

Spatial inequalities of disadvantage accumulation and their impact on employability in Hungary

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The aim of this study is to identify how the individual labour market disadvantages limited employment situation and regional employability of jobseekers in the 2007–2015 economic situation. The target groups of the study are long-term jobseekers, those over the age of 50 years, under-educated, disabled, and young entrants. The study follows a dual approach; on the one hand it presents labour market disadvantages in the group of the most disadvantaged jobseekers living in the disadvantaged areas of Hungary, and the types of interactions through which these contribute to the creation and fixation of unfavourable labour market situation of the affected; on the other hand, by analysing the country as a whole, it examines the spatial aspects of the accumulation of labour market disadvantages and the determining dimensions of the problem (multiple, dominant, and secondary disadvantages) in a territorial approach, on a settlement level. The results of the research dealing with the countrywide survey of unemployment show that individual disadvantages influence the opportunities of jobseekers through various mechanisms. These cumulative effects influence different segments of space in different ways and make the primary labour market (re)integration challenging.

Introduction

The 2008 global economic crisis led to a significant increase in unemployment in Hungary, which has made employment disadvantages one of the most serious

socio-economic challenges. With regard to the crisis sector, redundancies have particularly affected the disadvantaged, possibly less competitive people with basic and outdated secondary education. The jobseekers whose employability was hampered by the simultaneous presence of multiple disadvantages (multiplication) were in a particularly unfavourable situation. They form the target group of this study. Their situation is further undermined by the fact that their status has been historically embedded in many cases (long-term jobseekers, labour market hysteresis).

Some of the territorial labour market surveys of recent years point to the factors that significantly influence the development of unemployment in certain areas of Hungary (Siposné Nándori 2016). The other branch of geographic investigations was to define the local labour market catchment areas that could be interpreted as a possible dimension of functional urban areas, in which the authors sought to elicit the flexibility of the units and to cover the entire territory of Hungary, as well as detect temporal changes (Pénzes et al. 2015).

The issue of disadvantaged groups from the labour market perspective has been examined in a number of studies, drawing attention to the wide range of threats affecting jobseekers, mentioning the increased risk of slippage, poverty, and low educational attainment, and in this context, fixation in the jobseeker status (Jószai 1998, Kovács 1998, Csoba 1994). The studies also included entrants, women, low-skilled, people with large families, elderly people, people with reduced abilities, and minorities (Gere 1994, Frey–Gere 1992, Rimler 2004, Muity 2016, Fabula 2009, 2012, 2015, Balcsók 2000, Nemeskéri–Muity 2016, Benke 2006, Váradi 2004, Tésits–Székely 2007a, 2007b, 2007c, Koncz 2010, Ábrahám–Kertesi 1996) and the question of persistent jobseekers (Gere 1994, Laki 1996, Csaba 1999). Some of the works strongly referred to the tensions arising from the accumulation of disadvantages. István Balcsók and Gábor Koncz (2005) emphasise that in the case of the Roma people, the simultaneous presence of poverty and the unemployment trap are particularly present. Erika Nagy, Judit Timár, Gábor Nagy, and Gábor Velkey (2015) have pointed out that social marginalisation is closely related to the accumulation of spatial disadvantages. The deterioration of the position of rural areas also results in weakening the position of the people living there, a phenomenon which can ‘react’ to the decline of the regions as a catalyst, reproducing an unfavourable situation (Nagy et al. 2015). A question arises as to how the cumulative effects can be measured in certain territorial units in the dimension of the labour market disadvantages.

The spatial analysis of the accumulation of disadvantages is given territorial relevance by the fact that, although the greatest downturn in employment due to the crisis in 2008 occurred in manufacturing companies and supply chains concentrated in the northwest of the country, the recession was also tangible in the disadvantaged areas (Lócsei 2009a, 2009b, 2010, 2011). The embeddedness of the position of these

marginalised regions is a complex problem, to which Gábor Velkey (2014) also drew attention through the analysis of multiple dimensions. The problem is reinforced by the fact that the centres of the most disadvantaged areas of our country have a relative disadvantage in terms of their economic competitiveness (Vida 2016), and the weak employability of the free labour force of the examined region may play a role in the fixation of this position. The latter point may be related to the phenomenon of the accumulation of labour market disadvantages increasing the adverse effects of each other.

Although unemployment declined after 2010, the rate decreased to 4.4% in the fourth quarter of 2016 (based on data of the Hungarian Central Statistical Office [HCSO]), and in increasingly more sectors and regions the danger of labour shortage appeared. For a significant number of disadvantaged position jobseekers living in disadvantaged and underprivileged areas, public work programmes could offer job opportunities. The integration of this group into the primary labour market is still to be seen, which is reinforced by the experiences of the reintegration effect of public work programmes (O’Leary 1998, van Ours 2000, Kluve et al. 1999, Planas–Benus 2006, Hudomiet–Kézdi 2008, Csoba 2010a, 2010b, Tésits–Alpek 2014a, 2014b, 2015). This includes the fact that there is limited opportunity of integrating the most disadvantaged position jobseekers into the labour market, in addition to the mass and cumulative disadvantages.

Based on the experience of related work, it has become clear that unemployment is not a temporary problem, and there are strong obstacles for highly disadvantaged position jobseekers to find jobs in the primary labour market to which we have so far failed to find a reassuring solution. A determining part of the problem is formed of the cumulative occurrence of disadvantages in certain segments of space and – in particular, disadvantaged – groups of the society. This issue can become a decisive factor not only for the improvement of employment conditions and for the dynamisation of available human resources, but also for fixing of the problems of marginalised social groups. This work undertakes the analysis of the phenomenon through the settlement basis of our country.

The present study approaches the problem of accumulating disadvantages through the following issues. It outlines an approach on how it is possible to measure the accumulation of disadvantages in relation to individuals (relative disadvantage indicator) and territorial units (multiplication index). Using the elaborated procedure, it examines how the phenomenon of accumulation has prevailed nationwide in the period from 2007 to 2015. Further, it analyses that among the disadvantage accumulated jobseekers living in underprivileged areas, what are the factors that play a role in reducing employability. Finally, using the data of the HCSO, the study examines the extent to which disadvantage accumulation affects certain settlements in Hungary. It also examines the macro-level relationships of the cumulative spatial structure and the patterns of individual disadvantages.

