**CENTRE FOR REGIONAL STUDIES
OF HUNGARIAN ACADEMY OF SCIENCES**

DISCUSSION PAPERS

No. 50

Regional Characteristics of Human Resources in Hungary During the Transition

**by
János RECHNITZER – Melinda SMAHÓ**

Series editor

Zoltán GÁL

**Pécs
2006**

ISSN 0238–2008
ISBN 963 9052 59 0

Technical editor: Ilona Csapó
Maps: Valéria Fonyódi
Printed in Hungary by Sümegi Nyomdaipari, Kereskedelmi és Szolgáltató Ltd., Pécs.

Content

List of figures

List of tables

Introduction

The objective of regional development policies in the modern economies is the decrease of the disparities in the living conditions of the population. The interventions of the regional policies aim at the transformation of the economic sectors, the increase of the employment possibilities and the improvement of the different infrastructural and institutional conditions having an impact on the living conditions. The focus of the efforts is to guarantee possibilities by the renewal of the spatial factors promoting development and by the safeguarding of the conditions for a catching up. This latter factor serves spatial equalisation and the moderation of the regional disparities, the effects of which of course can only be felt in the long run.

The modern regional development policies do not consider space as a single unit; they apply the above-mentioned general objective in a differentiated approach (*Horváth,* 1998). From the 1970s it became evident that the respective regions have specific socio-economic structures, making it impossible to handle them in a uniform way. Only a differentiated system of objectives, tools and institutions can allow the activation of the local resources.

The factors seen as determining regional growth were previously economic factors and human resources – including labour force –, mostly their quantitative presence, later, from the 1980s, their qualitative composition (*Benko,* 1999). By the 1980s it became clear that in regional development the factors could not be separated, i.e. the economic, social, human-labour factors should not be treated separately, on the one hand, and the human elements were more and more appreciated, more exactly became the focal point of researches, on the other (*Rechnitzer,* 1993).

The last decade of the previous century demonstrated that those territories were successful in regional development that had a larger number and complex, active asset of human factors (*Enyedi,* 1997). Regional analysts and developers realised that in different points of the space alternative cultural ands social ties had emerged, due to the levels of schooling, professional structures, ways of life and living conditions of the inhabitants. The linkages change, identities are different, the links to the settlement and the region can be characterised by different parameters.

Work culture and the and culture of activities show definite regional characteristics, the accumulated experiences show different levels of activity, thus the adaptation to the new skills is very much differentiated in space, just because of these social and cultural correlations (*Hahne,* 1985). The former paradigm of regional development – import of the factors of production, top-down controlled transformation with a predominantly economic view – was questioned and replaced by a new way of thinking and action. This new, shaping paradigm has two central elements: the first is bottom-up approach; the second – basically connected to and deriving from the first – is the activation of the human resources, the promotion of its basic elements.

The first part of our study focuses on the new factors of regional development, including the elements generated by the human resources. The subsequent chapters deal with the regional structure of a few dimensions of human resources, demonstrating the regional characteristics that have stabilised or emerged in the 1990s and nowadays. Finally we summarise the characteristic features, implying the trends of regional development and thus the presumed methods of the activation of human resources.

1 Human resources and regional development

The precise definition of the human resources, a concept heard so often that it now almost seems a common place, is not an easy task. What is the point? It is that the human resources, the institutions contributing to their development, and the total of the social conditions and endowments together constitute those assets that a spatial unit disposes of. These factors are present both in themselves and jointly, the have impacts, they shape – reinforcing or weakening each other – the given spatial unit, and by the multitude of the spatial units, the whole of the spatial structure (*Enyedi*, 1996).

The recognition of knowledge in regional science as a factor determining regional development only started in the 1990s. The theories analysing regional development always reflected the current paradigms of economics, so for example the neoclassical theory dealt with the capital and labour effects (*Richardson*, 1969); then the export base theory considered the role of the sectors shaping the economic structure in regional growth (*North*, 1955). In the 1970s, the theory of endogenous development already featured human resources among the internal factors. The focal points of the analyses were nevertheless the endowments of the economic structure (*Hahne*, 1985) or the shaping of the institutional system of regional policy, the handling of the limits and shortcomings in this system (*Stöhr*, 1987).

The theories explaining the development of the national economies and the factors of their competitiveness also tried to follow and model the changing economic environment, which led to the elaboration of "new growth theories" (*EC*, 2003). The followers of the "new (endogenous) growth theory" challenged the hypotheses of the neoclassical experts – who excluded the role of the technological changes on economic development – and integrated technological externalities in their model. One of their excellent representatives, *Romer* (1990) emphasises the importance of knowledge creation in his growth theory. He argues that knowledge is a dominant form of capital, and the volume of economic growth primarily depends on the accumulation of knowledge. The most important feature of the knowledge-based societies is that the creation and utilisation of knowledge is the central element of the value

creation processes. He also emphasises that the technological changes occur as a consequence of the investments in new technologies and the human resources, as a return of these investments. Accordingly, technological development is to be seen as an endogenous factor of economic growth.

The theory of endogenous growth also supposes that all existing – codified and implicit ("*tacit*") – knowledge is freely available for the creation of the new technical knowledge. However, this has not been reinforced by the latest researches, as the findings revealed that the spread of the new technological knowledge – especially of the implicit knowledge – has geographical limits (*Anselin et al.* 1997; *Varga,* 1998; *Braczyk et al.* 1998; *Malecki-Oinas,* 1999).

According to the Schumpeterian endogenous innovation model, the businesses carry out technological developments built on *innovations* in order to maximise their profits. The model considers these technological developments as the most important source of economic growth. This theory says that the businesses are engaged in research and development activities mostly to build out temporary monopolies and realise and extra profit (*Romer,* 1990).

Due to the imperfect competition, the businesses are able to realise enough profit from their new products to cover their research and development expenses. The innovations involving better quality and more service content than the previous products are capable of replacing previous generations of the products; consequently they secure the extra profit of the innovator. These innovations then serve as inputs for the development activities of other businesses, contributing this way to the development of the general technological level and to economic growth. Typical examples for these innovations are information and communication technologies. In the Schumpeterian model the volume of growth is determined by the returns of the research costs, which depends on the magnitude of resources spent on innovation, the size of the market, the profitability of the research and development activity and the market positions of the innovators.

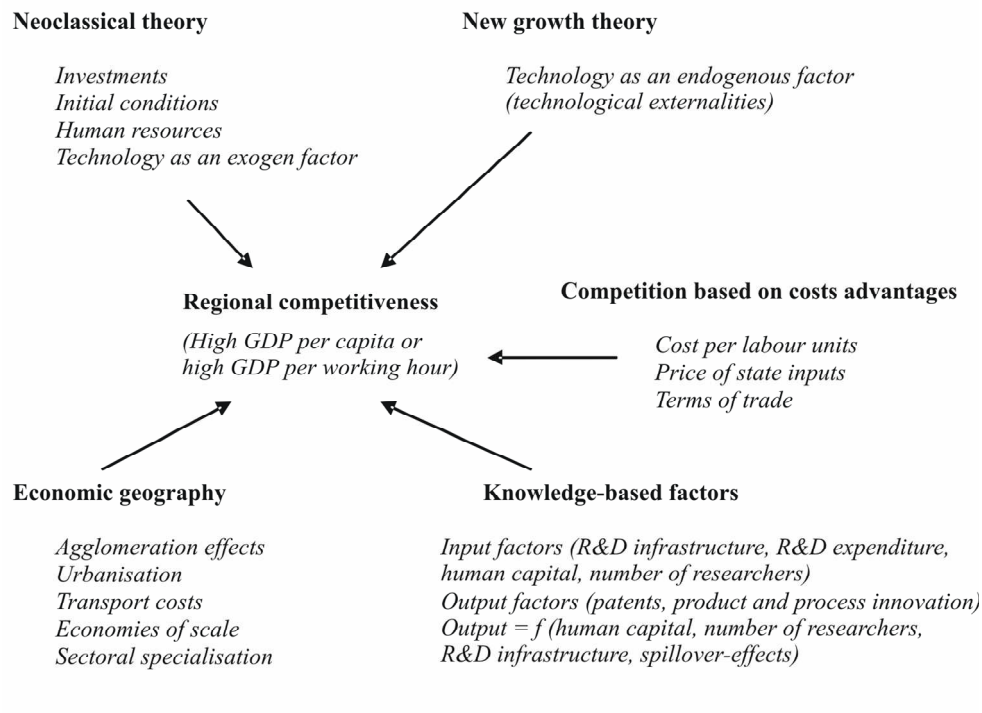
The theories that belong to the economic approaches of the *new economic geography* try to find out what factors lead to the concentration of the economic activities and which factors influence primarily regional competitiveness. The equilibrium model of the new theory of economic geography, by *Krugman* (1991/2003) can explain not only the geographical concentration of the economic activities but also the factors motivating the spatial reallocation of production and the transition of the interregional division of labour. Krugman's model combined the theories of Weber, Marshal and the evolutionist economists (Nelson, Winter) in an innovatory way. While Marshal e.g. builds his theory on the ideal of perfect competition, Krugman's approach also considers imperfect competition and the increasing returns. In his model, parallel to the decrease of the transport costs, the local markets lose some of their importance and the production becomes more and more mobile in space.

It comes from these theories that the competitive advantage of the advanced economies comes form their skills of knowledge production and knowledge utilisation in the first place. These days it is knowledge which is the basis of product, process and service innovations that also create new markets or make the production of the existing products and services cheaper. Knowledge comes from a continuous research and development activity that is carried out by highly skilled experts during an efficient technology transfer and the market implementation of the new ideas.

Knowledge-based economic development is typical for half of the OECD member states, an organisation involving the developed industrial countries. Knowledge production and the number of those employed in knowledge industries are rapidly increasing in these countries (*OECD*, 1996). The production of medium technology intensive and high-tech product increased from 44% in 1985 to over 50% by the turn of the millennium. The growth rate of these sectors has been significantly higher than the GDP growth rate for years (*Simmie*, 2003) *(Figure 1)*.

Figure 1

A different approach to regional competitiveness



Source: EC [2003], p. 131.

It is a generally accepted view that the wide spread of knowledge-based activities is playing an increasingly important role in the competitiveness of the respective countries and regions. Knowledge – as an essential component of innovation – is part of the circulation that leads to innovation and thus to the increase of export capacities and competitiveness. On the one hand, the export base of national and regional economies is the main driving force of growth. On the other hand, export and trade are most important mediators of internationally available knowledge and the transfer of skills indispensable for innovation – and the innovation loop is closed.

The models introduced by *Hagerstrand* (1952), describing the spatial spread of innovation launched those surveys that lead to the description of the innovation milieu where the role of the human resources is already of utmost importance (*Camagni*, 1991; *Rechnitzer*, 1993). Only one step further is the theory of knowledge regions that sees the new driving force of development in the accumulation of skills and in the institutions and actors responsible for that, also defining a new paradigm for regional development (*Scheff*, 1999; *Rösch*, 2000).

Meusburger (1998) devoted a comprehensive monograph to the introduction of the regional dimension of knowledge and training, in which we get an insight not only into the theoretical bases necessary for the survey of the new factor of economic development but also find the most important aspects and methods for the analysis of the human resources.

The Hungarian regional researches have neglected the analysis of knowledge of a new element in regional development so far. Essays were written on the independent, individual analysis of the respective elements of human resources, but these assessed the processes of the last decade and a half or the spatial transition of certain constituent factors not systematically, but from the aspect of the sectoral factors or the traditional regional resources (*Vámos*, 1992; *Tóth–Trócsányi*, 1997, 2000).

It is a new challenge thus to analyse the spatial aspects of the human resources, as we do not wish to describe this resource of innovation by one single factor, i.e. population; instead we focus on the effect mechanisms and the system of factors that mostly influence the human resources in a respective region. We divided this system into four constituents (human factors; quality of life; knowledge and skills dissemination; settlement network), as seen in *Figure 2*.

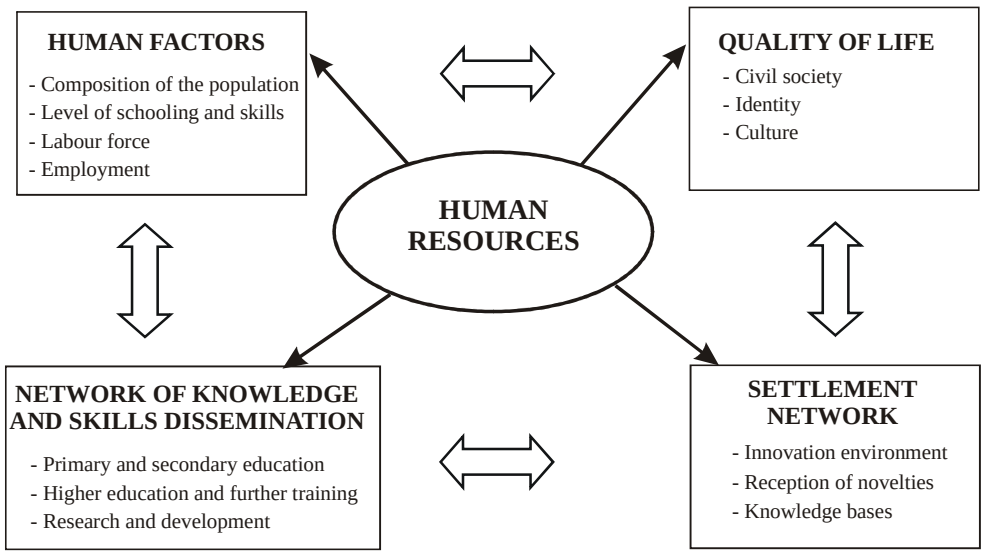
Each of these elements deserves a separate study, so we have selected a few of their components – for which territorial information is available –, and we attempt to introduce the processes of the 1990s on the basis of these.

The first one is the human factor that can be characterised by population and population trends, and different features of the population – in our case it is perhaps the schooling and skills, i.e. the level of training that is the most important. Further characteristics of the human factor are the stock of labour, activity rate, the structure of employment and its transition, rearrangement. Our essay does not deal

with these latter two issues. The Human Development Index is meant to illustrate the quality of the human resources; this index tries to find correlations between the level of schooling of the population and the economic performance, which makes is suitable for the definition of temporal and spatial development hierarchies.

Figure 2

Spatial factors influencing human resources



Source: compiled by the authors.

The second block focuses on the quality of life at regional level. Nowadays the cultural level of a respective region, the activity of the civil society or the identification of the population with the locality or region is seen as a factor promoting development. In our essay we analyse the latter two factors.

The third block contains the network of knowledge and skills dissemination, because school education at different levels (primary, secondary schools and higher education), research and development and the presence of its institutions and experts is of decisive importance in shaping the human resources of the municipalities and regions.

The fourth block is on the development of the settlement network, specifically the urban network. The settlement network is seen as an aura of the human resources. Human presence and the institutions representing play a role in the development of the settlements; on the other hand, the character and particular features

of the settlement also influence human actions and their circumstances. The mutual relationship and connection is demonstrated by the example of the urban network, partly by its restructuring in the early 1990s and by the analysis of a new knowledge and technology, finally by looking at the structure of the factors carrying knowledge.

In our essay we used the results of the Hungarian literature and the findings of Hungarian researches, we summarised them from the aspect of the human resources, and we carried out supplementary survey where we found it necessary, or we updated the data. In our work we tried to grab the processes of the 1990s in the first place, expanding our skills on the regional characteristics of the human resources in the transition period.

2 Human factors

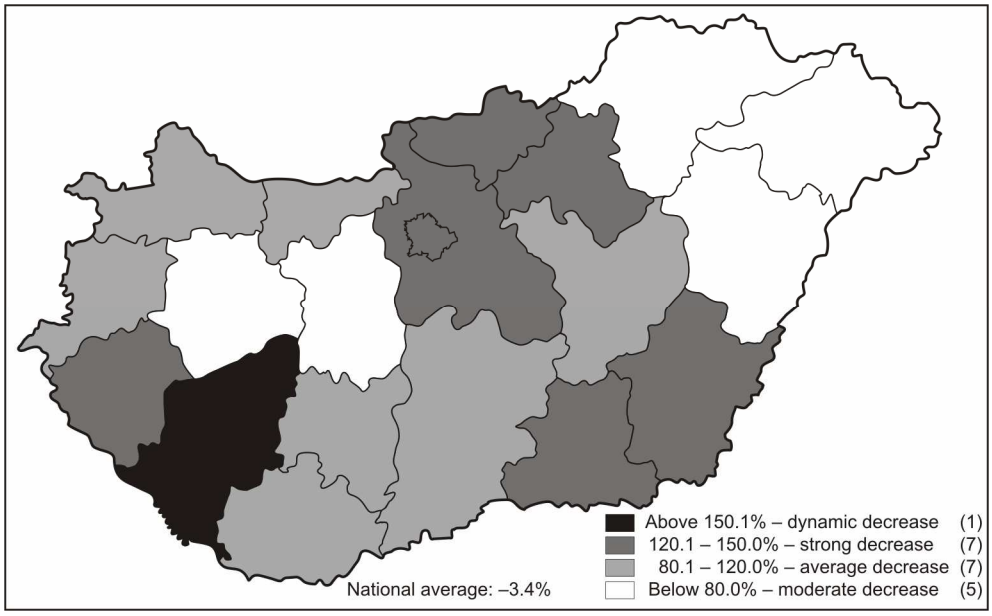
Hungarian regional science is in a lucky situation inasmuch as the population data within the human factors and the tendencies that can be seen from them are fairly well processed. The features of the population – although they are only surveyed in details at the censuses every ten years and at the time of the micro-census at half-time – allow a detailed spatial analysis.

The decrease of the population was a stable tendency in the last ten years, the number of population decreased by almost 300 thousand persons since 1990. In each region and all of the counties the number of population decreased, with the exception of Pest and Fejér counties and the settlements in the category of three to twenty thousand inhabitants. By the end of the decade, however, in not one county or region, or settlement category did the number of live births surpass the number of deaths (9.6‰ and 13.9‰, respectively), which means that ageing is now a phenomenon affecting the whole of the country, including the advanced and urbanised regions (*Report on the regional processes*… 2001). The regional disparities have stabilised, as there is a natural increase in Szabolcs-Szatmár-Bereg, Hajdú-Bihar and Borsod-Abaúj-Zemplén counties, in Transdanubia in Fejér and Veszprém counties. A high proportion of deaths was typical of the last decade, which is especially true in the capital city, the north Hungarian counties, but the situation is the most dramatic in the South Great Plain. In 1990, in sixty-one per cent of the Hungarian settlements the population aged sixty years or older outnumbered those younger than fifteen; in 1998, this was the case in 68% of the Hungarian settlements. Ageing is a lasting tendency; nowadays it is only the agglomeration of Budapest and the northeast part of Hungary where the proportion of children within the total population is higher than that of the elderly citizens.

The trends of the change of the population in 2000–2010 (*Figure 3*) reveal that in the southern parts of Hungary (between Szentgotthárd and Gyula) the decrease of the population will be faster than the national average, the decrease of the population might exceed ten per cent in this decade, which can be enhanced by migration. The pace of the population decrease will be somewhat slower in Szabolcs-Szatmár-Bereg, Borsod-Abaúj-Zemplén and Hajdú-Bihar counties, similarly moderate tendencies will be typical for the industrialised parts of Veszprém and Fejér counties. In the rural areas, the population decrease will be bigger in the coming decade (reaching 10 to 12 per cent), while the urban regions will have a more moderate decrease (2–4 per cent). Migration will contribute to the increase of the disparities (National Regional Development Concept, Ministry of the Environment and Regional Development, 1997).

Figure 3

Changes of the number of population between 2000 and 2010
(national average = 100%)



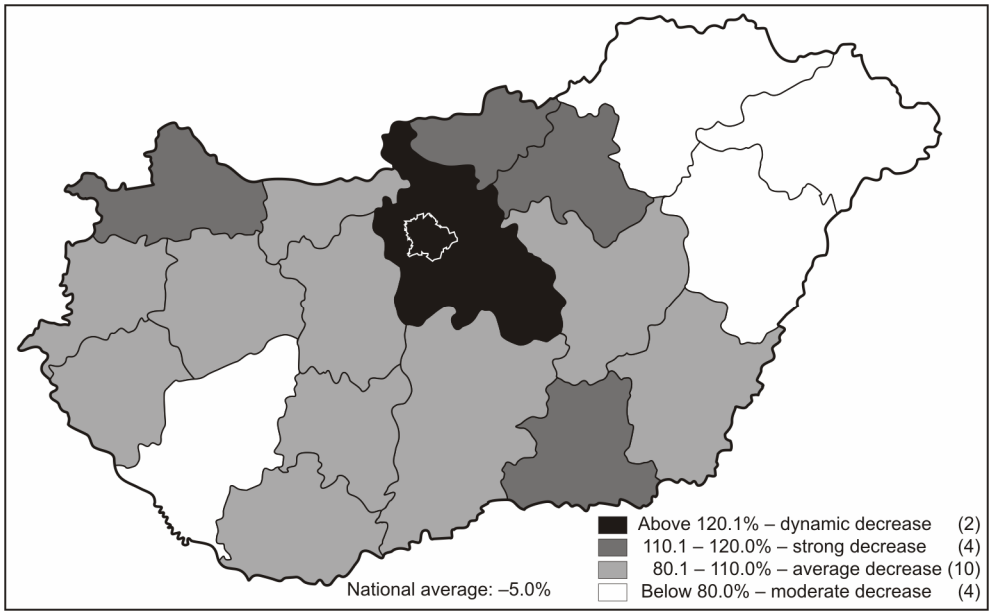
Source: National Regional Development Concept. Ministry of Environment and Regional Development, 1997

The regional disparities of the pool of labour force will be more striking in 2000–2010 than before (*Figure 4*). The decrease of the population aged 15–59 is the most striking in the capital city and its agglomeration, above-average decrease can also be

seen in Győr-Moson-Sopron county and in Nógrád and Heves counties, closely linked to the agglomeration of the capital city. We have already mentioned that the South Great Plain region is characterised by a high ageing index, this is one of the reasons why we expect a strong decrease of the number of labour force in this region.

Figure 4

Changes of the source of labour force (population aged 15–19) in the counties, 2000–2010 (national average = 100%)

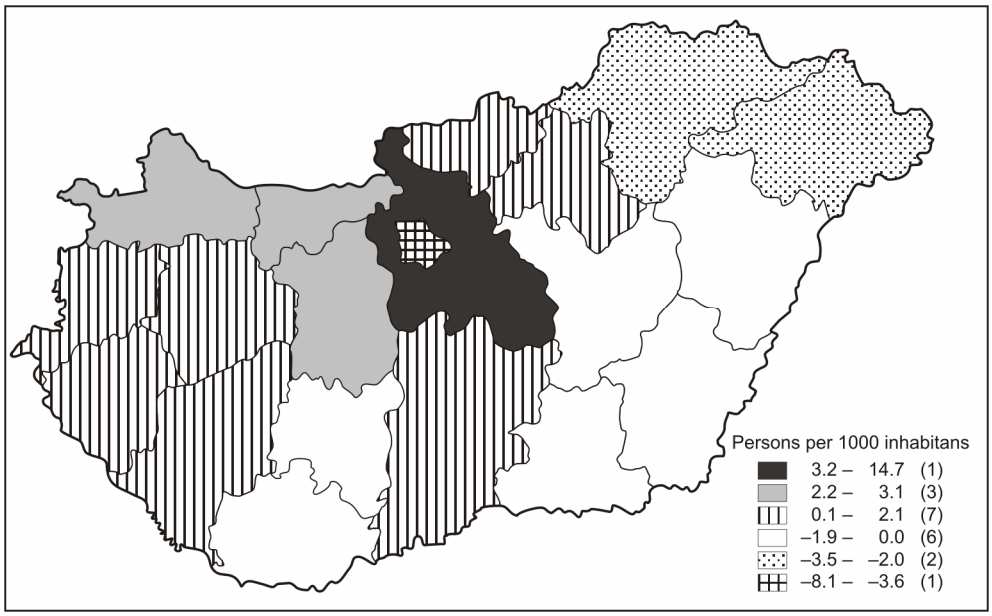


Source: National Regional Development Concept. Ministry of Environment and Regional Development, 1997.

The movement of human resources within Hungary, the migration showed different characteristics in the transition period than in the decades before. Migration was predominantly motivated by making a living and having better work conditions, so in the 1990s migration to large distances was significantly reduced. Long-distance migration was slowed down, in addition to the reduction of jobs, by the lack of housing, more exactly the striking growth in the regional disparities of housing costs. Migration now involved shorter distances, and the main targets of migration were the urbanised areas of Hungary *(Figure 5).* As a consequence of the population movements, the prosperous western centres and their hinterlands attracted the population of the eastern regions (see *Rédei,* 2001).

Figure 5

Permanent internal migration balance per one thousand inhabitants by counties, 2001



Source: Edited by the authors by HCSO data.

The age structure of the population participating in migration also changed, the share of the younger generation increased in the 1990s. The youth attend secondary schools and higher education institutions in these urbanised regions, having finished their studies they settle down there, in fact, in many cases they prepare the "relocation" of their families, parents and relatives living in the eastern parts of Hungary.

The migration balance of the urban settlements turned to negative in the 1990s, and this tendency is going on in the present decade. The outmigration of the population form the big cities started; the Budapest agglomeration strikingly transformed both as regards the number and the structure of its population (*Csanádi–Csizmady,* 2002), but more and more serious infrastructure and traffic problems also arise (*Kovács,* 2001). The big cities of Hungary are also losing their population, the suburbanisation trends affect the big cities of Transdanubia in the first place (*Bajmóczy,* 2000; *Hardi*, 2002), but the population decrease and outmigration are also palpable in the big cities of the other regions (*Timár–Váradi*, 2000).

It is the active (and innovative) part of the population that leaves the rural or depressed regions, leaving a growing share of elderly people and a decreasing working

population there. This raises several municipal management problems, since e.g. the utilisation of some services decreases, at the same time the demand for other services – especially for health and social services – increases; however, the impoverishing municipalities are unable to afford the provision of these services.

International migration is a new tendency; it had been rather exceptional before the systemic change. Today the number of foreigners staying in Hungary for a longer period of time is estimated to be around 150 thousand, the number of newcomers has stabilised at around 12–15 thousand annually (*Kobolka*, 2000; L. *Rédei*, 2001). The majority (85%) of them arrive from European countries – half of these from Romania –, ten percent from European Union member states, the rest from the neighbouring countries. Another 10% of the immigrants are from Asia, mostly China (*Kovács*, 2000). The geographical destinations of immigration are easy to designate: on the one hand, the border regions in the vicinity of the place of the immigration, and the centres of such regions, and the capital city, on the other hand. In the third place, the places of residence of friends and relatives (mostly in South Transdanubia) are the main places where the immigrants settle down (*L. Rédei*, 2001).

2.1 Schooling of the population

As regards the schooling of the population, a striking tendency seen both at national and regional level in the last decade is the spectacular increase in the average level of schooling of the population.[1] The average number of finished school classes increased by 1.1 between 1990 and 2001 – both the national and countryside average –, which means a 13.6 per cent increase in the national average and a slightly higher, 14 per cent increase in case of the countryside average (i.e. theaverage calculated without Budapest). While in 1990 the Hungarian population aged 7 or older had finished eight classes on the average, in 2001 the average school education of the population aged 7 or older[2] was almost 9.5 classes. When

[1] During the census of 1990 and 2001, the schooling of the population was measured by different methodologies: in 1990 the population aged 7 years and older was classified into different categories by the highest level of schooling finished, whereas in 2001 the highest number of finished school classes was taken into consideration in the classification. As the data relating to the two years cannot be directly compared in the form disseminated by the Central Statistical Office, we used the available data to create categories that allow the comparison of the data concerning the two censuses, and we re-grouped and corrected the existing data in these categories.
In the data series used in our survey we used the method looking at the highest level of school finished. The started but unfinished (yet or for ever) schools of a higher class (irrespective of the number of classes finished) was not taken into consideration, so the students of higher education in the respective years were classified among those who had finished secondary school.

[2] By population we mean the citizens aged seven years or older, as they are the part of the population relevant in the survey of school education.

looking at the figures of average school classes finished by counties we can see significant territorial disparities beyond the average growth in the value of this index, although the average number of finished school classes increased in each county (*Figure 6*).

