Post-Socialist New Towns in the Urban Network

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Introduction

The 1989 political transition significantly changed Hungary's spatial structure and settlement network, and brought a new type of structural differentiation. Based on this, the study of former socialist new towns is given special importance, as they form a special group within the urban network. Additionally, they were more strongly affected by the transition's negative effects. Handling their crises also required special resources which have not always been available.

The main purpose of this chapter is to identify the place of new towns in the urban network, to follow up on changes that occurred after the millennium and to find out whether new towns represent an identifiable, relatively homogeneous type. The analysis uses a wide range of "hard" socio-economic indicators but also emphasises the study of certain factors (such as industrial employment and attracting employees, and special demographic processes) which are key in the state and transformation of the towns we studied. It was important to compare processes in Hungarian socialist industrial towns with similar towns in Poland using basic socio-economic indicators.

The study has been realised within the confines of the research entitled "Social Polarisation in the Hungarian and Eastern-Central European 'New Town' Regions: Impacts of Transition and Globalisation" (K 106169), funded by the National Research, Development and Innovation Office.

Thus, the chapter attempts to present the position of former socialist industrial towns in the Hungarian urban network and to describe, through specific indicators, the employment structure of these towns and some specifics of their social structures. The internal structure of the group of industrial towns will be revealed by a hierarchical cluster analysis. Finally, some of those Polish towns will be examined that show a special picture similar to Hungarian "artificial towns".

The rankings of post-socialist towns

The ranking of former socialist new towns is analysed using unique variables categorised into five thematic principal components. The economic factors include attainable urban economic characteristics (employment rate, number of taxpayers, personal income tax rate, number of unincorporated enterprises, unemployment rate, inactive earners, business tax, number of self-employed entrepreneurs), the educational and management component describes the labour market (the percentage of intellectual leaders, people who attained higher education, white-collar workers, and service employees). Under social activity actions and institutions expressing the manifestations of local communities (participation in the votes, the number of and support for non-profit organisations, local public forums) were marked. The human resources principal component includes indicators related to higher education and institutions of higher qualifications (higher educational institutions, secondary schools); the variable group expressing innovation intends to make conclusions concerning renewal initiatives and institutions (innovation initiatives; patents and related categories, registered domain servers, companies working in the R&D&I sector, present innovative institutions), although this has not been analysed in detail in this chapter. Based on the defined five principal components, multivariable analyses were performed, assessing the role of each variable in shaping the structure then groups were formed among towns with related, identical elements in search of their characteristics and specificities.

Thus, the former socialist towns are illustrated in the following three sections within the context of the Hungarian urban network. First, their position in the key components (their ranking) based

on analyses for the years 2001 and 2011; the ten-year perspective of the changes in their positions is demonstrated in such a way. The other section,on the basis of the specific characteristics of the given town group in comparison to other cities, highlights how they differ from them and whether they show some significant features. Finally, it is demonstrated how the investigated towns can be grouped and with this the similarities and differences between the development pathways of the investigated towns is identified.

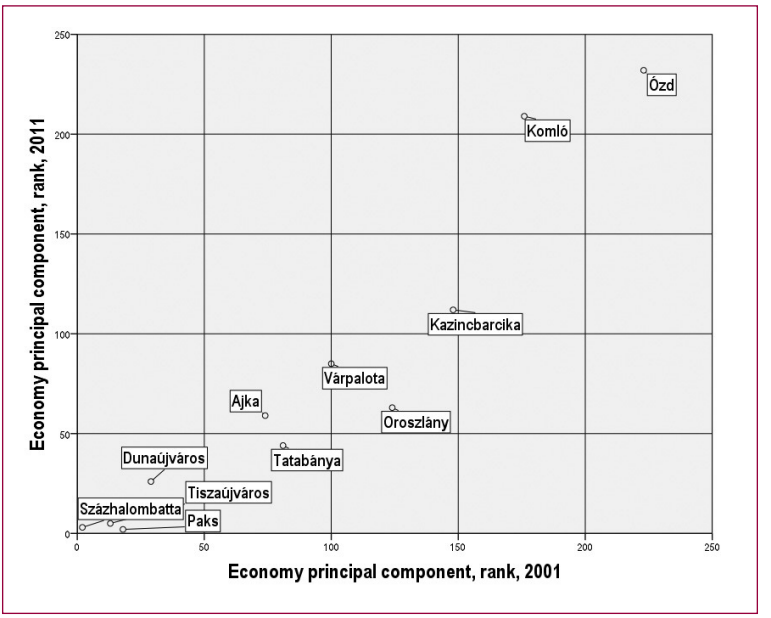
In 2001, 251 settlements of town rank could be examined; to ensure comparability, in the present study also a 251 towns based ranking was studied. The ranking was made on the basis of all the four dimensions, which well illustrates the changes having taken place in some towns or even the maintenance or the strengthening of positions.

Economy

The transformation of the economic structure of former socialist towns has essentially been completed by 2001, and the 2010s are seen as the years of stability. The economic indicators of Ózd – which is one of the biggest losers of the regime change – show a smaller decline but during the previous analysis it was also at the end of the town ranking sequence, its situation has not improved, the continually initiated restructuring attempts were unsuccessful. Similar trends can be reported for Komló, it was not able to stabilise its situation so it has slipped down to the bottom part of the town group ranking list.

Százhalombatta was able to maintain its strong industrial town character – thanks to basically its chemical, oil-processing industry – the town owns one of the distinguished leadership roles in the town ranking. Paks and Tiszaújváros significantly improved their positions; they are among the top ten towns in terms of economic indicators. The biggest leap is shown by Oroszlány and Tatabánya; in both towns the economic indicators were favourable in the decade after the millennium, this is probably due to their location and local development policies.

Figure 36: The positions of former socialist towns and their shifts in the ranking based on the economic principal component (2001; 2011)



Source: The author's own edition on the basis of the urban network database of Győr Automotive District research project

Education, labour market

Higher schooling and qualification played an important role in the restructuring of the urban network after the regime change *(Rechnitzer, 1993)*. The settling in companies primarily focused no longer on low-skilled labour force but rather on professionals, the ratio of manual workers decreased while the share of white collar workers increased.

