

THE CONTRIBUTION OF PNCDI 2 PROGRAMS TO THE DEVELOPMENT OF YOUNG RESEARCHERS' CAREERS¹

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Abstract

This paper aims to analyze the contribution of specific programs included in the National Plan for Research, Development and Innovation for the period 2007-2013 (PNCDI 2) to the development of young researchers' careers in Romania. In particular, the focus will be on the Post-doctoral research projects, as well as the Research projects to stimulate young independent teams, both aiming to support young people to develop their research career, the ultimate purpose being that of stimulating scientific excellence in Romanian research. Both quantitative and qualitative data was collected from young researchers participating to two competitions launched in 2012. An investigation was thus conducted in order to evaluate the main benefits generated by the participation to the above-mentioned research programs and characteristics of further research careers of the participants.

1. Introduction

In this paper we investigate the contribution of the Romanian National Plan for Research, Development and Innovation for the period 2007-2013 (PNCDI 2) to the development of young researchers' careers in Romania, by focusing on the following two specific programs: *Post-doctoral research projects*, as well as *Research projects to stimulate young independent teams*. The selection of these two programs from the PNCDI 2 was made on the basis that they both aim to support young researchers with PhDs to either create or strengthen their own research teams through the carrying out of an independent research program, or to develop an independent research career in research institutions in Romania. Both programs aim in the end to create incentives for scientific excellence in research.

The methodological approach consisted in collecting both quantitative and qualitative data from young researchers who had participated in one of the competitions launched in 2012 for the two programs. The data was then used as input in our investigation on the main benefits generated by the two research programs. A hypothetical counterfactual scenario was also built in order to assess the main benefits that would not have been obtained in the absence of the financed projects.

The main findings presented in the paper represent preliminary results of the POCA project "Developing the administrative capacity of the National Authority for RDI for implementing actions from the National Strategy for RDI 2014-2020".

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The structure of the paper is the following: section 2 describes the methodological framework, while Section 3 is dedicated to the main findings of the investigation. The last section concludes.

2. Methodological framework

The purpose of our study consisted in exploring the contribution of the two specific programs included in the National Plan for Research, Development and Innovation for the period 2007-2013 (PNCDI 2) to the development of young researchers' careers in Romania, namely the *Post-doctoral research projects* (2012 call), as well as the *Research projects to stimulate young independent teams* (2012 call).

As said earlier, both programs aimed mainly to support young people to develop their research career, but also to contribute to the stimulation of scientific excellence in research.

The methodological framework of our study is built upon the collection of both quantitative and qualitative data through the following two complementary approaches:

- I. *Exploratory questionnaire-based survey among beneficiaries*, consisting of:
 - Ø 30 face-to-face interview responses from post-doctoral researchers (*Post-doctoral research projects*),
 - Ø 22 on-line interview responses from project directors (*Research projects to stimulate young independent teams*)
- II. *Case studies* at the level of:
 - Ø 3 research projects funded through the *Post-doctoral research projects* program
 - Ø 3 research projects funded through the *Research projects to stimulate young independent teams* program
 - Ø Data from the project reports
 - Ø Face-to-face interview with the project directors
 - Ø Face-to-face interview with the representatives of the host (research) institutions

The data collection was financed by the National Scientific Research Institute for Labour and Social Protection during September-October 2017, through the POCA project “Developing the administrative capacity of the National Authority for RDI for implementing actions from the National Strategy for RDI 2014-2020”.

All the information gathered has been analysed following several topics, such as: continuation of research activities at the moment of the investigation, results achieved through the financed projects, results not achievable in the absence of financing and main benefits of the programs. We cover the perspectives of both researchers and research organizations where the projects have been implemented.

3. Main findings

The main findings of the two methodological approaches considered in the study (one regarding the exploratory questionnaire-based survey and the second one regarding case studies of projects) will be presented in this section.

3.1 Results of the exploratory questionnaire-based survey among beneficiaries

Regarding the beneficiaries of the *Post-doctoral research projects* that were analysed through explanatory questionnaire-based survey, it turned out that around 90% (27 persons)

were still carrying out research-activities at the moment of the survey, having on average around 12.3 years of experience in R&D activities.

When referring to the project directors of the *Young teams research* program, approximately 82% (19 persons) were still carrying out research-activities at the moment of the survey, with an average of 14.6 years of experience in R&D activities. Moreover, 80% of the researchers involved were still employed at the host institutions at the moment of the survey.