The figure immediately reveals the outstanding position of Budapest: the index of the capital city exceeded the national average by 14.1% in 1990 and by 14.5% in 2001. In 1990 Budapest and Győr-Moson-Sopron county showed values exceeding the national average (8.3), the indices of Vas, Csongrád, Komárom-Esztergom, Baranya, Fejér, Veszprém, Borsod-Abaúj-Zemplén, Zala and Pest counties were between the national average (8.3) and the country average (8.0). In Heves, Hajdú-Bihar, Somogy, Tolna, Békés, Nógrád, Jász-Nagykun-Szolnok, Bács-Kiskun and Szabolcs-Szatmár-Bereg counties we find figures that did not even reach the country average.

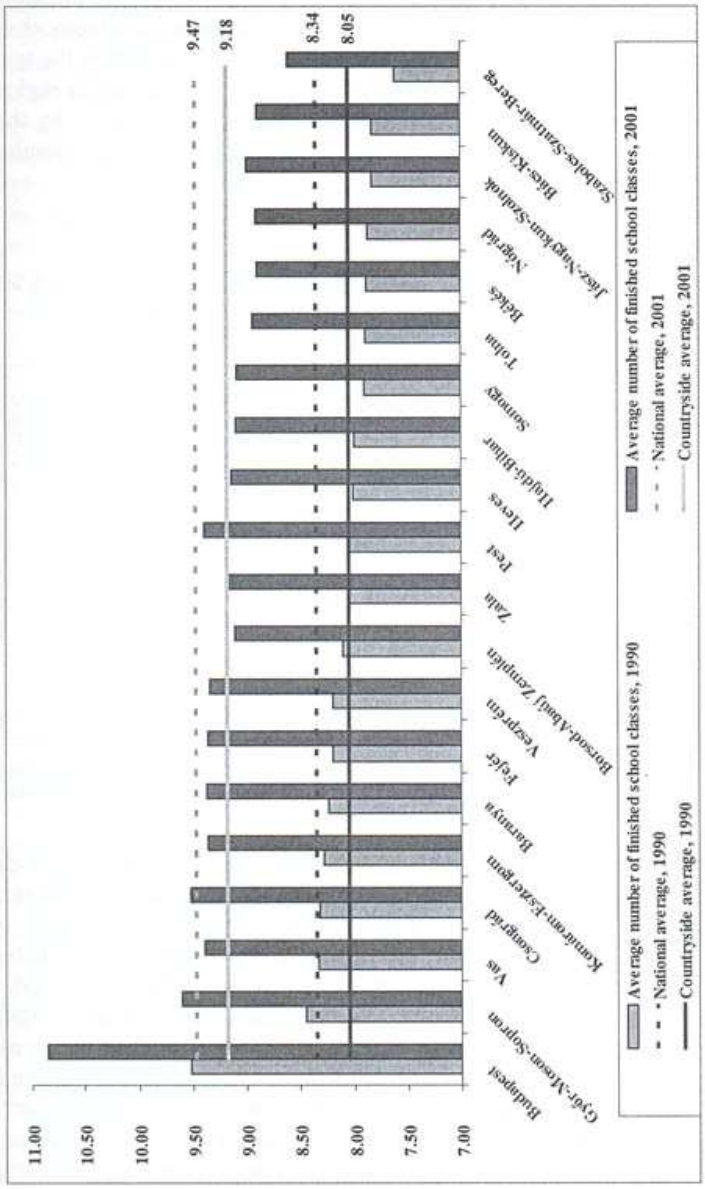
The most dynamic development was not in Budapest in the last ten years, despite the favourable position of the capital city. While the increase in the average number of finished schools was less – 14% – than the country average, there were some counties in which a growth exceeding the pace of the increase of the country average could be observed: they are Pest (16.7 per cent), Somogy (14.9 per cent), Jász-Nagykun-Szolnok (14.8 per cent), Csongrád (14.4 per cent), Heves (14.2 per cent) and Fejér (14.2 per cent).

As a consequence of the uneven development during the decade, the order of the counties changed by 2001. In 2001, in addition to Budapest and Győr-Moson-Sopron, Csongrád county also featured an index above the national average, but the position of Pest and Baranya counties improved significantly, too. In Pest county the average number of finished school classes hardly exceeded the country average in 1990, whereas in 2001 it was only 0.8% lower than the value of the national average. The dynamic growth of Somogy, Jász-Nagykun-Szolnok and Heves counties – well above the growth of the country average – was not enough to catch up these counties to the level of the country average by the end of the decade. The situation significantly worsened in Borsod-Abaúj-Zemplén county; the value exceeding the country average in 1990 fell to below that by 2001.

The average number of finished school classes was the highest in Budapest and the lowest in Szabolcs-Szatmár-Bereg county in both years. During the respective decade, the difference between the highest and lowest value of average number of finished school classes increased from 1.9-fold to 2.2-fold, which indicates the growth of regional disparities in the relation of Budapest and Szabolcs-Szatmár-Bereg county.

Figure 6

Average number of school classes finished by the population aged 7 and older, 1990, 2001
(in decreasing order by the 1990 values of the index)



Source: Calculation by the authors based on the county data of the censuses of 1990 and 2001. Source of the data: county data of the census of 1990, HCSO 1992. and www.nepszamlalas.hu

At the level of the largest territorial units, the regions, the growth of the average number of finished school classes shows a more homogeneous situation than in the case of the counties, which is explained by the different development dynamism of the counties making the individual regions. A growth exceeding the increase of the country average could only be seen in the South Transdanubian region, while the dynamism of the growth of the national average was surpassed by the regions of Central Hungary, Middle Transdanubia, North Great Plain and South Great Plain *(Table 1).*

Table 1

Positions of the Hungarian regions by the average number of school classes finished by the inhabitants, 1990, 2001

Region	1990		2001	
	position	Average number of finished school classes	position	Average number of finished school classes
Central Hungary	1.	9.05	1.	10.31
National average	–	8.34	–	9.47
West Transdanubia	2.	8.30	2.	9.42
Middle Transdanubia	3.	8.22	3.	9.36
Country average	–	8.05	–	9.18
North Hungary	4.	8.04	6.	9.08
South Transdanubia	5.	8.03	4.	9.17
South Great Plain	6.	8.00	5.	9.09
North Great Plain	7.	7.81	7.	8.89

Source: Calculation by the authors based on the county data of the censuses of 1990 and 2001. Source of the data: county data of the census of 1990, HCSO 1992. and www.nepszamlalas.hu

In the hierarchy of the regions, both in 1990 and 2001, the Central Hungarian region ranked first as regards the average number of finished school classes. It was the only region with indices above the national average. The following two regions, West Transdanubia and Middle Transdanubia kept their positions between the national and the country average, a rearrangement could only be seen in the case of the regions below the country average. The positions of South Transdanubia and South Great Plain improved, due to their dynamic development, while the North Hungarian region, the one closest to the country average in 1990, fell to the one but last position by 2001. In North Hungary, the index of Borsod-Abaúj-Zemplén county fell below the country average by 2001, in the South Great Plain region Csongrád county showed a dynamic development, its figure surpassed the country average by 2001. The North Great Plain – despite the spectacular development of Jász-Nagykun-

Szolnok county – showed a pace of development below the growth of the national average, it is still in the last position in the order of the regions: in all three constituent counties, the indices were below the country average both in 1990 and in 2001.

The difference of 0.3 class between the country average and the national average remained unchanged between 1990 and 2001, which implies the moderate approach of the country average to the national average, i.e. the slight decrease of the Budapest–country disparity, in the light of the growth of the average values of the index. The dynamism of the country average above the national average and the 5.8 per cent decrease in the standard deviation of the national average also indicate the decrease of the Budapest–country disparity.

In addition to the Budapest–country difference, significant territorial imbalances can be seen in the rural space, as well, both within and among the regions. The often more dynamic growth of the indices of the counties below the country average could not compensate their lagging behind coming from their unfavourable starting position, consequently most of the spatial disparities typical in the rural space in the beginning of the decade continued to exist in 2001. Although the relative positions of the regions with counties below the country average changed, the same four regions featured the lowest average number of finished classes in 1990 as in 2001. In other words, while the countryside is slowly catching up with Budapest – due to the above-average indices of West Transdanubia and Middle Transdanubia, and Pest, Baranya and Csongrád counties –, the spatial disparities of the rural space do not cease to exist.

2.2 Spatial structure of the schooling of the inhabitants

As a result of the rise in the average number of finished classes, in the educational structure of the population there was an increase in the share of those with higher school education within the total population, both at national level and country level (without Budapest). At the national level, the proportion of those without finished primary school fell to one-quarter, the share of those who had finished 1–7 classes of the primary school dropped by 10 per cent (from 29 to 19%) between 1990 and 2001.

The four per cent decrease in the share of those with finished only eight classes in primary school is a turning point, because the proportions of those belonging to all other categories (more finished classes) increased: the number of those who finished vocational and specialised secondary school increased by 5.4%, the proportion of grammar school graduates rose by 8.6%, whereas the share of those with higher education diploma increased by 1.3% between 1990 and 2001. After these increases, 18.4% of the population had vocational or specialised secondary school; almost 25%

of the population finished grammar school and 8.9% had finished college or university training.

The countryside indices, calculated without the data of Budapest, show similar tendencies, although the values of the country indices are less favourable in both years and in all categories: the share of those countryside citizens who have lower school education is higher than the national average, while the proportion of those with higher level of school education is below the national average. As regards the countryside Hungary, the proportion of those without finished primary school education fell from 2.2 per cent to 0.6 per cent, of those with 1–7 finished classes of primary school from 31 per cent to 21 per cent, while the share of those who had only finished eight classes of primary school fell from 32 per cent to 29 per cent from 1990 to 2001. The proportion of those who finished vocational or specialised secondary school increased from 13.9% in 1990 to 19.7% in 2001, whereas those who finished grammar school made 14.5% of the population in 1990 and 23 per cent in 2001; these figures were 5.9% in 1990 and 66.% in 2001, respectively, for the graduates of higher education institutions.

As regards the educational structure of the population, the situation was the best in Budapest in both 1990 and 2001, as the capital city boosted with the lowest share of those with low level of school education and the highest proportion of those with higher level of education. In both years in question, Szabolcs-Szatmár-Bereg county had the highest share, compared to its population, of those who had not even finished the eight classes of primary school or only 1 to 7 classes of that. Parallel to this, in 1990 this county featured the lowest proportion of those with secondary school and higher education leavers and in 2001 the smallest share of those who had college or university degree.

When comparing the schooling structure of the Budapest and the countryside population, significant disparities can be seen. The data in *Figure 7*. and *8*. reveal that the share of secondary school or higher education graduates within the total population was higher in Budapest, the proportion of those with less schooling was more significant in the countryside both in 1990 and 2001.

While in 1990 14.5 per cent of the population living in Budapest had higher education degree, the same figure for the countryside population was not more than 5.9%. These figures increased to 19.3 per cent and 6.6 per cent, respectively, which means that the dynamic increase in the share of higher education graduates resulted in the fact that one-fifth of the Budapest population aged 7 years or older had higher education diplomas, whereas in the countryside the increase of the share of the respective category of population was only 0.7%.

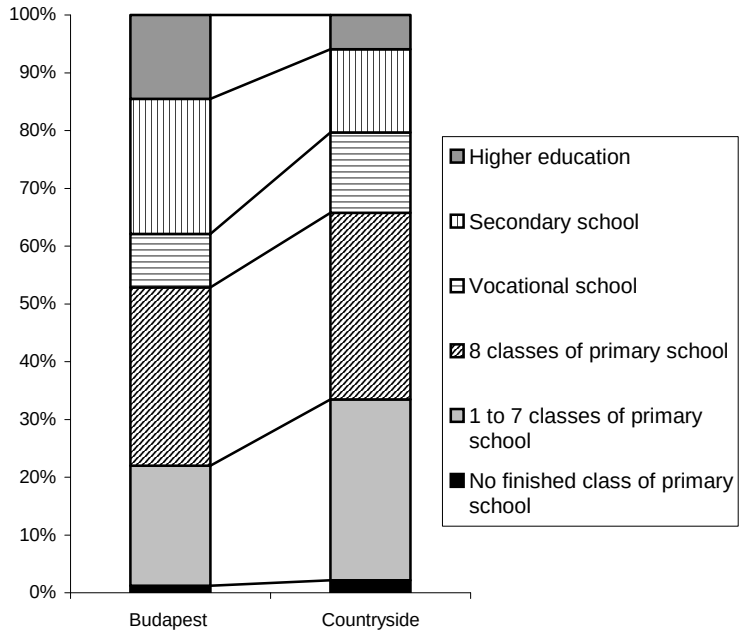
We can see that in 1990 the category biggest in number within the population aged seven years or older was those who had finished primary school education, both in Budapest and the countryside. By 2001, a dramatic decline had taken place in Budapest in the share of those with primary school education, at the same time the

proportions of secondary school and higher education graduates increased dynamically. In the capital city, in 2001 it was already secondary school graduates who made the biggest share of the population aged seven years or older, and the share of those with college or university diploma almost reached the proportion of those with not more than eight classes of primary school education. In the countryside population, the share of the category with 1 to 7 finished classes of primary school showed a considerable decrease, parallel to a significant increase of the categories with vocational and specialised secondary school education, and with grammar school education within the population aged seven years or older.

Comparing the processes in Budapest and the countryside, an increase is evident in both cases in the number of those with higher level of schooling within the population aged seven years or above. The difference is that in Budapest it was mainly due to the rise in the proportions of grammar school and higher education graduates, while in the countryside it was attributable to the increasing share of those with vocational and specialised secondary school, or with grammar school education.

Figure 7

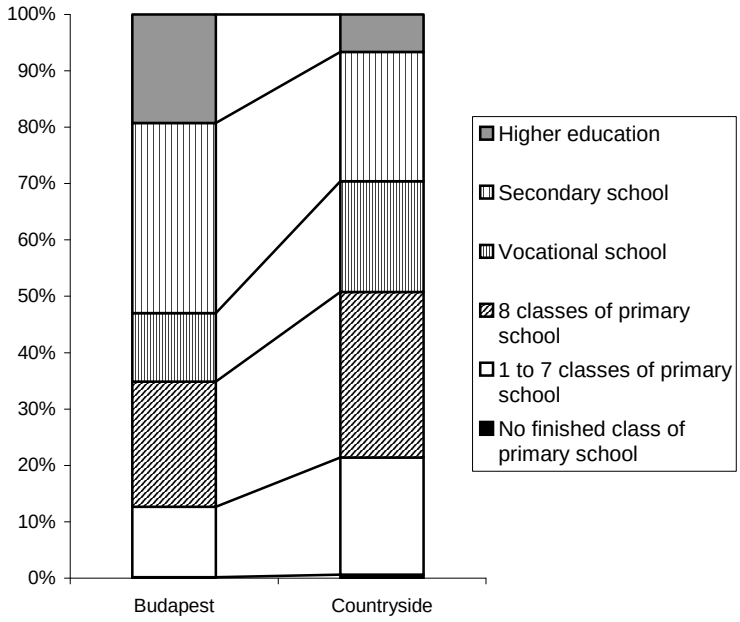
Breakdown of the population aged 7 and older by school education, 1990 (in per cent)



Source: Calculation by the authors based on the data of censuses.
Source of the data: county data of the census of 1990, CSO 1992.

Figure 8

Breakdown of the population aged 7 and older by school education, 2000 (in per cent)



Source: Calculation by the authors based on the data of censuses.
Source of the data: county data of the census of 2000, HCSO 2001.

In the spatial distribution of schooling it is the Budapest–country discrepancy too that dominates. While in 1990 44.3% of those with higher education graduates and 36.4% of secondary school leavers lived in the Central Hungarian region, not more than 29% of the population aged seven years or older lived in this region, which indicates a considerable concentration. The role of Budapest is outstanding even within the Central Hungarian region: while in 1990 Budapest was home to 19.8% of the Hungarian population aged seven years or older, the capital city concentrated 37.7 per cent of the higher education graduates and 28.5% of those who had finished secondary school. The concentration of those with higher education diploma in the Central Hungarian region further strengthened by 2001: in this year, almost half, 47.5% of those with higher education diplomas lived in this region, while the region's share from the Hungarian population aged seven years or older was only 28.2%. In the region of Central Hungary, the increasing concentration is due to the dynamic development of both Budapest and Pest county. As regards secondary

school graduates, the share of the Central Hungarian region slightly decreased, by approximately 2 per cent, as a consequence of two opposite processes: in Budapest there were 4.5% less, while in Pest county 2.4% more inhabitants of this category in 2001 than in 1990.

As regards those with less schooling than secondary school, their concentration can be seen in the countryside. While in 2001 fifteen per cent of the population aged seven years or older lived in the North Great Plain region, one-quarter of those who had not finished primary school lived in this region. Looking at the data at county level, the disadvantaged position of Szabolcs-Szatmár-Bereg county is the most striking. In 2001 Szabolcs-Szatmár-Bereg county was home to 5.6% of the population aged seven years or older, while its share from those without finished primary school education reached 12.8%. It is remarkable that the higher category of schooling, the smaller the share of the Hungarian population that lives in Szabolcs-Szatmár-Bereg county: 12.8% of those without primary school education, 7.4% of those with 1 to 7 finished classes of primary school, almost 6% of those with finished primary school education, 5.7% of those with vocational school or specialised secondary school certificate, 4.3% of secondary school graduates and 3.2% of those with higher education diploma were Szabolcs-Szatmár-Bereg county citizens in 2001. The same phenomenon, although to a more limited extent, was typical in Tolna, Nógrád and Hajdú-Bihar counties.

We get much information on the schooling of the population in a given region from the share of those with higher education diploma. In 1990, the national average of this group within the population aged 25 years or older was 10.6%, this figure increased to 12 per cent by 2001. In the countryside the same figures were 8.3% in 1990 and 9% in 2001.

Comparing the counties and regions of Hungary, significant differences can be seen in this respect, too. First of all we have to see the favourable position and dynamism of Budapest. In 1990, one-fifth of the population aged 25 years or older had higher education diploma in Budapest, by 2001 their share grew to one-fourth. These numbers are more modest in the countryside of Hungary. Besides the Budapest–country disparity, there are palpable differences within the country, as well. At the level of the regions, the Danube River is a division line: the indices of the county in Transdanubia were above the countryside average both in 1990 and 2001, while the indices of the Great Hungarian Plain counties remained below that in both years.

When we look at county level data, the differences are not unambiguous. In 1990 only Budapest boasted with values higher than the national average, while in 2001 Csongrád county too showed figures in excess of the national average, due to its dynamic development during this decade.

In 1990 the following counties had higher shares of those with higher education diplomas within the population aged 25 years or older in the countryside: Csongrád, Győr-Moson-Sopron, Hajdú-Bihar, Fejér, Baranya, Veszprém, Vas, Zala, Komárom-

Esztergom and Borsod-Abaúj-Zemplén. By the year 2001, the number of counties with positions in between the national and the countryside average decreased: Győr-Moson-Sopron, Baranya, Hajdú-Bihar, Fejér and Veszprém counties kept their positions, while Pest joined this leading group. The positions of Komárom-Esztergom, Vas, Zala and Borsod-Abaúj-Zemplén worsened, in 2001 the proportion of the higher education graduates within the population aged 25 years or older dropped below the countryside average in these counties.

Despite the fact that the positions of several counties worsened, in 2001 there was at least one county in each Hungarian region – with the exception of North Hungary – where the proportion of the higher education graduates within the population aged 25 years or older exceeded the countryside average. These are usually the counties with higher education – primarily university – centres: Fejér, Veszprém, Győr-Moson-Sopron, Baranya, Hajdú-Bihar and Csongrád counties.

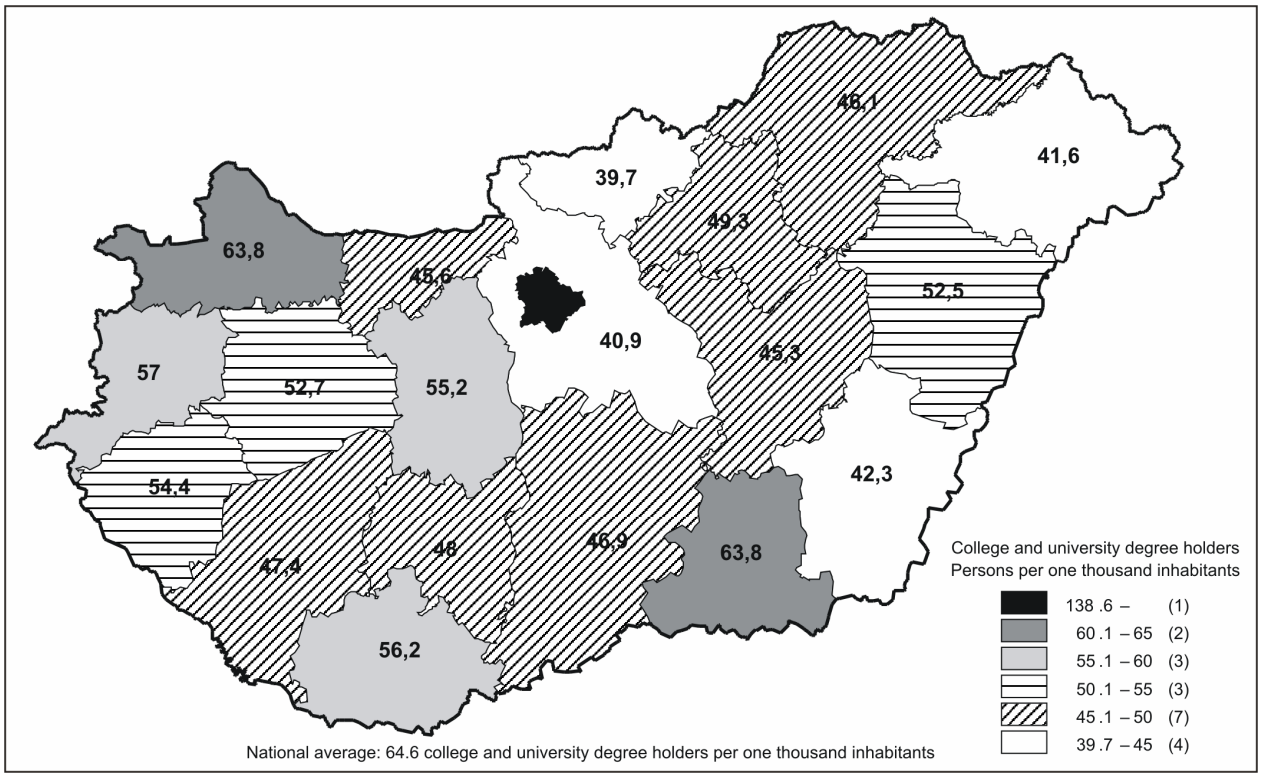
In 1990, the lowest proportions of higher education graduates within the population aged 25 years or older could be found in Békés county (7 per cent) and Nógrád (7.1%). By 2001, even these low values dropped considerably: the proportion of higher education diploma holders within the population aged 25 years or older fell to 5.6% in Békés and 5.8% in Nógrád county.

Figure 9 shows the regional composition of schooling and employment, including those in leading positions and other professionals. From the breakdown of school education per one thousand inhabitants, the high value of the capital city is striking (37%); together with Pest county the Central Hungarian region is home to every second person with higher education diploma (44.7%). Apart from this proportion, the regional disparities are not striking: the spatial structure of the higher education graduates is more or less balanced across Hungary. The counties with university centres stand out, also Győr-Moson-Sopron and Vas counties in Transdanubia. Looking at the same factor at the regional level, it is striking that the proportion of highly educated inhabitants is higher in the South Great Plain region (11 per cent) than in West Transdanubia where this figure is only 8.8%. This difference is interesting, as one would probably think that the areas with more advanced economy and higher income generating capacity will more definitely concentrate the proportion of higher education graduates. This is not the case, and we even have to remind of the anomaly that the supposedly less developed regions concentrate a higher proportion of the highly educated inhabitants. This statement is supported by the fact that 10.7% of all higher education graduates live in the South Great Plain region.

Figure 10 shows the spatial distribution of those in leading positions and of intellectuals and other professionals. The combination of the two categories – those in leading intellectual positions and other professionals – is made possible by the fact that these two are quite similar in their regional breakdown; the proportions of these two groups are quite the same. The role of the capital city is striking again in the spatial structure of these occupations, as the highest figure of intellectuals per

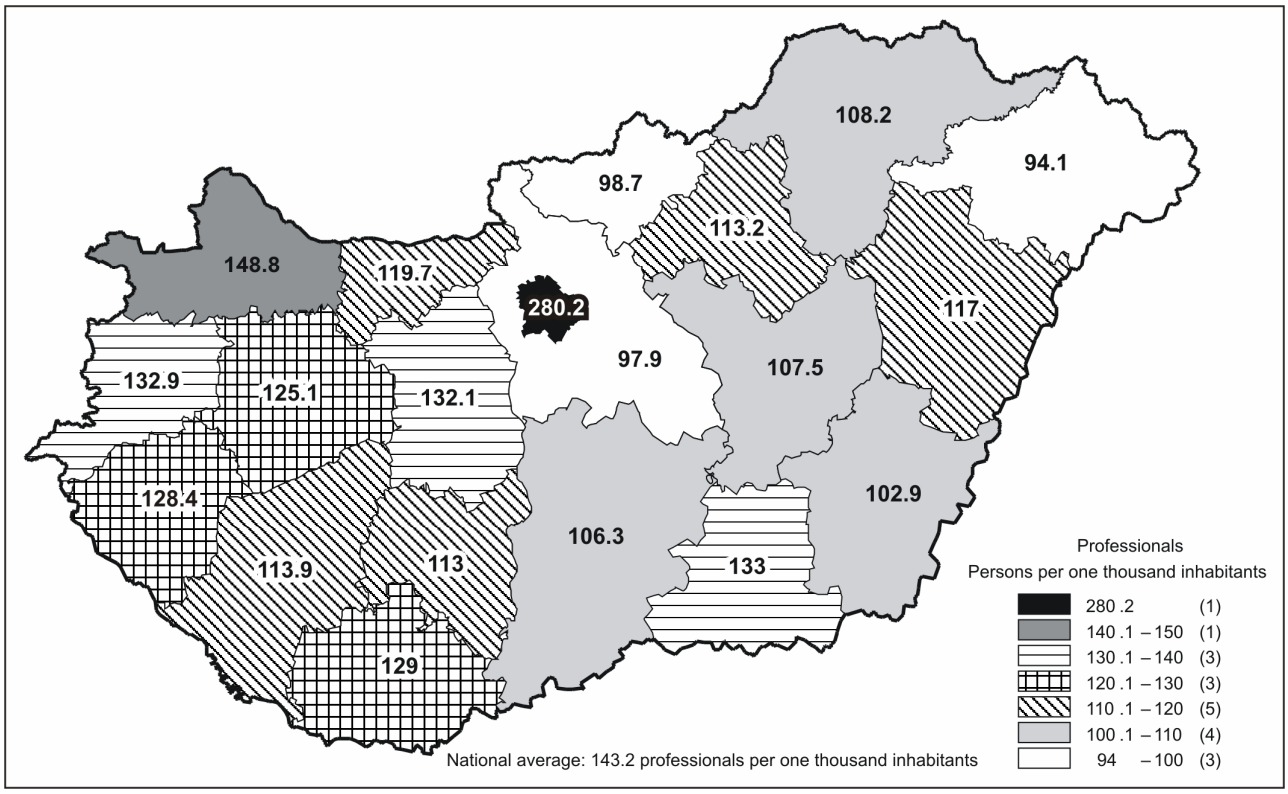
Figure 9

Regional disparities of the college and university degree holders per one thousand inhabitants, 2001*



*Data of the locally employed.
Note: number in brackets show how many counties belong to the respective category.
Source: calculation by the authors based on the HCSO data of the census of 2001.

Figure 10
Regional disparities of the professionals per one thousand inhabitants, 2001*



* Data of the locally employed.
Note: Number in brackets show how many counties belong to the respective category.
Source: Calculation by the authors based on the HCSO data of the census of 2001.

one thousand inhabitants can be found here. It is interesting that after Szabolcs-Szatmár-Bereg county, it is Pest county that has the last position in this respect: it indicates that the executive managers and the professionals are more likely to choose Budapest as their place of residence. In regional disparities, the tendencies mentioned above can be seen here as well: the counties of South Hungary with large university centres stand out (Csongrád and Baranya), together with the West Transdanubian and the Middle Transdanubian region. These regions feature values around the national aver age. In the eastern part of Hungary the share of the population with such occupations is lower; the number of intellectuals per one thousand inhabitants is approximately 100–110. This is probably the consequence of the more traditional economic structure, the high proportion of those employed in public services and the lowest level of entrepreneurial willingness. Regional disparities are thus clearly visible, not only as regards schooling, including higher education, but also in those professions that are connected to intellectual activities, i.e. management, organisation, marketing and development tasks.