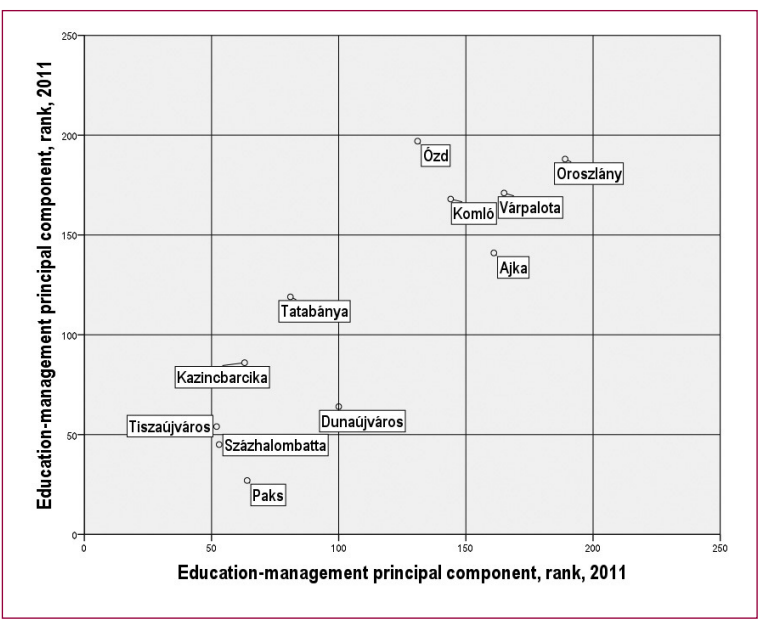
It was Ózd that produced the steepest fall in the ranking of education, sliding back by 68 places. In 1992, steel production ceased completely, the individual production units were trying to survive as an independent company – rather with less success and the durability of unemployment still cannot be eliminated. The situation of Tatabánya was different, its economy had been stabilised by the millennium, primarily due to foreign investments and the production and employment systems associated with them.

These organisations were hit hard by the 2008 crisis so the town's employment situation worsened between the two dates. It

should also be added that the educated, higher-income population does not live in the town, but rather in Tata and its region, they have moved out there, and these circumstances also played a role in its position changing in the ranking. The loss of the position of Kazincbarcika and Komló can also be explained by the crisis and the disruption of the economic structure. Várpalota's has also fallen back in rank. Tiszaújváros, however, sank only by two places lower, so it was able to maintain its relatively high level achieved in 2001, on the basis of employment and schooling indicators.

The biggest winners regarding educational indicators in the surveyed period are Dunaújváros and Paks. They show a spectacular improvement in the ranking, which can be explained partly by the high schooling demands of energy industry, as well as bythe medium-sized city's (city of county rank) widening institutional and servicing functions. Ajka, Százhalombatta and Oroszlány have also improved their situation to some extent, indicating that they were able to keep their skilled and highly trained labour force.

Figure 37: The positions of former socialist industrial towns and their shifts in the ranking based on the educational and management principal component (2001; 2011)



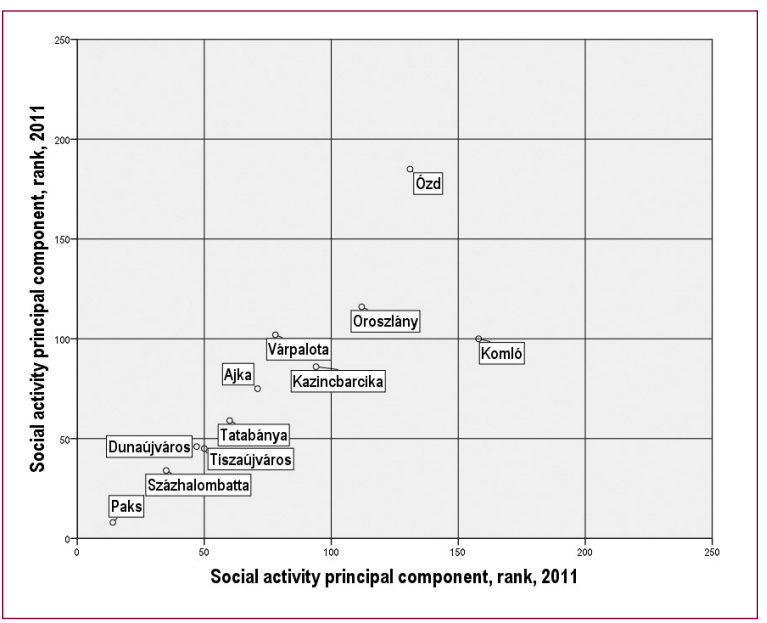
Source: The author's own edition on the basis of the urban network database of Győr Automotive District research project

Social activity and human resources

The positions of Ózd and Várpalota changed dramatically for the two dates. The principal component's indicators were strongly bound to incomes and to local community activity, which is probably moderate in both towns, although the reasons are certainly not identical –and these towns' character, location, history, development path – may all be different.

It is noteworthy that Komló with the negative economic indicators could improve its position by the indicators of social activity; the reasons for this require further analysis. We hypothetise that the higher participation on elections indicates a disciplined community; while the city's population declined it has better parameters in other indicators. Paks as an industrial small-medium town has already had a prominent position in these activities and could further improve it. Regarding this principal component no major shifts can be observed in case of other towns, which may indicate that there were no or only little changes in social activity, and its preconditions.

Figure 38: The positions of former socialist towns and their shifts in the ranking based on the social activity principal component (2001; 2011)



Source: The author's own edition on the basis of the urban network database of Győr Automotive District research project

For the majority of towns the data related to human resources show an overall decline as the set of variables usually includes data referring to higher education institutions. With the exception of Dunaújváros and Tatabánya, there are no colleges or universities or even affiliated colleges or university departments in the former socialist towns either. The improving position of Százhalombatta is primarily due to its location in the agglomeration of Budapest (this partly explains the changes of the previous period).

Changes in income and employment

The observed positions in the rankings prepared on the basis of complex indicators and their changes well illustrate the place of former socialist industrial cities in the urban network, and the fact that heterogeneity is more and more perceivable within the studied group,the different development paths on the basis of processes of the last decade have become more clear.

When seeking an answer to the question, what processes are going on in the background of changes, the changes of specific indicators must be examined, which themselves have significant explanatory value for economic development. On one hand, the decisive indicators of economic performance can be analysed, on the other hand, the indicators describing the structural changes.

In the latter case, one can get an answer to the question whether in the case of socialist towns that in the past decade maintained their position and made a relative progress how much role the successful process of industrial change has, and in addition, whether the investigated towns retained their industrial character both in their production and occupational structure.

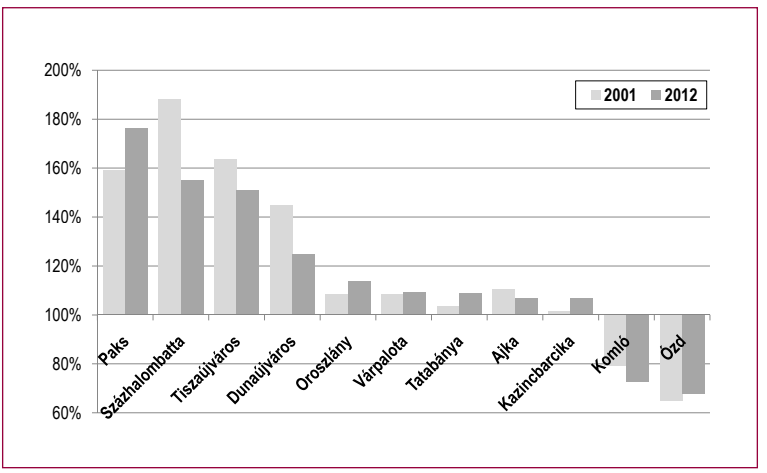
The changes in key indicators were overviewed in such a way that the values of the investigated towns were given in per cent, relative to average value of the 251 settlements of town rank for both dates. On the basis of this, both the relative positions and the shifts can be tracked accurately.

