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Funding Programmes for Internationally Mobile Postdocs: Perceived Impacts on Individuals, Institutions and Society. – An exploratory study.¹

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Background and research questions

Internationalization has been presented as a universal good, as if to create a cross-border, cross-cultural or global connection is to automatically trigger a flow of all-around benefits (...). The claim is made often enough about benefits to the common good (...) but the claim has mostly been couched in very general terms (Marginson, 2019). The internationalization of research is no longer a self-evident principle. Purpose and goals need to be defined and explained more than ever before (Deutscher Bundestag / Parliament of the Federal Republic of Germany, 2017). In order to explore the magnitude of impacts at a multitude of levels, seven programmes for funding of postdoctoral research stays abroad offered by two research funding organisations in Germany, namely the Volkswagen Foundation (VWS) and the Alexander von Humboldt Foundation (AvH) were selected. For a detailed description of the design, implementation and results of the study, see <https://www.psychologie.uzh.ch/de/bereiche/assoc/soho/forschung/wissenschaftsforschung.html>.

The selected initiatives represent three programme modes, namely the incoming, the outgoing and the capacity-building mode. The incoming fellows are those that come to Germany from abroad in order to conduct a research stay at a German university or a non-university research institution. The outgoing fellows are those that come from a university or a non-university research institution in Germany and go for a research stay abroad. The capacity-building fellows are either those that come from a developing country, emerging economy or a transition state in order to conduct a research stay at a German university or a non-university research institution, or in the case of the Volkswagen Foundation those that are based in Sub-Saharan Africa and receive funding in order to conduct research in their home country or region.

The study focuses on international long-term physical mobility, i.e. mobility of at least six months. The time frame of the study encompasses the VWS fellows who finished their

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fellowships between 2008 and 2018 and the AvH alumnae and alumni who finished their initial funding between 2013 and 2017.

In the current literature, the individual level is the most explored one. It is understandable: the funding that targets individual researchers focuses on individual impacts and those beyond the individual fellow are considered spill-over effects that are generally assumed to be stretching over to host institutions and institutions back home (and beyond) and they are usually not in the fore of effects' investigation. As Engberg et al. (2014, pp. 59-60) puts it, "informants familiar with the scholarship schemes were universal in their belief that they are meeting expectations and generating positive national outcomes, such as human-capital expansion, political and economic reform, improved relations with host countries and awareness of operational standards and practices elsewhere." Therefore, the objective of the study was to explore the magnitude of the perceived impacts and their facets as broadly as possible. Several levels of analysis were defined. First, the individual level, i.e. the perceived impacts of research stays on the postdoctoral researchers and their research conduct, their networking, career advancement and personal development. Second, the level of the working group for those that were integrated in or led one independently, i.e. the perceived impacts of research stays on the changes in the research conduct, group cohesion and integration in research communities and career development of members of the working group. Third, the institutional level, which entails the host institution in Germany (for incoming fellows), the institution of return in Germany (for outgoing fellows) and the institution of return or the home institution in a developing country (for capacity-building fellows). Finally, the study focuses on the societal level, which was divided into impacts on the research system on one hand and on other aspects of added value to societal life, such as politics, public discourse, economy and culture, both in Germany and in developing countries.

Data and methods

Intervention logics: In order to explore the magnitude of impacts at a multitude of levels, a systematic approach was selected. First, the concept of intervention logics was used to embrace the manifoldness of objectives, purposes and aims of the funding programmes. The reconstruction of systematically organised models graphically illustrating how intended impacts were supposed to materialise, was extremely conducive to mapping and structuring of the variety of pursued aims, and especially to organising them in a logical sequence. Second, an extensive literature research was conducted, encompassing both evaluation reports and academic literature. Subsequently, the intervention logics and results from the retrieved literature were utilised when designing the surveys.

Surveys: Two-stage online surveys of former fellows / alumnae and alumni, and a one-stage online survey of hosts of former incoming fellows were conducted using the Qualtrics software. Altogether, almost 3,000 former fellows and almost 2,000 hosts were invited to participate in the surveys. In the first round of the survey of former fellows, open-ended questions were asked about perceived effects at the various levels. Based on the analysis of answers, lists with "impact items" were drawn up at each of the different levels (19 to 43 items) and offered in the second round of the surveys, both to former fellows and hosts. Apart from impacts, the survey aimed at tracing the career development of the former fellows, by determining the situation at the application stage, immediately after the funding and at the time of data collection, utilising the European Union's framework for research careers. The design and the survey implementation strategy had all the aim to achieve high response rates. In detail, 65 – 89 per cent for VWS and 46 – 68 per cent for AvH former fellows and 42 per cent for AvH hosts are above-average response rates. Moreover, the results from the non-

response bias analysis show that overall, the distortions were so small that no adjustment of the data with weights was necessary.