2.3 Foreign language skills

The foreign language skills are basically determined by the level of schooling, but the cultural affinity of the population is also reflected in this factor. These together affect the quality of life. On the basis of the data of the 2001 census and information from the 1990s, processed in a former study, we attempt to highlight the spatial structure, with special reference to the changes that occurred in the 1990s (*Tóth–Trócsányi*, 1997).

Among the learnt languages (i.e. languages that are not the mother languages of the ethnic minorities), English, French and Spanish led the list in the early 1990s, because English and Russian were more wide-spread than the languages of the ethnic minorities (except German). There were large differences in language skills across the country. The spread of English language was evident, which is indicated by the fact that while in 1991 the regional difference was 14-fold between the (naturally) leading Budapest and the holder of the least favourable position (Borsod-Abaúj-Zemplén county), the situation changed a lot since then, the differences in English language skills grew to 38-fold by 2001. The leading position was held by Budapest again, the county in the last position was Nógrád. As regards the structure of language skills, German still leads (36.1%) but English is approaching it (reaching 35.5%), all other European languages have weak positions, only Russian is worth mentioning (6.9%), but French language is becoming more and more popular, too (4.1%).

Budapest was the leading spatial units in Hungary in the skills of learnt languages in 1991: 57% of those who spoke foreign language(s) lived in the capital city. The

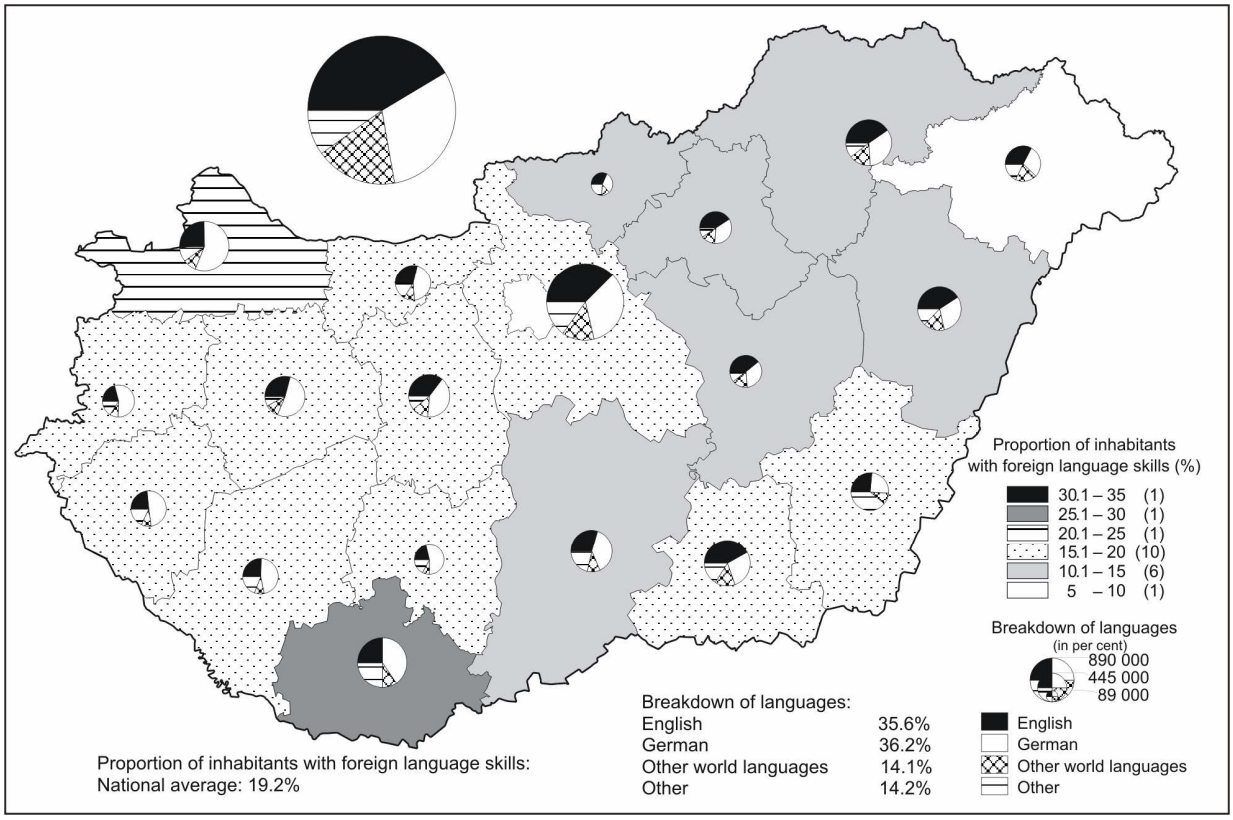
situation changed by 2001, the share of Budapest among the speakers of foreign languages dropped to 33.9%, together with Pest county to 43.7%. The regional differences are decreasing in foreign language skills. It is also true that there is a concentration of the speakers of less commonly spoken languages in Budapest: Spanish (59.0%), French (48.6%), Italian (46.5%), It is not valid for German, on the other hand, the Budapest citizens only make 28.1% of those who speak German in Hungary.

There are no striking differences between the rural areas west and east of the Danube River, if we look at the proportion of those with foreign language skills. In the two macro-regions the share of those who speak foreign languages is almost the same; the differences can be found among the languages spoken. The nine counties of Transdanubia are home to 38.6% of those who speak German, the highest figure can be found in Győr-Moson-Sopron county and the lowest in Tolna (7.4% and 2.8%, respectively). In the Great Hungarian Plain and North Hungary, on the other hand, English is dominant; the regions in question are home to 27.8% of those who speak English. The highest the share of English speakers is in Borsod-Abaúj-Zemplén county (4.9%), while in Nógrád only 1.1 of the population speak English. Also, the county with major university centres, i.e. Csongrád or Hajdú-Bihar feature high figures of population speaking English language *(Figure 11)*.

We can say that theoretically every fifth citizen of Hungary speaks a foreign language at some level, this proportion being the highest in Budapest (33.6%) and the lowest in Szabolcs-Szatmár-Bereg county (9.3%), which means that the regional disparity is 3.6-fold. Compared to the size of the population, in South Transdanubia we are the most likely to find somebody with foreign language skills. Within this region Baranya county has an outstanding position, in this county every fourth person is able to communicate in some language. The next counties “rich in languages” are Győr-Moson-Sopron (22.1%), Pest (19.3 per cent) and Komárom-Esztergom (18.9 per cent). In the order of the first five counties we also find Veszprém county (18.4 per cent). On the other hand, Northeast Hungary is a “language-deficient” region, as the order of the counties from the bottom is as follows: Szabolcs-Szatmár-Bereg (9.3 per cent), Jász-Nagykun-Szolnok (10.3 per cent), Nógrád (11.0 per cent), Borsod (11.7 per cent) and finally Bács-Kiskun county (14.0 per cent).

Figure 11

Language skills of the population, 2001



Note: number in brackets show how many counties belong to the respective category.

Source: HCSO data of the census of 2001.

2.4 Human development index

The human development index (HDI) was calculated according to the principles defined by the UNDP (the development programme of the UNO). The definition of human development is as follows: "The creation of an environment in which the humans can develop all of their resources, can live a productive and creative life in harmony with their needs and interests" (*A humán és a gazdasági…* 2001 p. 5.).

In the spirit of this definition the human development indices are made for countries and groups of countries, on the basis of the following factors:

- long and healthy life (life expectancy);
- skills level (literacy of the adult population, and the share of those attending the three types of schools, i.e. primary, secondary and higher education within the respective age group);
- living standards (amount of the GDP per capita calculated at purchasing power)[3].

The average of the three elements gives HDI, basically an index the possible maximum of which is 1.

The calculation of this index for territorial units was first done by Nemes Nagy, József (*Fóti,* 2000). The author emphasises in his introductory essay that the index "is good for demonstrating the relative development positions of the spatial units (the counties) in comparison with each other, and it magnifies regional disparities that are hardly palpable in international (cross-country) analyses" (ibid, p. 62.). We have to agree with Nemes Nagy, József's statement, i.e. that the application of the HDI index for various spatial units is suitable for highlighting the relative differences, discrepancies among the units, as well as the possible changes in these differences. On the other hand, this index is definitely unsuitable for the definition and demonstration of the "development level" of the territorial units within a given country, either in a

[3] For each component of HDI, we calculate an index in the following way: $I_i = (X_i - X_{min})/(X_{max} - X_{min})$, where X_{max} and X_{min} are the two extremes of the index, and X_i is the index for country or regional unit "i". The minimum and maximum values of the indices are fixed: for life expectancy these are 25 and 85 years; for literacy rate: 0 per cent and 100 per cent; for a combined gross schooling rate: 0 per cent and 100 per cent; for GDP per capita (at purchasing power standards): 100 Dollars and 40,000 Dollars. In our calculations, the combined gross schooling rate – similarly to the method used by Nemes Nagy, József – was substituted by the average number of finished school classes, and we considered the extremes of the index as zero and sixteen. The index of the skills level is the weighed average of the adult literacy index and the index of the average number of finished school classes, in which the literacy index is given a twofold and the average number of finished school classes a single weight. The calculation of the index of living standards is based on the GDP per capita (in USD at PPS) and takes places as follows: $W(y) = (\log y - \log y_{min})/(\log y_{max} - \log y_{min})$. The HDI values are simple arithmetic means of the calculated indices. The values of HDI range between 0 and 1, the higher values showing the higher level of development.

UNDP definition or any other system of comparison, since the income index is the only one where significant differences can be seen across the spatial figures. GDP, used to highlight living standards, strongly differentiates the counties, whereas the spatial disparities in the case of the other indices are less spectacular, their spatial differentiation effect is much more limited.

The significant differences among the HDI data gradually approached each other by the turn of the millennium (*Table 2*) While the difference between the highest and the lowest figure was 31-fold (!) in 1990[4], it was only 1.13-fold in 2001. The national figure of the index is increasing, too (the increase is 1.39-fold between 1990 and 2001), the main reason for which is the rising school education of the population and the continuous growth of GDP. The average life expectancy, unfortunately, did not increase, but its decrease is compensated by the schooling and the income positions to a much more significant extent, while the high rate of literacy within the skills level (99%) could be taken as stable during the 1990s.

The survey for the years 1990 and 1996–1997 did not bring any surprise (*Figure 12*). The capital city evidently kept its leading position, in fact not only was it able to keep but also to slightly improve it. In the human development index, the West Transdanubian counties and Fejér county are the leading rural counties. On the other hand, the North Hungarian counties were unable to improve their situation; in fact, they are more and more falling behind (strongly influenced by their weaker income positions). It is interesting that although the South Great Plain, the South Transdanubian region and Szabolcs-Szatmár-Bereg and Hajdú-Bihar counties were able to stabilise their positions, their indices remained well below the national average.

In order to register further changes, we made calculations for the changes between 1996–1997 and 2001. We found that the differences in human development indices decreased by 2001, parallel to the decrease of regional disparities, the more intensive catching up process and the decreasing pace of growth, practically the stagnation at a certain level in the central regions. In our opinion the change can only be seen in the regional GDP figures, as no major regional disparities can be demonstrated in either life expectancy or schooling level, and the literacy rate stabilised at a high level.

In *Table 3* we made a comparison of the 1996/1997 and the 2001 data, according to the volume of the changes. The national value of HDI grew by leaps from the middle of the last decade until 2001, by almost 37%. The background of this phenomenon is probably the climbing out of the economic crisis following the systemic change, which could be seen among other things in the dynamic growth of GDP. This strongly influenced HDI values both at the county the national level.

[4] Nemes Nagy elaborated the HDI value for 1990 in his essay, at that time regional GDP data were unavailable, he was only able to calculate with regional incomes that did not reflect the economic performance. Also, the discrepancy between the capital city and the countryside was significant then. This is one of the reasons why strong differences could be seen across the indices (*Nemes Nagy–Major*, 1999).

Table 2

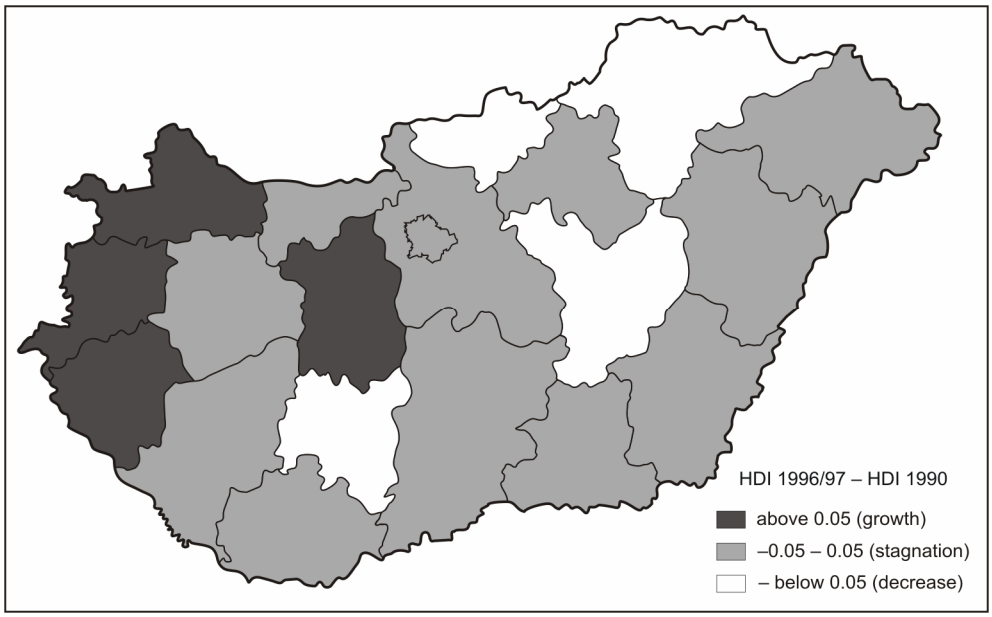
Development of the HDI indices at county level, 1990–2001

County, region	1990	1996	1999	2001
Budapest	0.899	0.915	0.866	0.865
Pest	0.448	0.471	0.790	0.802
Central Hungary	*0.673*	*0.693*	*0.838*	*0.847*
Fejér	0.656	0.709	0.821	0.828
Komárom-Esztergom	0.517	0.562	0.805	0.802
Veszprém	0.685	0.733	0.805	0.806
Middle Transdanubia	*0.619*	*0.668*	*0.812*	*0.814*
Győr-Moson-Sopron	0.818	0.883	0.841	0.839
Vas	0.652	0.788	0.823	0.825
Zala	0.593	0.684	0.813	0.804
West Transdanubia	*0.688*	*0.785*	*0.827*	*0.826*
Baranya	0.452	0.451	0.798	0.795
Somogy	0.324	0.280	0.789	0.784
Tolna	0.462	0.376	0.805	0.799
South Transdanubia	*0.413*	*0.369*	*0.797*	*0.792*
Borsod-Abaúj-Zemplén	0.261	0.169	0.788	0.782
Heves	0.508	0.524	0.800	0.789
Nógrád	0.419	0.218	0.776	0.772
North Hungary	*0.396*	*0.304*	*0.790*	*0.782*
Hajdú-Bihar	0.359	0.406	0.797	0.792
Jász-Nagykun-Szolnok	0.411	0.330	0.789	0.785
Szabolcs-Szatmár-Bereg	0.029	0.039	0.773	0.764
North Great Plain	*0.266*	*0.258*	*0.786*	*0.780*
Bács-Kiskun	0.295	0.322	0.796	0.787
Békés	0.519	0.543	0.796	0.789
Csongrád	0.592	0.610	0.815	0.806
South Great Plain	*0.468*	*0.491*	*0.802*	*0.794*
Total	0.584	0.595	0.817	0.814
Country (without Budapest)				0.798

Source: Nemes Nagy–Jakobi, 2003.

Figure 12

Changes of the HDI values from 1990 to l996–1997



Source: Fóti (ed.) 1999. p. 70.

Comparing the counties to the national figure of HDI, we can make three groups of them. The first group involves Budapest, Győr-Moson-Sopron, Veszprém and Vas counties, where the 1996/1997 values, well above the national average, approached the national average by 2001. These spatial units, the most developed ones in the middle of the 1990s, were unable to rise above the national average spectacularly by 2001, and although their relative positions compared to the average deteriorated seriously, the respective counties (with the exception of Veszprém) still featured figures in excess of the national average in 2001. The indices of Fejér, Heves, Csongrád, Békés, Komárom-Esztergom and Zala counties were within the 20 per cent range around the national average in both years in question, which means that these spatial units kept up with the national growth of the HDI. In their case an initial position around the national average had enough reserves that allowed them to reach values around or slightly above the national average, all changes considered.

The third group contains the previously underdeveloped areas, such as the South Transdanubian, the North Great Plain and, with the exception of Heves, the North Hungarian counties, also Pest and Bács-Kiskun. These spatial units usually doubled

their figures, their development was striking, the extent of their dynamism considerably exceeded the total of the changes at national level.

We have to find the reasons – and we have to repeat in this place that in the human development index the decisive index is the growth and development of GDP, since the life expectancy, the schooling and literacy rate are balanced and almost uniform (*Figure 13*). It is clear that the capital city and the West Transdanubia, maybe some Middle Transdanubian counties are unable to increase their GDP to a significant extent; they are "stuck" at a stable high value where any further progress requires significant resources. In the rest of Hungary, the growth of GDP had a stronger impact on the catching up in HDI, so the progress of the respective counties is more spectacular.

Table 3

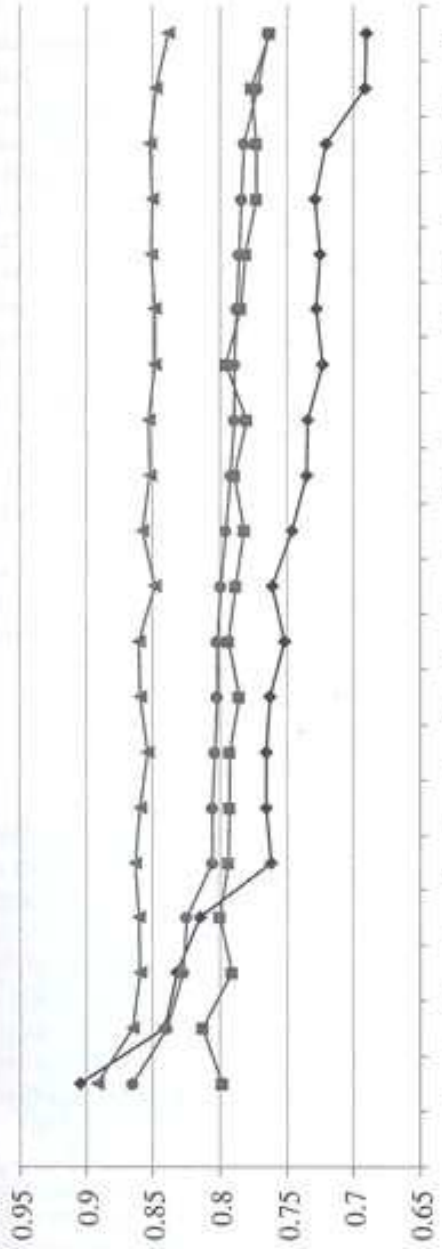
Changes of the values of the HDI index, 1996–2001

1996 \ 2001	Well above average (>121%)	Average or around the average (80–120%)	Below average (<80%)
Well above average (>121%)		Budapest Győr-Moson-Sopron Veszprém Vas	
Average or around the average (80–120%)		Fejér Heves Csongrád Békés Komárom-Esztergom Zala	
Below average (<80%)		Pest Hajdú-Bihar Jász-Nagykun-Szolnok Szabolcs-Szatmár-Bereg Nógrád Baranya Somogy Tolna Bács-Kiskun Borsod-Abaúj-Zemplén	

Source: Calculation by the authors.

Figure 13

HDI and its partial indices, 2001 (in decreasing order of HDI)



Source: Calculation by the authors.

3 Quality of life

Among the elements influencing the quality of the human factors that determine the components of human resources, we cannot neglect culture, and its physical forms, cultural heritage deriving from the existence of the cultural goods. The cultural heritage is one of the potential determinants of the spatial structure. In the Hungarian professional literature there are few examples for the analysis of culture at regional level. It comes from the complexity of the concept of culture that its analysis and interpretation is not an easy task. It can contain material and historical heritage (built environment, historical locations), intellectual and social heritage (cultural and intellectual goods and the socio-economic relations) and natural heritage (natural landscape), which together and individually affect regional development and the quality of the human resources (*Czene,* 2002). These factors, however, do not only characterise a spatial unit in themselves, i.e. by their existence; their changes, dynamism also affects the regional structure. Dynamism in this place means that the character, the features of their elements are not only occasionally but constantly present in the spatial unit, are integrated in all elements of the space, influencing its future condition.[5]

The cultural factors can thus involve a very wide range of factors, so in our essay we cannot analyse their spatial effects. However, a few aspects of the culture-related elements or those representing culture in some way are worth highlighting, in order to at least refer to the regional characteristics of these components.

3.1 Civil society

In the modernising societies the local communities are more and more influential on the development of the quality of life; their activity and influence are becoming more and more important. The character and integration of the local community, care can all demonstrate the internal content of the regional structure in local and regional values, and thus can refer to the division and differences of these values.

The local communities and their regional characteristics can be best demonstrated by the civil sector, and the organisations of the civil society. The regional presence and spatial division of the civil organisations, such as foundations, associations or special organised communities established for different purposes do not only repre-

[5] The role of the cultural heritage is only now being recognised, the effect of these goods on spatial development and the importance of the protection, i.e. the integration of cultural heritage in spatial development strategies and programmes is first mentioned in the ESDP (*European Spatial Development Perspective,* 2000). In Hungary, the National Regional Development Concept does not contain development considerations concerning the cultural heritage, but the National Physical Plan already mentions statements on this issue (*Czene,* 2002).

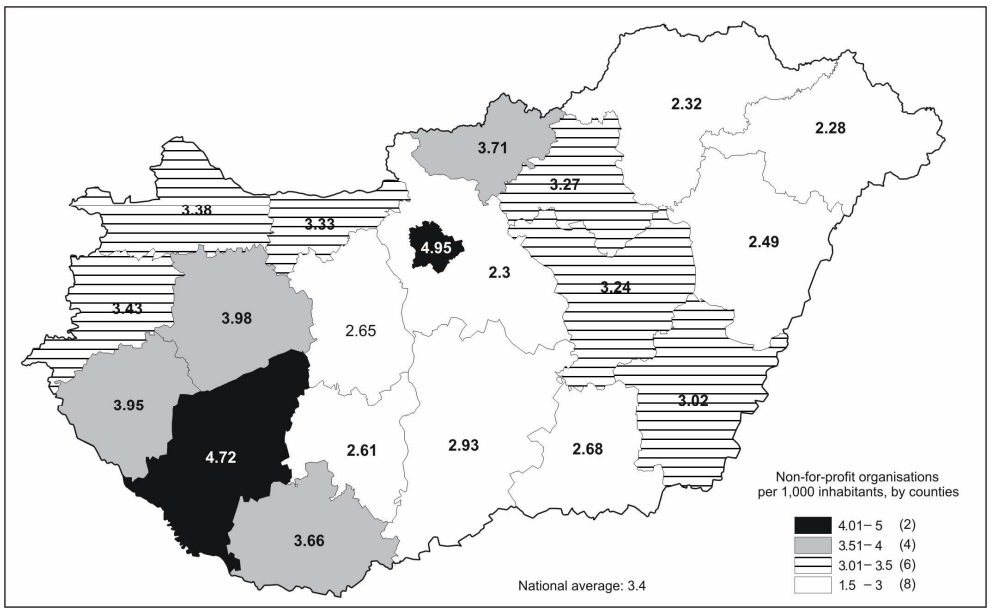
sent the financial conditions but also of the cultural values, traditions and the integration of the inhabitants.

The dynamic growth of the number of non-for-profit organisations took place during the systemic change. From 1989 to 1990 for example the number of such organisations doubled, and it doubled again in the following two years. In 1992 there were more than 30,000 self-organising social entities registered. Their number grew above 60,000 by 2000 (*Nárai*, 2000).

When analysing the regional structure it is advisable to take the number of units per one thousand inhabitants into consideration, as this well depicts the provision of a given region and the actual activity of the population living there (1993: *Figure 14*; 2000: *Figure 15*). The dynamic growth can be seen in the growth of the number of non-for-profit organisations per one thousand inhabitants: while in 1993 the average of this index was 3.4 at national level, it increased to 4.7 by 2000, which means a growth of almost 40%.

Figure 14

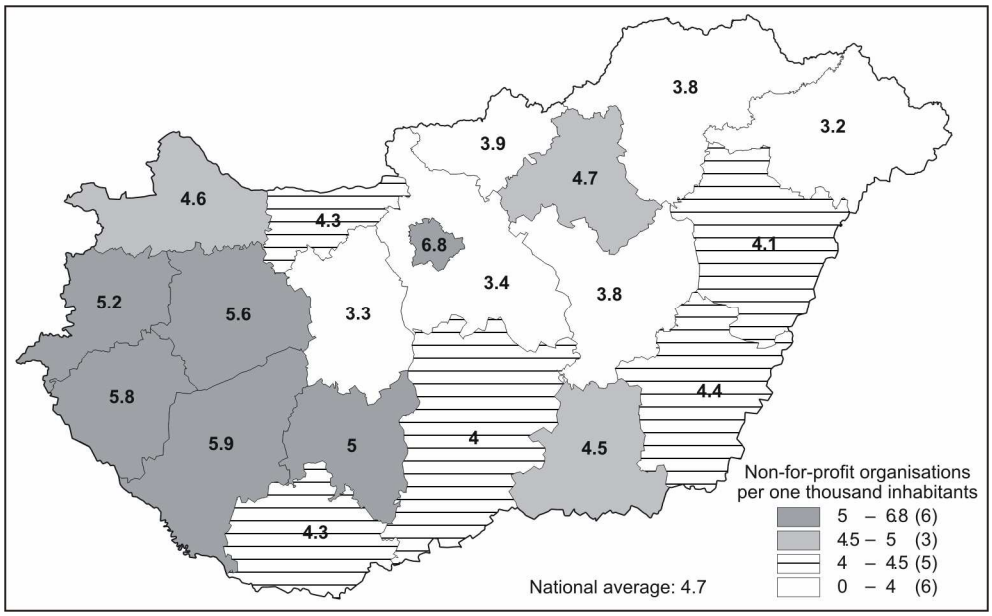
Number of non-for-profit organisations per one thousand inhabitants by counties, 1993



Source: Edited by the authors, based on Nonprofit szervezetek Magyarországon 1993 [Non-for-profit organisations in Hungary 1993]; Regional Statistical Yearbook 1992.

Figure 15

Number of non-for-profit organisations per one thousand inhabitants by counties, 2000



Source: Nárai, 2002.

Budapest stands out in both years in question as regards the number of non-for-profit organisations, followed, interestingly, by the counties around the Lake Balaton (Veszprém, Zala, Somogy). The number of non-for-profit organisations per one thousand inhabitants shows more homogeneity than disparities in the rest of Hungary. The spatial changes of the 1990s brought about equalisation and no significant division in the number of such organisations in the countryside of Hungary (*Rechnitzer,* 1998).

The density of non-for-profit organisations became balanced by the end of the 1990s, large territorial disparities could only be seen between Budapest (and the counties around the Lake Balaton) and the countryside. It is not necessary to explain the leading position of the capital city; it is understandable that the number of population and the economic and public administrative weight of Budapest are attractive for the establishment and operation of non-for-profit organisations. The counties of Lake Balaton are "little capital cities" in this respect, which comes from the appreciation of the lake as second home, more exactly as a place of recreation. The large number of holiday home owners, who are typically from Budapest or other big cities,

bring their local activity with them, and so the number of non-for-profit organisations is very high around the lake. The other extreme is Fejér county, a county that can be characterised by industrial employment, where the density of non-for-profit organisations is very low (3.3 organisations per one thousand inhabitants), close to the figure of Szabolcs-Szatmár-Bereg county (3.2. organisations per one thousand inhabitants).