For examining the income level, the personal income tax base index was used. The values show that the studied towns occupy a relatively favourable position, in 2001, only three towns – Komló and Ózd – produced below average indicators.

Taking the changes of the last decade into account, some convergence can be experienced within the analysed group of towns,

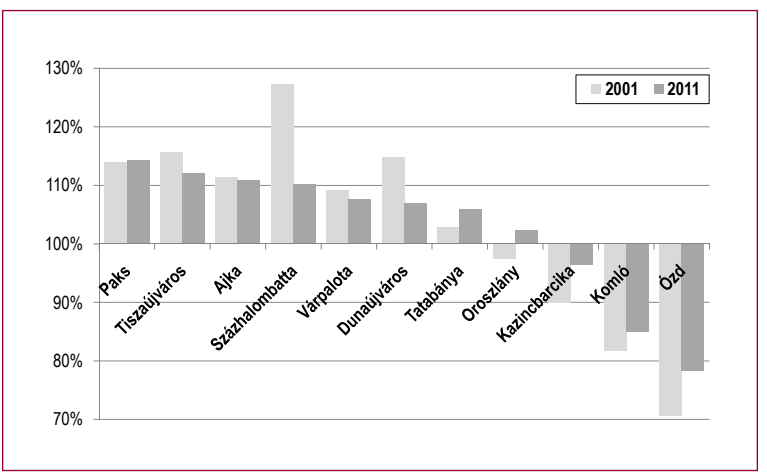
which is mainly due to the fact that out of the four towns with outstanding income indicators it is only Paks where an improving trend is seen; in Százhalombatta, Tiszaújváros and Dunaújváros a spectacular negative shift can be detected.

Figure 39: The relative value of the personal income tax base in the former socialist towns (2001; 2012)



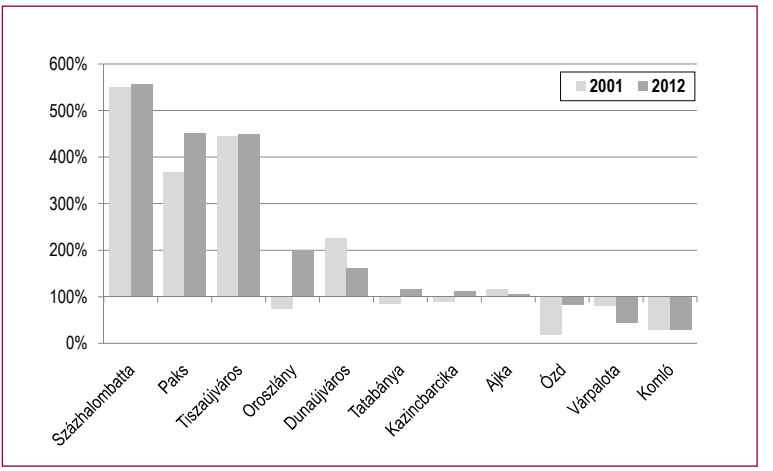
Source:The author's own edition based on the personal income tax database of National Tax and Customs Office

Figure 40: The relative level of employment in industrial towns (2001; 2011)



Source: The author's own edition on the basis of CSO Census (2001, 2011) data

Figure 41: The relative rate of business tax per capita in the former socialist towns (2001; 2012)



Source: The author's own edition on the basis of Hungarian State Treasury data.

Basically convergent processes can be observed in economic activity for the 2000s. A significant increase in the relative level of employment is seen in the towns occupying the worst position in this regard – Kazincbarcika, Ózd and Komló, while it is stagnating in the majority of settlements characterised by above average employment. In two towns being in a relatively favourable position compared to the average of the group – Dunaújváros and Százhalombatta – a sharp turn into a downward trend can be seen.

In terms of economic performance the relative size of business tax is a telling indicator. In this case, there is a considerable variance in the group of former socialist towns. Paks, Százhalombatta and Tiszaújváros primarily due to their large industrial plants are in the high elite of the entire urban network, further improving their relatively favourable positions gained over the past decade.The other extreme, the group of towns below the average index is represented by Ózd, Kazincbarcika and Várpalota; this latter town is characterised by favourable positions based on employment and income indicators. Far behind, they are followed by Komló which could not substantially improve its poor starting position by 2011. In terms of shifts the significant strengthening of Oroszlány is also remarkable.

Changes in employment structure

The transformation of the major economic sectors' employment conditions may be a key indicator of coping with the crisis resulting from the regime change. In the light of the data we attempt to highlight the distinctive processes that were characteristic of the studied new towns and which continue to take place today – but to a different intensity.

For all the towns studied it is true that within the total residential population the rate of employment between 1980 and 2001 declined steadily, and compared to the 2001 figures, the 2011 data show a slight improvement (although it should be noted that during the investigation of the entire new town network it has become clear that public employment plays a significant role in the improvement of employment level). In 1980 the employment rate was prominent in Paks, Százhalombatta and Tiszaújváros, the three municipalities, which served as locations for the "youngest" giant investment projects. None of the three towns have succeeded in reaching this ratio ever since. The 1990 data show a little variation between the towns, it can consistently be stated that the decline in the employment rate was dramatic even in the pre-transition decade. After the millennium as the transition process was slowing down, general trends, similar to the entire urban network, can be observed in industrial towns as well.

The employment figures in 2001 well reflect the difficulties of transition resulting from the regime change. The lowest employment potential can be observed in Ózd, Kazincbarcika and Komló which the latter three towns were able to surpass by 2011, but their positions remained the same.

The general trends of changes in employment structure right from the 1980s onwards show that the number of people employed in agricultural and industrial sectors started to decline, while in services it began to grow, but its extent varied differently during each of the periods; Between 1980 and 1990, this process was clearly more moderate than after the regime change. Differences are found not only in the intensity but also in how these proportions were changing between the investigated towns, and – keeping the number of elements of the previous survey – between the figures of employment in the different sectors of the 251 cities.

During the 1980s in the Hungarian cities (251) the relative majority of employees were working in the industrial sector (46.3%), but the representation of workers in the services area was already significant even at that time (41%). In contrast to this, 66% of the employees of the investigated towns were registered in the industrial sector and 30% in the service sector. The figures for the cities reversed after the transition, so the share of employment in the service sector reached an absolute majority. In the case of industrial towns this turn around took place after the millennium, but even then service sector workers were present in nearly the same proportion as workers in the industry. The 2011 Census data clearly show that industrial character is still strong in cities (44%), there was a much more modest than the national average (30%) decline in the share of employees in this sector. It is worth noting that the decline in the overall employment rate for the industrial cities is significantly higher than the urban average – even if a "compensation" process between 2001 and 2011 is taken into account – so in addition to a smaller reduction a significant narrowing of the base can be observed.

It would be worth examining the members of the group of industrial towns separately, that is to study what characteristic features the changes in the employment figures have within each sector.

The number of employees in each sector provided the basis for this by helping to define the employment structure for the surveyed cities (251) and for 11 industrial towns in certain years (1980, 1990, 2001, and 2011). The comparison of these records made it possible to calculate the deviation of the sectoral composition of employment for each industrial town from the mean value.

