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Impact Evaluation of the Erwin Schrödinger Fellowships with Return Phase

Final Report
for the Austrian Science Fund (FWF), Vienna

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1 Executive summary

The present impact evaluation of the Erwin Schrödinger Fellowships with Return Phase is based on a mixed-method approach and on an online-survey and a bibliometric analysis of the Schrödinger grant holders and a randomly selected control group. These quantitative elements are complemented by an expert workshop.

The results of this evaluation show that the Schrödinger Program has strong positive impacts on the individual researchers, the involved research institutions as well as the Austrian science system and the European Research Area.

On the level of the individual researchers, the survey results and the comparison with the respondents of the control group that never went abroad suggest that many Schrödinger fellows would not have been able to realize their stay abroad without the Schrödinger Program. This would have been an important loss to their careers, as such stays abroad turn out to have an unmistakable positive impact on the involved researchers' publication output and career prospects. The bibliometric analyses even show that the Schrödinger Program has a slightly more positive impact on research output than other stays abroad as realized by the respondents from the control group.

The higher research output and the good reputation enjoyed by the Schrödinger fellows within the Austrian science system also appear to explain the Schrödinger fellows' impressive career advancement. The survey results show that within 12 years since their Schrödinger fellowship, almost 60% of all Schrödinger alumni tend to become full professors.

Furthermore, this evaluation provides evidence that the Schrödinger Program also has a positive impact on the level of the Austrian universities and research institutions by promoting the transfer of knowledge and skills. The bibliometric analyses of co-publication patterns also show that the Schrödinger Program appears to improve the integration of Austria into international research networks.

At the level of the Austrian science system, the evaluation registered strong constraints that seem to reduce the positive impact of the Schrödinger Program. Both the Schrödinger fellows and the respondents from the control group point out the poor research conditions and unattractive career prospects within the Austrian science system. This is especially true for female researchers despite the numerous efforts for a better integration of women in science during the past decade. Therefore, two thirds of all Schrödinger fellows do not immediately return to Austria after their fellowship. This does not necessarily need to be seen as a loss to the Austrian science system, however, as the results of the bibliometric analyses show that the Schrödinger fellows that stay abroad assume the role of "bridge heads" that improve the integration of Austrian researchers in international research networks.

With regards to the impacts on the European Research Area, the survey results show that although most Schrödinger fellows go to host institutions in North America, Schrödinger fellows show an increased propensity to collaborate and co-publish with researchers from other European countries.

Finally, the evaluation results also suggest that the organization of and benefits provided by the Schrödinger Program are efficient and compatible with the objectives of the program. This appears to be the results of various reforms and adaptations in response to previous evaluations.

Based on these results, the evaluation team recommends a continuation of the Schrödinger Program, which has unmistakably positive impacts on the individual researchers, the involved research institutions and the Austrian science system overall as well as a high level of additionality. To increase the positive impacts of the Schrödinger Program, however, it seems warranted to focus on an improvement of the research conditions and career prospects within the Austrian science system.

2 Introduction

In April 2013, the Fraunhofer ISI was commissioned by the FWF to evaluate the Erwin Schrödinger Fellowships program with the objective to inform policy makers, especially at the European level, and to provide the FWF with the information it requires to further develop and continue the program. Since 1985, the Schrödinger Program has sent 2,271 researchers at the post-doctoral level abroad for a period of 10 to 24 months. It is the FWF's largest outgoing program for basic research at the post-doctoral level. Since 2009, it has been co-funded by the European Commission.

The present report is structured as follows. Section 3 provides a brief summary of the methodological approach. A more detailed description can be found in the Annex. Section 4 discusses whether and, if so, to what degree the Schrödinger Program could attain its goals. Section 5 analyses the impacts of the Schrödinger Program on the micro, meso and macro level, by looking at the impacts on the individual scientists, on the Austrian research institutions, on the Austrian science system overall and on the European Research area. Section 6 provides an assessment of the program management and design and examines the individual elements of the Schrödinger Program. This is followed by the conclusion in Section 7 and recommendations in Section 8.

The Annex (Section A.1) contains a detailed description of the methodological approach, the questionnaire as well as figures on gender differences among the respondents.

3 Methodology

The present evaluation is based on a combination of an online survey, bibliometric analyses and a workshop. This section provides a brief introduction of these methods, which are described in full detail in Annex A.2.

Through the use of bibliometric methods and data, it was possible to create a control group. To be able to do this the Schrödinger fellows had to be matched in the Scopus database, a database containing bibliometric information, obtained from scientific publications. With the help of automatic and manual matching methods, 91% of all Schrödinger fellows since 1985 could be identified in Scopus. A first bibliometric analysis of the identified fellows allowed the evaluators to determine the gender, scientific discipline, publication age and affiliation of the Schrödinger fellows.¹ Based on these criteria further scientists were randomly selected from the database and included in the control group, which possesses the exact same characteristics for the aforementioned criteria than the group of Schrödinger fellows. As the bibliometric database also includes contact details of the scientists, which usually provide such information on their publications, both groups, the Schrödinger fellows as well as the scientists in the control group could be invited to participate in an online survey.

With the information from the survey it was possible to subdivide the control group into the following subgroups:

1. Researchers with a stay abroad (of more than six months during their Ph.D., post-doc phase, or later career phases)
 - a. Researchers with a stay abroad that directly returned to Austria
 - b. Researchers with a stay abroad that did not directly return to Austria
2. Researchers without a stay abroad

Table 1 below shows the size of the different sub-groups. The division of the control group into multiple sub-groups allows for a range of different comparisons with the group of Schrödinger fellows.

¹ The publication age refers to the time since the first time a scientist appeared in the database with a first publication. This was used as a proxy for the scientists' real age.

Table 1: Number of respondents by sub-group

	Schrödinger		Control group	
	N	%	N	%
Number of respondents	703	100	613	100
With stay abroad	703	100	358	58
Without stay abroad	0	0	255	42
Directly returned to Austria	445	67	246	72
Stayed abroad	221	33	96	28
Current fellows/missings	37	-	16	-

Source: Data and calculations by Fraunhofer ISI.

The questions and design of the survey, which was conducted in September and October 2013, can be found in the Annex A.5. After the initial data cleaning, 1,545 Schrödinger fellows were contacted, of which 703 participated in the survey. This amounts to a response rate of 40%. For the control group survey, the response rate was 12.5%. As this was expected to be lower than the response rate for the survey of the Schrödinger fellows, however, the control group was design to be three times bigger than the group of Schrödinger fellows. 4,935 researchers were randomly selected and contacted. With 613 respondents, the number of is similar, despite the lower overall response rate.

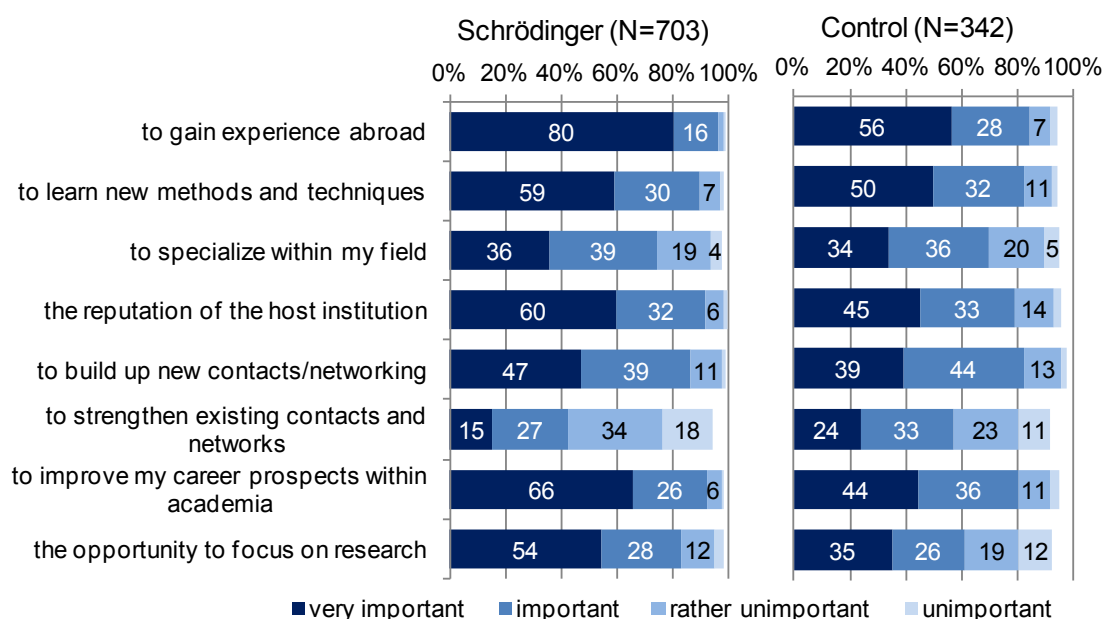
The online survey was complimented with a bibliometric analysis of the international mobility, interconnectedness and publication output of the Schrödinger fellows and the scientists of the control group.

Overall, the second strongest motivation for the Schrödinger fellows, after gaining experience abroad, is the improvement of their individual career prospects within academia. Also a large number of researchers from the control group (45%) mentioned this as "very important". This suggests that researchers at the post-doctoral level consider experience abroad as an important prerequisite for their career advancement. This is also consistent with statements from the workshop participants from the Austrian university sector and research funding organizations that it is generally expected from job candidates and applicants for research funding that they have some experience abroad. This may not be directly linked to the immediate goals of the Schrödinger Program but has to be seen as an important framework condition for the program attaining its objectives. The Schrödinger Program falls on fertile ground.

4 Goal attainment

The Schrödinger Program has two main goals: First, the promotion of scientific work at leading foreign research institutions to enable researchers at the post-doctoral level to gain experience abroad; and secondly, to facilitate access to new scientific areas, methods, procedures and techniques so as to contribute to the further development of science in Austria. The evidence gathered for this evaluation suggests that both objectives have been largely achieved.

Figure 1: Motivations to go abroad of the Schrödinger fellows and the researchers of the control group that went abroad²



Source: Data and calculations by Fraunhofer ISI

The survey results show that the program objectives are highly compatible with the motivations of the Schrödinger fellows (see Figure 1). 80% mentioned the motivation to gain experience abroad, 59% mentioned the motivation to learn new methods and techniques, 60% the high reputation of their host institution and 54% the opportunity to focus on research. Compared to the researchers of the control group with experience abroad, the

² This figure compares the Schrödinger fellows only with those researchers of the control group that also went abroad. Of the total 358 control group researchers that went abroad, however, only 342 completed the respective survey questions. 16 participants skipped these questions. The gaps to 100% represent the share of n/a-responses.

motivations of the Schrödinger fellows appear to be much stronger.³ Only with regards to the strengthening of "existing contacts and networks" the control group's motivations were stronger. It could be speculated that this is less important to the Schrödinger fellows because their research institutions already provide them with stronger networks, in which case networking may not be such a strong motivation anymore. All in all, however, the differences between the two groups suggest that the FWF has successfully selected and supported those scientists whose motivations are most compatible with those of the Schrödinger Program.

Female Schrödinger fellows tend to have higher expectations than their male colleagues. When looking at the main motives, the differences between men and women are particularly strong with regard to career prospects: 79% of the women but only 60% of the men indicate that the improvement of their career prospects within academia is a very important motive for their interest to go abroad. Also the establishment of (new) contacts and networks seems to play a more important role for women than for men.

However, the motivations and expectations of the fellows are not only compatible with the goals of the Schrödinger Program. The Schrödinger fellows also reported that their expectations were realized. 90% of the Schrödinger fellows saw their expectation to learn new methods and techniques completely (58%) or partially (32%) fulfilled through their fellowship. In the control group only 49% and 37% (or 86% in total) reported the same (see Figure 2). This result suggests that also the second goal of the Schrödinger Program, which is the facilitation of access to new scientific areas, methods, procedures and techniques so as to contribute to the further development of science in Austria, has been attained.

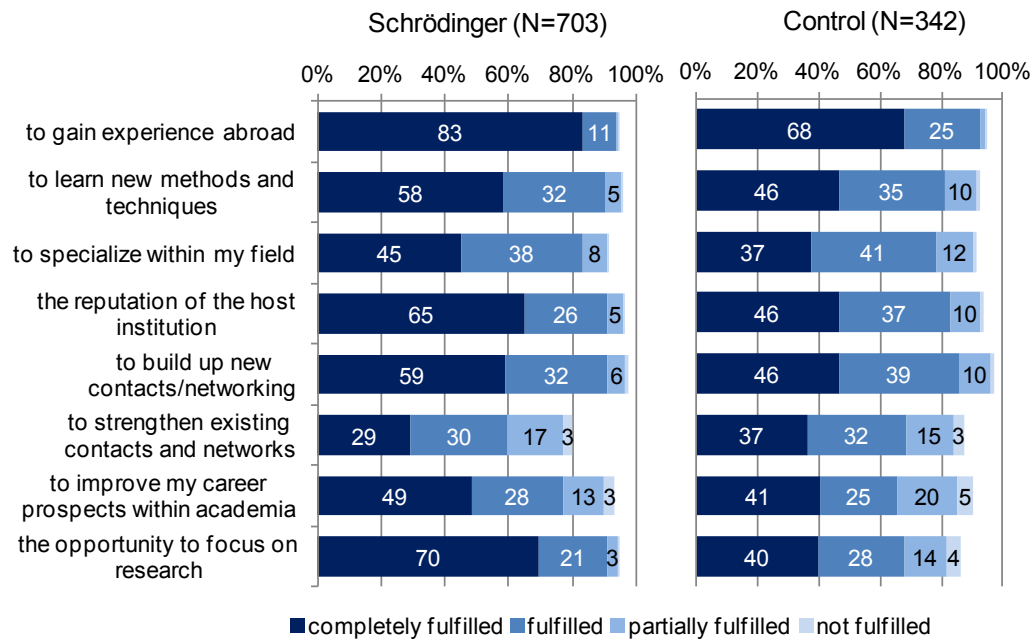
Figure 2 also shows that the objective to send the Schrödinger fellows to leading research institutions is achieved. 65% of the Schrödinger fellows, compared to 47% of the control group, indicate that their expectations regarding the reputation of the host institution were completely fulfilled.

From a science policy perspective, it is also remarkable that 70% of the Schrödinger fellows reported that their expectation to focus on research was "completely fulfilled" and another 21% answered that their expectations were "fulfilled". Figure 10 below lends further strength to this finding and shows that, during their Schrödinger fellowship, the Schrödinger fellows are able to focus on research to a significantly higher degree than during any other career phase.

³ The difference between the two groups with regards to the motivations is statistically significant at the 0.5 level (Kruskal-Wallis-Test). Only in the case of the learning of new methods the difference is significant at the 0.1 level. And in the case of specialization the difference is not significant.

With regards to the gender question, no substantial differences regarding the fulfillment of the male and female Schrödinger fellows' expectations could be found. Only in the case of the strengthening of existing contacts and networks, the women's expectations were fulfilled to a larger extent than the men's.

Figure 2: To what extent did your Schrödinger fellowship/stay abroad fulfill your expectations?⁴



Source: Data and calculations by Fraunhofer ISI.

Moreover, and as discussed in greater detail in Section 5.2.1 below, the Schrödinger Program also successfully attained the objective to promote the transfer of knowledge, methods and techniques. Figure 17 below, for instance, shows that 81% (50% "applies" and 30% "chiefly applies") of all Schrödinger fellows were able to apply the gained knowledge and skills in Austria.

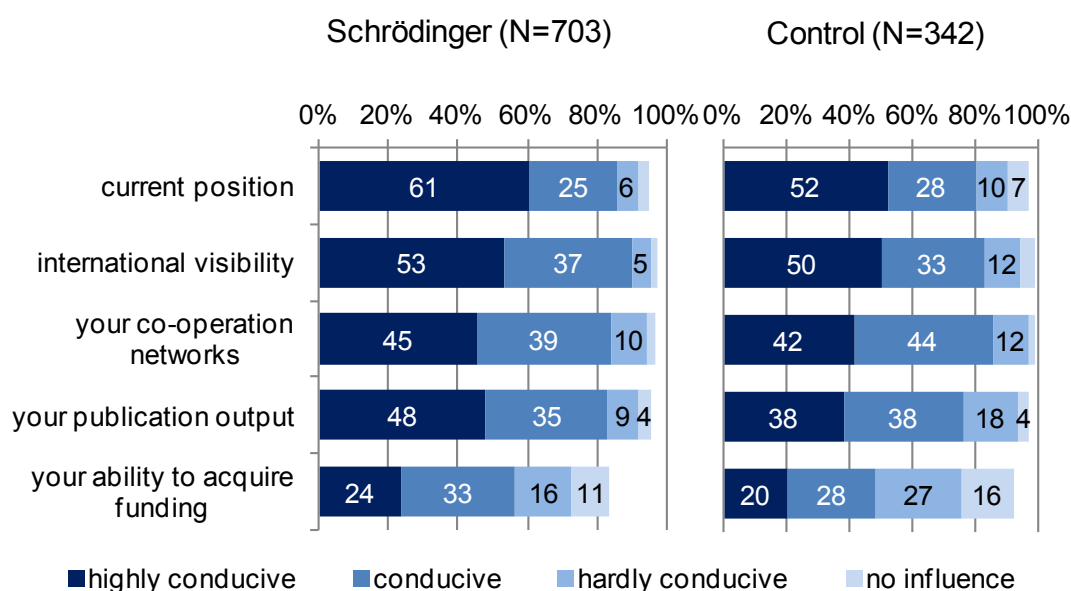
⁴ Again, only the researchers of the control group that did go abroad are included in this figure. With the exception of the expectation to specialize, all differences between the Schrödinger fellows and the control group are statistically highly significant (Kruskal-Wallis test).

5 Impact assessment

The impacts of the Schrödinger Program can be observed on three levels. On the micro level, the present evaluation registered impacts on the individual scientists. On the meso level, impacts on the Austrian Universities and other research institutions could be recorded. On the macro level, the Schrödinger Program impacted on the Austrian science system as well as the European Research Area. The following Sections will analyze the impacts that were recorded on each of the three levels.

5.1 Impact on the individual researchers

Figure 3: What impact did your Schrödinger fellowship/stay abroad have on your career, with regards to the following dimensions?⁵



Source: Data and calculations by Fraunhofer ISI.

On the micro level, the Schrödinger Program has had a positive impact on the individual researchers. Upon the question what impact the Schrödinger fellowship had on their careers, 61% of the fellows reported that their Schrödinger fellowship had been "highly conducive" for reaching their current position, as shown in Figure 3. Furthermore, the Schrödinger Programs' impact on international visibility (53% "highly conducive"), co-operation networks (45% "highly conducive") and publication output (48% "highly conducive") are also reported to have been very strong. The lowest impact the Schrödinger Program is reported to have had on its fellows' is the ability to acquire funding, while a high 57% still

⁵ Of the control group only the researchers with experience abroad were included.

consider their Schrödinger fellowship to be conducive (24% highly conducive; 33% conducive).

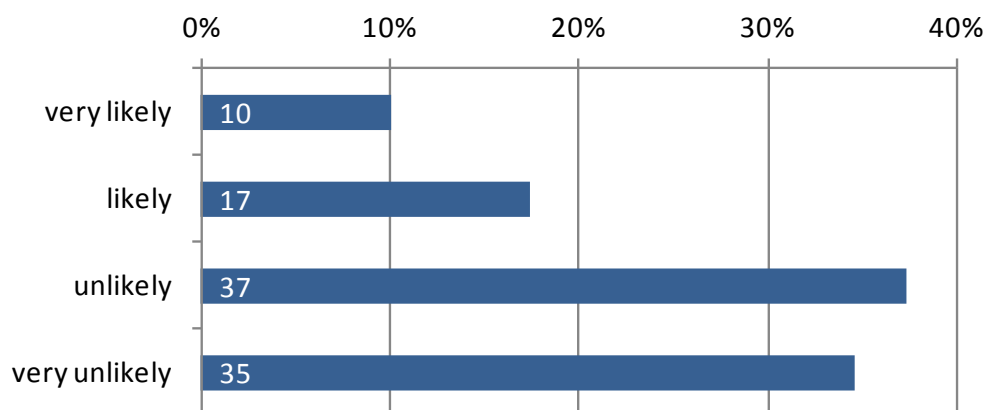
The impacts reported by the Schrödinger fellows in Figure 3 also tend to be higher than the impacts reported by the researchers of the control group that also had the possibility to go abroad.⁶

The remainder of this section will take a closer look on the Schrödinger Program's impact on the mobility of its fellows and their ability to go abroad, the fellows' research output as well as the career development after their Schrödinger fellowship, all of which were already touched upon in Figure 3 above.

5.1.1 Impact on international mobility

The survey results lend strong evidence in support of the hypothesis that the Schrödinger Program successfully promotes international mobility. Most fellows reported that they would not have been able to realize their stay abroad without the Schrödinger Program. In total, 72% of all Schrödinger fellows consider it to be "very unlikely" (35%) or just "unlikely" (37%) that they would have been able to realize this.

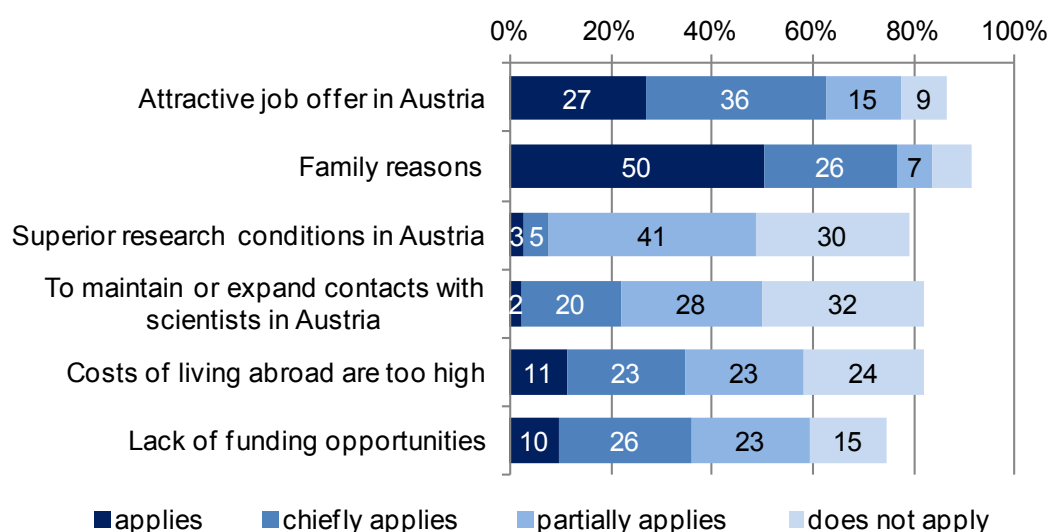
Figure 4: How likely do you consider it that you would have been able to go realize the stay abroad without the Schrödinger Program? (N=703)



Source: Data and calculations by Fraunhofer ISI.

⁶ In the case of the impact on the current position and the publication output, the difference between both groups is statistically significant at the 0.01 and 0.05 level respectively (Kruskal-Wallis). With regards to the remaining impact categories, however, the differences are not significant.

Figure 5: Control group without experience abroad: Reasons for not going abroad (N=255)⁷



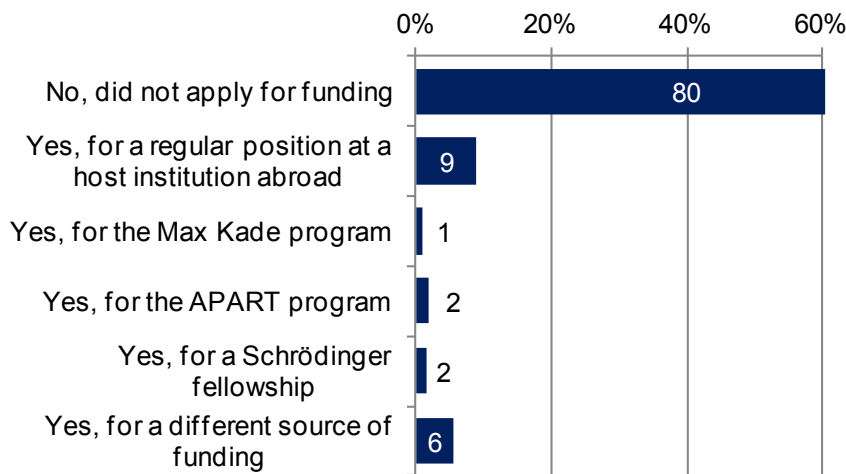
Source: Data and calculations by Fraunhofer ISI.

This finding is further strengthened by the information obtained from the control group. Of all control group researchers 42% were not able to go abroad. As important reasons for staying in Austria, these researchers often mentioned family reasons and the availability of a position in Austria. These reasons, however, can always be expected to play a role, also among Schrödinger fellows, who mentioned these as important reasons for returning to Austria after their fellowship (see Figure 27 below). At the same time, however, more than one third of the control group researchers that did not go abroad mentioned the high cost of living abroad and the lack of funding opportunities as reasons for their decision to stay in Austria (see Figure 5). These two reasons were ranked higher than existing research networks within Austria or the availability of an attractive job offer in Austria.⁸ This finding justifies the FWF's choice in the case of the Schrödinger Program to use financial incentives as an effective instrument to promote international mobility.

⁷ The gaps to 100% represent the share of n/a-responses.

⁸ The attractiveness of the Austrian science system – or rather the lack thereof – is an issue that will be discussed in greater detail in Section 5.3.1 below.

Figure 6: Control group researchers that did not go abroad: Did you apply for funding to go abroad? (N=255)



Source: Data and calculations by Fraunhofer ISI.

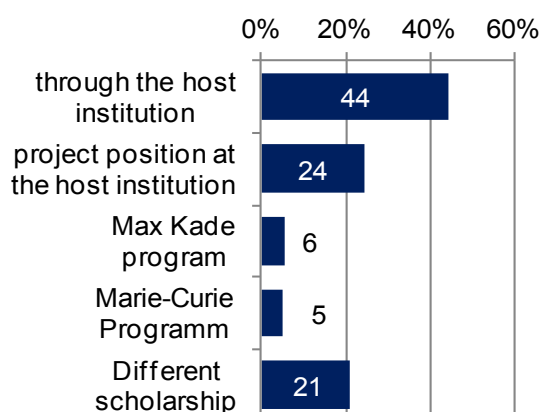
The lack of funding mentioned by the researchers that never went abroad, however, appears to be primarily a problem of perception. As shown in Figure 6, 80% of the control group researchers that never went abroad, never applied for funding either. This raises the question why they never did. Unfortunately, the findings of this evaluation do not provide a conclusive answer to this question. One potential explanation could be a lack of knowledge about the availability of such funding opportunities. Funding programs like the Marie-Curie or the Schrödinger Program, however, seem to be rather well advertised in the relevant target group. Whether there still is a lack of knowledge about adequate funding opportunities nonetheless will need to be examined in future evaluations.

