



The DFG Funding Ranking and its Contribution to an International Monitoring of University, Industry, and Government Cooperation Activities

Conference of the International Ranking Expert Group (IREG)

The Academic Rankings: From Popularity to Reliability and Relevance

Berlin, 6-8 October 2010

Structure of the presentation

A G E N D A

- 1.** Introduction - The DFG and its Funding Ranking
- 2.** Coverage - University, Industry, and Government Research Activities
- 3.** Analyses - Monitoring of the EU Framework Programme as an Example
- 4.** Case Study - Relevance of UIG Cooperation Activities in the Life Sciences
- 5.** Summary and Selected Findings

Motivation of the presentation

- ▶ International as well as national **research ranking studies** for the most part focus on comparisons of **higher education institutions**.
- ▶ Those rankings are often seen as direct performance indicators for the **research competitiveness of entire countries or regions**.
- ▶ **National research systems**, however, differ widely in the degree of participation of universities, governmental research centers and the industry.
- ▶ Based on analyses of the EU Research Framework Programme by different types of funding recipients this contribution explores the **relationship** between divers national **organisation structures of research systems** and the results of **university rankings**.

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What is the DFG?

Germany's largest research funding organisation

The DFG

- ▶ serves **all branches of science and the humanities** by funding research projects and facilitating cooperation among researchers
- ▶ supports the **education and advancement** of young scientific researchers
- ▶ promotes **equality** between men and women
- ▶ **advises parliaments and public authorities** on scientific matters
- ▶ fosters **relations between research and the private sector** and between **scientists and academics at home and abroad**

What is the DFG?

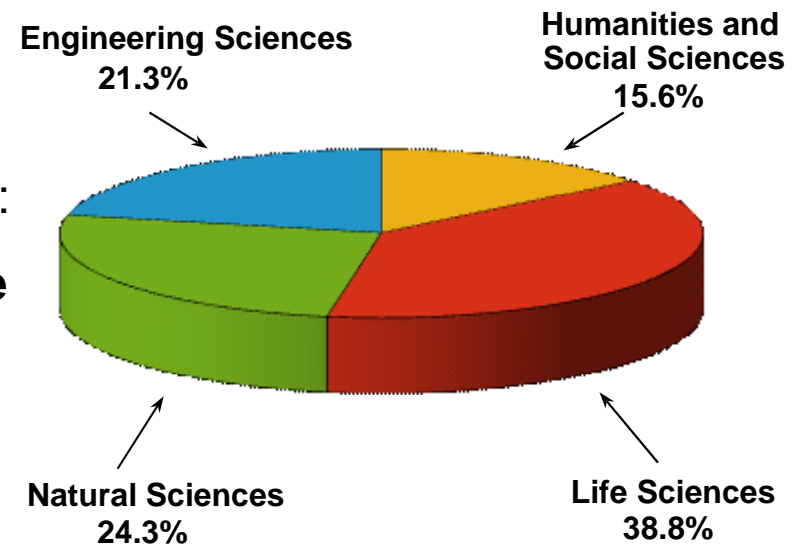
The DFG funding portfolio by research area and programme

- ▶ The DFG's 2009 **budget*** totalled **€2.2 billion**

- ▶ The DFG serves **all branches of science and the humanities**

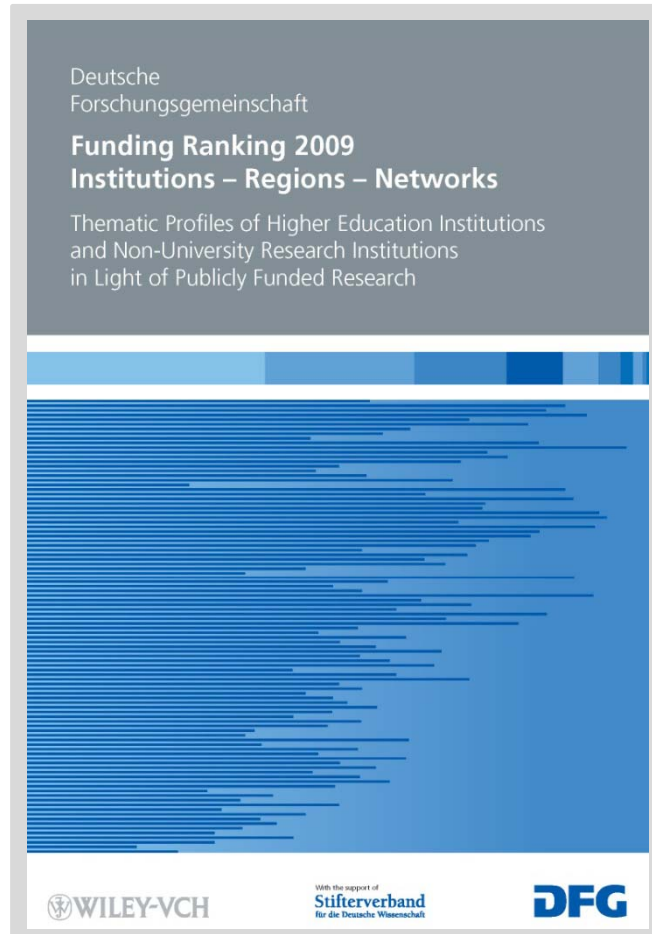
- ▶ The DFG funding portfolio covers different programme groups:

- ▶ **Individual grants programme**
- ▶ **Coordinated programmes**
- ▶ **Infrastructure funding**
- ▶ **prizes and others**



*Figures refer to actual expenditures in 2009

The DFG Funding Ranking: Background and history of the report



- ▶ In **1997** the DFG published the first **Funding Ranking**. Since then a new edition is published **every three years**. The Funding Ranking 2009 is the fifth edition.
- ▶ **Service** for the member institutions of the DFG; **contribution** to the discussion of the funding **profiles of research institutions**.
- ▶ The DFG Ranking is a **FUNDING**-Ranking: Funding volumes are used as **performance indicators** since the awards are distributed in a competitive process.
- ▶ While e.g. bibliometric performance indicators are only appropriate in specific disciplines, based on the **strong participation of researchers within funding activities across all fields of science**, the figures cover a broader range of research areas.

The DFG Funding Ranking: Objectives, approach and databases

Provision of funding information
regarding publicly financed research

- ▶ No costly and laborious data collection from the research institutions but direct processing of data concerning funding activities of central sources
- ▶ Indicators cover approximately 90 percent of the third-party funding income of higher education and non-university research institutions in Germany.

Subject-related Analyses

Classification according to
four scientific disciplines

Specifics:

DFG: 48 research fields
German government: 12 funding fields
EU: 8 funding fields

Analyses by source

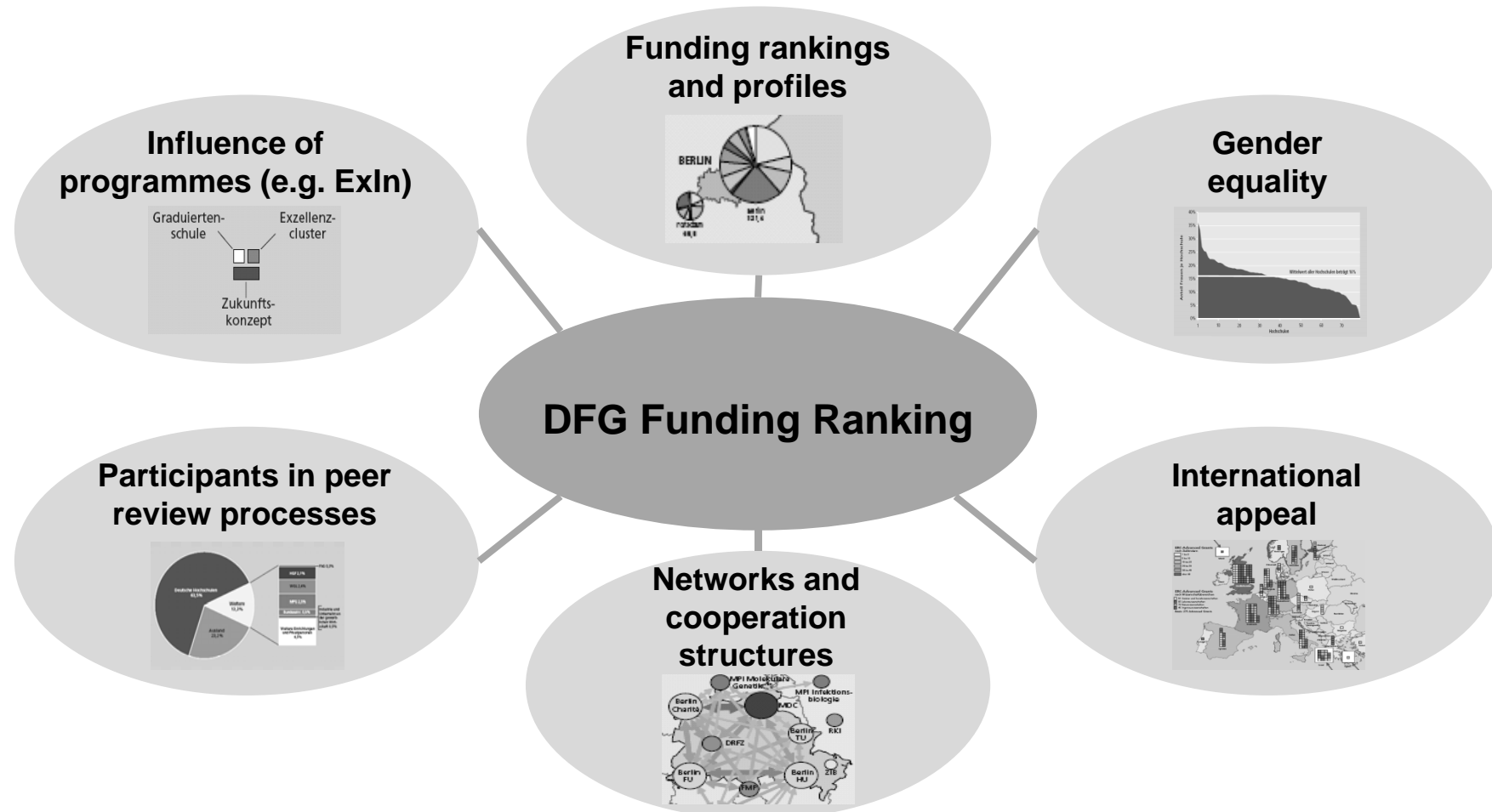
Deutsche Forschungsgemeinschaft
German government
European Union
European Research Council
German Federation of
Industrial Research Organizations
Alexander von Humboldt Foundation
German Academic Exchange Service

Analyses by recipients

Examples of differentiation:

countries, states, regions,
institutions, organisational
units etc.

