DFG infobrief
Research Funding – Facts and Figures

1.16

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Bridges between research and application – a statistical overview of knowledge transfer projects

In 2010, the Senate of the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) made the funding policy objective of knowledge transfer – defined as a bidirectional exchange between research and industry or society – a subject of focus. Various measures were initiated to help scientific findings obtained in DFG projects to be used and developed outside the research community while enabling research to benefit from the stimulus of real-world application. Two calls for proposals (July 2011 and May 2012) drew attention to the funding opportunities offered by the DFG and met with considerable interest. The purpose of this Infobrief is to describe the demand for knowledge transfer funding in the context of these calls for proposals and the structure of funded projects.

Projects involving an element of knowledge transfer have always been eligible for funding in many DFG programmes. In the individual grants programme, particular use has been made of this option in the engineering sciences. The Collaborative Research Centres programme has also included the explicit possibility of applying for "transfer projects" since 1996[1]. Finally, the Excellence Initiative placed a strong emphasis on transfer, with a variety of collaborative relationships with industrial and commercial partners being established and consolidated. In other words, DFG funding for knowledge transfer is not limited to the projects that resulted from the calls for proposals mentioned above. However, the calls for proposals and various other communication measures emphasised that DFG's definition of knowledge transfer is much broader than that of traditional technology transfer – and that knowledge transfer funding should be accessible and attractive to all disciplines[2]. Between 2010 and 2012, a proportion of the approved projects were funded from special funds to reduce competition with purely basic science projects in the decision-making process.

The responsibility to fund knowledge transfer does not only arise from demand from applicants. Professors at German universities surveyed in the Researcher Survey 2010 (Böhmer et al. 2011) regard the funding of knowledge transfer as an important duty of the DFG alongside its core task of funding research. In comparison with other duties such as representing the interests of the research community in the political arena (76 percent regard this as fairly or very important) and upholding good scientific practice (74 percent), but in particular

1 On this topic, see the detailed report on CRC transfer projects in Berger et al. (2012)

2 See www.dfg.de/en/research_funding/principles_dfg_funding/knowledge_transfer

compared with the support of early career researchers (considered by 83 percent as important or very important), it has a lower importance. However, almost 60 percent consider it important or very important that the DFG performs this task (Böhmer et al. 2011). To the individuals surveyed, this task is approximately equally important as the promotion of equal opportunity and the communication of information about research in Germany.

Data Basis

The DFG database contains structured process-produced data and documents that map the process from proposal submission and review to the funding decision and the final report and review of this report. Here, this data is used to make statements about proposals for and approvals of transfer projects and about demographic variables of applicants (e.g. age and gender).

The evaluations are based on 270 new proposals for individual grants submitted between 2006 and 2013. For the majority of analyses that follow, only proposals on which a decision had been reached by 31.12.2013 were taken into consideration (225 of 270). Of these, 129 were funded.

Results

Proposals for transfer projects were already being submitted (and funded) before the calls for proposals were issued; these are classified as transfer projects in the individual grants. This applied almost exclusively to the engineering sciences though. The aim of the calls in 2011 and 2012 was to move beyond pure technology transfer and diversify transfer activities with respect to disciplines and fields of application.

In the period stated, 31 proposals were submitted in the humanities and social sciences, 44 in the life sciences, 24 in the natural sciences and 171 in the engineering sciences.

As before, there is a noticeable preponderance of engineering sciences projects among the knowledge transfer projects: approximately 40 percent of the 270 knowledge transfer propo-

