Identifying the Best:
The CHE ExcellenceRanking for Natural Sciences, Economics, Political Science and Psychology in Europe

Sonja Berghoff
Uwe Brandenburg
Diane Carr
Cort-Denis Hachmeister
Hannah Leichsenring
Frank Ziegele

Working Paper No 124

October 2009

CHE Centre for Higher Education Development gGmbH
Verler Str. 6
D-33332 Gütersloh

Telephone: ++49 (0) 5241 97 61 0
Telefax: ++49 (0) 5241 9761 40
E-Mail: info@che.de
Internet: www.che.de

ISSN 1862-7188
ISBN 978-938589-93-8

CENTRE FOR HIGHER EDUCATION DEVELOPMENT

Identifying the Best: The CHE ExcellenceRanking for Natural Sciences, Economics, Political Science and Psychology in Europe

Sonja Berghoff
Uwe Brandenburg
Diane Carr
Cort-Denis Hachmeister
Hannah Leichsenring
Frank Ziegele

Working Paper No 124
October 2009

Abstract

The Centre for Higher Education Development (CHE) has designed an “ExcellenceRanking”. In the first round, the ranking concentrated on the natural sciences and mathematics.

The second round is dedicated to economics, political science and psychology. The centre applied a two-step approach for analysis. First, all European Departments in the surveyed fields were compared by a few general indicators. Second, for those departments that excelled in these indicators, an in-depth analysis was run based on an institutional questionnaire and a student survey.

Table of contents

List of Tables

List of Figures

1 Genesis and Philosophy

The Centre for Higher Education Development (CHE) created an “ExcellenceRanking” in the fields of biology, chemistry, mathematics, and physics in the first cycle and has now added the fields political science, psychology and economics as a sequel.

On the basis of our longstanding experience with ranking European higher education institutions in Austria, Belgium, Germany, the Netherlands, and Switzerland, the CHE intends to contribute to the development of the European Higher Education Area while demonstrating the competitive strength of European universities.

The CHE ExcellenceRanking is one of the strategies to extend the national perspective of the CHE UniversityRanking. Instead of looking at all HEIs for a single country, the approach of the ExcellenceRanking consists of selecting a small number of excellent institutions across Europe for further investigation[1].

[1] The ExcellenceRanking is also closely related to the EU Tender for the development of a world ranking that has been won by the CHERPA. CHERPA, or the Consortium for Higher Education and Research Performance Assessment, is a European network of leading institutions in the field of higher education. More information is available at: http://www.che.de/cms/?getObject=302&getNewsID=983&getCB=309&getLang=en

2 Target Groups

The CHE ExcellenceRanking targets the following groups:

1. *Undergraduates from European and non-European universities intending to earn a master's or PhD degree (or equivalent) in the surveyed fields:*

The objective of the CHE ExcellenceRanking is to fill the existing gap of information sought after by students who are in their final stage of (or just finished) their undergraduate studies and who intend to pursue a master's or PhD degree. Besides general information on the institutions with one or two top group places[2] in the ranking, these students will benefit by receiving more in-depth information on a highly selective group of top class Higher Education Institutions (HEIs) in the fields of biology, chemistry, mathematics, physics, economics, political science and psychology. The information is presented separately according to the different disciplines and according to the multidimensional approach of the CHE. This approach will not show a league table but rather, depending on different indicators, groups of particularly excellent HEIs. The information is divided into the different disciplines and according to the CHE-Ranking Principles:

- Neither an aggregation of individual indicators nor an overall score for an entire HEI, but rather a subject-related presentation of results.
- No weighed overall score for the research performance of a faculty, but rather a consideration of each indicator separately.
- No league table or ranks, but rather profiles of excellent HEIs.

2. *Higher Education Institutions (HEIs):*

The excellent HEIs can benefit from the CHE ExcellenceRanking in various ways. Firstly, being selected out of approximately 4.000 HEIs in the whole of Europe may be regarded as a highly useful marketing tool. Secondly, the CHE ExcellenceRanking informs prospective master's and PhD students and thus can be perceived by the included HEIs as an outstanding opportunity for student recruitment. Finally, the HEIs are able to compare their performance in a broad variety of aspects to that of other European HEIs of similar excellence. This will allow them to identify areas in which they may be able to increase their as of yet high-level standards.

3. *Organisations and the society at large*

Organisations such as foundations and other funding institutions are continuously in need of information regarding excellent higher education institutions whose programmes might best serve their grantees. The CHE ExcellenceRanking will provide such information with an awareness of the limitations of certain indicators. Moreover, it will allow the public to have an inside view into the research abilities and teaching capacities in the surveyed fields of the finest higher education institutions in Europe. Thus, the ranking will help to promote the knowledge society and will also prepare the included fields for the increasing demand for life-long learning.

[2] The methodology of the CHE ExcellenceRanking described later is based on a differentiation between European HEIs according to their top performance in up to four or five indicators.

3 Basic Methodology[3]

The CHE ExcellenceRanking follows the sound and internationally recognised methodological principles[4] which have been developed by the CHE. These principles include a discipline-oriented and multidimensional approach, abstaining from a comparison of institutions as a whole and taking the heterogeneous preferences of students into account. In doing so, we emphasize the importance of considering different perspectives from inside the university. Additionally, we highlight our preference to classify institutions in three broad quality clusters, rather than assigning individual ranks that focus on a limited number of universities per subject. Of course, the methodology is adapted to differences deriving from the heterogeneity of countries as well as to the specialities of the fields of analysis. The CHE ExcellenceRanking also adheres to the *"Berlin Principles on Ranking of Higher Education Institutions"*[5] as launched during the meeting of the International Ranking Experts Group (IREG) in Berlin in May 2006.

The CHE ExcellenceRanking differs from the established CHE UniversityRanking in that it looks for examples of excellence throughout the whole of Europe rather than presenting each institution in the context of the entire European higher education setting. In the first round, the search focused on the fields of biology, chemistry, mathematics, and physics. In a follow-up round, it has been extended to economics, political science and psychology.

3.1 Preselection

In the first pre-selection step, European HEIs were identified based on four indicators in the first round, published in2007, and five indicators in the second round, published in 2009. In order to be selected, a minimum of three stars in 2007 and two stars in 2009 was required.

Achieving a star means that the respective institution belongs to the group of institutions which account for at least 50% of the total achievement, e.g. 50% of the total amount of publications counted for all institutions. The share of stars therefore depends on the shape of the distribution: in the example of publications, if there are few institutions with a large number of publications the distribution is steep and it is thus more difficult to achieve a star than for a smoother distribution.

The CHE is aware that every selection of indicators, however carefully set up, carries the risk of overlooking individual research teams or of not taking into account a specific department with a particular expertise.

The classifications are based on the following indicators:

- **Number of publications[6] in the web of science**
  The "size" indicator

This is the number of publications found in the web of science with a query by institution and subject: biology, chemistry, mathematics, and physics, followed by political science, economics and psychology, with the publishing years from 1997 to 2004 for the natural

[3] For a detailed explanation of the methods, see annex A.

[4] See for example: Tavenas (2004), Van Dyke (2005), Usher/Savino (2006) and Marginson (2006).

[5] See: http://www.che.de/downloads/Berlin_Principles_IREG_534.pdf

[6] The publication and citation indicators were computed the CWTS Leiden.

sciences and mathematics as well as 1999-2006 for the other subjects. This indicator was chosen for both the 2007 and 2009 rounds.

- **Citations (normalized to the international standard)**
  The "reception" indicator

This indicator compares the average number of citations received by the papers of a research unit (CPP) with its international reference value, namely corresponding the field-based mean citation score (FCSm) by calculating the ratio. It was developed by Anthony van Raan and the CWTS as a measure for the visibility of a department compared to an international standard. Self-citations are excluded in the calculation of the ratio to prevent the ratio from being affected by divergent self-citation behaviour. This indicator was chosen for both the 2007 and 2009 rounds.

- **Outstanding researchers**
  The "lighthouse" indicator

This indicator identifies institutions with outstanding researchers. Only researchers that are still teaching at the specific institution are counted. Thomson Scientific provides a list of "Highly Cited Researchers," each of whom are among the 250 most cited researchers for their published articles within a specific time period.[7] In addition, Nobel prize winners and field medallists in mathematics were taken into account. This indicator was chosen for the 2007 round.[8]

- **Number of projects in the Marie Curie programme[9]**
  The "European dimension" indicator

This indicator measures European activity. The Sixth Framework Programme's Human Resources and Mobility (HRM) activity is largely based on the financing of training and mobility activities for researchers. These activities, known as the Marie Curie Actions, are aimed at the development and transfer of research competencies, the consolidation and widening of researchers' career prospects, and the promotion of excellence in European research. Six activity lines were taken into account relative to their financial impact and availability. This indicator was chosen for the 2007 round.

- **Student mobility**
  The European mobility dimension

This indicator measures the mobility opportunities for postgraduate students and is at the same time a European component. Together with the other European components, it is intended to counterbalance the missing European aspect of the Marie Curie programmes which could not be used for the subject fields in 2009 because of the restricted number of cases. This indicator was chosen for the 2009 round.

---

[7] See: http://hcr3.isiknowledge.com/home.cgi

[8] This indicator was eliminated for the next round for two reasons. Firstly, because the distribution among subject fields in the data for HiCi only allows its use for specific subjects such as natural sciences. Secondly, we found too high a correlation between HiCi and field-normalised citations with the risk that both are measuring similar effects.

[9] See: http://cordis.europa.eu/fp6/projects.htm

- **Teaching staff mobility**
  The European mobility and teaching dimension

Likewise, it was possible to analyse how many teachers were sent for compact teaching abroad periods within the ERASMUS programme. This indicator combines the European perspective with a teaching perspective. In addition, as teaching staff mobility (TS) is largely reciprocal, participating HEIs are not only proving to be internationally active but usually also receive teaching staff from abroad, adding an international component to their studies. This indicator was chosen for the 2009 round.

- **Erasmus-Mundus-Master**[10]

The European Union offers financial support for selected master's programmes. These programmes have to pass a careful screening process and competition for these grants is strong. Programmes are usually very interdisciplinary and sometimes only one of the departments participating in an EM programme could be considered, as the others did not cover the academic fields under scrutiny. This indicator was chosen for the 2009 round.

- **Book citations**

For the first time, an effort was made to try not only an analysis of the citation of articles, but also of books. CWTS Leiden undertook this endeavour as we were convinced that in the social science subjects analysed in 2009, books play a major role. Although it proved impossible to provide an analysis exactly comparable to article citations because of insufficiencies in the databases which are available, it was possible to identify a number of highly cited books which are considered highly relevant in the respective field. However, because of the scarceness of data, this indicator was not used as a self-reliant indicator but as a "+" indicator for the publication indicator. This indicator was chosen for the 2009 round.

The allocation of stars in any of the indicators resulted in a table containing all those universities which managed to receive at least one star. For the Excellence Group 2007, three out of four possible stars were needed to become "excellent"; for 2009, a minimum of one star of the two research-oriented indicators [publications (including highly cited books) or citations] and one additional star from one of the other three indicators (student mobility, teacher mobility, or ERASMUS MUNDUS) were required. Also in 2009, if a university managed to obtain three stars in the non-research based indicators, it became a member of the Excellence group.

3.2 In-Depth Analysis

In a second step, these institutions were analysed in-depth and presented in detail. Study conditions, programmes and other criteria were taken into consideration. In order to ensure the best possible quality of the endeavour as well as the utmost intercultural awareness, a group of HEIs covering different countries and academic fields was chosen to test the questionnaires and methods in 2007. Since education and research systems differ considerably within Europe, the CHE ExcellenceRanking was interested in giving these aspects of the research proper consideration. The testing partners were selected according to a variety of indicators, including performance levels in as many of the analysed fields as

[10] http://ec.europa.eu/education/programmes/mundus/projects/index_en.html

possible and regional spread, to help identify “cultural” differences in the various university systems. There was no need for this test to be repeated in 2009, but the questionnaires were given to experts in the relevant fields for review.

In the next project phase, the data collected from the institutions and the information gathered from the (PhD and master’s)student questionnaires were analysed and, depending on the validity and completeness of the data, ranked (i.e. stars were assigned to the departments doing best in this indicator). Other data were presented without the assignment of stars.