The DFG Funding Ranking: Aspects of statistical reporting

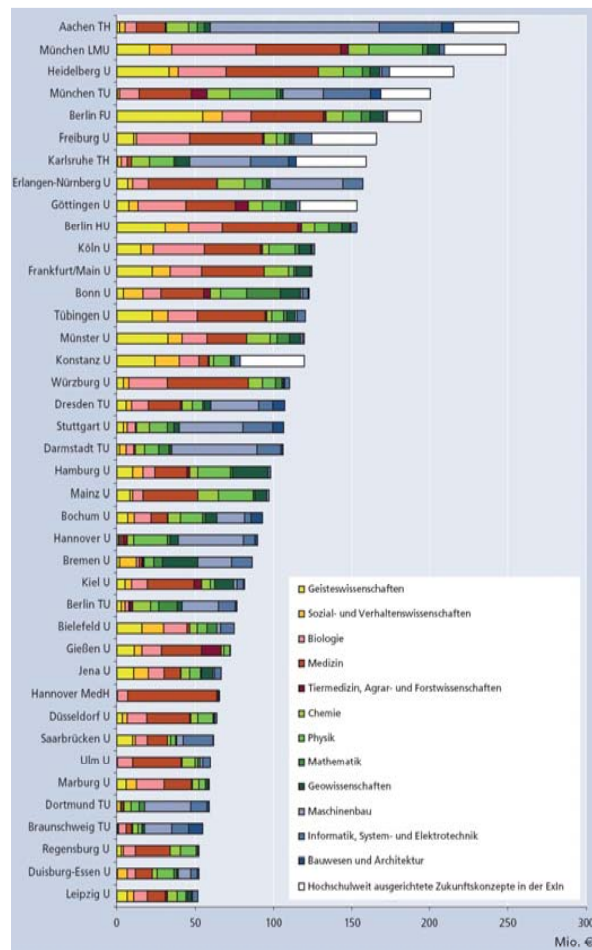


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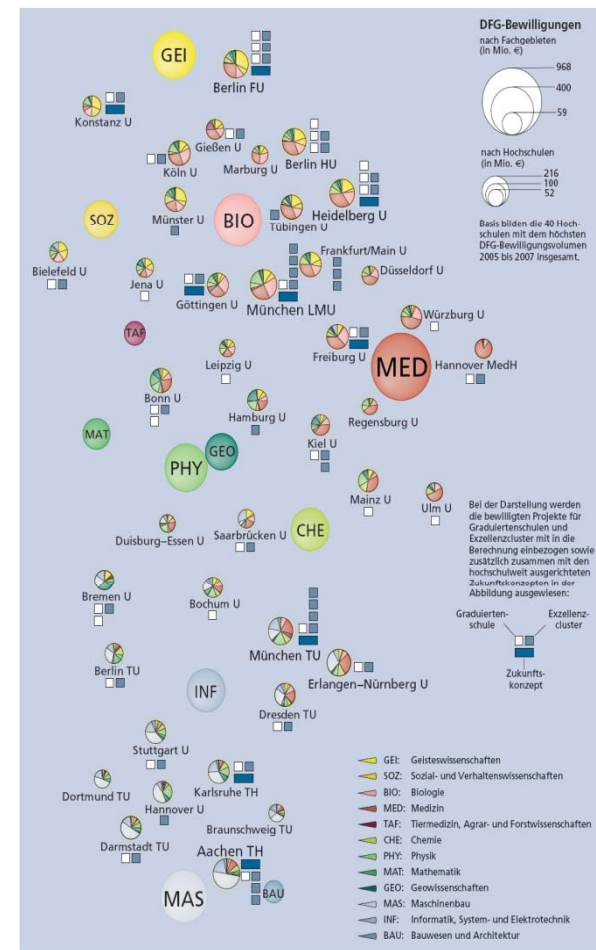
Various presentations for university profiles within the German higher education sector