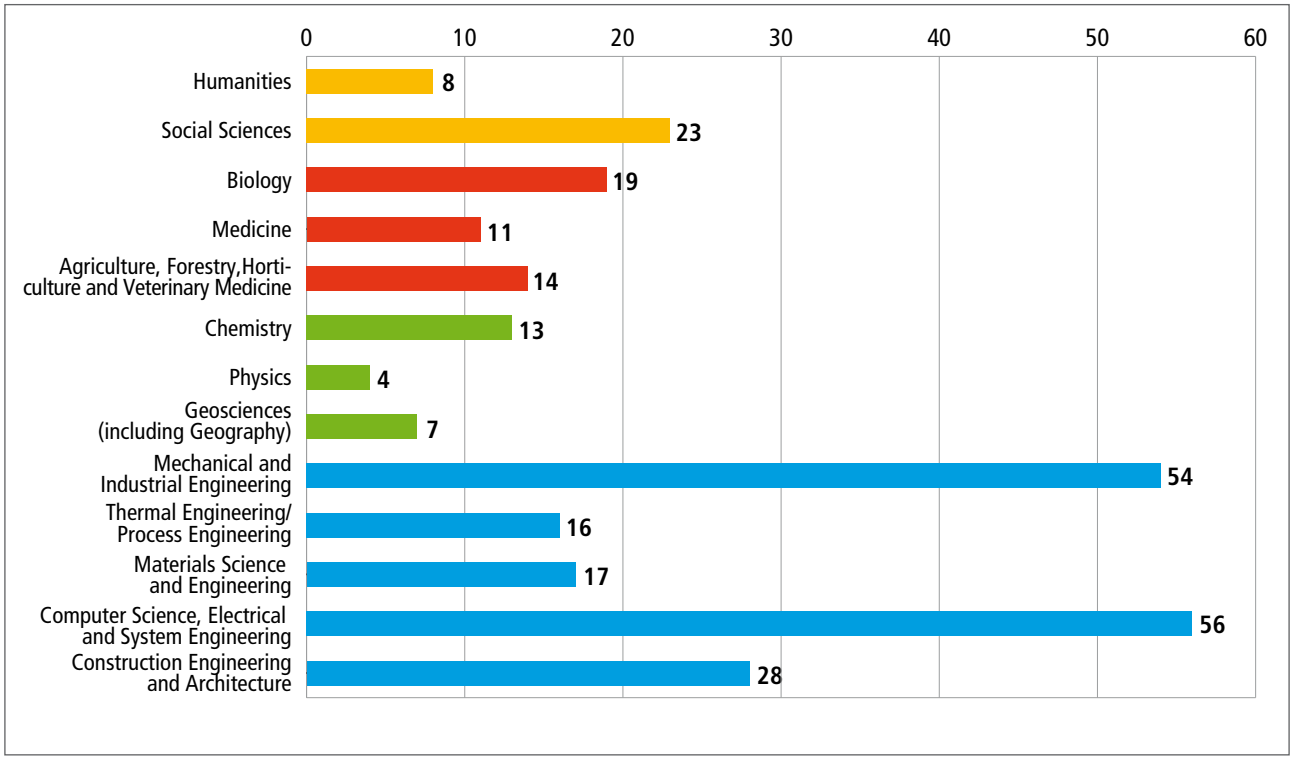

Figure 1: Number of transfer project proposals by research area (2006 – 2013)