In the 1990s a strong, almost functional relationship emerged between the activity of non-for-profit organisations and the position in the settlement hierarchy. The county seats and the traditional towns are the core areas for the organisation of the civil sector, whereas in the centres with smaller population and more limited functions the density of non-for profit organisations is strikingly decreasing. These organisations bearing social innovations also had temporal characteristics in the transition period, as in the first half of the 1990s the capital city and the big cities were the places where most of these organisations were founded, followed by the middle and small towns and large villages in the middle of the decade. Finally, in the late 1990s, civil organisations were founded in larger numbers in villages and other minor settlements.

The number of the non-governmental organisations itself does not reflect the number of actually working organisations, it does not show whether the organisations in a given region are actually active or not. The financial support of the civil sector and its regional disparities are more exact reflections of the actual operation and of whether the inhabitant are able to support community actions and if so, with how much money. The proportion of incomes from private resources was almost 20 per cent of the revenues of the non-governmental organisations in 1997, parallel to the decrease of the government supports and a significant increase of the revenues coming from the core activities (*Nárai,* 2000). On the whole, the total of the external resources, including both state and private supports, covered 40 to 45 % of the operational costs of the non-governmental organisations during the 1990s.

One form of the support from the inhabitants is that 1 per cent of the personal income tax of any taxpayer can be donated to the civil initiatives. The regional differences in the willingness of donating this amount to NGOs aptly show how much these non-governmental organisations are integrated into the local society and what opinion the inhabitants have about these organisations. The willingness to donate the 1% of personal income tax does not show the amount of the money but the fact whether the taxpayers used this opportunity at all, i.e. whether they wish to care about the civil sector. Hungary was divided in this respect too in 1997, as in Budapest more than one-fifth, in Győr-Moson-Sopron county over one-quarter of the taxpayers used their opportunity to support the civil sector, which affected almost one-third of the organisations. The situation was worse in the other parts of Hungary, as the proportion of beneficiaries was lower, as was the total of the dona-

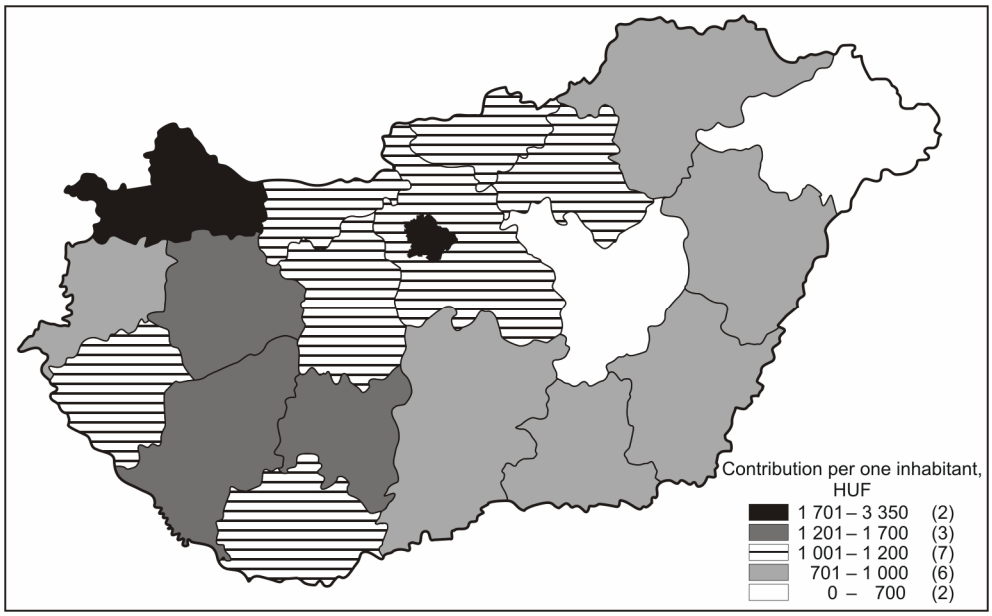
tions. There were counties, on the other hand, where the proportion of supported NGOs exceeded the national average, but with a more limited total amount.

The other form of supporting NGOs is direct donations, the total of which was 15 billion HUF in 1997. The amount of donations per inhabitants was 1,025 Forints, excluding Budapest. In the counties of Transdanubia the amount of financial donations exceeded the national average in each case, in the eastern part of Hungary only Heves and Nógrád reached this level. It is natural that in the counties with less favourable economic circumstances the support activity was lower; in Szabolcs-Szatmár-Bereg county, for example, the amount registered was only 573 Forints.

Regional disparities are thus well visible in the support of the non-governmental organisations as well (*Figure 16*). These disparities reflect the economic capacities of the regions but not only that: the characteristics of the settlement network, the local activity of the inhabitants, and the intellectual, cultural and primarily community ties are all factors that affect or influence the human resources and their quality.

Figure 16

Average contribution per one inhabitant (financial donation) to the revenues of the non-for-profit organisations by counties, 1997



Source: Nárai, 2000.

3.2 Regional and local identity

A novel, but not actually new form of the manifestation of the quality of life is regional identity. By identity we mean the linkages of the individuals and the communities to the space, and the cultural, emotional and cognitive content and manifestations of these linkages. Most of these are related to exact localities, definite, geographically designable areas (*Pálné*, 2000). Its tiers can be the *regions*, but in the Hungarian public administration and thinking the regions have no traditions (they were actually set up in 1996 as the units of spatial planning and programming). The internal cohesion of the regions is weak, their institutional system is not settled yet, they have no authorities, and although they have had some limited development resources recently, the amount of these is low and the possibilities of their use are limited. Regional identity is thus very weak. Regions as entities representing the intellectual cohesion have not been born yet, the governmental actors are more probable to think in this spatial unit than the actors of the economy are. The inhabitants do not show any sign of linkage to their regions; regional identity is more a political demand than an actually palpable, existing reality (*Szörényiné*, 2000).

The next level of identity could be the county, as counties have considerable traditions in both Hungarian public administration and public services. After the systemic change the counties lost their previous spatial organising and development functions that had been accompanied by resources, and the competency for the distribution of the resources. In the transition period the institution-operating function of the counties strengthened. The operation of these regional organisations only affected a narrow layer of the population; also, the municipal governments became legally equal to the county self-governments, i.e. there is no subordinate relationship among them at all. Accordingly, the counties gradually lost their influence; their role and direct effects are mostly restricted to the employees of their institutions. The influence of the counties on the inhabitants and their identity weakened, although there are surveys which found that the role of the counties was dominant and thus a prime factor of identity forming (*Oláh*, 2000). These analyses reveal that in settlements with lower number of population and weaker functions the demand for the county functions is stronger, whereas in bigger settlements with more significant number of inhabitants and functions (county seats, cities) this organising and interest representation responsibility of the counties is less typical.

The next level of identity is the level of the micro-regions. Their role was appreciated in the 1990s, now they function as a new field of regional identity. The micro-regions, each consisting of a minor centre and the surrounding, in some form integrated set of settlements are more and more pushed in the foreground and they are more and more visibly demonstrating their individual characteristics. The micro-regions are gradually taking over the former county linkages and have a more

and more clear picture of the future. This makes integration and the joint thinking and responsibilities of the stakeholders ever stronger. The identity with the micro-regions strongly affects human resources – and vice versa, the developing human resources are shaping regional identity, affecting this way the future of these spatial units in a favourable way.

Table 4 shows the triumph of locality, i.e. the reverse of the previous trend. Instead of the regions – or the counties in this place –, it is the devotion to the locality, the settlement that is in the centre of the thinking of the inhabitants (*Bőhm,* 2000). The spirit of the locality, the *genius loci* was finally released from the bottle, allowed in the first place by the gradual construction of the self-governmental system. Of course it was also a fact that a basic element of the bygone political system was the suppression of the interests, because of the stigmas of certain settlements they were often negatively discriminated, their functions were eliminated, their developments postponed and their activity weakened. After the systemic change the situation basically changed, the limits were eliminated, energies never seen before broke out which gradually created a different quality of life. This of course had a favourable effect on the development of the human resources, too *(Table 4)*.

We are not able to give a regional picture of identity because there have not been national level surveys conducted to find out the level of affection of the inhabitants to their respective places. Maybe such a survey would not be worthwhile, as the spirits of the individual places are so much different. However, it would be reasonable to define the level and the character of identity with regions at different development levels and their core settlements, and to interpret the components of this identity in some form.

Table 4

Indices of identity in Hungary, 1992–1996 (in per cent)*

Year	Municipality	Region	Country	Eastern Europe	Europe	World
1992	16.2	35.6	39.1	0.2	6.2	3.7
1996						
primary	48.5	5.3	38.1	0.5	4.3	3.6
secondary	21.1	12.2	20.7	1.0	16.0	5.1

* The indices of identity show how many per cent of the individuals (inhabitants) feel they are attached to the given spatial level, territorial unit.

Source: Bőhm, 2000.

4 The network of knowledge and the communication of information

The spatial characteristics of the institutions and personal conditions mediating knowledge have a fundamental effect on the human resources. We could presume that education as a public service is spatially equally distributed, as it should be available to each citizen. However, neither the network nor its quality is spatially even; several differences can be seen in both factors, accordingly the distribution of the human resources shows considerable differences, too.

4.1 Primary and secondary institutions

The primary schools are responsible for the elementary, compulsory education of the population aged 6–14. The number of children in this age group is gradually decreasing, by the end of the 1990s the number of primary school pupils was one-third less than in the 1980s. The spatial disparities decreased in 1990–1994, and then grew in the years afterwards. The reason for this is that the majority of the district schools established in the 1980s regained their independence, as one of the first successful actions of the local governmental system was the restoration of the independence of the settlements' schools. This resulted in striking developments in the small village dominated counties of Transdanubia, i.e. Vas, Zala and Somogy. The parameters of provisions improved – i.e. the number of pupils per one teacher or one classroom –, the small village schools were restored (mostly in the lower grades, only), the travel times decreased, and certain unprivileged social groups were also able to join in the school education. On the other hand, in the small schools (with 50–100 pupils) the personnel and equipment conditions for up-to-date teaching are absent, the municipalities responsible for the maintenance of these schools are unable to finance them, parallel to a constant decrease in the number of children.

The growth of the number of primary school stopped by the middle of the decade, their number was 3,455 by 2001, which is a 8.6% increase compared to 1990. In the handicapped North Hungarian region the school network did not expand, it actually remained at its 1990 level. Parallel to the expansion of the school network at the national level, the number of pupils decreased in the decade of the transition. The fifteen per cent decrease of the number of pupils reflects the decrease in the number of population, and also features new spatial disparities. The number of pupils per one thousand inhabitants decreased to the largest extent in those counties where the expansion of the network exceeded the average (Győr-Moson-Sopron and Budapest), which is probably due to the widening of the supply of education (e.g. church or foundation schools). In the peripheral regions the situation is the opposite, i.e. the growth of the pupils exceeded the average, but the network did not expand, i.e. the

level of education did not improve. The spatial structure of primary schools shows a picture opposite to the usual structure (*Table 5*).

The Danube River is a division line in this case, which means that the Great Hungarian Plain features a higher proportion of settlements with primary schools than Transdanubia (*Forray–Kozma,* 1999). In the latter region, 60–80% of the settlements have institutions of primary education. This comes from the settlement structure, the already mentioned large number of small villages, the denser network of centres or the strengthening of the suburbanisation tendencies.

The analyses mention that "the schools of East Hungary »produce« skilled labour for West Hungary" (*Forray–Kozma,* 1999. p. 35.). At the same time they indicate that the educational institutions are not only the scenes of training but also forums of socialisation where the less favoured social groups can learn values, patterns and future goals. If the educational units are missing – e.g. in regions dominated by small villages or in settlements inhabited by handicapped social groups –, these layers of the population are unable to acquire the management of the social organisations, in this case the educational institutions, and the necessary conditions of existence in these institutions. The consequence is the rapid peripherisation, falling behind of these social groups.

The contradiction of the present situation is that in these depressed regions the maintenance of the irreplaceable primary institutions is the responsibility of the municipal governments that struggle with serious difficulties. At the same time, a denser and locally available network of primary schools could significantly contribute to the social integration and the concomitant better conditions of the human resources (*Figure 17*).

Secondary education rearranged faster and more drastically than primary education did, as more pressure was put on this level in the period of transition. The proportion of grammar school training, a training finishing with final exams and offering the chance of higher education studies significantly increased, as a change of profile took place in these institutions from several aspects. The institutions found resources by expanding downwards (six- and eight-class grammar schools); also, the former skilled worker training schools started to run new vocational and grammar school classes (*Figure 18*).

The proportions of students in different types of secondary schools did not change until the 1980s: one-fifth of primary school leavers continued their studies in grammar schools, one-third of them in vocational schools and half of them in skilled worked training institutions. In the 1990s these proportions fundamentally changed, the training forms finishing with a school leaving certificate became dominant and the share of those participating in short skilled worked training courses significantly decreased. From 1990 to 1997, the proportion of students attending institutions giving a certificate increased from 56.5% to 74.6% within the total of the secondary school students (*Jelentés a területi folyamatok*… 2001).

Table 5

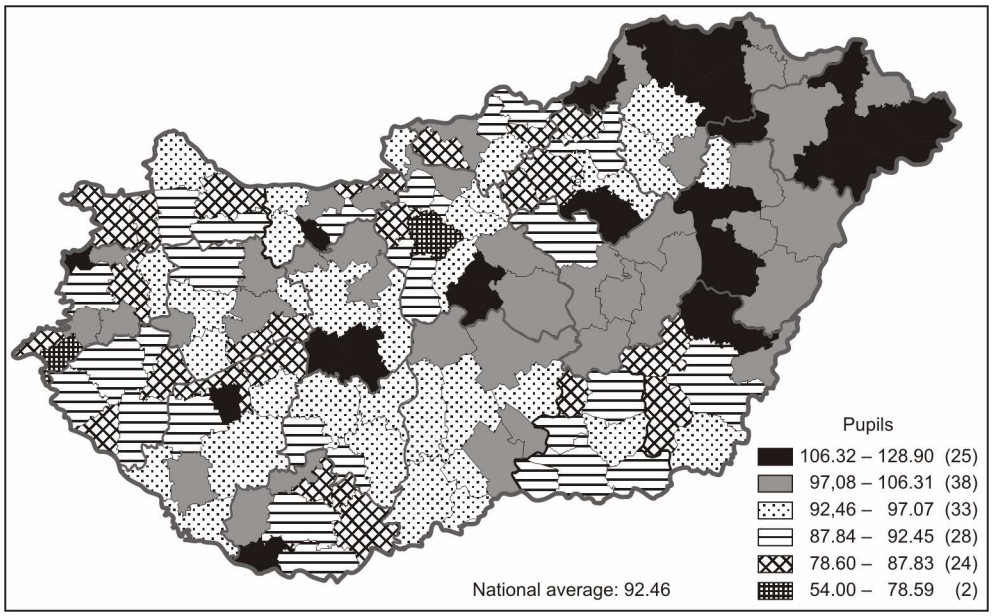
Institutions and a few indices of primary education in Hungary, 1990, 2001

County	Number of primary schools		Change (in per cent)	Number of primary school pupils per one thousand inhabitants		Change (in per cent)
	1990	2001		1990	2001	
Budapest	353	397	112.5	91.9	73.3	79.8
Pest	267	317	118.7	111.4	95.1	85.4
Central Hungary	620	*714*	115.2	*98.1*	81.6	83.1
Fejér	146	152	104.1	118.2	99.1	83.8
Komárom-Esztergom	111	122	109.9	113.2	96.1	84.9
Veszprém	158	164	103.8	118.8	93.8	79.0
Middle Transdanubia	415	438	105.5	*117.0*	96.5	82.4
Győr-Moson-Sopron	182	213	117.0	116.0	88.2	76.0
Vas	119	133	111.8	109.5	91.3	83.3
Zala	137	143	104.4	111.7	87.9	78.7
West Transdanubia	438	*489*	111.6	*112.9*	88.9	*78.7*
Baranya	176	*177*	100.6	106.1	91.2	85.9
Somogy	175	174	99.4	107.8	94.0	87.2
Tolna	98	115	117.3	113.4	93.3	82.2
South Transdanubia	*449*	466	103.8	108.5	*92.7*	85.4
Borsod-Abaúj-Zemplén	361	367	101.7	116.2	104.1	89.6
Heves	146	146	100.0	107.4	90.9	84.6
Nógrád	125	125	100.0	108.2	92.7	85.7
North Hungary	632	638	*100.9*	112.6	*98.9*	87.8
Hajdú-Bihar	160	184	115.0	116.6	104.2	89.4
Jász-Nagykun-Szolnok	124	144	116.1	116.0	99.5	85.8
Szabolcs-Szatmár-Bereg	256	268	104.7	127.0	111.1	87.5
North Great Plain	540	596	*110.4*	120.3	105.5	87.8
Bács-Kiskun	202	209	103.5	110.4	97.4	88.2
Békés	110	166	150.9	106.2	92.8	87.4
Csongrád	142	136	95.8	103.9	90.5	87.1
South Great Plain	454	511	112.6	*107.1*	93.9	87.7
Total	3548	3852	108.6	*109.0*	92.6	84.9
Country total (without Budapest)	3195	3455	*108.1*	*113.1*	*96.6*	85.4

Source: Calculation by the authors based on Regional Statistical Yearbook 1990, p. 69. and Hungarian Statistical Yearbook 2001, p. 226.

Figure 17

Number of primary school pupils per one thousand permanent inhabitants, 2001*

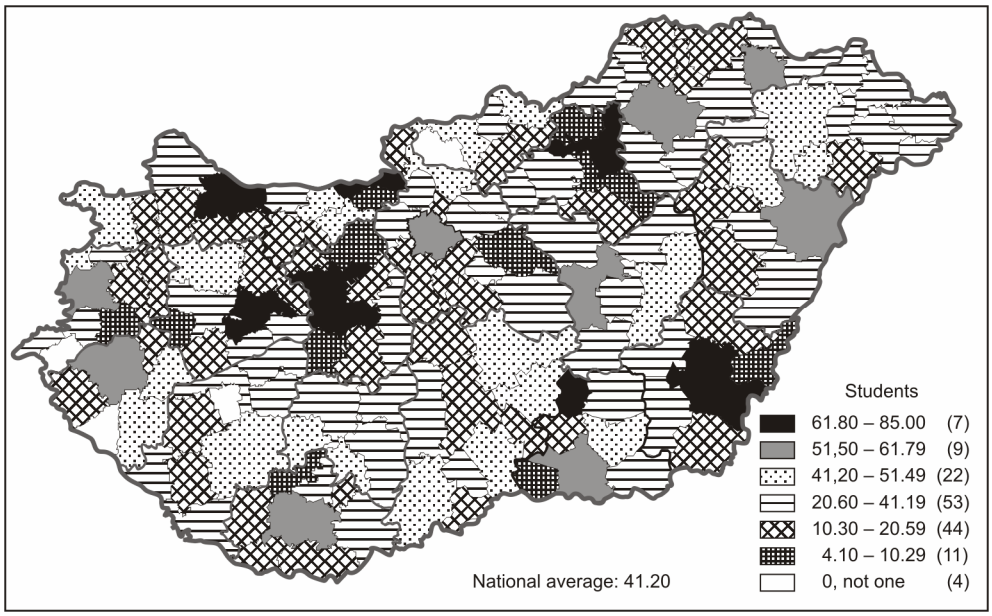


* Including special institutions for mentally handicapped children.
Source: HCSO T-STAR 2001.

In the secondary school network, regional disparities can also be shown. The capital city kept its leading position, not only because of the large number of population (Budapest provides the agglomeration as well), the traditional institutional network, a better informed management able to influence the whole educational policy, but also as a consequence of concentration of institutions who recruit students from all over Hungary. Csongrád and Győr-Moson-Sopron counties stand out with their networks of secondary educational institution, while the institutional networks of Bács-Kiskun, Somogy, Komárom-Esztergom, Veszprém and Békés lag behind the national average. In the North Great Plain counties, i.e. Hajdú-Bihar and Szabolcs-Szatmár-Bereg, but also in Pest and Baranya counties the network of grammar schools is dominant, the number of vocational schools is lower, the reason for which is that there is hardly anything to train the students wishing to make final exams for (*Forray–Kozma*, 1999). In Transdanubia it is Zala, Fejér and Somogy counties where the number of Figure 18institutions offering grammar school training is lower than the national average.

Figure 18

*Number of full-time secondary school students per one thousand permanent inhabitants, 2001**



* Including the relevant classes of grammar schools with six or eight classes.
Note: the numbers in brackets indicate the number of micro-regions in the relevant categories.
Source: HCSO T-Star 2001.

The reason for this is that formerly the number of skilled worker training institutions was significant in the first two counties, and the functions of these schools were taken over by the vocational schools; in the latter case, the reasons are to be found in the weaker network built out (large county with few centres).

The transition of the structure of secondary education, as we have seen, was motivated by the acquisition of the school leaving certificate (and also by the continuation of the studies in higher education institution for most of the students). The probability of being admitted to a higher education institution is shown by *Table 6*, demonstrating the proportion of those admitted in the average of several years. It is striking that Győr-Moson-Sopron and Szabolcs-Szatmár-Bereg have the same position in this respect, the probability is almost the same that the students finishing secondary schools in these two counties are admitted to higher education institutions; in fact, Szabolcs-Szatmár-Bereg county even surpassed the privileged west Hungarian

county on the basis of the last five years. The spatial structure in this respect is heterogeneous, there are considerable and striking disparities among the counties, as counties from both the Great Hungarian Plain and Transdanubia can be found among the leaders and the less successful counties alike.In general we can state that there are significant differences in Hungary as regards the chances to be admitted to higher education institutions. The institutions in the respective spatial units are unable to drastically change the structure and quality of their education, so the present structure is durable and very much stable, although the chances are improving on the whole for secondary school students to continue their studies at higher education institutions.

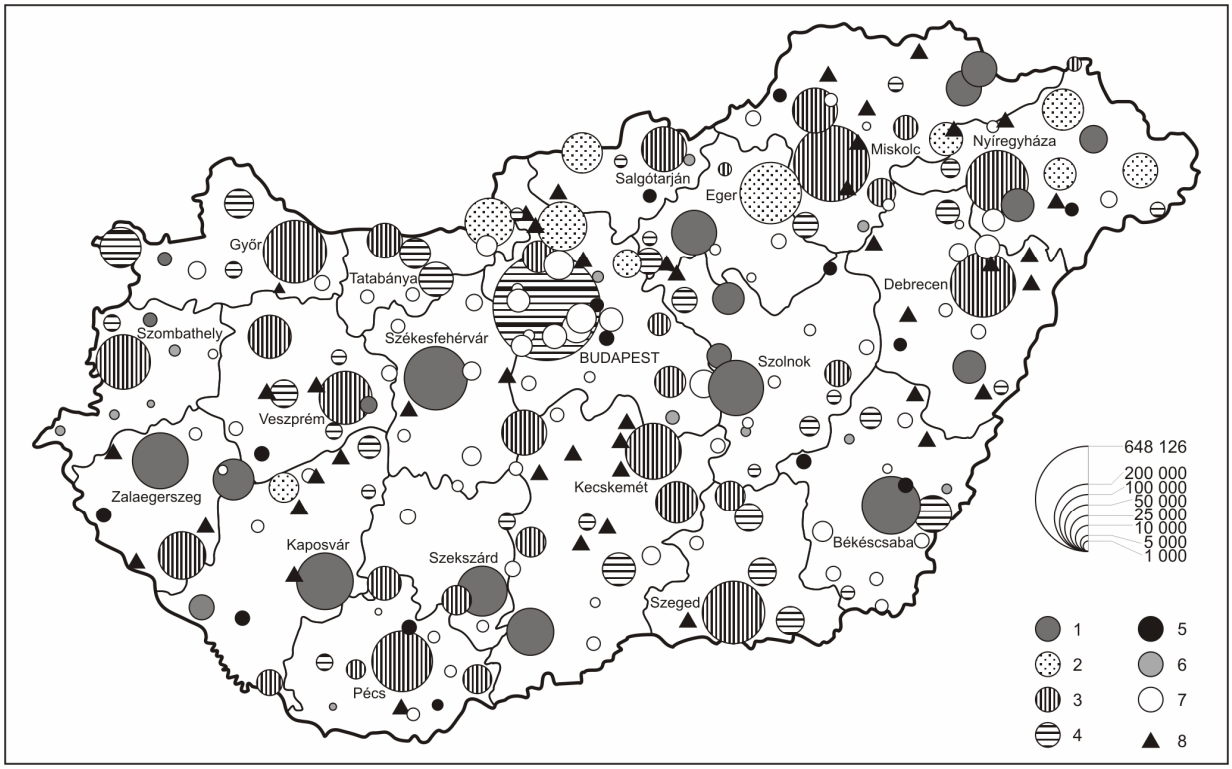
Table 6

Average proportion of those admitted to or students in their 4th year in higher education institutions (A/S) by counties, 1991–1998, 1994–1998

County	1991–1998		1994–1998	
	Order	A/S	Order	A/S
Győr-Moson-Sopron	1	32.98	2	35.53
Szabolcs-Szatmár-Bereg	2	32.97	1	35.67
Bács-Kiskun	3	32.29	4	33.29
Hajdú-Bihar	4	31.15	3	33.81
Vas	5	31.02	5	32.59
Csongrád	7	30.56	7	32.33
Borsod-Abaúj-Zemplén	8	30.38	8	32.23
Zala	9	29.31	13	29.85
Baranya	10	29.08	10	30.55
Veszprém	11	28.96	11	30.43
Tolna	12	28.94	9	30.74
Jász-Nagykun-Szolnok	13	28.25	12	30.01
Békés	14	27.00	14	28.51
Komárom-Esztergom	15	26.63	15	28.25
Fejér	16	26.41	16	27.39
Pest	17	25.99	17	27.52
Somogy	18	25.71	18	26.72
Nógrád	19	23.00	19	24.44
Budapest	20	22.84	20	24.01
Average of the counties		*27.76*		*29.33*

Source: Halász–Lannert, 2000.

Figure 19
Role of the secondary education in the towns in the provision of the countryside, 2000



Key: Number of the countryside population "served" compared to the population of the town: 1 – At least twice as much; 2 – One and half time – twice as much; 3 – The same number or one and half times higher; 4 – Half or the same number; 5 – Less than half; 6 – The town does not have non-resident students; 7 – The number of countryside population "served" is negative; 8 – there is no secondary school.
Source: Enyedi–Horváth, 2002 p. 252.

4.2 The network of higher education and knowledge mediators

The role of higher education is dominant in the development of human resources. While in the early 1990s 15.1% of the population aged 20–24 studied at higher education institution, and the proportion of full-time students was 11.3%, in 2001 the same figure for the respective age group was 42.9%, and 23.8% of this generation participated in full-time training. While in 1990 there were about 102,000 students participating in higher education, their number grew to 3.42-fold by 2001 (349,000 students), within that, the growth of students participating in full-time training was 2.51-fold. Actually 250,000 students had to be given new forms of training (e.g. post-secondary, remote training), new institutions had to be organised, new specialisations and the training of new professions had to be launched.[6] The reforms started in the 1980s, already, but the systemic change created a more open system of higher education, more sensitively reacting to the economic and social processes and also a system with a bigger independence – together with its more and more complex contradictions.

The regional breakdown of the growth of the number of students is not even (*Figure 20*). Budapest kept its leading position, although the share of all enrolled students in the institutions of Budapest fell from 44.1% in 1990 to 38.5% in 2001, and within that the participants of full-time training were not more than 42.1%. A balanced spread of the higher education institutions was typical in the 1990s, which led to the decrease of the spatial disparities on the whole (*Forray–Kozma*, 1999). Every county seat or second order centre that had any pride and also some traditions in higher education tried to build out or develop their positions in some way, as a result of which there are 42 settlements in Hungary now with higher education institution (*Figure 21*).