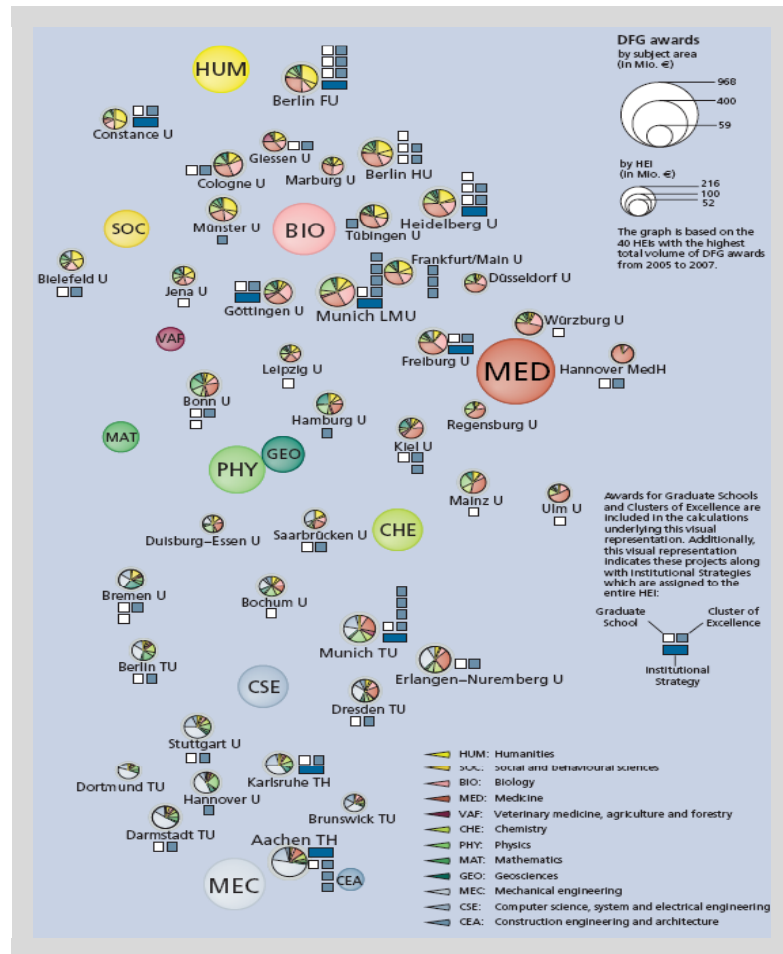
Hochschule	DFG-Bewilligungen gesamt			davon					2. Förderlinie der Exn für 2 Jahre
	Rang	Mio. €	kum. %	Geistes- u. Sozialwissenschaften	Lebenswissenschaften	Naturwissenschaften	Ingenieurwissenschaften		
Aachen TH	1	257,8	5,1	5,4	26,4	28,0	155,7		41,5
München LMU	2	249,8	10,0	25,1	112,8	59,2	2,9		28,6
Heidelberg U	3	215,4	14,2	29,5	89,5	28,0	6,2		41,2
München TU	4	209,4	19,2	1,8	55,8	48,7	43,6		21,4
Berlin FU	5	194,4	22,0	67,6	18,0	27,1	2,1		21,7
Freiburg U	6	185,5	25,2	12,7	81,2	18,2	12,2		41,0
Karlsruhe TH	7	159,4	28,4	2,9	5,9	26,9	67,6		45,1
Erlangen-Nürnberg U	8	157,6	31,5	18,0	54,6	22,2	29,8		
Göttingen U	9	152,5	34,5	12,8	79,2	28,4	2,4		26,7
Berlin HU	10	152,4	37,5	45,9	71,9	21,0	4,5		
Köln U	11	126,4	40,0	22,2	88,6	21,2	2,2		
Frankfurt/Main U	12	124,4	42,9	24,2	88,2	38,8	1,6		
Bonn U	13	122,8	44,9	18,4	42,2	57,9	5,0		
Tübingen U	14	120,4	47,2	22,0	62,1	17,5	6,0		
Münster U	15	119,8	49,6	41,7	41,0	24,6	2,4		
Konstanz U	16	119,7	52,0	48,0	18,9	15,9	2,9		48,9
Würzburg U	17	118,4	54,2	7,6	79,8	22,6	2,5		
Dresden TU	18	107,2	56,2	9,7	21,9	19,8	46,9		
Stuttgart U	19	106,2	58,4	6,6	6,0	27,2	67,0		
Darmstadt TU	20	106,1	60,5	6,1	5,1	22,2	70,7		
Hamburg U	21	96,7	62,4	18,9	28,9	48,6	2,2		
Mainz U	22	97,5	64,2	18,2	41,6	44,5	1,2		
Bochum U	23	92,6	66,2	11,2	21,7	28,7	29,4		
Hannover U	24	90,3	67,9	2,1	4,6	22,9	50,6		
Bremen U	25	86,7	69,7	12,6	2,8	25,6	24,7		
Kiel U	26	81,8	71,2	9,4	45,0	28,1	7,1		
Berlin TU	27	77,8	72,8	5,2	5,2	21,2	25,2		
Bielefeld U	28	74,8	74,2	28,0	16,6	12,2	10,8		
Gießen U	29	72,4	75,7	16,2	58,2	5,0	0,4		
Jena U	30	68,8	77,0	28,1	21,0	28,1	5,6		
Hannover MedH	31	65,8	78,2	0,4	84,2	0,2	0,0		
Düsseldorf U	32	62,6	79,6	6,0	48,1	15,4	1,4		
Saarbrücken U	33	61,8	80,8	12,2	28,1	6,0	22,7		
Ulm U	34	58,5	81,9	0,6	41,0	11,4	6,5		
Marburg U	35	58,2	82,1	12,2	25,7	18,4	0,9		
Dortmund TU	36	56,8	84,2	2,2	2,6	12,2	40,6		
Braunschweig TU	37	54,8	85,4	1,2	8,0	7,2	27,2		
Regensburg U	38	52,5	86,4	4,1	28,7	18,5	0,1		
Duisburg-Essen U	39	52,2	87,4	6,7	15,9	17,0	12,7		
Leipzig U	40	52,2	88,4	18,8	21,2	15,5	4,5		
Hochschulen insgesamt	01-159	5.876,7	100,0	769,4	1.722,7	1.570,6	1.074,7	229,4	
Dauer: II Hochschulen	159	124	70	06	97	9			

