ECONOMICS STUDENTS' MIGRATIONS IN THE HUNGARIAN HIGHER EDUCATION SYSTEM[*]

Szilárd Kovács[**]
Réka Pusztai[***]
Norbert Sipos[****]

The Hungarian Higher Education has faced several structural challenges since the regime change of 1990. The 'golden age' seems to be over and the government tends to impose severe limits on institutions regarding the number of state-financed students, the minimal application points and the institutions' missions. These new aspects influence the application procedures, as students are eager to achieve the highest price-value combination on the education market, which leads to internal and external migrations. In this study, we focus on the former, by using the agglomeration analysis of higher education institutions. We apply a modified Universal Law of Gravity to gather information about social and/or economic phenomena. On the level of single individuals, these types of decisions are random, but on the collective level, they can be characterized by certain principles and rules. This study explores the changes in the agglomeration areas and the limiting factors related to colleges and universities, offering economic education between 2004 and 2014. This period is adequate, as to identify the peculiarities and different influences

[**]   Szilárd Kovács, Eötvös József College, Hungary, H-6500 Baja, Szegedi út 2. Phone: ++ 36 70/339-62-29, e-mail: kovacs.szilard@ejf.hu
[***] Réka Pusztai, University of Pécs, Hungary, H-7622 Pécs, Vasvári P. u. 4. Phone: ++ 36 20/327-93-31, e-mail: reka.pusztai@ktk.pte.hu
[****] Norbert Sipos, Eötvös József College, Hungary, H-6500 Baja, Szegedi út 2. Phone: ++36 20/972-67-41, e-mail: sipos.norbert@ejf.hu

of the market, the government, and the global trends and to identify the new spatial roles of the institutions.

Keywords: migration; higher education; gravity model; student applications.

1. HUNGARIAN HIGHER EDUCATION SYSTEM

During the last decades there have been dramatic changes in the higher education (HE) systems all over the world (Barakonyi, 2010). The rapid expansion and thus the 'golden age' seem to be over and all the participants of the HE have to understand the new trends and requirements of their stakeholders, namely the labor market, students and the government. The 'Ivory Tower' point of view has become old-fashioned and unsustainable. In order to describe the HE environment some major new components of the HE have been selected:

- The classical Humboldtian HE concept has been replaced by the knowledge-based economy and whole-of-society approach. Therefore, the absolute requirements to provide the students with the supreme knowledge is no longer sustainable. Instead, more people in the developing countries want to participate in the tertiary level education, which means there is a high demand for universities and colleges. (Veroszta, 2010)

- The economic changes - the state is less willing and capable to finance the HE. Thus, individuals and families finance their own or their members' tertiary level education.

- The globalization of the HE sector, the ever-increasing competition among students not only at national, but also at the transnational level. More and more students have the opportunity to participate in exchange programs and families are willing to pay more for an education abroad.

- The emergence of online courses, the widespread of the easily accessible knowledge on the Internet, the possibility to take courses from home. All this reshapes the questions of knowledge appropriation.

- The aging population of the developed countries, and the capacity surpluses of the HE systems.

- The even more rapid changes of the necessary knowledge and the professors' obsolete materials can no longer be interesting or offer value to students.

- There are now new generations in the school systems, who have with different needs and attitudes (Balogh – Farkas 2013; Törőcsik 2011).

In Hungary, since the regime change in 1990 we have witnessed several critical points related/similar to those on the list. Studies have shown that more and more high-school graduates want to participate in the tertiary education, because of the parents' expectations and the wider range of opportunities that become available only if you have a college/university degree. This is in compliance with the European Union's expectations after the adhesion in 2004 which say that 40% of the members of younger generations should have a degree by 2020 (European Commission, 2010). The increasing demand on both sides (push from the government and pull from the students and their relatives) resulted in an increasing number of HE institutions being founded. The number of HE institutions increased from 77 in 1990 to 91 in 1994, and then decreased to 62 by 2000. At present, the number stands at 66 institutions. The number of faculties across the country increased from 117 in 1990 to 198 in 2012. The number of different courses available has also greatly increased (Oktatási Hivatal, Education Office, 2015). This does not mean that in Hungary the number of institutions is too high, when compared to the population number (about 10 million people), because 90% of the students study at the 30 biggest institutions. Besides, in 1990 there were only 108,000 students at higher education institutions, whereas there were more than 320,000 students in 2013, which means that in the last two decades the number of students has almost tripled. At first glance, it seems to be a good and reassuring tendency, but if we look deeper, future threats come to light. In the history of HE in Hungary, the peak of students was reached in 2005 with 424,000 participants and the number has been steadily decreasing since then (KSH, Hungarian Central Statistical Office, 2015). This decline is caused by the decreasing number of part-time students and the natural mitigation of the increased need for short-period courses. This tendency will probably continue, because of Hungary's aging population, accompanied by the declining birth rate. We estimate that the number of students will decrease under the psychological limit of 300,000.

Firstly, the HE system in Hungary has sustainability problems, because the liberalization of the higher education in the late 1980s brought about an increase in the number of students (about 100,000 until the regime change) and lecturers, whose number increased from 13,890 in 1980 to 17,302 in 1990. The increasing

demand was followed by yet another increase in the number of lecturers - in 2005 there were already 23,188 lecturers. The scientific and education sector does not react fast, so an almost 25% decrease in the number of students was accompanied by only a 12% decrease in the number of lecturers (Oktatási Hivatal, Education Office, 2015).

