



## WHAT DOES YOUNG AGE STRUCTURE SUGGEST ABOUT SOCIO-ECONOMIC DEVELOPMENT?

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### Annotation

Socio-economic development and the age structure of a population are often linked together in the public discourse. The development of an area and its age structure are significantly correlated in Europe according to researchers. In this paper we take a look behind this simplifications, providing insights about the link between age structure and the development of the area. Our hypothesis is, that favourable age structure does not necessarily mean a higher socio-economic situation. Henceforward we argue, that migration is one of the most significant indicators of regional socio-economic inequalities. However, the situation needs a deeper understanding. One part of the less favourable areas is characterised by an ageing population and out-migration, but in the other part we can experience the opposite. The statement that in the less developed areas we can only find ageing populations without young inhabitants, while in the developed areas we can find the opposite, is not true in Hungary. The study examines and compares the socio-economic situation in less favourable rural areas of Hungary where the less favoured situation can be found together with an unfavourable age structure and migration process, or its opposite, young age structure and growing population. We found that, however, Hungarian population is ageing (as population of Europe), the highest young population rate can be found in the most underdeveloped and the most developed micro-regions. The most underdeveloped micro-regions with favourable age structure are concentrated in the Eastern parts of Hungary as well as in Southern Transdanubia. In these micro-regions, the percentage of the Roma population, is higher than average. While the phenomena may not refer to causation, it seems that the two are closely related. For understanding regional inequalities, we need to look at numbers more closely. Sometimes it is important to revise the indicators, and it can happen, that the most basic perceptions have to be challenged in order to facilitate effective regional development.

KEY WORDS: ageing; migration; depopulation; socio-economic inequalities.

### Introduction

It is generally accepted that in industrial societies the populations of more developed regions have both younger age structures and higher levels of education, while less developed regions or places have older age structures. There is another consensus about internal migration, that regions with positive migration balance have younger age structures and higher levels of socio-economic development (Lichter 1993, Brown 1993, Campbell et al. 1993). According to the public perception (shared by policy makers) rural populations are declining, old and undereducated (Kulcsar et al. 2011).

It is very common that demographic changes in a region are partly causes and partly consequences of its economic and social situation. Many scholars have found significant association between territorial development and age structure in urban and rural context too (Zhang et al. 2015, Bloom et al. 2007, Maestas et al. 2016, Woetzel et al. 2016)

It is generally accepted that limited resources and services in disadvantaged communities and regions increase the old-age dependency ratio (Ingham et al. 2009).

However, the fact can be deduced, that the favourable age structure does not necessarily mean a higher socio-economic development level. We can find favourable age structure in some underdeveloped micro-regions of Hungary. In other areas the good geographical location (close to the city, there are touristic attractions, etc.), can partly compensate the unfavourable age structure and

demographic disadvantage. One part of the underdeveloped area is characterized by an ageing population, but the other part is just the opposite to them. The statement that in the less developed areas we can only find ageing populations without young inhabitants, while in the developed areas it is just the opposite, it is not true in all cases.

This study aims to compare the socio-economic situation in less favoured rural areas where the less favored situation can be found together with an unfavourable age structure and migration processes, or its opposite which means young age structure and growing population.

Our opinion is that the favourable age structure not necessarily runs with social-economic development. Underdeveloped micro-regions with favourable age structure concentrated in some parts of Hungary, where high level of unemployment, low life expectancy and high birth rate (with large roma population also) have observed.

### Data and methods

For analysis we are using micro-regional level regional data for the year 2015, and we also make few comparisons with 1998 data. The number of observations were 175 micro-regions. The data was provided by the National Statistical Office of Hungary (the database of National Regional Development and Spatial Information System). Budapest as a micro-region was treated

separately because of its outstanding performance in many aspects.

Based on four input variables we conducted Principal Component Analysis and created a Development Index, with which we aim to measure the socio-economic performance of a micro region. These input indicators were: unemployment rate, cars per 1000 inhabitants, income per inhabitant and migration rate. Migration rate was defined as immigrants per outmigrants (%).

**Table 1.** Principal Component A matrix

	Development Index
unemployment rate, %	-0,922
cars per 1000 inhabitants	0,889
income per inhabitant	0,848
immigrants per outmigrants, %	0,844

*Source: own calculations*

Based on the Principal Component A matrix (Table 1), the unemployment rate has a very close negative correlation with the component. The second closest coefficient belongs to the number of cars per inhabitant, with its 0.889 coefficient. The weakest but still very strong relationship is between the migration indicator and the component with 0.844 coefficient.

