



# University Admission Practices – Germany<sup>1</sup>

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## Relevant country background

Education in Germany is only partially regulated at the national level through federal law (Hochschulrahmengesetz, HRG). Most education issues are determined by the 16 German states (Bundesländer). Thus, each state has its own law that complements the federal rules (e.g. Berliner Hochschulgesetz (Berl HG) or Bayerisches Hochschulgesetz (BayHSchG)).

Universities are publicly funded, with a small segment of private universities. Until 2005, the HRG prohibited tuition fees for public universities. In June 2005, the German constitutional court (BVerfG) declared this ban to be an unconstitutional intervention into the legislative powers of the German states. Following this decision, many states introduced a tuition fee for their universities (around 500 EUR per semester) in the years of 2006 and 2007. By 2014, all states have abolished the tuition fees again, mainly due to widespread opposition based on the reasoning that higher education should be free of charge in order to attract students from poorer families.

As envisioned in the Bologna process, most subjects offered by German universities are taught in the Bachelor/Master system. Students receive a Bachelor's degree after 3 to 4 years of study. Getting a Master's degree usually takes another 1 to 2 years. Exceptions are subjects that qualify graduates for jobs that are either directly provided by the state (e.g. teachers, judges) or are subject to tight state regulation (e.g. doctors, pharmacists, dentists, lawyers). In these subjects students have to pass a state examination (Staatsexamen) at the end of their studies, and the duration of studies is typically longer than for other subjects.

For most of the 20<sup>th</sup> century, access to universities in Germany was based on the principle that every student who passes the university entrance qualification *Abitur* is guaranteed a seat at the university and program of her choice. However, in the 1960s entry barriers were introduced based on the final grade in the *Abitur* (*numerus clausus*) as a response to excess demand for seats in medicine. To allocate seats in medicine and other programs for which several universities faced excess demand, a central clearinghouse was established in 1972, called ZVS (Zentralstelle für die Vergabe von

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Studienplätzen). According to the HRG, the centralized clearinghouse should be employed for all subjects where the total number of applicants is expected to exceed the total number of seats at German public universities.

The number of subjects administered by the clearinghouse increased constantly in the 1980s and 1990s due to the generation of the baby boomers. However, starting in 2000 the number of subjects was reduced significantly. This was in part due to lower numbers of applicants, but also to the universities' decisions to select students themselves for the newly created Bachelor and Master programs, e.g. in biology and psychology. The decision whether a subject was included in the central clearinghouse or left to the decentralized market was taken by representatives of the states and the universities. By 2005, the only subjects administered by the clearinghouse were medicine, pharmacy, dental medicine, veterinary medicine, and psychology (until 2010/11). For these programs, the principles of the centralized procedure are regulated by law. This procedure is analyzed by Braun, Dwenger and Kübler (2010), Westkamp (2013), and Braun, Dwenger, Kübler and Westkamp (2014).

Congestion problems followed the decentralization of the admissions process and the decline of the clearinghouse for subjects other than medicine and related subjects. Every year, many seats in overdemanded programs could not be filled due to long-lasting move-up procedures with many rounds of new offers being made after rejections. As a response, a re-organization and re-naming of the clearinghouse to Stiftung für Hochschulzulassung was completed in 2008. The clearinghouse was turned into a foundation with the objective to serve the interests of universities.

A new admission procedure was introduced to be run in parallel to the centralized procedure for medicine and related subjects, called DoSV (literally meaning dialogue-oriented service procedure). It was first implemented in 2012. Participation is optional for the universities who typically use it only for a subset of their programs. The universities can decide upon their own enrolment policy and selection criteria within the legal framework of the state, with the final grade from high school (Abitur) being the main criterion.

In the following, the two procedures run by the central clearinghouse (Stiftung für Hochschulzulassung) will be described, namely (a) the procedure for medicine and related subjects, and (b) the DoSV. Furthermore, the decisions of universities to admit students in a decentralized fashion will also be accounted for, as part (c).

