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Who Applies for DFG Grants? Statistical Trends in Proposal Submission and Applicant Demographics

External funding continues to gain importance in Germany's higher-education and research system. The share of third-party grants as part of a university's total budget has been rising continuously in recent years (Wissenschaftsrat 2013). The Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) too has seen a sharp increase in the number of grant proposals submitted since 2009 – resulting in a steady decline in funding and success rates, in spite of a growing grant budget.

The general discussion of this development so far has focused heavily on the general trend of largely stagnating or even declining core support and the resulting need for more external funding. This Infobrief contributes to this discussion by examining not only the extent of this development, but also the question of whether and how the demographics of grant seekers and their submission patterns have changed in recent years. Using the example of individual grants, which constitute the core of DFG funding with around one-third of its total grant volume, a number of changes are identified that influence, to varying degrees, the increased demand for DFG grants in several of the scientific communities served by the DFG.

1 Introduction

In discussions about the redesign of the three major pacts (Pact for Research and Innovation, Excellence Initiative by the German Federal and State Governments, and Higher Education Pact), which are set to expire in the coming years, the issue of increased pressure to raise external funds has recently been gaining strong attention. Indeed, data of the Federal Statistical Office suggest that German university budgets increasingly rely on third-party grants. Between 1995 and 2012, the total amount of grant funding has more than doubled, and grant funding as a share of current expenditures has

increased from 14 to 28 percent (Statistisches Bundesamt 2014).

As possible causes for this increase, several factors are being discussed. A survey conducted in 2010 by the Institute for Research Information and Quality Assurance (iFQ) revealed that researchers attach increasing importance to third-party grants because without this source of funding they see few possibilities to carry out their research projects and finance the staff they need. In addition, successful grant proposals are also relevant to a researcher's reputation (Böhmer et al. 2011) as they are increasingly considered indicative of excellent research (Münch 2006). Another iFQ survey conducted at medi-

cal schools and departments in 2012 produced similar results. In it, researchers reported that they see a continued increase in the competition for funding and prestige that is also due to performance-based funding policies, which often consider the amount of grant money raised as an indicator of research performance. The majority of respondents agreed that the ability to attract performance-based funding significantly enhances an institution's reputation (Krempkow et al. 2013). This type of environment not only puts pressure on researchers, but it also provides an incentive to boast as many grants as possible. Lastly, researchers try to raise grants in order to compensate for gaps in basic funding, as the German Council of Science and Humanities has described in its recommendations for evaluating and driving research performance, noting a changing framework for academic research (Wissenschaftsrat 2011).

This is not merely a German phenomenon; increasing numbers of proposals and declining funding chances are reported internationally as well. For example, the National Science Foundation's funding rate dropped from 31 percent to 21 percent between 2001 and 2013 (National Science Foundation 2014).

This greater importance of third-party funding poses a challenge to the DFG as well. At present, two out of three professors at German universities submit at least one proposal to the DFG within a five-year period, according to the DFG's internal calculations.¹ The number of new projects submitted to the DFG's Individual Grants Programmes has increased between 2009 and 2013 from 8,500 to over 11,000. Again, this inevitably leads to declining funding rates.

To shed statistical light on this dynamic, a report on proposal statistics was prepared in 2014 and submitted for discussion to the DFG's statutory bodies. This Infobrief presents excerpts of the report and its main findings. The focus is on the individual grant. Accounting for approx-

imately 30 percent of the DFG's total grant volume, it forms the centrepiece of its funding activities and often serves as the starting point for proposals to establish coordinated programmes such as Collaborative Research Centres, Research Units, and Research Training Groups. It responds directly to structural changes in the research system. The analysis focuses primarily on changes in the population of applicants and their submissions to the DFG.

2 Submissions to the Individual Grants Programmes

Individual grants make up over one-third of the DFG's annual funding volume.² Proposals for research projects that focus on a specific topic for a limited duration may be submitted by scientists and scholars who have completed their training with a doctorate. The largest Individual Grants Programme, accounting for about 85 percent of the individual grants budget, is the Research Grants Programme. Other Individual Grants Programmes include the Emmy Noether Programme, the Heisenberg Programme, Reinhart Koselleck Projects, and Clinical Trials. In 2013, a total of 29,817 projects were being funded by the DFG. Of these, 13,846 new and renewal grants were being funded in the Individual Grants Programmes in the amount of 849 million euros. This is twice the funding sum allocated to the Excellence Initiative in 2013. In the following, new proposals for individual grants serve as the data base for the analysis of trends in proposal submissions.

2.1 Proposal and funding trends

Since 2009, continuous growth can be seen in the number of new proposals submitted to Individual Grants Programmes. From around

¹ Depending on the research area, these ratios range from 45 to 95 percent.