Bibliometric analysis: Finally, a bibliometric analysis, i.e. a mapping of citing authors' institutional affiliations, was conducted for two former fellows, in order to demonstrate how the development of former fellows' international visibility over time could be investigated (for cost reasons, the bibliometric analysis could only be carried out for a few fellows as examples). The analysis was based on the publication lists available at the time of application provided by the foundations and on the publications of the former fellows identified by the bibliographic data base Scopus.

Results

General results: Firstly, looking at the respective levels of analysis, the surveys showed that indeed, the individual level is where most impacts were perceived, i.e. where the proportion of impacts selected from our list is the highest and where the proportion of former fellows who reported a specific impact is highest as well. Secondly, the study explored potential negative impacts as well (e.g. finding a job after the end of the fellowship): however, they were (among) the least often mentioned impacts reported by the former fellows and hosts at all levels. Thirdly, some impact items were reported only seldom or not at all by the fellows. They have either socio-economic (e.g. establishing a start-up or spin-off company, improved products or processes) or socio-political (influence on national policy-making, founding of an NGO, contributions to science policy discussions) character.

Results at the different levels: In the following part, the most often perceived impacts at the respective levels are summarised from our research report (cf. Daniel, Bobokova & Mutz, 2021).

Most often perceived impacts on ...

Fellow himself / herself

I advanced my career in research.

The research stay meant a lot for my personal development.

I increased my visibility in international research.

Working group

(PhD) students in the working group benefited from my advice.

My cooperation with the working group (members of it) lasts until today.

I introduced new techniques, methods, or theories to the working group.

Host institution

I helped improve the institution's publication performance.

The institution benefited from a continued collaboration with me.

I taught or advised (PhD) students at the institution.

Research system in Germany

I maintained my contact with Germany.

The research project strengthened international research networks in Germany.

The research project increased the international visibility of research conducted in Germany.

Societal life in Germany (such as culture, politics, or economics)

I conveyed my favourable impressions of Germany to friends, colleagues or family.

I encouraged young researchers in my home country to learn German.

I continued to pay taxes and social insurance in Germany because I stayed or returned there.

Career development: The investigation of career development paths of former fellows yielded the following results that are valid for all funding programmes and initiatives of both foundations. Comparing the time points of the application, after the fellowship and when the data was collected, the careers of former fellows developed considerably, both in terms of receiving an open-ended employment contract and advancing from R2 (recognised researchers) over R3 (established researchers) to R4 (leading researchers) stage. This development could be observed regardless of the baseline situation, though of course, where a considerable proportion of former fellows held an open-ended contract before the funding already, the progression was less remarkable. The same holds true for those programmes or initiatives where a bigger proportion of fellows started at R3 level; here, the proportion of R3 fellows remained more or less stable over time.

Table 1 and 2 offer the results for the former Humboldt Research Fellowships (the largest funding programme included in our study). Almost 95 per cent of former fellows are currently engaged in research, 66 per cent of them have an open-ended contract (Table 1) and around 75 per cent are currently at the R3 or R4 level (established or leading researcher, see Table 2). Before the funding began, i.e. when the fellowship application was submitted, less than 36 per cent of the fellows had an open-ended employment contract within research (either full-time or part-time). Immediately after the end of the funding (fellowship), a considerable increase up to almost 53 per cent was observed. At the time when the survey was filled in, more than 66 per cent of former fellows reported to have an open-ended contract. Table 2 offers interesting details about the career development. At the time when the application for fellowship was submitted, more than half of the fellows were at the R2 level – the so-called “recognised researchers i.e. PhD holders who are not yet fully independent” (European Commission, 2011, p. 2). The number decreased by around 12 per cent points immediately after the end of the funding. At the time when the fellows answered the question (“current point in time”), the overall decrease regarding the R2 level was almost 30 per cent. Similarly, among the soon-to-be successful applicants for fellowships, there were almost 20 per cent of the so-called “established researchers” (R3). When their funding ended, their number increased by more than 12 per cent points and by now (“current point in time”) five more per cent reached R3 level. Finally, “leading researchers” (R4) accounted for almost 13 per cent of the applicants. After the end of the funding, they registered an increase by 13 and by the “current point in time” by another 12 per cent points. In sum, more than 75 per cent of former fellows are currently either at the R3 or the R4 level, and less than a quarter moved to or remained at R2 level.