In 1980, the proportion of people employed in agriculture in Paks was similar to the national urban average, which means that compared to the average of the investigated 11 towns it was much higher (by nearly 10%). The reason for this may be that although the building of the nuclear power plant had already started in 1969 its first block was put into operation in 1982, thus at that time it did not increase significantly the share of employment in industry. Besides, it must not be forgotten that Paks has always been performing market town functions and due to this inherent nature agricultural workers will always be present here in a higher proportion. As it has been mentioned earlier, in the case of industrial cities workers in the agricultural sector were always present in

a lower proportion, in 1980 in Ózd, Kazincbarcika and Komló the presence of workers employed in the agricultural sector was by 10% less than the national urban average.

In the 1980s the industrial employment ratio was particularly high in Ózd and Tiszaújváros, exceeding the national urban average by 25%, and the group average by more than 5%. In contrast to this, although there were industrial workers in Tatabánya, Dunaújváros and Paks in an above the national average ratio, yet they were slightly below average in the group, and this trend has subsequently been further strengthened, and in the case of the former two towns service sector won spectacularly more space, as Dunaújváros and Tatabánya of all the municipalities studied are the two most populous ones and thus this fact itself influences the palette of services offered. Tatabánya is a county seat at the same time, the centre of a larger region in the case of non-market services, so its employment needs are higher for non-market services. However, it can also be stated that in 1980, the presence of the service sector was weaker in industrial cities than the national urban average.

In the early 1990s industrial employment is still in the leading proportion, which is much higher than the national urban average. Tatabánya is the only town, whicha little bit obscuring its mining town character, had to perform the administrative tasks of more and more public services, and parallel with this, the proportion of people employed in the service sector was increasing. To a lesser extent, but in Paks, the employment rate in the industrial sector was also lower than in the other industrial towns.

By 2001, these trends appeared to be strengthened, thus the importance of agriculture was more and more declining, while the service sector became more and more prominent. However, the effects of the radical change in the industrial sector had become measurable which in the case of Tatabánya still can be explained by performing the county seat, and the town of county rank functions but the data also suggest that the two biggest losers of the forced industrialisation are Ózd and Komló. In the case of Százhalombatta the share of employment in the industrial sector is well below the average of the 11 investigated towns, which is the first sign that it began serving the labour demands of Budapest by the relative shrinking of local employment capacities.

According to the latest (2011) data, it can be stated that the role of agriculture is less dominant, employment rate in the industrial

sector is higher and the importance of service sector is still lower than the national urban average. The comparison to the average of the surveyed towns showed that in Ózd the employment rate in the agricultural sector was close to the national average, and it is higher than the average of the industrial towns. This means that parallel with the shrinking of absolute employment all sectors, except the industrial one, have undergone changes, after the closure of the factory the administrative tasks remained, which can be seen from the data as well.

The same is true for Paks as has been explained just above. In Ajka, one of the town's largest employers has been closed down thus liquidating one of the pillars of the local industry but here the proportion of industrial workers is high within the circle of industrial towns, and the presence of service sector is weak. One even more spectacular example for that is Oroszlány, where industry has maintained its strength and still does not concentrate servicing functions. The same is true for Tiszaújváros, where industrial base has not declined much.

One of the aims of the research is to find the role of industrial towns in the urban network. To do this, industrial towns were examined to see which position they can take regarding the proportion of industrial employment in the total urban network of (251) cities. To highlight the changes the rates for the year 1990 were sorted as a first step.The 11 industrial towns fall into the 10% of municipalities which could register the highest rate of industrial employment this year. Tatabánya is the only exception to this rule, which is explained by the reasons described above. After the regime change there has been a greater variance in terms of rankings, but the investigated industrial towns are still in the "upper" quintile. In the light of the 2011 data it can be verified that Ózd is the biggest loser of the period, producing the 10th highest rate of industrial employment in 1990, but being on the 73rd position in the ranking in 2011. There was a similar level of fall-back in the case of Százhalombatta, which can be explained by the proximity of Budapest.

Employment potential

Beyond the structural characteristics of employment the economic development processes of the surveyed towns is very well illustrated by changes in the employment potential. In this con-

text, it was studied what changes has the figure[1] of local employees undergone, on the other hand, by using commuting data, it was also examined what features can be discovered regarding the role of labour catchment centre.

Looking at the number of local employees it can be generally stated that in the former socialist industrial towns the narrowing of the employment potential was significantly greater after the regime change than in other towns. In the year 2011 in comparison to 1980 a 38.3% rate of decline was experienced in industrial towns, while the aggregate index of other investigated towns was only 22.3%. For industrial towns producing the largest decline this ratio exceeds 50%, of them Várpalota (69.7%) and Komló (63.7%) stand out; these two cities with Ózd (58.7%) even on national level are at the end of the list, among the ten towns showing the worst tendency. Lower than the total urban average decline rate is seen only for Százhalombatta, Paks and Tiszaújváros; the last town is one of the rare exceptions where the number of employees in the municipality has slightly expanded during the last three decades.

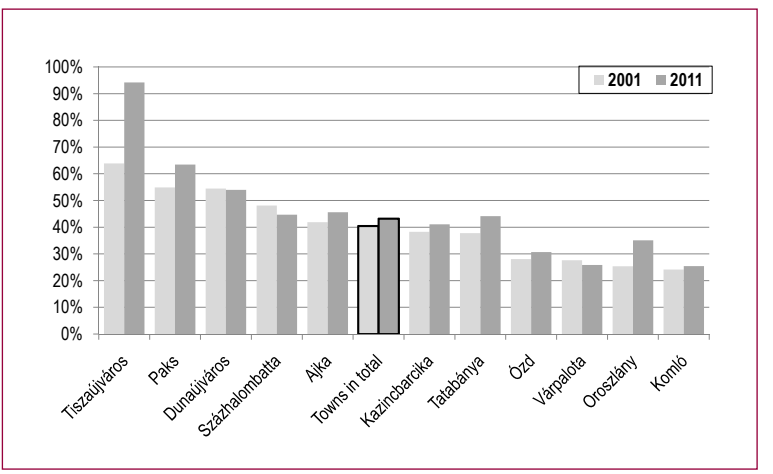
Analysing the processes in the period between 2001 and 2011, it can be said that the former socialist industrial towns overall have not taken a different from the whole urban network development path with typically slight growth in the number of local employees; the 5.1% growth rate may be considered to be somewhat more favourable in comparison with the other cities' corresponding indicator (4.4%). However, examining each of the towns individually, significant differences can be observed for the same period. The number of local employees dramatically increased in Tiszaújváros (44.1%) and in Oroszlány (30.8%); considering the entire urban network these rates are also outstanding. Tatabánya and Paks show a relatively favourable trend but there is a significant decline of around 10% in Dunaújváros and Várpalota.