Legende der Ranggruppen:

- 1. bis 10. Rang
- 11. bis 20. Rang
- 21. bis 30. Rang
- 31. bis 40. Rang
- 41. bis 60. Rang
- 61. und weitere Ränge



Disciplinary profiles of higher education institutions



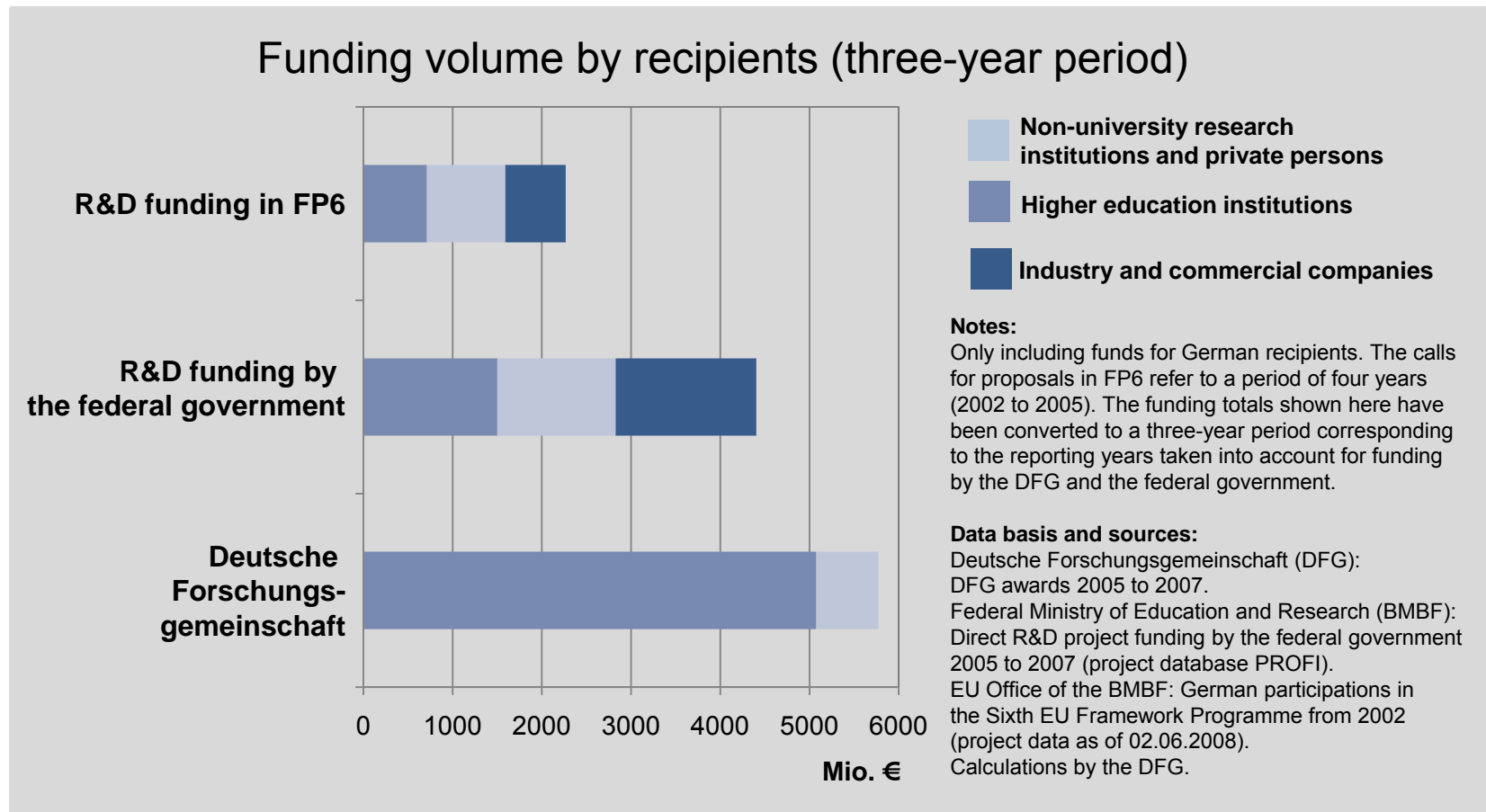
- Visualisation of disciplinary profiles
- Range of information:
 - funding volume
 - spectrum of disciplines of each university
 - participation of HEIs in the German Excellence Initiative
- Identification of HEIs with similar disciplinary profiles (**benchmarking**)
- More detailed analysis on research activities in different disciplines and fields of research (biotechnology, space research etc.) in the report

Disciplinary profiles of non-university research institutions

- ▶ Provision of **funding figures** also for non-university research institutions: identification of especially active research centers and of the thematic priorities, i.e. the funding areas on which these centers concentrate.
- ▶ The German **non-university research institutions** are manifold (differences in mission, profile, demand for external funding etc.).
- ▶ Major research performing organisations apart from HEIs:
 - **Fraunhofer Society**: focus on applied research; annual budget*: approx. 1.5 billion Euro.
 - **Helmholtz Association**: research in strategic programmes in six core fields; annual budget*: approx. 2.8 billion Euro.
 - **Leibniz Association**: umbrella organisation for various research institutions; annual budget*: more than 1.0 billion Euro.
 - **Max Planck Society**: primarily basic research in natural science and the humanities; annual budget*: approx. 1.3 billion Euro.

