INDUSTRIAL RESEARCHER

IMPACT ASSESSMENT

Documentation report

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Innovation Fund Denmark

Content

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Executive summary

Innovation Fund Denmark's Industrial Researcher program provides public support for research projects carried out in co-operation between firms, young researchers and universities. The aim being to promote growth, employment and productivity in the Danish society. The Industrial PhD program has in its current form existed since 1998, while the Industrial Postdoc program was established in 2011. Based on applications, support is granted to projects with high research quality and commercial potential.

Innovation Fund Denmark has a clear ambition of evaluating the impact of its programs. Partly because it is a considered as an obligation when distributing a considerable amount of public funds, partly because systematic impact assessments may identify potentials for improving program mechanisms to increase the effectiveness of the Fund in achieving its social objectives.

These objectives will only be met if the impact assessments are based on methods that are carefully designed and represent international best practice. Therefore, the aim of the impact assessment has been twofold:

- To develop a "state-of-the-art" methodology design in line with the international literature upon which the impact assessment could be based. Thus, as results may depend crucially on the chosen evaluation method, transparency concerning methodology design has had high priority in the project.
- To assess whether the Industrial Researcher program has impacted the participants in accordance with expectations as described in the intervention logic of Innovation Fund Denmark and the specific effect chain for Industrial Researcher. As relatively few Industrial Postdoc projects have been made, the impact assessment is primarily focused on the Industrial PhD program.

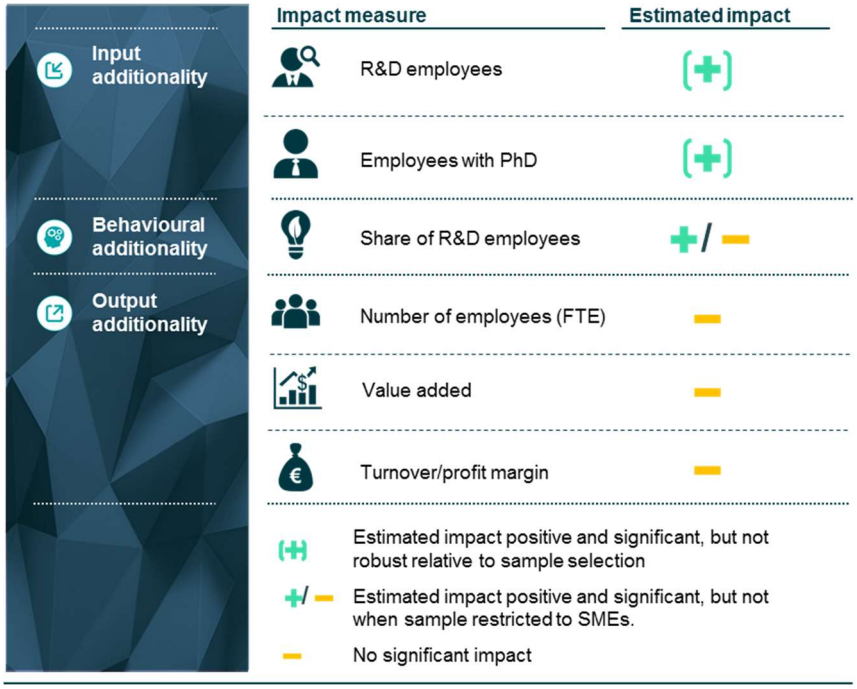
In the first phase of the project, a thorough review of Industrial PhD's program mechanisms was combined with a comprehensive literature review and a review of the available data sources to establish the best possible methodology design. A summary of the outcome of these activities and the design process in general is included in this documentation report, while accompanying reports contain all details.

Based on the methodology design, the impact assessment of Industrial PhD was carried out in the second phase. Separate analyses were made for the participating firms, PhD students and academic supervisors, i.e. the persons responsible for the projects at the universities at which the PhD students are enrolled.

During the impact assessment, a number of primarily data related issues emerged, which to some extent reduced the scope of the final impact assessment relative to the aspirations of the initial methodology design. Keeping this caveat in mind, the overall results of the impact assessment related to the participating firms are mixed:

- Overall, the impact assessment suggests that there is most likely a positive impact on the participating firms. Yet, the evidence is not statistically robust and conclusive.
- Evidence is strongest for the impact measures related to the firms' input into research activities, i.e. the number of R&D employees and employees with a PhD degree (input additionality), and partly for the share of R&D employees (behavioral additionality).
- By contrast, robust and statistically significant results were not obtained for the impact measures related to growth and profitability of the participating firms (output additionality).

Impact on firms



The mixed results may be a consequence of a fundamental methodological issue. Namely, that many of the firms participating in Industrial PhD are large and relatively unique in the population of all Danish firms. These characteristics imply, first, that it is unlikely that the impact of an (in value terms small) Industrial PhD project can be isolated from all the other factors influencing the performance of firms. Second, it is not always possible to identify non-participating firms that can reasonably be compared with the Industrial PhD firms, which further limits the possibilities of identifying the impact of the program.

As a supplement to the econometric analyses, a survey among firms that have participated in Industrial PhD projects was made. It showed a very high degree of satisfaction with the outcome of the projects, and that project results were or in the process of being implemented in most of the firms. Moreover, the majority of the respondents indicated that project participation has increased exchange of knowledge and co-operation with the participating university and/or other research institutions.