The employment potential can even more spectacularly be demonstrated by a relative indicator comparing the number of local employees with the total population of the municipality. In this regard, Tiszaújváros shows the best image; the number of

[1] The number of local employees in this case is understood as all the employed staff in the locality (local residents, local workers, and inward commuters).

local employees in 2011 was nearly the same as the permanent population (94.2%); in comparison to year 2001, it is more than a 30% increase. In Paks that can also be characterised by high rates (63.4%), the progress has been much less, about 10%; the situation is similar for Oroszlány as well but here the rate numbers are much lower (35.1%). The local employment potential of the two towns with the weakest economic performance, Ózd (30.1%) and Komló (25.4%) on the basis of this indicator is considered to be very weak and even Várpalota (25.9%) can be in the same category with them.The rest of the towns in 2011, were located in the band of 40-55%. Looking at these data it can be stated that after the regime change the inclusion of the former socialist industrial towns by their employment potential into the urban network shows an increasingly heterogeneous picture, and this trend continued even after the millennium. After a temporary decline in the 1990s the towns that can be considered successful from this aspect (Tiszaújváros, Paks, Oroszlány and partly Tatabánya) were able to improve their position and the situation of some cities stabilised at a lower level after 2000 (Ajka, Dunaújváros, Kazincbarcika), and there are some towns (Komló, Ózd) where the "free fall" following the regime change did not stop even in the last decade. The transformation after the regime change is well demonstrated by the fact

Figure 42: Changes in the ratio of local employees within the total local population (2001; 2011)



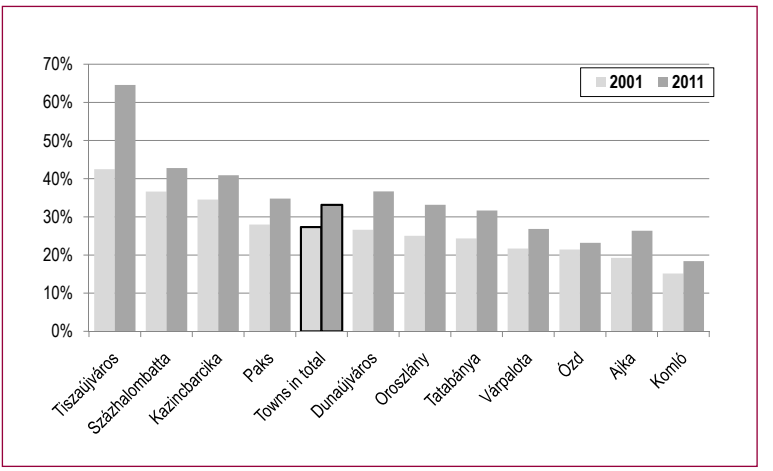
Source: The author's own edition on the basis of CSO Census (2001, 2011) data

that based on data from the year 1980, concerning the indices studied here, only two industrial towns (Ózd, Tatabánya) were not in the first third part of the city ranking, while by 2011 Kazincbarcika, Komló, Oroszlány and Várpalota also dropped out from there. A good illustration of the general decline is the average ranking order of socialist industrial towns – based on 251 cities – in 1970 it was 34, in 1980 48, while in 2011 it was only 92.

The specific features of commuting make the image of employment potential more diverse. In terms of national indicators, basically speaking, there was a decrease in the absolute number of commuters starting from the 1980s – which coupled with an increased downturn of employment still moderately increased the proportion of commuters – after the millennium this trend is reversed, additionally increasing the rate; as a result of this, by 2011 more than one third of employees in Hungary (34.5%) were commuters *(Kovács–Egedy–Szabó, 2015)*. The aggregate examination of the inward commuting ratio[2] among industrial town employees reveals that in the period between 2001 and 2011 in the former socialist industrial towns the pace of growth was faster than average, so they were a little bit ahead of the rest of the towns. While from 1980 until the turn of the millennium, there was no significant difference in inward commuting ratio between industrial cities and the rest of the towns, by 2011, the gap had visibly deepened; the inward commuting ratio in industrial towns was 36%, while in the rest of the towns the overall ratio was 32.9%. Examining the towns one by one, in all cases an upward trend is seen, the growth of inward commuting ratio only in three towns – Komló, Ózd, Várpalota – remained under the national urban average (6%), in other cases exceeded it. The indicator of Tiszaújváros is outstanding; its inward commuting ratio has increased to one and a half fold (from 42 to 65%), which means a 22% increase in absolute terms. The growth rate indicator of Dunaújváros (10%) and Oroszlány (8.1%) also significantly exceed the urban average. Regarding the ratio of inward commuters among local employees, in addition to the already mentioned Tiszaújváros (7th),

[2] Inward commuting ratio means the share of inward commuters in the total number of local employees.

Figure 43: The ratio of inward commuters among local employees (2001; 2011)



Source: The author's own edition on the basis of CSO Census (2001, 2011) data

Százhalombatta (53rd) and Kazincbarcika (62nd) take a relatively good position in the ranking of towns. In five towns – Ajka, Komló, Ózd, Tatabánya and Várpalota – the inward commuting ratio remained below the national urban average.

In case of outward commuting the dynamics was not similar between 2001 and 2011, the growth rate of the ratio is similar to that of other towns, and thus, the level in 2011 was the same, around 25% as well. The big break in this case was brought by the regime change; the typical for the socialist industrial towns, negligible outward commuting ratio[3] by 2001 caught up with the average of the other cities.The one by one examination of towns reveals greater heterogeneity than for the inward commuting ratio and the change tendencies cannot be considered as one-way processes. The positions of the three towns with the highest rate outward commuting rate figures in 2011 are radically different from each other in terms of employment potential characteristics. In the case of Százhalombatta that can be characterised by dynamic, positive economic indicators but shrinking relative local

[3] Outward commuting ratio means the share of outward commuters in the total number of local employees.

employment potential, the high outward commuting ratio (41.2%) is mainly due to its proximity and the labour force draining impact of Budapest; it is the capital city's suburbanisation processes that stand behind the positive net migration and population growth, thus, a substantial portion of newly arriving citizens has already got a job in Budapest. In Várpalota, the most affected town by outward commuting (50.9%) a continuing decline of local employment potential can be experienced, and the town's geographical location – the proximity of two relatively dynamic centres (Székesfehérvár, Veszprém) – provides favourable opportunities for absorbing the local labour surplus. About two-thirds of the town's outward commuters work on the two adjacent county seats. The fact that Pétfürdő, formerly belonging to the town, became independent in 1997 facilitated the narrowing of local employment potential and the increase of outward commuting ratio. It is important to note that the most drastic changes can be observed in the case of Várpalota; while Százhalombatta and Oroszlány had significantly higher than the industrial towns' average outward commuting ratio before the regime change, this indicator in Várpalota was among the lowest values on national level (in 1980, only 5.1%). The position of Oroszlány (37.4%) is special from the aspect, that its improving employment potential yet could not fully compensate for the negative trends of the 1990s, after the millennium, as a consequence of which by 2001 nearly half of the employees had become outward commuters. In any case, Oroszlány is the only former socialist industrial town – and it is among the 35 towns in Hungary – where from 2001 to 2011 outward commuting ratio was declining and the extent of this downfall (9.3%) is the second highest among the 251 cities studied. The geographical factors are partly responsible for the – already in pre-transition period – higher than the average degree of outward commuting. From the 1990s onward the proximity of Tatabánya provided increasing employment opportunities, although it should be noted that the only about a quarter of outward commuters work in the county seat.