Secondly, the Bologna Process, whose objectives were agreed in 1999 in Bologna, was being implemented. The countries who signed the Bologna declaration agreed to create a transparent and common base of a higher education system that would facilitate mobility, namely the European Higher Education Area, which would be an easy-to-understand and comparable education system. The training cycle became two-tiered in the majority of the study programs, accompanied by a flexible credit system. This helps to compare the acquired knowledge and competencies in a given institution in a given program with any other programs within the area. In Hungary, the new education system was introduced in 2006 and neither the labor-market, the government nor the higher education institutions seem to understand completely the differences between the bachelor and the master level.

The third major challenge is the continuously decreasing participation of the state in financing the costs of the education. The GDP proportionate of public spending on education as a whole decreased from 5.69% in 2003 to 4.08% in 2012 (KSH, 2014). This is a significant problem, because there are enormous differences in the implementation of this type of governmental policy: some programs lost all of the state-financed places and due to this the families have to cover all the costs of the tertiary education. Elementary and high school education are accessible to and free for every citizen, which is one of the universal rights, provided by the Fundamental Law of Hungary (Magyar Közlöny, Hungarian Official Gazette, 2011).

Until 2010, in a 10-year average 80% of the formation costs of full-time students and 55-60% of all participants in HE total was financed by the state. The academic year 2012/2013 was the first year when a dramatic change was introduced, because the state-financed places were reduced to 31,750 (Magyar Közlöny, 2012) which is 50% as compared to the previous year. The number of both the higher education applicants and admitted students decreased too, but not at this percentage. In 2011, a total of 115,841 students were admitted. The following year, 84,694 were admitted and in 2013 only 77,183, which seems to be a constant level for the future (Felvi.hu, 2015). In the application period of 2015, there are already 41 study programs with high number of minimal points required to be admitted. The minimum required number of points for every level

of education has been steadily increasing every year. (For the major changes, see Figure 1)
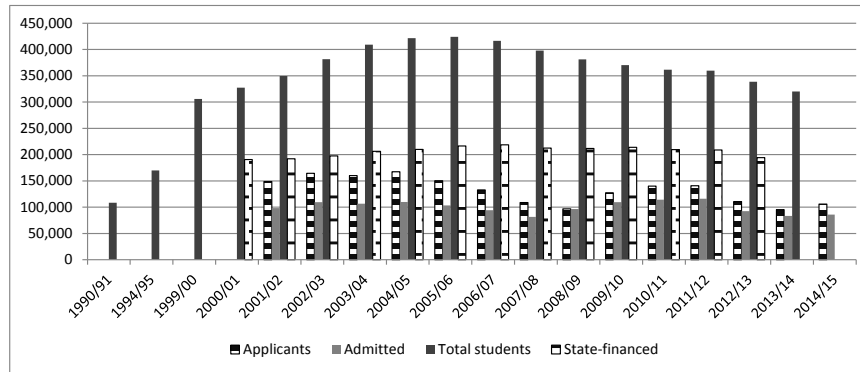

Figure 1. The applicants, admitted, state-financed and the total number of students within the Hungarian higher education system, 1990-2015

These changes alone would present a challenge to higher education institutions not considering other factors, which still may have a significant effect. The ever-changing needs of new student generations are an issue to be discussed as well (Balogh & Farkas, 2013). The major problem is how HE institutions can develop their own long-term strategies, because several decades ago they responded to the increased demand for their services and now it seems that the 'golden age' is over. It is essential to review their own role in the Hungarian and macro-regional environment and their relationship with the labor market actors, current and future students. They have to precisely determine their own attraction area towards high school students and their enrollment activities on a micro level, i.e. in Hungary and on a macro level, i.e. globally. Obviously, it is easier to concentrate on the micro level and our aim is to facilitate the decision-making process for the institutions' managements and the policy makers.

2. GOVERNMENT TOOLS FOR INFLUENCING STUDENTS' CHOICES

To achieve our goal, i.e. to provide information that can help institutions' managements and policy makers, we have to outline several basic assumptions about individuals' decision–making process.

In the last decades, a large and still constantly growing and flourishing field of research has been focusing on the characteristics of human's judgment and decision-making. It is a quite well-established fact that we make decisions that, although they bring some satisfaction or pleasure at the moment they are made, in the long run might turn out to reduce our welfare. A high-school senior's choice of university or college can be driven by a momentary emotion or feeling, and, as a consequence, he/she could end up wasting time and energy or earning less money during her life than he/she could have achieved. To help individuals not make these decision-making errors and to steer them towards decisions that will increase their welfare in the long run, libertarian paternalists claim an outsider's (in many cases this is the government's) intervention is legitimate as it can induce welfare increase for the decision-maker (Thaler & Sunstein, 2003, 2008).

The literature discussing students' choices for higher education usually defines several phases of the decision-making process. The most frequently adopted approach distinguishes three phases. The first phase is the formation of preferences; the second one is gathering information and excluding some of the alternatives; and the third phase is the actual choosing (see e.g. DesJardins et al., 2006; James et al., 1999; Jackson, 1978). In a questionnaire-based research, James and his colleagues (1999) investigated the significant factors in phase three. At the time of making the actual decision about the application procedure, factors like university prestige, the program offered and personal fit in the culture of a particular institution are identified. Considering course choices, applicants compare their own abilities to what is expected, they take into account the perceived quality of the education and the advice of outsiders as well. James and his colleagues (1999) conclude that preferences for faculties and courses are stronger than preferences for a given institution. They also emphasize the fact that high-school students are under-informed. They use word-of-mouth information more than expected and form judgment based on their peers' opinion. This way, their decision can lead to some suboptimal results. In line with this conclusion, one stream of literature on decision-making of adolescents suggests that adolescents cannot be considered competent decision-makers (Klaczynski et al., 2001). Based on these facts, an external participant's intervention into the decision seems to be legitimate. Even more so since most of higher education studies are financed by the state.