Alternatively, the low number of funding applications among the control group researchers that never went abroad could plausibly be explained by the researchers' low expectations about their ability to secure such funding. In this instance the Schrödinger Program might have become a victim of its own success. The fact that it is now firmly established as an elite funding program for early-career researchers might deter potential applicants from applying. Individual researchers might not even apply simply because they do not see a realistic chance that their application would be successful. To mitigate this effect that FWF might potentially be able to increase the number of applicants from this group by communicating the comparatively high acceptance rates of the Schrödinger Program more assertively.

Among the control group researchers 58% did go abroad. They used a range of alternative funding opportunities to realize their stay abroad (see Figure 7). Of the 58% that did go abroad, 44% were able to fund their stay abroad through the host institution or regular project positions at their host institution (24%). Another group was able to fund their stays abroad through the Max-Kade (6%) and Marie-Curie (5%) programs or various other

scholarships (21%). As suggested by Figure 5 above, however, the funding opportunities are limited. Therefore, the fact that other sources of funding are available does not necessarily mean that the Schrödinger fellows would have been able to fund their stay abroad if it had not been for the Schrödinger Program.

Figure 7: Control group researchers that did go abroad: How did you fund your stay abroad during the post-doc-phase? (N=222)⁹



Source: Data and calculations by Fraunhofer ISI.

5.1.2 Impact on research output

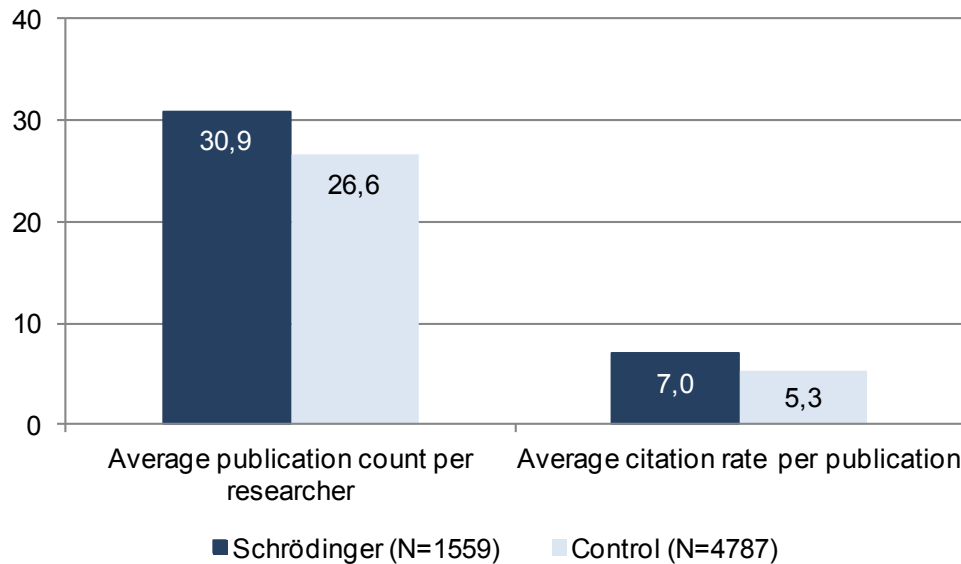
In addition to the promotion of international mobility, the Schrödinger Program also appears to have a positive impact on the research output of its fellows. The survey results on this matter (see Figure 3 above) were confirmed by the bibliometric analysis of the publication output of the Schrödinger fellows and the control group.

Both the comparison of career phases and the comparison with the control group suggest a positive impact of the Schrödinger Program. Figure 8 shows that the average publication counts of the Schrödinger fellows are higher than those of the researchers of the control group.¹⁰ Figure 8 also shows that the average citation rates per publication are higher among the Schrödinger fellows than the control group, including both groups, the researchers that went abroad and those that did not. On average the Schrödinger fellows have 30.9 publications, which were cited 7.0 times on average. The average publication count of the control group researchers is 26.6 and the average citation rate per publication is 5.3.

⁹ 136 control group researchers of those that went abroad skipped this question.

¹⁰ Control group, including those researchers that went abroad and those that did not go abroad.

Figure 8: Average publication count and citation rates of all researchers (Schrödinger and control group)¹¹

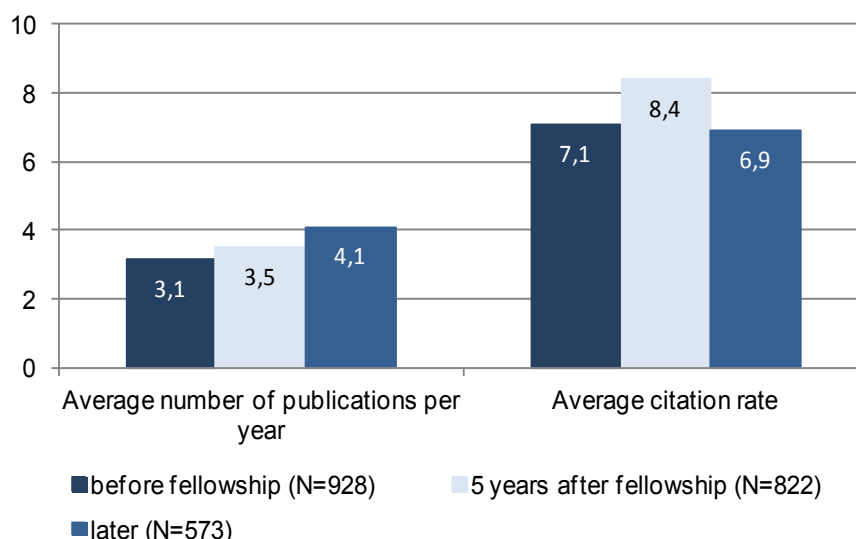


Source: Data and calculations by Fraunhofer ISI.

Needless to say, however, this does neither prove a causal link between the Schrödinger Program and the high publication output, nor does it reveal much about the direction of the causal relationship, if there is one. It might just be that the Schrödinger Program is very successful at selecting researchers with a high research potential. There are a number of indicators, however, that suggest a causal impact of the Schrödinger Program. Figure 9 looks at a period of five years from the start of the fellowships, which is a plausible window of time during which the results of the fellowships can be expected to be published, and compares this with the periods before and after this window. While the average publication count increases steadily from one period to the next, average citation rates peak during the window of the Schrödinger fellowship and are lower before and after. This suggests that the Schrödinger fellowship does not only increase the number of publications but indicates that it also has a positive impact the quality of these publications. As shown in Annex A.4, this finding holds true across all disciplines.

¹¹ The citation rate is the average number of citations per publication. The mentioned citation rates include self-citations. The exclusion of self-citations is problematic because technically it can be difficult to distinguish between citations of publications by the same author or citations by a different author with the same name. However, it is generally well established that there is always some degree of self-citation. And in the specific context of this study, there is no reason why one should expect Schrödinger fellows to use more self-citations than the researchers of the control group or vice versa.

Figure 9: Publication output and citation rate before and after the Schrödinger fellowship¹²

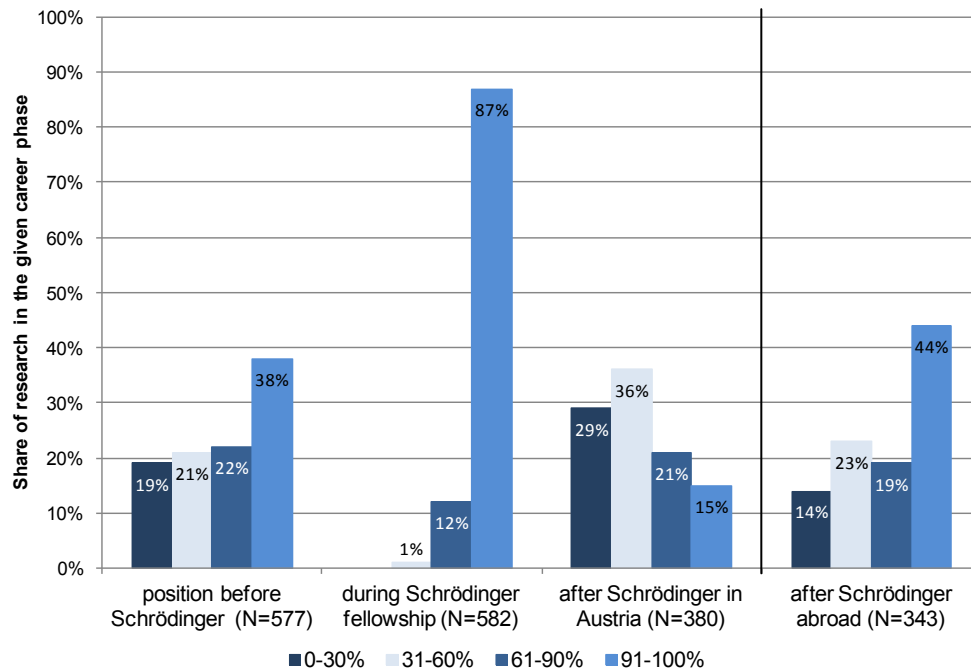


Source: Data and calculations by Fraunhofer ISI.

Another indication that supports the assumption that the observed increase in the publication output can be attributed to the Schrödinger Program is provided by the fact that the Schrödinger Program provides its fellows with the unique opportunity to focus entirely on research during their fellowship. Figure 10 shows that 87% were able to spend 91% to 100% of their time on research. This is dramatically higher than the time for research that the fellows enjoyed during the other phases of their careers. Only 15% were able to dedicate this much time to research upon their return no matter whether they returned to Austria or whether they stayed abroad. Also in their positions preceding their Schrödinger fellowship the reported research intensity is much lower.

¹² In contrast, to Figure 8, this Figure looks at average annual rather than total publication counts. The citation rates refer to the average citation rates per publication during the specified periods. The mentioned Ns are referring to the number of Schrödinger fellows that have published in the given period. Not all Schrödinger fellows have published in all of the three mentioned periods (before fellowship; 5 years after; later), however, while most fellows have published in more than one period.

Figure 10: Time available for research during the Schrödinger fellowship compared with earlier and later career phases¹³



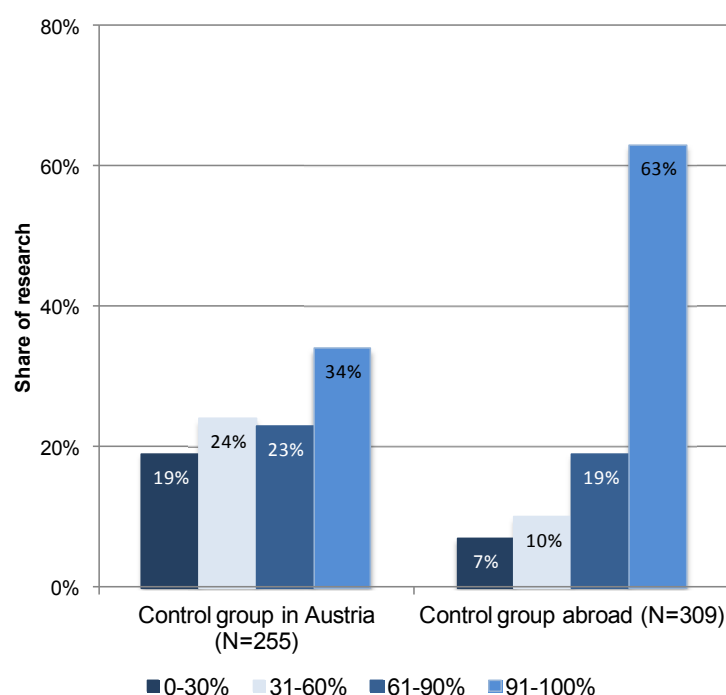
Source: Data and calculations by Fraunhofer ISI.

Also in comparison with the research focus of the control group, the time that Schrödinger fellows can focus on research during their fellowship appears to be exceptionally high. Figure 11 shows that only 34% of the researches of the control group working in Austria were able to dedicate 91% to 100% of their time on research. This large difference might well explain the higher publication output of the Schrödinger fellows.

It is noteworthy that the fellows that stayed abroad after the Schrödinger fellowship are able to focus more on research than their peers that returned to and stayed in Austria. This resonates with the critique of the research conditions in Austria discussed further below (Section 5.3.1). This is also confirmed by the survey results from the control group. The researchers of the control group that went abroad were able to focus 63% of their time exclusively on research.

¹³ The mentioned Ns refer to the total number of survey participants that have completed the individual questions on the career phases mentioned in the figure.

Figure 11: For those control group researchers that went abroad: Time available for research



Source: Data and calculations by Fraunhofer ISI.

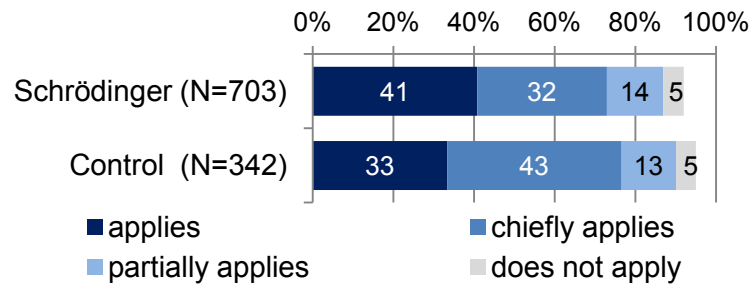
5.1.3 Impact on career development

As shown in Figure 12, the large majority of the responding Schrödinger fellows consider their fellowship to have had a positive impact on their career prospects in Austria. The Schrödinger fellows even consider the impact to be higher than the researchers of the control group. 41% of the Schrödinger fellows, compared to only 33% of the researchers of the control group responded that this statement fully "applies".¹⁴

Figure 13 shows that 50% of all Schrödinger fellows consider it to have been "very unlikely" (13%) or "unlikely" (37%) that they would have achieved their current position without their Schrödinger fellowship. The respondents of the control group attribute a similar importance to their stays abroad. It is quite remarkable that the respondents, many of which have already enjoyed long and successful careers, still attribute such a strong impact to their Schrödinger funded stays abroad.

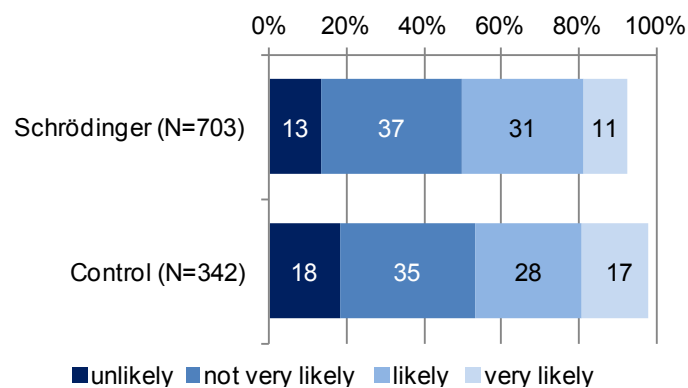
¹⁴ The difference between both groups, however, is not statistically significant (Kruskal-Wallis test).

Figure 12: Do you consider your Schrödinger fellowship/stay abroad to have strengthened your career prospects in Austria?¹⁵



Source: Data and calculations by Fraunhofer ISI.

Figure 13: How likely is it that you would have achieved your current position without your Schrödinger fellowship/stay abroad?¹⁶



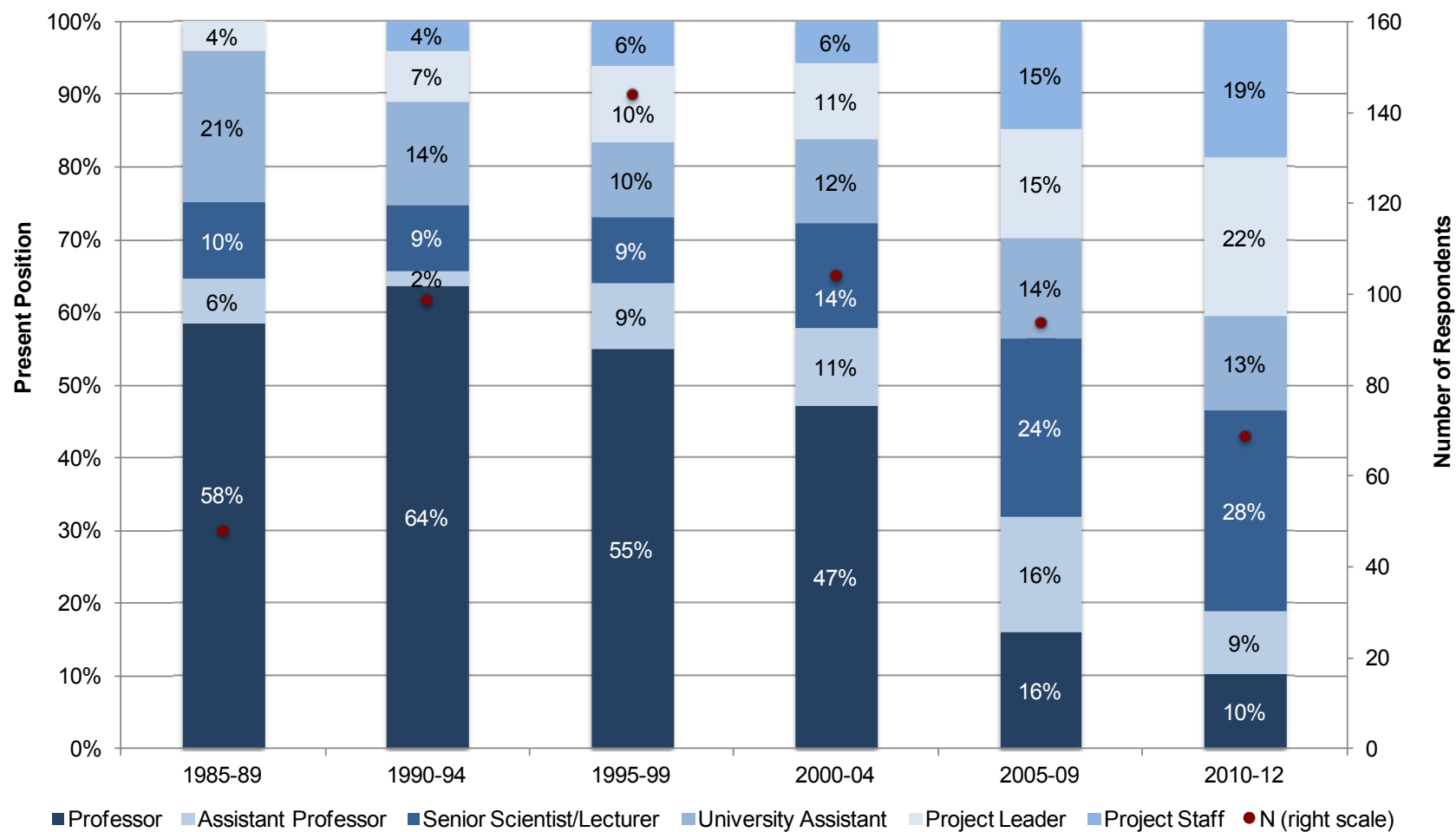
Source: Data and calculations by Fraunhofer ISI.

Figure 14 shows the highest positions that the Schrödinger fellows have achieved until today by start year of their fellowship. Of all Schrödinger fellows that commenced their stay abroad between 1985 and 1989, for instance, 58% have become full professors by now. Of the fellows that went abroad between 1990 and 1994 it is 64% and 55% for the fellows that went abroad between 1995 and 1999. Put differently, 55% of all Schrödinger fellows that went abroad 15 years or a longer time ago have become full professors since. This is fully consistent with the finding of the 2006 evaluation of the Schrödinger Program

¹⁵ This figure only includes those control group researchers that did go abroad. The difference between both groups, however, is not statistically significant (Kruskal-Wallis test).

¹⁶ This figure, too, only includes those control group researchers that did go abroad.

Figure 14: Highest position of the Schrödinger fellows today (2014), grouped by start year of the Schrödinger fellowship

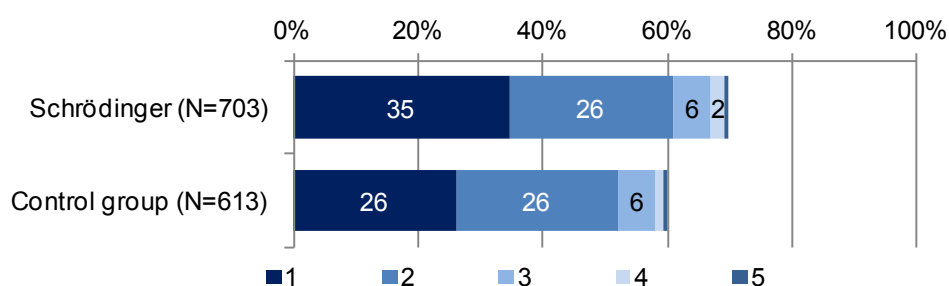


Source: Data and calculations by Fraunhofer ISI.

that slightly more than 50% of the researchers that have received a Schrödinger grant at least 15 years or longer ago have achieved professor positions.¹⁷

This raises the question to what extent the impressive career advancement of its fellows can be attributed to the Schrödinger Program. Again, a direct causal link is difficult to prove. It is instructive, however, to look at the factors that influence career advancement. The first factor is likely to be the research output of the given job candidate. In academic recruitment processes this is commonly measured by means of publication counts. And as Section 5.1.2 above suggests, the Schrödinger Program is very likely to have had a significant impact on the high publication output of its fellows.

Figure 15: All survey participants: How would you rate the reputation among heads of universities and research institutions of Schrödinger fellows/researchers that went abroad using school grades from 1 to 5 (1 = highest; 5 = lowest grade)?¹⁸



Source: Data and calculations by Fraunhofer ISI.

In addition to research output, informal factors, such as networks and reputation, can also be expected to play an important role in University recruitment processes. The Schrödinger Program appears to have a positive impact on both. Section 5.2.2 below shows the positive impact of the Schrödinger Program on the network and interconnectedness of its fellows. Figure 15 shows that, in total 61% of the responding Schrödinger fellows expected the reputation of Schrödinger fellows among heads of universities to be very high. Measured in school grades from 1 to 5, where 1 is the highest and 5 the lowest grade, 35% assessed the fellows reputation with the grade "1" and 26% with the grade "2", whereas only 52% of the researchers of the control group rated the reputation of researchers with international experience with the grades "1" (26%) or "2" (26%). This is

¹⁷ Warta, Katharina (2006): Evaluation of the FWF mobility programs Erwin Schrödinger and Lise Meitner. Technopolis. p. 11.

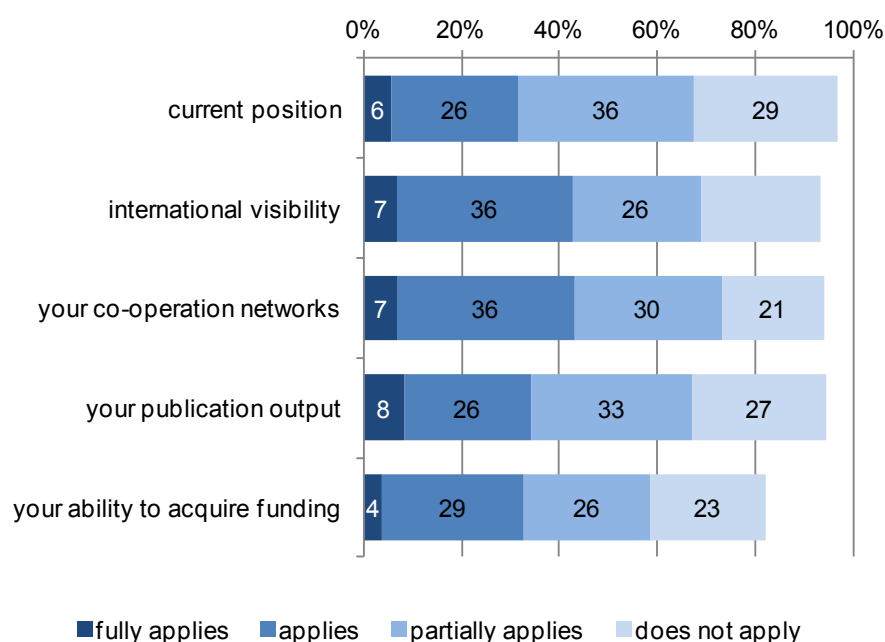
¹⁸ The gap to 100% represents the share of those survey participants that responded with n/a.

fully consistent with the workshop result that the Schrödinger Program has evolved into a career springboard attracting excellent academics and thus enjoying a very good reputation across the Austrian science system (see Figure 15), giving the Schrödinger fellows a significant advantage within this system.

The comparison with the control group provides another indication that the Schrödinger Program is likely to have had a causal impact on its fellows' impressive career advancement. A significant number of the researchers of the control group that did not go abroad consider their lack of experience abroad to have had a negative impact on their career. Across the five categories, between 33%, with regards to the ability to acquire funding, and 43%, with regards to international visibility and co-operation networks, of the researchers in the control group consider it to have been either very disadvantageous or just disadvantageous that they were never abroad (see Figure 16).

In sum, all the evidence presented in this section suggests that the Schrödinger Program has a positive impact on its fellows' career advancement. While it is not possible to prove a direct causal link, a number of indicators suggest that the observed effects can be attributed to the Schrödinger Program.

Figure 16: Control group without experience abroad: With regards to the following aspects, do you consider it to have been a disadvantage that you have never been abroad? (N=255)



Source: Data and calculations by Fraunhofer ISI.

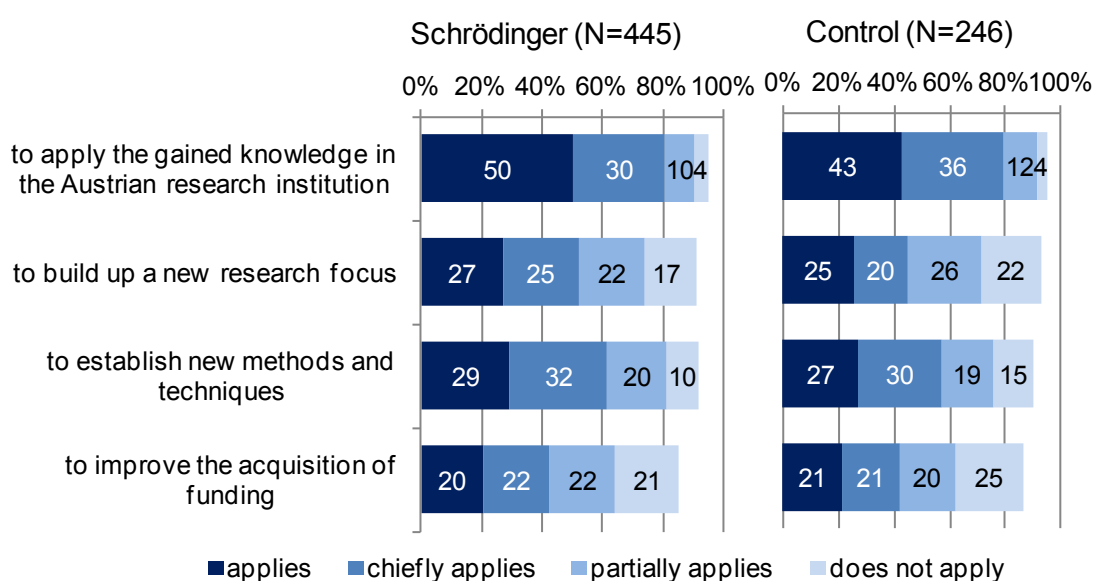
5.2 Impact on the research institutions and universities

The evidence gathered through the survey and the bibliometric analysis shows that the Schrödinger Program also has a positive impact on the involved research institutions and universities in Austria. At this level it is possible to distinguish between impacts on the transfer of knowledge, methods and techniques (Sub-Section 5.2.1) as well as the improved international interconnectedness of the involved institutions (Sub-Section 5.2.2)

5.2.1 Transfer of knowledge, methods and techniques

Figure 17 shows that the large majority of the questioned Schrödinger fellows were able to apply the knowledge they gained during their research stay abroad in Austria upon their return. 50% answered that this statement "applies" and another 30% responded that it "chiefly applies." Of the control group only 44% ("applies") and 36% ("chiefly applies") supported this statement.¹⁹ The Schrödinger fellows also reported that they were able to build up a new research focus and to establish new methods and techniques. The difference to the control group, however, is small and not statistically significant.

