perception of new services in urban and rural areas. It allowed conducting the subjective assessment of the social infrastructure and compare with the objective one (based on scientifically justified indicators). This technique was used in the works of S.M. Zhovnir (2008), O.G. Kornus (2009), N.G. Lukyanova (2011), L.G. Kalashnikova (2006), S.A. Chernyshev (2008) in which a questionnaire application was approved. The Czech geographer J. Spilkova (2005) in her work also carried out a survey in which representatives of the foreign companies engaged in industrial production and manufacturing services were asked to rank the territory of the Czech Republic, which, in their opinion, were the most appropriate for placing branches of foreign companies depending on the profile of their activity.

In the future research we will be applied methods worked out at the department for social and economic geography, and regional studies, V.N. Karazin Kharkiv National University. These are graph-analytical method for multidimensional classification of the socio-geographical objects and modeling the trajectory of the socio-geographical objects development.

The idea of the graph-analytical method for multidimensional classification of the socio-geographical objects is that the normalized multidimensional attribute space is projected onto the plane as a radar chart with normalized (in the range from 0 to 1) coordinate axes. Each described process (object) is displayed on the chart as a polygon (a number of angles corresponding to the space dimension) and optimization criterion is its area. The larger the area – the more progressive development. The described method is applied either to classify a set of socio-geographic features per a moment of time or to study their dynamics. This method can solve the optimization problem because the optimization criteria may serve a maximum or minimum of polygons area (Niemets and Niemets, 2013). It is possible to analyze, how the indicators characterizing the social infrastructure are differed from one another during period of time (we will consider the period from 2007 to 2012), per year or by components (subsystems of education, health care, trade, etc.).

The method of modeling the trajectory of the socio-geographical objects development is applied for determining territorial disparities in the region's social infrastructure development. The normalized multidimensional attribute space is represented as a hypercube, where the origin is a point {0, 0, 0 ..... 0}, which is regarded as the point of minimum and the end point is a point with coordinates {1 , 1, 1 ..... 1} as a point of maximum development. It is obviously, the diagonal of hypercube connecting these opposing points, may be regarded as the shortest, the most efficient path of the development, or as an ideal trajectory of the development, based on it it is possible to evaluate the deviation of real trajectories of socio-geographical systems . The trajectory of socio-geographical objects movement in normalized multidimensional space is characterized by two sets of indicators: a) the direction of movement, and b) linear parameters.

The first set of indicators includes cosines of angles formed by a segment of the trajectory (or a vector that is a tangent to it at this point) with the trajectories of other objects,

or other directions, such as medium, optimum or project (forecast) trajectory. The second set of indicators is given by many different linear characteristics of the trajectory : a) a path (ΔL), passed by the socio-geographical object for a certain period of time; b) speed of movement; c) the distance from the origin to the current point of the trajectory (L0); d) the distance from the current point to the end point of the trajectory (L1); d) the progress ratio (L0/L1), characterizing the rate of movement of the socio- geographical object from the initial to the final point; f) the distance from the current point of the subsystem (urban districts) trajectory to the trajectory of the more general system (the city); i) the distance between the current points of trajectories of different subsystems (urban districts). The Fig.1. shows distribution of the district socio-geographical systems by the cosine of the angle with respect to the optimal trajectory for the local block of indicators as one example of graphical representation of this method (Niemets and Niemets, 2013). This method was tested in the thesis of A.M. Samoilov on "Social security of a regional socio-geographical system (based on example of Kharkiv region)" (Samoilov, 2012). In our study, instead of blocks like agriculture, population, infrastructure, education, health care, environment years or subsystems of the social infrastructure can be identified.

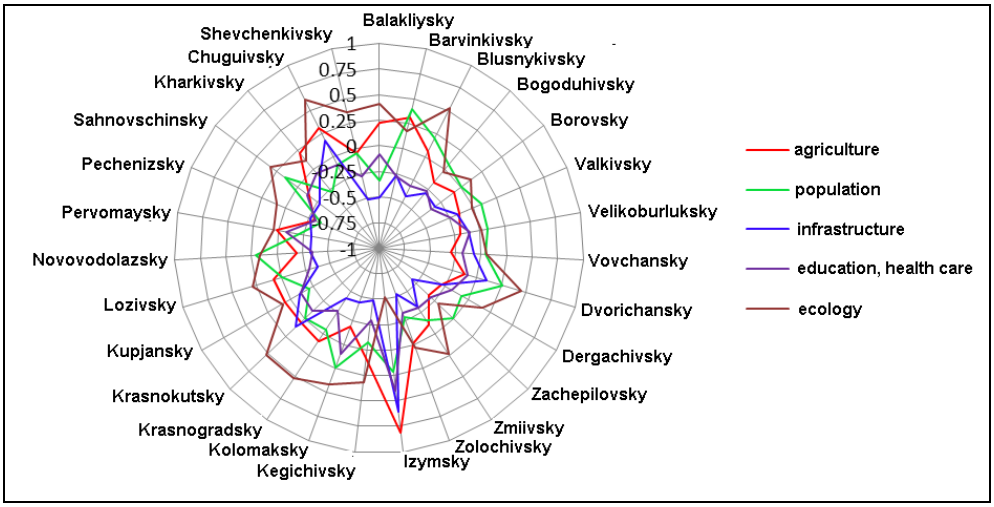


Figure 1 Distribution of the district socio-geographical systems by the cosines of the angle in respect to optimal trajectory by local blocs of indicators (2008 – 2009)

Source: Samoilov, 2012

CONCLUSIONS

Thus we can conclude that territorial disparities of the social infrastructure development are studied by such branch of human geography as geography of service industry. The conceptual apparatus includes such terms as "a service", "service industry of the population", "social sphere", "social infrastructure". There are four approaches to understanding of the concept "social infrastructure" and the own definition of this term from the point of view the system approach and the concept of the socio-geographical system. The functional and sectoral structure was determined to be represented by sectors, subsystems of the service sector of the population (social infrastructure); the territorial structure is presented by centers of various rank (points, centers, nodes) and territorial service systems, districts; the administrative

structure is formed by sectoral departments of regional, district state administrations, commissions of the regional, district and village councils.

The socio-geographical study of the social infrastructure is based on geographical, system, synergistic, informational and historical approaches. The technique of the social and geographical studies of the social infrastructure has different characteristics. In different works features of the population consumption of a region, the structure of employment in the production of services in the region are studied, typing of the region's districts is carried out based on cluster analysis, linear scaling, and etc. The quantitative methods have been considered which are used in the social and geographical studies of the social infrastructure – the linear scaling method, calculation of the territorial concentration index of service institutions, etc. Also graph-analytical method for multidimensional classification of the socio-geographical objects and modeling the trajectory of the socio-geographical objects development have been explored. Such theoretical socio-geographical studies of the social infrastructure are very important, because they classify various approaches to the understanding of this concept, techniques, and it is possible to work out a unified interpretation of the term, to develop new techniques to be allowed offering practical ways to optimize social infrastructure at the regional level for ensuring an appropriate level and quality of life.

REFERENCES

Alaev, E. (1983) *Socio-economic geography: the conceptual and terminological dictionary*. Moscow

Alekseev, A. – Kovalev, S. – Tkachenko, A. (1991) *Geography of service industry: basic concepts and methods*. Tver State University, Tver

Baklanov, P. (1986) *Spatial production systems*. Moscow

Baranovsky, N. (1992) *Territorial organization of service mobile forms in rural area of Chernihiv region*. The abstract for the Degree of PhD in Geography, Kyiv

Chernyshev K. (2008) *Socio-cultural service as a factor in improving the quality of people's life*. The abstract for the Degree of PhD in Geography, St. Petersburg

Dale, B. – Sjoholt, P. (2007) The changing structure of the central place system in Trondelag, Norvay, over the past 40-years – viewed in the light of old and recent theories and trends, *Swedish Society for Antropology and Geography*, 89B, 13-30.

Donskoy, V. A. (1994) *Territorial organization of the service sector of the population of the Central Krasnoyarsk economic and geographical area*. The abstract for the Degree of PhD in Geography, Irkutsk

Efremov, M. (2009) Infrastructure of the national economy and its role in social and economic development of Russia. *Bulletin MarSTU, Economics and Management,* 3, 55-61.

Fellmann, J. – Getis, A. – Getis, J. (2003) *Human geography: landscapes of human activities*. McGraw-Hill Higher Education, Boston – Burr Ridge – Dubuque

Gritsay, J. (2011) *Management of the social infrastructure development in a region (based on example of the Western North Federal District)*: The abstract for the Degree of PhD in Economics, St. Petersburg

Haken, G. (1980) *Synergetics*. Mir, Moscow

Kalashnikova, L. (2006) *The research of the rural social infrastructure using mathematical-cartographic modeling*. The abstract for the Degree of PhD in Geography, Saransk

Kornus, O. (2009) *Territorial organization of the service industry of the population in Sumy region and ways of improvement*. The abstract for the Degree of PhD in Geography, Kharkiv

Lukyanova, N. (2011) *Spatial differentiation of the large city's social infrastructure: based on an example of Smolensk*. The abstract for the Degree of PhD in Geography, Smolensk

Merkusheva, L. (1989) *Geography of service sector of the population*. Publishing of Krasnoyarsk University, Krasnoyarsk

Niemets, K. – Niemets, L. (2013) *Spatial analysis in human geography: new approaches, methods, models*. V.N. Karazin Kharkiv National University, Kharkiv

Pistun, N. (1996) *Fundamentals of the theory of human geography*. Vysha Shkola, Kyiv

Pitzl Gerald, R. (2004) *Encyclopedia of Human Geography*. Greenwood Press, Westport – Connecticut – London

Pokshyshevskyy, V. (1972) *Geography of service industry*. Moscow

Saushkyn, Y. (1973) *Economic Geography: History, Theory, Methods*. Practice, Moscow

Shabliy, O. (2003) *Fundamentals of General Human Geography*. Publishing office of Ivan Franko Lviv National University, Lviv

Sharygin, M. (2007) *Modern problems of economic and social geography*. Perm State University, Perm

Sokolowski, D. (2005) Changes of service structure in Polish cities during system transformation. *Bulletin of Geography (Socio-economic series)*, 4, 183-190.

Spilkova, J. (2010) Foreign firms and their perception of region in the Czech Republic: manufacturing industry versus producer services. *Acta Unversitatis Carolinae Geographica*, 1-2, 109-122.

Sulzhenko, V. (1994) *Territorial organization of the social infrastructure in Chita region in conditions of the transition to market economy*. The abstract for the Degree of PhD in Geography, St. Petersburg

Topchiev, O. (2009) *Socio-geographic research: methodology, methods and techniques*. Astroprint, Odessa

Troshev, D. (2004) *Territorial analysis and diagnosis of the service industry of the rural population in Perm region*. The abstract for the Degree of PhD in Geography, Perm

Tsutsieva, Z. (2012) *Geography of the social infrastructure in North Ossetia*. The abstract for the Degree of PhD in Geography, St. Petersburg

Vias, A.C. (2009) *International Encyclopedia of Human Geography*. Elsevier Ltd, Amsterdam – Oxford

Warf, B. (ed) (2006) *Encyclopedia of Human Geography*. SAGE Publications, Thousand Oaks, London, New Delhi

Zapototska, I. (2007) *Territorial organization of the social sphere of Cherkasy region and the major directions of its improvement*. The abstract for the Degree of PhD in Geography, Kyiv

Zelenyuk, Y. (2006) *Territorial organization of the social infrastructure in the Irkutsk-Cheremkhovsky economic district*. The abstract for the Degree of PhD in Geography, Irkutsk

Zhovnir, S. (2008) *Social and territorial organization of the services industry in a region in conditions of market transformation (based on an example of Vinnytsia region)*. The abstract for the Degree of PhD in Geography, Kyiv

Central European Regional Policy and Human Geography	Year IV, no. 1, **2014**, pp. 17-37.
HU ISSN 2062-8870, HU E-ISSN 2062-8889	Article no. 2014-2

SOCIO-GEOGRAPHICAL RESEARCH ON INDUSTRIAL AGGLOMERATIONS IN UKRAINE

Alexander V. GLADKEY, Acad.
University Professor, Taras Shevchenko National University of Kyiv, Ukraine
E-mail: gladkey_alex@univ.kiev.ua

Victoria GLIBOVETS, PhD
Assistant, Taras Shevchenko National University of Kyiv, Ukraine

Abstract: This paper presents the theoretical and methodological fundamentals for socio-geographic studies of industrial agglomerations. In this paper, we describe the essence of industrial agglomerations and the general principles of their formation and development. We also analyze several methodological approaches to conducting research on industrial agglomerations and suggest methods of delimitating industrial agglomeration territories. The paper includes a regional analysis of economic efficiency of industrial production in Ukrainian agglomerations. It also provides a study of the peculiarities of their sectorial and territorial structures as well as the principal directions for territorial agglomeration effect optimization.

Keywords: Industrial agglomerations, Ukraine, economic efficiency, territorial agglomeration effect, territorial structure, regional analysis

* * * * * * *

INTRODUCTION

In the contexts of developing market relations, ongoing transformations in the functional structure of Ukraine's economy, expanding international cooperation, and the country's growing integration into world trade and economic associations, Ukraine is now faced with the need to create new territorial forms of industrial activity that would be innovative, market-oriented, and self-contained. These territorial forms of industrial activity should operate on high technologies, have high levels of profitability and economic efficiency, and produce competitive products. Some scholars believe that all these requirements could be met by industrial agglomerations as they possess all the above mentioned features due to a specific agglomeration effect that inevitably develops on their territories. Taking into account the reasons listed above, we may say that today socio-geographical studies of industrial agglomerations in Ukraine are of particular topicality.

PURPOSES AND TASKS OF THE RESEARCH

The purpose of this research is to develop theoretical and methodological foundations for socio-geographical studies of industrial agglomerations and to test them using the example of

Ukraine. The research task is to identify ontological prerequisites for agglomeration formation and growth, define the essence of agglomerations, elicit principles of their development, classify them, establish the stages of studying agglomerations, identify and systematize methods of socio-geographical research, analyse conditions, factors, structural changes, and peculiarities of securing economic efficiency of industrial agglomerations in Ukraine, and finally make some forecasts as to their future development.

THEORETICAL AND METHODOLOGICAL FRAMEWORK

A comprehensive study of industrial agglomerations presupposes the definition of their essence, the identification of principles of their formation and development, and the establishment of scientific approaches to their classification. Hence, the first issue we shall deal with is the analysis of ontological foundations for the formation and development of cities and agglomerations. It should be noted that a number of philosophical, sociological, geographical, and economic schools see the city as a highly concentrated integrated settlement that has high evolution rates, causes significant changes in natural environment, houses a large number of people, the vast majority of whom are not engaged in agriculture, and is notable for the prioritized character of its formation as well as the application of market-based instruments of economic management. Big cities usually have as their core industrial principles of economic development. Their growth is based on the effect of production scale, the use of natural and human resources, deep industrial specialization, close industrial and infrastructural connections that enable the formation of industrial units, according to Drepper (1875), Galich (2003) and Gladkey (2008).

The ontological essence of agglomeration rests on its understanding as a compact and deeply integrated urban territory encompassing several cities of various ranks or functional types and characterized by the redistribution of economic functions among central and peripheral areas and the modification of economic efficiency formation mechanisms (Clark, 2003. At the same time agglomeration cores are distinguished by exceptionally high rates of anthropogenic landscape alteration, densely concentrated population settlement patterns, rapid development of dynamic market environments, their pioneering progress-oriented nature, their modularity, representativeness, etc. They are formed on the principles of post-industrial economy with the emphasis on activities connected with social industries, market infrastructures, science, information, and communication, creating thus extra competitive advantages for their economic development and securing higher standards of living for their citizens. Peripheral areas are in their turn characterized by a more intense industrial development if compared with agglomeration cores, as the agglomeration effect allows them to offer better economic conditions for such development (Agafonov, 1987; Babanskii, et al., 1966; Dotsenko, 2007; Litvinenko, 1980; Pidhrushnyy, 2007Topchiyev, 2005).

STAGES OF SOCIO-GEOGRAPHICAL RESEARCH

This understanding of the essence of industrial agglomerations is the result of multi-stage socio-geographical studies that have been conducted on this subject. For practical purposes, the evolution of socio-geographical research on industrial agglomerations should be divided into two periods. The first, industrial, period involved such stages as definition of the essence of agglomerations and agglomeration processes (general descriptive stage), detailed empirical studies of industrial development of cities and urban agglomerations (statistical and empirical stage), analysis of the economic categories of agglomerations development, instruments and factors of profit generation in agglomerated enterprises (economic and

theoretical stage), studies of the influence urbogenesis and settlement system have on industrial production agglomeration effect (geourban stage), conceptualization of doctrines on territorial production complexes, energy-production cycles, and the system of productive, technological and infrastructural connections in industrial production (stage of complex formation), elaboration of the concept of regional and urban planning of industrial agglomerations (district planning and urban development stage), studies of competitive advantages of industrial development when enterprises are concentrated on relatively small territory (cluster analysis stage). However, it is only during the post-industrial stage of socio-geographical research development that industrial agglomerations start to be seen as cores of deep social changes in the society, as well as cores of general development of social industries, market and commerce activities, technical innovations, and information technologies that serve as a basis for modern high-yield industrial production modules (Baburin and Kolomiec, 1997; Marynych, 1989; Rudenko, 2007; Tron'ko, 1968; Vakulenko et al., 1997).