Research methods

This analysis is based on both primary and secondary sources. Among the secondary resources, the online databases of the HCSO (<https://www.ksh.hu/?lang=en>), the settlement-level registers, labour market, and employment statistics are of utmost importance. The measurement of multiplication at the settlement level and the identification of the spatial structural elements were based on the HCSO data, among which, besides the number of registered jobseekers, the number of jobseekers registered over 180 days ago, long-term unemployed, disabled people¹, old people over 50 years, people with a primary school or lower level of education, and registered entrant jobseekers² were used.

The basis of the primary research, the analysis of the group-specific characteristics of the multiplication, was formed by a complex questionnaire survey that lasted for approximately one year (2016/2017). The target group of the questionnaire was formed from the most disadvantaged micro-regions (HCSO 2007) and from the jobseekers living in the districts to be developed by complex programmes based on the 290/2014 (XI. 26.) Government Decree. The target group of the questionnaire was provided by the highly disadvantaged jobseekers. As the scope of these jobseekers was not defined in the labour statistics, the target group was reached through multiple channels. On the one hand, the questionnaires were filled out by the beneficiaries of the Employment Substitution Grant, a group that met a good approximation of the criteria for the examination. The survey also included people who were formerly employed in public work programmes, but are currently in the jobseeker status. In several cases, the questionnaires were sent to the jobseekers by the staff of the local government. The cover letter and the supplementary telephone calls asked the local authorities to fill out the questionnaires and then return them. The survey was also supplemented by a personal field questionnaire survey, during which the offices assisted in finding the jobseekers. As a result of the survey for approximately 1 year, 579 people filled out the 56-question questionnaire.

¹ The study defines all jobseekers who are deemed by the *m*) point of Article 58 Paragraph 5 of the 1991 IV. Law of promoting employment and providing for the unemployed, as people with reduced working capabilities. According to this, 'a person with reduced working capability: who is physically or mentally disabled or whose employment and job retention chances are reduced due to physical or mental impairment following medical rehabilitation.'

² The present work considers all those jobseekers as entrants, who are labelled so by the *k*) point of Article 58 Paragraph 5 of the 1991 IV. Law of promoting employment and providing for the unemployed. According to this, an entrant jobseeker is a person 'who is under the age of 25 – in the case of a person with a higher education under 30 years of age –, who has the conditions required for the establishment of an employment relationship, and who is a jobseeker registered by the Public Employment Service, provided that he or she has not been entitled to an unemployment benefit after completing his or her studies. The person cannot be considered as an entrant jobseeker, who is receiving pregnancy and maternity benefit, infant and child care fees or childcare allowances, is in pre-trial detention, imprisonment, and detention or performing military service and civilian service.'

The multiplication index was developed to measure the accumulation of disadvantages on a territorial basis, which was determined on the basis of the following ratio:

$$\text{Multiplication index (M-index)} = \frac{\text{Merged number of people with disadvantages}}{\text{Number of registered jobseekers}} \quad (1)$$

The counter of the multiplication index is the sum of the number of people with examined disadvantages per category, and the denominator contains the total number of registered jobseekers (see Table 1).

Table 1

**Number of registered jobseekers in four Hungarian settlements
and their M-index, 2015**

Settlement	Number of registered jobseekers (person)						M-index
	registered over 180 days ago	having reduced working capabilities	older than 50 years	with primary or lower education	younger than 18 years (entrants)	Total	
Ipolyszög	26	1	14	33	13	55	87/55=1.5818
Sávoly	22	1	7	26	6	32	62/32=1.9375
Foktő	36	1	16	35	6	82	94/82=1.1463
Martonyi	18	1	4	15	1	24	39/24=1.6250

Note: Registered jobseekers may have more than one disadvantage.

Source: Own calculation based on HCSO data.

The multiplication index provides an answer, assuming an even distribution of disadvantages, what is the minimum number of disadvantages per registered jobseeker. If the value of the indicator increases, the tensions arising from the accumulation of disadvantages increase in the case of the given territorial entity. The index includes the following five disadvantages:

- jobseekers registered over 180 days ago;
- registered jobseekers with reduced working capabilities;
- registered jobseekers older than 50 years;
- registered jobseekers with primary or lower education;
- registered entrant jobseekers.

The maximum value of the multiplication index is 5, which occurs in the extreme case where each registered jobseeker – at the given territorial level – has all the examined disadvantages. The other extreme is 0. In this case, there is no person among the registered jobseekers with any of the five disadvantages listed above in the given territorial entity.

The relative disadvantage index (RDI) aims to determine the extent of the accumulation of disadvantages for each individual, calculated in the following manner:

$$\begin{aligned} \text{Relative disadvantage index (RDI)} &= \\ &= \frac{\text{Number of disadvantages that are characteristic of the given jobseeker}}{\text{Total number of examined disadvantages}}. \quad (2) \end{aligned}$$

The counter of the RDI indicates that among the examined labour market disadvantages at the time of the questionnaire survey, how many were characteristic of the given jobseeker, while the denominator was the number of disadvantages considered in the analysis. However, in the value of the denominator, only those disadvantages are taken into consideration that may occur simultaneously for the given jobseekers and the mutually exclusive ones are not considered. The present work is based on the questionnaire survey that assesses the following seven disadvantages:

- being over the age of 50 years (the jobseeker has reached the age of 50 years when filling out the questionnaire);
- young people (the jobseeker has not reached the age of 18 years when filling out the questionnaire);
- people with primary or lower qualifications;
- person with large family (being in a relationship or married and raising three or more children) or raising children alone;
- long-term (over 1 year) jobseekers;
- entrants;
- people with bad financial situation.