The libertarian paternalistic tools for governmental intervention are designed to steer biased decisions but at the same time to preserve the freedom of choice. An individual should always be able to choose an alternative compared to what it is considered to be the best from the outside and these alternative actions should

be available with the lowest cost possible (Thaler & Sunstein, 2003, 2008). In the following paragraphs some preferred tools of light paternalism will be presented.

Paternalistic information telling (Jolls et al., 1998) aims to eliminate biases in perception and evaluation of different options. Information is needed to make rational decisions and the re-framing (Tversky & Kahneman, 1981) of information can be used to put a bigger emphasis on possible risks related to the decision outcomes or to promote advantages of alternative opportunities.

Introducing cooling-off periods (Loewenstein et al., 2001) aims to avoid decisions made in an exaggerated state of mind and the long-lasting negative effects that may occur. In case of applications, the decisions have been forming during a longer period but after making a list, students still have five months when they can change their order of preference. Cooling-off period could be applied here by making the changing process more difficult (e.g. if a day-later-confirmation was needed to finalize the change).

Designing the applied defaults consciously can be really effective as well, as defaults are inevitable (Thaler & Sunstein, 2003; Sunstein & Thaler, 2003). Default's effectiveness is based on the *status quo* bias (Samuelson & Zeckhauser, 1988). Most decision-makers do not change, but adhere to the default option. So if governments wanted to increase participation in higher education, every high school student could be automatically assigned to a university based on their results – of course with the option to cancel the application or to change it. Certainly, higher education has to remain an option that is really consciously planned and demanded by the individual. However, providing an application form filled with data of each individual can be already considered as a light default that makes it easier and more attainable for the students to get involved in the application process.

Taxes are not considered to be exactly light or libertarian tools. However, as e.g. sin taxes can be appropriate in the case of *internalities* (Gruber & Kőszegi, 2001), assuming that individuals do not act in their best interest and choose field of study based on peers' opinion instead of investigating the demands of the labour market, making one field of study more easily or more hardly accessible than another can be an acceptable tool.

We did a preliminary research by measuring the effect of governmental interventions on the decisions of higher education applicants. It was found that interventions do not really seem to modify future students' choices concerning their field of study. Although the preferences of Hungarian government clearly

encourage science, technical and medical studies and engineering, the number of high-school graduates who apply to business, law and social science faculties has not decreased. On the one hand, a reason for this can be that there are simply too many factors that influence their decisions (trend, current salaries in a specific field, family traditions, etc.) so that governmental influence cannot be treated separately. On the other hand, one might apply an indirect approach: although shifts in the applications from one field to another may only appear in the long-run, students who perceive study in their chosen field as becoming more expensive may make a compromise and change their *place* of study (where the costs of living costs are lower). This is why it makes sense to include the territorial dimension in the research. This way, smaller towns that provide study opportunities in the same fields can become increasingly attractive. Growth in attractiveness can be researched by applying the gravity model.

Finally, a third possible reason could be that governmental intervention has very little or no significant effect at all, because higher education applicants are making rather *quality* decisions (Klaczynski et al., 2001). First, they have been forming their decisions for a longer period of time – for years in some cases. Second, people get much information about the options and outcomes as high schools provide future students with a lot of information and encourage students to visit universities. And third, there is a lot of paperwork to be done at the time of the application, decisions cannot be made as quickly as e.g. a purchasing decision.[1]

A different explanation why government interventions cannot induce changes can be found in the argumentation of another stream of literature, presented by Klaczynski et al (2001). Based on survey results, these researchers argue that in some situations adolescents are just as competent decision makers as adults. Not only are their cognitive abilities (e.g. searching for information, perceiving and evaluating options) developed but they also tend to be more prone to apply decision-making heuristics and make more biased decisions as well (Jacobs & Narloch, 2001). Halpern-Felsher and Cauffman (2001) also claim that differences between the decision-making of adolescents and adults are caused rather by the decreasing importance of social factors than by improvement in their cognitive abilities. These results together with the fact that Higher Education applications count as quality decisions suggest that adolescents cannot be steered that easily.

---

[1] Although as mentioned before, once applicants choose their options they have around five months to make changes – even based on momentary decisions – regarding the institutions they have applied to.

3. THE GRAVITY MODEL

The gravity models take off from the assumption that there are general principles and regularities which can be observed in the macro human mass-based spatial movements and flows. However, this may not be valid at the individual level, because the decisions and choices are rather driven by irregular and non-conformist actions. Summarizing the vast variety of different paths will create a determinate projection; thus, the social movements and migration have already a more likely understandable shape with their own force-fields.

The analysis of the massive and systematic spatial movements does not have a long history, as it dates back to the second half of the 19th century. The people's movement between the settlements was studied by Carey and Ravenstein, who came to the conclusion that the flow between major cities is substantially more intense than the ones between small towns (Fotheringham et al., 2000). This finding was compared to the gravitational attraction force and it was also found that, due to other factors, a high degree of similarity can be observed with the law of universal gravity. This states that the force of gravitational attraction between two objects is determined by the mass and the distance of the objects in the way that it is directly dependent upon the masses of both objects and inversely proportional to the square of distance that separates their centers (Dusek, 2003).