ESSENCE OF INDUSTRIAL AGGLOMERATIONS

Having analysed the materials above we are now able to outline the following distinctive features of industrial agglomerations as special forms of territorial industrial concentration: 1) presence of a large multi-functional city (or a group of cities) performing the functions of a core and a centre of industrial gravity, 2) presence of highly urbanized agglomeration areas with increased abilities to assimilate and adopt the agglomeration effect, 3) establishment of high absolute rates of industrial production development, 4) prevalent development of highly specialized science-based industry modules, 5) development of a specific territorial agglomeration effect (Bechmann, 1995; Henderson, 2000; Thisse and Fujita, 2004).

Thus, an industrial agglomeration is a form of spatially concentrated industrial production complex formed on the basis of concentrated urban settlement systems and characterized by its considerable economic development efficiency that rests on the exploitation of specific social and economic advantages of this formation. Industrial agglomerations are distinct in their specific systems of territorial settlement, industrial production, natural environment, as well as their social and economic systems, which emphasize their integrated modular nature and densely concentrated form, as well as the substantial alterations they cause in their territorial surroundings. Industrial agglomerations differ from industrial hubs both quantitatively and qualitatively in their urbanization processes, population settlement patterns, industrial development, their genesis, the prevalent factors of their development, their industrial functions diversification levels, their peculiar forms of territorial concentration of industrial production, and the instruments of their economic efficiency generation.

The specific features of industrial agglomerations set a base for the territorial agglomeration effect (Agafonov and Islyaev, 1987; Fujita et al., 1999; Ishchuk, 2003; Kuzminska, 1981; Thisse and Fujita, 2004). This effect is generated by enhanced provision of agglomerated enterprises with land resources and labour forces on the peripheral territories and high levels of engineering service, and is maintained by means of securing the enterprises' proximity to the lines of communication and establishing their close cooperation with the social complex of the agglomeration core. This results in reduced manufacturing time and costs, improved infrastructural services, increased efficiency of information resources and technological innovations exploitation etc.

LAWS AND PRINCIPLES

Having analysed a vast body of both Ukrainian and international socio-geographical studies of industrial agglomerations (Agafonov and Islyaev, 1987; Blasio, 2005; Brunello, 2007; Krugman and Fujita, 2004; Pontes, 2005; Richardson, 1995; Shabliy, 2001; Sluka, 2006; Tarasova et al., 2005) we singled out the following laws of their formation: 1) the law of territorial concentration of production around agglomeration cores and arteries, 2) the law of increased production diversification and specialization, 3) the law of growing regional competitiveness of industrial enterprises in oligopolistic agglomerations, 4) the law of growing numbers of working places closer to the agglomeration core and the growing amount of funds closer the peripheral areas, 5) the law of decrease in economic efficiency of industrial production from the agglomeration centre to its periphery, 6) the law of increased multi-industry economic efficiency in areas close to the agglomeration core, 7) the law of growing industrial production modularity closer to the agglomeration core, 8) the law of intensified diversity of industries closer to the agglomeration core, 9) the law of intensified contacts and communication closer to the agglomeration core, 10) the law of reduced portion of low innovation extractive industries and the growth of modern science-based industries; 11) the law of proportionality and territorial complexity formation.

The basic principles of industrial agglomerations development are as follows: the principle of efficient exploitation of advantages created by the territorial agglomeration effect and industrial production specialization and concentration; the principle of giving priority to the development of science oriented industrial modules; the principle of government-backed support and economic stimulation of principal sectors of specialised industrial agglomeration development; the principle of promoting market-based mechanisms of industrial development; the principle of establishing unified systems of central and peripheral agglomeration areas management; the principle of implementing better social standards of living, environmental protection and ensuring rational exploitation of natural resources.

INDUSTRIAL AGGLOMERATIONS CLASSIFICATION

The theoretical analysis of industrial agglomerations formation would be incomplete without a survey of the existing scientific approaches to their classification (Clark, 2003; Sluka, 2006; Thisse and Fujita, 2004). We believe that the starting point for any classification of industrial agglomerations formation should be the definition of the type of social formation they exist in. The study of Ukrainian and foreign scholars' works on this topic shows that within the industrial agglomeration type there can be distinguished three basic subtypes, which are agglomerations formed in transition economies, agglomerations formed in new industrialization economies, and agglomerations formed in other industrial and agricultural economies. These subtypes may be further divided into historically formed agglomerations and developing agglomerations according to their respective degrees of maturity. Our research data allows us to classify the monocentric agglomerations of Kyiv and Kharkiv and the polycentric agglomerations of Donetsk-Makiivka and Dnipropetrovsk-Dniprodzerzhynsk as historically formed Ukrainian agglomerations, and the Ukrainian industrial agglomerations of Lviv and Odesa as developing agglomerations existing in transition economy.

The next stage of agglomeration classification involves the identification of prevalent factors of agglomeration development, whereas the last stage presupposes the identification of the principal specialization branches. The major factors of industrial agglomerations development are their specialization in extractive and low innovation manufacturing industries as well as low rates of market instruments implementation. Following the pattern

outlined above, we may distinguish the West European, North American, and Asian Pacific subtypes of post-industrial agglomerations. Their development factors include highly qualified labour forces, oligopolistic capital, modern information and communication technologies, innovations etc. The classification of agglomerations according to their territorial and structural features presupposes the analysis of their core structure (monocore, policores), the character of agglomeration areas development (monovector, polyvector, radial-circular, radial semi-circular, littoral, scattered), and the peculiarities of urbanization processes manifested in the formation of cities with different population numbers.

RESEARCH METHODOLOGY

Having analysed the principal methodological approaches to the study of industrial agglomerations we may now distinguish three major concepts of socio-geographical research on agglomerations. The concept of local territorial production complexes deals with the functions of agglomerations as complex-forming units, which they are able to perform due to their stable infrastructural and industrial territorial links, industrial cooperation and production combination within integrated energy production cycles. According to this concept, the efficiency of industrial agglomerations is generated by means of saving costs through production scale adjustment, integrated use of raw and waste materials, infrastructure and communications, wide specialization of enterprises, and a unified management system (Litvinenko, 1980; Ishchuk, 2003; Zaharchenko, 2004).

The concept of industrial clusters deals with the mechanisms of complementary economic effect generation resulting from the integration of closely situated enterprises of one industry on the basis of their common economic situation and close geographical connections, their united scientific and innovation bases, as well as the existence of a highly diverse product demand, intensified spatial competition, creation of affiliated enterprises and market infrastructure elements that are instrumental in enhancing competitive advantages of cluster industrial production. Furthermore, industrial clusters are characterized by the concentration of related modular enterprises operating on high technologies. Competing among themselves, these industrial enterprises secure high standards of production and economic efficiency (Clark, 2003; Pilipenko, 2005).

The concept of regional competitiveness has in its core the identification of features of industrial efficiency generation in the contexts of limited development resources, concentrated and differentiated industrial enterprises and labour forces, and the intersection of economic agents' business interests. Agglomerated environment benefits the development of high-yield, modular, innovative, and differentiated types of industrial activities that are distinguished for their considerable competitive advantages (Fujita et al., 1999; Krugman and Fujita, 2004; Ugryumova, 2005). This concept is the one that prevails among Ukrainian scholars who work in the contexts of globalization, changing social system, and market relations promotion.

For practical purposes industrial agglomerations should be considered within the framework of systematic structural analysis as the unity and opposition of their central and peripheral elements that can be witnessed by their component, territorial and management plans (Gritsay et al., 1991). The central areas of agglomerations accumulate large numbers of people and resources, generate innovations as well as market and business activities, and at the same time create a socially developed and highly communicative environment. They also perform market, entrepreneurial, credit, financial, banking, innovative, cultural, educational, intellectual, international, representational, informative, communicative, modular, industrial, infrastructural, municipal, and residential functions as well as functions of high

technology development and implementation, academic research conduction and social orientation. Peripheral agglomeration territories are characterized by intense industrial, residential, and infrastructural development and are intended for the maximum exploitation of agglomeration effects of the cores. The main functions performed by peripheral agglomeration territories are the innovative, modular functions and the function of low-technology production. Other their functions include the function of energy production, applied research conduction, as well as infrastructural, transport, communicative, innovative, agricultural, recreational, educational, cultural, residential, environmental, and specialized sports functions. Therefore, an agglomeration centre (core, cores) acts as the major generator of information, communication, credit and financial resources, as well as social transformations, innovations, market and business forces, progressive management practices etc. The more accessible these kinds of material and spiritual goods are, the more efficient peripheral zone industrial enterprises can be in their operation, while their land, labour or infrastructure expenditures are reduced.

It can be seen that, in terms of territory, industrial agglomerations also consist of central and peripheral elements. The specific natural, social, and economic conditions of their integration determine the existence of several functional and territorial structure types of industrial agglomerations. These types are the monocentric (radial-circular, radial semi-circular, littoral, mono- and polyvector) and polycentric (polycore circular, polycore semi-circular, polycore littoral and polycore scattered) types. The monocentric type of the functional and territorial structure of agglomerations is represented by Paris, Detroit, Tokyo, Cairo, and Bombay agglomerations (Kyiv, Kharkiv, Odessa, and Lviv agglomerations in Ukraine), whereas Minas Gerais, Randstadt, Amsterdam- Haarlem, Norfolk-Hampton-Newport agglomerations (Donetsk-Makiivka and Dnipropetrovsk-Dniprodzerzhynsk agglomerations in Ukraine) are the examples of the polycentric type.

In terms of management, industrial agglomerations are governed by their central and peripheral authorities. The central authorities are supposed to combine their efforts so as to provide branches of activities responsible for securing the maximum agglomeration effect with the best conditions for their functioning, whereas the peripheral authorities focus on the adaptation, assimilation, and efficient exploitation of agglomeration effects of the core. Therefore, regional development management in industrial agglomerations should be aimed at discovering optimal ways of interaction between the centre and the periphery with regard to their principal functions and territorial structures.

THE METHOD OF DELIMITATION AND RESEARCH OF THE ECONOMICAL EFFICIENCY OF INDUSTRIAL AGGLOMERATIONS

There exist several principal concepts of determining boundaries of industrial agglomerations including the concepts of district and city planning, territorial and industrial, social and infrastructure, synergistic, or integrative, functional and communicative concepts and the concept of industrial clusters (Burian, 1973; Gladkey, 2008; Kuzminska, 1981; O'Donoghue and Gleave, 2004). However, none of the above-mentioned concepts can fully reflect the essence of industrial agglomeration processes or the specific features of agglomeration effect that evolves on their territories. The concept of economic (agglomeration) production efficiency we would like to present in this paper is based on the analysis of industrial efficiency rates determined by the territorial agglomeration effect (Gladkey, 2008). This concept of delimitating industrial agglomerations in Ukraine is our major patented idea and belongs to the author (Gladkey, 2008). Our concept is essentially different from the research conducted by Soviet scholars for, unlike the latter, it rests upon market instruments of economic management, regional competition development, prioritized promotion of

entrepreneurial activities in agglomerations, and general profit growth. In many of its aspects, this concept correlates with the findings of such scholars as Richardson (1995), Henderson (2000), Clark (2003), Thisse and Fujita (2004) and Krugman and Fujita (2004). However, it is distinct from them in the method applied to assess regional economic efficiency and delimitate agglomerations (Gladkey, 2008; O'Donoghue and Gleave, 2004) as well as in the conceptual understanding of efficiency generation processes in agglomerations (Gladkey, 2008; Kuzminska, 1981; Pilipenko, 2005;) and of the essence of the territorial agglomeration effect (Agafonov and Islyaev, 1987; Thisse and Fujita, 2004; Gladkey, 2008).

Analyzing previously acquired experience, we came to the conclusion that the most effective method of defining the measures of industrial agglomerations is the application of the concept of economical (agglomerative) efficiency of manufacture in conjunction with the analysis of its urban – localization characteristics, foundations to which were stated in the works of number of native (M. Agafonov, S. Ishchuk, V. Zaharchenko) and foreign scientists (M. Porter and M. Enright, D. O'Daunahugh, B. Glave, M. Fujita and J-F. Thisse).

According to this concept, setting the measures of agglomeration has to be based on the agglomerative effect which is formed around the central core (cores) and promote the increase of efficiency of industrial manufacture and the fullest and proportional usage of the advantages of the agglomerated allocation.

According to the concept of the industrial clusters by M. Porter and M. Enright, the surroundings of the industrial agglomerations is characterized with increased indexes of competition and economic efficiency of the management. Agglomerative effect of a territory stimulates the increase of the commercial income of an enterprise, growth of the indexes of the output of labour, profitability, efficiency of usage of the main means (capital productivity and equipment of the stock). These and other indexes that characterize the efficiency of the industrial manufacture have to be in the basis of defining the agglomerative effect and delimitation of the industrial-agglomerative formations. With their help we can define the level and the character of the agglomerative processes of particular territories, identify the agglomerated zone of the influence of a big city (groups of cities) as well as approach the development of effective ways of optimization of the functional structure of agglomeration.

We also need to mention that any big city has its own zone of impact in the measures of which the increased indexes of social-economic efficiency of allocation of a manufacture are formed. However, the agglomerated territory differs from the ordinary zone of impact because of its great possibilities for adequate perception and adaptation of the mentioned social-economical effect, as well as for production of its own social-economic advantages. These processes are possible only if there are highly - urbanized suburban territories around a big city namely the urban agglomeration. To consider the factor of an urban concept, the indexes of the efficiency of industrial manufacture have to be modulated by means of the matrix of the shortest distances to the centre of settlement system and to each of its elements in particular. Such elements can be performed by urban settlements and small towns (townships) that have industrial function.

It is advisable that the process of delimitation of the industrial agglomerations should be divided into few essential stages. The first stage of delimitation of the measures of industrial agglomerations of a particular territory (administrative area, region, autonomous republic or the whole county in general) is the gathering and processing of a needed statistical information about the development of industrial manufacture in particular small administrative areas, cities, small towns (if such materials are available). Materials of CTEA (Classification of Types of the Economic Activity) as well as the materials of regional and local yearly statistical summaries and the data of statistical local administrations can serve as the source of information. In our opinion, the absolute indexes of the development of industrial manufacture (amount of products sold, number of industrial – manufacturing staff, cost of

the main means of manufacture, net profit (income) from product realization, cost of products sold etc.) can serve as such data which will become the basis for calculation of the qualitative characteristics of the efficiency of manufacture afterwards.

The indexes of the industrial manufacture are calculated on the basis of the primal statistical data: the productivity of labor (as the part of the amount of the products sold and the number of industrial – manufacturing staff), overall profitability (part of net profit (receipts) and the cost of the products sold calculated in percentage), equipment of the stock (the part of the value of the main means and the number of IMS (Industrial – Manufacturing Staff) and the capital productivity (the part of the amount of the products sold and the value of the main means).

One of such indexes is the profitability of the industrial manufacture. It is defined as a percentage correlation of the net profit of a company and the amount of its expenses. If the profitability of a company is over 100 %, the company has a profit:

$$R = \frac{P}{S} \times 100\% , (1)$$

R – the profitability of an industrial manufacture, P – net profit (income) from the realization of product (goods, labor, services), S – the cost of the product sold (goods, labor, services) which is calculated according to the formula:

$$S = MC+LC+SC+AC+OC+IC+UC+TC, (2)$$

MC – material costs, LC – labor payment expenses (costs) , SC – contributions into social programs, AC – amortization costs, OC – operational costs, IC – other expenses, UC – uncommon costs, TC – income taxes.

In turn, the net profit (income) from the realization of products can be described with such economical indexes:

$$P = G+OG+IG+UG-UT, (3)$$

G – profit (income) the realization of product c OG – other operational incomes, IG – other common incomes, UG – uncommon incomes, UT – indirect taxes and other check – offs from the income. Sometimes, instead of a net profit, the other indexes of the profit of a manufacture are used: the amount of the products sold, GVA (Gross Value Added) etc. however, the first one does not fully reproduce the peculiarities of the formation of profit of a company, and the second one is not calculated by the governmental statistics throughout the local administrative areas and cities at the example of particular types of economic activity.

The economic efficiency of a manufacture is closely connected with the index of the productivity of labor which is based on the correlation of the amount of the elaborated (realized) products and the workforce applied. The productivity of labor is calculated with the amount of products or services made by a worker per unit of time:

$$LP = \frac{V}{L} , (4)$$

LP – labor productivity, V – the amount of the realized product (goods, labor, services), L – the number of working staff. For calculation of this index the materials of CTEA (Classification of Types of the Economic Activity) are used, which includes the overall value of a company. Moreover, the number of the working – manufacturing staff is calculated only

with the number of full time workers, as the official statistics only this type of index is available. The index of the productivity of labor marks the efficiency of the usage of the workforce in the company, decrease of labor capacity and the development of unification, automation, robotics, informatization, etc.

The equipment of the stock and the capital productivity plays a great role in defining the economic efficiency. The equipment of the stock, or the primary means equipment, is the amount of the primary means of a company valuable (financial) equivalent per one worker (of a manufacturing – working staff). It is calculated by means of the division of the average yearly value of the primary active means per the average yearly number of workers:

$$F_a = \frac{\bar{F}}{\bar{L}}, (5)$$

F_a – the equipment of the stock, F – average yearly book value of the primary active means, L - the average yearly number of workers (of a manufacturing – working staff). The index is used for the economic analysis of a manufacture's provision with the primary means as the basis of growth of the productivity of labor, revealing the reserves, taking measures in order to increase the efficiency of a manufacture, etc.

