

Study on mobility patterns and career paths of EU researchers

**TECHNICAL REPORT 2 – Part I: Mobility Survey
of the Higher Education Sector**

**Presentation of the results with focus on career
path and international mobility among EU re-
searchers, and main factors inhibiting mobility
and career development of EU researchers, in
the higher education sector**

Prepared for:

**European Commission
Research Directorate-General
Directorate C – European Research Area Univer-
sities and Researchers**

IDEA Consult

in consortium with:

- **NIFU STEP**
- **WIFO**
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Brussels, April 2010



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WIFO 

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EXECUTIVE SUMMARY / POLICY BRIEF

A. KEY FINDINGS

We find that:

- International mobility is a feature of the research career path of many European HEI researchers. More than half (56%) of all EU27 HEI researchers have experienced international mobility (of at least three months duration) at least once during their research career. Of these researchers, more than half (that is 29% of all EU27 HEI researchers) have experienced international mobility during the last three years.
- Male researchers are more likely to have experienced international mobility across the whole of their research careers (59%) compared with female researchers (52%). This holds true across all broad scientific domains but the difference is most marked in the Social Sciences and Humanities (64% versus just over 50%). However, our data for international mobility over the last three years suggests that this gap is getting smaller, but it is still statistically significant.
- There appears to be a strong link between previous experience of mobility as a student and the likelihood of being internationally mobile during the subsequent research career. Researchers having obtained their highest degree in a country other than that of their citizenship are overrepresented in the group of previously internationally mobile researchers, and more than 20% of all EU27 HEI researchers have been mobile via student exchange programmes such as ERASMUS.
- 60% of all EU27 HEI researchers have worked for more than one public research organisation during the course of their research career. Amongst those who have been internationally mobile, half (50%) have moved to a new job in a new country at least once during their research career. The proportion is highest for researchers working in natural science and technology fields (57%) and lowest for those working in social sciences and humanities (43%).
- 17% of all EU27 HEI researchers have been employed as a researcher in both the public and the private sector during their researcher career.
- More than half (55%) of all EU27 HEI researchers without previous experience of mobility have also actively considered future mobility. Of those without previous experience of mobility, post-doctoral researchers are most likely to have actively considered mobility.
- International mobility is associated by researchers with positive impacts upon subsequent career progression. 80% of all EU27 HEI researchers with previous experience of international mobility believed that their mobility experience had resulted in positive impacts upon their career.
- Personal/family factors are an explanatory factor for lack of mobility whilst quality of life motives, career progression goals, personal research agenda goals and training and development goals are all explanatory factors for mobility.

- Of these, all except quality of life factors seem to play a role in all kinds of mobility (quality of life issues seem to be less important in relation to research visits not involving a change of job). We also find that there are changes in perspective across the career and life-course of the researcher, with personal and family factors seem in general to be more important to considerations of future mobility for our previously-mobile respondents than they have been in relation to past decisions to become mobile.
- We find that research-related factors such as access to appropriate research facilities and collaborators, or levels of and ability to access research funding are more important factors in determining the attractiveness of a potential 'target' country for international mobility than are salary and incentives. Labour market and immigration policy factors seldom seem to be important either as 'push' factors encouraging researchers to leave a particular national system or as 'pull' factors attracting researchers to a particular system. However, they do register as difficulties encountered by researchers in their own experiences of mobility.
- Generally, we find differences both between the perceptions of previously mobile versus those of researchers with no experience of mobility - but also between the perceptions held by all researchers and the reality experienced during specific instances of mobility. Factors such as obtaining funding, finding a suitable position and making childcare arrangements are both perceived as important concerns and are experienced as obstacles by a (sizeable) minority of mobile researchers. Other factors, such as healthcare and pensions arrangements, are similarly experienced as obstacles by a (sizeable) minority of researchers but do not present themselves as inhibiting factors for, or barriers to, future mobility to the same extent as do caring and personal relationships, obtaining funding and finding a position.

B. CONTEXT

Knowledge, research and innovation are accepted as key factors in global competition. Europe, Japan, the United States, China, and increasingly India and Brazil, have recognized the importance of knowledge for sustained economic growth. Since the year 2000, the European Commission has focused on increasing Europe's competitiveness through the creation of the European Research Area (ERA) in which excellence of research and research infrastructure, and circulation of researchers, takes a prominent position. The European Council of March 2008 invited Member States and the EU to remove barriers to the free movement of knowledge, in particular by making the labour market for European researchers more open and competitive, providing better career structures, transparency and family-friendliness. Furthermore, the Competitiveness Council in September 2008 welcomed the Commission's recent communication "Better careers and more mobility: A European partnership for researchers, which proposes that Member States endorse common and complementary objectives in the field of careers and mobility of researchers. Researchers are thus seen as the cornerstone of knowledge creation, diffusion and application. Global competition for the best researchers is a fact. Yet we have very little systematic knowledge about stocks and flows of researchers

within, into and out of the ERA, and little understanding of the research career issues driving and stemming from researcher movements. This study aims to fill some of these gaps.

C. APPROACH

Defining researchers

'Researcher' does not appear as a distinct category in the International Standard Classification of Occupations (ISCO), research being treated as an activity potentially carried out by many categories of personnel. There are two widely accepted international definitions of 'researcher', namely: the OECD (Canberra Manual, 1995) definition based around the concept of Human Resources in Science and Technology (HRST) and that given in the OECD Frascati Manual (2002), the basis on which OECD member state R&D statistics are collected. The present study adopts the activity-based Frascati definition of 'researcher'. To be sure that only researchers meeting this definition were included in the sample, all respondents were asked to confirm that they performed tasks equivalent to the Frascati definition as part of their employment. Those who responded negatively were excluded from the analysis.

Defining international mobility

There is also no accepted definition of international mobility, and mobility with regard to researchers is more problematic than other forms of highly-skilled worker mobility because it does not necessarily involve migration or cross-border working. Much 'researcher mobility' involves shorter or longer research visits to research institutions, collaborators or facilities elsewhere. For the purposes of the present study we define international mobility as the physical movement of an individual researcher from one country to another country (into, out of or within the EU) either to a new employment position (i.e. involving a change of employer) or for a research visit (not involving a change in employer) of at least three months duration. Other surveys within the larger MORE study are investigating intersectoral research mobility and the special case of EU-US research mobility.

Sampling

The survey on which these results are based represents the first systematic study of international mobility of HEI researchers across the EU27. Within the constraints of the data available to characterise the population of researchers working in European HEIs, a rigorous sampling methodology was developed in order to arrive at results which could meaningfully be extrapolated to the entire population of EU27 HEI researchers. The population was characterised based upon Eurostat's headcounts for 2006 supplemented where necessary by estimates (based on earlier years or from other statistics) made by the MORE consortium. The two stage stratified cluster sampling strategy adopted is explained in detail in the full survey report submitted to the EC in November 2009 (revised in January 2010) and will be published as part of the final project synthesis report in mid-2010). Stratification was by country (27) and broad field of science (3 – Natural Sciences and Technology, Medical Sciences and Agriculture, and Social Science and Humanities) with the 'clusters' being individual university departments. Following this methodology 1,660 HEIs across 27 EU member states were selected. University department websites were checked for researchers' email addresses. In the case of one country, only, France, the lack of information on websites made it necessary to supplement the results of this

search activity with additional emails (5,250) derived from the EC FP6 and FP7 databases. After cleaning, 41,857 individual researchers were identified as targets. The online survey was launched by email in June 2009 and closed at the end of September 2009. After cleaning, 4,538 responses were analysed.

Important notes

1. In this policy brief we present headline results relating to the EU27 as a whole. All the proportions presented in the various figures in this Policy Brief, and all percentages quoted in the text represent the extrapolation to **the whole estimated EU27 researcher population** and not simply the actual proportion of valid responses received.
2. The inclusion of French participants in the 5th and 6th Framework programs in the sample, due to the difficulties we met in identifying HEI researchers in the websites of French Universities, lead to a realised sample of the French respondents which does not fully reflect the population characteristics of French HEI researchers. Furthermore, the response rate amongst French researchers was considerably lower compared with the response rate of HEI researchers in other Member States. Therefore, throughout the report we chose not to publish mobility figures for France, but the responses from French researchers are kept in calculations of the overall international and intersectoral mobility rates in EU27 and by fields of science. In Annex 5 we discuss this issue in greater detail and we show that if we exclude the responses given by French HEI researchers from the overall sample of responses, this does not alter in any fundamental way the (extrapolated) results on HEI researchers international and intersectoral mobility shares in EU27 (by country and by scientific fields) presented in this report.

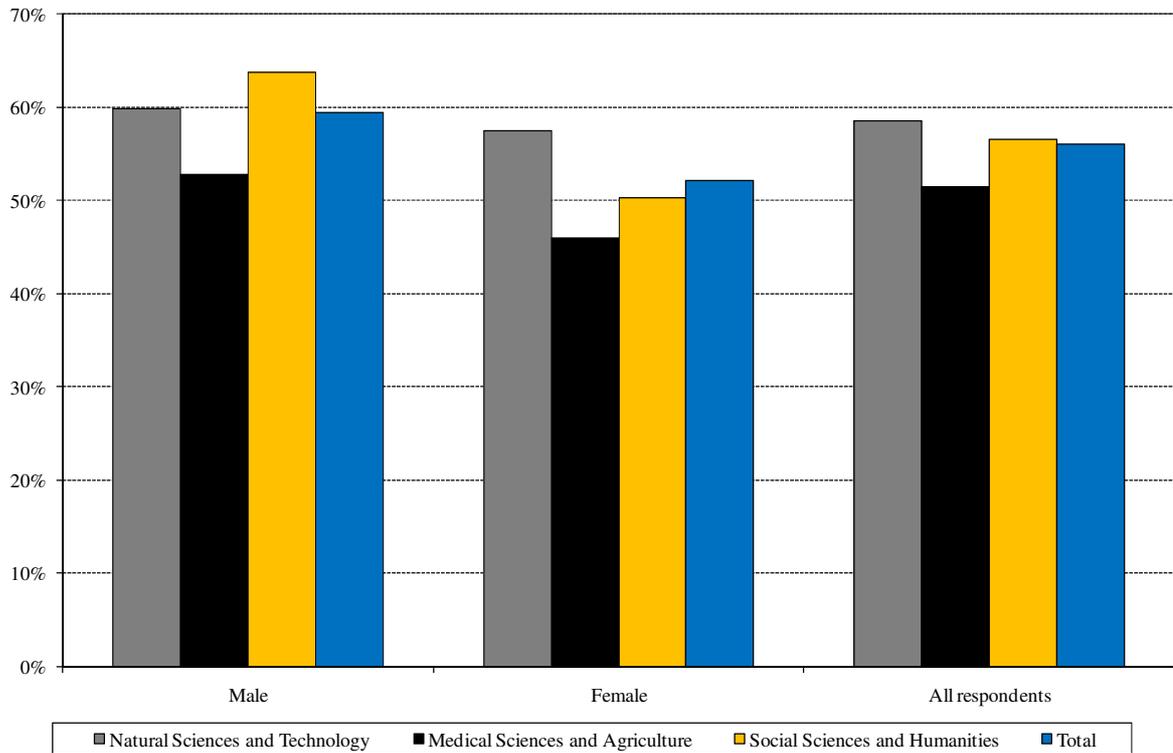
D. FINDINGS

International research mobility in EU27

More than half (56%) of all researchers employed in EU27 HEIs have experienced international mobility (within the definition of this study) at least once during their research career (see Figure 1). The shares vary by broad scientific domain and gender, with Medical Sciences and Agriculture researchers being less likely to have experienced international mobility than either Natural Sciences and Technology researchers or Social Sciences and Humanities researchers. Male Social Science and Humanities researchers are most likely to have experienced mobility during their career (64%), while (?) the largest group of previously mobile female researchers can be found in Natural Sciences and Technology subjects (57%). Experience of international mobility across the whole researcher career is higher for male researchers (59%) across all domains than for female researchers (52%), supporting other research evidence that suggests that female researchers experience specific additional barriers or disincentives to mobility over and above male researchers. The difference is least marked in the Natural Sciences and Technology fields (60% versus 57%) and most marked in the Social Sciences and Humanities (64% versus just over 50%). However, if we focus only on mobility events in the last three years (see Figure 2), the gender difference disappears. This is a striking finding and one which will require investigation in future research. Have the additional specific barriers to the mobility of female researchers mentioned above really been overcome in recent years?

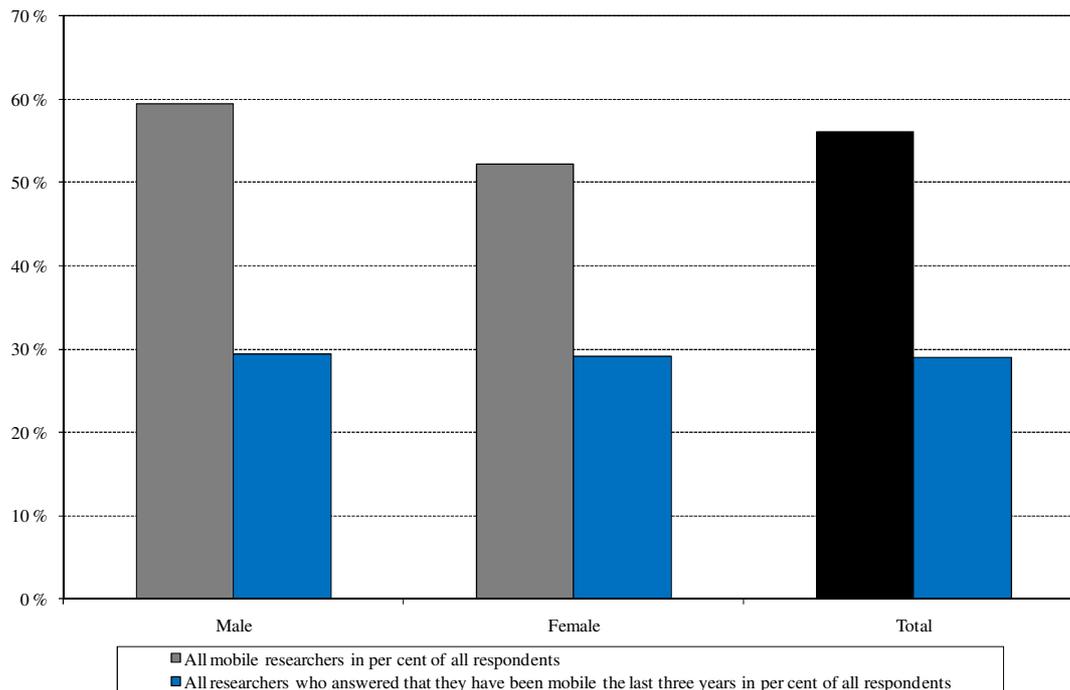
Across all scientific domains, we also find (not surprisingly) that current doctoral researchers are less likely to have experienced mobility during their time as a researcher than are post-doctoral researchers and researcher in the residual category “other researcher”.

Figure 1: Share of researchers in the higher education sector in EU27 with international mobility experience **at least once** in their research career by field of science and by gender. n=4,538.



Source: MORE Study: Mobility Survey of Researchers in the Higher Education Sector, 2009.

Figure 2: Share of researchers in the higher education sector in EU27 with international mobility experience in the last three years by gender. n=4,538.



Source: MORE Study: Mobility Survey of Researchers in the Higher Education Sector, 2009.

Mobility types: international job-mobility and research visits

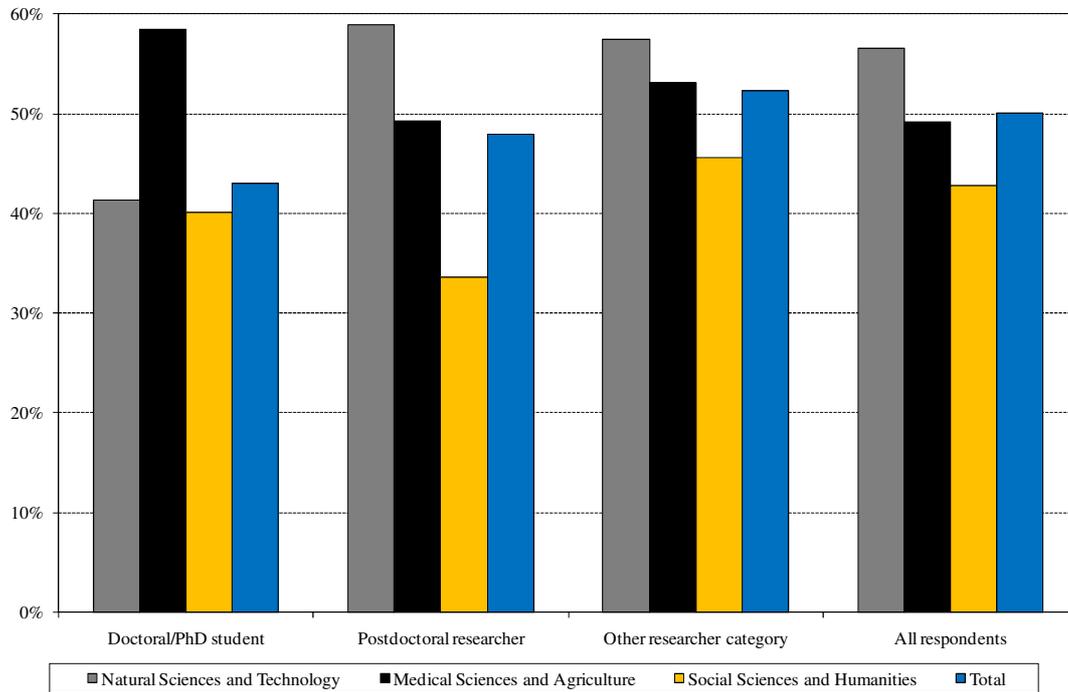
Of those researchers who have previously been internationally mobile (Figure 3) we see that half (50%) have experienced international job mobility (that is, have moved to a new employer in a different country) at least once during their research careers. The proportion is highest for researchers in natural sciences and technology fields (57%) and lowest for those working in social sciences and humanities (43%).

Turning to international research visits (Figure 4) we find that 78% of all EU 27 HEI researchers who have previously been internationally mobile have made at least one international research visit (of at least three months duration and not involving a change of employer) during their time as a researcher. The proportion is highest for researchers who classified themselves in the 'other researcher' job category¹ (80%) and lowest for current doctoral researchers (74%).

Social science and humanities researchers are most likely to have already experienced a research visit whilst a doctoral or post-doctoral researcher, whilst the proportions are much more similar at later stages and across all researcher categories.

¹ We can consider the category "other researchers" to consist largely of more established researchers for which the categories doctoral student and post-doctoral researcher did not apply. However, as the term "other researcher" was used in the survey we will use this term for preference throughout. For a more in-depth analysis of the age and seniority profile of the "other researcher category", please see Chapter 4.3.1, in particular Figure 12, Figure 13 and Figure 14.

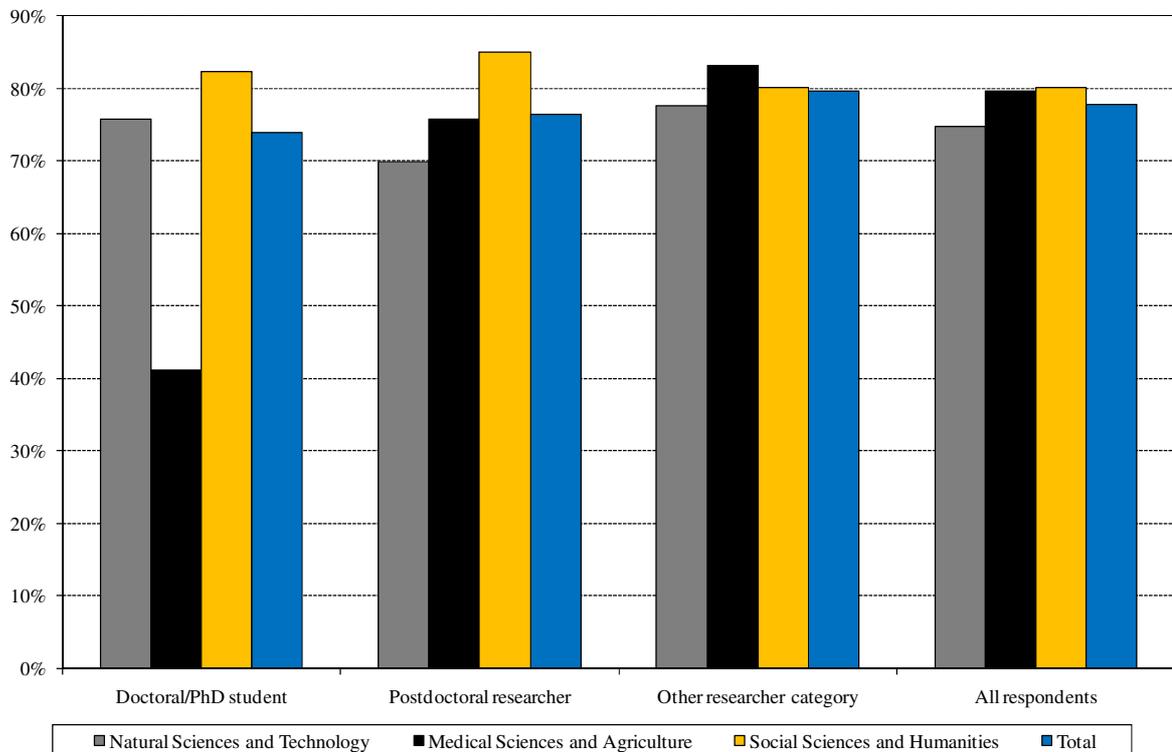
Figure 3: Share of internationally mobile researchers in the EU27 HEI sector having experienced **at least** one move to a new employer in another country in their research career by field of science and by researcher type. n=2,586.



Source: MORE Study: Mobility Survey of Researchers in the Higher Education Sector, 2009.

Note: Mind that it is not clear what a “move to a new employer in another country” may mean for a doctoral student as in many, perhaps most, cases such students are not employed. However, we have chosen not to remove this category from the figure as these responses are of course included in the ‘all respondents’ category. This is because these three researcher categories are of necessity applied to all respondents and hence, here as well as throughout the entire report, we always present results for each one of these three types for completeness.

Figure 4: Share of international mobile researchers in the EU27 HEI sector having experience of **at least** one research visit (3 months or more) to another country in their researcher career by field of science and by researcher type. n=2,586.

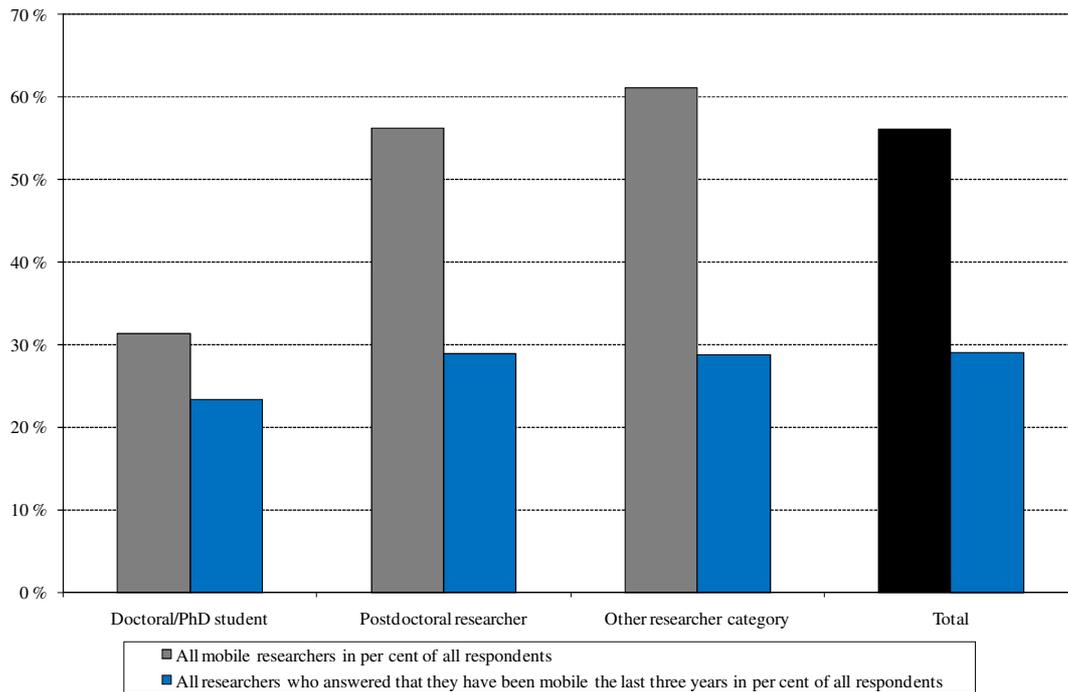


Source: MORE Study: Mobility Survey of Researchers in the Higher Education Sector, 2009.

Recent experience of international mobility

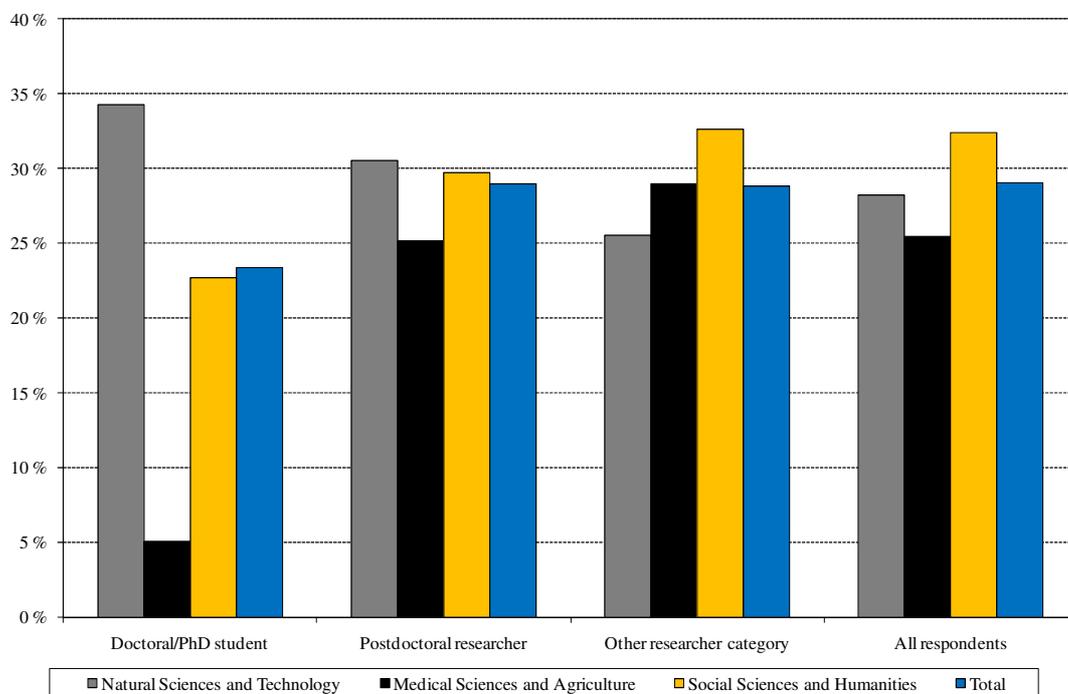
From Figure 5 we can compare the different proportions of doctoral, post-doctoral and “other researcher” types in EU27 HEIs across all scientific domains who have been internationally mobile, either recently (in the last three years) or during the course of their researcher career as a whole. The findings show that recent experience of international mobility, at just under 30%, is almost exactly the same for all researcher categories with the exception of current doctoral researchers, whilst experience of international mobility across the whole of the researcher career is, not surprisingly, more common in the “other researcher” category, which is likely to include those with the longest research careers. We thus find (see also Figure 6) that 29% of all EU27 HEI researchers have experienced international mobility (both international job mobility and research visits not involving a change of employer) within the last three years. Also from Figure 6, we can see that (taking all researchers across the three broad scientific domains) current doctoral researchers are, not surprisingly, least likely to have experienced international mobility within the last three years (23%). However, interestingly, we also find that doctoral researchers working in Natural Sciences and Technology fields are more likely to have been internationally mobile in the last three years (34%) than researchers at any career stage in any other broad scientific domain. Only a very small share (5%) of current doctoral researchers in Medical Sciences and Agriculture fields has experienced international mobility in the last three years.

Figure 5: Mobile researchers by researcher type as a share of all researchers in EU27 HEI sector. n=4,538.



Source: MORE Study: Mobility Survey of Researchers in the Higher Education Sector, 2009.

Figure 6: Share of researchers who have been internationally mobile in the last three years among all researchers in the EU27 HEI sector by field of science and by researcher type. n=4,538.



Source: MORE Study: Mobility Survey of Researchers in the Higher Education Sector, 2009.

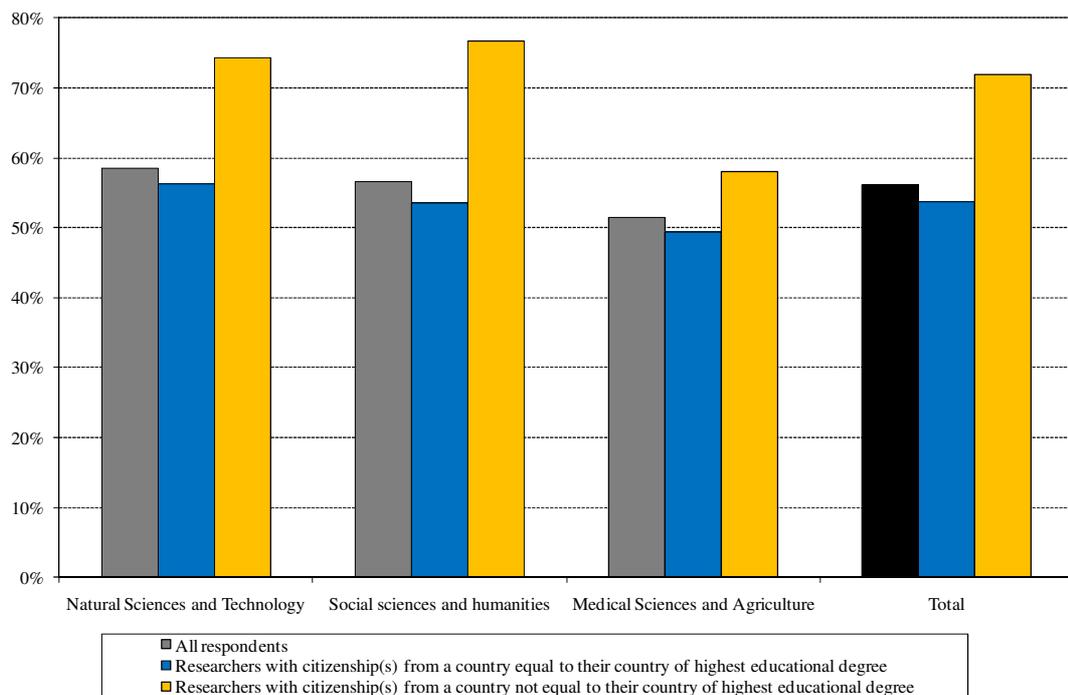
Educational mobility and research mobility

The survey results provide strong evidence that previous experience of mobility during a researcher’s educational career and research training is positively associated with the likelihood of being internationally mobile during the subsequent research career. Figure 7 shows that researchers having obtained their highest degree in a country other than that of their citizenship are over-represented in the group of previously internationally mobile researchers, the same pattern holding for each of the three broad scientific domains. This raises interesting questions about the role of formal exchange programmes.

Figure 8 shows that more than 20% of all EU27 HEI researchers have been mobile as a student (under exchange programmes such as ERASMUS).

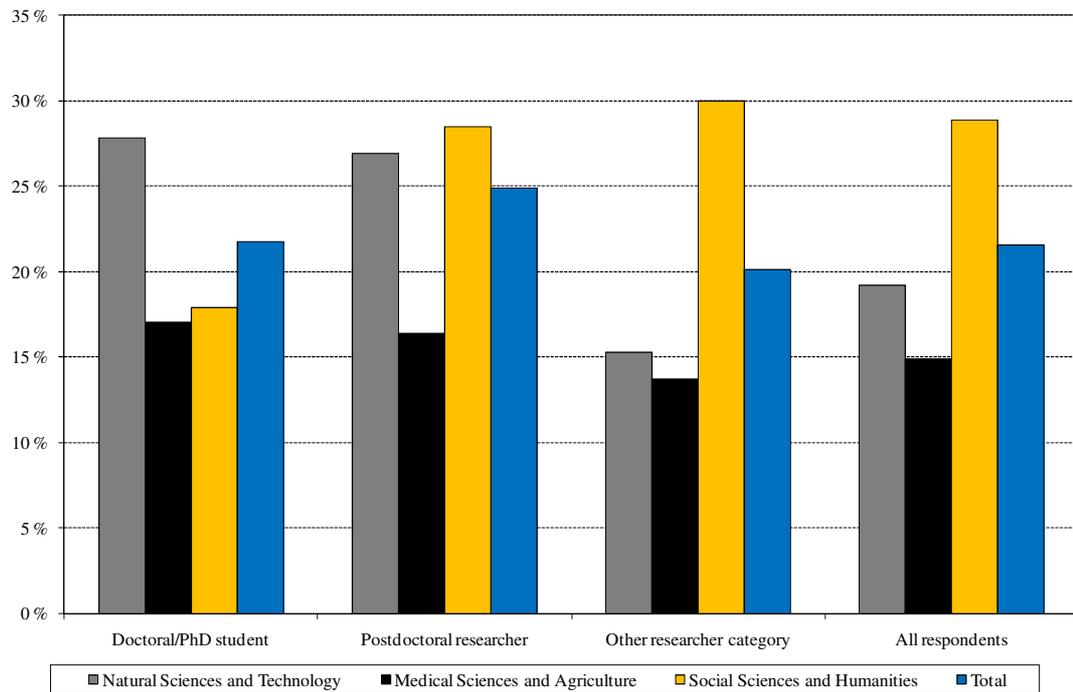
A regression analysis of the survey results (see Annex 5) reveals that there is a strong link between international mobility as a researcher and mobility as a student, i.e. those who were mobile as a student are clearly more likely to be mobile as researchers.

Figure 7: Share of international mobile researchers in the higher education sector in EU27 by field of science, and by country of attainment of highest degree (blue columns for country of citizenship, yellow columns for a country other than country of citizenship). n=4,538.



Source: MORE Study: Mobility Survey of Researchers in the Higher Education Sector, 2009.

Figure 8: Share of all researchers in the higher education sector in EU27 by field of science and by researcher category who have previously been mobile as part of a post-secondary student exchange programme. n=4,533.



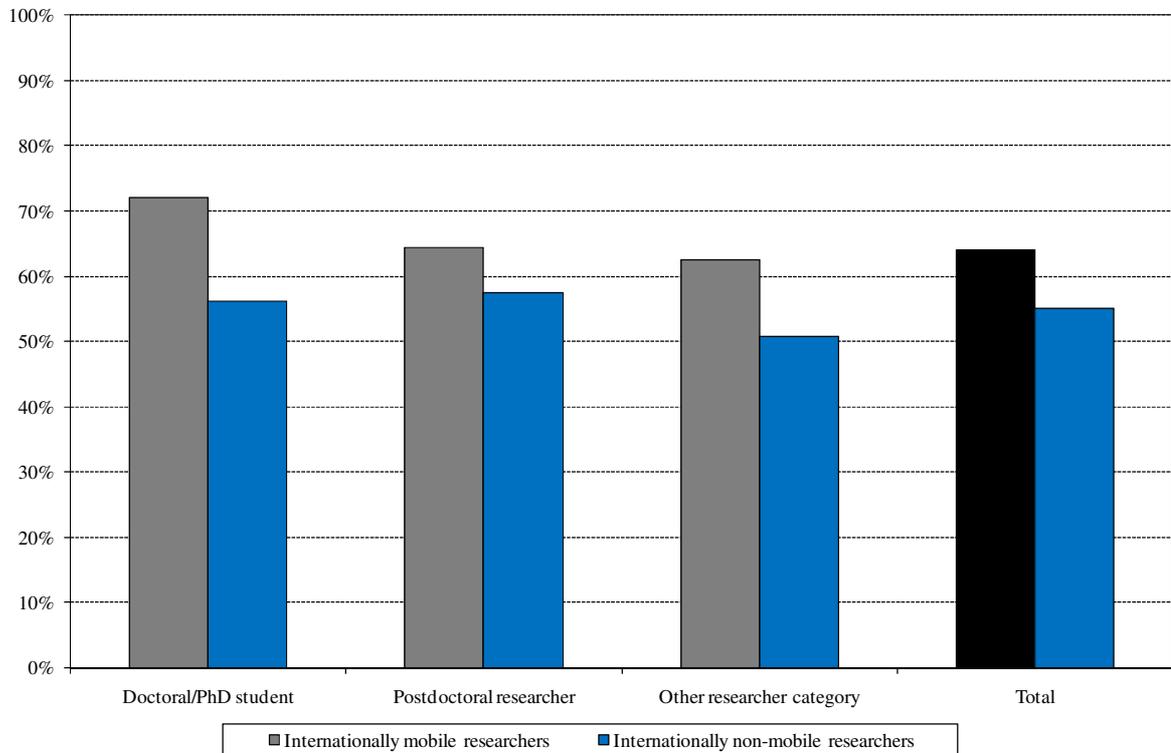
Source: MORE Study: Mobility Survey of Researchers in the Higher Education Sector, 2009.

Future intentions and impacts

A further focus for our survey was the perceptions that researchers had in terms of the impact previous experience of international mobility has had on their research careers. We also asked researchers to tell us about their future intentions as regards international mobility. Figure 9 shows the share of EU27 HEI researchers who have actively considering international mobility in the future. We can see that 64% of researchers with previous experience of international mobility have considered further mobility in the future, whilst 55% of researchers who have no previous experience of international mobility have also considered international mobility in the future. Coupled with the findings about the impact of previous undergraduate mobility on likelihood of future mobility we can conclude that mobility breeds mobility.

Of those who have no previous experience of international mobility, post-doctoral researchers are most likely to have considered being mobile in the future (57%) whilst of those with previous experience doctoral researchers are most likely to be considering further mobility (72%). The share of researchers who have actively considered future mobility is lowest amongst the "other researcher" category likely to capture those with more research experience and longer researcher careers, suggesting that experience of mobility in the early stages of a researcher career are most likely to have a positive impact in terms of future motivation towards international mobility.

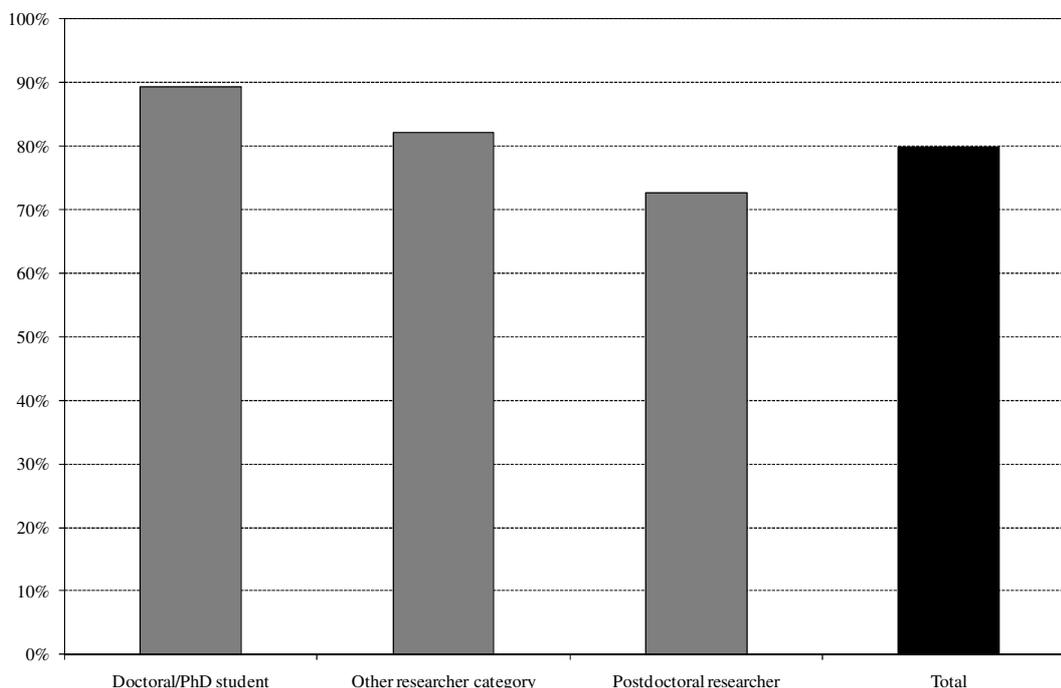
Figure 9: Share of researchers in the EU27 HEI sector who have **actively considered** international mobility in the future by mobility status (i.e. whether they have been internationally mobile at least once in their researcher career or not) and by researcher type. *n*=2,584 for internationally mobile researchers, and *n*=1,949 for internationally non-mobile researchers.



Source: MORE Study: Mobility Survey of Researchers in the Higher Education Sector, 2009.

Finally, turning to perceptions of impact of international mobility upon career progression, we can see from Figure 10 that 80% of all EU27 HEI researchers with experience of international mobility believe that mobility has had positive or significantly positive impacts upon their career progression. This share is highest for doctoral students, perhaps suggesting some expectation rather than realisation of career progression benefits amongst respondents in this category.

Figure 10: Share of researchers in the EU27 HEI sector among all those with experience of international mobility who believe that mobility has had **positive or significant positive** impacts on their career progression by researcher type. n=2,584.

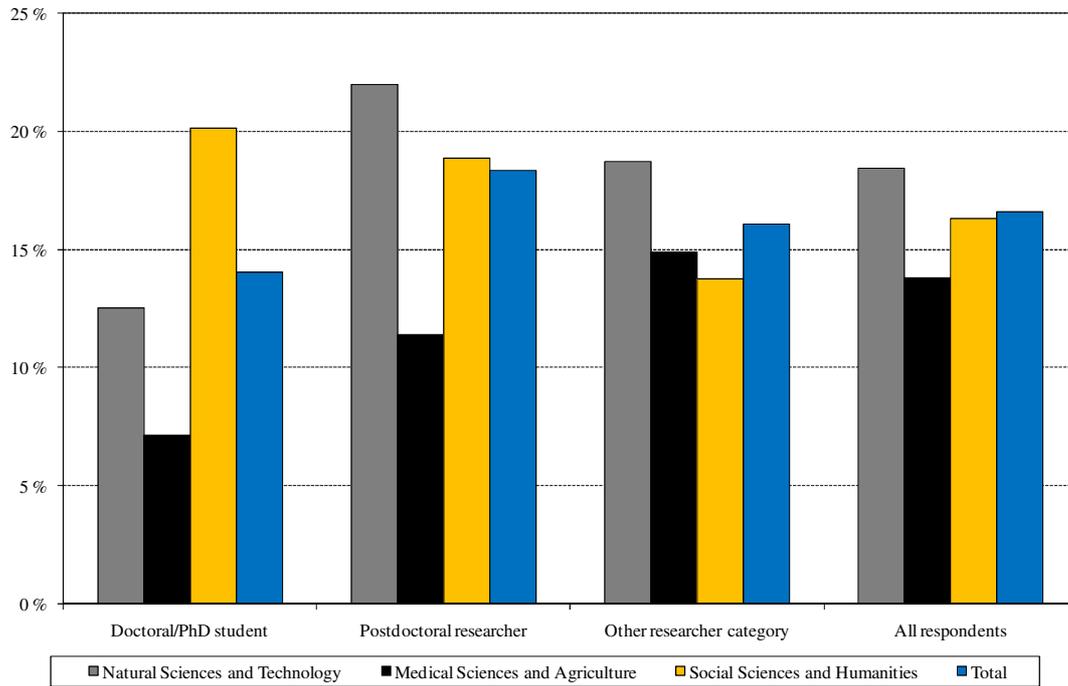


Source: MORE Study: Mobility Survey of Researchers in the Higher Education Sector, 2009.

Job mobility

An interesting finding of the survey is that job-to-job mobility, both intersectoral and in particular intrasectoral, seems to be higher than expected. We estimate that about 60% of all EU27 HEI researchers have worked for more than one public research organisation during the course of their research career. We also estimate from our results (see Figure 11) that about 17% of all EU27 HEI researchers have worked at some point of time as researchers in the private sector. As expected, researchers within Medical Sciences and Agriculture report lower levels of intersectoral mobility than their counterparts in the two remaining fields of sciences.

Figure 11: Share of researchers in the EU27 HEI sector who have been employed as a researcher in both the public and the private sector by field of science and by current status as a researcher. n=4,537.



Source: The Mobility Survey of the Higher Education Sector.

E. ABOUT THE MORE PROJECT

This Policy Brief has been compiled by Kieron Flanagan of the Manchester Institute of Innovation Research at Manchester Business School (University of Manchester, UK) and by Aris Kaloudis and Pål Børing at NIFU STEP (Norway).

The three main objectives of the MORE project as a whole are, to:

- Update and further develop existing indicators on mobility in Europe²
- Develop further insights into the factors inhibiting or supporting the mobility and career development of researchers
- Develop new studies on mobility and career paths of researchers to supplement the existing information

A final report is due to be submitted to the Commission in July 2010 and will be made publicly available upon approval.

² Namely those collected under the aegis of the Integrated Information System on European Researchers (IISER) study, see: <http://ftp.jrc.es/EURdoc/JRC46823.pdf>.

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ACKNOWLEDGEMENTS

This report has been prepared by Aris Kaloudis (NIFU STEP) and Kieron Flanagan (University of Manchester) and is the result of a vast amount of co-ordinated work efforts done by the MORE consortium.

Chapter 1 has been prepared by Aris Kaloudis and Kieron Flanagan. Chapter 2 has been prepared by professor Yiannis Bassiakos (University of Athens) with contribution from Aris Kaloudis (NIFU STEP). Chapter 3 has been prepared by Nikos Maroulis (Logotech, Greece) and Aris Kaloudis (NIFU STEP). Chapters 4 and 5 have been prepared by Pål Børing (NIFU STEP) with contributions from Aris Kaloudis (NIFU STEP). Chapter 6 has been prepared by Kieron Flanagan (University of Manchester) and Aikaterini Karakasidou (University of Manchester) with assistance from Yanuar Nugroho, Dimitri Gagliardi and Deborah Cox (also all University of Manchester). Yiannis Bassiakos (University of Athens) has provided advice and additional analytical support throughout.

Comments on a draft version of this report have been received from Yiannis Bassiakos, Bernd Ebersberger, Sharon Levin and Philippe Mogu  rou (members of the Quality Assessment Team). We thank them all for their valuable comments and recommendations.

The questionnaire of the Mobility Survey of the Higher Education Sector has been prepared by NIFU STEP and University of Manchester in close collaboration with IDEA Consult. Peter Whitten (DG RTD) and his colleagues provided valuable comments throughout the entire period of preparation of the survey questionnaire.

The demanding logistics of the overall survey exercise, including the identification of a large number of universities, university departments and all contact information of more than 40,300 researchers from the Higher Education sector in EU27 have been undertaken by Nikos Maroulis (Logotech), Alexandros Nioras (Logotech) assisted by MRB Hellas (Greece). Professor Yannis Bassiakos (University of Athens) designed the sampling methodology and supervised all phases of the sampling process. Further, Nikos Maroulis (Logotech) programmed and implemented the web survey.

Special thanks go to Arnold Verbeek (IDEA Consult) and Elissavet Lykogianni (IDEA Consult) who throughout the entire survey exercise provided overall guidance as Project Director and Project Manager, respectively.

1 INTRODUCTION

The development and production of indicators on researchers, their mobility patterns and their career paths is acknowledged as a key priority for the design of policies promoting the European Research Area (ERA). Yet, though a clear definition of researchers is available and provided by the Frascati manual (OECD, 2002), the measurement of stocks of researchers and, in particular, the measurement of researchers mobility patterns remains a challenging task. The only harmonised European data-collection on R&D-personnel is the Research and Development survey under the responsibility of Eurostat (regulation 753/2004). This survey collects, among other things, data on Research and Development personnel, but the provision of information on researcher mobility patterns is not a part of the survey. Furthermore, the Frascati manual does not provide guidelines on how to define and measure mobility of R&D personnel.

Therefore, and as an attempt to improve our knowledge in this area this report presents:

- 1) Definitions of different types of researcher mobility.
- 2) A novel methodology for measuring researcher mobility patterns in the EU27 based on survey data from the Mobility Survey of the Higher Education Sector.
- 3) New indicators on European researcher mobility by (broad) scientific field and type of researcher (in particular, distinguishing PhDs, post-docs and other types of researchers).
- 4) The sampling method of the survey has been designed with the purpose of constructing well-behaved indicators of mobility in EU27.
- 5) A thorough analysis of drivers and barriers of mobility as perceived by the respondents.

In this chapter we discuss the concept of researcher mobility with some key definitions. Section 1.2 provides an overview of the content of this report. Section 1.3 summarises the main findings.

1.1 The concept of researcher mobility and research questions

We define researchers as the “professionals engaged in the conception or creation of new knowledge, products, processes, methods and systems and also in the management of the projects concerned” (Frascati Manual, OECD 2002).

The concept of *mobility* normally relates to three types of movements, that is, the geographical, job mobility and mobility related to research visits.

Geographical mobility refers to the physical movement of an individual to another region, nation or continent. Depending on the original place (sender) and new place (receiver), we can distinguish between the following types of geographical mobility:

- *Regional mobility*: mobility to another region within the same country.
- *International mobility*: mobility to another country (possibly other continent). International mobility flows can be classified as: Intra-EU mobility; Inflows into EU from other (“third”) countries; Outflows from EU to other countries (e.g. US, Japan, China, India, etc.).

Job mobility is the concept used to describe the movement to another job. Depending on the nature of the new job, the following types of job mobility can be distinguished:

- *Career mobility*: carry out a different job (occupational category) for the same employer (e.g. moving from junior to senior researcher/manager, etc.).
- *Intrasectoral mobility*: carry out the same job for another employer in the same sector (e.g. moving as a post-doc researcher from one university to another).
- *Intersectoral mobility*: carry out a researcher job for another employer in another sector (e.g. moving from university to industry or vice versa).

Researchers, in particular university researchers, do not always change employer contracts, but are nevertheless moving to another country or sector for some time. The latter phenomenon is called "*research visits*" (i.e. exchanges of staff). So far, little is known about this phenomenon. Therefore we have incorporated and measured this type of movements in the present Mobility Survey of the Higher Education Sector. We define research visits as: a mobility event lasting at least 3 months and without a change of employer. Though considering research visits as a mobility event deviates from the traditional Eurostat definition in which mobility is only considered as job-to-job mobility, the Mobility Survey data enables us to distinguish between job-to-job mobility events on the one hand and on the other hand research visits.

The main focus of the present study was on *measuring international researcher mobility patterns and inter- and intrasectoral researcher mobility patterns, as well as, the occurrence of international research visits*. Career and regional mobility is not the subject of this report.

Implementation of mobility definitions in the questionnaire

The main geographical mobility questions in the survey were the following:

- a) *In your researcher career (which also encompasses the whole period of your PhD education) have you worked in another country than the country where you attained your highest educational degree, including research visits of 3 months or more? (NOTE: For this project, if you answer yes to this question you are considered as an "internationally mobile" researcher.):* Yes / No

- b) *If yes in question a, did any of these instances of international mobility involve:*

	Yes	No
A move to a new employer in another country?	<input type="checkbox"/>	<input type="checkbox"/>
A research visit to another country without a change of employer?	<input type="checkbox"/>	<input type="checkbox"/>

- c) *If yes in question a, have you been internationally mobile the last three years?* Yes / No

Perhaps, question (a) is the most counter-intuitive and requires some comments and a justification.

Both the Frascati Manual and the definitions used in this study consider all PhD-students engaged in R&D as researchers. Thus, a researcher – also a PhD-student – who never moved from the country where he/she attained the highest educational degree is considered as a non-internationally mobile researcher even if this person before the commencement of his/her researcher career has moved from another country to the country where he/she attained his/her highest educational degree for educational or other purposes. With this clarification we achieve a more precise definition of the phenomenon of *internationally mobile researcher*, since we exclude all cases of *student mobility* or *economic or social migration incidents* unrelated to research activities.

The main sectoral mobility questions in the questionnaire were the following:

d) Which of the following ‘career paths’ best describes your situation? i) I started as a researcher in the public sector, after which I moved to the private sector. I have since moved back to the public sector; ii) I started as a researcher in the private sector, after which I moved to the public sector. I am still working in the public sector; iii) Other, please specify.

e) During your employment career as a researcher have you worked for more than one public research organisation (university, higher education institution or other public research institute)? Yes / No

f) How many times have you moved job from one public research organisation (university, institute of higher education or other public research institute) to another?

The temporal dimension of mobility events

Mobility can be of a temporary nature or it can be permanent. The distinction between these two types does not only depend on the time span of the movement (i.e. length of stay), but is also linked to the intentions of the mobile person. If the individual researcher wishes to return to the previous location, then the mobility event could be considered temporary. If the individual researcher is not interested in returning, the move could be considered as “permanent”. In this study we do not investigate “temporal” aspects of observed researcher mobility.

However, we do measure shares of EU27-researchers having experience of at least one international mobility event (job-to-job mobility and/or research visits) during their entire researcher career *and* shares of researchers with experience of at least one international mobility event (job-to-job mobility and/or research visits) the *last three years* of their researcher careers. Further, we also investigate and measure researchers’ intentions regarding future mobility both among those who have never been internationally mobile and among those who have experience with at least one event of international mobility.

Combining several research positions – joint appointments

So far we only considered types of mobility occurring sequentially in time (i.e. a researcher moves from one location to another). It is, however, possible that a researcher combines two or more research jobs at the same point in time. These

seconding positions can be held within the same organisation (i.e. a medicine professor who works both at a university hospital clinic and in the same university's department of medicine), in two different organisations within the same sector (i.e. in two different universities) and in the same country, in two different organisations in two different sector (i.e. at a university and at a lab in a private company) but still in the same country, or in two (or more) different countries (not so uncommon phenomenon for a researcher living close to the border of two countries). This issue has not been investigated in the Mobility Survey of the Higher Education Sector.