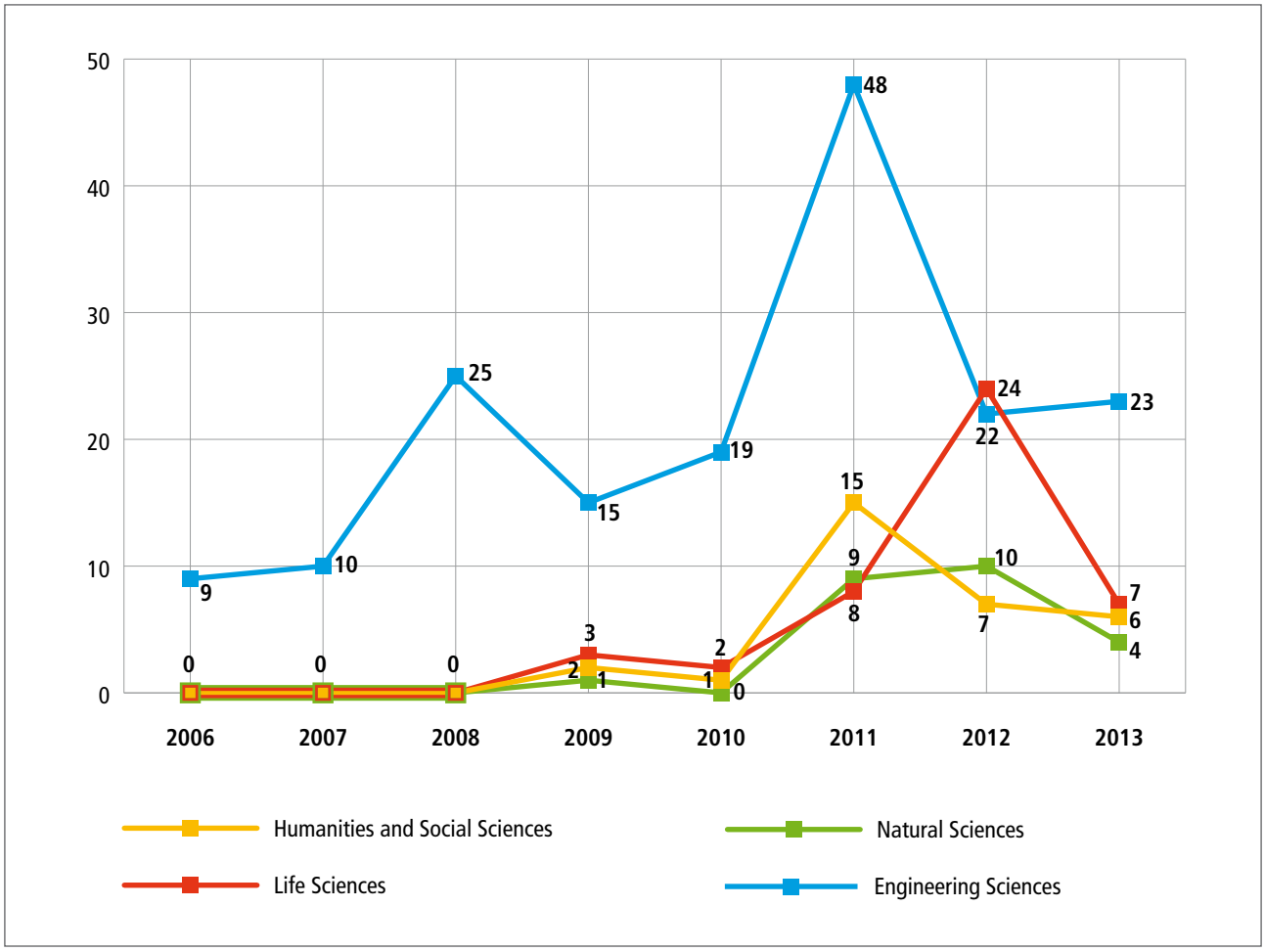

Figure 2: Number of proposals for transfer projects in individual grants programme over time (2006 – 2013) by scientific discipline

sals came from two engineering sciences disciplines: mechanical and industrial engineering, and computer science, electrical and systems engineering. In total, around two thirds of proposals came from the engineering sciences (see Figure 1).

The trend over time clearly shows the disciplinary diversification (see Figure 2). Of the funding proposals for transfer projects received since 2006, up until 2008 proposals of this type were solely submitted in the engineering sciences and in 2009 and 2010, only a few proposals are found in other disciplines.

With the first call for proposals in 2011, the number of proposals increased substantially in all scientific disciplines. The rise in demand was especially noticeable in the engineering sciences. The call in 2012 produced a peak in the number of proposals in the life sciences. In 2013, when no call was issued, the number of proposals evened out at a somewhat higher level.

Overall, it can be noted that the calls have raised the profile of this funding option such that researchers in non-engineering subjects are now aware of it. Whether this situation will continue remains to be seen.