Indicators fulfilling the following criteria were presented with assigned stars:

1. A sufficiently high percentage of institutions (at least 50%) were able to provide reliable and dependable data.
2. The data provided could be considered comparable between countries within reasonable boundaries. For example, funding proved to be impossible as an indicator because budgeting systems varied too much; the calculation of staff costs and the level of detail that could be shared by the HEIs were also too diverse.
3. Student evaluations were only taken into account if the sample group size for each indicator was at least ten students.

As a result, for the following indicators stars were assigned:

- **students' judgements** on the doctoral and master's levels, such as the overall situation, aspects of training and courses, counselling and advise, the computer equipment, the laboratories and the library. For doctoral students, more research-oriented aspects were judged, e.g., the possibility to take part in the scientific community by attending conferences or workshops and by publishing papers. (For both 2007 and 2009).
- the percentage of **international staff** within the group of staff with a doctorate. (For both 2007 and 2009).
- the percentage of **international doctoral and master's students**. (For both 2007 and 2009).
- the **percentage of female staff, doctoral and master’s students** (2007 only)
- the **gender balance**, i.e. the deviation from a 50/50-distribution regarding the staff, doctoral and master’s students (2009 only)
- the **number of subject-specific scientific journals** available in the library on a subscription basis (either print or as e-journal) (2009 only)
- the **number of memberships in editorial boards** of major scientific journals per 10 members of the scientific staff (2009 only)
- the **number of renowned scientific prizes** won by staff members (political science only)
- the **number of international conferences** held or organised by the department in 5 recent years (political science only)

- the average **percentage per year of scientific staff teaching in summer schools** (political science only)

Data quality differed between 2007 and 2009. In 2007, a lot of data were missing or were given in a way that made the numbers incomparable so that many facts could not be compared in the ranking. Examples were the number of exchange students in each subject or even the exact number of doctoral students within a department. Data which did not meet the criteria mentioned above but were of informational value were not ranked (i.e. stars assigned) but presented as quantitative and qualitative information in the online version of the CHE ExcellenceRanking. Facts on the size of the departments, admission conditions, and details on academic programmes (such as study abroad or course offerings) were also outlined. The data in the institutional questionnaires for 2009 were more complete, thus allowing for more facts that could be ranked, as can be seen from the list above. Another distinctive difference between the analysis in 2007 and in 2009 is the evaluation of the percentage of women. In the first round, because of the traditionally low percentages of women in the natural sciences and mathematics (i.e., significantly below 50%), the "percentage of women" was taken as an indicator. In 2009, however, because of the very different cultures of the subject fields under scrutiny, we found many institutions with considerably more than 50% women. This led to a reconsideration of the gender issue. As we are convinced that a majority of women is not better than a majority of men and that an equal proportion is ideal, we changed the indicator into "gender balance". Thus, 50% was considered to be the ideal and the deviation from this ideal signifies the standing of the individual HEI.

A central feature of the online version is the possibility to access the departments/faculties not only via an simple list of the excellence group departments but also via the research categories, one of the most valuable informative assets of the endeavour. Each department was asked to name their research groups and to assign them to one or more research categories. This allows for the option to search for a subfield of a subject and to identify those departments working on a student's own field of interest. More than ***2,000 research groups*** were named by the departments.. Prospective doctoral students are possibly less interested in the general performance of a faculty or department than in a specific research group. They usually have very clear ideas about the specialised topic on which they are focusing. Thus, it might be of some value for a student searching for a biology doctoral programme specialising in insects to know that the faculty at University A is excellent in its research output in this domain. However, it might be much more interesting for this individual to learn that he could delve into honeybee studies at the University of Würzburg's "bee group". Or, a student in astrophysics might be attracted less by the overall performance of the Physics Department at the University of Copenhagen than by its research group focusing on dark matter and cosmology. These are just two examples illustrating the particular added value of the in-depth analysis of the CHE ExcellenceRanking.

4 Findings on the Country Level

4.1 Results of the Preselection – All Subjects

In 2007, due to the more restrictive selection criteria, 66 HEIs were selected for one of the Excellence Groups in the natural sciences. In 2009, 75 universities were added to the ranking; the selection criteria were chosen a bit differently to be able to give prospective master's or doctoral students information on more European universities.

In the individual fields, the numbers for 2007 were 33 in biology, 25 in chemistry, 24 in physics, and 20 in mathematics; in 2009, 51 universities were named excellent in political science, 69 in economics and 59 in psychology.

Table 1: Number of universities in the Excellence Group aggregated for 2007 and 2009

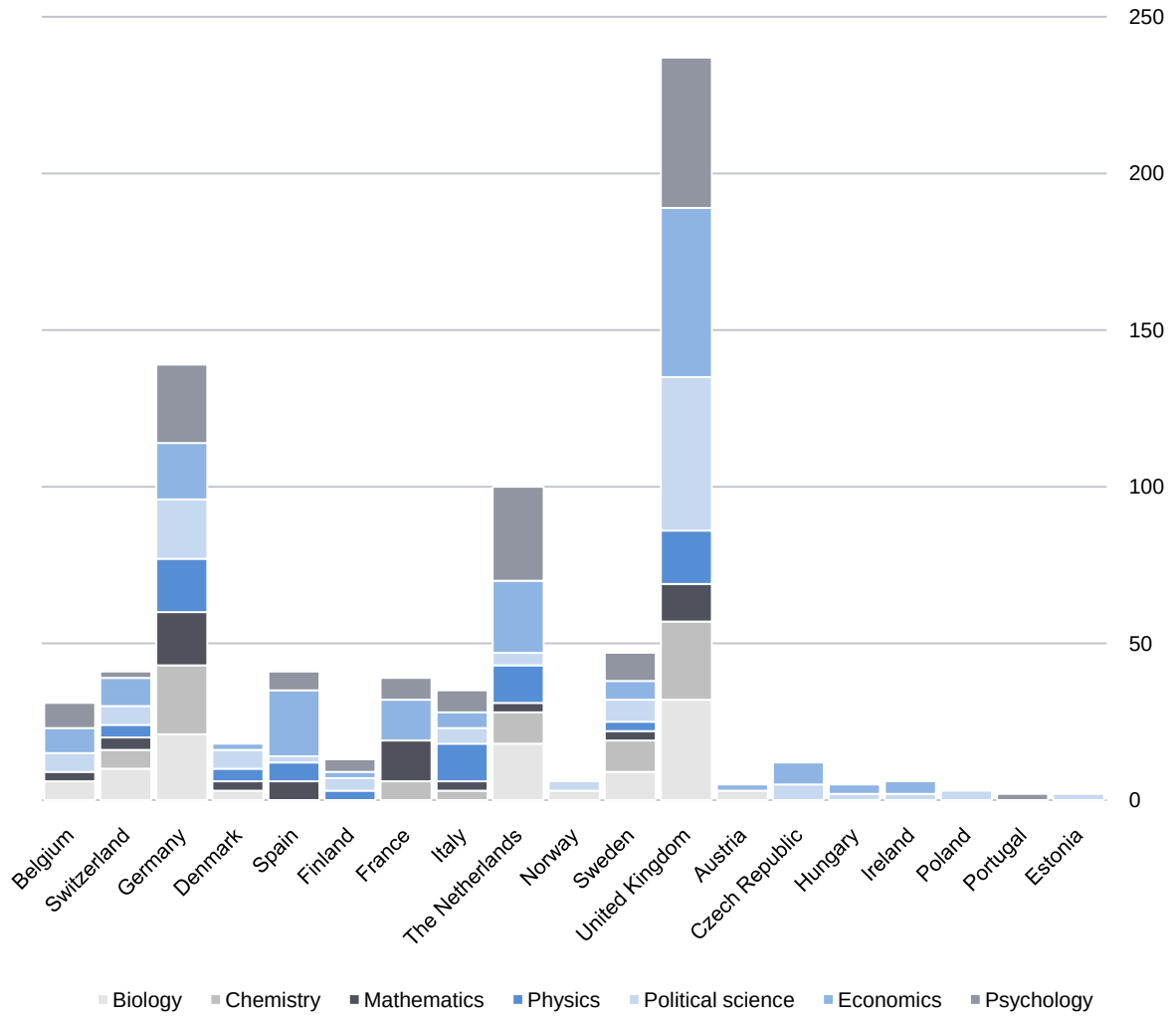
Country	Number of universities
United Kingdom	36
Germany	29
France	13
The Netherlands	10
Spain	9
Italy	8
Sweden	8
Switzerland	7
Belgium	5
Ireland	3

Country	Number of universities
Czech Republic	2
Denmark	2
Finland	2
Hungary	2
Austria	1
Estonia	1
Norway	1
Poland	1
Portugal	1

Table 2: Distribution of stars according to subjects across countries

	United Kingdom	Germany	The Netherlands	Sweden	Spain	Switzerland	France	Italy	Belgium	Denmark	Finland	Czech Republic	Ireland	Norway	Austria	Hungary	Poland	Estonia	Portugal
Biology	32	21	18	9	0	10	0	0	6	3	0	0	0	3	3	0	0	0	0
Chemistry	25	22	10	10	0	6	6	3	0	0	0	0	0	0	0	0	0	0	0
Economics	54	18	23	6	21	9	13	5	8	2	2	7	4	0	2	3	0	0	0
Mathematics	12	17	3	3	6	4	13	3	3	3	0	0	0	0	0	0	0	0	0
Physics	17	17	12	3	6	4	0	12	0	4	3	0	0	0	0	0	0	0	0
Political Science	49	19	4	7	2	6	0	5	6	6	4	5	2	3	0	2	3	2	0
Psychology	48	25	30	9	6	2	7	7	8	0	4	0	0	0	0	0	0	0	2

Figure 1: Distribution of stars according to subjects across countries



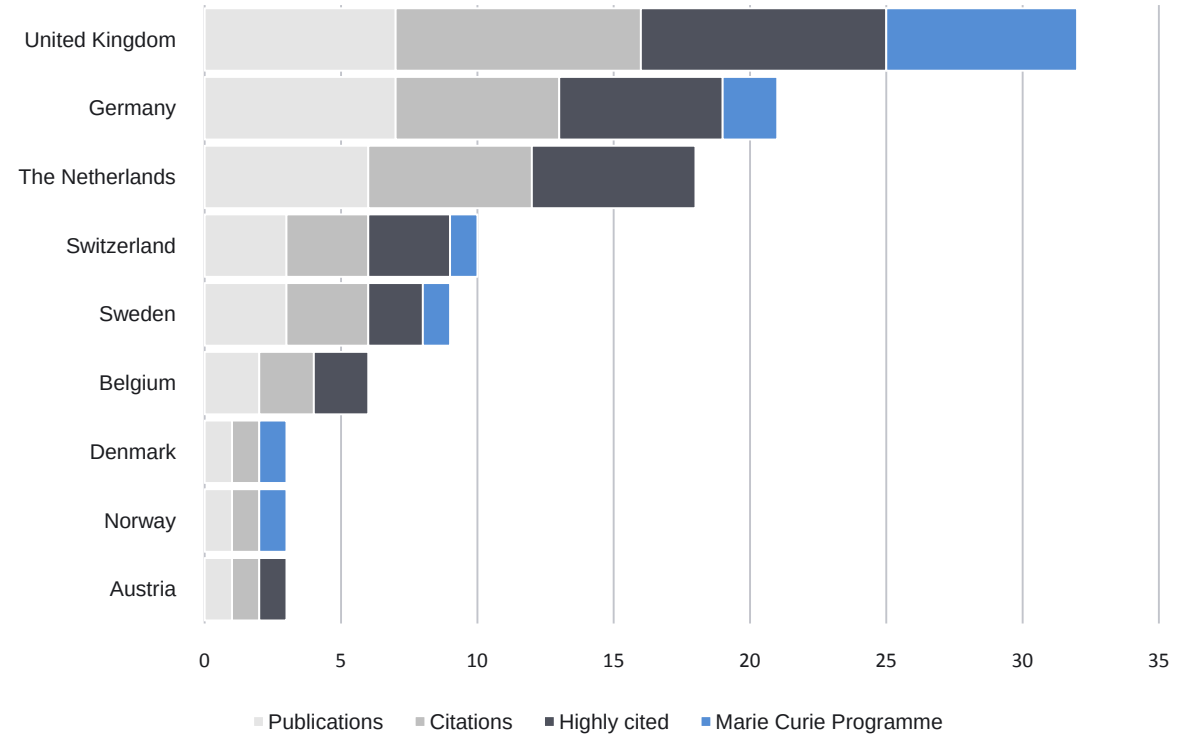
4.2 Results of the Preselection - Single Subjects