The gender distributions of the investigated beneficiaries of the two programs are quite similar, having approximately 44% male researchers and 56% females. The age-groups distributions, however, differ between the two programs beneficiaries, according to the specificities of the targeted groups of the two programs. More precisely, among the interviewed beneficiaries of the *Young teams* program, around 50% were between 30-40 years old and 25% were below 30 years old. Among the beneficiaries over 41 years old, 18% were below 54 years old, while only around 6% were older than 55 years old. In comparison to it, the beneficiaries of the *Post-doctoral research* projects were mostly younger than 40 years old (around 60%), while the rest were between 41 to 54 years old.

Regarding the results achieved through the *Post-doctoral research* program, the vast majority of the respondents believe that the projects results led mostly to knowledge and skills development (87% of the respondents), enhanced visibility at national and international level (83%), significant scientific contributions (73%), as well as fulfilment of scientific criteria for promotion (70%). Less than 47% appreciated the access to mobilities, while some have considered relevant the access to international research teams (36.7%) and to further financing (33%), while only 16% appreciated that their post-doctoral research project led to high transferability potential of results or even personal fulfilment (see Figure 1 below).

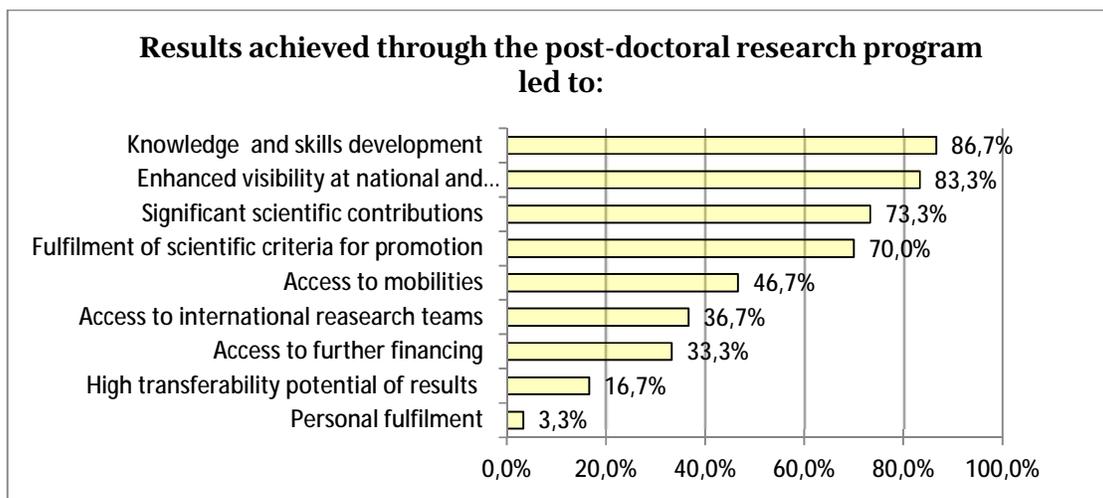