Funding Conditions and Prerequisites

Proposals for knowledge transfer projects are not restricted in terms of topic and may be submitted at any time, with no constraints being imposed by call timetables. At the same time, DFG knowledge transfer project funding is subject to certain prerequisites. One of the requirements for submitting a proposal is at least one completed or ongoing DFG-funded project, on the results of which the transfer project will

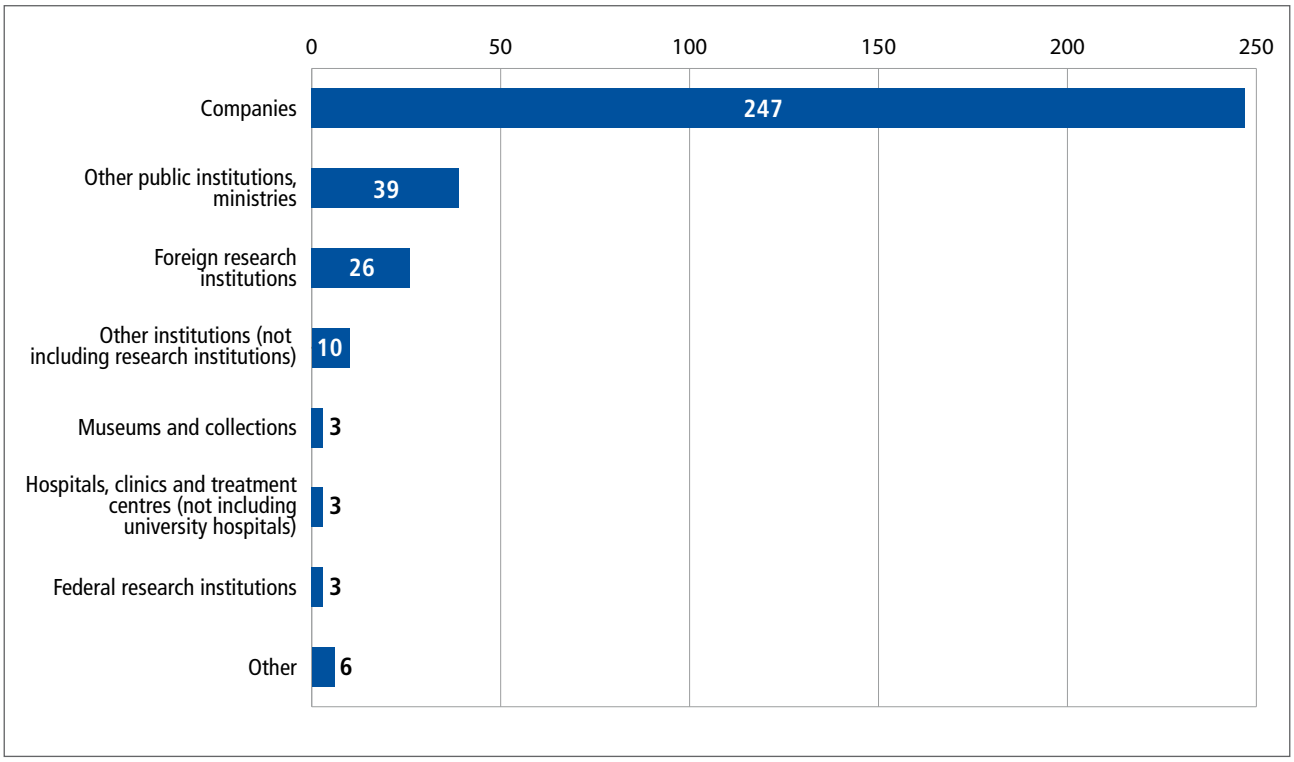

Figure 3: Institution type of application partners in proposals for transfer projects

be based. The majority of applicants (67 percent) present proposals with a connection to one completed or ongoing DFG project, while another 21 percent refer to two previous projects. 20 proposals (7 percent) made reference to three or more projects[3]. An above-average proportion of projects originated from coordinated programmes, with two groups being particularly prominent: a Research Unit in plant science and a Priority Programme in industrial engineering, whose work has provided the basis for an unusually large number of proposals for transfer funding.