The examination of the impacts of commuting balance on employment potential reveals that the former socialist industrial towns form a specific, more or less homogeneous group on the basis that the resources of the tendency, manifesting in somewhat more favourable than the overall average of towns employment

potential after the turn of the millennium, are less balanced. It can be seen that the vast majority of the supply of local employment expansion is provided by inward commuters from other settlements; among the towns showing an increase in the absolute number of local employees there are only two – Oroszlány and Tatabánya – where the number of resident local employees also increased between 2001 and 2011, the rest of the towns show a decrease in this aspect, which of course, is largely due to outward migration, strongly present among the active, especially young people. This one-sided increase may lead to the question having been formulated in the introductory part; how the carry over effects of "under-urbanisation" formulated in the context of delayed urban development prevail in the present. A more detailed assessment of employment potential beyond this will help to refine and also to explain the image, which shows the transformation of the former socialist industrial towns and the further differentiation of their development pathways.

The internal divisions of the post-socialist new towns

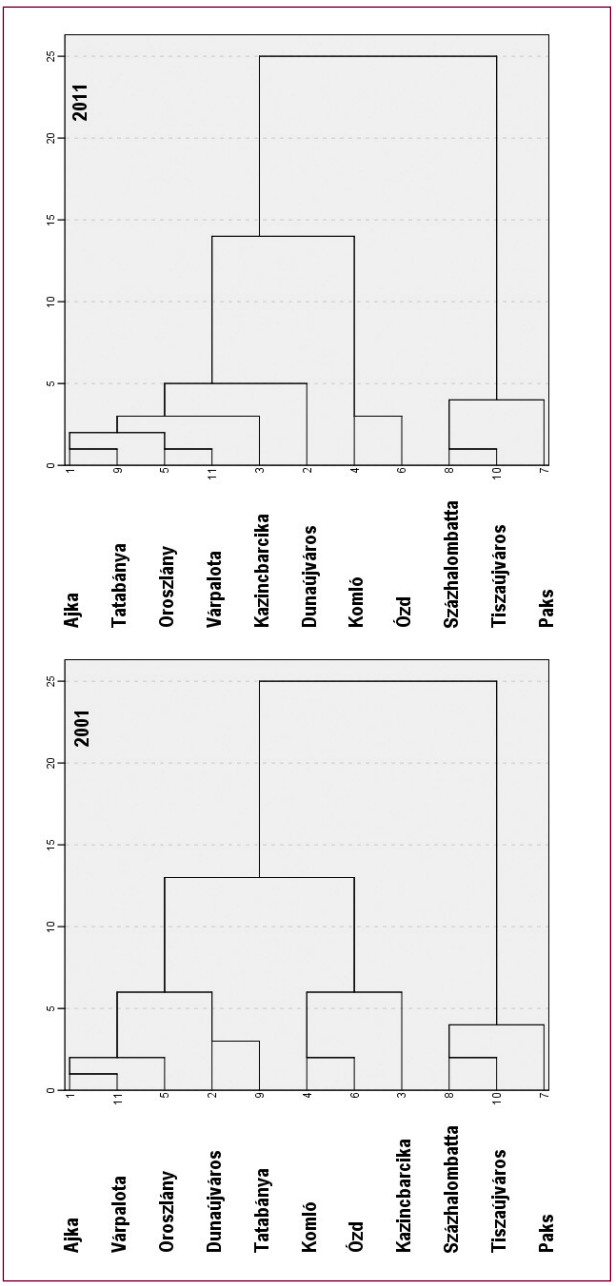
The internal stratification of the towns was examined by using hierarchical cluster analysis. Instead of the five main components originally developed only three were included in the analysis since the effects of human resources and of innovation indicators on the formation of groups are less relevant from the aspects of our analysis. The results of the cluster analysis for the two points of time reveal that the internal order of stratification is considered as stable, shifts and/or changes in the course of group formation are not typical. Based on the cluster structure three categories of cities are well outlined, the stratification may be interpreted as a kind of development hierarchy as well.

The first group consists of the three towns, which stand out from the group of former socialist towns mainly by their economic performance. For Paks and Tiszaújváros it is the presence of a large plants that bases the favourable position; for Százhalombatta positive conditions are ensured by being the only domestic crude oil processing base, the location in the proximity of Budapest, and being part of the capital city's agglomeration zone.

The second cluster is made up of towns where the negative trends in the nineties stopped or reversed in the past decade. Ajka, Várpalota and Oroszlány in economic terms show an improvement compared to the millennium, and there are no negative trends in the skills and occupational structure indicators. However, the indicators of social activity moved adversely in this town group. Interestingly, these indicators generally do not have a negative impact on the former socialist towns; in fact, with the exception of Ózd these towns have improved their positions to some extent. Tatabánya, the fourth city belonging to this cluster, indicates changes in the last ten years because as long as its indicators for the year 2001 showed similar values with those of Dunaújváros – so to speak they were twin-towns – according to the clustering for year 2011 did not belong to either group. The county seat has significantly improved its economic positions, however, based on its labour skills, and occupational structure had an opposite career. Dunaújváros is a town with relatively favourable starting position, able to essentially improve its positions, so based on the 2011 classification it rather appears as a separate entity.

The third group is represented by Komló and Ózd, as the two towns with the worst indices showing the signs of complex crises and of further falling behind. Both the complex indicators of the changes of economic potential and the unique indicators having some demonstrational force for explaining economic performance, illustrate the unfavourable trends, and a more moderate pace of recognisable improving tendencies, registered at certain factors in the case of other towns. From the changes of indicators it can be deducted that the unfavourable trends are present in several dimensions, in a mutually reinforcing manner in these two towns. Based on the data for year 2001 Kazincbarcika showed similar to these two towns' features, but in that case, over the past decade the degree of falling behind and its complexity were not moving along with the indicators of Komló and Ózd; in the case of Kazincbarcika the trends were basically stagnating. As a result of this, the town cannot be classified clearly into the group of the weakest performance indicators. It has shown low investment attraction ability due to its primarily weaker than the average economic endowments, unfavourable geographical location, and other factors.

Figure 44: The hierarchical clustering structure of the former socialist towns on the basis of the investigated three principal components (2001; 2011)



Source: The author's own edition on the basis of the urban network database of Győr Automotive District research project

International background

As a complement to the analysis of domestic towns the examination of some key indicators provides an opportunity to place the processes described into a broader context by involving Polish industrial towns. Performing a multi-dimensional analysis based on complex indicators on a similar data structure was not possible as certain indicators are not available on municipal level in Poland, and some indicators even in our domestic study were based on individual data collection, which in this case cannot be carried out.