4.2.1 Biology (2007)

Table 3: Stars Table Biology

Country	Universities	Stars
United Kingdom	9	32
Germany	7	21
The Netherlands	6	18
Switzerland	3	10
Sweden	3	9
Belgium	3	6
Austria	1	3
Denmark	1	3
Norway	1	3

Figure 2: Star distribution across countries in Biology

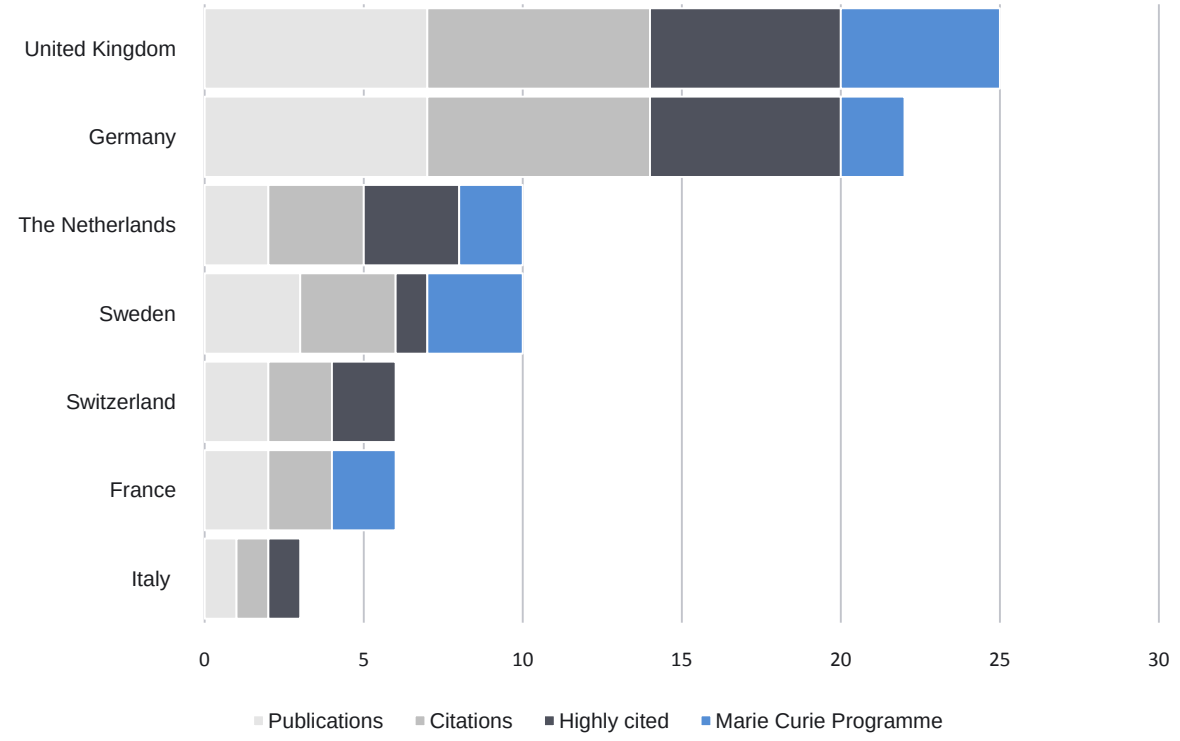


4.2.2 Chemistry (2007)

Table 4: Stars Table Chemistry

Country	Universities	Stars
United Kingdom	7	25
Germany	7	22
Sweden	3	10
The Netherlands	3	10
France	2	6
Switzerland	2	6
Italy	2	3

Figure 3: Star distribution across countries in Chemistry



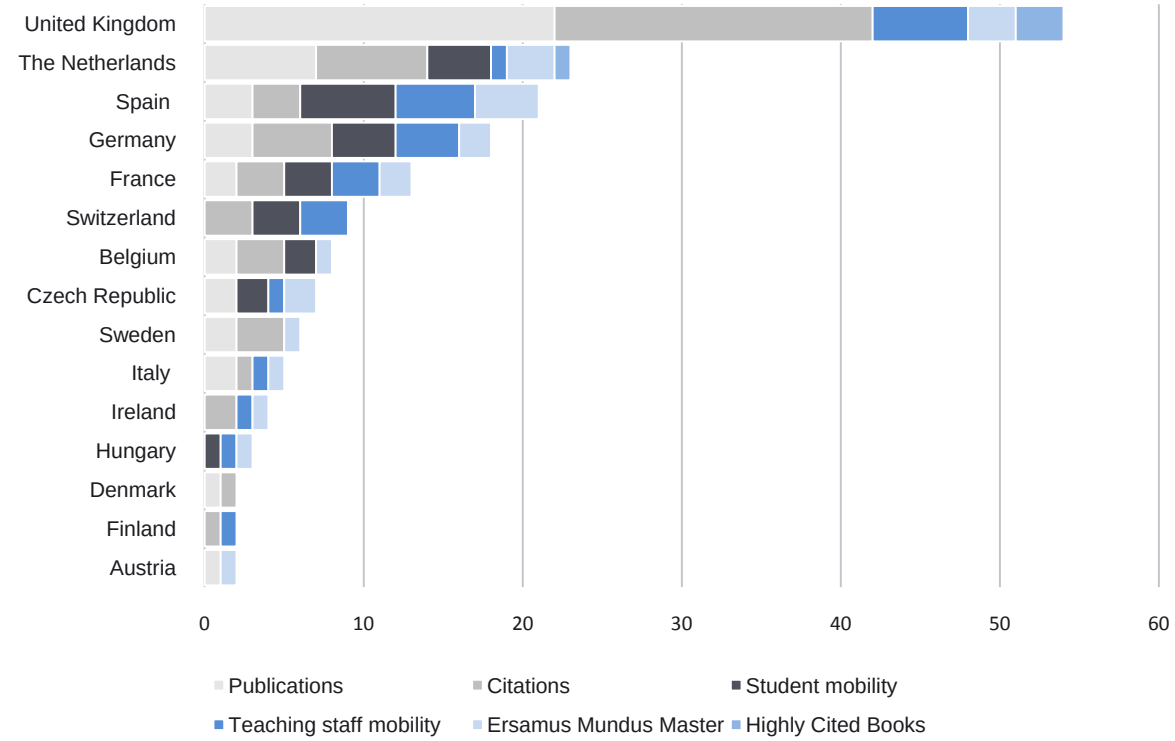
4.2.3 Economics (2009)

Table 5: Stars Table Economics

Country	Universities	Stars
United Kingdom	23	54
The Netherlands	7	23
Spain	7	21
Germany	7	18
France	5	13
Switzerland	3	9
Belgium	4	8
Czech Republic	2	7

Country	Universities	Stars
Sweden	3	6
Italy	4	5
Ireland	2	4
Hungary	1	3
Austria	1	2
Denmark	1	2
Finland	1	2

Figure 4: Star distribution across countries in Economics

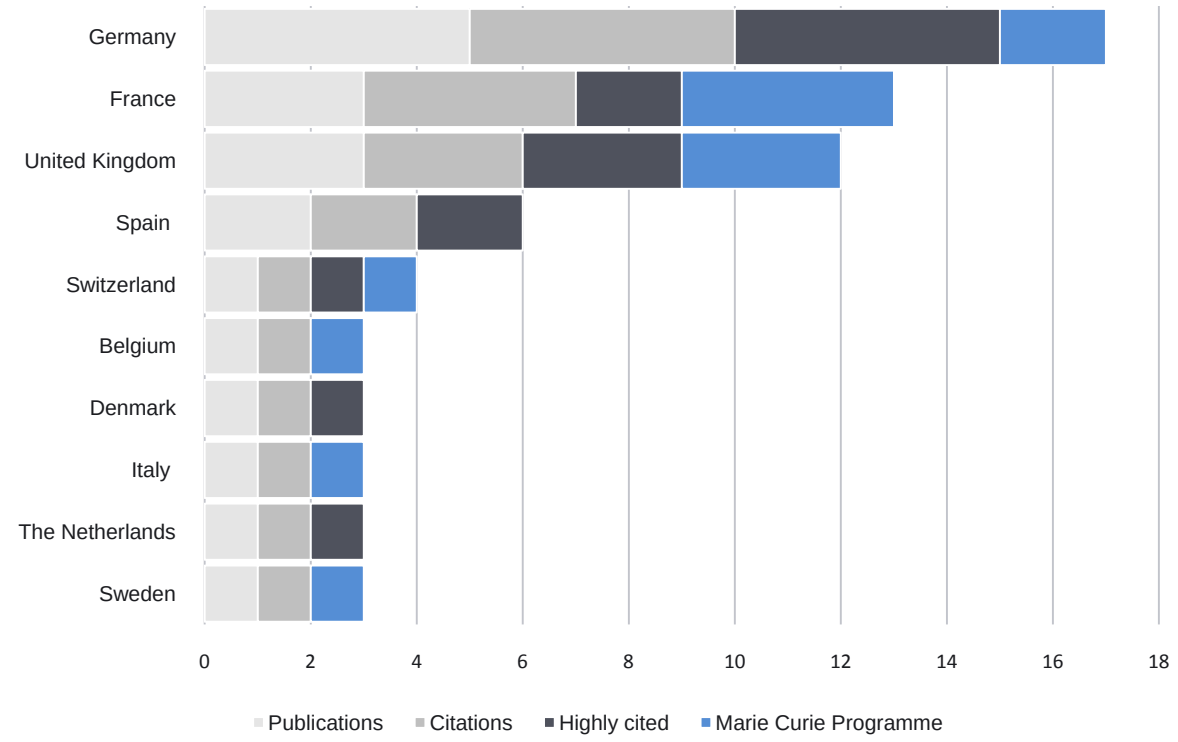


4.2.4 Mathematics (2007)

Table 6: Stars Table Mathematics

Country	Universities	Stars
Germany	5	17
France	4	13
United Kingdom	3	12
Spain	2	6
Switzerland	1	4
Belgium	1	3
Denmark	1	3
Italy	1	3
Sweden	1	3
The Netherlands	1	3

Figure 5: Star distribution across countries in Mathematics

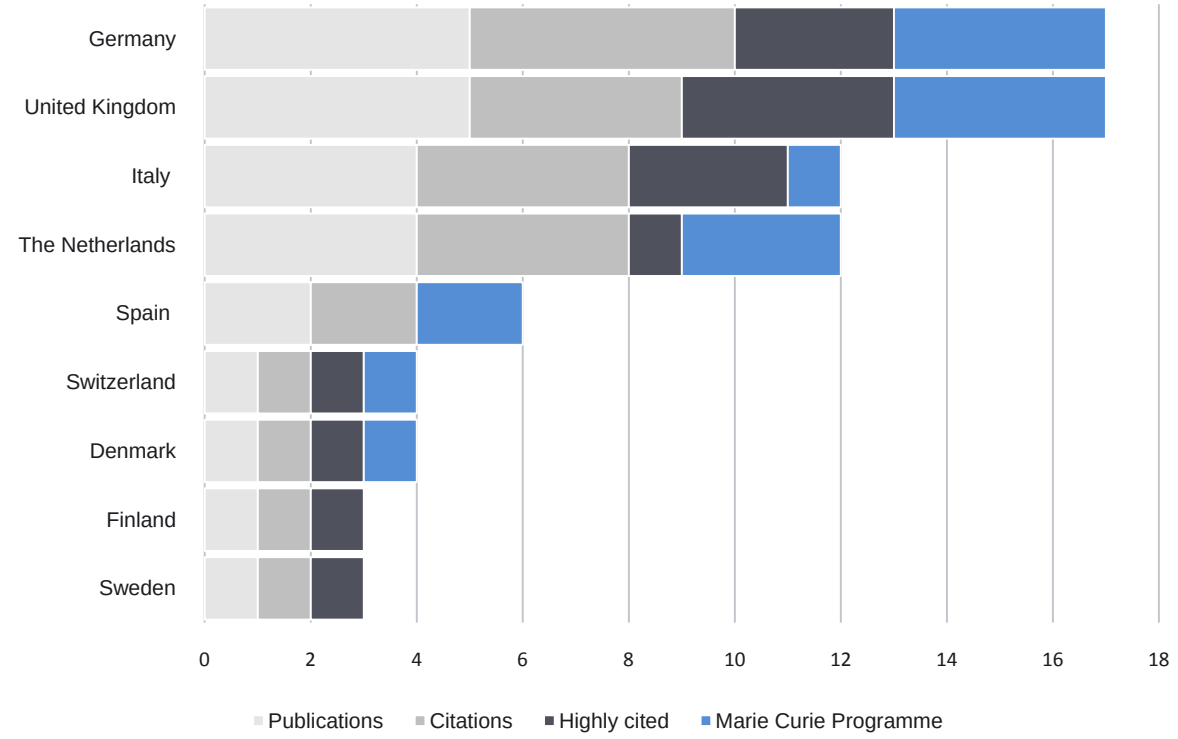


4.2.5 Physics (2007)

Table 7: Stars Table Physics

Country	Universities	Stars
Germany	5	17
United Kingdom	5	17
Italy	4	12
The Netherlands	4	12
Spain	2	6
Denmark	1	4
Switzerland	1	4
Finland	1	3
Sweden	1	3