The capital productivity, or the productivity of the primary means, expresses the manufacturing relations to the economic efficiency of the usage of the manufacture means. The qualitative aspect of these relations reflects the criterion of the economic efficiency – the receiving of the maximal effect with the available or less available resources. Quantitative expression of the capital productivity is calculated with the correlation of the amount of the realized product (goods, labor, services) to the amount of means used for its receiving:

$$F_r = \frac{V}{F}, (6)$$

F_r - the capital productivity of a manufacture, V – the amount of the realized products (goods, labor, services) per a certain unit of time, F – the value of the primary means of manufacture used for the receiving the product per a certain unit of time.

At the second stage of the research, each index of the economic efficiency, at the example of particular areas and / or inhabited territories, has to be modulated with the help of the matrix of the shortest distances between them. Let us use the formula of the gravitational model which was first introduced by John Stuart in 1958 and complemented and developed in the works of our native scientists (Y. V. Medvedkov, O. A. Yevteyev, S. A. Kovalyov):

$$H_i = V_i + \sum_{j=1}^{n} \frac{V_j}{R_{ij}}, (7)$$

H_i – gravitational modulator of i – area of a territory (city), n – the total number of areas (cities) which are being researched, V_i – qualitative feature of the development of the industrial manufacture of other areas (cities) which are taken into the research, R_{ij} – the distance from i – area (city) to other areas (cities). To make the accurate calculations according to this formula, we created a computer program based on the Delphi programming language.

According to the researches done, this is the method that in the most adequate way reflects the level of the agglomeration (the formation of the agglomerative effect) of the industrial manufacture at the example of particular local administrative areas (as the basic points for calculation of the distances it is advisable to consider the administrative centers of the areas and non – administrative cities (city authorities) that develop within their borders). According to this method, we can identify those theories of a high level of the economic efficiency of a manufacture which were formed with the help of the agglomerative effect, putting aside the accidental indexes and those zones of an increased efficiency that have other non - agglomerative factors of the formation and development (in other words, that were formed within the areas of a special (free) economic zones, the territories of a priority development, on the basis of massive involvement of investments and labor resources, etc.).

The following stage of the research is the selection of the particular clusters of territories with a different level of agglomeration according to the modulated data. As our previous part of the research has showed, the usage of a classical cluster analysis, which is included to the standardized set of the statistical functions (for example, it is included to the package of computer programs of processing of the statistical material Statistica 6.0, developed by Statsoft, Inc. Company), has a low – ranged efficiency of application as it does not consider the possibility of the existence of nonlinear dependencies between the input data and the emergence of the agglomerated system.

In our opinion, more effective way of clustering has to be the construction of so – called 'cards of self – organization' by Kohonen, based on the grouping of a certain quantity of data with the help of Neural Network. This method carries out the clustering of the indexes on the basis of precise study of their connections not by means of the mechanical comparison of data but through the creation of complex nonlinear dependencies between input and output parameters. According to many scientists, the construction of clusters 'cards of self – organization' by Kohonen is the effective tool for analysis of the processes of dimensional interaction and interconnectedness of different processes and occurrences within a certain area.

Neural Network is the totality of neurons that interact between each other in some particular way. Each neuron has neuron fiber outgrowths (dendrite) of two types: few dendrites which receive the impulses (inputs, x) and one which transfers the impulses – axon (output, y). The last one contacts with the dendrites of other neurons through special formations – synapses, which affects the force of the impulse. When going through the synapse, the impulse changes a few times (weighting coefficient, w,). The impulses that enter the neuron at one time through the couple of dendrites are summed. If the summary impulse exceeds a particular limiting notch, the neuron becomes engaged, forms its own impulse and transfers it further through the axon. This is the same principle that the artificial Neural Networks operate, which allows us to calculate the output signal according to the sum of the input ones with considering the weighting coefficients. Kohonen's method allows us to run the multidimensional clustering of the regions according to the similarity of their indexes which characterize their development.

Construction of such cards provides the ordering of the structure of neurons into two – dimensional network with hexagonal or rectangular cells as a rule. Each neuron is the n – dimensional vector, the size of which is defined by the size of the output vectors. On every stage of studying the Neural Network one of the vectors is being selected from the input set of data, and then the search of the most similar vector of the coefficient of neurons is being made. During this process the 'winner neuron' is being defined, which is the most similar to the input vector and identifies to which class the sample belongs. Herewith, the similarity if defined as the Euclidean distance between the vectors. One cluster includes the vectors whose in - between distances within the group are smaller than the distances to the

neighboring groups. The computer software of this process is produced by the BaseGroupLabs Company and performed by the DeductorStudio 5.5 package of programs.

Processing of the modulated data of the economic efficiency of a manufacture (at the example of particular administrative areas and city council authorities) according to Kohonen's method allows us to mark out couple of groups of clusters which are characterized with a different level of agglomeration. Moreover, as the research shows, within the measures of a highly – developed mono - centric agglomerations of a metropolitan type, five clusters are being effectively defined: highly – agglomerated, medium – agglomerated, low – agglomerated, inclined to agglomerating and non – agglomerated territories. These agglomerations are characterized with a high level of development of the agglomerative effect as their core is a fully developed multifunctional city which is distinguished by an immense influence on the surrounding territories. Therefore, under this influence the zone of agglomerating significantly grows and differentiates into different clusters. But, in our opinion, only highly – agglomerated and separate parts of medium – agglomerated areas should be considered the territory of agglomeration of a metropolitan type. Low – agglomerated and inclined to agglomerating territories are characterized with a weakened display of the agglomerative effect and are not included to the zone of agglomeration. However, they have great perspectives to enter the number of the agglomerated territories, and this fact gives huge possibilities to prognostication of the ways of a further development of the industrial agglomerations.

In the conditions of agglomerative metropolitan type, as the research has showed, highly – agglomerated territories totally comprise to the industrial agglomerations, when medium – agglomerated ones comprise only partially, mostly within the measures of separate urban settlements, small towns and along the centripetal transport trunks. That is why it is advisably to carry out some additional researches among the medium – agglomerated agglomerations to define the level of the agglomeration of an industrial manufacture on the level of separate urban settled areas and small towns with industrial functions. The method of carrying out such kind of research for the agglomerations of metropolitan type totally correspond to the previous method. On its basis and according to the previously characterized levels of agglomeration (5 clusters), different groups of urban settlements (small towns) shall be defined, which will significantly complement and concretize previous researches.

A bit different interpretation of data of clustering according to the Kohonen's method of Neural Networks is typical for polycentric old – industrial agglomerations and for the agglomerations that are being formed. Firstly, as the research has showed, the territories of bottom administrative areas of those regions which hold previously mentioned agglomerations, should be divided onto four clusters: highly – agglomerated, medium – agglomerated, low – agglomerated, inclined to agglomerating and non – agglomerated territories. It is explained by the forming of a significantly smaller agglomerative effect if the areas of old – industrial development, as the core of the agglomerative formations of this type mostly contains not the fully developed and multifunctional city but the city with a distinctive industrial function (which is often of a monopolistic type) and insufficient development of socially and market – oriented functions. The zone of the agglomeration of such city has a considerably narrower territorial measures because of the weakened agglomerative effect and insufficient influence on the efficiency of the concentration of industrial companies.

Similar processes are typical also for the developing agglomerations but mostly because of insufficient concentration of those kinds of human activity that form significant competitive advantages of the development of industrial manufacture in the agglomerated territories (of a commercial, financial, banking activity, companies of market infrastructure, etc.). However, because of the poly – formation of such cores of agglomeration and the

development of a modular market – oriented manufactures, the zone of their influence can be wider than that of an old – industrial areas.

Secondly, the territory of an old – industrial agglomerations and the developing agglomerations is generally limited only by the areas of a high level of agglomeration because of previously mentioned reasons. In the medium – agglomerated territories the particular agglomerated settlements can develop, being closely surrounded by the areas of the previous groups. It is especially typical for the regions of a high level of the industrial development which not only the industrial agglomerations but also the other forms of local IC (Industrial Complex), (mono – and poly – cored industrial formation, industrial areas, etc.). In such territories the carrying of the additional specifying researches of the level of agglomeration at the example of particular city settlements and small towns are especially important. With their help we can concretize the measures of agglomeration, having divided all the settlements of highly and medium - agglomerated territories onto 4 clusters.

Thirdly, the delimitation of the measures of the industrial agglomerations that are being formed in the industrial areas, in the surroundings that is intensely saturated with different forms of local IC (Industrial Complex), has to end with the correcting clustering of the indexes of the economic efficiency of the manufacture of the urban settlements, modulated with the help of matrix of distances to the central core. These researches have a considerably smaller level of authenticity with a significant zone of agglomerating, as they produce a smaller diversification of data for clustering and do not consider the summary action of an urban surroundings. However, in the limited space of an old – industrial agglomerations, with an insignificant zone of agglomerating, in order to remove the zones of influence of other local TVK of a formational type in the final researches and to mark out the agglomerative ones, such correctional researches have their cognitive value.

The method of the delimitation of the measures of industrial agglomerations, introduce by us, is based on the precedent experience of our native and foreign schools of economic and social geography and the theory of regional economy. Its approbation at the example of industrial agglomerations of Ukraine brought some positive results and confirmed the cognitive value of previously proposed approaches. Yes, the measures of the agglomerations, defined according to the concept of rating the economic efficiency of a manufacture, generally match the researches of the past years of the following authors (S. I. Ishchuk, O. V. Gladkyi, E. K. Kuz'minska, R. I. Lytvynenko and others). The application of a given method can become an effective way of delimitation of the agglomerative formations and the increasing of the efficiency of functioning of an industrial manufactures on the basis of optimal usage of the advantages of agglomerative effect of territories.

DELIMITATION OF INDUSTRIAL AGGLOMERATIONS IN UKRAINE

We have performed our own delimitation of industrial agglomerations in Ukraine using the existing methods of agglomerations delimitation (Gladkey, 2008). Thus, if we take Kyiv agglomeration, we can distinguish there a group of highly agglomerated (Kyievo-Sviatoshynskyi, Vyshhorodskyi, Brovarskyi, Boryspilskyi, Obukhivskyi, Vasylkivskyi, Fastivskyi, and Kaharlytskyi) and mid-agglomerated (Borodianskyi and Makarivskyi) areas (Figure 1,2). The agglomerated cities of this agglomeration include Irpin, Vyshneve, Boyarka, Bucha (highly agglomerated cities) and Vyshhorod, Brovary, Boryspil, Vasylkiv, Ukraiinka, Obukhiv, Fastiv, Kaharlyk. Kharkiv agglomeration is also composed of both highly agglomerated (Kharkivskyi, Derhachivskyi, Chuhuyivskyi, Novovodolahskyi, Zmiivskyi, Pechenizkyi) and mid-agglomerated (Zolochivskyi, Valkivskyi, Kehychivskyi, Pervomaiskyi, Balakleiskyi, Shevchenkivskyi) areas. This agglomeration has within its boundaries highly

agglomerated cities of Derhachi, Liubotyn, Chuhuyiv, Zmiiv, Merefa, and Pivdenne, along with several mid-agglomerated cities such as Balakliya, Valky, Pervomaiskyi.

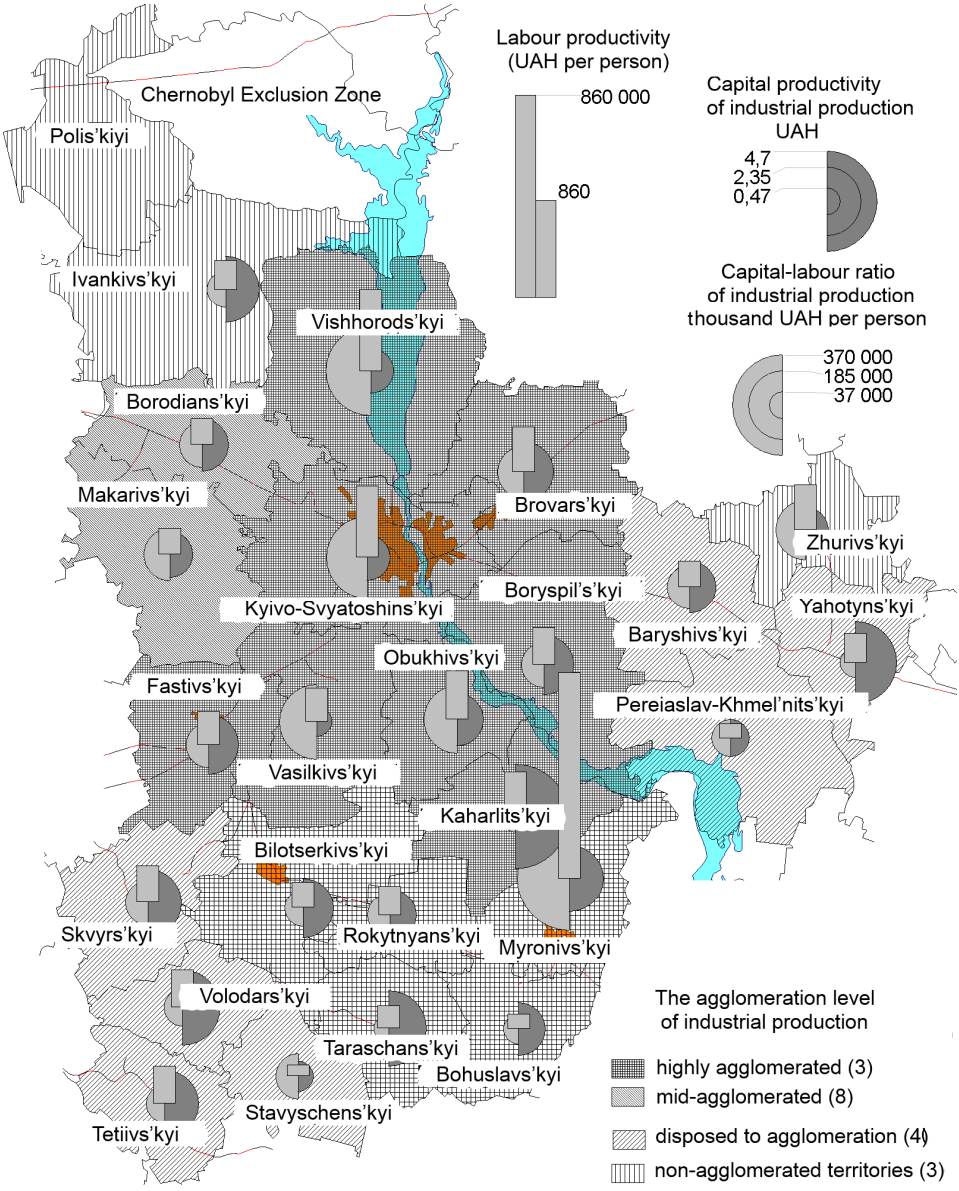


Figure 1 The delimitation of the territory of Kyiv industrial agglomerations

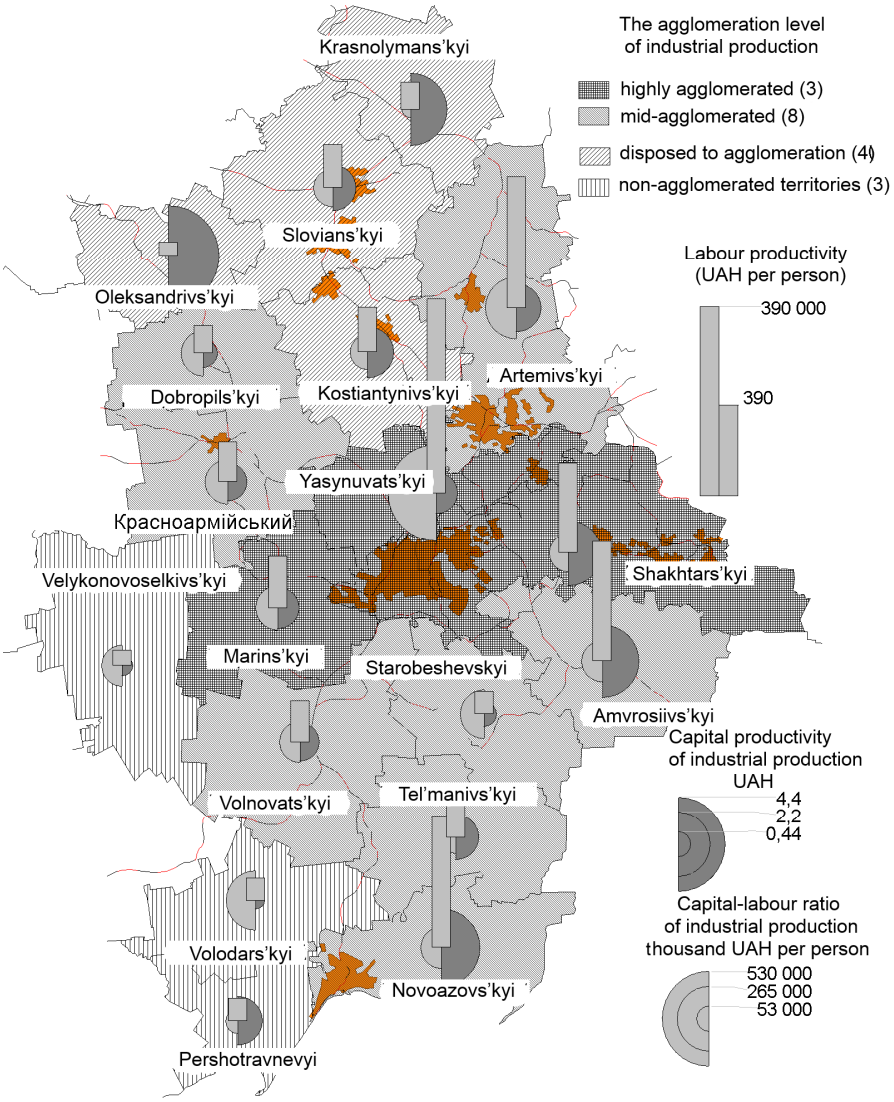


Figure 2 The delimitation of the territory of Donetsk- Makeevka industrial agglomerations