Figure 1. Results achieved through the post-doctoral research program

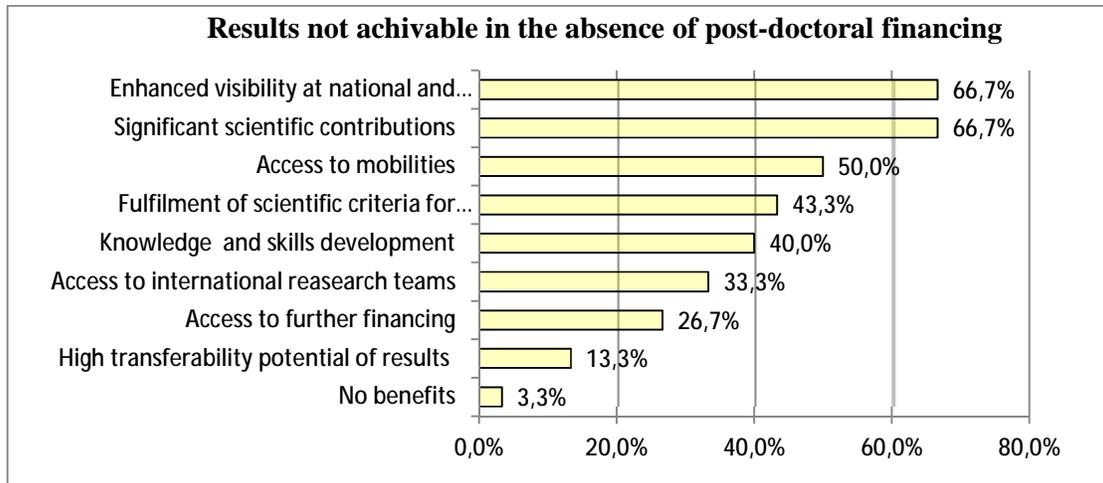


Figure 2. Results not achievable in the absence of the post-doctoral research program

When being asked to estimate the types of results that would have not been achieved in the absence of the post-doctoral financing, the respondents placed on top of the list the enhanced visibility at national and international level, as well as the increase in the significant scientific contributions. Half of the respondents also considered that without the post-doctoral financing they would not have had access to mobilities, while others expected less fulfilment of scientific criteria for promotion, less knowledge and skills development, or access to international research team or to further financing in the absence of the program. Very few of the respondents considered, however, that no real benefits were obtained from the post-doctoral research program.

Moreover, the respondents place among the main benefits of international mobility programs the following: collaborations with world-renowned experts (40% of the respondents), access to scientific bibliography (33%), or access to software and laboratories (30%) (see figure 3).

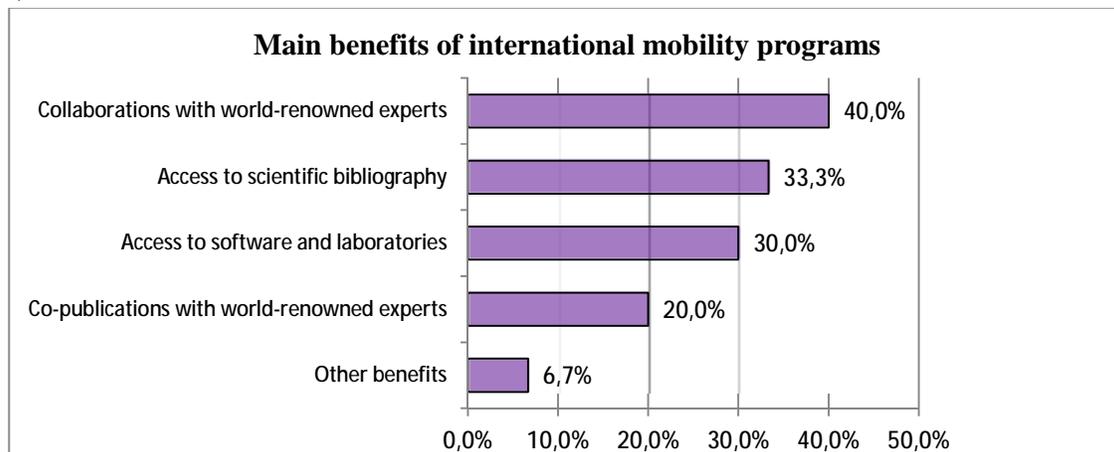


Figure 3. Main benefits of international mobility programs

Under the counterfactual scenario, the respondents kept a similar hierarchy of the main benefits believed not to be achievable in the absence of international mobility programs (see figure 4 below).