Influencing factors, motivations and impact of mobility

Based on the Mobility Survey data we also investigate factors which influence the mobility flows of researchers. We call them "**influencing factors**", because the same factors can be either driving or facilitating elements (push factors) or hampering elements (pull factors). Depending on the individual researcher, particular factors may be so important that they can be considered as the *main motivations* for being mobile.

We may also distinguish between *positive, neutral and negative* effects of mobility. At a research system level we would assume that researcher mobility stimulates the flow of tacit knowledge within the system (positive impact), but there can be negative as well as positive impacts. For example, a type of mobility which traditionally is considered as negative is the one where qualified human capital from non-frontier research countries goes abroad. This phenomenon is known as "brain drain". The international literature, however, in the 90s documented a high rate of return for this personnel recorded in countries such as China, India or Taiwan and because of that scholars have argued that it is more appropriate to talk about "brain circulation" than "brain drain" (or brain gain, brain waste, etc.). Though impacts of mobility, is not a central theme of this report, we do present results from the Mobility Survey of the Higher Education Sector which provide valuable information on impacts of mobility (or non-mobility), in particular at the level of the individual researcher career.

1.2 The content of the report

The focus in this report is on the career path and international mobility among EU27 researchers in the higher education sector, and on the main factors inhibiting mobility and career development of EU27 researchers in this sector.

Chapter 2 provides key definitions and technical details on the methodology that has been used for designing and targeting the sample of researchers in the higher education sector, as well as, technical details on the formulae applied for the measurement of mobility shapes and other issues.

Chapter 3 describes the implementation phases of the Mobility Survey of the Higher Education Sector. The last section in the chapter discusses the limitations stemming from the practical difficulties we met in the design and the implementation phase of the survey.

Chapter 4 provides estimates of key-characteristics of the researcher population in the higher education sector in EU27 as calculated from the survey responses and based on the methodology developed in Chapter 2.

Chapter 5 presents new indicators on international and intersectoral researcher mobility for researchers in the higher education sector in EU27 and measures in-

tentions regarding respondents' future mobility plans both for those that are internationally mobile and those who are not internationally mobile.

Chapter 6 analyses influencing factors, motivations and impact of mobility on researcher careers based on the Mobility Survey data of the Higher Education Sector.

2 METHODOLOGY AND DEFINITIONS

The general principle followed in the entire MORE project and, consequently, also in the *Mobility Survey of the Higher Education Sector* was to anchor the entire survey methodology exercise to the main R&D definitions provided by the Frascati manual (OECD 2002) and to Eurostat statistics on R&D personnel (*researcher head counts*) in the EU27 by performing sector and by scientific field. The main reason for that is because the MORE project has the ambitious goal of providing *representative* statistics of mobility behaviour among *all* researchers in the EU27 higher education sector.

This goal implies that the answers from the respondents can be weighted in such a way that the aggregate estimates must correspond to the EU27 population of researchers. The overall methodology of the survey focused therefore on targeting the sample of the respondents in a manner permitting a valid extrapolation of the answers we collected to the overall population of researchers in EU27.

For the Mobility Survey of the Higher Education Sector, the overall number of the population of researchers in the higher education sector in EU27 is defined as the sum of the number of researchers (head count) in this sector in all 27 Member States based on the Eurostat statistics (year 2006) in six fields of science and technology, that is, *Natural Sciences, Engineering and Technology, Medical Sciences, Agricultural Sciences, Social Sciences and Humanities*. When information was missing in the official Eurostat statistics, we estimated the missing values on the basis of information from previous years or by using FTE (full time equivalent) statistics³. In this way, we constructed a 27X3 table with statistics and estimates of the number of researchers in 27 Member States and in three aggregated scientific fields. These are:

1. *Natural Sciences and Technology* (abbreviated as NATURAL in this report). The number of researchers in this field is the sum of Eurostat figures for *Natural Sciences* and *Engineering and Technology*.
2. *Medical Sciences and Agriculture* (abbreviated as HEALTH in this report). The number of researchers in this field is the sum of Eurostat figures for *Medical Sciences* and *Agricultural Sciences*.
3. *Social Sciences and Humanities* (abbreviated as SOCIAL in this report). The number of researchers in this field is the sum of Eurostat figures for *Social Sciences* and *Humanities*.

2.1 Sampling method for the Mobility Survey

The target group for the Mobility Survey are researchers in the higher education sector. The higher education sector is defined in the Frascati Manual as:

- A) *All universities, colleges of technology and other institutions of post-secondary education, whatever their source of finance or legal status.*
- B) *It also includes all research institutes, experimental stations and clinics operating under the direct control of or administered by or associated with higher education institutions.*

³ The total number of (head count) researchers in the higher education sector in 2006 is, therefore, our estimate, and not Eurostat data estimates.

The best basis for conducting our survey (and other similar future surveys) would have been of course a list of all researchers in all Higher Education Institutions (HEI) which are included in the Eurostat statistics. Such a list does not exist. Neither a complete list of all HEI with information on the number of researchers within each department exists. The available information consists of fragmented (and incomplete) lists of universities and departments of universities in the various countries.

Under these circumstances, the sampling method used for the Mobility Survey of the Higher Education Sector is a two-stage stratified cluster sampling with a specific number of *stratification variables*⁴.

In the two-stage stratified cluster sampling we used two stratification variables for the Mobility Survey of the Higher Education Sector. These are *country* and *field of science*. This resulted in 81 *strata*⁵ (the 27X3 table); 27 EU member countries and three fields of science. We repeat that the three fields of science are (i) Natural Sciences and Technology, (ii) Medical Sciences and Agriculture, and (iii) Social Sciences and Humanities. The cluster sampling has been used within each stratum.

Clusters are the individual departments of universities. The precise definition of a cluster is "Department A of University B in Country C and Field of Science D". Each stratum will, therefore, consist of at least one cluster, and will be a specific department of a university within this stratum. A department within each university is defined as a "degree conferring unit of the university". Usually, it will correspond to a particular science, for example Mathematics.

Sampling definitions

As in any survey, one should start by defining the necessary quantities and concepts needed to conduct a scientifically sound survey.

- **Population:** The total population of researchers in EU27 is: "Researchers are professionals engaged in the conception or creation of new knowledge, products, processes, methods and systems and also in the management of the projects concerned." This definition covers professionals with tertiary (or higher) education and not "technicians and equivalent staff" & "other supporting staff"⁶.
- **Population member:** Each researcher defined above.
- **Sampling Frame:** A full list of the researchers in the population, along with all information necessary to identify and contact them (such a list does not exist).

⁴ See Annex 1 for a discussion on sampling methodologies and for a justification of why a two-stage stratified cluster sampling is the best for this particular study.

⁵ It should be noted that the actual number of strata is 77, since the final sample did not contain any researchers from four strata. The impact of this omission is negligible, since these strata contained fewer than 500 researchers in a population of roughly one million researchers.

⁶ Note that the definition of researchers is not restricted only to tertiary educated, but covers also professionals with lower than tertiary education. Also note that there is no official definition as such of postdoctoral researchers, but our analysis is based on a self-assessment question in the Mobility Questionnaire of the Higher Education Sector (see Question 34 in Annex 2).

- **Sampling unit:** Implies the members in the population, i.e. individual researchers, which are to be included in the sample.
- **Stratification variable:** Any variable identifying particular characteristics of the members of the population, which are known, or suspected, to be related to the characteristics under measurement by the survey. In the present case the stratification variables are: a) Country with 27 levels, the 27 EU member countries; b) Scientific area with 3 levels, Natural Sciences and Technology, Medical Sciences and Agriculture, and Social Sciences and Humanities.
- **Cluster:** Any grouping of population members based on some characteristic they have in common (usually of geographic nature). In the present survey clusters will be the individual departments of universities. A department, within each university, is defined as a "degree conferring unit of the university" and it will usually correspond to a particular science, such as, for example Mathematics. Within each institute, it is defined as the division which has a degree of autonomy and pursues research in a particular field of science.

The following sections present the estimates of proportions and their (estimated) variances, which have been used in the sample size calculations and, once the surveys are completed, *in the analysis of the results*.

2.2 Estimation methodology

In this survey the following methodological issues form the basis for the sampling process and the estimation of the proportions and their variance.

"Cluster (population) Frame": The list of all clusters of the population, presented in such a manner, that any cluster can be identified, located and contacted. This list will also contain the stratification parameters. In order to compile this frame and use in the sampling algorithm, information on the number of the clusters within each stratum in each of the EU27 member countries will be needed. The sizes of the clusters will be assumed unknown, since such information is unavailable in a large subgroup of EU27 countries. In order to implement two stage stratified cluster sampling, the sampling frame should be a file with the stratification parameters as the variables and the clusters as the records. The stratification parameters are: a) *Country*: 27 levels, corresponding to EU27 and b) *Field of Science*: three levels. For each combination of stratification parameters values there will be as many records as clusters. As mentioned, the definition of a cluster will be "Department of University or Research Institute X in Country Y and Field of Science Z".

This choice of clusters was made, because increasing the number of clusters brings the resulting estimators closer to being unbiased. Each record will correspond to a single cluster (for example "Malta, University of Valetta, Dept. of Mathematics", which implies as many entries for University of Valetta as departments in Natural Sciences exist within it).

2.2.1 Estimators and their properties

The sample size and allocation method was based on estimating proportions - with particular focus on estimating proportions of mobile researchers. The final sample selection method has been *stratified cluster sampling*, with strata the country-field of science combination and clusters the University as appropriate. The final sample size is not pre-determined since the number of researchers is

not known in all clusters, but it will be a function of the particular clusters, which are selected in the sample. Within each stratum h , a single stage cluster sampling has been applied, selecting a random sample of clusters of size m_h . In order to calculate m_h for each stratum, the sampling fraction from each cluster (f_2) will be set equal to 5%. This proportion was chosen based on the average cluster size, so that it would correspond to the initial sample size.

The sampling fraction (f_h^*) of individuals from each stratum will be based on the initial sample size n , and will be equal to $\frac{n_h}{n}$, where n_h is the initial sample size within each stratum. The sampling fraction (f_1) of clusters from each stratum will be equal to $\frac{m_h}{M_h} = \frac{f_h^*}{f_2}$, hence from each stratum h , $m_h = M_h \cdot \frac{f_h^*}{f_2}$ clusters will be selected with simple random sampling (M_h is the number of clusters in stratum h of the population). Since the number of individuals within each cluster is not known, the final sample size within each stratum will be a function of the clusters selected, thus it will be a random variable itself. As a result, the proportion will be estimated by a ratio estimator, which will be slightly biased. The larger the number of clusters selected from each stratum, the smaller this bias will be. It should be noted here that cluster sampling leads to larger variance of the estimators, which is partially mitigated through stratifying during the first stage of the sampling process. The estimate of the overall proportion (for example the proportion of internationally mobile researchers) and its estimated variance in the full sample and the method to derive the proportion estimate and its estimated variance within each stratum are presented below (see point b).

Further, c) and d) present the formulae for the calculation of the sample mean and its variance within each stratum and overall, respectively. Finally, in point e), the method to estimate proportions and means for subpopulations within the original population is presented. Such sub-populations are the result of conditional answers, as for example in the case of recent (within the last three years) mobility, present only in the sub-sample which was classified as mobile through the positive answer in a previous question about mobility in general.

a) Sample per cent or proportion and its variance within each stratum

Within each stratum an estimate for the proportion is $\hat{p}_h = \frac{\sum_{i=1}^{m_h} B_{hi} \hat{p}_{hi}}{\sum_{i=1}^{m_h} B_{hi}}$, where

$$\hat{p}_{hi} = \frac{\sum_{k=1}^{\beta_{hi}} y_{hik}}{\beta_{hi}}, \text{ with } B_{hi} \text{ the number of elements in cluster } i \text{ of stratum } h \text{ and } \beta_{hi}$$

the number of elements, sampled from cluster i of stratum h and y_{hik} the sample observations (=1, if the characteristic under measurement is present, =0 otherwise), i.e. \hat{p}_{hi} is the proportion estimate in cluster i of stratum h . The estimated variance of \hat{p}_h is:

$$S_h^2 = \frac{1}{m_h \cdot \bar{B}_h^2} \cdot \frac{\sum_{i=1}^{m_h} (B_{hi} \hat{p}_{hi} - B_{hi} \hat{p}_h)^2}{m_h - 1} \left(1 - \frac{m_h}{M_h}\right) + \frac{M_h}{n_h^2 m_h} \sum_{i=1}^{m_h} \left[B_{hi}^2 \frac{\hat{p}_{hi}(1 - \hat{p}_{hi})}{\beta_{hi} - 1} \left(1 - \frac{\beta_{hi}}{B_{hi}}\right) \right] \quad (1).$$

The first term of the sum above is the variance between clusters, while the second is the variance within each cluster.

b) Sample per cent or proportion and its variance for the full sample

An estimator of the per cent or proportion is defined as:

$\hat{p}_{st} = \sum_{h=1}^L W_h \hat{p}_h$ where $W_h = \frac{N_h}{N}$ is the stratum weight, N_h the number of elements in stratum h of the population, N is the number of elements in the population, L is the number of strata, and \hat{p}_h is the sample proportion within stratum h , as defined in the previous section.

The estimator of the variance of the sample proportion is:

$$S_{st}^2 = \sum_{h=1}^L W_h^2 S_h^2, \text{ where } S_h^2 \text{ is given in equation (1) above.}$$

The results yield nearly unbiased estimators when the number of clusters sampled within each stratum is over 30. The bias is a decreasing function of the number of clusters. On the other hand, it is quite difficult to get the information needed for sampling purposes for many clusters. A good compromise is achieved when the sampling rate within each cluster is fixed at 5%, as mentioned in a) above. With these assumptions, the calculations in point a) give the number of clusters to be selected in stratum h .

c) Sample mean and its variance within each stratum

Within each stratum an estimate for the mean is $\bar{X}_h = \frac{\sum_{i=1}^{m_h} B_{hi} \bar{X}_{hi}}{\sum_{i=1}^{m_h} B_{hi}}$, where

$$\bar{X}_{hi} = \frac{\sum_{k=1}^{\beta_{hi}} x_{hik}}{\beta_{hi}}, \text{ with } B_{hi} \text{ the number of elements in cluster } i \text{ of stratum } h \text{ and } \beta_{hi}$$

the number of elements, sampled from cluster i of stratum h and x_{hik} the sample observations, i.e. \bar{X}_{hi} is the mean estimate in cluster i of stratum h . The estimated variance of \bar{X}_h is:

$$S_h^2 = \frac{1}{m_h \cdot B_h^2} \cdot \frac{\sum_{i=1}^{m_h} (B_{hi} \bar{X}_{hi} - B_{hi} \bar{X}_h)^2}{m_h - 1} \left(1 - \frac{m_h}{M_h} \right) + \frac{M_h}{n_h^2 m_h} \sum_{i=1}^{m_h} \left[B_{hi}^2 \frac{S_{hi}^2}{\beta_{hi}} \left(1 - \frac{\beta_{hi}}{B_{hi}} \right) \right] \quad (2),$$

where S_{hi}^2 is the sample variance within cluster i of stratum h . The first term of the sum above is the variance between clusters, while the second is the variance within each cluster.

d) Sample mean and its variance for the full sample

An estimator of the mean is defined as $\bar{X}_{st} = \sum_{h=1}^L W_h \bar{X}_h$, where $W_h = \frac{N_h}{N}$ is the

stratum weight, N_h the number of elements in stratum h of the population, N is the number of elements in the population, L is the number of strata, and \bar{X}_h is the sample mean within stratum h , as defined in the previous section. The estimator of the variance of the sample mean is $S_{st}^2 = \sum_{h=1}^L W_h^2 S_h^2$, where S_h^2 is given in equation (2) above.

Important note: All calculations above are based on the assumption that the desired accuracy of the estimates (E) of the proportions **in the full sample** will be ± 0.02 , and the confidence level $\alpha=0.05$.

It should be made clear that the final sample size of the survey differs slightly from the designed one, since the number of elements in the sample will be a function of the clusters selected. As a result, the final accuracy of the estimates may differ slightly from the pre-determined ones.

2.2.2 Conditional estimates

A number of questions in the survey are conditional to whether the respondent replied with a yes or no to the question of international mobility (see question 55 in the questionnaire in Annex 2) in the sense that the respondent gets different sets of questions after responding to this question.

This conditional probability is, in particular, important when we estimate the full sample (EU27) shares of the recently mobile researchers (those who answered yes in question 58 of the questionnaire: "Have you been internationally mobile the last three years?") on the population of all mobile researchers.

In calculating these shares, we follow exactly the same methodology as in Section 2.2.1 with two modifications. First, we use the estimates of the proportions of internationally mobile researchers within each stratum to estimate the number of internationally mobile researchers and the cluster sizes within each stratum of this "internationally mobile population". This is done by multiplying the percentage mobile by the corresponding numbers in the original population, in each of the 77 strata by multiplying the original cluster count within each stratum by the proportion of clusters that had mobile researchers in the original sample stratum, as there are clusters (that is, university units) where *all* researchers answered that they are not mobile.

Estimating conditional proportions or means

If a proportion or a mean is calculated in a sub-sample of the original sample conditioned to the answers the respondents provide in the questionnaire, the following problem arises: the population cluster counts and sizes as well as stratum sizes and the overall population count are no longer valid, i.e. a new "population" is now under study. In the present study a researcher is classified as internationally mobile if he or she has answered positively in a question about international mobility. In a subsequent question the said researcher is asked if he/she has been recently mobile. This question is answered only by the internationally mobile researchers. This process has in fact created a new sub-population: the internationally mobile researchers. In this population key parameters have changed: i.e. population size, stratum size, cluster count and cluster size are no longer the same, and have to be estimated. The estimated values are given by the equations:

$N_{IM} = NP_{IM}$, where N_{IM} and P_{IM} the new population count and the proportion of internationally mobile researchers, respectively, and N the original population size.

$N_{IMh} = N_h P_{IMh}$, where N_{IMh} and P_{IMh} the new population count and the proportion of internationally mobile researchers within stratum h , respectively, and N_h the original size of stratum h in the population.

$B_{IMhi} = B_{hi}P_{IMh}$, where B_{IMhi} and P_{IMh} the new population count and the proportion of internationally mobile researchers within stratum h , respectively, while B_{hi} is the size of cluster i in stratum h of the original population.

Finally the new number of clusters in the population is given by $M_{IMh} = M_h P_{MCh}$, where P_{MCh} is the proportion of clusters with mobile researchers in stratum h of the population. With these estimated population parameters the formulae of Section 2.2.1 can be used to produce estimates for the proportions and the means and their variances in the sub-populations.

3 THE MOBILITY SURVEY: IMPLEMENTATION

The sample of researchers in the higher education sector has been developed in three steps following the requirements of the sampling methodology (see Chapter 2). In the first step, a list with all HEIs has been created. Then, in the second step, a database with all faculties/departments of all HEIs identified in step 1 was developed for each country. Finally, in the third step, a sample of the identified HEI departments was selected by using simple random sampling. Then a database with all researchers working in the selected clusters (that is, the university departments within each one of the 81 strata as described in Chapter 2) and their contact details has been developed. These email lists were then checked using sophisticated software and inactive emails were removed. The whole procedure is described in a greater detail in the following sections.

3.1 First step: Development of a list of universities

A database containing the universities which are members of the European Universities Association (EUA members Directory) in all EU27 countries was created. Further, this list of universities was enriched with information on HEIs found in a variety of sources such as the national HEIs associations, web sites of ministries of education, national statistical offices and other sources. This database contains information such as the names of the higher education institutions and their electronic addresses.

3.2 Second step: Development of the faculty and department database

All HEIs identified in step 1 were searched using their web sites in order to identify all the faculties or departments. The following information was gathered:

- Organisation name (HEI)
- Department name
- Field of science
- Web reference

This task was relatively time-consuming as the organisational structure of universities differs even within the same country. Therefore, a decision had to be made for each single university on what was the appropriate organisational unit to be included in the database, namely the school; the faculty; the department or the institute (for some cases this was a valid option). An effort was made to include all organisational units which provide a degree. Under this process we identified 22,648 HEIs units (clusters) which were used in the next step for cluster sampling.

Table 1 below lists the number of HEI clusters identified in the 27 Member States.

Table 1: HEIs units used for clustering.

Country	Faculties / departments
Austria	330
Belgium	305
Bulgaria	535
Cyprus	21
Czech Republic ⁷	1,071
Denmark	245
Estonia	259
Finland	484
France	1,206
Germany	3,396
Greece	464
Hungary	314
Ireland	289
Italy	1,370
Latvia	81
Lithuania	442
Luxembourg	32
Malta	26
Netherlands	693
Poland	3,796
Portugal	374
Romania	877
Slovakia	551
Slovenia	50
Spain	1,733
Sweden	760
United Kingdom	2,944
Total EU27	22,648

⁷ The large number of university units in the Czech Republic is partly the result of detailed and rich information on the Higher Education Institutions websites in this country and also a result of their structure and partly of the fact that the units found were considerably smaller than in other countries. Of course, the noteworthy lack of standardisation and the quality differences of the web-information available on national university units was a serious limitation in this study. Improving this information (e.g. through launching an EU-university portal providing standardised information) should be a priority of the EC in the next years.

3.3 Third step: Development of the researcher database

Following the methodology described in Chapter 2, we selected 1,660 HEIs units as our cluster sample from the database created in step two. Table 2 shows the distribution of clusters by stratum (that is, country and scientific field).

Table 2: Number of clusters in the realised cluster sample by stratum.

Country	Health	Natural	Social	Total
Austria	1	7	17	25
Belgium	4	9	10	23
Bulgaria	5	16	19	40
Cyprus		1	1	2
Czech Re-	20	30	29	79
Denmark	2	7	9	18
Estonia	3	8	8	19
Finland	6	11	19	36
France	4	32	52	88
Germany	19	97	131	247
Greece	3	15	16	34
Hungary	4	7	12	23
Ireland	4	6	10	20
Italy	19	40	41	100
Latvia	1	2	3	6
Lithuania	3	12	17	32
Luxembourg	1	1	1	3
Malta	1	1	1	3
Netherlands	14	14	23	51
Poland	42	11	121	278
Portugal	3	13	11	27
Romania	11	26	27	64
Slovakia	13	9	18	40
Slovenia	1	1	2	4
Spain	18	54	55	127
Sweden	9	21	26	56
United King-	22	57	136	215
Total EU27	23	61	815	1,660

From these selected units, all researchers were then counted and identified based on the information available on the websites. More specifically the following information was gathered:

- Name of researcher.
- E-mail of researcher.
- Telephone number of researcher.
- Title / position.

In some cases, the originally selected departments / faculties contained either no information about their staff, or had information only for a small share of their researchers. In these cases these departments were replaced by others in the same stratum (that is, in the same country and scientific field combination). This replacement process involved around 28% of the originally selected clusters.

In the case of France all departments were checked but the resulting outcome in terms of e-mails remained poor. So the research team complemented the above list with 5,240 new emails derived from the FP6 and FP7 databases. Unfortunately no information was available regarding their departments and filed of science. This information was collected ex-post for only the fraction of the researchers who finally accepted to participate in the survey.

Overall, 47,097 names and e-mails were collected. Their allocation per country and science field is presented in Table 3.

In order to validate the emails lists the research team randomly checked a large number of emails. Moreover, the final list of emails was checked by a software tool and bad or inactive email addresses were removed. In addition a number of researchers requested to be excluded from our e-mail lists. In total 8.9% of the original list of 47,097 emails were removed (wrong e-mails and requests to be deleted from the list) resulting in a final list of 41,857 emails.

Table 3: Number of HEIs clusters included in the sample and the respective number of researchers per country and scientific field.

Country	Number of faculties / departments				Number of email addresses			
	Health	Natural	Social	Total	Health	Natural	Social	Total
Austria	2	7	18	27	31	538	341	910
Belgium	4	10	10	24	88	279	165	532
Bulgaria	5	16	20	41	41	178	263	482
Cyprus		1	1	2		15	5	20
Czech Republic	20	30	29	79	247	447	346	104
Denmark	2	7	9	18	242	592	543	1,377
Estonia	3	8	8	19	64	147	58	269
Finland	6	11	19	36	76	251	277	604
France*	4	33	51	88	89	512	638	1,239
Germany	35	97	131	263	840	2,359	2,906	6,109
Greece	3	15	16	34	35	449	211	695
Hungary	4	7	12	23	105	374	235	714
Ireland	4	6	10	20	95	300	199	594
Italy	19	40	41	100	719	2,487	1,574	4,780
Latvia	1	2	3	6	31	176	69	276
Lithuania	6	13	17	36	81	206	225	512
Luxembourg	1	1	1	3	4	18	8	30
Malta	1	1	1	3	7	5	85	97
Netherlands	14	14	23	51	332	460	710	1,502
Poland	62	115	121	298	517	1,762	1,242	3,521
Portugal	4	13	11	28	177	494	265	936

Romania	11	29	27	67	171	546	314	1,031
Slovakia	13	9	18	40	152	190	246	588
Slovenia	1	1	2	4	10	14	84	108
Spain	18	54	56	128	635	2,484	2,233	5,352
Sweden	9	21	26	56	546	1,153	1,420	3,119
United Kingdom	22	57	141	220	703	2,346	3,307	6,356
Total	274	618	822	1,714	6,038	18,782	17,969	41,857

* Numbers for France do not include the 5,240 emails derived from FP6 & FP7 databases.

3.4 Implementation of the Mobility Survey

After an intensive period of collaboration for the development of the questionnaire for the Mobility Survey of the Higher Education Sector (April-June 2009)⁸, the survey was launched on the 26th of June 2009 and 3 reminders were sent before the closing date of the survey. The last reminder was sent on September when most researchers were back from vacations.

This process resulted in increasing the response rates for almost all countries with the exception of France. In order to overcome this difficulty the project team translated the Commission's invitation letter in French and we forwarded the invitation letter once again to all selected email addresses. In addition, a new e-mail list of French researchers collected from the FP6 and FP7 databases was created, as described in the previous sections.

The survey closed on 1 October 2009. After a quality check, cleaning of wrong entries and duplicate submissions, 4,538 completed⁹ and valid questionnaires remained in the database. The response rates and the number of respondents per country are exhibited in Table 4. As per standard statistical practice, it was agreed with the EC that we should exclude countries with small absolute levels of responses (in this case less than 40 respondents) from all figures and tables in Chapter 4 and 5. This affects the following five countries: Cyprus, Latvia, Luxembourg, Malta and Slovenia. All countries are, however, included in the Mobility Survey data of the Higher Education Sector for EU27 as a whole.

Table 4: Final realised sample of researchers in HEIs in EU27.

Country	Contacted	Completed	Per cent
Austria	721	109	15
Belgium	471	82	17
Bulgaria	393	52	13
Cyprus	18	2	11
Czech Republic	908	89	10
Denmark	1,136	166	15

⁸ See the questionnaire in Annex 2.

⁹ Note that the total number of valid questionnaires was 4,654. The reason why we removed 116 valid questionnaires was: a) 77 responses had to be removed from the data set after a thorough check of the quality of the responses; b) In addition, 39 respondents are over 70 years, and these retired persons are excluded from the sample.

Country	Contacted	Completed	Per cent
Estonia	244	43	18
Finland	481	71	15
France	6,305	224	4
Germany	5,361	536	10
Greece	622	68	11
Hungary	523	46	9
Ireland	465	77	17
Italy	4,157	590	14
Latvia	219	21	10
Lithuania	421	53	13
Luxembourg	29	7	24
Malta	71	14	20
Netherlands	1,394	261	19
Poland	2,694	300	11
Portugal	733	76	10
Romania	669	95	14
Slovakia	469	49	10
Slovenia	106	16	15
Spain	4,683	570	12
Sweden	2,772	343	12
United Kingdom	5,811	578	10
Total	41,876	4 538	11

3.5 Limitations of the sampling methodology and the implementation phase

The sampling methodology adopted in this survey has, as all sampling methodologies, some limitations. The most important limitations are:

First, as mentioned above we constructed a list of HEIs and their departments for this survey. In this task we prioritised universities and colleges of technology which are members of the European University Association or national HEI associations, websites of Ministries etc. However, contrary to the Frascati definition of the "Higher Education Sector" we did not include in our lists "research institutes, experimental stations and clinics or minor other types of institutions of post-secondary education operating under the direct control of, or administered by higher education institutions". Hence, all the results from our survey reflect this fact. If the mobility behaviour is different among (the low number of) researchers working in these types of HEIs then our estimates of mobility indicators are not entirely representative. If anything, we expect that international mobility flows in the excluded types of HEIs are lower than those observed in universities and colleges of technology and other post-secondary education institutions¹⁰. However,

¹⁰ Conversely, we expect that the sectoral mobility rates of the researchers within this group of HEIs is higher than the observed (see Chapter 5).

due to the phenomenon of joint-appointments¹¹, we believe that this deviation from the Frascati definition does not affect our estimations in any serious manner.

Second, the entire sampling exercise was designed with the purpose to estimate the shares of internationally mobile researchers in the entire EU27 with an error margin ± 0.02 , and the confidence level $\alpha=0.05$. This goal has been achieved. It is clear, however, that estimates of mobility proportions (or other estimates found in Chapters 4 and 5) at a country and/or at a scientific field level are estimates with quite higher error margins. We did not calculate error margins for all the variables analysed in this report. However, we did calculate in Annex 44 error margins for all the estimated shares of internationally mobile researchers for all Member States and for all three scientific fields (see also Annex 5, section 3).

Third, as mentioned in Chapter 1, the purpose of this report is to construct a well-defined and well-behaved set of estimates of researcher mobility in the EU27, including estimates of shares of researchers with recent mobility events. In doing this we used appropriate methodology for extrapolating the results of our survey at the EU27 level. This methodology is presented in Chapter 2 and the results presented in Chapters 4 and 5. In addition we have also explored in more detail the experiences and perceptions of our respondents regarding international mobility, impacts of mobility upon the research career, and specific country "hot-spots" for mobility. These findings are summarised in Chapter 6. The purpose of Chapter 6 is not to provide population estimates but to explore in much greater depth the phenomenon of international researcher mobility than previous studies have been able to do.

Fourth, given the difficulties we experienced in finding contact information for researchers from French HEIs and given the use of French participants in the 6th and 7th Framework Programmes to resolve that problem, the observed high shares of internationally mobile researchers in the higher education sector in France probably reflect this deviation from the sampling selection process described in Chapter 2 and in Chapter 3. With this and the low final response rate for France in mind, we have conducted a robustness analysis in Annex 5, where we compare the profile of French responders with responders from a number of other Member States, as well as, results from an advanced form of logit analysis which also respect the extrapolation needs of the analysis. The robustness analysis provides a) a greater insight on the factors and demographic characteristic of international mobility of researchers, and b) a greater understanding of those characteristics of researchers which we need to take into consideration in future mobility surveys. This survey was necessarily experimental but for any future surveys of the scale and ambition (in terms of indicators) of this one we strongly recommend that a check-control procedure for non-response analysis be factored into the time and cost planning.

As a last remark we wish to underline the fact that – due to the reasons explained above - throughout the report we chose not to publish mobility figures for France, but the responses from French researchers are kept in calculations of the overall international and intersectoral mobility rates in EU27 and by fields of science. In Annex 5 we discuss this issue in greater detail and we demonstrate that **the exclusion of the responses given by French HEI researchers does not alter in any fundamental way the (extrapolated) results on HEI researchers international and intersectoral mobility shares, presented in this report.**

¹¹ For example, when a researcher has a principal position in a university clinic and a second appointment in the Faculty of Medicine in the university of his/her clinic (or other Faculty in the same or other university) this is an example of a joint-appointment.

4 ESTIMATES OF KEY CHARACTERISTICS OF THE EU27 RESEARCHER POPULATION

This chapter provides estimates of key population characteristics of the population of researchers in EU27 as calculated on the basis of the results of the Mobility Survey of the Higher Education Sector and on the basis of the methodology developed in Chapter 2. When available we compare our estimates with Eurostat statistics as a control exercise.

Section 4.1 presents estimates of characteristics of the population of researchers in EU27, such as, gender, age, marital status and family situation (number of children). In Section 4.2 we focus on population estimates based on the respondents' education and training, while in Section 4.3 we present information on population estimates based on the respondents' researcher status.

All country share estimates are calculated on the basis of the respondents' country of affiliation, which we use as the country variable for all figures and all tables in Chapters 4 and 5. By "country of affiliation" we mean the country where the university unit (cluster) of the respondent (see Chapter 3) is localised. In the survey, we asked the researchers to report the country in which their principal employer is located. Only 3 per cent of the respondents reported a different country of principal employer from their country of affiliation.¹²

Important note

Note that figures on France are not reported in the figures and tables of this chapter (and Chapter 5). As explained in Chapter 3 and Annex 5, the population estimates of mobility shares for France are most likely significantly higher than the "real" mobility shares amongst French HEI researchers. This is due to the significantly lower response rates from this country compared with the rest of EU27 and to the fact that many of the French respondents had to be identified from the list of FP5 and FP6 participants – while all other responders have been identified from the websites of their HEI. We expect that researchers participating in FPs tend to be more mobile than non-participants. However, as shown in Annex 5, if we exclude the responses given by French HEI researchers from the sample, this does not alter in any fundamental way the (extrapolated) results on HEI researchers international and intersectoral mobility shares in EU27 (and by country and by scientific fields) presented in this report. Therefore, we chose to keep the responses we received from French researchers when calculating overall EU27 figures throughout the analysis in Chapters 4 and 5 but – as already mentioned – without reporting the specific figures for France.

¹² Note that the sampling and targeting research populations has been done on the basis of the information we found on the web pages of the higher education institutions. It is methodologically incorrect to use the "country in which their principal employer is located" as the "country of affiliation", since the "country where the university unit of the respondent is localised" is the basis for creating a representative indicator from the sample of researchers we have contacted in this project.

4.1 Gender, age, marital status and children

4.1.1 Gender and age

Table 5 shows that 63 per cent of the respondents are men. The table also shows that the share of male researchers is about the same for the following three (overlapping) groups of researchers: those who supervise research, those who improve or develop new products/processes/services, and those who carry out research.

Table 5: Estimated shares of researcher population in the higher education sector in EU27 by type of researcher and by gender based on (adjusted) shares of respondents' gender in the Mobility Survey.

Type of researcher	Male (%)	Female (%)	Total	Sample size (n)
Researchers who carry out research	63	37	100	4,458
Researchers who supervise research	64	36	100	3,575
Researchers who improve or develop new products/processes/services	64	36	100	2,407
Total	63	37	100	4,538

Source: The Mobility Survey of the Higher Education Sector.

Notes:

1) The table is based on the following questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "What is your gender?" (Question 8), (ii) "In the context of your present job do you carry out research?" (Question 5), (iii) "In the context of your present job do you supervise research?" (Question 6), and (iv) "In the context of your present job do you improve or develop new products/processes/services?" (Question 7).

2) The table is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.

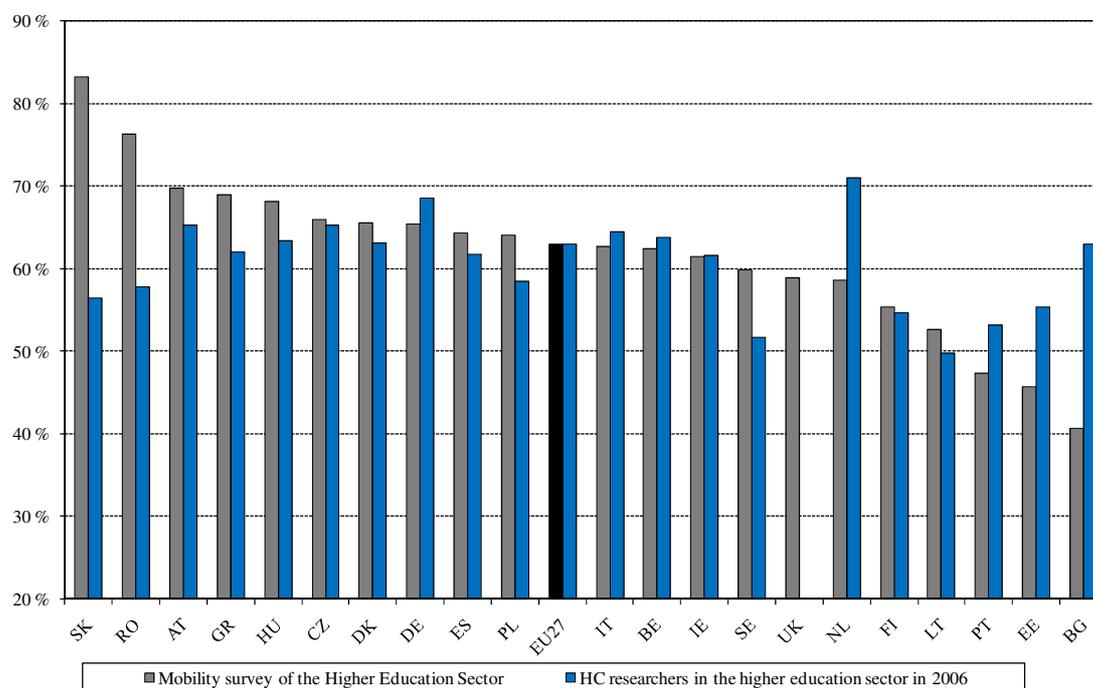
3) The shares of EU27 researchers in the table are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

Figure 1 shows that the realised share of male researcher respondents is in fact equal to the estimated share of the male researcher population in EU27 – estimate based on data for EU researchers in the higher education sector in 2006 from the Eurostat database (63%)¹³. Further, it follows from Figure 1 that Slovakia (83%) and Romania (76%) have the highest shares of male researchers, while Bulgaria (41%), Estonia (46%) and Portugal (47%) have the lowest shares. However, the shares for these countries are fairly different from the corresponding shares based on the Eurostat database. This is also the situation with Netherlands, Sweden and Greece. For large countries such as Germany, Spain and Italy the shares of male respondents are much the same as the corresponding Eurostat shares¹⁴.

¹³ Note that the Eurostat share for EU27 as a whole (63%) is our estimate based on Eurostat data, and not Eurostat data/estimate (see note 6 in Figure 1).

¹⁴ Some of the country-specific Eurostat shares are our estimates based on Eurostat data, and not Eurostat data/estimates (for details, see note 6 in Figure 1).

Figure 1: Estimated shares of male researchers in the higher education sector in EU27 based on (adjusted) shares of respondents' gender by country of affiliation in the Mobility Survey (n=4,538) (gray columns; and black column for the total) compared with corresponding Eurostat shares (blue columns).



Source: The Mobility Survey of the Higher Education Sector and Eurostat data (R&D statistics).

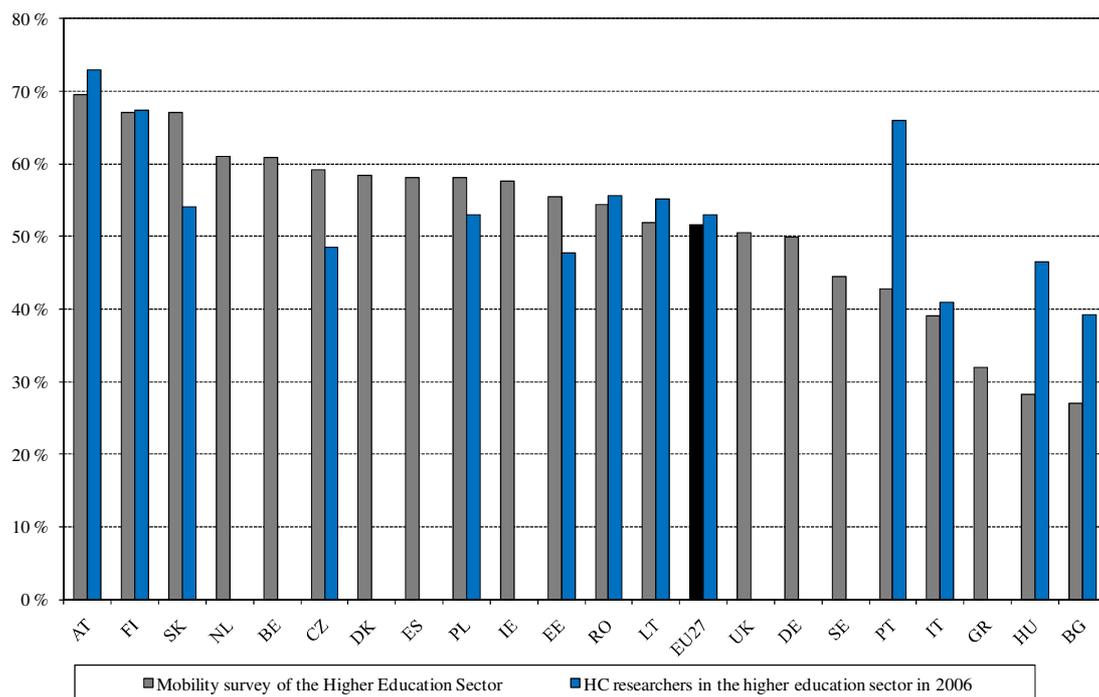
Notes:

- 1) The grey-coloured shares in the figure are based on the following question in the Mobility Questionnaire of the Higher Education Sector (Question 8): "What is your gender?" (see Annex 2).
- 2) The grey-coloured shares in the figure are only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) Cyprus, Latvia, Luxembourg, Malta and Slovenia are excluded from the figure, since there are few respondents from these countries.
- 4) France is excluded from all the figures and tables in Chapters 4 and 5.
- 5) The Eurostat data were downloaded in September 2009.
- 6) Eurostat data for HC (head count) researchers, in total and by gender, for the higher education (HE) sector for 2006 are not available for Belgium, Greece, Netherlands, Portugal, Sweden and the United Kingdom. For these countries, except for the United Kingdom, we estimate (i) the share of HC male researchers in the HE sector in each country in 2006 by using the corresponding share in 2005, and (ii) the total number of HC researchers in the HE sector in each country in 2006 by using the fraction of FTE (full-time equivalent) researchers in the HE sector in 2006 and 2005 multiplied by the total number of HC researchers in the HE sector in 2005. Based on (i) and (ii), the number of HC male researchers in the HE sector in each of these countries in 2006 is estimated by multiplying the estimated share of HC male researchers in the HE sector in 2006 (from (i)) with the estimated total number of HC researchers in the HE sector in 2006 (from (ii)). The share for EU27 as a whole is estimated by us by the fraction of the sum of observed or estimated numbers of HC male researchers and the sum of observed or estimated total numbers of HC researchers in the HE sector in all EU27 countries in 2006, but without including United Kingdom. For the following countries we use Eurostat data, and not any estimates of these data: Bulgaria, Czech Republic, Denmark, Germany, Estonia, Ireland, Spain, France, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, Austria, Poland, Romania, Slovenia, Slovakia and Finland (see notes 3 and 4). Note that the sum of all EU27 researchers is our estimate, and not Eurostat data/estimate. We have not estimated and included data for the United Kingdom in EU27, since there are no Eurostat data for HC or FTE numbers of female researchers for the higher education sector for the United Kingdom for the whole period 2000-2008.
- 7) In the figure we measure the share of EU27 researchers by the country a person's email address refers to.
- 8) The grey-coloured shares in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

Half of the respondents are younger than 45 years old (see Figure 2), which is not far from what we estimate with data for EU researchers in the higher educa-

tion sector in 2006 from the Eurostat database (53%)¹⁵. Austria (70%), Finland and Slovakia (both 67%) have the highest shares of respondents in this age group, while Bulgaria (27%) and Hungary (28%) have the lowest shares. The corresponding shares for Portugal, Hungary and Bulgaria are quite higher in the Eurostat database¹⁶. For Slovakia, the Czech Republic and Estonia the Eurostat shares are relatively lower, while for Finland and Romania the Mobility Survey shares of the Higher Education Sector are about the same as the Eurostat shares.

Figure 2: Estimated shares of researcher population in the higher education sector in EU27 by age and by country of affiliation based on the distribution of age among the respondents in the Mobility Survey (gray columns; and black column for the total) compared with corresponding Eurostat shares (blue columns). Shares of researchers younger than 45 years old. $n=4,538$.



Source: The Mobility Survey of the Higher Education Sector and Eurostat data (R&D statistics).

Notes:

- 1) The grey-coloured shares in the figure are based on the following question in the Mobility Questionnaire of the Higher Education Sector (Question 9): "What is your year of birth?" (see Annex 2).
- 2) The grey-coloured shares in the figure are only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) Cyprus, Latvia, Luxembourg, Malta and Slovenia are excluded from the figure, since there are few respondents from these countries.
- 4) France is excluded from all the figures and tables in Chapters 4 and 5.
- 5) The Eurostat data were downloaded in September 2009.
- 6) Eurostat data for HC (head count) researchers by age group for the higher education (HE) sector for 2006 are not available for Belgium, Denmark, Germany, Ireland, Greece, Spain, France, Italy, Malta, Netherlands, Poland, Portugal, Sweden and the United Kingdom (see notes 3 and 4). For Italy, Poland and Portugal we estimate (i) the share of HC researchers less than 45 years old in the HE sector in each country in 2006 by using the corresponding share in 2005, and (ii) the total number of HC researchers in the HE sector in each country in 2006 by using the fraction of FTE (full-time equivalent) researchers in the HE sector in 2006 and 2005 multiplied by the total number of HC researchers in the HE sector in 2005. Based on (i) and (ii), the number of HC researchers less than 45 years old in

¹⁵ The age interval in Figure 2 for the Mobility Survey of the Higher Education Sector is used to make it possible to compare with Eurostat data. Note that the Eurostat share for EU27 as a whole (53%) is our estimate based on Eurostat data, and not Eurostat data/estimate (for details, see note 6 in Figure 2).

¹⁶ The Eurostat share for Portugal is our estimate based on Eurostat data, and not Eurostat data/estimate (see note 6 in Figure 2).

the HE sector in each of these countries (i.e. Italy, Poland and Portugal) in 2006 is estimated by multiplying the estimated share of HC researchers less than 45 years old in the HE sector in 2006 (from (i)) with the estimated total number of HC researchers in the HE sector in 2006 (from (ii)). We have not estimated the share of HC researchers less than 45 years old in the HE sector in 2006 for Belgium, Denmark, Germany, Ireland, Greece, Spain, France, Malta, Netherlands, Sweden or the United Kingdom (see notes 3 and 4), since there are no data available on HC researchers by age group for these countries for the whole period 2000-2008. For the following countries we use Eurostat data, and not any estimates of these data: Bulgaria, Czech Republic, Estonia, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Austria, Romania, Slovenia, Slovakia and Finland (see note 3). The share for EU27 as a whole is estimated by us by the fraction of the sum of observed or estimated numbers of HC researchers less than 45 years old and the sum of observed or estimated total numbers of HC researchers in the HE sector in all EU27 countries in 2006, but without including Belgium, Denmark, Germany, Ireland, Greece, Spain, France, Malta, Netherlands, Sweden or the United Kingdom. The sum of all EU27 researchers is therefore our estimate, and not Eurostat data/estimate.

7) There are no Eurostat data available for FTE researchers by age group for the HE sector.

8) In the figure we measure the share of EU27 researchers by the country a person's email address refers to.

9) The grey-coloured shares in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

Table 6 shows the share of EU27 researchers by age group and country of affiliation. According to that Austria (31%), Slovakia and Finland (both 28%) have the highest shares of respondents in the youngest age group (i.e. those less than 30 years old). Austria and Slovakia also have among the lowest shares of respondents in the oldest age group (i.e. those between 61 and 70 years old), while the corresponding share for Finland is much higher. Spain has the highest share of respondents in the age group between 41 and 50 years old (38%), while Hungary has the lowest share in this age group (9%). In other words, we observe at a country level some age distribution discrepancies between the realised sample of the survey and the age distribution of the researcher population as provided by Eurostat data. However, *at the EU27 level*, the age distribution between the sample and our overall EU27 population estimate – which is based on Eurostat data – is approximately the same.

Table 6: Estimated age distribution of researcher population in the higher education sector in EU27 by country of affiliation. Estimates based on respondents' age distribution in the Mobility Survey. n=4,538.

Country	Acronym	Less than 30 years	Between 31 and 40 years	Between 41 and 50 years	Between 51 and 60 years	Between 61 and 70 years	Total
Belgium	BE	18	30	27	14	11	100
Bulgaria	BG	4	20	23	36	18	100
Czech Republic	CZ	16	34	21	19	9	100
Denmark	DK	18	35	13	27	7	100
Germany	DE	8	32	29	22	9	100
Estonia	EE	18	25	24	31	3	100
Ireland	IE	9	39	26	19	7	100
Greece	GR	0	18	22	44	16	100
Spain	ES	9	32	38	18	3	100
Italy	IT	2	24	35	24	14	100
Lithuania	LT	3	30	30	20	18	100
Hungary	HU	3	24	9	54	10	100
Netherlands	NL	12	35	27	18	8	100
Austria	AT	31	30	25	9	4	100

Poland	PL	12	35	21	22	9	100
Portugal	PT	2	26	35	30	8	100
Romania	RO	6	36	27	27	4	100
Slovakia	SK	28	33	15	18	6	100
Finland	FI	28	21	26	15	10	100
Sweden	SE	6	27	32	23	12	100
United King- dom	UK	4	31	33	24	8	100
Total	EU27	8	30	30	22	9	100

Source: The Mobility Survey of the Higher Education Sector.

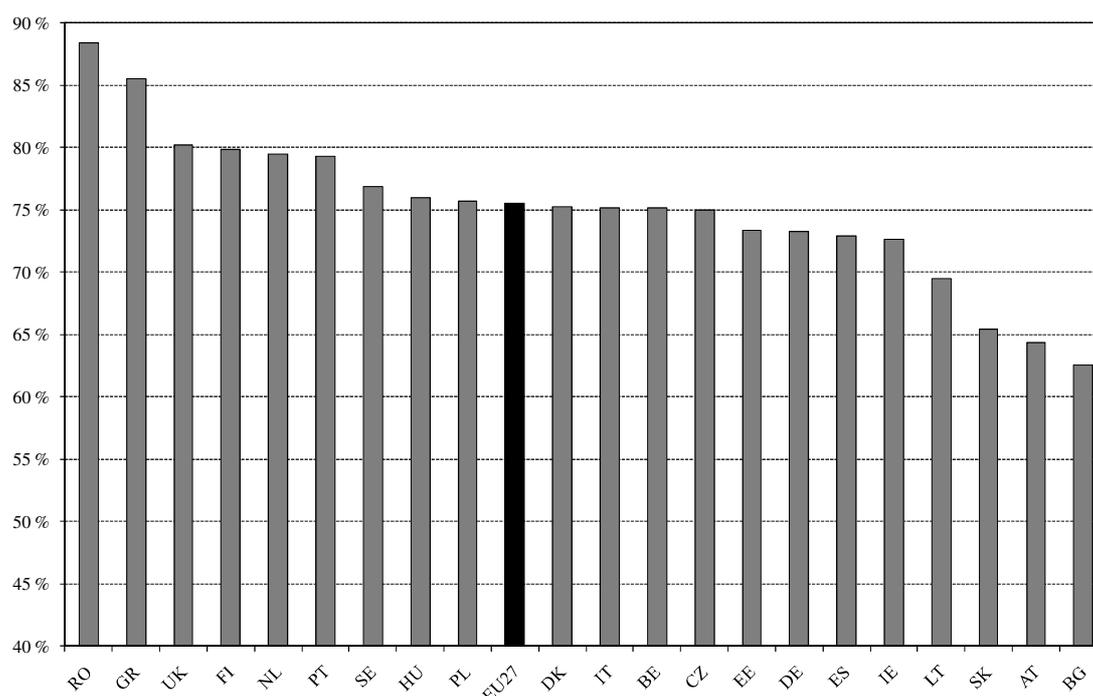
Notes:

- 1) The table is based on the following question in the Mobility Questionnaire of the Higher Education Sector (Question 9): "What is your year of birth?" (see Annex 2).
- 2) The table is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) Cyprus, Latvia, Luxembourg, Malta and Slovenia are excluded from the table, since there are few respondents from these countries.
- 4) France is excluded from all the figures and tables in Chapters 4 and 5..
- 5) In the table we measure the share of EU27 researchers by age group and the country a person's email address refers to.
- 6) The shares in the table are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

4.1.2 Marital status and children

76 per cent of the respondents are either married or co-habiting with a partner, see Figure 3. This share is highest in Romania (88%) and Greece (86%) and lowest in Bulgaria (63%), Austria (64%) and Slovakia (65%). Figure 4 shows that 63 per cent of the respondents also have children. Hungary is on the top, where 75 per cent of the respondents have children, while this share is lowest in Austria (42%).

Figure 3: Estimated shares of married or cohabiting researchers among all researchers in the higher education sector in EU27 by country of affiliation. Estimates based on respondents' marital status in the Mobility Survey. $n=4,538$.

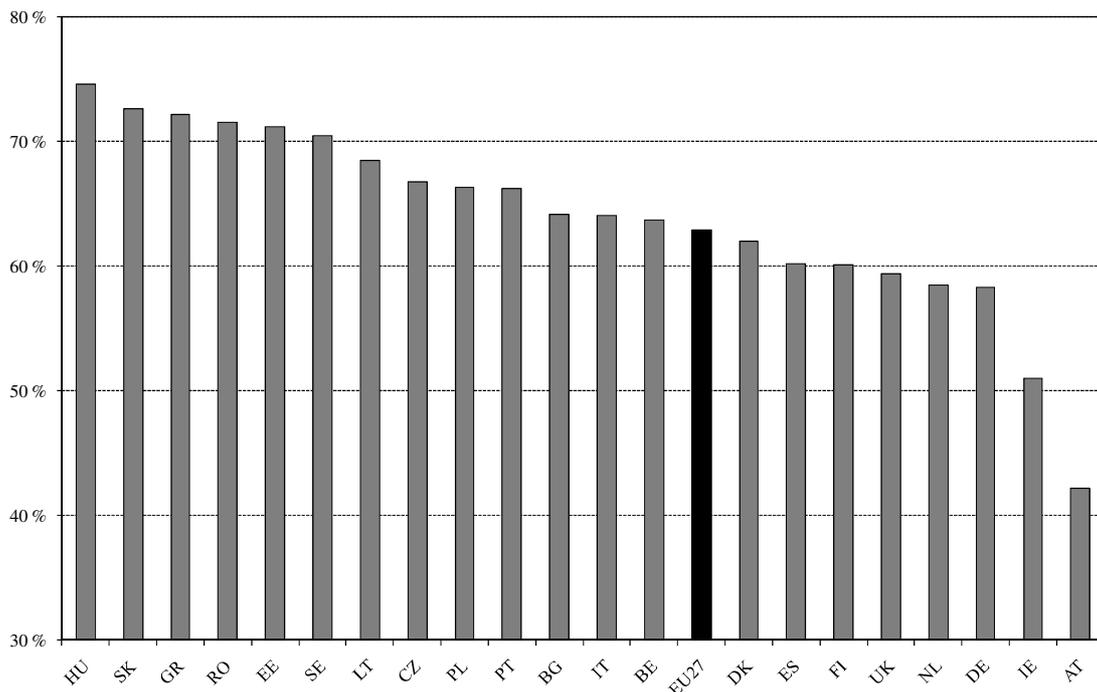


Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure is based on the following question in the Mobility Questionnaire of the Higher Education Sector (Question 12): "What is your marital status?" (see Annex 2).
- 2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) Cyprus, Latvia, Luxembourg, Malta and Slovenia are excluded from the figure, since there are few respondents from these countries.
- 4) France is excluded from all the figures and tables in Chapters 4 and 5.5) In the figure we measure the share of EU27 researchers by the country a person's email address refers to.
- 6) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

Figure 4: Estimated shares of researcher with children in the higher education sector in EU27 by country of affiliation. Estimates based on respondents' family status in the Mobility Survey. n=4,538.



Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure is based on the following question in the Mobility Questionnaire of the Higher Education Sector (Question 13): "Do you have children?" (see Annex 2).
- 2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) Cyprus, Latvia, Luxembourg, Malta and Slovenia are excluded from the figure, since there are few respondents from these countries.
- 4) France is excluded from all the figures and tables in Chapters 4 and 5.
- 5) In the figure we measure the share of EU27 researchers by the country a person's email address refers to.
- 6) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

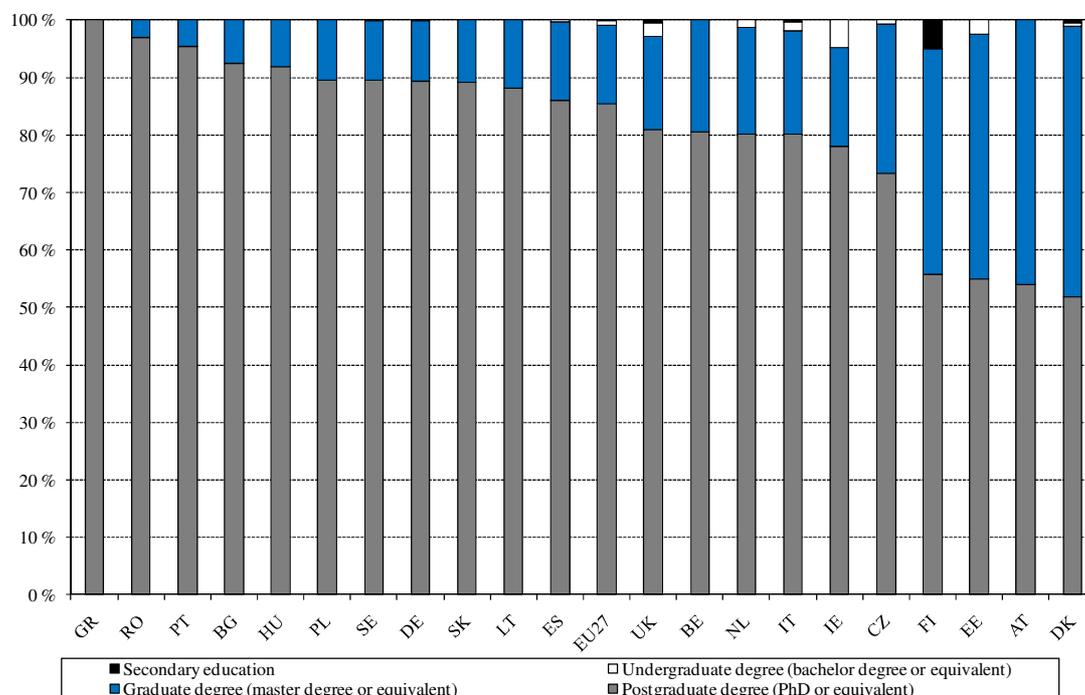
4.2 Education and training

4.2.1 Highest educational attainment

Figure 5 shows that 85 per cent of the respondents have a postgraduate degree (PhD or equivalent) as their highest educational attainment, and 14 per cent have a graduate degree (master degree or equivalent). Only 1 per cent have an

undergraduate degree (bachelor degree or equivalent), while less than 1 per cent have a secondary education (i.e. high school, gymnasium, grammar school, lyceum or equivalent) as their highest educational attainment. The share of respondents with a postgraduate degree as their highest educational attainment is highest in Greece (100%, i.e. all respondents from this country) and Romania (97%), and lowest in Denmark (52%) and Austria (54%). Denmark (47%) and Austria (46%) have the highest shares of researchers with a graduate degree, and Ireland has the highest share of researchers with an undergraduate degree (5%) as the highest educational attainment. Finland has the highest share of researchers with only secondary education (5%) as the highest educational attainment, while there are very few respondents in this group in each of the other EU27 countries.

Figure 5: Estimated shares of researchers in the higher education sector in EU27 by highest educational attainment and by country of affiliation. Estimates based on respondents' highest educational attainment in the Mobility Survey. n=4,538.



Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure is based on the following question in the Mobility Questionnaire of the Higher Education Sector (Question 17): "Highest Educational Attainment." (see Annex 2).
- 2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) Cyprus, Latvia, Luxembourg, Malta and Slovenia are excluded from the figure, since there are few respondents from these countries.
- 4) France is excluded from all the figures and tables in Chapters 4 and 55) In the figure we measure the share of EU27 researchers by the country a person's email address refers to.
- 6) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

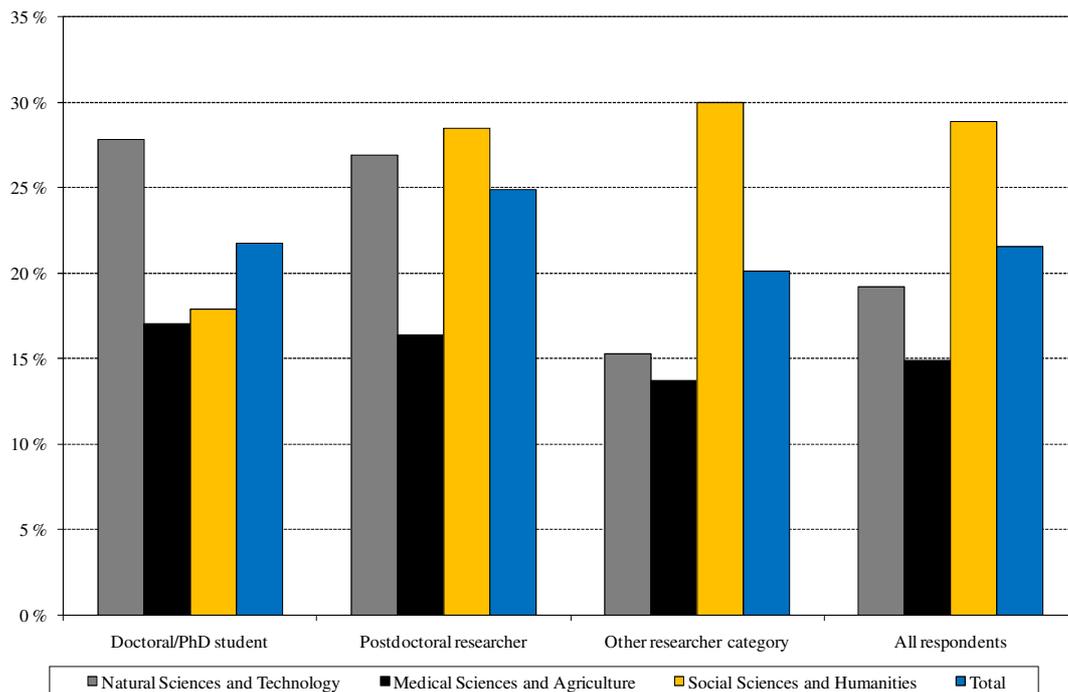
4.2.2 Student mobility and student apprenticeship

As Figure 6 indicates, 22 per cent of the respondents have been 'exchange students' during their post-secondary education. Figure 6 shows that larger shares of researchers in the Social Sciences and Humanities have been internationally mobile as students compared with researchers in the other two fields of science.

Furthermore, survey results show that the shares of researchers that have been mobile as students is highest in Austria, Netherlands and Poland (all countries 29%), and lowest in Bulgaria (8%).

Figure 7 shows that 28 per cent of the respondents have worked in industry on a formal placement, internship, apprenticeship or similar, with the highest share in Romania (44%) and the lowest share in Slovakia (12%).

Figure 6 : Estimated shares of researchers in the higher education sector in EU27 who have been 'exchange students' during their post-secondary education by field of science and by current status as a researcher. Estimates based on respondents' student mobility status in the Mobility Survey. n=4,533.

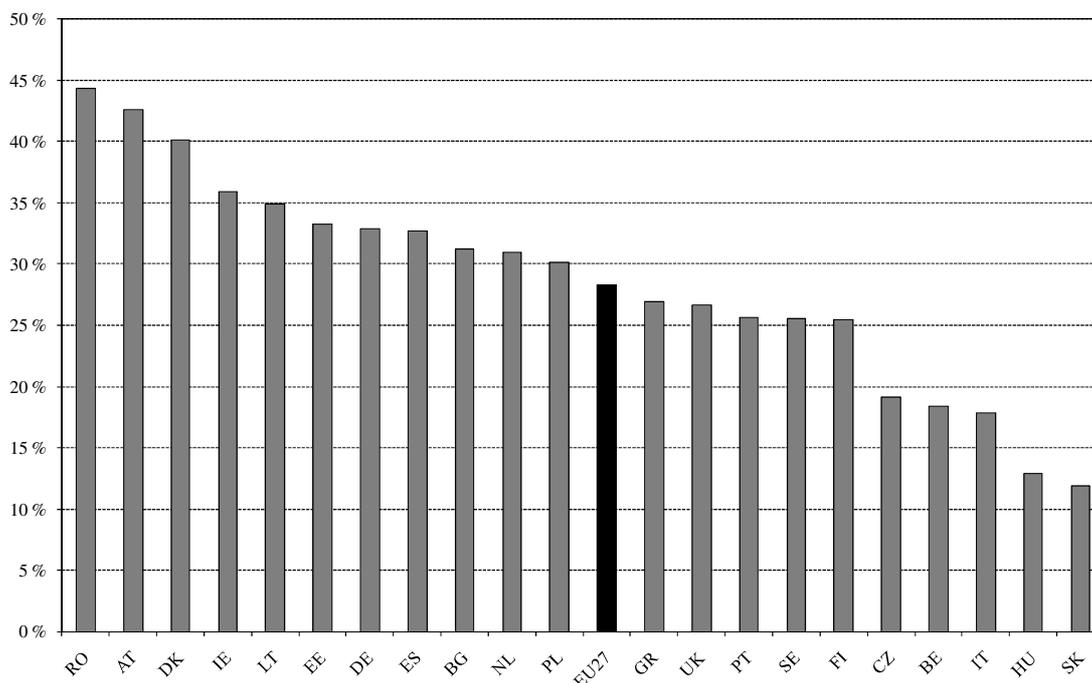


Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure is based on the following questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "Which of the following categories do you consider best describes your current status as a researcher?" (Question 34), and (ii) "During your post-secondary education (i.e. in further or higher education, excluding your PhD if you have one) did you spend time (minimum 3 months) as an 'exchange student' (e.g. Erasmus or similar) in a different country from the country in which you were conducting your studies?" (Question 26).
- 2) The figure is only based on persons less than or equal to 70 years, in order to exclude retired researchers from the sample.
- 3) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

Figure 7: Estimated shares of researchers in the higher education sector in EU27 who have worked in industry on a formal placement, internship, apprenticeship or similar by country of affiliation. Estimates based on respondents' apprenticeship status in the Mobility Survey. n=4,533.



Source: The Mobility Survey of the Higher Education Sector.

Notes:

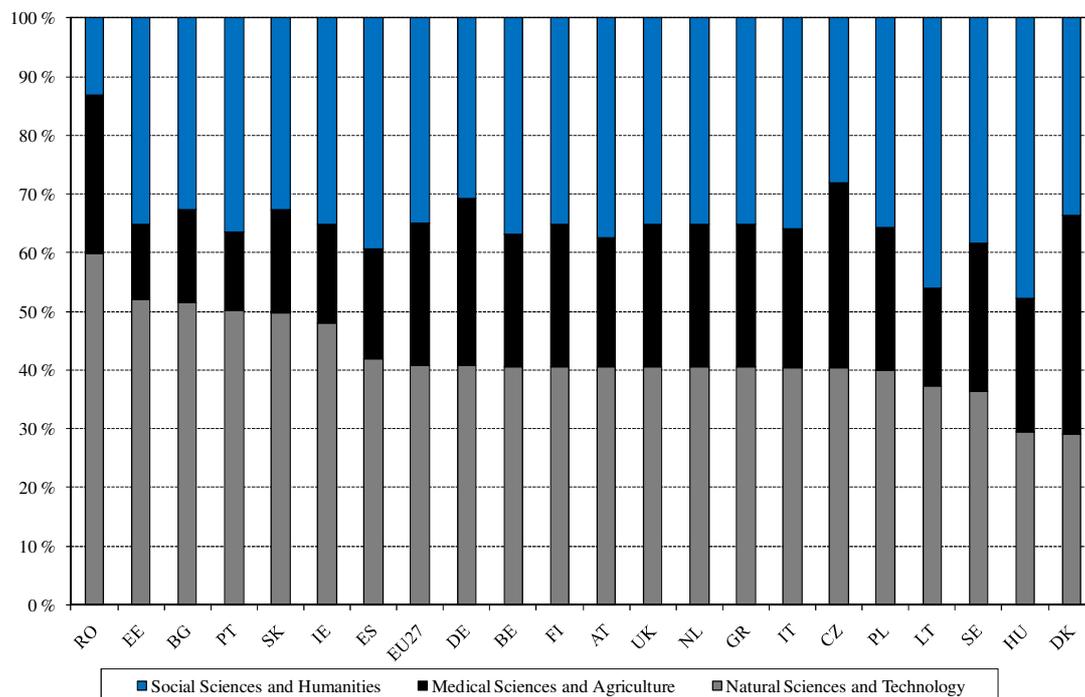
- 1) The figure is based on the following question in the Mobility Questionnaire of the Higher Education Sector (Question 27): "During your post-secondary education (i.e. in further or higher education, excluding your PhD if you have one) did you spend time working in industry on a formal placement, internship, apprenticeship or similar? Please exclude part-time or vacation jobs unrelated to your programme of study." (see Annex 2).
- 2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) Cyprus, Latvia, Luxembourg, Malta and Slovenia are excluded from the figure, since there are few respondents from these countries.
- 4) France is excluded from all the figures and tables in Chapters 4 and 5.
- 5) In the figure we measure the share of EU27 researchers by the country a person's email address refers to.
- 6) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

4.2.3 Field of science

Figure 8 presents the share of EU27 researchers by field of science for each of the EU27 countries. Based on the figure 41 per cent of the researchers from EU27 work in a scientific field in the broad Natural Sciences and Technology domain, 35 per cent in the Social Sciences and Humanities, and 24 per cent in the Medical Sciences and Agriculture. Due to the methodological design of the survey, *the realised scientific field distribution corresponds very closely to the scientific field distribution of the EU27 researcher population estimates based on Eurostat data.*

Romania (60%) has the highest share of researchers in the Natural Sciences and Technology, while this share is lowest in Denmark and Hungary (both 29%). Denmark (37%) has the highest share of researchers in the Medical Sciences and Agriculture, while Hungary (48%) and Lithuania (46%) have the highest shares of the researchers in the Social Sciences and Humanities.

Figure 8 : Estimated shares of researchers in the higher education sector in EU27 by field of science and by country of affiliation. Estimates based on respondents' field of science and country of affiliation in the Mobility Survey. $n=4,538$.



Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 2) Cyprus, Latvia, Luxembourg, Malta and Slovenia are excluded from the figure, since there are few respondents from these countries.
- 3) France is excluded from all the figures and tables in Chapters 4 and 5.
- 4) In the figure we measure the share of EU27 researchers by the country a person's email address refers to.
- 5) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

Table 7 shows the share of graduates by field of education based on the UNESCO/OECD/Eurostat (UOE) database on education statistics (tertiary education graduates, including PhD awards, by field of education). We have aggregated the fields of education in the UOE database in such a way as to permit direct comparison with the three groups of scientific fields in Figure 8.

From Table 7 we conclude that the share of tertiary education graduates (and PhD graduates) in EU27 is much lower for those with an education in the Natural Sciences and Technology, and lower for those with an education in the Medical Sciences and Agriculture, compared to the respective shares of EU27 researchers in these to scientific fields. Thus, the recruitment bases for researchers in the Natural Sciences and Technology and the Medical Sciences and Agriculture are clearly smaller compared with the recruitment basis for researchers in the Social Sciences and Humanities.

Table 7: The share of tertiary education graduates (including PhD graduates) by field of education in selected EU27 countries. UOE-database.

Country	Natural Sciences and Technology	Medical Sciences and Agriculture	Social Sciences and Humanities	Total
Belgium	19	21	60	100
Czech Republic	25	16	59	100
Denmark	18	29	54	100
Germany	25	15	60	100
Ireland	8	20	73	100
Greece	22	17	61	100
Spain	24	21	56	100
France	25	15	61	100
Italy	18	21	61	100
Hungary	14	14	71	100
Netherlands	14	21	66	100
Austria	28	13	58	100
Poland	16	13	72	100
Portugal	28	23	49	100
Slovakia	23	26	51	100
Finland	29	24	47	100
Sweden	22	30	49	100
United Kingdom	19	18	63	100
Total	20	18	62	100
Number of graduates	605 829	523 431	1 843 967	2 973 227

Source: The UNESCO/OECD/Eurostat (UOE) database on education statistics (Graduates by field of education).

Notes:

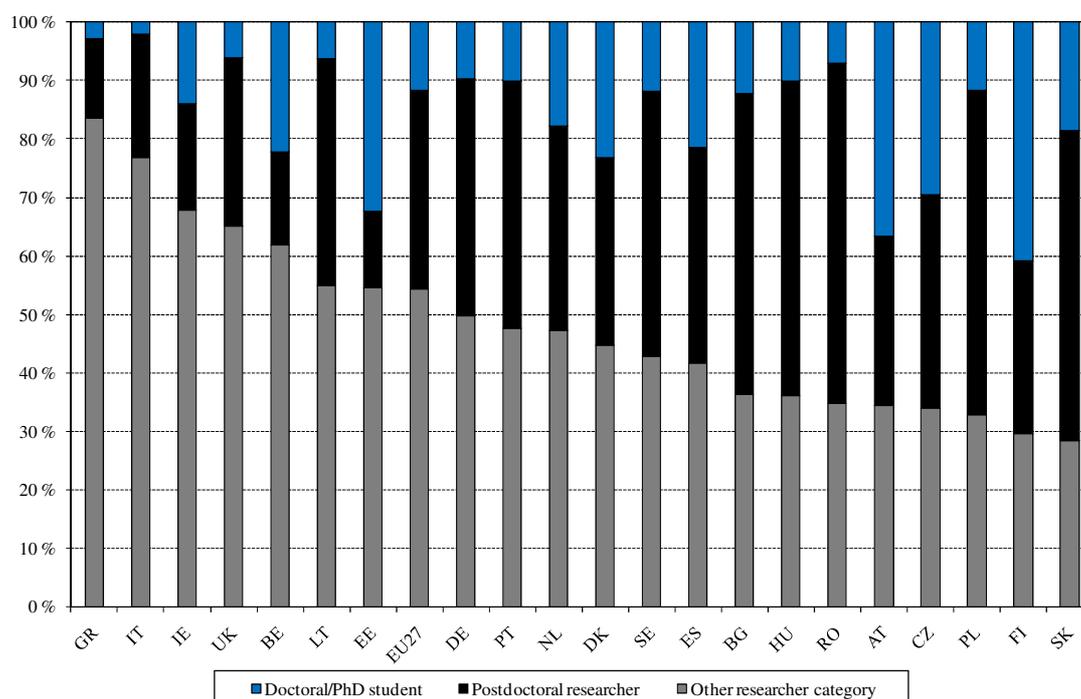
- 1) The main publications on which the data are based are the annual publications *Education at a Glance* and *Education Policy Analysis*.
- 2) All the definitions and conventions used in the underlying data collection, as well as the methodologies used to compile the published statistics and indicators derived from them, are presented in the *OECD Handbook for Internationally Comparative Education Statistics: Concepts, Standards, Definitions and Classifications* (see Chapter 5 for the definition and classification of educational programmes).
- 3) The table presents statistics for tertiary-type A and advanced research programmes for 2007 for available EU27 countries in the UOE database. Luxembourg is excluded from the table, since there are no graduates from this country.
- 4) The group of Natural Sciences and Technology consists of the following educational programmes: (a) 440: Physical sciences (ISC 44), (b) 460: Mathematics and statistics (ISC 46), (c) 480: Computing (ISC 48), and (d) 500: Engineering, manufacturing and construction.
- 5) The group of Medical Sciences and Agriculture consists of the following educational programmes: (a) 420: Life sciences (ISC 42), (b) 600: Agriculture, and (c) 700: Health and welfare.
- 6) The group of Social Sciences and Humanities consists of the following educational programmes: (a) 140: Education (ISC 14), (b) 200: Humanities and Arts, and (c) 300: Social sciences, business and law.
- 7) Educational programmes within services and programmes not known or unspecified are not included in the table.
- 8) The total number of graduates in the table is the sum of all graduates from the selected countries in the table. Note, however, that here we include figures for France since these directly retrieved from the UOE database.

4.3 Respondents' researcher status

4.3.1 Current status as a researcher

In the Mobility Survey of the Higher Education Sector we asked the respondents to indicate their researcher status by selecting one of the following three options: a) *doctoral/PhD student*; b) *post-doctoral*; and c) *“other researcher category”*. In the realised sample we find that 12 per cent of the population are doctoral/PhD students¹⁷, 34 per cent are postdoctoral researchers, and 54 per cent are in the residual *“other researcher category”*¹⁸.

Figure 9: Estimated shares of researchers in the higher education sector in EU27 by current status as a researcher and by country of affiliation. Estimates based on responses on researcher status in the Mobility Survey. n=4,538.



¹⁷ There are Eurostat data (Education statistics for enrolments) on PhD students (students at the ISCED level 6; second stage of tertiary education leading to an advanced research qualification) in the EU27 countries. For 2007 we find 525,809 PhD students in EU27 (excluding Germany and Luxembourg, since there are missing values for these two countries). However, this number also includes foreign doctoral candidates in each EU27 countries. For EU27 as a whole there are 116,698 foreign doctoral candidates in 2007, with missing values for Germany, Ireland, Greece, Luxembourg and Netherlands. This implies that there are about 42 per cent PhD students among all EU27 researchers in the higher education sector in 2007 (excluding Germany, Ireland, Greece, Luxembourg and Netherlands). On the other hand, based on well-documented information from the Norwegian R&D system, we know that about 27,000 researchers worked in the Norwegian higher education sector in 2007 while the number of PhD students was about 5,500 in the same year (that is, 20 per cent of all researchers in the Norwegian higher education sector). Evidently, either 42 per cent is an (unrealistically?) high share of PhD students or not all PhD students are counted as researchers in EU27. Be that as it may, it is likely that the group of PhD students in the Mobility Survey is smaller (under-represented) compared with the share of PhDs in the EU27 population of researchers in the higher education sector. Instead of 12 per cent, a share of PhDs of 20 per cent in the realised sample of respondents might have reflected more accurately the population characteristics in the EU27.

¹⁸ We have explored the characteristics of those in the *“other researcher”* category – see the discussion on the following pages.

Source: The Mobility Survey of the Higher Education Sector.

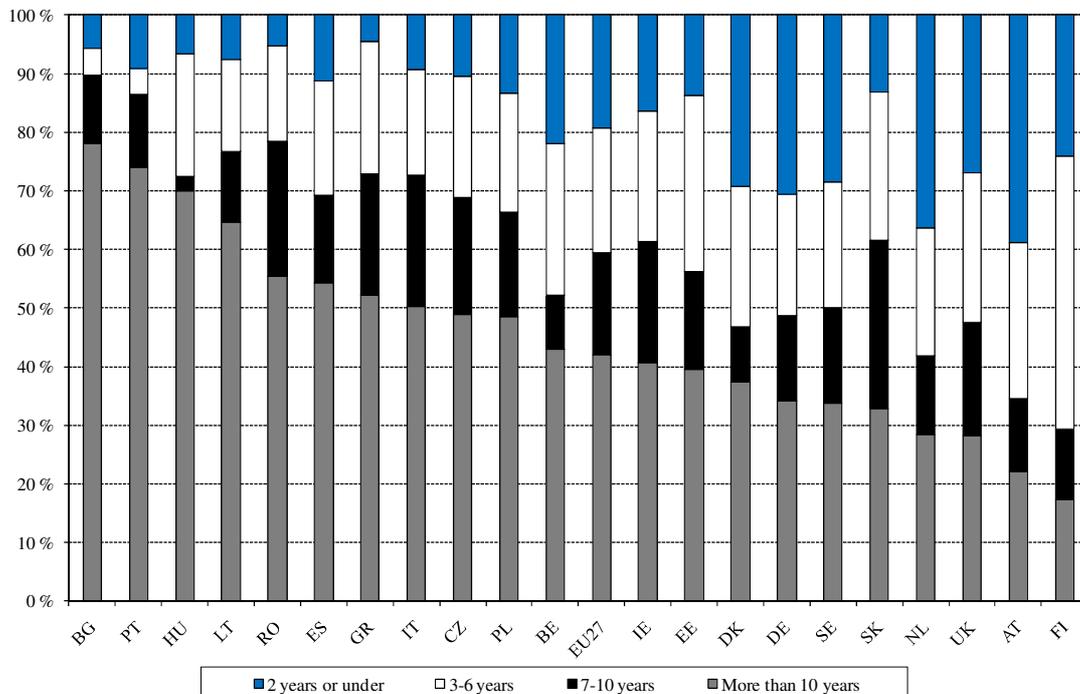
Notes:

- 1) The figure is based on the following question in the Mobility Questionnaire of the Higher Education Sector (Question 34): "Which of the following categories do you consider best describes your current status as a researcher?" (see Annex 2).
- 2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) Cyprus, Latvia, Luxembourg, Malta and Slovenia are excluded from the figure, since there are few respondents from these countries.
- 4) France is excluded from all the figures and tables in Chapters 4 and 5.
- 5) In the figure we measure the share of EU27 researchers by the country a person's email address refers to.
- 6) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

Figure 9 shows that Italy (2%) and Greece (3%) have the lowest shares of doctoral/PhD students in the realised survey sample, while Finland (41%) and Austria (37%) have the highest shares. Romania (58%) and Poland (56%) have the highest shares of postdoctoral researchers, and Estonia (13%) and Greece (14%) have the lowest shares. Greece (84%) and Italy (77%) have the highest shares of researchers in "other researcher" categories, while this share is lowest in Slovakia (28%) and Finland (30%).

Figure 10 depicts that 42 per cent of the respondents have been employed by their principal employer for more than 10 years, 17 per cent for 7-10 years, 21 per cent for 3-6 years, and 19 per cent for 2 years or less. Bulgaria (78%), Portugal (74%) and Hungary (70%) have the highest shares of respondents who have been employed for more than 10 years, and Finland (17%) and Austria (22%) the lowest. Austria (39%) has the highest share of respondents who have been employed in 2 years or under, while Greece (4%) has the lowest share.

Figure 10: Estimated shares of researchers in the higher education sector in EU27 by years employed by their principal employer and by country of affiliation. Estimates based on responses in the Mobility survey. n=4,537.



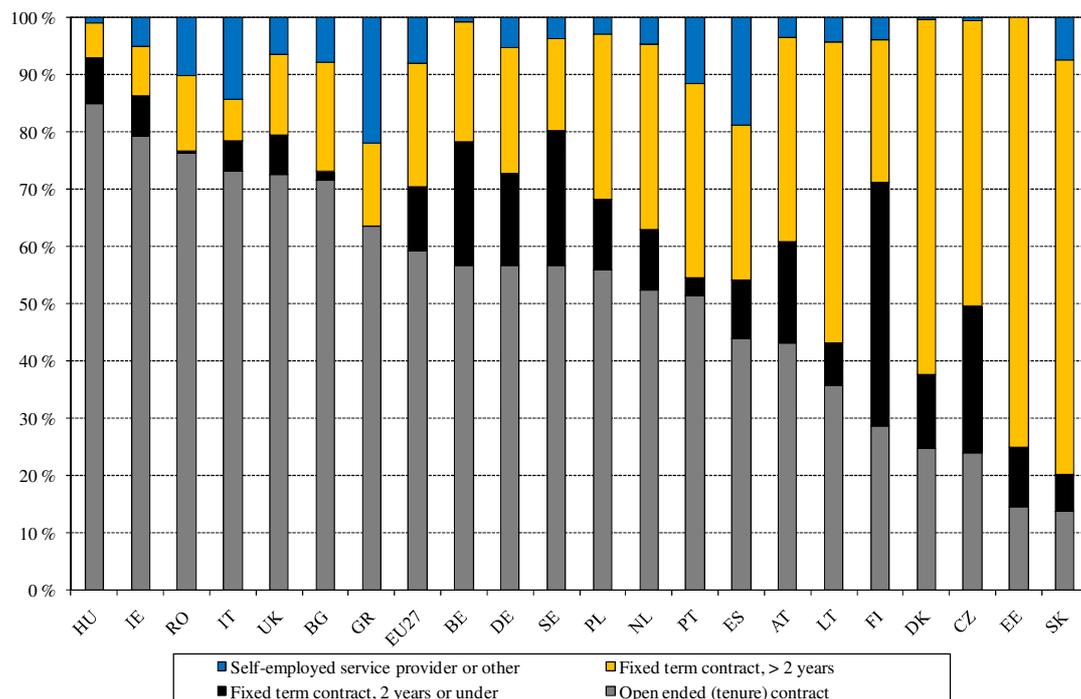
Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure is based on the following question in the Mobility Questionnaire of the Higher Education Sector (Question 39): "How long (years) have you been employed by this principal employer?" (see Annex 2).
- 2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) Cyprus, Latvia, Luxembourg, Malta and Slovenia are excluded from the figure, since there are few respondents from these countries.
- 4) France is excluded from all the figures and tables in Chapters 4 and 5.
- 5) In the figure we measure the share of EU27 researchers by the country a person's email address refers to.
- 6) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

Figure 11 shows that 59 per cent of the respondents have an open ended (tenure) contract, 11 per cent a fixed term contract of 2 years or less, 21 per cent a fixed term contract of more than 2 years, and 8 per cent are in the category "self-employed service provider or other". Hungary (85%) and Ireland (79%) have the highest shares of respondents on an open ended contract, while Slovakia (14%) and Estonia (15%) have the lowest shares. Estonia (75%) and Slovakia (72%) have the highest shares of respondents on a fixed term contract of more than 2 years, while Finland (43%) has the highest share of respondents on a fixed term contract of 2 years or under. Greece (22%) has the highest share of respondents in the category "self-employed service provider or other".

Figure 11: Estimated shares of researchers in the higher education sector in EU27 by employment contract status and by country of affiliation. Estimates based on responses on contract status in the Mobility Survey. n=4,537.



Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure is based on the following question in the Mobility Questionnaire of the Higher Education Sector (Question 41): "What is your employment contract status?" (see Annex 2).
- 2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) Cyprus, Latvia, Luxembourg, Malta and Slovenia are excluded from the figure, since there are few respondents from these countries.
- 4) France is excluded from all the figures and tables in Chapters 4 and 5. In the figure we measure the share of EU27 researchers by the country a person's email address refers to.

6) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

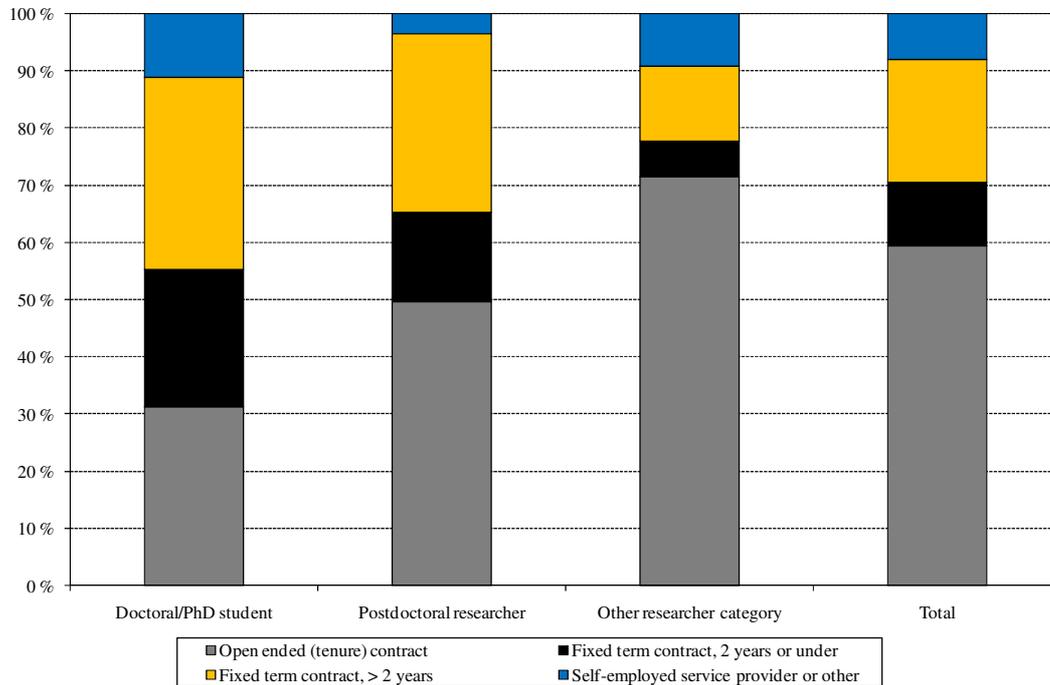
Doctoral/PhD students have the lowest share on an open ended contract (31%), while researchers in "other researcher" categories have the highest share (72%). This is presented in Figure 12. On the other hand, doctoral/PhD students have the highest shares in the three other contract categories. Researchers in "other researcher" category have the lowest shares in the two fixed term contract categories, while postdoctoral researchers have the lowest share in the category "self-employed service provider or other" (4%). Half of the postdoctoral researchers have an open ended contract, while 31 per cent have a fixed term contract of more than 2 years.

Figure 13 shows that postdoctoral researchers are younger than researchers in "other researcher" category, mainly because they have a higher share of researchers who are younger than 35 years old (25% for postdoctoral researchers, and 9% for researchers in "other researcher" category) and a lower share of those who are between 55 and 70 years old (18% for postdoctoral researchers, and 25% for researchers in "other researcher" category). The share of researchers between 35 and 54 years old is, however, approximately the same for postdoctoral researchers (57%) and researchers in "other researcher" category (65%). Moreover, according to the figure doctoral/PhD students are much younger than the two other researcher categories. This is not a surprising result. 56 per cent of the doctoral/PhD students are younger than 35 years old, and 31 per cent are between 35 and 54 years old. 13 per cent of the doctoral/PhD students are in the oldest age group.

According to Figure 14 and Figure 15, 28 per cent of the respondents have been working under their employment contract status for 2 years or under, 24 per cent for 3-6 years, 15 per cent for 7-10 years, and 34 per cent for more than 10 years. Figure 14 shows that 19 per cent of the researchers in "other researcher" category have been working under their employment contract status for 2 years or under, while the same share for postdoctoral researchers is 36 per cent. This share is lowest for doctoral/PhD students (42%), which is not a surprising result. 40 per cent of the researchers in "other researcher" category have been working under their employment contract status for more than 10 years, while this share is 26 per cent for postdoctoral researchers and 16 per cent for doctoral/PhD students.

Figure 15 shows that Austria (52%) and Denmark (47%) have the highest shares of respondents in the contract status category of 2 years or under, while Bulgaria (73%) and Hungary (60%) have the highest shares of respondents who have been working under their contract status for more than 10 years.

Figure 12: Estimated shares of researchers in the higher education sector in EU27 by employment contract status and by current status as a researcher. Estimates based on responses on contract and researcher status in the Mobility Survey. n=4,537.

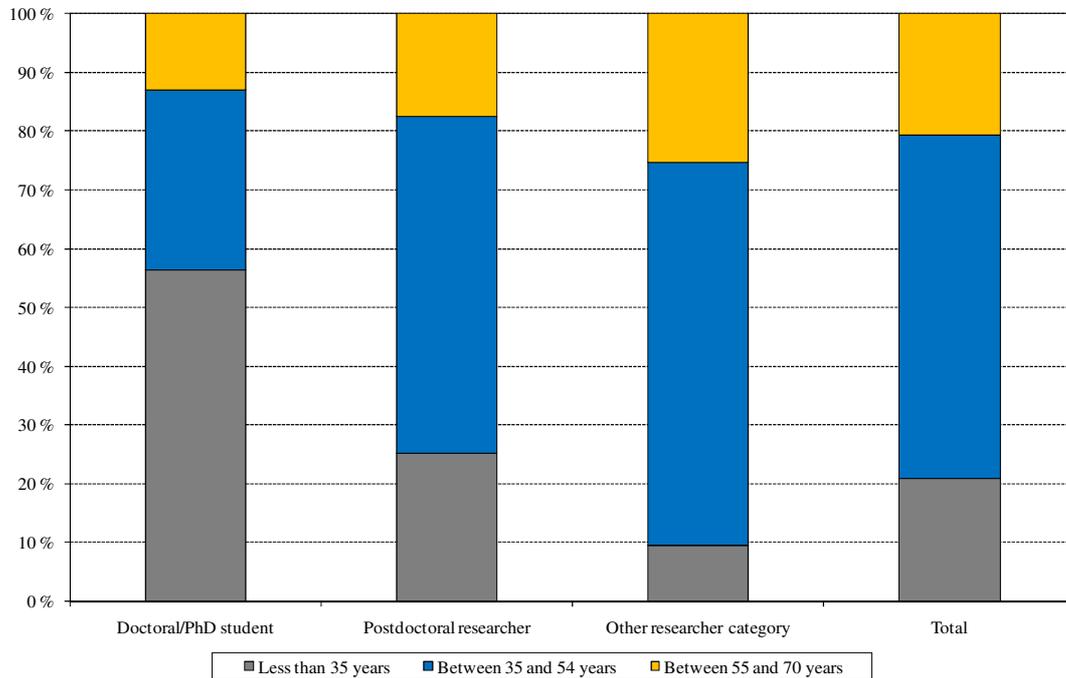


Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure is based on the following questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "Which of the following categories do you consider best describes your current status as a researcher?" (Question 34), and (ii) "What is your employment contract status?" (Question 41).
- 2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

Figure 13: Estimated shares of researchers in the higher education sector in EU27 by age group and by current status as a researcher. Estimates based on responses on year of birth and researcher status in the Mobility Survey. n=4,538.

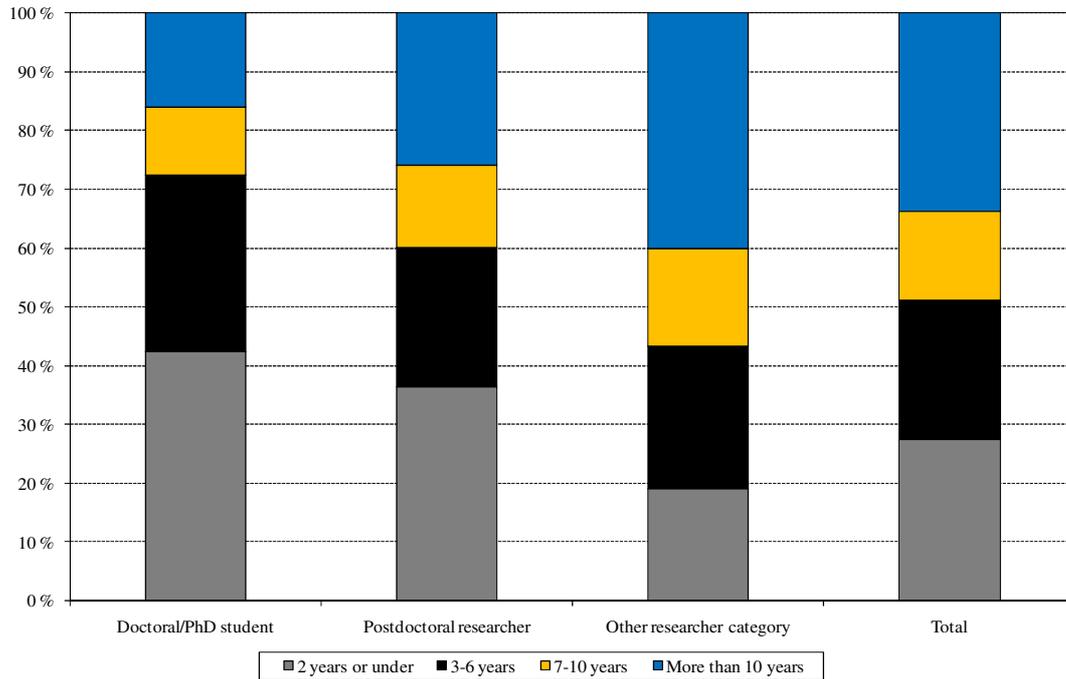


Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure is based on the following questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "What is your year of birth?" (Question 9), and (ii) "Which of the following categories do you consider best describes your current status as a researcher?" (Question 34).
- 2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

Figure 14: Estimated shares of researchers in the higher education sector in EU27 by years of seniority under their current status as a researcher. Estimates based on responses in the Mobility Survey. n=4,537.

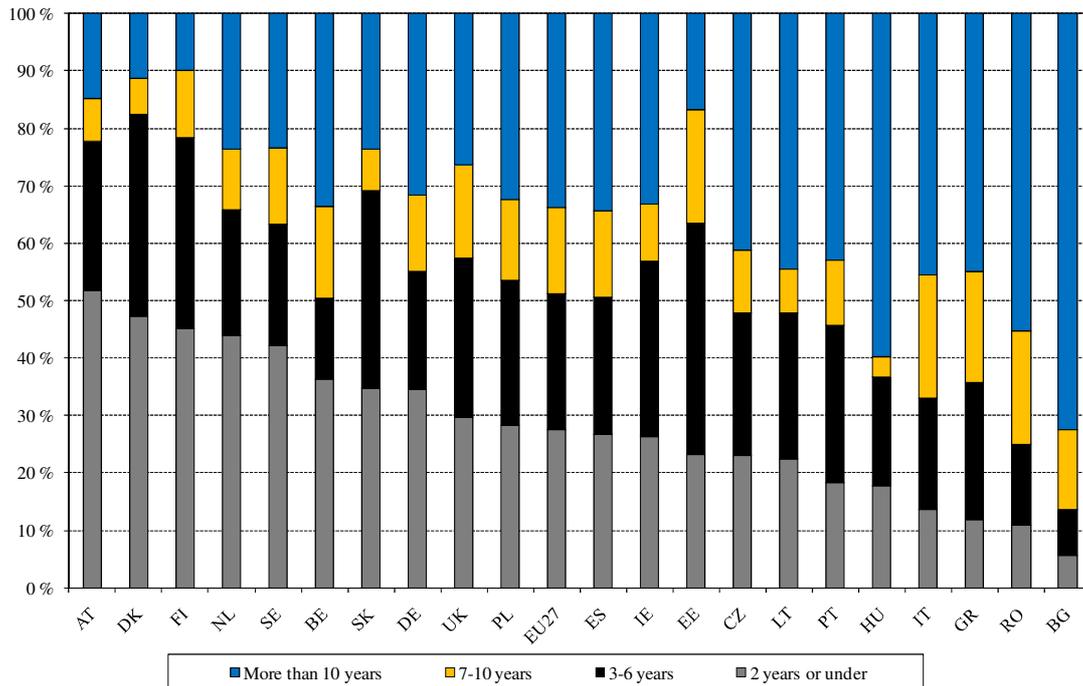


Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure is based on the following questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "Which of the following categories do you consider best describes your current status as a researcher?" (Question 34), and (ii) "How long (years) have you been working under this contract status (i.e. your employment contract status?" (Question 42).
- 2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

Figure 15: Estimated shares of researchers in the higher education sector in EU27 by years of seniority and by country of affiliation. Estimates based on responses in the Mobility Survey. $n=4,537$.



Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure is based on the following question in the Mobility Questionnaire of the Higher Education Sector (Question 42): "How long (years) have you been working under this contract status (i.e. your employment contract status?" (see Annex 2).
- 2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) Cyprus, Latvia, Luxembourg, Malta and Slovenia are excluded from the figure, since there are few respondents from these countries.
- 4) France is excluded from all the figures and tables in Chapters 4 and 5.
- 5) In the figure we measure the share of EU27 researchers by the country a person's email address refers to.
- 6) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

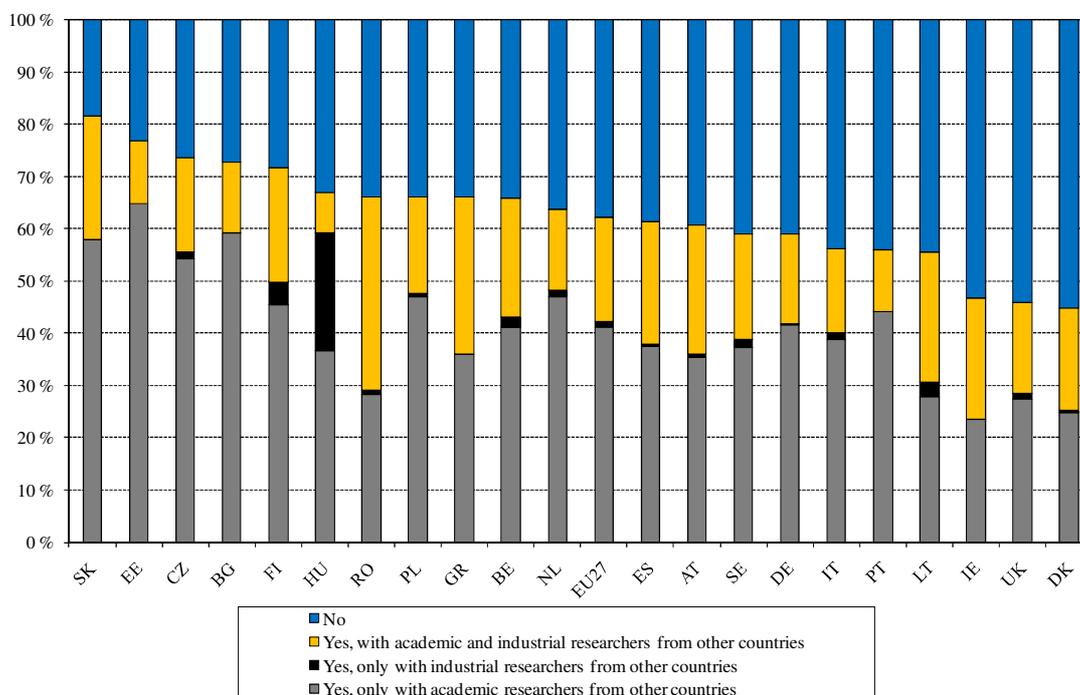
4.3.2 Formal collaboration with academic and business sector researchers

Figure 16 presents estimates of formal collaboration patterns in the higher education sector in EU27. We estimate that 62 per cent of the population of researchers have formal collaboration with academic and/or business sector researchers from other countries. This share is highest for researchers from Slovakia (82%) and Estonia (77%), and lowest for researchers from Denmark (45%), the United Kingdom (46%) and Ireland (47%).

In Figure 16 we differentiate between those who have formal collaboration with academic researchers, business sector researchers and both groups. 41 per cent of the population of researchers have formal collaboration with academic researchers from other countries. 20 per cent collaborate both with academic and business sector researchers from other countries. 38 per cent have no formal collaboration with other researchers. Estonia (65%) has the highest share of researchers who collaborate with academic researchers from other countries, while Denmark (25%) has the lowest share. Denmark (55%), United Kingdom (54%) and Ireland (53%) have the highest shares of researchers who have no formal collaboration.

Figure 17 shows that 32 per cent of the respondents have formal collaboration with business sector researchers from the country where they principally work as researchers. This share is lowest for doctoral/PhD students (21%), and highest for researchers in “other researcher” categories (33%). The corresponding share for postdoctoral researchers is 31 per cent. Furthermore, we find the highest share of respondents who have formal collaboration with business sector researchers among those in the Natural Sciences and Technology (41%), and the lowest share among those in the Social Sciences and Humanities (20%). The same pattern is found for researchers in “other researcher” categories. Postdoctoral researchers have the highest share among those in the Medical Sciences and Agriculture (40%), while doctoral/PhD students have the lowest share among those with the same scientific field (10%).

Figure 16: Estimated shares of researchers in the higher education sector in EU27 by whether they have formal collaboration with academic or business sector researchers from other countries. Estimates based on responses in the Mobility Survey. n=4,453.



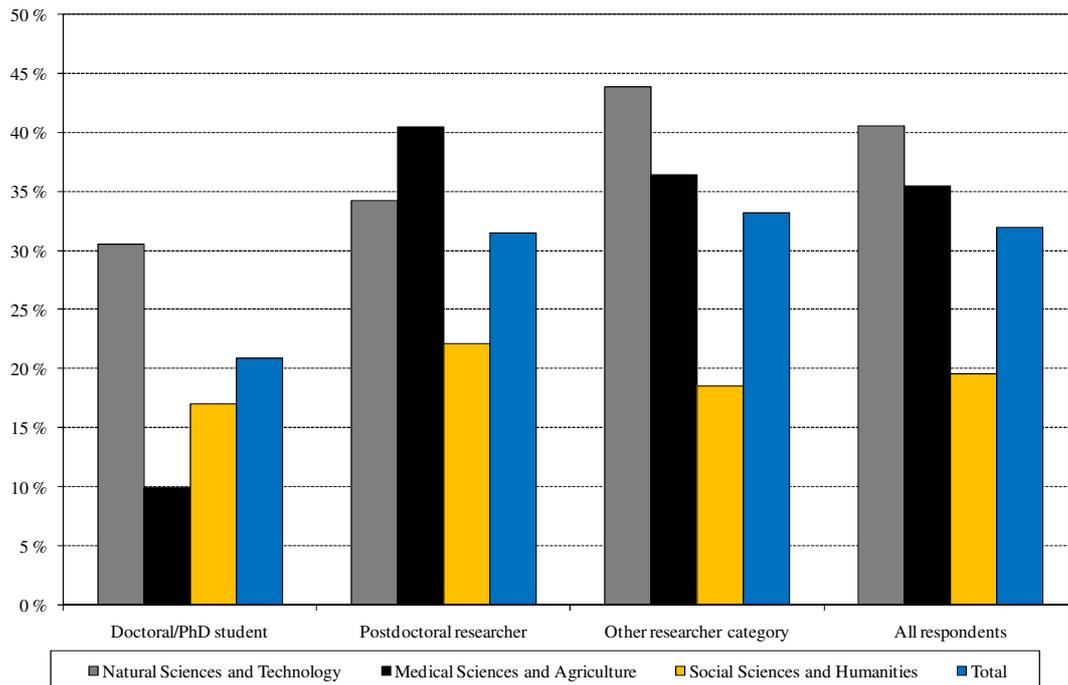
Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure is based on the following question in the Mobility Questionnaire of the Higher Education Sector (Question 44): “Does your current work as a researcher involve some form of formal collaboration (i.e. contractually based collaboration) with academic or business sector researchers from other countries?” (see Annex 2).
- 2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) Cyprus, Latvia, Luxembourg, Malta and Slovenia are excluded from the figure, since there are few respondents from these countries.
- 4) France is excluded from all the figures and tables in Chapters 4 and 5.
- 5) In the figure we measure the share of EU27 researchers by the country a person’s email address refers to.
- 6) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

Figure 17: Estimated shares of researchers in the higher education sector in EU27 with formal collaboration with business sector researchers from the country

where they principally work as researcher. Estimates based on responses in the Mobility Survey. n=4,436.



Source: The Mobility Survey of the Higher Education Sector.

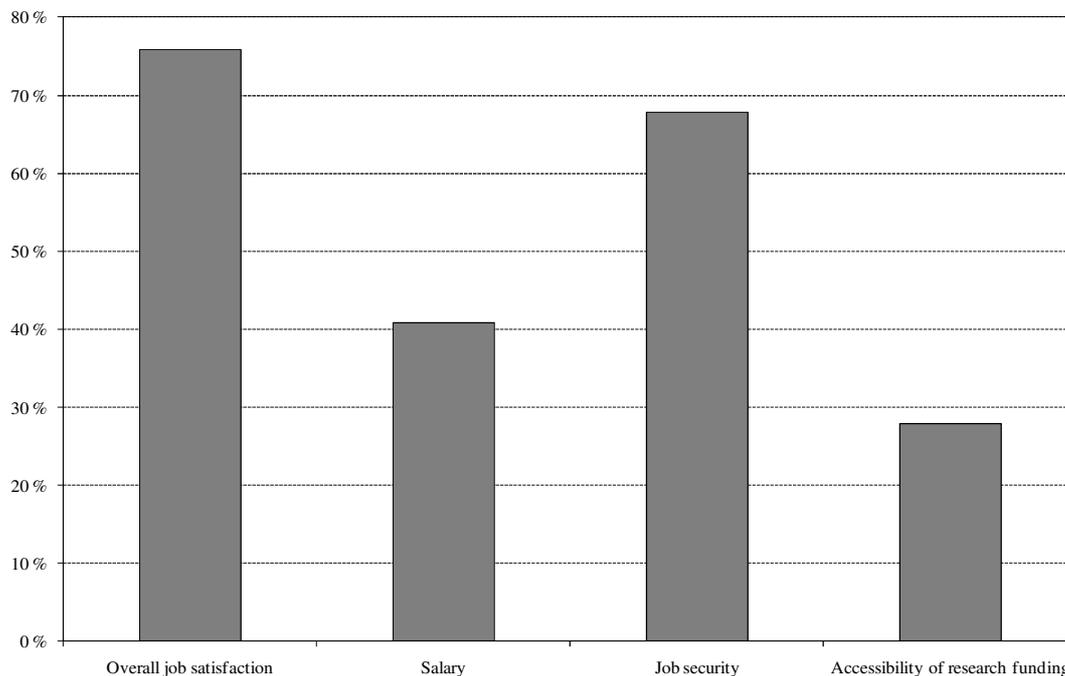
Notes:

- 1) The figure is based on the following questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "Which of the following categories do you consider best describes your current status as a researcher?" (Question 34), and (ii) "Does your current work as a researcher involve some form of formal collaboration (i.e. contractually based collaboration) with business sector researchers from the country where you principally work as researcher?" (Question 45).
- 2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

4.3.3 Satisfaction of current primary employment situation

Figure 18 presents estimates of satisfaction of current primary employment situation in the higher education sector in EU27. It can be derived from the figure that 76 per cent of the respondents are satisfied or very satisfied with their current primary employment situation as a researcher in relation to the overall job satisfaction, while 68 per cent are satisfied or very satisfied in relation to the job security. 41 per cent are satisfied or very satisfied in relation to the salary, while 28 per cent answer the same in relation to the accessibility of research funding.