People with a bad financial situation are classified as individuals who, according to their own admission, typically spend their full monthly income by the end of the month, have a regular problem in paying the utility costs, and often have to postpone the settlement of their accounts. The maximum value of RDI is always 1 and this is when a jobseeker is affected by all the examined disadvantages – taking into account the disadvantages exclusive of each other, six are considered. Accordingly, the RDI takes up a value 1 in the case of those, for example, who are under the age of 18 years and have a maximum 8th grade elementary education, who are simultaneously people with large family or raising children alone, entrants, long-term jobseekers, and in a bad financial situation. The minimum value is 0 and arises in the case of those jobseekers who do not possess even one of the indexed disadvantages.

The study also calculates the dominant and secondary nature of disadvantages. The disadvantage is dominant if most of the time, the number of registered jobseekers was annually the highest of the examined territorial entity during the period between 2007 and 2015. In the case of a secondary nature, the occurrence of the attribute is the second most common. If there were more disadvantages in the given year with the same number of jobseekers in the first and/or second place, a 'mixed' type was identified. The variability of the disadvantages measures what percentage of the examined years were the dominant or secondary disadvantages in the first and second places. In other words, if one of the disadvantages arose five times

in the first place in the investigated territorial entity, its variability was 55.6% (it was in the first place five times during the 9-year time horizon of the study).

The spatial framework of the study is used to reveal the group-specific relationships of the cumulative effects of disadvantages that were formed by the area of the questionnaire survey (the most disadvantaged micro-regions (HCSO 2007) and the districts to be developed by complex programmes based on the 290/2014. (XI. 26) Government Decree), to which the analysis refers to as a disadvantaged area. When analysing the territorial pattern of multiplication, the study covers the whole country. The work addresses the area of the districts developed by the complex programme, which is sometimes referred to as the most disadvantaged and/or peripheral area. By the control group, the study at all times means those settlements based on the 290/2014 (XI. 26) Government Decree that did not fall into areas to be developed by a complex programme.

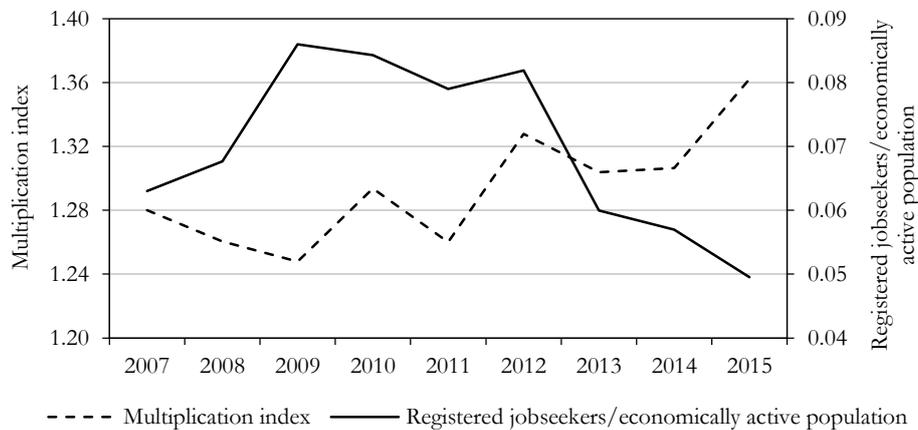
Results

National value of multiplication and its relation with unemployment

In 2008, the world economic crisis coincided with the decline in the multiplication index, which resulted in the lowest national value of the examined period in 2009.

Figure 1

Multiplication index and the number of registered jobseekers in proportion to the economically active population (aged 15–64)



Source: Own calculation based on HCSO data.

The reason for this was, among other things, that although employers typically prefer to reduce less productive and/or more easily replaceable labour force at first, during recession, those with more favourable labour market opportunities also lose their job at a higher rate (while also increasing their job-seeking time). Their share

within the entire group thereby rises, while in turn reducing the specific weight of those with a disadvantage. This is confirmed by the fact that in 2008–2009, besides a 36% increase in the number of registered jobseekers, the total number of examined disadvantages only increased by 32%.

The system of public work programmes changed in 2011 and 2012 – the National Public Work Programme was launched on 1 January 2011 and the Start Work Model Programmes began.

Public work programmes starting particularly from 2012, in addition to economic prosperity that significantly helped to reduce the number of long-term jobseekers as the organisers of the programmes and the aid system, also provided a strong motivation for the involvement of people who had long since wanted to find a job. Between 2012 and 2015, a decline in unemployment could be observed and this was primarily associated with a significant decline in the number of long-term jobseekers and low-school graduates. As the employment opportunities of jobseekers who were more favoured and less concerned by the accumulation of disadvantages improved, the value of the multiplication index continuously increased, indicating the increasingly limited employability of the still available human base.

By analysing the whole period (2007 to 2015), it is possible to set up the ranking of the disadvantages in terms of the dimension of growth/reduction to observe which group showed what type of exposure, based on which we can conclude the impact of the given disadvantage on employability. If, during the crisis, the number of a disadvantaged group increased significantly, however, at the time of economic prosperity, the decline was lower, we can assume that the employability of the concerned people was at a lower degree. This is particularly true in light of the fact that the number of jobseekers in the whole 2007–2015 period fell below the 2007 value by 2015, namely ‘correction’ took place in this respect. In light of these results, the most serious disadvantage of employability proved to be for those aged over 50 years. While in the case of the other disadvantages, the rate of decline in comparison to the local maximum of the group’s own size ranged from 40 to 60% by 2015, the improvement was only 23% among those over the age of 50 years.

Group-specific role of each disadvantage in multiplication

The following describes the extent to which as well as through what type of cause and effect relationships do the individual disadvantages result in the appearance of cumulative effects for the cumulatively disadvantaged jobseekers living in disadvantaged areas. The results of the questionnaire survey carried out among the most disadvantaged jobseekers living in disadvantaged regions showed that the highest level of occurrence for multiplication is in the case of those aged over 50 years (see Table 2).