² A complete overview of the DFG's funding portfolio, broken down by the grant volumes of the five programme groups and the individual funding instruments, can be found in the 2013 Annual Report (page 160, Table 3), available at www.dfg.de/en/annual_report/.

8,500 in 2009, more than 11,300 new proposals were reviewed in 2013. This represents an increase of 2,800 proposals, or about one-third. The number of new proposals approved declined during the same period. In 2009, about 4,100 new projects were approved. By 2012, this number was down about 15 percent to approximately 3,500 (Figure 1).

Along with the increase in the number of new proposals reviewed, the volume of funds requested in the period 2009 to 2013 grew as well – from about 2.3 billion euros in 2009 to about 3.1 billion euros in 2013. This represents growth of about one-third. The total grant amount declined by around 100 million euros in 2009 and 2011. In 2013, it was 685 million euros. Both the increase in the sum requested and the decrease in the sum awarded largely stabilized by 2013 compared to the previous year (Figure 2).

What differences emerge in the development of submissions regarding the different research areas? To convey an idea, Figure 3 shows the relative and absolute change in the number of submissions by research area. The 14 research areas constitute the second level, below the four major scientific disciplines, of the DFG's subject classification.³ In order to map the development, the periods 2008 to 2010 and 2011 to 2013 are compared. This view of three-year periods allows a robust assessment of trends even in smaller research areas. The research areas are presented here in descending order of growth rate.

It turns out that more proposals were reviewed in all research areas between 2011 and

³ See Table 1 in the 2013 Annual Report (pp. 156 – 157) at www.dfg.de/en/annual_report/ for the top three levels of the DFG subject classification system, and see www.dfg.de/dfg_profil/gremien/fachkollegien/faecher for the fourth level.