Figure 6: Star distribution across countries in Physics



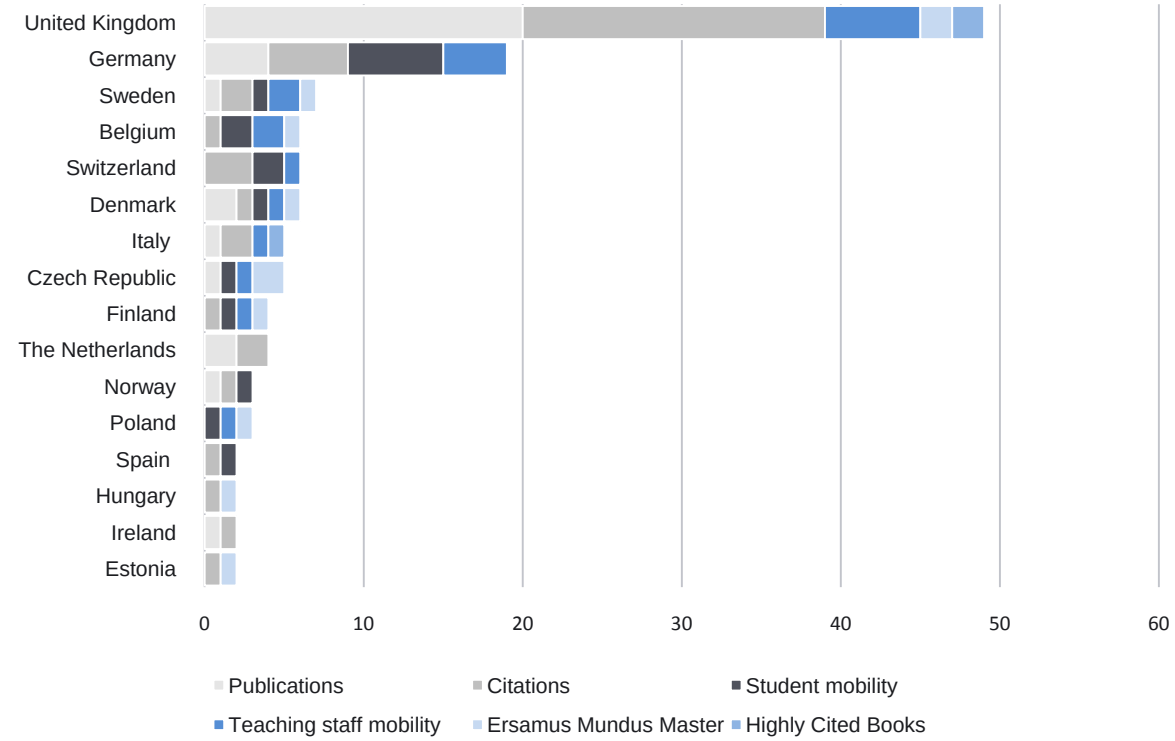
4.2.6 Political Science (2009)

Table 8: Stars Table Political Science

Country	Universities	Stars
United Kingdom	21	49
Germany	8	19
Switzerland	3	6
Italy	3	5
Sweden	2	7
Belgium	2	6
Denmark	2	6
Czech Republic	2	5

Country	Universities	Stars
The Netherlands	2	4
Finland	1	4
Norway	1	3
Poland	1	3
Estonia	1	2
Hungary	1	2
Ireland	1	2
Spain	1	2

Figure 7: Star distribution across countries in Political Science



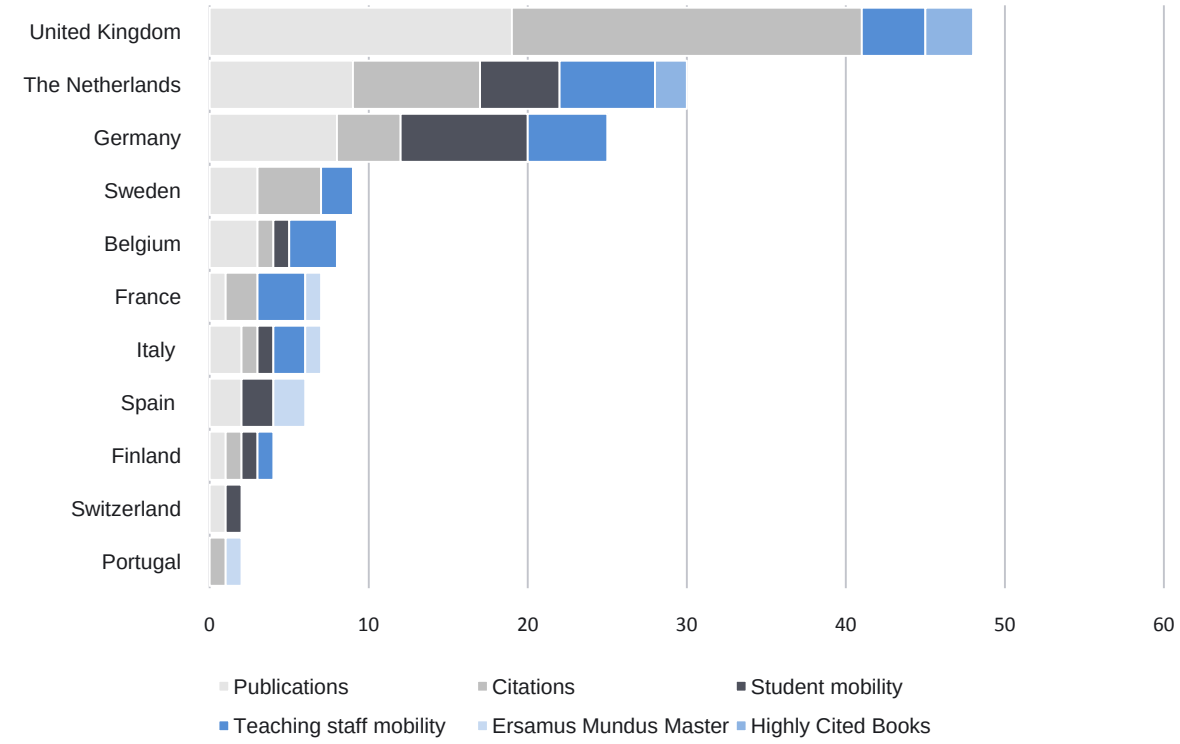
4.2.7 Psychology (2009)

Table 9: Stars Table Psychology

Country	Universities	Stars
United Kingdom	22	48
The Netherlands	9	30
Germany	10	25
Sweden	4	9
Belgium	3	8
France	3	7

Country	Universities	Stars
Italy	4	7
Spain	2	6
Finland	1	4
Portugal	1	2
Switzerland	1	2

Figure 8: Star distribution across countries in Psychology



5 Results of the In-Depth-Analysis

The in-depth-analysis consisted of the institutional questionnaire in which a number of facts were asked from the departments and a student (master's and doctoral students) questionnaire. In the first data collection for the natural science the number of departments participating in the in-depth-analysis unfortunately was quite low. As a result, only two kinds of indicators were chosen for the ranking (i.e. assigning "stars"): 1) the percentages of international students/researchers and of women in different degree levels and 2) the students' judgements.

In the 2008 data collection (Political Science, Economics, Psychology) the number of participating departments was higher and some new indicators (e.g. memberships in editorial boards) were developed that could be "ranked" for these subjects. However, to be able to compare the results across all subjects included in the ranking, only the proportion of international staff and students, the proportion of female staff and students and the students' judgements are reported in this working paper. The results for the other indicators can be found in the online-version of the ranking (www.excellenceranking.eu).

5.1 Proportion of International Staff and Students

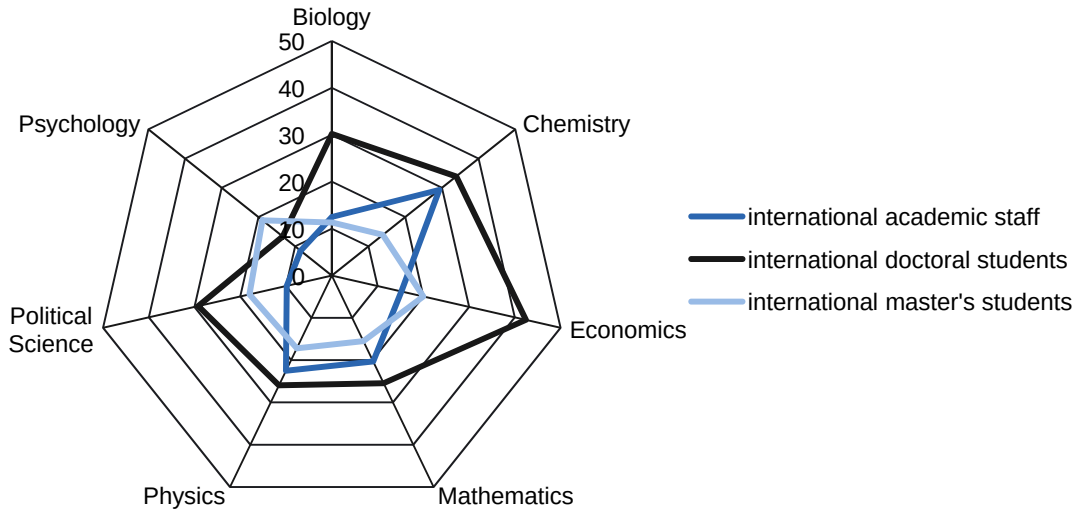
Table 10 shows the median proportion of internationals for the academic staff, doctoral and master's student as well as the number of cases (i.e. departments that answered the question). Figure 9 shows medians graphically.

Table 10: Proportion of international staff and students across subjects (in %)

	Biology		**Chemistry**		**Economics**		**Mathe-matics**		**Physics**		**Political Science**		**Psychology**	
	Md	N	Md	N	Md	N	Md	N	Md	N	Md	N	Md	N
staff	12,5	12	29,3	11	15,2	34	20,3	8	22,5	9	9,85	26	8,5	34
doctoral students	30,2	11	33,9	11	42,4	35	25,45	8	25,95	12	29,2	27	13,35	32
master's students	11,3	14	13,9	9	20	29	15,5	7	17,2	11	18	22	18,9	30

Remarks: Md=Median; N=Number of cases

Figure 9: Proportion of international staff and students across subjects (in %)



With the exception of psychology, the degree of internationalisation is highest for the doctoral students, reaching a median of over 42% in economics. In the natural sciences, the median of the percentage of international academic staff is higher than the median percentage for the master's students. In the 2009 subjects (Economics, Political Science, Psychology) it is the other way around – the proportion of international master's students being higher than the proportion of international staff.