When selecting the range of surveyed towns, efforts were made to apply the same criteria determining the scope of the national socialist industrial towns. Based on these criteria, 11 Polish towns were selected whose formation, development was basically determined by industry and their town rank was obtained under the period of state socialism – the only exception of this is Żory, a town with centuries-old tradition, but its development as an industrial town mostly dates back to the period of socialism. It was also important that the selected Polish industrial towns in terms of production structures and sectoral determination should be in similar situation to that of the investigated domestic settlements, so among them centres of various industries can be found, including coal mining (Jastrzębie-Zdrój, Ruda Śląska, Piekary Śląskie), metallurgy and metal processing industry (Stalowa Wola, Świętochłowice accordingly, Żory), mechanical engineering (Tychy, Świdnik) and chemical industry (Kędzierzyn-Koźle, Police), as well as a town with a more diversified industry (Myszków). Similarly to some Hungarian towns, there are a few among the Polish ones as well of which industrial traditions reach back to the period before World War II – such as some cities in the Upper Silesia industrial region and Stalowa Wola, the metallurgical centre in the Central Industrial Area developed in the 1930s – but basically these cities were the same priority targets of socialist industrialisation as Ózd, Tatabánya and Várpalota in Hungary. Nowa Huta, perhaps the most spectacular symbol of the Polish socialist heavy industry investments had to be excluded from the analysis because it is not an independent settlement and a only very limited scope of statistical data is available about it. *Table 28* shows the basic features of the Polish towns involved in the analysis.

First, the demographic processes in the towns are compared, which allows to get a partial, indirect picture of the development paths of settlements. In the 1990s the rapid population decline of towns and among them especially of socialist industrial towns is a typical trend in the former socialist countries. This happened to a similar extent and pace in Poland as well *(Grossmann Haase–Rink–Steinführer, 2008; Stryjakiewicz–Ciesiolka–Jaroszewski, 2012)*. It can be seen from the demographic data of the surveyed cities, that the population decline continued even after the millennium, this process is slightly faster in the case of Hungarian cities (between 2000 and 2014 the population loss was 8% compared to the 5.8% loss value of Polish towns). Only the population of one town – Százhalombatta – increased in the period of the survey, and even in one Polish town – Świdnik – was the population decline rate below the average value of the given country's towns.

In order to more precisely determine the demographic conditions of the towns, an examination of the primary factors behind the population changes is needed. In terms of age structure today it can no longer be said in either country, that the age structure of

Table 28: The Polish industrial towns studied

Town	Year of town declaration	Population (2014)
Jastrzębie-Zdrój	1963	90 794
Kędzierzyn-Koźle	1950	62 840
Myszków	1950	32 499
Piekary Śląskie	1939	56 755
Police	1961	33 404
Ruda Śląska	1959	140 669
Stalowa Wola	1945	63 291
Świdnik	1954	40 078
Świętochłowice	1947	51 494
Tychy	1951	128 621
Żory	1272	62 051

Source: Polish Statistical Office

industrial towns can be regarded as youthful and dynamic which was typical for the 1990s *(Szymanska, 1993);* today among the investigated towns only five were found (Ózd, Police, Százhalombatta, Tiszaújváros, Żory), where the ratio of younger age groups in the population surpassed the national average. The rearrangement of the age structure of course, determines the natural demographic processes as well; for both the Hungarian and Polish towns it is seen that the trends were unfavourable over the past decades but to varying degrees. Considering the whole territory of Poland the demographic processes of population are characterised by favourable indicators – an annual average of 0.2 per thousand natural population growth between 2002 and 2014, while in Hungary this indicator is -3.7 per thousand – and similar disparities are found in the case of the investigated towns as well.

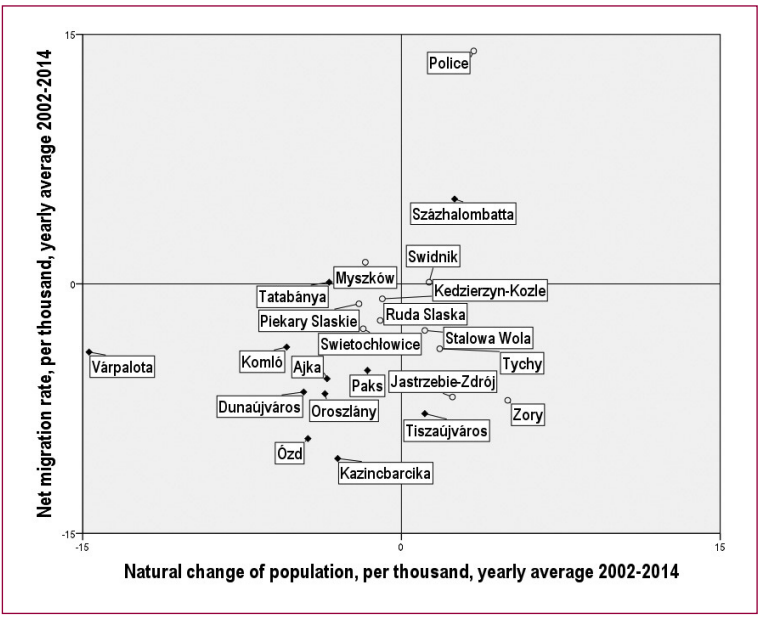
There is a natural population growth in six Polish towns in the indicated period, while in Hungary it can only be observed in two cases – Százhalombatta and Tiszaújváros. However, by taking the migratory movements into account, the differences are smaller between the Hungarian and Polish towns; in both cases, the constant exodus is a characteristic feature, with only a few exceptions, with sustained positive net migration. On the basis of these two indicators the demographic profile of the Hungarian and Polish industrial towns can be drawn, as shown in *Figure 45*.

It is clearly visible that in terms of demographic characteristics there is a perceptible difference between the towns of the two countries; while the exodus is considered a general, identical trend of both countries, the demographic indicators show differences between the towns of the two countries; in the majority of Polish towns natural increase has a certain compensation effect, which explains the lower the rate of population decline.

Comparing the employment rate[4] with the weight of industrial employment rate there is an opportunity to typify the restructuring processes which have taken place in the towns, both by their character and their relative success. Basically speaking, in terms of relative employment ratio the data of Polish cities contain substantially less favourable values, both for the year of 2001 and for the year of

[4] For reasons of comparability, the ratio of employees within the population aged 15 or more was used in the survey.

Figure 45: The demographic trends of the towns studied (2002-2014) (annual averages)



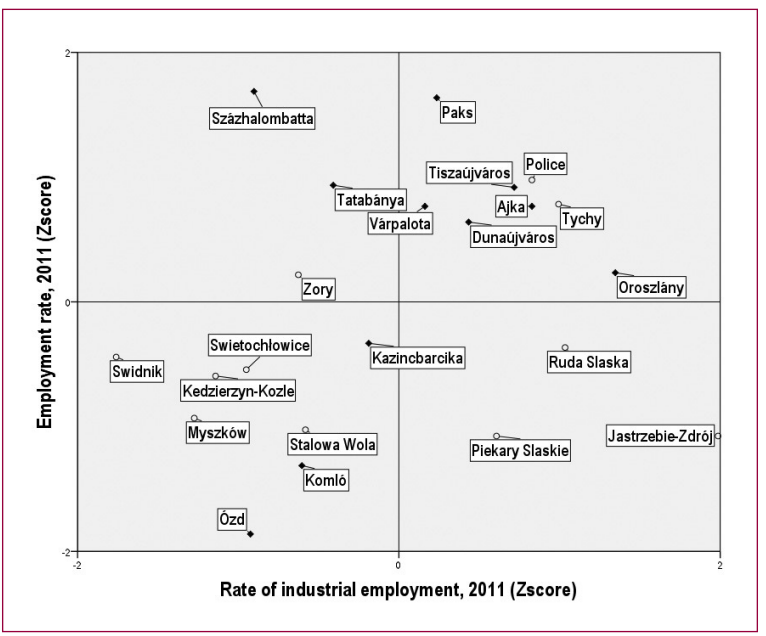
Source: The author's own edition on the basis of CSO T-STAR and Glówny Urzad Statystyczny – Local Data Bank data

2011. While in the majority of the Hungarian industrial towns in both years the rates are above the national average – the three exceptions in both cases are Komló, Kazincbarcika and Ózd – in the Polish towns only the indicators for Police exceed significantly the national average, and in 2011 Tychy was catching up to it. While in the case of the Hungarian towns there was some convergence in employment in 2011, in the Polish cities the deviations were relatively similar, the lagging cities did not improve their position significantly, but cities in a better position did not fall back either.