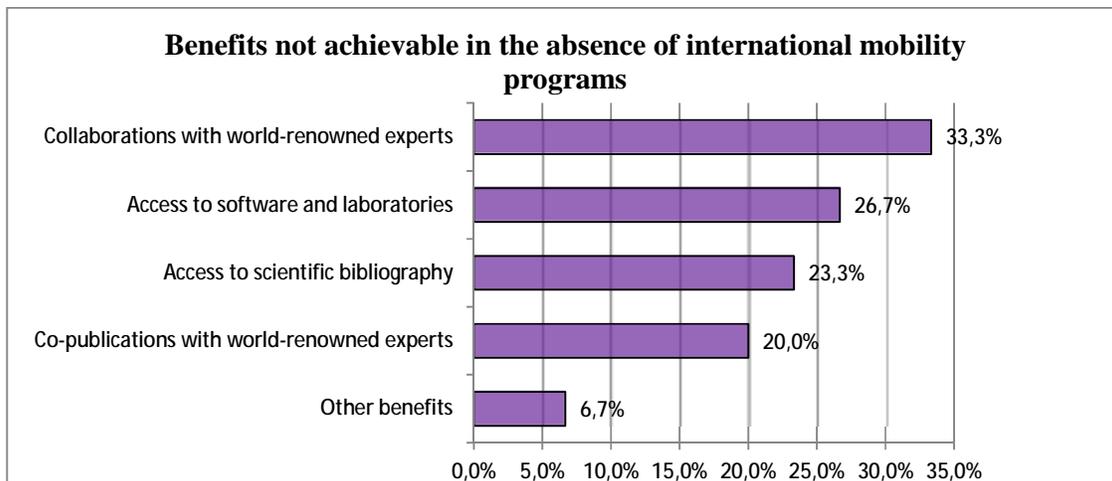


Figure 4. Benefits not achievable in the absence of international mobility programs

Concerning the perception of the beneficiaries of the *Young teams research* programs upon the projects results, the vast majority believe that the main benefits consist mainly of enhanced visibility at national and international level (91%), as well as an increase in significant scientific contributions (just as equally important). Highly important are also the benefits of extended and strengthened collaborations, as well as the opportunity for knowledge and skill development, while half of the respondents consider also the access to research networks and infrastructure among the main benefits of the Young teams research financing scheme (see Figure 5 below).

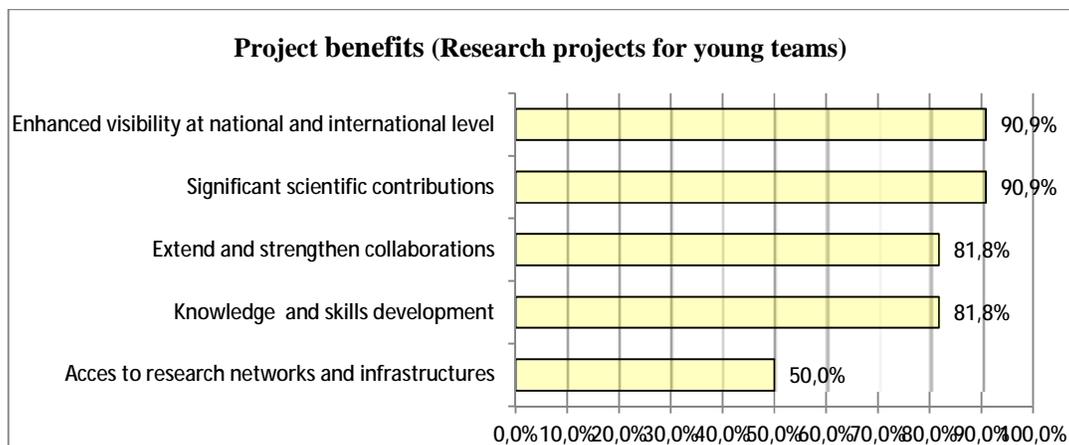
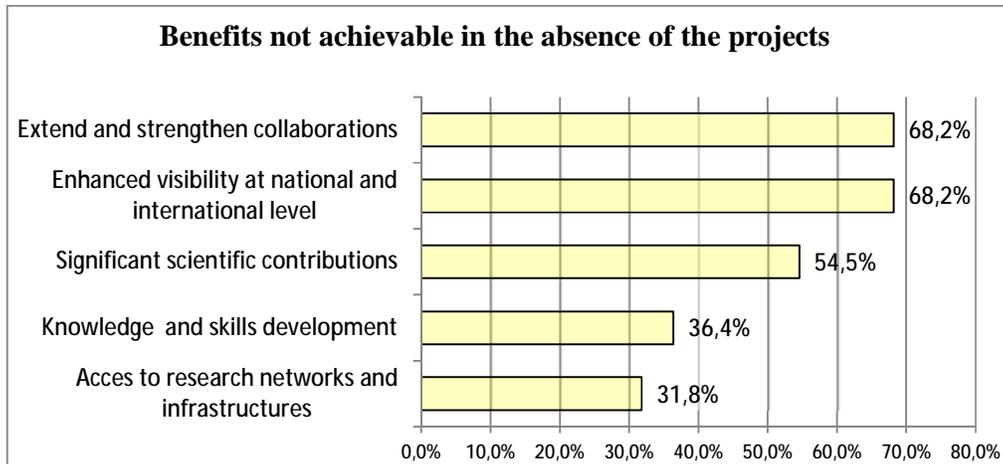


Figure 5. Project benefits (Research projects for young teams)

When being asked to estimate the types of results that would have not been achieved in the absence of the young teams financing, the respondents placed on top of the list the enhanced visibility at national and international level, as well as the opportunity to extend and to strengthen collaborations. More than half of the respondents also considered that without the financing of young teams they would not have managed to increase their significant scientific contributions. Others would have expected less knowledge and skills development, or access to research networks and infrastructures in the absence of the financing.