Figure 17: Returning researchers: Upon your return to Austria, were you able...²⁰



Source: Data and calculations by Fraunhofer ISI.

¹⁹ The difference is statistically significant at a significance level of 0.05.

²⁰ The mentioned Ns only include those respondents that stated that they directly returned to Austria.

Figure 17 also suggests that the Schrödinger Program also has a positive impact on the ability to acquire research funding. This may partly be explained by the fact that a Schrödinger fellowship can improve the international interconnectedness of the fellow (see Section 5.2.2) and thus access to international research consortia, which tend to be more likely to acquire funding. This also appears to be confirmed by the survey responses of the control group.²¹

In all cases, except for the acquisition of research funding, where the responses of the control group are slightly higher, the impacts of the Schrödinger fellowships appear to have been slightly higher than those of the stays abroad enjoyed by the researchers of the control group. However, also the respondents from the control group point at a positive impact of research stays abroad, thus confirming the findings of the survey of the Schrödinger fellows.

Male Schrödinger fellows tend to be much more optimistic about their ability to contribute to their Austrian research institution than their female colleagues. Whereas more than one third of the male respondents indicate that they were able to apply the gained knowledge in the Austrian research institutions, for instance, only 26% of the female respondents verify such an impact. Women are also more modest with regards to the introduction of new methods and techniques (see Figure 50 in the Annex A.3).

5.2.2 International interconnectedness

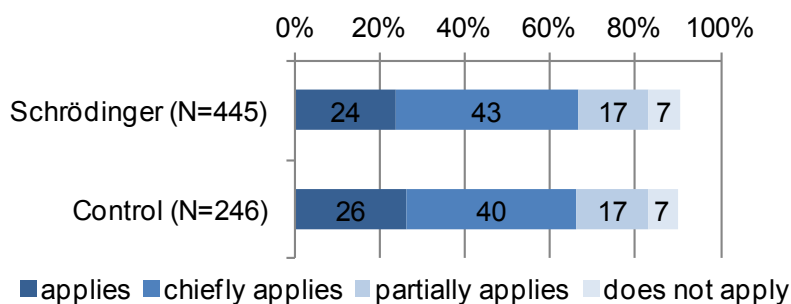
The Schrödinger Program also supports the international interconnectedness of the involved research institutions, as shown in Figure 18. In sum, 67% of the Schrödinger fellows responded that the statement that the Schrödinger Program improved the interconnectedness and visibility of Austrian science "applies" (24%) or "chiefly applies" (43%). The control group reported a similar impact.²²

One way in which the returning researchers improve the international interconnectedness of their Austrian home institutions is through their relationship with their former host institution. As shown in Figure 19, the large majority of Schrödinger fellows reported that they are still in touch with their old host institution in various ways, ranging from conferences and co-publications, joint research projects and regular visits to the exchange of researchers. Women, however, tend to be more modest about their ability keep in touch with their host institutions (see Figure 51 in the Annex A.3).

²¹ The difference between the two groups is not statistically significant.

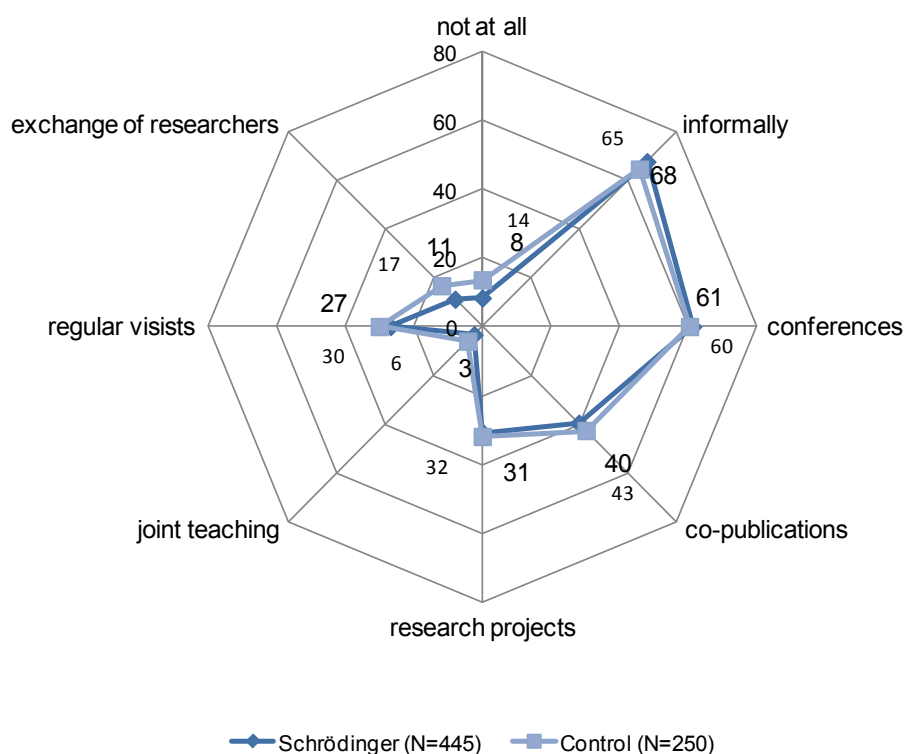
²² The differences are not statistically significant.

Figure 18: Returning researchers: Upon your return, were you able to improve the international interconnectedness and visibility of your home institution?



Source: Data and calculations by Fraunhofer ISI.

Figure 19: Returning researchers: In which way, if at all, are you still in touch with your host institution?²³



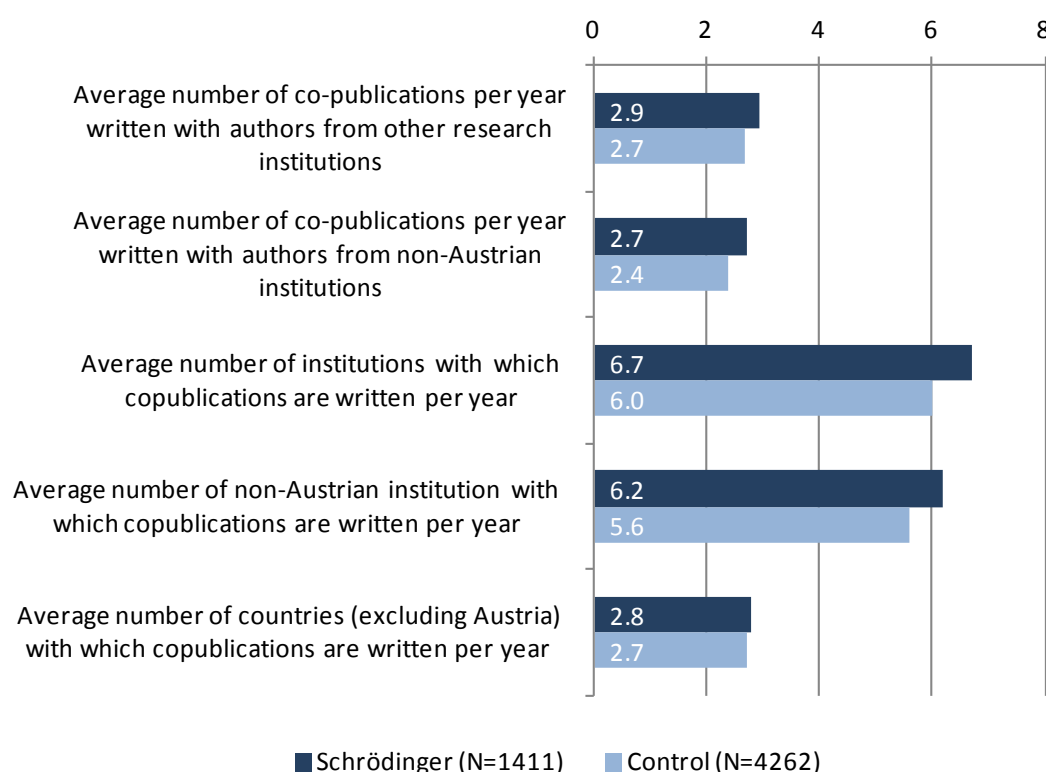
Source: Data and calculations by Fraunhofer ISI.

²³ The figure only includes those researchers (Schrödinger and control) that directly returned to Austria after their stay abroad.

The researchers of the control group also reported to be still in touch with their former host institution. In some cases, they appear to be more actively in touch with their former hosts than the Schrödinger fellows are with theirs. The difference between both groups, however, is not statistically significant.

These results are confirmed by the bibliometric analysis, which also suggest that the Schrödinger Program has a positive impact on the integration of Austria's research institutions in international research networks. Figure 20 shows that the Schrödinger fellows co-publish more than the researchers of the control group. On average, they also co-publish with a larger number of non-Austrian co-authors and non-Austrian institutions and a larger number of different countries.

Figure 20: Co-publication patterns of all Schrödinger fellows and all researchers of the control group²⁴

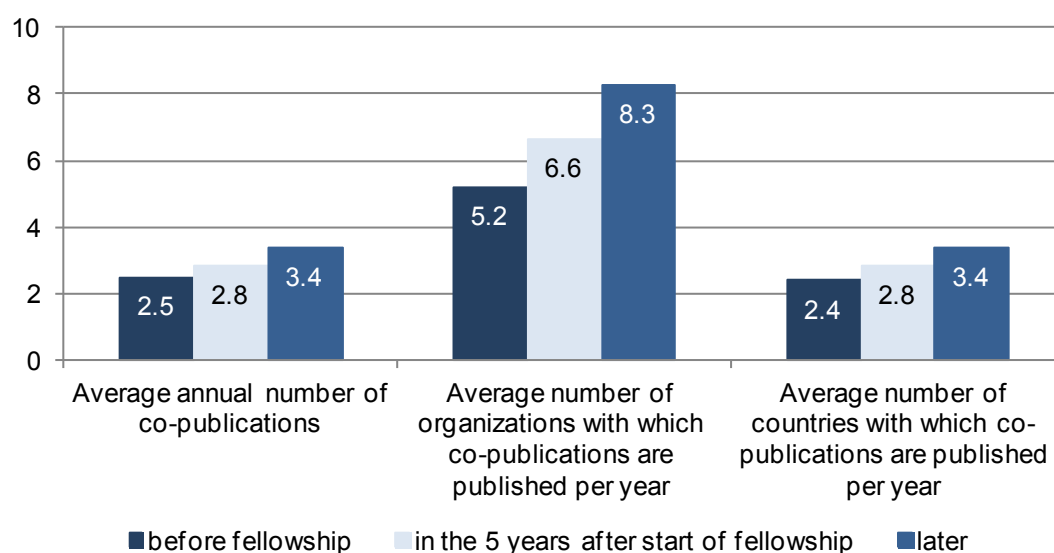


Source: Data and calculations by Fraunhofer ISI.

²⁴ The average number of institutions refers to the number of different research institutions that appear in the Schrödinger's and control group researchers' co-publications. These numbers are not concerned with individual researchers.

However, not only the comparison with the control group but also the in-time comparison suggests a positive impact of the Schrödinger Program. The number of co-publications as well as the number of organizations and countries with which the fellows co-operate increases significantly from the time before the fellowship to the time of the fellowship and the later career phase (see Figure 21). Again, the time of the fellowship is defined as the five years from the start of the fellowship, which is the typical window of time in which research results reach the publication stage. As shown in Annex A.4, this finding holds true across all fields of science.

Figure 21: Co-publication patterns of the Schrödinger fellows before, during and after their fellowship (N=1411)



Source: Data and calculations by Fraunhofer ISI.

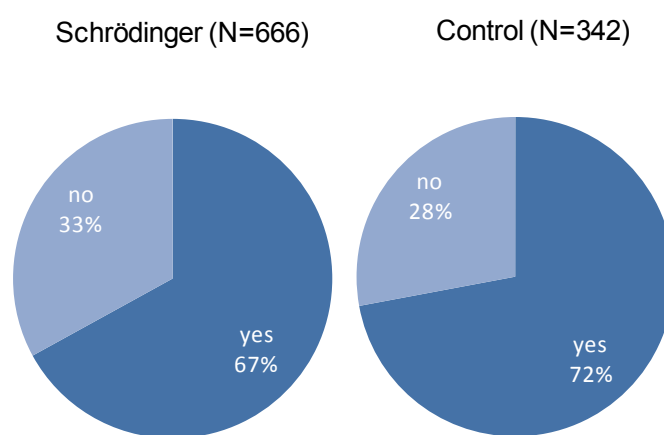
5.3 Impact on the Austrian science system and the European Research Area

The Schrödinger Program also has an impact at the macro level, on the Austrian as well as the European science system. At this level, the main question is whether the fellows stay in academia, whether they return to Austria or whether they stay abroad and, if so, whether this leads to a loss of the Austrian or European science system. This question is addressed in Section 5.3.1. Section 5.3.2 discusses the impact of the Schrödinger Program on the integration of the European Research Area.

5.3.1 Ongoing mobility

Of all Schrödinger fellows that have already completed their fellowship, 67% directly returned to Austria within 12 months after their fellowship. This is slightly lower than the return rate of around 76% reported in the previous evaluation from 2006.²⁵ By comparison, 72% of the researchers of the control group that went abroad directly returned. This is also higher than the return rate of the Schrödinger fellows.

Figure 22: Did you return to Austria directly (within 12 months) after your Schrödinger fellowship/stay abroad?²⁶



Source: Data and calculations by Fraunhofer ISI.

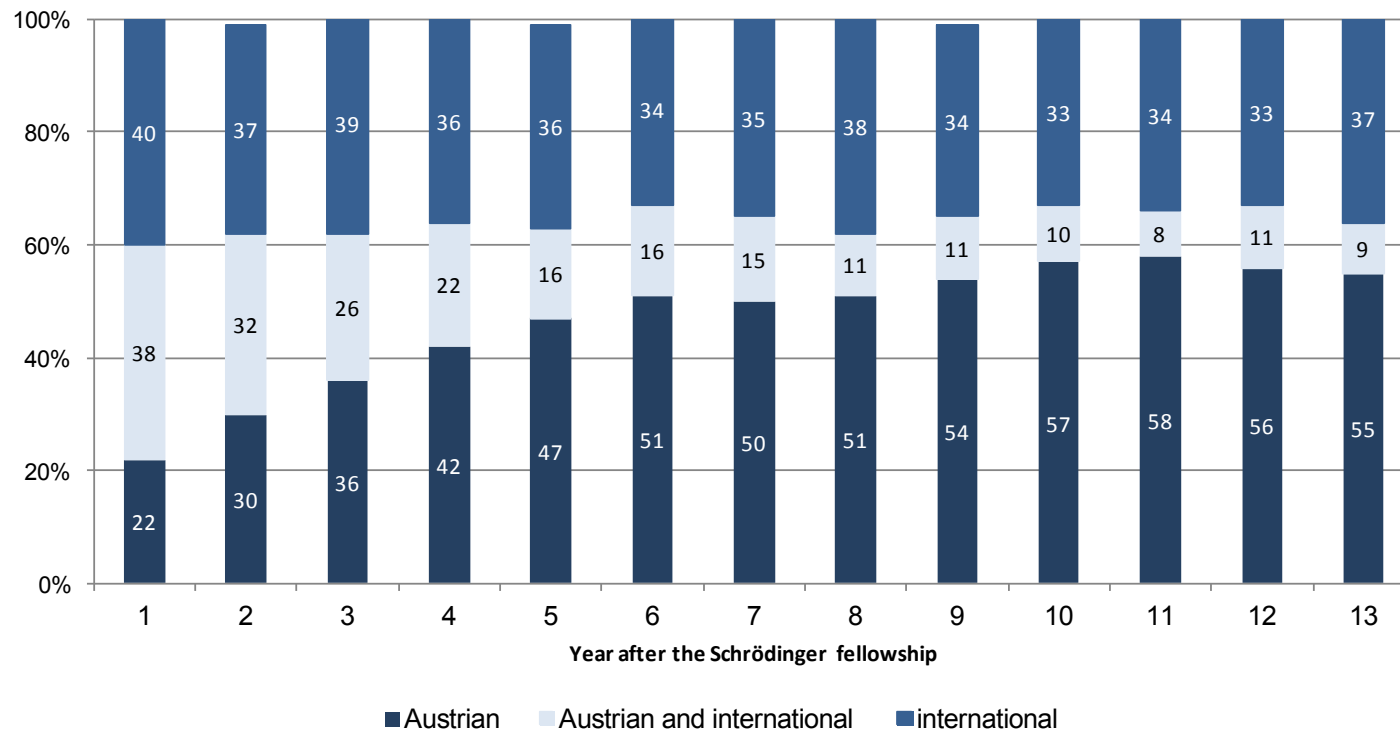
Figure 24 shows that 17% of the Schrödinger fellows that stayed abroad, returned at a later point in their careers. 7% return within the first four years after the fellowship and another 7% return 4 to 10 years later. That means that a significant number of Schrödinger fellows stay abroad.

These survey results are confirmed by the bibliometric analysis. Figure 23 shows the affiliations of the Schrödinger fellows during the years following their fellowship. The figure is based on the information that the Schrödinger fellows provide on their publications regarding their institutional affiliation. A little less than 40% of all Schrödinger only report international affiliations on their publications. And a little more than 60% state on their publications that they are affiliated to both an Austrian and an international institution. In the survey, as shown in Figure 22, 67% of the Schrödinger fellows stated that they returned to Austria. This number is slightly higher but still relatively close, considering the

²⁵ Warta, Katharina (2006), p. 22.

²⁶ Of the control group, only those researchers are included who did go abroad.

Figure 23: Affiliation(s) of the Schrödinger fellows during the years following the Schrödinger fellowship (N=1559)²⁷

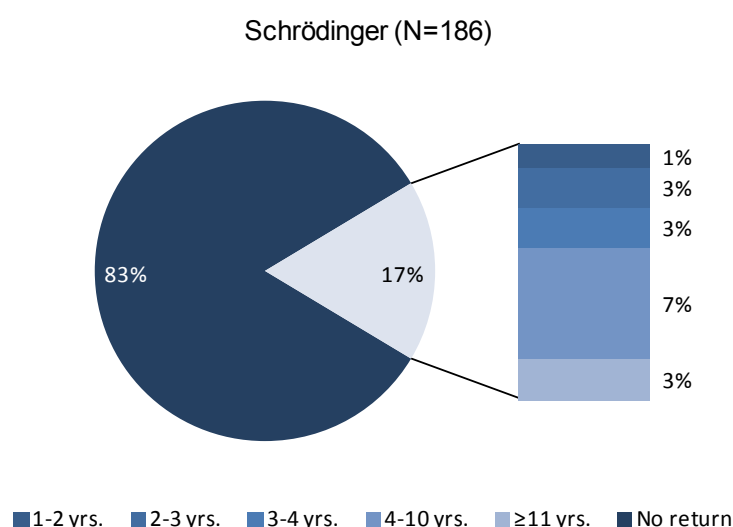


Source: Data and calculations by Fraunhofer ISI.

²⁷ This Figure is based on the information that the Schrödinger fellows provide on their publications regarding their publications. This is not to be confused with the place of work, where they spent most of their time. Researchers often tend to have multiple institutional affiliations.

fact that the bibliometric findings are based on completely different data. The difference might be explained by the fact that the Schrödinger fellows simply publish more under their international affiliations than their Austrian affiliations.

Figure 24: Schrödinger fellows that initially stayed abroad: Did you return to Austria eventually, and if so when?²⁸



Source: Data and calculations by Fraunhofer ISI.

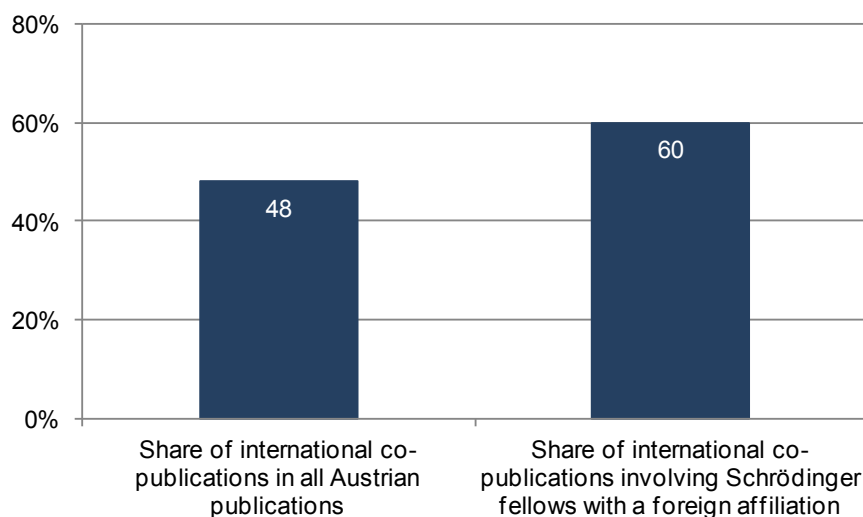
During the years directly succeeding the stays abroad, the share of Schrödinger fellows with affiliations in Austria and abroad is higher than in later years. This appears to confirm the finding of Section 5.2.2 above that the Schrödinger Program promotes the international interconnectedness of its fellows. This effect, however, appears to decrease over time.

The most commonly cited reason for the decision to stay abroad is the existence of an attractive job offer.²⁹ This was stated by 73% of all Schrödinger fellows that did not directly return and 69% of the researchers of the control group (see Figure 26 below). Of the Schrödinger fellows that stayed abroad 48% stayed at their host institution and 52% moved on to a different institution abroad.

²⁸ Not all of the 221 Schrödinger fellows that staid abroad completed this question.

²⁹ This is especially true for men, whereas women often did not mention this opportunity.

Figure 25: International co-publications involving Schrödinger fellows with a foreign affiliation



Source: Data and calculations by Fraunhofer ISI.

The high number of non-returning fellows does not necessarily have to be interpreted as a loss to Austrian science. The bibliometric analysis suggests that the Schrödinger fellow staying abroad tend to assume the role of "bridge heads." They improve the international interconnectedness and the integration of the Austrian science system in international academia. Figure 25 shows that whenever such bridge heads are involved in co-publications with Austrian researchers tend to co-publish with other non-Austrian authors more often. In the case where Austrian publications involve a Schrödinger fellow that stayed abroad, the share of international co-publication is 60%. These publications include an Austrian author, a Schrödinger fellow or alumni working abroad, as well as another international co-author. In contrast, only 48% of all Austrian publications – i.e. publications involving at least one Austrian author – are international co-publications – i.e. publications involving an Austrian as well as a non-Austrian author. This comparison suggests that with a Schrödinger fellow that stayed abroad the share of international co-publications is significantly higher than without their involvement.³⁰

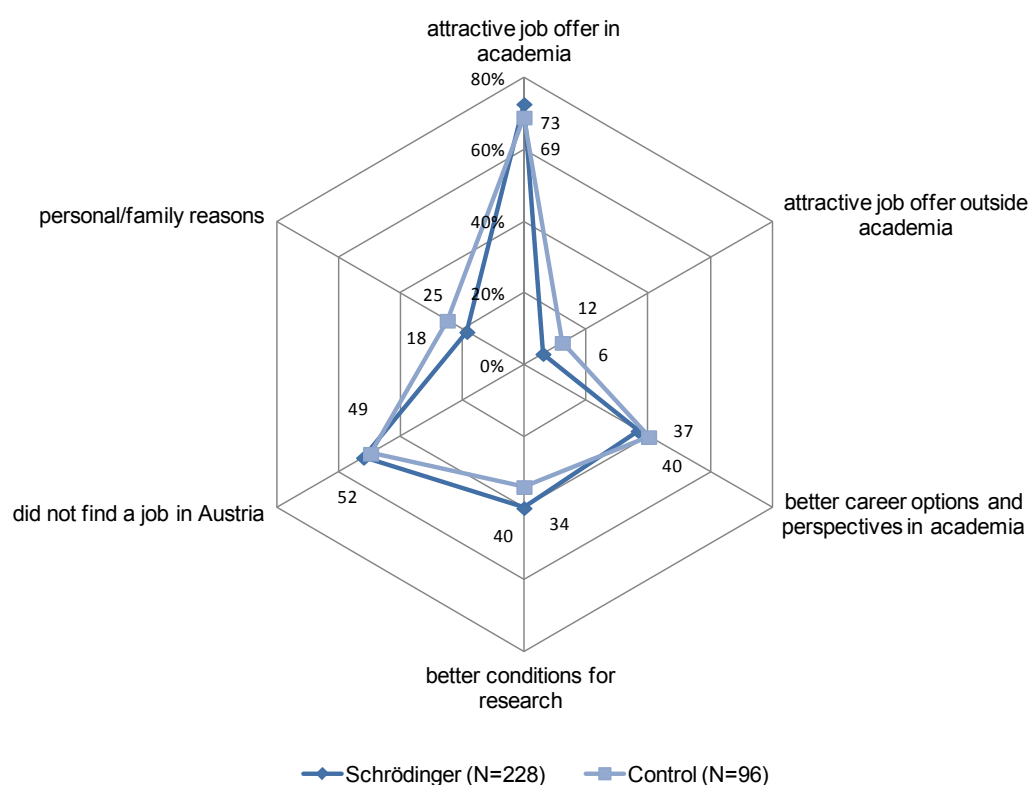
Moreover, it is important to consider the reasons why the Schrödinger fellows did not return. According to the survey results, 52% of the Schrödinger fellows that stayed abroad reported that they did not find a job in Austria (see Figure 26). From the perspective of allocative efficiency, it ought to be welcomed that researchers for whom there is no ade-

³⁰ These calculations are based on institutional affiliations, i.e. the affiliation that authors mention on scientific publications.

quate position in Austria stay abroad and continue to gain experiences and skills until a compatible position becomes available.

The main reason why Schrödinger fellows stay abroad, however, has to do with the career options and research conditions abroad that are considered to be significantly better than the conditions in Austria. 73% reported that they stayed because they found an attractive academic job. 37% mentioned the better career options and perspectives abroad and 40% cite the better conditions for research as a reason for staying abroad.