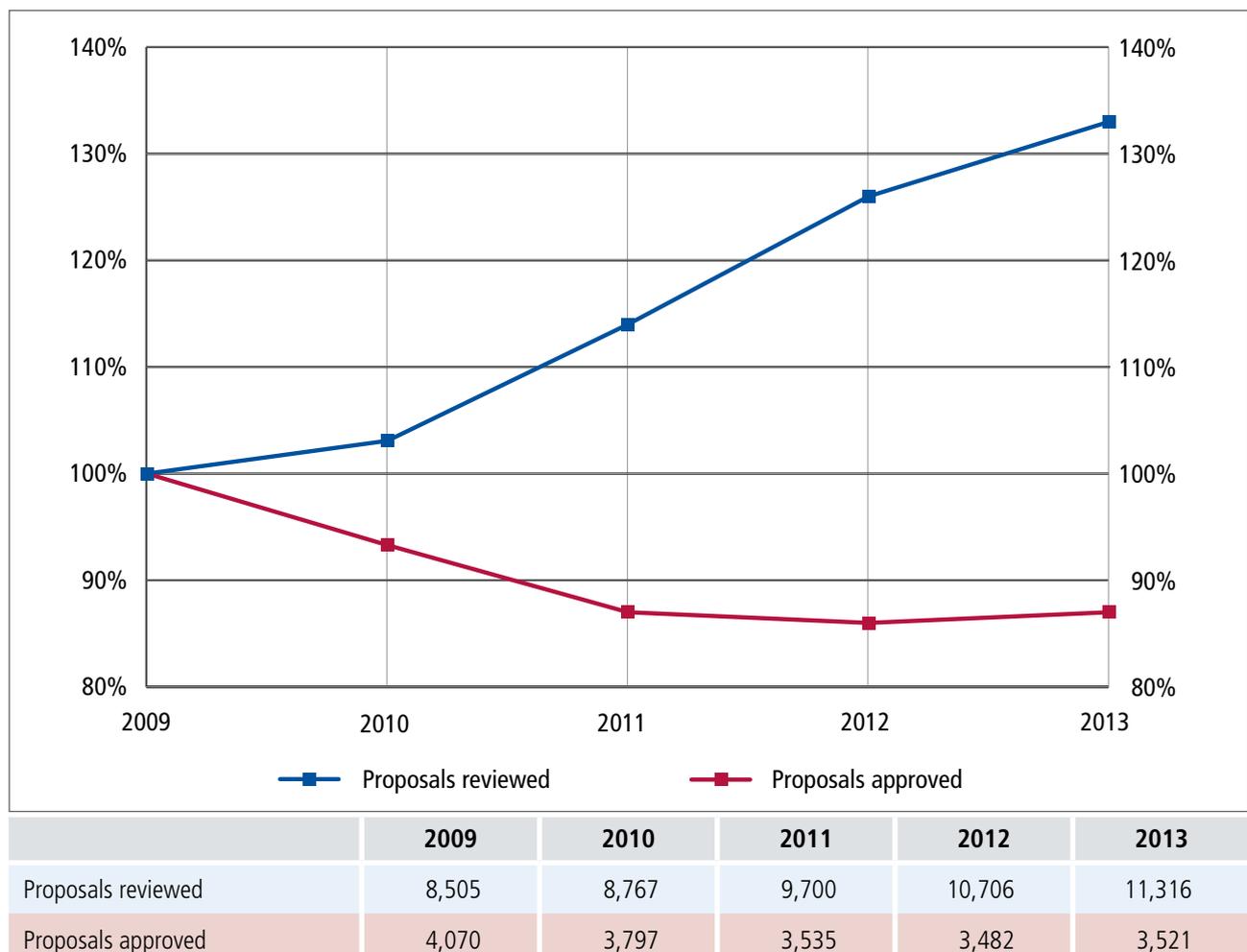


Figure 1: Absolute and relative development of the number of new proposals reviewed and approved in the Individual Grants Programmes (2009 to 2013, 2009 = 100)

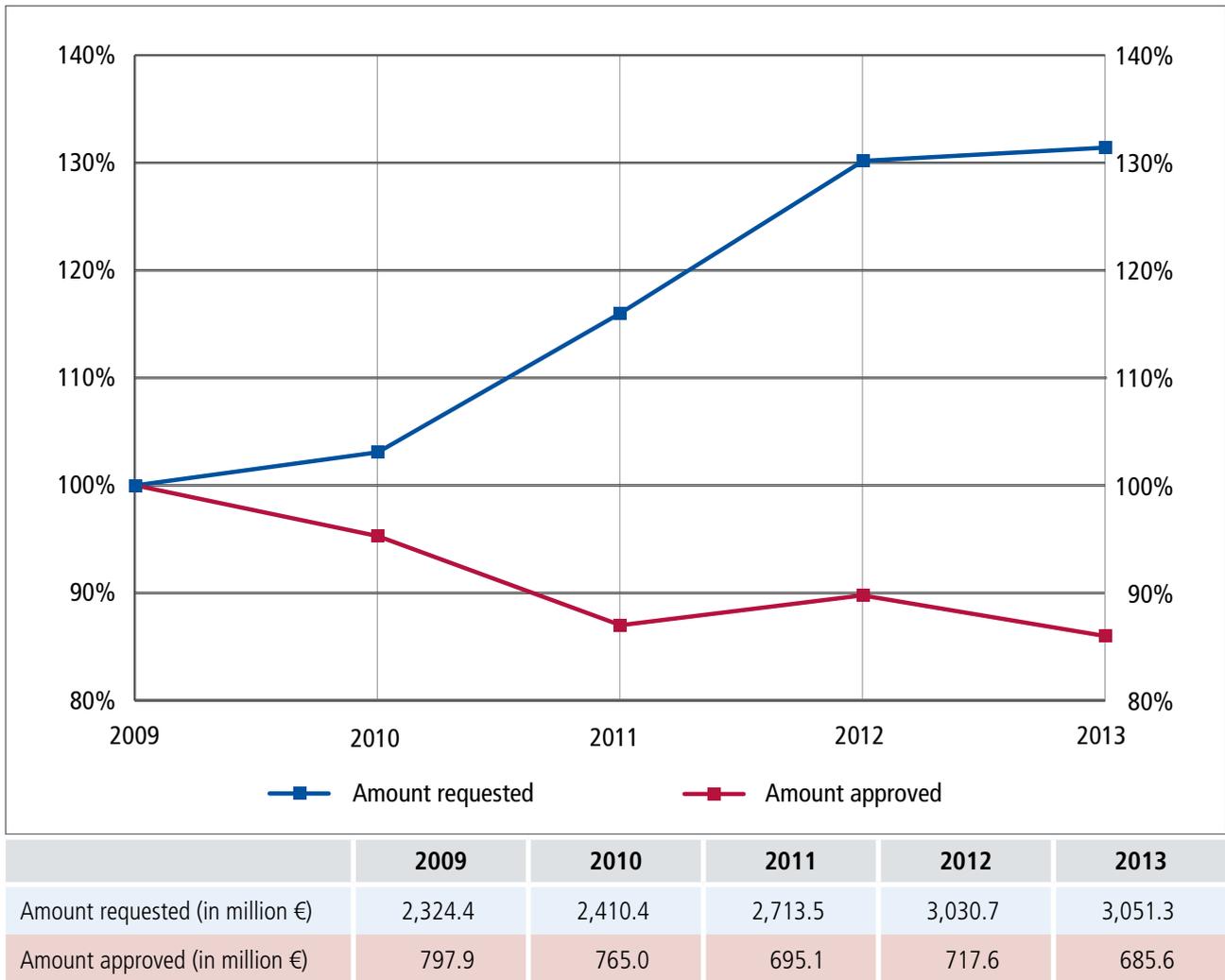


Figure 2: Absolute and relative development of the amount requested and the amount approved for new proposals in the Individual Grants Programmes (2009 to 2013, 2009 = 100)

2013 than in the previous comparison period. Overall, the period 2008 to 2010 is outnumbered by 23 percent. The biggest increase can be seen in three of five engineering areas (Construction Engineering and Architecture; Computer Science, Electrical and Systems Engineering; Materials Science and Engineering), in Biology, and in Social and Behavioural Sciences. Relatively low growth rates, however, occurred in the areas of Chemistry; Thermal and Process Engineering; Geosciences; and Humanities.

