



# University Admission Practices – Hungary

Péter Biró<sup>1</sup>

## Relevant country background

Higher education is regulated at the national level in Hungary. Most universities and colleges are publicly funded, with a small number of universities which are privately owned or run by Churches. Higher education is free of charge in principle (there were some attempts to introduce fees for all, but they failed). There is, however, a quota for state-financed places and all students who cannot fit in this quota (or want to take more than one degree) have to pay some contribution. This contribution corresponds approximately to the minimum monthly wage (around 300 EUR) charged for each semester. For indication on the numbers, in the last main matching round in 2011, the total number of applicants was 140,953 and 125,733 of them applied for state-financed places. The total number of students admitted was 98,003 and 66,906 of them got a state-financed place (thus around 31,000 students are charged fees for their studies at programmes starting in September 2011).

In accordance with the Bologna process, the Hungarian higher education system has switched to the Bachelor-/Master system. Students receive a Bachelor's degree after 3 to 4 years and a Master's degree usually takes 2 additional years, except for medical and law studies where no BSc degree is granted.

Admissions have been organised via a centralised matching scheme since 1985. In the current system three matching rounds are conducted every year, starting from 2008. The main round is in spring, finishing with the announcement of the score-limits in July. There is an additional round at the end of the summer for unfilled programmes which starts in September, and the third matching round is conducted in the winter for students who want to start their MSc studies in February. In 2010, the number of applicants in the above three matching rounds were 140,308, 13,789 and 7,483, respectively.

---

*“Matching in Practice” is a research network that brings together the growing community of researchers in Europe working on the various aspects of assignment and matching in education and related labour markets.*

*These country profiles are part of a collective effort by network members to map matching practices across Europe*

*[www.matching-in-practice.eu](http://www.matching-in-practice.eu)*

---

<sup>1</sup> Hungarian Academy of Sciences - Mechanism design research unit, [biro.peter@krtk.mta.hu](mailto:biro.peter@krtk.mta.hu)

The matching scheme is based on a centralised scoring system. The students apply for BSc or MSc programmes. Their scores are coming from their secondary school grades and from their maturity exams. Regarding the latter, students can choose between normal or high levels. Volunteering for a high level exam may result in extra scores, but these are more difficult to pass. A new government regulation proposes to make high level exams compulsory in those subjects which are relevant for the programme the student applied for. Exams are centralised, but a student may have different scores for different programmes, as only the relevant subjects are considered (e.g. for computer science programmes, the grades and exam scores for physics are counted, but for economics history is considered instead, besides the main subjects – such as math, Hungarian literature and grammar). Extra scores can be obtained if the applicant has a certificate in some languages, or had good results in national or international competitions (not just scientific, but also sports or art), or because of social and medical conditions (e.g. young mothers and disabled people get priority).

Note that the scoring system was less centralised before 2000. For example, universities could hold interviews. The reason for having a centralised scoring method based only on common exams is the presence of national quotas set by the government in each subject (e.g. in computer science only the best 3,000 applicants can study for free every year). So the performance of these students, who want to get state-financed places in a subject, must be comparable even if they apply to different universities.

Students may apply for any number of programmes, although they are charged a fee for every item (about 10 EUR) after the third application. This might be a reason why the average length of the preference lists is 3.5 and not higher (see [5] on this issue). The applicants also indicate whether they are willing to pay the contribution or whether they are applying for a state-financed place regarding each programme in their lists. (For example, the first choice of a student may be a state-financed place in an Economics BSc programme at university A, her second choice might be another state-financed place at university B but her third choice can be a privately-financed place in the Economics BSc programme again at university A and so on.) In other words, students may be admitted to a programme under two kinds of contracts (either they pay a contribution or not) and their preference lists are on possible contracts.

The quotas for each programme are set by the universities in agreement with the responsible Ministry. A specificity of the Hungarian system is that universities can set also lower quotas for each programme they offer and if the lower quota is not filled then the programme is cancelled. Besides the lower and upper quotas for each programme, which apply for both the state-financed and privately-financed students, there are upper quotas in each subject set by the government for the total number of students admitted for state-financed studies.