Figure 26: Researchers that stayed abroad: Critical factors influencing the decision to stay abroad³¹

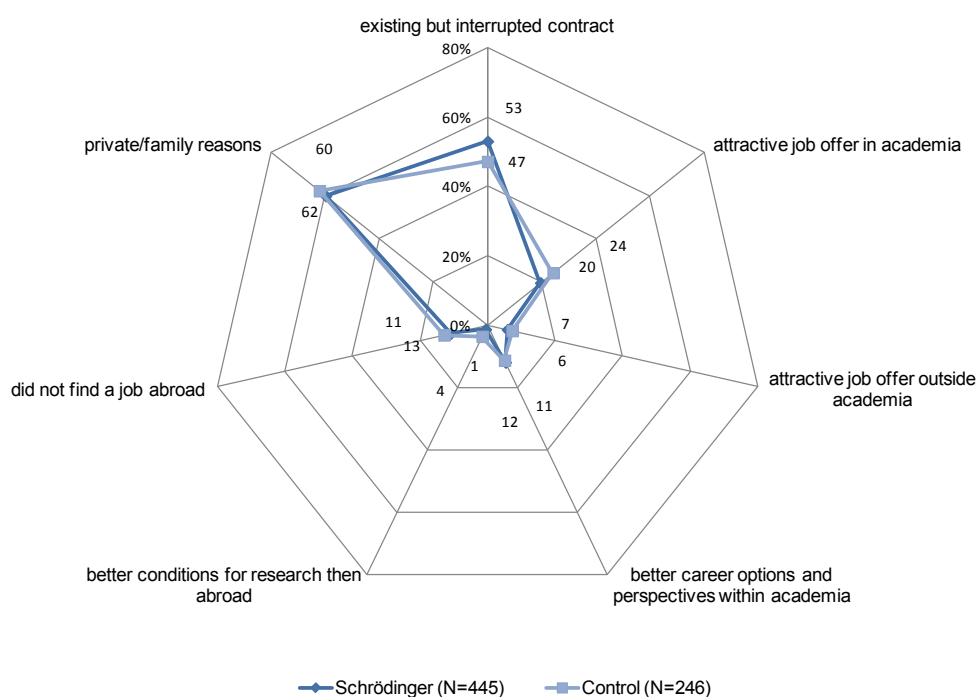


Source: Data and calculations by Fraunhofer ISI.

³¹ Includes only those researchers (Schrödinger and control) who staid abroad.

The attractiveness of academia outside Austria is mirrored in Figure 27 that highlights the poor research conditions and unattractive career prospects in Austria. Asked about the critical factors influencing their decision to return to Austria, only 12% of the respective Schrödinger fellows declared that they considered the career options and perspectives within Austrian academia to be better than abroad. Only 1% cited the research conditions in Austria as a reason for their return. These results were also confirmed by the researchers of the control group.

Figure 27: Researchers that directly returned to Austria: Critical factors influencing the decision to return to Austria³²



Source: Data and calculations by Fraunhofer ISI.

The relative unattractiveness of research conditions and career prospects in Austria has already been addressed by previous research. Janger, Strauss and Campbell had made

³² Includes only those researchers (Schrödinger and control) who directly returned after their stay abroad or Schrödinger fellowship

similar observations.³³ The authors explain the frustration with the Austrian science system by the high prevalence of a chair rather than a departmental system and the absence of a tenure track system. Both tend to lead to a dualisation of the academic job market in which the "insiders" control attractive permanent positions and the "outsiders" compete for a limited number of temporary positions.

The most commonly cited factor for the decision to return to Austria are private and family reasons with 60%. Next 53% mentioned pre-existing contracts that were only interrupted for the Schrödinger fellowship as a reason for their return. This suggests that the Schrödinger fellows tend to have deep personal and professional roots in Austria. However, the poor research conditions and career prospects in Austria lead researchers to go and to stay abroad.

The unattractiveness of the Austrian science system is also confirmed by the responses of the control group as well as the workshop participants. Factors undermining the attractiveness of the Austrian science system that were commonly mentioned in the survey as well as the workshop include:

- The temporary nature of many entry level academic jobs.
- The "Kettenvertragsregelung", a provision from the 2002 legal framework for universities, that forces universities and research institutions to offer a permanent contract to all employees, who have been employed on temporary contracts for six years, or eight years in the case of non-full-time employment.³⁴ In practice, however, it was argued, this leads to a situation where researchers often lose their position at the end of this period instead of being offered a permanent job.

³³ Janger, J./Strauss, A./Campbell, D.F.J. (2013): Academic careers: a cross-country perspective. Work Package. 305 MS64 "Research paper on new university research organization model", Part II, Working Paper no 37.

³⁴ This provision is based on § 109 of the Universitätsgesetz from 2002: § 109 (1 and 2) in German: (1) Arbeitsverhältnisse können auf unbestimmte oder bestimmte Zeit abgeschlossen werden. Arbeitsverhältnisse auf bestimmte Zeit sind bei sonstiger Rechtsunwirksamkeit des Arbeitsvertrags auf höchstens sechs Jahre zu befristen, sofern in diesem Bundesgesetz nicht anderes bestimmt ist. (2) Eine mehrmalige unmittelbar aufeinanderfolgende Befristung ist nur bei Arbeitnehmerinnen und Arbeitnehmern, die im Rahmen von Drittmittelprojekten oder Forschungsprojekten beschäftigt werden, bei ausschließlich in der Lehre verwendetem Personal sowie bei Ersatzkräften zulässig. Die Gesamtdauer solcher unmittelbar aufeinanderfolgender Arbeitsverhältnisse einer Arbeitnehmerin oder eines Arbeitnehmers darf sechs Jahre, im Fall der Teilzeitbeschäftigung acht Jahre nicht überschreiten. Eine darüber hinausgehende einmalige Verlängerung bis zu insgesamt zehn Jahren, im Fall der Teilzeitbeschäftigung bis zu insgesamt zwölf Jahren, ist bei sachlicher Rechtfertigung, insbesondere für die Fortführung oder Fertigstellung von Forschungsprojekten und Publikationen zulässig. Source: <http://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=20002128>

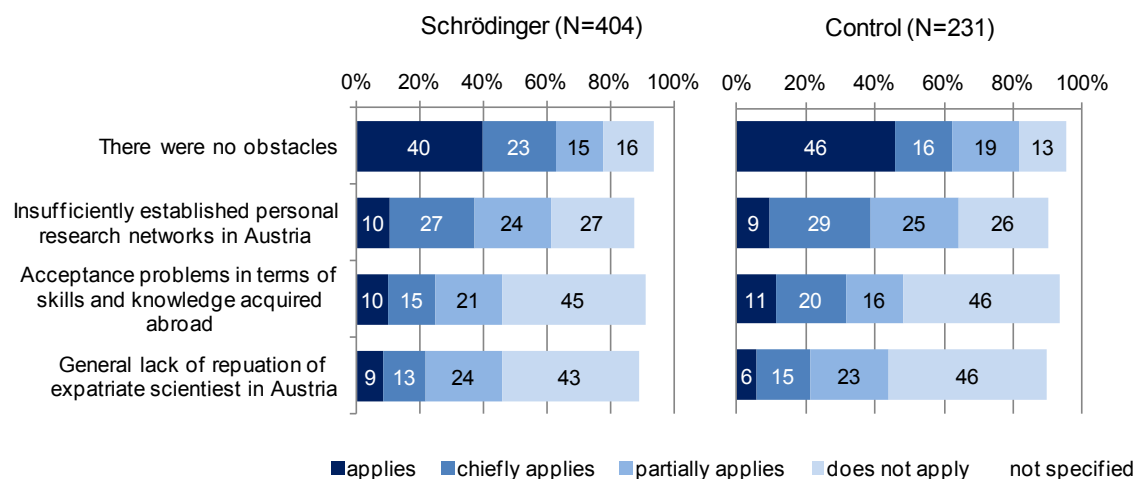
- The lack of appreciation for ambitious young researchers with research experience at leading research institutions outside academia. Many returning researchers feel that they are not welcome and that the knowledge and skills they have gained are not appreciated. One of the survey respondents declared that:

„I was treated like a student, not like a researcher with decades of experience. I was given a tiny desk without a phone in a room full of students." ³⁵

- The perception that academic recruitment processes lack transparency and that they are not based on meritocratic principles.

As discussed in Annex A.4 below, the survey shows that the working conditions are deemed to be particularly unattractive in the field of biology.

Figure 28: Researchers that returned to Austria: What obstacles, if any, were you confronted with upon your return?³⁶



Source: Data and calculations by Fraunhofer ISI.

With regards to factors influencing the decision to stay abroad or to return to Austria there are a number of differences between male and female Schrödinger fellows. During the post-doc phase women tend to have permanent contracts less often than their male colleagues therefore they also reported less often that they returned to Austria because they had an existing contract. Moreover, women also tend to mention the better research conditions and career options abroad more often than their male colleagues. With regards to

³⁵ Translated from German. Original: "Ich wurde behandelt wie eine Diplomandin, nicht wie eine Forscherin mit jahrzehntelanger Erfahrung. Hatte einen zu kleinen Schreibtisch, kein Telefon, in einem Zimmer voller Studierender".

³⁶ Only includes those researchers (Schrödinger and control) that went abroad and directly returned to Austria thereafter. However, not all survey participants completed this question.

private and family reasons it is noteworthy that for both women and men family reasons are an equally important factor to return to Austria, however, three times more women (12%) mentioned private and family reasons as a factor influencing their decision to stay abroad than men (4%). For more information see Figure 52 and Figure 53 in the Annex.

Although 40% of all Schrödinger fellows reported that they did not see any obstacles upon their return, Figure 28 shows a number of obstacles that the Schrödinger fellows were confronted by upon their return that undermine the attractiveness of the Austrian science system. The statement that "insufficiently established personal networks in Austria" pose an important constraint was supported by 51% of the respondents ("applies" (9%), "chiefly applies" (22%) or "partially applies" (20%)). A total of 39% saw the lack of appreciation for skills and knowledge obtained abroad as an obstacle. These survey results are similar for the control group and confirm the anecdotal evidence provided by the workshop.³⁷ These obstacles appear to be higher for women than for men (see Annex A.3).

Of the female Schrödinger fellows only 29% agreed with the statement that there were no obstacles, compared to 39% of all men. Women tend to see insufficiently established personal networks in Austria and the general lack of reputation of expatriate scientists in Austria to be larger obstacles than their male colleagues.

This alarming situation can only be addressed by improving the working conditions within the Austrian science system. The results show very clearly that the Schrödinger Program is not the reason why researchers do not return to Austria. With the introduction of the funded return phase, the Schrödinger Program already appears to do all it can to promote the return of its fellows.

5.3.2 Impact on the European Research Area

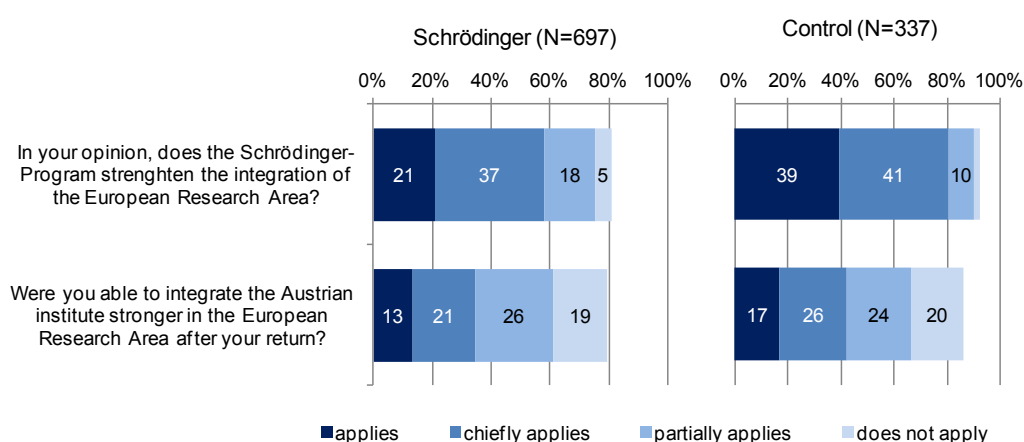
On the macro level, not only impacts on the Austrian science system but also implications for the European Research Area could be observed. Figure 29 shows that a total of 58% of the responding Schrödinger fellows were of the opinion that the Schrödinger Program strengthens integration of Austria in the European Research Area (21% responded with "applies" and 37% with "chiefly applies").

21% responded with "applies" and 37% with "chiefly applies". A total of 34% answered that the Schrödinger Program improved the integration of their home institution in the European Research Area. The respondents of the control group see the impact of their stays abroad to be stronger on the European Research Area than the responding

³⁷ The differences between both groups are not statistically significant.

Schrödinger fellows.³⁸ This may be explained by the fact that more than other researchers the Schrödinger fellows are able to go to the leading institutions in their field, which tend to be in North America rather than Europe. Consequentially, many fellows do not see any impact on the European Research Area. Figure 30 shows that the large majority of Schrödinger fellows go to the United States. However, a significant share also goes to research institutions in Europe.

Figure 29: Were you able to improve the integration of Austria in the European Research Area?³⁹



Source: Data and calculations by Fraunhofer ISI.

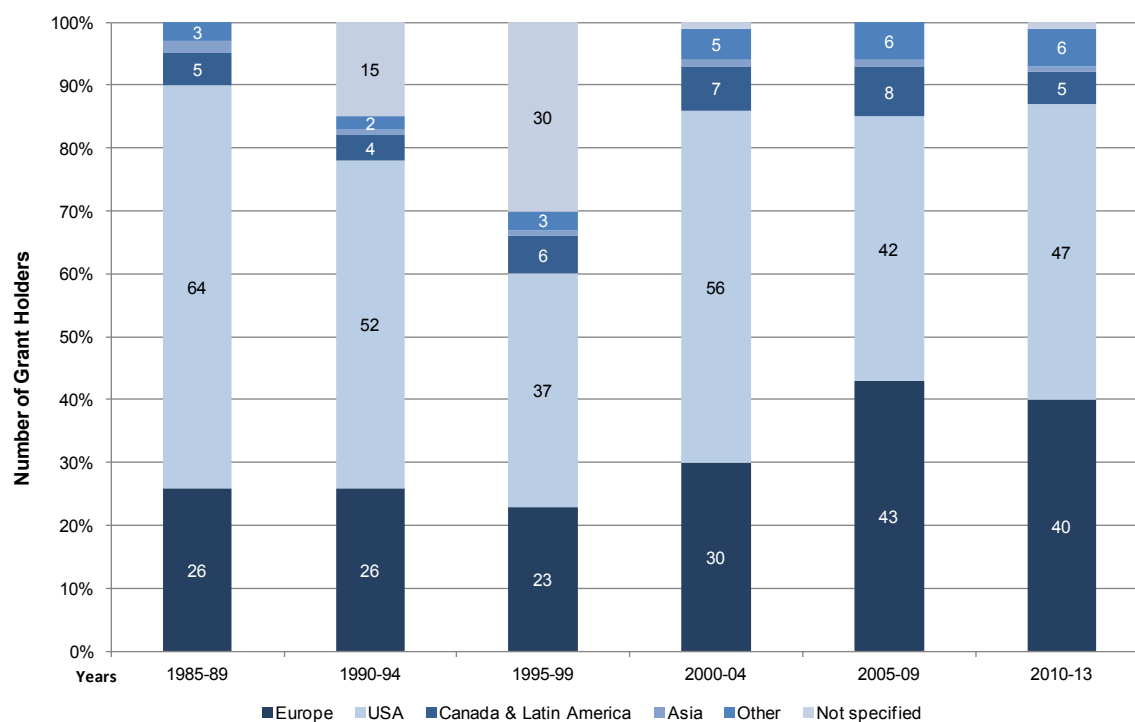
The bibliometric analysis suggests that the Schrödinger Program has a positive impact on the intra-European research collaborations in the form of co-publications. Whilst 70% percent of all Schrödinger fellows and researchers of the control group co-publish with other authors from Austria, a large number also co-publishes with researchers from other European countries. Researchers from the United States still represent the largest group of international co-authors. 60% of all Schrödinger fellows (46% of all researchers of the Control group) co-publish with authors from the United States. This confirms the finding that the United States are an important destination and collaboration partner for Austrian scientists. However, 8 of the top 10 countries, including Austria, for co-publications are European. Schrödinger fellows co-publish almost as often with German co-authors (59%) as with American co-authors. Around 30% of all Schrödinger fellows also co-publish with co-authors from Great Britain (38%), Switzerland (32%), France (30%), Italy (27%) and The Netherlands (25%). This shows that the Schrödinger fellows are already well inte-

³⁸ This difference is statistically significant at the 0.1 level.

³⁹ From the control group only those researchers that went abroad were included.

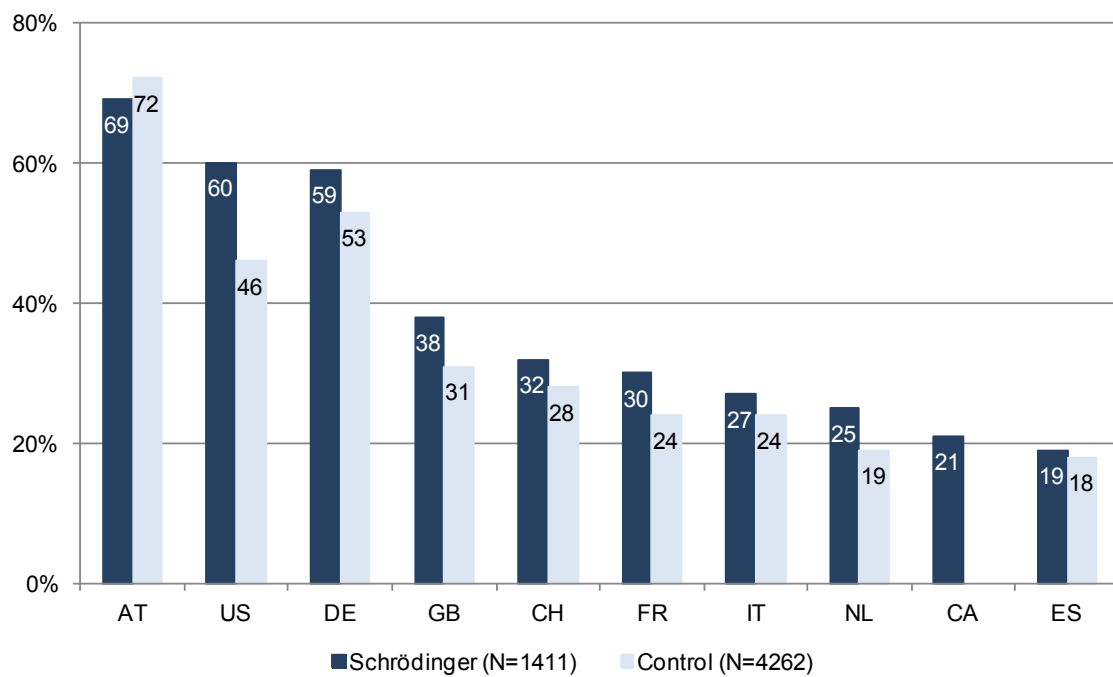
grated in international and European research networks. They also tend to co-publish more often with authors from other European countries than the researchers from the control group.

Figure 30: Destinations of the Schrödinger fellows by year (1985-2013)



Source: Data and calculations by Fraunhofer ISI.

Figure 31: Top 10 list of countries for co-publications



Source: Data and calculations by Fraunhofer ISI.

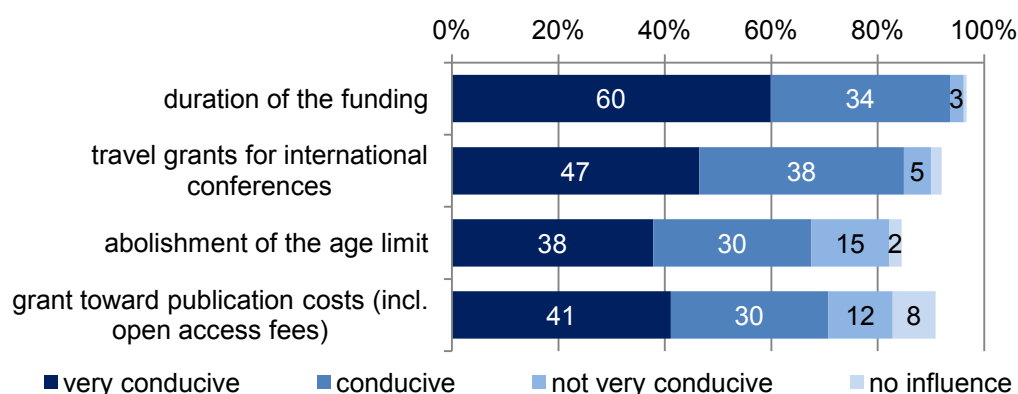
6 Program assessment

Since 1985, the Schrödinger Program has been evaluated, redeveloped and improved several times. As a result, the design of the program can be considered to be highly compatible with its goals to enable researchers at the post-doctoral level to gain experience at leading foreign research institutions and thereby to facilitate access to new scientific areas, methods, procedures and techniques so as to contribute to the further development of science in Austria.

Most elements of the Schrödinger Program have been rated to be "highly conducive" to the objectives of the program by the Schrödinger fellows. 94% consider the duration of the funding of 10 to 24 months without a return phase and 16 to 36 months with a return phase to be "very conducive" (60%) or "conductive" (34%) to the objectives of the Schrödinger Program (see Figure 32). In the previous evaluation from 2006 it was recommended to differentiate the length of the funding, in response to subject dependent needs. At that time the length was still 10 to 24 months only. The survey results of the present evaluation suggest that the length of the funding no longer is an issue. There were no significant differences between the various scientific disciplines.⁴⁰

The abolishment of the previous age limit of 35 years that was recently introduced achieved a total approval of 68% (38% "very conducive" and 30% "conductive"). Also the travel grants for international conferences and the grant toward publication costs achieved a high approval by the survey participants.

Figure 32: How do you assess the following elements of the Schrödinger Program, with regards to the Schrödinger Program's objectives? (N=703)



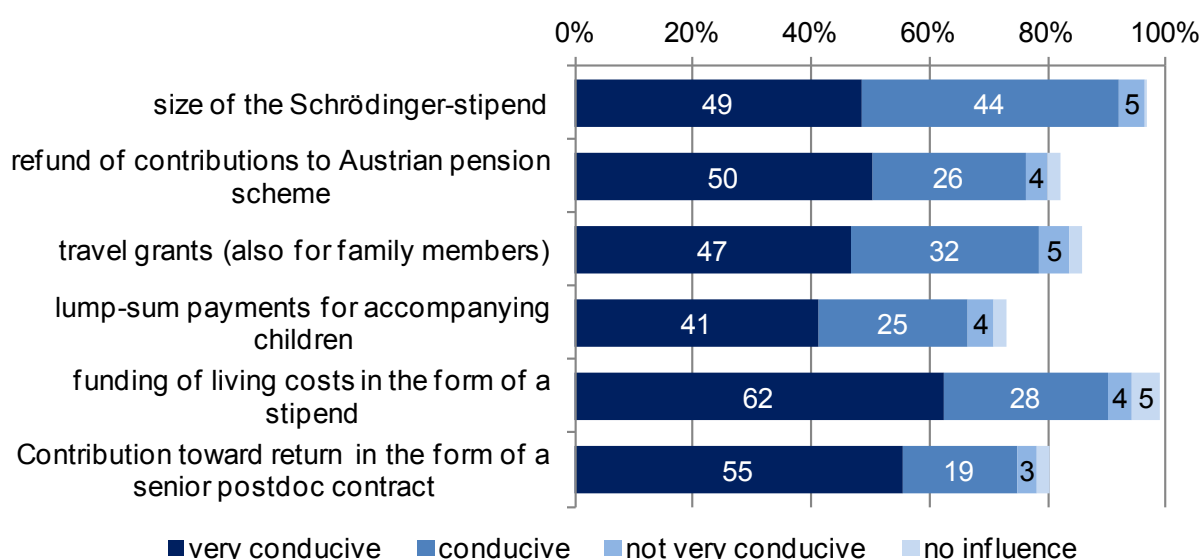
Source: Data and calculations by Fraunhofer ISI.

⁴⁰ This is also statistically significant.

Figure 33 shows that also the size and form of funding achieved a high approval by the survey participants. A remarkable total of 93% consider the size of the funding to be "very conducive" (49%) or "conductive" (44%). A total of 90% of the survey participants also considered the fact that the funding is paid in the form of a stipend to be "very conducive" (62%) or "conductive" (28%). Also the travel grants for family members and the payments for accompanying children are viewed very positively.

The recently introduced refund of contributions to the Austrian pension scheme received the third highest approval with 50% rating it to be "very conducive" (26% "conductive").

Figure 33: How do you assess the following financial benefits of the Schrödinger Program, with regards to the Schrödinger Program's objectives? (N=703)

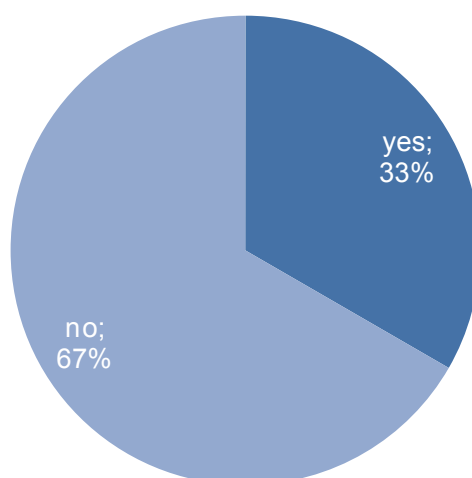


Source: Data and calculations by Fraunhofer ISI.

The return phase through which Schrödinger fellows can be awarded a senior post-doc salary for a period of 6 to 12 months upon their return, achieved the second highest approval rating after the funding of living costs in the form of a stipend with 55% of the survey participants rating it to be "very conducive" to the objectives of the program. With the introduction of the return phase in 2009, the FWF responded to the finding of the 2006 evaluation that a quarter of all Schrödinger fellows stayed abroad.

Of all fellows that assumed their fellowship with the beginning of 2009 and later and thus had access to it, roughly one third made use of it. This share may seem rather small but it is not surprising given the fact that many Schrödinger fellows either return to an existing contract or directly find an attractive position after their fellowship (see Figure 27).

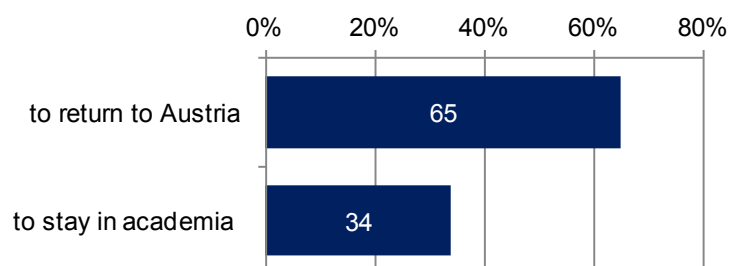
Figure 34: Did you use the funded 'return phase' introduced in 2009 (N=111)



Source: Data and calculations by Fraunhofer ISI.