5.2 Proportion of Female Staff and Students

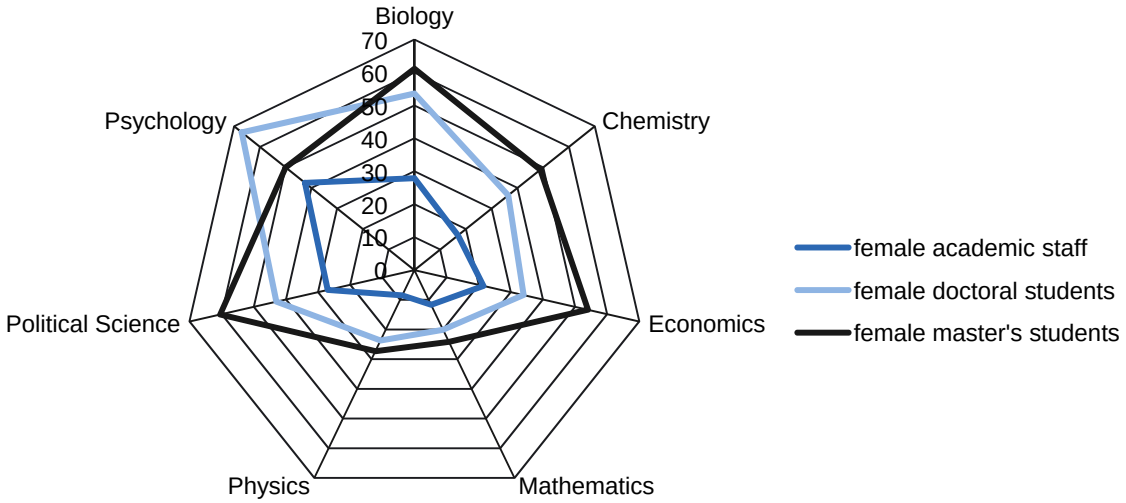
Table 11 shows the median proportion of females for the academic staff, doctoral and master's student as well as the number of cases (i.e. departments that answered the question). Figure 10 shows medians graphically.

Table 11: Proportion of female staff and students across subjects (in %)

	Biology		Chemistry		Economics		Mathe-matics		Physics		Political Science		Psychology	
	Md	N	Md	N	Md	N	Md	N	Md	N	Md	N	Md	N
staff	27,9	14	16,9	16	21,5	32	11,7	11	8,5	10	27	27	42,5	36
doctoral students	53,6	12	36,4	11	34	37	20,1	9	23,7	13	43	28	67	35
master's students	61,15	14	48,85	10	54	33	24,2	7	27,3	12	60,5	24	50	31

Remarks: Md=Median; N=Number of cases

Figure 10: Proportion of international staff and students across subjects (in %)



With the exception of psychology, the median of the proportion of females is highest between the masters's students. In psychology, the proportion of female doctoral students is even higher, reaching as much as 67 percent. In all other subjects, the median of the proportion of female doctoral students is smaller. The smallest proportion of females can be found between the academic staff. This is a very common finding – the proportion of women decreasing with the rising level of qualification.

5.2.1 Students' Judgements

For about 40 percent of the departments, there are enough judgements to make comparisons between results. For mathematics, the percentage is about a fourth, for chemistry and physics about a half. In many cases, there were too few students to obtain higher numbers.

Students were asked for their opinions on different aspects of their study situations. They were provided with several statements like "the study conditions are excellent" and were asked to choose how much they agree with this statement, from "I agree very much" to "I don't agree at all." For computations and graphics, these judgements were translated to a scale from 1 = "very much agreement" to 6 = "total disagreement."

Table 12: Details on the composition of the indicators

Indicator (mas. = master's students, doc. = doctoral students)	**Short description**
Overall study situation (mas.&doc.)	Comprehensive judgement looking at the overall situation.
Advisory (mas.&doc.)	Comprises judgements on the availability of advisors, their assistance in career planning, their caring for the student's personal development and the quality of counselling.
Career centres (mas.&doc.)	Judgements on the assistance in finding an adequate employment position by the university's career centre, on informational events, student initiatives, partnerships with companies or research institutes, and the possibilities of internships.
Examinations (mas.&doc.)	Contains judgements on the transparency of study and examination requirements, whether the coursework is in line with the content of the examinations, the fairness of examinations and the awarding of marks and organisational aspects.
Laboratories (mas.&doc.)	Considers judgements on the state of the laboratories as well as the space and the equipment of laboratories.
Library (mas.&doc.)	Judgements on the stock of literature (whether it is up-to-date, available and accessible) and on services such as search facilities or opening hours
Training (mas.&doc.)	Includes judgements on the quality of theory and methodology training, the level of interdisciplinarity, the variety of course content and quality of instruction.
Study organisation (mas.&doc.)	Comprises judgements on the transparency of admission conditions, assistance regarding formal procedures, and the organisational framework.
IT-infrastructure (mas.)	Includes judgement on hardware equipment, subject-specific software, condition of computers and service.
Counselling (mas.)	Judgements on admission, counselling on studying abroad, social and psychological counselling, counselling in relation to studies.
Websites (mas.)	Judgements on the web sites of the department: information on organisational aspects, courses and research team. Availability of an English website.
Rooms (mas.)	Students' opinions on the rooms: their condition, space and technical facilities
Social relations (mas.)	What students think about student organisations, contact to other students, teamwork and the relation to academic teaching staff.
Conference attendance (doc.)	Doctoral students' opinions about the information on conferences, the time to prepare contributions for these and the financial support for visiting conferences.
Contact with other doctoral students (doc.)	Doctoral students' opinions about the teamwork with other PhD-students, PhD student organisations and discussions outside own team.
Publication possibilities (doc.)	What doctoral students think about their opportunity to publish and the counselling services on writing and placing papers.
Research community (doc.)	Doctoral students' judgements on the informal contact to the scientific community and guest researchers.
Teamwork (doc.)	What doctoral students think about team communication, organisation and social relationships.
Time for PhD project (doc.)	Doctoral students judge whether they have enough time for writing their thesis.
Workroom (doc.)	Doctoral students' opinions about the state of the workroom, the space and the computer equipment.
Workshops (doc.)	What doctoral students think about the possibilities to participate in workshops, whether they get enough information about these and financial aid for them.
Research stay (doc.)	Doctoral students' opinions about their possibilities to arrange a research stay abroad.

The judgements were grouped according to the mean of the departments' students, the overall mean, the number of students answering, and the variation of their judgements. The following figure, for example, shows for chemistry the confidence intervals, the departments' mean judgements and the overall mean for one indicator - the overall work and study situation.

Universities with a confidence interval (CI) completely on the left side of the overall mean can be said to receive judgements above average and therefore belong to the top group in students' judgements. Universities with a confidence interval completely on the right side of the overall mean are rated below average and therefore belong to the bottom group in students' judgements. The rest of the universities remain in the intermediate group.

Figure 11: Error bar diagram for chemistry

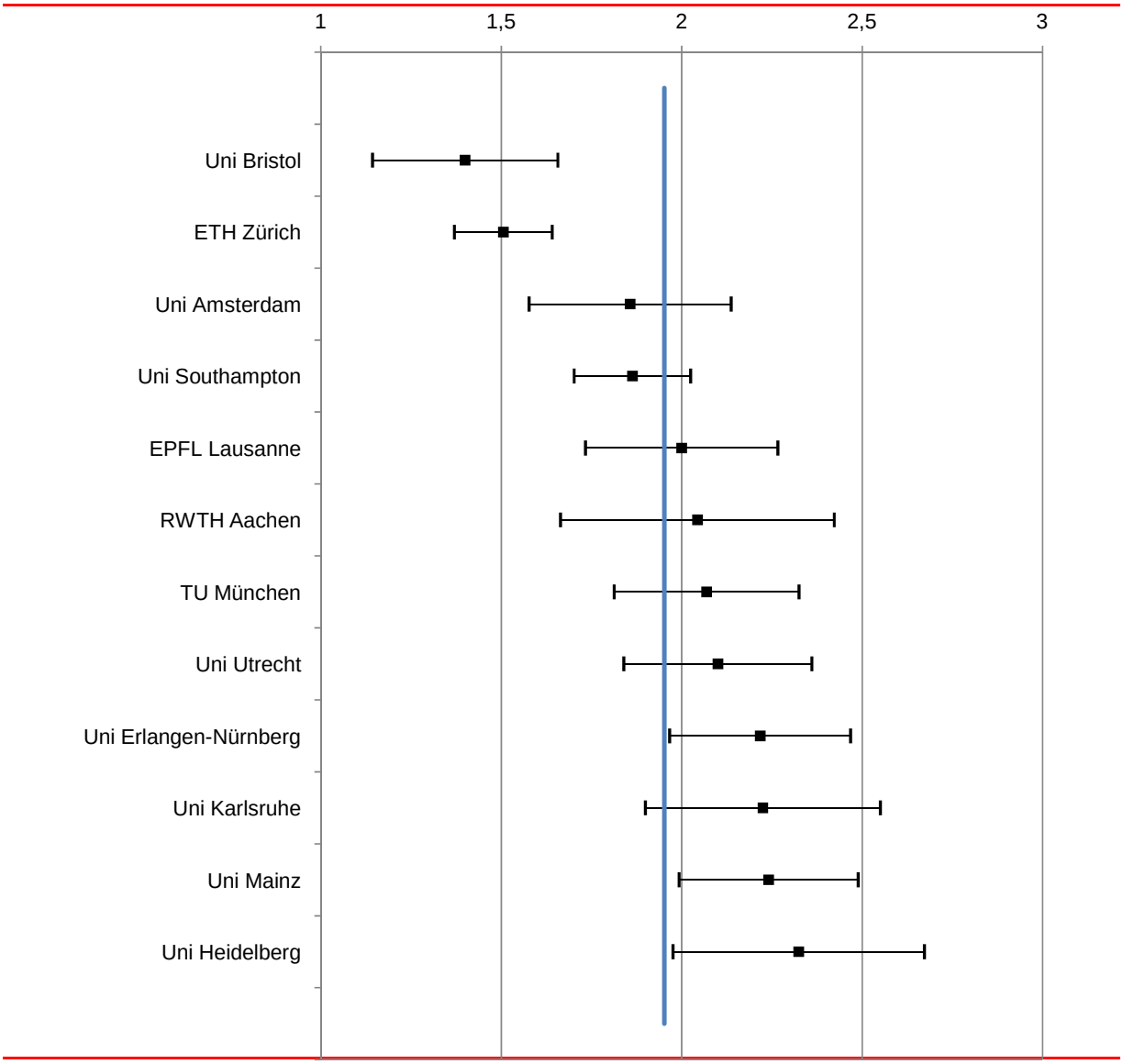
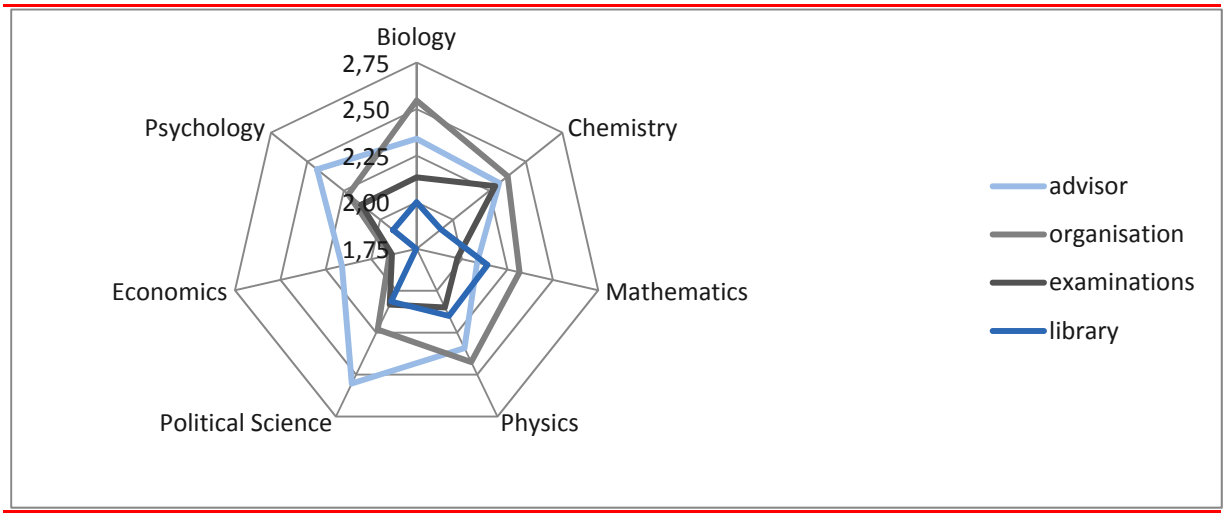


Figure 12 shows the average judgements of students across fields for four of the above mentioned indicators: Advisory, Study organisation, Examinations and Library. Though the few number of universities in the sample does not allow general conclusions from these averages, one can see, that the level of judgement does not differ that much throughout these fields. Organisation is criticised more in the sciences whereas advisors and counselling are judged less good in Political Science and Economy.

