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*Final Report, 2019-10-02*

# Analysis of Intersectoral Mobility

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technopolis |group| October 2019

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# 1 Introduction

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## 1.1 Background

### 1.1.1 Definition of intersectoral mobility

Intersectoral mobility is at the core of knowledge transfer between the academic and non-academic sectors. In this report, intersectoral mobility is defined as the physical mobility of researchers between sectors (e.g. academia/industry/govt. agency/research institutes) in both directions. However, intersectoral mobility can also be considered in a broader context of knowledge exchange through people including the hiring of higher-level university graduates and researchers, PhD projects involving placements in private companies, dual career paths in public research organisations, universities and industry as well as spin-off creation.

Mobility between academia and other sectors is an important aspect for positive societal changes. The mobile researchers create bridges between the different sectors as they gain perspectives and insights from both sectors. This sort of mobility strengthens the trust between different organisations and underpins a common understanding of different thematic areas and societal challenges and perspectives, which in turn enables the sectors to collaborate and work towards the same ends. Intersectoral mobility can also challenge habitual ways of thinking within the sectors and foster fully new perspectives.

The study was commissioned by The Swedish Foundation for Strategic Research (SSF) and was undertaken March–October 2019. November 12, 2019, SSF organised an open one-day seminar on the topic Intersectoral mobility, where results from the study were presented.

The study team at Faugert & Co Utvärdering / Technopolis Sweden wishes to extend our gratitude towards all who generously shared their thoughts and experiences during the interviews.

## 1.2 Support instruments at SSF

To foster intersectoral mobility in Sweden, SSF financially supports intersectoral mobility directly through three different programmes. Each programme offers funding for research during mobility periods at different levels in academia, from PhD candidates to well-established researchers.

### 1.2.1 Strategic Mobility

The Strategic Mobility programme (SM) was the first programme at SSF which purpose was to support intersectoral mobility of researchers. From 2007 the programme has aimed at helping well-established scientists from industry and academia to be more mobile between the sectors. The programme has a budget of SEK15m per year and each applicant can receive up to SEK1.5m for his or her project, including an option of SEK500k for repatriation in academia. The grant is supposed to cover a salary equivalent of four to twelve months of full-time work, which can be distributed part-time.

The number of applications has shifted over the years, but always remained between 20 and 60 each year with a peak 2009 with just over 60 applications. As an average, SSF funds 15 intersectoral projects each year and a big majority of those are researchers either coming from or moving to large corporations such as ABB, Ericsson and SAAB.

### 1.2.2 Industry Doctoral Student

SSF's second programme, Industry Doctoral Student (ID), focuses on PhD candidates. The ID programme has a budget twice as large as the SM programme, SEK30m per year. It targets individuals who have not yet been admitted to a PhD or a licentiate programme, or who have a licentiate degree but aim for a PhD. The admitted candidates are supposed to share their time between the company and the HEI, and they must also have two supervisors - one from each sector. Each applicant can apply for either a two-year grant á SEK1.25m or a 4–5 year grant á SEK2.5m. The grant is expected to cover about half

of what a PhD or licentiate project normally costs. The other half is expected to be covered by the participating company.

With 256 applications in total and 60 approved projects, which add up to 23% approval rate.

### 1.2.3 Research Institute Doctoral Student

The most recent mobility programme at SFF is the Research Institute Doctoral Student (FID; *Forskningsinstitutsdoktorand*). Instead of focusing on direct mobility between industry and academia, e.g. between HEIs and firms, FID tries to foster mobility through funding PhD or licentiate candidates at research institutes. These institutes are by definition promising environments for intersectoral networks, as a lot of the research being made there fill the gaps between academia and industry – or link the sectors together.

Since 2018, SFF has allocated SEK20m per year to candidates who, similar to ID, are supposed to share their time at the research institute and the HEI. SSF expects to be able to fund eight projects per year, each project receiving SEK2.5m.

In this report we do not take the FID programme into consideration due to its recent establishment. All the approved projects from the programme’s first period are still in their preparatory state.

## 1.3 Study questions

The following study questions have guided our investigation of intersectoral mobility:

Scope	Evaluation Questions
<b>Intersectoral mobility in general</b>	<ul style="list-style-type: none"> <li>• What myths and facts can be identified regarding intersectoral mobility?</li> <li>• What obstacles exist regarding intersectoral mobility?</li> <li>• What are the similarities and differences between Sweden, Norway and Denmark concerning intersectoral mobility?</li> <li>• How important is intersectoral mobility in Sweden?</li> <li>• What is the added value of intersectoral mobility?</li> </ul>
<b>SSF’s programmes</b>	<ul style="list-style-type: none"> <li>• What are the effects, that we can see today, from SM and ID?</li> <li>• Through which methods and how have the participating organisations chosen which projects to focus on?</li> <li>• What are the positive and negative experiences from the programmes?</li> <li>• What tools could be considered to increase intersectoral mobility?</li> <li>• Are there any overlaps with other programmes, calls or initiatives in Sweden?</li> <li>• How could SSF’s programmes be modified with regard to other similar initiatives or programmes?</li> </ul>

## 1.4 Method

The methods used to gather the necessary information for this study were literature and document studies, scoping interviews and in-depth interviews.

### 1.4.1 Literature and document studies

Literature and document studies were done for several purposes. We have used SSF’s own documentation, programme descriptions and calls for applications to get an understanding of the programmes. Moreover, we have read and analysed a substantial number of scientific articles, reports

and other relevant documents that investigate the subject of intersectoral mobility, with the purpose to grasp the general view and the facts concerning intersectoral mobility in Sweden and beyond.

#### 1.4.2 Scoping interviews

The first interviews were scoping interviews, which purpose were to get a broader understanding of SFF's programmes and the issue of intersectoral mobility in Sweden, Norway and Denmark. We have done scoping interviews with four key individuals from the Scandinavian countries.

#### 1.4.3 In-depth interviews

The scoping interviews were followed by in-depth interviews with a selection of participants from the programmes and their supervisors. In total, excluding the scoping interviews, 21 people were interviewed, and the interviews followed a semi-structured template based on the study questions. To encourage a flexible and dynamic conversation, we did not always follow the template strictly. This method enables the conversation to evolve and include other interesting views, which may not have been foreseen beforehand.

One thing to keep in mind when analysing the results is that our selection of interviewees most probably has a bias concerning the risks and benefits of intersectoral mobility. Most of the PhD candidates and researchers who we interviewed have been or are now undergoing a financially supported intersectoral mobility period and are therefore most likely to have a more positive view on the matter than the average PhD candidate or researcher. However, we have also talked to the academic and industrial supervisors, who we assume have a broader and more nuanced perspective on intersectoral mobility.