This is partly related to the lower level of education, but it also goes beyond the fact that the competitive advantage of secondary school education for the re-

searched people significantly lagged behind as opposed to those aged 18–25 years. The obsolescence experienced in the professions in comparison to the young is a more serious problem for those aged 50 years. This is reinforced by the limitations of local job opportunities as well as the locally available lower incomes, which simultaneously increase the commuting constraint of the region's jobseekers. This is a serious challenge for jobseekers over the age of 50 years, partly because a change in residence can only help the mobility constraint to a limited degree, given that the property in disadvantaged villages cannot be or can only be converted to capital at a low value. Such constraints in the group of people over the age of 50 years – as opposed to the younger age groups – also occurred more strongly. The factors that can be associated with reduced working capability are the highest in this group, which on the one hand have biological causes and on the other hand, results in long-term unemployment being more general in their case.³ This means that they must endure the detrimental effects for a longer period.

Table 2

Relative disadvantage index of people with or without disadvantages, 2017

Disadvantage	Question in the survey questionnaire: 'Do you have any disadvantages listed below?'	
	Yes	No
	Significant relationship ($p < 0.05$)	
Registered jobseekers are		
older than 50 years	0.578	0.392
with primary or lower education	0.539	0.357
registered over 180 days ago	0.529	0.349
	Non-significant relationship	
younger than 18 years (entrants)	0.445	0.467
having reduced working capabilities	–	–

Source: Own calculation based on HCSO data.

Low educational attainment with increasing technical standard and expectations of employers makes finding a job less possible. Moreover, the increase in mechanisation displaces a part of the physical labour force. The perception of deteriorating primary labour market opportunities is shown by the fact that, at the time of the survey, respondents considered public work programmes to be a realistic alternative for employment, and they were recently active in this framework. Low educational attainment attracts a number of additional factors based on the experience of the study and reduces the mobility associated with the low degree of flexibility of the group – in respect of sector, working time, pay, and sphere – thus, its multiplication

³ Pearson's chi-squared test: $p = 0.000$ at two-sided 0.05 significance levels.

effects are strong. In addition, with a drop in the degree of education, there was less interest in acquiring new qualifications (69.5% of them were willing, while the same proportion in the control group was 78.0%). Those who would undertake acquisition of new skills and qualifications listed in the first place the entrance requirements for the courses, followed by their usefulness and eventually the costs as a limiting factor. In jobs requiring lower qualifications, the expected value of income is also more moderate; 96.0% of the respondents reported public work programme salaries and income around the minimum wage. 73.0% of the respondents considered their financial situation to be bad. In the case of downsizing, unfavourable income and financial situation may soon result in the cumulative appearance of disadvantages considering the fact that from only weak income there is a marginal possibility to form reserves. Alternative sources of income could provide a viable option, but only 10.4% of the respondents had this option.

In addition, the high multiplication value of long-term jobseekers is rather relieved by public work programmes and the phenomenon of labour shortage. The former's impact on disadvantaged areas is greater due to the regional centre of mass of the Start Work Programmes. Among the adverse effects of long-term job seeking, the weakening of labour socialisation and motivation, the disengagement of labour market expectations, and the unfavourable inherited patterns and work culture appeared strongly. In addition to these direct impacts, the interviewees also pointed out indirect factors, such as the development of addictions, the resulting health and financial problems, unemployment becoming a 'lifestyle', as well as settling solely for public work programmes.

The low proportion of disabled people in the sample did not allow the RDI average to be determined in a reliable manner. Thus, in the case of this group, the multiplication examination may be subject to subsequent analyses. In the case of entrants, the multiplication did not show a significant correlation in respect to the RDI.

Based on the above, it was found that among the examined disadvantages, those over 50 years of age finished in the first place, followed by low educational attainment and long-term job seeking, were those job-related disadvantages, which could justifiably make the jobseekers living in disadvantaged areas significantly vulnerable to cumulative effects, thus reducing their employability.

Territorial context of the accumulation of disadvantages

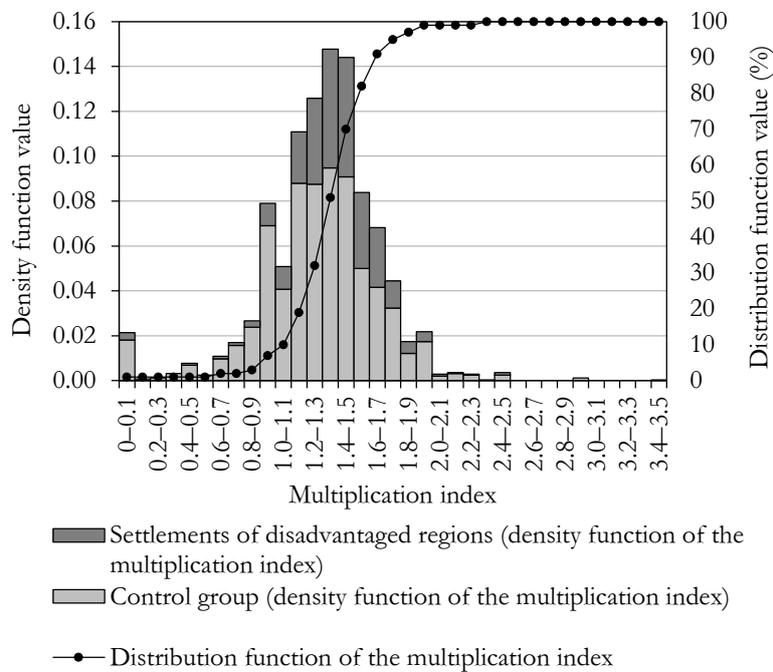
Based on the frequency distribution of the 2015 multiplication index of all the settlements, the spatial structure of the Hungarian labour market shows a spatially variable picture (see Figure 2).

This is also confirmed by the index values and cumulative frequency values calculated per settlement group (settlements in districts to be developed by complex programmes/control group). In all the examined years, among the settlements in

the districts to be developed by a complex programme, the indicator of the inclination was lower than in the control group (-0.8199 in 2007, -0.2297 in 2009, 0.9546 in 2015, compared to the -0.1449 , -0.0306 , and the -0.5905 values of villages and cities without complex classification). In other words, the values of the settlements in the area of the districts to be developed with a complex programme, the centre of mass for the distribution shifted less towards the low multiplication index ranges, the phenomenon of disadvantage accumulation is likely to be stronger here than in the control group.