We can witness a spectacular growth of the number of students and of the places and supply of training, as the new institutions received a large mass of students and offer almost all forms of training (post-secondary, graduate, professional further training, doctoral school). The counties home to institutions established in the 1990s mainly on local initiatives (mostly as foundations or organisations created as outlets of some Budapest institutions in the county seat, gradually becoming independent) have outstanding positions (Fejér, Komárom-Esztergom, Jász-Nagykun-Szolnok, Békés). In the development of the existing networks some counties or their centres are also very dynamic (Heves, Veszprém, Győr-Moson-Sopron, Baranya, Pest and Szabolcs-Szatmár-Bereg).[7] The division line of development might be 1996: from 1990 until 1996 the number of students had been steadily growing, but in the

[6] The register of the Hungarian Accreditation Board follows the university and college majors, whose number is continuously growing, partly due to the competition of the institutions and partly because of the more and more specialised demands (www.mab.hu).

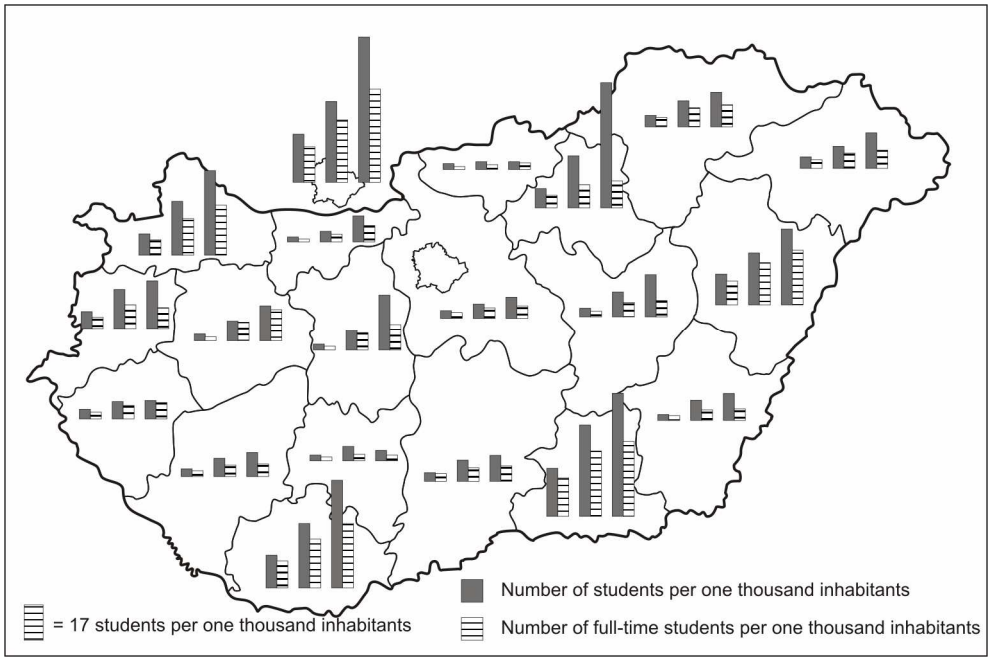
[7] Only taking growth exceeding the national average into consideration.

counties listed above and their centres of higher education the number of students grew by leaps again. There is a long list of reasons; the dominant is the appearance of several market elements in training (e.g. paying courses, remote training), also, the demand for certain professions grew extremely rapidly (e.g. for economists, ICT experts, lawyers, communication experts etc.), whereas some profession lost their popularity steadily (e.g. teachers) of temporarily (e.g. training of engineers). Some institutions were able to better adapt to these market effects than the others, so a new, spatially quite even structure of higher education can be seen now in Hungary, assisted by the integration of several state-owned higher education institutions in the late 1990s (in 2000).

By the late 1990s the number of those participating in higher education more than tripled. The question is what human resources this spectacular growth is built on. Higher education requires well-trained experts and trainers, so it can be set as a requirement that the lecturers should be experts with adequate qualifications (professional qualifications, scientific degrees). The comparison of the staff of lecturers in 1990 and 2001 reveal thought-provoking characteristics (*Figure 22*).

Figure 20

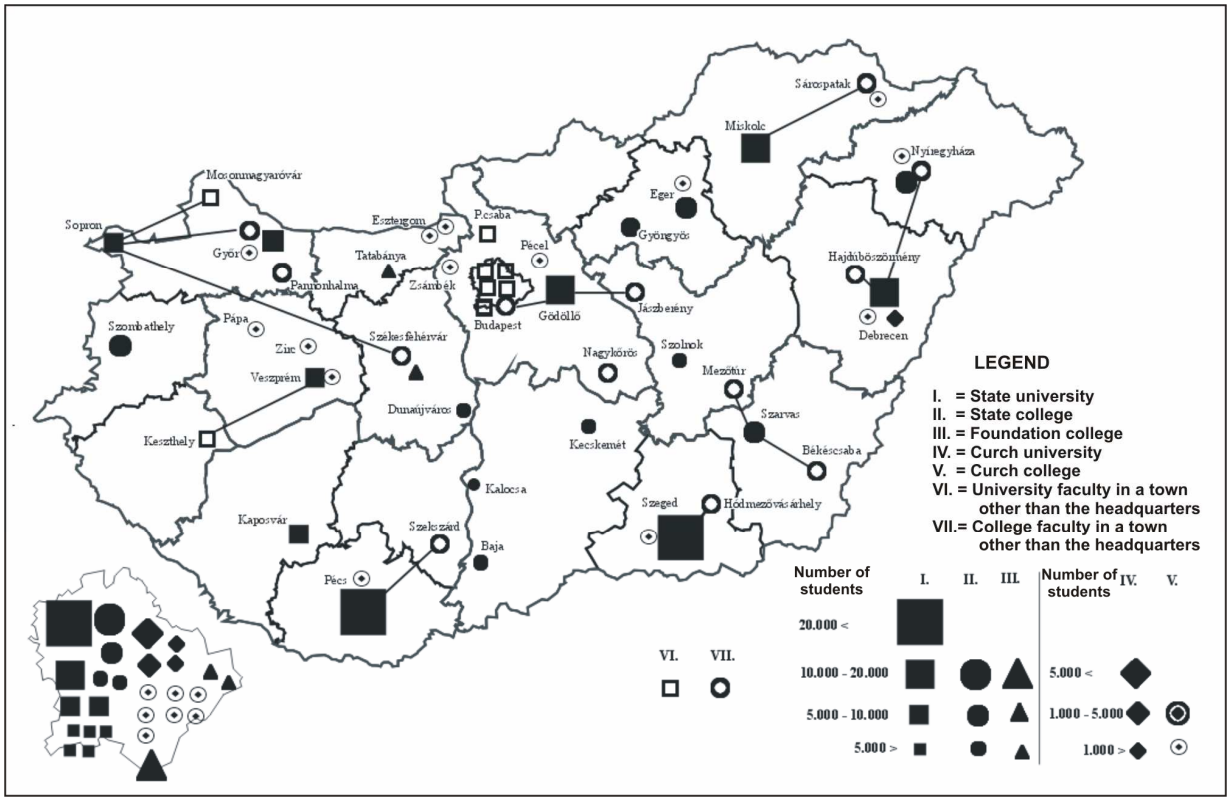
Number of higher education students in the counties, 1990, 1996, 2001
(students per 1,000 inhabitants)



Source: Calculation by the authors based on HCSO data.

Figure 21

Spatial distribution of the higher education institutions in 2002

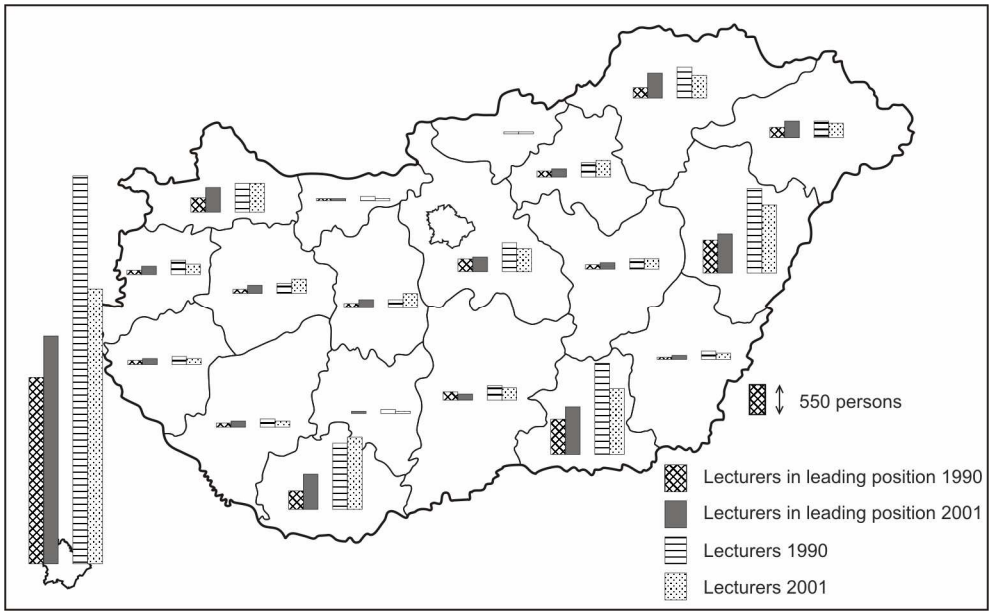


Note: we did not feature all institutions in the map, as we only considered the units down to the faculty level, excluding institutions and other smaller forms of higher education (for example centres of consultancy).

Source: Ministry of Education, Department of Statistics.

Figure 22

Number of full-time lecturers in the higher education institutions of the counties, 1990, 2001



Source: Calculation by the authors. Source of the data: Statistical Bulletin. Felsőoktatás 1990/91; Felsőoktatás 2000/2001. Ministry of Education.

While the number of students multiplied, the set of lecturers remained intact both in its number and structure, or their number even slightly decreased (by 5.9%) during the decade of great reforms.[8] The number of senior lecturers (university or college professors, associate professors) actually did not change much, and the structure of the set of such lecturers did not change significantly, either. Parallel to the decrease of the share of the capital city in higher education, there was only a slight decrease in the proportion and number of the senior lecturers of the Budapest institutions (50.7% in 1990 and 47.7% in 2001). The newly employed lecturers actually substitute those leaving the institutions, so the larger number of students is

[8] On the basis of statistics published by the Ministry of Education, the number of full-time lecturers decreased, while the data published by the Hungarian Central Statistical Office reveal a growth in the number of lecturers. According to the oral statement of the HCSO, the difference is due to the fact that the HCSO data contain not only the data of the full-time lecturers.

served by the same number of lecturers as before.[9] The structure of the lecturers' status did not become better, as in the larger university centres the growth of the proportion of the senior lecturers did not keep up with the increase in the number of students. In the new centres of higher education, the number of lecturers was adjusted to the growth of the number of students. Presently it is frequent that the senior lecturers travel, commute from the capital city or some large regional centres of higher education to the new institutions. The everyday lecturing is done by the local lecturers who usually do not (yet) possess scientific degrees. However, the qualification system of higher education requires that the persons responsible for the majors or the subjects should be senior lecturers, which is the case formally, in paper – but in practice this requirement is only met with difficulties in the new institutions and majors.

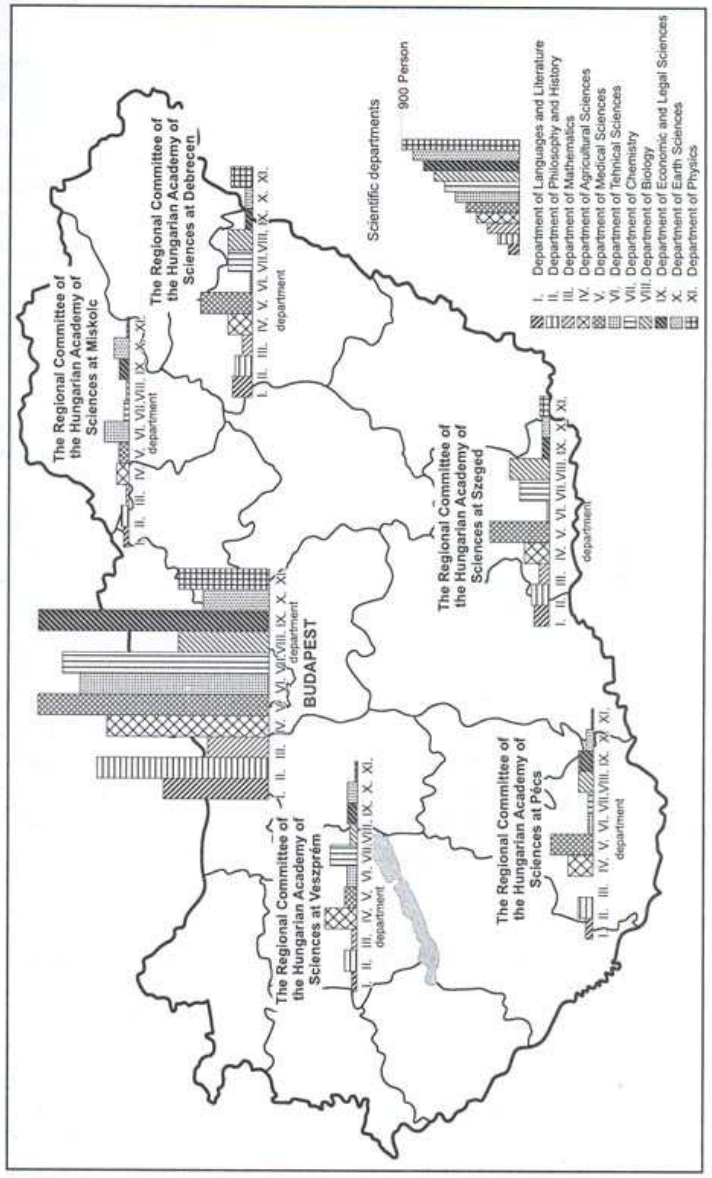
This leads to survival of the intellectual leading and organising role of the capital city in the long run, in fact, the intellectual resources are further concentrated, as the capital city did not become an "exporter" but remained an "importer" of intellectual goods in the 1990s. The new centres of higher education in the countryside can only become the intellectual centres and promoters of their regions with great difficulties, as they have an extremely low proportion of qualified personnel, and they are engaged with lecturing; also, those who are responsible for majors and professions (at least formally), are usually not more than "commuters", in the professional jargon they are called "intercity professors". The regional disparities, the concentration of the highly qualified experts in the capital city can be best demonstrated by the spatial distribution of the members of the public body of the Hungarian Academy of Sciences (*Table 7*).

The distribution of the members of the public body of the Hungarian Academy of Sciences according to their place of residence shows a clear dominance of Budapest, supporting our statement above that the capital city is the greatest "supplier" and also the receiver of the highly qualified intellectual resources these days. The regional disparities can be further elaborated by highlighting the structural problems, i.e. looking at the number of members in the different science classes of the public body, in a breakdown by the regional academic committees (*Figure 23*).

[9] Personal fluctuation is strengthened by the fact that the number of PhD doctors was 3.300 in the new qualification system, and a total of 6.500 people received scientific degrees, habilitation (university private lecturer status) was achieved by 2.150 persons (www.mab.hu). These figures show that the majority of the scientific qualifications are absorbed by higher education; they actually secure the continuous supply of qualified personnel.

Figure 23

Breakdown of the public body members of the HAS by science classes in the territories of the respective regional committees, 2002



Source: HAS.

Table 7

Regional distribution of the members of the public body of the Hungarian Academy of Sciences, 2000

Region	D.Sc. (persons)	C.Sc. (persons)	Ph.D. (persons)	Total	
				persons	in %
Budapest and its hinterland	1537	4138	524	6199	65.7
Debrecen and its hinterland	153	534	130	817	8.7
Miskolc and its hinterland	43	273	49	365	3.8
Pécs and its hinterland	98	370	55	523	5.5
Szeged and its hinterland	210	532	104	846	9.0
Veszprém and its hinterland	90	375	54	519	5.4
No data available	26	118	28	172	1.9
Total	2157	6340	944	9441	100.0

Source: Data on the non academy doctor members of the public body of the Hungarian Academy of Sciences (as of 24 September 2000.) Research Organisation Institute of HAS, Budapest.

The structure is stable, in other words: it is extremely conservative. Looking at the structure of the regional committees, the number of qualified persons in the traditional university and higher education professions is outstanding. For example, in the Veszprém Academic Committee working in North Transdanubia, the number of agricultural experts (Keszthely, Mosonmagyaróvár), and of chemists (Veszprém) is the highest. The proportion of economists and lawyers is low among the members of the public body (8.2 per cent), although such trainings at university level are done in three places of the region (Győr, Sopron and Veszprém), parallel to college level training in four places (Dunaújváros, Tatabánya, Székesfehérvár and Szombathely). This phenomenon is typical in all academic regions, which implies the inner content of the regional disparities of the intellectual resources and thereby the lasting, long-term contradictions of the Hungarian human resources.

4.3 Regional disparities and characteristics of research and development

In regional policy there is a more and more definite demand to integrate technology development both into its objectives and into the tools and institutional system of implementation. It has been recognised that the competitiveness of a given region can only be enhanced by the more and more sophisticated systems of research and development. It is absolutely necessary to explore all forms of research and devel-

opment at regional level and to activate them, partly to strengthen the regional endowments and partly to adjust them to the general processes of R & D. The national monopoly of science and technology has ceased to exist; its gradual decentralisation has started by the promotion of regionalisation. This resulted both in the transformation of the institutional system and the more equal spread of the central resources, the elaboration of new financing models and the novel measurement of the efficiency of developments.

The transformation had a deep impact on research and development, similarly to the other sectors of the economy. The elimination or transformation of the system of large state-owned companies tore apart the previous economic and R & D co-operations. The decreasing number of orders from companies at the turn of the 1980s and 1990s, the declining national income and then the consolidation of the state budget, together with the concomitant consolidation of higher education and the academic sector postponed the fall of the R & D sector to the end of the decade (*Table 8*). While the GDP has been continuously increasing since 1994, although at a slowing pace, the decrease of the share of R & D reached its nadir in 1996. In 1987 the R & D expenditure made 2.6% of the GDP, in 1989 it was still 2.0%, then it fell to 0.7% of the GDP by 1996. This figure stagnated until 1999, since then the positions of R & D have improved by 0.1% annually, exceeding 1% by now, still lagging far behind both the Hungarian figures of the late 1980s and the present figures of the European Union.

Table 8

Conditions of research and development

Year	GDP index (1989=100)	R & D expenses in % of GDP
1989	100	2.0
1990	94	1.6
1991	83	1.1
1992	80	1.1
1993	79	1.0
1994	81	0.9
1995	82	0.8
1996	81	0.7
1997	85	0.7
1998	88	0.7
1999	90	0.7
2000	95	0.8
2001	98	0.9

Source: Calculation by the authors based on HCSO data.

The positions of the scientific researches in the last decade were characterised by the narrowing down of the resources on the one hand, and a considerable restructuring, on the other (*Magyarország 1990–2001*, 2002). The available – human and financial – resources decreased in the time of the decline or stagnation of the economic performance, later stagnated in the years following the start of the economic growth, and still later they moderately grew. The present level – approximately 1 per cent of R & D expenditure from the GDP – is far below the European average and only half of the Hungarian figure ten years ago.

The restructuring in the field of research and development resulted in the decrease of the state financed researches, on the one hand, and the relative strengthening of R & D in the company sector and even more in higher education, on the other. The share of R & D employment – parallel to a significant decline in total employment – decreased significantly, although not to the same extent as the resources, later it stagnated. The total of R & D expenditure grew significantly in numbers, but it did not reach the extent of the inflation. The most significant financial source of R & D expenses is still state budget. In the second half of the decade – as a consequence of the foreign investments and the accession process to the European Union, e.g. the participation in the 5th and 6th framework programme of the EU –, the role of foreign and international organisations is also visible now in financing.

In 1989 almost half of the R & D expenditure was used in state-owned research institutes and other research places, 38 per cent in the business sector and the rest in higher education. The share of budgetary sector has continuously decreased, the reasons for which are the transformation of certain research institutes into business ventures or the closedown of some institutes, and the decrease of the budgetary support. The proportion of budgetary organisations fell to less than 30%, the share of businesses grew to 44%, that of higher education to 28%.

As regards the number of employees, the shares of the business and the higher education sectors changed the most dramatically (*Table 9*). The number of employment in the state-owned R & D sector fell to one-third by the middle of the decade, and its share from the whole sector also fell from 42% to 29%. This situation did not change much until the turn of the millennium. Higher education suffered a more moderate loss of employment, and by the beginning of the new decade it had 10% more researchers, but 5% less auxiliary staff than in the late 1980s. The proportion of research and development staff in higher education grew from 26% to 40% in 12 years. In the public sector, the number of researchers fell to almost a half in the period in question, while their proportion from the total number of researchers moderately decreased. The fall of the number of auxiliary staff was larger than that of the researchers and developers, so the share of R & D staff grew from 48% in 1989 to 64% by now.

Table 9

*Employment in research and development**

Branches	R & D staff					
	number (thousand people)			proportion (per cent)		
	1989	1995	2001	1989	1995	2001
Budgetary sector	15.9	7.7	7.8	37.6	39.3	33.9
of which: research and development	*7.4*	*3.9*	*4.7*	*36.3*	*37.1*	*32.0*
Business sector	17.7	5.6	6.8	41.8	28.6	29.6
of which: research and development	*7.7*	*2.6*	*4.1*	*37.7*	*24.8*	*27.9*
Higher education	8.7	6.3	8.4	20.6	32.1	36.5
of which: research and development	*5.3*	*4.0*	*5.9*	*26.0*	*38.1*	*40.1*
Total:	42.3	19.6	23.0	100.0	100.0	100.0
of which: research and development	*20.4*	*10.5*	*14.7*	*100.0*	*100.0*	*100.0*

* Number calculated for the full-time employees in proportion with the time spent on research and development activities

Source: calculation by the authors based on Magyarország 1990–2001 [2002] p. 70. and Hungarian Statistical Yearbook 2001. p. 513.

The impact of the transformed system of scientific qualifications is now visible; the number of those with such qualifications is 49% higher now than it was in 1989. Almost 60% of those in this category – doctors of science, candidates of science, PhD-s – work in research and development places. The structure of the activity transformed, too. As regards expenditure, in the late 1980s experimental researches, in the mid–1990s basic and applied researches, in 2001 experimental researches once again were the primary activity.

4.4 Changes of the territorial structure

In our survey we were able to calculate the first spatial order on the basis of three parameters for 1995 (number of R & D places, R & D expenditure per one inhabitant, number of researchers and developers per 10,000 inhabitants), so we can relate to the deepest crisis of the Hungarian R & D capacities and performance. If we add up the positions, we get a sort of order for the R & D potential of the respective countries for the given year. The second order was made on the basis of the last available data, the data for 2001. Although a six-year period is a relatively short time for monitoring the major changes (*Table 10*).

Table 10

Rank-order of the R & D potential, 1995, 2001

Final order	County	R & D places (1996)	R & D expenditure per one inhabitant	Research and development staff per 10,000 inhabitant	*Total of positions*
1995					
1.	Budapest	1.	1.	1.	*3.*
2.	Csongrád	2.	2.	2.	6.
3.	Hajdú-Bihar	4.	3.	3.	*10.*
4.	Baranya	3.	7.	4.	*14.*
5.	Győr-Moson-Sopron	6.	5.	5.	*16.*
6.	Veszprém	8.	4.	6.	*18.*
7.	Pest	7.	8.	8.	*23.*
8.	Borsod-Abaúj-Zemplén	5.	11.	7.	*23.*
9.	Fejér	12.	6.	12.	*30.*
10.	Szabolcs-Szatmár-Bereg	9.	10.	11.	*30.*
11.	Heves	10.	12.	10.	*32.*
12.	Jász-Nagykun-Szolnok	13.	13.	8.	*34.*
13.	Békés	16.	9.	15.	*40.*
14.	Vas	11.	17.	14.	*42.*
15.	Somogy	17.	14.	13.	*44.*
16.	Bács-Kiskun	14.	15.	16.	*45.*
17.	Tolna	18.	16.	18.	*52.*
18.	Zala	15.	19.	19.	53.
19.	Komárom-Esztergom	18.	18.	20.	56.
20.	Nógrád	20.	20.	16.	56.
2001					
1.	Budapest	1.	1.	1.	3.
2.	Csongrád	2.	2.	2.	6.
3.	Hajdú-Bihar	3.	4.	3.	*10.*
4.	Győr-Moson-Sopron	6.	3.	5.	*14.*
5.	Baranya	5.	6.	4.	*15.*
6.	Veszprém	7.	5.	7.	*19.*
7.	Pest	4.	8.	8.	*20.*
8.	Fejér	11.	7.	6.	*24.*
9.	Borsod-Abaúj-Zemplén	8.	13.	9.	*30.*
10.	Bács-Kiskun	10.	10.	13.	33.
11.	Somogy	13.	12.	10.	35.
12.	Békés	12.	9.	15.	36.
13.	Heves	14.	14.	11.	39.
14.	Szabolcs-Szatmár-Bereg	9.	17.	14.	*40.*
15.	Jász-Nagykun-Szolnok	17.	11.	17.	*45.*
16.	Vas	15.	18.	12.	*45.*
17.	Komárom-Esztergom	16.	15.	16.	*47.*
18.	Zala	18.	16.	18.	*52.*
19.	Tolna	19.	20.	19.	*58.*
20.	Nógrád	20.	19.	20.	*59.*

Source: Bulletin of the West Transdanubian Research Institution, CRS of HAS, 152/d.

The table shows that hardly any change occurred in the relative R & D potential that had emerged by the middle of the last decade. Breaking down the order into groups of five we can see that for the majority of the counties maybe the position within the respective group of five changed somewhat.

The same five counties can be seen in the first – best – group: Győr-Moson-Sopron and Baranya changed positions, due to the relatively better R & D expenditure proportions of the previous county. This is attributable to the revival of the business R & D (e.g. by the Audi automotive company) and also to the expansion of the higher education capacities. The improvement of the position in the R & D expenditure projects that the total R & D potential of the county will improve, too. This makes it possible that Győr-Moson-Sopron will come up to position three, if the present trends continue.

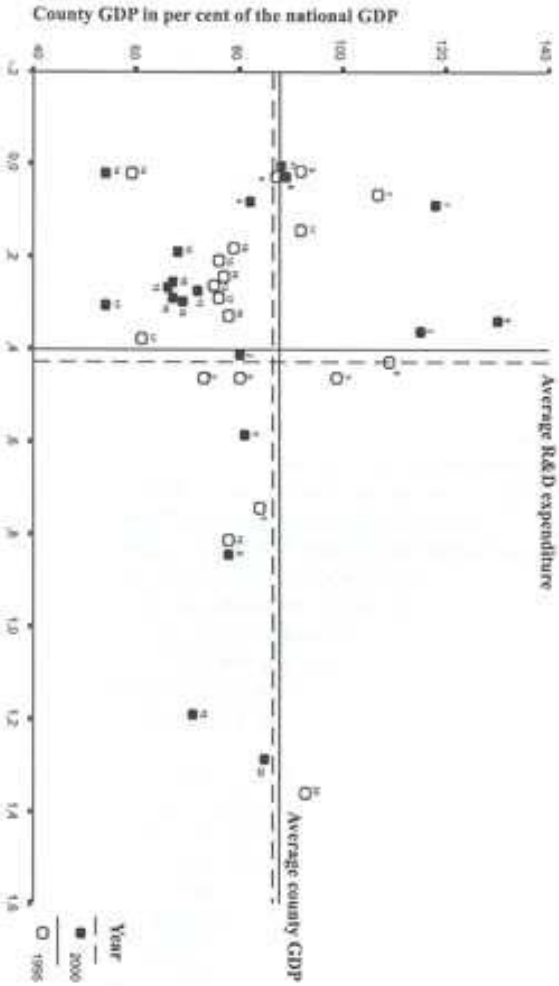
In the group containing the weakest five counties there are no more than two changes. On the one hand, Komárom-Esztergom and Tolna county changed positions 17. and 19., now Komárom-Esztergom has the better position; on the other hand, a new actor showed up at position 16: Bács-Kiskun county was replaced by Vas county. As regards the change of the positions in the order, the position of three counties changed considerably for the better and also three for the worse; the total position of Bács-Kiskun improved by 12 scores, moving the county from position 16 to 10, while the positions of Somogy and Komárom-Esztergom improved by 9 scores in both cases. For Somogy county it meant two, for Komárom-Esztergom four positions advance in the order. The biggest decline was shown by Jász-Nagykun-Szolnok and Szabolcs-Szatmár-Bereg counties: the total of the scores increased by 10 for Jász-Nagykun-Szolnok, so it fell 4 positions back in the hierarchy, while Szabolcs-Szatmár-Bereg's total of scores increased by 11, putting the county three places back in the order.