2.2 More proposals from women

In addition to different trends across research areas, there are also changes in the demographic composition of grant seekers.

Figure 4 looks at two key characteristics of applicants in the DFG's Individual Grants Programmes: age and gender. It shows the respective change in the number of proposals reviewed by comparing the periods 2008 to 2010 and 2011 to 2013.

Overall, it can be noted that the number of proposals submitted by young researchers has increased. We also see that, in absolute terms, the age cohorts of applicants under 40 and of those aged 45 to 55 have contributed especially strongly to the growth in submissions.

The age profile of female applicants differs from that of their male counterparts. While the age cohorts between 35 and 55 years dominate among men, the cohorts between 30 and 45 are strongest among women. The age group of women over 50, in comparison, submits only a small

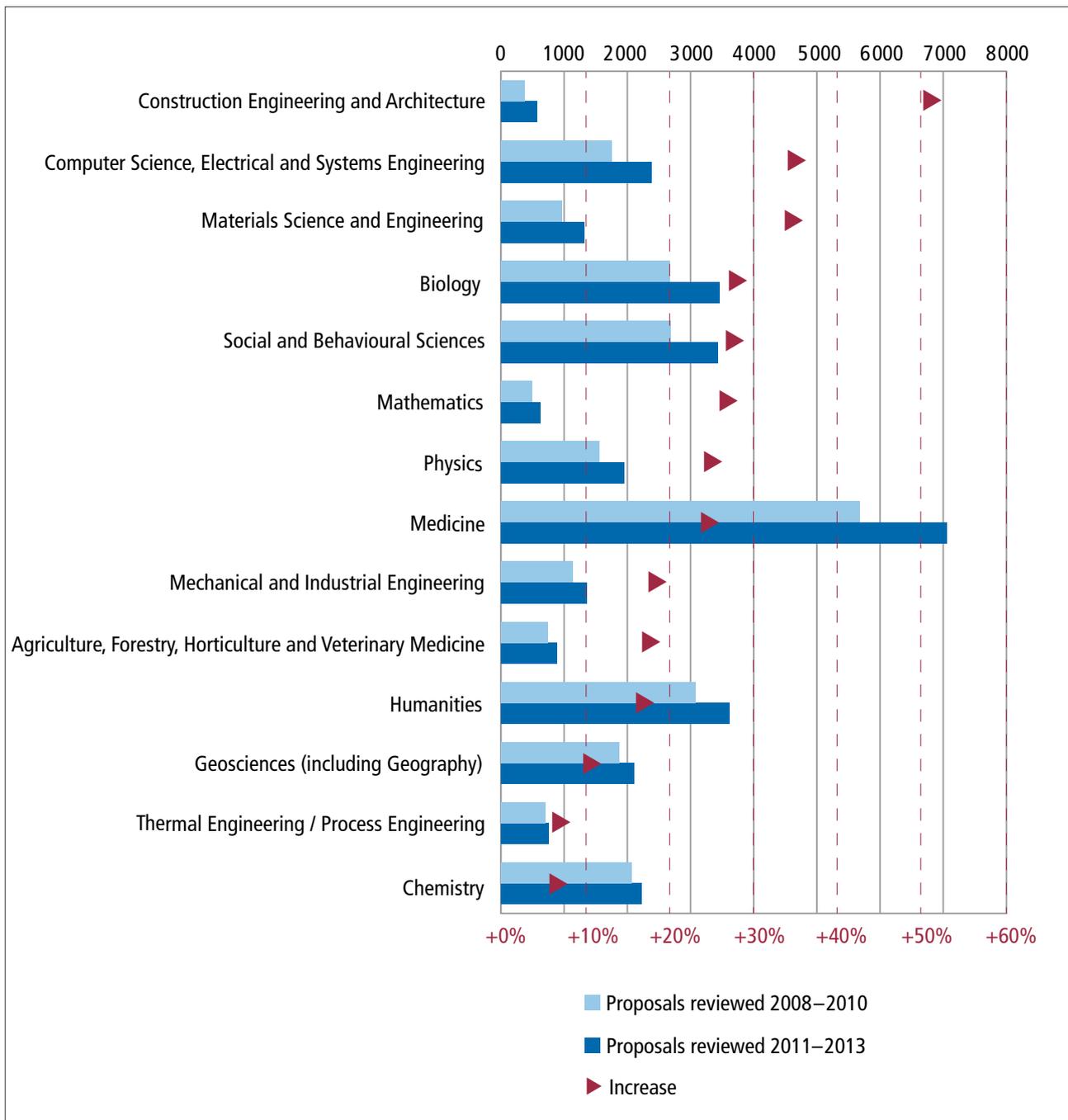


Figure 3: Absolute and relative increase in proposal submissions by research area: 2008–2010 compared to 2011–2013 (new proposals in the Individual Grants Programmes)

portion of proposals. Especially the younger cohorts are thus responsible for the increase in submissions from women: The figure shows that the growth between the two periods is much more pronounced for them than for men.