Figure 2

Distribution and density functions of the multiplication index of Hungarian settlements, 2015



Source: Own calculation based on HCSO data.

In the case of cumulative frequencies, approximately a quarter of the control group's settlements in 2007 had a multiplication index of 1.0 or less, as opposed to the 5.9% of settlements from districts developed by a complex programme. Although the difference between the two groups of settlements decreased in the years under review to 14.0% in 2009 and to 10.2% in 2015, the settlements of the control group were still more than 17.0% in 2015, while only 7.0% of the most disadvantaged areas had a maximum value of 1.0. This is confirmed by the distribution curve shown in Figure 2, which shows the dispersion of the settlements in districts

to be developed with a complex programme in relation to the multiplication index. The curve reaches an intensive growth rate of approximately 10% and above in the range of 1.1–1.7 as opposed to the control group, where the slope of the distribution curve starts to increase dynamically at the 0.9 index value. The increased accumulation of disadvantages appears above a 1.0 value, and the 1.5 level implies serious tensions, indicating that half of the registered jobseekers have at least two disadvantages if the examined properties are distributed evenly. Therefore, the exposure of the most disadvantaged settlements eased during the examined period, but remained perceptible.

At the national level, with the improvement of the labour market situation, an increase in the proportion of settlements with a high multiplication index of at least 2.0 can be observed. Moreover, in the area of the control group, the proportion is approximately 1% higher (3.1%) than in the less favourable towns and cities from a labour market perspective in 2015. The increment is particularly noticeable given that the same index was only 0.4–1.0% in 2007 and 0.4–0.6% in 2009 in both the areas. This also points to the reduction in the amount of human resource that can still be rationally employed. The reason for this among others is that, in conjunction with the increase in primary labour market demand and the shortage of labour in the individual sectors, employers are increasingly absorbing available jobseekers, which within the group – assuming rational employers – is thereby the principle for the proportion of less-disadvantaged people to decrease, thus increasing the multiplication.

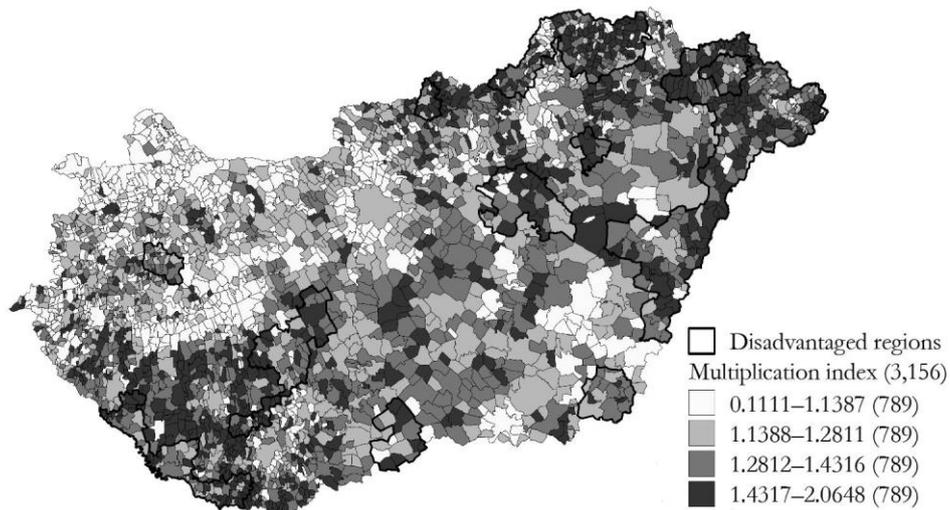
The multiplication spatial structure projected on the entire period from 2007 to 2015, although in the transition zone between the north-western Hungary and the central region with a better labour market and border regions with less favourable rates, is strongly mosaic (settlements with more favourable and less favourable multiplication indexes appear parallel and adjacent to each other) and are divided into three separate districts. These areas can be primarily characterised by high index values, the intermediate zone contains mixed multiplication settlements with a high dispersion, and the stronger labour market position settlement groups are characterised by more favourable cumulative values (see Figure 3), but these regions do not fully cover the ‘classic’ labour market-spatial relationships represented by the relative indicator.

Although the outline of the more favourable employment zones is mapped out, their compactness is damaged, their structure becomes mosaic, and the occurrence of settlements with high multiplication does not necessarily appear in regions with high unemployment. The extent of the areas less affected by cumulative disadvantage effects in the northwest shrinks to the territory of Győr-Moson-Sopron County. The Balaton region is also characterised by settlements with low multiplication index, similar to the better employment opportunity areas of the Southern Great Plains; however, the competitive advantage of Central Hungary can no longer

be clearly distinguished and is typically narrowed down to the settlements around Budapest. The northern part of Bács-Kiskun County and the south-eastern part of Pest County appear new – in the case of disadvantage accumulation – depressed zones. In contrast to the labour market position that can be drawn from the relative indicator, strong multiplication zones also occur in the southern regions of Zala and Fejér County, and in the south-eastern region of Pest County. Although it is lagging behind the more favourable positions of the country in terms of its labour market situation, the involvement of the internal areas of Somogy County are also considerably more serious than the employment condition in terms of multiplication.

Figure 3

**Degree of involvement of Hungarian settlements
in the accumulation of disadvantages, 2007–2015**



Note: See settlement numbers in parentheses.

Source: Own elaboration based on HCSO data.

The favourable position of Budapest is related to the employment role of the capital and this can be associated with suburbanisation. It is conspicuous that areas with a favourable relative index in which population growth could be observed over the past 20 years typically had low or average multiplication index values. This is partly due to the fact that the migration component of population growth is likely – in the context of stronger employment situation – to attract groups with better labour market position. The increase of the proportion of young, skilled entrants, and the presence of advanced higher education institutions (HEIs) also contribute to the more favourable value of multiplication. HEIs have a positive impact on the value of multiplication, not only in Budapest, but also in the big cities in rural areas, while the indicators of the biggest rural university cities belonged to the better categories

in the examined period. This finding coincides with the more favourable effects of HEIs on the economy (Kotosz et al. 2016).