### 1.5 Disposition of the report

**Chapter 2** presents findings related to motives, expectations, obstacles, outcomes and effects of intersectoral mobility. A few comparisons with the Scandinavian neighbour countries as well as other parts of EU are also given. Results from pervious studies of various scope and scale are presented side by side with the empirical findings from the investigation of SSF's SM and ID programmes. In this way, the interview data and the literature review are mirrored. **Chapter 3** presents the conclusions and reflections regarding SSF's intersectoral activities.

## 2 Review of intersectoral mobility; views of the intersectorally mobile

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### 2.1 Motives and expectations

There are incentives as well as disincentives to engage in intersectoral mobility, both from academia's side and from the companies' side. One of the reasons for higher education institutions (HEIs) to develop closer relationships with companies, through intersectoral mobility, is to make their research more relevant and to gain access to private funds and resources. Furthermore, the HEIs are expected to pursue their "third mission" more intensely, which can be achieved by cooperating more with businesses. On the other hand, intersectoral mobility might appear irrelevant to HEIs in the sense that research in the private sector may be of a more applicable character and oriented towards meeting market demands.<sup>1</sup> Therefore, scepticism has been voiced from academia regarding the scientific quality of the research in intersectoral projects.

The companies' rationale for involving in university collaborations is that it enables them to co-develop knowledge that addresses the specific problems that they are facing. Collaboration also provides access to data, skills, technology and human capital, which are all critical resources for improving economic performance and innovation capability.<sup>2</sup> The companies are not always as interested in getting their

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<sup>1</sup> Salimi, N., Bekkers, R. & Frenken, K. "Does working with industry come at a price? A study of doctoral candidates' performance in collaborative vs. non-collaborative Ph.D. projects", *Technovation*, 2015, volumes 41–42, pages 51–61

<sup>2</sup> Ibid

research published in scientific journals, but instead want the research to have applicable and market-oriented outcomes.

When interviewing R&D managers for 50 companies collaborating with two universities in Stockholm, Broström<sup>3</sup> identified four main drivers and motives for the industry to collaborate with academia:

- Collaboration for process or product development
- Access to academic networks; the possibility of connecting with prominent researchers could sometimes be a stronger incentive than just the networks furthering the research within a particular research area
- Competence development/supply; to be able to recruit competent researchers as well as to retain personnel, securing research capacity and future human capital supply
- Business opportunities involving business models such as distributing academic research results and the use of academic experts in product evaluations, or when academia often is a substantial part of the customer base

These four drivers were also touched upon when companies, in collaboration with three Swedish industrial PhD schools, expressed their reasons for involvement.<sup>4</sup> Some of the reasons mentioned were access to new knowledge and state-of-the-art research, and to develop internal R&D activities as a base for competence development and personnel recruitment. For the participating PhD schools in that study, their incentives were to develop their doctoral education, strengthening ties with industry, and to strengthen their university's position within certain research areas.

If we turn to the participants in SM and ID, their motives for engaging in intersectoral mobility is of course mostly presented on individual level, but partly, the motives still echo what was found in the studies mentioned above. In terms of initiating ID projects and establishing the collaboration between parties, and appointing industrial PhD candidates, our interviewees described a few different ways to do this. A couple of interviewees mentioned that the projects were initiated by the industrial PhD candidate, where some were extensions of previous projects (i.e. master projects or theses work, or usual academia-industry collaboration projects). Other projects emerged due to the PhD candidate's increased interest in conducting academic research and PhD training with the current industry employer. In other cases, ID project proposals were initiated by the supervisors without a particular PhD candidate in mind. These projects were typically advertised either on the university or company job advertisement sites. In one case the industrial PhD candidate was personally approached by the industrial supervisor. Our interviewees mentioned that project ideas usually are identified by the company but in close collaboration with the PhD candidate or academic partner. However, there are some examples of the other way around.

For SM participants there are two ways in which they initiated their strategic mobility projects. Interviewees mentioned that it was either the SM participant – moving from academia to industry – who initiated the mobility project because s/he had discovered the SSF funding scheme while looking for research funding, and then contacted the industrial part, or that the SM participant – moving from industry to academia – realised that a project idea was 'too' academic (and risky) for the employer's usual R&I activities (and support), but that it could be conducted by the help of SSF funding.

The interviewees explained that there were occasionally some pre-existing contacts on organisational level (between the company and the university) but for the most part, the contacts were rather new or, in a few cases, were none-existing prior to the mobility project. The (new) contacts were often

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<sup>3</sup> Broström, A. "Firms' rationales for interaction with research universities and the principles for public co-funding", *The Journal of Technology Transfer*, 2012, volume 37, Issue 3, pages 313–329

<sup>4</sup> Gustavsson, L., Nuur, C. & Söderlind, J. "An Impact Analysis of Regional Industry-University Interactions: The Case of Industrial PhD Schools", *Industry and Higher Education*, 2016, volume 30, issue 1, pages 41-51



established through personal encounters during conferences, or through re-established personal work-related contacts with the research environment/company.

The ID participants saw very few possibilities to carry out the project without SSF's funding; neither the ID participants nor their supervisors saw any alternatives to SSF's funding scheme for industrial doctorates. There was only one case where the ID project proposal was submitted to another financier prior to the SSF submission.<sup>5</sup> One PhD candidate put it as follows:

*We had no obvious alternatives to SSF's ID programme. Most grants we found were directed towards post-docs and not PhD candidates; there were some other foundations we considered but for those, the amounts were smaller and did not cover the entire PhD period of 4–5 years. So, they were not suitable alternatives.*

This was slightly different for the SM participants. In several cases, the SM interviewees mentioned that the SM project could have fitted into a "standard collaboration project". However, they also mentioned that this was not exactly what they were interested in at the moment since they were looking for deeper contacts with the other sector.

A majority of the SM interviewees described that they were searching for a funding scheme which provided them with the opportunity to develop deeper knowledge exchanges and research engagements with the other sector. This included having the opportunity to conduct a study with other characteristics than the ones they were used to, such as more 'academic' projects (for industry researchers) or end-user centred projects (for academic researchers). These aspects were among the reasons for choosing the SSF funding scheme instead of other funding schemes (schemes provided by Vinnova, the Swedish Energy Agency, Formas, other research foundations or the EU, for example).

On a Europe-wide level, the MORE3 study investigated what the top three motives for intersectoral mobility were, taking the researchers' current sectors of employment into account.<sup>6</sup> Through surveys, it was found that for researchers working within the public sector, networking, contributing to society and progressing their career were the main motives behind their choice to undertake an intersectoral move. Networking was also one of the main motives for researchers from the private sector, and specifically researchers from SMEs and start-ups, who wanted to change sector to be able to research their ideas further and finally making them marketable.