This induced the idea of applying the gravity model to the spatial aspect. We have to underline that the law and the gravity model are similar in terms of the names. Namely, the development of the social processes' gravity model is based on the approach of physical and natural sciences. However, the theoretical support of the models is incomplete, despite it may serve for accurate estimates of spatial movements. Tamás Dusek did a very detailed study about the constraints and similarities of the gravity model and law of universal gravity (Dusek, 2003).

For the widespread use of the model to examine the social processes, one had to wait for the late 1940s and the period after the World War II onwards, when the geography and the newly 'emerging' regional economics adopted this approach. Several case studies were done in this period and based on the experiences it can be concluded that the spatial application of the model is the most suitable for areas with sparse city networks and low population density, whilst it has some considerable distortions examining territories with intense city networks and high population density. The 'golden age' of the gravity model were the 1970s, when some major summarizing and systemizing studies were done and practical applications developed. Then, for almost 20 years the model

remained in the background, it seemed to be forgotten. In the early 1990s it became popular again, especially among geography and regional economics scholars. This new interest was accompanied by the accessibility of personal computers which greatly decreased the complicated calculations and, thus, newer areas arose that could be researched. During this period the most important fields of application were connected to the relative relations of attractions and transport networks. (Nagy, 1996)

After the year 2000, different publications, mainly related to the determination of the inner attraction area of the cities, authored by G. Nagy were released. The Hungarian theoretical issues and organizing works are tied to the name of Tamás Dusek, whilst the examination of the European spatial is connected to the studies of Kincses and Tóth (2013).

Two basic areas are known for the application of the gravity model based on the physical analogy: the first is the examination of spatial flows (Filippo et al., 2012), which includes the intensity of transport links and the flows of information. The second is the delineation of attraction areas, which discovers the spatial potential of commercial units, workplaces, schools and hospitals (Kincses & Tóth, 2012).

4. METHODOLOGY

Based on the previous studies (Kovács & Sipos, 2014a, 2014b; Sipos & Kovács, 2014), we can confirm that the model has some major findings about the HE institutions' attraction area, but this is our first attempt to consider the time as a dependent variable. We use the statistical database of the higher education application data, provided by the Hungarian Office of Education for the period 2004-2014. This period includes the majority of the direct and indirect effects mentioned above, but to be able to draw conclusions from the statistical data of the different years and to keep in mind our focus, we have selected the application procedure of 2004, 2009 and 2014 and analyzed them by comparing the total dataset.

In this way, we want to grasp the influence of the changes identified in the higher education environment and those of the governmental actions. Within this context, we attempt to determine the attraction areas of the Hungarian higher education institutions offering an economic education (a total of 32 cities). Not every settlement participated in the competition of the higher education institutions, because there is a HE institution in only a small number of them.

Therefore, the relationship between some of the cities is a one-way one, while to some larger ones, it is a two-way one.
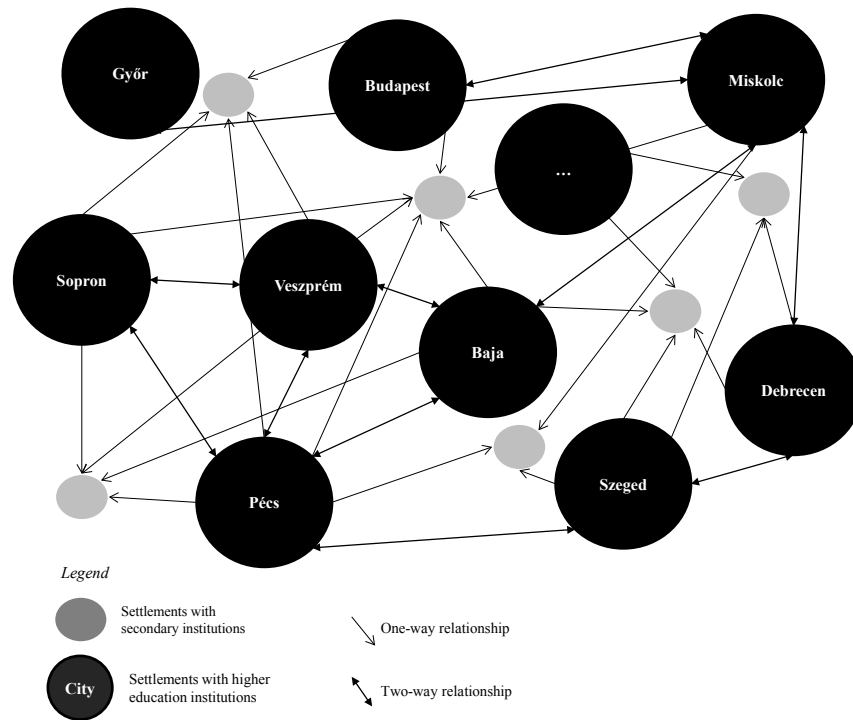

Figure 2. The Gravity Model principles in the case of the Hungarian economic education-related higher education institutions.

In the model of this study (Figure 2), there is a one-way relationship between the settlements with secondary institutions and higher education institutions' campus and two-way ones between the 32 cities. The relationship between the 'mass' and 'distance' can be examined through the analysis of the gravitational attraction. The initial equation of the study is based on the Hansen gravity model:

$$V = g(P_i x P_j) / d_{i,j}^b,$$

where:

V – the attraction potential of the Hungarian higher education institutions offering an education in economics,

P_i – the number of students admitted from settlement 'i' (capita),

P_j – the number of students admitted to 'j' higher education institution (capita),

$d_{i,j}$ – the distance between settlement 'i' and institution 'j' (km),

g – empirical constant (in the case of the law of universal gravity 1),

b – distance's exponent (in the case of the law of universal gravity 2).