It is also true in the case of the north-western Hungary, the Balatonfüred, Balatonalmádi, and Veszprém districts that the differentiated labour demand (also requiring skilled workers and highly qualified professionals) created a favourable position region, enjoying the beneficial effects of the automobile industry and in all the machine industries.

It is becoming most common in the transition zone that the settlements with otherwise more favourable rates – mainly villages – show an unfavourable cumulative structure.

In the transition area, the settlements with more favourable job-seeking rates are becoming most common – mainly villages – to show an unfavourable cumulative structure. Exploring the background effects requires further investigation. However, it can be stated that the labour attracting ability of a more favourable labour market centre is also involved in these. In this case, however, it is important to make a distinction between the aforementioned suburban areas and the other types of zones. The effect mechanism differs in the latter as at this time, there is no new, skilled workforce flowing into the vicinity of the employment centre, but the factories operating there tend to attract jobseekers with a relative competitive advantage in their own village from the partially small village periphery through their commuters. As a result, the proportion of cumulatively disadvantaged unemployed people in the attracted settlements rises, which increases multiplication.

The connected zones with significantly high multiplication index can be found in the districts to be developed by a complex programme. As a result of the unfavourable economic situation and the weaker employment centres here, moving away can be a method to escape unemployment for disadvantaged jobseeker groups. As this will typically be possible for people with better financial standing and mobility, the stationary jobseekers will be more likely to accumulate disadvantages. However, in the examined region, the proportion of the Roma also exceeds the national average, which, in view of the cumulatively disadvantageous situation of this jobseeker group (Kertesi 2000), increases the incidence of people highly affected by disadvantages in the labour supply.

Based on the settlement-level correlation studies, the value of the relative indicator (number of registered jobseekers/economically active population) is the first among the factors that correlate with the territorial features of multiplication, which showed a positive relation with the degree of accumulation⁴ in all 3 years. With the intensification of employment depression, the level of disadvantage accumulation is also typically higher at the settlement level. Simultaneously, one can sense the relieving strength of the relation, namely that besides the districts to be developed by

⁴ The value of Pearson's correlation was 0.504 in 2007, 0.498 in 2009, and 0.362 in 2015 with a significance level of 0.01.

a complex programme, the areas with more favourable employment ratios are also increasingly affected in the phenomenon of multiplication.

The strongest decrease shown in the strength of the relation, however, was the relationship of multiplication and income position. While a correlation coefficients of -0.411 and -0.409 appeared in 2007 and 2009 respectively, among the total settlement income per capita and the multiplication index, this declined⁵ to -0.174 by 2015. Therefore, the phenomenon begins to break away from the problem of the less favourable income situation understood at the settlement-level; jobseekers may also be affected by multiplication in wealthier villages and cities. The correlation between the jobseekers groups was more subtle, the average degree of the financial situation and the accumulation of disadvantages shows a significant relation at the individual level, the average relative disadvantage ratio of people with poor financial standing was 0.43 , for the people living in an average financial situation this value was just over 0.31 , and in the case of those above the financial average, it is reduced⁶ to 0.29 .

The spatial structure mostly differed from the pattern concerning the whole period of the survey in the strengthening of the contrasts and the extension of the high multiplication zone in 2015. This was strongly influenced by the decline in the number of jobseekers in parallel to the increase in labour shortages (see Figure 4).

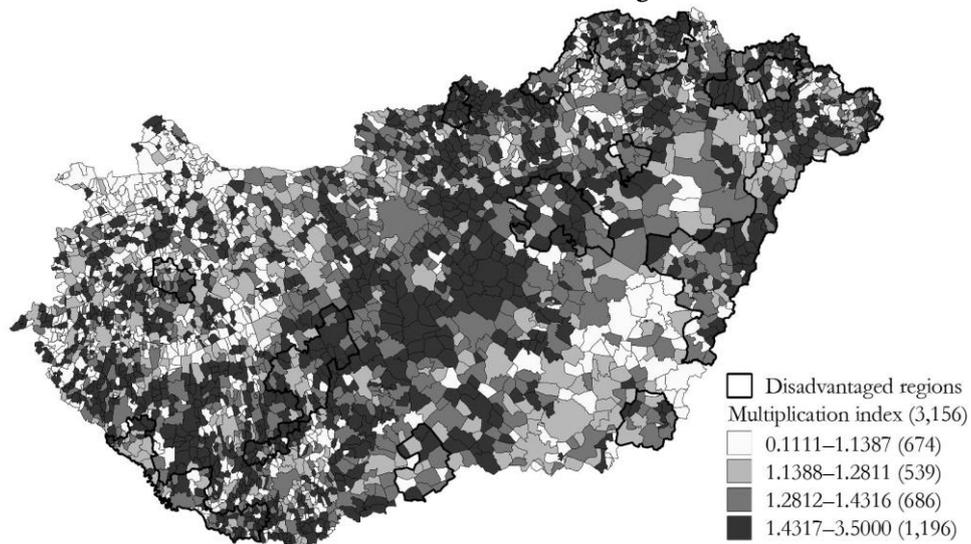
The correlation is supported by the fact that the highest growth rates in the multiplication index were shown by those regions (Central Hungary, Central Transdanubia and Western Transdanubia) where the size of the labour shortage also proved to be in the top three based on HCSO data. Growth was also observed in the relation of cities with larger populations. In this approach, the multiplication index helps to outline the meso- and micro-regions (high M-index value), in which a further increase of employment is particularly challenging and can be increased even more by partly including a bigger proportion of the group of highly-disadvantaged jobseekers. The disadvantaged area becomes more mosaic, but the dominant settlement form remains the highly affected type in respect of accumulation.

⁵ Pearson's correlation with a significance level of 0.01.

⁶ ANOVA *F*-test: 29.947, significance level: 0.000; value of the Levene-test: 0.440, significance level: 0.644; Kolmogorov–Smirnov-test: 0.180, significance level: 0.000. The condition of normality based on the test is not fulfilled.

Figure 4

Degree of involvement of Hungarian settlements in the accumulation of disadvantages, 2015



Note: See settlement numbers in parentheses.
Source: Own elaboration based on HCSO data.