According to the Federal Statistical Office, the proportion of women in academia at all stages of their careers increased steadily from 2011 to 2013 (Statistisches Bundesamt 2013). Along the same lines, the Joint Science Conference reports

a gain in the share of women among the total number of academic staff at all career stages in universities from 1992 to 2011 (Gemeinsame Wissenschaftskonferenz 2013). This is also reflected in the number of individual grant proposals the DFG has received from women.⁴ A simi-

⁴ More information and data on the representation of women among applicants and in the bodies and committees of the DFG can be found at www.dfg.de/en/research_funding/principles_dfg_funding/equal_opportunities/monitoring_equal_opportunity.

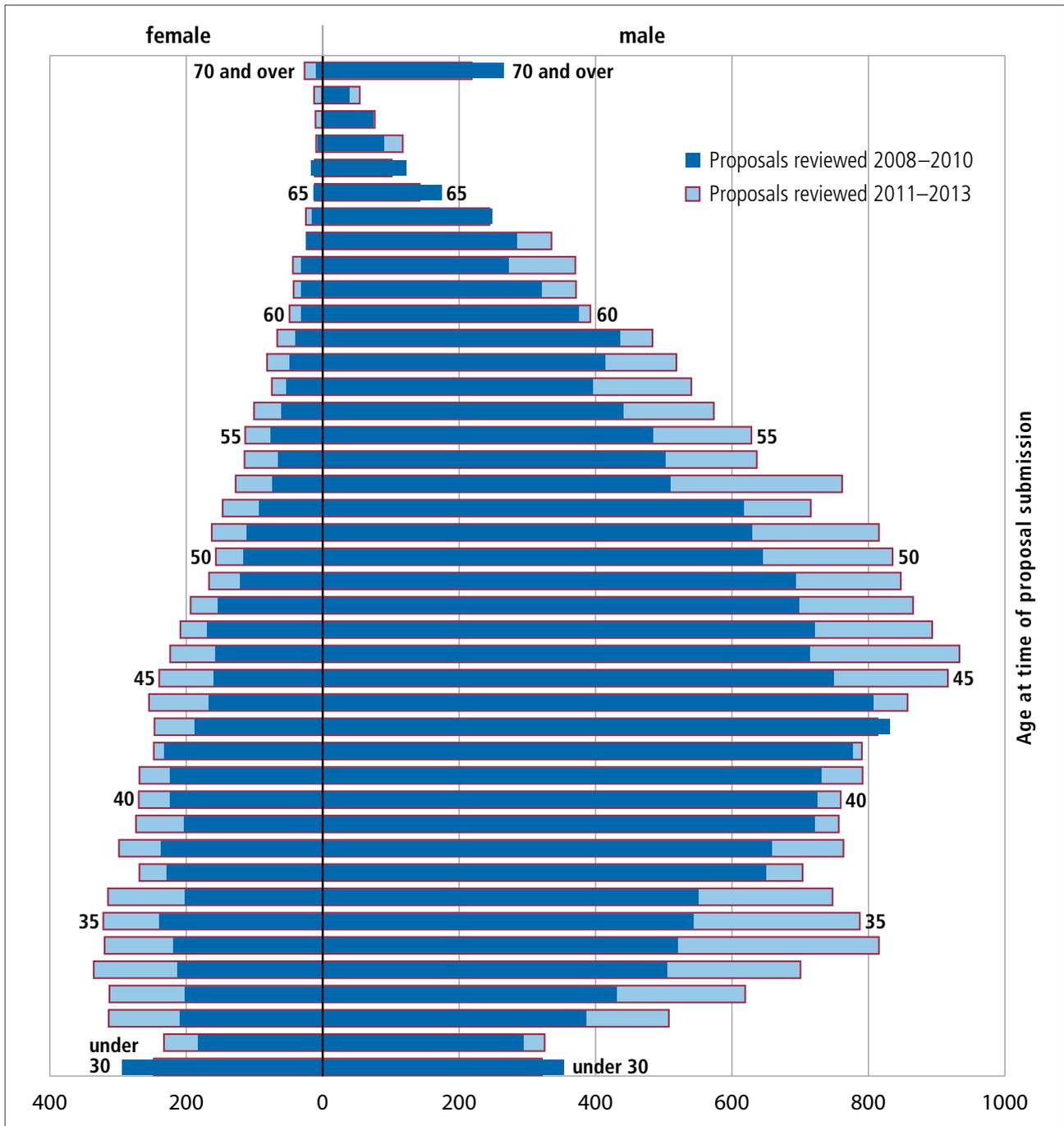


Figure 4: Development of the number of new proposals reviewed, by applicant age and gender (2008–2010 compared to 2011–2013)

lar trend can be observed in other countries, for example at the US National Science Foundation. There, too, the share of proposals submitted by women has grown, as noted in the Report to the National Science Board on the National Science Foundation's Merit Review Process Fiscal Year 2013 (National Science Foundation 2014).

