

## **External evaluation of the Special Research Programme (SFB):**

### **Statement of the Austrian Science Fund FWF on the evaluation report**

#### **Context of the evaluation**

The main aim of the FWF is to foster and sustainably support excellence in research in Austria. An important component of the portfolio of the FWF, as well as of similar funding organisations internationally, is to facilitate the formation of large research networks that perform cooperative basic research—frequently across the borders of scientific and scholarly disciplines.

In Austria, the first programme to support large research networks was established by the FWF in 1975 and was called ‘Joint Research Networks’ (German: ‘Forschungsschwerpunkte’, FSP). This programme was subsequently rebranded as ‘National Research Networks’ (‘Nationale Forschungsnetzwerke’, NFN). In 1993, the NFN programme was complemented by the establishment of Special Research Programmes (‘Spezialforschungsbereiche’, SFB). Based on an evaluation of both programmes in 2004, the FWF merged the NFN and the SFB programmes in 2010.

The key aims of the SFB programme are to fund excellent research in Austria and to create regional centres of excellence. By establishing SFBs, research institutions demonstrate their commitment to setting long-term research priorities at their institutions, which is reflected in their strategic development plans. Hence, SFBs help shape the research profile of Austrian research institutions. In the long term, SFBs support Austria in its ambition to form internationally leading and attractive hubs for science and research. Additionally, SFBs build on existing strengths and enhance them.

The SFB programme is rooted in the fundamental principles of the FWF: no thematic constraints, driven by curiosity (‘basic research’), and evaluated on the basis of research excellence according to the highest international standards. Concurrently, SFBs need to fit into the research strategy and profile of the respective institutions. Hence, a joint commitment must be made by both the host institutions and the researchers involved.

Until 2011, SFBs were comprised of 6-15 researchers at a central location (with exceptions) for up to three funding periods (4-3-3 years). Since 2011, as recommended by an external evaluation (2004), SFBs comprise 5-15 researchers, of which 50% must be based at the primary host location. The funding period has been shortened (up to two periods of 4 years each). Additionally, gender mainstreaming has become a central component of the SFB funding scheme.

### Key data of the Special Research Programme

- From 2004 to 2018 the FWF allocated around €203 million (7.6% of its total budget; 8.6% in 2018) for SFBs.
- During this period, 29 SFBs were funded. These SFBs included 331 sub-projects and 2,778 participating researchers and scientists.
- 36 host institutions contributed to these SFBs.
- The average funding success rate was 14% (i.e., out of a total number of 212 applications for SFBs).
- Biology, Medical-Theoretical Sciences & Pharmacy, Physics & Astronomy, and Mathematics accounted for 72% of the funded sub-projects and received 75% of the granted budget.

### Evaluation: Goals and Commissioning

In 2019, following an international call for tender, the FWF commissioned the Austrian Institute of Technology (AIT) to evaluate the Special Research Programme. The AIT team was led by Michael Dinges. In addition, KU Leuven was subcontracted to carry out the bibliometric analyses. Wolfgang Glänzel and Bart Thijs were responsible for providing these analyses.

The main goal was to evaluate whether the key objectives of the SFB programme were fulfilled, in terms of supporting outstanding research in Austria, enhancing human resources in research, and—more generally—in strengthening the Austrian science and research landscape. Furthermore, the evaluators assessed to what extent the implementation and management of the programme was appropriate and efficient. Finally, the evaluation was supposed to provide an in-depth analysis of how the SFB programme fits into the funding portfolio of the FWF as well as into the Austrian research funding landscape in general.

The overarching programme objectives, as referenced in the evaluation, were:

- Support outstanding research in Austria by funding long-term, multidisciplinary/interdisciplinary and (by international standards) exceptionally innovative research networks (SFBs) in order to create a 'critical mass' in the respective research domain;
- Expand human resources in science and research and improve diversity in research and education;
- Achieve broader effects on the Austrian science and research landscape by supporting universities and other research institutions in their own strategy in shaping and advancing their research profiles, by increasing public awareness of top-quality research by supporting science communication and in supporting knowledge transfer and appropriate dissemination strategies.