Based on the Development Index, we created four categories of socio-economic development. The thresholds of the categories were made based +/- 1 standard deviation from the mean of the factor loadings. The four categories with the number of micro regions are as follows:

- Underdeveloped districts (Factor loading up to -1): 37 micro regions
- Moderately underdeveloped districts (Factor loading from -1 up to 0): 49 micro-regions
- Moderately developed district (Factor loading from 0 up to 1): 57 micro regions
- Developed district (Factor loading from 1 and over): 32 micro-regions

In the following section we would like to argue why we selected our four input variables. There is no question in literature why unemployment rate and income per inhabitant are significant measures of social-economic development. Using the cars per inhabitant indicator as a measure of social-economic development is also not new in scientific research. Researchers Bíró and Monlár (2004) as well as Faluvégi (2004) applied this indicator for measuring the well-being and economic development of micro regions in Hungary. They used more input variables in their analysis, but they found that this measure is fitting to the factor model of other development indicators. Cars per inhabitant indicator was also used by Obádovics (2012) and Kulcsár et al. (2011) in micro-regional level.

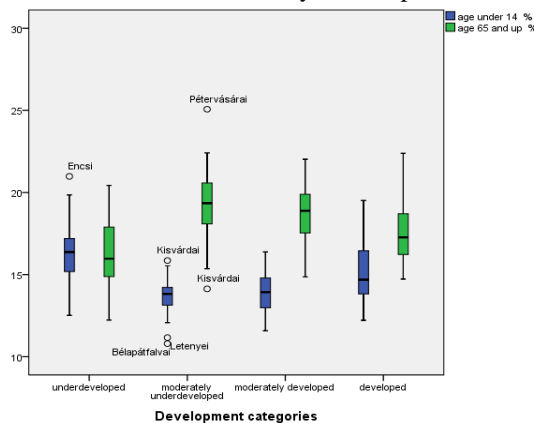
In our opinion, migration is one of the most significant indicators of regional socio-economic disparities. Scholars argue that future migration can be detected/forecasted by analysing the demographic and economical trends within the region (Fassmann - Hintermann 1998, Dustmann et al. 2003, Hárs et al. 2004). In addition, the motivations behind migration

decisions are complex, still decisions are driven not only based on personal reasons and the destination region's magnetic factors, but also the unattractiveness of the issuing region (Gödri, 2016). Based on these facts, we believe that migration indicator should be considered when we would like to see the development process of a region.

In the following paragraph we explain our conceptualised definitions used in this article. In this paper young age rate is defined as the percentage of the population aged 14 years old or younger. Old age rate was calculated as the percentage of population aged 65 or older. For 1998, due to data availability, we used different definition, old age is considered 60 years or older. For better comparability, when we look at the differences in time, we used the same definition for elderly for the 2015 year too (in Table 2 and Table 3).

## Results

Figure 1 shows that the highest rate of the population under the age of 14 can be found in the underdeveloped group (16.3%), followed by the developed group with 15.0%. In the moderately developed and moderately



underdeveloped group 13.9% and 13.7% respectively.

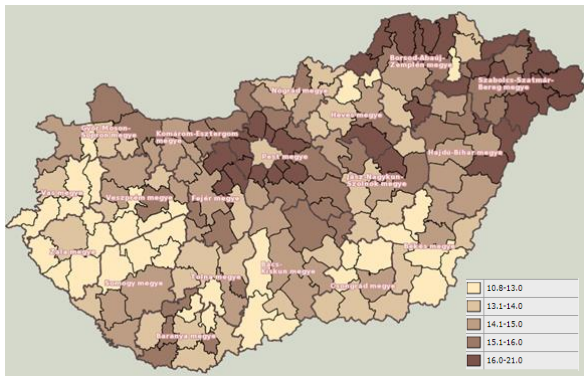
**Fig. 1.** Percentage of population of the micro-regions under 14 years and over 64 years by development categories, 2015

*Source: own construction*

The highest proportion of the elderly is in the moderately underdeveloped group with 19.3%, followed by the moderately developed group, where the rate is 18.7%. In developed areas, 17.4%, while in underdeveloped areas 16.3% of the population is over 65 years of age.

In the underdeveloped group Encs micro-region stands out with its youth ratio of over 21%. From the moderately undeveloped group, the Pétervására micro-region needs more attention with its outstanding old age rate (25%).

Based on the above mentioned details we can observe, that in every development category, old age rate exceeds young age rate, with one exception, namely in the underdeveloped group. Evidence show, that underdevelopment goes along with young age structures.