Broken down by research areas, the development is different. Table 1 shows the evolution of the number of new proposals reviewed according

to scientific discipline and research area. Presented are the total numbers and the submissions from women. The comparison between the periods from 2008 to 2010 and from 2011 to 2013 shows that the participation of women in the Individual Grants Programmes increased: While the total number of reviewed proposals grew by about 23 percent, the number of those submitted by women rose by 34 percent. This development holds across scientific disciplines and research areas.

Analysis by scientific discipline reveals a particularly strong increase in the number of reviewed proposals from women in the Humanities and Social Sciences, as well as – at a numerically lower level – the Engineering Sciences. At the next-lower classification level by research area, participation by women grew especially in Materials Science and Engineering; Computer Science, Electrical and Systems Engineering; Construction Engineering and Architecture; and Social and Behavioural Sciences. Weaker increases are noted in the Geosciences (including Geography); Humanities; Agriculture, Forestry, Horticulture and Veterinary Medicine; and Chemistry. No growth is seen in the area of Physics.

These changes are consistent with figures from the report of the Joint Science Confer-

ence on gender equality with respect to the increase in the number of women between 2008 and 2011. In the disciplines represented there – Language and Cultural Studies; Mathematics/Natural Sciences; Engineering Sciences; Human Medicine/Health Sciences – the number of women employed as academic and creative arts staff as well as lecturers and assistant professors grew strongest in the Engineering Sciences with approximately 40 percent, ahead of Language and Cultural Studies with 27 percent growth (Gemeinsame Wissenschaftskonferenz 2013).

2.3 More proposals from first-time applicants

Another important factor influencing the development of the number of proposals is

Scientific Discipline / Subject	Total			From women		
	2008–2010	2011–2013	Increase	2008–2010	2011–2013	Increase
Humanities and Social Sciences	5 771	7 051	+22%	1 706	2 299	+35%
Humanities	3 082	3 613	+17%	928	1 161	+25%
Social and Behavioural Sciences	2 689	3 438	+28%	778	1 138	+46%
Life Sciences	9 099	11 395	+25%	2 284	3 078	+35%
Biology	2 674	3 462	+29%	696	903	+30%
Medicine	5 677	7 052	+24%	1 416	1 949	+38%
Agriculture, Forestry, Horticulture and Veterinary Medicine	748	881	+18%	172	226	+31%
Natural Sciences	5 993	6 902	+15%	785	932	+19%
Chemistry	2 071	2 227	+8%	271	355	+31%
Physics	1 555	1 948	+25%	164	164	+0%
Mathematics	492	624	+27%	53	71	+34%
Geosciences (including Geography)	1 875	2 103	+12%	297	342	+15%
Engineering Sciences	4 937	6 378	+29%	416	649	+56%
Mechanical and Industrial Engineering	1 137	1 356	+19%	63	87	+38%
Thermal Engineering / Process Engineering	704	760	+8%	61	64	+5%
Materials Science and Engineering	970	1 313	+35%	109	203	+86%
Computer Science, Electrical and Systems Engineering	1 750	2 378	+36%	130	210	+62%
Construction Engineering and Architecture	376	571	+52%	53	85	+60%
Total	25 800	31 726	+23%	5 191	6 958	+34%

Table 1: Increase in the number of new proposals reviewed in the Individual Grants Programmes overall and from women, by scientific discipline and research area (2008–2010 compared to 2011–2013)

the participation of individuals and groups applying for the first time. In the following, we look at those who had not previously applied for individual grants from the DFG. Figure 5 shows the evolution of the number of reviewed proposals and the percentage of these by first-time applicants in the Individual Grants Programmes. Their share increased by five percentage points between 2009 and 2013. In spite of a slight drop compared to 2012, this share was still about three percentage points higher in 2013 than in 2009. New applicants now account for almost one-quarter of the DFG's "customer base".

2.4 More proposals from frequent applicants

Another change in the applicant population can be found in the submission activity of individual researchers requesting individual grants.