Based on these objectives, the main goals of the evaluation were:

- to review the FWF's current SFB funding programme in order to identify strengths and weaknesses; to quantify outcome, output, and impact; and to assess the effects of the implementation of the recommendations stated by the first evaluation of the programme in 2004;
- to provide evidence-based recommendations to the FWF and its supervisory bodies on if and how the SFB programme should be continued, improved, or restructured;
- to provide recommendations for the further development of its overall funding strategy, particularly for large centres of excellence in basic research (i.e., from 2020 onwards).

## Key Results and Lessons Learned

The evaluation emphasised that the SFB programme had been successful in its main goal of supporting excellent research at Austrian science and research institutions. There had been continuous growth in publication output, the PIs of SFBs had published in high-impact journals, and the publications had been highly cited. SFB publications surpassed national citation levels as well as citation impacts of Stand-Alone Projects as measured by metrics of citation impact.<sup>1</sup> Furthermore, a substantial portion of SFB publications had appeared in multi-disciplinary journals such as, *Nature*, *Nature Communications*, or *PNAS*.

While the general output and impact in terms of citations were well above average, the SFB programme had been less successful when it came to fostering interdisciplinary research. In terms of publications, SFB publications scored lower in terms of interdisciplinarity than publications from Stand-Alone Projects and from overall publications in Austria (as covered in the Web of Science database). Furthermore, interdisciplinary collaboration tended to connect sub-disciplines that were closely related.

Furthermore, there was a strong dominance of certain disciplines on a 1-digit level:<sup>2</sup> 57% of the funding awarded went to Natural Sciences (which included Biology) as well as 26% to Human Medicine & Health Sciences. In contrast, Humanities and Social Sciences accounted for 8% and 4%, respectively, of the granted budget. The thematic weighting was stronger compared to Stand-Alone Projects, but similar to the START Programme and the Wittgenstein Award.

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<sup>1</sup> The evaluators also performed an additional analysis in which they looked at Characteristic Scores and Scales (CSS). CSS are used to analyse citation impact and are divided into four classes: 'poorly cited' (1), 'fairly cited' (2), 'remarkably cited' (3), and 'outstandingly cited' (4). The general distribution of papers over those classes is 70% in class 1, 21% in class 2, 7% in class 3, and 2%-3% in class 4. Compared to this reference standard, both publications from FWF Stand-Alone Projects and SFB publications achieve a better distribution whereas the latter outperform the former.

<sup>2</sup> This refers to the fields of science classification of Statistics Austria: <https://www.fwf.ac.at/fileadmin/files/Dokumente/Antragstellung/wiss-disz-201507.pdf>, accessed 16 March 2020.

The evaluators observed a similar concentration on a small set of disciplines on the 3-digit level. Within Natural Sciences and Human Medicine & Health Sciences, four sub-disciplines accounted for 72% of all sub-projects and 75% of the granted budget. These were Biology, Medical-Theoretical Sciences & Pharmacy, Physics & Astronomy, and Mathematics.

When it came to the goal of expanding human resources in sciences, the SFB programme had succeeded in supporting a high number of early-career researchers. SFBs offered outstanding opportunities to provide improved PhD training due to the network structure, the collaborative nature of the programme, and the high-quality research carried out. There was, however, a caveat in terms of young PIs. Both quantitative and qualitative evidence indicated that in cases where a granted SFB had sub-projects rejected, those sub-project leaders were observably younger than their counterparts. Furthermore, project leaders were composed of older and male scientists. This had to do with the fact that career attainment, indicated by academic title, increased the probability of success, and rapid career progression seemed to be particularly important for success as an SFB (sub-)project leader. In conclusion, SFBs increased quality but not necessarily diversity in research.

The evaluators also stated that the SFB programme did not fully meet its own expectations in funding research excellence while 'boosting gender mainstreaming and gender-balanced orientation of research and education'. The overall participation of female researcher in SFBs increased from 32.9% to 40.6% between 2004 and 2018. However, the share of female (sub-)project leaders remained low at 19.3%,<sup>3</sup> and the share of female postdocs even decreased from 50% to 34% during the same time period (2004-2018). Additionally, the share of female pre-docs in SFBs was lower than the share of PhD graduates in the respective field of science. This led the evaluators to the conclusion 'that the SFBs is [sic!] not capable of improving the conditions for women in research, as it does not even exploit the existing potential of women in the field.'<sup>4</sup> In terms of grant applications, female coordinators or key researchers were statistically related to significantly lower acceptance rates in the first stage of the application process.<sup>5</sup> During the second stage of the application, no difference could be found.