Another finding in the MORE3 study is that the longer the researchers had advanced in their careers, the likelier they were to undergo an intersectoral move. These results are not analysed further in the study, but a likely cause to this is that the longer a researcher has worked within academia, the more secure and confident he or she is as well as more open to face other challenges than those present at HEIs. When only analysing to which sector the mobile researchers from different levels of academia chose to move to, PhD holders or equivalent who are not yet fully independent, were more likely to move to SMEs and start-ups, while established researchers were more likely to move to the not-for-profit sector.

## 2.2 Obstacles towards intersectoral mobility

In a Dutch study, the conflicting interests and goals between companies and HEIs are brought to light.<sup>7</sup> Making research outcomes public is one of the most challenging issues between industry and academia. Researchers from academia are in general oriented towards producing publications and spreading their results as widely as possible. Additionally, they have incentives to publish their results promptly to maximise citation impact. The companies' aim is, in most cases, to commercialise the knowledge. In

<sup>5</sup> Here the proposal was initially intended as a sub-project of a larger research project which was submitted to Vinnova as part of a project within one of the Strategic innovation programmes (SIP). However, the larger research project was declined by the SIP and then the ID-part of it was, successfully, submitted to SSF as an isolated ID-project.

<sup>6</sup> European Commission, *MORE3 study – Final report*, 2017, p. 148

<sup>7</sup> Salimi, N., Bekkers, R. & Frenken, K., "Does working with industry come at a price? A study of doctoral candidates' performance in collaborative vs. non-collaborative Ph.D. projects", *Technovation*, 2015, volumes 41–42, pages 51–61

other words, the industry has an incentive to surreptitiously appropriate and develop research outcomes, rather than disclose them through academic publications. This divergence of interests can cause the results from a collaboration not to be published at all, or that only parts of the findings will be publicly disclosed. Alternatively, the publication of results may be delayed until the company has had time to apply for a patent or commercialise the knowledge. We are not certain how frequent or serious this problem actually is, but we have previously come across such issues that were serious, for example, a young postdoctoral researcher who did her research at a company was denied to publish the results as the company perceived them to be negative to the company. To complete a postdoc period without any publications is obviously catastrophic. Her research career unfortunately ended then and there.<sup>8</sup>

Several interviewees mentioned that the programme arrangements are especially good in terms of dealing with different views on publications since the programmes cater for the ability to publish academic papers whilst working with industrial research projects. The mobility programmes also provide industry researchers who have shifted to academic research with the chance to keep the original (fixed) position in the industry, thus providing the industrial researchers with the ‘safety’ needed to dare trying academic research.

On a Swedish national level, the KLOSS<sup>9</sup> report identified a range of challenges constituting obstacles for intersectoral mobility. Some of these challenges stem from personal incentives (or the lack thereof) as well as differing views on merits in the two sectors. Other challenges are of a more practical nature, where obstacles arise from a lack of understanding the regulatory framework and the difficulties in trying to accommodate the different demands from two different employers. The report also addressed the differences between Swedish HEIs with regard to what type of research is being conducted (mostly applied or basic), degree of organisational support, geographical location and the set-up of the regional economy, for example, which could all be factors promoting or hindering this type of mobility for researchers and teachers.

Single individuals often constitute the necessary bridge for initiating cooperation between different organisations. The KLOSS report stated that there is a need for both academia and their partners to find solutions that facilitate and stimulate individuals to be more mobile between the organisations. Today, the incentives for researchers to undertake such mobility are rather weak and even inverted, the report stated, as there is no clear mode of measuring the academic merits of non-academic collaborations. Moreover, there are no requirements from academia for researchers to collaborate with other sectors within their discipline. As a result, collaboration with sectors outside of academia are not prioritised or particularly rewarded. From a historical perspective, Benner and Sörlin ascertained that education, research and collaboration are today relatively separated at many Swedish HEIs and the authors noted the need for a move towards making intersectoral mobility part of both research and education.<sup>10</sup> This would require changes in the merit system and creating incentives regarding collaboration.

Naturvetarna,<sup>11</sup> a Swedish trade union for academics in the natural sciences, has also addressed the compatibility (or lack thereof) regarding research activities in non-academic sectors and the Swedish academic merit system. They see this as one of two major obstacles concerning intersectoral researcher mobility, making it difficult for those who once left academia to return. Naturally, scientific merits should weigh heavily when recruiting to positions in HEIs, but Naturvetarna argues that scientific knowledge can be acquired through other means than publications in scientific journals. Furthermore, it is not certain that the university lecturer with the highest publication count makes the best teacher, Naturvetarna states. They perceive the comparatively better working conditions, job security, salary and possibility for career advancement in industry as the other major obstacle towards returning to

<sup>8</sup> Åström, T. et al, *Evaluation of Swedish National Research Programmes for the Pharmaceutical, Biotechnology and Medical Technology Industries*, 2013, Faugert & Co Utvärdering.

<sup>9</sup> Broström, A., Feldmann, A. & Blaus, J. *Strategisk samverkan – möjligheter och modeller som stärker lärosätet som utbildningsinstitution, forskningsmiljö och samhällsaktör*, 2015, KLOSS

<sup>10</sup> Benner, M. & Sörlin, S. *Samverkansuppgiften i ett historiskt och institutionellt perspektiv*, 2015, Vinnova

<sup>11</sup> Nicklasson, H. & Andersson, S. *Trygghet och attraktivitet – en forskarkarriär för framtiden. Betänkande av Forskarkarriärutredningen. Synpunkter från Naturvetarna*, 2016, Naturvetarna

academia. The economic rewards for conducting research in industry are much stronger than those academia can offer.

The SM and ID participants were asked to briefly reflect on expectations and potential obstacles towards intersectoral mobility and potential ways around them. Their answers reflected to a large extent what was presented in previous studies, including those referred above. The most common expectation, or in fact concern, regarding intersectoral mobility, turned out to be whether the mobility period would fit with the academic career system properly. Concerns of falling behind in terms of publications and grants, and of not being able to conduct research as freely as desired, were accentuated by a few interviewees. However, engaging with a programme like SM or ID was highlighted as beneficial, since they provide the participants with the opportunity to still maintain their academic career while engaging in industrial research. One SM participant from academia put it as follows:

*Some certainly think it is a bit scary, some probably think that it does not fit the career system, and that is probably true to some extent. You have to plan the mobility period so that you still are able to do what is expected: write publications, apply for funding, or whatever you need to do as a scientist. The SSF projects are good in this sense since you can do it halftime, which provides you with time to keep things alive both within the project as well as 'at home'.*

One PhD supervisor added to the reasoning quoted above by exemplifying with more details about the academic career system and the potential embedded difficulties with changing sectors and establishing these types of project collaborations:

*There is, of course, a research career ladder that is linked to the way government funding looks like. It is very regulated in time; a certain number of years after the dissertation and at a certain age you have to seek certain positions. Researchers are afraid to jump off the research career course. Researchers are also afraid of not being as free. It is very much linked to the career structures and the funding systems.*

Regarding the question of potential obstacles for mobility, the interviewees mentioned three different potential barriers. First, the fact that research is done slightly different in the different sectors. The lack of insight or deeper understanding of the other sector's working methods and general foci was a major aspect to it, one SM participant stated:

*One of the obstacles: the industry thinks that academia is a bit tedious and a bit annoying in this that you have to know the truth. On the other hand, academia thinks that industry is only focused on its products. It's hard to find each other but I think it's really important to do it. We are such a small country; therefore, we need to work together to move forward and become more competitive. It is when working together the really interesting areas of development arise, the areas where the application of the research is quickly found. I think this [SSF's mobility programmes] is a good way to do it.*

The second obstacle which emerged from the interviews was the companies' problems to finance mobility actions on their own. It was portrayed as follows by a SM participant:

*Companies might find it difficult to finance or prioritise funding for mobility to universities, however, having the opportunity to do it is important. Here, SSF is an excellent way of enabling mobility. The grants provide the funding needed to change sectors for a while.*

Thirdly, absence of personal contacts or a network in the other sector was presented as an obstacle. Several interviewees mentioned that the reason why their mobility period was initiated and completed so seamlessly was because they had pre-existing contacts with the other sector, including personal contacts or contacts on an organisational level, i.e. the company or research environment being

frequently engaged in jointly conducted research (academia-industry collaborations). In addition to the personal contacts, the interviewees mentioned that the pre-existing contacts on organisational level also provided them with greater knowledge of what to expect from the mobility period as well as what was expected of themselves as scientists in the new environment.

Last, a general demand for ways to lower the barriers and thereby increase the incentives for intersectoral exchange was something that came up in almost all interviews. Several interviewees stressed the importance of increased mobility to be able to get researchers from the different sectors to understand each other and subsequently be able to conduct more joint research. The SSF mobility programmes were, again, regarded as important facilitators.

It is clear that academia and industry have different merit systems. A large number of the interviewees pointed out that that academia regards citations and publications as the strongest merits, whilst the industry emphasises other merits (work experience and the level and profile of education degrees for example). These two ways of assessing merits result in difficulties to re-enter academia after a certain time spent in the industry sector. Almost all of our interviewees pointed out that if you want to pursue a career in academia you must stay in academia and not try to pursue a career as an industrial scientist.

In addition to differing merit assessments, some interviewees meant that the industrial scientists have more stable/beneficial careers in terms of more opportunities to obtain fixed positions, that they receive higher wages and a better work-life balance since they have the security that comes with a fixed position. This view from some of the interviewees was clearly confirmed in a recent study of research careers in academia and in the private sector.<sup>12</sup> The study covered Sweden, Denmark and The Netherlands. The security of a fixed position is rare for scientists in academia in the earlier career stages. The provision of better career opportunities in industry is something that further hinders mobility from industry to academia.

### 2.3 Outcomes and effects of intersectoral mobility

With reference to the described differences between the two sectors when it comes to publishing the findings from a collaborative project, and the differences in terms of assessing merits, there is in fact little empirical evidence for the notion that involving industry in research would result in fewer publications. For example, one study found a positive correlation between industrial collaboration and the amount of publications among Norwegian professors (they did however describe their research as applied to a great extent).<sup>13</sup> Another study found that it is more likely for academic staff who are affiliated with larger multi-disciplinary research centres facilitating university-industry interaction, to have more publications than staff who do not have that type of affiliation.<sup>14</sup> In the same vein it was found that university researchers who have collaborated with the private sector have a higher publication rate compared to colleagues not involved in private sector collaboration.<sup>15</sup> Finally, in a large-scale case study on collaborative doctoral education, no evidence was found to suggest that academic standards were compromised through a collaborative approach between universities and industry.<sup>16</sup>

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<sup>12</sup> Melin, G. et al, *Research careers at universities and large companies – Ten case studies from Denmark, the Netherlands and Sweden*, Background report to: *Karrierer i forskningen – Sammenhæng og fleksibilitet i forskeres karriereveje* (Danmarks Forsknings- og Innovationspolitiske Råd), 2019, Faugert & Co. & Teknologisk institut

<sup>13</sup> Gulbrandsen, M. & Smeby, J-C., "Industry funding and university professors' research performance", *Research Policy*, 2005, vol. 34, issue 6, pages 932-950

<sup>14</sup> Ponomariov, B.L. & Boardman, P.C., "Influencing scientists' collaboration and productivity patterns through new institutions: university research centers and scientific and technical human capital", *Research Policy*, 2010, volume 39, issue 5, pages 613-624

<sup>15</sup> Abramo, G., et al, "University-industry collaboration in Italy: A bibliometric examination", *Technovation*, 2009, volume 29, issues 6-7, pages 498-507

<sup>16</sup> Borrel-Damian, L., *Collaborative doctoral education – University-industry partnerships for enhancing knowledge exchange*, 2009, European University Association

In the Dutch study referred to earlier,<sup>17</sup> the authors also compared the academic performance of collaborative PhD projects and purely academic PhD projects. It was found that the collaborative doctoral candidates had a higher average number of publications. Collaboration projects with the industry or public research organisations (PROs) also received a higher number of citations in total, although not per publication. These doctoral candidates had furthermore, not surprisingly, registered more patents and received more patent citations compared to their non-collaborative colleagues. One of the major explanations for the comparatively higher publication productivity and impact was long-term collaboration with a specific company, and in this case it was Philips. This company has a long history of university collaboration and the authors suggested that this tradition led to higher quality research, perhaps through attracting skilful academic supervisors and talented doctoral candidates. Continuing this line of reasoning, the authors stated that the positive impact on the research could perhaps be attributed to self-selection by the doctoral candidates, where more motivated and promising candidates more often engage in collaborative PhD projects compared to their colleagues who do not engage in intersectoral interaction. The study clearly states in its conclusions that involvement of industry or PROs in PhD projects does not compromise the quality and performance of the academic output.