Lviv agglomeration, just like other agglomerations described above, has highly agglomerated (Pustomytivskyi, Mykolaiivskyi, Horodotskyi) and mid-agglomerated

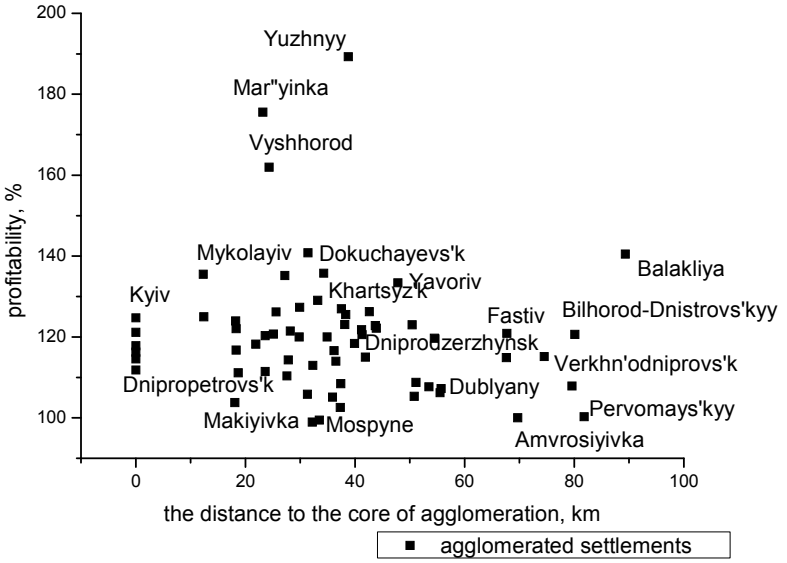
(Kamyanka-Buzkyi, Buskyi, Zolochivskyi, Peremyshlianskyi, Zhydachivskyi, Yavorivskyi) areas. The group of highly agglomerated cities in this agglomeration consists of the cities of Horodok, Pustomyty, Komarno, Mykolaiiv, whereas mid-agglomerated cities include the cities of Vynnyky, Dubliany, Zhovkva, Kamianka-Buzka, Bibrka, Yavoriv, Novoiavorivsk. The group of highly agglomerated areas in Odessa agglomeration consists of Ovidiopolskyi, Biliaiivskyi and Kominternivskyi areas with a single mid-agglomerated area being Bilhorod-Dnistrovskyi region. Its agglomerated cities are Yuzhnyi, Illichivsk, Teplodar, Biliaiivka and Odessa. Donetsk-Makiivka agglomeration is considered to cover the territories belonging to Donetsk and Makiivka city councils as well as Yasynuvata, Krasnohorivka, and Mariinka areas. This agglomeration includes the cities of Donetsk, Makiivka, Yasynuvata, Krasnohorivka, Marinka, Dokuchaiivsk, Khartsyzk, Mospine, Avdiivka, Ilovaisk, Zuhres, and Amvrosiivka (see Figure 2).

Dnipropetrovsko-Dniprodzerzhynskyi industrial agglomeration includes such highly agglomerated areas as Dnipropetrovskyi, Novomoskovskyi, Petrykivskyi regions as well as the mid-agglomerated regions of Krynychanskyi, Solonianskyi, and Synelnykivskyi. Among the agglomerated cities of this agglomeration one can find Dnipropetrovsk, Dniprodzerzhynsk, Pidhorodne, Novomoskovsk, Synelnykove, and Verkhnodniprovsk.

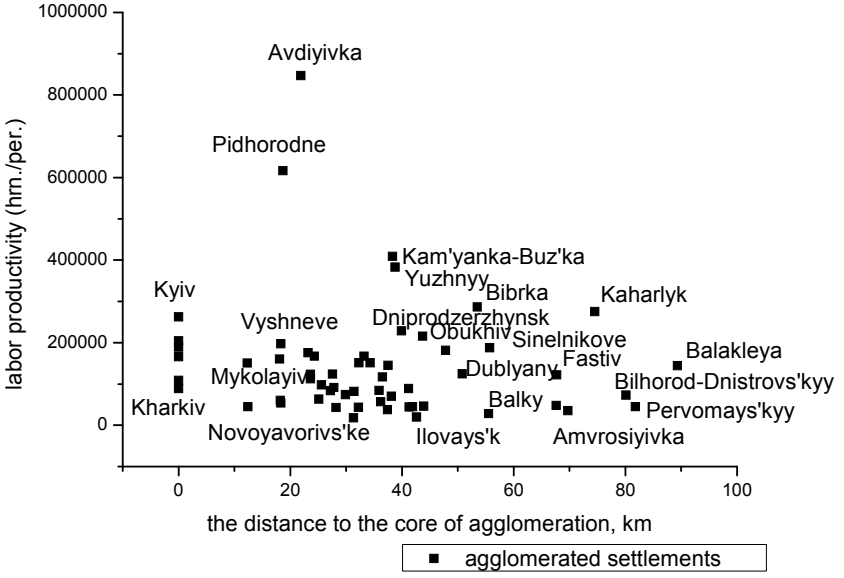
FUNCTIONAL STRUCTURES OF INDUSTRIAL AGGLOMERATIONS OF UKRAINE

Both sectorial and territorial industrial production structures of agglomerations in Ukraine show clear tendencies towards increased implementation of innovations, modularity, and sectorial diversity of industries, greater diversification of high technology commerce-oriented activities, ever growing importance of location centrality and territorial concentration of production facilities for cost efficiency generation (Rudenko, 2003; Rudenko, 2007).

Nowadays industrial agglomerations in Ukraine mainly specialise in food-processing industries, timber industries, electric power, gas, and water production and distribution. Furthermore, Kyiv, Kharkiv, and Odesa agglomerations also specialise in machine building industries, Lviv agglomeration specialises in light industries, Odesa agglomeration – in innovative chemical and petrochemical industries, Donetsk-Dnipropetrovsk and Makiivka-Dniprodzerzhynsk agglomerations – in metallurgical industries as well as mineral and fuel resources extraction. The rates of sectorial diversity of industries in Ukrainian agglomerations increase closer to agglomeration cores, which indicates how flexible and multi-component their sectorial structure is. Industrial efficiency rates tend to decrease slowly when moving away from the areas around the core, where they reach their peak (Figure 3). Agglomeration cores themselves also have lower industrial efficiency rates than the territories surrounding them (Gladkey, 2008).



a)



b)

Figure 3 Dependence of the level of profitability (a) and labor productivity (b) of the industrial production from the distance to the core of agglomeration

Industrial agglomeration labour force numbers are the largest in the vicinity of the cores, whereas peripheral territories located far from the core have the largest amounts of manufacturing facilities (Figure 4, 5). However, it does not concern median agglomerated settlements that have small resource volumes and labour force numbers due to the excessive production centralization performed on their territories in Soviet times and the outflow of mobile production resources to the areas around agglomeration cores (Blasio, 2005; Brunello, 2007; Dotsenko, 2007).

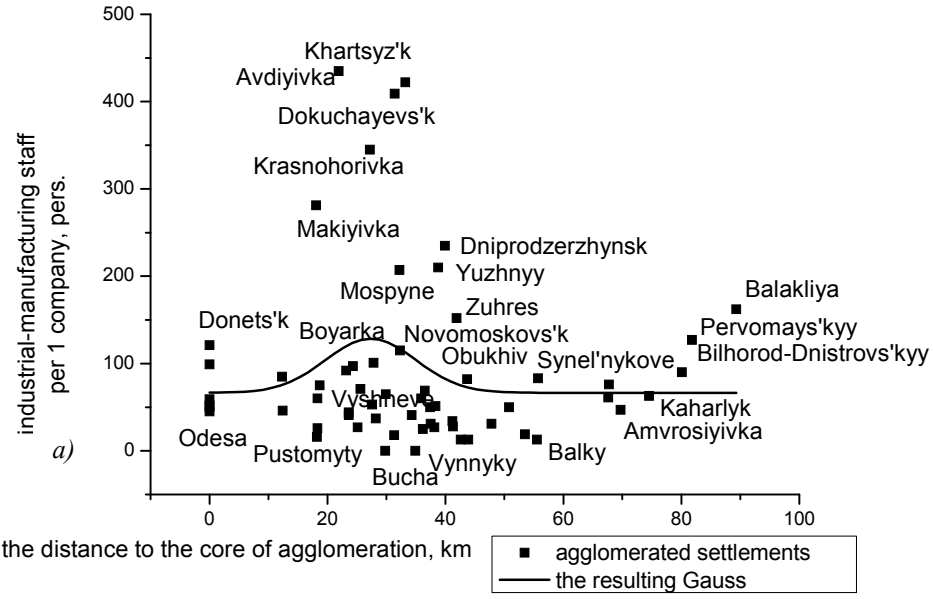


Figure 4 Dependence of the number of labour resources from the distance to the core of agglomeration.

The regularities outlined above show that Ukrainian industrial agglomerations form a special mechanism of labour force exploitation, which is characterized by certain structural disproportions caused by industrial enterprises being unable to take full advantage of the territorial agglomeration effect, agglomeration modularity, innovative business functions, and peculiarities of their competitive environment. Insofar as resource supplies of Ukrainian agglomeration settlements are concerned, the patterns of their growth in peripheral agglomeration territories that had been discovered earlier are in force, and only grow with the agglomeration settlements increasing vicinity to agglomeration cores, the causes of which had been explained earlier.

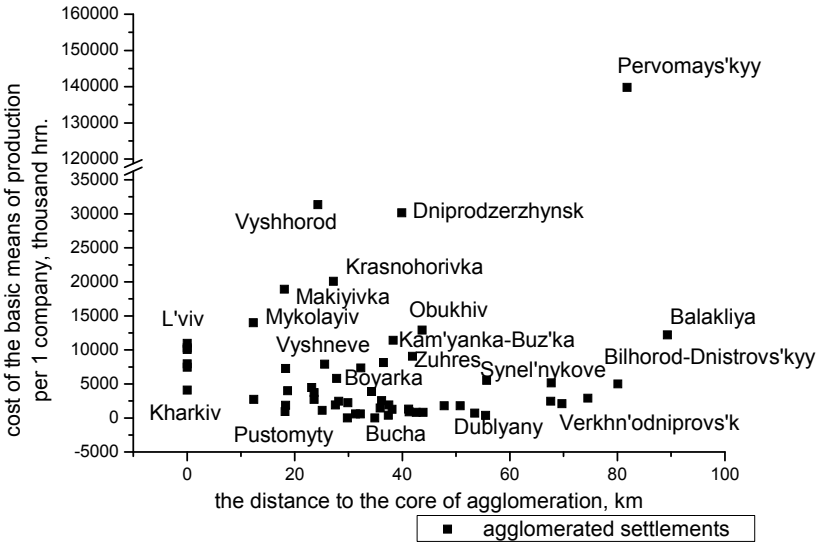


Figure 5 Dependence of the number of funds from the distance to the core of agglomeration.

TRANSFORMATIONS IN ECONOMIC EFFICIENCY OF INDUSTRIAL AGGLOMERATIONS IN UKRAINE

As Ukrainian economy transforms industrial agglomerations experience a significant increase in their industrial production rates in areas close to agglomeration cores, whereas these rates drop in peripheral areas. This shows that industrial development in agglomeration areas close to its core that benefits from the advantages of agglomerated placement is now uncontrolled (Gladkey, 2008; Zaharchenko, 2004).

Sectorial transformations of Ukrainian industrial agglomerations are manifested in increased absolute and relative development rates of commercially oriented agglomeration industries (food-processing industries, timber industries, mineral resources extraction, construction materials manufacturing, metallurgical industries, ready-made metal products manufacturing, light industries etc.), greater diversification of industries, higher rates of market-oriented activities development. Thus, monocentric agglomerations have considerably higher absolute and relative rates of food, metals, metal products, non-energy mineral products, and construction materials manufacturing. Ukrainian polycentric agglomerations are characterised by growing employment in and output volumes of metal industries, ready-made metal products manufacturing, energy resources extraction, production and distribution of electricity, gas, water, food, chemical and petrochemical products etc. (Zaharchenko, 2004).

Food processing industries, timber industries, non-energy mineral extraction and mineral processing, electricity, gas, and water production and distribution industries of Ukrainian monocentric agglomerations have high economic efficiency rates, not unlike Donbas and Prydniprovia regions of Ukraine, where the rates of economic efficiency of metallurgical, mineral extraction, food-processing and other industries are also quite high.

Moreover, innovative industrial branches have high efficiency rates if compared with other areas, although it should be mentioned that they are developing rather slowly and sporadically and the developing areas are usually the ones situated near the core (Rudenko, 2007).

FORECASTS FOR INDUSTRIAL AGGLOMERATION DEVELOPMENT IN UKRAINE

In order to identify the major directions of improvement in the functional structure of Ukrainian industrial agglomerations and to detect the patterns of its transformation induced by market instruments, we have conducted an expert (rating) evaluation of the prospective areas of industrial development in Ukrainian industrial agglomerations up till 2020 (Mezencev, 2004, 2005). Within the framework of this evaluation we have gathered data by suggesting leading scholars, professors, specialists in industrial production development within large cities and agglomerations to fill in our questionnaires. The respondents were asked to rate the current development prospects of certain industries in Ukrainian industrial agglomerations (up till 2020) using a 10-point scale (10 p. - Maximum 1 p. - Minimum).

The results of our research and experts' opinions indicate that the industries of innovative engineering (electronics, electrical engineering, professional equipment engineering, aircraft construction), new technologies (electric welding etc.), food-processing industries, innovative chemical industries, light industries, and construction materials manufacturing have the best forecast ratings within Kyiv agglomeration.

Kharkiv agglomeration is expected to specialise in highly innovative engineering, chemistry, construction materials manufacturing, light and food-processing industries. It is very attractive for potential Ukrainian and foreign investors, and could also attract the capitals of international companies and transnational corporations working in precision instruments and machine tools industries, as well as vehicles, tractors, agricultural equipment, aircraft manufacturing, armament industries etc.

Lviv agglomeration is expected to experience significant development of light, innovative engineering (electronics, electrical engineering, machine tools, and professional equipment engineering), chemical and petrochemical industries. The industries that would require some stimulation are timber, food-processing, and construction materials manufacturing industries. Enterprises of light, chemical, and petrochemical industries have rather high rates of economic efficiency in this agglomeration.

Odesa agglomeration has received the highest forecast ratings concerning its future food-processing (sea-based industrial complex, viticulture, and wine-making), light, chemical, petrochemical, innovative engineering, and shipbuilding industries development. The experts believe that in this agglomeration special attention should be paid to the formation of innovative high-yield chemical industries on the basis of raw materials from Odesa oil terminal and a number of petrochemical plants located in Yuzhne City and Kominternivskyi District.

The near future shall see Donetsk-Makiivka agglomeration maintaining its specialisation in ferrous and non-ferrous metallurgy, fuel and energy production, whereas metal-intensive mechanical engineering, professional equipment engineering, machine tools and construction materials manufacturing, light and food-processing industries would require some extra stimulation. Furthermore, Donetsk-Makiivka agglomeration would also need to reduce the number of its large, environment-damaging, power-intensive enterprises.

Dnipropetrovsk-Dniprodzerzhynsk agglomeration is expected to experience the development of its steel, innovative engineering, extraction chemistry industries. However, its construction materials manufacturing and food-processing industries would require more

stimulation. Moreover, the agglomeration's specialization in metallurgical industries should eventually be replaced by the development of innovative metallurgic technologies (innovative non-ferrous industries in particular), innovative engineering, chemistry and coke chemistry.

CONCLUSIONS AND PROSPECTS FOR FUTURE RESEARCH

Modern industrial agglomerations are the principal forms of settlement and territorial organization of economy. They create a number of social and economic advantages (based on their agglomeration effect), which allow certain industries to gain extra economic efficiency. Further studies of industrial agglomerations will contribute to the development of economies, strengthening competitive abilities of products, innovation activities stimulation, improvement of market relations, entrepreneurship, and competition.

REFERENCES

Agafonov, N. – Islyaev, A. (1987) *Laws and principles of siting and territorial organization of social production*. Nauka, Lviv

Babanskii, V. – Belousova, E. – Vishnevsky, A. (1966) *The Conurbations of USSR (Fundamentals and conclusions)*. NYYP Gradostroytel'stva, Kyiv

Baburin, V. – Kolomiec, A. (1997) Regional differences in the dynamics of industrial production in Russia. *Bulletin of Moscow University. Series 5. Geography, 4*, 50-54.

Bechmann, M. (1995) Economic Growth in a Central Place System. *In: Urban agglomerations and economic growth. (Publications of the Egon-Sohmen-Foundation),* Springer-Verlag, Berlin, 107-117.

Blasio, G. de. (2005) Do workers benefit from industrial agglomerations? *Journal of Regional Science*, 45(4),. 797-827.

Brunello, G. (2007) Do spatial agglomeration and local labor market competition affect employer-provided training? Evidence from the UK. *Regional Science and Urban Economics*, 37 (1), 1-21.

Burian, A. (1973) The delimitation of conurbations. Territorial system of production and resettlement. *In: Proceedings of the University of Perm, № 311*, Perm University Publishing , Perm, 15-19.