## Summary box

Organization of higher education	Mostly public universities; a small number of private universities
Stated objectives of admissions policy	<p>(a) Seats are reserved for students with best grades (20%) and students with long waiting times (20%) (priority-based part of the procedure); remaining places (60% + empty seats from first two quotas) allocated on basis of universities' preferences (two-sided part of the procedure). The two parts are administered sequentially in the aforementioned order.</p> <p>(b) + (c) Admissions criteria chosen by universities within the rules set by the states.</p>
Who's in charge of admissions?	<p>(a) and (b) Clearinghouse.</p> <p>(c) Universities.</p>
Admissions system in place since	<p>(a) 1972, with several changes.</p> <p>(b) 2012</p>
Available capacity	Capacity is determined for each subject at a university as the number of students a university has to admit per professor (see <i>Kapazitätsverordnung KapVO</i> ).
Timing of enrolment	<p>(a) Clearinghouse sets uniform date for applications.</p> <p>Admission letters for the priority-based part of the matching procedure are sent out about two months before the semester starts; admission letters for the two-sided part are sent out about one month later.</p> <p>(b) Clearinghouse sets dates for different phases of DoSV procedure.</p> <p>(c) Exact dates are determined by universities with lots of variation, but there have been attempts by universities to harmonize dates in order to alleviate congestion problems.</p>
Information available to students prior to enrolment period	<p>(a) All relevant data from past years (e.g. grades necessary to be admitted to each university in the different parts of the procedure, length of waiting time necessary to be considered under the waiting time quota, tie breaking criteria applied etc.). Boston mechanism for the two quotas is explained in detail, university-proposing Gale-Shapley for the two-sided part is not explained. Advice on strategic issues is provided.</p> <p>(b) Different steps of matching procedure are explained in detail, including the first part which mimics decentralized market. Deferred-acceptance algorithm applied in Coordination Phase 2 is not explained, but students are told that they should rank their applications according to their preferences.</p> <p>(c) Varies widely across universities, no centralized source of information.</p>

Restrictions on preference expression	<p>(a) Applicants apply directly to the clearinghouse. Applicants can apply for a place in only one of the subjects offered in the centralized match. Applicants are allowed to submit one rank order list containing at most six universities for each part of the procedure. The two rank-order lists from an applicant can be completely different.</p> <p>(b) Applicants can apply to and rank-order up to 12 programs.</p> <p>(c) No restrictions concerning number of subjects and universities</p>
Matching procedure	<p>(a) Boston mechanism for the priority-based part. The remaining seats are allocated among remaining applicants using the university-proposing deferred-acceptance mechanism.</p> <p>(b) University-proposing deferred-acceptance algorithm where first step of algorithm takes place in real time.</p> <p>(c) Applications and admissions at the level of the universities</p>
Priorities and quotas	<p>(a) Quota for students with excellent grades from high school (20% of seats) and quota for students with longest waiting times (20% of seats). The remaining 60% are allocated according to applicants' and universities' preferences.</p> <p>(b) and (c) Universities set their own rules (<i>Zulassungsordnung</i>) within the legal framework of the states.</p>
Tie-breaking	<p>(a) Several tie-breaking rules such as handicaps, parents living close by etc., lottery.</p> <p>(b) + (c) Left to decide by each individual university and state laws.</p>

## Description of current practices

### a) Procedure for medicine and related subjects

The clearinghouse allocates all seats in medicine, dentistry, pharmacy, and veterinary medicine at public universities in Germany.<sup>3</sup>

The admissions procedure is sequential and consists of a priority-based part where a fraction of total capacity is allocated among special applicants on the basis of their preferences and exogenous admission criteria, as well as a two-sided part in which the remaining seats are allocated among remaining applicants on the basis of the applicants' and universities' preferences.

In the priority-based part, 20% of places are reserved for applicants with very good average grades from high-school and 20% for applicants who have waited a long time since finishing high-school (where this

<sup>3</sup> In the winter term 2018/2019, there were around 43,631 applicants for 9,232 seats in medicine, 4,244 applicants for veterinary medicine with 1,076 seats, 6,190 applicants for dental medicine with 1,518 seats, and 3,980 applicants for pharmacy with 1,841 seats.

waiting time can be used for an apprenticeship for example). In order to determine who is eligible to obtain one of the seats reserved for applicants with very good average grades, all applicants are first ordered with respect to their average grades from best to worst, independent of their preference lists submitted. Applicants are then selected one at a time according to this ordering until the number of selected applicants equals the 20% of total capacity that is reserved for students with the best grades. The assignment of these selected students to the universities is determined by the Boston mechanism on the basis of the reported preferences (as well as average grades and social criteria to break ties). An analogous procedure is employed for students with the longest waiting times.