The centralised matching is run by a non-profit governmental organisation (called *Educatio Kht*) which announces the score-limits for all programmes regarding both the state-financed and privately-financed places. Each student is admitted to the first programme on her list where she achieves the score-limit. Score-limits for state-financed places are higher than for privately-financed places, so those who are willing to pay a contribution can get admitted more easily. An interesting by-product of the matching system is that the score-limits are actually very good indicators of the quality and popularity of the programmes, and they highly correlate with the students' preferences and with the job market perspective of the graduates.

## Summary box

Organization of higher education	Mostly public universities, some universities run by Churches and a small number of private universities.
Stated objectives of admissions policy	Freedom of choice. Free studies for the best students only, with a governmental control on the number of students in each subject. Further students can also be admitted if they pay a contribution.
Who's in charge of admissions?	A non-profit governmental organisation.
Admissions system in place since	1985, but has been reformed several times, the last significant change was in 2007.
Available capacity	The quotas are determined for each programme by the universities in accordance with the Ministry. Universities may also set lower quotas. National quotas for state financed places are set by the government in each subject.
Timing of enrolment	There are three matching rounds. The main one terminates in July and an extra matching run is conducted in August for the remaining places. Finally there is a third run for MSc programmes starting in spring.
Information available to students prior to enrolment period	All the relevant information about the programmes is available in a centrally published booklet. The central website contains detailed information on the past matching rounds, including the quotas, the number of students who applied/ who got admitted, the final score-limits, and many additional statistics.
Restrictions on preference expression	There is no restriction, but the applicants are charged for every item in their lists after the third one.
Matching procedure	A score-limit algorithm based on the student-proposing Gale-Shapley algorithm. The students apply for programmes, and the algorithm generates a score-limit for each programme (different score-limits for state-financed and privately financed places). Every applicant is admitted to the first place where she achieves the score-limit.
Priorities and quotas	The scores of the students are coming from their grades and central entrance exams, with some additional scores for competitions, language certificates, or social and medical conditions.
Tie-breaking	There is no tie-breaking, students with equal scores are either rejected or accepted together ('equal treatment policy').
Further special feature	Students may apply for a pair of programmes in the case of teaching studies. The matching problem induced by this feature has the same nature as the resident allocation problem with couples.

## Description of current practices

The current matching scheme is based on the student-proposing Gale-Shapley algorithm. But it has at least four special features:

1. Ties can occur, since students applying for the same programme may have equal scores. The attempted solutions are the so-called stable score-limits, which satisfy the condition that we cannot decrease the score-limit of any over-demanded programme without violating its quota. This means that the last group of student applying to a programme with the same score, with whom the quota would be exceeded, are all rejected. See related theoretical results in [1].
2. In addition to the upper quotas some colleges may have lower quotas as well. This feature has been studied in [2]. The bad news is that for a reasonable stability concept the existence of a stable solution is not guaranteed any more, and the related problem is NP-hard.
3. Some sets of colleges may have common upper quotas. This feature has been studied also in [2]. The presence of common quotas does not necessarily ruin the nice properties of the college admissions problem. In fact, when the set system is so-called 'nested' then a stable solution is guaranteed to exist and a generalised Gale-Shapley method finds a stable solution. This was the case in the Hungarian application until 2007. Since then the corresponding set system is not nested any more, a stable solution may not exist and the related problem is NP-hard.
4. Students can apply for pairs of teaching programmes (e.g. to become teachers in both math and physics). This problem is closely related to a well-known problem of resident allocations with couples where junior doctors may form couples and submit joint applications for pair of positions. See a survey on the latter problem [4]. Note that this feature also implies that stable solution may not exist and makes the related computational problem NP-hard.

Since the current model of the application embeds NP-hard computational problems because of three special features from the above four, it is reasonable to use different heuristics in practice. The score-limit algorithm used by Educatio Kht is based on the student-proposing Gale-Shapley mechanism (see [1]). There are however, additional adjustments because of the common quotas (essentially the students who do not fit in the national quotas are rejected), paired applications (if one application from a paired application is rejected then the other must be withdrawn as well). Furthermore, the lower quotas are obtained by the following heuristics. If at a certain point of the program some lower quotas are violated then the algorithm selects a programme where the number of admitted applicants per lower quota ratio is the lowest and closes the programme. All the programmes closed during the execution of the algorithm will be cancelled.