Clark, G. et al. (2003) *The Oxford Handbook of Economic Geography*. Oxford University Press, New York

Dotsenko, A. et al. (2007) *Settling in Ukraine: Problems and Prospects*. RVPS Ukrayiny NAN Ukrayiny, Kyiv

Drepper, J. (1875) *History of intellectual development of Europe*. St. Petersburg

Fujita, M. – Krugman, P. – Venables, A. (1999) *The Spatial Economy: Cities, Regions and International Trade*. MIT Press, Cambridge MA

Galich, Z. (2003) *City and urbanization - phenomena and paradigms of civilization*. Mysl', Moscow

Gladkey, O. (2008) *Scientific basis of socio-geographical studies of industrial agglomeration*. Obriyi, Kyiv

Gladkey, O. (2009) *Directions for use of the information environment in the development of design documentation for construction of industrial enterprises in industrial agglomerations*. Patent 41038 Ukraine, MPK (2009) G 06 F 17/00.

Gritsay, O. – Joffe, G. – Treyvish, A. (1991) *Center and periphery in regional development*. Nauka, Moscow

Henderson, V. (2000) *How urban concentration effects on economic growth? The World Bank development research group*. New York

Ishchuk, S. (2003) *Industrial Complex of Ukraine: the scientific basis of territorial organization*. Kyiv

Kuzminska, E. (1981) Industrial Agglomeration as a form of territorial organization of production. *Economic Geography,* 31, 22-25.

Krugman, P. – Fujita, M. (2004) The new economic geography: past, present and the future. *Papers in Regional Science*, 83. 139-164.

Litvinenko, R. (1980) Industrial agglomeration of USSR and prospects of their integrated development. *In: Main directions of integrated regional development (Miscellanea of scientific papers),* SOPS USSR AN USSR, Kyiv, 127-147.

Marynych, O. (1989) *Geographic Encyclopedia of Ukraine*. Kyiv

Mezencev, K. (2004) *Regional forecasting of socio-economic development.* Publishing center „ Kyiv University", Kyiv

Mezencev, K. (2005). *Human Geography Forecasting of Regional Development*. Publishing center „ Kyiv University", Kyiv

O'Donoghue, D. – Gleave, B. (2004) Note on methods for measuring industrial agglomeration. *Regional Studies*, 38 (4), 419-427.

Pilipenko, I. (2005) *The competitiveness of countries and regions in the world economy: theory, experience of small countries in Western and Northern Europe*. Ojkumena, Smolensk

Pidhrushnyy, G. (2007) *Industry and Regional Development of Ukraine (the theory and practice of social and geographical research)*. Abstract. Kyiv.

Pontes, J. (2005) Agglomerations in a vertically-related oligopoly. *Portuguese economic journal,* 4, 157-169.

Richardson, H. (1995) Economies and Diseconomies of Agglomeration. *In: Urban agglomerations and economic growth. (Publications of the Egon-Sohmen-Foundation),* Springer-Verlag, Berlin, 123-157.

Rudenko, L. (2003) *Ukraine: Industry and Investment Activities, Atlas*. DNVP „Kartohrafiya", Kyiv:

Rudenko, L. (2007) *National Atlas of Ukraine, Atlas*. DNVP „Kartohrafiya", Kyiv

Shabliy, A. (2001) *Human Geography: theory, history*. Ivan Franko National University of Lviv, Ukrainian Studies, Lviv

Sluka, N. (2006) *Current geodemographic trends in world cities*. Moscow

Tarasova, N. – Kalinichenko, I. – Hors'kyy, A. (2005) *Industrial Complex of Ukraine: economic transformation and development priorities*. Naukovyy svit, Kyiv

Thisse J.-F. – Fujita, M. (2004) *Economics of Agglomeration: cities, industrial location and regional growth.* Cambridge University Press, Cambridge

Topchiyev, O. (2005) *Socio-geographic research: methodology, methods and techniques*. Astroprynt, Odesa

Tron'ko, P. (1968) *History of the towns and villages of the Ukrainian SSR*. Home Edition Ukrainian Soviet Encyclopedia, Kyiv

Ugryumova, A. (2005) *Manage of economic growth of agglomerations (On an example of the Moscow agglomeration), Tutorial.* Moscow

Vakulenko, V. – Dekhtyarenko, Yu. – Drapikovs'kyy, O. (1997) *The economy of cities: Ukraine and international experience, Tutorial.* Osnovy, Kyiv

Zaharchenko, V. (2004) *Transformation processes in regional industrial systems of Ukraine*. Gipanis, Vinnitsa

Central European Regional Policy and Human Geography	Year IV, no. 1, **2014**, pp. 39-49.
HU ISSN 2062-8870, HU E-ISSN 2062-8889	Article no. 2014-3

CONSUMER HABITS FROM THE PERSPECTIVE OF THE GLOBAL ECONOMIC CRISIS IN EAST-CENTRAL EUROPE

Anikó KHADEMI-VIDRA
Faculty of Economics and Social Sciences, Szent István University, Gödöllő, Hungary,
E-mail: khademi.vidra.aniko@gtk.szie.hu

Abstract: The economic crisis does not exert its effects in a homogenous manner, due to different economic, social, commercial and socio-cultural factors affecting the various countries, they react in different "quantitative" and "qualitative" ways to the crisis. Consumers in the former communist countries had relatively simple shopping habits, but this is not valid anymore nowadays. However, we also have to consider that the occurrence of the crisis also changed consumer attitudes. The present study focuses on the Hungarian agglomeration zone, as compared to the Romanian, Slovakian changes in consumer habits and changes in the pre-crisis years.

Keywords: consumer behaviour, crisis, comparative research, East-Central Europe, trading zones

* * * * * * *

INTRODUCTION

The imprints of the global economic crisis appear complex: the crisis situation yields substantial inflation, fluctuation, and unemployment worldwide, and it restructures the market as well. These processes affected businesses in several ways that are best interpreted as obstacles: their presence – creating business insecurity and unpredictability – generated not growth, but constraint. The substantial general insecurity impacts individual paths of life as well: households will often try to minimize and rationalize their expenses by developing their own "crisis alternatives." In the European Union, and even in East-Central Europe, the crisis hit citizens of individual countries in differing measures. Several authors, for example Farkas (2012), establish that the measure of decline depended on the disequilibrium accumulated before the crisis. Thus the growth potentials of Poland, Slovakia, and the Czech Republic declined at a lesser rate (Végh, 2012), while Hungary drifted away from the Visegrád countries. The growth of Romania's economy continued following the 2007 EU accession, but due to the economic crisis the "ascending arc took a new turn" (Szőke and Végh, 2012). Hereinafter we describe in detail the Hungarian research ground's – Budaörs-Törökbálint-Biatorbágy – conditions before and after the crisis. Then, along the same dimensions, we present the results of the Hungarian, Romanian, Slovakian research within the framework of comparative analysis.

THE EFFECTS OF THE CRISIS IN EUROPE

The Euro zone is facing gloomy prospects these days. Many countries – primarily in Southern Europe – took constraining measures in order to reduce national debt, resulting in an increase in taxes and a decrease in wages, pension payments, and social services. In several European countries, the number of the unemployed workers is high, and the economy is declining.

The Spanish economy stagnated by 0.3 percent, the Portuguese by 0.8 percent between June and September in 2012 (Table 1). The gross domestic product (GDP) of France increased by 0.2 percent in the third quarter, compared to the previous 3 months – according to the French statistical office, Insee. According to the federal statistical office (Destasis), Germany's economic growth is primarily because of foreign demand (www.bbc.co.uk). One of the determining phenomena of background events explaining these figures is the increasingly uncertain standing of the European money-market. Ernst & Young has conducted a survey in six European countries – Belgium, France, Germany, Italy, Spain, and the United Kingdom - about bank clients' (individual consumers') relationship with their banks (level of satisfaction, intentions, future needs). Because of the depth and duration of the debt crisis, consumer confidence in banks has regressed dramatically.

Table 1 The distribution of certain European countries' economic growth rates in 2011 and 2012, %

	2011, 4th quarter	**2012, 1st quarter**	**2012, 2nd quarter**	**2012, 3rd quarter**
Euro zone	-0,3	0	-0,2	-0,1
Germany	-0,1	0,5	0,3	0,2
France	0	0	-0,1	0,2
Italy	-0,7	-0,8	-0,7	-0,2
Spain	-0,5	-0,3	-0,4	-0,3
Netherlands	-0,6	0,2	0,1	-1,1
Portugal	-1,4	-0,1	-1,1	-0,8

The results show that banks have to work very hard to measure up to the challenges and keep their clients. Today's economic recession has had a different effect on the citizens of individual countries: in the United Kingdom, more than half of those asked feel that their confidence in the banking sphere has decreased; in contrast, 60 percent of German respondents said that the crisis did not have any negative effect on the levels of confidence in banks. In many cases, to increase consumer loyalty and trust, banks have to work out new strategies for unsatisfied clients, and to prevent dropouts. Client dropout constitutes the largest risk in Spain, where every fifth client plans to modify its primary service provider. At the same time, France and Belgium seem to be less affected by the impact of dropout rates. (Ernst & Young 2010)

REPORT ON THE BUDAÖRS-TÖRÖKBÁLINT-BIATORBÁGY TRADING ZONE

There is an apparent spatial restructuring of previously flourishing and successful commercial spaces and zones due to the crisis. Located in Budapest's western agglomeration, the Budaörs-Törökbálint-Biatorbágy area (Figure 1) is a plastic example of crisis-generated phenomena: the once abounding area preferred by individual consumers and companies as well, i.e. the "golden triangle," is now – with the presence of fewer and fewer businesses – a crisis zone.

Figure 1a The Budaörs-Törökbálint-Biatorbágy suburban region (Budaörs)
Source: Google Earth

Figure 1b The Budaörs-Törökbálint-Biatorbágy suburban region (Törökbálint)
Source: Google Earth

Figure 1c The Budaörs-Törökbálint-Biatorbágy suburban region (Biatorbágy)
Source: Google Earth

At the end of the '80s, the structural collapse of the large-scale socialist industry at once created a new situation in Budapest: the system of workplaces was fundamentally transformed, as the big state-owned corporations were replaced by privately owned small and medium-sized companies. In the period when companies relying on fewer employees were being established, in the matter of days the rate of commuting dropped to zero or decreased radically, which led to the radical transformation of suburban areas (Sikos, 2009). Settlements in a favorable structural situation started growing dynamically and attracted developers, development resources, and capital to themselves. Budaörs, Biatorbágy, or Törökbálint started improving dynamically in this period. Commerce (TESCO, AUCHAN, CORA, IKEA, METRO, OBI, BAUMAX, BRICO-STORE, later the PREMIER OUTLET, GL OUTLET), the less environmentally damaging industrial parks (Biatorbágy, Törökbálint), or the subdivisions (among others in Biatorbágy, Budakeszi, Budajenő, Telki, Páty, Törökbálint, Üröm, and numerous settlements near Budapest) served the demands of Budapest, and enriched the agglomeration settlements, but they relied on the extended metropolitan educational, cultural, and medical infrastructure. The proportion of people who moved out from Budapest in a very short amount of time was enormous: about a quarter million people found their new homes in one of the suburban areas (Table 2).

The present (2012) panorama, however, shows something else already: the area's two-decade-old boom has come to quite a halt. The underlying economic and social changes, the global recession, debt, and the restructuring of Hungarian real estate and commercial estate

prices, have transformed the face of the examined area on a complex manner. These processes are also reflected in the statistical data, especially when comparing segments before and after the crisis. Although the permanent population of settlements shows an increase, the number of incoming residents has not really increased after all. Based on these data, we may conclude that the suburbanization process has slowed down; the number of newly built flats has decreased throughout the agglomeration. In the Budaörs settlement, for instance, which plays the most central role in the area, the number of newly built interiors decreased by almost one half in those four years.

Table 2 Distribution of enterprises, department stores, and other stores in three of the agglomeration's settlements (2006, 2010)

	Biatorbágy		Budaörs		Törökbálint	
	2006	2010	2006	2010	2006	2010
The number of individually owned specialty shops of furniture, household products, and lighting	1	1	3	2	7	6
The number of individually owned specialty shops selling other industrial products	5	1	25	8	11	1
The number of individually owned grocery shops	9	4	26	17	9	6
The number of individually owned retail stores (without human pharmacies)	28	28	93	79	40	34
The number of grocery shops and stores	26	22	53	45	30	26
The number of specialty shops of furniture, household products, and lighting	4	4	38	33	76	61
The number of second-hand specialty shops	1	4	10	14	5	6
The number of restaurants, buffets	41	46	135	132	44	44
The number of individually owned greengrocery shops	2	3	6	4	1	2
The number of bakeries and candy shops	1	9	7	17	3	7
The number of vehicle component specialty shops	5	9	11	25	6	4
The number of machine, equipment, wholesale depositories	3	5	8	14	4	n.a.

Source: T-STAR 2006, 2010

In this megastore-dominated region, the number of shops operated by small businesses is decreasing in a homogenous manner: shops selling groceries, industrial goods, furniture, household items, or lighting are closing at the rate of 15% on average. From this process showing balanced deceleration, one dimension stands out -- businesses selling industrial products: in Törökbálint from the almost one dozen businesses that had formerly existed (11), by 2010 only one remained on the market; even in Budaörs, the number of such businesses has decreased to one third. The background to these changes is probably that

because of the crisis consumer habits have simplified: they prefer the megastores, which offer bigger and better discounts and satisfy multifunctional demands. Meanwhile, because of this process, small shops are increasingly abandoned and going out of business. Changes in global consumer trends are also reflected in the fact that the number of second-hand stores has grown significantly in the area. (Törökbálint 120 %, Budaörs 140 %, Biatorbágy 400 %).

The number of small eateries is nearly stagnant; greengroceries serve consumers' needs by opening a new business in each of the two smaller settlements (Biatorbágy, Törökbálint), but at the same time closing two shops in Budaörs. The strongly growing number of bakeries (in Biatorbágy nine fold, in Törökbálint and Budaörs by roughly two and half) may possibly be a reflection of the qualitative expectations of more demanding customers. At the same time, it is possible that for a certain consumer group, these commercial units which have diversified their product line with dairy products may have turned into an important scene for daily shopping. Also worthy of emphasis – in the case of Biatorbágy and Budaörs – is the huge increase in specialty shops selling auto parts and the 60 % average rise in the number of wholesale machine and equipment depositories.

THE METHODOLOGY OF THE RESEARCH

Interviewers recorded the Hungarian questionnaire of our research in August of 2012; recording[1] of the Romanian and Slovakian questionnaires took place in January of 2013. The Hungarian field was the Budaörs-Törökbálint-Biatorbágy commercial zone. Data were collected in Brasov, Romania and in Nitra, Slovakia. The number of respondents was 1,050 persons. Our questionnaire consisted of a demographic section, a customer and consumer section, and a section that measures consumer consciousness forming due to the crisis. The present analysis is just a fraction of the analysis of the valuable and useful results our research has yielded: it "only" presents the dimensions which can be compared the most plastically. First we present our research results regarding the full sample. Afterwards we examine in the case of each question whether a significant difference appears between the countries. In such cases where it does, or where there is no significant difference but the result is interesting, we depict our results in a cross-reference table or display it on a diagram.

"Then and Now"

We asked in our questionnaire survey how often the respondent visits this commercial area - the location of the survey- compared to the previous five years.

Every second respondent answered that he or she visits the given commercial area – where the query was conducted – with the same frequency as five years earlier (Figure 2). At the same time, the proportion of those who came here more often in the past is 28.9 percent, but the proportion of those who came here less in the past is hardly more than 15 percent. It would have been worthy for the questionnaire to ask an (open-ended) question which examines that if there was a change in the frequency of visiting this place (currently comes here more or less frequently) compared to the precious five years, what would the reason for the change be.

1 The Romanian survey was conducted and datas were recorded by Fülöp Ildikó, the Slovakian survey was conducted and datas were recorded by Erika Huszárik. The global SPSS analysis was made by Tünde Bogardi. Ildikó Fülöp, Erika Huszárik and Tünde Bogardi are Ph.D students at the Enyedi György Doctoral School of Regional Studies (Szent István University, Gödöllő, Hungary)

If we examine whether there is a significant difference among the three countries involved in the research regarding the answers to this question, then it is verifiable that there is no statistically detectable correlation between these two variables (Table 3).

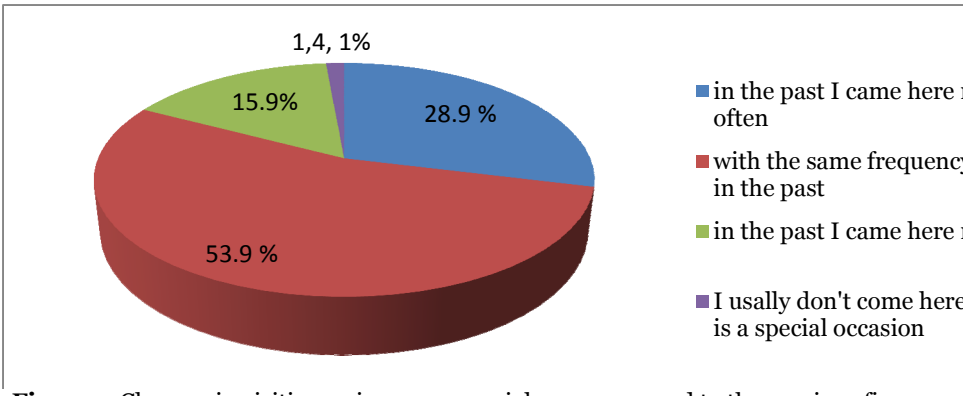


Figure 2 Changes in visiting a given commercial area compared to the previous five years

Source: own survey

Table 3 Changes in visits to a commercial area compared to the past five years in the three countries

		With what kind of frequency do you visit this customer neighborhood - compared to the previous five years?				Sum
		I came here more often in the past	with the same frequency	I came here less in the past	I usually don't come here, this is a special occasion	
Hungary	N	93	169	40	5	307
	%	30,3%	55,0%	13,0%	1,6%	100,0%
Romania	N	93	174	48	6	321
	%	29,0%	54,2%	15,0%	1,9%	100,0%
Slovakia	N	69	132	52	1	254
	%	27,2%	52,0%	20,5%	0,4%	100,0%
Total	N	255	475	140	12	882
	%	28,9%	53,9%	15,9%	1,4%	100,0%

Source: own survey

We can see from the cross-reference table that in all three examined countries, nearly one third of the respondents went regularly to the given customer neighborhood more in the past, but the proportion of those who visit them with the same frequency as earlier exceeds

50% . The most considerable difference appears in the proportion of those who went there less in the past than currently: in Hungary it is 13%, in Romania it is 15%, while in Slovakia it is more than 20%.