Another condition of funding is that a cooperation agreement must be signed with the application partner and this agreement must be checked by the DFG's Legal Affairs department. This is to ensure that the rights of both parties are upheld and that both partners, i.e. the research partner and the application partner, make an appropriate and if possible equal contribution. This usually involves participation in the project work and the provision of staff. However, the application partner cannot receive funding from the DFG.

The institutional affiliation of the project partners illustrates the constellation between research and application partners; while more than 85 percent of applicants[4] are based at universities, the vast majority of application partners in transfer project proposals are companies, followed by public institutions (often schools), ministries, and foreign research institutions (see Figure 3). Only a small number of partners are involved in multiple proposals; in total, 228 different "participating institutions" can be identified. A similar result could be seen in the study of transfer projects in Collaborative Research Centres: approximately 80 percent of application partners in this programme are involved in just one transfer project (see Berger et al. 2012).

Some application partners want to be involved in multiple transfer projects, with the result that 337 participations were counted. Here too the Research Unit in plant science is

3 In 13 projects (5 percent) there was no connection with a previous DFG project; these projects did not meet the funding criteria.

4 Only current institutional affiliation was taken into account. Multiple affiliations are not taken into account.

to the fore, having initiated 17 projects with the same application partner, in this case a provincial government and local research institutes in Ecuador.

The fact that so few application partners are found in multiple collaborative relationships is presumably due to the fact that application partners must make a sizeable contribution of their own. Additionally, in contrast to European Commission or BMBF funding, DFG funding is not available to companies. This also has the effect that it is mainly larger companies which are available as partners. For public institutions such as schools it is difficult to provide the expected financial and staffing contribution.

Structure of Transfer Projects

Of the 270 project proposals submitted since 2006, 129 were approved. We will now focus on these approved projects. Of these, 7 projects were in the humanities and social sciences, 21 in the life sciences, 7 in the natural sciences and 94 in the engineering sciences. Transfer projects in the engineering sciences account for approximately 73 percent of the total. If we compare this with proposals for transfer projects submitted in the framework of Collaborative Research Centres, proportionally slightly more proposals were submitted from other disciplines as part of the call for proposals process. In CRC transfer projects the proportion of projects from the engineering sciences is 83 percent (Berger et al. 2012).

As other projects funded through research grants, transfer projects can be flexibly adapted to the requirements necessary to the success of the project. Transfer projects, which after all follow on from a successful earlier project, usually have a shorter time scale.

In the engineering sciences and the humanities and social sciences, the proportion of projects lasting between 24 and 36 months – the maximum funding duration – is considerably lower than 50 percent. A much larger proportion of projects have a time scale of 24 months or less (see Figure 4). In the life sciences, however, with the exception of one project (with a time scale of 27 months and therefore belonging to the highest category), the maximum funding duration of 36 months is fully used. A similar