While the orders highlighted in *Table 10* only measure the relative potentials and the changes of those, the two-dimension scaling of the county R & D performance within the county GDP and economic development level (specific regional GDP) better reflects the positions of R & D within the respective counties. Also, it has important messages for the R & D and regional policy (*Figure 24* and *Table 11*). If we feature the two indices on the two axes of a coordinate system, the four fields represent four basically different groups of counties, as regards their R & D potential. The horizontal axis of the system demonstrates the R & D performance of the respective counties compared to the county GDPs, while the vertical axis was used to show the specific economic performance of the respective counties compared to the national average.

There are two possible solutions to set a dividing axis. The first is to compare the value of both factors to their average; the other is the use of a theoretical division line. We used the latter in our analysis. In the case of the R & D performance, the value of 1.0% within the GDP was the limit above which a

Figure 24

Regional development level and the level of R & D, 1995, 2001



The identification numbers of the counties are in Columns 1 of Table 11.

Note: the value of Budapest is in the upper right corner in both years, but its position compared to the GDP average will not fit into this figure.

Source: Bulletin of the West Transdanubian Research Institution, CRS of HAS, 152/d

Table 11

Regional development level and the level of R & D, 1995, 2000

County*	1995			2000		
	R & D expenditure in per cent of the county GDP	County GDP in per cent of the national GDP	L: low H: high	R & D expenditure in per cent of the county GDP	County GDP in per cent of the national GDP	L: low H: high
Budapest (1)	1.44	181	HH	1.50	196	HH
Pest (2)	0.46	73	LL	0.41	80	LL
Central Hungary	1.28	144	HH	1.29	154	HH
Fejér (3)	0.46	99	LL	0.36	115	LH
Komárom-Esztergom (4)	0.03	87	LL	0.08	82	LL
Veszprém (5)	0.74	84	LL	0.59	81	LL
Middle Transdanubia	0.44	91	LL	0.36	94	LL
Győr-Moson-Sopron (6)	0.43	109	LH	0.34	130	LH
Vas (7)	0.07	107	LH	0.09	118	LH
Zala (8)	0.02	92	LL	0.03	89	LL
West Transdanubia	0.22	103	LH	0.20	115	LH
Baranya (9)	0.46	80	LL	0.84	78	LL
Somogy (10)	0.21	76	LL	0.19	68	LL
Tolna (11)	0.14	92	LL	0.00	88	LL
South Transdanubia	0.29	82	LL	0.41	77	LL

Continuing Table 11

County*	1995			2000		
	R & D expenditure in per cent of the county GDP	County GDP in per cent of the national GDP	L: low H: high	R & D expenditure in per cent of the county GDP	County GDP in per cent of the national GDP	L: low H: high
Borsod-Abaúj-Zemplén (12)	0.29	76	LL	0.27	66	LL
Heves (13)	0.26	75	LL	0.27	72	LL
Nógrád (14)	0.02	59	LL	0.02	54	LL
North Hungary	0.24	73	LL	0.23	66	LL
Hajdú-Bihar (15)	0.82	78	LL	1.19	71	HL
Jász-Nagykun-Szolnok (16)	0.24	77	LL	0.25	67	LL
Szabolcs-Szatmár-Bereg (17)	0.38	61	LL	0.31	54	LL
North Great Plain	0.51	71	LL	0.64	64	LL
Bács-Kiskun (18)	0.18	79	LL	0.30	69	LL
Békés (19)	0.33	78	LL	0.29	67	LL
Csongrád (20)	1.36	93	HL	1.29	85	HL
South Great Plain	0.64	83	LL	0.65	74	LL
Total	0.76			0.79		

* The numbers in the brackets are the identification numbers of the counties used in Figure 24.

Source: Calculation by the authors based on the Hungarian Statistical Yearbook 1995 (p. 458.) and 2001 (p. 518.).

county has relatively favourable R & D performance or potential by the Hungarian standards. Below the 1.0% level, the R & D positions of the respective county are moderate or weak. In the case of the specific GDP values, we set the value of 100 as the limit above which a county has strong, below which weak it has positions. The coordinate system thus features the following four groups:

- strong economic potential and favourable R & D capacities (upper right field);
- weak economic potential and favourable R & D capacities (lower right field);
- strong economic potential and moderate R & D capacities (upper left field);
- weak economic potential and moderate R & D capacities (lower left field).

The applied two-dimensional scaling shows a rather homogeneous picture of the economic development and R & D positions of the Hungarian counties (*Table 12*). Three-quarters of the counties can be found in field 4, both in 1995 and 2001. The figure also shows that in these counties the stagnation or moderate growth of the R & D performance, a decline of the economic potential compared to the average is typical. This tendency will remain typical in the coming years, despite the increasing spatial disparities of the economic development measured with the GDP and the catching-up programmes of regional development policy. It comes from the fact that the foreign direct investments arriving at the more advanced counties in the middle of the 1990s implement at least the supplementary investments necessary to secure the competitiveness of the counties, whereas the counties with a shortage of capital received less capital injections compared to the more developed counties in the last years (with the exception of the multinational retail networks).

Table 12

R & D potential and the types of economic development

III. Strong economy, moderate R & D *Fejér, Győr-Moson-Sopron, Vas*	I. Strong economy, intensive R & D *Budapest*
IV. Weak economy, moderate R & D *Baranya, Bács-Kiskun, Békés, Borsod-Abaúj-Zemplén, Heves, Jász-Nagykun-Szolnok, Komárom-Esztergom, Pest, Nógrád, Somogy, Szabolcs-Szatmár-Bereg, Tolna, Veszprém, Zala*	II. Weak economy, intensive R & D *Csongrád, Hajdú-Bihar*

Source: Table 10.

In the Hungarian circumstances it is only Budapest that belongs to the ‘strong economy–favourable R & D performance’ category. In the figure we did not show

the values of the capital city, as in this case the national average calculated with the capital city would have narrowed down the other categories, and the changes of the positions of the respective counties between the two years in question would have blurred. The good R & D potential is unfortunately coupled with weak economic performance in Csongrád and Hajdú-Bihar counties, as the good R & D performance is incapable of improving the economic performance to a level that increases the overall relative economic positions of the respective counties.

In the case of three counties – Fejér, Győr-Moson-Sopron and Vas – we can see a disharmony between the R & D capacity and the relatively advanced economic performance. It is not surprising that the regional development programmes of both West Transdanubia and Middle Transdanubia treat the development of the innovation milieu as a selected priority and both regions have worked out their *regional innovation strategies*.

The figure shows that the positions of two counties changed considerably over the period in question, which means that they moved from one field of the coordinate system to another. Hajdú-Bihar county moved from field 4 – with a worsening economic potential – to the sector with favourable R & D capacities. Fejér county, also from sector 4, moved to the sector that implies good economic performance, besides worsening R & D performance.

As a summary we can say that in the short run the good R & D capacities did not affect the growth of the county GDP values in Hungary, and vice versa, the outstanding economic performance – by Hungarian standards – is not founded by the increase of the R & D capacities.

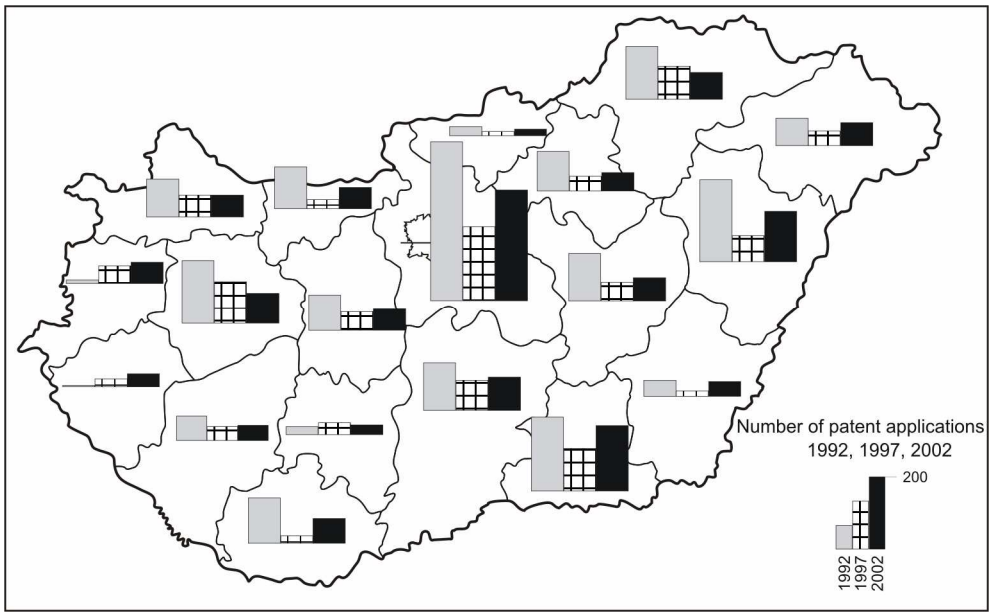
4.5 Characteristics of the transition period

The concentration of the resources of research and development in the capital city did not decrease; in fact, it increased in the years of the transition. The activities, organisations and also the information carrying the innovations are all concentrated in Budapest. The significant organisational changes taking place in the research and development sector hit the capital city too, nevertheless Budapest kept its leading position in this sector.

As an example let us take a look at the applications for patents, which well illustrates the spatial structure of research and development. While in 1992 almost 2,700 applications for patents were submitted to the Hungarian Patent Office, the number of applications continuously decreased over the decade, reaching the nadir in probably 1998. The national tendency of the change in the number of applications for patents could also be seen in most of the counties, while the spatial distribution of the applications shows a very much differentiated picture (*Figure 25*).

Figure 25

Number of applications for patents at the Hungarian Patent Office by counties, 1992, 1997, 2002



* The Data of Pest county without Budapest.
Source: Edited by the authors based on the data of the Hungarian Patent Office.

In absolute terms, the most dramatic changes took place in the case of Budapest in the previous decade: while in 1992 a total of 1,544 applications for patents were submitted in capital city, in 1997 this number dropped to less than half, and the number applications submitted in 2002 was just over that in 1992. Parallel to the changes following the national tendencies, the concentration of Budapest was typical all the time, although its scale decreased somewhat: in 1992, 57% of the applications for patents were submitted by Budapest persons or organisations, by 1997 this figure decreased to 55%, and to 50% by 2002.

The number of applications for patents per one million inhabitants was 262 in 1992; this figure fell back to 130 by 1997 and then started to rise again after the nadir, to reach 154 applications per one million inhabitants by 2002.

The total number of research and development units decreased, the majority of them was reorganised. Those organisations that were closed down were usually the ones outside Budapest, in the countryside centres. A limited number of research and development businesses appeared, as in a few centres (Győr, Székesfehérvár) the

developers of the large businesses founded smaller organisations, several of whom still successfully operate, having expanded their activities.

A few large multinational companies have located or are planning to locate research and development units to Hungary, and these units are usually concentrated in Budapest and its region, too. Their connections to the universities, to higher education and to other research units are still weak, is has only been initiated in Budapest and a few other cities of Hungary so far that innovation parks should be organised parallel to the universities, creating thereby a considerable intellectual concentration that also entails economic and regional development effects. In the rural higher education and economic centres the will to found innovation and technology centres is given, but the resources are missing, the organisational structure and the development directions are unsettled yet and the permanent interest conflicts of the stakeholders set back the initiatives.

While the renewal of the economic structure was faster and more successful in the western and north-western parts of Hungary, these regions were and still are in a very bad situation as regards research and development and also higher education. The only progressive connection that we can see is the one between the restructuring of the economy of the capital city and the research and development and higher education basis of Budapest – due to the large-scale concentration –, but such a phenomenon is completely missing in the non-capital city centres, in fact, just the opposite is the typical case.

The renewal of the territorial structure of Hungary and the performance of the economy is not connected directly to research and development and higher education in the transition in Hungary (*Table 13*). It is clear that not these capacities are the main motivators of location, the attractors of foreign and Hungarian direct investments or the generators of the restructuring of the economy. Probably the first phase after the establishment of the market economy, the phase of quantitative growth and restructuring, is going to be followed by another phase when the relationships among the economic units and the resources of science higher education are gradually established. A few signs of this can already be seen in the case of Budapest (e.g. the location of research and development centres and the increasing volume of orders for R & D).

In the rural centres of science and higher education, the available capacities allow a faster territorial development and can also offer more favourable conditions for the restructuring of the local and regional economies. It is evident, on the other hand, that regional and local resources (of local governments, economic organisations and interest representations) are inadequate for the realisation of these efforts.

The local and regional self-governments have attributed so far a varying significance to the settlement and regional development possibilities lying in higher education and, to a more limited extent, scientific research. What we can say is that

those smaller centres were more determined to assist the development of this sector

Table 13
Amounts paid to higher education from the resources of the National Technical Development Fund in 1996–2000, by planning-statistical regions

Planning-statistical region	1996	1997	1998	1999	2000	1996–2000		Share of regions from GDP (%)
						Million HUF	Share (%)	
Central Hungary	154.2	716.7	246.4	199.6	234.8	1551.8	55.60	43.11
Middle Transdanubia	8.7	60.5	9.8	12.8	8.6	100.3	3.59	11.08
West Transdanubia	9.5	13	23.1	16.6	7.2	69.4	2.49	11.23
South Transdanubia	28.1	145.2	32.7	11.7	22.7	240.5	8.62	7.26
North Hungary	13.3	45.2	6.4	17.3	18	100.1	3.60	8.15
North Great Plain	22.7	275.6	34.8	22.4	32.6	388.1	13.91	9.61
South Great Plain	29.6	185.7	29.1	44	51.5	339.9	12.19	9.56
Total	266.1	1441.8	382.2	324.5	375.4	2791.1	100.00	100.00

Source: Positions of the research and development in higher education. Ministry of Education, Budapest, 2001

(mostly by the provision of establishments and to a lesser extent by the donation of financial means) that usually did not have higher education at all or where higher education had been one-sided – or where the effect of the personal relations reinforced the significant traditions (a few university towns). The bigger centres are slower to recognise that the development of the scientific and higher education capacities have a considerable impact on the future of the respective settlements. Today it is demonstrated also in Hungary that the existence of higher education in an adequate volume does have an impact on the local economy (*Hardi–Rechnitzer*, 2003). Regional and local actors are interested in the short-term results, whereas the effect of research and development and its institutions can be seen in a longer period of time, so enthusiasm cannot replace either the resources or the continuous lobbying for the development of the institutions.

Regional policy and science and technology policy have not had much in common in the past fifteen years. Both policies were engaged with the creation of their own identities, thus neither regional policy had concrete messages for science and higher education nor the shaping science and technology policy was interested in spatial structure and regional processes.

The *National Regional Development Concept of Hungary* (1998) mentioned the spatial structure of research and development and higher education in Hungary[10], but there were no comprehensive researches behind the development paths designated in the Concept. In addition, the Concept was more rejected than accepted, due to the lack of professional reconciliations.

[10] The Concept puts the centres that harmonise research and development and the development of businesses into three categories. The first group is made up by the regional innovation centres where the organisation of science parks is desirable: such centres are Pécs, Szeged, Miskolc, Debrecen, Sopron and Veszprém. The second category involves the innovation centres that "possess comparative advantages" as links of the chain. These are Mosonmagyaróvár, Keszthely and Gödöllő. The third group are the junctions of industrial restructuring, where technology centres directly assisting the region-specific production and its services should be located, together with industrial parks and de-centres of higher education: they are Győr, Dunaújváros, Székesfehérvár, Tatabánya, Szombathely, Zalaegerszeg, Kaposvár, Kecskemét, Nyíregyháza, Szolnok, Eger and Békéscsaba. The text of the concept and the map in its annexes do not correspond to each other, it is actually not explained what the authors mean under the certain categories, probably what they did was the simple categorisation of the university centres and sub-centres and the colleges. Since then, however, the structure of higher education has changed after the structural integrations. Finally, the authors did not give specific research directions; they were not connected to the business structures of the respective regions. In our opinion this categorisation, the ideas of this "institutional models" is not feasible enough professionally. The research and development chapter of the *National Regional Development Concept of Hungary* is a good example for the lack of adequate analyses and strategy for the territorial structure of this activity, accordingly the development suggestions are inadequate, too, as they are not built on the inner correlations of the regions and are not connected to the renewal of technology policy itself, either.

At certain organisational developments the weak sings of the assertion of spatial aspects could be seen, such as in the establishment of the institutions of the Bay Zoltán Research Foundation, the instrument centres of OTKA (Országos Tudományos Kutatási Alap, National Scientific Research Fund) and the de-centres of the European Union 5th Framework Programme (Győr, Veszprém, Pécs, Miskolc, Debrecen, Szarvas and Szeged), but these were not parts of a conceptual approach but were aiming at the managing the lack of it.

At the development concepts of higher education and its new industrial system, regional aspects (e.g. lack of certain fields of science, accessibility, concentration of capacities) were not given much emphasis; these concepts were not built on the development and renewal ideas of the regional economies. At the transformation of the institutional and tools system of regional development (e.g. decentralised resources), research and development and higher education capacities were not taken into consideration, or if they happened to be, without resources allocated to them.

A careful initiative was made in the last third of the 1990s for the regionalisation of research and development, when the county chambers of commerce were given limited resources by the former National Technical Development Committee. The few years of experience does not allow us to draw far-reaching conclusions. The support of research and development at regional level was raised again in 2004, in connection with the act on the innovation fund. Besides the regional development councils, regional innovation councils could be created. They can handle decentralised innovation resources on the basis of the principles set by the regional level, and their activity can be assisted by the newly established regional innovation agencies. A considerable shift towards regionalisation and also decentralisation was made this way, the results of which will probably become visible in the long run.

The institutional system of regional development was gradually built out both at county and regional level. The development concepts and programmes of the counties and primarily of the regions deal with research and development; they specify the demands and plan the enlargement of the institutions, mainly in the regional centres and the locations of the research and development institutes. The research and development ideas appearing in the concepts[11] are not integrated into an adequate organisational system, they are nut supported by resources, so research and development appears as a rather general objective of regional development and not as part of a structure promoting the internal renewal of the regional economy. The concepts cannot fit research and development into the institutional level, either, because there are no adequate models and alternatives for solutions for this in the Hungarian regional development practice. Also, the international programmes do not take this segment into consideration yet.

[11] Those county development concepts have chapters on research and development where there are universities or significant higher education institutions in the county. In other concept we can read general statements, most of which specify demands but not exact development ideas.

On the other hand, it is a definite achievement that there is an expressed demand for the support of research and development at territorial (regional) level. However, without models and suitable partners (governmental or regional bodies) and interest representation, no specific tools and institutional system has been created so far in the spatial units, accordingly the concepts and programme are mainly concentrating on the conservation or the minimum development of the existing structures.

5 Settlement network

Analysing the relationship of the settlement network and the human resources we can see that the settlements, their institutions, operation, the character of their economy and society, their communities, values and a lot of their other factors have an impact of the people's lives and also their capacities. The central settlements concentrate the most important actors of the economy, build out their local and regional institutions that attract and also transform the population. On the other hand, the centres with a smaller range of functions gradually lose their human resources, decreasing thereby their economic capacity, which may lead to the further deterioration of the functions.

We could go on with the list of consequences; instead we only say that it is important to look at the economic, social and institutional structures determined by the settlement network, and on the basis of this to search their impacts on the structure and regional characteristics of the human resources. In the subsequent pages we concentrate on the urban network within the total of the settlements. The cities and towns are the determinants and focal points of regional processes. The inner movements, the restructuring, the hierarchy and spatial division of the urban network, the transformation of some of its old functions and the appearance and spread of new attractions do not only describe the regional processes but can also highlight the role and influence of the respective elements of human resources.

5.1 The innovative milieu and its changes in the nineties

First we try to introduce the rearrangement of the urban network in the nineties, in order to illustrate the factors that actually impact the regional processes, and represent the renewal and innovation milieu of the regional processes.

Is there a shift in the urban network in the 1990s? We can only give a precise and scientifically supported answer to this question if we measure the structure at the two dates with the same parameters. The comparison is hard to make, nevertheless we can make a provisional comparison of the beginning and the last third of the nineties (*Rechnitzer,* 1993, 2002).

On the basis of the analyses made we can draw the following conclusions on the rearrangement of the urban network and the factors promoting it *(Figure 26* and *27*). The first conclusion is that by the end of the decade, among the elements of the network, the integration and interdependence of the factors and institutions representing the modern business and economic services is more expressed. These new urban functions are interrelated, and as a consequence of the consumer capacities motivated by the economic potential, they appear in the cities in an ever larger number and improving quality. By the turn of the millennium they reached a certain mass both as regards their supply and their spatial spread, and they became dominant elements of the quality and division of the urban network.

The second conclusion is that while in the early nineties it was the traditional centre functions, i.e. mostly institutions connected to public services (education, health care, justice and public administration) that primarily influenced the urban network and its division, by the late 1990s the business and economic services and market factors became the prime factors. The elements making the network built on public services thus lost some of their importance, and they were replaced by the functions connected to the economy, or the functions related to market and consumption, and also the towns as the places of population concentration and attraction.

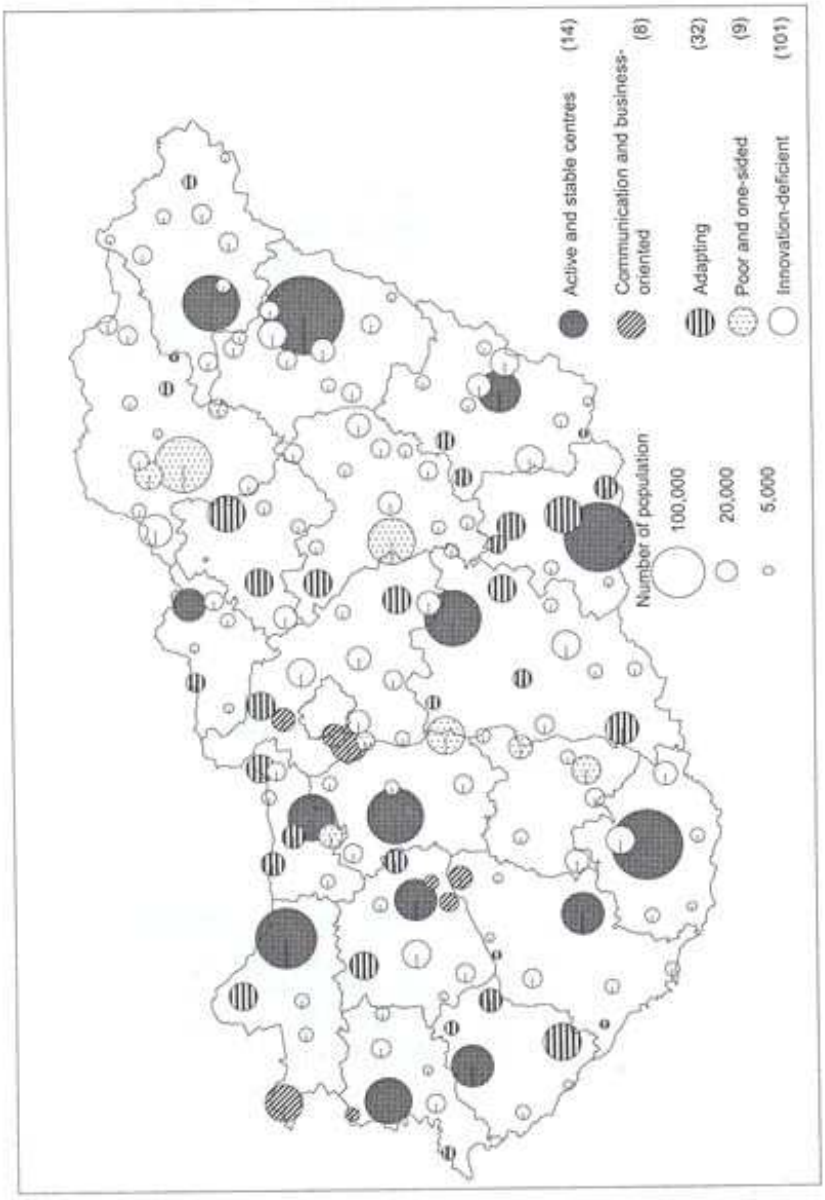
The third characteristic is that, besides the market and consumption factors, very closely related to them, the accessibility, good transport location of the towns was highly appreciated. The better the access to a town, the stronger attraction it has on its region and the wider range of services the town integrates, the richer the supply of its consumer market becomes.

The fourth statement is that while in the early nineties the human resources, especially the schooling of the population was a dominant factor in the development of the network, schooling, including the strong influence of those with higher education degrees, lost its importance by the end of the decade. The structure in this respect may have become more balanced, and the economic factors – including incomes or elements representing consumption – may induce bigger disparities than human resources do. Human resources have probably become more homogeneous within the urban network.

The change of the division of the urban network is striking: of the 164 towns examined in 1990, 97 towns (59% of the total) shifted in one direction or the other. The number of stable and active towns increased: they are usually the county seats, large cities and some middle towns with old traditions. These centres are the strong points of the network; they have established their regional functions and are home to 35.2% of the total population of Hungary, according to our survey.

Figure 26

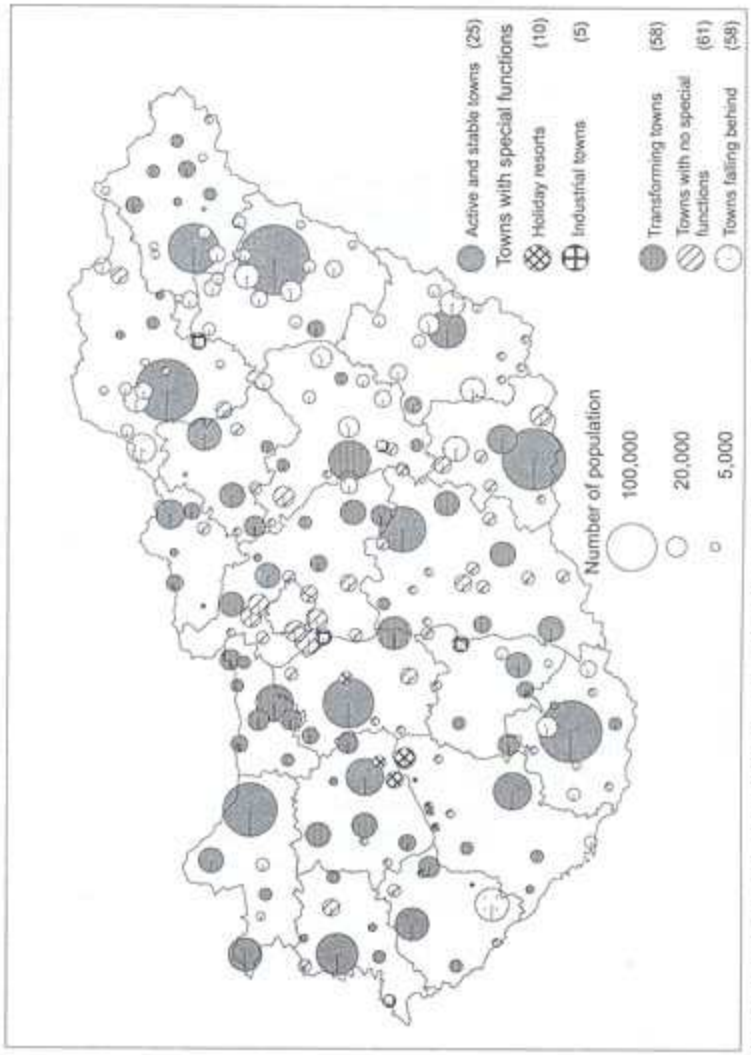
Division of the urban network by innovative milieu, 1990



Source: Calculated by the authors.

Figure 27

Division of the urban network by innovation milieu, 1997



Note: The numbers in brackets indicate the number of towns in the respective category.
Source: Calculation by the authors.

The group of towns with special functions rearranged, too. It is not the mixed functions but the concentration of the individual, outstanding local characteristics that separate those towns whose situation is good due to several factors. The long-term development, on the other hand, is exposed to economic booms or seasonality effects, so the development strategies have to include the expansion of the consumption and service functions of the respective town. A large-scale rearrangement took place in the last years in the set of towns in transition, able to improve their positions. Several large towns managed to get out of the category of the unstable settlements (e.g. Hódmezővásárhely, Eger and Szekszárd), also, many traditional middle towns reinforced and stabilised their situation (such as Baja, Keszthely or Mosonmagyaróvár).