In another study, the economic effects of companies collaborating with the University of Copenhagen were measured.<sup>18</sup> The potential impact from collaboration generally overlap and occur at different time levels:

1. Within 0–2 years behavioural changes start to manifest; organisational changes regarding university collaborations and strategic management changes
2. Within 1–5 years innovative effects can be identified through increased overall R&D activity or patenting
3. Within 2–10 years the economic effects can be distinguished through increased productivity or increased employment
4. In 5–20 years social effects, through new solutions to societal challenges or socio-economic growth, can be identified

The different levels of impact show that this type of collaboration can affect companies, universities and the surrounding society in many different ways. When addressing the economic effects of collaboration, an econometric analysis in the study showed that companies collaborating with the university increased their productivity per employee with a yearly average of 6.5 percent. However, the formal R&D collaborations are just ‘the tip of the iceberg’. Hiding underneath the formal collaborations are numerous less formalised connections like informal personal contacts or academic scientists serving as company consultants or members of advisory boards. These interactions are less visible than the formal partnerships, but they are vital components in building and maintaining strong, long-term relationships between companies and universities.

An evaluation of the Danish Industrial PhD Programme quantified the effects of university-industry collaboration, although specifically analysing collaboration through doctoral projects.<sup>19</sup> It was found that industrial PhDs on average earn approximately 7–10 percent more than both regular PhDs and comparable university graduates. Industrial PhDs were more likely to be found in top level company positions in their organisation and more likely to be found in positions requiring high-level specialist knowledge than their more academically oriented peers. The companies hosting industrial PhDs were characterised by high growth in gross profit and saw on average an increased patenting activity. They also experienced more positive developments in gross profit and employment growth compared to the firms in the control group.

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<sup>17</sup> Salimi, N., Bekkers, R. & Frenken, K., “Does working with industry come at a price? A study of doctoral candidates’ performance in collaborative vs. non-collaborative Ph.D. projects”, *Technovation*, 2015, volumes 41–42, pages 51–61

<sup>18</sup> *Measuring the economic effects of companies collaborating with the University of Copenhagen*, Damwad, 2012.

<sup>19</sup> *Analysis of the industrial PhD programme*, Danish Agency for Technology and Innovation, 2011.

In a Swedish study<sup>20</sup> where a case study of three industrial PhD schools was undertaken, four major conclusions were drawn regarding their effects: 1) Industry-university collaborations in industrial PhD schools can result in highly valuable and often commercial knowledge; 2) collaborations in industrial PhD schools can be a crucial source of human capital for regional industry; 3) collaborations in industrial PhD schools can have very positive impacts for the participating new universities; and 4) there is potential for these dynamics gained through industry–university collaboration to be sustainable in the long term.

It was found that 51 percent of the doctoral candidates were working at the same company a few years after completing their dissertation, 25 percent were still in the industrial sector but at a different company, while 9 percent went to academia and the remaining 12 percent did not finish their PhD training. Many of the projects resulted in new and/or developed products and processes. The high degree of involvement from companies in formulating and funding the projects, together with them being heavily involved in the supervision of the doctoral candidates, resulted in strong industry relevance for the projects. The companies' connections with academia were in general not entirely new, but in most cases these ties were strengthened through the collaboration. The companies' involvement in the projects led to a more systematic and scientific approach to problem-solving within the organisation.

When turning to the participants in the ID and SM programmes, the overall experience of the mobility period was positive. Insights about how the other sector works, establishment of personal contacts and the opportunity to develop one's craft are particularly valuable aspects mentioned by the interviewees.

In terms of programme arrangements and support, the overall picture is that the interviewees were content with this both in terms of programme structure, administrative duties, and project arrangements (including room for project modifications). The interviewees found the SSF programmes to be accessible and not too demanding in terms of administrative duties, like project management and reporting. Several interviewees credited SSF for managing to keep the programmes accessible and 'light' in terms of administration without compromising the scientific quality of the research projects. One interviewee stated:

*It has worked well with SSF because they provide a great opportunity to devote a lot of time to the research, and you need to spend relatively little time on administration. I would say that the time needed to be spent on reporting is at a good level, you do not administer away the research money this way.*

One important aspect of the programmes, according to a majority of the interviewees, is that the programmes are flexible. There is flexibility both in terms of planned absence (like parental leave) as well as sudden need for absence (sickness or passing of family members), or for project mishaps which for example required adjustments of the project end date. The possibility to have such project-timeline-related modifications was mentioned by several PhD candidates as the main reason for them to be able to work with their dissertation at all since, according to them, other schemes do not allow this.

One SM programme participant put it as follows:

*The SSF programmes are a very good arrangement if you come from the industry and want to conduct research. They are more flexible than other programmes and corresponds well with the working conditions we have here. If we had funding from e.g. Vinnova, it would have been more strictly monitored, and we would not have had the opportunity to receive deferral for parental leave and other things. The opportunity to receive a deferral was a necessity for me to be able to conduct my research.*

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<sup>20</sup> Gustavsson, L., Nuur, C. & Söderlind, J. " An Impact Analysis of Regional Industry-University Interactions: The Case of Industrial PhD Schools", *Industry and Higher Education*, 2016, volume 30, issue 1, pages 41-51

Another programme participant is on the same lines:

*I had a death in the family and was on sick leave for it afterwards. I thought my project would be closed prematurely. However, I applied for an extension and was met with great flexibility and support from SSF. The project results achieved were considered sufficient for an extension, which meant that I will now be able to work on my dissertation.*

Although the experiences amongst programme participants were generally positive, there were a couple of PhD candidates who highlighted the fact that the role of an industrial PhD candidate or ‘cross-border researcher’ may be difficult sometimes. This is because an industrial PhD candidate is not fully belonging to one specific workplace but rather belonging to two different workplaces during the mobility period. This mostly favours the scientific work but also results, in some cases, in a feeling of not fully belonging to either one of the workplaces. This feeling seems to be present amongst the PhD candidates even though their supervisors are making sure that they are included in everyday workplace activities (weekly meetings, seminars and coffee breaks, kick-offs and training events). Based on this experience, a couple of the interviewed PhD candidates requested experience-sharing events, managed by SSF, for programme participants. One PhD candidate suggested:

*It may be a good idea to meet other PhD candidates to exchange experiences and discuss, for example, how others have dealt with the role as an industrial PhD candidate, potential setbacks or difficulties etc. SSF should start networks for us, people who have the same role. It does not have to be physically but can be some sort of internet forum for PhD candidates tied to SSF.*

Related to the request for networks, several interviewees (both ID and SM participants) expressed the wish for continuous follow-up meetings, knowledge-exchange meetings and mid-term workshops for programme participants. Such meetings could provide programme participants with the opportunity to speak to other programme participants as well as to share experiences of being a cross-border researcher, in order to better deal with the duality of the mobility experience.

When asked if there were any desired changes to the programmes that they would like to see, most interviewees struggled to think of any, since they, in general, were content with the programme arrangements. However, there are three areas for improvement that some interviewees mentioned: communication efforts; the frequency of calls and programmes directed towards postdocs; and the opportunity to have some sort of reestablishment support.