**Figure 6. Benefits not achievable in the absence of the projects
(Research projects for young teams)**

3.2 Results of the case studies

The second methodological approach consisted in collecting qualitative data through case studies among the beneficiaries of the two programs dedicated to young researchers. The information gathered through the case studies allowed us to build a more holistic image of the results achieved through the two research programs, both from the researchers' perspective and the research organizations' position.

From the researchers' perspective involved in the *Post-doctoral research* projects we learned that knowledge and skills in the scientific field (including access to relevant software) improved, along with visibility and publication (especially ISI articles). Moreover, the post-doctoral research program allowed the researchers to continue their research activities started during the PhD program. However, the researchers state that the retention in the academic career would have been the same in the absence of the project.

From the research organization's perspective, the projects contributed to the development of the research infrastructure (workstations, software, laboratories) and improved the visibility of the institution. Moreover, although the projects did not contribute to attract new researchers, it positively influenced the performances of the existing ones.

Among the researchers' answers during the interviews, the following phrases were stated:

- “*At that time, I didn't have any other opportunities to further finance my research*”
- “*Probably, I would have achieved the same results but it would have taken more time or collaborations or I wouldn't have had all the necessary resources*”
- “*I gained more knowledge and skills due to the new software that has been acquired within the project*”
- “*Even in the absence of the postdoc, I would have still be working at the university*”
- “*The results obtained through the project wouldn't have been possible as they required resources that we didn't have*”

Similarly, the general perception of the researchers' involved in the *Young teams* research projects consisted in the following benefits: improved visibility and publication (especially ISI articles), access to international collaborations, higher motivation, improved access to scientific

books, international conferences and research mobility, as well as the development of small teams of researchers, including young PhD Candidates.

From the research organization's perspective, the projects contributed to the improvement of the institution's visibility at international level and also of the institution's research infrastructure. Moreover, the young teams program also helped retaining young researchers in the institution

Among the researchers' answers during the interviews, the following comments are noteworthy:

- *“I gained higher motivation through the participation to international conferences and through the discussions with mathematicians from abroad”*
- *“I would have continued my research in the absence of the project, but I wouldn't have been able to go to the conferences, for example...”*
- *“I am extremely satisfied with my new relations with colleagues from abroad”*
- *“I developed a good working relationship with a younger colleague which is a good thing for both of us”*
- *“I believe that without funding, we cannot have results in research, at least not results which are recognized at international level”*

4. Conclusions

This paper aimed to analyse the contribution of two specific programs of the National Plan for Research, Development and Innovation for the period 2007-2013 to the development of young researchers' careers in Romania. In particular, the focus was on the Post-doctoral research projects, as well as on the Young teams research projects, aiming to support young researchers with PhDs to create or strengthen their own research teams or research career.

Both quantitative and qualitative data was collected from beneficiaries of financing through the two programs during the calls launched in 2012. The investigation focused on evaluating the main benefits generated by the research projects, as well as those that would not have been obtained in the absence of the findings.

The main findings of the analysis indicated that funding through PNCDI2 has helped young researchers to improve their international visibility, develop their skills and knowledge, obtain significant scientific results and access and strengthen collaborations. Moreover, according to researchers' opinions, most of these gains would have been difficult to achieve in the absence of financing.

On the one hand, post-doctoral researchers, being at an earlier stage of their career, as compared to project directors of young teams, value more the gains in skills and knowledge and the access to international mobilities, which consequently improved their access to international research infrastructures and encouraged collaborations. On the other hand, project directors of young research teams believe that extending and strengthening collaborations is the main benefit drawn from the funding.

Finally, the projects' host organizations' perspective emphasized the role of funding for researchers retention within the organization and the positive contribution to research infrastructure development.

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