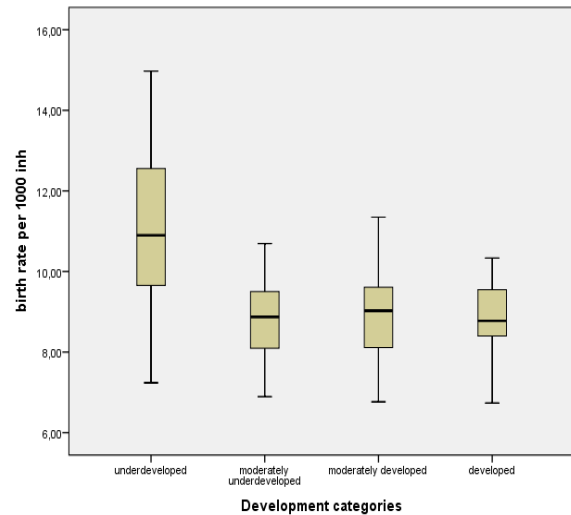
**Fig. 2.** Percentage of population of the micro-regions under 14 years by development categories, 2015

Source: own construction

If we look at the geographical position of the young districts in Figure 2, we can observe, that the proportion of young people is the highest in the developed areas around Budapest and in the underdeveloped districts of North-East Hungary (darker colour). High proportion of elderly people can be found in the Southern Great Plain region, and in Southern Transdanubia and Balaton lake region (lighter colour). The number of elderly people in most parts of the country exceeds the number of youth, the only exception is the districts around Budapest and the districts with a dominantly large roma population in the North Eastern part of the country.

It is also important to see the volume of the regeneration of the population along different development categories. We argue that birth rate is an important indicator of underdevelopment. In Figure 3 we can observe, that while significant differences between the birth rate of the three more developed groups can not be detected (9 permille), the birth rate of the underdeveloped group is significantly higher with 11 permille. The results of birth rate suggest, that in the underdeveloped regions high young age rate can be considered as a consequence of high fertility.

We also looked at life expectancy at birth, as an other common indicator of the well-being and social, economical situation of a region. We found significant differences in life expectancy along the development categories. The life expectancy of males is significantly increasing with development, while for female the growth is less notable and there is no significant difference between the two most developed groups at all. This suggests that female and male life expectancy does not show the same phenomena in different economic development.



**Fig. 3.** Birth rate of the micro-regions by development categories, 2015

Source: own construction

However, it should be emphasised that in the underdeveloped group there is a greater difference in the life expectancy of men and women, and the difference between the two gender is decreasing with higher development.

**Table 2.** Migration balance (in-out/1000 inh.) of the micro-regions aggregated to NUTS2 level by development categories, 2015

REGION	under-developed	moderately under-developed	moderately developed	developed	together 2015	together 1998
Central Hungary (without Budapest)			3,3	11,0	8,1	11,5
Central Transdanubia		-7,5	-0,4	2,6	0,6	1,4
Western Transdanubia		-6,8	-1,3	5,6	3,3	0,7
South Transdanubia	-9,3	-3,8	-1,1		-2,9	-0,6
Northern Hungary	-7,8	-3,9	0,6		-4,1	-2,5
North Plain	-6,8	-6,1	-1,6		-4,6	-1,5
South Plain	-8,9	-4,5	0,0	13,6	-1,6	-0,3
<b>ALL TOGETHER</b>	<b>-7,4</b>	<b>-4,5</b>	<b>-0,1</b>	<b>7,1</b>	<b>-0,3</b>	<b>-5,7</b>
Budapest					1,4	-5,7

Source: own calculations

Table 2 summarises the migration balance of NUTS2 level regions in Hungary. The migration potential of Central Hungary was the highest in 1998 and still is in 2015, although it has fallen by more than 3 percentage points.

The decline, however, only affected the moderately developed districts, the developed regions maintained their position. Over the past 10 years, the migration potential of Budapest has increased substantially, the pre-2000 outmigration wave has reversed, and the return of young people and working people to Budapest has started.

The migration potential of Tiszakécskei micro-region in the Southern Great Plain region has to be highlighted, with its 133.3% migration rate. In the North Hungary

region the migration potential of Egri (105%) and Rétsági district (122%) were positive.

The migration potential of Central Transdanubia region decreased significantly compared to 1998, and there was a shift towards Western Transdanubian region in terms of migration. In the districts of Pannonhalma, Csorna, Tét, Sopron, Kőszeg, Győr and Kapuvár, the number of immigrants exceeds the number of outmigrants by 10%.

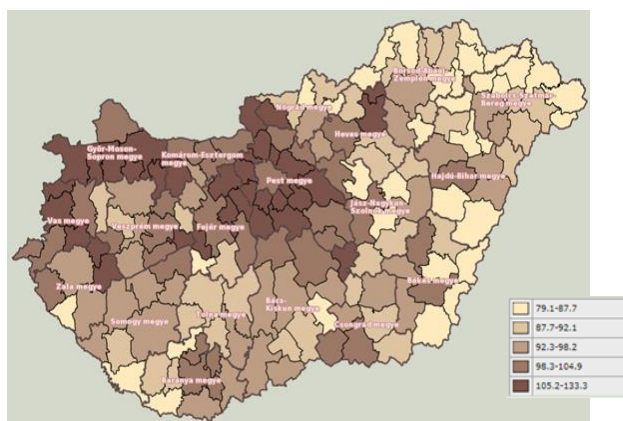
The geographical position of the micro-regions with the highest outmigration rate can be seen in Figure 4. The highest outmigration rate is marked with the lightest colour.