Figure 6 breaks down the number of new proposals reviewed according to the activity

level of the applicants. During the period from 2008 to 2010, a total of 2,232 new proposals reviewed in the Individual Grants Programmes were from applicants who submitted four or more proposals in these three years. This represents a 9 percent share of the total number of reviewed proposals. In the period from 2011 to 2013, the percentage of proposals from these particularly active grant seekers was 2 percentage points higher at 11 percent. The portion of grant requests from applicants who submitted one proposal during the relevant periods went down from about one-half to 44 percent. Overall, the share of proposals submitted by particularly active applicants increased in the Individual Grants Programmes.

3 Conclusion

The results of this study reflect structural changes in the funding of German universities. The focus of the general debate has been on the

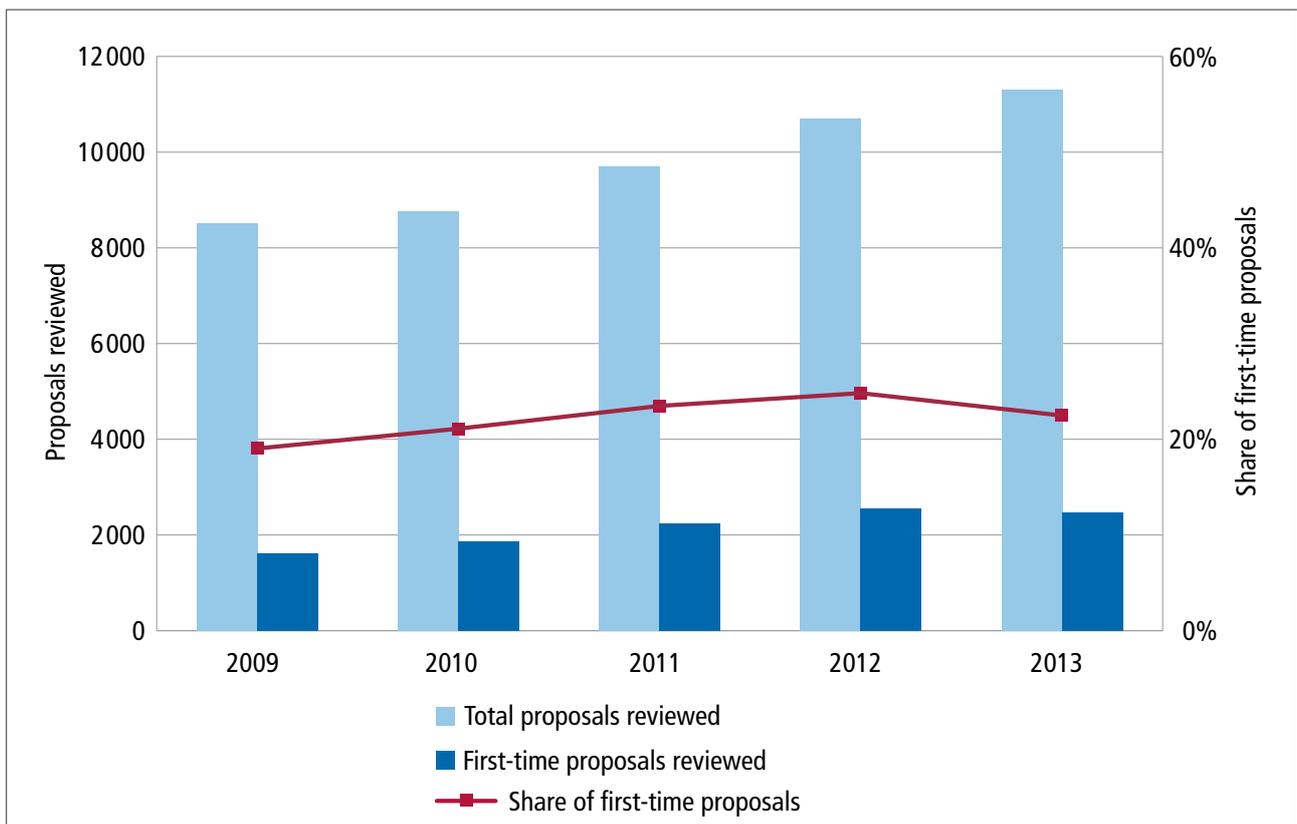


Figure 5: Development of the total number of reviewed proposals and of the number and share submitted by first-time applicants (new proposals in the Individual Grants Programmes)