There was a mass "intrusion" of the small and middle towns established between 1971 and 1988 into the category of transforming towns able to improve their situation, representing the third stability level[12] of the urban network. In the beginning of the 1990s, most of these towns could be considered as lagging centres, lacking innovation, but they were able to strengthen their regional organising functions by the last third of the decade. The transition is more striking in the small towns of the territories west of the Békéscsaba–Salgótarján line; east of this division line only a few towns, usually the already mentioned centres of Szabolcs-Szatmár-Bereg county, were able to make this progress to another category.

A larger number of small and medium sized towns founded in the 1970s and 1980s were able to improve their situation, receive new service institutions and also develop their regional positions. Probably by the early 1990s the institutional systems and the hinterlands of these towns had been established, which contributed to the appearance of further, new functions and at the same time the stabilisation of their human resources base.

The group of the ex-socialist and industrial towns, which existed at the time of the first survey, although with poor and one-sided innovations, disintegrated. Some of them now belong to the new industrial towns (like Paks, Százhalombatta or Tiszaújváros), some of them managed to renew themselves, probably due to their county seat functions (Szekszárd and Miskolc), and it is only Szolnok that made a relatively minor step, as it now belongs to the category of the towns in transition.

The group of towns without innovations fell apart in the nineties, too. A significant set of towns (those founded between 1971 and 1988) made a move to the group of the transforming, stabilising towns. It means that now there is a group of towns that managed to survive the shock of the transition, the market functions and the innovative institutions representing them are gaining a more and more important role in their urban functions. Nevertheless there are some "static" towns,

[12] The first level is the capital city, level 2 is made up by the regional centres, level 3 are the meso-centres and level 4 are the micro-regional centres.

mostly in the Trans-Tisza region (the territories of Hungary east of the Tisza River) and in North Hungary, so in the small towns of *Békés, Hajdú-Bihar, Jász-Nagykun-Szolnok*, and *Borsod-Abaúj-Zemplén* the wave of the national modernisation cannot be seen. Although there are new institutions, elements of the market economy and units of the new services, their weigh is still low, moderate compared to the total of the characteristics of the respective towns. It is interesting that in Transdanubia there are only four static towns in this respect (Csorna, Szigetvár, Mohács and Tolna).

The small towns that were given the town rank in the 1990s (there are 53 such towns now in Hungary) do not automatically belong to those falling behind; in fact, these new small centres are definitely divided, different factors are dominant in them. Besides the new holiday resorts, one industrial town and four small towns are among the towns in transition (Csepreg, Aszód, Pécsvárad and Máriapócs). Twenty-six towns are in a transition situation, most of them in Transdanubia, in the agglomeration of Budapest, in the region between the Danube and the Tisza Rivers – the ones falling behind in the Trans-Tisza region again. The majority of the settlements that were awarded the town rank in the 1990s thus did not contribute significantly to the modernisation of the urban network as a whole; in fact, they considerably deteriorated its quality. This mass award of new towns, not considerate enough, only increased the tensions in the network. The criteria of the award of town rank are connected to the institutional infrastructure, to quantitative characteristics and not to the presence of the elements of modernisation (*Csapó–Kocsis*, 1997; *Kara* , 1998).

The analyses revealed that the transport relations played a significant role in the modernisation of the individual elements of the network. If we compare the distances of the settlements from the motorway network at the different times and the positions of the towns, we get a characteristic structure. The correlation between the two things is not unequivocal and indirect. The developing towns within those in transformation make the majority in the stripe of the best access, within 30 minutes from the motorways. Probably these are the towns where the structural changes will accelerate in the future, where market services and their institutions will play an increasingly important role and that will become more attractive not only for the economic units but also for the inhabitants.

In the early 1990s a large-scale rearrangement took place in the Hungarian urban network. The institutions of market economy showed a spectacular development, by the end of the nineties they became the dominant factors in shaping the total of the settlement network. The big cities, with a larger population, considerable hinterland, mature and multi-level institutional system and income generating capacity were able to better react to the factors bearing modernisation, thus they were able to stabilise their situation and also expand their regional organising functions.

In the network, the towns built on one particular function or one particular economic (industrial) activity are separated from each other. The traditional middle towns and the small and medium sized towns founded in the 1970s and 1980 gradually got rid of the negative economic impacts of the systemic change. They were able to integrate the institutions of the market economy and accommodate those institutions of the service sector that mediate modernisation.

In the towns in transition situation, without a stable structure and institutional system – many of whom gained the town rank by administrative measures –, the building out of the institutional system carrying modernisation is still accidental, the economic structure is fragile, the income positions are less favourable, so the future development of these towns is uncertain. In the group of those falling behind we see a larger number of centres that were awarded the town rank in the nineties (or in the last twenty-thirty years in the Trans-Tisza region). There were achievements in the development of the market institutions and services and the economic base as a whole, but the pace of these developments lagged behind the development of the whole of the network, making the falling behind of these towns striking and palpable. The majority of these towns can be found in agricultural areas or industrial crisis regions, so they are not able either to absorb energy from or give energy to their hinterlands.

To sum it up, the urban network was not static in the 1990s, the total of the urban system and the majority of the individual towns tried to adapt to the market economy, partly by the integration of institutions and partly by the expansion of the new regional functions. In the major part of the network, the shock typical for the early 1990s has gradually disappeared by now. Ever larger groups of small and medium sized towns in all regions of Hungary have either regained their functions or are preparing for the reception of new functions. In the nineties, the dilution of the network started, which increased the density of the urban network and accordingly the competition for the new functions in certain regions, while in other places, due to the backward situation of some regions, the new towns have not been able so far to become the mediators of the institutional systems of modernisation. The large towns became the evident winners of the network, the successful towns – at a different pace and at different times –; in these towns the new institutional system of the market economy has emerged and stabilised, so the regional effects of these towns have gained a new dimension, primarily built on consumption; also, they concentrated the human resources.

Based on the experiences of the nineties, the projected trend of the future development of the urban network is the further strengthening of the large cities, the expansion of their functions and thereby the ever sharper competition among each other. The traditional middle towns and the small towns founded before the mid–1980s are expected to stabilise their situation, and also to increase their micro-regional, in the better case meso-regional functions. We also think that the circle of

towns with special functions is likely to expand, i.e. the increase in the number of holiday resorts, agglomeration towns (also around the regional centres) and as a – now visible – new phenomenon, of border towns. Finally, the revival of the small towns may be spectacular in those regions where the conditions of a long-term economic growth are given, allowing these towns to join in the regional networks that are more and more definitely shaped by the economies of the large towns. In those regions where the large towns are unable to strengthen the development of the network, are engaged with the rearrangement and stabilisation of their own structures, the small towns will continuously stagnate, parallel to the quiet decrease of their institutions and services. Probably new awards of town rank as an administrative and political "act" will be necessary in the future too. There are still regions in Hungary with a deficiency of towns, but the newly recognised towns will only be able to have an impact on their micro-regions – or they already have an impact –, and will not influence significantly the development of the whole urban network. Competition and the most intensive integration into the European network will remain typical of the large towns; these towns will remain the primary factors in the development of the network and the determinants of the structures at regional level.

5.2 Spread of a new skill and technology

In our further analyses of the Hungarian urban network we tried to explore what differences and similarities can be found between the socio-economic development level of the towns and a new knowledge technology system, the provision with info-communication infrastructure[13] (*Csizmadia–Grosz–Rechnitzer*, 2001).

As regards the development level of the towns in the field of info-communication technology, the findings of the survey of the available infrastructure and info-communication services allowed the separation of several different categories. The factors making these categories are manifold, but there are a few especially important characteristics. One of the most important features is that the development level of the towns in info-communication technology is influenced by the size of the given town, together with the – historically developed – central functions and roles in cause and effect relationship with the size. The traditional centres of Hungary – county seats, towns with county rank, regional centres –, that had been the

[13] We analysed the info-communication infrastructure through 12 variants, which are the following: secondary and higher education institutions offering ICT training; number of info-communication businesses in manufacturing industry; number of businesses related to products and non-material production; businesses interested in the media economy; internet service forms; domain names; number of telephone subscriptions; share of business lines within all telephone lines; number of mobile phone service subscribers.

centres of the socio-economic development for a long time, also have an outstanding position within Hungary as regards the provision of info-communication services (*Figure 28*).

These towns concentrate the majority of the businesses active in the info-communication sector (both in manufacturing and the services sector), the number and quality of the available communication infrastructure (both the traditional and most up-to-date, internet-based ones), and the level of the connected services is well above the services available in the small and medium sized towns. They also have a considerable advantage in the field of ICT training. A special group of them are the traditional regional centres (Debrecen, Szeged, Pécs and maybe Miskolc); their special positions are reinforced by their role in university and scientific research and the institutions of these researches.

Somewhat behind the traditional regional centres but above the level of the county seats and the micro-regional centres we find a distinct group, the group of the towns that are new or partial regional centres. On the basis of the info-communication indices, in addition to Győr, Kecskemét, Székesfehérvár and Nyíregyháza, we can mention Veszprém, mostly due to its university traditions and research bases.

The county seats and the micro-regional centres can be classified into two basic categories. One category is made up by the county seats and towns with county rank, at the next level of the hierarchy, that have traditionally played and still play a considerable role in the settlement structure. In the second group we find a few middle-sized towns in the vicinity of Budapest: Vác, Szentendre, Budaörs, Gödöllő, Budakeszi, Dunakeszi, Érd and Esztergom. Their dynamic development is definitely the consequence of the proximity of the capital city, the suburbanisation tendencies gaining a momentum in the last decade and, among other things, also the spread of the info-communication sector.

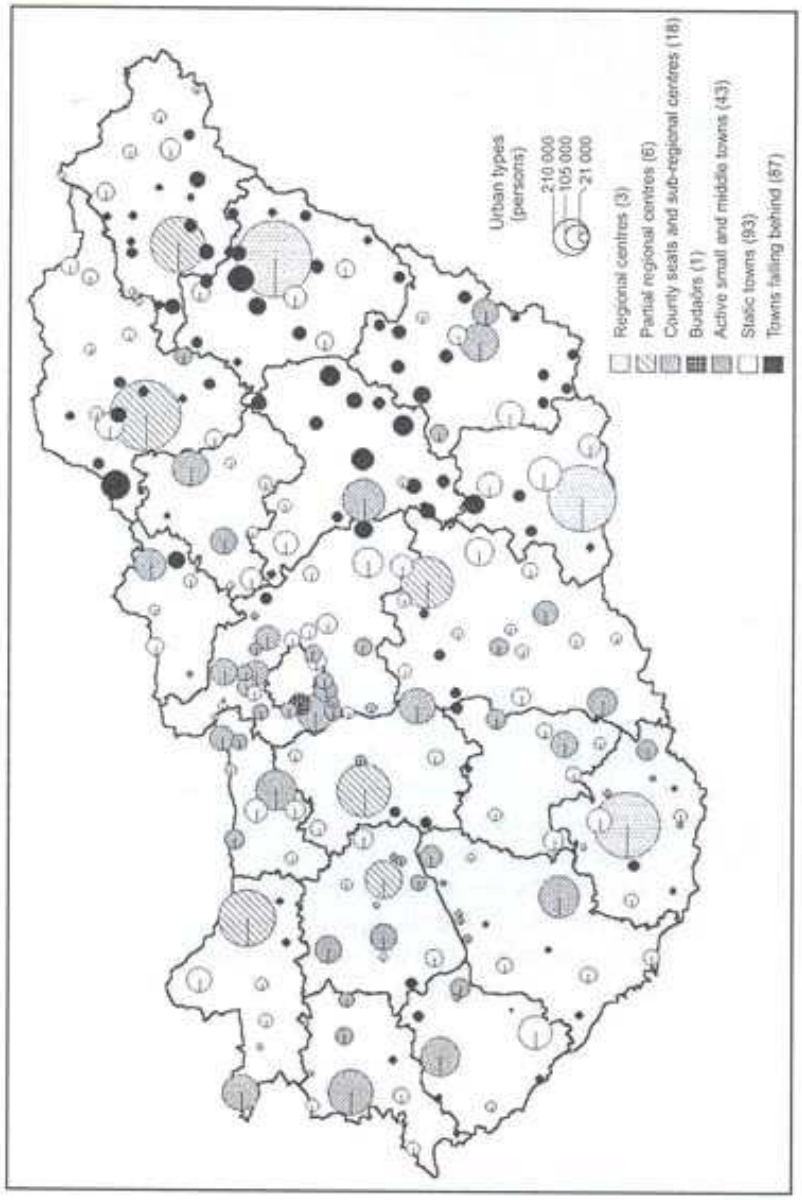
Mainly in the Budapest agglomeration, but also in North Transdanubia – a region advanced both in social and economic sense –, and also in the South Great Plain region there are several active, dynamically developing small and medium sized towns. In these settlements both the quantity of the info-communication infrastructure and the activity of the businesses in this sector exceed the national average.

Regarding their activity and mobility, a homogeneous group of towns are the so-called holiday or bathing towns, but their special position is attributable much more to their specific economic functions than their provision with info-communication infrastructure.

Most of the small and medium sized towns – approximately a hundred of them – do not show any particular activity in the reception of info-communication technology, in their case a lower level of provision, well below the national average is typical. Finally there is a significant number of towns (58) that are in the group characterised by lagging development and falling behind; they are definitely

Figure 28

Possible groups of the Hungarian towns on the basis of the info-communication sector



Note: The numbers in brackets indicate the number of towns in the respective category.
Source: Rechnitzer–Grosz–Csizmadia, 2003.

concentrated in the north-eastern part of Hungary (of course there are a few such towns in other regions of Hungary too).

We can rightly say that the info-communication infrastructure of the Hungarian towns is primarily determined by the size of the towns (differences among the traditional large cities, the county seats and the small and medium sized enterprises), their geographical location (disparities of the dynamically developing, the stagnating and lagging, and the backward regions) and also their special features (e.g. the dominance of the holiday resort functions, belonging to the agglomeration of the capital city, university and higher education centres). We cannot show a close relationship between the time of the award of the town status and the development level in information and communication technologies. Leaving the regional and micro-regional centres out of consideration, among the towns given the towns rank in the last decade there are active towns, static ones and lagging small towns as well.

Of the 251 towns of Hungary, only 20–25 can be seen as definitely developed, if we consider the development level of the information and communication technologies, the available infrastructure and the supply of such services – however, they are home to some 40% of the urban population of Hungary without Budapest (2 million people). A further one million inhabitants live in the 70–75 relatively active small and medium sized towns that are trying to catch up with the former group, whereas in the other, more than 150 towns we cannot actually talk about a strong presence of info-communication sector – in fact, 60 of these towns are definitely backward and still falling behind. It means that the number of urban population left out of the development of the information and communication sector is almost 2 million.

As regards the info-communication infrastructure, the spatial structure and the settlement structure of Hungary are more or less divided; there are disequilibria in this respect. The majority of the most advanced towns – regional and micro-regional centres – can be found in North Transdanubia and the agglomeration ring surrounding Budapest, whereas the southern and eastern parts of Hungary (South Transdanubia and the territories east of the Danube River) are in a less favourable position. This is underlined by the geographical location of the backward towns, as most of them are concentrated in North Hungary. From the aspect of info-communication infrastructure, the most deprived areas are the regions lying east of the Salgótarján–Szolnok–Békéscsaba line.

5.3 Knowledge bases at the turn of the millennium in the urban network

The study of the knowledge-based renewal capacity of the urban network can raise several questions. The issues can be the definition of the content of knowledge-based renewal, and the choice of the indices and factors suitable for its description. Another issue can be time – should we analyse the renewal in the network in a time series? We can think about the methods of analysis, the well-known limits of the analyses or the difficulties that we encounter during the application. Last but not least our conclusions may lead to disagreements, as the towns see the reality in the different ways and comprehend the reasons and explanations differently. In fact, their analysis of the situation may considerably differ from what the academics put down in this study.

If we want to get a clear picture of the endowments of a given settlement in connection with the many forms of renewal capacities, we need a *single model* that carries

1. the dominant material factors of innovation (e.g. economic development level of the households and the organisations, institutional system, employment and unemployment);
2. endowments offered by the human resources (e.g. the level of schooling, proportion of the highly qualified segment of the labour market, higher education and research and development); and naturally
3. the sings of innovative behaviour at the local level, besides the presence of the adequate supporting institutional system (e.g. the presence of institutions supporting patents and innovations, the weight of the R & D sector).

We put all these factors into *five groups of analysis* and examined them for a total of 251 towns. *1. The index of the economic development* level summarises the data of the inhabitants, the local economic actors and the institutions and organisations involved in the local economic activities. In the creation of the new, complex variable, the indices measuring the income positions of the households and the dynamics of the employment play the most significant role. *2. The four indices of the main component 'schooling and management'* sum up the segments of the labour market data of the census of 2001. The index reflects the existence of the economic and state roles and functions built on advanced, highly qualified professional and especially managerial jobs. In the establishment of this variable the main role is played evidently by the indices measuring the proportion of the professionals, within this that of the intellectuals in leading positions. *3. The index of the main component 'social activity'* is made up by the data measuring the willingness of participation in the referendum of the EU accession, the organisational and financing (support) background of the civil society and the complexity of the local social

publicity. The main factors in this variable are the indices measuring the electoral behaviour and the weight of the non-for-profit sector. *4. The dimension of human resources* reflects the institutional and human weight, the development level of the higher education sector. In the concise variable, the most significant component is the proportion of the qualified lecturers in leading positions in higher education, and the urban parameters measuring the faculties of higher education, and secondary institutions. *5.* The main component *'innovation'* aggregates four indices directly, and a total of eleven indices indirectly. The structure of the indices shows that this dimension describes primarily the local innovative activities and the supporting real physical and digital institutional system, the service milieu in the background. The biggest importance was attributed to the indices depicting innovative initiatives patented over the last ten years, the development level of the information and communication technologies and the density of the network-based digital services.

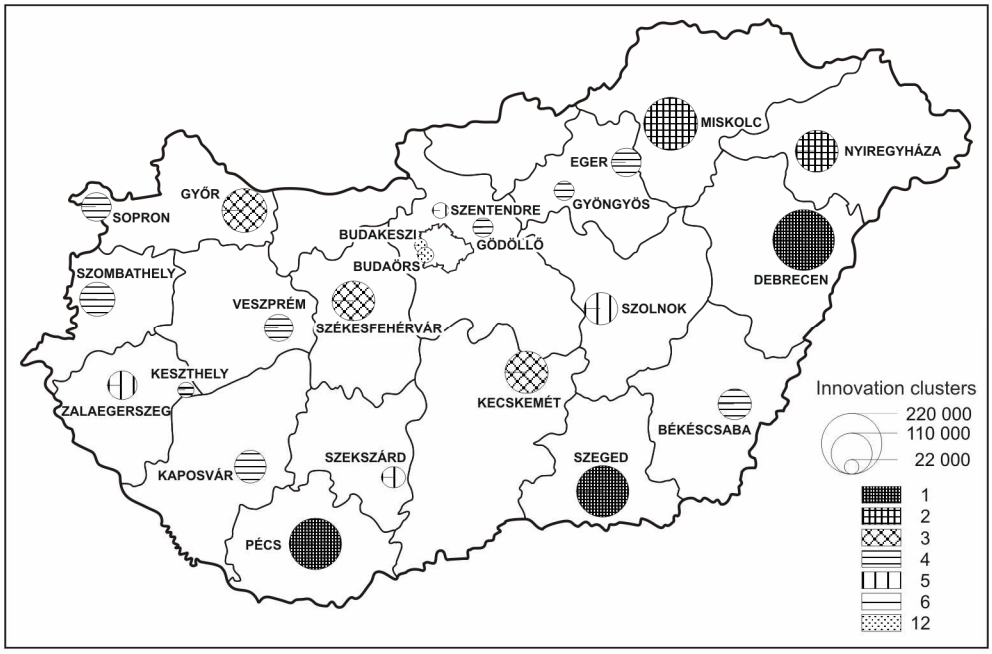
We analysed the innovation potential of the towns on the basis of the data of the five main components, and the aggregated values of these became the elements of clustering. In this two-step action we managed to separate eleven groups that show a relative homogeneity in the "space" defined by the axes of economy, schooling, society, human resources and innovation, and are also markedly different from each other (*Figures 29* and *30*).

The three big towns of cluster 1 (Szeged, Pécs, Debrecen) as traditional regional centres are in the focal point of higher education and innovation processes, with good labour market and economic parameters. These centres, that are home to more than 10 per cent of the total non-Budapest urban population of Hungary (just five million inhabitants) are the most innovative members of the Hungarian urban network. Their primary feature, in addition to the characteristics reflecting high, above-average level of schooling and the presence of a knowledge-oriented labour market, is the outstandingly high average values of human resources and innovation indices. With regard to the development dimensions connected to innovation, cluster 2 is made up by big towns with central roles, belonging to the cutting edge (Miskolc and Nyíregyháza) that only lag behind in their economic parameters. These two towns have 6 per cent of the total non-Budapest urban population, but their economic data are only around the average, even if we take the total of the Hungarian urban network into consideration. If they improve their less favourable economic potentials, they will have everything that is needed to have more intensive and successful innovative functions. Members of cluster 3, i.e. Győr, Székesfehérvár and Kecskemét (7 per cent of the respective urban population) are among the towns with excellent innovation capacities if we consider the total set of towns in Hungary. Actually the number of innovative initiatives is high, the institutional system is given, but the adequate human potential is less developed, there are no university bases or they only have a short history. Another common feature sepa-

rating these towns from others is the presence of very developed economic factors, and the significant share of the foreign capital.

Figure 29

Division of the urban network by the knowledge base
(towns with high renewal capacity)



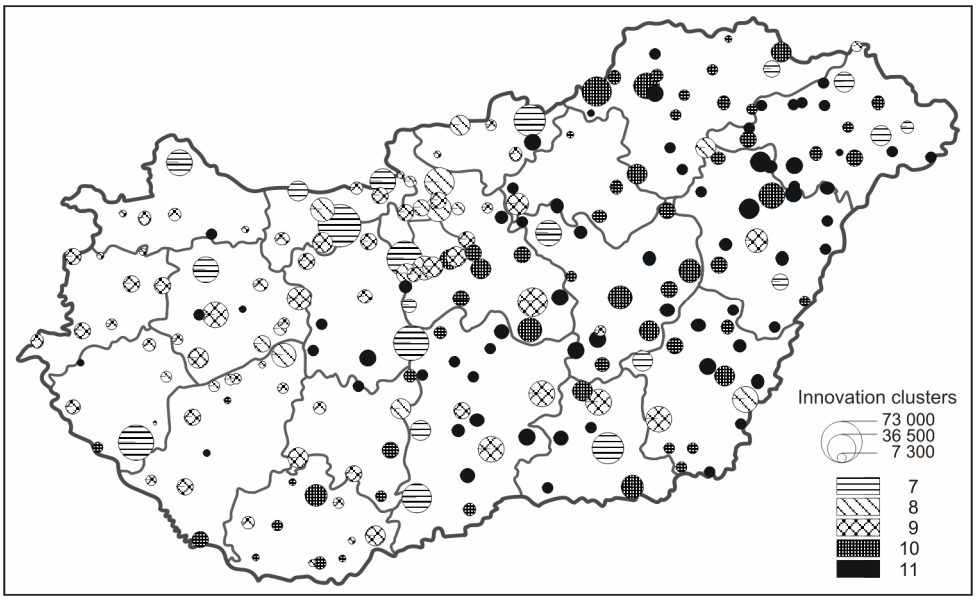
Legend: 1 – Regional centres with complex structure I. (3 towns – 533 thousand persons – 10.8%); 2 – Regional centres with complex structure II., with less favourable economic parameters (2 towns – 303 thousand persons – 6.1 per cent); 3 – Centres with a shaping innovation potential and built on strong economic foundations (3 towns – 342 thousand persons – 6.9 per cent); 4 – Centres with considerable higher education and human resources base (6 towns – 389 thousand persons – 7.9 per cent); 5 – Sub-regional centres with good endowments (4 towns – 198 thousand persons – 4.0 per cent); 6 – Towns with predominantly higher education orientation (3 towns – 86 thousand persons – 1.7 per cent); 12 – towns in the Budapest agglomeration, with outstanding economic and labour market conditions (2 towns – 36 thousand persons – 0.7 per cent).

The size of the circles indicating the towns are proportionate with their number of population, the percentage figure indicates their share from the urban population of Hungary calculated without Budapest.

Source: West Transdanubian Research Institute, CRS of HAS, 2003.

Figure 30

Division of the urban network by the knowledge base
(towns with limited renewal capacity)



Legend: 7 – Towns in a transition situation, with innovation potential (20 towns – 636 thousand persons – 12.9 per cent); 8 – Towns in a transition situation, with less innovation potential (23 towns – 324 thousand persons – 6.6 per cent); 9 – Average level of urban development with low human resources base and innovation potential (59 towns – 770 thousand persons – 15.6 per cent); 10 – Towns less developed than the average (59 towns – 764 thousand persons – 15.5 per cent); 11 – Towns with definitely unfavourable endowments (67 towns – 545 thousand persons – 11.1 per cent).

The size of the circles indicating the towns are proportionate with their number of population, the percentage figure indicates their share from the urban population of Hungary calculated without Budapest.
Source: West Transdanubian Research Institute, CRS of HAS, 2003.

The members of cluster 4 are secondary centres with considerably dynamism (for example Sopron, Szombathely or Eger), it is mainly their higher education functions that put them into a cluster of selected importance from the aspect of innovation. The six towns of this cluster are home to 8 per cent of the non-Budapest urban population, they have above-average endowments in all indices but their rate of innovation is much more moderate compared to the previous clusters. The factors connected to human resources, higher education are already given and the

economic and social conditions are also favourable. The presence of the institutional system supporting and serving innovation is not complete, and the proportion of actually implemented innovative initiatives is low. The towns of cluster 5 (for example Szentendre, Zalaegerszeg and Szolnok) cannot beconsidered by any means as settlements with central functions from the aspect of innovation features and higher education and research capacities. They concentrate 4 per cent of the urban population. Their specific feature is the well organised civil society on the one hand, and the high schooling indices and the good indices of knowledge-oriented leading professional positions for to the number of inhabitants, on the other. A separate cluster (6) is made up by the three middle towns with smaller population, oriented mainly for higher education (Gyöngyös, Keszthely and Gödöllő). Their development indices measuring the background factors of renewal are good, but the development indices show a large-scale dissonance. Although the presence of higher education and the proportion of the share of the adequate local human resources are outstandingly high, the number of local innovative actions is only around the average. The complexity of the institutional system of innovation is also much more moderate than in the previous clusters.

Two settlements, two new organising centres of the agglomeration ring around the capital city are Budaörs and Budakeszi, not fitting into the classification at all (cluster 12). Their common feature is their excellent economic and labour market conditions, good innovation potential and moderate human (higher education and R & D) parameters. As regards the economic and schooling data and the indices measuring the presence of the developed knowledge-based and qualification-oriented positions on the local labour market, Budaörs and Budakeszi are far above the level of the other small and medium sized towns.

The set of towns in the second line from the aspect of renewal capacity involves 43 settlements scattered all over Hungary, making two clusters. Their total population is 960 thousand inhabitants, which means that they are home to one-fifth of the non-Budapest urban population of Hungary. The members of cluster 7 typically show a moderate level of development in all indices of categorisation, and the human and innovative capacities are somewhat above the average values. The former and present industrial centres, most of the ex-socialist towns and the county seats in less favoured position can be grouped here. They were prone to significant transformation, restructuring impacts, which carries the possibilities of a dual development, depending on their reactions. Cluster 8 is the collective group of holiday resorts, settlements built on the tourism potential, micro-regional centres, and newly created industrial centres. These towns have favourable economic and labour market opportunities. Within the employees, the proportion of professionals, of intellectuals in leading positions exceeds the urban average. On the other hand, they do not feature above-average indices in the human and institutional segment, extremely important

for the innovative capacity. Although their economic parameters are above those in cluster 7, they lag behind in the factors related to innovation.