Changes in the living standard

We asked for a comparison with the years before the crisis, when we examined whether our respondents can save some money (Figure 3).

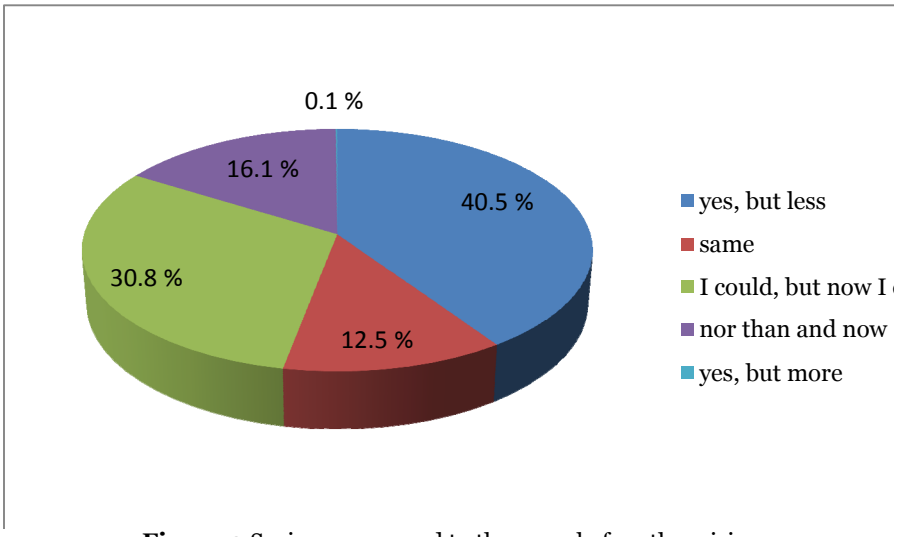


Figure 3 Savings compared to the years before the crisis

Source: own survey

More than 40 % of the respondents can save less than in the years before the crisis. In addition, the proportion of those respondents who could save some money earlier but now can't exceeds 30%. It needs to be emphasized that more than 15% is the proportion of those who neither then nor now have any savings. Only 12.5% said that they can save the same amount as earlier, and only one respondent said that he has more savings now. (Although a reason for this ratio may be that there was no such answer option in the questionnaire originally, but we checked emerging problems with the interviewers continuously, so the chance of this is negligible.)

I examined the same question from the perspective of whether a significant difference appears between the individual countries' respondents (Figure 4), and found that it does ($p<0,05$). The proportion of those who can save some money now, but less is close to 50% in Slovakia, while in Hungary it's hardly more than one third of the respondents. A considerable difference appears in the proportion of those, who can save as much money as before. One of four Romanian respondent said it, while every tenth in Slovakia, and 3.6% of the sample can save the same amount of money in Hungary. In Hungary the proportion of those respondents who could save some money earlier but now can't exceeds 40%. In Slovakia its 30%, and 17.4% in Romania. The proportion of those who neither then nor now have any savings is close to every fifth respondent in Hungary, 15.4% in Slovakia, and 12.4% in Romania. We asked our respondents to form a judgment on their living standard compared to the years before the crisis.

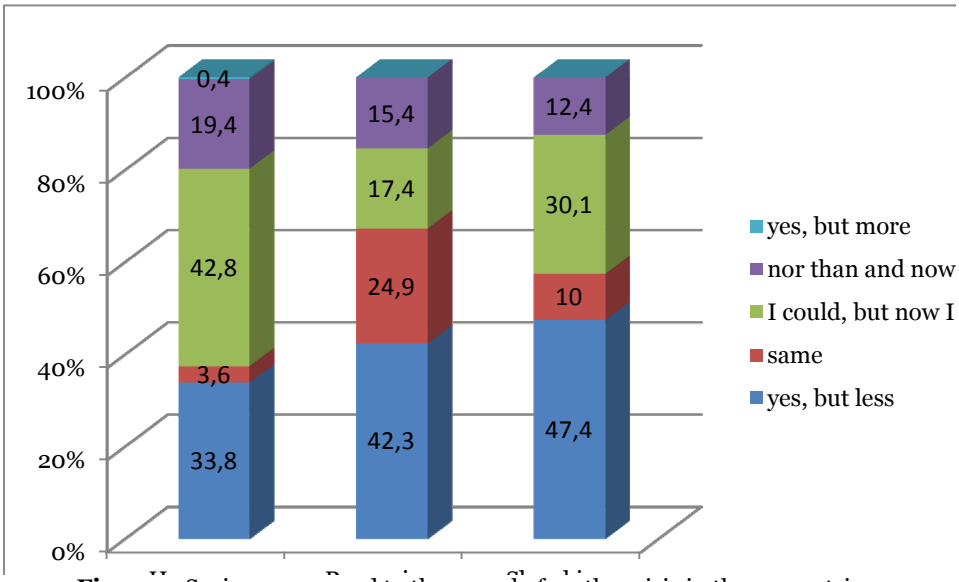


Figure 4 Savings compared to the years before the crisis in three countries

Source: own survey

More than 60% of the respondents said, that their living standard is lower compared to years before the crisis (Figure 5), 35.6% answered that they have the same living standard, and only 3.6% said that their living standard is higher now. A significant difference appears between the examined countries according to, how the respondents judge their living standard compared to the years before the crisis ($p<0.05$).

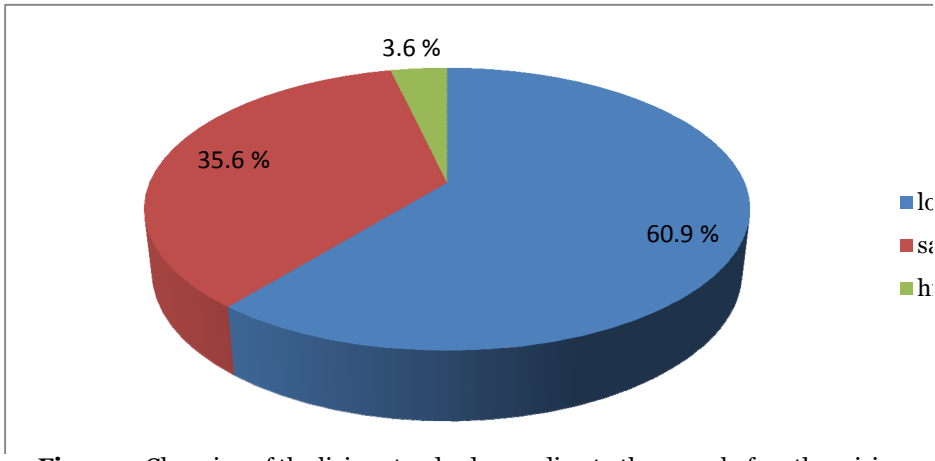


Figure 5 Changing of the living standard according to the years before the crisis

Source: own survey

Compared to the years before the crisis more than 70% of the Romanian respondents (Figure 6), and more than 60% of the Hungarian sample believes, that their living standard is lower, while this proportion does not attain 50% in Slovakia (although this is a quite tall value also). If we examine, that how many percentages of the respondents said, that they have the same living standard now in the examined three countries we can see, that it's more than 45% in Slovakia, close to 38% in Hungary, and every fourth respondent said it in Romania. It needs to be emphasized that in Romania and in Slovakia about 5% of the sample said, that their living standard is higher now, but in Hungary this proportion does not attain 1.5%.

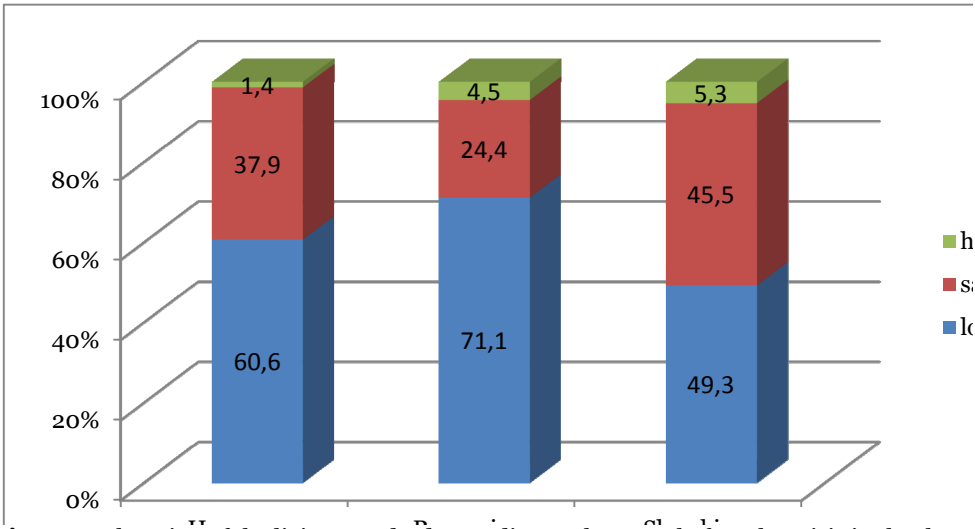


Figure 6 Changing of the living standard according to the years before the crisis in the three examined country

CONCLUSIONS

The economic crisis causes a great fear to the consumers, and generates a stress situation to the actors of the market. In this situation considerable and long-distance changes set in in the consumer behavior: the consumers save more and the greatness of their spending was held back. Considerable restructurings came into existence on the market; the customers moved away downwards on the demand curve, the number of the trademark changes is growing and the consumers postpone their bigger item shopping's. We were curious in our research, that in connection to the examined three East-Central European countries what kind of similar or different trends can we see in the consumers behavior before and after the crisis. In point of the frequency of shopping, all three countries show a homogeneous picture: more than three-quarter of the sample go shopping less, or the same times like before the crisis. Compared to this, the measure of the savings compared to the years before the crisis turned out interestingly, and very differentiated in concern to the three examined countries. Although we cannot diagnose a strong group for one of the countries who have said that they can put aside more than earlier, it is nevertheless conclude that both the Slovak and Romanian respondents can save more money, as the Hungarian survey respondents. In Romania every fourth, in Slovakia every tenth, and 3.6% of the Hungarian respondents said that they are able to put aside as much as before. Nearly twice as many Slovakian respondents indicated

that "can save, but less" than Hungarian. Based on these results, we can establish that in point of the accumulation of the family savings Hungary performs the worse. It seems that the judgment of the living standard follows the mapping of the amount of savings. Due to this, we hypothesized that least the Romanian, and most the Hungarian respondents feel, that they are living in a lower standard of living, than before. Compared to this nearly three-quarters of Romanians perceived decrease in quality of life, sixty percent of Hungarians, and almost half of the surveyed Slovakians. Behind these results might stand, that the respondents – thanks to their own feeling of insecure and crisis – drawn up their new preferences in their expenditures, and probably they redirected their other consumer activities (cultural- leisure consumption) to accumulate their savings. In conclusion we can say, that the first analyze etape of our comparative research strengthen us in our original goal, that it's required, and worthy monitoring the new attitudes adopted to the macro context, and the changed consumer habits and motivations that occurred during the crisis. Exceptionally exciting phenomenon is that that former Easter Block countries go through the crisis in a very similar way, but in other cases, along other variables, they understood the crisis very different. The fact mentioned in the introduction is squarely strengthen: the east-central European Slovakia's prospects for growth fail less, the imprints of the crisis can be found in Romania also, but Hungary is driftingrom the Visegrád countries. (Farkas, 2012)

REFERENCES:

Ernst & Young (2010) Understanding customer behavior in retail banking. The impact of the credit crisis across Europe.

Farkas, B. (2012) The Impact of the Global Economic Crisis in the Old and New Cohesion Member States of the European Union. *Public Finance Quaterly,* 57(1), 53-70.

Sikos, T. T. (2009) Key to success of the outlet shopping centers located in optimal site. *Hungarian Geographical Bulletin,* 58(3), 181-200.

Szőke, Á. – Végh, M. Z. (2012) Románia recessziója – zuhanórepülés? In (B. Farkas – É. Voszka – J. Mező (eds) Válság és válságkezelés az Európai Unió kohéziós országaiban, Szegedi Tudományegyetem, Gazdaságtudományi Kar, Szeged, 134-141.

Végh, M. Z. (2012) Szlovákia –a legjobb felzárkózó a válságban. In (B. Farkas – É. Voszka – J. Mező (eds) Válság és válságkezelés az Európai Unió kohéziós országaiban, Szegedi Tudományegyetem, Gazdaságtudományi Kar, Szeged, 98-105.

Central European Regional Policy and Human Geography	Year IV, no. 1, **2014**, pp. 51-63.
HU ISSN 2062-8870, HU E-ISSN 2062-8889	Article no. 2014-4

COMPETITIVENESS OF HUNGARIAN TOWNS AFTER THE CHANGE OF REGIME

János PÉNZES
Assistant Professor, Department of Social Geography and Regional Development Planning, University of Debrecen, Hungary, E-mail: penzes.janos@science.unideb.hu

Abstract: Current investigation applied the method of triadic decomposition of GDP per capita using it as an indicator to express the competitiveness in static, dynamic and combined forms. The results partly supported the former findings about the development characteristics of Hungarian towns. Some outputs of the current investigation highlighted new trends and spatial processes of competitiveness of towns after the millennium.

Key words: competitiveness, decomposition of GDP, post-socialist transformation, spatial structure, towns

* * * * * * *

INTRODUCTION

Current paper targeted to provide a comprehensive overview about the competitiveness of Hungarian towns after the change of regime with special emphasis on the period after the millennium. Competition between towns and its measurement generated debates over the last decades. There are some precedent analyses of competitiveness for towns in Hungary and the current investigation made an attempt to produce new results about this issue.

ON TERRITORIAL COMPETITIVENESS

The issue of territorial competitiveness has transformed into a more important concern on the different territorial levels during the last decades. However, it is important to emphasize that the experts' theories and approaches are not homogeneous. For example, Paul Krugman's conception is that the territorial units (countries or cities) do not compete with each other as places, but they only serve as locations for the competing companies (Krugman, 1994). In spite of this, competition between regions can be observed (according to Michael E. Porter's point of view), but similarly to the competition of industrial sectors, the competitive advantages, in other words, the absolute advantages became important; since nowadays the comparative advantages hardly prevail (Porter, 2008). These more-or-less confronting opinions represent the relevance of the question and the ongoing debate about it.

Territorial (regional is more frequently used – but in this case 'territorial' adjective adequately emphasizes the broader geographical approach of the issue) competitiveness can be defined as the ability to offer an attractive and sustainable environment for firms and

residents to live and work (Dijkstra et al., 2011). Regional competitiveness in spite of its primarily economic content is not only economic but social category as well (Nemes Nagy, 2004). From this aspect, the objective of the current study is to analyze the components of regional competitiveness in order to detect the location and restructuring of the clusters of competitiveness in Hungary after the change of regime.

Territorial competitiveness is an important part of the comparative analyses of territories on different levels (cross country, regional or city level comparative studies). It can be regarded as important and mainstream research area for the economy and economic processes of the European Union as well (Dijkstra et al. 2011; European Parliament, 2007; European Commission, 2010). More country analyses can be listed (inter alia the Hungarian ones Bujdosó et al., 2011; Kozma, 1998; Lengyel and Rechnitzer, 2013; Lukovics, 2010; Nemes Nagy, 2004; Rechnitzer and Tóth, 2014, Khademi-Vidra A.-Pap B.-Szarvák T. 2009). Considerable shift can be observed within the revaluation of the territorial level of competitive units from the concept about country or regional level competitiveness, towards the competitiveness of cities or urban areas (Khademi-Vidra A. - Szarvák T. 2009). However, it is important to emphasize that locations on different territorial levels do not compete with each other, and cities with significantly disparate extent are not on the same field of competitiveness (Egedy, 2012).

THE MEASUREMENT OF COMPETITIVENESS

There are several easier or more complex methods which are developed to measure the territorial competitiveness and its changes (Lengyel, 2000). Annual rankings are published about the largest cities of the world economy based on different economic indicators (Csomós, 2011). Global cities or major towns form urban zones with their hinterlands that concentrate considerable economic production and the concept of functional urban regions or large urban zones has become part of the general approach of territorial competitiveness. Their joint consideration is obviously derived from the suburbanization process of population and economic activities. The networking productive relations form an organic unit of cities and hinterlands (OECD, 2012).