The large majority of the fellows that used it cited it as the main reason for their return and half of the respondents reported that it was also an important factor in their decision to stay in academia at all. Although the number of fellows that have made use of the return phase, and thus respondents, is rather low this provides a first and good indication that the introduction of the return phase constitutes an improvement of the program.

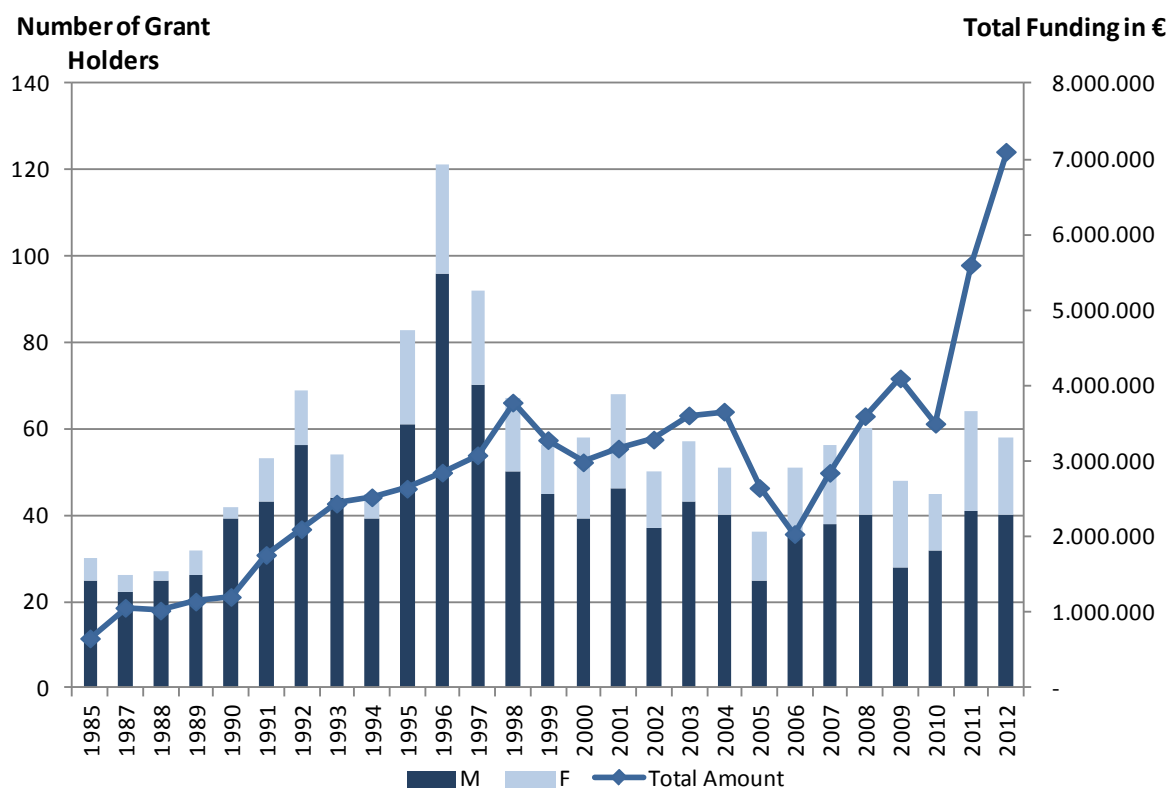
Figure 35: Did the return phase contribute to your decision... (N=37)



Source: Data and calculations by Fraunhofer ISI.

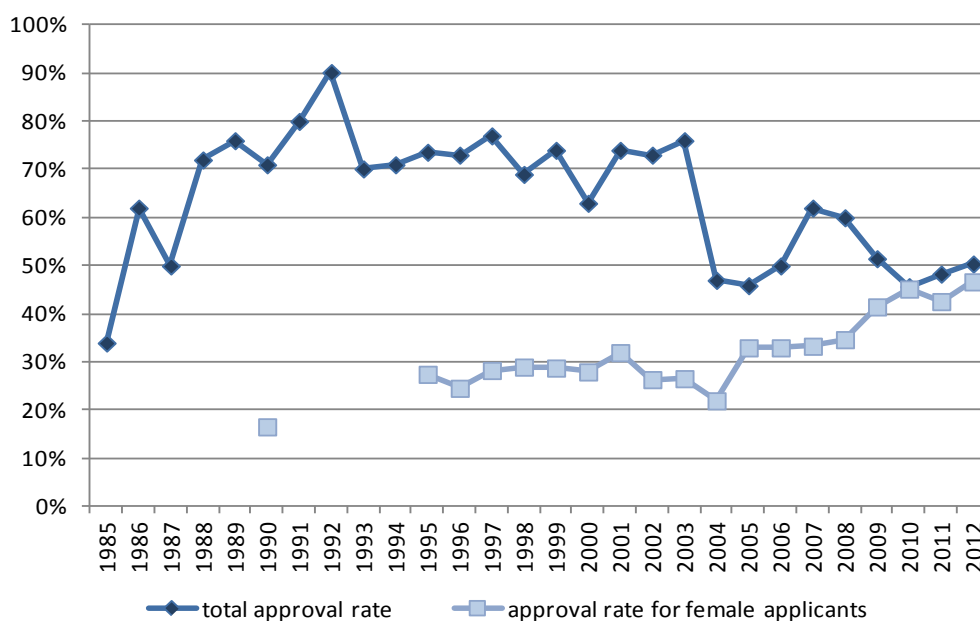
The introduction of the return phase was made possible by the FWF's successful application for EU co-funding within the framework of the Marie Curie Actions (COFUND). The EU's co-funding amounts to 40% of the Schrödinger Program's budget. The effect of the co-funding can also be seen in Figure 36. After a small slump in the mid 2000s, the total funding increased sharply in 2009, allowing the FWF to maintain a high number of grant holders and a high approval rate despite the extra costs created by the return phase. This is also a direct response to the recommendation of the 2006 evaluation to ensure that funding can be continuously assigned according to demand, given the good overall performance of the program.

Figure 36: Total funding and number of grant holders (1985-2012)



Source: Data and calculations by Fraunhofer ISI.

Figure 37: Acceptance rate (1985-2012)



Source: Data and calculations by Fraunhofer ISI.

The acceptance rate is shown in Figure 37. Despite a decline from 90% in 1992 to an acceptance rate of around 70% until 2002, the current acceptance rate of around 50% is still rather high. Given the positive impacts of the program as described above, however, this rate cannot be considered to be too high. It is also noteworthy that the acceptance rate for women has increased steadily and is now almost just as high as the acceptance rate for men.

7 Conclusions

The evidence gathered by this evaluation suggests that the Schrödinger Program with a return phase is well managed and that its overall objectives are achieved. The way in which the program has been repeatedly evaluated and how it has continuously been adapted and improved is commendable. This is also reflected in the high level of satisfaction expressed by the surveyed Schrödinger fellows.

The evaluation results also suggest the accomplishment of the program's twin goals (1.) to enable early-career researchers to gain experience at leading foreign research institutions and thus (2.) to facilitate Austria's access to knowledge and methodologies developed in the international scientific arena. The self-reported reputation of the foreign host institutions is significantly higher among the Schrödinger fellows than the researchers of the control group that also went abroad. At the same time, a number of findings also indicate a positive impact on the transfer of knowledge and methodologies.

The evaluation assessed the impact of the program on four different levels: The individual researchers' careers, the involved research institutions, the Austrian Science system and the European Research Area.

At the level of the individual researchers, the Schrödinger Program proved to have a positive impact on research output and career development. This was confirmed by the survey, the bibliometric analyses as well as the control group comparison. The Schrödinger fellows did not only tend to achieve higher publication and citation rates. They also tended to publish significantly more and attract more citations during and shortly after their fellowship than in the career phases before and after their fellowship. Another notable finding is that 47% of all Schrödingers that started their fellowship before 2005 have become full professors until today. Of all fellows that started before 1995, 64% have become full professors. This confirms the respective findings from the previous evaluation in 2006.

At the level of the involved Austrian universities and research institutions, too, a positive impact could be measured. The Schrödinger Program appears to promote the transfer of knowledge and methodologies into Austria. The bibliometric analyses of co-publication patterns also show that the Schrödinger Program appears to improve the integration of Austria into international research networks.

At the level of the Austrian science system, fears of a potential brain drain could not be confirmed. Although 33% of all fellows do not immediately return to Austria after the end of their fellowships, the bibliometric analyses show a strong 'bridge head' effect. The fact that fellows stay abroad tends to have a positive effect on the integration of Austrian science into international research networks, measured by means of co-publications.

At this level, however, the evaluation also registered strong constraints that limit the positive impact of the Schrödinger Program. Both the Schrödinger fellows and the respondents from the control group alike unequivocally criticize the poor research conditions and unattractive career prospects within the Austrian science system. This criticism was particularly raised among female researchers. These conditions are also the most commonly cited reason for the decision not to return to Austria after the Schrödinger fellowship.

At the level of the European Research Area, the survey results show that although most Schrödinger fellows go to host institutions in North America, Schrödinger fellows show an increased propensity to collaborate and co-publish with researchers from other European countries.

8 Recommendations

Based on the aforementioned conclusions, a continuation of the Schrödinger Program is to be recommended without any reservations. Furthermore, the following specific recommendations are made:

1. The FWF should continue its efforts to increase the funding available for the Schrödinger Program in order to continue to fund as many early career academics as financially possible. Therefore, the program's acceptance rates should be kept at a high level. The evaluation results suggest that the FWF has always successfully selected the most motivated and adequate candidates for Schrödinger funding. However, there are two reasons to consider supporting even more researchers with a Schrödinger fellowship:
 - a. The comparison with the control group showed that the group of researchers that are bound to benefit from such stays abroad is much broader. There appear to be more adequate candidates than fellows that are funded through Schrödinger.
 - b. The increasing internationalization of science is likely to demand a higher degree of international interconnectedness of Austrian researchers and the Schrödinger Program proved to be an effective tool to promote this.
2. Deciding on the allocation of research funding across career phases, it should also be taken into consideration that research stays abroad during the post doc phase, compared to other career phases, proved to have a particularly positive impact.
3. The FWF, to the extent that this is in its power, but also all other actors that shape Austrian science policy need to work on an improvement of the research conditions and career prospects within the Austrian science system, which were criticized so strongly by the 1.316 researchers surveyed for this study as well as the participants of the expert workshop.
 - In this context, the so-called *Kettenvertragsregelung* was commonly criticized. This provision in the 2002 legal framework for universities is alleged to have the unintended effect of making it more, rather than less, difficult for early-career researchers to move out of temporary employment into permanent positions. This issue, however, was not the focus of this evaluation and ought to be carefully evaluated in future research.
 - Another factor that might be considered in this context is the availability of positions allowing early-career researchers to focus on research. The survey results suggest that the self-reported time available for research decreases dramatically once they return to Austria.

This translates into two recommendations:

- a) As these issues are largely beyond the control of the FWF, it should promote the policy debate on these issues and it should endorse international collaboration and policy learning, as also other countries such as Germany, for instance, may be facing similar problems.
 - b) Based on the evidence compiled for the present study, it is strongly recommended to dedicate a future evaluation to the careful assessment of the impact of temporary employment and related policies on the career choices and development, and research performance and mobility of early-career researchers.
4. Efforts to promote the role of women in science should be maintained. Although the gap in the yearly number of male and female Schrödinger fellows has almost been closed, the empirical evidence gathered by this evaluation suggests that there still is room for improvements. The survey results show that female Schrödinger fellows found it more difficult to transfer the knowledge gained abroad to their Austrian research institutions. Moreover, female Schrödinger fellows significantly less often had the opportunity to return to an existing position at their home institution, which they had interrupted for their stay abroad. They also mentioned significantly less often that they found an attractive job offer upon their return to Austria.
5. Considering that this evaluation could provide first evidence supporting a positive impact of the return phase, this new element of the Schrödinger Program should be continued and reevaluated once more researchers have made use of it.

Annex

A.1 Report to COFUND

A.1.1 Has the co-funded project attracted other additional funding?

The Schrödinger Program has only been funded by the FWF and COFUND.

A.1.2 Have social security conditions for fellows changed due to COFUND?

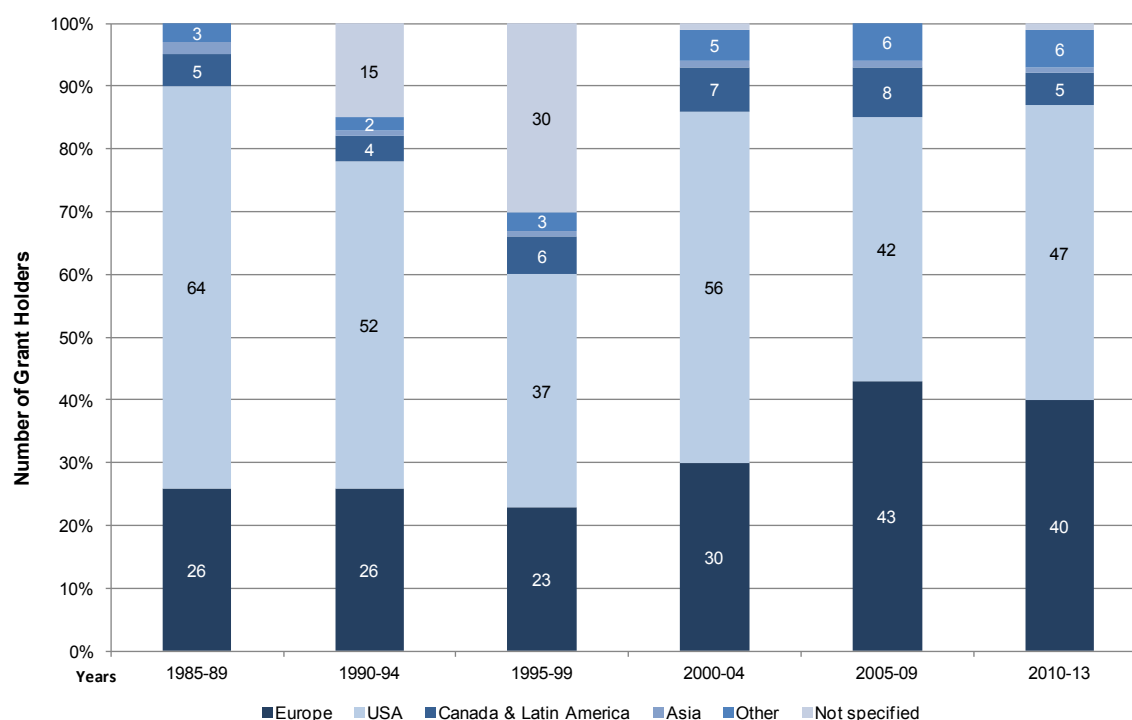
As a result of COFUND, the FWF has been able to start refunding voluntary contributions to the Austrian statutory pension insurance during the time of the fellowship. The survey results suggest that this has had a very positive impact. 50% of the fellows that participated in the survey considered it to be "very conducive" to the objectives of the program. Another 26% considered it to be "conductive".

Moreover, the COFUND contributions were used to facilitate the reintegration in the Austrian job market of the returning Schrödinger fellows. Returning fellows now have the opportunity to apply for a "return phase" of 6 to 12 months that is funded with a senior post-doc salary. Although the return phase was mainly intended to reduce the risk of a brain drain and to increase the duration of funding, which was criticized in a previous evaluation, this new instrument can also be considered to have had a positive impact on social security conditions. The return phase received a high approval rating by the survey respondents. Of all survey participants, 55% considered it to be "very conducive" to the objectives of the program.

A.1.3 Indicate the impact of the programme for the European Research Area, e.g. impact on employment or transnational mobility or other aspects

The Schrödinger Program improves the integration of the European Research Area in two ways. First, it promotes intra-European mobility of researchers. Although the majority of Schrödinger fellows still spend their fellowship in the United States, the share of fellows that goes to other European countries has increased considerably. While in the late 1990s only 23% of all funded fellows went to European countries, today 40% have chosen European host institutions (see Figure 38).

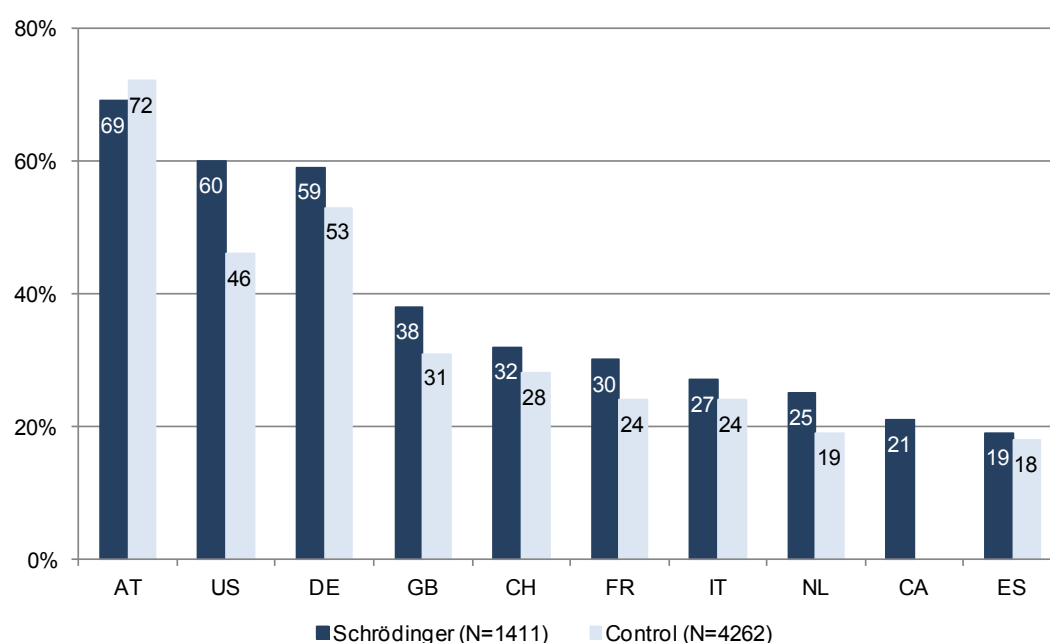
Figure 38: Destinations of the Schrödinger fellows by year (1985-2013)



Source: Data and calculations by Fraunhofer ISI.

The bibliometric analysis suggests that the second way that the Schrödinger Program improves the integration of the European Research Area is by promoting intra-European research collaborations in the form of co-publications. Although again the United States represent the most important co-publication partner, Germany follows as a close second. And in total 8 of the top 10 co-publication partner countries are European. It is also noteworthy that the researchers of the control group collaborate more with the United States and less with European partner countries (see Figure 39).

Figure 39: Top 10 list of countries for co-publications



Source: Data and calculations by Fraunhofer ISI.

A.1.4 Indicate whether the program may have generated results and/or best practices (expertise or scientific advice) which could be used by policy makers, e.g. improvement of the evaluation of fellowships.

The main result of the present impact evaluation is that stays abroad during the post-doc phase are beneficial on many different levels, the level of the individual researchers, the level of the involved research institutions, and the level of the science system. Of course, the empirical findings of this study cannot directly be generated to other countries. Deductively, however, there is no reason why one should expect such mobility programs should have a less positive impact in other countries. Therefore, this finding may also serve as best practice example that might be considered by policy-makers elsewhere.

A second – albeit related – policy lesson that can be drawn from the impact evaluation of the Schrödinger Program is that research stays abroad during the post doc phase, compared to other career phases, proved to have a particularly positive impact. Again, it is not possible to generalize directly from the Schrödinger Program to similar programs in other countries. Nonetheless, this finding might be considered by policy-makers in Austria or elsewhere that need to decide on the allocation of research funding across different career phases.

Third, the impact evaluation of the Schrödinger Program also provides answers on the question whether such mobility programs may lead to an unintended "brain drain." The present study showed that such fears are largely unfounded. First, most researchers tend to have strong professional and personal roots in their country of origin and therefore always have a strong incentive to return. This finding was also confirmed by the information obtained from the control group. Secondly, this study could show that the fact that researchers do stay abroad does not necessarily need to be interpreted as a loss to the home country. By means of bibliometric analyses, it could be shown that the Schrödinger fellows that stay abroad tend to form "bridge heads" that improve the integration of Austria into international research networks. Both of these findings may also be considered by policy-makers elsewhere.

Fourthly, the present study also showed that the main factor influencing researchers' decision to stay abroad is the relative attractiveness of research conditions and career prospects of the home country. The survey respondents and expert workshop participants strongly criticized these conditions, which were also cited as the main reason why researchers did not return to Austria. Conversely, the best way to reduce the risk of a brain drain is to improve the attractiveness of research careers in the home country. This finding should also be considered in other countries that are deemed to be rather unattractive by early-career researchers, such as Germany. While this is not the focus of the present evaluation, the collected evidence suggests that a critical factor determining the attractiveness of career prospects are policies toward temporary employment. While more research will be necessary on this point, the case of Austria suggests that the policies meant to promote researchers' access to permanent positions, such as the *Kettenvertragsregelung*, appear to have the opposite effect. After the end of the stipulated time frame in which temporary employment is still allowed, researchers do rather appear to lose their current positions rather than move into permanent ones. As several countries, such as Germany, have similar policies, this issue should be carefully evaluated in future research.

A.1.5 Please indicate whether and how the program will continue in the future (after the COFUND project); if the program is to be discontinued or reduced in size, please provide reasons.

The Schrödinger Program with a return phase will be continued. This is supported by the results of the present impact evaluation, which recommends a continuation of the program without any reservations.

A.1.6 Identify additional data which could describe the impact of the program. If possible, comment on this data and analyze these impacts.

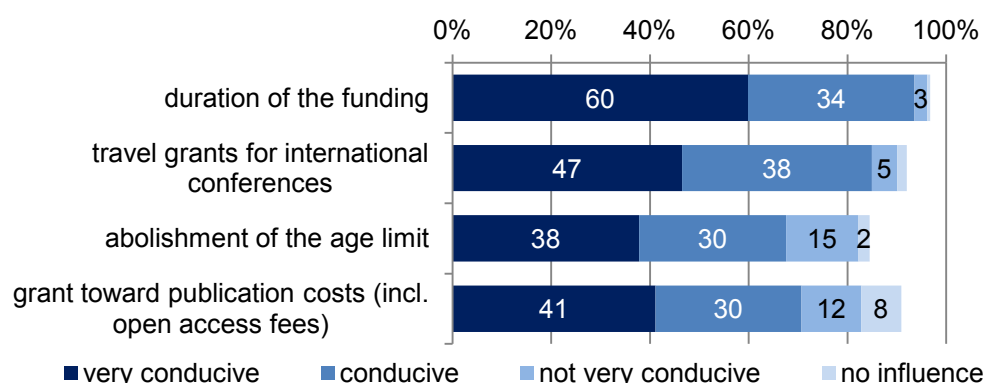
The present impact evaluation is based on a survey, a bibliometric analysis and an expert workshop. The evaluation shows that these data gathering methods are complementary. It also demonstrates the suitability of bibliometric methods for the creation of randomly selected control groups and for the measuring of research performances and collaboration activities across time within individual disciplines. Due to diverging publication and citation traditions in the various disciplines and due to the uneven coverage of the bibliometric database, however, comparisons across disciplines are not possible.

In addition to these methods, no additional data sources could be identified that could be used to describe the impact of the program.

A.1.7 Fellows' satisfaction: The satisfaction/dissatisfaction of fellows should be reported, for example on the basis of a questionnaire distributed by the beneficiary and/ or host organization during the co-funded program.

Since 1985, the Schrödinger Program has been evaluated, redeveloped and improved several times. This is also reflected in the high level of satisfaction of the Schrödinger fellows with the program.

Figure 40: How do you assess the following elements of the Schrödinger Program, with regards to the Schrödinger Program's objectives? (N=703)



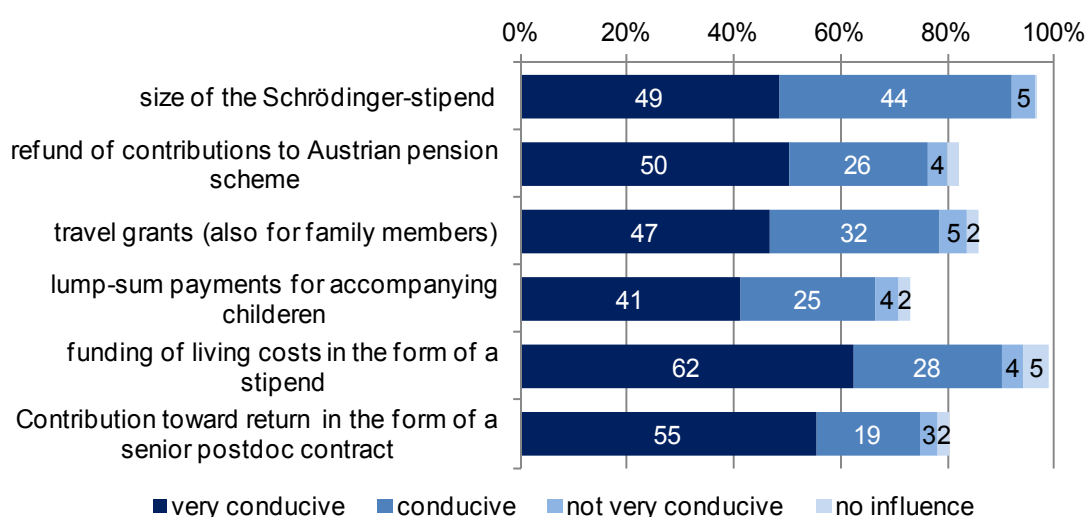
Source: Data and calculations by Fraunhofer ISI.

In the survey, most elements of the Schrödinger Program have been rated to be "highly conducive" to the objectives of the program by the Schrödinger fellows. 94% consider the duration of the funding of 10 to 24 months without a return phase and 16 to 36 months

with a return phase to be "very conducive" (60%) or "conductive" (34%) to the objectives of the Schrödinger Program (see Figure 40). In the previous evaluation from 2006 it was recommended to differentiate the length of the funding, in response to subject dependent needs. At that time the length was still 10 to 24 months only. The survey results of the present evaluation suggest that the length of the funding no longer is an issue. There were no significant differences between the various scientific disciplines.⁴¹

The abolishment of the previous age limit of 35 years that was recently introduced achieved a total approval of 68% (38% "very conducive" and 30% "conductive"). Also the travel grants for international conferences and the grant toward publication costs achieved a high approval by the survey participants.

Figure 41: How do you assess the following financial benefits of the Schrödinger Program, with regards to the Schrödinger Program's objectives? (N=703)



Source: Data and calculations by Fraunhofer ISI.

Figure 41 shows that also the size and form of funding achieved a high approval by the survey participants. A remarkable total of 93% consider the size of the funding to be "very conducive" (49%) or "conductive" (44%). A total of 90% of the survey participants also considered the fact that the funding is paid in the form of a stipend to be "very conducive" (62%) or "conductive" (28%). Also the travel grants for family members and the payments for accompanying children.