In the two-sided part which is conducted about one month after the priority-based part, all remaining places are allocated among the remaining applicants on the basis of the applicants' preferences and criteria chosen by the universities. The assignment is generated by applying the university-proposing deferred acceptance algorithm.

Importantly, applicants can submit separate and potentially completely different preference lists for each part of the procedure.

### **b) DoSV procedure for all subjects (apart from medicine and related subjects)**

The DoSV procedure is optional for university programs. To date, it is only employed for undergraduate (bachelor) programs while all seats in master programs are assigned by the universities in a decentralized manner. Originally, the DoSV was only open to programs with excess demand and restricted access (numerus clausus), but it was recently opened up to all programs. However, universities still tend to use it for its larger and more oversubscribed programs such as psychology, economics, business administration, and law. For psychology for example, almost all programs are filled through the DoSV. Since 2012, the number of programs and universities using the DoSV procedure has increased steadily as well as the number of seats allocated. Only 17 universities with 22 programs participated in the first year that the DoSV was implemented (winter term of 2012/13). In the winter term 2015/2016, the total number of students who were assigned to a program through the DoSV was 80,905. In the winter term 2018/19 overall 161 universities participated, and 192,196 students were admitted through the procedure. Relative to the roughly 432,000 students who started university in the winter term 2018/19, around 44 percent of first-year undergraduate students were assigned to a program through the DoSV in 2018/19.

As described in more detail in Grenet et al. (2019), the DoSV mechanism is based on the university-proposing deferred-acceptance mechanism. The main difference is that the first stage of the algorithm is extended. In this first stage, the universities send out offers and students can accept or reject them, independent of their ranking of the programs. After this stage, the remaining students can adjust their ranking of university programs, and the Gale-Shapley deferred-acceptance mechanism is run to fill the remaining seats.

Students can apply to up to 12 university programs that are administered through the DoSV. Additional applications are possible to programs that are not part of DoSV, including medicine and related subjects.

The application procedure has the following structure:

During the Application Phase which lasts for three months, students apply to the programs. By default, these applications are ranked by their arrival time in the system although students may actively change the ordering at any time. Then, Coordination Phase 1 starts in which university programs rank the applicants and submit the ranking to the clearinghouse. The clearinghouse sends admission offers to the top applicants on the list up to the program's capacity. A student with one or more offers may hold these

offers, or accept one of them and leave the system. The student can also reject an offer. In this case, the clearinghouse immediately makes a new offer to the next applicant on the list. This phase lasts for one month. At the end of it, all first-round offers by programs have been sent out. Then, the Decision Phase starts (lasting for two weeks). The only difference between Coordination Phase 1 and the Decision Phase is that first-round offers of universities have to be sent out in Coordination Phase 1. At the end of the Decision phase, students have either left the system, e.g., by accepting an offer, or they have finalized their rank-order list of programs.

In Coordination Phase 2, a program-proposing deferred-acceptance mechanism is run for the remaining students and all available and tentatively held seats. In two final Clearing phases, a random serial dictatorship mechanism is applied in order to assign all remaining seats. In particular, a lottery determines which applicant gets to choose among all remaining seats first, second etc. Programs and students that were not part of the DoSV procedure can also register for the Clearing phases.

## Recent policy change

Admissions procedures used by the clearinghouse have often been revised since its establishment of in 1972.

The most important recent policy change is the introduction of the DoSV in 2012 in response to congestion problems. In the years prior to the introduction of DoSV, many seats in programs with excess demand remained unfilled because students received offers too late due to many rounds of rejections and new offers being made. The DoSV with its common deadlines and the deferred-acceptance mechanism guarantees a timely clearing of the market if all programs are part of the procedure.

The procedure for medicine and related subjects is currently undergoing a reform, following the decision of the Bundesverfassungsgericht in 2017.

## Perceived issues

The admissions procedure for medicine and related subjects is not strategy-proof, i.e., it is manipulable by the students. First, the Boston mechanism employed in the quotas for top-grade students and students with long waiting times invites strategic behavior. Moreover, the sequential implementation of the quotas creates strategic issues for the top-grade students. Since the quota for top-grade students is filled first, the quota can be a trap for these students by matching them to their less preferred universities although they would be able to get a seat at their top choice in the two-sided part of the procedure. Unstable matchings result if the top-grade students report their preferences truthfully (see Braun et al. 2010, Westkamp, 2011, Braun et al. 2014).