Overall, the evaluators stated that the SFB programme 'has lost momentum over the last 15 years'<sup>6</sup> and developed from an FWF flagship programme into 'an extremely competitive niche'.<sup>7</sup> They gave a number of reasons for this conclusion: a decrease in the percentage of SFB funding in relation to the overall FWF funding budget. While 14.7% of FWF funding went to SFBs in 2014, this number dropped to 5.6% in 2018. Concurrently, the overall acceptance rate decreased from 54% to 14%. In this regard, the evaluators stated that the SFB

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<sup>3</sup> The overall percentage of female professors at Austrian universities is 25.9%. Furthermore, while the percentage of female (sub-)project leaders is still around 20%, the percentage of female PIs without a professorship has decreased.

<sup>4</sup> Dinges, M. et al. (2020), Evaluation FWF Special Research Programmes, p. 62.

<sup>5</sup> According to the statistical analysis performed in the evaluation, female researchers are about 8% less likely than men to receive an SFB sub-project grant (p. 60).

<sup>6</sup> Ibid., p. 78

<sup>7</sup> Ibid.

programme 'funds existing spots of excellence and reinforces existing strengths rather than shaping research profiles of research organisations'.<sup>8</sup>

### Main results in a nutshell

- The impact of the SFB programme in terms of publication output and impact remains very high and is above average compared to both national and international projects.
- SFB projects score low in terms of interdisciplinary publications; in addition, interdisciplinary collaboration is mainly restricted to closely related sub-disciplines.
- SFBs offer outstanding opportunities to provide improved PhD training.
- While the overall participation of female researchers has increased, the percentage of female PIs still remains (too) low.
- The acceptance rate is very low at 14% and the percentage of SFBs in overall FWF project funding decreased from 14.7% in 2014 to a mere 5.6% in 2018.

### Recommendations

The evaluation team of the AIT and the KU Leuven provided the following nine recommendations:

- FWF's funding share allocated to network programmes should aim to reach a minimum level of 25%.
- FWF should elaborate measures that allow stronger participation of more disciplines and support the emergence of new fields of excellence.
- FWF should keep the overall programme structure (network size, funding provided, duration, etc.) and the principles of a two-stage peer review process.
- FWF should incorporate measures that strengthen the performance of multi-/interdisciplinary research.
- FWF should take stronger consideration of the network level in funding decisions and limit interventions into the network composition of SFB.
- FWF should incorporate measures that strengthen gender mainstreaming at a network level.

With regards to programme management, the following recommendations were made:

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<sup>8</sup> Ibid.

- FWF should simplify and harmonise application and reporting instructions, forms, and templates.
- FWF should speed up the communication of reviewer assessments to SFB applicants.
- FWF should provide additional support mechanisms for promoting knowledge transfer and dissemination beyond the scientific community.

## Conclusions

The evaluation conducted by the AIT together with the KU Leuven provided several avenues for the FWF to reassess the SFB programme and its position within its programme portfolio.

The evaluators recommended increasing the budget for network programmes to at least 25% of the FWF’s total project funding. This seems ambitious given that the SFBs exhibit a current share of 5.6%. However, when considering all network programmes together (i.e., DK, doc.funds, FG, and SFB), their share was 17.4% of the FWF’s total project funding in 2019 (see Table 1).