Concerning communication, some interviewees mentioned that they were not aware of the SM or ID programmes before submitting their application to SSF, and the PhD candidates especially highlighted this as a potential point for improvement. To target the right audience SSF could preferably advertise more at universities (and companies) and directly to potential PhD candidates, one interviewee suggested.

Regarding the frequency of calls and the establishment of programmes directed towards postdocs, one PhD supervisor mentioned the following:

*I think it would be important to expand and keep the existing programmes alive. I'm very positive towards all of them, they fill an important purpose and are good. They could perhaps be bigger, or at least calls could come more frequently. If calls came more frequently, we would have an easier time to synchronise the project-start with the start of new PhD candidates, because we bring in PhD candidates on an ongoing basis, non-dependant on the academic year. If funding-schemes could reflect this our PhD candidates would not have to wait too long to work on their dissertation.*

Another supervisor suggested:

*A mobility programme for young aspiring researchers would be a perfect complement to the programmes now present, to ensure that they move in and out of academia with less risk during major parts of their careers. It would stimulate mobility even further.*

Regarding re-establishment support for programme participants, one academic PhD supervisor pointed out that the Swedish research community is lacking mobility arrangements where a scientist moving from academia to the industry (and back again) can get additional funding for resuming his or her academic career. The interviewee noted that this could be a way forward for SSF if there is a desire to establish complementary mobility programmes or modify the present ones.

*Something SSF could do is to have an approach where the participant receives re-establishment funding post the mobility period. The Wallenberg Foundation, for example, is funding postdocs abroad for two years, and, to attract researchers to return to Sweden, they provide participants with two additional years of funding to help the researchers resume their career back in Sweden. SSF could think of a similar approach, through the mobility-call, if they want researchers to try their luck in the industry but then come back to the university with the chance of competing with those who have stayed in academia the entire time. If they design it for young people, who are not established but maybe done a postdoc and are still in the process of establishing themselves, it would be positive for the researcher mobility as well.*

An industry PhD supervisor shed some more light on the importance of supporting researcher mobility throughout the research career, and not just for an ID or SM mobility period. The supervisor stressed the importance of enabling positions in academia where the industry may be able to re-enter academia, substantially. Accordingly, the interviewee highlighted other modifications that SSF might consider.

*I imagine that SSF often wants to promote research and innovation by using money but another important aspect to focus on is to ensure that those who teach at universities have an updated picture of what kind of research the industry conducts. I feel that you could provide young people with more opportunities to be in the industry during studies. I think it would be good since today's research is going very fast and what we are doing right now is not in the textbooks, they are too old. So, it would be good if SSF has e.g. financial support for industry researchers who want to start mentor programmes for these students out in the business world.*

*Also, many universities have a shortage of teachers and those who are there have a high pressure on teaching. Mobility aid to promote exchanges, but also to encourage the support of industry scientists to teach would be positive. With adjustments like these, you both get the industry into the academy and vice versa. A lot of things are done by us already on goodwill. But we are limited in what we can do due to resources.*

Nearly all of the interviewees voiced this type of reasoning to some degree. The research system of Sweden was said to largely lack ways into academia for industry scientists. A number of the interviewees concluded this to be a substantial disadvantage for the research community as well as for the Swedish industry sector. Finally, the mobility of knowledge and competences were mentioned by the interviewees as a way of progressing the scientific work and making the best use of the researchers' knowledge and competencies.

The mobility experience was evidently a fruitful and knowledgeable experience. Altogether the programme participants obtained many valuable experiences. They mentioned things like engaging in deeper knowledge-exchanges, rendering personal contacts in the other sector and establishing research networks for future collaboration as important results of the programme participation. Many



interviewees especially highlighted the fact that they had gained more insights of the other sector's working procedures, perspectives and scientific challenges. Some of them also mentioned that these insights were the most important outcomes from the mobility period as they provided them with tools for how to better and more effectively work with researchers from the other sector in the future.

Several programme participants also mentioned that they now have more opportunities to broaden their area of expertise since they are engaging with researchers from both sectors and understand scientific matters of both worlds from the inside, so to speak. Such experience was said to be an eye-opener to some interviewees with respect to how research projects which combine perspectives from both industry and academia could be conducted, and it was emphasised how valuable it is to have people who have a basic understanding of both sectors. This was regarded as a significant factor in increasing (Sweden's) competitiveness through industry-academia collaborations.

One interviewee stated the following:

*Two great benefits of this specific movement, university-industry, is that you obtain a network of collaboration partners more naturally and long-lasting if you share the workplace and also that you by this get a personal overview of technical issues – which academia works with – that apply to different branches of the industry in Sweden. I believe that it is important for innovation both now and in the future.*

Subsequent to the mobility period, there has been a certain increase of mobility both for the programme participants as well as on an organisational level. There are many former programme participants who now have positions in academia as affiliated researchers or who continue to work on research projects with partners from the other sector. A couple of companies have continued to have PhD candidates through SSF's ID programme. Several industrial PhD candidate supervisors underlined that the ID programme is a good way to establish more (significant) contact points between industry and academia. Some interviewees mentioned that after they had participated in the mobility programme, they had obtained a sort of ambassador position with respect to intersectoral mobility. Such ambassadorship could contribute to more intersectoral mobility amongst researchers and that is something that SSF might consider contributing to.

## 2.4 Comparisons with Scandinavia and Europe

In terms of in which sector we find most researchers, in the EU, on average, the private sector is not far behind the public one (where most HEIs can be found). As of 2014, four out of ten researchers across the EU countries work in the private sector, according to the MORE3 study.<sup>21</sup> However, the balance between the countries differ considerably; the share of the private sector (in terms of no. of researchers) was highest in Sweden, 67 percent, while Croatia only had 15 percent of their researchers working in the private sector. The share of researchers in Norway's private sector was 49 percent in 2014 and in Denmark it was 60 percent.

The share of researchers who are employed at HEIs but have experience from the private sector is a little different. The MORE3 Indicator Report<sup>22</sup> found that 11 percent of the researchers at HEIs in Europe had experience from the private sector; 10 percent of the researchers from Swedish HEIs had such experience. The share of HEIs researchers with experience from the private sector in Denmark was 13 percent and in Norway it was 10 percent. On the other end, the study reported that in Bulgaria 20 percent of the HEI researchers had previous experience from the private sector, and in Greece and Hungary it was 16 percent.