The recently introduced refund of contributions to the Austrian pension scheme received the third highest approval with 50% rating it to be "very conducive" (26% "conductive").

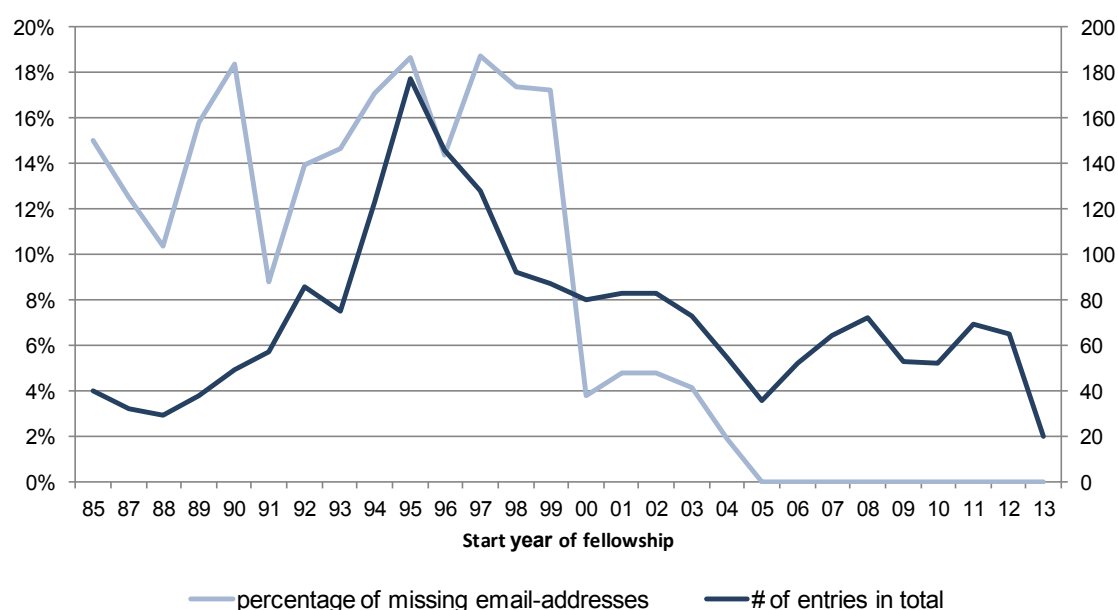
⁴¹ According to the Kruskal-Wallis test the probability value is 0.0293.

A.2 Data gathering and methods

A.2.1 Original dataset

The original data of the Schrödinger fellows was delivered in several Excel tables that contained various characteristics of the individual fellows: All tables covering the fellows up to 1999 had fields for the project numbers, the name of the fellow, the title of his or her project, the host institution and the email address of the fellow. In the tables for the later years, the date of birth of the fellow as well his institution at the time of application was covered. We will describe later how this information could help further in the matching process. However, as will be explained later in more detail, the email address was the most important feature in the matching, in that its coverage had a high impact on the overall performance of the matching.

Figure 42: Percentage of entries with missing email information in the original dataset (left y-axis) and total number of entries (right y-axis) and per year.



Source: Data and calculations by Fraunhofer ISI.

This was however no mandatory information and thus not equally covered over the whole time period. In particular in the early years many entries with missing email addresses could be found. Figure 42 shows the number of entries over the years 1985 to 2013 that were contained in the delivered dataset as well as the percentage of entries with missing email information. Apparently, the number of entries in the dataset had a peak in 1995

with more than 160 granted fellowships⁴² – a time period in which the share of entries with missing email addresses was also the highest.

A.2.2 Data cleaning

Some Schrödinger fellows were listed multiple times with different project numbers in the original dataset in the case that a grant was extended or similar. In some cases, these entries also contained different meta data as for instance different email addresses etc. For the matching, all entries for one fellow had to be combined. On the one hand, the combination enabled the usage of all available information for one person. Also the matched IDs in Scopus could be consolidated, if e.g. different email addresses were given for the different entries. Furthermore, the project number was used as a unique identifier to count the number of fellows in the analyses and calculate the success rate of the matching. Duplicates, i.e. fellows with more than one ID, could thus disrupt the results.

In order to merge duplicate entries for one person, the available information was used for a matching in the FWF database itself. For some fellows, the new ID was only an extension of the old ID. This was true for all IDs of the form "J XXXX-YYY" for which an equivalent ID with the pattern "JXXXX" could be found. These 77 entries for which this held true were checked manually and all names were identical except for minor changes like an additional middle name or similar. For the remaining fellows, the other data had to be used to eliminate the double entries.

In the first, and also the most precise, approach all entries for which an entry with the same name, date of birth and project title could be found were subsumed under one project number. In a second step, this procedure was repeated for the remaining entry set to identify those duplicates with the same name and date of birth. A final step on the remaining set used a matching on the name and title. In all cases a tolerance rate of 5 characters for changes in the title were used, i.e. titles with 5 additional/other/less characters were set equal. This was done to account for minor changes in the title for reapplications. For instance, one applicant had the following variations in his project title across different database entries:

- The role of imprinting of human IGF2R gene in oncogenesis
- The role on imprinting of t. human IGF2R gene in oncogenesis
- The role on imprinting of the human IGF2R gene in oncogenesis

⁴² Note that this number was calculated based on the "uncleaned" dataset (as delivered) with possible multiple entries (see below for further explanations). There was a table for each year between 1985 and 1999 separately as well as one covering "all fellows", with entries for 1995 as well as for other years. A first import of both datasets can result in an overlap and thus higher numbers for these years as well.

With the presented approach, these entries could be all subsumed under one ID. In the end, the dataset contained 1686 IDs instead of 2015 in the original dataset.

Subsequently, further database cleaning turned out to be necessary, when the email correspondence with the survey participants showed that several researchers that were granted a Schrödinger fellowship never assumed the fellowship. With the help of the FWF another 55 researchers to which this applies could be identified and deleted from the database. It was assumed that these researchers would not be able to make any meaningful statements about the Schrödinger fellowship as they have not experienced it themselves. They were also not included in the control group because the latter was meant to be selected randomly.

A.2.3 Matching procedure

In order to be able to analyse the Schrödinger fellows using bibliometric methods it is necessary to identify the fellows in a bibliometric database. The database chosen for this project is Scopus. Compared to alternative databases, Scopus has the great advantage that it provides unique identification codes to each author. As a result authors can be traced across publications and across time. The process of identifying the Scopus identifications of the Schrödinger fellows is called ‘matching’.

During the first attempt to match the Schrödinger fellows from the above-described database with the authors registered in the Scopus database, email addresses were used. This can be seen as the matching with the highest precision as the probability for people sharing the same email address is close to nil. This resulted in a matched set of approximately 49.4% of the fellows. The remaining Schrödinger fellows had to be matched with less precise approaches.

For these matches the name of the Schrödinger fellows was used in two ways: For a precise matching, the full name as given in the Schrödinger data was used, if no match was found in that way, only the last name was used. The name was combined with the following features:

1. home institution,
2. Austrian address and address with host country,
3. Austrian address.

The home institution was provided in the Schrödinger data and was a textual string that was compared with the organization name given in Scopus. A deviation of up to two characters was accepted to allow for name variants or spelling errors on both sides. As described above, the first matching was performed based on the full name for the set of fellows that could not be matched with the email address. The follow-up matching used the

same features but only the last name in both databases. In the Schrödinger data, the name needed to be split for that purpose based on the space characters.

In the next step, not the exact organization name but its address was used to look for possible matches for the fellows. We identified those authors in Scopus that had an affiliation at one point in their career with an Austrian address and at any other point in their career that of the host institute of the respective Schrödinger fellowship. Of course, the name was used in the same way as before to identify the possible matches, i.e. first the full name was used and only in the case of no matches was the query conducted with the last name only.

The remaining set of unmatched fellows was then compared to the set of Scopus authors with an affiliation in Austria, again with comparison of their name. In a final matching, only the name was used. To use only those matches that were not too ambiguous, those matches that resulted in one Schrödinger fellow being matched to more than three authors in Scopus were excluded in the end. Up to three different IDs in Scopus were allowed as there are cases of authors in Scopus with multiple IDs in particular if names or affiliations have changed.⁴³ In particular in the matching with the name and the institution, matches to more than three Scopus IDs were found and in that way excluded.

As the last steps were highly unreliable, the results of these matches were verified by a manual assessment. Eight of the previous matches were corrected in that way. Also, the remaining set of then 343 fellows were manually checked for matches in the Scopus database. For 263, a matching author ID in Scopus could be identified.

Table 2 shows the number of Schrödinger fellows that could be matched with the Scopus authors in the described way. The table shows the results after those matches to more than three Scopus authors were excluded. Most matches were achieved with the email address comparison. As described above, this was also the most precise method. Because of the restriction that no more than three matched IDs in Scopus were allowed, the number of matches based on the name only is relatively low. Also, the fact that the matching was conducted sequential according to precision helped to keep this number low.

Although the number of fellows that could not be attributed a Schrödinger ID is comparatively low, the question is whether the failure to match the remaining 9% of all fellows was due to a structural bias. This is a critical question because this bias would also influence the control group, which, as described below, is based on the matched Schrödinger fel-

⁴³ Cf. Moed, H.F./Aisati, M./Plume, A. (2013): Studying scientific migration in Scopus. *Scientometrics*. March 2013, 94 (3), pp. 929-942.

lows. A potential bias of bibliometric databases such as Scopus or Web of Science is their incomplete coverage of researchers in the social sciences and humanities.

Table 2: Number of matched SIDs

Matching by...	# matched SIDs	# matched SIDs – cumulative	% of matched SIDs – cumulative
email	819	819	46%
Name and institution	360	1,179	66%
Name, AT and host country	105	1,284	72%
Name and AT	63	1,347	75%
Name	5	1,352	76%
Manual look-up	269	1,621	91%
Sum	1,621	1,621	91%

Source: Data and calculations by Fraunhofer ISI.

According to the bibliometric data, 11.3% of the (matched) Schrödinger fellows had social sciences or arts and humanities as a research field. In comparison, the aggregated numbers on the web page correspond to 10.9%. Thus it seems as if no bias had been introduced by the matching. However, in the later conducted survey approximately 19.6% of the respondents said that they were working in the social sciences or arts and humanities. Yet, with only the data at hand, it is difficult to determine how this discrepancy came to be. The coverage of the social sciences and the arts and humanities in bibliometric databases is generally considered to be rather low.⁴⁴ There are various reasons for this, such as the

⁴⁴ Chi, Pei-Shan (2013): Do Non-Source Items Make a Difference in the Social Sciences? Proceedings of ISSI 2013 – the 14th International Conference of the International Society of Scientometrics and Informetrics, Vienna, Austria, July 15-18, 2013; Butler, Linda/ Visser, Martijn S. (2006): Extending citation analysis to non-source items. *Scientometrics*, 66 (2), pp. 327-343; Van Leeuwen, Thed. (2006): The application of bibliometric analyses in the evaluation of social science research. Who benefits from it, and why it is still feasible. *Scientometrics* 66 (1), pp. 133-154; Hicks, Diana M. (2004): The four literatures of social science. In: Moed, H./Glänzel, W./Schmoch, U. (Eds.): *Handbook of Quantitative Science and Technology Research*. Dordrecht, the Netherlands: Kluwer Academic; Nederhof, Anthony J./Zwaan, R.A./De Bruin, R.E./Dekker, P.J. (1989): Assessing the usefulness of bibliometric indicators for the humanities and the social and behavioural sciences: A comparative study. *Scientometrics* 15 (5), pp. 423-435; Archambault, Éric/Vignola Gagné, Etienne/Côté, G./Larivière, V./Gingras, Y. (2006): Benchmarking scientific output in the social sciences and humanities: The limits of existing databases. *Scientometrics* 68 (3), pp. 329-342.

language bias against non-English language publications and different citation and publication behaviour in these scientific fields.⁴⁵

With regards to the pure percentages of matched and unmatched fellows, this bias could not be confirmed. There does not appear to be an over-proportional number of researchers from the arts, humanities and social scientists among those that could not be matched. Therefore, the control group also does not need to be expected to be biased in this respect.

At the same time, however, it should be noted that despite the good coverage on the level of researchers, the databases coverage at the level of publications may not be as good. Researchers that are present in the bibliometric database may not be present with all their publications. Given the above mentioned limitations of the Scopus database in this area, this problem can be expected to be particularly strong in the case of the social sciences and humanities. In the subsequent analysis this weakness of the dataset is always taken into account. First, the bibliometric results are always triangulated with the survey results whenever possible. Second, the analysis will refrain from direct comparisons between the different disciplines. Third and with regards to the interpretation of the results, it will be assumed that the publication and citation behaviour observed through bibliometric methods is likely to be much stronger in practice.

A.2.4 Control group creation

Based on the information that could be found for the Schrödinger fellows, a control group was created that consisted of Austrian researchers with comparable characteristics. For each Schrödinger fellow, "twins" were identified in the bibliometric database. For that, as much information about each Schrödinger fellow as possible was used. However, some bibliometric data was excluded to ascertain its usability in the later analysis. For instance, the information about the publication behaviour was not used as it was one goal of the bibliometric analysis to compare the publication output of funded researchers with those in the control group. Because of that, this information could not be used in the creation of the control group, as this would lead to exactly the same results for both groups in an analysis. Thus, the focus was on characteristics that were significant for the status of a researcher on the one hand, but irrelevant for the bibliometric analysis itself on the other hand. In the end, the following features were used for the control group creation:

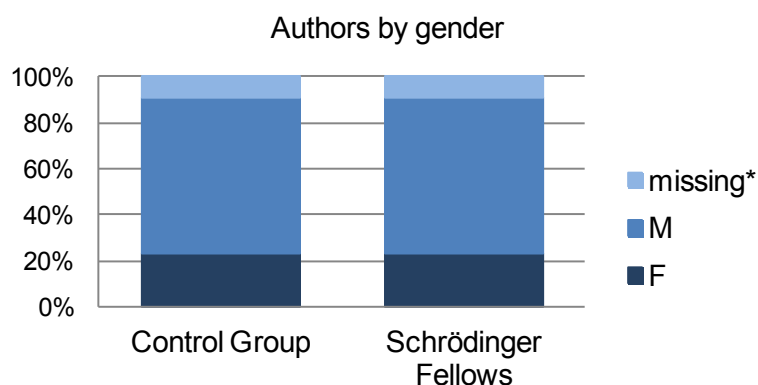
⁴⁵ Nederhof, Anton J. (2006): Bibliometric monitoring of research performance in the social sciences and the humanities: A review. *Scientometrics* 66(1), pp. 81-100; Norris, Michael/Oppenheim, Charles (2007): Comparing alternatives to the Web of Science for coverage of the social sciences' literature. *Journal of Informetrics* 1(2), pp. 161-169.

- the research field in which most publications were published
- the gender of the researcher, which was automatically extracted from first names
- the scientific age of the researcher, i.e. the number of years the researcher has been actively publishing according to Scopus
- Austrian institution as a research address

Assuming that survey participation rates among the control group would be significantly lower than among the Schrödinger fellows, the control group was meant to be three times as large as the Schrödinger fellow group. Therefore, three "twins" were identified for each fellow. If one or more information was missing, the respective value for the "twin" was selected randomly. In that way, not only could we find "twins" for the fellows that could be matched in the Scopus database, but also for the remaining ones.⁴⁶ Thus, the size of the control group was 5058 researchers.

Figure 43 shows the gender for the authors identified in the Schrödinger data and the associated control group. There are some ambiguous names for which the gender cannot be identified automatically. This was true for 9% of the Schrödinger fellows and also for the persons identified in the control group.

Figure 43: Distribution of gender among the Schrödinger (N=1686) fellows and the control group (N=5058)



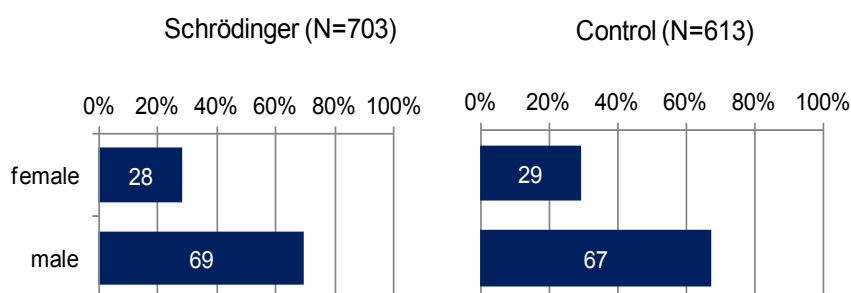
*gender can be both male and female or cannot be found in the database

Source: Data and calculations by Fraunhofer ISI.

⁴⁶ For the unmatched fellows, the remaining fixed selection criterion for the "twin" was the Austrian research address

According Figure 44, which shows the actual gender distribution of both groups as reported by the respondents of the survey, the bibliometric approach worked quite well. The actual differences between both groups are insignificant.

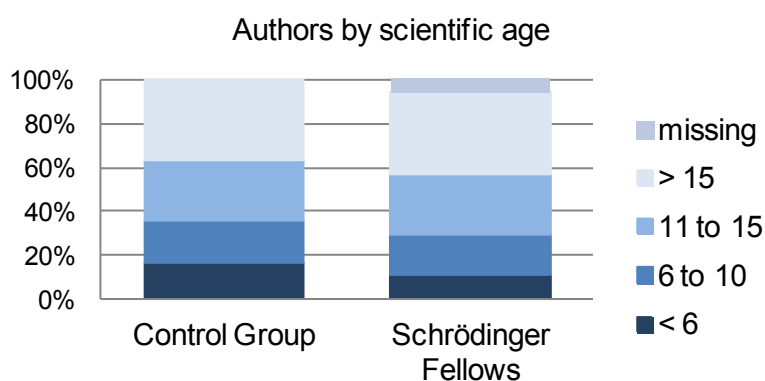
Figure 44: Gender distribution, as reported by the respondents of the Schrödinger fellows and the researchers of the control group



Source: Data and calculations by Fraunhofer ISI.

The scientific age of the researchers was identified by a look-up in the database for their first publication. The goal of this selection criterion was to have a control group with a similar distribution of career statuses as in the Schrödinger fellow set. Since Scopus does not include information as research position or degree, the number of years of scientific activity was calculated.

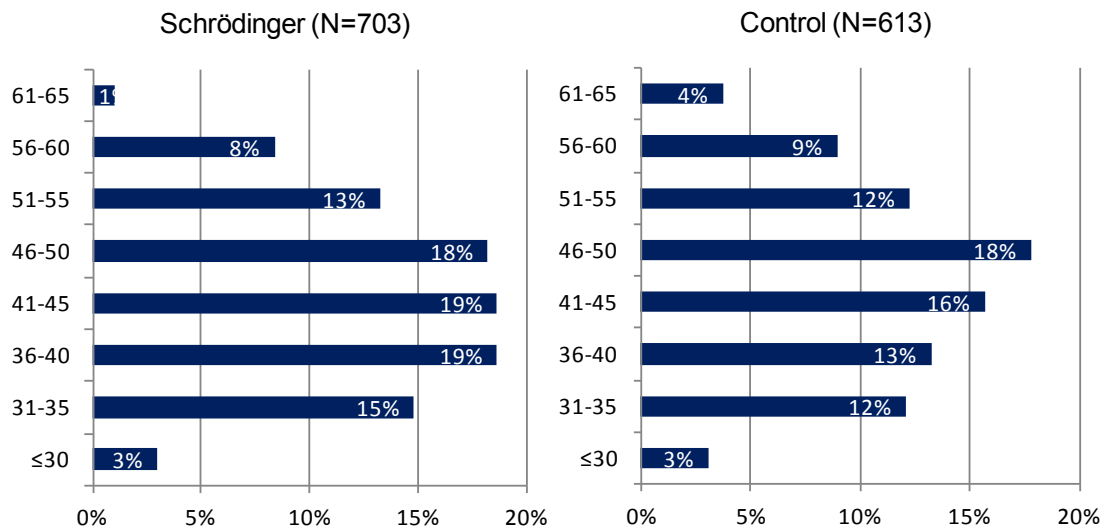
Figure 45: Distribution of scientific age among the Schrödinger (N=1686) fellows and the control group (N=5058)



Source: Data and calculations by Fraunhofer ISI.

Figure 46 shows the actual age distribution as reported by the survey respondents and demonstrates that there are no significant differences between the two groups.

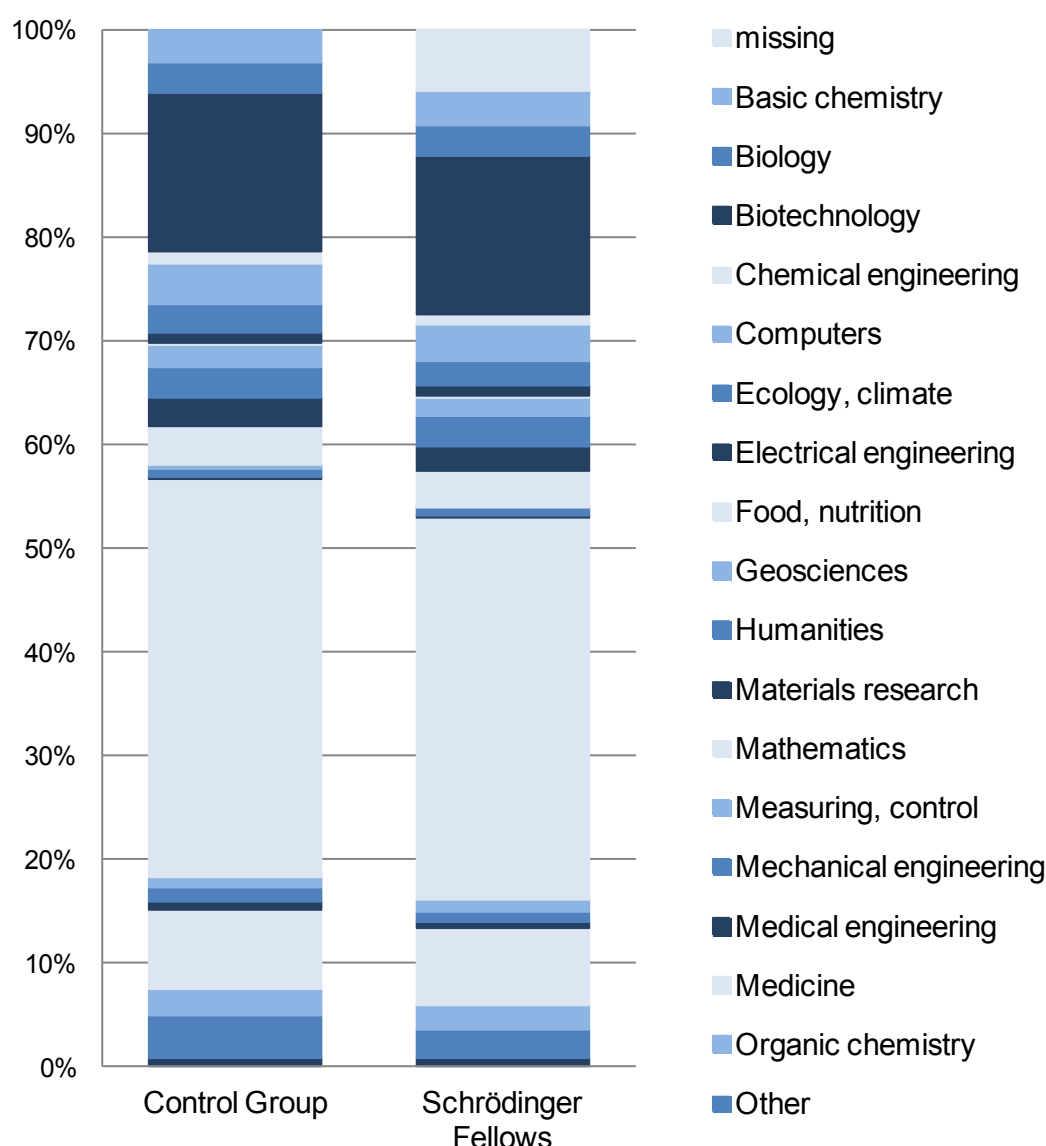
Figure 46: Age distribution, as reported by the respondents of the Schrödinger fellows and the researchers of the control group



Source: Data and calculations by Fraunhofer ISI.

As we were working with the database version of 2012, the age was determined as the difference between the first publication year and 2012, so that the minimum age was 0 (if a researchers' first publication was registered for 2012). The researchers were assigned to different age group which are depicted in Figure 45. For 36 Schrödinger fellows, no scientific age could be determined because of missing information in the database. In total (i.e. including the unmatched fellows), 6% had a missing scientific age so that their twins were chosen with a random scientific age. Figure 45 shows what the final distribution in the control group looks like – the overall distribution is not majorly influenced in by the random selection of age for approximately 300 "twins".

Figure 47: Distribution of research field in Schrödinger fellows and control group

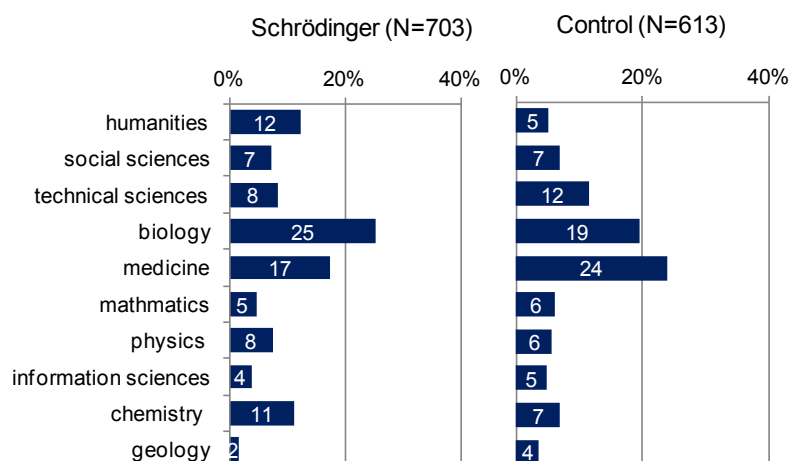


Source: Data and calculations by Fraunhofer ISI.

Finally, Figure 47 depicts the distribution across the research fields. Not all scientific fields in Scopus were covered by the Schrödinger fellows. Again, the 6% of Schrödinger fellows for whom the data was missing – either because they were not matched or no respective data could be found – were mirrored in a random field selection. The figure shows that the overall distribution in the control group is unaffected by this.

This is confirmed by the survey responses of the Schrödinger fellows and the respondents of the control group. According to Figure 48, there some small, but no major, differences between the self-reported scientific disciplines of the two groups.

Figure 48: Scientific disciplines, as reported by the respondents of the Schrödinger fellows and the researchers of the control group



Source: Data and calculations by Fraunhofer ISI.