## Recent policy change

There was a policy change in 2007 which induced significant changes to the algorithm as well. Until 2007 each programme had separate quotas for state-financed and privately-financed student. E.g. a particular programme could have 450 places for state-financed students and 50 places for privately-financed ones. Since 2007, there is only a common quota for these students (e.g. 500 places for both kinds of students), keeping the national quotas for state-financed places. The theoretical consequence of this change was that the set system lost its 'nested' property and the existence of a stable solution is not guaranteed any more, making also the computational problem NP-hard (see [2] for details). In practice, good universities attract even more state-financed students (e.g. from the 500 places at one year 492 were occupied by state-financed students and only 8 by privately financed ones – as this was a prestigious programme), however, less prestigious (usually smaller or rural universities) got less state-financed students and worse students in general.

Another change in the algorithm was that its orientation has been switched. Until 2007 the algorithm was based on the college-proposing Gale-Shapley mechanism and since then it uses the applicant-proposing version, providing lower stable score-limits, which is more favorable to the students, see [1].

The current government proposes significant changes in higher education which is likely to affect the admission procedure. The proposal is now under debate.

## Perceived issues

The Hungarian university admission system is performance-based. This may be considered fair, since in principle every student has an equal opportunity to get a free place in higher education. However, coming from a stronger secondary school or from a highly educated family will increase the chances of some students, whilst those coming from less educated families and weak schools are unlikely to get admissions to prestigious universities. Especially the extra points given for language certificates are seen as unfair for students coming from poor families, as usually the normal language classes offered at secondary schools are not enough to pass state language exams. Thus, those who can afford to have private lessons have an advantage.

The existence of state-financed and privately-financed places can also be seen as unfair, as students coming from wealthy families can get admission to better places by paying the contribution. However, most people do not see this as a big issue, as the number of state-financed places are relatively high at the moment (about 2/3 of the total seats – although this is going to be reduced according to the new governmental proposal). Also it is possible to get state-supported student loans, which helps everyone cover the costs of the studies, including the contribution if needed.

Given the demographic decline of the country, the number of students leaving secondary schools is going to decrease from now on. Thus if the quotas remain the same then the number of unfilled places will increase, especially at less prestigious or rural universities. This will inevitably lead to the closing down of some universities. Meanwhile, the new government proposal indicates a strict plan to reduce the number of state-financed places, partly because of the financial crisis that hit Hungary rather hard. This may speed up the above restructuring process, although the government is in favour of keeping the rural universities, so special policies are likely to come in the new regulation.

The government can also influence the number of students in different subjects through the national quotas for state-financed places. The engineering quotas have been increased and other quotas (especially for humanities) have been reduced in the past years, by saying that this is what the industry and the national economy needs. However, the raised quotas led to smaller score-limits in some engineering programmes, meaning that some weak students have been admitted. This has been seen as a problem by some prestigious universities, as they want to keep the high standards of their education (and this is also not always good for the weak students who are struggling and often drop out from these programmes). A possible solution would be to give the universities the right to impose additional admission criteria (e.g. not allowing admissions for engineering studies to those whose exam results were poor in maths, even if their total score is relatively high) or to set higher score-limits than the algorithm would output, even if their quotas remain unfilled.

## Existing data

Statistics are available at [6]. The complete (but encoded) data of a matching round in 2008 has been made available to Biró et al. [2] for their study.

## Legal texts

2005. évi CXXXIX. törvény a felsőoktatásról.

[http://net.jogtar.hu/jr/gen/hjegy\\_doc.cgi?docid=a0500139.tv](http://net.jogtar.hu/jr/gen/hjegy_doc.cgi?docid=a0500139.tv)

## Other resources and references

[1] Péter Biró. Student Admissions in Hungary as Gale and Shapley Envisaged. Technical Report. Dept of Computing Science, University of Glasgow, TR-2008-291 (2008).