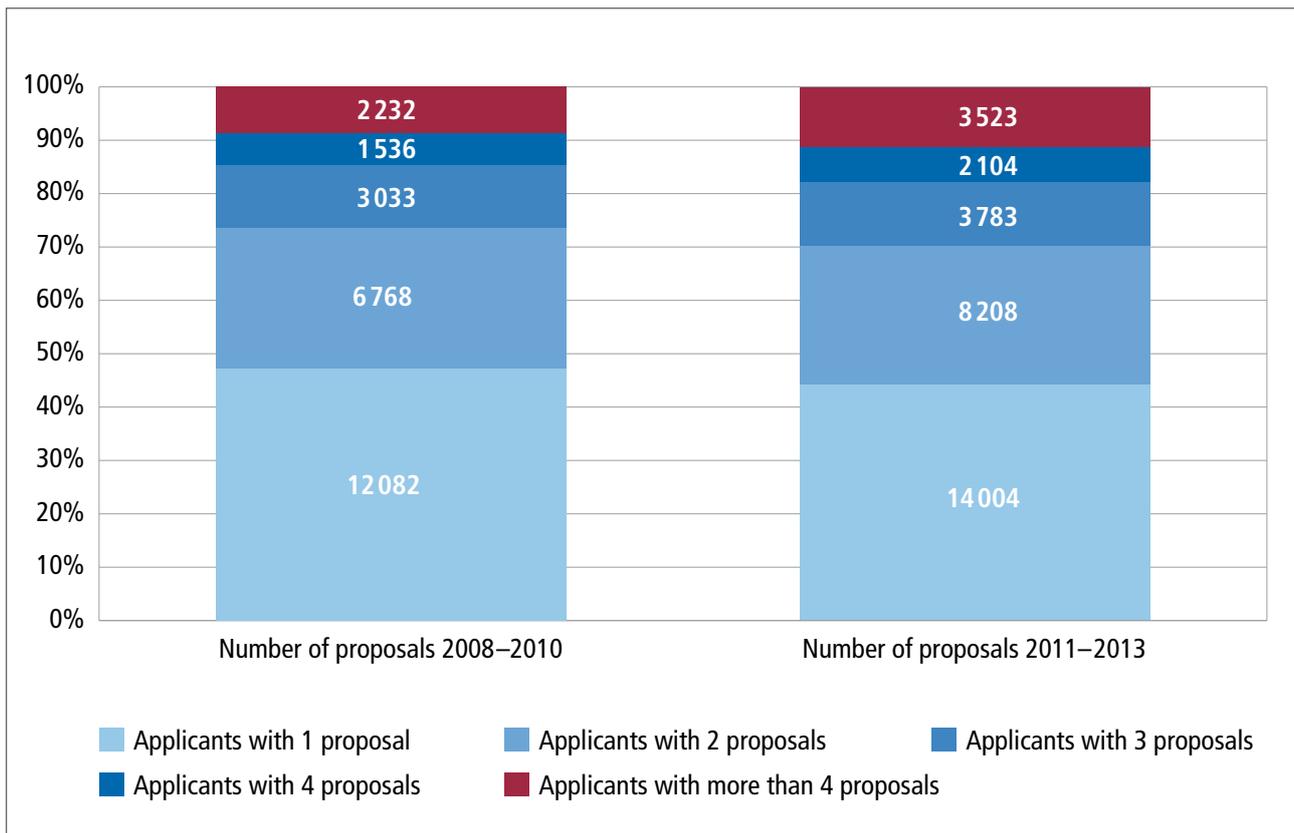


Figure 6: New proposals reviewed by applicant activity (new proposals in the Individual Grants Programmes 2008–2010 and 2011–2013)

growing importance of third-party grants to fund academic research and higher education, and the consequently growing demand from researchers for grants to fund their projects. This Infobrief also took a look at changes in the population of grant seekers that have brought about greater demand for DFG grants. It turns out that the strength of this trend varies across different groups of applicants and their submission patterns.

The outlook for the academic research system and particularly for the funding of universities in Germany is currently the subject of much debate. The lack of core funding, which researchers perceive, increases the need to raise third-party grants and heightens the competition for these. The growing number of grant proposals and grant seekers reduces funding chances on an individual basis. The DFG has discussed this development with policymakers for some time and tries to devise measures to counteract this general trend in a focused way. It has achieved

a slight stabilisation of grant approval rates for 2013, inter alia by shifting funds in certain funding programmes, mainly to the benefit of individual grants funding. “This appears to have stopped the worrisome negative dynamic for now,” said DFG President Peter Strohschneider at the DFG’s Annual Press Conference on 3 July 2014. Nevertheless, the DFG President appealed to policymakers by calling “for significant improvement of basic funding for universities and for the further development of the research system in Germany as a whole”.

Preliminary numbers for 2014 confirm this trend toward stabilisation. On the one hand, submissions of new proposals in the Individual Grants Programmes remained stable or even dropped slightly in 2014; on the other hand, around 300 more new proposals for individual grants were approved compared to the previous year. This represents an improvement of funding chances by 3 percentage points (from 31 to 34 percent).

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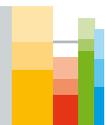
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(Version dated: 19 May 2015)

DFG infobrief



Legal information

Issue 1.15

The DFG infobrief is published by the Information Management Section of the German Research Foundation (DFG), Bonn.

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Basic layout: besscom, Berlin; Tim Wübben, DFG
Design: Olaf Herling, Warstein