Looking at the relative proportion of employees in the industry, it is seen that in 2011, for both the Hungarian and the Polish towns the industrial employment rate was approximately one and a half times more than the national average. On this basis, industrial town characteristics can be clearly identified in both countries, but the tendencies of change compared to 2001 are going in the opposite direction. While in the Hungarian towns during the last 10 years an increase in the relative rate is observed in general – only in Százhalombatta can be seen a slight downward trend – i.e.

the decrease in the industrial employment rate does not really affected these towns, in the case of Polish cities there is a significant decrease – along constant national industrial employment rates – which suggests that in Poland the excessive concentration of the spatial structure of industry has eased during the recent period. In some cities – the mining and metallurgical centres of the Upper Silesian industrial zone and Police – the industrial employment rate remained above 50%, but in towns only slightly exceeding the national average already in the year 2001 – Myszków, Świdnik, Kędzierzyn-Koźle – there was a further decrease, a decade after the millennium these towns did no longer show primary industrial character in terms of employment.The comparison of employment rate with the industrial employment rate for the year 2011 is shown in *Figure 46*.

Figure 46: The position of the Polish and Hungarian industrial towns on the basis of employment rate and industrial employment rate (2011) (relative standard values)[5]



Source: The author's own edition on the basis of CSO T-STAR and Główny Urzad Statystyczny – Local Data Bank data.

[5] The scores show the values of standardised (0 average, unit variance) variables generated from the ratios compared to national average.

Comparing the indicators the types that can be linked to the differing development paths depending on the success and way of restructuring can be well defined. Basically towns with high employment rate can be regarded as successful. Among them renewing, restructuring towns are making up one group. Százhalombatta can be regarded as such a town; its employment diversification is primarily due to its favourable position and location in the Budapest agglomeration; the other is Tatabánya, where on one hand the transformation of traditional mining based production structure has partially taken place – primarily due to foreign capital investment – on the other hand, with the increase of its regional role, the tertiary sector has also strengthened.

The other group of successful towns consists of those where the preservation of good positions was secured in a way by the industry. Such towns, usually built on a big industrial plant, are the centres of more innovative, more competitive sectors of heavy industry. By this primarily the chemical industry is meant; the conditions of Tiszaújváros and Police meet these criteria. Paks, as another special example of an industrial plant-based town which can be characterised by positive trends, owes its favourable position to the energy industry. Those towns can also belong to this category where the structural change was not primarily going together with the diversification of the production structure but rather brought about a relative success in the utilisation of the existing industrial potentials. Tychy and partly Dunaújváros are towns of such a type. External factors have a greater impact on the disposition of Oroszlány, and Várpalota into this group. In terms of their locations, they belong to the primary labour catchment area of dynamic or dynamising centres (Székesfehérvár, Tatabánya), which played a major role in their recovery from the crisis parallel to the degradation of their industrial capacities before the millennium. This ambivalent situation is well reflected in the indicators of Várpalota, where the extremely low local employment potential generated large-scale migration and population restructuring but the indicators of economic activity and of living conditions do not signify definitely unfavourable situations.

One group of towns with low employment rate include those Polish mining and metallurgical centres where heavy industrial activity has been preserved, although to a more limited extent, and where the benefits of the town's favourable location can be

utilised in some form (the three towns are parts of the Upper Silesian conurbation).

The towns in the worst position are characterised by the downfall of industrial employment level with low labour force participation ratio. These towns are considered to be the biggest losers of the transition; the restructuring process was inhibited by mutually reinforcing negative factors. Not only their current situation is regarded as unfavourable, but generally it can be declared about them that over the past decade, instead of catching-up processes and consolidation they are increasingly characterised by further falling behind. For most of these towns beyond the regression of heavy industry or mining their far away location from dynamic regions is another very significant problem (Komló, Ózd, Stalowa Wola, Świdnik) so their opportunities to join the suppliers' networks and to attract new capital investments are rather limited.

The joint investigation of the situation of Polish and Hungarian industrial towns and of the recent more than a decade period suggests that the nature and the extent of transformational crisis and the successful and unsuccessful ways of restructuring show a similar picture for the two countries. In both countries industrial towns are forming a special group in the urban network which can be well characterised in some ways and which face similar problems, but their opportunities and the pathways they have taken over the past decade are very diverse.

Conclusions

One of the major goals of analysing socio-economic processes in the former socialist post-industrial towns after the millennium was to prepare a kind of register about those tendencies which serve as a basis for the surveyed towns to appear in a well-identifiable specific group. Furthermore, those tendencies were also investigated which serve as a basis for rather an inclusion into an urban network shaping under a new type of framework. To meet this end, in addition to providing an overall analysis of complex indicators the aim was to highlight more specific factor groups; those that in the past, had a distinctive character mainly in regard of occupational structure, employment potential, and social structure.

The analyses reveal a mixed picture;in some cases, common characteristics can be noticed, but in many aspects the dissolution of the specific nature, a kind of new fundaments based – successful or less successful – integration can be observed. The rapid transformation processes of the 1990s, turning into different directions, based on the ability of coping with complex crises and on the existence of its supporting resources, strongly determined the pathways of the investigated towns in the years following the millennium.

The primary factor of the differentiation of the former socialist industrial towns is the extent of the settlement's industrial character. Primarily the cities based on a big plant or on the innovative and advanced sectors of heavy industry – chemical, energy industry – can be regarded as places where the transition was in such a way successful that industrial production remained a dominant factor and the towns managed to more or less retain their positions. Another way of stabilisation based on industry; the renewal of the production structure can also be discovered to some extent – in the cases of Oroszlány and Tatabánya – but its possibilities are limited to areas that were the primary targets for foreign direct investment from the 1990s onwards. The falling behind of towns characterised by the preservation of their industrial character but also by the drastic narrowing of their potentials and capacities and by the lack of internal resources necessary for restructuring continued after the millennium.

Those towns can be considered as examples of successful transition in which to some extent a detachment from the circle of industrial towns can be observed, either through a significant shift in the production and employment structure (Százhalombatta) or making it more balanced (Tatabánya) in such a way that they are not considered as a forced process pushing towards a further lag.