The GDP per capita indicator is frequently used for expressing the level of development. However, it is not available for smaller territorial units – some evaluation methods were developed to express it (e.g. Kiss, 2003; Lőcsei and Németh, 2006) or some of the authors replaced it by other indicators – income per capita is frequently adopted. The decomposition of GDP per capita (or income per capita) can also be found in the related literature. The most often used ones from these are the dual and triadic decomposition of GDP (e.g. Nemes Nagy, 1987; 2004; Pénzes, 2014; Rechnitzer and Tóth, 2014; Tóth and Nagy, 2013; Vrtěnová et al., 2009). In the case of touristic competitiveness, there is a special formula for the decomposition of the GDP per capita indicator (e.g. Tóth and Dávid, 2011).

The triadic decomposition of competitiveness (for more details see Nemes Nagy, 2004) can be expressed by the following formula (1):

$$(1) \qquad \frac{GDP}{population} = \frac{GDP}{employees} * \frac{employees}{active\_age} * \frac{active\_age}{population}$$

where:

- ‘population’ means the number of population in a given territory;
- ‘employees’ means the number of employees in a given territory;

- 'active_age' means the number of active age population;

With the logarithmic transformation the formula could be written in this form (2):

$$\log\frac{GDP}{population} = \log\frac{GDP}{employees} + \log\frac{employees}{active\_age} + \log\frac{active\_age}{population} \quad (2)$$

In the current analysis the input data were modified according to the available database for the Hungarian settlement level.

Where:

- 'taxable income' was applied instead of 'GDP' [from the database of the Hungarian National Tax and Customs Administration (NAV) and Hungarian Central Statistical Office (KSH)];
- 'population' was replaced by 'permanent population' in a given locality (from the census data of the Hungarian Central Statistical Office);
- 'employees' was expressed by the number of employees in a given locality (from the census data of the Hungarian Central Statistical Office);
- 'active_age' means the number of active age permanent population (between 18 and 59 years) (from the census data of the Hungarian Central Statistical Office).

The components can be interpreted as:

(3) DEVELOPMENT = PRODUCTIVITY + EMPLOYMENT + DEMOGRAPHY

The core indicator and the three components provided the basis for a categorisation in which all of these elements were compared to the average of the given indicator (average was calculated without the extremely high value of Budapest in every cases). Above average values were labelled with '1' and below average values were marked with '0'. After the clustering process, static competitiveness categories were formed in this way:

- *complex competitive advantage* where 'development' and all of the components were above average;
- *multi-factored competitive advantage* where 'development' was above average and only one of the components was below average;
- *single-factored competitive advantage* where 'development' was above average and only one of the components was above average;
- *single-factored competitive disadvantage* where 'development' was below average and only one of the components was below average;
- *multi-factored competitive disadvantage* where 'development' was below average and only one of the components was above average;
- *complex competitive disadvantage* where 'development' and all of the components were below average.

The illustrated calculation was carried out for three census years – 1990, 2001 and 2011. On the basis of these computations not only *static* clusters could be separated but *dynamic* ones as well. In this case, the basis of comparison was the average change of the given indicator between the census years and above average or below average change could be used for the categorisation – with similar principles as in the 'static' approach.

The combination of the static and dynamic approaches provides the basis to create combined competitiveness categories in the following form (Nemes Nagy, 2004) (Table 1).

This method could provide the possibility to detect the static view of each component or to investigate the changes by the dynamic aspect in details. However, these must have been limited in order to present only the most comprehensive characteristics of the research.

Table 1. Combined competitiveness categories

Categories		*Static*	
		Competitive advantage	Competitive disadvantage
Dynamic	Competitive advantage	*Increasing competitive advantage*	*Decreasing competitive disadvantage*
	Competitive disadvantage	*Stagnating competitive advantage*	*Continuous competitive disadvantage*

Data source: Nemes Nagy, 2004

The results of the calculations provide comprehensive basis for ranking and comparing the Hungarian towns using the static, dynamic and combined approach.

It is important to emphasize that this approach of competitiveness provides clear and unambiguous categorisation of towns, however, the difference in their figures might be only negligible separated by the average value (see the detailed results for static competitivenesss listed in the Appendix).

HUNGARIAN TOWNS AND THEIR COMPETITIVENESS

The calculations were completed for the Hungarian towns. The results are not comparable to former findings (Nemes Nagy, 2004) because the input indicators were different.
Current study differs from the referred investigation in the number of towns as their figure was increased from 274 by 328 during the last decade (the latest stage of their assignment is not involved in the current investigation).

The differentiation of Hungarian towns has a significant influence on the spatial pattern of the country. The conditions of development principally altered after the change of regime. Beluszky and Győri summarized these in their study (Beluszky and Győri, 1999):

- The transition to market economy significantly influenced the development of towns. The self control of settlements was built up instead of centrally controlled decisions. However, the economic decision makers had also larger autonomy in their steps and in the selection of geographical location. Local characteristics became more important.
- The weakening role of the county councils unchained the autonomy of towns.
- The changes of administrative divisions caused the disappearance of one important functional development possibility.

- The possibilities of regional developments decreased with the disappearing relationship between industrial developments and other infrastructural developments.
- The financial principles of self governments meant a completely new form, however, the dependence from the state budget remained considerable.
- The regional cohesion funds were reduced, their significance became negligible.
- The regional transformation of the economy began after the change of regime. Some parts of the country were declined and other territories became attractive for the economic investors – forming the characteristic spatial disparities in the investments and employments (Nemes Nagy, 1998).
- Regulations created after the change of regime did not prefer towns over other settlements. The rapid growth of towns caused the increase of the number of 'de jure' towns without real urban functions (e.g. Bujdosó, 2014; Pirisi, 2009).

The changes in the development paths of Hungarian towns are under the listed constraints. Beluszky and Győri suggested an impressive ranking of towns in their referred study and they provided a comprehensive overview about the processes forming the rank of Hungarian towns. Current analysis – due to its methodology – could not be as comprehensive and complex as that in the cited publication. Some of the results of the current investigation prove their formerly suggested statements. However, the analysis of competitiveness means a different approach from the aspect of the ranking of towns.

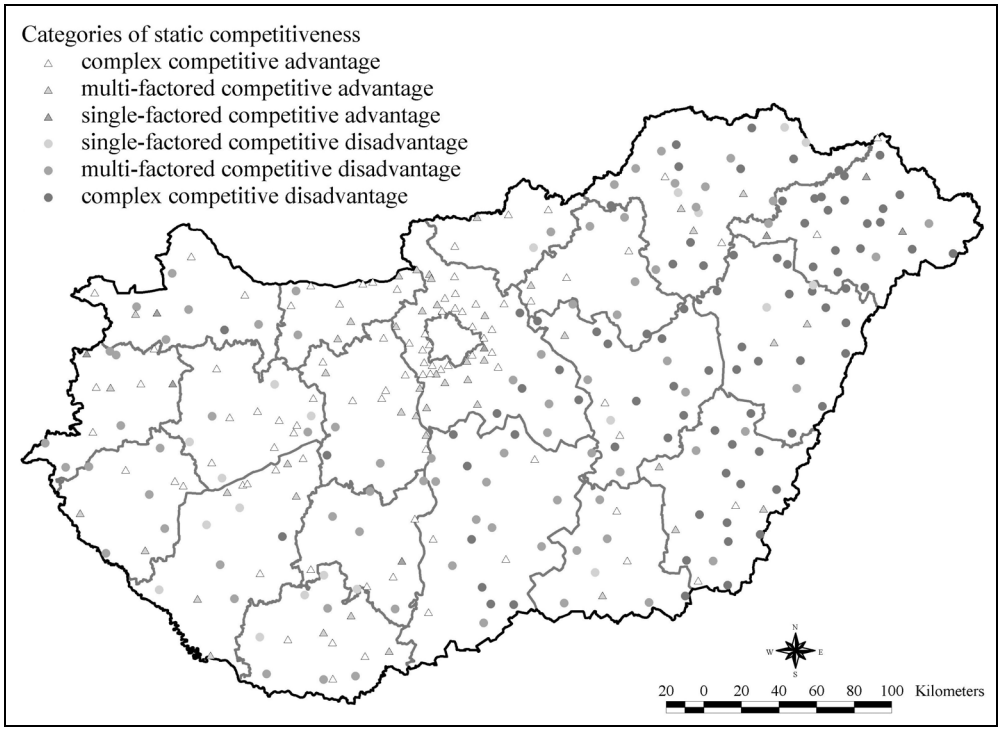


Figure 1. Categories of the static competitiveness of towns, in 1990

Source: edited by the author and calculated based on the database from the NAV and KSH

Static competitiveness provided the situation of towns in 1990 that can be interpreted as the starting point after the change of regime. The present set of towns (according to the list at the beginning of 2013) was involved in the calculation in order to make the results comparable. 327 towns were included in this investigation (without Budapest).

43.7 percent of the towns presented above average development level, in other words had competitive advantage (by their income per capita value) and 27.2 percent of the towns showed complex competitive advantage. The territorial pattern of this group of towns was considerably even but the most spectacular features of the spatial structure tend to be illustrated (Figure 1). The agglomeration of Budapest and Northeast Hungary were apparently in better positions. This is reflected by the location of towns with complex competitive disadvantage. 26.3 percent of the towns were in this category of competitiveness and most of them gained their town privilege after the change of regime. Almost every town with complex competitive disadvantage is located in the eastern part of the country only three of them (Enying, Igal and Tét) are in the Transdanubian part of Hungary.

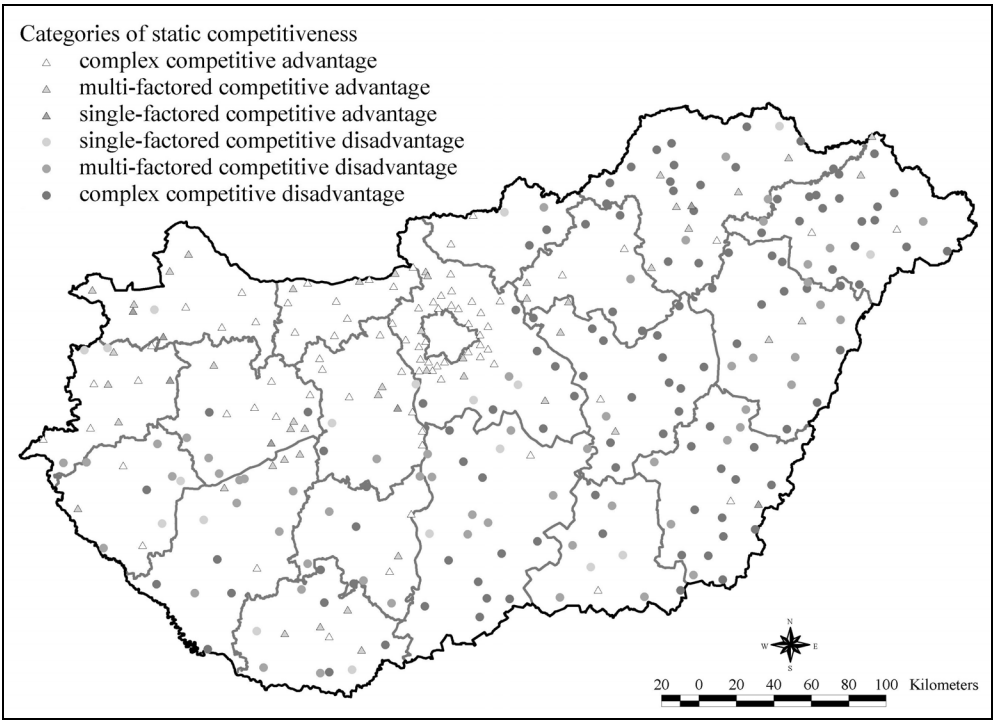


Figure 2. Categories of the static competitiveness of towns, in 2011

Source: edited by the author and calculated based on the database from the NAV and KSH

The illustrated pattern of competitiveness was altered as a result of the transition to market economy and the changes listed previously. 40.7 percent of the towns had competitive advantage and 23.9 percent was in the category of complex competitive advantage in 2011 (Figure 2). (The results of static competitiveness in 2001 and dynamic competitiveness are not detailed due to the limited extent of the current paper.) The ratio of towns with complex

competitive disadvantage increased spectacularly and exceeded 35.4 percent of the number of towns. At the same time, their location became more characteristic (e.g. almost 40 percent of the towns with complex competitive advantage located within 30 kilometres of Budapest. The concentration of the top towns could be detected within the hierarchy of settlements as well. Only 6 towns with county rank were excluded from the group of towns with complex competitive advantage; Sopron, Hódmezővásárhely, Salgótarján and three regional centres (namely Debrecen, Miskolc and Pécs). Hódmezővásárhely showed single-factored competitive disadvantage and Salgótarján was obviously in the worst situation from this group of towns (with multi-factored competitive disadvantage). The regional centres were separated due to their disadvantageous age structure.

The concept of combined competitiveness unites the approach of static and dynamic aspects. The falling behind of towns between 1990 and 2001 triggered by the transformation crisis is clearly illustrated by the map in Figure 3. The continuous competitive disadvantage was the most dominant symbol in Eastern Hungary. Only a few towns could hold their positions, mainly the largest towns. Conditions of the towns in Northwest Hungary and in the agglomeration of Budapest became even more competitive.

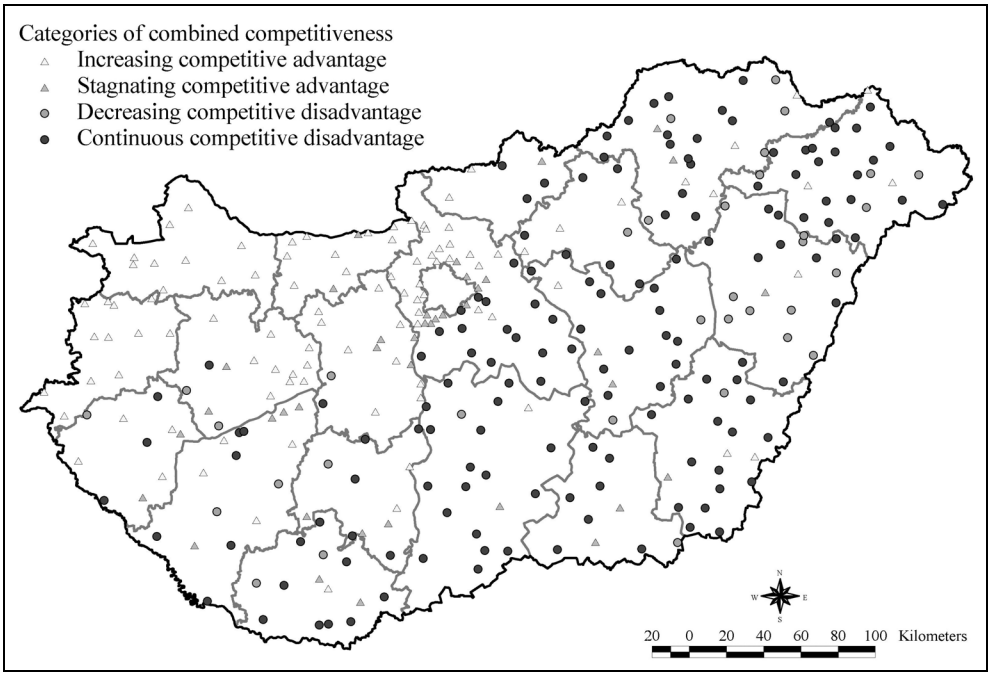


Figure 3. Categories of the combined competitiveness of towns between 1990 and 2001
Source: edited by the author and calculated based on the database from the NAV and KSH

After the millennium most parts of the towns on the Great Hungarian Plain could fix their position and their competitiveness was improved (Figure 4). Exceptions could be detected in the eastern part of Jász-Nagykun-Szolnok county or the southern territories of Békés and Bács-Kiskun counties. Continuous competitive disadvantage was characteristic in the northern part of North Hungary. Most parts of the towns in Somogy county were in this group of settlements. Lake Balaton was not guarantee to definite competitive advantage

especially in its western basin. Increasing competitive advantage was typical in the agglomeration of Budapest and only in some isolated parts of the country with mosaic-like pattern.

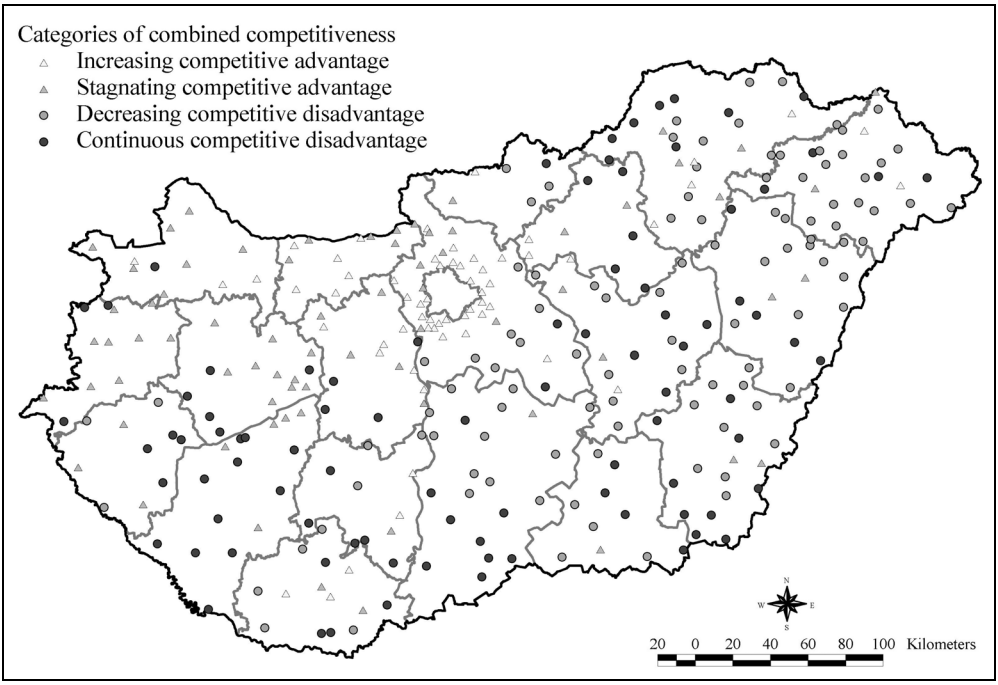


Figure 4. Categories of the combined competitiveness of towns between 2001 and 2011
Source: edited by the author and calculated based on the database from the NAV and KSH

The rapid growth of towns highlights the issue of competitiveness of towns from the aspect as well. How can be the positions of towns characterised by the year of gaining their rank? The effect of the territorial policy of the socialist era is clearly reflected by the competitiveness pattern of towns by the results for 1990 (Figure 5).