Figure 18: Estimated shares of researchers in the higher education sector in EU27 by job satisfaction. Estimates based on responses in the Mobility Survey. n=4,537.



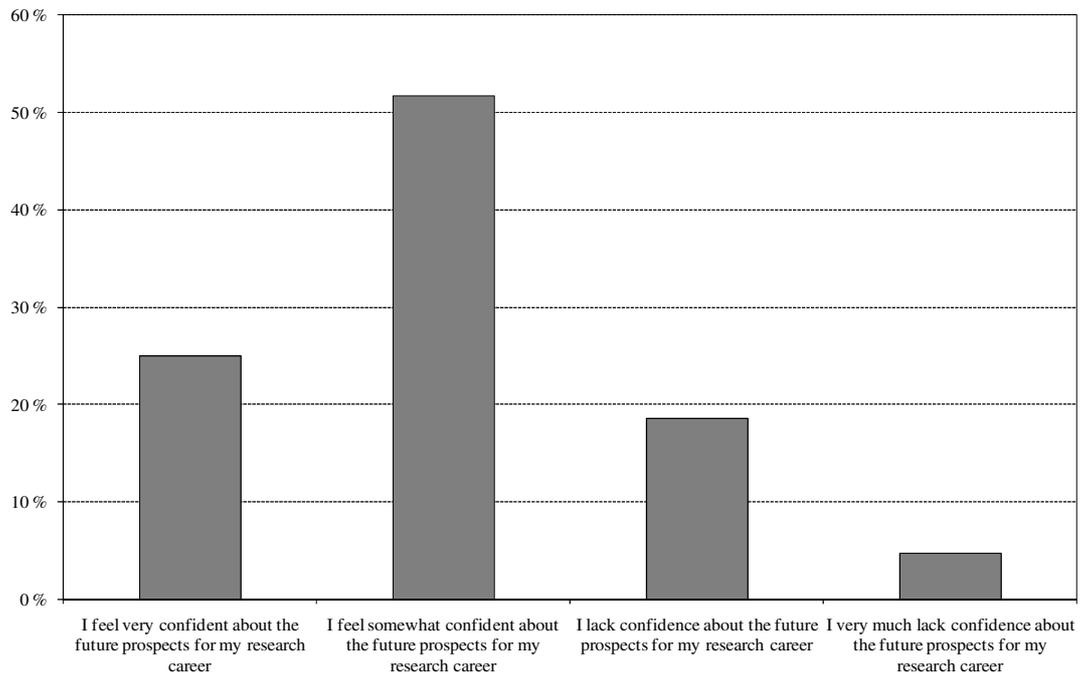
Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure is based on the following question in the Mobility Questionnaire of the Higher Education Sector (Question 46): "How satisfied are you with your current primary employment situation as a researcher in relation to the following dimensions?" (see Annex 2).
- 2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

77 per cent of the respondents feel somewhat confident or very confident about the future prospects for their research career. This is derived from Figure 19. However, 23 per cent lack confidence or very much lack confidence about the future prospects for their research career.

Figure 19: Estimated shares of researchers in the higher education sector in EU27 by how confident they feel in the future prospects for their research career. Estimates based on responses in the Mobility Survey. n=4,537.



Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure is based on the following question in the Mobility Questionnaire of the Higher Education Sector (Question 47): "Overall, how confident do you feel in the future prospects for your research career?" (see Annex 2).
- 2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

5 CAREER PATHS AND INTERNATIONAL MOBILITY AMONG EU27 RESEARCHERS

In this chapter we investigate career paths and international mobility among EU27 researchers. Section 5.1 provides statistics on experience of mobility with a focus on the researcher's career path – mainly inter- and intrasectoral mobility, and Section 5.2 focuses on international mobility. Section 5.3 presents indicators on EU27 researchers' future mobility plans and indicators on mobility impacts on EU27 researchers' careers, while Section 5.4 focuses on the effects of international mobility on future career progression. Main findings and conclusions are presented in Section 5.5.

As in Chapter 4, figures on France are not reported in the graphs and tables of this chapter. As explained in Chapter 3 and Annex 5, the population estimates of mobility shares for France are most likely significantly higher than the "real" mobility shares amongst French HEI researchers. This is due to the significantly lower response rates from this country compared with the rest of EU27 and to the fact that many of the French respondents had to be identified from the list of FP5 and FP6 participants – while all other respondents have been identified from the websites of their HEIs. We expect that researchers participating in FPs tend to be more mobile than non-participants. However, as shown in Annex 5, if we exclude the responses given by French HEI researchers from the sample, this does not alter in any fundamental way the (extrapolated) results on HEI researchers international and intersectoral mobility shares in EU27 (and by country and by scientific fields) presented in this report. Therefore, we chose to keep the responses we received from French researchers when calculating overall EU27 figures throughout the analysis in Chapters 4 and 5 but – as already mentioned – without reporting the specific figures for France. As an example, we mention that if we exclude French responders from the sample (this means that we measure mobility only in the EU26), the new total international mobility shares for the EU26 (53.6 %) drop by about two and a half percentage points compared with the EU27 mobility share estimate (56%).

5.1 Experience of mobility: Career paths

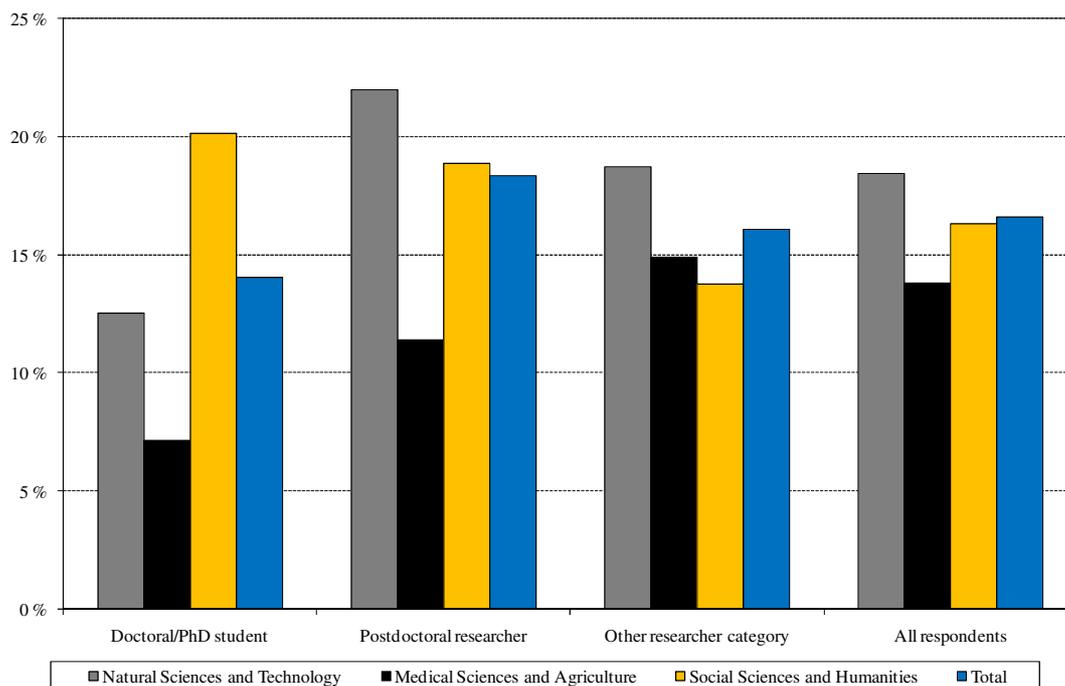
5.1.1 Intersectoral mobility

Figure 20 shows that 17 per cent of the researchers in the higher education sector in EU27 are estimated to have been employed as a researcher in both the public and the private sector. This share is highest for those in the Natural Sciences and Technology (18%), and lowest for those in the Medical Sciences and Agriculture (14%). We also find that this share is highest among postdoctoral researchers (18%), and lowest among doctoral/PhD students (14%). Both postdoctoral researchers (22%) and researchers in the "other researcher" category (19%) have the highest share among those in the Natural Sciences and Technology, while doctoral/PhD students (20%) have the highest share among those in the Social Sciences and Humanities. The latter result is partly due to the fact that Social Sciences doctoral/PhD students with sectoral mobility experience (i.e. they have been employed as a researcher in both the public and the private sector) are older than their counterparts in the two remaining fields of science. This can be derived from Table 9. Furthermore, if we compare Table 8 and Table 9 we see that doctoral/PhD students with sectoral mobility experience are older than doctoral/PhD students without this experience (i.e. they have always been employed as a researcher in the public sector), and this result also holds for each of the

three scientific fields. Table 10 establishes that the highest share of researchers with sectoral mobility experience among Social Sciences doctoral/PhD students is found in the oldest age category (i.e. those between 55 and 70 years old).

Figure 21 depicts the share of researchers who have been employed in both the public and the private sector by country of affiliation. We see that this share is highest for researchers from Denmark (33%), Finland (25%) and Romania (24%), and lowest for Slovakia (4%) and Hungary (6%).

Figure 20: Estimated shares of researchers in the higher education sector in EU27 who have been employed as a researcher in both the public and the private sector by field of science and by current status as a researcher. n=4,537.



Source: The Mobility Survey of the Higher Education Sector.

Notes:

1) The figure is based on the following questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "Which of the following categories do you consider best describes your current status as a researcher?" (Question 34), and (ii) "Which of the following 'career paths' best describes your situation? (please consider only changes of employer, not research visits): (a) I have always been employed as a researcher in the public sector (university, other higher education institution, public or governmental research institute), or (b) I have been employed as a researcher in both the public and the private sector." (Question 50).

2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.

3) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

Table 8: The number of researchers in the higher education sector in EU27 by age group, field of science and by current status as a researcher (per cent). Only those who have always been employed as a researcher in the public sector. n=3,812.

	Less than 35 years old	Between 35 and 54 years old	Between 55 and 70 years old	Total
Doctoral/PhD student				

Natural Sciences and Technology	70	25	4	100
Medical Sciences and Agriculture	69	22	9	100
Social Sciences and Humanities	52	40	8	100
Total	64	30	6	100
Postdoctoral re-searcher				
Natural Sciences and Technology	33	54	12	100
Medical Sciences and Agriculture	27	57	15	100
Social Sciences and Humanities	21	60	19	100
Total	27	57	16	100
Other researcher category				
Natural Sciences and Technology	9	66	26	100
Medical Sciences and Agriculture	10	63	27	100
Social Sciences and Humanities	11	60	28	100
Total	10	63	27	100
All respondents who have always been employed as a researcher in the public sector				
Natural Sciences and Technology	24	57	19	100
Medical Sciences and Agriculture	25	55	20	100
Social Sciences and Humanities	19	58	23	100
Total	22	57	21	100

Source: The Mobility Survey of the Higher Education Sector.

Notes:

1) The table is based on the following questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "What is your year of birth?" (Question 9), (ii) "Which of the following categories do you consider best describes your current status as a researcher?" (Question 34), and (iii) "Which of the following 'career paths' best describes your situation? (please consider only changes of employer, not research visits): (a) I have always been employed as a researcher in the public sector (university, other higher education institution, public or governmental research institute), or (b) I have been employed as a researcher in both the public and the private sector." (Question 50).

2) The table is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.

Table 9: The number of researchers in the higher education sector in EU27 by age group, field of science and by current status as a researcher (per cent). Only those who have been employed as a researcher in both the public and the private sector. n=725.

	Less than 35 years old	Between 35 and 54 years old	Between 55 and 70 years old	Total
Doctoral/PhD student				
Natural Sciences and Technology	60	30	10	100
Medical Sciences and Agriculture	63	25	13	100
Social Sciences and Humanities	34	47	18	100
Total	49	37	14	100
Postdoctoral researcher				
Natural Sciences and Technology	21	58	20	100
Medical Sciences and Agriculture	29	54	17	100
Social Sciences and Humanities	23	60	17	100
Total	23	59	18	100
Other researcher category				
Natural Sciences and Technology	8	70	22	100
Medical Sciences and Agriculture	9	54	37	100
Social Sciences and Humanities	7	66	27	100
Total	8	67	25	100
All respondents who have been employed as a researcher in both the public and the private sector				
Natural Sciences and Technology	18	62	20	100
Medical Sciences and Agriculture	22	51	27	100
Social Sciences and Humanities	17	61	22	100
Total	18	60	22	100

Source: The Mobility Survey of the Higher Education Sector.

Notes:

1) The table is based on the following questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "What is your year of birth?" (Question 9), (ii) "Which of the following categories do you consider best describes your current status as a researcher?" (Question 34), and (iii) "Which of the following 'career paths' best describes your situation? (please consider only changes of employer, not research visits): (a) I have always been employed as a researcher in the public sector (university, other higher education institution, public or governmental research institute), or (b) I have been employed as a researcher in both the public and the private sector." (Question 50).

2) The table is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.

Table 10: Estimated shares of researchers in the higher education sector in EU27 who have been employed as a researcher in both the public and the private sector by age group, field of science and by current status as a researcher. $n=4,537$.

	Less than 35 years old	Between 35 and 54 years old	Between 55 and 70 years old	Total
Doctoral/PhD student				
Natural Sciences and Technology	13	16	35	13
Medical Sciences and Agriculture	9	2	0	7
Social Sciences and Humanities	18	18	37	20
Total	13	15	28	14
Postdoctoral re-researcher				
Natural Sciences and Technology	19	25	23	22
Medical Sciences and Agriculture	8	11	9	11
Social Sciences and Humanities	17	25	15	19
Total	16	22	17	18
Other researcher category				
Natural Sciences and Technology	11	19	19	19
Medical Sciences and Agriculture	35	10	22	15
Social Sciences and Humanities	10	15	12	14
Total	16	15	17	16
All respondents				
Natural Sciences and Technology	16	18	21	18
Medical Sciences and Agriculture	10	11	16	14
Social Sciences and Humanities	13	18	13	16
Total	14	16	17	17

Source: The Mobility Survey of the Higher Education Sector.

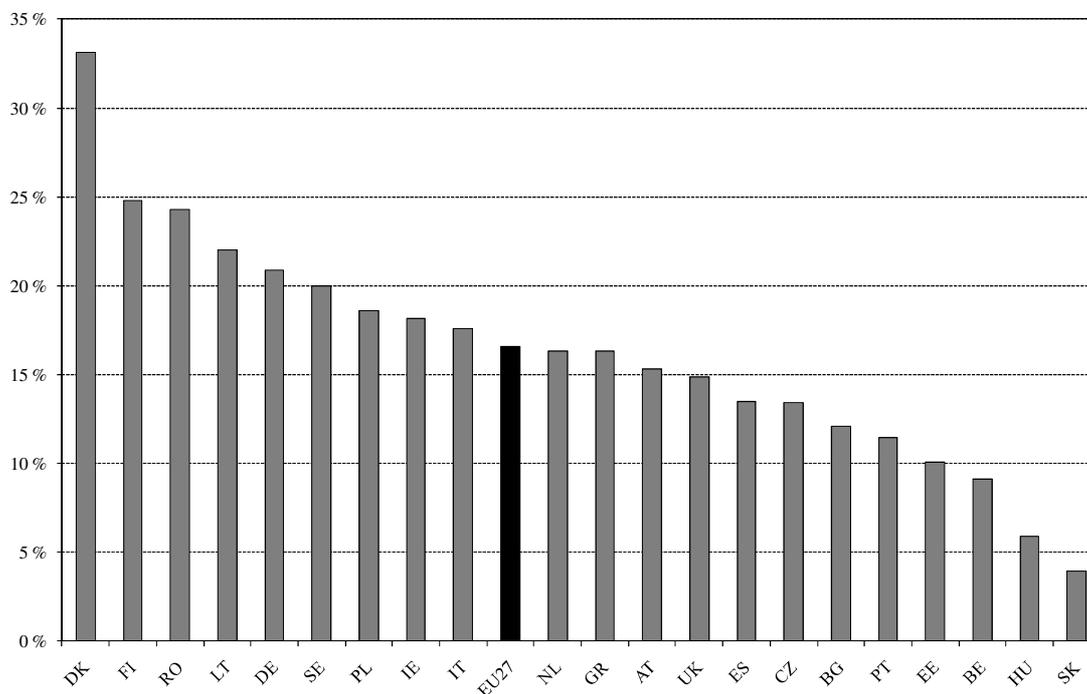
Notes:

1) The table is based on the following questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "What is your year of birth?" (Question 9), (ii) "Which of the following categories do you consider best describes your current status as a researcher?" (Question 34), and (iii) "Which of the following 'career paths' best describes your situation? (please consider only changes of employer, not research visits): (a) I have always been employed as a researcher in the public sector (university, other higher education institution, public or governmental research institute), or (b) I have been employed as a researcher in both the public and the private sector." (Question 50).

2) The table is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.

3) The shares of EU27 researchers in the table are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

Figure 21: Estimated share of researchers in the higher education sector in EU27 who have been employed as a researcher in both the public and the private sector by country of affiliation. n=4,537.



Source: The Mobility Survey of the Higher Education Sector.

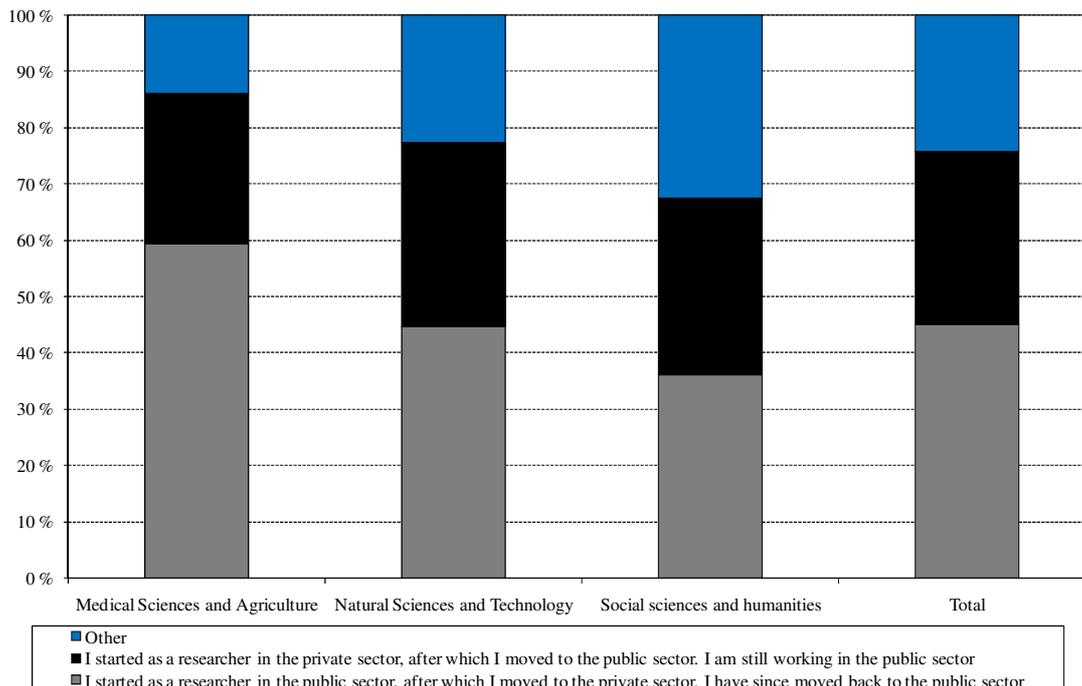
Notes:

- 1) The figure is based on the following question in the Mobility Questionnaire of the Higher Education Sector (Question 50): "Which of the following 'career paths' best describes your situation? (please consider only changes of employer, not research visits): (i) I have always been employed as a researcher in the public sector (university, other higher education institution, public or governmental research institute), or (ii) I have been employed as a researcher in both the public and the private sector." (see Annex 2).
- 2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) Cyprus, Latvia, Luxembourg, Malta and Slovenia are excluded from the figure, since there are few respondents from these countries.
- 4) France is excluded from all the figures and tables in Chapters 4 and 5.
- 5) In the figure we measure the share of EU27 researchers by the country a person's email address refers to.
- 6) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

Figure 22 provides the share of researchers who have been employed in both the public and the private sector by 'career paths' and by field of science. From the figure we see that the share of researchers who started their career in the public sector, then moved to the private sector and back again to the public sector, is highest for those in the Medical Sciences and Agriculture (59%), and lowest for those in the Social Sciences and Humanities (36%).

Further, Figure 22 shows that the share of researchers who commenced their careers in the private sector after which they moved to the public sector and remained there, is highest in the Natural Sciences and Technology (33%), and lowest for those in the Medical Sciences and Agriculture (27%).

Figure 22: Estimated share of researchers in the higher education sector in EU27 by 'career paths' and by field of science. Only researchers who have been employed as a researcher in both the public and the private sector.¹⁹ n=726.



Source: The Mobility Survey of the Higher Education Sector.

Notes:

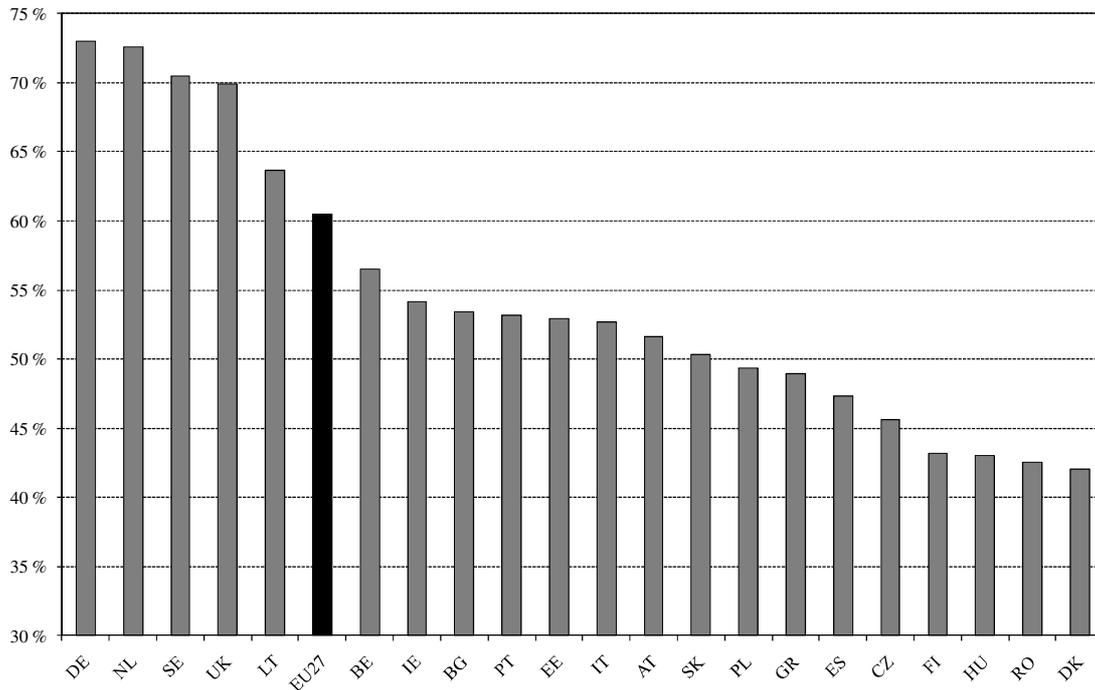
- 1) The figure is based on the following question in the Mobility Questionnaire of the Higher Education Sector (Question 51): "Which of the following 'career paths' best describes your situation?" (see Annex 2).
- 2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

5.1.2 Intrasectoral mobility

60 per cent of the respondents have worked for more than one public research organisation. This is seen in Figure 23. The same figure shows that this share is highest for Germany (73%), Netherlands (73%), Sweden (70%) and United Kingdom (70%), and lowest for Denmark (42%), Romania (43%), Hungary (43%) and Finland (43%).

¹⁹ The category "other" consists of several different groups of respondents. Two main groups are: (i) researchers who have moved between public and private sectors at various stages (and different from the career paths described in the two other categories), and (ii) researchers who are employed in the public sector, but at the same time work in the private sector (for example, a part-time job or they have their own firm).

Figure 23: Estimated share of researchers in the higher education sector in EU27 who have worked for more than one public research organisation by country of affiliation. n=4,538.



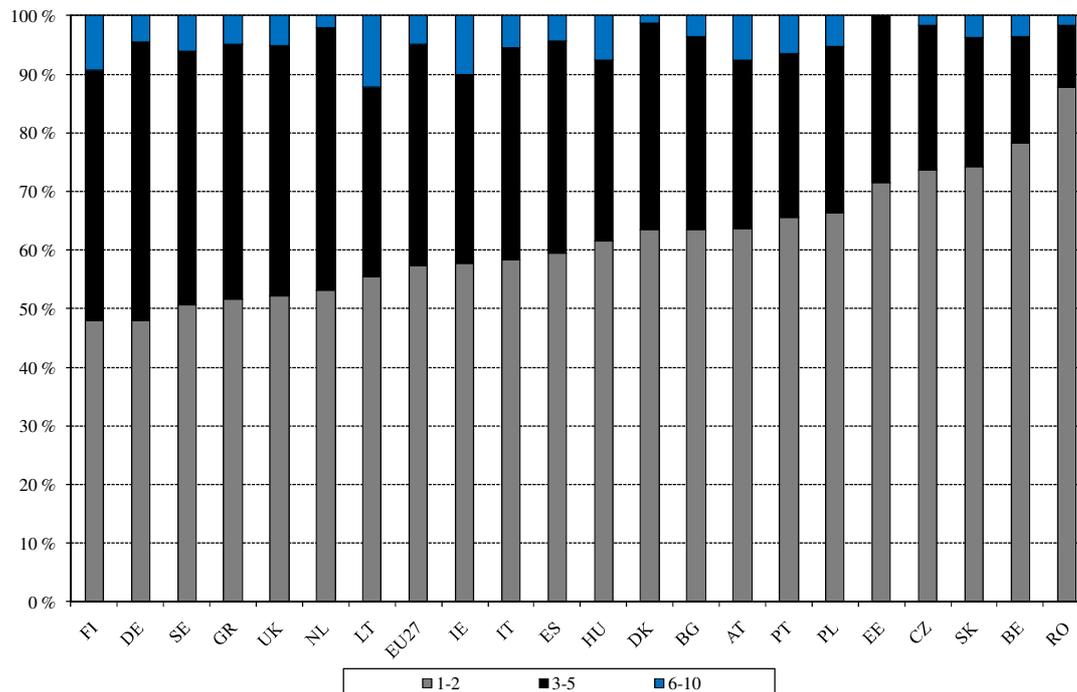
Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure is based on the following question in the Mobility Questionnaire of the Higher Education Sector (Question 52): "During your employment career as a researcher have you worked for more than one public research organisation (university, higher education institution or other public research institute)?" (see Annex 2).
- 2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) Cyprus, Latvia, Luxembourg, Malta and Slovenia are excluded from the figure, since there are few respondents from these countries.
- 4) France is excluded from all the figures and tables in Chapters 4 and 5.
- 5) In the figure we measure the share of EU27 researchers by the country a person's email address refers to.
- 6) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

Figure 24 shows that 57 per cent of the researchers have moved one or two times from one public research organisation to another, 38 per cent have moved 3-5 times, and 5 per cent have moved more than six times. The share of researchers who have moved one or two times is highest for those from Romania (88%) and Belgium (78%), and lowest for those from Finland and Germany (both 48%). We find that the share of 3-5 movements is highest for researchers from Germany (47%) and Netherlands (45%).

Figure 24: Estimated share of researchers in the higher education sector in EU27 by the number of job movements from one public research organisation to another and by country of affiliation. n=2,497.



Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure is based on the following question in the Mobility Questionnaire of the Higher Education Sector (Question 53): "How many times have you moved job from one public research organisation (university, institute of higher education or other public research institute) to another?" (see Annex 2).
- 2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) Cyprus, Latvia, Luxembourg, Malta and Slovenia are excluded from the figure, since there are few respondents from these countries.
- 4) France is excluded from all the figures and tables in Chapters 4 and 5.
- 5) In the figure we measure the share of EU27 researchers by the country a person's email address refers to.
- 6) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

5.2 Experience of international mobility

5.2.1 International mobility during the researcher career

Figure 25 shows that 56 per cent of the EU27 researcher population in the higher education sector are estimated to have been internationally mobile researchers, i.e. they have worked²⁰ in another country than the country where they attained their highest educational degree. This share is highest for researchers in the "other researcher" category (61%), and lowest for doctoral/PhD students (31%). The corresponding share for postdoctoral researchers is 56 per cent, which is the same per cent as for all respondents. Of course, these estimates also include cross-border research visits.

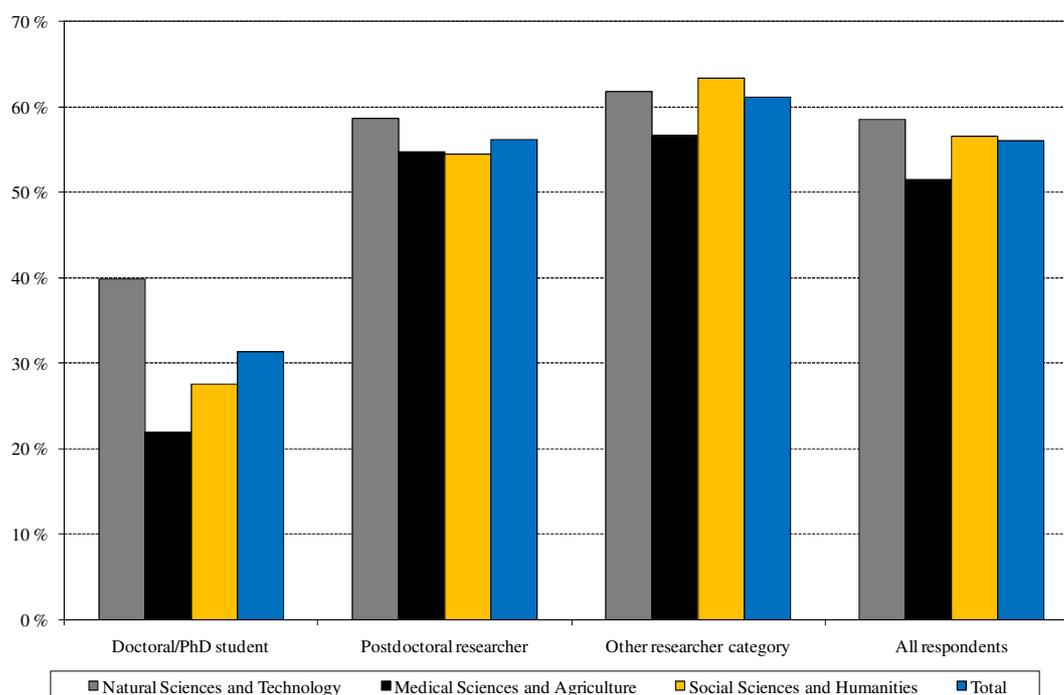
Figure 25 also shows that Natural Sciences and Technology fields have the highest share of internationally mobile researchers (59%), while Medical Sciences and

²⁰ Including research visits of three months duration or longer.

Agriculture fields have the lowest share (52%). The same pattern holds for doctoral/PhD students, where the share is 40 per cent for those in the Natural Sciences and Technology and 22 per cent for those in the Medical Sciences and Agriculture.

Males (59%) have had career tracks with greater international mobility than females (52%). This is presented in Figure 26. The share of internationally mobile researchers is highest for those in the Social Sciences and Humanities among male researchers (64%), and highest for those in the Natural Sciences and Technology among female researchers (57%). Researchers in the Medical Sciences and Agriculture have the lowest share for both genders (53% for males, and 46% for females).

Figure 25: Estimated share of researchers in the higher education sector in EU27 with international mobility experience at least once in their researcher career by field of science and by current status as a researcher. n=4,538.



Source: The Mobility Survey of the Higher Education Sector.

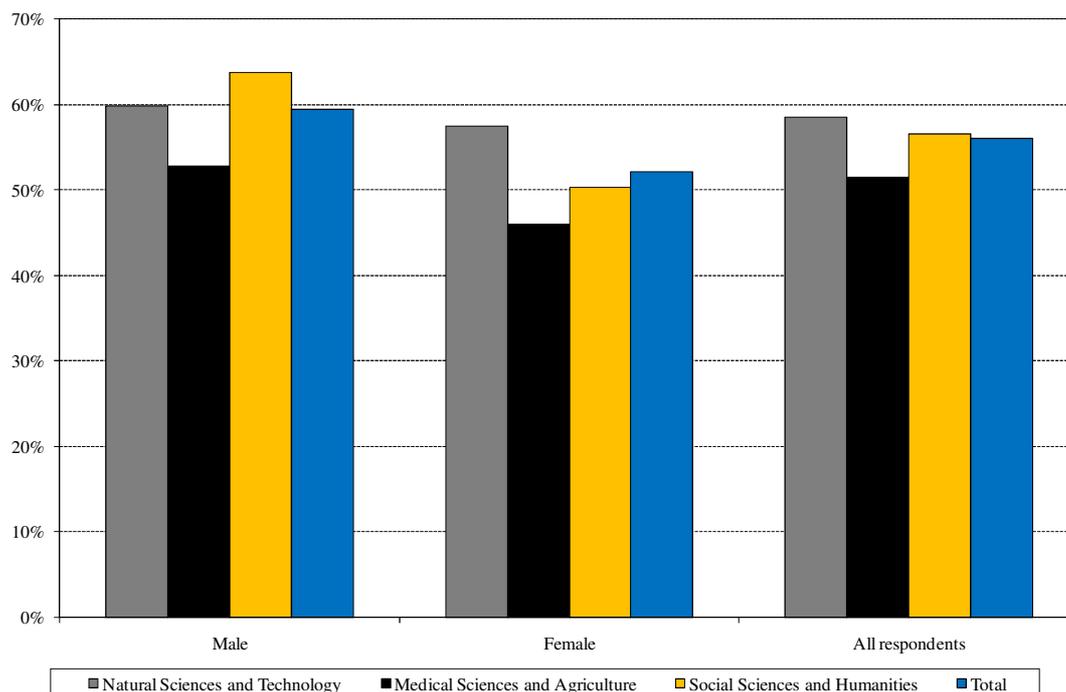
Notes:

1) The figure is based on the following questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "Which of the following categories do you consider best describes your current status as a researcher?" (Question 34), and (ii) "In your researcher career (which also encompasses the whole period of your PhD-education) have you worked in another country than the country where you attained your highest educational degree, including research visits of 3 months or more? (NOTE: For this project, if you answer yes to this question you are considered as an "internationally mobile" researcher.)" (Question 55).

2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.

3) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

Figure 26: Estimated share of international mobile researchers in the higher education sector in EU27 by field of science and by gender. n=4,538.



Source: The Mobility Survey of the Higher Education Sector.

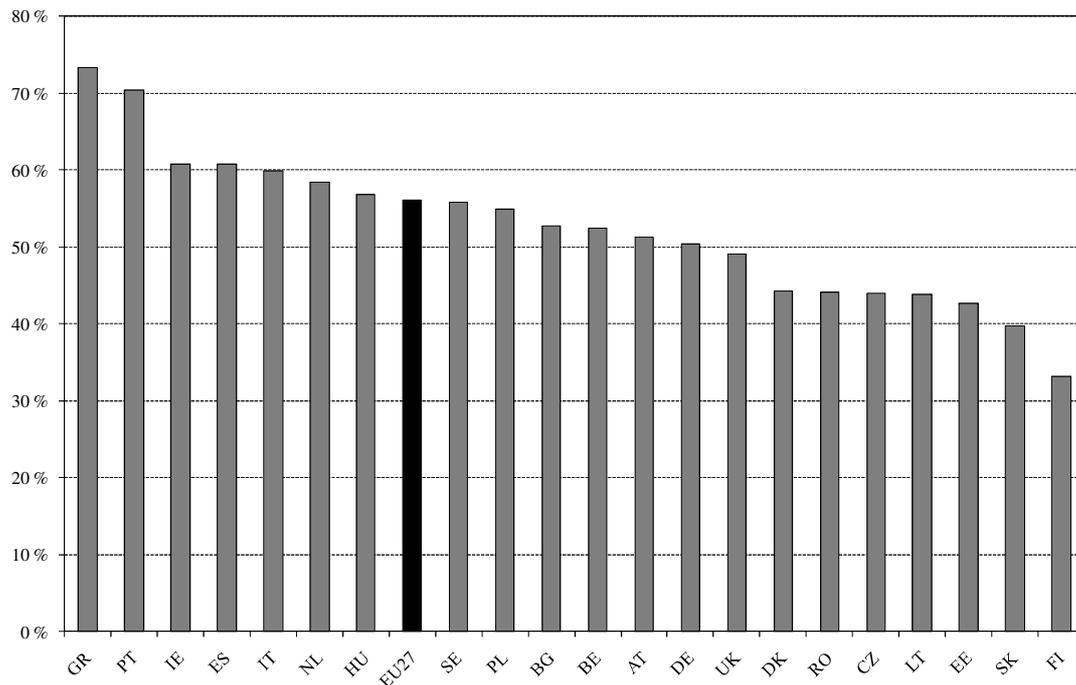
Notes:

- 1) The figure is based on the following questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "What is your gender?" (Question 8), and (ii) "In your researcher career (which also encompasses the whole period of your PhD-education) have you worked in another country than the country where you attained your highest educational degree, including research visits of 3 months or more? (NOTE: For this project, if you answer yes to this question you are considered as an "internationally mobile" researcher.)" (Question 55).
- 2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

Figure 27 shows estimated shares of internationally mobile researchers in the higher education sector by country of affiliation²¹. We see that this share is highest for Greece (73%) and Portugal (70%), and lowest for Finland (33%) and Slovakia (40%). Table 11 shows the share of internationally mobile researchers both by country of affiliation and field of science.

²¹ By "country of affiliation" we mean the country in which the research organisation – and consequently the e-mail address of the respondents – is located.

Figure 27: Estimated shares of international mobile researchers in the higher education sector in EU27 by country of affiliation. n=4,538.



Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure is based on the following question in the Mobility Questionnaire of the Higher Education Sector (Question 55): "In your researcher career (which also encompasses the whole period of your PhD-education) have you worked in another country than the country where you attained your highest educational degree, including research visits of 3 months or more? (NOTE: For this project, if you answer yes to this question you are considered as an "internationally mobile" researcher.)" (See Annex 2.)
- 2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) Cyprus, Latvia, Luxembourg, Malta and Slovenia are excluded from the figure, since there are few respondents from these countries.
- 4) France is excluded from all the figures and tables in Chapters 4 and 5.5) In the figure we measure the share of EU27 researchers by the country a person's email address refers to.
- 6) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

Table 11: Estimated shares of international mobile researchers in the higher education sector in EU27 by country of affiliation and by field of science. n=4,538.

Country	Acronym	Natural Sciences and Technology	Medical Sciences and Agriculture	Social Sciences and Humanities	Total
Belgium	BE	68	25	41	52
Bulgaria	BG	51	41	61	53
Czech Republic	CZ	56	25	47	44
Denmark	DK	63	8	68	44
Germany	DE	49	42	59	50
Estonia	EE	33	13	69	43

Ireland	IE	54	77	62	61
Greece	GR	66	100	63	73
Spain	ES	63	57	60	61
Italy	IT	52	70	62	60
Lithuania	LT	53	56	32	44
Hungary	HU	47	100	42	57
Netherlands	NL	78	40	49	58
Austria	AT	46	56	49	51
Poland	PL	59	57	49	55
Portugal	PT	84	47	61	70
Romania	RO	40	50	37	44
Slovakia	SK	37	50	42	40
Finland	FI	22	49	35	33
Sweden	SE	58	61	51	56
United Kingdom	UK	61	24	53	49
Total	EU27	58	52	56	56

Source: The Mobility Survey of the Higher Education Sector.

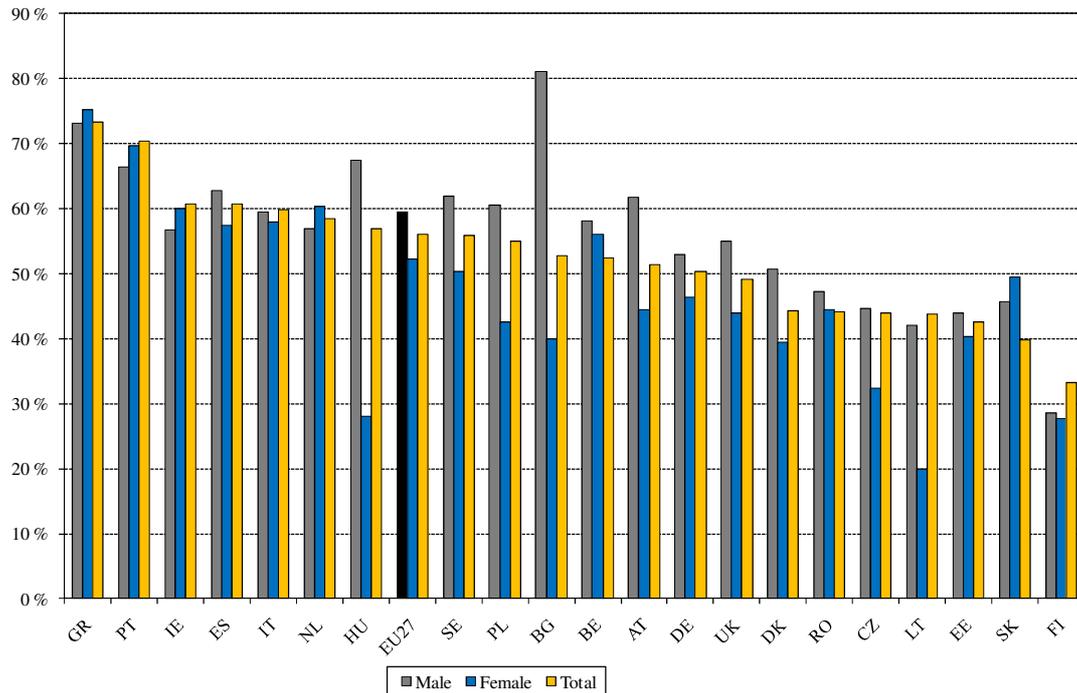
Notes:

- 1) The table is based on the following question in the Mobility Questionnaire of the Higher Education Sector (Question 55): "In your researcher career (which also encompasses the whole period of your PhD-education) have you worked in another country than the country where you attained your highest educational degree, including research visits of 3 months or more? (NOTE: For this project, if you answer yes to this question you are considered as an "internationally mobile" researcher.)" (See Annex 2.)
- 2) The table is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) Cyprus, Latvia, Luxembourg, Malta and Slovenia are excluded from the table, since there are few respondents from these countries.
- 4) France is excluded from all the figures and tables in Chapters 4 and 5.
- 5) In the table we measure the share of EU27 researchers by the country a person's email address refers to, and by field of science.
- 6) The shares of EU27 researchers in the table are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

Figure 28 presents the share of internationally mobile researchers both by gender and country of affiliation. We see that males are more internationally mobile than females for most of the EU27 countries.

We observe in Figure 29 that postdoctoral researchers are more internationally mobile than doctoral/PhD students in most of the EU27 countries, except for Portugal, Bulgaria and Greece. For the majority of the EU27 countries, researchers in the "other researcher" category are more internationally mobile than postdoctoral researchers.

Figure 28: Estimated shares of international mobile researchers in the higher education sector in EU27 by gender and by country of affiliation. n=4,538.

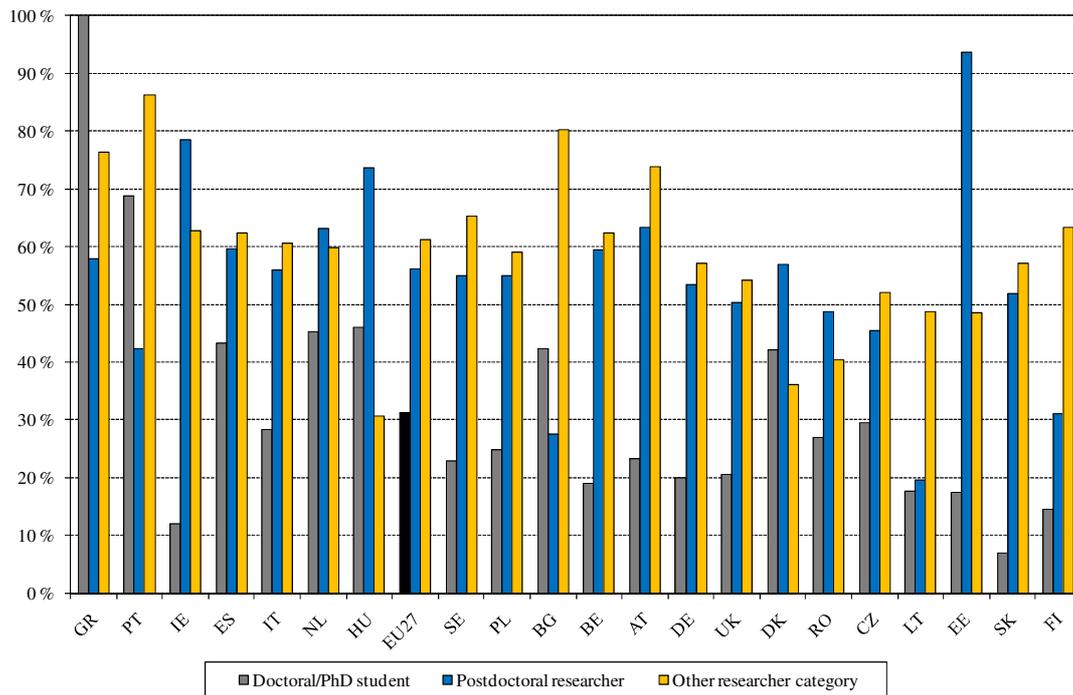


Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure is based on the following questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "What is your gender?" (Question 8), and (ii) "In your researcher career (which also encompasses the whole period of your PhD-education) have you worked in another country than the country where you attained your highest educational degree, including research visits of 3 months or more? (NOTE: For this project, if you answer yes to this question you are considered as an "internationally mobile" researcher.)" (Question 55).
- 2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) Cyprus, Latvia, Luxembourg, Malta and Slovenia are excluded from the figure, since there are few respondents from these countries.
- 4) France is excluded from all the figures and tables in Chapters 4 and 5.
- 5) In the figure we measure the share of EU27 researchers by the country a person's email address refers to, and by gender.
- 6) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

Figure 29: Estimated share of international mobile researchers in the higher education sector in EU27 by current status as a researcher and country of affiliation.²² n=4,538.



Source: The Mobility Survey of the Higher Education Sector.

Notes:

1) The figure is based on the following questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "Which of the following categories do you consider best describes your current status as a researcher?" (Question 34), and (ii) "In your researcher career (which also encompasses the whole period of your PhD-education) have you worked in another country than the country where you attained your highest educational degree, including research visits of 3 months or more? (NOTE: For this project, if you answer yes to this question you are considered as an "internationally mobile" researcher.)" (Question 55).

2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.

3) Cyprus, Latvia, Luxembourg, Malta and Slovenia are excluded from the figure, since there are few respondents from these countries.

4) France is excluded from all the figures and tables in Chapters 4 and 5.

5) In the figure we measure the share of EU27 researchers by the country a person's email address refers to.

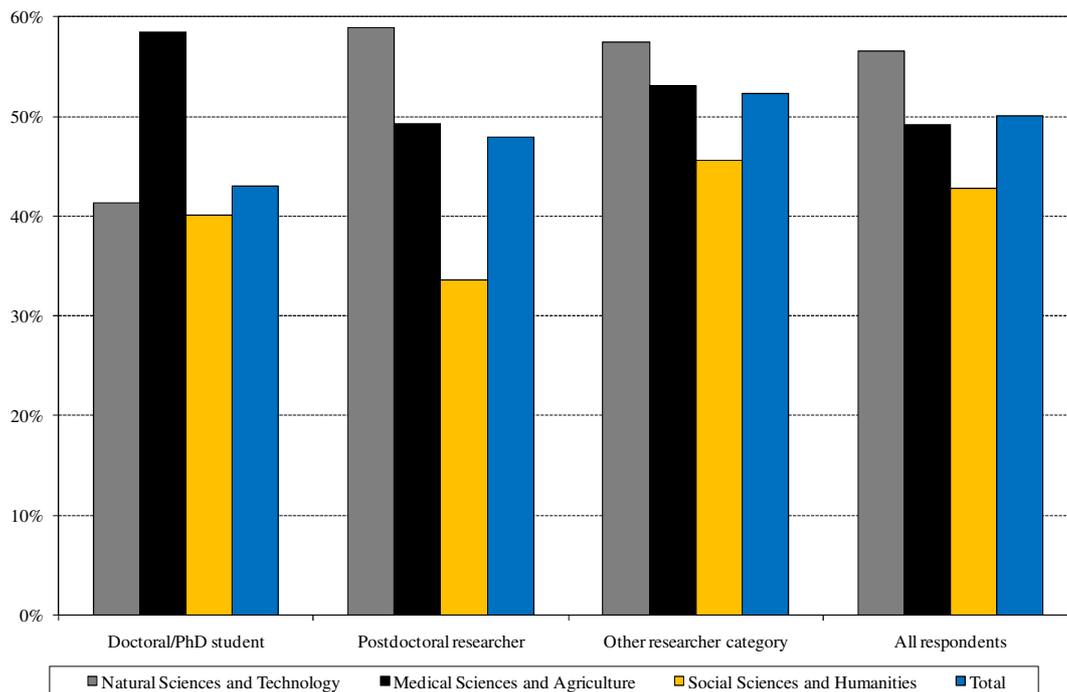
6) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

Figure 30 shows that 50 per cent of the internationally mobile researchers have experience of at least one move to a new employer in another country in their researcher career. This share is highest for researchers in the Natural Sciences and Technology (57%), and lowest for those in the Social Sciences and Humanities (43%). The same pattern holds for the three main status groups of researchers, but with one exception: For doctoral/PhD students we find the highest share among researchers in the Medical Sciences and Agriculture (58%). Furthermore, the figure also shows that researchers in the "other researcher" category have the highest share of researchers with experience of changing job (52%), while doctoral/PhD students have the lowest share (43%).

²² We have used the same rank of EU27 countries as in Figure 27. **Error! Reference source not found..**

Figure 31 presents the share of internationally mobile researchers having experience of at least one move to a new employer in another country in their researcher career by country of affiliation. This share is highest for internationally mobile researchers from the United Kingdom (75%) and Austria (73%), and lowest for those from Slovakia (9%) and Romania (18%). Concurrently, as Figure 27 (and Figure 31) clearly shows, the share of internationally mobile researchers among all researchers in the higher education sector is lower in the United Kingdom and Austria than for EU27 as a whole²³.

Figure 30: Estimated shares of researchers in the higher education sector in EU27 having experience of at least one move to a new employer in another country in their researcher by field of science and by current status as a researcher. Estimated shares among all internationally mobile researchers. n=2,586.



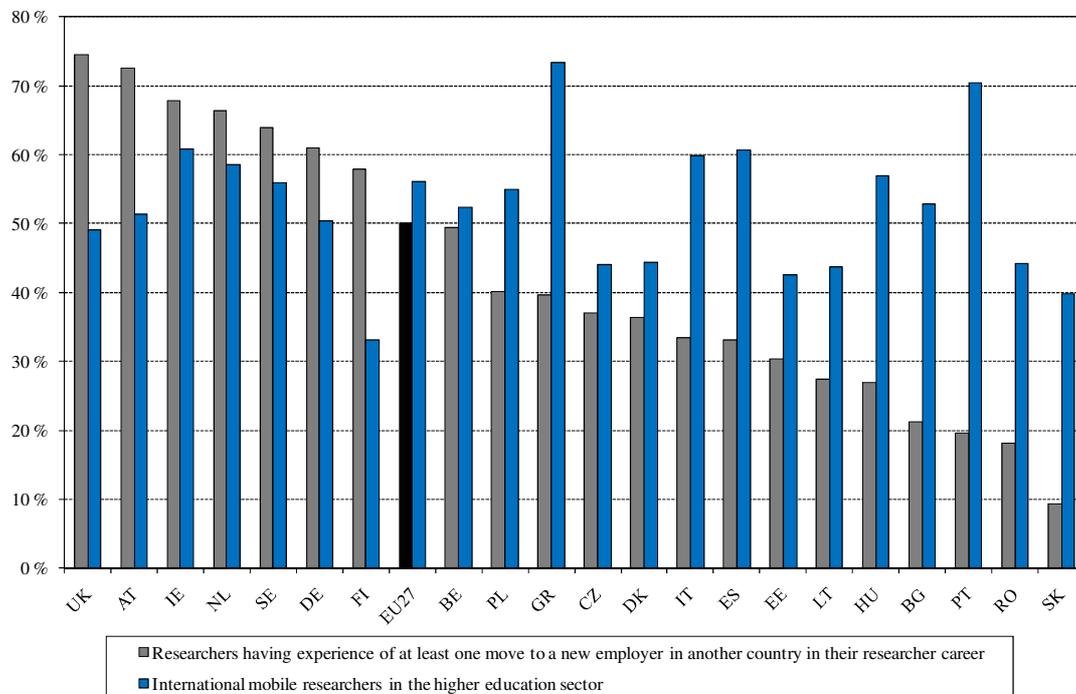
Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure is based on the following question in the Mobility Questionnaire of the Higher Education Sector (Question 57): "Did any of these instances of international mobility involve a move to a new employer in another country?" (see Annex 2).
- 2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for mobile researchers.