Table 1: FWF funding 2019

Programme	Funding approved € million	%
<b>Stand-Alone Projects (incl. Clinical Research)</b>	119.5	50.3%
<b>International Programmes</b>	32.7	13.8%
<b>Doctoral Programmes/doc.funds/Research Groups/SFB</b>	41.4	17.4%
<b>START Programme and Wittgenstein Award</b>	10	4.2%
<b>Schrödinger/Meitner</b>	17.3	7.3%
<b>Career Development for Female Scientists</b>	11.8	5.0%
<b>PEEK/TCS/WKP</b>	4.7	2.0%
<b>Total</b>	<b>237.4</b>	<b>100.00%</b>
<b>Coordinated Programmes</b>		
<b>Doc.funds</b>	10.7	4.5%
<b>SFB</b>	20.5	8.6%
<b>Research Groups</b>	4.2	1.8%
<b>Doctoral Programme</b>	6.0	2.5%
<b>Total</b>	<b>41.4</b>	<b>17.4%</b>

The FWF is currently discussing how its network programmes can increase diversity and support researchers and groups best in terms of disciplinary backgrounds, career stage, and gender. Thus, while the structure of the SFB in terms of network size, funding provided, duration, etc. was considered as highly appropriate by the evaluators, the FWF will carefully consider all recommendations when introducing more flexibility into its funding portfolio.

In general, the recommendations need to be assessed in relation to the overall FWF programme portfolio and, in particular, in light of the announced 'Excellence Initiative'. At the moment, this initiative consists of three pillars with the preliminary components 'Excellence Clusters', 'Emerging Fields', and 'Austrian Chairs of Excellence'. At least the 'Excellence Clusters' will be an additional large network-oriented programme, which means that additional funding will become available. The 'Emerging Fields' pillar of the initiative aims at funding projects and areas of research that are not yet developed to a degree where they can be funded through the SFB programme or (potentially) 'Excellence Clusters'. 'Austrian Chairs of Excellence' are intended to support Austrian research institutions in attracting the most talented researchers and/or providing excellent conditions for the best researchers already working at these institutions according to their strategic priorities. These pillars, especially 'Excellence Clusters' and 'Emerging Fields', need to be aligned with the SFB programme in order to create opportunities for funding the best researchers at Austrian research institutions, independent of disciplinary background and gender, throughout various career stages.

For the FWF, it is interesting to note that interdisciplinary collaboration is among the key motivations for participating in an SFB project. Fostering these kinds of projects and collaborations is an important objective for the FWF, which has implemented a range of funding programmes, including very recent ones. Furthermore, the discrepancy reported by the evaluators regarding the self-perception of researchers is worth mentioning: while SFB projects tended to be less interdisciplinary than expected (e.g., interdisciplinary publications), the participants themselves considered their projects to be truly interdisciplinary. This may reflect the different understanding of the term interdisciplinarity and the knowledge production practices associated with it, which range from 'borrowing' particular methods or tools from other disciplines to co-developing research questions connecting various disciplines.

Overall, the FWF agrees with the evaluation report's assessment that potential tensions between calls for excellence and incentives for interdisciplinary collaboration deserve attention. This primarily concerns methods and approaches for evaluating inter- and transdisciplinary excellence.

Gender mainstreaming has been a key element of the SFB programme since 2011 and remains a key goal of the FWF's overall strategy. During the past year, the career programmes were re-structured to improve the conditions for female researchers. The low number of early-career researchers and female PIs as well as the lower approval rate of female researchers at the first evaluation stage is considered a major reason for concern. Hence, the FWF will carefully discuss adaptations to the SFB evaluation criteria and the procedures for rejecting particular sub-projects in SFB applications in order to remove unwanted biases.

## **In closing, a word on the cooperation with the evaluators**

The FWF is committed to the standards of evaluation developed by the Austrian Platform for Research and Technology Policy Evaluation.<sup>9</sup> In addition, the FWF has adopted its own quality and transparency rules that formed the basis of this evaluation.<sup>10</sup> These sets of rules provide a clear line with regard to the relationship between the ‘evaluator’ and the ‘client’. The cooperation with the team led by Michael Dinges was characterised by professional distance, accepting and adhering to these different roles, and, in the context of linking different data sources, the evaluation benefited from a productive and appreciative collaboration, which is the basis for the development of a common understanding of the nuances of the FWF’s Special Research Programmes.

Coordination of the statement: Thomas Völker and Falk Reckling

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<sup>9</sup> <https://www.fteval.at> , accessed 11 March 2020.

<sup>10</sup> <https://www.fwf.ac.at/en/research-funding/decision-making-procedure-evaluation/evaluation-standards/quality-and-transparency-rules-for-evaluations/> , accessed 11 March 2020.