By adjusting the model, we continuously reduced the exponent of the distance, which was necessary because of the fact that students do not commute from their home to the place of the higher education on a daily basis, but once a week or every two weeks (over a certain distance). It follows that its function must be reduced, because while in daily commute time and distance play a significant role, their importance decreases gradually as the commuting period is longer.

However, this assumption has not been proved during the comparison of the model's results and the statistical admission database, presumably because of the distortion caused by the input database, which contains information about the settlements of the secondary institution not the residents' ones. Therefore, in the presented versions we apply the value of 2.

The empirical constant is determined by three factors. Firstly, we categorized the settlements' population (10,000, 50,000 and 100,000 inhabitants) and equally transformed the scale from 1 to 2 (where 2 means the highest population category). Secondly, we gave a score of 2 when the sending settlements' and the HE institutions' county were the same.

Finally, we searched the local business tax of 2010 (available data), because it indicates the total sales revenue of the businesses located in the settlements. The municipalities have the right to set the tax rate and we adjusted the amount to evaluate the settlements' performance on the same basis, and then we transformed it to a scale from 1 to 2 (where 2 means the Budapest district). By calculating the average of these three factors, we received the value of the empirical constant.

5. RESULTS OF THE ANALYSES

When the model was run with the above detailed parameters, the results greatly confirmed the previous hypothesis. Namely, the most important institutions in Hungary are in the capital; the provincial HE institutions have smaller county or region-level attraction areas. The colleges have even smaller effect, mainly reduced to their local settlement and the very close agglomeration

area. On the full dataset of 2004-2014, Budapest had the highest attraction value of more than 46% of the 282 settlements in the study (we differentiated between the 23 Budapest districts).

Surprisingly, Nyíregyháza was second, although it is not a classical university and it was expected that it would be only local, but it was strong - not only in its home county (Szabolcs-Szatmár-Bereg), as well as in the vicinity. A bigger institution (Pécs) occupies the third place.

The different institutions are indicated with a unique shape combination for better visualization. In the 11-year average, a total of 4 institutions (Esztergom, Piliscsaba, Vác, Zsámbék) were unable to form their own attraction areas, because there are bigger institutions in the vicinity (Figure 3).
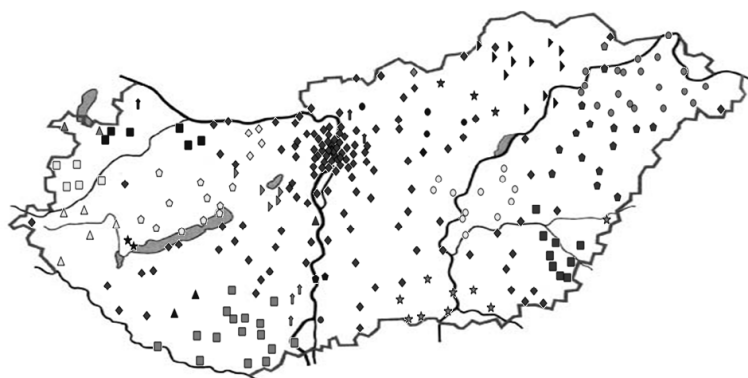
Legend:

● Baja	● Baja	● Baja	● Baja	● Baja	● Baja
■ Békéscsaba	■ Békéscsaba	■ Békéscsaba	■ Békéscsaba	■ Békéscsaba	■ Békéscsaba
◆ Budapest	◆ Budapest	◆ Budapest	◆ Budapest	◆ Budapest	◆ Budapest
⬠ Debrecen	⬠ Debrecen	⬠ Debrecen	⬠ Debrecen	⬠ Debrecen	⬠ Debrecen
▲ Dunaújváros	▲ Dunaújváros	▲ Dunaújváros	▲ Dunaújváros	▲ Dunaújváros	▲ Dunaújváros

Figure 3. The Gravity Model's result of the economic formation centres, 2004-2014

In the last decades, Hungarian higher education has faced several changes. Therefore, the aggregated analysis can lead to false conclusions and we have to look deeper to understand the tendencies. In order to discover the differences, we compare the data of 2004, 2009 and 2014 in a summarizing table (Table 1).

Table 1. Analysis of the model reliability

	2004-2014	**2004**	**2009**	**2014**
Identical	214	172	187	195
Different	68	81	70	64
- Budapest	*33*	*40*	*29*	*31*
Total	282	253	257	259
Percentage	75.89%	67.98%	72.76%	75.29%

Based on the gravity model of 2004, Budapest had the greatest area (108). It was followed by Nyíregyháza (23), Szolnok (19) and Békéscsaba (15) (Figure 4). Both of the latter settlements lost the majority of their territories after the introduction of the Bologna Process, while Debrecen, Pécs, Szeged and Veszprém increased their attraction area (Figure 5) to a significant level.