In the Annex to the MORE3 study the total share of researchers who had been intersectorally mobile is presented. The data from 2016 show that 24.8 percent of all researchers in EU28 had been

<sup>21</sup> MORE3 study – Final report, European Commission, 2017, p. 146

<sup>22</sup> MORE3 Second Interim Report – Indicator report on researchers, European Commission, 2017, p. 115

intersectorally mobile; mobility from a HEI to the public sector and the government was the most common, 12.7 percent.<sup>23</sup> Both Sweden (26.9 percent) and Denmark (27.8 percent) had a few percentages more of intersectorally mobile researchers than the EU28 average. In Norway, almost a third (31.4 percent) of the researchers had been mobile between different sectors. Among the Norwegian researchers, a relatively large share moved to the private sector compared to the other countries, a pattern which was also confirmed by one of our interviewees from the institute NIFU in Norway. Denmark's and Norway's substantially larger respective institute sector may be an explanation for their slightly higher numbers of intersectorally mobile researchers compared to Sweden.

## 3 Conclusions and reflections

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### 3.1 Conclusions

Both as a summarising section and as conclusions, we return to those of the study questions that we have found empirical answers to. Following this, the few remaining study questions will be reflected upon briefly.

- Question: What are the effects, that we can see today, from SM and ID?
  - Conclusion:
    - Many SM participants continue to be intersectorally mobile after the programme support has come to its end (it is yet too early to draw such conclusions about ID participants)
    - All interviewees mention outcomes like deepened knowledge-exchanges, widened personal contacts in the other sector and established research networks for future collaboration, and broadened expertise
    - Also, participants gained better insights of the other sector's working procedures, perspectives and scientific challenges. These insights provided the programme participants with tools of how to more effectively work with researchers from the other sector in the future
- Question: Through which methods and how have the participating organisations chosen which projects to focus on?
  - Conclusion:
    - There were several different ways of initiating projects. All 'methods' seem to be based on the participant's interest in moving between the sector and/or to conduct a 'different' type of research
    - For the ID programme there are two ways:
      - 1) the PhD candidates initiated it themselves, or 2) the supervisors initiated it and then appointed a PhD candidate (via advertisement or approaching younger colleagues)
    - For SM participants there are also two ways:
      - 1) the SM participant – moving from academia to industry – initiated the mobility project because they had discovered the SSF funding scheme while looking for research funding, and then they contacted the industrial part; 2) the SM participant – travelling from industry to academia – had a project idea which was 'too' academic (and risky) for the employer's usual R&I activities (and support), but thought that it could be conducted by the help of SSF funding
- Question: What are the positive and negative experiences from the programmes?
  - Conclusion:

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<sup>23</sup> European Commission, *Survey on researchers in European Higher Education institutions – Annex to MORE3 study*, 2017, p. 243

- All interviewees were positive towards the programme that they got funding from; they had meaningful and knowledgeable experiences
- A demand for increased communication efforts and networking/meeting opportunities was however voiced
- Question: What obstacles exist regarding intersectoral mobility?
  - Conclusion:
    - The different merit systems make it difficult to change sector. The most common expectation, or in fact concern, regarding intersectoral mobility, turned out to be whether the mobility period would fit the academic career system properly
    - Research is conducted differently in the different sectors; there is a lack of understanding of the other sector's working methods and intention with the research
    - The usually better employment conditions in the private sector – sometimes substantially better – hinder mobility from the private sector to academia
    - Except SSF's mobility programmes, there are few possibilities to fund intersectoral mobility in Sweden
- Question: Are there any overlaps with other programmes, calls or initiatives in Sweden?
  - Conclusion:
    - No evident overlaps with other programmes in Sweden. On the contrary, SSF's programmes fill an almost empty void with regard to programmes that financially support intersectoral mobility
- Question: How could SSF's programmes be modified with regard to other similar initiatives or programmes?
  - Conclusion:
    - As there are almost no other opportunities to have an intersectoral mobility period funded, the most important conclusion is to keep the programmes that are already established
    - If modifications of the existing programmes were to be considered, expanding the SM programme to facilitate intersectoral research mobility for more researchers at various stages of the research career is advised. Today, the SM programme has half the budget volume of the ID programme. It is desirable to increase the numbers of mobile individuals

### 3.2 Reflections

- Question: What is the added value of intersectoral mobility?
  - The literature review and the results from SSF's programmes show that intersectoral mobility is an important tool to increase the effectiveness of research. An intersectorally mobile period gives a deeper understanding of the different needs and intentions with research in the other sector. The very meeting with a different environment is believed to result in new ways of thinking, and thus in novel ideas and hopefully new solutions to various problems. It is the meeting with a new environment and the 'breaking' of views and thoughts together with colleagues who look at things differently, that leads to knowledge transfer, knowledge sharing, and knowledge development. This process is the added value that intersectoral mobility is intended to stimulate and nurture.
- Question: What tools could be considered to increase intersectoral mobility?
  - The participants of SSF's programmes identified obstacles very similar to what has been presented in various studies previously. The different research aims, merit systems and employment conditions between academia and the private sector are among the major obstacles for intersectoral mobility. It is thus of importance to try to overcome those obstacles. As mentioned in one of the bullet points shortly above, to continue the mobility programmes that are set up is most crucial; thereafter to expand them. The SM programme seems most critical to

scale up as it currently does not allow for very many individuals to shift sector. We repeat that a positive outcome from our analysis of SSF's programmes is that they cater well for facilitating the participants' needs and mitigating negative effects that can occur.

- Question: How important is intersectoral mobility in Sweden?
  - This study does not provide an answer to this question. A few observations can however guide us at least to some extent. Sweden has the highest share of researchers in the private sector of all EU member states, 67 percent (in 2014). It makes sense to say that all of them has once taken the step to move from academia to the private sector. The trick is then for them to maintain valuable contacts with academia and engage in collaboration of mutual interest and relevance. When it comes to researchers at HEIs who have experience from the private sector, the figures are quite different: 10 percent of the researchers from Swedish HEIs had such experience, just below the EU average. The share of researchers who had been intersectorally mobile was on the other hand slightly above the EU average. When the situation in Sweden is pictured through these numbers, one could argue that if we must choose, support to researchers in the private sector so that they can collaborate with academia is more important than supporting their intersectoral mobility. In contrast, with only 10 percent of the researchers in academia having experience from the private sector, supporting their intersectoral mobility would seem important, as well as supporting opportunities for collaboration between sectors. After all, the knowledge transfer and co-production of new knowledge that we seek and believe is so important, can be achieved both when an individual is intersectorally mobile, and when individuals from different sectors collaborate without being mobile.