Figure 12: Average student judgements across fields

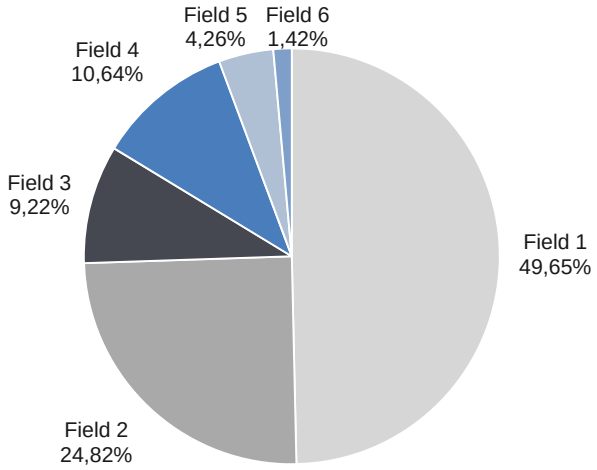


6 Findings on the University Level

6.1 Distribution of Excellence Group Placements across Universities

Figure 13 shows the percentages of universities excelling in only one field, two fields, and so on. About half of the universities included in the ranking excelled in only one of the surveyed subjects, another quarter of the universities excelled in two subjects. Interestingly, the percentage of universities excelling in 3 and 4 subjects was almost the same, about 10 percent with even slightly more universities excelling in 4 subjects than in three. Excellence in 5 fields was only reached by 6 universities (4,3%) whereas only the universities of Cambridge and Oxford were able to reach the Excellence Group in 6 fields.

Figure 13: Percentages of number of placements in the Excellence Group per university



No university was able to excel in all subjects surveyed. Table 13 shows the distribution of the Excellence Group placements across all the universities in the ranking.

Table 13: Distribution of excellence group placements across universities

University	Number of fields in the excellence group	Biology	Chemistry	Economics	Mathematics	Physics	Political science	Psychology
University of Cambridge	6	X	X	X	X	X		X
University of Oxford	6	X	X	X	X		X	X
Universiteit van Amsterdam	5		X	X		X	X	X
The University of Birmingham	5	X		X		X	X	X
Københavns Universitet	5	X		X	X	X	X	
Universiteit Leiden	5	X	X			X	X	X
Ludwig-Maximilians-Universität München	5	X		X		X	X	X
Universiteit Utrecht	5	X	X		X	X		X
Universitat de Barcelona	4			X	X	X		X
Università di Bologna	4		X	X			X	X
University of Bristol	4		X	X			X	X
Rijksuniversiteit Groningen	4	X		X		X		X
Katholieke Universiteit Leuven	4	X		X			X	X
Imperial College London	4	X	X		X	X		
University College London	4	X		X			X	X
Université catholique de Louvain	4			X	X		X	X
University of Manchester	4			X		X	X	X

University	Number of fields in the excellence group	Biology	Chemistry	Economics	Mathematics	Physics	Political science	Psychology
University of Sheffield	4	X		X			X	X
University of Sussex	4		X	X			X	X
Uppsala Universitet	4	X	X				X	X
The University of York	4	X		X			X	X
Eidgenössisch Technische Hochschule Zürich	4	X	X		X	X		
Universität Zürich	4	X		X			X	X
Vrije Universiteit Amsterdam	3	X		X				X
Humboldt-Universität zu Berlin	3			X			X	X
University of Edinburgh	3	X				X		X
University of Essex	3			X			X	X
Albert-Ludwigs-Universität Freiburg	3	X		X				X
University of Glasgow	3	X					X	X
Ruprecht-Karls-Universität Heidelberg	3		X			X		X
Helsingin Yliopisto	3					X	X	X
University of Leeds	3			X			X	X
Lunds Universitet	3		X	X		X		
Technische Universität München	3	X	X			X		
Erasmus University Rotterdam	3	X		X				X
The University of Warwick	3			X			X	X
Rheinisch-Westfälische Technische Hochschule Aachen	2		X		X			
University of Aberdeen · King's College	2			X				X
Universitat Pompeu Fabra	2			X			X	
University of Bath	2			X				X
Universität Bern	2			X			X	
Universität Bielefeld	2			X	X			
Rheinische Friedrich-Wilhelms-Universität Bonn	2				X	X		
Cardiff University	2						X	X
Universiteit Gent	2	X						X
Göteborgs Universitet	2						X	X
Friedrich-Schiller-Universität Jena	2						X	X
Universität Konstanz	2						X	X
University of Lancaster	2			X			X	
London School of Economics and Political Science	2			X			X	
Universiteit Maastricht	2			X				X
Universidad Autónoma de Madrid	2				X	X		
Johannes Gutenberg-Universität Mainz	2		X			X		
Newcastle University	2			X			X	
The University of Nottingham	2			X			X	
Universitetet i Oslo	2	X					X	
Università degli Studi di Padova	2					X		X
Université Paris-Sud 11	2		X		X			
Univerzita Karlova v Praze	2			X			X	
Vysoká škola ekonomická v Praze	2			X			X	
Università degli Studi di Roma La Sapienza	2					X		X
University of Southampton	2		X					X
Karolinska Institutet	2	X						X
KTH Kungliga Tekniska Högskolan Stockholms	2		X		X			
Universitet Stockholms	2	X		X				
University of Strathclyde	2			X			X	
Universiteit van Tilburg	2			X				X
Eberhard Karls Universität Tübingen	2	X			X			
Wageningen Universiteit	2	X		X				
Universität Wien	2	X		X				
Bayerische Julius-Maximilians-Universität Würzburg	2	X						X
Aarhus Universitet	1						X	
Aberystwyth University	1						X	
Université de Provence - Aix Marseille I	1							X

University	Number of fields in the excellence group	Biology	Chemistry	Economics	Mathematics	Physics	Political science	Psychology
University of Wales/Prifysgol Cymru, Bangor	1							X
Universitat Autonoma de Barcelona	1			X				
Queen's University Belfast	1						X	
Freie Universität Berlin	1						X	
Technische Universität Berlin	1				X			
Universita' Commerciale Luigi Bocconi Milano	1			X				
Vrije Universiteit Brussel	1			X				
Budapesti Corvinus Egyetem	1			X				
Central European University	1						X	
Universidad de Cantabria	1			X				
Universidade de Coimbra	1							X
Technische Universität Darmstadt	1						X	
University College Dublin, National University of Ireland	1			X				
University of Dublin, Trinity College	1						X	
Heinrich-Heine-Universität Düsseldorf	1	X						
Durham University Science Laboratories	1		X					
University of East Anglia	1			X				
Heriot-Watt University Edinburgh	1			X				
Friedrich-Alexander-Universität Erlangen-Nürnberg	1		X					
Università degli Studi di Firenze	1					X		
European University Institute	1						X	
Johann Wolfgang Goethe-Universität Frankfurt	1						X	
Université de Geneve	1	X						
Georg-August-Universität Göttingen	1	X						
Uniwersytet Jagiellonski	1						X	
University of Joensuu	1			X				
Universität Karlsruhe	1		X					
École Polytechnique Fédérale de Lausanne	1		X					
University of Lausanne	1						X	
Universität Leipzig	1							X
Université des Sciences et Technologies de Lille U.S.T.L.	1			X				
University of Limerick	1			X				
University of Liverpool	1							X
King's College London	1							X
Loughborough University	1			X				
Leuphana Universität Lüneburg	1			X				
Université Lumière Lyon 2	1							X
Universidad Complutense de Madrid	1			X				
Universidad Carlos III de Madrid	1			X				
Universidad Politécnica de Madrid	1			X				
Universität Mannheim	1			X				
Philipps-Universität Marburg	1							X
Facultés Universitaires Notre-Dame de la Paix	1			X				
Radboud Universiteit Nijmegen	1							X
Örebro universitet	1							X
L'Université Paris Descartes	1							X
Université Paris-Dauphine	1			X				
Université Paris 1 Panthéon Sorbonne	1			X				
Université Paris-Nord 13	1			X				
Université Pierre et Marie Curie	1				X			
Université Paris 7 - Denis Diderot	1				X			
Università di Pisa	1					X		
Universität Potsdam	1						X	
University of Reading	1			X				
Université de Rennes 1	1		X					
Università di Roma Tor Vergata	1				X			
University of Salford	1						X	

University	Number of fields in the excellence group	Biology	Chemistry	Economics	Mathematics	Physics	Political science	Psychology
Universität St. Gallen	1			X				
Handelshögskolan i Stockholm	1			X				
Université Louis Pasteur Strasbourg	1				X			
Universität Stuttgart	1		X					
University of Sunderland	1							X
Tartu Ülikool	1						X	
Université Toulouse 1	1			X				
Universität Trier	1							X
Universitat de València	1							X
Bergische Universität Wuppertal	1			X				

6.2 Excellence Group Tables

Table 14 to Table 20 show the Excellence Groups in the different subjects and the results for the preselection indicators

Table 14: Excellence Group Biology

University	Country	Publications	Citations	Highly Cited	Marie Curie
Vrije Universiteit Amsterdam	The Netherlands	X	X	X	
The University of Birmingham	United Kingdom	X	X	X	
University of Cambridge	United Kingdom	X	X	X	X
Heinrich-Heine-Universität Düsseldorf	Germany	X	X	X	
University of Edinburgh	United Kingdom	X	X	X	X
Albert-Ludwigs-Universität Freiburg	Germany	X	X	X	
Université de Geneve	Switzerland	X	X	X	
Universiteit Gent	Belgium	X	X	X	
University of Glasgow	United Kingdom	X	X	X	
Georg-August-Universität Göttingen	Germany	X		X	X
Rijksuniversiteit Groningen	The Netherlands	X	X	X	
Københavns Universitet	Denmark	X	X		X
Universiteit Leiden	The Netherlands	X	X	X	
Katholieke Universiteit Leuven	Belgium	X	X	X	
Imperial College London	United Kingdom	X	X	X	X
University College London, University of London	United Kingdom	X	X	X	X
Ludwig-Maximilians-Universität München	Germany	X	X		X
Technische Universität München	Germany	X	X	X	
Universitetet i Oslo	Norway	X	X		X
University of Oxford	United Kingdom	X	X	X	X
Erasmus University Rotterdam	The Netherlands	X	X	X	
University of Sheffield	United Kingdom		X	X	X
Karolinska Institutet	Sweden	X	X	X	
Universitet Stockholms	Sweden	X	X	X	
Eberhard Karls Universität Tübingen	Germany	X	X	X	
Uppsala Universitet	Sweden	X	X		X
Universiteit Utrecht	The Netherlands	X	X	X	
Wageningen Universiteit	The Netherlands	X	X	X	
Universität Wien	Austria	X	X	X	
Bayerische Julius-Maximilians-Universität Würzburg	Germany	X	X	X	
The University of York	United Kingdom		X	X	X
Eidgenössisch Technische Hochschule Zürich	Switzerland	X	X	X	X
Universität Zürich	Switzerland	X	X	X	