Currently (application procedure of 2014) Nyíregyháza is the 5th, Szolnok is the 6th and Békéscsaba is the 9th in the ranking, while Debrecen, Pécs and Miskolc became the biggest of the provincial HE institutions. In 11 years, the attraction area of Szombathely was totally lost, due to the steadily growing potential of Budapest, Győr and Sopron. (Figure 6).
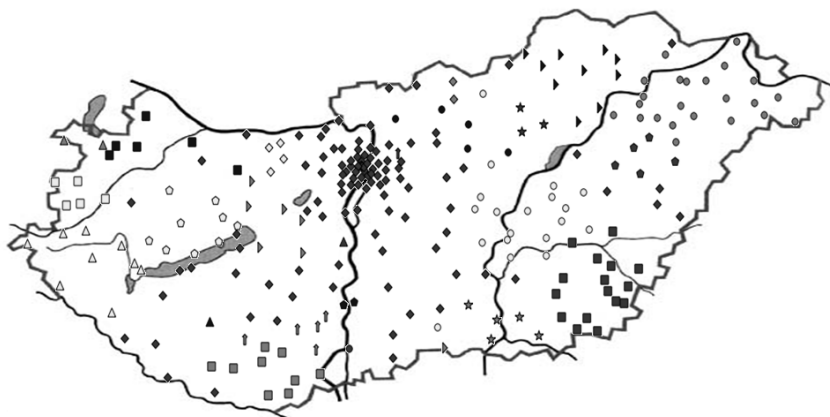

Figure 4. The Gravity Model's result of the economic formation centres, 2004.
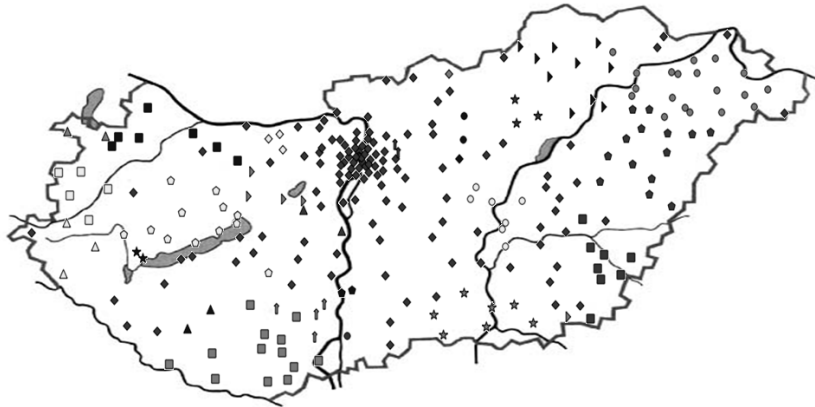
Figure 5. The Gravity Model's result of the economic formation centres, 2009

We emphasize that a significant difference can be observed between the Eastern and Western settlement structure of Hungary, because the Great Plains are characterized by rare but relatively big settlements, whilst in the other parts of the country the contrary is true, as the city network is dense, but the settlements are relatively small.
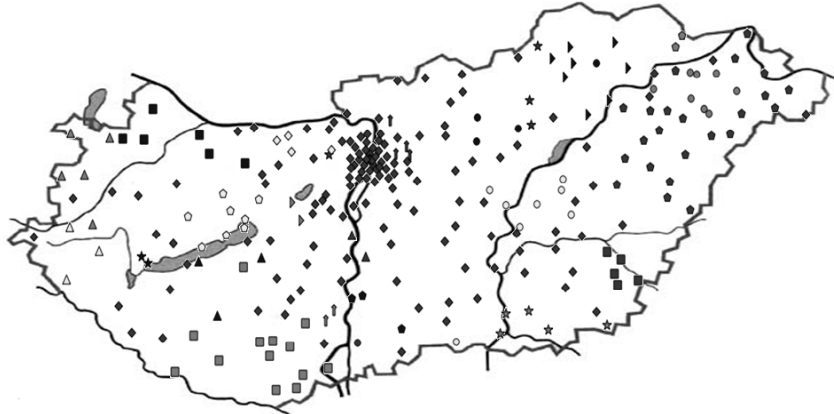

Figure 6. The Gravity Model's result of the economic formation centres, 2014.

The model used the size of the settlements but not their density when calculating. Therefore, HE institutions operating in areas with lower number of cities will have fewer potential scores. To eliminate this distortion, we have to

analyze not only the results of the model but the potential volume of the HE candidates.

To determine the reliability of the model, we have to compare our results, based on the potential scores and the number of admitted students; namely whether high school graduates from a given settlement (with college) pursued their studies mostly in the model-proposed city with an HE institution or not. In the period from 2004 to 2014, students from 282 settlements were successfully admitted to the higher education institutions and the potential scores in 214 cases had the same result, which means that the general reliability is 75%. The accuracy of the model increases with years, probably due to perceived quality improvement in the distance transport caused by the infrastructural investments. Therefore, current distances and those from 2004 could be substantially different (as previously demonstrated by Table 1).

The errors of the model primarily derive from the really strong attraction capability of the capital. In Budapest, many HE institutions are concentrated, their attraction force is cumulated and they act as a big consortium, thus reducing the role of distance. In 45% of the errors, the main factor is the attraction area of Budapest, in 8 settlements in every examined period the higher education candidates choose Budapest and not the HE city suggested by the model. The rest of the errors are mainly found in the border of the other HE institutions' attraction area.

6. CONCLUSION

Higher education faced several changes in the last decades, which reshaped the existing patterns and institutional auto declaration. Demographic changes, the spread of online courses, the globalization and internationalization of the HE sector, the acceleration of the knowledge obsolescence cycle, the newly emerging needs of new generations and the fiscal capabilities of the governments are all so severe and fundamental factors that the HE institutions cannot afford to remain further more in the 'Ivory Tower'. Even in Hungary we are living the effects of these factors as the 'golden age' of the millennium is over, higher education needs to be redefined.

The governments have different tools to divert the intentions of the HE candidates from using lightly influencing libertarian paternalistic methods to an almost deterministic taxation policy in the education. In Hungary, students still study at HE institutions that offer a degree in economics, in spite of government's efforts which can mean that adolescents cannot be steered that easily or that their

decision-making is directed by social factors, rather than by the changes in their cognitive abilities.