²³ Note that the gray columns (black column for the total) in the figure show the number of researchers having experience of at least one move to a new employer in another country in per cent of internationally mobile researchers in each EU27 countries, while the blue columns show the number of internationally mobile researchers in per cent of all respondents in each EU27 countries.

Figure 31: Estimated share researchers in the higher education sector in EU27 having experience of at least one move to a new employer in another country in their researcher career by country of affiliation (gray columns; and black column for the total). Estimated shares among all internationally mobile researchers. These shares are compared with the estimated shares of internationally mobile researchers in the higher education sector in EU27 (blue columns). $n=2,586$.



Source: The Mobility Survey of the Higher Education Sector.

Notes:

1) The figure is based on the following questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "In your researcher career (which also encompasses the whole period of your PhD-education) have you worked in another country than the country where you attained your highest educational degree, including research visits of 3 months or more? (NOTE: For this project, if you answer yes to this question you are considered as an "internationally mobile" researcher.)" (Question 55), and (ii) "Did any of these instances of international mobility involve a move to a new employer in another country?" (Question 57).

2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.

3) Cyprus, Latvia, Luxembourg, Malta and Slovenia are excluded from the figure, since there are few respondents from these countries.

4) France is excluded from all the figures and tables in Chapters 4 and 5.

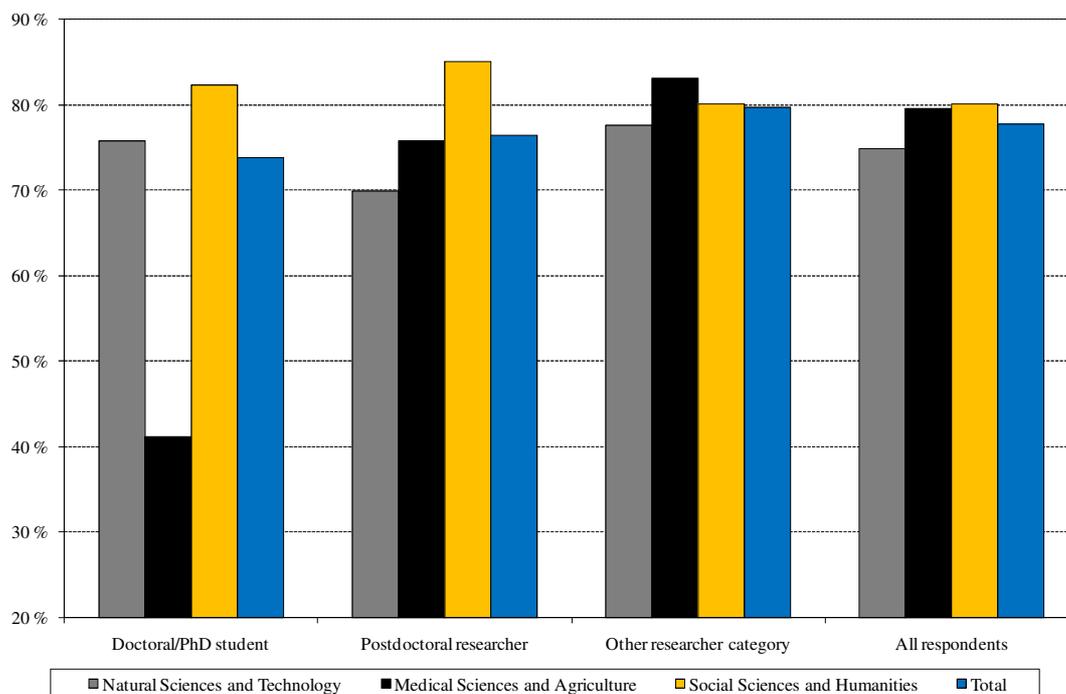
5) In the figure we measure the share of EU27 researchers by the country a person's email address refers to.

6) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for mobile researchers for the gray columns (and black column for the total) and the weights for all respondents for the blue columns.

78 per cent of the internationally mobile researchers have experience of at least one research visit in another country in their researcher career. This is seen in Figure 32. We find the highest share for researchers in the "other researcher category" (80%), and the lowest share for doctoral/PhD students (74%). There are small differences between the three main scientific fields for EU27 as a whole. However, for doctoral/PhD students we find a much higher share of researchers with experience of research visits for those in the Social Sciences and Humanities (82%) than for those in the Medical Sciences and Agriculture (41%).

We see from Figure 33 that due to a low (but “representative”) number of researchers from this country in the sample, all respondents from Estonia have experience of research visits in their researcher career. This share is also high for respondents from Bulgaria (98%). Austria (56%) and the United Kingdom (59%) have the lowest shares.

Figure 32: Estimated share of researchers in the higher education sector in EU27 having experience of at least one research visit in another country in their researcher career by field of science and current status as a researcher. Estimated shares among all internationally mobile researchers. n=2,586.

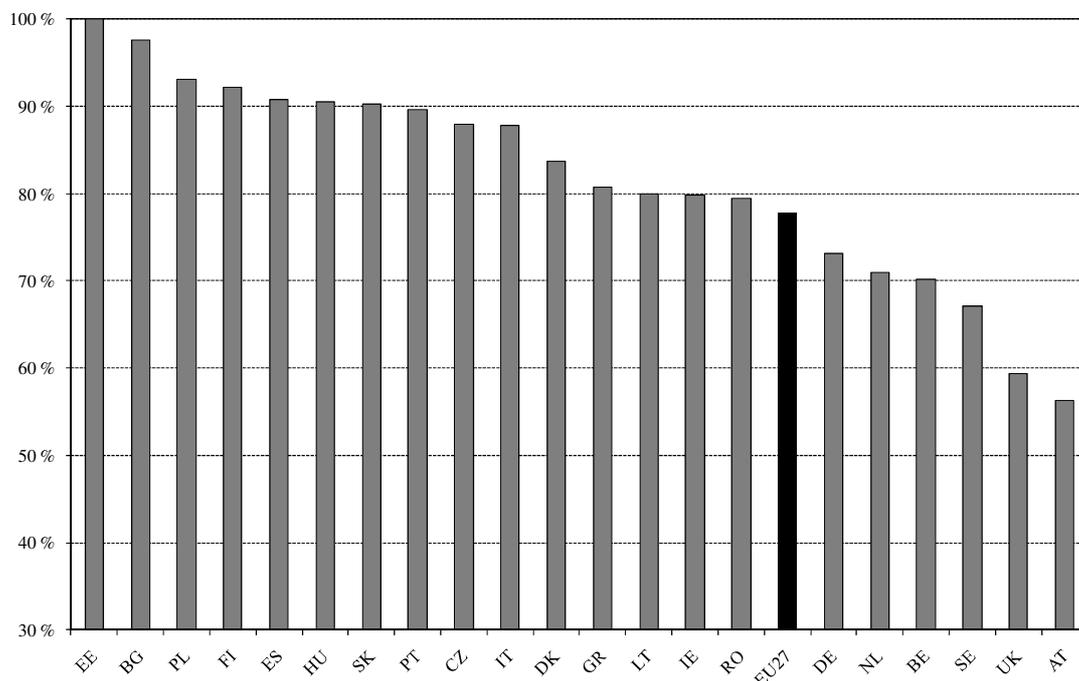


Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure is based on the following question in the Mobility Questionnaire of the Higher Education Sector (Question 57): “Did any of these instances of international mobility involve a research visit to another country without a change of employer?” (see Annex 2).
- 2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for mobile researchers.

Figure 33: Estimated share of researchers in the higher education sector in EU27 having experience of at least one research visit in another country in their researcher career by country of affiliation. Estimated shares among all internationally mobile researchers. $n=2,586$.



Source: The Mobility Survey of the Higher Education Sector.

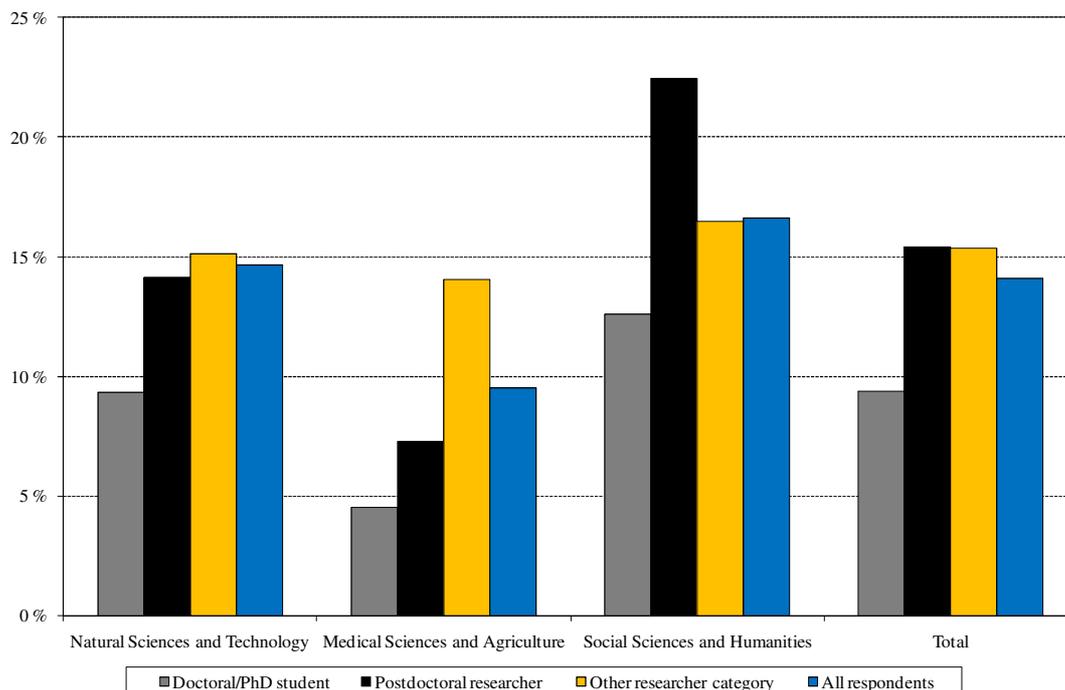
Notes:

- 1) The figure is based on the following question in the Mobility Questionnaire of the Higher Education Sector (Question 57): "Did any of these instances of international mobility involve a research visit to another country without a change of employer?" (see Annex 2).
- 2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) Cyprus, Latvia, Luxembourg, Malta and Slovenia are excluded from the figure, since there are few respondents from these countries.
- 4) France is excluded from all the figures and tables in Chapters 4 and 5.
- 5) In the figure we measure the share of EU27 researchers by the country a person's email address refers to.
- 6) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for mobile researchers.

In Figure 35 we see that the share of internationally mobile researchers is higher among those who attained their highest educational degree in a country from which they do not hold a citizenship (72%), compared with researchers with citizenship(s) from a country equal to their country of highest educational degree (54%). The same pattern holds for each of the three main scientific fields.

Only 14 per cent of all researchers have attained their highest degree in a country without having a citizenship from that country. This is presented in Figure 34. This figure shows that respondents in the Social Sciences and Humanities have the highest share of such researchers (17%), while those in the Medical Sciences and Agriculture have the lowest share (10%).

Figure 34: Estimated distribution of researchers in the higher education sector in EU27 who attained their highest educational degree in a country without having a citizenship from that country. n=4,538.



Source: The Mobility Survey of the Higher Education Sector.

Notes:

1) The figure is based on the following six questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "Please list the country or countries of your citizenship" (Question 11), (ii) "Highest educational attainment" (Question 17), (iii) "In which country did you obtain your postgraduate degree (PhD or equivalent)?" (Question 18), (iv) "In which country did you obtain your graduate degree (master degree or equivalent)?" (Question 21), (v) "In which country did you obtain your undergraduate degree (bachelor degree or equivalent)?" (Question 24), and (vi) "In which country did you obtain your secondary education (i.e. high school, gymnasium, grammar school, lycee or equivalent)?" (Question 28). For researchers with a postgraduate degree, graduate degree, undergraduate degree or secondary education as their highest educational attainment, the country variable (i.e. the country of highest educational attainment) is set equal the country in (iii), (iv), (v) or (vi), respectively.

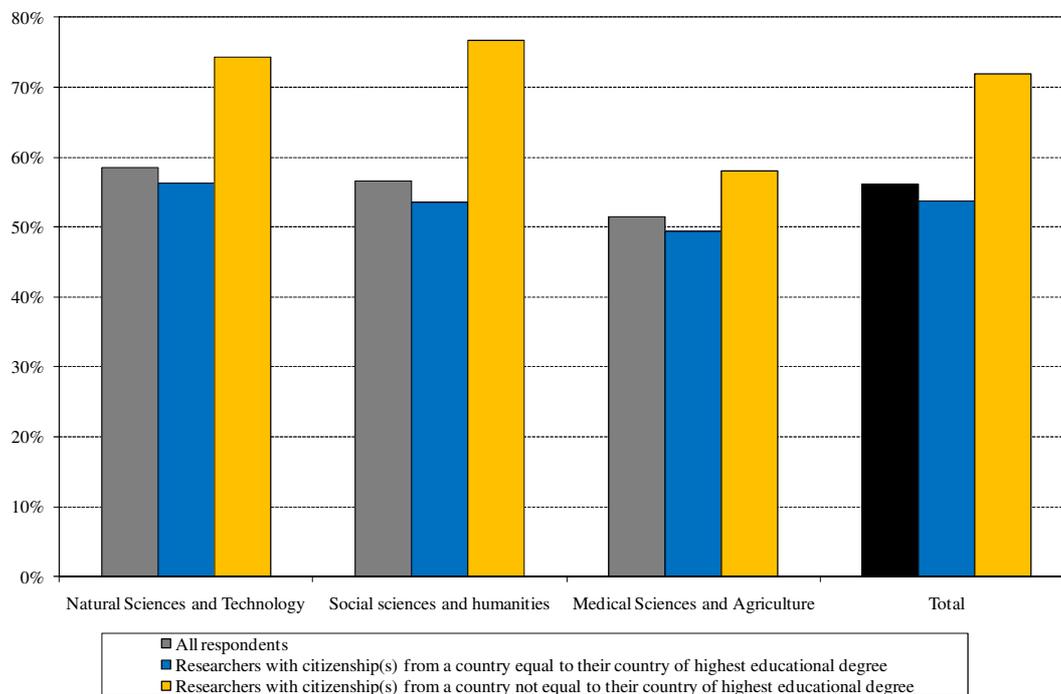
2) No respondents have more than three citizenships.

3) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.

4) In the figure we measure the share of EU27 researchers by field of science and current status as a researcher. Current status as a researcher is based on the following question in the Mobility Questionnaire of the Higher Education Sector (Question 34): "Which of the following categories do you consider best describes your current status as a researcher?"

5) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

Figure 35: Estimated shares of international mobile researchers in the higher education sector in EU27 by field of science (gray columns; and black column for the total), and by whether they have attained their highest educational degree in a country with (blue columns) or without (yellow columns) having a citizenship from that country. n=4,538.



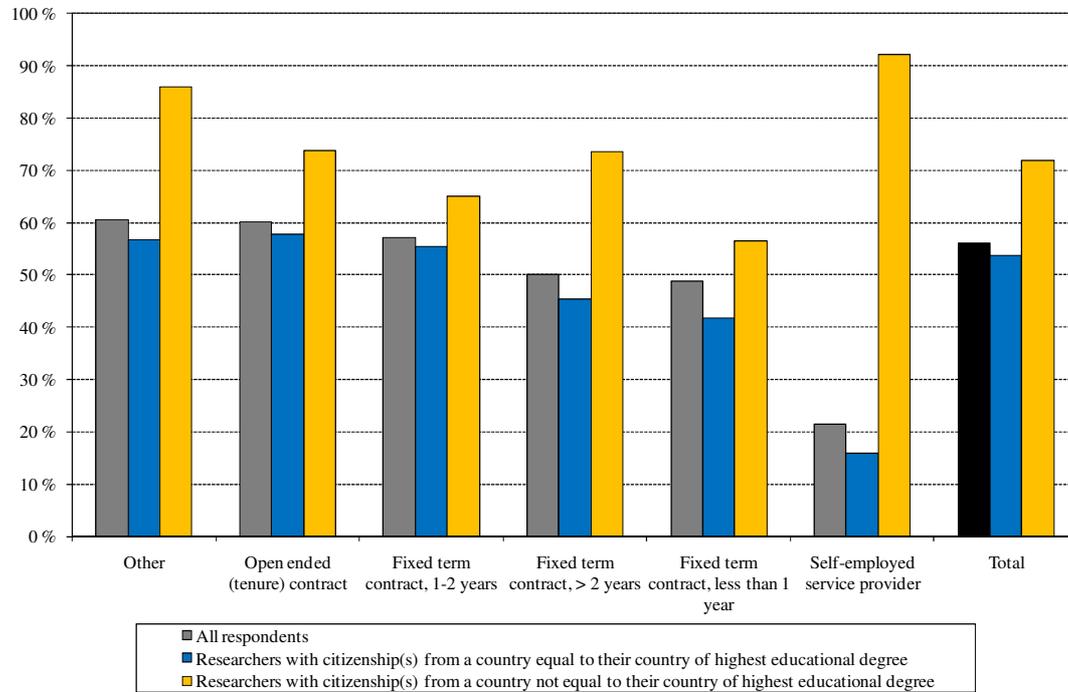
Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure is based on the following question in the Mobility Questionnaire of the Higher Education Sector (Question 55): "In your researcher career (which also encompasses the whole period of your PhD-education) have you worked in another country than the country where you attained your highest educational degree, including research visits of 3 months or more? (NOTE: For this project, if you answer yes to this question you are considered as an "internationally mobile" researcher)" (see Annex 2).
- 2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

According to Figure 36 researchers with an open ended (as opposed to a fixed term) contract have the highest share of internationally mobile researchers (60%), together with those in the category "other researcher" (60%). This share is lowest among those in the "self-employed service provider" category (21%). Both Figure 36 and Figure 37 show that the share of internationally mobile researchers is lower among those with citizenship(s) from a country equal to their country of highest educational degree, compared with those with citizenship(s) from a country not equal to their country of highest educational degree, and this result holds for each group of employment contract status and both genders.

Figure 36: Estimated shares of international mobile researchers in the higher education sector in EU27 by employment contract status (gray columns; and black column for the total), and whether they have attained their highest educational degree in a country with (blue columns) or without (yellow columns) having a citizenship from that country. n=4,537.

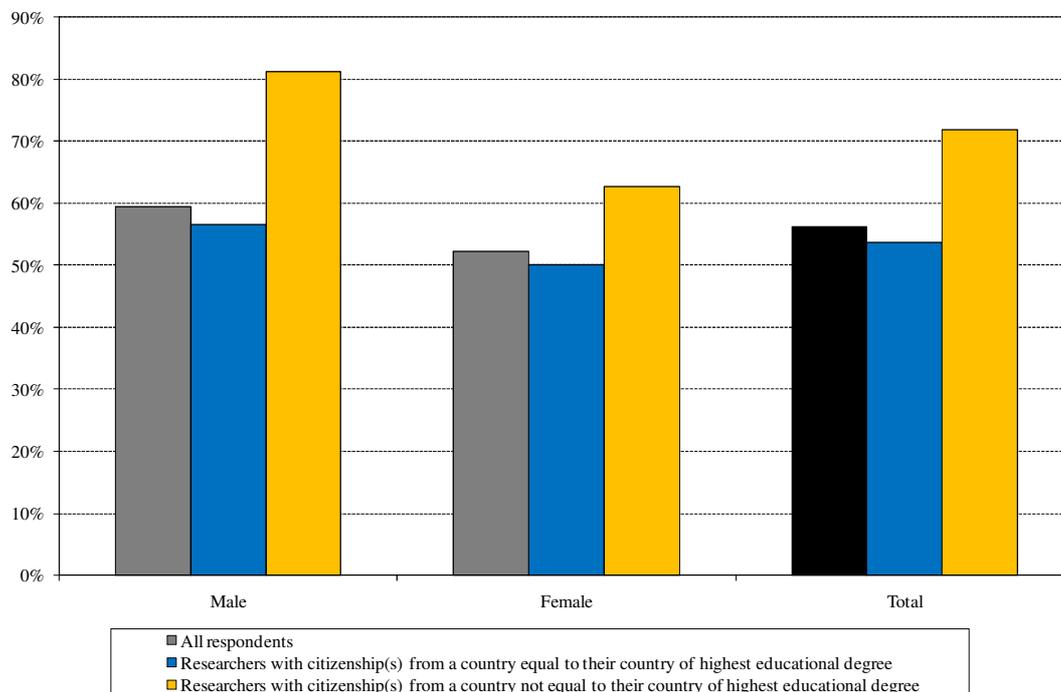


Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure is based on the following questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "What is your employment contract status?" (Question 41), and (ii) "In your researcher career (which also encompasses the whole period of your PhD-education) have you worked in another country than the country where you attained your highest educational degree, including research visits of 3 months or more? (NOTE: For this project, if you answer yes to this question you are considered as an "internationally mobile" researcher.)" (Question 55).
- 2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) In the figure we measure the share of EU27 researchers by their employment contract status.
- 4) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

Figure 37: Estimated share of international mobile researchers in the higher education sector in EU27 by gender (gray columns; and black column for the total), and by whether they have attained their highest educational degree in a country with (blue columns) or without (yellow columns) having a citizenship from that country. n=4,538.



Source: The Mobility Survey of the Higher Education Sector.

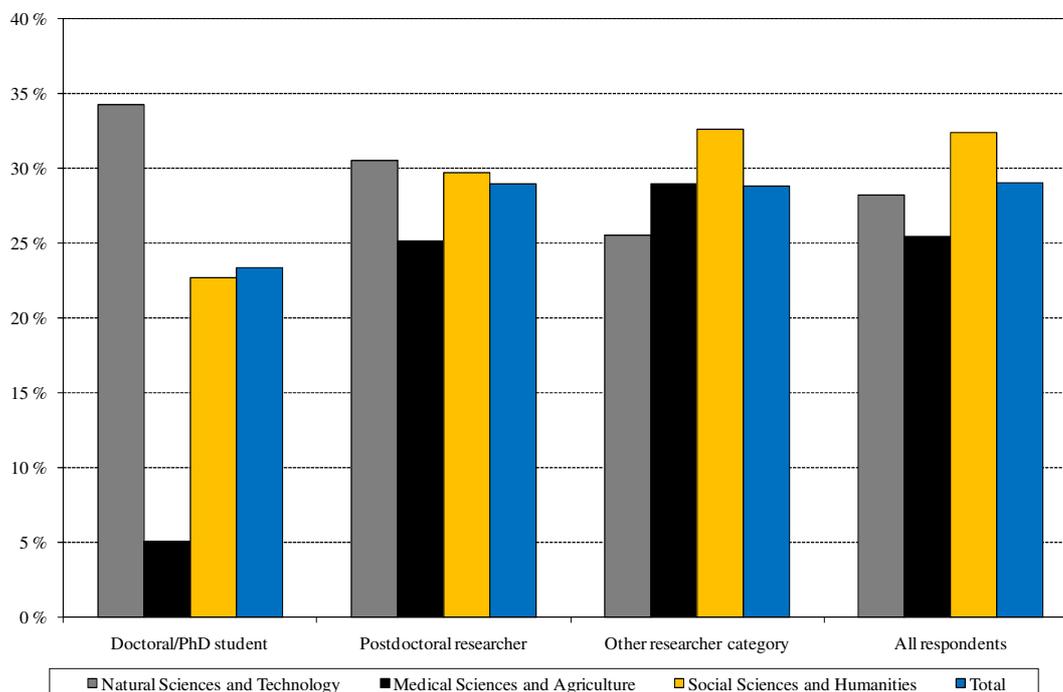
Notes:

- 1) The figure is based on the following questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "What is your gender?" (Question 8), and (ii) "In your researcher career (which also encompasses the whole period of your PhD-education) have you worked in another country than the country where you attained your highest educational degree, including research visits of 3 months or more? (NOTE: For this project, if you answer yes to this question you are considered as an "internationally mobile" researcher.)" (Question 55).
- 2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) In the figure we measure the share of EU27 researchers by gender.
- 4) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

5.2.2 International mobility the last three years

Figure 25 focuses on international mobility of researchers during their entire researcher careers, while Figure 38 limits the time period to the last three years. Figure 38 shows that 29 per cent of the EU27 researcher population in the higher education sector have been internationally mobile the last three years. We find the same per cent for postdoctoral researchers and researchers in the "other researcher" category (29%). As expected, doctoral/PhD students have the lowest share of incidents of recent international mobility (23%). We observe that doctoral/PhD students in the Natural Sciences and Technology have the highest international mobility the last three years among all current status groups and scientific fields in Figure 38 (34%), while doctoral/PhD students in the Medical Sciences and Agriculture have the lowest mobility (only 5%).

Figure 38: Estimated shares of researchers who have been internationally mobile the last three years by field of science and by current status as a researcher. Shares among all researchers in the higher education sector in EU27. n=4,538.



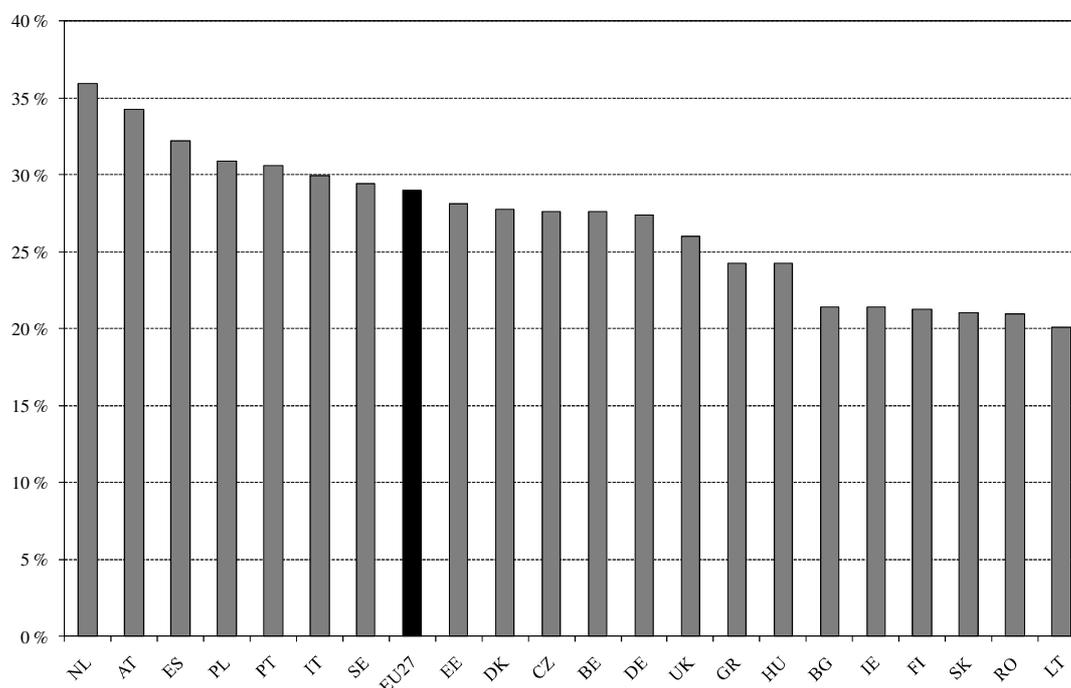
Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure is based on the following questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "Which of the following categories do you consider best describes your current status as a researcher?" (Question 34), and (ii) "Have you been internationally mobile the last three years?" (Question 58).
- 2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

It follows from Figure 39 that among all researchers in the higher education sector, the researchers from the Netherlands (36%) and Austria (34%) have the highest shares of international mobility the last three years, while those from Lithuania (20%), Romania, Slovakia, Finland, Ireland and Bulgaria (all countries 21%) have the lowest shares. Table 12 shows the share of researchers who have been internationally mobile the last three years among all respondents both by country of affiliation and field of science.

Figure 39: Estimated shares of researchers who have been internationally mobile the last three years among all researchers in the higher education sector in EU27 by country of affiliation. Shares among all researchers in the higher education sector in EU27. $n=4,538$.



Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure is based on the following question in the Mobility Questionnaire of the Higher Education Sector (Question 58): "Have you been internationally mobile the last three years?" (see Annex 2).
- 2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) Cyprus, Latvia, Luxembourg, Malta and Slovenia are excluded from the figure, since there are few respondents from these countries.
- 4) France is excluded from all the figures and tables in Chapters 4 and 5.
- 5) In the figure we measure the share of EU27 researchers by the country a person's email address refers to.
- 6) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

Table 12: Estimated shares of researchers who have been internationally mobile the last three years among all researchers in the higher education sector in EU27 by country of affiliation and by field of science. Shares among all researchers in the higher education sector in EU27. $n=4,538$.

Country	Acronym	Natural Sciences and Technology	Medical Sciences and Agriculture	Social Sciences and Humanities	Total
Belgium	BE	25	8	33	28
Bulgaria	BG	11	19	39	21
Czech Republic	CZ	37	6	38	28
Denmark	DK	42	8	37	28
Germany	DE	26	23	33	27
Estonia	EE	22	4	47	28

Ireland	IE	25	0	26	21
Greece	GR	31	17	21	24
Spain	ES	36	15	36	32
Italy	IT	18	42	36	30
Lithuania	LT	19	0	29	20
Hungary	HU	18	0	39	24
Netherlands	NL	52	21	28	36
Austria	AT	22	44	37	34
Poland	PL	21	41	35	31
Portugal	PT	48	9	14	31
Romania	RO	18	30	11	21
Slovakia	SK	18	33	13	21
Finland	FI	12	39	19	21
Sweden	SE	27	33	29	29
United Kingdom	UK	29	12	33	26
Total	EU27	28	26	32	29

Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The table is based on the following question in the Mobility Questionnaire of the Higher Education Sector (Question 58): "Have you been internationally mobile the last three years?" (see Annex 2).
- 2) The table is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) Cyprus, Latvia, Luxembourg, Malta and Slovenia are excluded from the table, since there are few respondents from these countries.
- 4) France is excluded from all the figures and tables in Chapters 4 and 5.
- 5) In the table we measure the share of EU27 researchers by the country a person's email address refers to, and by field of science.
- 6) The shares of EU27 researchers in the table are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

From Figure 40 to Figure 44 we compare the two groups in Sections 5.2.1 and 5.2.2 by field of science, current status as a researcher, country of affiliation, employment contract status and gender: all internationally mobile researchers in per cent of all respondents, and all researchers who answered that they have been internationally mobile the last three years in per cent of all respondents.

Figure 40 shows that respondents in the Natural Sciences and Technology have the lowest share of internationally mobile researchers in per cent of all respondents (59%), while those in the Social Sciences and Humanities have the lowest share of researchers who answered that they have been internationally mobile the last three years in per cent of all respondents (32%). Those in the Medical Sciences and Agriculture have the lowest share for both groups (52% and 26%, respectively).

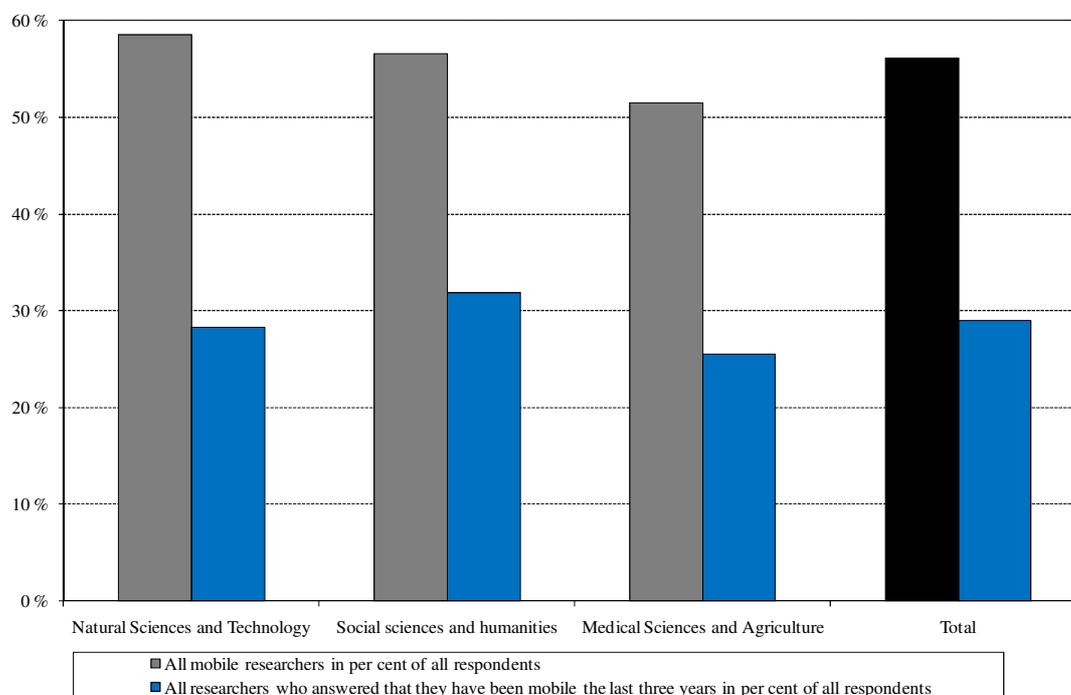
In the beginning of Section 5.2.2 we concluded that doctoral/PhD students have the lowest share of internationally mobile researchers in per cent of all respondents, and also the lowest share of internationally mobile researchers who answered that they have been mobile the last three years in per cent of all respondents. This is also seen in Figure 41. The figure shows, however, that the differences in the share of mobile researchers between doctoral/PhD students and the two other groups are much smaller if we focus on the last three years instead of the overall researcher career.

Figure 42 shows that countries with high shares of researchers who have been internationally mobile in their researcher career, do not necessarily have high shares of researchers who have been mobile the last three years. For example, the shares of all internationally mobile researchers for Greece (73%) and Ireland (61%) are above the corresponding share for EU27 as a whole (56%), but their shares of internationally mobile researchers the last three years (Greece 24%, Ireland 21%) are under the corresponding share for EU27 as a whole (29%).

We find the highest number of those who have been internationally mobile over the last three years as a percentage of all respondents among researchers with a fixed term contract of 1-2 years (46%), while those in the category "self-employed service provider" have the lowest share (see Figure 43). The latter group also has the lowest share of all internationally mobile researchers among all respondents.

Figure 44 shows that males and females have the same share of researchers who have been internationally mobile the last three years as a percentage of all respondents (both 29%).

Figure 40: Estimated shares of researchers in the higher education sector in EU27 by mobility status and by field of science. $n=4,538$.

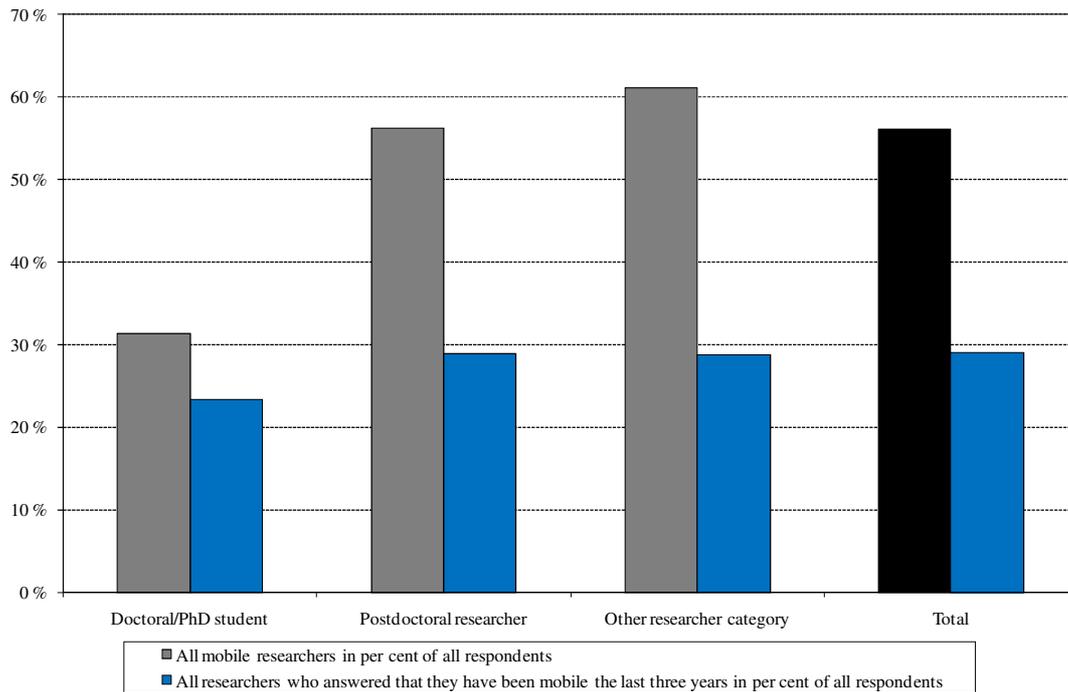


Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure shows the shares of internationally mobile researchers among all researchers versus internationally mobile researchers the last three years among all researchers.
- 2) The figure is based on the following questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "In your researcher career (which also encompasses the whole period of your PhD-education) have you worked in another country than the country where you attained your highest educational degree, including research visits of 3 months or more? (NOTE: For this project, if you answer yes to this question you are considered as an "internationally mobile" researcher.)" (Question 55), and (ii) "Have you been internationally mobile the last three years?" (Question 58).
- 2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

Figure 41: Estimated shares of researchers in the higher education sector in EU27 by mobility status and by current status as a researcher. n=4,538.

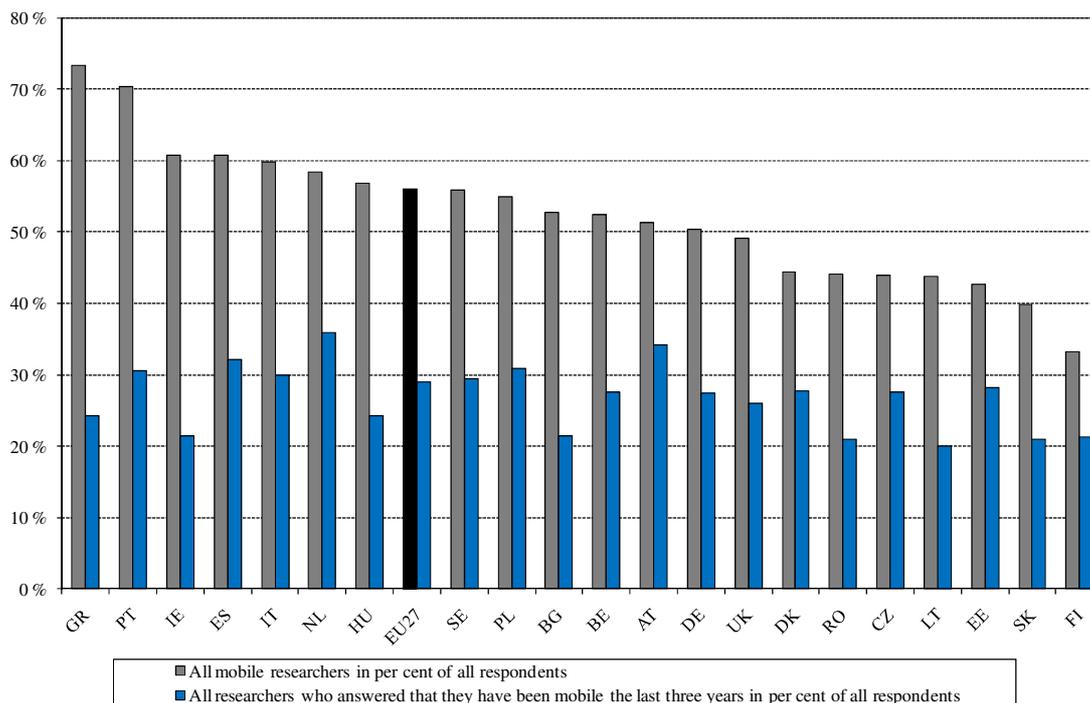


Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure shows the shares of internationally mobile researchers among all researchers versus internationally mobile researchers the last three years among all researchers.
- 2) The figure is based on the following questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "Which of the following categories do you consider best describes your current status as a researcher?" (Question 34), (ii) "In your researcher career (which also encompasses the whole period of your PhD-education) have you worked in another country than the country where you attained your highest educational degree, including research visits of 3 months or more? (NOTE: For this project, if you answer yes to this question you are considered as an "internationally mobile" researcher.)" (Question 55), and (iii) "Have you been internationally mobile the last three years?" (Question 58).
- 2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

Figure 42: Estimated shares of researchers in the higher education sector in EU27 by mobility status and by country of affiliation. n=4,538.

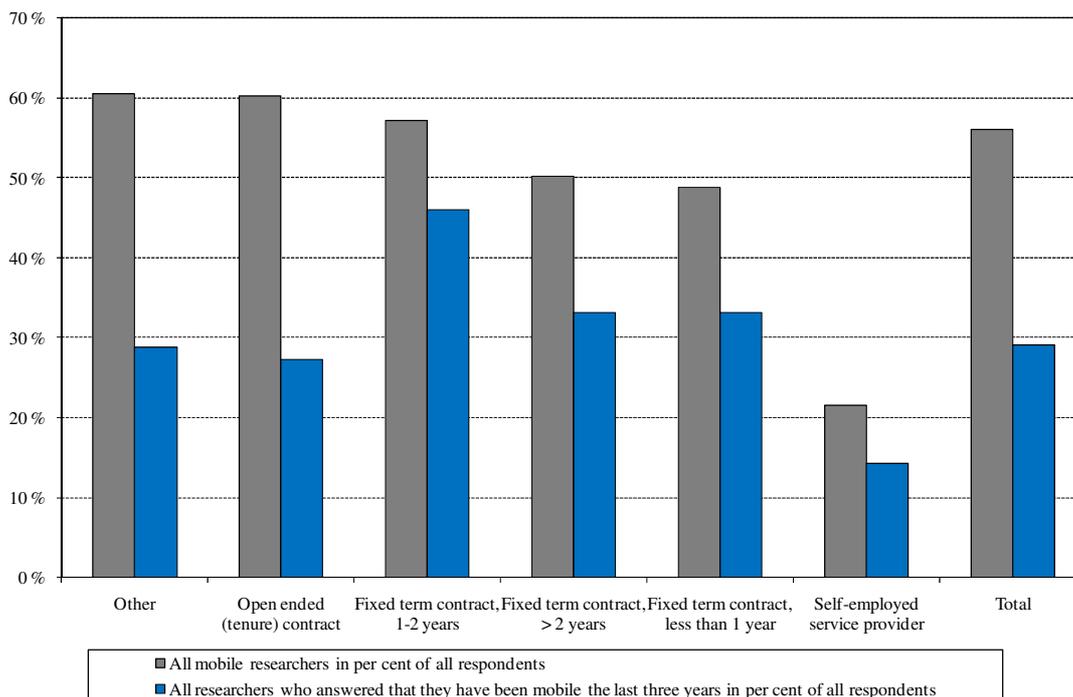


Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure shows the shares of internationally mobile researchers among all researchers versus internationally mobile researchers the last three years among all researchers.
- 2) The figure is based on the following questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "In your researcher career (which also encompasses the whole period of your PhD-education) have you worked in another country than the country where you attained your highest educational degree, including research visits of 3 months or more? (NOTE: For this project, if you answer yes to this question you are considered as an "internationally mobile" researcher.)" (Question 55), and (ii) "Have you been internationally mobile the last three years?" (Question 58).
- 3) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 4) Cyprus, Latvia, Luxembourg, Malta and Slovenia are excluded from the figure, since there are few respondents from these countries.
- 5) France is excluded from all the figures and tables in Chapters 4 and 5.
- 6) In the figure we measure the share of EU27 researchers by the country a person's email address refers to.
- 7) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

Figure 43: Estimated shares of researchers in the higher education sector in EU27 by mobility status and by employment contract status. $n=4,537^{24}$.



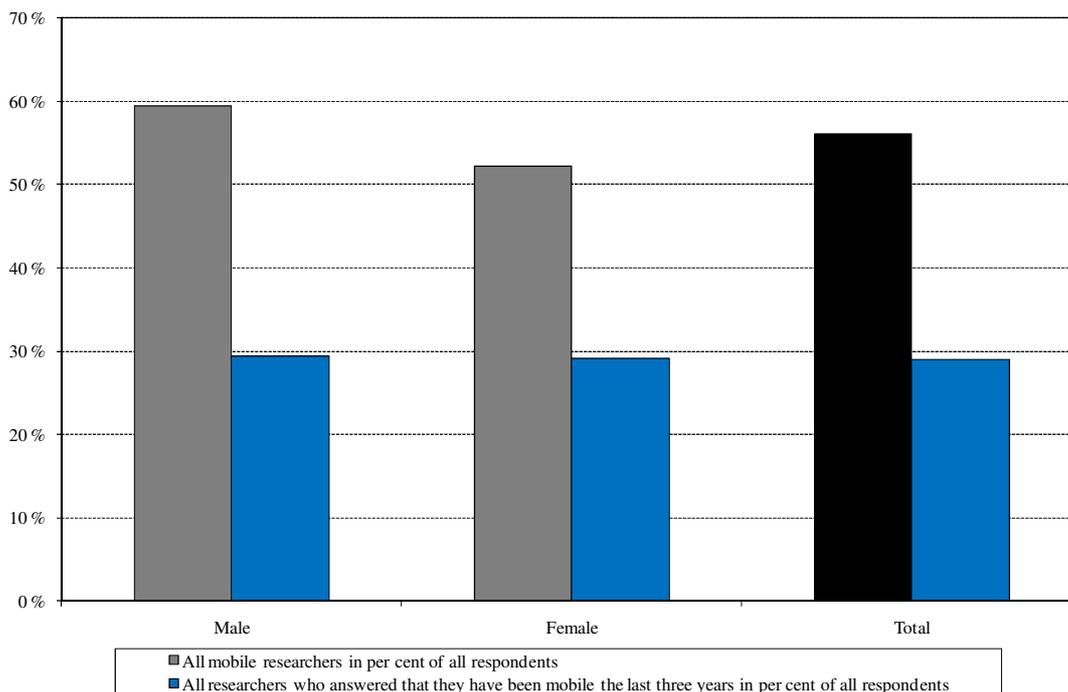
Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure shows the shares of internationally mobile researchers among all researchers versus internationally mobile researchers the last three years among all researchers.
- 2) The figure is based on the following questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "What is your employment contract status?" (Question 41), (ii) "In your researcher career (which also encompasses the whole period of your PhD-education) have you worked in another country than the country where you attained your highest educational degree, including research visits of 3 months or more? (NOTE: For this project, if you answer yes to this question you are considered as an "internationally mobile" researcher.)" (Question 55), and (iii) "Have you been internationally mobile the last three years?" (Question 58).
- 3) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 4) In the figure we measure the share of EU27 researchers by their employment contract status.
- 5) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

²⁴ The "other" category consists of several different groups, for example: (a) researchers with scholarship, fellowship or grant, (b) civil servants, and (c) researchers with partly fixed and partly open ended contract.

Figure 44: Estimated shares of researchers in the higher education sector in EU27 by mobility status and by gender. n=4,538.



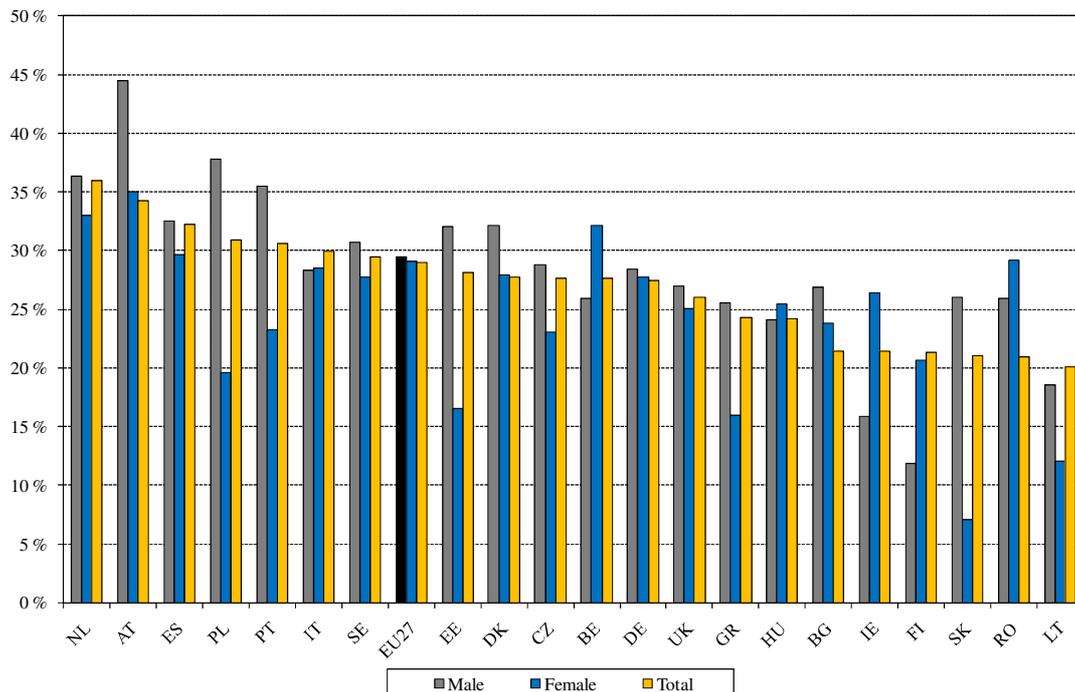
Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure shows the shares of internationally mobile researchers among all researchers versus internationally mobile researchers the last three years among all researchers.
- 2) The figure is based on the following questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "What is your gender?" (Question 8), (ii) "In your researcher career (which also encompasses the whole period of your PhD-education) have you worked in another country than the country where you attained your highest educational degree, including research visits of 3 months or more? (NOTE: For this project, if you answer yes to this question you are considered as an "internationally mobile" researcher.)" (Question 55), and (iii) "Have you been internationally mobile the last three years?" (Question 58).
- 3) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 4) In the figure we measure the share of EU27 researchers by gender.
- 5) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

Figure 28 shows the internationally mobility shares during the entire researcher career both by gender and country of affiliation, while Figure 45 focuses on the international mobility shares the last three years. From Figure 45 we see that males have been more internationally mobile the last three years than females for most of the EU27 countries.

Figure 45: Estimated shares of researchers who have been internationally mobile the last three years by gender and by country of affiliation. Shares among *all* researchers in the higher education sector in EU27. $n=4,538$.



Source: The Mobility Survey of the Higher Education Sector.

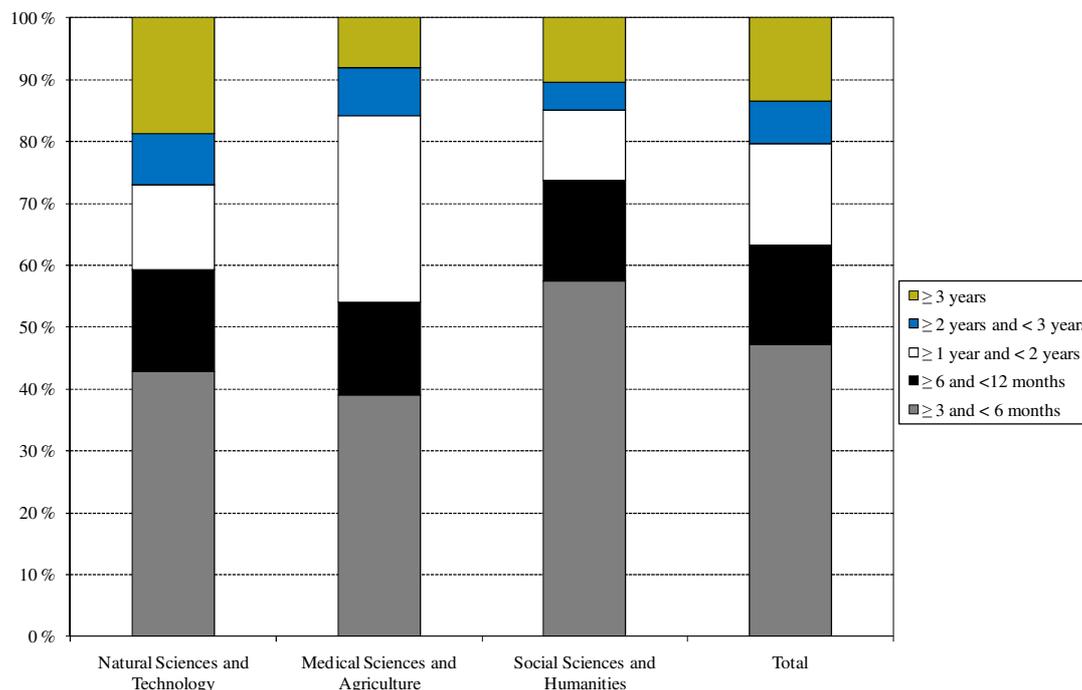
Notes:

- 1) The figure is based on the following questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "What is your gender?" (Question 8), and (ii) "Have you been internationally mobile the last three years?" (Question 58).
- 2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) Cyprus, Latvia, Luxembourg, Malta and Slovenia are excluded from the figure, since there are few respondents from these countries.
- 4) France is excluded from all the figures and tables in Chapters 4 and 5.
- 5) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for all respondents.

Figure 46 shows the share of researchers who have been internationally mobile the last three years by field of science and duration of stay. In the figure we only focus on the duration of stay of "Country 1" (see Question 60 in Annex 2).²⁵ We see that 47 per cent of the respondents have a duration of stay of at least 3 months but under 6 months; 16 per cent have either a duration of at least 6 months but under 1 year; 16 per cent have a duration of at least 1 year but under 2 years; 7 per cent have a duration of at least 2 years but under 3 years; and 13 per cent have a duration of at least 3 years. The highest share of researchers in the shortest duration category is found for those in the Social Sciences and Humanities (57%), while this share is lowest for those in the Medical Sciences and Agriculture (39%). Researchers in the Natural Sciences and Technology have the highest share of researchers in the longest duration category (19%), while researchers in the Medical Sciences and Agriculture have the lowest share (8%). Note that researchers in the Medical Sciences and Agriculture have a high share of those with a duration of at least 1 year but under 2 years (30%).