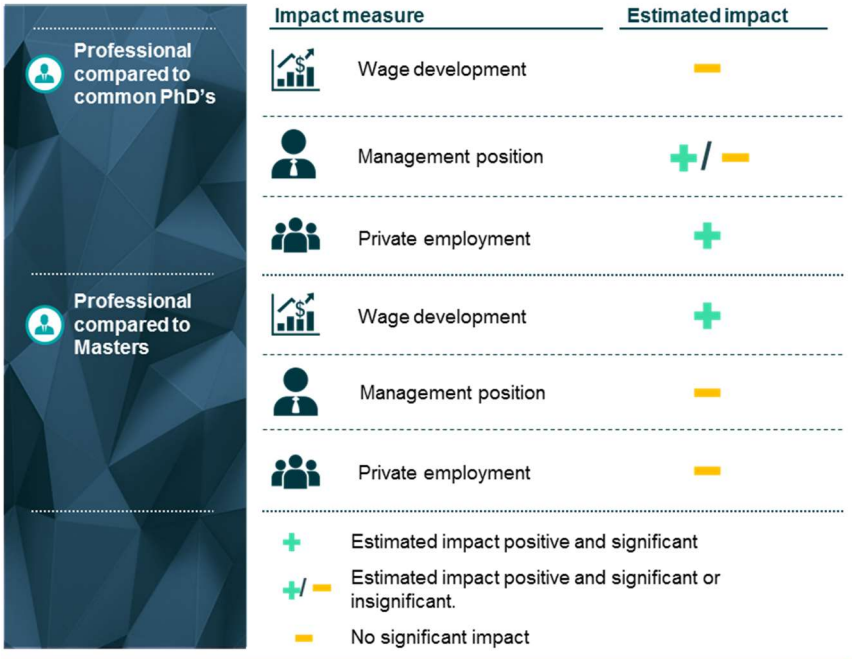
Overall, the results concerning the impact on the participating firms are relatively similar to those found in previous evaluations of Industrial PhD.

As regards the participating PhD students, the results show that:

- Compared to a group of similar common PhDs, Industrials PhDs are more likely to become employed in the private sector and in a managerial position after they have completed their PhD project. There is no significant impact on the wage development following project completion.
- Compared to a group of similar people with a Master degree, Industrial PhDs experience a higher growth in wage income after project completion, while the likelihood of being employed in the private sector and in a managerial position is almost identical for the two groups.

In sum, the Industrial PhD program offers a unique value proposition for people with a Master degree who are to decide on their future career path. Thus, the program seems attractive for people who wish to pursue a career where knowledge at the highest level is combined with employment in the private sector and a relatively high likelihood of achieving a managerial position

Impact on PhD students



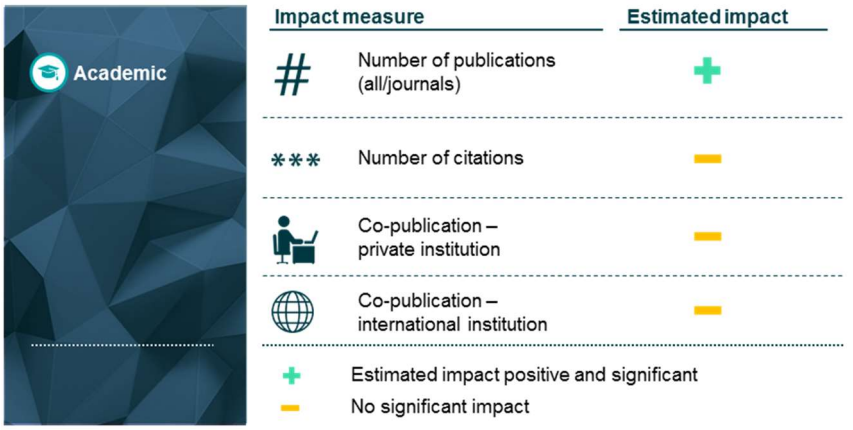
These results for the participating PhD students are in line with those found in previous evaluations of the Industrial PhD program.

Finally, regarding the participating academic supervisors, the scope of the impact assessment was quite limited due to data limitations.

Nonetheless, it was found that academic supervisors appear to publish more publications, both when all types of publications and only journal articles are considered, than their peers at Danish research in-

stitutions. By contrast, no significant results were identified using citations and different measures for co-publication as impact measure.

Impact on academic supervisors



To summarize, the impact assessment of Industrial PhD indicates that there are benefits of participation for firms, PhD students as well as academic supervisors. However, while the results for the participating students are statistically significant and robust, the evidence for a positive impact on firms and academic supervisors is not as strong and should be interpreted with care.

As already mentioned, it has been an explicit objective of the project to establish a methodology design that can be used as benchmark and inspiration for future impact assessments within Innovation Fund Denmark and elsewhere.

Hopefully, the detailed account of the impact assessment provided in this documentation report can provide guidance to areas which can be explored further. E.g., the impact on firm behavior which is a key objective of the Industrial Researcher program, and the impact on academic supervisors. Furthermore, as reported elsewhere, the report also points to areas where relevant data can be collected by Innovation Fund Denmark with relative ease in the future.