Therefore, the spatial application of the universal law of gravity can be useful to analyse the attraction areas of a higher education institution, because the distance and the non-conformity of a non-residential higher education participation can be viewed as a quality decision. Besides, the study uses objective HE applicants' data. The results of this approach are likely to fit a model in the determination of the HE institutions' attraction area.

Based on the results of the Hungarian economics education, it is clearly visible that there is a dynamic growth in the attraction areas of Budapest and Debrecen, whilst this causes a dramatic fall in the Békéscsaba, Nyíregyháza and Szolnok areas. Debrecen's development is connected to the setback of the Nyíregyháza and Békéscsaba areas, and Budapest attained territory from Szolnok. The dominance of the capital is indisputable and so is the applicants' tendency to apply to HE institutions in Budapest. On the other hand, the classical provincial institutions could strengthen their positions in their regions and smaller colleges could strengthen theirs in their local and narrow agglomeration areas. The role of a HE institution in the local economy is really important, but its viability greatly depends on demographic characteristics of the region. This way, they are restricted to their territories and a bigger change in the applicants' tendency affects greatly their operation area in their enrollment activities. The reliability of the model is more than 75%, which is a rather good ratio in social sciences.

In the gravity model, the parameter of the distance affecting the gravitational force varies along the spatial coverage of the settlements. Its score can be adjusted by involving other factors. In order to obtain further even more accurate estimates of the empirical constants, other relevant aspects may be taken into consideration, but preserving the simplicity and clarity of the model during the process. On the one hand, human decisions are not always characterized by rationality, thus, the results and the reality can be different. On the other hand, our research in this phase highlights the higher education institutions that hold the best position. Nowadays, the competition is even fiercer not only between institutions but also between students. Therefore, not only the second's, but the third position's potential is significant and we should take that into consideration.

REFERENCES

1. Balogh, G., & Farkas, F. (2013). Tehetségek menedzselése a PTE KTK-n: Y-generációs hallgatók a szervezetekben (Talent management at the UP-FBE: Y-generation students in the organizations). *Marketing és Menedzsment*, *43*(2), 62 – 75.

2. Barakonyi, K. (2010). A felsőoktatás versenyképességéről (About the competitiveness of the higher education). *Vezetéstudomány*, *12,* 4 – 19.

3. DesJardins, S. L., Ahlburg, D. A., & McCall, B. P. (2006). An integrated model of application, admission, enrollment, and financial aid. *The Journal of Higher Education*, *77*(3), 381 – 429.

4. Dusek, T. (2003). A gravitációs modell és gravitációs törvény összehasonlítása. (The comparison of the gravity model and the universal law of gravity). *Tér és Társadalom*, *17*(1), 41 – 58.

5. European Commission (2010). *Communication from the Commission. Europe 2020. A European strategy for smart, sustainable and inclusive growt*h, http://ec.europa.eu/eu2020/pdf/COMPLET%20EN%20BARROSO%20%20%20007%20-%20Europe%202020%20-%20EN%20version.pdf [Accessed March 3, 2015]

6. Felvi.hu: http://felvi.hu [Accessed March 5, 2015]

7. Filippo, S., Maritan, A., & Néda, Z. (2012). *Human Mobility in a Continuum Approach*, http://arxiv.org/pdf/1206.4359.pdf [Accessed February 25, 2015]

8. Fotheringham, A. S., Brunsdon, C., & Charlton, M. (2000). *Quantitative geography*, London: SAGE Publication

9. Halpern-Felsher, B. L., & Cauffman, E. (2001). Costs and benefits of a decision: Decision-making competence in adolescence and adults. *Applied Developmental Psychology*, *22*, 257 – 273.

10. Jackson, G. A. (1978). Financial Aid and Student Enrollment. *The Journal of Higher Education, 49* (6), 548 – 574.

11. Jacobs, J. E., & Narloch, R. H. (2001). Children's use of sample size and variability to make social inferences. *Applied Developmental Psychology*, *22*, 311 – 331.

12. James, R., Baldwin, G., & McInnis, C. (1999). *Which University?: The factors influencing the choices of prospective undergraduates*, Department of Education, Training and Youth Affairs 99/3.

13. Jolls, C., Sunstein, C. R., & Thaler, R. H. (1998). A behavioural approach to law and economics. *Stanford Law Review, 50* (5), 1471 – 1550.

14. Kincses, Á., & Tóth, G. (2012). Gravitációs modell alkalmazása a térszerkezet vizsgálatára (The application of the gravity model to analyze spatial structure). *Területi Statisztika*, *15* (52), 479 – 491.

15. Klaczynski, P. A. (2001). Framing effects on adolescent task representation, analytic and heuristic processing, and decision making: Implications for the normative/descriptive gap. *Applied Developmental Psychology*, *22*, 289 – 309.

16. Kovács, Sz., & Sipos, N. (2014a). A pécsi egyetemisták "vándorlása" (The 'migration' of the University of Pécs students), In: Kuráth, G. – Héráné Tóth, A. – Sipos, N. (eds.): *PTE Diplomás Pályakövető Rendszer tanulmánykötet 2014 (UP Graduduate Career Tracking System proceedings 2014),* Pécs: Pécsi Tudományegyetem, 47 – 62.

17. Kovács, Sz., & Sipos, N. (2014b). Az Eötvös József Főiskola helye és szerepe a magyar felsőoktatásban (The role and place of the Eötvös József College in the Hungarian higher education). *Sugo Szemle*, *1* (2), 54 – 69.