Table 1 What type of employment contract / source of financing did/do you have within research? (Compilation: Development over time.)

Response options	When you submitted your fellowship application	Immediately after the end of funding	Current point in time
Open-ended	38.5% (N = 353)	52.8% (N = 466)	66.3% (N = 603)
Of total	100.0% (N = 917)	100.0% (N = 882)	100.0% (N = 910)

Source: Daniel, Bobokova & Mutz (2021, p. 110)

Table 2 At which level were/are you active as a researcher? (Compilation: Development over time.)

Response options	When you submitted your fellowship application	Immediately after the end of funding	Current point in time
R1	*13.4% (N = 131)	**0.0% (N = 0)	*0.0% (N = 0)

R2	54.2% (N = 529)	41.9% (N = 390)	24.8% (N = 240)
R3	19.8% (N = 193)	32.4% (N = 301)	37.3% (N = 361)
R4	12.6% (N = 123)	25.7% (N = 239)	37.8% (N = 366)
All	100.0% (N = 976)	100.0% (N = 930)	100.0% (N = 967)

* Candidates who have nearly completed their doctoral degrees are eligible to apply (under certain conditions).

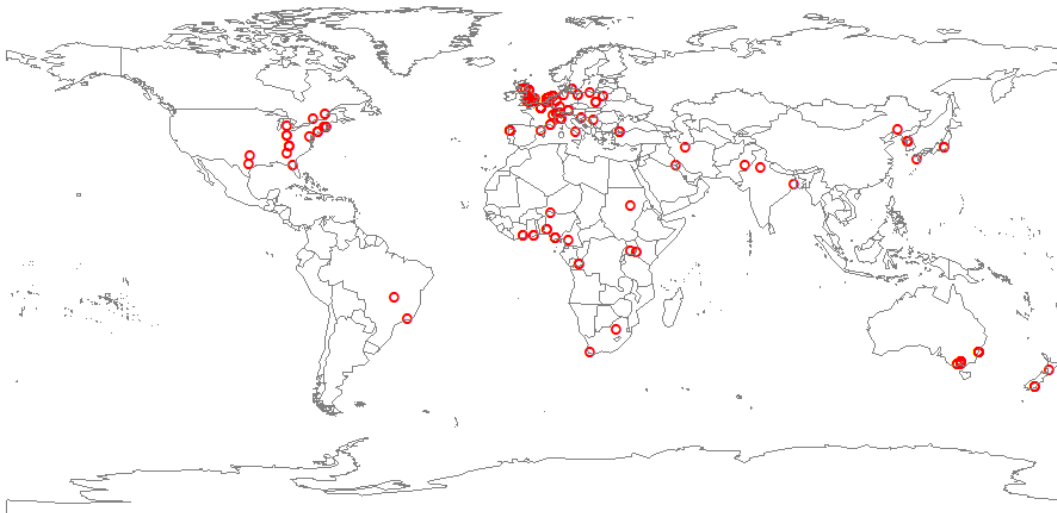
** Response option was not available for this time frame.

R1: First stage researchers (up to the point of PhD),
 R2: Recognised researchers (PhD holders who are not fully independent),
 R3: Established researchers (researchers who have developed a level of independence),
 R4: Leading researchers (researchers leading their research area or field).
 Source: European Commission (2011): Towards a European Framework for Research Careers, p.2.

Source: Daniel, Bobokova & Mutz (2021, p. 110)