More than 180 towns of Hungary – with a total population over two million – would make a single cluster in a simple case, whose basic feature is underdevelopment. The separation of the following three groups could actually be explained by the grades of backwardness. In these groups it is not the human elements, not the heterogeneity of the institutional system of innovation and not even the presence of the different levels of higher education that differentiates. Their lagging in the promotion and support of innovation, the renewal of the local economy and society is universally serious. On the other hand, the economic potential, the level of schooling, the viability of the civil society and the complexity of local publicity definitely disintegrates this large block into three groups at different levels of development. The members of cluster 9 have average economic and social indices, unfavourable innovation potentials and a lack of adequate human resources. In cluster 10 the unfavourable innovation, higher education and R & D endowments are accompanied by moderately developed economic and social characteristics. The last group, cluster 11 features the least favoured towns of the Hungarian urban network, with universally bad development indices and a total lack of innovative capacity: they are the marginal towns.

If we look at the economy, social life and the structure of the labour market, the 251 towns of Hungary can be put into two blocks of more or less the same size: the share of the towns with below-average and above-average parameters is more or less the same. On the other hand, the two main components playing a significant role in the innovation potential, one measuring the human resources–higher education–research sector and the innovative environment, and the other one mapping the actual results, show a much more homogeneous picture. This highlights the fact that the majority of the towns show a significant lagging behind the "innovation elite". As regards human resources, 78 per cent of the Hungarian towns are below the aggregate average of the towns, in connection with innovation 76% of them are below that.

As the hierarchy of the clusters more or less followed the differences in the development level, it was also suitable for grabbing the "macro-structure" or the urban innovation potential. The data of the distribution show that in 75% of the 251 towns we cannot see good endowments in any component of the innovation configurations. Towns belonging to clusters 9–11 do not possess the economic, social, education and research capacities founding the local renewal processes, or the functions built on these capacities. We have another large block (clusters 7 and 8). These two groups can be called the "second line", as they already have average or slightly above-average parameters. In 17 per cent of the towns we can see several foundations of the further development, as regards the institutional system and the human elements. Really advanced, already marked innovation potential and the

closely related economic–schooling–social parameters can only be found in a very narrow "minority" of the Hungarian towns. If we analyse Hungary with the factors that we compiled and applied, we can say that not more than 8% of the towns of Hungary can be said to have mature innovation potential.

In the knowledge-based division of the urban network in Hungary the size plays a dominant role. In most of the Hungarian towns with less than forty thousand inhabitants the background conditions that could create an innovative environment for the economic and social actors of the region are missing. In the case of small and medium sized towns, the geographical differences are big. In North Hungary and the two regions of the Great Hungarian Plain a few big towns of outstanding "performance" are accompanied by a backward, relatively underdeveloped urban network. The elements of development are concentrated in the big towns. In the other four regions, the "segregation of the settlements built on similarities" shows a more balanced distribution. In these regions there is a much larger set of towns that are around average or in slightly above-average position as regards the renewal capacity. In the northern and eastern parts of Hungary the biggest problem is not underdevelopment but the low number of towns that are able to catch up. In most cases those settlements have considerable renewal capacities that have had centuries of urban traditions (among the big cities of the Hungarian countryside, only one is "younger" than six hundred years) (*Csizmadia–Grosz–Rechnitzer*, 2004).

6 Trends and conclusions

We can say that human resources as a new dimension of economic and social development is a notion very complex in content, thus its analysis takes a complex, painstaking effort. In a regional approach this complexity is even more visible, as we compare regions of different characteristics where it does matter what development path they have gone through and during that what endowments they have accumulated. In the territorial units there are values or carriers of values all the time that, knowingly or not, contribute to the development of the quantity and even more the quality of the human resources. The way and extent of this contribution depends on several factors, such as the geographical location of the given territorial unit, its economic structure, the institutional system that it has created and its operators, the historical development of the settlement, the accumulated knowledge, the composition of the inhabitants, the image of the territorial unit, its development concepts and ideas, the political activity and many other elements. We cannot and must not analyse and assess the human resources of the spatial units on the basis of only a few factors. We have to strive for complexity, the mapping of the compli-

cated network of the factors and only when we have done that it is reasonable to draw conclusions and define development objectives.

Consequently, in addition to the survey of the simpler or more complicated correlations of the traditional evaluations of data in the regional analyses of human resources, it is necessary to apply sampling procedures, case studies and other methods of sociology. The complex methods allow the exploration of the more subtle correlations of the factors and the display of their synergies.

The few Hungarian analyses demonstrate that there is a strong stochastic, but not functional correlation between the regional structures of human resources and the economy in the decade of the transition. The regional economic structure as a whole has an impact on the territorial structure of human resources; it influences the spatial structure of human resources, but the more sophisticated, the more subtle picture we want to make of the situation, the larger number of factors we find, some of which are not dependant on the economic potential. We can state that the extensive indices of human resources (e.g. employment, level of training and schooling, certain measurable skills) are more closely related to the economic endowments of the spatial units. However, the other indices that can be called intensive (quality of life, social activity, culture) are determined not only by the economic conditions but also the inner resources (hidden energies) of the given spatial unit, having a significant impact thereby on the quality and also the regional division of human resources.

On the basis of this we can also register that the regional structures of human resources were stable in the nineties, they did not change considerably in the decade of the transition, no territorial restructuring took place in this respect.

No convergence took place among the regions, equalisation processes cannot be seen; to the opposite, disparities of new type emerged. The new knowledge and skills show a definite concentration in the capital city and to a lesser extent in the regional centres, and they filter down the lower levels of the settlement hierarchy slowly, so to say stealthily, many times accidentally. In addition to the capital city–countryside dichotomy, a west–east discrepancy can also be seen in the case of the human resources, i.e. the western, mostly border regions were more active in concentrating and expanding their capacities than the eastern, Great Plain regions of Hungary were. At the same time it is also clear that the traditional large centres of the eastern parts of Hungary are able to stabilise institutions representing the knowledge base, their output is of large volume, but in many cases they train human resources for the western parts of Hungary, due to the migration.

A similarly growing gap can be seen between the economic performance and the institutions determining the knowledge base, the latter were unable to integrate into the economy at the local level. Also, the importance of the position occupied in the settlement hierarchy is still valid, as the central or peripheral location influenced the existence and the activity level of the human resources. Besides the va-

lidity of this general conclusion of course there are several – maybe more and more – new/old constituents of development that do not necessarily follow the determined paths of development, slowly disintegrating and eroding this way the present regional structure.

The breakout points are described in the development concepts and programmes, both at regional and national level. The regions have recognised that without the comprehensive development of their human resources they will not be able to improve their conditions. The development of human resources appears in many ways, with different emphases and objectives in the future objectives and action plans. Maybe it would be possible to implement the objectives of the regions if they had more independence, more freedom in the assertion of the regional wills – and this could accelerate the decrease of the spatial disparities.

Among the recommendations we have to mention that the objectives defined in the regional development concepts, and the programmes based on these objectives should be given an opportunity for implementation, because the regional, bottom-up initiatives can be much more successful than a few actions launched at national level.

In those regions that have a high concentration of human resources, the related institutional system is mature and there is a demand by the economy for resources of high quality, the knowledge region programmes should be worked out. The objective of the knowledge region programmes is to strengthen and fill up with content the inner co-operations of the existing institutional network, handle the existing disparities at regional level, create new types of network connections and thereby activate an ever larger mass of stakeholders for regional development.

The renewal of the human resources takes a long time, it has a national policy level (population-, education-, social- and science policy) but the regional level is also important, where the establishment and integration of the institutional frameworks can be done. In addition, we must not neglect the local level where the quality and conditions of life and the foundation of the environment fostering innovation can be the goals. In other words, each level has their space of action and competence, but they can only have an impact together. The negligence of the regional and the local level, the lack of recognition and the inadequate support of these spatial levels will further deepen the territorial disparities, making the long-term and spatially even distribution of the human resources impossible.

References

ANSELIN, LUC – VARGA, ATTILA – ACS, ZOLTÁN 1997: Local Geographic Spillovers between University Research and High Technology Innovations. – *Journal of Urban Economics.* 42. pp. 422 – 448.

BAJMÓCY, PÉTER – KISS, JÁNOS 1999: Megyék, régiók és központjaik – modellek tükrében [Counties, Regions and their Centres by Mathematical Models]. – *Tér és Társadalom.* 1–2. pp. 31–51.

BENKO, GEORGES 1999: *Regionális tudomány* [Regional Science]. Pécs–Budapest, Dialog Campus Kiadó.

BŐHM, ANTAL 2000: A térségi identitás Magyarországon [Regional identity in Hungary]. In: GLATZ FERENC (ed.): *Területfejlesztés és közigazgatás-szervezés (Megye, régió, kistérség).* Budapest, MTA, 2000. pp. 111–126. (Magyarország az ezredfordulón. Stratégiai kutatások a Magyar Tudományos Akadémián. IV. A területfejlesztési program tudományos alapozása).

BRACZYK, HANS-JOACHIM – COOKE, PHILIP – HEIDENREICH, MARTIN (eds.) 1998: Regional Innovation Systems. The Role of Governances in a Globalized World. UCL Press, London.

CAMAGNI, ROBERTO 1991: Local "Milieu", uncertainty and Innovation Networks: Towards a New Dynamic Theory of Economic Space. In: CAMAGNI, ROBERTO (ed.): *Innovations Networks: Spatial Perspectives.* Belhaven, London–New York, pp. 121–144.

CSANÁDI, GÁBOR – CSIZMADY, ADRIENNE 2002: Szuburbanizáció és társadalom [Suburbanisation and Society]. – *Tér és Társadalom.* 3. pp. 27–55.

CSAPÓ, TAMÁS – KOCSIS, ZSOLT 1997: A várossá nyilvánítás elvi kérdései és a potenciális városok az Észak-Dunántúlon [Principal issues of the declaration of new towns, potential towns in Northwest Transdanubia]. – *Tér és Társadalom.* 1. pp. 183–197.

CZENE, ZSOLT 2002: A kulturális örökség területfejlesztési megközelítése [The Cultural Heritage in Regional Development Approach]. – *Tér és Társadalom.* 4. pp. 25–38.

RECHNITZER, JÁNOS – GROSZ, ANDRÁS – CSIZMADIA, ZOLTÁN 2003: A magyar városhálózat tagozódása az infokommunikációs infrastruktúra alapján az ezredfordulón [The Hungarian Urban Network's Structure Based on the Information and Communication Infrastructure at the Turn of the Millennium]. – *Tér és Társadalom.* 3. pp. 145–197.

DŐRY, TIBOR – RECHNITZER, JÁNOS 2000: Regionális innovációs stratégiák [Regional innovation strategies]. Budapest, Oktatási Minisztérium.

ENYEDI, GYÖRGY – HORVÁTH, GYULA (eds.) 2002: *Táj, település, régió* [Landscape, settlement, region]. Budapest, MTA Társadalomkutató Központ, Kossuth Kiadó. (Magyar tudománytár, 2.).

ENYEDI, GYÖRGY 1996: Regionális folyamatok Magyarországon az átmenet időszakában [Regional processes in Hungary in the time of the transition. Humans, settlements, regions]. Budapest, Hilscher Rezső Szociálpolitikai Egyesület. (Ember, település, régió).

ENYEDI, GYÖRGY 1997: A sikeres város [Key Issues for Prosperity of Cities]. – *Tér és Társadalom*. 4. pp. 1–7.

ESDP 1999: European Spatial Development Perspective. Towards Balanced and Sustainable.

Development of the Territory of the EU, Office for Official Publications of the European Communities, Luxembourg, European Community

FORRAY R., KATALIN – KOZMA, TAMÁS 1999: *Regionális folyamatok és a térségi oktatáspolitika* [Regional processes and regional educational policy]. Educatio Füzetek. Budapest, Oktatási Központ.

FORRAY R., KATALIN – HÍVES, TAMÁS 2002: Jelentkezés a felsőoktatásba, 2001 [Applying to Third Level Institutions, 2001]. – *Tér és Társadalom.* 1. pp. 99 – 134.

FÓTI, KLÁRA (ed.) 1999: Az emberi erőforrások jellemzői Magyarországon 1999 (Characteristics of the human resources in Hungary in 1999). Institute for World Economics of the Hungarian Academy of Sciences, Budapest

FÓTI, KLÁRA (ed.) 2003: A szegénység enyhítéséért – helyzetkép és javaslatok 2000 – 2002 (To ease poverty – present situation and suggestions 2000 – 2002). A Human Development Report, Hungary 2000 – 2002. Institute for World Economics of the Hungarian Academy of Sciences – United Nations Development Programme

HAGERSTRAND, T. [1952]: The Propagation of Innovation Waves. Lund Studies in Geography, 4. Gleerup, Lund.

HALÁSZ, GÁBOR – LANNERT, JUDIT (ed.) 2000: Jelentés a magyar közoktatásról (Report on the Hungarian public education). National Institute for Public Education, Budapest

HARDI, TAMÁS [2002]: Szuburbanizációs jelenségek Győr környékén (Suburbanisation Effects in the Surroundings of Győr). Tér és Társadalom, No. 3. pp. 57 – 85. p. 82

HARDI, TAMÁS – RECHNITZER, JÁNOS (eds.) 2003: *A Széchenyi István Egyetem hatása a régió fejlődésére* [The impact of the Széchenyi István University on regional development]. Győr, Széchenyi István Egyetem Gazdaság- és Társadalomtudományi Intézet. (Tudományos füzetek, 5).

HORVÁTH, GYULA 1998: *Európai regionális politika* [European regional policy]. Budapest–Pécs, Dialóg Campus Kiadó.

Jelentés a területi folyamatok alakulásáról, a területfejlesztési politika érvényesüléséről, és az Országos Területfejlesztési Koncepció végrehajtásáról, Budapest, VÁTI Kht. 2001.

KANALAS, IMRE 2000: Az információs-kommunikációs technikák terjedésének regionális különbségei Magyarországon [Regional Disparities in the Spreading of Information – Communication Technologies in Hungary]. – *Tér és Társadalom.* 2–3. pp. 159–172.

KARA, PÁL 1998: Várossá válások az önkormányzati rendszerben (Awards of town rank in the local governmental system). Gazdaság és Gazdálkodás, April, pp. 265–267.

KOLBOLKA, ISTVÁN 2000: Schengen határai biztonságpolitikai – kiemelten migrációs szempontból nézve [The Borders of Schengen from the Point of View of a Security and Migration Policy]. – *Tér és Társadalom.* 2–3. pp. 265 – 273.

KOVÁCS, TERÉZ 2000: Migrációs folyamatok Magyarországon a rendszerváltozás után [Migration processes in Hungary after the systemic change]. In: HORVÁTH, GYULA – RECHNITZER, JÁNOS (eds.): *Magyarország területi szerkezete és folyamatai az ezredfordulón.* Pécs, MTA Regionális Kutatások Központja. pp. 431–442.

KRUGMAN, PAUL 2003: *Földrajz és kereskedelem* [Geography and trade]. Budapest, Nemzeti Tankönyvkiadó.

K+F funkciók és menedzsmentfunkciók megjelenése a hazai nagyvállalatoknál a gazdasági térszerkezet szempontjából. A gazdasági térszerkezet vizsgálatát elősegítő új dimenziók, illetve az ezzel kapcsolatos módszerek kutatása [The appearance of R & D functions

and management functions at the Hungarian large businesses from the aspect of regional economic structure. Research on the new dimensions promoting the survey of the economic spatial structure and the applicable methods. Bulletins of the West Transdanubian Research Institute, 152/d, 2003. Topic leader: LADOS, MIHÁLY. Pécs, MTA Regionális Kutatások Központja. (Manuscript).

L. RÉDEI, MÁRIA 2001: *Demográfia* [Demography]. Budapest, ELTE Eötvös Kiadó.

MALECKI, EDWARD J. – OINAS, PAIVI 1999: Spatial Innovation Systems. In: MALECKI, EDWARD J. – OINAS, PAIVI (eds.): *Making Connections. Technological Learning and Economic Change.* Ashgate, Aldershot, pp. 7–33.

MATOLCSY, GYÖRGY (ed.) [2000]: A tudástársadalom kiépítésének forrásai Magyarországon a térszerkezetben és a szellemi vagyon növekedésének tényezőiben (Sources of the establishment of knowledge society in Hungary in the spatial structure and in the factors of intellectual property growth). Ministry of Education, Budapest

MEUSBURGER, PETER 1998: Bildungsgeographie. Wissen und Ausbildung in raumlichen Dimension. Spektrum Akademischer Verlag, Heidelberg – Berlin.

NÁRAI, MÁRTA 2000: Nonprofit szervezetek a kilencvenes évek Magyarországán [Non-for-profit organisations in Hungary in the 1990s]. In: HORVÁTH, GYULA – RECHNITZER, JÁNOS (eds.): *Magyarország területi szerkezete és folyamatai az ezredfordulón.* Pécs, MTA Regionális Kutatások Központja. pp. 443 – 465.

NÁRAI, MÁRTA 2002: *A civil szerveződések szerepe a helyi társadalom életében – civil háló a Nyugat-dunántúli régióban* [The role of civil organisations in the life of the local society – a network o civil organisations in West Transdanubia. Pécs, MTA Regionális Kutatások Központja. (Manuscript).

NEMES NAGY, JÓZSEF – JAKOBI, ÁKOS 2003: *A humán fejlettségi index (HDI) megyék közötti differenciáltsága 1999-ben* [Differences of the Human Development Index (HDI) across the Hungarian counties in 1999]. Budapest, Eötvös Loránd Tudományegyetem. (Manuscript).

EC [2004] A new partnership for cohesion. Convergence, competitiveness, cooperation. Thirdreport on economic and social cohesion. European Commission, EUR-OP, Brussels.

NORTH, DOUGLASS C. 1955: Location Theory and Regional Economic Growth. – *The Journal of Political Economy*. 63. pp. 243–258.

NYITRAI, FERENCNÉ 2001: *A humán és a gazdasági fejlődés. Nemzetközi összehasonlítás* [Human development and economic development. An international comparison] Budapest, Központi Statisztikai Hivatal.

OECD [1996]: The Knowledge-Based Economy. OECD, Paris.

OLÁH, MIKLÓS 2000: Adalékok a regionális identitás megrajzolásához [Contributions to the mapping of regional identity]. In: GLATZ, FERENC (ed.): *Területfejlesztés és közigazgatás-szervezés. (Megye, régió, kistérség.)* Budapest, Magyar Tudományos Akadémia. pp. 143–182.

PÁLNÉ KOVÁCS, ILONA 2000: Régiók Magyarországa: utópia vagy ultimátum? [Hungary of the regions: a utopia or an ultimatum?] In: HORVÁTH GYULA – RECHNITZER JÁNOS (eds): *Magyarország területi szerkezete és folyamatai az ezredfordulón.* Pécs, MTA Regionális Kutatások Központja.

RECHNITZER, JÁNOS 1993: Szétszakadás vagy felzárkózás. A térszerkezet alakító innovációk [Disintegration or catching up. Innovations shaping the spatial structure]. Győr, MTA Regionális Kutatások Központja.

RECHNITZER, JÁNOS [1998]: A nonprofit szervezetek területi szerkezete (Spatial structiure of the non-for-profit organisations). In: KURTÁN, SÁNDOR – SÁNDOR, PÉTER – VASS, LÁSZLÓ (eds.): *Magyarország évtizedkönyve, 1988–1998.* Budapest, Demokrácia Kutatások Magyar Központja Alapítvány. pp. 539–554.

RECHNITZER, JÁNOS 2002: A városhálózat az átmenetben, a kilencvenes évek változásai [The Hungarian Urban System in the Transition, Changing Direction in the 90s]. – *Tér és Társadalom*. 3. pp. 165–184.

RECHNITZER, JÁNOS – CSIZMADIA, ZOLTÁN – GROSZ, ANDRÁS 2004: A magyar városhálózat tudásalapú megújító képessége az ezredfordulón [The Knowledge Based Renewing Capability of the Hungarian Urban Network at the Turn of the Millennium]. – *Tér és Társadalom.* 2. pp. 117–156.

RICHARDSON, HARRY W. 1969: Regional Economics: Location Theory. Urban Structure and Regional Change. New York, Weidenfeld and Nicolson.

ROMER, PAUL MICHAEL 1990: Endogenous Technological Change. – *Journal of Political Economy*. 5. pp. 71–102.

RÖSCH, ANDREAS 2000: Kreativ Milieux als Faktoren der Regionalentwicklung. – *Raumforschung und Raumordnung.* 58. pp. 161–172.

SCHEFF, JOSEF 1999: Lernende Regionen. Regionale Netzwerke als Antwort auf globale Herausforderungen. Linde, Vienna.

SIMMIE, JAMES 2003: Innovation and Urban Regions as National and International Nodes for the Transfer and Sharing of Knowledge. – *Regional Studies.* 6 –7. pp. 607–620.

STÖHR, WALTER B. 1987: A területfejlesztési stratégiák változó külső feltételei és az új koncepciói. – *Tér és Társadalom.* 1. pp. 96–113.

SZÖRÉNYINÉ KUKORELLI, IRÉN 2000: Régió-e a Nyugat-Dunántúl? [Is West Transdanubia a real region?] In: GLATZ, FERENC (ed.): Területfejlesztés és közigazgatásszervezés. (Megye, régió, kistérség.) Budapest, Magyar Tudományos Akadémia. pp. 209–230.

TIMÁR, JUDIT – VÁRADI, MONIKA MÁRIA 2000: A szuburbanizáció egyenlőtlen fejlődése az 1990-es évek Magyarországán [The uneven development of suburbanisation in Hungary in the 1990s]. In: HORVÁTH, GYULA – RECHNITZER, JÁNOS (eds.): Magyarország területi szerkezete és folyamatai az ezredfordulón. Pécs, MTA Regionális Kutatások Központja. pp.153–175.

TÓTH, JÓZSEF – TRÓCSÁNYI, ANDRÁS 1997: A magyarság kulturális földrajza (Cultural geography of the Hungarian nation). Pannónia Tankönyvek, Pécs

TÓTH JÓZSEF – TRÓCSÁNYI ANDRÁS 2002: *A magyarság kulturális földrajza II.* [Cultural geography of the Hungarian nation II]. Pécs, Pro Pannonia Kiadói Alapítvány (Pannónia Tankönyvek).

VÁMOS, DÓRA (ed.) 1992: *A szürkeállomány fehér foltjai. A szellemi potenciál térszerkezete Magyarországon* [White patches of the human resources. The spatial structure of intellectual potential in Hungary]. Budapest, Felsőoktatási Koordinációs Iroda.

VARGA, ATTILA 1998: *University Research and Regional Innovation: A Spatial Econometric Analysis of Academic Technology Transfers.* Kluwer Academic Publishers, Boston, Dordrecht, London.

The *Discussion Papers* series of the Centre for Regional Studies of the Hungarian Academy of Sciences was launched in 1986 to publish summaries of research findings on regional and urban development.

The series has 5 or 6 issues a year. It will be of interest to geographers, economists, sociologists, experts of law and political sciences, historians and everybody else who is, in one way or another, engaged in the research of spatial aspects of socio-economic development and planning.

The series is published by the Centre for Regional Studies.

Individual copies are available on request at the Centre.

Postal address

Centre for Regional Studies of the Hungarian Academy of Sciences
P.O. Box 199, 7601 PÉCS, HUNGARY
Phone: (36–72) 523 800
Fax: (36–72) 523 803
www.dti.rkk.hu
www.rkk.hu

Director general

Gyula HORVÁTH

Editor

Zoltán GÁL
galz@.rkk.hu

Papers published in the Discussion Papers series

Discussion Papers /Specials

BENKŐNÉ LODNER, Dorottya (ed.) (1988): Environmental Control and Policy: Proceedings of the Hungarian–Polish Seminar in the Theoretical Problems of Environmental Control and Policy

OROSZ, Éva (ed.) (1988): Spatial Organisation and Regional Development Papers of the 6th Polish–Hungarian geographical Seminar

DURÓ, Annamária (ed.) (1993): Spatial Research and the Social–Political Changes: Papers of the 7th Polish–Hungarian Seminar

DURÓ, Annamária (ed.) (1999): Spatial Research in Support of the European Integration. Proceedings of the 11th Polish–Hungarian Geographical Seminar (Mátraháza, Hungary 17–22 September, 1998)

GÁL, Zoltán (ed.) (2001): Role of the Regions in the Enlarging European Union

HORVÁTH, Gyula (ed.) (2002): Regional Challenges of the Transition in Bulgaria and Hungary

KOVÁCS, András Donát (ed.) (2004): New Aspects of Regional Transformation and the Urban-Rural Relationship

BARANYI, Béla (ed.) (2005): Hungarian–Romanian and Hungarian–Ukrainian border regions as areas of co-operation along the external borders of Europe

Discussion Papers

No. 1 OROSZ, Éva (1986): Critical Issues in the Development of Hungarian Public Health with Special Regard to Spatial Differences

No. 2 ENYEDI, György – ZENTAI, Viola (1986): Environmental Policy in Hungary

No. 3 HAJDÚ, Zoltán (1987): Administrative Division and Administrative Geography in Hungary

No. 4 SIKOS T., Tamás (1987): Investigations of Social Infrastructure in Rural Settlements of Borsod County

No. 5 HORVÁTH, Gyula (1987): Development of the Regional Management of the Economy in East-Central Europe

No. 6 PÁLNÉ KOVÁCS, Ilona (1988): Chance of Local Independence in Hungary

No. 7 FARAGÓ, László – HRUBI, László (1988): Development Possibilities of Backward Areas in Hungary

No. 8 SZÖRÉNYINÉ KUKORELLI, Irén (1990): Role of the Accessibility in Development and Functioning of Settlements

No. 9 ENYEDI, György (1990): New Basis for Regional and Urban Policies in East-Central Europe

No. 10 RECHNITZER, János (1990): Regional Spread of Computer Technology in Hungary
No. 11 SIKOS T., Tamás (1992): Types of Social Infrastructure in Hungary (to be not published)
No. 12 HORVÁTH, Gyula – HRUBI, László (1992): Restructuring and Regional Policy in Hungary
No. 13 ERDŐSI, Ferenc (1992): Transportation Effects on Spatial Structure of Hungary
No. 14 PÁLNÉ KOVÁCS, Ilona (1992): The Basic Political and Structural Problems in the Workings of Local Governments in Hungary
No. 15 PFEIL, Edit (1992): Local Governments and System Change. The Case of a Regional Centre
No. 16 HORVÁTH, Gyula (1992): Culture and Urban Development (The Case of Pécs)
No. 17 HAJDÚ, Zoltán (1993): Settlement Network Development Policy in Hungary in the Period of State Socialism (1949–1985)
No. 18 KOVÁCS, Teréz (1993): Borderland Situation as It Is Seen by a Sociologist
No. 19 HRUBI, L. – KRAFTNÉ SOMOGYI, Gabriella (eds.) (1994): Small and medium-sized firms and the role of private industry in Hungary
No. 20 BENKŐNÉ Lodner, Dorottya (1995): The Legal-Administrative Questions of Environmental Protection in the Republic of Hungary
No. 21 ENYEDI, György (1998): Transformation in Central European Postsocialist Cities
No. 22 HAJDÚ, Zoltán (1998): Changes in the Politico-Geographical Position of Hungary in the 20th Century
No. 23 HORVÁTH, Gyula (1998): Regional and Cohesion Policy in Hungary
No. 24 BUDAY-SÁNTHA, Attila (1998): Sustainable Agricultural Development in the Region of the Lake Balaton
No. 25 LADOS, Mihály (1998): Future Perspective for Local Government Finance in Hungary
No. 26 NAGY, Erika (1999): Fall and Revival of City Centre Retailing: Planning an Urban Function in Leicester, Britain
No. 27 BELUSZKY, Pál (1999): The Hungarian Urban Network at the End of the Second Millennium
No. 28 RÁCZ, Lajos (1999): Climate History of Hungary Since the 16th Century: Past, Present and Future
No. 29 RAVE, Simone (1999): Regional Development in Hungary and Its Preparation for the Structural Funds
No. 30 BARTA, Györgyi (1999): Industrial Restructuring in the Budapest Agglomeration
No. 31 BARANYI, Béla–BALCSÓK, István–DANCS, László–MEZŐ, Barna (1999): Borderland Situation and Peripherality in the North-Eastern Part of the Great Hungarian Plain
No. 32 RECHNITZER, János (2000): The Features of the Transition of Hungary's Regional System