'De jure' towns possessing their rank before 1945 were the most competitive ones in 1990 followed by those towns gained their rank until 1980. More than 50 and 40 percent of them were in the category of complex competitive advantage. 75 percent of the oldest towns were competitive in the light of these results. Towns gaining their rank after 1980 were less competitive and the first wave of new towns after the change of regime were the least competitive group of towns in general. In lots of cases rank was only symbolic after 1990 and the real economic background was missing.

Towns altogether were in more favourable position than the national values.

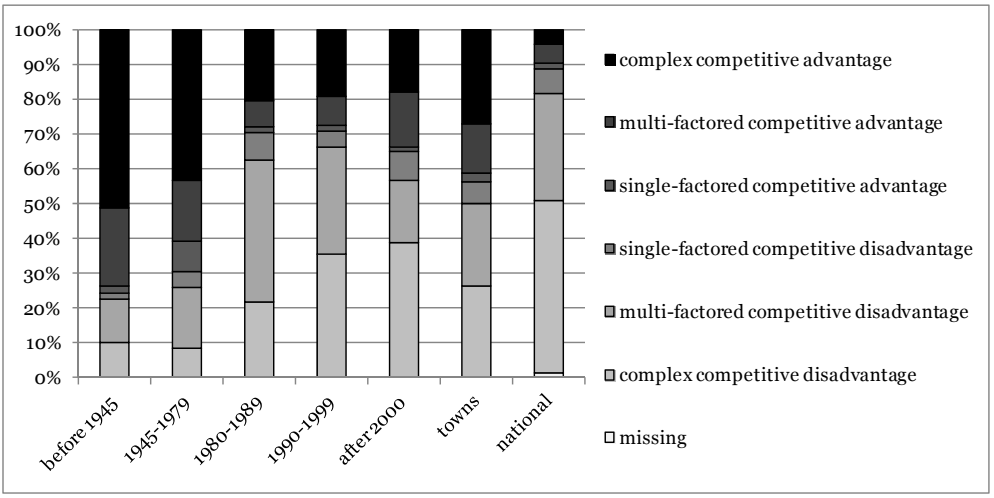


Figure 5. Static competitiveness categories of towns by the year of gaining of their rank in 1990

Source: edited by the author and calculated based on the database from the NAV and KSH

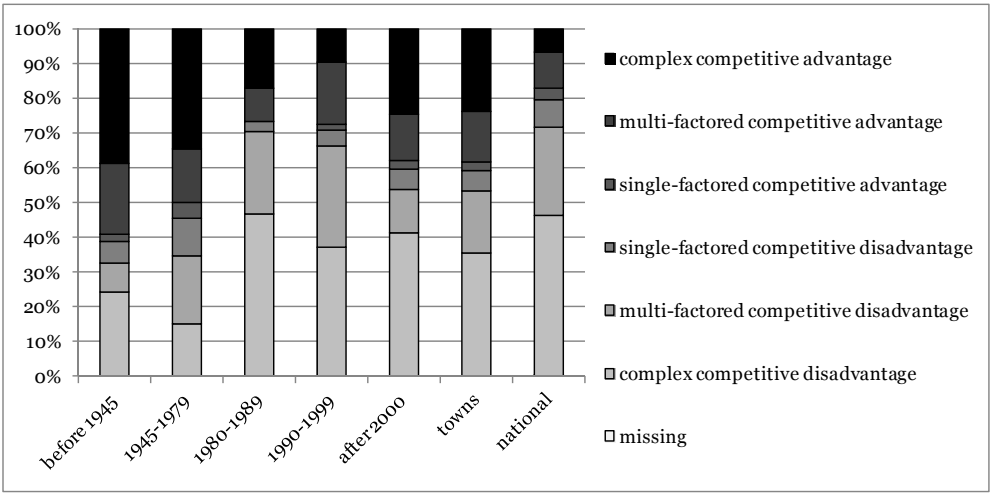


Figure 6. Static competitiveness categories of towns by the year of gaining of their rank in 2001

Source: edited by the author and calculated based on the database from the NAV and KSH

The illustrated significant disparities between the goups of towns categorised by their age as 'de jure' towns decreased by 2011 (Figure 6). Oldest towns – including the county seats and the rest of the largest towns were the most dynamic by the competitiveness calculations. The group of towns gaining their rank after the millennium represent a 'Janus faced' character as approximately 25 percent of the young towns had complex competitive

advantage and more than 40 percent of them were characterised by complex competitive disadvantage. This fact is the result of different reasons for the designation of settlements to towns – some of them are located in areas without real centres, others are rapidly growing dynamic settlements in the agglomeration of Budapest.

We made an attempt to summarize the processes after the change of regime with the fusion of the results of combined competitiveness for the two decades (Figure 3 and 4). (Figure 4). Figure 7 contained 9 categories:

- 'stable advantage' (31 towns) in which towns were in the best category in both delineations of the combined competitiveness;
- 'bottom up' category (12 towns) showed the most spectacular emerging from the continuous disadvantage group to the increasing competitiveness (e.g. Gyál, Gyömrő, Ócsa, Cegléd in the surroundings of Budapest; Pécsvárad, Szentlőrinc close to Pécs and Jászárokszállás or Kisvárda);
- 'accelerating' category (91 towns) were in the worst category between 1990 and 2001 and could step forward by 2011;
- 'overtaking' category (18 towns) became part of the group of increasing competitive advantage by 2011. It is a mixed category with former socialist towns (e.g. Martfű, Oroszlány) or traditional agricultural towns (e.g. Mezőkövesd) or agglomeration towns (e.g. Fót, Halásztelek, Pécel, Vecsés);
- 'stagnating' towns (26 towns) were in an intermediate state during both decades (e.g. Miskolc, Pécs, Szeged, Szolnok – the largest ones);
- 'lagging behind' (29 towns) were characterised by a fall in their competitiveness reaching the continuous competitive disadvantage category (e.g. Hódmezővásárhely, Salgótarján with some centres of tourism including Keszthely, Tapolca or the former socialist town of Komló);
- 'breaking down' (59 towns) category consisted of those towns which were in the most advantageous competitive category during the first decade and they stepped back to the category of stagnating competitive advantage (e.g. large towns regarded as competitive: Győr, Székesfehérvár or other county seats like Békéscsaba, Debrecen, Kaposvár, Kecskemét, Nyíregyháza, Szombathely, Veszprém, Zalaegerszeg and Dunaújváros, Sopron). Demographic conditions became disadvantageous in most cases;
- 'top down' (11 towns) towns presented the largest fall from the first category to the continuous competitive disadvantage category. Most of them were in Transdanubia (e.g. centres of tourism such as Hévíz and Zalakaros);
- 'stabil disadvantage' (50 towns) formed the most backward towns from this respect. Most typically in north Borsod-Abaúj-Zemplén, along the Central Tisza area, in south Békés and Bács-Kiskun. Southern Transdanubia was also characterised by this type of towns.

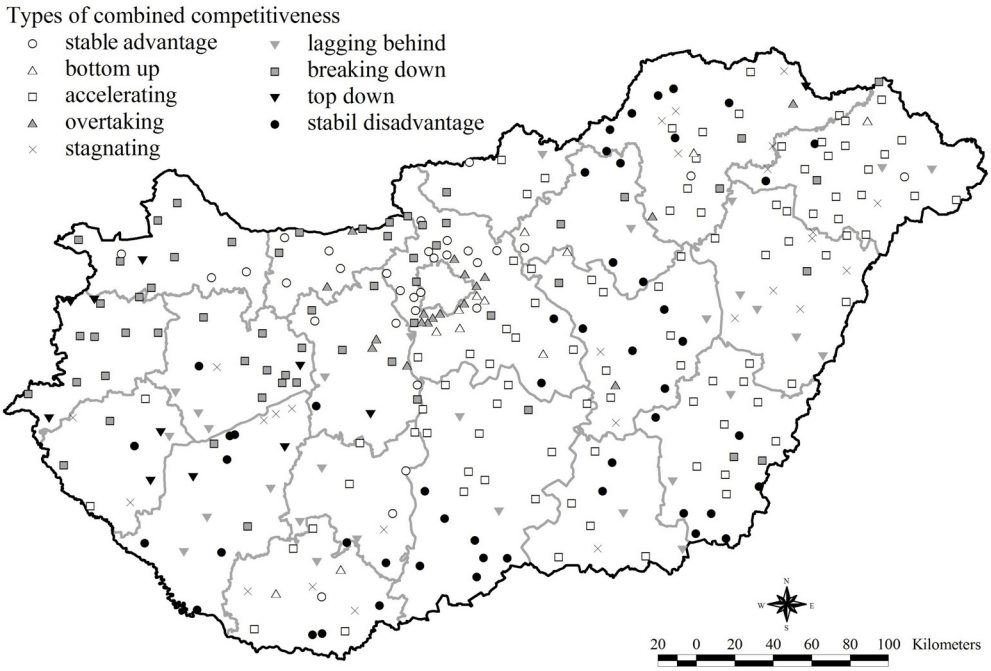


Figure 7. Categories of the combined competitiveness of towns between 2001 and 2011
Source: edited by the author and calculated based on the database from the NAV and KSH

CONCLUSIONS

The conditions of development of Hungarian towns were completely altered as a result of the transition to market economy. The development paths of towns were examined by several methods during the last decades. Current analysis put the emphasis on the issue of territorial competitiveness by applying the triadic decomposition of income per capita. The results presented some well known facts about the concentration of competitive towns in the surroundings of Budapest and in the northwestern part of the country. In general, towns tend to be more competitive than other settlements, however, there are significant differences between them. The extended inner and outer peripheries along the border showed the largest proportion of towns with competitive disadvantage. However, new results were derived from the calculations carried out for the last census year. The formerly dynamic axis of development along Lake Balaton seemed to be segmented and most of the towns with county rank also lost their massive competitive advantage (primarily as the result of their demographic processes). Continuous areas tended to be characterised by desperate competitive disadvantage in the Great Hungarian Plain (besides the well known traditional areas). However, the results seemed to support the moderate development of some those towns that faced with enormous fall in their economic performance. These changes after the millennium have not been able to diminish the most significant disparities of the spatial structure of Hungary.

ACKNOWLEDGEMENT
This research was supported by the **European Union** and the **State of Hungary, co-financed by the European Social Fund** in the framework of TÁMOP-4.2.4.A/ 2-11/1-2012-0001 'National Excellence Program'.

REFERENCES

Beluszky, P. – Győri, R. (1999) A magyarországi városhálózat és az EU-csatlakozás. *Tér és Társadalom*, 13(1-2), 1-30.

Bujdosó, Z. (2014): A vidék városodása Északkelet-Magyarországon. In: (ed. Takácsné György K.) *XIV. Nemzetközi Tudományos Napok.* Konferenciakötet, Gyöngyös 2014.03.27-2014.03.28., Károly Róbert Főiskola, Gyöngyös

Bujdosó, Z. – Remenyik, B. – Dávid, L. – Tóth, G. (2011) Connection between tourism and regional development on the Hungarian-Croatian border. *Central European Regional Policy and Human Geography*, 1(2), 27-40.

Csomós, Gy. (2011) Role of Cities in the Economy of Central Europe: Some Measurement Methodologies. *Central European Regional Policy and Human Geography*, 1(2), 41-50.

Dijkstra, L. – Annoni, P. – Kozovska, K. (2011) *A new regional competitiveness index: Theory, Methods and Findings*. European Union Regional Policy Working Papers, 02/2011

Egedy, T. (2012) A gazdasági válság hatása a nagyvárosok versenyképességére Magyarországon. *Földrajzi Közlemények*, 136(4), 420-438.

European Commission (2010) *Investing in Europe's future*. Fifth report on economic, social and territorial cohesion

European Parliament (2007) Regional disparities and Cohesion: What strategies for the future. Directorate General Internal Policies of the Union, Policy Department Structural and Cohesion Policies, IP/B/REGI/IC/2006_201, (http://www.europarl.europa.eu/hearings/20070625/regi/study_en.pdf accessed: 02-12-2013)

Khademi-Vidra A.-Pap B.-Szarvák T. (2009) Vidéki térségek, felsőoktatás, információs társadalom – egy szakfejlesztési elképzelés Jászberényből, Paideia, 2009/1, 197-174.p.

Khademi-Vidra A. - Szarvák T. (2009) *Are the social traps manageable? -Lifelong Learning characteristics and motivation of the Romany population*. In: Paideia 2009/2, 81-99 p.

Kiss, J. P. (2003) A kistérségek 2000. évi GDP-jének becslése. In (ed. J. Nemes Nagy) *Kistérségi mozaik*. Regionális Tudományi Tanulmányok 8., ELTE Regionális Földrajzi Tanszék – MTA-ELTE Regionális Tudományi Kutatócsoport, Budapest,

Kozma, G. (1998) A gazdasági élet szereplőinek térbeli preferenciái. *Falu város régió*, 5(9), 7-14.

Krugman, P. (1994) Competitiveness: A dangerous obsession. *Foreign Affairs*, 2, 28-44.

Lengyel, I. (2000) A regionális versenyképességről. *Közgazdasági Szemle*, 47(12), 962-987.

Lengyel, I. – Rechnitzer, J. (2013) The competitiveness of regions in the Central European transition countries. *The Macrotheme Review*, 2(4), 106-121.

Lőcsei, H. – Németh, N. (2006) A Balaton régió gazdasági ereje. *Comitatus: Önkormányzati szemle*, 16(7-8), 7-22.

Molnár, E. – Pénzes, J. – Radics, Zs. (2011) Az 1971-es OTK kiemelt alsófokú központjainak fejlődési pályája az elmúlt négy évtizedben. In (T. Csapó – Zs. Kocsis eds.) *Az 1971. évi*

OTK hatása a hazai településrendszerre (szuburbanizáció, aprófalvak, településszerkezet). Savaria University Press, Szombathely

Lukovics, M. (2010) Measuring Innovation Performance and Competitiveness in the Hungarian Micro-regions. In: *Sustainable Regional Growth and Development in the Creative Knowledge Economy*: 50th Congress of the European Regional Science Association. (http://www-sre.wu.ac.at/ersa/ ersaconfs/ ersa10/ERSA2010finalpaper333.pdf accessed: 02-12-2013)

Nemes Nagy, J. (1987) *A regionális gazdasági fejlődés összehasonlító vizsgálata*. Akadémiai Kiadó. Budapest

Nemes Nagy, J. (1998) Vesztesek – nyertesek – stagnálók (a társadalmi-gazdasági változások regionális dimenziói). *Társadalmi Szemle*, 53(8-9), 5-18.

Nemes Nagy, J. (2004) Új kistérségek, új városok. Új versenyzők? In (J. Nemes Nagy ed.) *Térségi és települési növekedési pályák Magyarországon*. Regionális Tudományi Tanulmányok 9., ELTE Regionális Földrajzi Tanszék – MTA-ELTE Regionális Tudományi Kutatócsoport, Budapest

OECD (2012) *Defining "Urban". A New Way to Measure Metropolitan Areas*. Organization for Economic Co-operation and Development. Paris

Pénzes, J. (2014) Central and peripheral areas in Hungary after the change of regime. In (A. Csata – G. Fejér-Király – O. György – J. Kassay – B. Nagy – L-J. Tánczos eds.) *Challenges in the Carpathian Basin – Global challenges, local answers*. Annual International Conference on Economics and Business. 17th of May, 2014, Miercurea Ciuc, Romania. RISOPRINT, Cluj-Napoca. CD-edition. pp. 170-188.

Pirisi, G. (2009) Város vagy nem város? Dilemmák a formális és a funkcionális városfogalom kettőssége kapcsán. *Területi Statsiztika*, 49(2), 129-136.

Porter, M. E. (2008) *On competition*. Updated and expanded edition. Harvard Business Press, Boston

Rechnitzer, J. – Tóth, T. (2014) Territorial Competitiveness in Central and Eastern Europe. *Journal of Business Administration Research,* 3(1), 96-106.

Tóth, G. – Dávid, L. (2011) Competitiveness of Tourism Regions in Hungary. *Anatolia: an international journal of tourism and hospitality research,* 22(3), 418-423.

Tóth, G. – Nagy, Z. (2013) Eltérő vagy azonos fejlődési pályák? A hazai nagyvárosok és térségek összehasonlító vizsgálata. *Területi Statisztika,* 53(6), 593-612.

Vrtěnová, L. – Sobotka, M. – Malá, L. (2009) Measurement of regional disparities and economic competitiveness of regions, *Scientific Papers of the University of Pardubice, Series D,* 14, 287-300.