18. KSH (2014). *Oktatási befektetések (2003–2012) (Public spending on education, 2003–2012),* http://www.ksh.hu/thm/2/indi2_2_2.html [Accessed March 3, 2015]

19. KSH (2015). *Oktatás 1960-* (Education 1960-), http://www.ksh.hu/docs/hun/xstadat/xstadat_hosszu/h_wdsi001b.html [Accessed February 18, 2015]

20. Loewenstein, G. – Weber, E. U. – Hsee, C. K. – Welch, N. (2001). Risk as feelings, *Psychological Bulletin*, *127*(2), 267 – 286.

21. Magyar Közlöny (2011). *Magyarország Alaptörvénye (Fundamental Law of Hungary),* http://www.magyarkozlony.hu/pdf/11546 [Accessed February 12, 2015]

22. Magyar Közlöny (2012). 1007/2012. (I. 20.) *Kormány határozat: A 2012-ben a felsőoktatásban felvehető, államilag támogatott hallgatói létszámkeretről (Government resolution 1007/2012 (I. 20.) on the number of state funded places in higher education in the academic year 2012/13),* http://www.kozlonyok.hu/nkonline/MKPDF/hiteles/MK12006.pdf [Accessed February 11, 2015]

23. Máté, G., Néda, Z., & Benedek, J. (2011). *Spring-Block Model Reveals Region-Like, Structures*. http://journals.plos.org/plosone/article?id= 10.1371/journal.pone.0016518 [Accessed February 2, 2015]

24. Nagy, G. (1996). A gravitációs modell alkalmazási lehetőségei a településen belüli mozgások tanulmányozására (The application possibilities of the gravity model to study inner settlement-movements). *Tér és Társadalom*, *10* (2 – 3), 149 – 156

25. Oktatási Hivatal (2015). http://www.oktatas.hu/felsooktatas/ felsooktatasi_statisztika [Accessed March 2, 2015]

26. Samuelson, W., & Zeckhauser, R. J. (1988). Status Quo Bias in Decision Making. *Journal of Risk and Uncertainty*, *1*(1), 7 – 59.

27. Sipos, N., & Kovács, Sz. (2014). The South-Hungarian higher education institutions' agglomeration based on the gravity model, in: Csata, A. – Fejér-Király, G. – György, O. – Kassay, J. – Nagy, B. – Tánczos, L. J. (eds.): *11th Annual International Conference on Economics and Business: Challenges in the Carpathian Basin: Global Challenges, Local Answers,* Csíkszereda: Sapientia Hungarian University of Transsylvania, May 16-17, 2014, 929 – 942.

28. Sipos, N., & Kuráth, G. (2013). The Graduate Tracking and Attainment Model at the University of Pécs. *Journal of Education, Culture and Society, 2*, 247 – 261.

29. Thaler, R. H., & Sunstein, C. R. (2003). Libertarian paternalism. *American Economic Review* - Papers and Proceedings, 175-179.

30. Thaler, R. H., & Sunstein, C. R. (2008). *Nudge: Improving Decisions About Health, Wealth, and Happiness*.Yale University Press, New Haven & London.

31. Törőcsik, M. (2011). „…Már megint egy érthetetlen, új generáció – értékek, trendhatások, trendcsoportok ('…Yet another incomprehensible, new generation – values, trend effects, trend groups), in: Kilár, F. (ed.): *Mandulavirágzási tudományos napok: Velünk élő kémia - a kémia éve (The chemistry living with us – the year of the chemistry),* Pécs: Pécsi Tudományegyetem, from February 28 to March 4, 2011, 11 – 19.

32. Tversky, A., & Kahneman, D. (1981). The Framing of Decisions and the Psychology of Choice. *Science*, *211,*453 – 458.

33. Veroszta, Zs. (2010). *Felsőoktatási értékek - hallgatói szemmel. A felsőoktatás küldetésére vonatkozó hallgatói értékstruktúrák feltárása. (Higher educational values – from a student perspective. The revelation of the student value structure regarding the higher education mission),* PhD dissertation.

MIGRACIJE STUDENATA EKONOMIJE U MAĐARSKOM VISOKOŠKOLSKOM OBRAZOVANJU

Sažetak

Mađarsko visoko obrazovanje se suočavalo s nekoliko strukturnih izazova od promjene sustava 1990. godine. Čini se da je „zlatno doba" gotovo i da vlada želi uvoditi značajna ograničenja za visokoškolske institucije, s obzirom na broj studenata, čiji se studij financira iz javnih sredstava, minimalan broj bodova potrebnih za upis, kao i u svezi misija samih institucija. Ovi novi čimbenici djeluju na upisnu proceduru, s obzirom da

studenti žele postići najbolju kombinaciju cijene i vrijednosti na obrazovnom tržištu, što dovodi do internih i eksternih migracija. U ovom se radu analiziraju interne migracije pomoću analize aglomeracija visokoškolskih institucija. Koristi se modificirani univerzalni zakon gravitacije, kako bi se prikupile informacije o društvenim, odnosno ekonomskim fenomenima. Na razini pojedinca, odluke mogu biti slučajne, ali na kolektivnoj razini, one mogu poprimiti obilježja, utemeljena na određenim principima, odnosno pravilima. U ovom se radu proučavaju promjene aglomeracijskih područja i ograničavajućih čimbenika u periodu između 2004. i 2014., za više škole i sveučilišta, koja nude ekonomsko obrazovanje. Ovaj je period relevantan za utvrđivanje specifičnosti i različitih oblika djelovanja tržišnih, političkih i globalnih trendova te identificiranja prostornog utjecaja pojedinih institucija.