Role of individual disadvantages in the development of the territorial image of multiplication

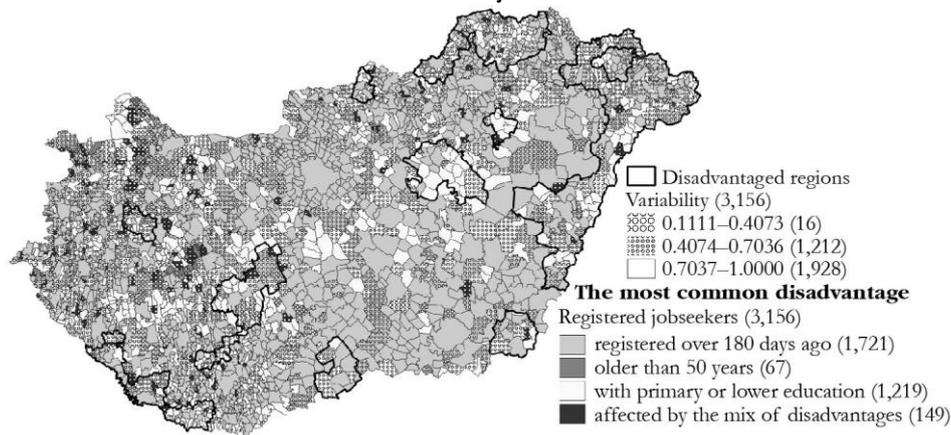
Long-term job seeking appeared almost without exception as a dominant disadvantage in the examined period between 2007 and 2015, with a 55.0% share on the national level, which was followed by the lack of education (38.6%) (see Figure 5).

The range of dominant disadvantages shows a strong deviation in the relation of the districts to be developed by a complex programme and the control group⁷. In the previous region, lack of education is significantly stronger; it is dominant in more than 54% of the settlements as opposed to 34% proportion of the more favourable areas. From the viewpoint of employment, the image of the most disadvantaged areas is determined by this one disadvantage. Apart from the historical embeddedness of the problem, the selective migration affecting the region has a decisive role in its generalisation.

⁷ Pearson's chi-squared-test: 97.435, significance level: 0.000.

Figure 5

The most common disadvantage for registered jobseekers
and its variability, 2007–2015



Note: See settlement numbers in parentheses.

Source: Own elaboration based on HCSO data.

In contrast, the settlements of the control group are more heterogeneous in terms of the dominant disadvantages. The situation of the more favourable north-western, the Balaton, and the central region is particularly specific; a large number of mixed-type settlements can be found among the villages and cities with significant disadvantages.

In 2015, the settlements of the control group were hit harder by long-term job seeking, with nearly 59.0% of the settlement affected as a dominant disadvantage, while in the districts to be developed by a complex programme, this value reached 40.7%. The effect of the Start Work Programmes primarily concentrating on peripheral areas could have played a part in this.

People over the age of 50 years have the third largest occurrence among the prevalent disadvantages, more typical of the settlements with a better labour market position. This disadvantage became dominant due to the fact that, while in the settlements to be developed by a complex programme the age structure is younger, the proportion of elderly people in the settlements of the control group is higher (where age over 50 years proved to be a dominant disadvantage in 2015, the average proportion of elderly people from the general population was close to 44.5%, while it was only 39.0% in the settlements primarily affected by the lack of education)⁸.

⁸ ANOVA *F*-test: 130.315, significance level: 0.000; saturation homogeneity condition is not fulfilled; Levene-test: 28.97, significance level: 0.000.

Regarding Hungary as a whole, a further correlation can be observed in the dominant disadvantage and in the dimension of the degree of multiplication as well.⁹ The settlements with the highest M-index values are those where the dominant disadvantage is the low level of education (average M-index of 1.376). The emergence of low educational attainment as a major disadvantage at the national level is therefore often accompanied by higher M-index values and thus with multiplication effects. This relationship is also manifested in a regional breakdown; however, in the area of the districts to be developed with a complex program, the contrast between the individual settlement categories is typically smaller than in the control group.

There are significant differences in the character of dominant disadvantages in the village/city relation at the national level.¹⁰ Although the proportion of long-term job seeking is dominant in both settlement types, the cities are almost exclusively dominated by it (80.5% in the first place in comparison to the 51.3% of the villages), and in the villages the lack of qualification and the mixed character is more typical. The latter is almost a unique village feature (5.2% versus 1.1% involvement of cities). Considering territorial breakdown, the above relationships are valid around the same percentage distribution to the settlements of the control group; however, in the case of the districts to be developed by a complex programme, the pattern is different. On the one hand, both in the case of villages and cities falling in the area of the districts to be developed by a complex programme, the proportion of long-term jobseekers is smaller, which may be attributed, among others, to the impacts of the Start Work Programmes, and on the other hand, the lack of education in the cities located there occurred as a more severe challenge (in 35.5% of the cities it was dominant in comparison to 13.6% that is characteristic of the control group). While the mixed character was dominant in the villages of the control group, simultaneously the villages of the districts to be developed by a complex programme, this was hardly determinant (none of the cities and only 4.4% of the villages were dominant). Another feature is that over the age of 50 years appeared almost exclusively in the villages of the control group as a dominant disadvantage.

In respect of variety – that is, how stable was the paramountcy of the disadvantages during the whole period – the degree of heterogeneity was lower in Budapest and in the inner parts of the country. In other words, among other things, significant in regard that a more complex, focusing on more disadvantages and more flexible tools, can be instrumental in remedying the situation in the areas with higher variability, while the solution of the primary problem in less variable parts of the country can result in a similarly powerful improvement.