²⁵ None of the respondents who have missing values for Country 1 have non-missing values for Country 2, 3, 4 or 5 (see Questions 64, 68, 72 and 76 in Annex 2).

Figure 46: Estimated shares of researchers in the higher education sector in EU27 who have been internationally mobile the last three years by field of science and by duration of stay (first country). $n=1,339$.



Source: The Mobility Survey of the Higher Education Sector.

Notes:

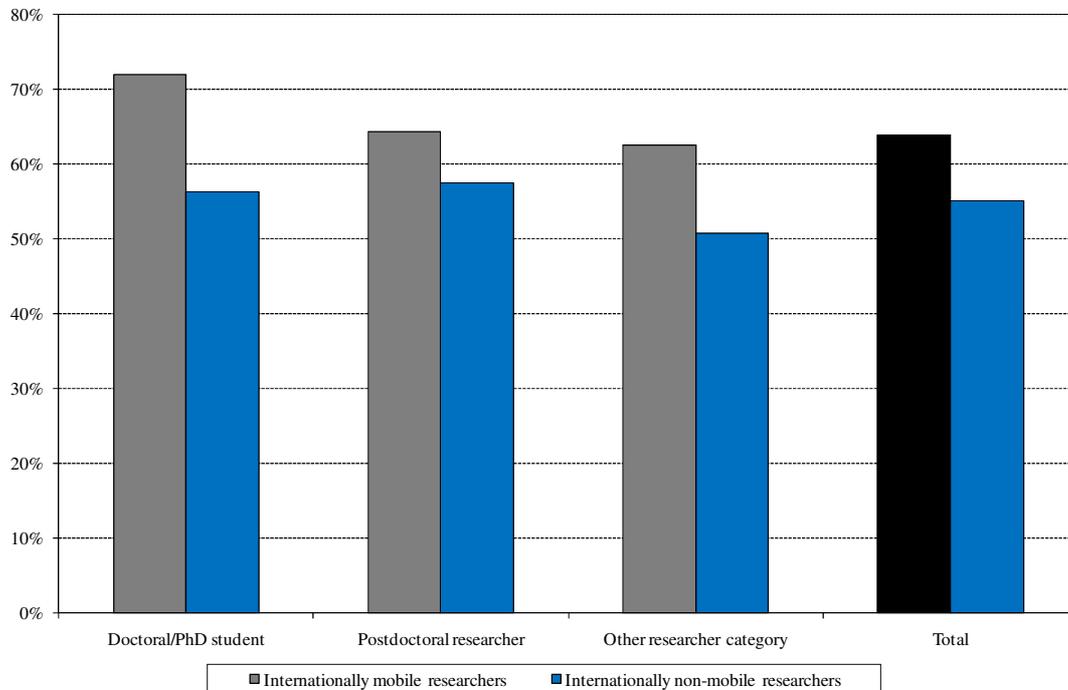
- 1) The figure is based on the following question in the Mobility Questionnaire of the Higher Education Sector (Question 60): "Duration of stay", Country 1 (see Annex 2).
- 2) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 3) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for mobile researchers.

5.3 Future mobility plans

We see from Figure 47 that among the internationally mobile researchers, 64 per cent have actively considered being internationally mobile in the future, while the corresponding share among internationally non-mobile researchers is 55 per cent. Doctoral/PhD students have the highest share of those who have actively considered being internationally mobile in the future among internationally mobile researchers (72%), while postdoctoral researchers have the highest share among non-mobile researchers (57%). Researchers in the "other researcher" category have the lowest shares among both internationally mobile researchers (63%) and non-mobile researchers (51%).

Figure 48 shows that respondents in the Social Sciences and Humanities have the highest shares of those who have actively considered being internationally mobile in the future among both previously mobile researchers (74%) and non-mobile researchers (58%). Those in the Medical Sciences and Agriculture have the lowest share among previously internationally mobile researchers (50%), and those in the Natural Sciences and Technology have the lowest share among non-mobile researchers (53%).

Figure 47: Estimated shares of researchers in the higher education sector in EU27 who have actively considered being internationally mobile in the future by mobility status (i.e. whether they have been internationally mobile at least once in their researcher career or not) and by current status as a researcher. $n=2,584$ for internationally mobile researchers (gray columns; and black column for the total), and $n=1,949$ for internationally non-mobile researchers (blue columns).

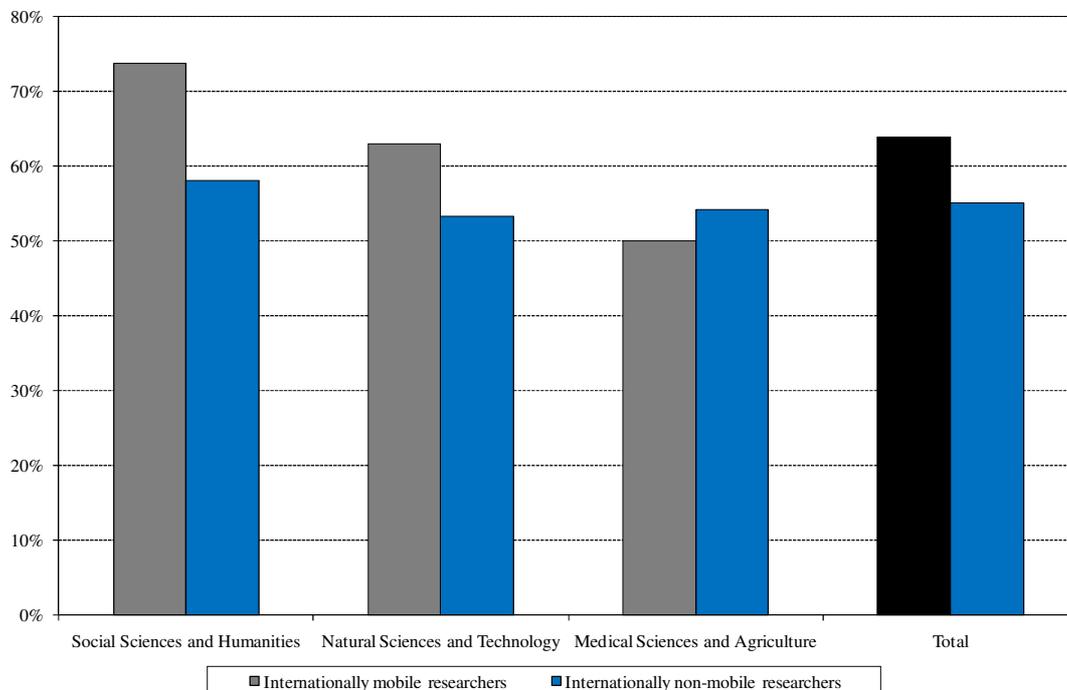


Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure is based on the following questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "Which of the following categories do you consider best describes your current status as a researcher?" (Question 34), (ii) "Have you actively considered being internationally mobile in the future?" (Question 87), and (iii) "Have you actively considered being internationally mobile in the future?" (Question 102).
- 2) For this project, a person is considered as an "internationally mobile" researcher if (s)he answered yes to the following question: "In your researcher career (which also encompasses the whole period of your PhD-education) have you worked in another country than the country where you attained your highest educational degree, including research visits of 3 months or more?" (Question 55).
- 3) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 4) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for mobile researchers for the group of internationally mobile researchers and the weights for non-mobile researchers for the group of internationally non-mobile researchers.

Figure 48: Estimated shares of researchers in the higher education sector in EU27 who have actively considered being internationally mobile in the future by mobility status (i.e. whether they have been internationally mobile at least once in their researcher career or not) and by field of science. $n=2,584$ for internationally mobile researchers (gray columns; and black column for the total), and $n=1,949$ for internationally non-mobile researchers (blue columns).



Source: The Mobility Survey of the Higher Education Sector.

Notes:

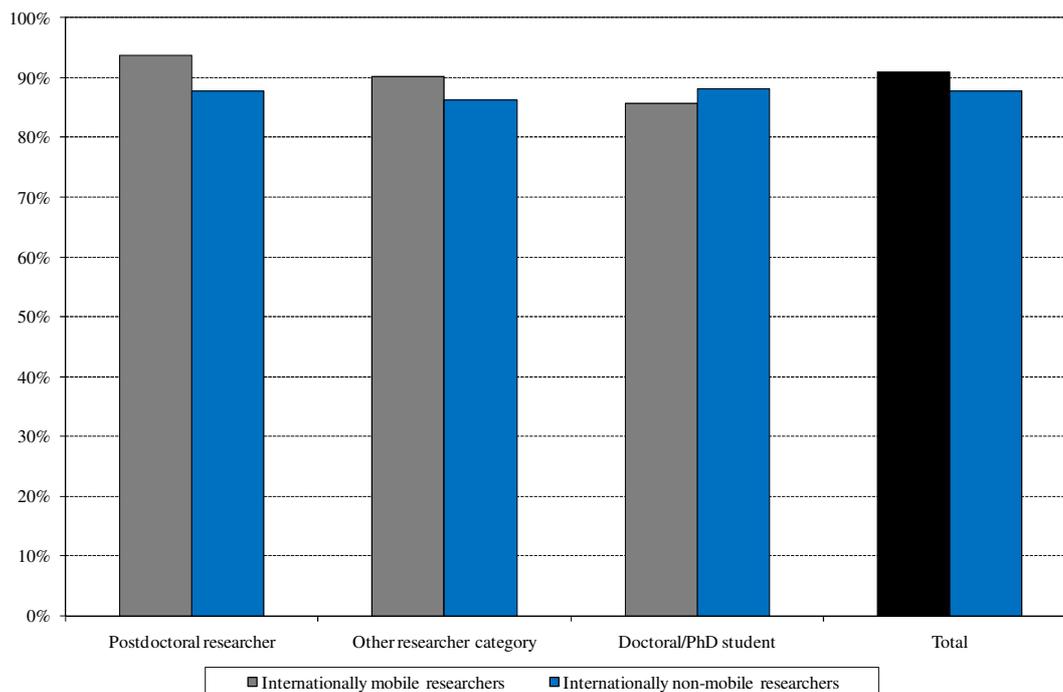
- 1) The figure is based on the following questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "Have you actively considered being internationally mobile in the future?" (Question 87), and (ii) "Have you actively considered being internationally mobile in the future?" (Question 102).
- 2) For this project, a person is considered as an "internationally mobile" researcher if (s)he answered yes to the following question: "In your researcher career (which also encompasses the whole period of your PhD-education) have you worked in another country than the country where you attained your highest educational degree, including research visits of 3 months or more?" (Question 55).
- 3) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 4) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for mobile researchers for the group of internationally mobile researchers and the weights for non-mobile researchers for the group of internationally non-mobile researchers.

Figure 49 shows that among the internationally non-mobile researchers, 88 per cent are open to the possibility of being mobile in the future. This share is somewhat higher for internationally mobile researchers, namely 91 per cent. Doctoral/PhD students have the lowest share of those who are open to the possibility of being mobile in the future among internationally mobile researchers (86%), but have the same per cent (together with postdoctoral researchers) as for all internationally non-mobile researchers (88%). Postdoctoral researchers have the highest share among internationally mobile researchers who are open to the possibility of being mobile in the future (94%).

Respondents in the Social Sciences and Humanities have the highest share of those who are open to the possibility of being mobile in the future among internationally mobile researchers (93%). At the same time they have the lowest share among non-mobile researchers (87%), but there are small differences be-

tween non-mobile researchers by scientific field. Those in the Medical Sciences and Agriculture have the lowest share among mobile researchers who are open to the possibility of being mobile in the future (84%).

Figure 49: Estimated shares of researchers in the higher education sector in EU27 who are open to the possibility of being mobile in the future by mobility status (i.e. whether they have been internationally mobile at least once in their researcher career or not) and current status as a researcher. $n=2,584$ for internationally mobile researchers (gray columns; and black column for the total), and $n=1,949$ for internationally non-mobile researchers (blue columns).



Source: The Mobility Survey of the Higher Education Sector.

Notes:

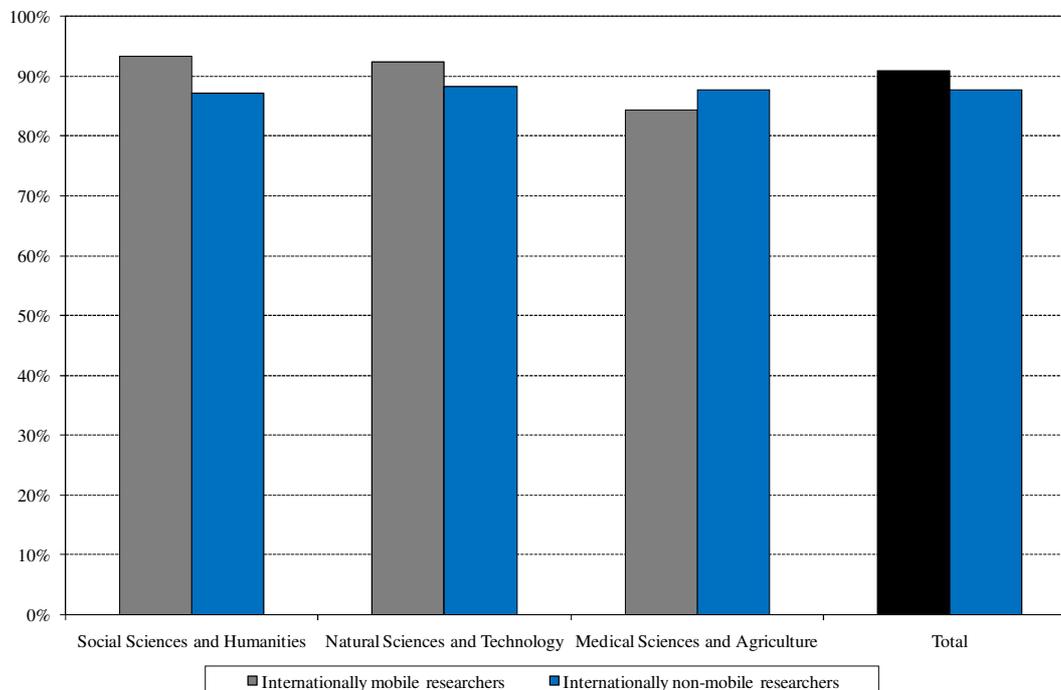
1) The figure is based on the following questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "Which of the following categories do you consider best describes your current status as a researcher?" (Question 34), (ii) "Are you open to the possibility of being mobile in the future?" (Question 88), and (iii) "Are you open to the possibility of being mobile in the future?" (Question 103).

2) For this project, a person is considered as an "internationally mobile" researcher if (s)he answered yes to the following question: "In your researcher career (which also encompasses the whole period of your PhD-education) have you worked in another country than the country where you attained your highest educational degree, including research visits of 3 months or more?" (Question 55).

3) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.

4) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for mobile researchers for the group of internationally mobile researchers and the weights for non-mobile researchers for the group of internationally non-mobile researchers.

Figure 50: Estimated shares of researchers in the higher education sector in EU27 who are open to the possibility of being mobile in the future by mobility status (i.e. whether they have been internationally mobile at least once in their researcher career or not) and by field of science. $n=2,584$ for internationally mobile researchers (gray columns; and black column for the total), and $n=1,949$ for internationally non-mobile researchers (blue columns).



Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure is based on the following questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "Are you open to the possibility of being mobile in the future?" (Question 88), and (ii) "Are you open to the possibility of being mobile in the future?" (Question 103).
- 2) For this project, a person is considered as an "internationally mobile" researcher if (s)he answered yes to the following question: "In your researcher career (which also encompasses the whole period of your PhD-education) have you worked in another country than the country where you attained your highest educational degree, including research visits of 3 months or more?" (Question 55).
- 3) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 4) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for mobile researchers for the group of internationally mobile researchers and the weights for non-mobile researchers for the group of internationally non-mobile researchers.

5.4 The effects of international mobility on future career progression

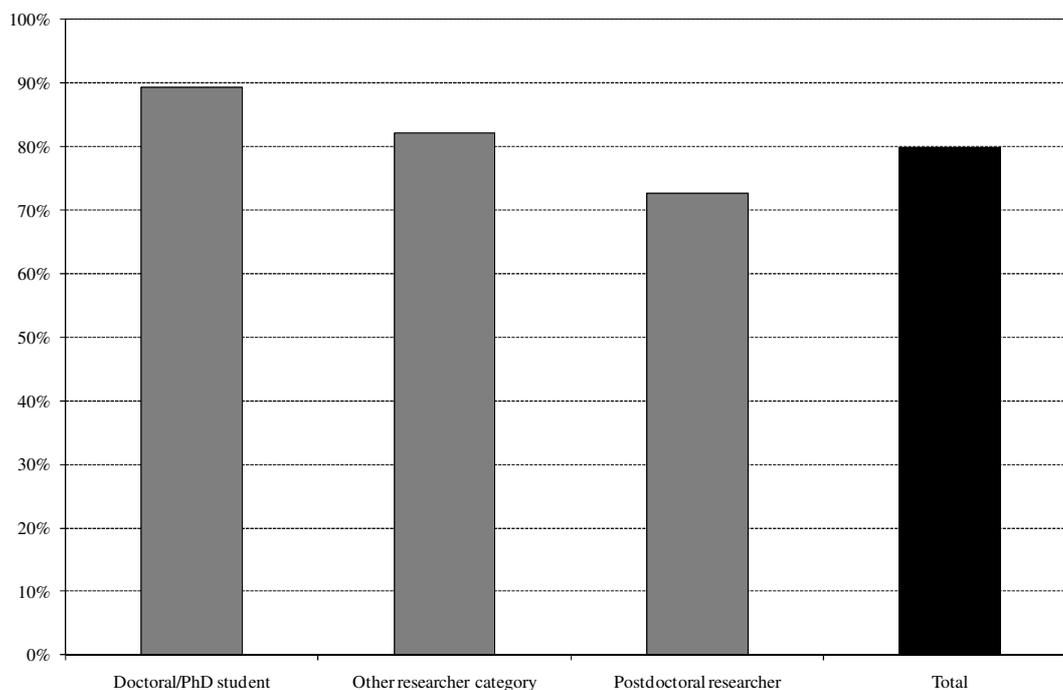
Figure 51 shows that 80 per cent of the internationally mobile researchers in the higher education sector in EU27 state that their time as a mobile researcher has had positive or significant positive impacts on their career progression (

Table 13 gives an overview of the overall distribution). This share is highest for doctoral/PhD students (89%), and lowest for postdoctoral researchers (73%). For researchers in the “other researcher” category this share is 82 per cent.

According to Figure 52 (see

Table 14 for an overview of the overall distribution) respondents in the Natural Sciences and Technology have the highest share of internationally mobile researchers who answer that mobility has had positive or significant positive impacts on their career progression (82%). We find the lowest share among those in the Social Sciences and Humanities (78%).

Figure 51: Estimated shares of researchers in the higher education sector in EU27 who answer that mobility has had positive or significant positive impacts on their career progression by current status as a researcher. Estimated shares among all internationally mobile researchers. n=2,584.



Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure is based on the following questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "Which of the following categories do you consider best describes your current status as a researcher?" (Question 34), and (ii) "Overall, what effect has your time as a mobile researcher had on your career progression?" (Question 86).
- 2) For this project, a person is considered as an "internationally mobile" researcher if (s)he answered yes to the following question: "In your researcher career (which also encompasses the whole period of your PhD-education) have you worked in another country than the country where you attained your highest educational degree, including research visits of 3 months or more?" (Question 55).
- 3) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 4) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for mobile researchers.

Table 13: Estimated shares of researchers in the higher education sector in EU27 who answer that mobility has had significant negative, negative, positive, significant positive impacts or no impact on their career progression by current status as a researcher. Estimated shares among all internationally mobile researchers. $n=2,584$.

Current status as a researcher	Significant negative impacts	Negative impacts	No impact	Positive impacts	Significant positive impacts	Total
Doctoral/PhD student	1	3	7	47	43	100
Postdoctoral researcher	4	5	19	42	30	100
Other researcher category	3	2	13	38	45	100
Total	3	3	14	39	41	100

Source: The Mobility Survey of the Higher Education Sector.

Notes:

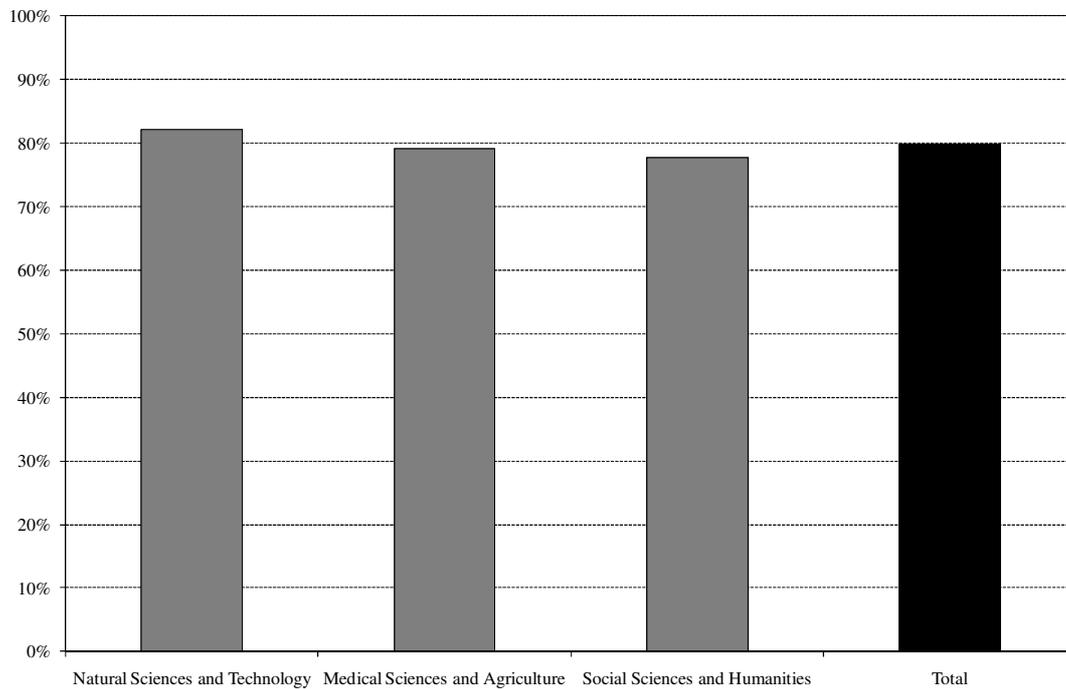
1) The table is based on the following questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "Which of the following categories do you consider best describes your current status as a researcher?" (Question 34), and (ii) "Overall, what effect has your time as a mobile researcher had on your career progression?" (Question 86).

2) For this project, a person is considered as an "internationally mobile" researcher if (s)he answered yes to the following question: "In your researcher career (which also encompasses the whole period of your PhD-education) have you worked in another country than the country where you attained your highest educational degree, including research visits of 3 months or more?" (Question 55).

3) The table is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.

4) The shares of EU27 researchers in the table are calculated by using the proportion method described in Chapter 2, where we use the weights for mobile researchers.

Figure 52: Estimated shares of researchers in the higher education sector in EU27 who answer that mobility has had positive or significant positive impacts on their career progression by field of science. Estimated shares among all internationally mobile researchers. n=2,584.



Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure is based on the following question in the Mobility Questionnaire of the Higher Education Sector (Question 86): "Overall, what effect has your time as a mobile researcher had on your career progression?" (see Annex 2).
- 2) For this project, a person is considered as an "internationally mobile" researcher if (s)he answered yes to the following question: "In your researcher career (which also encompasses the whole period of your PhD-education) have you worked in another country than the country where you attained your highest educational degree, including research visits of 3 months or more?" (Question 55).
- 3) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 4) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for mobile researchers.

Table 14: Estimated shares of researchers in the higher education sector in EU27 who answer that mobility has had significant negative, negative, positive, significant positive impacts or no impact on their career progression by field of science. *Estimated shares among all internationally mobile researchers. n=2,584.*

Field of science	Significant negative impacts	Negative impacts	No impact	Positive impacts	Significant positive impacts	Total
Natural Sciences and Technology	2	3	13	40	42	100
Medical Sciences and Agriculture	5	1	14	28	52	100
Social Sciences and Humanities	4	3	16	44	33	100
Total	3	3	14	39	41	100

Source: The Mobility Survey of the Higher Education Sector.

Notes:

1) The table is based on the following question in the Mobility Questionnaire of the Higher Education Sector (Question 86): "Overall, what effect has your time as a mobile researcher had on your career progression?" (see Annex 2).

2) For this project, a person is considered as an "internationally mobile" researcher if (s)he answered yes to the following question: "In your researcher career (which also encompasses the whole period of your PhD-education) have you worked in another country than the country where you attained your highest educational degree, including research visits of 3 months or more?" (Question 55).

3) The table is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.

4) The shares of EU27 researchers in the table are calculated by using the proportion method described in Chapter 2, where we use the weights for mobile researchers.

Figure

53

(see

Table 15 for an overview of the overall distribution) shows that 69 per cent of the internationally mobile researchers in the higher education sector in EU27 think that further international mobility would have positive or significant positive impacts on their future career progression. This share is highest for doctoral/PhD students (85%), and lowest for researchers in the "other researcher" category (66%).

Likewise,

Figure

54

(see

Table 16 for an overview of the overall distribution) shows that respondents in the Social Sciences and Humanities have the highest respective share (70%), while those in the Medical Sciences and Agriculture have the lowest share (67%).

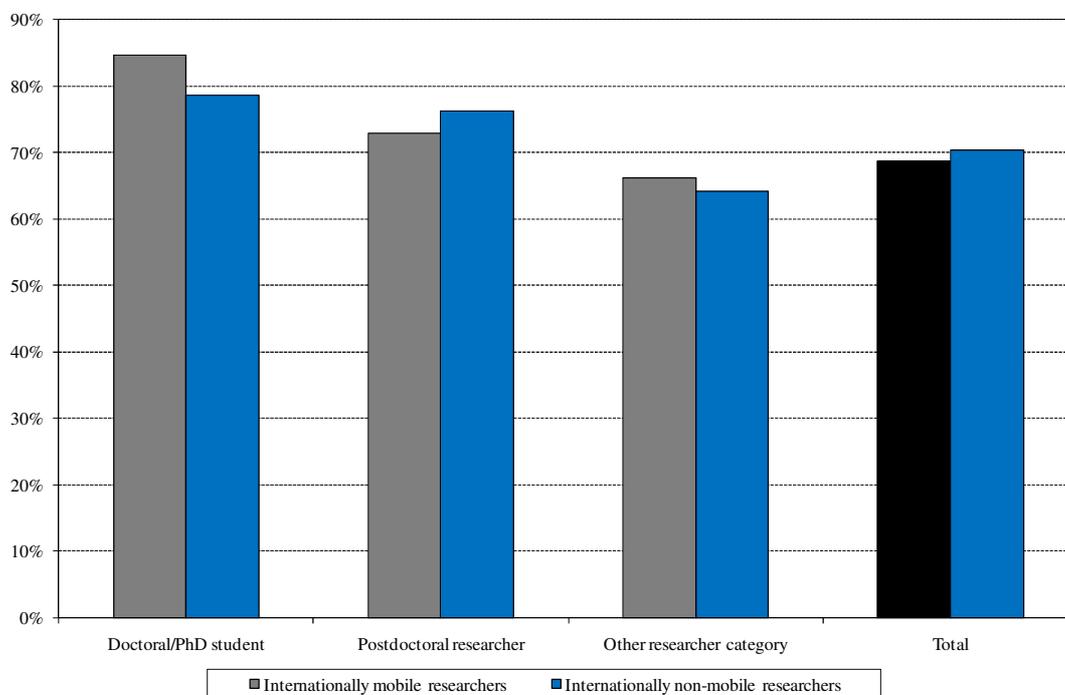
Figure

53

and

Figure 54 also show that 70 per cent of the internationally non-mobile researchers answer that they think international mobility would have positive or significant positive impacts on their future career progression. Doctoral/PhD students have the highest share (79%), and researchers in the "other researcher" category the lowest share (64%). Moreover, this share is highest for respondents in the Medical Sciences and Agriculture (74%), and lowest for those in the Social Sciences and Humanities (67%).

Figure 53: Estimated shares of researchers in the higher education sector in EU27 who answer that mobility would have positive or significant positive impacts on their future career progression by mobility status (i.e. whether they have been internationally mobile at least once in their researcher career or not) and by current status as a researcher. $n=2,583$ for internationally mobile researchers (gray columns; and black column for the total), and $n=1,949$ for internationally non-mobile researchers (blue columns).



Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure is based on the following questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "Which of the following categories do you consider best describes your current status as a researcher?" (Question 34), (ii) "What effects do you think further international mobility would have on your future career progression?" (Question 96), and (iii) "What effects do you think international mobility would have on your future career progression?" (Question 110).
- 2) For this project, a person is considered as an "internationally mobile" researcher if (s)he answered yes to the following question: "In your researcher career (which also encompasses the whole period of your PhD-education) have you worked in another country than the country where you attained your highest educational degree, including research visits of 3 months or more?" (Question 55).
- 3) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 4) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for mobile researchers for the group of internationally mobile researchers and the weights for non-mobile researchers for the group of internationally non-mobile researchers.

Table 15: Estimated shares of researchers in the higher education sector in EU27 who answer that mobility would have significant negative, negative, positive, significant positive impacts or no impact on their future career progression by mobility status (i.e. whether they have been internationally mobile at least once in their researcher career or not) and by current status as a researcher. n=2,583 for internationally mobile researchers, and n=1,949 for internationally non-mobile researchers.

Current status as a researcher	Significant negative impacts	Negative impacts	No impact	Positive impacts	Significant positive impacts	Total
Internationally mobile researchers						
Doctoral/PhD student	0	2	13	41	44	100
Postdoctoral researcher	4	2	21	50	23	100
Other researcher category	1	3	30	45	21	100
Total	2	2	27	46	23	100
Internationally non-mobile researchers						
Doctoral/PhD student	3	1	17	38	41	100
Postdoctoral researcher	3	3	18	50	26	100
Other researcher category	2	4	29	44	20	100
Total	2	3	24	46	24	100

Source: The Mobility Survey of the Higher Education Sector.

Notes:

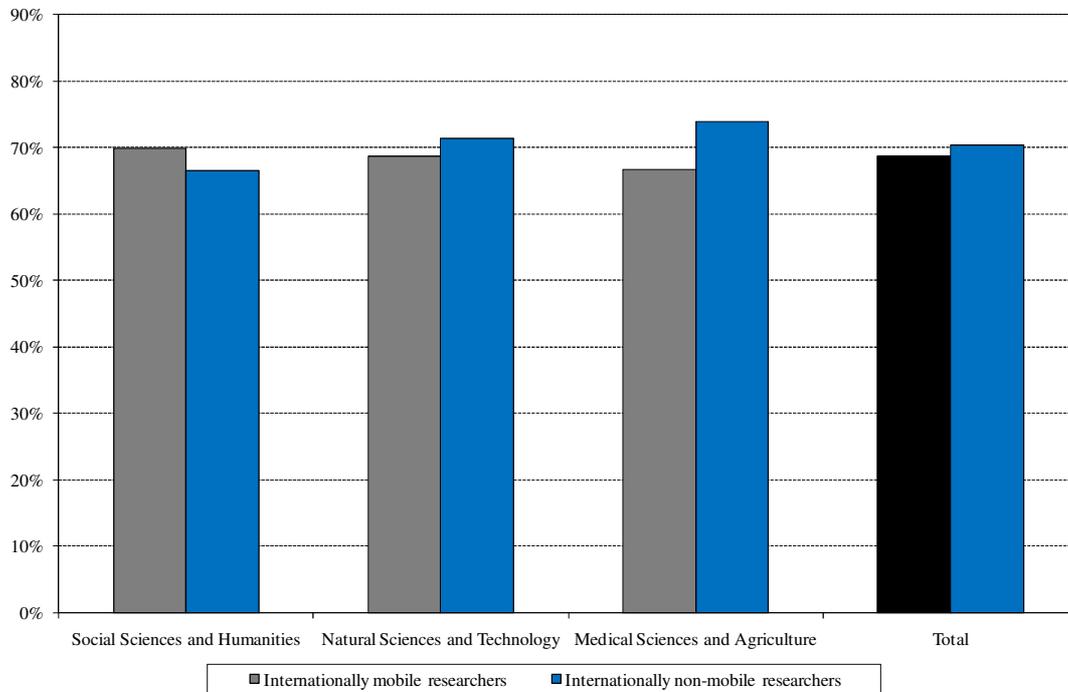
1) The table is based on the following questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "Which of the following categories do you consider best describes your current status as a researcher?" (Question 34), (ii) "What effects do you think further international mobility would have on your future career progression?" (Question 96), and (iii) "What effects do you think international mobility would have on your future career progression?" (Question 110).

2) For this project, a person is considered as an "internationally mobile" researcher if (s)he answered yes to the following question: "In your researcher career (which also encompasses the whole period of your PhD-education) have you worked in another country than the country where you attained your highest educational degree, including research visits of 3 months or more?" (Question 55).

3) The table is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.

4) The shares of EU27 researchers in the table are calculated by using the proportion method described in Chapter 2, where we use the weights for mobile researchers for the group of internationally mobile researchers and the weights for non-mobile researchers for the group of internationally non-mobile researchers.

Figure 54: Estimated shares of researchers in the higher education sector in EU27 who answer that mobility would have positive or significant positive impacts on their future career progression by mobility status (i.e. whether they have been internationally mobile at least once in their researcher career or not) and field of science. $n=2,583$ for internationally mobile researchers (gray columns; and black column for the total), and $n=1,949$ for internationally non-mobile researchers (blue columns).



Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The figure is based on the following questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "What effects do you think further international mobility would have on your future career progression?" (Question 96), and (ii) "What effects do you think international mobility would have on your future career progression?" (Question 110).
- 2) For this project, a person is considered as an "internationally mobile" researcher if (s)he answered yes to the following question: "In your researcher career (which also encompasses the whole period of your PhD-education) have you worked in another country than the country where you attained your highest educational degree, including research visits of 3 months or more?" (Question 55).
- 3) The figure is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.
- 4) The shares of EU27 researchers in the figure are calculated by using the proportion method described in Chapter 2, where we use the weights for mobile researchers for the group of internationally mobile researchers and the weights for non-mobile researchers for the group of internationally non-mobile researchers.

Table 16: Estimated shares of researchers in the higher education sector in EU27 who answer that mobility would have significant negative, negative, positive, significant positive impacts or no impact on their future career progression by mobility status (i.e. whether they have been internationally mobile at least once in their researcher career or not) and field of science. n=2,583 for internationally mobile researchers, and n=1,949 for internationally non-mobile researchers.

Field of science	Significant negative impacts	Negative impacts	No impact	Positive impacts	Significant positive impacts	Total
Internationally mobile researchers						
Natural Sciences and Technology	1	2	28	46	23	100
Medical Sciences and Agriculture	1	1	31	47	20	100
Social Sciences and Humanities	3	3	25	46	24	100
Total	2	2	27	46	23	100
Internationally non-mobile researchers						
Natural Sciences and Technology	2	3	24	45	26	100
Medical Sciences and Agriculture	3	3	21	51	23	100
Social Sciences and Humanities	2	4	28	43	24	100
Total	2	3	24	46	24	100

Source: The Mobility Survey of the Higher Education Sector.

Notes:

1) The table is based on the following questions in the Mobility Questionnaire of the Higher Education Sector (see Annex 2): (i) "What effects do you think further international mobility would have on your future career progression?" (Question 96), and (ii) "What effects do you think international mobility would have on your future career progression?" (Question 110).

2) For this project, a person is considered as an "internationally mobile" researcher if (s)he answered yes to the following question: "In your researcher career (which also encompasses the whole period of your PhD-education) have you worked in another country than the country where you attained your highest educational degree, including research visits of 3 months or more?" (Question 55).

3) The table is only based on persons less than or equal to 70 years old, in order to exclude retired researchers from the sample.

4) The shares of EU27 researchers in the table are calculated by using the proportion method described in Chapter 2, where we use the weights for mobile researchers for the group of internationally mobile researchers and the weights for non-mobile researchers for the group of internationally non-mobile researchers.

5.5 Main findings and conclusions

This chapter presents the main findings from the first systematic and representative study ever on mobility patterns among researchers in the higher education sector in the EU27. Methodologically, there are limitations regarding the usefulness of those estimates and indicators with high error margins, but we are confi-

dent that the results presented here are reliable for the EU27 as a whole and for the majority of Member States (unfortunately, with the exception of France)²⁶.

More than half of EU27 researchers in the higher education sector have been at least once in their *researcher* careers internationally mobile. This includes incidents of *research visits of a minimum of three months duration*. This chapter (e.g. Figure 35, Figure 36 and Figure 37), Figure 6 in Chapter 4 and Annex 5 (logit regression analysis) present substantial evidence showing that *student international mobility* is a major factor determining whether a researcher will be internationally mobile in the future or not.

Researchers in the Medical Sciences and Agriculture are less mobile than those in the Natural Sciences and Technology *and* those in the Social Sciences and Humanities (see Figure 40). It is not clear why this is so, but this finding is noteworthy.

Research visits are by far the main form of international mobility among researchers in the higher education sector. Cross-country changes of employer are also a surprisingly common phenomenon. The United Kingdom, Austria, Ireland, the Netherlands and Sweden are the Member States with the highest shares of job-to-job researcher mobility (see Figure 31), but most of the Member States seem to have large shares of researchers with international research working experience²⁷.

Researchers in the "other researcher" category are more likely to have at least one experience of international researcher mobility, but this result is partly due to the fact that we have included research visits and that these researchers are older than doctoral/PhD students and postdoctoral researchers.

Female researchers have been less mobile over the course of their researcher careers than their male colleagues. This is true both in total and within the three broad scientific domains (see Figure 26). Annex 5 demonstrates also that though gender differences are clearly smaller among those who have been internationally mobile *the last three years* (see Figure 44), gender is still a significant explanatory factor of mobility in EU27.

Another important finding is that intersectoral and in particular intrasectoral research job-to-job mobility is much more common than one might have thought. For example, we estimate that about 17 per cent of researchers in the higher education sector in EU27 do have working experience from both the public and the private sector. As expected, this share is lower among the researchers in the Medical Sciences and Agriculture than in other scientific fields.

One of the most interesting results in this report is that more than half of the non-mobile researchers do plan to be mobile in the future. Chapter 6 presents the factors that may inhibit and/or retard these processes. We also find that as much as 88 per cent of the non-mobile researchers are open to the possibility of being mobile in the future. This share is somewhat higher for internationally mobile researchers, namely 91 per cent. Furthermore, we find that 80 per cent of the internationally mobile researchers answer that their time as a mobile researcher has had positive or significant positive impacts to their career progression. 69 per cent of the internationally mobile researchers answer that they think further international mobility would have positive or significant positive impacts on their future career progression. About the same share of the internationally non-mobile researchers (70 per cent) answer that they think international mobility would have positive or significant positive impacts on their future career progression.

²⁶ We remind that France is excluded from all the figures and tables in Chapters 4 and 5.

²⁷ We remind again that PhD is considered as an integral part of a researcher's career.

6 RESEARCHER PERCEPTIONS AND EXPERIENCES OF MOBILITY – MOTIVES, DRIVERS, OBSTACLES AND IMPACTS

6.1 Introduction

In the **WP1 Scoping Report** we hypothesise that a range of personal and research related motives and a set of personal and family life related, career and work-life balance related, research related (institution level and national level systemic) factors and labour market and immigration related factors may all be implicated in decisions by researchers whether or not to be mobile. We were able to explore the role of many of these factors in relation to the respondent's past experience of mobility in the HEI survey questionnaire. We also asked about many of the same factors in relation to attitudes towards future mobility. Our results confirm that many of these factors are important in understanding the propensity to mobility of European researchers. In what follows we present a discussion of each factor drawing upon three kinds of analysis: first, where appropriate, the logistic regression (logit) analysis of the weighted (extrapolated) data (as detailed in Annex 5) to determine the extent to which responses about each factor predict the past experience of mobility for researchers in European HEIs; second, a detailed descriptive statistical analysis of motivating factors, inhibiting factors and obstacles in relation to both past mobility (actually experienced mobility) *and* future orientation towards mobility (as detailed in Annex 6); and finally, a systematic qualitative analysis of open-text comments received from respondents in relation to the factors (almost a quarter of our respondents made at least one free-text comment²⁸).

6.2 Personal motives affecting the individual researcher's decision to become mobile

6.2.1 Personal and family factors

The literature suggests that personal relationships and family ties are highly important factors in (and are significantly impacted by) a decision to become mobile and therefore we sought in our survey to explore the role such factors play in encouraging researchers to be mobile in the past - but also in dissuad-

²⁸ The survey instrument included four questions where the respondent could openly discuss any outstanding issues not covered by the questionnaire or elaborate on information already provided. Question 56 and Question 78 were available for additional comments clarifying the respondent's mobility status, whilst Question 97 asked "Could you please provide any other comment or information you wish to share regarding your experience of international mobility, any obstacles to mobility you have encountered and the impacts mobility has had on your career?" and Question 111 asked "Could you please provide any other comment or information you wish to share regarding international mobility, especially the costs and benefits of mobility?" to our previously mobile and previously 'non-mobile' respondents, respectively. In total, 1,161 researchers responded in at least one of the above mentioned questions (excluding simple "no comments" or "thank you" responses). On the whole, 1,414 responses were analysed: 292 in Question 56, 231 in Question 78, 575 in Question 98 and 316 in Question 111. The sub-sample of respondents that provided comments has similar characteristics to the overall sample with regard to age, gender, researcher status and experience of mobility. It should be borne in mind that some countries are slightly over-represented in the sub-sample of open-text respondents relative to the overall sample, notably Spain, Italy and Germany.

ing them from mobility. The logit analysis suggests that a strong motivation regarding personal and family factors is an explanatory factor for lack of mobility across the European HEI researcher's research career. This is true for both job mobility and research visits, and remains true for recent mobility experiences (in the last three years)²⁹.

The descriptive analysis confirms this picture. We find that personal and family factors were "important" or "highly important" for almost fully three-quarters of respondents in their past decisions not to become mobile. Just over 40 per cent of those respondents who indicated that they had spent more than three months as a researcher in another country than the country from which they achieved their highest educational attainment did not see personal and family factors as a very important influence on their most recent past experience of mobility. However, personal and family factors (not surprisingly) are of greater importance when thinking about *future* mobility, with only 22 per cent of respondents viewing personal and family factors as being of little importance in relation to further mobility in the future (Annex 6, Table 17). This picture was broadly similar for male and female respondents (Annex 6, Table 18). Female respondents with children were still more likely to see personal and family factors as a highly important influence in considering future mobility (Annex 6, Table 19).

Some of those respondents who discussed their personal motivations for becoming mobile in their open-text responses suggested that personal motivations change over time: "in the past ... I took decisions based only in what would enhance my chances of securing a tenured position. In the future I will move to get better quality of life for me and my family ... rather than giving priority to academic and career considerations". Often the boundaries between personal and research-related motives are blurred: "I did spend 6 months in a different country during my PhD education, but that was an arrangement in order to work in the same place as my husband". "My last major move to the Netherlands was a result of a marriage to a Dutch researcher; other factors were of a little importance". "I moved for personal reasons - to join my husband. While I did not have a problem finding a job in the academic sector, I feel that my career progression was adversely affected by moving to UK". Other respondents argued that mobility is not so much a function of personal motives as a necessity forced upon researchers by the nature of their profession, as an increasing precondition for career development and by problems in national research systems (lack of funding, short-term contracts etc). As one respondent put it, researchers today are "science nomads" forced by the "the lack of permanent posts, the funding system of short-term post docs and the stranglehold on funding for new investigators".

6.2.2 Quality of life and work/life balance factors

The logit analysis (Annex 5) suggests that a strong motivation regarding quality of life factors is an explanatory factor for mobility across the European HEI researcher's entire research career and for recent mobility (i.e. during the past three years). Looking at the different categories of mobility this holds true for job mobility across the entire career, although for research visits across the entire career the logit analysis does not conclude that quality of life concerns are an explanatory factor. It seems logical that such factors

²⁹ However the picture for those previously non-mobile respondents who expressed an interest in future mobility was broadly similar to those with previous experience of mobility (Annex 6).

would be more of an issue in relation to international job mobility than to research visits not involving a change of employer.

Turning to the detailed picture from the survey, almost two-thirds of those respondents who met the study definition of having previously been mobile viewed quality of life factors as an important or highly important influence on their personal motivation for their most recent past experience of mobility. Over 80 per cent of those same researchers would see quality of life factors as being important or highly important in any future decision to be mobile (Annex 6, Table 21). Interestingly, around 60 per cent of those who have not previously been mobile (in the definition of this study) see such factors as having played an important or highly important role in dissuading them from mobility in the past, whilst much the same proportion as for previously mobile respondents would see quality of life factors as important or highly important in decisions about future mobility (although proportionally fewer of these previously 'non-mobile' respondents would classify quality of life issues as highly important in relation to future mobility decisions than would the 'previously mobile' respondents) (Annex 6, Table 22).

Pressure on questionnaire length and complexity meant that, in the final version of the questionnaire, no closed questions on work/life balance factors as a specific motivating factor in mobility decisions were included. From the respondents that described their personal motivations for mobility in the four main open-ended questions, more specified work / life balance factors and other personal factors as their main motivation for past and future mobility than specified training, development and other career-related or research-related factors as their main motivation. These comments suggest that motivations for mobility are affected by the career stage and family situation of the respondent.

Work/life balance and quality of life issues were mentioned in several comments as motivations for mobility in the future. This includes better child care and education. One comment suggested that mobility was "intellectually stimulating" in itself. Another commented that it is "what makes research worth doing". Mobility, for these respondents, is a life experience, and a number of respondents stated that they would consider moving "for pleasure", "for fun" or personal development including experiencing a foreign country, working with different people, broadening one's horizons and acquiring different experiences, practicing or learning a foreign language. Learning about other cultures was mentioned as a motivation for mobility from several respondents. Apart from the cultural experience, some of these researchers mentioned the need for change in addition to a need to gain new knowledge. The combination of both personal and career related factors was mentioned by some commenting respondents as a motivation for future mobility: "I would only move again if I thought that my research potential could improve significantly via the gain of funding and improved facilities and that this could accommodate my personal life (partner is also a researcher)". Finally, returning to country of birth or citizenship, perhaps after a long time away, or to a country previously visited or worked in, was mentioned by some respondents, even in circumstances where the move was not seen as attractive from a research or career perspective.

6.2.3 Training and development goals

The logit analysis (Annex 5) suggests that training and development goals represent the strongest explanatory factor for mobility across the European HEI researcher's entire research career and specifically for job mobility. When considering recent international mobility (last three years) and all international research visits (i.e. non job mobility across the entire career) a strong

orientation towards training and development remains a strong predictor although personal research agenda goals seem to be equally strong predictors.

Turning to the detailed analysis we find that training and development goals appear to be important motivating factors for future mobility both for previously mobile respondents and previously 'non-mobile' respondents (Annex 6, Table 23 and Annex 6, Table 24). In contrast, training and development goals seem to have played much less of a role in dissuading previously 'non-mobile' respondents from opting to be mobile, with more than half of these respondents stating that such goals were unimportant or only slightly important in relation to their past decisions not to become mobile. In the open-text responses we found that, where training and development goals were mentioned, they not surprisingly tended to be very closely bound up with career progression and research-related goals. In turn, all these career and research-related goals themselves tended to be closely entwined with other personal and family motives, reminding us that for the individual researcher these issues are all ever-present and hard to disentangle.

6.2.4 Career progression goals

The logit analysis (Annex 5) suggests that career progression goals also represent an explanatory factor for mobility across the European HEI researcher's entire research career and this remains true across both types of mobility (research visits and job mobility) and when considering only recent mobility.

Turning to the detailed analysis of the survey responses, we find that career progression goals are important motivating factors for future mobility both for previously mobile respondents and previously 'non-mobile' respondents (Annex 6, Table 25 and Annex 6, Table 26). Once more, however, they seem to have played a less important role in the past decisions of 'non-mobile' researchers not to become mobile.

Some open-text responses were related to the career path of the respondent and especially to the pursuit of mobility in order to take advantage of a career opportunity, to advance a research career or to become a recognised researcher. Several of these respondents mentioned stimulating their research or /and advancing their career as the main factors motivating them for future mobility. These included finding a good salary, a suitable or/and permanent position, new motivations for their research, other benefits for their research field, getting access to infrastructure, or a position with better working conditions including less administrative load and teaching requirements, as well as access to both good students and local research partners. The desire to return to a previous host country for future collaboration was also mentioned. For a small number of commenting respondents, their willingness to move in the future is related to their desire to continue working after the official retirement age in their current country. The mobility challenge for older and more senior researchers is an issue which comes through very clearly from the open-ended responses and is one to which we shall return.

6.2.5 Personal research agenda

The logit analysis (Annex 5) suggests that personal research agenda motives are a strong explanatory factor in the mobility of European HEI researchers. This remains true across all categories but seems strongest for research visits and for recent mobility. Turning to the detailed results, we find that pursuing their own personal research agenda is a key motive for respondents to become mobile, both in relation to past decisions and in relation to their orien-

tation towards future mobility (whether for previously mobile or for previously 'non-mobile' respondents). Once more, however, it seems that the personal research agenda has been much less of a factor in the past decisions of 'non-mobile' respondents not to become mobile (Annex 6, Table 27 and Annex 6, Table 28). Whilst generally, it seems hard for some researchers to disentangle completely research from other kinds of motivations for mobility, research-related motives mentioned in the four main open-ended questions include collecting bibliography, establishing new contacts and collaborations and learning new ways of working.

6.3 "Push" and "Pull" factors influencing propensity to be mobile

6.3.1 Introduction

In the preceding section we have explored the role of personal motivations of varying kinds in decisions about whether or not to be internationally mobile. Now we turn to the role played by a range of potentially important factors relating to the employing or hosting research organisation and to the wider labour market, research and 'innovation' system to which that organisation belongs. In our questionnaire we asked previously mobile respondents to tell us how important various factors falling into these different categories have been both as "push" factors encouraging them to leave a particular organisation and system and as "pull" factors encouraging them to go to a particular host or destination organisation and system (for the case of their most recent instance of mobility). We also asked our previously non-mobile respondents what role these various factors had played (if any) in their past decisions to remain in place. Finally we asked both categories of respondent to consider what role these factors might play as "push" and "pull" factors in relation to any possible future mobility. Detailed results for each "push" and "pull" factor in relation to past and future mobility are provided in Annex 6. Here we present the key findings.

6.3.2 Organisation level factors

6.3.2.1 Career related factors

Looking at the experiences and future intentions of previously-mobile respondents, we see that **availability of career opportunities** in the host/destination research performing organisation and/or system are slightly more important as 'pull' factors influencing mobility (Annex 6, Table 30) than is the relative lack of availability of such opportunities in the home institution or system is as a 'push' factor for mobility (Annex 6, Table 29). Previously 'non-mobile' respondents also perceive the lure of career opportunities in the potential destination institution or system as an important 'pull' factor for mobility (Annex 6, Table 32). However these previously 'non-mobile' respondents are more evenly distributed between those for whom availability of career opportunities at home was a factor in dissuading them from mobility in the past and those for whom it was not an important factor (Annex 6, Table 31).

Turning to **salary and incentives** we can see that poor financial rewards and incentives have not been a significant 'push' factor in the previous mobility of respondents, although both amongst this group and the previously 'non-mobile', salary and incentives do appear to be a more important 'push' factor for future mobility (Annex 6, Table 33, Table 35). This may reflect a feature

of the research career path whereby salary and incentives may become more important motivating factors later in the career. Salary and incentives are also more important 'pull' factors for future mobility than they have been for past mobility (Annex 6, Table 34). Finally, good salaries and incentives at home seldom appear to have been a highly important factor in dissuading respondents in the 'non-mobile' category from becoming mobile in the past (Annex 6, Table 35).

Poor working conditions at home do not appear to be a major 'push' factor for most respondents who have been mobile in the past (Annex 6, Table 37). They appear a little more important as push factors influencing propensity to become mobile in the future for both previously mobile (Annex 6, Table 37) and 'non-mobile' (Annex 6, Table 39) respondents. Again, better working conditions in an actual or potential host or destination location appear to play a slightly more important role as 'pull' factors influencing both past mobility and future propensity to mobility (Annex 6, Table 38, Table 40).

In almost 50 per cent of cases conditions at work seem to have been important or highly important in helping dissuade previously 'non-mobile' respondents from mobility (Annex 6, Table 39).

In the open-text responses several of those researchers who discussed 'push' factors stated that the lack of job opportunities in their country of birth or citizenship (or previous country of work) is what keeps them mobile and especially the lack of tenured positions and the general insecurity of the researcher profession. This, combined with the lack of research funding and low salaries was the main push factor for mobility mentioned by those respondents who commented on this topic. For one mobile researcher from the Netherlands the main push factor has been the lack of job opportunities at the first career stages, though later the reason for not returning to the country of origin was the inability to transfer pension rights.

The availability of funding or/and good salary and the existence of a suitable position seem to have been important pull factors or considerations for a number of the open-text respondents. Some respondents who commented on this issue stressed that the funding or salary must be adequate to cover any additional costs arising from mobility (logistics costs etc.) in order to be considered as a 'pull' factor.

Other respondents explained that they had pursued mobility to find better working conditions. However these conditions were often research-related, and issues mentioned as possible triggers of future mobility in open-text comments included high administrative loads, excessive teaching requirements, lack of access to good students and a lack of suitable research collaborators. According to one respondent this latter factor is especially an issue for researchers moving from less developed countries to more developed countries in Western Europe, North America, Australia, etc. It is to such research-related factors that we will turn next.

6.3.2.2 Research related factors

We begin our exploration of research-related 'push' and 'pull' influences on mobility by considering **access to research equipment and facilities**. For just over a third of previously mobile respondents, lack of access to equipment and facilities at home played an important or highly important role as a 'push' factor in influencing the decision to move (Annex 6, Table 41). In relation to future mobility they are a more important 'push' factor for both previously mobile and for previously 'non-mobile' respondents, probably reflecting an increased need for access to leading edge facilities and equipment as the research career progresses. For previously mobile respondents access to

equipment and facilities for research is a major 'pull' factor both in relation to past mobility and, especially, in relation to potential future mobility (Annex 6, Table 42). For the 'non-mobile' respondents we can also see that access to equipment and facilities at the host or destination location represents a major 'pull' factor towards future mobility (Annex 6, Table 44). However, equipment and facilities at home seem to have played slightly less of a role as a 'stay' factor dissuading non-mobile respondents from having become mobile in the past (Annex 6, Table 43).