The ruling of the German constitutional court (Bundesverfassungsgericht) in 2017 regarding the procedure for medicine and related subjects necessitates changes in the procedure. The court stated that every applicant should have fair and equal access to publicly provided study programs, that in case of scarcity of seats, ability and qualification of the applicants should be decisive, and that the criteria employed should reflect the different aspects of ability and qualification. Based on this reasoning, the court criticized, among other things, the two-sided part of the procedure and required that common and

standardized criteria be applied by the universities and that these criteria be codified by law. In response to the ruling, there will be changes to the admission criteria in this quota (which will remain to be applied for 60% of seats). At the same time, the quota for the top-grade students, based solely on the Abitur grade, will be increased to 30%. The former quota based on waiting time will be extended to other criteria unrelated to the Abitur grade and will be reduced to 10% of all seats, since the court ruled that the waiting time quota is not required in its current form. The reform of the system has not yet been implemented.

For all subjects other than medicine and related subjects, the decentralized market suffers from congestion, and a large number of seats remained unfilled every year for many years following the demise of the clearinghouse in the late 1990s. The new platform DoSV was launched in 2012, later than planned due to technical problems. It has improved the situation considerably in that the number of unfilled seats in programs with excess demand has decreased markedly. But since participation in the DoSV is optional for the programs and by far not all programs and universities participate, universities still face the problem that they need to overbook their programs in order to fill all seats. The reason is that applicants can accept offers from programs not administered through the DoSV, on top of an offer they may have accepted in the system. The increase in the number of programs administered by the DoSV over the past years has alleviated this problem, but has not solved it completely.

The DoSV procedure allows students to accept offers early and to re-rank their preference list during the phase in which they receive new offers. This mimics a decentralized admissions process and gives students more time to make up their mind and collect information about programs as compared to a centralized admissions procedure in which students have to submit a complete preference list right away. However, it emerges from the data of the DoSV that participants are influenced by early offers in the sense that they accept them more often than (potential) later offers (Grenet, He, and Kübler, 2019). This creates an incentive for the universities to send out their offers earlier. To limit strategic behavior and effects on student outcomes, it might be advisable that the clearinghouse bundles early offers and sends them out on a few dates only (see Grenet, He, and Kübler, 2019, for details).

## Existing data

The clearinghouse stores the data it uses, but the dataset is not public. However, the clearinghouse has granted researchers access to the data. For example, a dataset from the procedure for medicine and related subjects has been used by Braun et al. (2010) and Dwenger et al. (2018). Data from the DoSV procedure have been made available to Grenet, He and Kübler (2019) for their study.

## Legal texts

Federal law: *Hochschulrahmengesetz* <http://www.gesetze-im-internet.de/hrg/>

State laws: *Hochschulgesetze*, e.g. Berl HG for Berlin

<http://gesetze.berlin.de/default.aspx?words=BerlHG&btsearch.x=42&filter>

Admission rules (*Hochschulzulassungsverordnung* and *Berliner Hochschulzulassungsgesetz*) for programs with selective admissions <http://www.berlin.de/sen/wissenschaft-und-forschung/rechtsvorschriften/>

Determination of capacities (*Kapazitätsverordnung KapVO*) <http://www.schure.de/22220/kapvo.htm>

Decision of the Bundesverfassungsgericht: BVerfG, Urteil des Ersten Senats, Dezember 19, 2017 - 1 BvL 3/14 -, Rn. (1-253), [http://www.bverfg.de/e/ls20171219\\_1bvl000314.html](http://www.bverfg.de/e/ls20171219_1bvl000314.html)

## Other resources and references

Braun, Sebastian, Nadja Dwenger, Dorothea Kübler and Alexander Westkamp (2014), Implementing Quotas in University Admissions: An Experimental Analysis, *Games and Economic Behavior*, Vol. 85, 232–251.