**Table 3.** Ageing index (65+/15<) of the micro-regions aggregated to NUTS2 level by development categories, 2015

REGIONS	under-developed	moderately under-developed	moderately developed	developed	together 2015	together 1998
Central Hungary (without Budapest)			155,1	128,7	138,0	99,7
Central Transdanubia		155,2	178,7	176,2	176,3	102,4
Western Transdanubia		232,8	221,2	178,8	191,7	119,5
South Transdanubia	160,6	196,7	194,4		193,5	117,3
Northern Hungary	134,8	179,2	187,6		165,3	109,3
North Plain	130,9	156,2	171,8		150,5	93,9
South Plain	194,8	197,9	189,7	179,8	192,5	120,9
Budapest					204,8	164,0
<b>ALL TOGETHER WITH BUDAPEST</b>	<b>174,5</b>	<b>183,6</b>	<b>182,3</b>	<b>155,7</b>	<b>174,8</b>	<b>115,8</b>

Source: own calculations

The proportion of elderly people increased in Southern Transdanubia, Western Transdanubia and Central Transdanubia regions from 1998 to 2015. The highest growth is detected in Central Transdanubia with 6.6% increase. This region includes the northern part of the Lake Balaton. After Bélapátfalva and Pétervására districts, the most elderly districts in Hungary are the districts of Balatonfüred and Balatonalmádi.



**Fig. 4.** Migration rate (in/out %) of the micro-regions by development categories, 2015

Source: own construction

In Western Transdanubian region, the proportion of the elderly is outstandingly high in the moderately

developed and moderately underdeveloped areas (Lenti, Keszthelyi, Zalaszentgróti and Letenyi districts). In the underdeveloped districts, the high proportion of elderly people is relatively low. The lowest proportion of the elderly is in the developed districts of the Central Hungary region (Pest county) and in the Northern Great Plain region in the underdeveloped districts of Hajdúhadháza, Kemece, Nyírbátor, Baktalórántháza, Záhony, Mátészalka, Nyíradony and the moderately undeveloped Kisvárd district, and in the underdeveloped Northern Hungary region (Encsi, Szikszói, Mezőcsáti districts).

In Table 3 we can see the ageing index of the micro-regions aggregated to NUTS2 level by development categories. Ageing index was calculated by dividing the old aged population (65 years or older) by the young population (14 years or younger). In 2015, the aging index was over 100% in all regions. The most favourable situation is in the underdeveloped districts of the Northern Great Plain and Northern Hungary (Hajdúhadháza, Encs, Szikszó, Kemece districts) and Pest county (Budakeszi, Szigetszentmiklós, Dunakeszi districts). The 15 most youngest districts belong to the group of underdeveloped districts. The two oldest districts, as we have seen in the case of old age rate, are the Bélapátfalva and the Pétervására districts. With the exception of the two districts, the first 10 most ageing districts can be found in south and southwest of Hungary, in the underdeveloped and moderately underdeveloped

districts of Southern Great Plain, as well as in the moderately developed and moderately underdeveloped districts of Southern Transdanubia. We found extremely high ageing index in Western Transdanubia, in Letenye and Lenti districts.

## Conclusions

It is clear that age structure and economic development are related with each other. However, this relation is often interpreted as a link between young age structure and good economic performance. As our research showed, the picture is more complex. In our study we found that the statement that in the less developed areas we can find only ageing populations without young inhabitants, is not true in Hungary. The most underdeveloped micro-regions with favourable age structure are concentrated in the Eastern parts of Hungary as well as in Southern of Transdanubia. In these micro-regions, the percentage of the Roma population is higher than average. While causation is not certain, it seems that the two are closely related, which emerges a need for additional research on this field. The developed regions with high rate of young population have very high positive migration balance concentrated around Budapest. The most ageing regions are the capital city Budapest, Southern Great Plain and Transdanubia. The population of Hungary is ageing (as population of Europe), but we can find high rate of young population in the most underdeveloped, and in the most developed micro-regions too. We also found that in Southern Transdanubia, Northern Hungary and North Great Plain regions there are no developed micro regions at all.

The importance of these results for policy makers is that it highlights the differences in development needs of regions which seem to be similar in some aspects. For understanding regional inequalities, we need to look at numbers more closely. Sometimes it is important to revise the indicators, and it can happen, that the most basic perceptions have to be challenged.

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**RECEIVED: 1 September 2017**

**ACCEPTED: 10 October 2017**

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