It is noteworthy, however, that more Schrödinger fellows self-categorized themselves in the humanities. As the coverage of the humanities and social sciences by the bibliometric databases is known to be less good than in other fields, this difference can be expected to have a negative impact on the results of the bibliometric analyses of the Schrödinger fellows compared to the researchers of the control group. In reality, the Schrödinger fellows can be expected to perform even better in comparison to the researchers of the control group. Given the small share of researchers that this concerns, however, the effect can be expected to be rather small. In the social sciences, however, the distribution is identical in both groups.

A.2.5 Survey response rates

As mentioned in Section 3, the survey was conducted in September and October 2013. Of the 1,545 Schrödinger fellows that were contacted, 703 participated in the survey. This amounts to a response rate of 40%. For the control group survey, the response rate was 12.5%. Given the larger size of the control group (4,935 researchers), however, the number of 613 responses is close to that of the treatment group.

As shown in Table 3 there are no significant differences in the participation rates differentiated by gender, research fields, or publication performance, neither in the control group nor among the Schrödinger fellows. The only significant difference exist in the case of Schrödinger fellows with a high scientific age and early Schrödinger fellows which tended to participate more often than their younger colleagues. Therefore, these factors were treated with considerable attention in the analyses discussed in this report.

Table 3: Survey participation patterns

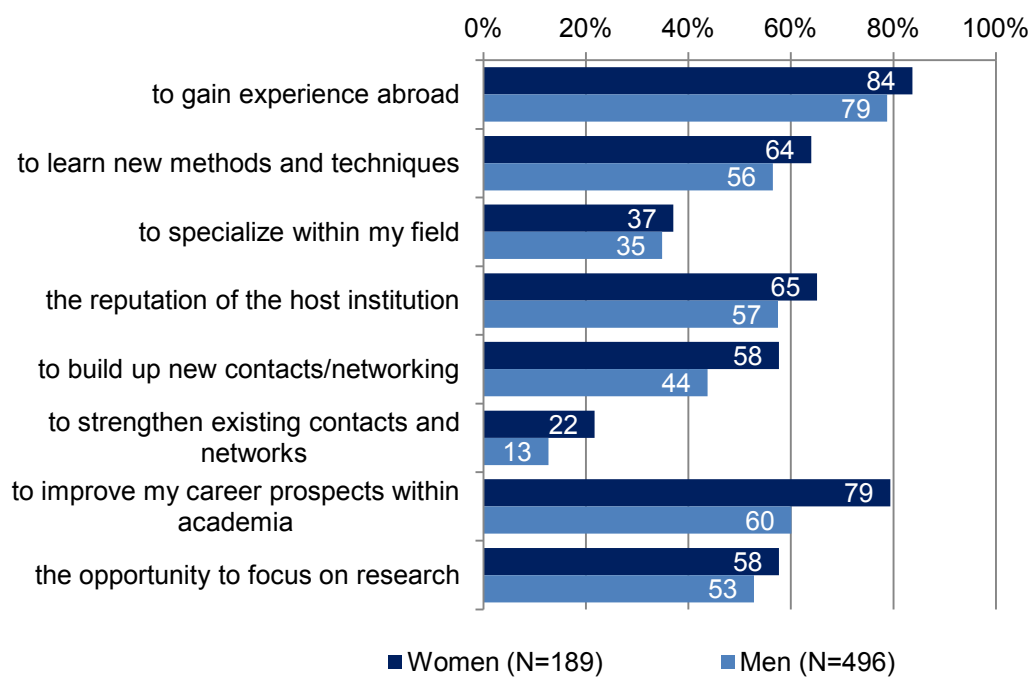
Significance-Test (ordered logit)	Schrödinger	Control
scientific age	0,000**	0.407
gender	0.588	0.273
research field	0.393	0.117
start year	0,000**	---
number of publications	0.452	0.793

** 5% significance

Source: Data and calculations by Fraunhofer ISI.

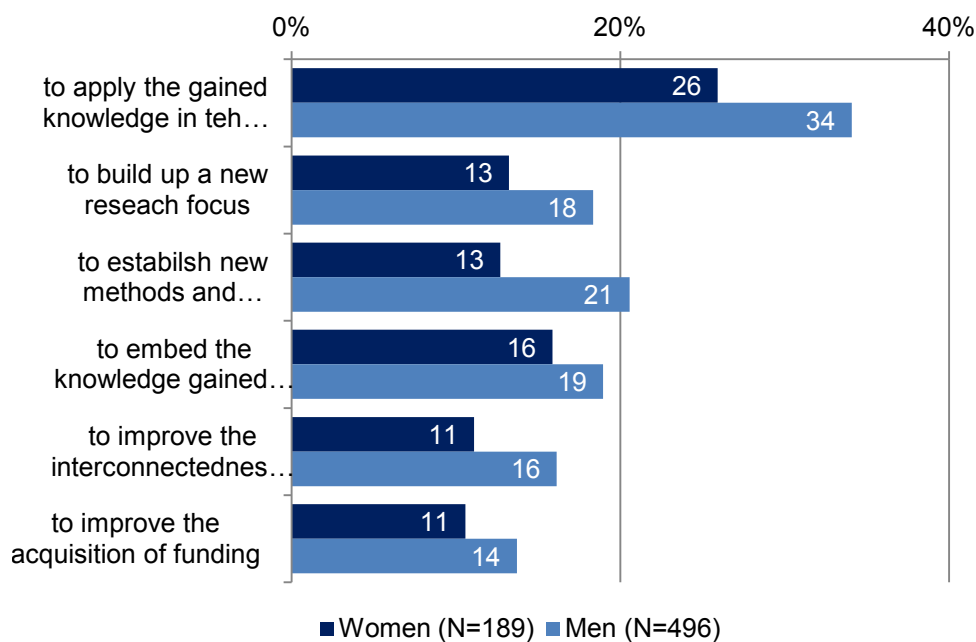
A.3 Gender aspects

Figure 49: Gender differences: Motivations to go abroad



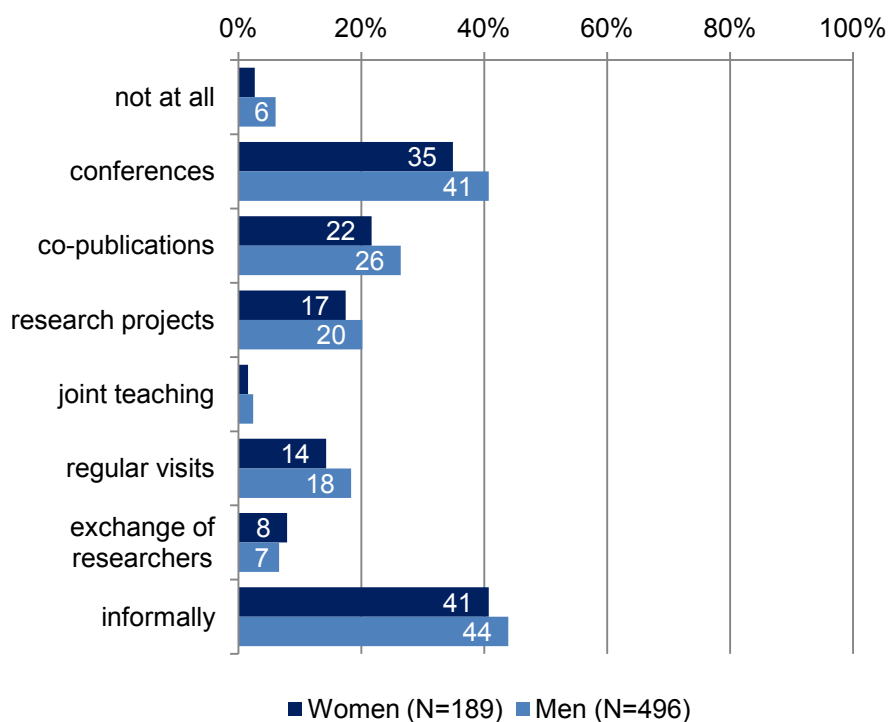
Source: Data and calculations by Fraunhofer ISI.

Figure 50: Gender differences: Upon your return, were you able to...



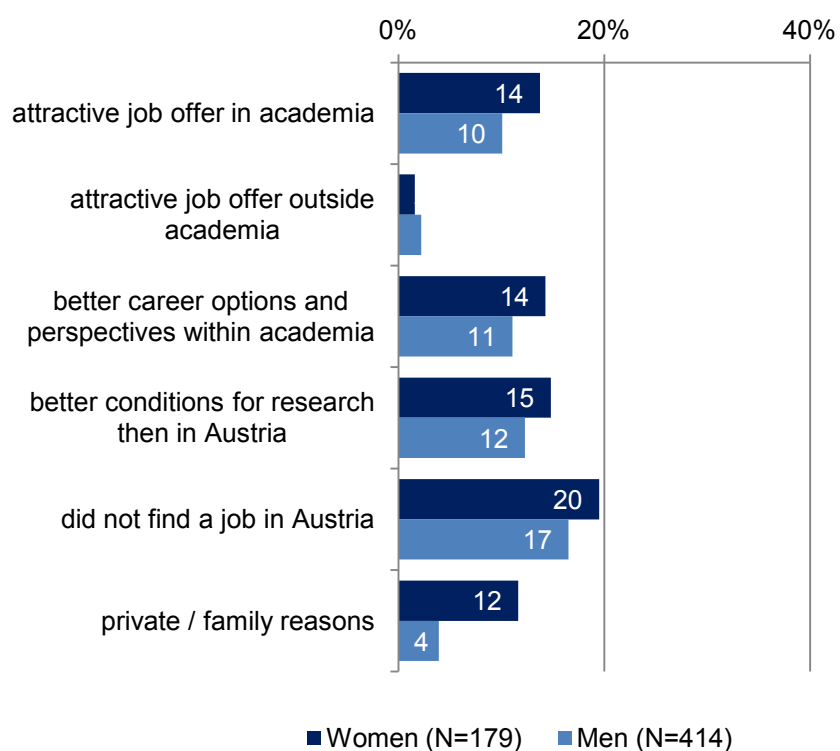
Source: Data and calculations by Fraunhofer ISI.

Figure 51: Gender differences: In which way, if at all, are you still in touch with your host institution?



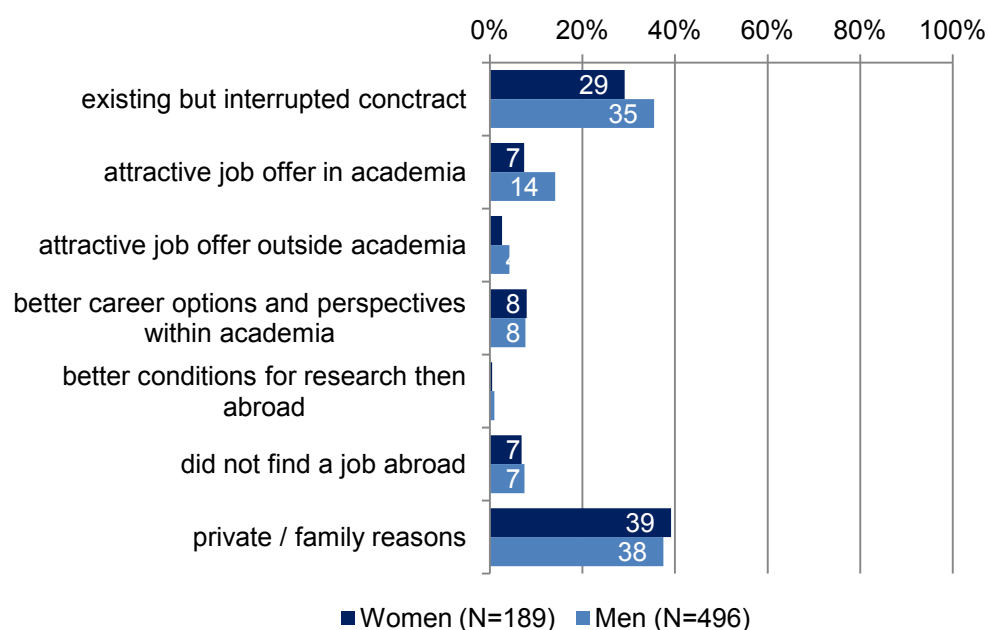
Source: Data and calculations by Fraunhofer ISI.

Figure 52: Gender differences: Critical factors influencing the decision to stay abroad



Source: Data and calculations by Fraunhofer ISI.

Figure 53: Gender differences: Critical factors influencing the decision to return to Austria



Source: Data and calculations by Fraunhofer ISI.

A.4 Disciplinary differences

Overall, the survey and the bibliometric analysis did not show large differences across scientific disciplines. With regards to the development of citation rates over time (see Figure 9), for instance, the general trend that citations increases with the Schrödinger fellowship and decreases afterwards can be observed in all disciplines (see Table 5).

Table 4: Average citations rate across disciplines

	Before fellowship	During the 5 years following the fellowship	Later
Social sciences and Humanities	7,4	8,1	5,8
Engineering	6,2	6,3	5,4
Medicine	8,1	9,5	7,7
Natural sciences	7,6	9,1	7,9

Source: Data and calculations by Fraunhofer ISI.

Regarding the development of publications counts over time (see Figure 9), the general trend of a continues increase of publications over all three period to another could be ob-

served in all disciplines except for the social sciences and humanities, where the value falls from 1.7 to 1.6 publications in the last period, suggesting that the Schrödinger Program is particularly valuable for researchers from this field. In engineering there is no increase from the first to the second period (see Table 4).

Table 5: Average publications per year across disciplines

	Before fellowship	During the 5 years following the fellowship	Later
Social sciences and humanities	1.3	1.7	1.6
Engineering	2.2	2.2	2.6
Medicine	2.9	3.1	3.6
Natural sciences	2.6	2.9	3.4

Source: Data and calculations by Fraunhofer ISI.

Also with regards to co-publications (see Figure 21) it is possible to see a similar trend across disciplines. The number of co-publications rises steadily across the above-mentioned career phases. Only in the social sciences and humanities the co-publication count decreases slightly after the Schrödinger fellowship, suggesting that the Schrödinger Program is particularly valuable for researchers from this field.

Table 6: Average number of annual co-publications across disciplines

	Before fellowship	During the 5 years following the fellowship	Later
Social sciences and Humanities	1,2	1,6	1,5
Engineering	1,9	2,0	2,4
Medicine	2,2	2,5	2,9
Natural sciences	2,2	2,5	2,9

Source: Data and calculations by Fraunhofer ISI.

As to be expected, however, publication and citation practices tend to differ across disciplines. In medicine, for instance, researchers tend to publish considerably more often than in the social sciences and humanities. Moreover, the coverage of the bibliometric database used for this project is not equally good for all disciplines. Therefore, these indicators *cannot* be used for comparisons across disciplines. Cross-temporal comparison, however, are possible and as shown above confirm the trends observed over all disciplines.

In several instances, however, there were subtle differences between the various disciplines. With regards to the motivation to go abroad (see Figure 1), for instance, the learn-

ing of new methods and techniques is a stronger motivation among researchers from the natural sciences than researchers from the social sciences and humanities.

The opportunity to specialize is a particularly strong motivation for medical researchers. This group also reported most frequently in the survey that their expectations with regards to the learning of new methods and techniques as well as their expectations with regards to specialization were fulfilled (see Figure 2). More than other researchers, medical researchers also reported more often that they were able to establish a new research focus upon their return to Austria.

Researchers from the social sciences, humanities and information sciences, in turn, reported significantly more often that they were able to apply the knowledge and techniques acquired abroad upon their return to Austria.

Unlike expected, however, no systematic differences to researchers from the other fields could be found with regards to researchers from the social sciences and humanities and researchers from all other fields. The survey responses of biologists, however, tended to diverge more commonly from the average.

Researchers from the field of biology and also medicine consider it to be significantly more likely than researchers from the other fields that they would have been able to realize their stay abroad without their Schrödinger fellowship. In the case of biology, this appears to be explained by the fact that biologists stated almost twice as often as their colleagues from other disciplines that they stayed abroad because they received attractive job offers from foreign universities. At the same time, biologists responded most commonly that they did not find a position in Austria upon their return. This directly corresponds with the fact that biologist also consider research conditions and job prospects abroad to be significantly more attractive than researchers from other fields.

Researchers from the humanities, social sciences and medicine stated most commonly that they could return into pre-existing contracts that they had only interrupted for the period of their Schrödinger fellowship.

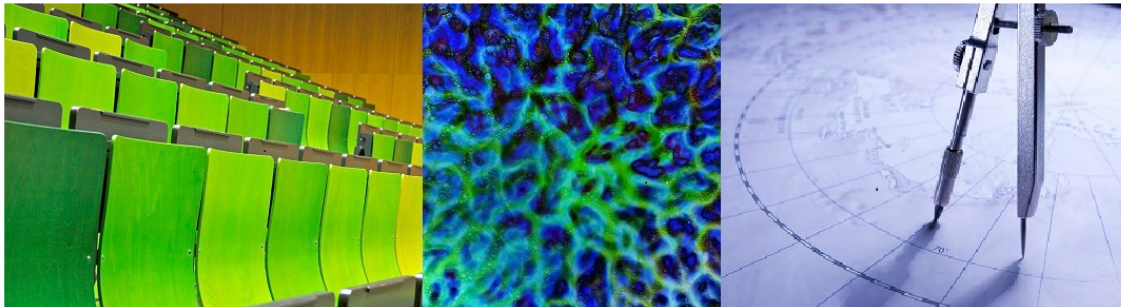
A.5 Survey questions

A.5.1 Treatment group/Schrödinger fellows



Der Wissenschaftsfonds.

6%



Sehr geehrte Damen und Herren,

wir freuen uns, dass Sie sich an unserer Online-Befragung zum Erwin-Schrödinger-Programm beteiligen. Die Befragung möchte ein repräsentatives Meinungsbild von ehemaligen und aktuellen Stipendiaten des Erwin-Schrödinger-Programms ermitteln und so wertvolle Hinweise über die positiven Aspekte des Programms, aber auch über Verbesserungspotential in Erfahrung bringen.

Bei Rückfragen wenden Sie sich bitte per E-Mail an: schroedinger-evaluation@isi.fraunhofer.de

Herzlichen Dank für Ihre Unterstützung!

Dr. Susanne Bühner & Dr. Niclas Meyer

Fraunhofer-Institut für System- und Innovationsforschung ISI | Breslauer Straße 48 | 76133 Karlsruhe | Telefon 0049 721 6809 497

Ihre Angaben werden streng vertraulich behandelt. Sie werden nur aggregiert und anonymisiert im Projektkontext verwendet.

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Vorschau beenden



Der Wissenschaftsfonds.

11%

Welche Beweggründe hatten Sie, sich für ein Erwin-Schrödinger-Stipendium zu bewerben?

	sehr wichtig	wichtig	eher unwichtig	unwichtig	keine Angabe
Sammeln von Auslandserfahrung	☐	☐	☐	☐	☐
Erwerb / Anwendung neuer Methoden, Verfahren und Techniken	☐	☐	☐	☐	☐
Möglichkeit zur fachlichen Spezialisierung	☐	☐	☐	☐	☐
Renommee / hohe Qualität der ausländischen Forschungsstätte	☐	☐	☐	☐	☐
Etablierung neuer Kontakte / Networking	☐	☐	☐	☐	☐
Vertiefung bestehender Kontakte	☐	☐	☐	☐	☐
Verbesserte Karrierechancen im Wissenschaftssystem	☐	☐	☐	☐	☐
Möglichkeit, sich ausschließlich der Forschung zu widmen	☐	☐	☐	☐	☐
Sonstiges:	☐	☐	☐	☐	☐

In welchem Umfang wurden Ihre Erwartungen erfüllt?

	voll und ganz erfüllt	weitgehend erfüllt	eher nicht erfüllt	in keinsten Weise erfüllt	keine Angabe
Sammeln von Auslandserfahrung	☐	☐	☐	☐	☐
Erwerb / Anwendung neuer Methoden, Verfahren und Techniken	☐	☐	☐	☐	☐
Möglichkeit zur fachlichen Spezialisierung	☐	☐	☐	☐	☐
Renommee / hohe Qualität der ausländischen Forschungsstätte	☐	☐	☐	☐	☐
Etablierung neuer Kontakte / Networking	☐	☐	☐	☐	☐
Vertiefung bestehender Kontakte	☐	☐	☐	☐	☐
Verbesserte Karrierechancen im Wissenschaftssystem	☐	☐	☐	☐	☐
Möglichkeit, sich ausschließlich der Forschung zu widmen	☐	☐	☐	☐	☐
Sonstiges:	☐	☐	☐	☐	☐

Für wie wahrscheinlich halten Sie es, dass Sie auch ohne die Schrödinger-Förderung den Aufenthalt an der ausländischen Forschungsstätte hätten realisieren können?

- ☐ sehr wahrscheinlich
- ☒ wahrscheinlich
- ☐ eher unwahrscheinlich
- ☒ unwahrscheinlich
- ☐ keine Angabe

Für wie wahrscheinlich halten Sie es, dass Sie auch ohne die Schrödinger-Förderung Ihre heutige Position erreicht hätten?

- ☐ sehr wahrscheinlich
- ☒ wahrscheinlich
- ☐ eher unwahrscheinlich
- ☒ unwahrscheinlich
- ☐ keine Angabe

[Zurück](#) [Weiter](#)



Der Wissenschaftsfonds.

In welcher Weise waren (bzw. sind) Sie während Ihres Auslandsaufenthalts weiterhin mit österreichischen WissenschaftlerInnen in Kontakt?

Mehrfachnennungen sind möglich

- ☐ Überhaupt nicht
- ☒ Im Rahmen von Konferenzen und Tagungen
- ☐ Im Rahmen gemeinsamer Publikationen
- ☒ Im Rahmen gemeinsamer Forschungsprojekte
- ☐ Im Rahmen einer Habilitation
- ☒ Durch die Betreuung von DissertantInnen
- ☐ Im Rahmen gemeinsamer Lehrveranstaltungen
- ☒ Durch informellen Austausch
- ☐ Sonstiges:

Sind Sie nach Abschluss Ihres Schrödinger-Stipendiums (innerhalb von 12 Monaten) nach Österreich zurückgekehrt ?

- ☐ ja
- ☒ nein
- ☐ Nicht zutreffend, da noch StipendiatIn

Was war für Ihre Entscheidung, nach Ihrem Schrödinger-Stipendium im Ausland zu bleiben, ausschlaggebend?

Mehrfachnennungen sind möglich

- ☐ Vorliegen eines konkreten attraktiven Stellenangebotes der Gastinstitution
- ☒ Vorliegen eines konkreten attraktiven Stellenangebotes einer anderen Forschungseinrichtung
- ☐ Vorliegen eines konkreten attraktiven Stellenangebotes außerhalb der Forschung
- ☒ Längerfristig bessere Karrierechancen und berufliche Perspektiven innerhalb der Wissenschaft
- ☐ Deutlich bessere Forschungsbedingungen im Ausland
- ☒ Keine passende Stelle in Österreich
- ☐ Familiäre / private Gründe
- ☐ Sonstiges:

Was war für Ihre Entscheidung, nach Ihrem Schrödinger-Stipendium nach Österreich zurückzukehren, ausschlaggebend?

Mehrfachnennungen sind möglich

- ☐ Finanzierung einer Rückkehrphase durch den FWF
- ☒ Bestehender, aufrechter Dienstvertrag (Karenzierung)
- ☐ Vorliegen eines konkreten attraktiven Stellenangebotes in der Forschung
- ☒ Vorliegen eines konkreten attraktiven Stellenangebotes außerhalb der Forschung
- ☐ Längerfristig bessere Karrierechancen und berufliche Perspektiven innerhalb der Wissenschaft
- ☒ Deutlich bessere Forschungsbedingungen als im Ausland
- ☐ Keine passende Stelle im Ausland
- ☒ Familiäre / private Gründe
- ☐ Sonstiges:

[Zurück](#) [Weiter](#)

Der Wissenschaftsfonds.

Haben Sie die seit 2009 angebotene Rückkehrphase genutzt?

- ☐ Ja
- ☒ Nein
- ☐ Nein, ich war vor 2009 Schrödinger StipendiatIn

Wenn Ja, hat die Rückkehrphase Ihrer Meinung nach dazu beigetragen,

- ☐ dass Sie überhaupt nach Österreich zurückgekehrt sind?
- ☒ dass Sie in der Wissenschaft geblieben sind?
- ☐ Sonstiges:

Wenn Nein: Was waren ihre Gründe, die Rückkehrphase nicht zu nutzen?**Haben Sie konkrete Pläne, in den nächsten drei Jahren nochmals ins Ausland zu gehen? Und wenn ja, in welches Zielland?**

- ☐ Nein
- ☒ Ich bin bereits im Ausland und zwar in:
- ☐ Ja, und zwar längerfristig nach:
- ☒ Ja, und zwar für mindestens sechs Monate nach:
- ☐ Ja, mehrere kürzere Aufenthalte in:

Konnten Sie nach Ihrer Rückkehr

	trifft voll und ganz zu	trifft eher zu	trifft eher nicht zu	trifft gar nicht zu	keine Angabe
das erworbene Wissen / Know-how direkt in die österreichische Forschungsstätte einbringen?	☐	☐	☐	☐	☐
ein im Ausland begonnenes Projekt zu Ende führen?	☐	☐	☐	☐	☐
direkte Anschlussarbeiten starten?	☐	☐	☐	☐	☐
einen neuen Forschungsschwerpunkt an der österreichischen Forschungsstätte aufbauen?	☐	☐	☐	☐	☐
neue Methoden / Techniken an der österreichischen Forschungsstätte etablieren?	☐	☐	☐	☐	☐
Ihre berufliche Karriere wie geplant voran bringen?	☐	☐	☐	☐	☐
das im Rahmen des Schrödinger-Stipendiums erworbene Wissen in Österreich verankern?	☐	☐	☐	☐	☐
die internationale Vernetzung und Sichtbarkeit der österreichischen Forschungsstätte verbessern?	☐	☐	☐	☐	☐
die Drittmiteinnahmen am neuen Wirkungsort deutlich steigern?	☐	☐	☐	☐	☐
die österreichische Forschungsstätte stärker in den Europäischen Forschungsraum integrieren?	☐	☐	☐	☐	☐
Sonstiges:	☐	☐	☐	☐	☐

[Zurück](#) [Weiter](#)



Der Wissenschaftsfonds.

Mit welchen Hindernissen sahen Sie sich bei Ihrer Rückkehr konfrontiert?

	trifft voll und ganz zu	trifft eher zu	trifft eher nicht zu	trifft gar nicht zu	keine Angabe
Es gab keine Hindernisse	☐	☐	☐	☐	☐
Unzureichend etablierte persönliche Forschungsnetzwerke innerhalb Österreichs	☐	☐	☐	☐	☐
Akzeptanzprobleme hinsichtlich der im Ausland erworbenen Fertigkeiten und Kenntnisse	☐	☐	☐	☐	☐
Generell mangelnde Reputation im Ausland tätiger WissenschaftlerInnen in Österreich	☐	☐	☐	☐	☐
Sonstiges:	☐	☐	☐	☐	☐

In welcher Form sind Sie noch mit WissenschaftlerInnen Ihrer damaligen Zielinstitution in Kontakt?