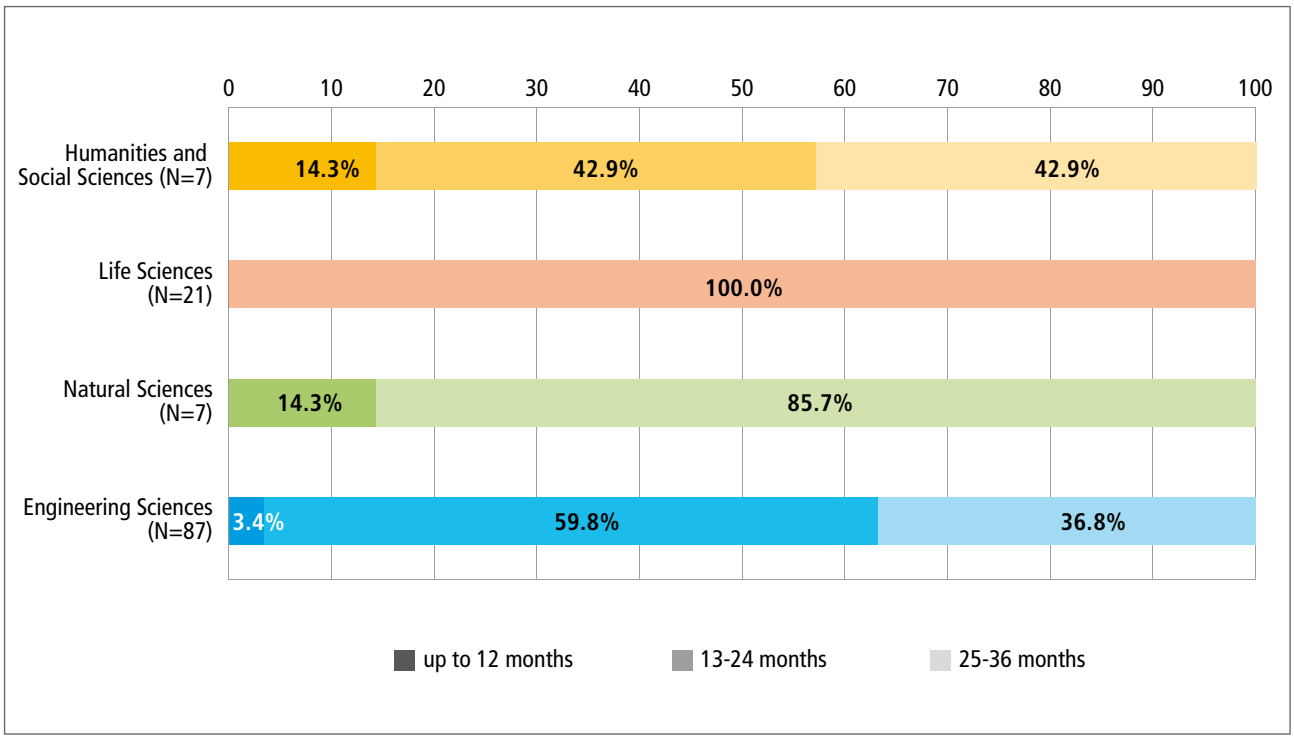

Figure 4: Funding duration by scientific discipline (here: approved proposals only)