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## Appendix A Interview details

### A.1 Details of interviews with programme participants, supervisors and strategic actors

#### A.1.1 Details of interviews

Methodological details	
Selection method	<p>The selection of interviewees was made by directly approaching possible candidates of each respondent group.</p> <ul style="list-style-type: none"> <li>For ID participants; the first ID call managed by SSF was in 2014, therefore the successful applicants of this round were approached. In two cases we contacted 'backup' individuals from the 2015 call.</li> <li>For the ID participants supervisors, we tried to reach the already interviewed ID's academic and industrial supervisors as far as possible. In 3 cases 'backup' supervisors were chosen.</li> <li>SM participants were chosen from the Strategic mobility call of 2016</li> </ul> <p>In addition to this, considerations regarding gender as well as geographical and institutional scope were made.</p>
Invites and reminders sent	13/05/2019 – 10/06/2019
Total individuals contacted	31
Bounced	0
Interviews conducted	21
Response rate	68%
<p>Comment: All interviews were conducted via telephone or Skype. In addition to the ones displayed in this table 4 scoping interviews with strategic actors in Sweden, Denmark and Norway were conducted (see A.2).</p>	

Name	Institution	Category (ID/SM participant, ID supervisor)	Project carried out at	Gender
Adelöf, Julia	AstraZeneca	ID participant	Primarily AstraZeneca	F
Anglart, Dorota	DeLaval	ID participant	DeLaval International AB / SLU, Sveriges lantbruksuniversitet	F
Bengtsson, Erik	Lunds universitet	ID participant	Sony Mobile Communications AB/ Lunds universitet	M
Bood, Mattias	Göteborgs universitet/ Chalmers	ID participant	Primarily AstraZeneca	M
Jacobsson, Sven	Ericsson	ID participant	Ericsson/Chalmers	M
Kahlin, Magnus	Saab	ID participant	Saab/Linköpings universitet	M
Thesleff, Alexander	Chalmers	ID participant	Integrum/ Chalmers	M
Bormann, Dierk	ABB Corporate Research	SM participant	KTH	M
Broström, Markus	Umeå universitet	SM participant	Umeå Energi AB	M
Fredriksson, Robert	Uppsala universitet	SM participant	QMED/Galderma	M
Hallander, Per	Saab AB	SM participant	KTH	M

Name	Institution	Category (ID/SM participant, ID supervisor)	Project carried out at	Gender
McKee, Sally	Chalmers	SM participant	Rambus Labs	F
Pei Breivold, Hongyu	ABB Corporate Research	SM participant	Mälardalens högskola	F
Selegård, Linnea	Saab Aeronautics	SM participant	Linköpings universitet	F
Ansell, Hans	Saab Group	ID supervisor	-	M
Lemurell, Malin	AstraZeneca	ID supervisor	-	F
Moverare, Johan	Linköpings universitet	ID supervisor	-	M
Niklaus, Frank	KTH	ID supervisor	-	M
Ohlin, Mats	Lunds universitet	ID supervisor	-	M
Zetterberg, Madeleine	Göteborgs universitet	ID supervisor	-	F
Öktem, Ozan	KTH	ID supervisor	-	M

## A.1.2 Interview questions

### A.1.1.1 Interview questions: ID/SM-participants

- Briefly describe what you are doing now after your SM period.
- Please describe what your project was about; the parties involved; whether the cooperation was new or established before and who initiated the cooperation.
- Why did you apply for the ID/SM programme with the project?
- Are there any other mobility programmes similar to SFF's that you know of?
  - Differences/similarities with SFF's ID program?
  - Did you ever consider applying or any of these programmes with your project? Why/Why not?
- The intersectoral researcher mobility in Sweden is relatively small, against this background: what do you perceive as the biggest obstacle to intersectoral mobility?
  - What incentives would need to be in place to counteract this?
- How was your mobility period?
  - Any positive/negative experiences?
  - Did the experience match pre-existing expectations (or myths) regarding intersectoral mobility?
- How did the contact with SSF (in terms of administration, financing, questions etc.) work?
- The intersectoral researcher mobility in Sweden is relatively small (against this background): What do you perceive as the biggest obstacle to intersectoral mobility?
  - Did you experience the obstacle yourself?
  - Did you experience any other obstacle?
  - What incentives would need to be in place to counteract the obstacle(s)?
- Are there any measures for increased intersectoral mobility as SSF as financier could work with? If so, what?
- Is there anything else you would like to add regarding the mobility programme, or about intersectoral mobility that we have not already touched on?



### A.1.1.2 Interview questions: ID supervisors (both academic and industrial)

- Describe briefly what the project was about.
  - Why did you apply to the ID programme with the project? Was the cooperation between project parties a new or already established one?
- Are there any other mobility programmes similar to SFF's that you know of? Differences/similarities with SFF's ID program? Did you ever consider applying or any of these programmes with your project? Why/Why not?
- The intersectoral researcher mobility in Sweden is relatively small (against this background): what do you perceive as the biggest obstacle to intersectoral mobility?
  - What incentives would need to be in place to counteract this?
- Are there any measures for increased intersectoral mobility as SSF as financier could work with? If so, what?
- Is there anything else you would like to add regarding the mobility programme, or about intersectoral mobility that we have not already touched on?

## A.2 Details of scoping interviews with strategic actors

### A.2.1 Interviewees

Name	Institution	Country
Frida Lawenius	Naturvetarna, Public Policy and Government Relations	Sweden
Håkan Regnér	SACO, Social Policy Department	Sweden
Fredrik Niclas Piro	The Nordic Institute for Studies in Innovation, Research and Education (NIFU)	Norway
Leif Henrik Jakobsen	Denmark's Technological Institute	Denmark

### A.1.3 Interview questions

#### A.2.1.1 Interview questions: strategic actors (Swedish)

The scoping interviews with the Swedish strategic actors were open in their character, therefore the questions below only reflect the overarching questions, and not specific follow-up or sub-questions.

- What kinds of 'common understandings' regarding intersectoral mobility in Sweden are there?
  - What are myths and facts about intersectoral mobility (in Sweden)?
  - What do your union members think about it?
- What do you perceive as the biggest obstacle(s) to intersectoral mobility in Sweden?
- What does intersectoral mobility look like outside Sweden? (Internationally, and in other Scandinavian countries)
- What would SFF as a research financier and owner of a number of industrial doctoral and researcher mobility programmes be able to do to counteract obstacles to the Swedish intersectoral mobility?
  - What incentives would need to be in place to counteract this?
  - Something else that SFF should do?
- Anything else you would like to add?

#### A.2.1.2 Interview questions: strategic actors (Danish and Norwegian)

- What does the mobility between academia and industry for researchers look like in Denmark/Norway?

- Do your researchers tend to move between academia and industry?
- We know that there is the ErhvervsPhd order/Nærings-Ph. D.-order in Denmark/Norway: Can you tell us a little more about it? Positive/negative experience regarding it?
- Do you have any other support/schemes for researchers who want to move between academia and industry in your country? (e.g. other programmes/measures from public financiers, grant providers or universities etc.)
- Is there anything else you would like to add regarding the mobility programme, or about intersectoral mobility that we have not already touched on?



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