*Source: www.research-in-germany.de

Overall institutional coverage: University, industry, and government research activities



Structure of the presentation

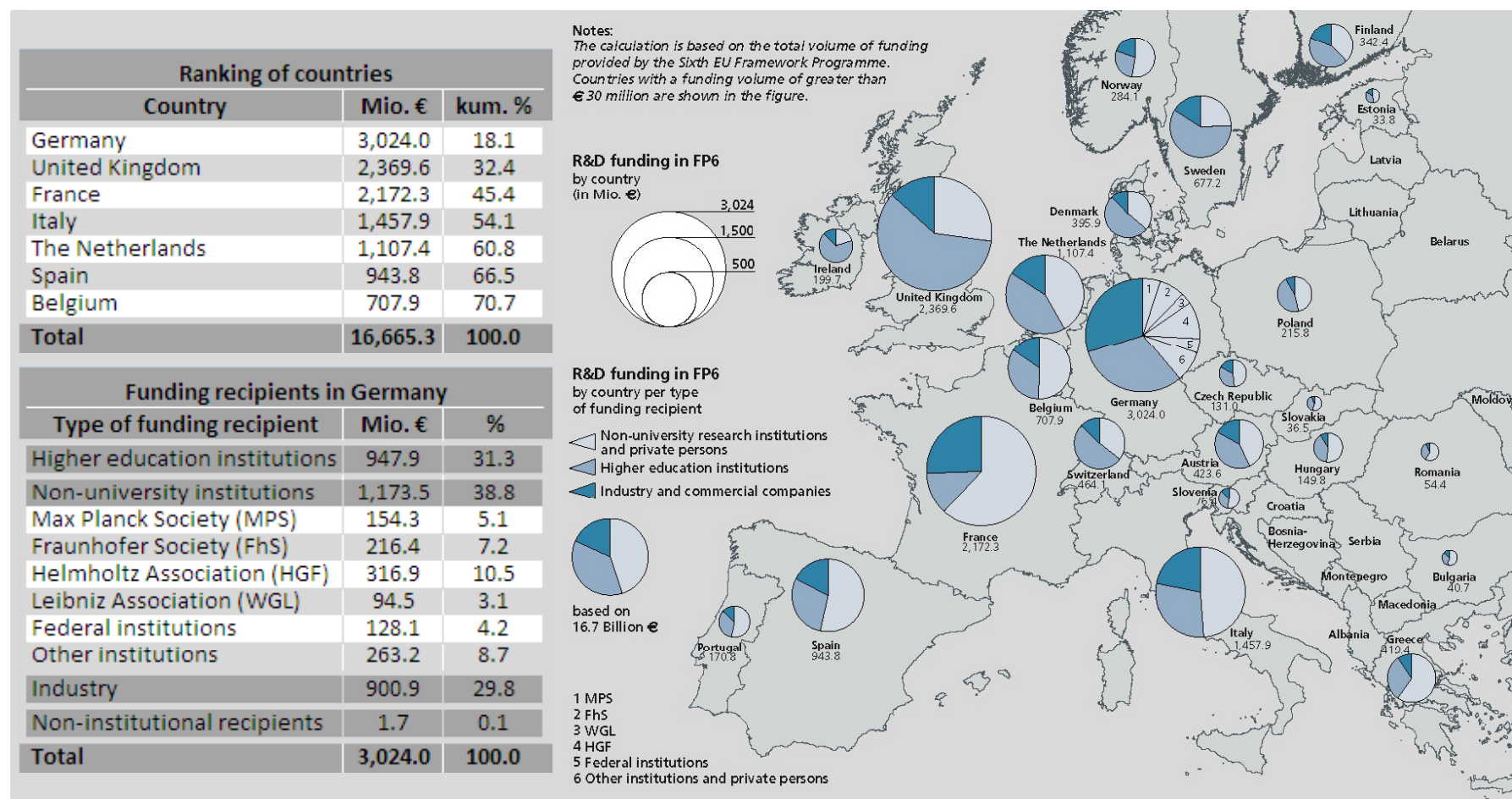
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Analyses of the 6th EU Research Framework Programme

- ▶ The following case study is based on the project database for the **EU's Sixth Framework Programme** for Research and Technological Development (FP6) which ran from 2002 to 2006.
 - Total budget of FP6: approximately **17 billion Euro**
 - **10,058 contracts** with **74,400 participations**
- ▶ The special focus is on the thematic priority “**Life sciences, genomics and biotechnology for health**”.
 - Total budget: approximately 2.3 billion Euro
 - 599 contracts with 6,827 participations
- ▶ For analyses by **German** recipients in the life sciences we **additionally** use data on research funding by the **DFG** and the **federal government** (total budget incl. EU funding: 3.2 billion Euro).
- ▶ The funding volumes are used as an **indicator for research performance**.