Table 15: Excellence Group Chemistry

University	Country	Publications	Citations	Highly Cited	Marie Curie
Rheinisch-Westfälische Technische Hochschule Aachen	Germany	X	X		X
Universiteit van Amsterdam	The Netherlands		X	X	X
Università di Bologna	Italy	X	X	X	
University of Bristol	United Kingdom	X	X	X	X
University of Cambridge	United Kingdom	X	X	X	X
Durham University Science Laboratories	United Kingdom	X	X		X
Friedrich-Alexander-Universität Erlangen-Nürnberg	Germany	X	X	X	
Ruprecht-Karls-Universität Heidelberg	Germany	X	X	X	
Universität Karlsruhe	Germany	X	X	X	
École Polytechnique Fédérale de Lausanne	Switzerland	X	X	X	
Universiteit Leiden	The Netherlands	X	X	X	
Imperial College London	United Kingdom	X	X	X	X
Lunds Universitet	Sweden	X	X	X	X
Johannes Gutenberg-Universität Mainz	Germany	X	X	X	X
Technische Universität München	Germany	X	X	X	
University of Oxford	United Kingdom	X	X	X	X
Université Paris-Sud 11	France	X	X		X
Université de Rennes 1	France	X	X		X
University of Southampton	United Kingdom	X	X	X	
KTH Kungliga Tekniska Högskolan Stockholms	Sweden	X	X		X
Universität Stuttgart	Germany	X	X	X	
University of Sussex	United Kingdom	X	X	X	
Uppsala Universitet	Sweden	X	X		X
Universiteit Utrecht	The Netherlands	X	X	X	X
Eidgenössisch Technische Hochschule Zürich	Switzerland	X	X	X	

Table 16: Excellence Group Economics

University	Country	Publications	Citations	Student mobility	Teacher mobility	Erasm. Mundus Master	Highly cited books
University of Aberdeen	United Kingdom	X	X				
Universiteit van Amsterdam	The Netherlands	X	X	X	X		
Vrije Universiteit Amsterdam	The Netherlands	X	X	X			
Universitat Autonoma de Barcelona	Spain	X		X	X	X	
Universitat de Barcelona	Spain		X	X			
Universitat Pompeu Fabra	Spain	X	X	X	X		
University of Bath	United Kingdom	X	X		X		
Humboldt-Universität zu Berlin	Germany	X		X	X	X	
Universität Bern	Switzerland		X	X	X		
Universität Bielefeld	Germany			X	X	X	
The University of Birmingham	United Kingdom	X					X
Universita' Commerciale Luigi Bocconi Milano	Italy	X	X				
Università di Bologna	Italy	X			X	X	
University of Bristol	United Kingdom	X	X				
Vrije Universiteit Brussel	Belgium		X			X	
Budapesti Corvinus Egyetem	Hungary			X	X	X	
University of Cambridge	United Kingdom	X	X				X
Universidad de Cantabria	Spain			X	X	X	
University College Dublin, National University of Ireland	Ireland		X			X	
University of East Anglia	United Kingdom	X	X				
Heriot-Watt University Edinburgh	United Kingdom		X			X	
University of Essex	United Kingdom	X	X		X		
Albert-Ludwigs-Universität Freiburg	Germany		X	X			

University	Country	Publications	Citations	Student mobility	Teacher mobility	Erasm. Mundus Master	Highly cited books
Rijksuniversiteit Groningen	The Netherlands	X	X	X			
University of Joensuu	Finland		X		X		
Københavns Universitet	Denmark	X	X				
University of Lancaster	United Kingdom	X	X				
University of Leeds	United Kingdom	X	X				
Katholieke Universiteit Leuven	Belgium	X	X				
Université des Sciences et Technologies de Lille U.S.T.L.	France			X	X	X	
University of Limerick	Ireland		X		X		
London School of Economics and Political Science	United Kingdom	X	X				X
University College London, University of London	United Kingdom	X	X			X	
Loughborough University	United Kingdom	X			X		
Université catholique de Louvain	Belgium	X		X			
Leuphana Universität Lüneburg	Germany		X		X		
Lunds Universitet	Sweden		X			X	
Universiteit Maastricht	The Netherlands	X	X	X			X
Universidad Complutense de Madrid	Spain			X	X	X	
Universidad Carlos III de Madrid	Spain	X		X	X		
Universidad Politécnica de Madrid	Spain		X			X	
University of Manchester	United Kingdom	X	X				
Universität Mannheim	Germany	X	X	X			
Ludwig-Maximilians-Universität München	Germany	X	X				
Facultés Universitaires Notre-Dame de la Paix	Belgium		X	X			
Newcastle University	United Kingdom	X	X				
The University of Nottingham	United Kingdom	X	X		X		
University of Oxford	United Kingdom	X	X				
Université Paris-Dauphine	France		X		X		
Université Paris 1 Panthéon Sorbonne	France	X		X		X	
Université Paris-Nord 13	France		X		X		
Univerzita Karlova v Praze	Czech Republic	X		X	X	X	
Vysoká škola ekonomická v Praze	Czech Republic	X		X		X	
University of Reading	United Kingdom	X			X		
Erasmus University Rotterdam	The Netherlands	X	X			X	
Universität St. Gallen	Switzerland		X	X	X		
University of Sheffield	United Kingdom	X	X				
Handelshögskolan i Stockholm	Sweden	X	X				
Universitet Stockholms	Sweden	X	X				
University of Strathclyde	United Kingdom	X	X			X	
University of Sussex	United Kingdom	X	X		X		
Universiteit van Tilburg	The Netherlands	X	X			X	
Université Toulouse 1	France	X	X	X			
Wageningen Universiteit	The Netherlands	X	X			X	
The University of Warwick	United Kingdom	X	X				
Universität Wien	Austria	X				X	
Bergische Universität Wuppertal	Germany		X		X		
The University of York	United Kingdom	X	X				
Universität Zürich	Switzerland		X	X	X		

Table 17: Excellence Group Mathematics

University	Country	Publications	Citations	Highly Cited	Marie Curie
Rheinisch-Westfälische Technische Hochschule Aachen	Germany	X	X	X	
Universitat de Barcelona	Spain	X	X	X	
Technische Universität Berlin	Germany	X	X	X	X
Universität Bielefeld	Germany	X	X	X	
Rheinische Friedrich-Wilhelms-Universität Bonn	Germany	X	X	X	X
University of Cambridge	United Kingdom	X	X	X	X
Københavns Universitet	Denmark	X	X	X	
Imperial College London	United Kingdom	X	X	X	X
Université catholique de Louvain	Belgium	X	X		X
Universidad Autónoma de Madrid	Spain	X	X	X	
University of Oxford	United Kingdom	X	X	X	X
Université Paris-Sud 11	France	X	X	X	X
Université Pierre et Marie Curie	France	X	X		X
Université Paris 7 - Denis Diderot	France	X	X		X
Università di Roma Tor Vergata	Italy	X	X		X
KTH Kungliga Tekniska Högskolan Stockholms	Sweden	X	X		X
Université Louis Pasteur Strasbourg	France		X	X	X
Eberhard Karls Universität Tübingen	Germany	X	X	X	
Universiteit Utrecht	The Netherlands	X	X	X	
Eidgenössisch Technische Hochschule Zürich	Switzerland	X	X	X	X

Table 18: Excellence Group Physics

University	Country	Publications	Citations	Highly Cited	Marie Curie
Universiteit van Amsterdam	The Netherlands	X	X	X	
Universitat de Barcelona	Spain	X	X		X
The University of Birmingham	United Kingdom	X	X	X	
Rheinische Friedrich-Wilhelms-Universität Bonn	Germany	X	X	X	X
University of Cambridge	United Kingdom	X	X	X	X
University of Edinburgh	United Kingdom	X	X		X
Università degli Studi di Firenze	Italy	X	X		X
Rijksuniversiteit Groningen	The Netherlands	X	X		X
Ruprecht-Karls-Universität Heidelberg	Germany	X	X	X	X
Helsingin Yliopisto	Finland	X	X	X	
Københavns Universitet	Denmark	X	X	X	X
Universiteit Leiden	The Netherlands	X	X		X
Imperial College London	United Kingdom	X	X	X	X
Lunds Universitet	Sweden	X	X	X	
Universidad Autónoma de Madrid	Spain	X	X		X
Johannes Gutenberg-Universität Mainz	Germany	X	X	X	
University of Manchester	United Kingdom	X		X	X
Ludwig-Maximilians-Universität München	Germany	X	X		X
Technische Universität München	Germany	X	X		X
Università degli Studi di Padova	Italy	X	X	X	
Università di Pisa	Italy	X	X	X	
Università degli Studi di Roma La Sapienza	Italy	X	X	X	
Universiteit Utrecht	The Netherlands	X	X		X
Eidgenössisch Technische Hochschule Zürich	Switzerland	X	X	X	X

Table 19: Excellence Group Political Science

University	Country	Publications	Citations	Student mobility	Teacher mobility	Erasm. Mundus Master	Highly cited books
Aarhus Universitet	Denmark	X	X		X	X	
Aberystwyth University	United Kingdom	X	X				
Universiteit van Amsterdam	The Netherlands	X	X				
Universitat Pompeu Fabra, Barcelona	Spain		X	X			
Queen's University Belfast	United Kingdom	X	X		X		
Freie Universität Berlin	Germany	X		X	X		
Humboldt-Universität zu Berlin	Germany	X			X		
Universität Bern	Switzerland		X	X			
The University of Birmingham	United Kingdom	X	X				
Università di Bologna	Italy		X		X		
University of Bristol	United Kingdom	X	X				
Central European University	Hungary		X			X	
Cardiff University	United Kingdom	X	X		X		
Technische Universität Darmstadt	Germany		X	X			
University of Dublin, Trinity College	Ireland	X	X				
University of Essex	United Kingdom	X	X				
European University Institute	Italy	X	X				X
Johann Wolfgang Goethe-Universität Frankfurt	Germany		X	X			
University of Glasgow	United Kingdom	X	X				
Göteborgs Universitet	Sweden		X		X		
Helsingin Yliopisto	Finland		X	X	X	X	
Uniwersytet Jagiellonski	Poland			X	X	X	
Friedrich-Schiller-Universität Jena	Germany		X	X	X		
Københavns Universitet	Denmark	X		X			
Universität Konstanz	Germany	X	X				
University of Lancaster	United Kingdom	X	X				
University of Lausanne	Switzerland		X		X		
University of Leeds	United Kingdom	X	X				
Universiteit Leiden	The Netherlands	X	X				
Katholieke Universiteit Leuven	Belgium		X	X	X		
London School of Economics and Political Science	United Kingdom	X	X				X
University College London, University of London	United Kingdom	X				X	
Université catholique de Louvain	Belgium			X	X	X	
University of Manchester	United Kingdom	X	X				X
Ludwig-Maximilians-Universität München	Germany	X		X			
Newcastle University	United Kingdom	X	X				
The University of Nottingham	United Kingdom	X			X		
Universitetet i Oslo	Norway	X	X	X			
University of Oxford	United Kingdom	X	X				
Universität Potsdam	Germany		X	X	X		
Univerzita Karlova v Praze	Czech Republic			X	X	X	
Vysoká škola ekonomická v Praze	Czech Republic	X				X	
University of Salford	United Kingdom		X		X		
University of Sheffield	United Kingdom	X	X				
University of Strathclyde	United Kingdom	X	X		X		
University of Sussex	United Kingdom	X	X				
Tartu Ülikool	Estonia		X			X	
Uppsala Universitet	Sweden	X	X	X	X	X	
The University of Warwick	United Kingdom	X	X		X		
The University of York	United Kingdom	X	X			X	
Universität Zürich	Switzerland		X	X			

Table 20: Excellence Group Psychology

University	Country	Publications	Citations	Student mobility	Teacher mobility	Erasm. Mundus Master	Highly cited books
University of Aberdeen · King's College	United Kingdom	X	X				
Université de Provence - Aix Marseille I	France		X		X		
Universiteit van Amsterdam	The Netherlands	X	X	X	X		
Vrije Universiteit Amsterdam	The Netherlands	X	X		X		
University of Wales/Prifysgol Cymru, Bangor	United Kingdom	X	X		X		
Universitat de Barcelona	Spain	X		X		X	
University of Bath	United Kingdom		X		X		
Humboldt-Universität zu Berlin	Germany	X	X	X			
The University of Birmingham	United Kingdom	X	X				
Università di Bologna	Italy		X			X	
University of Bristol	United Kingdom	X	X				
University of Cambridge	United Kingdom	X	X				X
Cardiff University	United Kingdom	X	X				
Universidade de Coimbra	Portugal		X			X	
University of Edinburgh	United Kingdom	X	X				
University of Essex	United Kingdom		X		X		
Albert-Ludwigs-Universität Freiburg	Germany	X		X			
Universiteit Gent	Belgium	X	X		X		
University of Glasgow	United Kingdom	X	X				
Göteborgs Universitet	Sweden	X	X				
Rijksuniversiteit Groningen	The Netherlands	X	X	X	X		
Ruprecht-Karls-Universität Heidelberg	Germany	X		X			
Helsingin Yliopisto	Finland	X	X	X	X		
Friedrich-Schiller-Universität Jena	Germany	X		X	X		
Universität Konstanz	Germany		X	X			
University of Leeds	United Kingdom	X	X				
Universiteit Leiden	The Netherlands	X	X				
Universität Leipzig	Germany	X		X	X		
Katholieke Universiteit Leuven	Belgium	X		X	X		
University of Liverpool	United Kingdom	X	X				
King's College London	United Kingdom	X	X				
University College London, University of London	United Kingdom	X	X				X
Université catholique de Louvain	Belgium	X			X		
Université Lumière Lyon 2	France		X		X		
Universiteit Maastricht	The Netherlands	X		X			
University of Manchester	United Kingdom	X	X				
Philipps-Universität Marburg	Germany	X			X		
Ludwig-Maximilians-Universität München	Germany	X	X		X		
Radboud Universiteit Nijmegen	The Netherlands	X	X	X	X		X
Örebro universitet	Sweden		X		X		
University of Oxford	United Kingdom	X	X				
Università degli Studi di Padova	Italy	X		X	X		
L'Université Paris	France	X			X	X	