Braun, Sebastian, Nadja Dwenger and Dorothea Kübler (2010), Telling the Truth May Not Pay Off: An Empirical Study of Centralised University Admissions in Germany, *The B.E. Journal of Economic Analysis and Policy*, Vol. 10: Iss. 1 (Advances), Article 22.

Dwenger, Nadja, Dorothea Kübler and Georg Weizsäcker (2018), Flipping a Coin: Evidence from University Applications, *Journal of Public Economics*, Vol.167, 240-250.

Grenet, Julien, Yinghua He and Dorothea Kübler (2019), Decentralizing Centralized Matching Markets: Implications from Early Offers in University Admissions, WZB Discussion Paper SP II 2019–208.

Westkamp, Alexander (2013), An Analysis of the German University Admissions System, *Economic Theory*, Vol. 53, 561-589.

Information about the matching procedures provided by the clearinghouse (*Stiftung für Hochschulzulassung*) can be found at <http://www.hochschulstart.de>

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

- Cantillon, Estelle (2011), [Matching practices for elementary schools – Belgium \(French-speaking region\)](#), MiP Country Profile 1
- Kübler, Dorothea (2011), [University admission practices – Germany](#), MiP Country Profile 2
- Irving, Rob (2011), [Matching practices for entry-labor markets – Scotland](#), MiP Country Profile 3
- Kiselgof, Sofya (2011), [Matching practices for universities – Ukraine](#), MiP Country Profile 4
- Biró, Péter (2011), [University admission practices – Hungary](#), MiP Country Profile 5
- Biró, Péter (2012), [Matching practices for secondary schools – Hungary](#), MiP Country Profile 6
- Chen, Li (2012), [University admission practices – UK](#), MiP Country Profile 7
- Chen, Li (2012), [University admission practices – Ireland](#), MiP Country Profile 8
- Cantillon, Estelle and Koen Declercq (2012), [University admission practices – Belgium](#), MiP Country Profile 9
- Chen, Li (2012), [Matching practices for elementary schools – Ireland](#), MiP Country Profile 10
- Chen, Li (2012), [Matching practices for secondary schools – Ireland](#), MiP Country Profile 11
- Manlove, David (2012), [Matching practices for primary and secondary schools – Scotland](#), MiP Country Profile 12
- Merlino, Luca Paolo and Antonio Nicoló (2012), [Matching practices for elementary schools – Italy](#), MiP Country Profile 13
- Merlino, Luca Paolo and Antonio Nicoló (2012), [Matching practices for secondary schools – Italy](#), MiP Country Profile 14
- Merlino, Luca Paolo and Antonio Nicoló (2012), [University admissions practices – Italy](#), MiP Country Profile 15
- Hiller, Victor and Olivier Tercieux (2013), [Matching practices in secondary schools – France](#), MiP Country Profile 16
- Calsamiglia, Caterina (2014), [Matching Practices for elementary and secondary Schools – Spain](#), MiP Country Profile 17
- Lauri, Triin, Kaire Põder, and André Veski (2014), [Matching practices for elementary schools – Estonia](#), MiP Country Profile 18
- Salonen, Mikko A.A. (2014), [Matching practices for secondary schools – Finland](#), MiP Country Profile 19
- Terrier, Camille (2014), [Matching practices for secondary public school teachers – France](#), MiP Country Profile 20
- Basteck, Christian, Katharina Huesmann, and Heinrich Nax (2015), [Matching practices for secondary schools – Germany](#), MiP Country Profile 21
- Cantillon, Estelle (2015), [Matching practices for secondary schools – Belgium \(French-speaking region\)](#), MiP Country Profile 22
- Frys, Lucien and Staat, Christian (2016), [University admission practices – France](#), MiP Country Profile 23
- Andersson, Tommy (2017), [Matching Practices for Elementary Schools – Sweden](#), MiP Country Profile 24
- Bronfman, S., Hassidim, A., Kalif, G., and Romm, A. (2017), [Matching practices for entry-labor markets – The Israeli Medical Internship Match](#), MiP Country Profile 25
- Herzog, Sabrina and Thilo Klein (2018), [Matching practices for childcare - Germany](#), MiP Country Profile 26
- Forsberg, Håkan (2018), [Matching practices for secondary schools - Sweden](#), MiP Country Profile 27

Klein, Thilo and Philip vom Baur (2019), [Matching practices for trainee teachers - Germany](#), MiP Country Profile 28