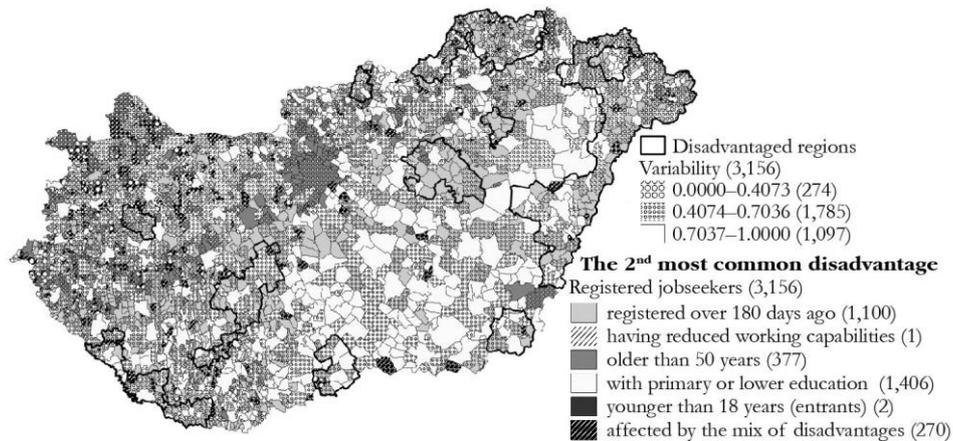
⁹ ANOVA *F*-test: 163.253, significance level: 0.000; saturation homogeneity condition is not fulfilled; Levene-test: 15.162, significance level: 0.000.

¹⁰ Pearson's chi squared test: 106.786, significance level: 0.000.

There is also a significant difference in the regional distribution of secondary disadvantages between the districts to be developed by a complex programme and the other settlements of the country (see Figure 6).

Figure 6

The second most common disadvantage for registered jobseekers and its variability, 2007–2015



Note: See settlement numbers in parentheses.
 Source: Own elaboration based on HCSO data.

It is a tangible difference that the mixed character at this level is already decisive in all of the groups, although still primarily as a local feature. In the case of secondary disadvantage, the districts to be developed by a complex programme and the cities of the control group show differences. Although the lack of education was high in the second place in both types (60–70%) in the cities of the most disadvantaged areas, long-term job seeking also achieved a significant proportion.

On the regional level, a definite rupture extends from the central areas of Zala County through the Balaton–Székesfehérvár–Budapest line, from which to the northwest the mixed and the aged over 50 years disadvantages are in second place in a varied pattern. In contrast, the duo of long-term jobseekers and the lack of education are more typical southeast of the line.

Conclusions

The present study, with the help of two indicators (relative disadvantage index and multiplication index) examined the group-specific and territorial impacts of the accumulation of individual labour market disadvantages, which are making the dissolution of the labour market situation more challenging. The focus of the study, in the case of group-specific impacts, was on jobseekers living in disadvantaged areas,

while the examination of the spatial image of multiplication covered the whole country.

The national level survey of the labour market situation and the multiplication index showed that the decline in unemployment typically occurs along with the increase in multiplication, which is logical considering that employment is typically achieved first by those people who are easier to employ and are less affected by disadvantages. Thus, the specific proportion of disadvantaged jobseekers is increasing. In this approach, the multiplication index also shows the territorial limitation of employability for the still available free labour force.

The study of disadvantaged jobseekers living in disadvantaged areas has confirmed that the cumulative effects are present among the people involved in the questionnaire survey, and the appearance of other disadvantages were generated by, in the first place, those aged over 50 years, followed by low educational attainment and long-term job seeking. The improvement of the economic situation and public work programmes together have led to a significant reduction in the number of long-term jobseekers and low-education graduates in comparison to the values experienced in the years of the crisis.

The analysis of the territorial image of the accumulation of disadvantages showed that the disadvantaged districts to be developed by a complex programme are more affected by the problem; however, levelling can be experienced in this regard. Multiplication also appears in the more favourable areas of employment, which is due to, among other reasons, the selective recruitment of labour force by employers. In contrast, in the weaker economic regions, a high degree of multiplication was mainly due to selective migration and higher proportion of disadvantaged jobseekers within the population.

The accumulation of disadvantages is mitigated by a favourable labour market environment if it involves suburbanisation, labour inflow, and/or the presence of a strong HEI. However, the centre of better employment by itself did not induce a low degree of involvement in the accumulation of disadvantages. The Hungarian multiplication spatial structure is divided into three different zones; these are mainly disadvantaged areas characterised by high index values, the intermediate zone with mixed multiplication settlements, and stronger position settlement groups characterised by more favourable cumulative values. The spatial structural image of the multiplication differs from the structure outlined by the relative indicator.

The extent of the areas with favourable multiplication indicators in the north-west shrinks to the territory of Győr-Moson-Sopron County. The strong position of the Balaton region remains, similar to the better employment areas of the Southern Great Plain. Simultaneously, the competitive advantage of Central Hungary can no longer be clearly distinguished and is typically narrowed to settlements around Budapest. The northern part of Bács-Kiskun County and the south-eastern part of Pest County appear as new – in the case of disadvantage accumulation – depressed

zones. The spatial structure mostly differed from the pattern concerning the whole period of the survey in the strengthening of the contrasts and the extension of the high multiplication zone in 2015.

A dominant disadvantage at the national level over the entire period was long-term job seeking followed by the lack of education. However, there are territorial differences in this respect. On the one hand, in the districts to be developed by a complex programme, the lack of education and long-term job seeking is the most typical pair, while in the control group, the image is more heterogeneous; on the other hand, long-term job seeking enters the first place. In this area, being over 50 years has also emerged as a dominant disadvantage. In the relation of villages/cities, the dominance of long-term jobseekers is stronger in cities, while in the villages, the lack of education and almost unique mixed features are more typical.

The main lesson of the analysis of accumulation is that different combinations of disadvantages are affecting the emergence of additional tensions differently. A cumulatively disadvantaged situation is more likely to ruin the labour market opportunities than a single disadvantage by itself. It is necessary for the long-term improvement of the labour market situation of the most disadvantaged regions and jobseekers that certain employment policy instruments respond specifically to the problems created by certain types of accumulation.

Besides the effects of multiplication, employment alternatives (a job that provides suitable salary and permanent placement, which is as close to the primary labour market as possible) can also be mitigated by the complex application of passive and active employment policy instruments. On the one hand, it provides livelihood and on the other hand, it orientates the unemployed into programmes whose structures have been developed based on their special labour market position. This can be more effectively achieved in combination with individual mentoring.

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