This picture is broadly replicated for **access to research collaborators**, which presents itself as a major 'pull' factor in both the past experience of previously mobile respondents and, even more, in the future orientation of all respondents who expressed an openness towards future mobility, whether previously mobile or not (Annex 6, Table 46, Table 48). Once more the importance of a factor in the home system as a 'push' factor seems to be stronger for future mobility than for past mobility (Annex 6, Table 45, Table 47). And once more those respondents who are classed as having not previously been mobile are almost evenly spread between those for whom access to the right network of research collaborators in the home institution or research system was, and for those for whom it was not, an important or highly important factor in dissuading them from mobility in the past (Annex 6, Table 47).

The open-ended comments on 'push' and 'pull' factors confirmed that access to better facilities and to "good colleagues" can be important as 'pull' factors. Social connections as well as professional ones can also be important and several of these respondents stressed that personal networks can shape mobility patterns. In terms of specific research related pull factors not offered as options in the closed questions, one respondent stated that access to "new knowledge and skills (methodologies, etc.)" can be more important than access to facilities and equipment. Another pull factor mentioned was finding a country where one's research field is highly-developed relative to the researcher's country of origin. Working in an environment of academic freedom was the stated main 'pull' factor for one respondent; whilst another specified an emphasis on interdisciplinary research in the USA as a 'pull' factor for future mobility towards this country.

6.3.3 Location-related factors

A desire to return to a country to/in which the researcher has previously visited/ worked has been important or highly important in the previous mobility of a third of our mobile respondents, and in the future mobility intentions of just over 40 per cent of previously mobile respondents who are contemplating further mobility in the future (Annex 6, Table 49). Not surprisingly, this is a weaker motivation for most respondents considered as previously non-mobile for the purposes of this study (Annex 6, Table 50).

The importance of combining a good research career and a family was highlighted in a comment by one respondent, while other comments highlighted the importance of affordable and good quality childcare and schools. Finally, a factor not considered in the questionnaire but mentioned in a comment by one respondent is distance from the country of origin, with that person suggesting that the choice of host country will depend on whether he/she could "travel home cheaply, easily and frequently". An interesting comment was made by one respondent, who suggested that using non-scientific factors to decide the destination is based on the fact that a minimum quality of infrastructure and working conditions is available in the western world: "After all, in 'rich' western cities, a lab is a lab, and you get decent working conditions".

And another also commented that “in reality the jobs and funding are probably similar, but in terms of personal and life experiences it is very attractive”.

Our open text comments strongly suggest that non-scientific, non-career location-related factors such as history, culture and quality of life in the destination country can turn into the single ‘pull’ factor for mobility. Even the language of the destination country was mentioned by several respondents as the ‘pull’ factor that dictated their choice and by several others as an important ‘pull’ factor for future mobility. One respondent suggested that being familiar with the overall ideology, customs, political and academic system of the host country is important. Another non-scientific, non-career related ‘push’ factor that was mentioned was political instability of the home/sending’ country.

6.3.4 Labour market factors

Unattractive **labour market regulations** at home seem generally to be unimportant as a ‘push’ factor influencing respondents to become mobile (Annex 6, Table 51), although they seem more influential in relation to future orientation towards mobility of previously ‘non-mobile’ respondents who are now considering mobility. They also appear to be an important ‘stay’ factor in about a third of cases of past decisions not to become mobile (Annex 6, Table 52, Table 53). They appear seldom to have played a significant role as ‘pull’ factors in influencing the past mobility of our mobile respondents (Annex 6, Table 52) but they register more strongly as a possible ‘pull’ factor for future mobility, both for those who have and those who have not been mobile in the past (Annex 6, Table 52, Table 54).

Immigration regulations have been important as ‘push’ and ‘pull’ factors in a very small minority of cases whether of previous mobility or in relation to future intentions. They have also very rarely proved important as ‘stay’ factors dissuading researchers from becoming mobile in the past (see: Annex 6, Table 55 - Table 58). They are also seldom mentioned in the open-text responses and, when mentioned, not as ‘push’ or ‘pull’ factors as such but rather as difficulties anticipated (and occasionally encountered).

6.3.5 Pension and social care system factors

Pension and social care provisions seem to have played little role as ‘push’ factors influencing our respondents to become mobile, although they appear to be slightly more influential on the future orientation towards mobility of previously ‘non-mobile’ respondents now considering mobility (Annex 6, Table 59, Table 61). They also appear to be an important ‘stay’ factor in more than a third of cases of past decisions not to become mobile (Annex 6, Table 61). Pension and social care provision in the host or destination country seems to have played little role as a ‘pull’ factor in influencing the past mobility of previously mobile respondents (Table 52). As with labour market regulations, pension and social care are more evident as a possible ‘pull’ factor for *future* mobility, both for those who have and those who have not been mobile in the past (Table 60, Table 62). Although never ranked highly as important ‘push’ or ‘pull’ factors, pension and social care issues were sometimes discussed by open text respondents as barriers to, or sources of difficulty in connection, with mobility.

6.3.6 Research “system” factors

The general level of research funding available in the national research system appears to have been an important ‘push’ factor in over a third of

past cases of mobility but seem to be a more important 'push' factor for further mobility in the future, with some 60 per cent of previously mobile researchers and more than 60 per cent of 'non-mobile' researchers indicating that levels of research funding are important or highly important factors in driving them to consider leaving the system for another (Annex 6, Table 63, Table 65). The picture is stronger still for level of funding in the host or destination system as a 'pull' factor, whether for previous or future mobility (Annex 6, Table 64, Table 66). Funding levels also appear to have been an important retention or 'stay' factor in dissuading almost half of those respondents classed as 'non-mobile' from having moved in the past (Annex 6, Table 65).

The **ability to access research funding** for the respondent's own research proved to be slightly more important as a past 'push' factor influencing previous mobility (Annex 6, Table 67) and particularly as a possible 'push' factor influencing both previously mobile and non-mobile respondents towards mobility in the future (Annex 6, Table 67). It has been an important 'pull' factor for half of all previously mobile respondents and is an important 'pull' factor for over 70 per cent of those previously mobile respondents who are considering further mobility in the future (Annex 6, Table 69) - and more so for those who are classed as having never been mobile (Annex 6, Table 70). It has also played an important or highly important role as a retaining 'stay' factor in dissuading researchers from becoming mobile in the past (Annex 6, Table 68).

A small number of open-text respondents provided a detailed description of a situation in their country of origin that they feel is 'pushing' them to pursue mobility. 'Push' factors mentioned by several of these respondents included the lack of public research funding, the lack of job security for researchers, lack of competitive salaries, over-supply of young researchers and under-supply of positions, lack of a general research structure supporting research (e.g. technicians, research fellows, etc), as well as the prevalence of a traditional teaching-oriented culture rather than a research culture in universities. There were a small number of complaints about hierarchical academic systems in some countries in which senior professors are seen to have "absolute decisional control".

6.3.7 Innovation "system" factors

In the closed, structured questions we explored the role of **company and user links** as a potential 'push' or 'pull' factor. The responses suggest that lack of such links in the home/sending system have not historically been important as 'push' factors for mobility except in a minority of cases (Annex 6, Table 71) - though they do register as a more important potential 'push' factor for future mobility (Annex 6, Table 71, Table 73). They seem to be more important as 'pull' factors in the host or destination system (Annex 6, Table 72). They have also played some role in a significant minority - around a third - of past decisions to stay within the original home system and not become mobile (Annex 6, Table 73). Links with companies and the innovation 'system' were not mentioned at all as 'push' or 'pull' factors affecting mobility choices by any of our open-text respondents.

1.5.2 Potential and experienced obstacles to mobility

The European Researcher's Partnership Study (RINDICATE, 2008) surveyed researchers about the roles played by a range of potential barriers or inhibiting factors for researcher mobility. It found that factors which are experi-

enced as significant problems during the course of mobility events, such as issues relating to health care provision or pension contributions, do not necessarily act as *barriers* to mobility. In the present study we also explored a range of potential barriers and inhibiting factors in relation both to the previous experience of respondents and their previous life-decisions relating to mobility, and in relation to their actual experience of mobility. The list of barriers and inhibiting factors explored in the present study was slightly modified from the Partnership/RINDICATE study set on the basis of the findings of the conceptual and literature review work undertaken in WP1, and the modalities of the two surveys themselves are rather different, but it is nonetheless possible to qualitatively read across the two sets of results.

Starting first with those researchers who have previously been mobile in line with the definition of international researcher mobility operationalised in this study, we can see how a range of obstacles and possible inhibiting factors affect motivation to further mobility (Figure 55 and Figure 59, below). It can be seen that the factors which raise the greatest concern amongst these researchers, by far, are obtaining funding for mobility and finding a suitable visiting or job position. Social and cultural integration, language issues and immigration issues present the least concerns to these previously mobile researchers, whilst issues surrounding the maintenance or transfer of health-care insurance or pension rights and the finding of suitable accommodation also raise few serious concerns. Maintaining personal relationships and making childcare arrangements seem to be of more serious concern.

Turning to those researchers who have, in the definition of our study, never been mobile, we can explore the role the various factors have played in dissuading these researchers from being mobile in the past (Figure 56 and Figure 61). Here we see a greater role for concerns around personal relationships, childcare arrangements and caring responsibilities. Finding a suitable position and obtaining funding for mobility are again significant concerns, though slightly less so than for those who have been mobile. Relatively few 'non-mobile' researchers view health insurance, pension care and immigration regulations as having presented significant barriers to mobility in the past.

We can also explore the perceptions of these previously 'non-mobile' researchers about each of these factors in relation to future mobility (Figure 57). Here we can see that, even more than for those who have previously been mobile, obtaining funding for mobility and finding a suitable visiting or employment position are major concerns or significant obstacles to most. Maintaining existing personal relationships, making childcare arrangements and other caring responsibilities also remain important concerns for many, with childcare in particular a severe obstacle to a share of applicable researchers only slightly lower than that of mobility funding concerns. This is more clearly apparent in Figure 60, which charts just the "severe obstacles".

Finally, we can explore the actual experience of previously-mobile researchers in relation to these various factors in Figure 58 and Figure 62. Interestingly, healthcare and pension factors now become relatively more significant, with a sizeable minority (over 12%) of applicable researchers finding pension issues to be a source of major difficulty. However it is worth noting that only a small share of respondents found any of these factors to be a cause of major difficulties in their actual previous experience of mobility.

Looking across these various results it seems that there are not only some differences both between the perceptions of mobile versus non-mobile researchers but also between the perceptions of all researchers and the reality experienced by mobile researchers. Factors such as obtaining funding, finding a suitable position and making childcare arrangements are both perceived as significant concerns and are experienced as obstacles by a sizeable minority

of mobile researchers. Other factors, such as healthcare and pensions arrangements, are experienced as obstacles by a sizeable minority of researchers but do not present themselves as inhibiting factors for, or barriers to, future mobility to the same extent as do caring and personal relationships, obtaining funding and finding a position.

Several researchers commented in the open sections of the questionnaire on barriers and inhibiting factors. Family-related barriers, including childcare arrangements, personal relationship and other caring responsibilities, were frequently mentioned as obstacles faced during past mobility instances, problems expected in future mobility and as factors which dissuaded researchers from becoming mobile in the past. As several respondents stated, one faces the question "career or family" after a while. In some cases the family does not want to be mobile. Securing a job for a partner in the host/destination country can be a major difficulty. In some cases the inability to do so causes significant financial and psychological strain on the couple or family. Conversely, if the partner of a researcher has a very stable, senior and/or well paid position this partner may feel obliged to stay behind, and this factor can be a barrier to mobility. As one respondent noted, many academics reflect a new type of family / relationship that has risen, namely the long-distance relationship / family.

In some cases, both partners are researchers. Here, a common issue is that the chosen host country or a researcher in one field may not always be so appropriate for one in another. This can lead some researchers or their partners to change sector, become unemployed or live separately. In some cases, then, 'mobility' can become the obstacle to 'family' rather than vice-versa.

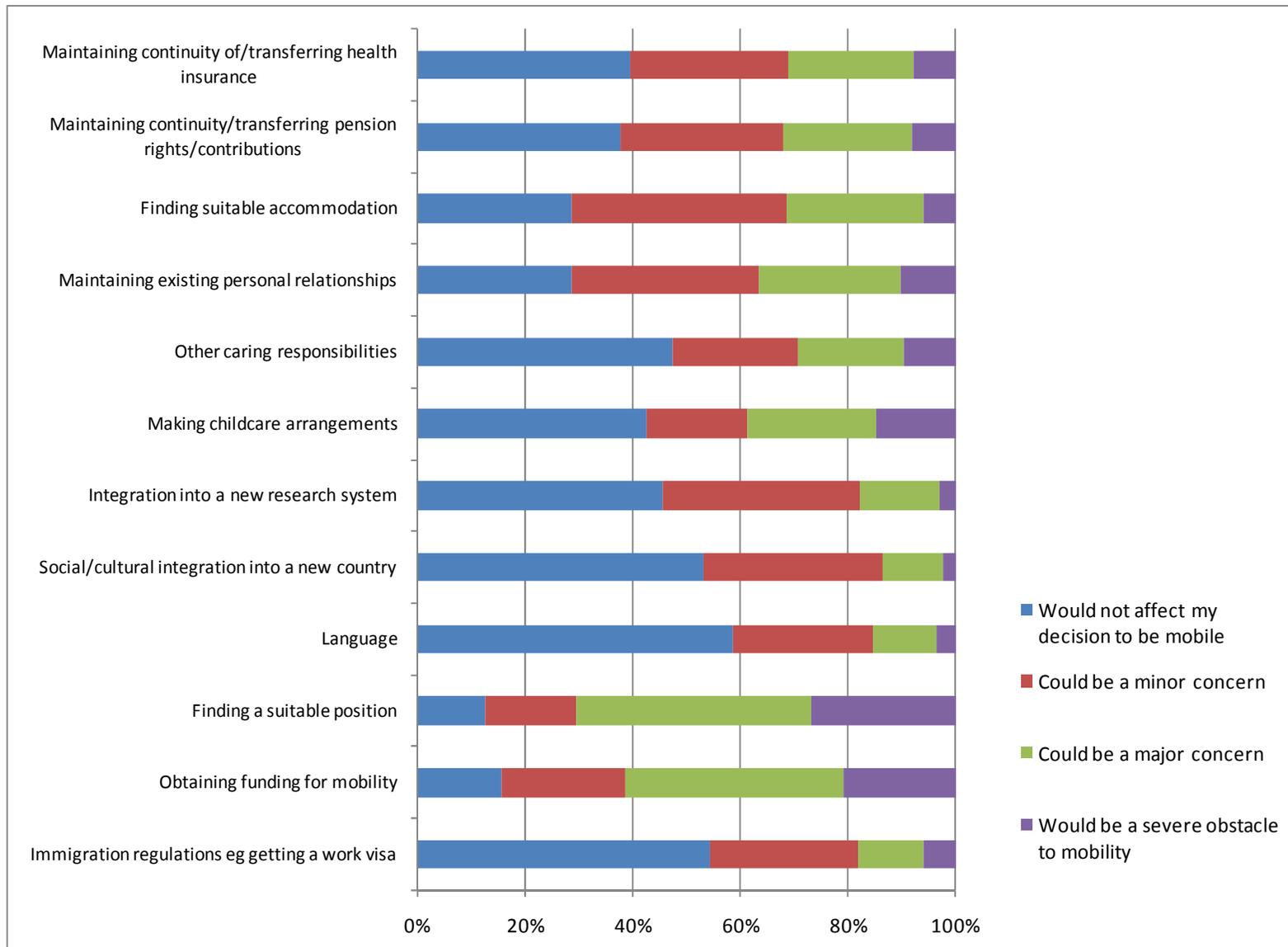


Figure 55: Summary - factors which affect motivation to become a mobile researcher (Group A - previously mobile researchers), n=see reference table in Annex 6

Source: The Mobility Survey of the Higher Education Sector

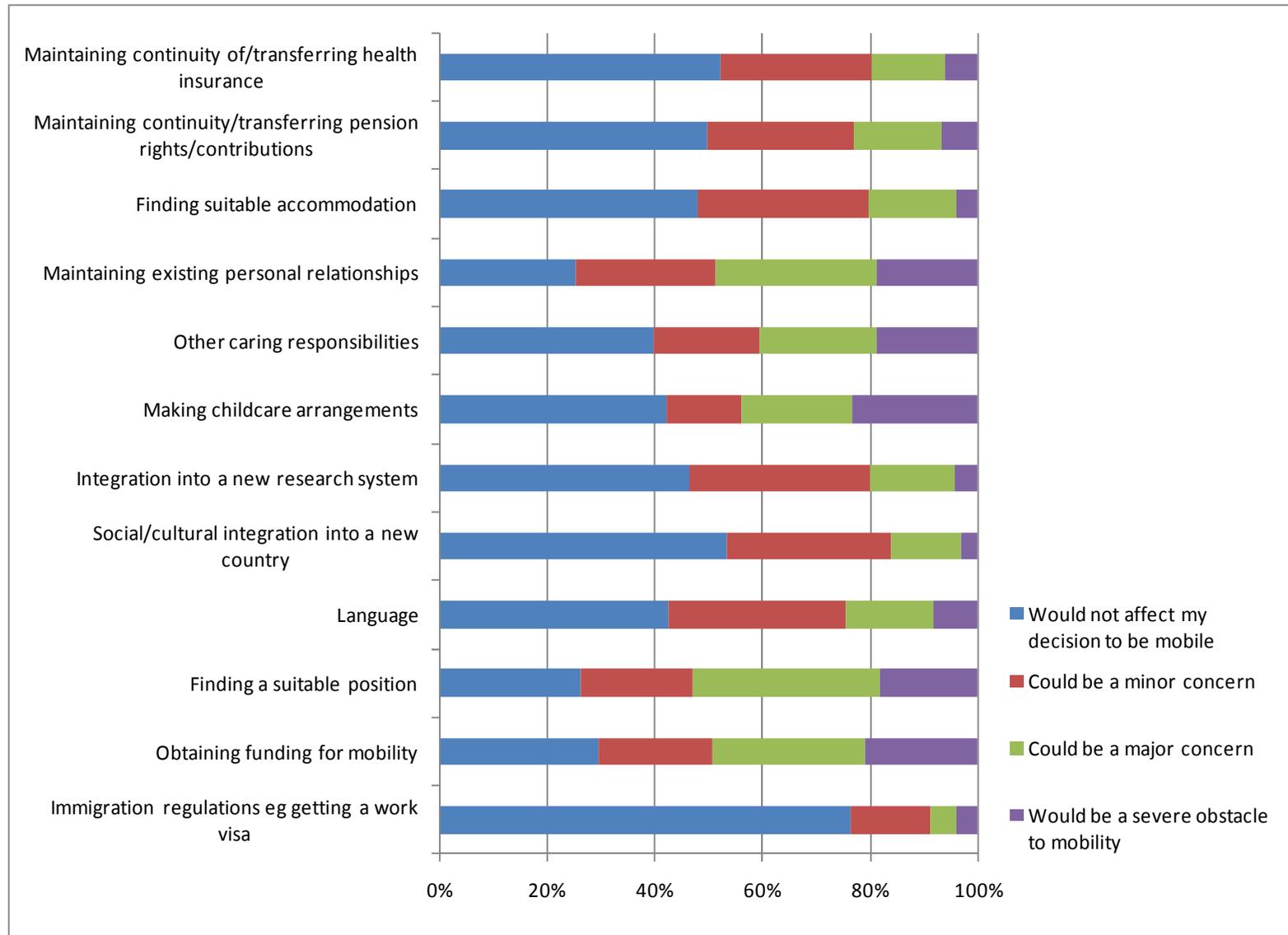


Figure 56: Summary – inhibiting factors and barriers to mobility in the past (Group B - previously 'non-mobile' researchers), n=see reference table in Annex 6
 Source: The Mobility Survey of the Higher Education Sector

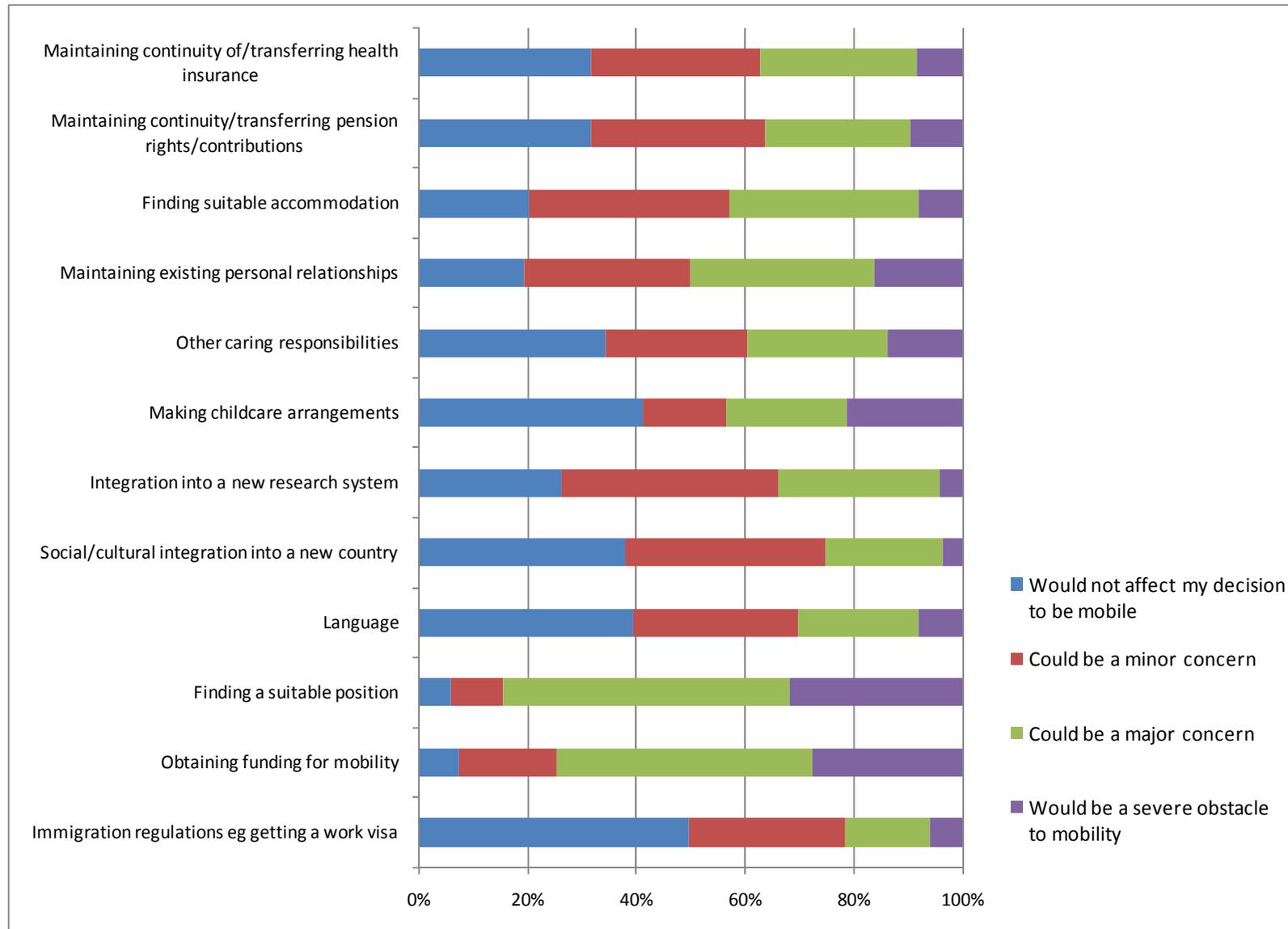


Figure 57: Summary - factors as a consideration in any future decision to be mobile (Group B - previously 'non-mobile' researchers), n=see reference table in Annex 6

Source: The Mobility Survey of the Higher Education Sector

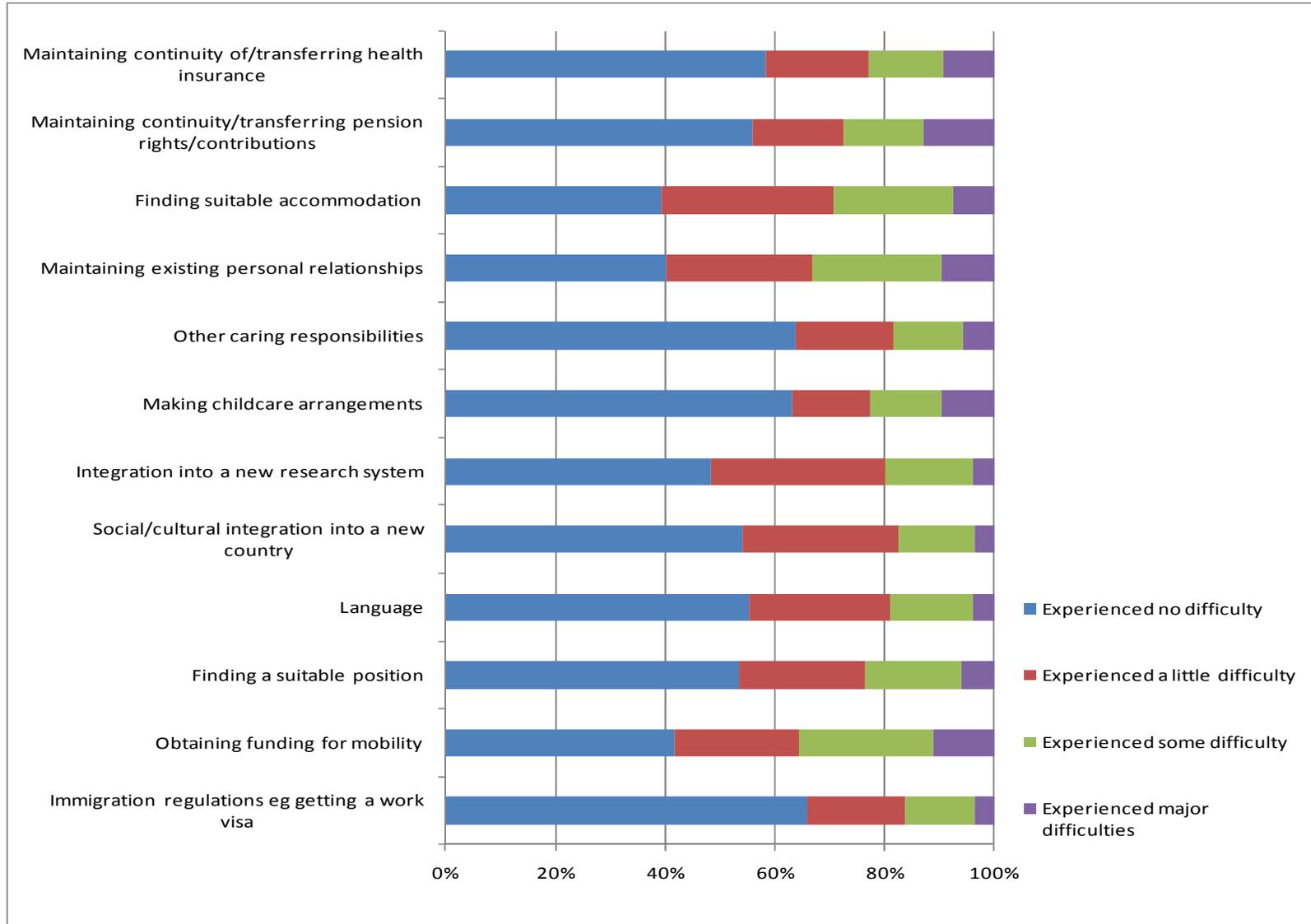


Figure 58: Summary – Obstacles experienced by previously mobile researchers in relation to past mobility (Group A - previously mobile researchers), n=see reference table in Annex 6

Source: The Mobility Survey of the Higher Education Sector

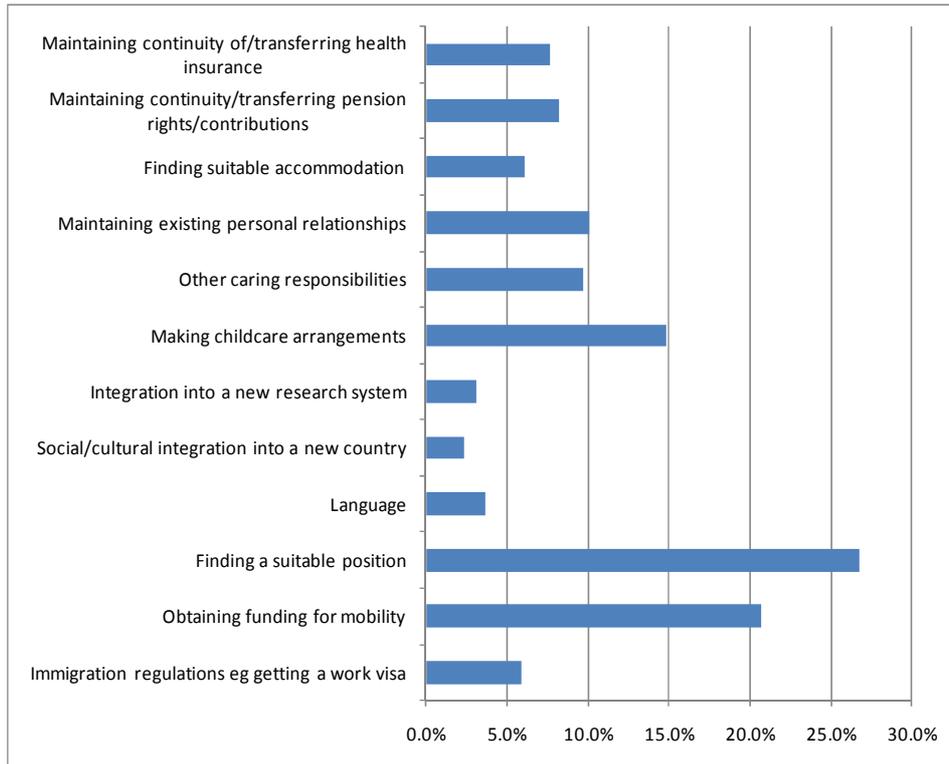
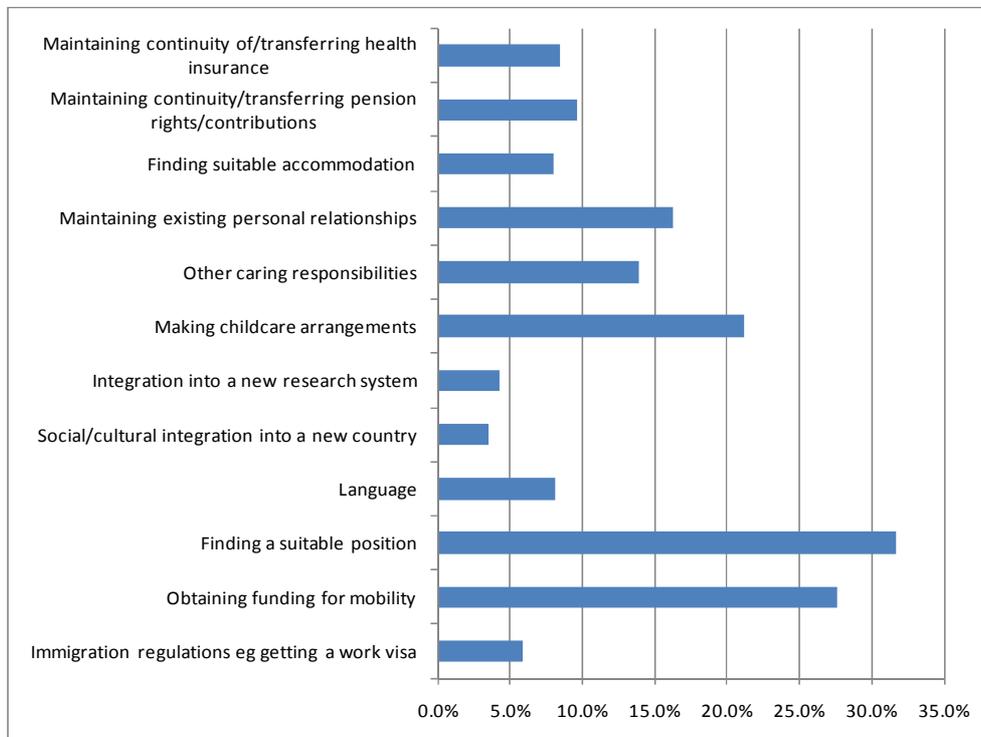


Figure 59 (above): Barriers to mobility: share of applicable³⁰ previously mobile researchers who rate each factor as a severe obstacle to future mobility (Group A - previously mobile researchers), n=see reference table in Annex 6

Source: The Mobility Survey of the Higher Education Sector



³⁰ That is, excluding respondents who selected a 'not applicable' option.

Figure 60 (above, previous page): Barriers to mobility: share of applicable previously 'non-mobile' researchers who rate each factor as a severe obstacle to future mobility (Group B researchers), n=see reference table in Annex 6

Source: The Mobility Survey of the Higher Education Sector

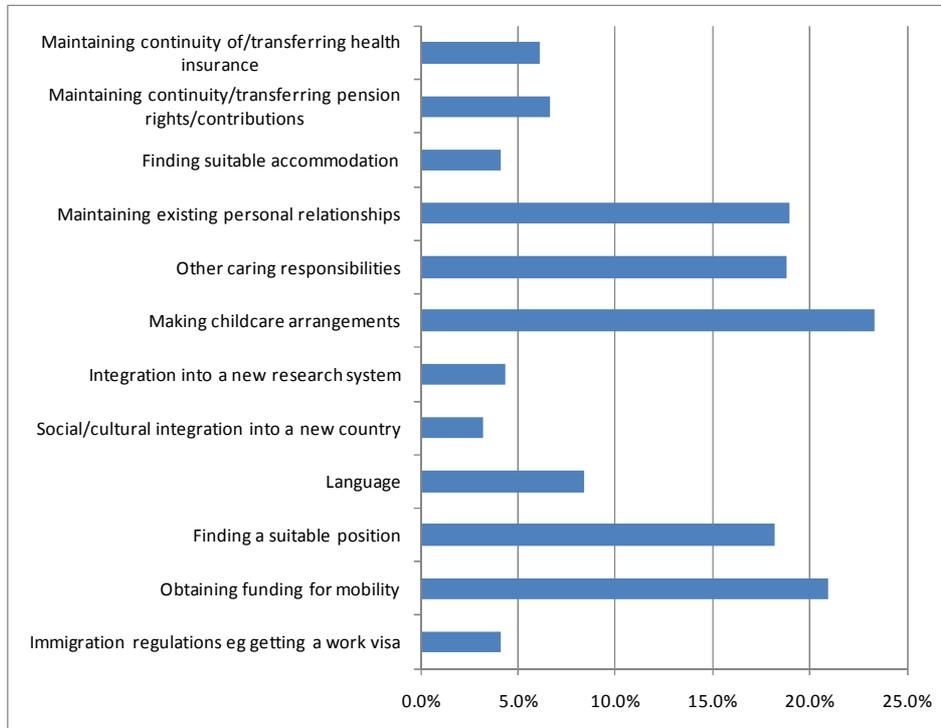


Figure 61 (above): Barriers to mobility: share of applicable previously 'non-mobile' researchers who have experienced each factor as a severe obstacle to mobility in the past (Group B researchers), n=see reference table in Annex 6

Source: The Mobility Survey of the Higher Education Sector

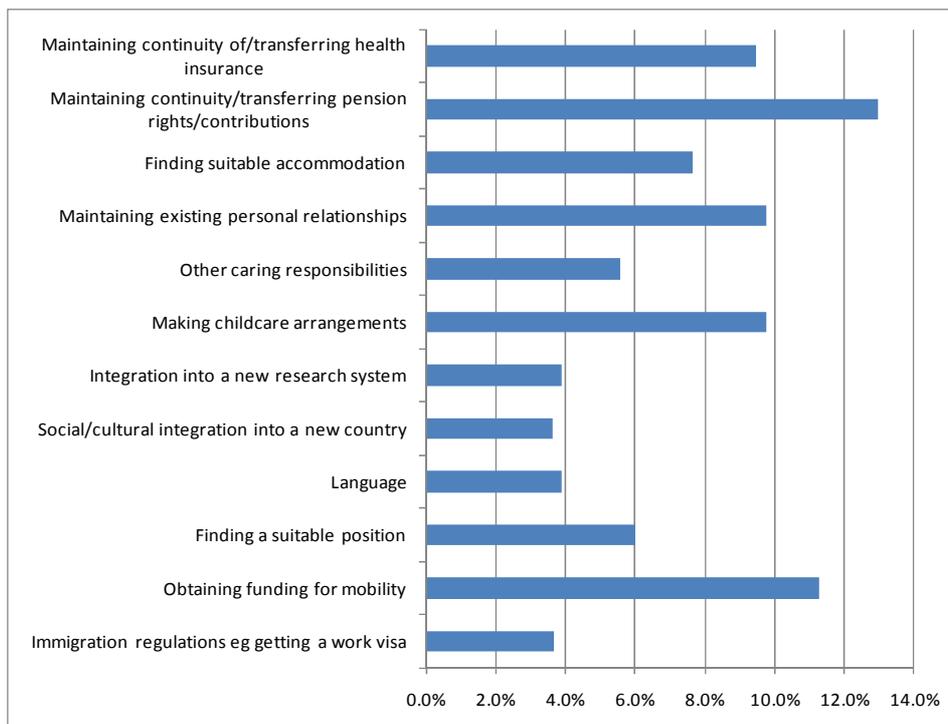


Figure 62 (above, previous page): Barriers to mobility: share of applicable previously mobile researchers who have experienced major difficulties with each factor in relation to past mobility

(Group A researchers), n=see reference table in Annex 6

Source: The Mobility Survey of the Higher Education Sector

As the discussion above makes clear, childcare and other caring responsibilities are a significant issue. Finding the right schools for children and sometimes disrupting their education can be a major consideration according to the open-text responses. However, the older the children are, the greater the flexibility of the researcher. Other caring issues mentioned included caring for elderly parents or/and a disabled child, parent or partner.

Practical matters regarding moving the whole family were also experienced both as actual problems and potential barriers by some of the respondents who commented on barriers and inhibiting factors. Finding good and affordable schools and suitable accommodation may be especially hard on a junior researcher's salary. Selling or letting the home property in the sending country is also a concern raised by some. Generally, the logistical costs of mobility are greater for researchers with families than for single researchers and this is not necessarily taken into account by fellowships and salaries: "It takes a COUPLE of years to settle down with family, but most of Post-doc contracts are maximum for three years duration!!!".

Several researchers with family obligations many of whom were women, noted that having a family forced them to consider only short research visits of no more than a few weeks. Some respondents discussed the specific obstacles facing female researchers with children stemming from expectations or demands about their role as mother and sometimes from the fact that husbands or male partners are less flexible about mobility: "International mobility is not always easy to pursue for women (who mostly are supposed to follow their husbands and not the other way around) and especially not with children". It was also suggested that male-dominated academic systems can pose a further barrier to mobility for women researchers. Mobility may also be particularly hard for single parents and a few divorced researchers mentioned that they returned to their country of origin to be with their children. Some respondents specifically mentioned that single parenthood had prevented them from considering mobility.

Funding for mobility as a barrier/inhibitor was frequently mentioned by those who chose to make comments about barriers. The availability of funding is, not surprisingly, generally seen a precondition for opting to be mobile or considering to be mobile. Many researchers who had been mobile in the past discussed the "high costs" of mobility, noting that relocation costs often have to be met by the researcher. One respondent even proposed tax incentives for mobile researchers.

Several complained about the lack of funding for mobility at the national level and specific difficulties in obtaining mobility funding in certain countries (Italy, Spain, Romania, and Sweden were mentioned by name). Some respondents commented on the bureaucratic nature of European Commission mobility funding as an obstacle or even a barrier to mobility. One felt that EC funding tends to be biased away from funding shorter-term mobility of the kind that could be more appropriate for researchers with families. Some researchers also mentioned lack of access to research funding in host/destination countries for non-nationals of that country.

There seems to be an age factor for mobility funding (and research funding in general), with a possible bias towards young or early-stage researchers. Re-

spondents complained about the lack of schemes and funding for experienced and senior researchers. One respondent noted that these problems may be compounded for those researchers who have moved into academia from the private sector, who can struggle to access funding in systems in which the presumption is of a standard career progression from PhD to senior professorship.

Some respondents suggested that their role, employer or workload might discourage mobility. Barriers mentioned included heavy administration, research management or teaching loads (with Ireland, UK, Germany and Poland mentioned as examples), lack of sabbaticals, etc. A small number of non-European researchers currently working in Europe commented about immigration regulations. The USA was specifically mentioned as a destination for which immigration conditions could be a barrier. The lack of opportunities (positions) in other countries can clearly be a barrier.

A few researchers argued that research mobility experience is not always recognised and valued in recruitment and does not translate into career progression and salary: some even argued that it is penalised in specific national research systems. Complaints were made by returning researchers that in some systems leaving a post in a public research institution / university for a long time means that you run the risk of losing your position on the career ladder, whilst those that stay within the same system have more potential for promotion. Generally, it was noted that different research systems "don't communicate well in terms of recognition of titles and previous career". A few respondents commented on the lack of competition-based internationally open recruitment in many national research systems within Europe, also a factor explored by the previous RINDICATE study. One researcher commented that "greater openness for mobility in Europe also has to do with coordination and organization of hiring in the scientific community in different countries. Very often these processes are not coordinated in time and quite opaque to mobile researchers switching country. Here Europe really must improve".

Some researchers who commented here mentioned the lack of complementarity between social security systems within Europe: "The EU is still too heterogeneous in terms of regulations on pensions, health care, childcare and so on. This clearly imposes a large cost on those who want to move". A few respondents faced career progression obstacles mainly because of difficulties in integrating into a new system with different cultural and institutional norms. Others mentioned a lack of support in the new system to start a new project or research group. One respondent put it like this: "You are always considered as an outsider, even if you have a senior position and an international reputation in your area of research".

Whilst language does not appear as a key factor in the closed question responses, some respondents did discuss language barriers, for instance: "Language is a major barrier for UK researchers, hence the focus to work in English speaking locations rather than Europe". Social integration was also mentioned: "...living standards can be very different, sometimes it is hard to adapt to the cultural life"; "The social integration and immigration regulation in some country are sometime frustrating but this had minor influence in the final result".

Finally, finding information about mobility was a problem raised by some respondents, who reported a lack of easily accessible information on academic and research posts, funding opportunities, accommodation, the overall tax, labour and health system, and information for researchers moving with families.

6.4 Impacts of mobility

Some respondents in the open-ended questions commented on the impacts of mobility on different aspects of their personal and scientific life, including personal and family life, research agenda and career track, prospects and progression. The majority of the respondents who commented attributed a positive or mixed impact on mobility, with few attributing only negative impacts of mobility.

Some of those that attributed positive impacts to mobility even consider their mobility experience to have been positive and enriching despite the obstacles encountered. It was stressed that mobility has a positive impact at multiple levels including personal and professional life (career, research agenda etc.). According to these respondents mobility is "an integral part" of a researcher's life, especially important for young researchers and a precondition for those that want to be competitive and "at the frontiers of research". It was also mentioned that mobility is "beneficial for all partners", revealing impacts not only on the individual but also at the institutional level (e.g. impacts on the hosting institution) and at the system level (research system, society etc.). An interesting point noted is that even researchers who have never experienced mobility, attempted to but did not succeed in becoming mobile, or would like to pursue mobility but who face obstacles, and even some of those who have had a previous bad experience, and/or are not willing to become mobile (some of whom are very senior researchers nearly or indeed already retired) have a positive perceptions of the impact of mobility.

Most negative impacts of mobility in the open-ended questions were reported on the researchers' personal and family life and / or on their career progression, while very few respondents reported negative impacts on their research agenda. Also, just few of these respondents reported negative impacts on all levels including personal and family life and personal development, research output and career progression.

Some of the respondents who provided comments on the impact of mobility in the open ended questions reported a combination of simultaneous positive and negative impacts of mobility; while some others reported that mobility had or is expected to have neither positive nor negative impact on their career and/or research and/or personal life.

The impact of mobility depends on the context. It is a unique blend of the characteristics of the sending and hosting country, the sending and hosting institution, the person involved (career stage, age, family condition, research field, personal ambitions etc) and the characteristics of the mobility instance (duration etc.). "Whether or not it is regarded a benefit depends on your Department and faculty, and for sure - where you have been. Harvard is better than the University of the Unknown City". "Effects on career can depend heavily on coordination with current progress of career; if currently your environment provides all you need a change of environment could be momentarily disastrous - in the long term mobility in general is highly appreciated in the research community". As one respondent stated mobility "is not good per se".

6.4.1 On personal and family life

Although the impact of mobility on the personal and family life of researchers was a central feature of the conceptual review under WP1, no closed questions on the topic remain in the final version of the Mobility Survey of the Higher Education Sector Questionnaire, and so our insights into such impacts must come entirely from the open-ended responses.

Few respondents who commented on the impacts of mobility mentioned that mobility had (or would have) positive impacts on their family life. However, several mentioned that mobility has or is expected to have positive impacts on their personal life. These respondents praised the impact of mobility on personal development, opening the researcher's mind and his/her horizons, not only scientifically, but also culturally. As part of this cultural experience, researchers discover foreign countries, people and cultures, acquire new knowledge and new skills including new language and adaptability skills and establish new personal networks. This personal growth makes the researcher more independent and autonomous both in his/her personal and professional life. Another positive impact for some is that the researcher leaves his/her everyday routine and "tedious day-to-day duties", becoming more creative - thus mobility contributes to job satisfaction and future motivation. As one respondent mentioned "Mobility is what makes research worth doing", while another commented that mobility made him/her "feel recognized intellectually and personally". A positive impact on the overall quality of life of the respondent was also suggested by some respondents.

Most negative impacts of mobility expressed through the open text responses were reported on the researchers' personal and family life and / or on their career progression. Just a few of these respondents reported negative impacts on all levels including personal and family life and personal development, research output and career progression. Mobility is seen by some researchers to have a negative impact on family life. If the family follows the researcher abroad, problems of social integration might occur. Additionally, respondents pointed out problems in moving school-age children from city to city and system to system, and spoke of the need for children at some stage to be able to stay in one place, finish school and socialise normally. Moving during this period can have serious negative impacts on the children education and the overall family's lifestyle according to these respondents. Moreover, when the partner of the researcher is also working it can sometimes be hard or even impossible to find him/her a job, causing financial and other strains on the family and the individuals. Being away from friends and family could also have a negative psychological effect on the researcher, according to one commenter, who described called mobility as "dislocating and lonely". Finally, there can also be personal/civic implications of mobility: as one respondent pointed out, mobile researchers can effectively lose their right to vote.

Some respondents reported financial strains due to high costs related to relocation (logistic costs, accommodation, different tax regimes etc), especially if this involves moving a whole family. Meeting these costs is often left to the researcher. It was also noted that since post-doctoral salaries can be relatively low these financial problems can be magnified.

The negative impact of mobility on an individual's personal or family life also includes problems with pensions, health insurance and other social benefits of the individual or his/her family. For example being doubly insured or losing social care benefits (including pension, private or public health insurance etc.) after returning to the country of origin / sending country if no contributions were paid while abroad. Even when contributions are paid, for example for pension, in different hosting countries, some respondents reported losing several pension years due to incompatibility of social security systems. One respondent commented that these problems can also arise from non-job mobility such as research visits taken during sabbaticals. Other social care bonuses can also be lost: for instance one researcher's wife lost out on a bonus in her German pension for child education since her child was born in England.

6.4.2 On the individual researcher's career

As part of the indicator work reported in Chapter 5 we have already provided an estimate of impact upon research career of mobility for the whole population of EU HEI researchers. Here we concentrate on open-ended comments on career impacts of mobility. A number of the respondents that commented on the impacts of mobility in the open-ended questions attributed a positive impact of mobility on the researcher's career track and career prospects. According to some of these respondents mobility is an asset for one's CV, increasing his/her competitiveness and showing "flexibility, creativity and willingness to change (locally or mentally the field of work)", ultimately enhancing the attractiveness of the researcher for some employers. Mobility can contribute towards getting good (high or/and permanent) positions. In some countries a period of mobility abroad is a precondition to get a permanent tenured position since mobility is highly appreciated in specific fields, institutions and countries (respondents mentioned the Netherlands, Sweden and Germany, while one respondent conversely mentioned that mobility is not valued in this way in the UK). It was also argued that mobility can improve the international visibility of the researcher and his/her work and thus contributes to career progression. Mobility can contribute to the independence and autonomy of the individual since his/her confidence is increased, but also since he/she can in some cases more successfully apply for funding (either in the host country or the sending country upon return), taking advantage of the new collaborations or/and the new skills or/and the visibility. Also the positive effect on career progression in some cases follows an increased productivity e.g. a high number of papers. However, a few respondents believed that mobility is not important to their career and/or necessary for their research since they have international collaborations and funding which can bring with it similar benefits. Some respondents, mainly more senior researchers (nearly or already retired) commented that the positive impact of mobility on the career path of a researcher, mainly applies for younger researchers, while for those already in senior positions mobility will have fewer such impacts.

Other respondents in the open-ended questions reported a negative impact on career progression, mainly due to difficulties of returning to a previous system, reintegrating and finding a job. In some countries international experience may not be valued or even if it is valued in theory it does not translate into salary and promotion in practice. It was pointed out that in some of these countries leaving your post in a public research institution / university for a long time leads to losing position in the career ladder. A returning researcher must "restart" his/her career whilst contemporaries that have stayed within the system have an advantage. Moreover, respondents reported that mobility can lead to loss of contacts with colleagues and other partners in the sending country, thus making later return difficult. According to one respondent it takes several years to build up a 'name' as a researcher in the country you are in, through media attention, funding from local charities, access to research samples, contacts with publishers etc., and this network is usually lost when you leave the country. Another respondent commented that colleagues can even be hostile towards a researcher that pursues mobility. Moreover, entering a new system can also be problematic according to some respondents, since again you lack the network that "will grant you jobs and resources".

Finally, it was suggested by some that mobility may be more likely to disturb career progression if the researcher is in a senior position. One now elderly senior researcher reported that mobility earlier in his career has had a negative impact on his career continuity and pension, leading to the effective loss of two years of his career.

6.4.3 On the individual researcher's research agenda

Although the impact of mobility on the actual science performed by researchers was a central feature of the conceptual review under WP1, no closed questions on the topic remain in the final version of the Questionnaire, and so our insights into such impacts must come entirely from the open-ended responses.

A number of respondents who discussed impacts mentioned positive impacts of mobility on the content and trajectory of their research. It was noted that mobility contributes to professional development and the acquisition of necessary research skills. The mobile researcher can learn about new research methodologies and acquire access to new infrastructure and new research skills that might not be available in his/her country of origin; or update his/her existing skills in order to be at the frontier of the field. According to some respondents mobility broadens the scope of their research, providing exposure to new ways of thinking and new ideas. It can also be useful for comparative work. Mobility was also characterised in some comments as beneficial for sharing experience (even for older researchers) and improving communication through collaborations. Being exposed to a new research and management system has been beneficial to some respondents, leading to improved research quality, but also for some increased output and efficiency e.g. through a high number of international publications etc, or even to the launch of a new field. Moreover, collaborations have for some respondents led to funding and thus benefited both the career and research agenda in the long-term (keeping contacts).

Conversely, some respondents stated that losing one's network of contacts in the home or 'sending' country can affect not only the researcher's career progression upon return, but also the content and trajectory of his/her research. Losing contacts means losing potential future collaborators and can be a barrier to return. A European researcher who spent many years in the USA reported that upon return he/she faced such a problem. Clearly when mobility has a negative impact on career progression and especially on finding a suitable job this can cause not only disruption of the researcher's career path but also of the research agenda. Finally, according to another respondent mobility leaves too little time to adjust to the new environment and develop one's research agenda and thus does not encourage excellent research.

6.5 Future motivation towards mobility

Over half (55.2%) of all previously 'non-mobile' respondents (in our survey definition) had actively considered or are actively considering mobility in the future. This rises to 62.5 per cent for all respondents (Table 75). The great majority of respondents, regardless of whether they have had past experience of mobility and whether or not they have actively considered mobility in the future, are open to mobility in the future, with even 72.3 per cent of those who have not actively considered mobility in the future reporting themselves as being open to mobility in the future (Annex 6, Table 76, Table 77). Across all respondents, the breakdown for male and female researchers is broadly similar (Annex 6, Table 78 - Table 81) although the shares (of those who reported their marital status) are different for married/co-habiting respondents and single ones. Although single researchers are slightly more likely to have actively considered future mobility (Annex 6, Table 82 - Table 85). Perhaps unsurprisingly, researchers with children are somewhat less likely to have actively considered future mobility than those without (Annex 6, Table 86, Table 87). Researchers with children are almost as likely as those

without to be open to the possibility of mobility in the future (Annex 6, Table 90, Table 91). Finally, the picture is much the same for female researchers with children as for all researchers with children (Annex 6, Table 88 - Table 93).

We find that 76.7 per cent of all researchers (both previously mobile and previously 'non-mobile' under the terms of the survey definition) who have a specific preferred country of interest for future mobility are interested in making a short-term research visit to that country rather than in seeking new employment in that country. A smaller proportion of previously 'non-mobile' researchers who expressed an interest in future mobility (17.9%) than previously mobile researchers who expressed the same interest (27.6%) are interested in seeking new employment in that country.

Respondents who have previously been mobile (in the terms of our study) and who nominated a country of preference for future mobility were also asked whether they had previously visited or worked in that country. From this we find that 73.6 per cent of respondents who have previously been mobile and who have a specific country in mind for further mobility in the future have previously visited or worked in that country. Respondents who have previously visited or worked in their nominated country are slightly more likely to be considering finding new employment in that country (27.5%) than is the case for all researchers who are considering future mobility and have a country preference, whether previously mobile or not (23.3%). However, the proportion of previously mobile respondents interested in seeking new employment in their target country of choice is almost exactly the same as for those who have not previously visited that particular country of preference (28%).