R&D funding in the 6th EU Research Framework Programme by country per type of funding recipient



Differences in the organisation structures of national research systems

- ▶ There are significant differences in the relative shares of funds allocated to the **different actors between the European states**.
- ▶ In the **UK** more than half of the funds went to the university sector. Accordingly, UK universities regularly reach high positions in worldwide university rankings. In **France** or **Germany** governmental research centers are key players in the national research landscape.
- ▶ These differences indicate different ways of organising national research systems. Furthermore, in the different countries **regional cooperation patterns** between the various research performing institutions are more or less pronounced.
- ▶ It is of great importance to also consider the different organisation structures of **national research systems** when interpreting results of international university rankings in the context of a **cross-country comparison of research performance**.

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Funding ranking in the 6th EU Research Framework Programme in the life sciences by higher education and non-university institution

Position ¹⁾		Higher Education Institution	Country	FP6 Participations		Position	Governmental Research Organisations ²⁾	Country	FP6 Participations	
FP6	ARWU			N	€				N	€
1	1	KAROLINSKA INSTITUTE	Sweden	107	48,2	1	INSERM	France	156	62,1
2	3	UNIVERSITY OF OXFORD	UK	65	34,0	2	HELMHOLTZ ASSOCIATION	Germany	110	46,8
3	8	UNIVERSITY OF LEIDEN	Netherlands	62	28,5	3	CNRS	France	108	44,2
4	2	UNIVERSITY COLLEGE LONDON	UK	55	21,3	4	MAX PLANCK SOCIETY	Germany	72	55,1
5	5	IMPERIAL COLLEGE LONDON	UK	51	21,5	5	EMBL	Germany	62	35,0
6	n.a.	LUND UNIVERSITY	Sweden	50	17,0					
7	4	UNIVERSITY OF CAMBRIDGE	UK	49	21,8					
8	14	UNIVERSITY OF ROTTERDAM	Netherlands	48	25,1					
9	24	UNIVERSITY OF COPENHAGEN	Denmark	46	19,7					
10	24	UNIVERSITY OF HELSINKI	Finland	43	19,2					
11	14	KATHOLIEKE UNIVERSITY LEUVEN	Belgium	42	16,0					
12	14	UNIVERSITY OF HEIDELBERG	Germany	41	14,9					
12	14	UNIVERSITY OF MILAN	Italy	41	14,2					
14	n.a.	RADBOD UNIVERSITY NIJMEGEN	Netherlands	40	21,0					
14	n.a.	UTRECHT UNIVERSITY	Netherlands	40	17,7					
16	9	UNIVERSITY OF ZURICH	Switzerland	38	11,3					
17	6	KING'S COLLEGE LONDON	UK	37	18,7					
17	24	UNIVERSITY OF UPPSALA	Sweden	37	15,5					
19	10	UNIVERSITY OF MUNICH	Germany	36	19,2					
20	n.a.	UNIVERSITY OF GENEVA	Switzerland	35	13,1					
20	n.a.	HEBREW UNIVERSITY	Israel	35	10,2					
22	14	UNIVERSITY OF MANCHESTER	UK	32	12,5					
23	24	UNIVERSITY OF FREIBURG	Germany	29	10,9					
23	12	UNIVERSITY OF AMSTERDAM	Netherlands	29	10,8					
23	11	UNIVERSITY OF BASEL	Switzerland	29	8,9					

► High correlation between ARWU and FP 6 funding ranking for universities

► The funding figures also allow to compare the results to non-university institutions

► Thereby, the importance of these institutions for specific countries comes into sight

¹⁾ Compared is the ranking of participations in the EU FP6 health priority with the results of the ARWU ranking in clinical medicine and pharmacy.

²⁾ For comparative purposes with universities it has to be considered that these organisations often subsume various research institutes at different locations.

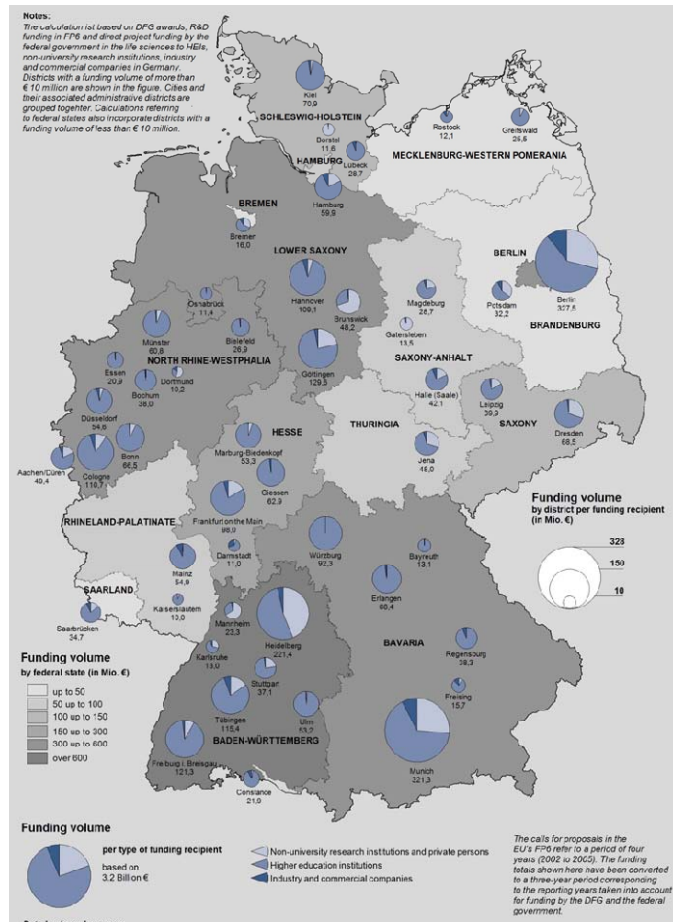
Data basis and sources:

Academic Ranking of World Universities (ARWU) 2010.