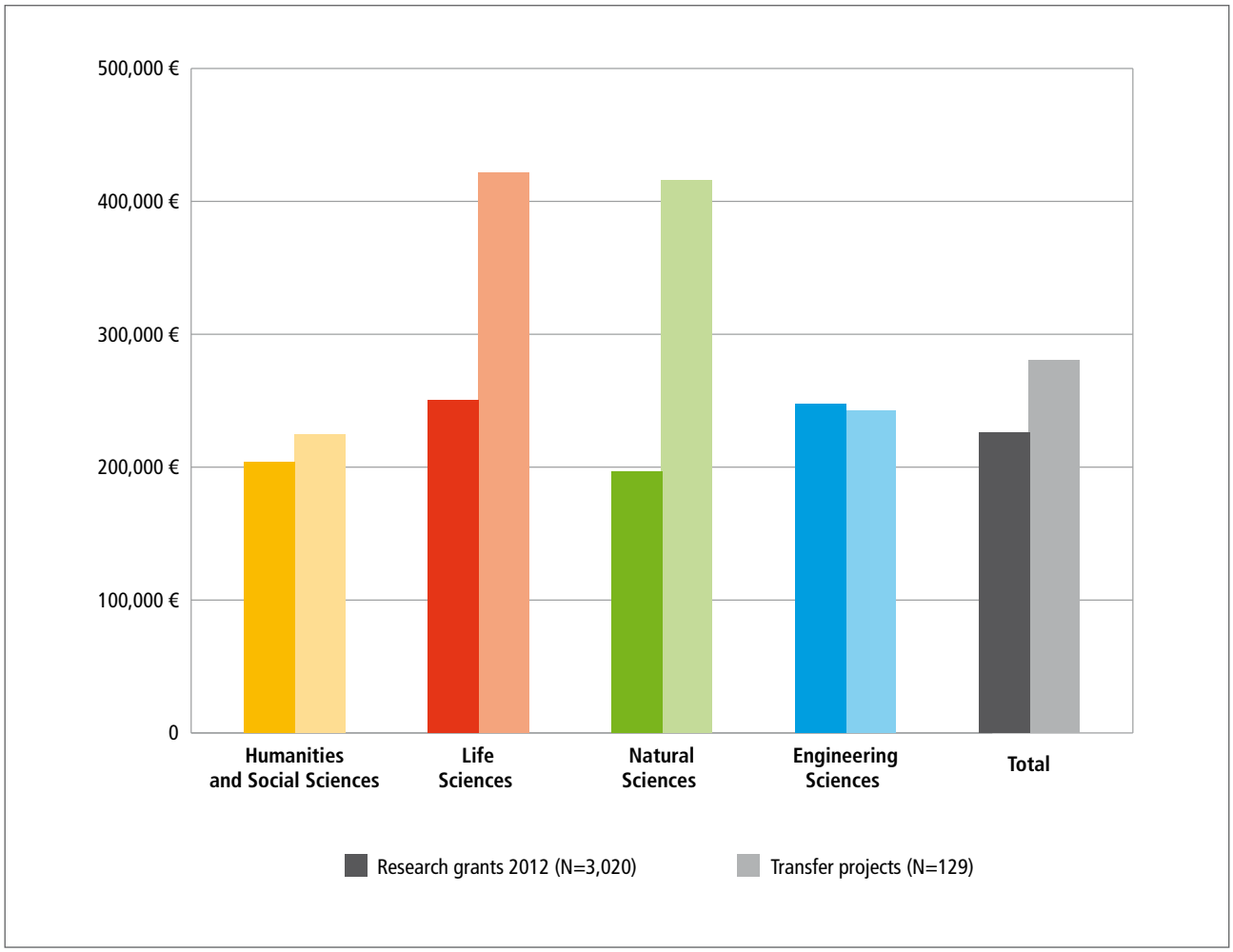

Figure 5: Comparison of average award amounts for transfer projects (2006–2013) and research grants (2012) by scientific discipline (including programme allowance for indirect project costs)

pattern can be seen in the natural sciences, where projects are also of longer duration.

In terms of the average award amount, there is also a difference between the life sciences and natural sciences on the one hand and the humanities and social sciences and engineering sciences on the other. In the latter two disciplines, transfer projects are very similar in their financial scope to projects funded through research grants (see Figure 5). In the life sciences they are associated with costs over 50 percent higher and in the natural sciences with costs over 100 percent higher. However, these average values (arithmetic mean = €280,000, median = €248,000) are mainly due to a number of unusually large projects. In total, 11 projects of over €500,000 were approved. Of these, four were in the life sciences and two in the natural sciences.

Conclusion

In summary, the engineering sciences still account for the majority of transfer projects. This is unsurprising given the "natural" practical relevance of this discipline and the fact that – unlike other scientific disciplines – researchers in the engineering sciences have access to existing collaborative relationships. If we look at transfer projects as a whole, the figures considered in this Infobrief are, therefore, characterised by typical patterns found in the engineering sciences. For example, there is a predominance of collaborations with companies and of applicants from (technically oriented) universities. Researchers from other scientific disciplines have been made aware (to a modest degree) of the available funding opportunity through the calls for proposals. That projects in other disci-

plines have a slightly different structure can be seen, for example, in the financial size of the approved grants, which is much higher in the life sciences and natural sciences than in the humanities and social sciences and the engineering sciences[5]. Overall, the number of knowledge transfer projects has increased slightly.

The DFG believes that the knowledge transfer projects it supports provide additional value in many ways, and not just in the direct implementation of the project aims. Knowledge transfer projects also offer opportunities for the practical training of early career researchers and for a deeper understanding between application and research partners. In addition, further collaborations are often initiated after the completion of a project. Ultimately, these projects benefit both sides: application partners gain rapid access to scientific findings and expertise with which to tackle specific problems, while researchers can (further) develop and test their research questions in the real world.

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5 Some examples of funded transfer projects are described here: www.dfg.de/en/research_funding/principles_dfg_funding/knowledge_transfer and www.dfg.de/dfg_magazin/aus_der_wissenschaft/archiv/1409_erkenntnistransfer

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