Mehrfachnennungen sind möglich

- ☐ Überhaupt nicht
- ☐ Im Rahmen von Konferenzen und Tagungen
- ☐ Im Rahmen gemeinsamer Publikationen
- ☐ Im Rahmen gemeinsamer Forschungsprojekte
- ☐ Im Rahmen gemeinsamer Lehrveranstaltungen (Studierenden-Austausch o.ä.)
- ☐ Durch regelmäßige Besuche des Zielinstituts
- ☐ Durch Forschungsaufenthalte von WissenschaftlerInnen der Zielinstitution in Österreich
- ☐ Durch informellen Austausch
- ☐ Sonstiges:

Wie bewerten Sie die nachfolgend aufgeführten Programmelemente im Hinblick auf die Ziele des Schrödinger-Programms, d.h. die Förderung von Auslandsaufenthalten an führenden Forschungseinrichtungen im Ausland und Erleichterung des Zugangs zu neuen Wissenschaftsgebieten und Methoden.

	sehr förderlich	förderlich	kaum förderlich	keinen Einfluss	keine Angabe
Förderdauer	☐	☐	☐	☐	☐
Reisezuschüsse für internationale wissenschaftliche Kongresse	☐	☐	☐	☐	☐
Aufhebung der Altersgrenze bei der Förderung	☐	☐	☐	☐	☐
Publikationskostenübernahmen (inkl. Open Access Kosten)	☐	☐	☐	☐	☐

Welche Programmelemente wären aus Ihrer Sicht zusätzlich sinnvoll im Hinblick auf das Programmziel?

Wie bewerten Sie folgende Förderleistungen?

	sehr förderlich	förderlich	kaum förderlich	kein Einfluss	keine Angabe
Förderhöhe des Auslandsstipendiums	☐	☐	☐	☐	☐
Refundierung der gesetzlichen Pensionsversicherungsbeiträge in Österreich durch den FWF	☐	☐	☐	☐	☐
Reisekostenzuschüsse (auch für mitreisende Familienangehörige)	☐	☐	☐	☐	☐
Kinderpauschalen für mitreisende Kinder	☐	☐	☐	☐	☐
Finanzierung des Lebensunterhaltes in Form eines Stipendiums im Ausland	☐	☐	☐	☐	☐
Rückkehrförderung in Form eines Dienstvertrages an der Forschungsstätte (senior postdoc)	☐	☐	☐	☐	☐

Sehen Sie Verbesserungsmöglichkeiten für die Programmgestaltung und -durchführung? Wenn ja, welche?

[Zurück](#) [Weiter](#)

 **Fraunhofer**
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Der Wissenschaftsfonds.

Bitte geben Sie chronologisch die weiteren Stationen Ihres bisherigen Karriereverlaufs nach Absolvieren des Schrödinger-Stipendiums an, indem Sie lediglich die relevanten Kästchen mit der Maus auf die rechte Seite ziehen.

Station nach Beendigung des Stipendiums in Österreich

Station nach Beendigung des Stipendiums im Ausland

(gegebenenfalls) weitere Station in Österreich

(gegebenenfalls) weitere Station im Ausland

(gegebenenfalls) weitere Station in Österreich

(gegebenenfalls) weitere Station im Ausland

➡

Bitte beschreiben Sie Ihre hierarchischen Positionen während Ihrer zentralen Karrierestationen anhand der nachfolgend aufgeführten Kategorien näher:

	Forschungstätigkeit bei Antragstellung für das Schrödinger-Programm	vom Schrödinger-Programm unterstützter Aufenthalt an Zielinstitution	Station nach Beendigung des Stipendiums in Österreich	Station nach Beendigung des Stipendiums im Ausland	(gegebenenfalls) weitere Station in Österreich	(gegebenenfalls) weitere Station im Ausland	(gegebenenfalls) weitere Station in Österreich	(gegebenenfalls) weitere Station im Ausland
Projektmitarbeiter/in	☐	☐	☐	☐	☐	☐	☐	☐
Projektleiter/in	☐	☐	☐	☐	☐	☐	☐	☐
Senior lecturer	☐	☐	☐	☐	☐	☐	☐	☐
Senior Scientist / Artist	☐	☐	☐	☐	☐	☐	☐	☐
Universitätsassistent/in	☐	☐	☐	☐	☐	☐	☐	☐
Assistenzprofessor/in	☐	☐	☐	☐	☐	☐	☐	☐
Assoziierte/r Professor/in (inkl. ao. Univ.Prof, Univ.DoZ.)	☐	☐	☐	☐	☐	☐	☐	☐
Universitätsprofessor/in	☐	☐	☐	☐	☐	☐	☐	☐
Gastprofessor/in	☐	☐	☐	☐	☐	☐	☐	☐
Position in einem Unternehmen	☐	☐	☐	☐	☐	☐	☐	☐
kein Beschäftigungsverhältnis im akademischen wissenschaftlichen Bereich	☐	☐	☐	☐	☐	☐	☐	☐

Bitte beschreiben Sie uns Ihren Karriereweg noch etwas genauer, indem Sie den Anteil der Forschung an Ihrer Arbeitszeit in der jeweiligen Position, das Land (bzw. im Falle von Österreich den Ort) und den relevanten Zeitraum eintragen.

	Zeitpunkt (Jahr des Beginns)	Land/Ort	Aufgabenanteil Forschung in % der Gesamtarbeitszeit
Forschungstätigkeit bei Antragstellung für das Schrödinger-Programm			
vom Schrödinger-Programm unterstützter Aufenthalt an Zielinstitution			
Station nach Beendigung des Stipendiums in Österreich			
(gegebenenfalls) weitere Station in Österreich			
Station nach Beendigung des Stipendiums im Ausland			
(gegebenenfalls) weitere Station in Österreich			
(gegebenenfalls) weitere Station im Ausland			
(gegebenenfalls) weitere Station im Ausland			

[Zurück](#) [Weiter](#)



Der Wissenschaftsfonds.

Sind Sie vor Inanspruchnahme des Schrödinger-Stipendiums bereits im Ausland gewesen?

- ☐ Ja, als Post-Doktorand
- ☐ Ja, während (eines Teils) der Dissertation
- ☐ Ja, Master im Ausland
- ☐ Ja, Bachelor im Ausland
- ☐ Ja, Auslandssemester/Jahr, z.B. im Rahmen von Erasmus
- ☐ Ja, während (eines Teils) der Schulzeit
- ☐ Ja, (teilweise) im Ausland aufgewachsen
- ☐ Nein

Welchem Wissenschaftsgebiet sehen Sie sich mit Ihrer Forschung am ehesten zugehörig?**Bitte beschreiben Sie die Art der Forschungsstätte an der Sie momentan tätig sind:**

- ☐ Universität
- ☐ Privatuniversität
- ☐ Fachhochschule
- ☐ Akademie der Wissenschaften
- ☐ Außeruniversitäre Forschungsstätte
- ☐ Unternehmen
- ☐ Sonstiges:

Zum Abschluss der Befragung möchten wir Sie um die Beantwortung drei persönlicher Fragen bitten:

- ☐ Frau ☐ Mann

Bitte nennen Sie uns Ihr Geburtsjahr:**In welchem Jahr haben Sie Ihre Dissertation abgeschlossen:****Wir senden Ihnen gerne nach Abschluss der Auswertung eine Zusammenfassung der Ergebnisse zu. Haben Sie daran Interesse?**

- ☐ nein
- ☐ ja, meine Emailadresse lautet:

Haben Sie noch Anmerkungen zur Befragung oder zum Erwin-Schrödinger Programm?**Sie sind am Ende der Befragung angekommen. Bitte markieren Sie hier, wenn Sie an Ihren Angaben keine Änderungen oder Ergänzungen vornehmen wollen. Drücken Sie anschließend auf "weiter", um den Fragebogen endgültig abzusenden:**☐[Zurück](#) [Weiter](#)



Der Wissenschaftsfonds.

17%

Wir möchten uns noch einmal herzlich für die Teilnahme an der Befragung bedanken.

Zur Beurteilung inwieweit das Schrödinger-Programm das Ziel erreicht hat, die internationale Vernetzung und Mobilität österreichischer Wissenschaftler zu fördern, erfolgt im Rahmen dieser Studie auch eine bibliometrische Analyse der Publikationen und Ko-Publikationen österreichischer und nicht-österreichischer WissenschaftlerInnen. Diese Analyse wird anhand öffentlich zugänglicher Publikationsdaten durchgeführt. Auch diese Ergebnisse werden selbstverständlich ausschließlich in anonymisierter und aggregierter Form veröffentlicht. Wir möchten Sie im Zuge dessen informieren, dass wir die Adressdaten, die wir bereits für diese Befragung genutzt haben, auch für die bibliometrischen Analysen nutzen werden.

Die Studie wird ab Frühjahr 2014 auf der Homepage des FWF verfügbar sein oder Ihnen direkt zugehen, falls Sie Ihre Emailadresse angegeben haben.

Fenster schließen

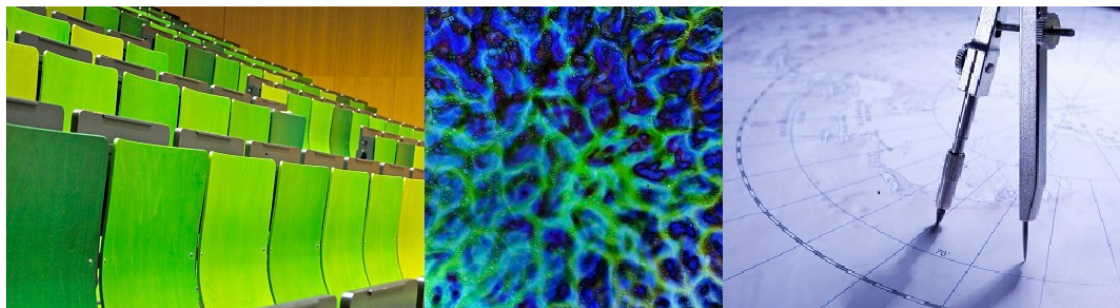


A.5.2 Control group



Der Wissenschaftsfonds.

6%



Sehr geehrte Damen und Herren,

wir freuen uns, dass Sie sich an unserer Online-Befragung zur internationalen Mobilität von österreichischen WissenschaftlerInnen beteiligen.

Bei Rückfragen wenden Sie sich bitte per E-Mail an: wissenschaftler-mobilitaet@isi.fraunhofer.de

Herzlichen Dank für Ihre Unterstützung!

Dr. Susanne Bühner & Dr. Niclas Meyer

Fraunhofer-Institut für System- und Innovationsforschung ISI | Breslauer Straße 48 | 76133 Karlsruhe | Telefon 0049 721 6809 497

Ihre Angaben werden streng vertraulich behandelt. Sie werden nur aggregiert und anonymisiert im Projektkontext verwendet.

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Weiter



Waren Sie schon einmal zu Forschungszwecken für mindestens sechs Monate im Ausland? Wenn ja, geben Sie bitte die Dauer des Aufenthalts in Monaten in Zahlen an?

- ☐ Während der Dissertation:
- ☒ In der Post-Doc-Phase
(bis vier Jahre nach Abschluss des Doktorats):
- ☐ Im weiteren Karriereverlauf:
- ☐ Keine Auslandsaufenthalte

Welche Beweggründe hatten Sie, ins Ausland zu gehen?

	sehr wichtig	wichtig	eher unwichtig	unwichtig	keine Angabe
Sammeln von Auslandserfahrung	☐	☐	☐	☐	☐
Erwerb / Anwendung neuer Methoden, Verfahren und Techniken	☐	☐	☐	☐	☐
Möglichkeit zur fachlichen Spezialisierung	☐	☐	☐	☐	☐
Renommee / hohe Qualität der ausländischen Forschungsstätte	☐	☐	☐	☐	☐
Etablierung neuer Kontakte / Networking	☐	☐	☐	☐	☐
Vertiefung bestehender Kontakte	☐	☐	☐	☐	☐
Verbesserte Karrierechancen im Wissenschaftssystem	☐	☐	☐	☐	☐
Möglichkeit, sich ausschließlich der Forschung zu widmen	☐	☐	☐	☐	☐
Sonstiges:	☐	☐	☐	☐	☐

In welchem Umfang wurden Ihre Erwartungen erfüllt?

	voll und ganz erfüllt	weitgehend erfüllt	eher nicht erfüllt	in keinsten Weise erfüllt	keine Angabe
Sammeln von Auslandserfahrung	☐	☐	☐	☐	☐
Erwerb / Anwendung neuer Methoden, Verfahren und Techniken	☐	☐	☐	☐	☐
Möglichkeit zur fachlichen Spezialisierung	☐	☐	☐	☐	☐
Renommee / hohe Qualität der ausländischen Forschungsstätte	☐	☐	☐	☐	☐
Etablierung neuer Kontakte / Networking	☐	☐	☐	☐	☐
Vertiefung bestehender Kontakte	☐	☐	☐	☐	☐
Verbesserte Karrierechancen im Wissenschaftssystem	☐	☐	☐	☐	☐
Möglichkeit, sich ausschließlich der Forschung zu widmen	☐	☐	☐	☐	☐
Sonstiges:	☐	☐	☐	☐	☐

[Zurück](#) [Weiter](#)

Welche Bedeutung hatte der Aufenthalt im Ausland für Ihre persönliche Karriere?

	sehr förderlich	förderlich	kaum förderlich	kein Einfluss	keine Angabe
Im Hinblick auf Ihre heutige berufliche Position	☐	☐	☐	☐	☐
Im Hinblick auf Ihre Profilbildung innerhalb Ihrer Disziplin	☐	☐	☐	☐	☐
Im Hinblick auf Ihre (internationale) Sichtbarkeit	☐	☐	☐	☐	☐
Im Hinblick auf Ihre Kooperationsnetzwerke	☐	☐	☐	☐	☐
Im Hinblick auf Ihren Publikationsoutput	☐	☐	☐	☐	☐
Im Hinblick auf die erfolgreiche Einwerbung von Drittmitteln	☐	☐	☐	☐	☐
Sonstiges:	☐	☐	☐	☐	☐

Für wie wahrscheinlich halten Sie es, dass Sie Ihre heutige Position auch ohne Aufenthalt im Ausland erreicht hätten?

- ☐ sehr wahrscheinlich
- ☒ wahrscheinlich
- ☐ eher unwahrscheinlich
- ☐ unwahrscheinlich

Stärken längerfristige Aufenthalte österreichischer WissenschaftlerInnen im Ausland Ihrer Meinung nach

	trifft voll und ganz zu	trifft eher zu	trifft eher nicht zu	trifft nicht zu	Einschätzung nicht möglich
die individuellen Karriereaussichten der WissenschaftlerInnen auf nationaler Ebene?	☐	☐	☐	☐	☐
die individuellen Karriereaussichten der WissenschaftlerInnen auf internationaler Ebene?	☐	☐	☐	☐	☐
die Forschungsaktivitäten österreichischer Forschungsstätten?	☐	☐	☐	☐	☐
das Renommee österreichischer Forschungsstätten?	☐	☐	☐	☐	☐
die internationale Vernetzung österreichischer Forschungsstätten?	☐	☐	☐	☐	☐
die Attraktivität des Wissenschaftsstandorts Österreich?	☐	☐	☐	☐	☐
die internationale Sichtbarkeit der österreichischen Grundlagenforschung?	☐	☐	☐	☐	☐
die Integration des Europäischen Forschungsraums?	☐	☐	☐	☐	☐
Sonstiges:	☐	☐	☐	☐	☐

[Zurück](#) [Weiter](#)



Der Wissenschaftsfonds.

39%

In welcher Weise waren Sie während Ihres Auslandsaufenthalts weiterhin mit österreichischen WissenschaftlerInnen in Kontakt?

Mehrfachnennungen sind möglich

- ☐ Überhaupt nicht
- ☐ Im Rahmen von Konferenzen und Tagungen
- ☐ Im Rahmen gemeinsamer Publikationen
- ☐ Im Rahmen gemeinsamer Forschungsprojekte
- ☐ Im Rahmen einer Habilitation
- ☐ Durch die Betreuung von DissertantInnen
- ☐ Im Rahmen gemeinsamer Lehrveranstaltungen
- ☐ Durch informellen Austausch
- ☐ Sonstiges:

Sind Sie nach Österreich zurückgekehrt ?

- ☐ ja
- ☐ nein

Was war für Ihre Entscheidung, nach Österreich zurückzukehren, ausschlaggebend?

Mehrfachnennungen sind möglich

- ☐ Bestehender, aufrechter Dienstvertrag (Karenzierung)
- ☐ Vorliegen eines konkreten attraktiven Stellenangebotes in der Forschung
- ☐ Vorliegen eines konkreten attraktiven Stellenangebotes außerhalb der Forschung
- ☐ Längerfristig bessere Karrierechancen und berufliche Perspektiven innerhalb der Wissenschaft
- ☐ Deutlich bessere Forschungsbedingungen als im Ausland
- ☐ Keine passende Stelle im Ausland
- ☐ Familiäre / private Gründe
- ☐ Sonstiges:

Mit welchen Hindernissen sahen Sie sich bei Ihrer Rückkehr konfrontiert?

	trifft voll und ganz zu	trifft eher zu	trifft eher nicht zu	trifft gar nicht zu	keine Angabe
Es gab keine Hindernisse	☐	☐	☐	☐	☐
Unzureichend etablierte persönliche Forschungsnetzwerke innerhalb Österreichs	☐	☐	☐	☐	☐
Akzeptanzprobleme hinsichtlich der im Ausland erworbenen Fertigkeiten und Kenntnisse	☐	☐	☐	☐	☐
Generell mangelnde Reputation im Ausland tätiger WissenschaftlerInnen in Österreich	☐	☐	☐	☐	☐
Sonstiges:	☐	☐	☐	☐	☐

[Zurück](#) [Weiter](#)

Konnten Sie nach Ihrer Rückkehr

	trifft voll und ganz zu	trifft eher zu	trifft eher nicht zu	trifft gar nicht zu	keine Angabe
das erworbene Wissen / Know-how direkt in die österreichische Forschungsstätte einbringen?	☐	☐	☐	☐	☐
ein im Ausland begonnenes Projekt zu Ende führen?	☐	☐	☐	☐	☐
direkte Anschlussarbeiten starten?	☐	☐	☐	☐	☐
einen neuen Forschungsschwerpunkt an der österreichischen Forschungsstätte aufbauen?	☐	☐	☐	☐	☐
neue Methoden / Techniken an der österreichischen Forschungsstätte etablieren?	☐	☐	☐	☐	☐
Ihre berufliche Karriere wie geplant voran bringen?	☐	☐	☐	☐	☐
die internationale Vernetzung und Sichtbarkeit der österreichischen Forschungsstätte verbessern?	☐	☐	☐	☐	☐
die Drittmiteinnahmen am neuen Wirkungsort deutlich steigern?	☐	☐	☐	☐	☐
die österreichische Forschungsstätte stärker in den Europäischen Forschungsraum integrieren?	☐	☐	☐	☐	☐
Sonstiges:	☐	☐	☐	☐	☐

In welcher Form sind Sie noch mit WissenschaftlerInnen Ihrer damaligen Gastinstitution in Kontakt?

Mehrfachnennungen sind möglich

- ☐ Überhaupt nicht
- ☐ Im Rahmen von Konferenzen und Tagungen
- ☐ Im Rahmen gemeinsamer Publikationen
- ☐ Im Rahmen gemeinsamer Forschungsprojekte
- ☐ Im Rahmen gemeinsamer Lehrveranstaltungen (Studierenden-Austausch o.ä.)
- ☐ Durch regelmäßige Besuche der damaligen Gastinstitution(en)
- ☐ Durch Forschungsaufenthalte von WissenschaftlerInnen der Institution(en) in Österreich
- ☐ Durch informellen Austausch
- ☐ Sonstiges:

In welcher Form sind Sie mit anderen WissenschaftlerInnen außerhalb Österreichs in Kontakt?

Mehrfachnennungen sind möglich

- ☐ Überhaupt nicht
- ☐ Im Rahmen von Konferenzen und Tagungen
- ☐ Im Rahmen gemeinsamer Publikationen
- ☐ Im Rahmen gemeinsamer Forschungsprojekte
- ☐ Im Rahmen gemeinsamer Lehrveranstaltungen (Studierenden-Austausch o.ä.)
- ☐ Durch regelmäßige Besuche der damaligen Institution(en)
- ☐ Durch Forschungsaufenthalte ausländischer WissenschaftlerInnen in Österreich
- ☐ Durch informellen Austausch
- ☐ Sonstiges:



Der Wissenschaftsfonds.

44%

Was war für Ihre Entscheidung, im Ausland zu bleiben, ausschlaggebend?

Mehrfachnennungen sind möglich

- ☐ Vorliegen eines konkreten attraktiven Stellenangebotes in der Forschung
- ☒ Vorliegen eines konkreten attraktiven Stellenangebotes außerhalb der Forschung
- ☐ Längerfristig bessere Karrierechancen und berufliche Perspektiven innerhalb der Wissenschaft
- ☒ Deutlich bessere Forschungsbedingungen im Ausland
- ☐ Keine passende Stelle in Österreich
- ☒ Familiäre / private Gründe
- ☐ Sonstiges:

Wie haben Sie Ihren Auslandsaufenthalt während der Post-doc-Phase finanziert?

- ☐ Durch die Gastinstitution
- ☒ Durch eine Projektstelle an der Gastinstitution
- ☐ Über ein Max Kade Stipendium
- ☒ Über ein APART Stipendium
- ☐ Über ein AAS-CEE Stipendium
- ☒ Über ein ROM Stipendium
- ☐ Über ein Erwin-Schrödinger Stipendium
- ☒ Über das Marie-Curie Programm
- ☐ Über ein anderes Stipendium, bitte nennen:
- ☒ Sonstiges:

Falls Sie ein Stipendium erhalten haben:

Für welchen Zeitraum erfolgte die Förderung (in Monaten)?

keine Angabe ▼

In welcher Höhe erfolgte die Förderung (brutto, pro Monat)?

keine Angabe ▼

[Zurück](#)
[Weiter](#)

Bitte geben Sie chronologisch die einzelnen Stationen Ihres bisherigen Karriereverlaufs an, indem Sie lediglich die relevanten Kästchen mit der Maus auf die rechte Seite ziehen.

Erste Forschungsstelle in Österreich

Ggf. weitere Forschungstätigkeit in Österreich

Erster Forschungsaufenthalt im Ausland

Ggf. weitere Forschungsaufenthalte im Ausland

Erste Rückkehrstation in Österreich

Weitere Station in Österreich nach Rückkehr

Ggf. erneuter Auslandsaufenthalt

Derzeitige Position

➔

Bitte beschreiben Sie Ihre hierarchischen Positionen während Ihrer zentralen Karrierestationen anhand der nachfolgend aufgeführten Kategorien näher:

	Erste Forschungsstelle in Österreich	Ggf. weitere Forschungstätigkeit in Österreich	Erster Forschungsaufenthalt im Ausland	Ggf. weitere Forschungsaufenthalte im Ausland	Erste Rückkehrstation in Österreich	Weitere Station in Österreich nach Rückkehr	Ggf. erneuter Auslandsaufenthalt	Derzeitige Position
Projektmitarbeiter/in	☐	☐	☐	☐	☐	☐	☐	☐
Projektleiter/in	☐	☐	☐	☐	☐	☐	☐	☐
Senior lecturer	☐	☐	☐	☐	☐	☐	☐	☐
Senior Scientist / Artist	☐	☐	☐	☐	☐	☐	☐	☐
Universitätsassistent/in	☐	☐	☐	☐	☐	☐	☐	☐
Fachhochschulassistent/in	☐	☐	☐	☐	☐	☐	☐	☐
Assistenzprofessor/in	☐	☐	☐	☐	☐	☐	☐	☐
Assoziierte/r Professor/in (inkl. ao. Univ.Prof., Univ.DoZ.)	☐	☐	☐	☐	☐	☐	☐	☐
Universitätsprofessor/in	☐	☐	☐	☐	☐	☐	☐	☐
Fachhochschulprofessor/in	☐	☐	☐	☐	☐	☐	☐	☐
Gastprofessor/in (Universität / FH)	☐	☐	☐	☐	☐	☐	☐	☐
Position in einem Unternehmen	☐	☐	☐	☐	☐	☐	☐	☐
kein Beschäftigungsverhältnis im akademischen wissenschaftlichen Bereich	☐	☐	☐	☐	☐	☐	☐	☐
Sonstiges	☐	☐	☐	☐	☐	☐	☐	☐

Zurück Weiter



Der Wissenschaftsfonds.

Name

83%

Bitte beschreiben Sie uns Ihren Karriereweg noch etwas genauer, indem Sie den Anteil der Forschung an Ihrer Arbeitszeit in der jeweiligen Position, das Land (bzw. im Falle von Österreich den Ort) und den relevanten Zeitraum eintragen.

	Aufenthalt begann im Jahr	Land/Ort	Aufgabenanteil Forschung in % der Gesamtarbeitszeit
Erste Forschungsstelle in Österreich			
Ggf. weitere Forschungstätigkeit in Österreich			
Erster Forschungsaufenthalt im Ausland			
Ggf. weitere Forschungsaufenthalte im Ausland			
Erste Rückkehrstation in Österreich			
Weitere Station in Österreich nach Rückkehr			
Ggf. erneuter Auslandsaufenthalt			
Derzeitige Position			

Zum Abschluss der Befragung möchten wir Sie um die Beantwortung der folgenden Fragen bitten:

☐ Frau ☐ Mann

Bitte nennen Sie uns Ihr Geburtsjahr:

Welchem Wissenschaftsgebiet sehen Sie sich mit Ihrer Forschung am ehesten zugehörig?

Bitte beschreiben Sie die Art der Forschungsstätte an der Sie momentan tätig sind:

- ☐ Universität
☐ Privatuniversität
☐ Fachhochschule
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Wir möchten uns noch einmal herzlich für die Teilnahme an der Befragung bedanken.

Die Studie, die sich mit der Mobilität österreichischer WissenschaftlerInnen allgemein und Erwin-Schrödinger-StipendiatInnen im Besonderen befasst, wird ab Frühjahr 2014 auf der Homepage des FWF verfügbar sein oder Ihnen direkt zugehen, falls Sie Ihre Emailadresse angegeben haben.

Zur Beurteilung der internationalen Vernetzung und Mobilität österreichischer WissenschaftlerInnen erfolgt im Rahmen dieser Studie auch eine bibliometrische Analyse der Publikationen und Ko-Publikationen österreichischer und nicht-österreichischer WissenschaftlerInnen. Diese Analyse wird anhand öffentlich zugänglicher Publikationsdaten durchgeführt. Auch diese Ergebnisse werden selbstverständlich ausschließlich in anonymisierter und aggregierter Form veröffentlicht. Wir möchten Sie im Zuge dessen informieren, dass wir die Adressdaten, die wir bereits für diese Befragung genutzt haben, auch für die bibliometrischen Analysen nutzen werden.

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