EU Office of the BMBF: Participations in the Sixth EU Framework Programme from 2002 (project data as of 02.06.2008).

Calculations by the DFG.

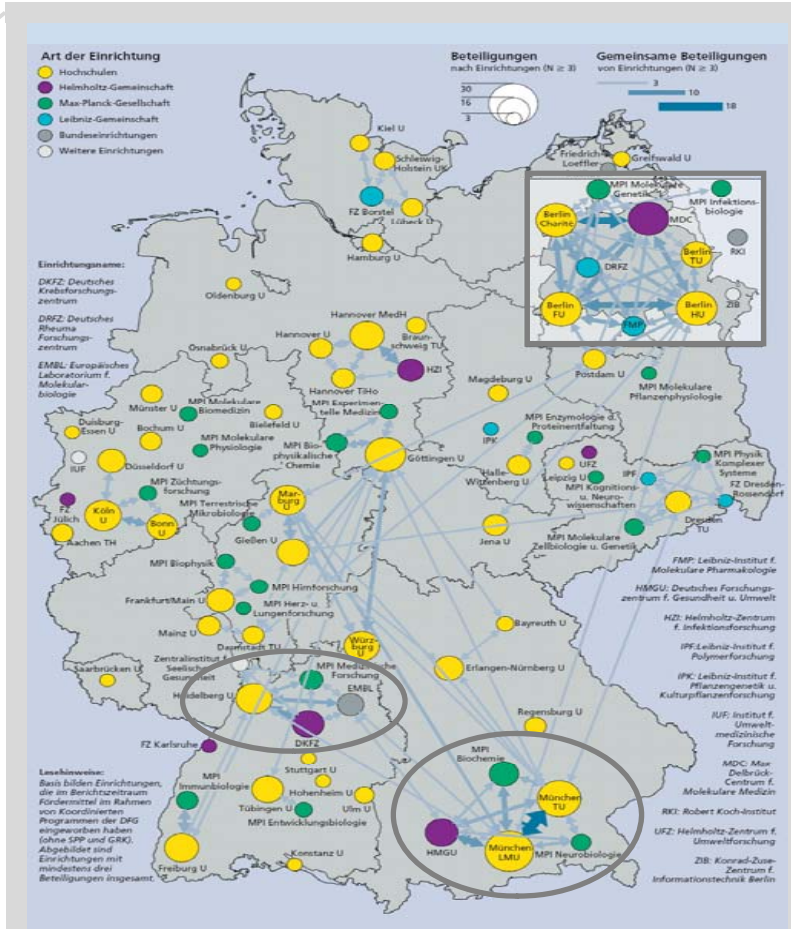
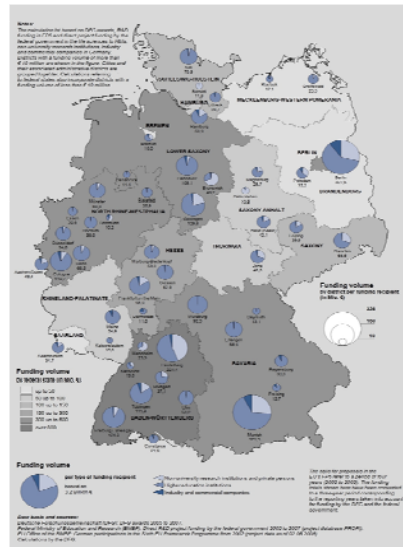
Regional distribution of R&D funding by the DFG, federal government and the EU in the life sciences per type of funding recipient



- ▶ The life sciences sector in Germany is characterised by **strong regional cooperation patterns** between the various research performing institutions.
- ▶ There are **large regional differences** in the relative shares of funds allocated to the different types of institutions.
- ▶ Also in a national perspective, it is problematic to deduce information about **regional research performance** from studies which are focused on a specific performing sector.
- ▶ Further development of the analysis in the future: Visualisation of **university, industry, and government** cooperation activities.

Participations of research performing institutions in funding programmes and the resulting cooperative relationships

Example for a visualisation of DFG funded cooperation activities in the life sciences



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Summary and selected findings

- ▶ This contribution illustrates the relationship between the different organisation structures of national research systems and results of university ranking studies.
 - The analyses of the EU FP 6 indicate the differences in the relative shares of funds per type of funding recipient in an EU wide comparison as a result of different profiles of national research systems.
 - The example of the life science sector in Germany confirms these results. There are significant differences in the relative share of funds allocated to the university, governmental and industry sector.
- ▶ It is of great importance to also consider the different organisation structures of national research systems when interpreting results of university rankings in the context of a cross-country or regional comparison of research performance.
- ▶ High acceptance and the demand for ever more differentiated analyses have encouraged the DFG to further develop the Funding Ranking in the future; in particular: more profound analyses for university, industry, and governmental sectors as well as visualisations of their cooperation activities.



Thank you very much for your attention!