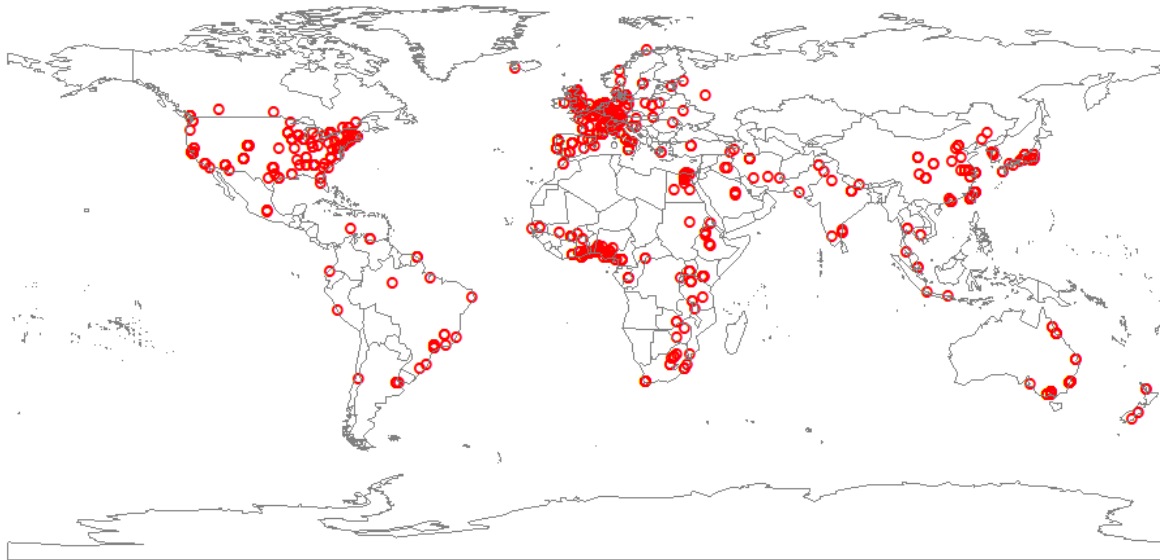
Bibliometric analysis: The bibliometric analysis conducted, for example, for a senior researcher from Ghana showed a very strong increase in the number of citing institutions, cf. Figure 1 and 2.

Figure 1: Institutional affiliation of authors who cited publications of the VWS former fellow that he or she had published up to the beginning of the fellowship



Source: Daniel, Bobokova & Mutz (2021, p. 218)

Figure 2: Institutional affiliation of authors who cited publications of the VWS former fellow that he or she had published from the end of the fellowship until 2019.



Source: Daniel, Bobokova & Mutz (2021, p. 218)

Sustainability of cooperation: The majority of the AvH and VWS fellows were of the very similar perception in terms of networks they broadened by new collaborative partners and that their cooperation with the working group (members of it) lasts until today. The continuation of the cooperation between the researchers and the institution was observed somewhat less often. Still a considerable proportion perceived to have become a contact person for the institution searching for partners and to have hosted visits by researchers of the former host institution at the institution where they were engaged after the end of the funding. Finally, the most often observed at the societal level was the fact that the former fellows maintained the contact with Germany, which provides, in the context of sustainability of the funded collaborations, a very relevant indication as well.

Discussion

This study explored the range of potential impacts of funded long-term research stays perceived by internationally mobile postdocs and their hosts at various levels as broadly as possible, and by using multiple methods. However, if the question was to what extent the perceived impacts were achieved and caused by the funding programme, other methods would need to be applied. One could use, for example, quasi-experiments (e.g. within-group designs, cf. Kassab, Mutz & Daniel, 2020) and modern data technology (e.g. propensity score matching, cf. Mutz, Wolbring & Daniel, 2017) to establish a causal relationship between funding and observed impacts.

The presented study outlines a few questions, answers to which can facilitate a future programme design, implementation and subsequent evaluation. At what levels would the funding organisation like to pursue objectives within a funding programme? Should the focus be just on the individual level, arguing, that the individual funding is what is provided? Or, should the focus remain on the individual level but spill-over effects (to the working group, host institution and society) should be considered as well? Or, does the funding organisation want to pursue goals at the individual, working group, institutional and societal level

(research system and other aspects of societal life)? Are there overarching objectives that are not specific to a programme or initiative, but to which they contribute together?

After the above-mentioned questions have been answered, the suggestion for the funding organisation would be to design or modify programming documents describing the pursued objectives in a narrative way and develop an intervention logic for each funding programme, such as those presented in our research report (cf. Daniel, Bobokova & Mutz, 2021). For each level, where results would be expected (from the individual to society), the report suggests disentangling the logical chain of changes into outputs, outcomes, programme-specific impacts and overarching impacts. As far as indicators are concerned, ideally, their target values would be set and they would have a reference to baseline values.

Additional questions that our study would like to outline, are related to internationalisation@home, socio-economic and socio-political impacts and gender parity: Could research stays of international mobile postdocs coming to a host country for a research stay be used more strongly in future for the internationalisation of universities@home? Should socio-economic and socio-political impacts be explicit goals of funding in the future? Is there a need for a more proactive search for highly qualified women among applicants, reviewers and hosts?

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