[2] Péter Biró, Tamás Fleiner, Robert W. Irving and David F. Manlove. The College Admissions problem with lower and common quotas. *Theoretical Computer Science* 411, 3136-3153 (2010).

[3] Péter Biró, Tamás Fleiner. A magyarországi felvételi algoritmusok rövid bemutatása. (A short introduction to the algorithms used in Hungarian admissions systems). (2008).

[http://www.felvi.hu/felsooktatasihely/archivum/Algoritmusok/a\\_magyarorszagi\\_felveteli\\_besorolo\\_algoritmusok\\_rovid\\_bemutatasa](http://www.felvi.hu/felsooktatasihely/archivum/Algoritmusok/a_magyarorszagi_felveteli_besorolo_algoritmusok_rovid_bemutatasa)

[4] Péter Biró, Flip Klijn. Matching with couples: A multidisciplinary survey. Discussion Paper, Institute of Economics, Hungarian Academy of Sciences, MT-DP-2011/39 (2011).

[5] L.Á. Kóczy, A magyarországi felvételi rendszerek sajátosságai. *Közgazdasági Szemle* 57:(2) pp. 142-164. (2010), in Hungarian.

[6] Central web-portal for Hungarian higher education admissions. [www.felvi.hu](http://www.felvi.hu)

## MiP Country Profiles downloadable from [matching-in-practice.eu](http://matching-in-practice.eu)

- MiP Country Profile 1. Cantillon, Estelle (2011), [Matching practices for elementary schools – Belgium \(French-speaking region\)](#).
- MiP Country Profile 2. Kübler, Dorothea (2011), [University admission practices – Germany](#).
- MiP Country Profile 3. Irving, Rob (2011), [Matching practices for entry-labor markets – Scotland](#).
- MiP Country Profile 4. Kiselgof, Sofya (2011), [Matching practices for universities – Ukraine](#).
- MiP Country Profile 5. Biró, Péter (2011), [University admission practices – Hungary](#).
- MiP Country Profile 6. Biró, Péter (2012), [Matching practices for secondary schools – Hungary](#).
- MiP Country Profile 7. Chen, Li (2012), [University admission practices – UK](#).
- MiP Country Profile 8. Chen, Li (2012), [University admission practices – Ireland](#).
- MiP Country Profile 9. Cantillon, Estelle and Koen Declercq (2012), [University admission practices – Belgium](#).
- MiP Country Profile 10. Chen, Li (2012), [Matching practices for elementary schools – Ireland](#).
- MiP Country Profile 11. Chen, Li (2012), [Matching practices for secondary schools – Ireland](#).
- MiP Country Profile 12. Manlove, David (2012), [Matching practices for primary and secondary schools – Scotland](#).
- MiP Country Profile 13. Merlino, Luca Paolo and Antonio Nicoló (2012), [Matching practices for elementary schools – Italy](#).
- MiP Country Profile 14. Merlino, Luca Paolo and Antonio Nicoló (2012), [Matching practices for secondary schools – Italy](#).
- MiP Country Profile 15. Merlino, Luca Paolo and Antonio Nicoló (2012), [University admissions practices – Italy](#).
- MiP Country Profile 16. Hiller, Victor and Olivier Tercieux (2013), [Matching practices in secondary schools – France](#).
- MiP Country Profile 17. Calsamiglia, Caterina (2014), [Matching Practices for elementary and secondary Schools – Spain](#).
- MiP Country Profile 18. Lauri, Triin, Kaire Põder, and André Veski (2014), [Matching practices for elementary schools – Estonia](#).
- MiP Country Profile 19. Salonen, Mikko A.A. (2014), [Matching practices for secondary schools – Finland](#).
- MiP Country Profile 20. Terrier, Camille (2014), [Matching practices for secondary public school teachers – France](#).
- MiP Country Profile 21. Basteck, Christian, Katharina Huesmann, and Heinrich Nax (2015), [Matching practices for secondary schools – Germany](#).
- MiP Country Profile 22. Cantillon, Estelle (2015), [Matching practices for secondary schools – Belgium \(French-speaking region\)](#).