University	Country	Publications	Citations	Student mobility	Teacher mobility	Erasm. Mundus Master	Highly cited books
Descartes							
Università degli Studi di Roma La Sapienza	Italy	X			X		
Erasmus University Rotterdam	The Netherlands	X	X				
University of Sheffield	United Kingdom	X	X				
University of Southampton	United Kingdom	X	X				
Karolinska Institutet	Sweden	X	X				
University of Sunderland	United Kingdom		X		X		
University of Sussex	United Kingdom	X	X				
Universiteit van Tilburg	The Netherlands	X	X		X		X
Universität Trier	Germany		X	X			
Uppsala Universitet	Sweden	X	X		X		
Universiteit Utrecht	The Netherlands	X	X	X	X		
Universitat de València	Spain	X		X		X	
The University of Warwick	United Kingdom	X	X				
Bayerische Julius-Maximilians-Universität Würzburg	Germany	X		X	X		
The University of York	United Kingdom	X	X				X
Universität Zürich	Switzerland	X		X			

7 Outlook to the future

The CHE ExcellenceRanking is regarded as a first and tentative approach towards the identification of excellent universities in certain academic fields. Methods had to be developed and tested, and the first round showed the need to adjust these methods in follow-up rounds. One particularly interesting, although not surprising, finding was that the precise formulation of wording in the questionnaires posed many more difficulties than envisioned. Though the research team had been aware of the problem of definitions, understandings of the same word, and different payment systems, it was still possible to observe considerable extra need for explanation, especially concerning budget definitions and the nomenclature of academic positions. According to the philosophy of CHE, this adaptation took place already in the 2008/2009 survey of political science, economics and psychology and will continue to take place in cooperation with the institutions analysed.

In the near future the CHE ExcellenceRanking will be repeated for the natural sciences. This will enable us to compare (at least some of) the results over time. In this way, the CHE ExcellenceRanking continues to aim at supporting the idea of the European Higher Education Area (EHEA) while at the same time satisfying the public's thirst for "discovering the best." It will, however, remain one of the major tasks of the project to always reflect the methodological stipulations and boundaries imposed on any kind of ranking.

8 References

Tavenas, François (2004). EUA Report "Quality Assurance: A Reference System for Indicators and Evaluation Procedures", EUA: Brussels.

Van Dyke (2005). "Twenty Years of University Report Cards." In: Higher Education in Europe, Vol. 30, No. 2, pp. 103-124.

Usher/Savino (2006). "A World of Difference: A Global Survey of University League Tables." Toronto, ON: Educational Policy Institute.

Marginson, Simon (2006). “Australian universities in the global context.” Financial Review Higher Education Summit, 22-23 March, Sydney.

9 Annex: Methodology

9.1 The preselection indicators

- **Number of publications[11] in the web of science (1997 – 2004)**

This is the number of publications found in the web of science with a query by institution and subject: chemistry, mathematics, physics biology as well as political science, economics and psychology, with the publishing years from 1997 to 2004 (for chemistry, mathematics, physics and biology) resp. 1999-2006 (for political science, economics and psychology). This indicator is meant as a "size" indicator describing the overall impact of a science department. A star is given to those institutions which have the largest publication output and belong to the group which comprises of at least 50% of all publications counted. Taken into consideration were those universities with at least 3.000 publications counted in the web of science in the years 1997 to 2004 (resp. 1999 to 2006), across all subjects.

- **Citations (normalized to the international standard)**

This indicator compares the average number of citations received by the papers of a research unit (CPP) with its international reference value, namely corresponding to the field-based mean citation score (FCSm) by calculating the ratio. It was developed by Anthony van Raan and the CWTS as a measure for the visibility of a department compared to an international standard. Self-citations are excluded in the calculation of the ratio to prevent the ratio from being affected by divergent self-citation behaviour.

If the ratio CPP/FCSm (= crown indicator) is above (or below) 1.0, this means that the papers of the research unit are cited more (or less) frequently than an 'average' publication in the field(s) in which the research unit is active. FCSm constitutes a worldwide field-specific average in a specific (combination of) field(s). In this way, one may obtain an indication of the international position of a research unit in terms of its impact compared to a world average. This world average is calculated for the total population of articles published in CI journals assigned to a particular field. This indicator focuses on the "reception" impact of such a department in its scientific community. The universities with the highest citation indices covering 50% of the sum received a star. In biology, three subjects were mixed so that the average indicator tends to be a little bit smaller; in this case, the limit is 0.9.

- **Outstanding Researchers**

This indicator identifies institutions with outstanding researchers. Only researchers that are still teaching at the specific institution were counted. Thomson Scientific provides a list of "Highly Cited Researchers," which are among the 250 most cited researchers for their published articles within a specific time period.[12]

To identify highly cited researchers, ISI begins with all articles indexed in the Thomson Scientific Citation Databases over a 20-year rolling time period; the period 1984-2003 was used for HEI pre-selection. Each article in the database is assigned to one or more of the 21 categories in ISIHighlyCited.com based on the ISI classification of the journal in which the article was published. Categories counted were chemistry, mathematics, physics, and

[11] The publication and citation indicators were computed by Prof. Dr. van Raan from the CWTS Leiden.

[12] See: http://hcr3.isiknowledge.com/home.cgi

biology - in particular, biology & biochemistry, microbiology, molecular biology & genetics, and plant & animal science. This indicator stresses the “lighthouse” factor of a department within its community. A star is granted to those universities with at least one outstanding researcher working in the respective field. This indicator was only used in 2007. As it proved to be too closely related to the citations’ indicator, it was decided to no longer use it for natural sciences or other fields.

- **Number of projects in the Marie Curie programme**[13]

This indicator measures European activity. The Sixth Framework Programme's Human Resources and Mobility (HRM) activity is largely based on the financing of training and mobility activities for researchers. These activities, known as the Marie Curie Actions, are aimed at the development and transfer of research competencies, the consolidation and widening of researchers' career prospects, and the promotion of excellence in European research. Data were taken from the Cordis database of the European Commission (http://cordis.europa.eu/fp6/projects.htm). The following activity lines were taken into account relative to their financial impact and availability (i.e. EXCs are very scarce but heavily funded whereas EIFs or IIFs are rather abundant but substantially less funded):

  - *Marie Curie Intra-European Fellowships (**EIF**)*
  - *Marie Curie Incoming International Fellowships (**IIF**)*
  - *Marie Curie Research Training Networks (**RTN**)*
  - *Marie Curie Host Fellowships for Early Stage Research Training (**EST**)*
  - *Marie Curie Excellence Grants (**EXT**)*
  - *Marie Curie Chairs (**EXC**)*

This indicator highlights the European dimension of the departments. In computing the top group in this indicator, the intra-European fellowships (EIF) and Incoming International fellowships (IIF) received a single weight, the research training networks (RTN) and the host fellowships (EST) a double weight, and the excellence grants (EXT) and chairs (EXC), a triple weight. The method used to identify the stars was similar to the method used for grouping the publication indicator. In biology, chemistry and mathematics, three points were sufficient for a star. In physics, a star was awarded for a minimum of four points. It was used in 2007 but not in 2009 because the academic fields analysed in 2009 are not covered sufficiently in the MC programme.

- **Student mobility**

This indicator measures the mobility opportunities for postgraduate students and is at the same time a European component. Together with the other European components, it is intended to counterbalance the missing European aspect of the Marie Curie programmes which could not be used for the subject fields in 2009 due to the restricted number of cases. It was first used in 2009. A star is given to those institutions which have the largest student mobility and belong to the group which comprises of at least 80% of all cases counted here. In economics 35 students were sufficient for a star, in political science 30 and in psychology 16 students.

[13] See: http://cordis.europa.eu/fp6/projects.htm

- **Teaching staff mobility**

Likewise, it was possible to analyse how many teachers were sent for compact teaching abroad periods within the ERASMUS programme. This indicator combines the European perspective with a teaching perspective. In addition, as teaching staff mobility (TS) is largely reciprocal, participating HEIs are not only proving to be internationally active but usually also receive teaching staff from abroad, adding an international component to their studies. It was also used the first time in 2009. A star is given to those institutions which have the largest teaching staff mobility and belong to the group which comprises of at least 80% of all cases counted here, the minimum number of teaching staff mobility to achieve a star was 3 for all three subjects in 2009.

- **Erasmus-Mundus-Master**[14]

The European Union offers financial support for selected master's programmes. These programmes have to pass a careful screening process and competition for these grants is strong. Programmes are usually very interdisciplinary and sometimes only one of the departments participating in an EM programme could be considered as the others did not cover the academic fields under scrutiny. A star was allocated when a department could be identified as being a participating institution in an EM programme. The indicator was first used in 2009.

- **Book citations**

For the first time, an effort was made to try not only an analysis of the citation of articles, but also of books. CWTS Leiden undertook this endeavour as we were convinced that in the social science subjects analysed in 2009, books play a major role. Although it proved impossible to provide an analysis exactly comparable to article citations because of insufficiencies in the databases which are available, it was possible to identify a number of highly cited books which are considered highly relevant in the respective field. However, because of the scarceness of data, this indicator was not used as a self-reliant indicator but as a "+" indicator for the publication indicator. It was first used in 2009.

9.2 Institutional (department) survey

In order to identify the right contact person, the universities chosen for the in-depth analysis were contacted at the central level, usually the office of the vice-chancellor, president or equivalent. In addition, where the information was available, international offices were often identified as first contact points. The institutions were asked to name a contact person for the project. In the end, this varied from one person for the entire project to different persons for each subject and from academics to administrators. Not all institutions answered and others did, but stated that they were not interested in participating.

[14] http://ec.europa.eu/education/programmes/mundus/projects/index_en.html

Table 21: Response rates in the institutional survey

Subject (year of publication)	Universities included in the survey	Universities answering the questionnaire
Biology (2007)	23	15 (65,2%)
Chemistry (2007)	25	17 (68%)
Economics (2009)	69	34 (49,3%)
Mathematics (2007)	19	10 (52,6%)
Physics (2007)	24	17 (70,8%)
Political Science (2009)	51	27 (52,9%)
Psychology (2009)	59	37 (62,7%)

The questionnaire can be found at www.che-excellenceranking.eu.

9.3 Student survey

The student survey used an online questionnaire created. One version was intended for master's students and another for doctoral students. The questionnaire was accessible only via a certain web link and with a personal code. Anonymity of student identity was maintained. The universities could choose whether they wanted to send out paper letters or e-mails containing the link and a personalised code.

Table 22: Universities participating in the student surveys

Subject	Universities included in the survey	Universities conducting a student survey
Biology (2007)	23	14 (60,9%)
Chemistry (2007)	25	12 (48%)
Economics (2009)	69	40 (58%)
Mathematics (2007)	19	7 (36,8%)
Physics (2007)	24	11 (45,8%)
Political Science (2009)	51	29 (57%)
Psychology (2009)	59	38 (64,4%)

The questionnaire can be found at www.che-excellenceranking.eu.

ISSN 1862-7188
ISBN 978-938589-93-8