6.6 Country "hotspots" for mobility

6.6.1 Introduction

In previous sections we have explored the role of various factors as what we have termed 'push' and 'pull' factors in influencing mobility decisions of respondents. Here we examine in more detail the responses for 'pull' factors for future mobility, exploring their relationship to those specific "hotspot" countries for mobility that were nominated by respondents who were interested in the possibility of being mobile in the future. We present first the "hotspots" themselves and then the "pull" factors associated with country "hotspots" for those respondents who are considering international research mobility.

6.6.2 "Hotspots" identified as attractive targets for future mobility

Figure 63 and Figure 64 overleaf show the most commonly nominated preferred "hotspot" countries for possible future mobility identified by both 'previous mobile' and previously 'non-mobile' respondents. These results are shown for each of the three broad fields of science into which researchers were assigned as part of the sampling procedure. For those with previous experience of mobility, from all fields of science, the United States of America was the most commonly nominated country of preference for future mobility, followed by the United Kingdom, Germany and France. Interestingly, Figure 64 shows that, for the previously 'non-mobile' group of respondents, the United Kingdom becomes more popular than the United States as a preferred destination for future mobility for researchers in the medical and agricultural sciences and for social scientists and humanities researchers, whilst for the

bulk of our previously 'non-mobile' respondents, in the natural sciences and technology domain, the United States remains the most popular preferred destination. Similarly, for the 'non-mobile' group France becomes slightly more popular than Germany as a destination for both social science and humanities researchers and medical and agricultural scientists, but not for natural sciences and technology researchers.

Figure 63 (overleaf): Most preferred destination countries for future mobility nominated by previously mobile researchers (Group A) by researcher's main field of science

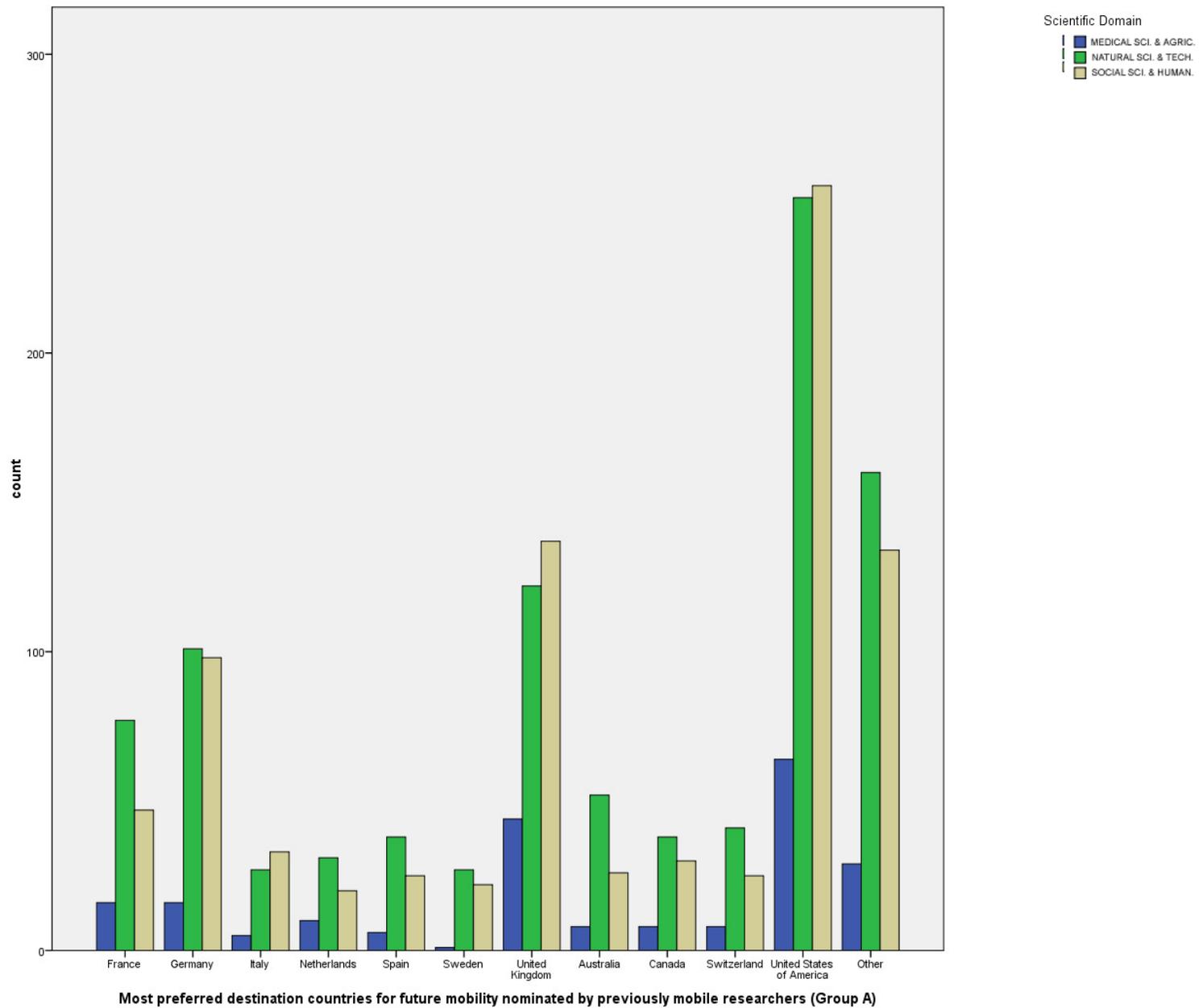
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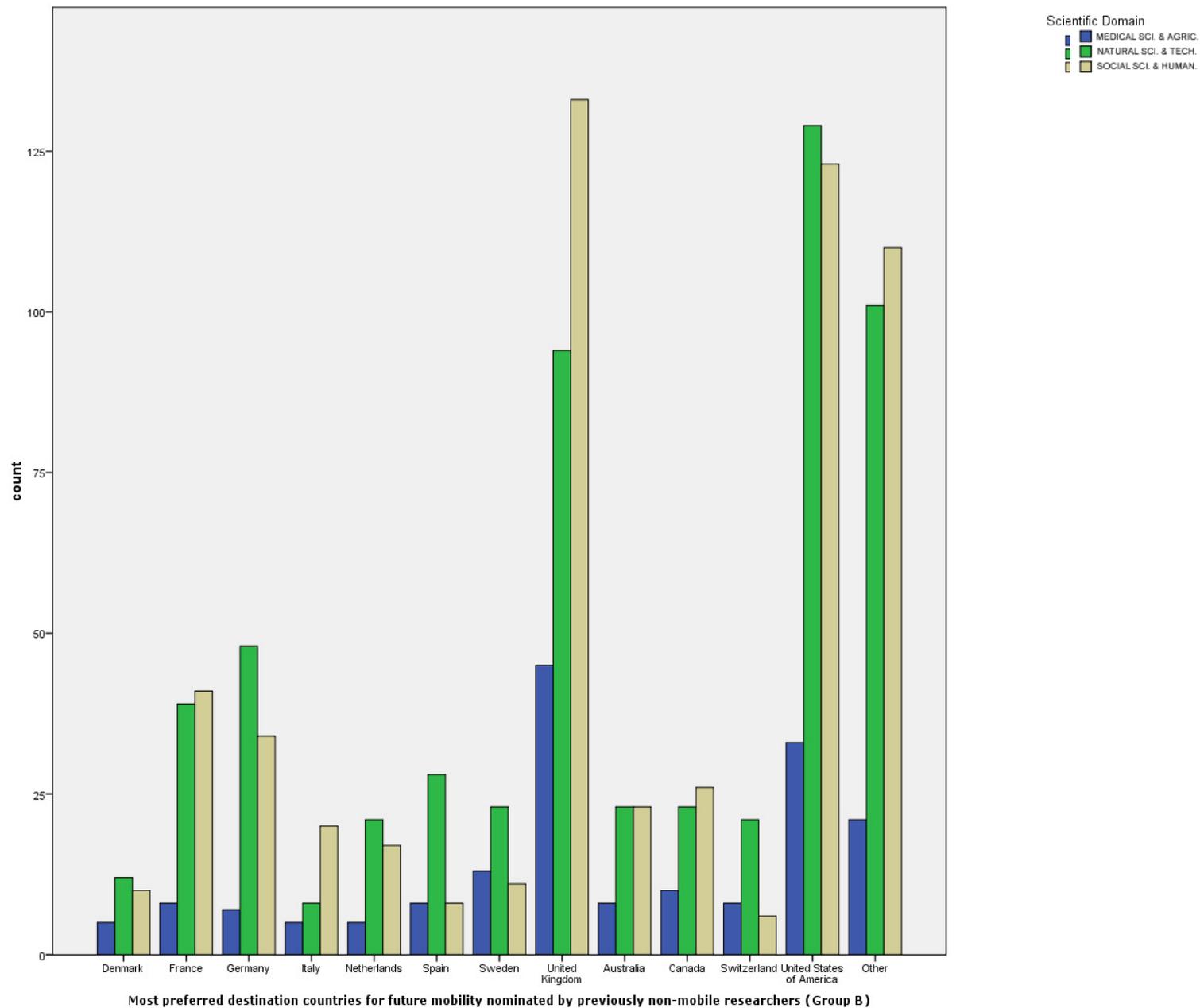
1)The graph shows only countries accounting for at least 1 per cent of valid nominations for that question, with the 'other' category representing the remaining countries.

Figure 64 (overleaf): Most preferred destination countries for future mobility nominated by previously 'non-mobile' researchers (Group B) by researcher's main field of science

Notes:

1)The graph shows only countries accounting for at least 1 per cent of valid nominations for that question, with the 'other' category representing the remaining countries.





6.6.3 Career related factors

Annex 6, Figure 70 shows the most popular countries nominated by researchers where availability of career opportunities was rated as an “important” or “highly important” pull factor. Here once more, the most popular three countries are, in order, the USA, the UK, Germany and France. The UK receives a similar number of nominations to the US from medical sciences and agriculture researchers. The picture is broadly similar for salary and incentives (Annex 6, Figure 71), though the UK and Germany show a more similar picture for this pull factor for natural scientists and for social scientists and humanities researchers, whilst the USA and UK picture is once again similar for Medical and Agricultural researchers. Turning to working conditions, Annex 6, Figure 72 shows that, the overall order of popularity is once more the same, the picture for the UK and Germany is once again quite close for natural sciences and social sciences and humanities whilst the picture for the USA and UK are once more similar for medical sciences and agriculture.

6.6.4 Research related factors

Turning now to research-related factors, Annex 6, Figure 73 shows the most popular “hotspot” countries for which better access to research facilities and equipment constituted important or highly important pull factors. As usual the USA is the most commonly nominated country, with the UK scoring relatively close to the USA for medical sciences and agricultural researchers (though less so than for career-related conditions). In turn the picture for the UK and Germany is somewhat similar for natural scientists and engineers and for social scientists and humanities researchers, whilst Germany and France show a very similar score for medical sciences and agricultural researchers. Annex 6, Figure 74 shows the picture for access to research collaborators. Once more the UK is not so far behind the USA for this pull factor for medical sciences and agriculture whilst lagging much more behind for the natural science and technology and for social sciences and humanities. Again Germany is not very far behind the UK for social sciences and humanities researchers and especially for natural sciences and technology researchers, with France also not far behind on natural sciences and technology. Once more Germany and France score similarly for this pull factor for medical sciences and agriculture researchers.

6.6.5 Labour market factors

Annex 6, Figure 75 shows the most nominated countries for which more attractive labour market regulations constituted an important or highly important pull factor for researchers. Here we start to see some differences from the pattern seen for career and research related factors. Whilst the USA scores highly for both social sciences/humanities and natural sciences/technology the difference between the USA, the UK and Germany for natural sciences/technology is much less marked. Germany and the UK score an almost equal number of nominations under this pull factor for natural sciences/technology, whilst Germany outscores the UK for social sciences/humanities. In contrast the UK outperforms all other countries for medical sciences and agriculture for this pull factor, including the USA. France performs generally much more poorly on this factor than for career and research related factors – losing out on third place in all three broad scientific domains. The other factor in this category, immigration regulations, is charted in Annex 6, Figure 76. This issue is not likely to constitute a pull factor for researchers holding EU citizenship considering working in other EU states but is a factor for non-EU citizens considering working in the EU and for EU citizens considering working outside the EU. The USA is in first place for this pull factor for all scientific domains, and particularly so for natural sciences/technology and for social sciences/humanities. Not surprisingly given the proviso just made, Canada and Australia appear to score well for this pull factor for so-

cial sciences/humanities and for natural sciences/technology. Germany performs well for natural sciences/technology and for social sciences/humanities - but much less so for medical sciences and agriculture. The UK performs well for all scientific domains.

6.6.6 Pension and social care factors

The picture again changes somewhat when pension and social care factors are considered as pull factors (Annex 6, Figure 77). Whilst the USA remains the highest scoring country for this pull factor for natural sciences/technology and social sciences/humanities, Germany now scores more highly than the UK for these domains. The UK however scores almost as highly as the US for medical sciences/agriculture, with Germany close behind and Switzerland and France following up with very similar profiles.

6.6.7 Research "system" factors

In terms of attractiveness of the national research "system", we see an interesting picture. When levels of research funding available nationally is considered as a pull factor for future mobility Annex 6, Figure 78, we see that the UK and Germany are closely matched for natural sciences/technology and especially for social sciences/humanities, and slightly less so for medical sciences/agriculture, where the UK comes closest to matching the USA as the most attractive "system". France scores behind Germany for natural sciences/technology and social sciences but is equal to Germany for health sciences/humanities. When accessibility of research funding is considered the picture is somewhat similar (Annex 6, Figure 79).

6.6.8 Innovation "system" factors

Finally we turn to the possibility that innovation "system" factors act as strong pull factors for researcher mobility to particular countries. The questionnaire asked about the prospect of better links with companies and other users of research as a pull factor for future mobility. Annex 6, Figure 80 shows the results for the most popular nominated countries. Like labour market and social system factors, this was less commonly nominated as an important pull factor than career, research and research "system" related factors. For those who did rate this as an important or highly important pull factor the country picture is broadly similar to the established pattern, with the USA scoring highest, especially outperforming the leading EU nations the UK, Germany and France for natural sciences/technology. The scores for the USA, the UK and Germany for this pull factor are somewhat closer for social sciences/humanities, whilst this pull factor once more rates relatively highly for the UK for our medical sciences/agriculture respondents.

6.7 New issues emerging from the survey

In the above sections we have explored the global survey results in relation to the key factors hypothesised as being relevant to researcher mobility based on review of previous studies and associated literature. There are also some new issues emerging from the survey results. These are the mobility of older and more senior researchers, and the issue of short-term mobility.

6.7.1 Mobility of older researchers

Some respondents explicitly identified themselves as retired (e.g. Professor Emeritus) or nearly retired senior researchers / academics. Retired/emeritus researchers were not explicitly targeted by the Survey and indeed researchers over the age of 70 have

been excluded for the purposes of indicator development (though not for the analysis of questions about motivations, barriers, impacts and push and pull factors). However the presence of such researchers in our sample, and the comments some of them have made in the open-ended questions, raise new issues in terms of research careers and researcher mobility which may be especially germane in the light of population ageing.

One of the main issues raised by those who commented on this issue is that mobility as a phenomenon has changed over time. For the older generation of researchers / academics mobility was not a common practice in the past, fewer opportunities existed and it was generally more difficult to pursue mobility: "I regret that for my generation it was extremely complicated"; "After age 40 it is more difficult to follow the international research standard in your domain"; "International mobility conditions are deeply changed this last years...". It was mentioned that postdoctoral grants and other types of funding were harder to obtain, while it was also harder in view of "career continuity and social rights" in the 70s and 80s. Some of the barriers mentioned by senior academics / researchers regarding mobility in the early stages of their career or now are similar to barriers mentioned by researchers today. These include: heavy teaching load, lack of information, family, no sabbatical period and others. Also some mention past political and economic situations as having hampered mobility in earlier stages of their careers, for instance researchers from the former Soviet republics.

An interesting finding is the desire or plans of some senior researchers to work after retirement either in their current country or another country. This is mainly motivated by their desire not to improve their career so much, but to share their experience and "give back knowledge" to the society, to young researchers and other scholars, establishing collaboration; or simply by their need to continue being active after retirement and disseminate their work internationally: "I am at the end of my career. I would like to share my expertise and experience other institutional settings"; "...as I am approaching mandatory retirement at age 65, I will be free to pursue research elsewhere but will need financial support to do so"; "I'm 56, so career is becoming less important. Driver is that society can use my knowledge"; "I am close to retirement (2 years) and international research mobility after retirement would be a positive factor to facilitate future research and enable dissemination of my work elsewhere".

Some stated that they have already started or are planning to start working part time and will not have formal research contracts. Some of the senior respondents are currently in an instance of mobility while others have had instances of mobility in the past. Shorter mobility periods and mobility for teaching seem to be more attractive for some senior researchers. A few of the respondents stated that they are "forced" to become mobile after retirement due to the compulsory retirement age in some countries, with the UK, Germany and France mentioned as examples: "My future mobility plans are based on desire to continue working beyond the UK compulsory retirement age"; "My one reason for leaving the UK is the age of retirement issue"; "Of course the attraction of CNRS and ENS in Paris was (and still is) a major one, but the too early retirement age reduces the perspectives to my currently very active scientific life"; "Major reason to move would be the fact that I am not allowed to work beyond 65 years of age in Germany". Getting their pension gives some of these senior respondents the freedom to become mobile and pursue their interests, while others consider mobility as a source of income to complement their pension "I am officially retired with a full pension. I therefore am open to interesting research collaborations, but am not looking for a future or career possibilities"; "I am being 'forced' to retire from my present University position in 2010, so I am looking for an alternative sources of income to supplement my existing pension". One researcher that experienced mobility after retirement commented that this has been an important experience for him/her: "after official retirement as university professor had a very important experience of international mobility".

Furthermore, some respondents in the main open-ended questions suggested a lack of opportunities for senior researchers. According to these responses there seems to be an age factor for mobility funding (and research funding in general), with some programmes having an age limit "Indeed after the age of 65 it is getting more and more difficult to find research funding"; "Most of the funds available for international collaboration, especially from EU grants, are restricted to young people (<35)"; "Too many programs are limited to the age of 35". A lack of career opportunities was also noted, with most offers usually being made to younger researchers "In my age is not possible to work abroad as the majority of offers for candidates is limited to 30 - 35 years". Generally, respondents pointed out a lack of schemes and funding for experienced researchers and a general tendency of EU policy to favour younger researchers' policies "Consideration of age is a serious problem. While I welcome policies opening up research opportunities to young and aspiring people, there should be equally effective policies for experienced researchers". So an issue for further study is if there is actually a case of ageism around Europe and if this age discrimination against senior researchers mentioned in the open-ended responses should cause concern especially in a "greying" Europe: "Ageism is rife - unable to obtain suitable employment to fit my qualifications. There is an emphasis on 'young' researchers, I have been informed that there is no chance of being taken on at my age despite anti-ageism legislation. I find this a complete waste of my education and associated motivation and commitment as a 'mature' late developer".

Moreover, one respondent that moved from the private sector to academia also pointed out that, in his case, the lack of postdoctoral funding for older or part-time researchers was an obstacle and emphasised the barrier posed for inter-sectoral mobility by a postdoctoral and research grant system that "assumes a standard career progression from PhD to senior professor and discourages career switches or re-entrants".

However, other senior researchers that provided comments in the open-ended questions are not willing to move now or continue working after retirement: "I am six years from retirement - no point in international mobility at this stage". Some of them have experienced mobility earlier in their life but hesitate to be mobile again due to their age. Some senior researchers that have been mobile in the past talk about the positive impact of mobility on their career progression "I have benefited from my international travels academically and in career enhancement, but as I am now close to the ending of my career I have few future mobility plans", but some also mention the loss of pension rights as a result of mobility in early years and also as a barrier to future mobility: "I have lost out on pension rights by teaching in two countries and working as an international civil servant". One respondent mentioned the difficulty of returning to the country of origin and the risk of social isolation.

Generally, respondents from those that identified themselves in the open-ended questions as retired, nearly retired or senior researchers / academics seem to have a positive opinion about mobility, but they mainly relate it to younger researchers and are willing to support it in this form: "The fact that I have answered 'No' for last questions does not mean that I am against mobility. Just on contrary I am absolutely for the mobility and I have put it into practice recently for short periods. The only reason for my answers is that I am just on the border of being emeritus. But I will support strongly the mobility of my younger colleagues". Senior researchers also consider family and personal issues, such as a retired partner, caring responsibilities for elderly parents, property and deterioration of their health as barriers for mobility in their age, along with holding leading senior positions in their current institution: "I am 63 years old and mobility is rather tiring for me"; "Due to age and leading position I do not think about significant change"; "Due to my age (62) and the fact that I already have several health problems, international mobility is no further option"; "Early career mobility is fantastic. Now older, family commitments and my wife's job largely preclude it".

6.7.2 Very short term mobility

Although the focus of the survey was on substantial period of research mobility of three months or more, several respondents that provided comments in the four main open-ended questions stressed that mobility for less than 3 months can be very attractive. This is especially the case for women, researchers with family obligations, more senior researchers and researchers with professional obligations in one country (e.g. teaching) that do not allow for long periods of absence. International conference visits and short visits of a few weeks appear to be regarded as particularly beneficial by these respondents. It was also suggested that ICTs (virtual mobility) and cheap travel makes long-term mobility less necessary (or in other words increases the impact of short-term mobility). For instance, most library access for researchers is electronic, while the Internet simplifies professional communications, supporting distant collaborations. The ability to maintain an international network by means of short visits and 'virtual mobility' makes long term mobility unnecessary in some cases. However, one respondent pointed out that some countries are "resistant" to short visits (e.g. the US for security reasons). It was also noted that a short visit (e.g. staff exchange) – or a PhD – can lead to further longer-term mobility.

6.8 Summary

This chapter has summarised the analysis of those parts of the survey questionnaire which went beyond indicator construction to explore in depth some of the issues surrounding mobility and the decisions regarding mobility made by individual researchers. In what we believe to be the first survey of its kind we asked researchers about their personal motives as they affected decisions to become mobile, about factors which acted to 'push' them away from one system and 'pull' them towards another, about barriers and obstacles experienced in the past, and about impacts of mobility (real and expected). Finally we asked about the future orientation of respondents towards mobility and collected data about likely 'hotspots' for future mobility.

At the global level the logistic regression (logit) analysis (Annex 5) suggests that personal/family factors are an explanatory factor for lack of mobility, a finding strongly confirmed by the detailed analysis, whilst quality of life motives, career progression goals, personal research agenda goals and training and development goals are all explanatory factors for mobility. Of these, all except quality of life factors seem to play a role in all kinds of mobility (quality of life issues seem to be less important in relation to research visits not involving a change of job). We also find that there are changes in perspective across the career and life-course of the researcher, with personal and family factors seem in general to be more important to considerations of future mobility for our previously-mobile respondents than they have been in relation to past decisions to become mobile.

In line with the strong emphasis on research-related and training goals from the analysis of motives we find that research-related factors such as access to appropriate research facilities and collaborators, or levels of and ability to access research funding are more important factors in determining the attractiveness of a potential 'target' country for international mobility than are salary and incentives. Labour market and immigration policy factors seldom seem to be important either as 'push' factors encouraging researchers to leave a particular national system or as 'pull' factors attracting researchers to a particular system. However they do register as difficulties encountered by researchers in their own experiences of mobility.

Generally, we find differences both between the perceptions of previously mobile versus those of researchers with no experience of mobility - but also between the perceptions held by all researchers and the reality experienced during specific instances of mobility. Factors such as obtaining funding, finding a suitable position and making

childcare arrangements are both perceived as important concerns and are experienced as obstacles by a (sizeable) minority of mobile researchers. Other factors, such as healthcare and pensions arrangements, are similarly experienced as obstacles by a (sizeable) minority of researchers but do not present themselves as inhibiting factors for, or barriers to, future mobility to the same extent as do caring and personal relationships, obtaining funding and finding a position.

Mobility is an event in the personal, family and social life of a researcher as well as a step which may have impacts on the content and direction of their research, on the progression (for good or for ill) of their research career, and on the research institution(s) and networks in which they work. It is these impacts which, in turn, have effects upon the broader national research and innovation "systems" in which researchers and research performing institutions act.

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LIST OF ABBREVIATIONS

Country	Abbreviation
Belgium	BE
Bulgaria	BG
Czech Republic	CZ
Denmark	DK
Germany	DE
Estonia	EE
Ireland	IE
Greece	GR
Spain	ES
France	FR
Italy	IT
Cyprus	CY
Latvia	LV
Lithuania	LT
Luxembourg	LU
Hungary	HU
Malta	MT
Netherlands	NL
Austria	AT
Poland	PL
Portugal	PT
Romania	RO
Slovenia	SI
Slovakia	SK
Finland	FI
Sweden	SE
United Kingdom	UK
Total	EU27

ANNEX 1 SAMPLING METHODS

There are three general methods relevant for this study. A brief description of these methods will be presented in this section, along with their advantages and disadvantages. At the end of the section a method will be proposed and its choice will be justified.

- A) **Simple Random Sampling (SRS):** In simple random sampling, a full sampling frame is required (a condition often not present in many situations, as in the present one). Each member of the population is selected with equal probability. All typical estimation theory and statistical inference is based on SRS.
- B) **Stratified Random Sampling (StRS):** In Stratified Random Sampling, the population is divided into strata and SRSs are selected from each stratum, usually of size proportional to the stratum size (proportional allocation). Estimation and inference should be adapted to reflect the sampling probabilities (not needed in proportional allocation). The major advantage is a reduction in variance, since usually the variance within each stratum is smaller the overall variance of the population. A full sampling frame is also required in StRS.
- C) **Cluster sampling:** In Cluster sampling the population members are divided into clusters and the sampling process involves sampling the clusters (and not the population members), with either SRS or StRS, and then selecting all members within each sampled cluster (single stage clustering) or a sub-sample of members from each cluster (two stage clustering). A major disadvantage of this method is that it increases the variance of the estimates. It is though the only method applicable when a sampling frame does not exist, but only listings within each cluster can be written up, once a particular cluster is identified.

In this type of studies, *Stratified Random Sampling (StRS)* is the method of choice, because of the stratified structure of the population and because it minimises the variance of the estimators. This method assumes, however, that there exists a list of all population members along with information about their stratum membership and how to contact them. This method could not be applied in our case, since such lists does not exist.

The next best method is a *two stage Stratified Cluster Sampling*, where the clusters are selected with probabilities proportional to their size and a fixed number of observations from each cluster is selected with simple random sampling. This was also impossible, since the sizes of the clusters were not known in advance. Thus, the only method left to be used in this survey is the two stage Stratified Cluster Sampling, *where simple random sample of clusters is selected and a fixed proportion of observations from each cluster is selected with simple random sampling*. The sample size was selected in such a way as to achieve a target error rate for the primary variable (% mobile), of $\pm 1.5\%$, if the sampling method was simple random sampling. The study – with a two stage stratified cluster sampling design – actually achieved an error rate of $\pm 1.48\%$, which is very close to the target.

CONCLUSION: Under these circumstances, the only method which can be applied is Two-Stage Stratified Cluster Sampling where simple random sample of clusters is selected and a fixed proportion of observations from each cluster is selected with simple random sampling.

ANNEX 2 THE MOBILITY QUESTIONNAIRE OF THE HIGHER EDUCATION SECTOR

1. Welcome to the Researcher Mobility Survey of the Higher Education Sector

2. Besides a number of simple but important questions about you and your education and research career, we will ask you a series of questions on the role of certain factors (personal life, working and/or country related conditions etc.) in influencing your attitudes to past and potential future mobility. We will also ask you about the possibility of being mobile in the future, and moreover about the (expected) impacts of international mobility on your research career. It should take no more than 20 minutes to complete the questionnaire but you can save your response and return to the survey at any time. Your responses will remain strictly confidential and will only be used for the purposes of this mobility study. Thank you very much for your time and support. Please start with the survey now by clicking on the Continue button below.

3. ABOUT YOU

4. The following 3 questions serve the purpose of screening researchers from non-researchers so that: If 'yes' is crossed in at least 1 box: "You are considered to be a RESEARCHER". If 'no' is crossed in all boxes: "You are not considered to be a RESEARCHER". Please note that according to Eurostat definitions all postgraduate students at the PhD level engaged in R&D activities are considered as researchers. They typically hold basic university degrees and perform research while working towards the PhD. Therefore, if you hold a PhD degree (or equivalent), we will ask you to consider the period of your PhD education as the period you started a researcher career.

5. In the context of your present job do you carry out research?

Yes

No

6. In the context of your present job do you supervise research?

Yes

No

7. In the context of your present job do you improve or develop new products/processes/services?

Yes

No

8. What is your gender?

Male

Female

9. What is your year of birth?

Country listing is preceded by EU27, followed by all other countries in alphabetical order.

Drop-down list

10. What is your country of birth?

Drop-down list

11. Please list the country or countries of your citizenship. (You can choose more than one country by using the Ctrl button.)

Drop-down list

12. What is your marital status?

- Married or cohabiting
- Single
- Prefer not to disclose

13. Do you have children?

- Yes
- No

14. Number of children:

Drop-down list

15. What is the age of your eldest child?

Drop-down list

16. YOUR EDUCATION AND TRAINING

17. Highest educational attainment:

- Postgraduate degree (PhD or equivalent)
- Graduate degree (master degree or equivalent)
- Undergraduate degree (bachelor degree or equivalent)
- Secondary education (i.e. high school, gymnasium, grammar school, lycee or equivalent)

18. In which country did you obtain your postgraduate degree (PhD or equivalent)?

Drop-down list

19. In which year did you obtain your postgraduate degree (PhD or equivalent)?

Drop-down list

20. Did you have a graduate degree (master degree or equivalent)?

Yes

No

21. In which country did you obtain your graduate degree (master degree or equivalent)?

Drop-down list

22. In which year did you obtain your graduate degree (master degree or equivalent)?

Drop-down list

23. Did you have an undergraduate degree (bachelor degree or equivalent)?

Yes

No

24. In which country did you obtain your undergraduate degree (bachelor degree or equivalent)?

Drop-down list

25. In which year did you obtain your undergraduate degree (bachelor degree or equivalent)?

Drop-down list

26. During your post-secondary education (i.e. in further or higher education, excluding your PhD if you have one) did you spend time (minimum 3 months) as an 'exchange student' (e.g. Erasmus or similar) in a different country from the country in which you were conducting your studies?

Yes

No

27. During your post-secondary education (i.e. in further or higher education, excluding your PhD if you have one) did you spend time working in industry on a formal placement, internship, apprenticeship or similar? Please exclude part-time or vacation jobs unrelated to your programme of study.

Yes

No

28. In which country did you obtain your secondary education (i.e. high school, gymnasium, grammar school, lycee or equivalent)?

Drop-down list

29. In which year did you obtain your secondary education (i.e. high school, gymnasium, grammar school, lycee or equivalent)?

Drop-down list

30. If applicable, in which country did you obtain a second educational attainment equivalent to your highest educational attainment (for example a second Masters)?

Drop-down list

31. In which year did you obtain this second attainment?

Drop-down list

32. Please indicate in which field of research you have obtained your highest educational attainment.

Drop-down list

33. YOUR CURRENT EMPLOYMENT AS A RESEARCHER

34. Which of the following categories do you consider best describes your current status as a researcher?

- Doctoral/PhD student
- Post-doctoral researcher
- Other researcher category

35. What is the name of your current employer? If you are employed by more than one employer, please give the name of the organisation that you consider to be your principal employer as a researcher.

36. In which country is this principal employer located?

Drop-down list

37. Is this also your current country of residence?

- Yes
- No

38. Please indicate your country of residence.

Drop-down list

39. How long (years) have you been employed by this principal employer?

Drop-down list

40. Is your principal employer:

- A university or other higher education institution (HEI)
- A public or government research institute
- A private, not-for-profit research institute (e.g. research foundation)
- A private firm
- Other

41. What is your employment contract status?

- Fixed term contract, less than 1 year
- Fixed term contract, 1-2 years
- Fixed term contract, > 2 years
- Open ended (tenure) contract
- Self-employed service provider
- Other, please specify _____

42. How long (years) have you been working under this contract status?

Drop-down list

43. Does this contract involve full- or part-time work?

- Full-time
- Part-time

44. Does your current work as a researcher involve some form of formal collaboration (i.e. contractually based collaboration) with academic or business sector researchers from other countries?

- Yes, only with academic researchers from other countries
- Yes, only with industrial researchers from other countries
- Yes, with academic and industrial researchers from other countries
- No

45. Does your current work as a researcher involve some form of formal collaboration (i.e. contractually based collaboration) with business sector researchers from the country where you principally work as researcher?

Yes

No

46. How satisfied are you with your current primary employment situation as a researcher in relation to the following dimensions?

	Very dissatisfied	Somewhat dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
Overall job satisfaction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Salary	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Job security	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Accessibility of research funding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

47. Overall, how confident do you feel in the future prospects for your research career?

I feel very confident about the future prospects for my research career

I feel somewhat confident about the future prospects for my research career

I lack confidence about the future prospects for my research career

I very much lack confidence about the future prospects for my research career

48. YOUR EXPERIENCE OF MOBILITY

This section focuses on your experience of mobility during your research career. Please consider the entire period of your PhD education, if you hold or studying towards one, as an integral part of your career as researcher.

49. a) Career path

50. Which of the following 'career paths' best describes your situation? (Please consider only changes of employer, not research visits.)

I have always been employed as a researcher in the public sector (university, other Higher Education Institution, public or governmental research institute)

I have been employed as a researcher in both the public and the private sector

51. Which of the following 'career paths' best describes your situation?

- I started as a researcher in the public sector, after which I moved to the private sector. I have since moved back to the public sector
- I started as a researcher in the private sector, after which I moved to the public sector. I am still working in the public sector
- Other, please specify _____

52. During your employment career as a researcher have you worked for more than one public research organisation (university, higher education institution or other public research institute)?

- Yes
- No

53. How many times have you moved job from one public research organisation (university, institute of higher education or other public research institute) to another?

54. b) Geographic mobility

Please consider the entire period of your PhD education as an integral part of your career as researcher.

55. In your researcher career (which also encompasses the whole period of your PhD education) have you worked in another country than the country where you attained your highest educational degree, including research visits of 3 months or more? (NOTE: For this project, if you answer yes to this question you are considered as an "internationally mobile" researcher.)

- Yes
- No

56. Please feel free to provide any additional comments below.

57. Did any of these instances of international mobility involve:

	Yes	No
A move to a new employer in another country?	<input type="checkbox"/>	<input type="checkbox"/>
A research visit to another country without a change of employer?	<input type="checkbox"/>	<input type="checkbox"/>

58. Have you been internationally mobile the last three years?

- Yes
- No

59. Please provide the name of the country (countries) you worked in for 3 months or more in the last 3 years and indicate the duration of your stays. Please list up to five countries in which you have stayed most recently. Country 1:

60. Duration of stay:

- ≥ 3 and < 6 months
- ≥ 6 and < 12 months
- ≥ 1 year and < 2 years
- ≥ 2 years and < 3 years
- ≥ 3 years

61. Are you still located in this country as a researcher?

- Yes
- No

62. Do you want to add another country?

- Yes
- No

63. Country 2:

64. Duration of stay:

- ≥ 3 and < 6 months
- ≥ 6 and < 12 months
- ≥ 1 year and < 2 years
- ≥ 2 years and < 3 years
- ≥ 3 years

65. Are you still located in this country as a researcher?

- Yes
- No

66. Do you want to add another country?

- Yes
- No

67. Country 3:

68. Duration of stay:

- ≥ 3 and < 6 months
- ≥ 6 and < 12 months
- ≥ 1 year and < 2 years
- ≥ 2 years and < 3 years
- ≥ 3 years

69. Are you still located in this country as a researcher?

- Yes
- No

70. Do you want to add another country?

- Yes
- No

71. Country 4:

72. Duration of stay:

- ≥ 3 and < 6 months
- ≥ 6 and < 12 months
- ≥ 1 year and < 2 years
- ≥ 2 years and < 3 years
- ≥ 3 years

73. Are you still located in this country as a researcher?

- Yes
- No

74. Do you want to add another country?

Yes

No

75. Country 5:

Drop-down list

76. Duration of stay:

≥ 3 and < 6 months

≥ 6 and < 12 months

≥ 1 year and < 2 years

≥ 2 years and < 3 years

≥ 3 years

77. Are you still located in this country as a researcher?

Yes

No

78. Please feel free to provide any additional comments below.

79. A: FOR RESEARCHERS WHO HAVE BEEN INTERNATIONALLY MOBILE

80. Was your most recent instance of international mobility a research visit which did not involve a change of job?

Yes

No

81. Did this international mobility also involve a change of sector (e.g. from academia to industry)?

Yes

No

82. To what extent were the following factors important in influencing your personal motivation to become mobile? If a factor was not a consideration please select 'unimportant'.

	Unimportant	Not very important	Important	Highly important
Personal/family factors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My quality of life (or that of my family)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My training and development goals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My career progression goals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My personal research agenda (i.e. the content and direction of my research)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Desire to return to a country in which I have previously lived/worked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

83. To what extent were the following factors important in your decision to leave the country you had previously been working in? If a factor was not a consideration please select 'unimportant'.

	Unimportant	Not very important	Important	Highly important
Lack of access to the facilities / equipment necessary to my research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of suitable research collaborators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of links with companies and users of research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
General level of research funding nationally	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ability to access funding for your own research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of availability of career opportunities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poor salary and incentives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poor conditions at work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poor pension and social care provision	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unattractive labour regulations (e.g. working week, health and safety laws)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Immigration regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

84. To what extent were the following factors in the host or destination country to which you moved important in your decision to become mobile?

	Unimportant	Not very important	Important	Highly important
Access to the facilities / equipment necessary to my research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to suitable research collaborators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Possibility of links with companies and users of research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
General level of research funding nationally	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ability to access funding for your own research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Availability of career opportunities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
More attractive salary and incentives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
More attractive working conditions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
More attractive pension and social care provision	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
More attractive labour regulations (e.g. working week, health and safety laws)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Immigration regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

85. In opting to be a mobile researcher, did you experience difficulties in relation to any of the following factors?

	Experienced no difficulty	Experienced a little difficulty	Experienced some difficulty	Experienced major difficulties	Not applicable
Immigration regulations (e.g. getting a work visa)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Obtaining funding for mobility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Finding a suitable work/visitor position	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Language	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Social/cultural integration in the host/destination country	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Integration into a new 'research system'	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Making child care arrangements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other caring responsibilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Maintaining existing personal relationships	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Finding suitable accommodation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Maintaining continuity of / transferring pension rights or contributions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Maintaining continuity of/ transferring health insurance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

86. Overall, what effect has your time as a mobile researcher had on your career progression?

- Mobility has had significant negative impacts on my career progression
- Mobility has had negative impacts on my career progression
- Mobility has had no impact on my career progression
- Mobility has had positive impacts on my career progression
- Mobility has had significant positive impacts to my career progression

87. Have you actively considered being internationally mobile in the future?

- Yes
- No

88. Are you open to the possibility of being mobile in the future?

- Yes
- No

89. To what extent are the following factors in your current position/country of work important in motivating you to consider further mobility in the future? If a factor is not a consideration please select 'unimportant'.

	Unimportant	Not very important	Important	Highly important
Lack of access to the facilities / equipment necessary to my research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of suitable research collaborators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of links with companies and users of research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
General level of research funding nationally	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ability to access funding for your own research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of availability of career opportunities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poor conditions at work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poor salary and incentives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poor pension and social care provision	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unattractive labour regulations (e.g. working week, health and safety laws)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Immigration regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

90. Which country location is the most attractive to you in terms of potential future mobility?

Drop-down list

91. Have you ever worked in or undertaken a research visit to this country?

- Yes
- No
- Not applicable

92. To what extent are the following factors important in influencing your personal motivation to future international mobility? If a factor is not a consideration please select 'unimportant'.

	Unimportant	Not very important	Important	Highly important
Personal/family factors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My quality of life (or that of my family)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My training and development goals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My career progression goals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My personal research agenda (i.e. the content and direction of my research)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Desire to return to a country in which I have previously lived/worked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

93. Would you anticipate:

- Moving to that country for a fixed term research visit (without changing jobs)?
- Seeking a new employment position in that country?

94. To what extent are the following factors important in making that country an attractive location for future mobility?

	Unimportant	Not very important	Important	Highly important
Access to the facilities / equipment necessary to my research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to suitable research collaborators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Possibility of links with companies and users of research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
General level of research funding nationally	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ability to access funding for your own research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Availability of career opportunities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
More attractive salary and incentives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
More attractive working conditions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
More attractive pension and social care provision	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
More attractive labour regulations (e.g. working week, health and safety laws)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Immigration regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

95. To what extent do you think the following factors would affect your motivation to move to or visit that country as a researcher?

	Would not affect my decision to be mobile	Could be a minor concern	Could be a major concern	Would be a severe obstacle to mobility	Not applicable
Immigration regulations (e.g. getting a work visa)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Obtaining funding for mobility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Finding a suitable work/visitor position	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Language	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Social/cultural integration in the host/destination country	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Integration into a new 'research system'	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Making child care arrangements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other caring responsibilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Maintaining existing personal relationships	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Finding suitable accommodation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Maintaining continuity of / transferring pension rights or contributions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Maintaining continuity of/ transferring health insurance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

96. What effects do you think further international mobility would have on your future career progression?

- Further mobility would have significant negative impacts on my career progression
- Further mobility would have negative impacts on my career progression
- Further mobility would have no impact on my career progression
- Further mobility would have positive impacts on my career progression
- Further mobility would have significant positive impacts on my career progression

97. Could you please provide any other comment or information you wish to share regarding your experience of international mobility, any obstacles to mobility you have encountered and the impacts mobility has had on your career?

98. B: FOR THOSE WHO HAVE NEVER BEEN INTERNATIONALLY MOBILE AS A RESEARCHER

99. To what extent have the following personal factors been important in dissuading or preventing you from being internationally mobile during your research career so far? If a factor has not been relevant please select 'unimportant'.

	Unimportant	Not very important	Important	Highly important
Personal/family factors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My quality of life (or that of my family)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My training and development goals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My career progression goals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My personal research agenda (i.e. the content and direction of my research)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

100. To what extent have the following factors in your current position/country of work been important in influencing your decision not to become mobile so far?

	Unimportant	Not very important	Important	Highly important
Access to the facilities / equipment necessary to my research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to suitable research collaborators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Possibility of links with companies and users of research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
General level of research funding nationally	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ability to access funding for your own research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Availability of career opportunities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attractive salary and incentives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attractive conditions at work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attractive pension and social care provision	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attractive labour regulations (e.g. working week, health and safety laws)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Immigration regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

101. To what extent have the following considerations been important in dissuading or preventing you from being internationally mobile so far? If a factor has not been relevant please select 'unimportant'.

	Have not influenced me so far	Have been a minor consideration	Have been a major consideration	Have been a severe obstacle to mobility	Not applicable
Immigration regulations (e.g. getting a work visa)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Obtaining funding for mobility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Finding a suitable work/visitor position	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Language	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Social/cultural integration in the host/destination country	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Integration into a new 'research system'	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Making child care arrangements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other caring responsibilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Maintaining existing personal relationships	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Finding suitable accommodation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Maintaining continuity of / transferring pension rights or contributions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Maintaining continuity of/ transferring health insurance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

102. Have you actively considered being internationally mobile in the future?

Yes

No

103. Are you open to the possibility of being mobile in the future?

Yes

No

104. To what extent are the following factors important in influencing your personal motivation to future international mobility? If a factor is not a consideration please select 'unimportant'.

	Unimportant	Not very important	Important	Highly important
Personal/family factors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My quality of life (or that of my family)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My training and development goals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My career progression goals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My personal research agenda (i.e. the content and direction of my research)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Desire to return to a country in which I have previously lived/worked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

105. To what extent are the following factors in your current position/country of work important in motivating you to consider mobility in the future?

	Unimportant	Not very important	Important	Highly important
Lack of access to the facilities / equipment necessary to my research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of suitable research collaborators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of links with companies and users of research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
General level of research funding nationally	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ability to access funding for your own research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of availability of career opportunities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poor conditions at work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poor salary and incentives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poor pension and social care provision	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unattractive labour regulations (e.g. working week, health and safety laws)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Immigration regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

106. If there is a specific country that you find most attractive in terms of potential future international mobility, please indicate which one:

Drop-down list

107. Would you anticipate:

- Moving to that country for a fixed term research visit (without changing jobs)?
- Seeking a new employment position in that country?
- Not applicable

108. To what extent are the following factors important in making that country an attractive target for future mobility?

	Unimportant	Not very important	Important	Highly important
Access to the facilities / equipment necessary to my research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to suitable research collaborators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Possibility of links with companies and users of research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
General level of research funding nationally	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ability to access funding for your own research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Availability of career opportunities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
More attractive salary and incentives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
More attractive conditions at work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
More attractive pension and social care provision	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
More attractive labour regulations (e.g. working week, health and safety laws)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Immigration regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

109. To what extent would the following factors be important in any future decision to move to or visit that country as a researcher?

	Would not affect my decision	Could be a minor consideration	Could be a major consideration	Would be a severe obstacle to mobility	Not applicable
Immigration regulations (e.g. getting a work visa)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Obtaining funding for mobility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Finding a suitable work/visitor position	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Language	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Social/cultural integration in the host/destination country	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Integration into a new 'research system'	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Making child care arrangements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other caring responsibilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Maintaining existing personal relationships	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Finding suitable accommodation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Maintaining continuity of / transferring pension rights or contributions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Maintaining continuity of/ transferring health insurance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

110. What effects do you think international mobility would have on your future career progression?

- Mobility would have significant negative impacts on my career progression
- Mobility would have negative impacts on my career progression
- Mobility would have no impact on my career progression
- Mobility would have positive impacts on my career progression
- Mobility would have significant positive impacts on my career progression

111. Could you please provide any other comment or information you wish to share regarding international mobility and especially the costs and benefits of mobility?

112. Thank you for your participation in the survey

ANNEX 3 THE NUMBER OF NON-MISSING VALUES IN EACH QUESTION IN THE MOBILITY SURVEY OF THE HIGHER EDUCATION SECTOR

We mentioned in Section 3.4 that after a quality check, cleaning of wrong entries and duplicate submissions, 4,538 completed and valid questionnaires remained in the database. The following table shows the number of persons who have answered each question in the Mobility Survey of the Higher Education Sector among these 4,538 valid questionnaires, and with information about which group of respondents who have to answer each question (see Annex 2 for the different questions in the Mobility Survey):

Question (Q)	Number of persons who have answered the question	Group of respondents who have to answer the question
Q5	4,538	All respondents
Q6	4,538	All respondents
Q7	4,538	All respondents
Q8	4,538	All respondents
Q9	4,538	All respondents
Q10	4,538	All respondents
Q11	4,538	All respondents
Q12	4,538	All respondents
Q13	4,538	All respondents
Q14	2,791	Only those who have children
Q15	2,791	Only those who have children
Q17	4,538	All respondents
Q18	3,795	Only those with a postgraduate degree (PhD or equivalent)
Q19	3,795	Only those with a postgraduate degree (PhD or equivalent)
Q20	3,314	All respondents
Q21	4,132	All respondents
Q22	4,132	All respondents
Q23	3,919	All respondents
Q24	3,097	All respondents
Q25	3,097	All respondents
Q26	4,533	All respondents
Q27	4,533	All respondents
Q28	4,538	All respondents
Q29	4,538	All respondents
Q30	910	Only those who have obtained a second educational attainment equivalent to their highest educational at-

		tainment
Q31	846	Only those who have obtained a second educational attainment equivalent to their highest educational attainment
Q32	4,538	All respondents
Q34	4,538	All respondents
Q35	4,152	All respondents
Q36	4,538	All respondents
Q37	4,538	All respondents
Q38	111	Only those with a current country of residence not equal with the country where their principal employer is located
Q39	4,537	All respondents
Q40	4,537	All respondents
Q41	4,537	All respondents
Q42	4,537	All respondents
Q43	4,537	All respondents
Q44	4,453	All respondents
Q45	4,436	All respondents
Q46	4,537	All respondents
Q47	4,537	All respondents
Q50	4,537	All respondents
Q51	726	Only those who have been employed as a researcher in both the public and the private sector
Q52	4,538	All respondents
Q53	2,694	Only those who have worked for more than one public research organisation
Q55	4,538	All respondents
Q56	310	All respondents
Q57	2,586	Only those who have been internationally mobile
Q58	2,586	Only those who have been internationally mobile
Q59	1,339	Only those who have been internationally mobile the last three years
Q60	1,339	Only those who have been internationally mobile the last three years
Q61	1,339	Only those who have been internationally mobile the last three years
Q62	1,339	Only those who have been

		internationally mobile the last three years
Q63	456	Only those who have been internationally mobile the last three years and want to add another country
Q64	456	Only those who have been internationally mobile the last three years and want to add another country
Q65	456	Only those who have been internationally mobile the last three years and want to add another country
Q66	456	Only those who have been internationally mobile the last three years and want to add another country
Q67	113	Only those who have been internationally mobile the last three years and want to add another country
Q68	113	Only those who have been internationally mobile the last three years and want to add another country
Q69	113	Only those who have been internationally mobile the last three years and want to add another country
Q70	113	Only those who have been internationally mobile the last three years and want to add another country
Q71	29	Only those who have been internationally mobile the last three years and want to add another country
Q72	29	Only those who have been internationally mobile the last three years and want to add another country
Q73	29	Only those who have been internationally mobile the last three years and want to add another country
Q74	29	Only those who have been internationally mobile the last three years and want to add another country
Q75	8	Only those who have been internationally mobile the last three years and want to add another country
Q76	8	Only those who have been internationally mobile the

		last three years and want to add another country
Q77	8	Only those who have been internationally mobile the last three years and want to add another country
Q78	237	Only those who have been internationally mobile the last three years
Q80	2,586	Only those who have been internationally mobile
Q81	2,586	Only those who have been internationally mobile
Q82 Personal/family factors	2,518	Only those who have been internationally mobile
Q82 My quality of life (or that of my family)	2,519	Only those who have been internationally mobile
Q82 My training and development goals	2,520	Only those who have been internationally mobile
Q82 My career progression goals	2,523	Only those who have been internationally mobile
Q82 My personal research agenda (i.e. the content and direction of my research)	2,521	Only those who have been internationally mobile
Q82 Desire to return to a country in which I have previously lived/worked	2,512	Only those who have been internationally mobile
Q83 Lack of access to the facilities / equipment necessary to my research	2,414	Only those who have been internationally mobile
Q83 Lack of suitable research collaborators	2,407	Only those who have been internationally mobile
Q83 Lack of links with companies and users of research	2,396	Only those who have been internationally mobile
Q83 General level of research funding nationally	2,409	Only those who have been internationally mobile
Q83 Ability to access funding for your own research	2,397	Only those who have been internationally mobile
Q83 Lack of availability of career opportunities	2,400	Only those who have been internationally mobile
Q83 Poor salary and incentives	2,401	Only those who have been internationally mobile
Q83 Poor conditions at work	2,393	Only those who have been internationally mobile
Q83 Poor pension and social care provision	2,386	Only those who have been internationally mobile
Q83 Unattractive labour regulations (e.g. working week, health and safety laws)	2,394	Only those who have been internationally mobile
Q83 Immigration regulations	2,386	Only those who have been internationally mobile
Q84 Access to the facilities / equipment necessary to my research	2,414	Only those who have been internationally mobile
Q84 Access to suitable re-	2,421	Only those who have been

search collaborators		internationally mobile
Q84 Possibility of links with companies and users of research	2,398	Only those who have been internationally mobile
Q84 General level of research funding nationally	2,405	Only those who have been internationally mobile
Q84 Ability to access funding for your own research	2,396	Only those who have been internationally mobile
Q84 Availability of career opportunities	2,401	Only those who have been internationally mobile
Q84 More attractive salary and incentives	2,405	Only those who have been internationally mobile
Q84 More attractive working conditions	2,399	Only those who have been internationally mobile
Q84 More attractive pension and social care provision	2,391	Only those who have been internationally mobile
Q84 More attractive labour regulations (e.g. working week, health and safety laws)	2,395	Only those who have been internationally mobile
Q84 Immigration regulations	2,384	Only those who have been internationally mobile
Q85 Immigration regulations (e.g. getting a work visa)	2,445	Only those who have been internationally mobile
Q85 Obtaining funding for mobility	2,426	Only those who have been internationally mobile
Q85 Finding a suitable work/visitor position	2,417	Only those who have been internationally mobile
Q85 Language	2,410	Only those who have been internationally mobile
Q85 Social/cultural integration in the host/destination country	2,420	Only those who have been internationally mobile
Q85 Integration into a new 'research system'	2,427	Only those who have been internationally mobile
Q85 Making child care arrangements	2,409	Only those who have been internationally mobile
Q85 Other caring responsibilities	2,396	Only those who have been internationally mobile
Q85 Maintaining existing personal relationships	2,419	Only those who have been internationally mobile
Q85 Finding suitable accommodation	2,408	Only those who have been internationally mobile
Q85 Maintaining continuity of / transferring pension rights or contributions	2,415	Only those who have been internationally mobile
Q85 Maintaining continuity of/ transferring health insurance	2,424	Only those who have been internationally mobile
Q86	2,584	Only those who have been internationally mobile
Q87	2,584	Only those who have been internationally mobile
Q88	2,584	Only those who have been internationally mobile

Q89 Lack of access to the facilities / equipment necessary to my research	2,240	Only those who have been internationally mobile
Q89 Lack of suitable research collaborators	2,243	Only those who have been internationally mobile
Q89 Lack of links with companies and users of research	2,225	Only those who have been internationally mobile
Q89 General level of research funding nationally	2,244	Only those who have been internationally mobile
Q89 Ability to access funding for your own research	2,234	Only those who have been internationally mobile
Q89 Lack of availability of career opportunities	2,233	Only those who have been internationally mobile
Q89 Poor conditions at work	2,232	Only those who have been internationally mobile
Q89 Poor salary and incentives	2,239	Only those who have been internationally mobile
Q89 Poor pension and social care provision	2,216	Only those who have been internationally mobile
Q89 Unattractive labour regulations (e.g. working week, health and safety laws)	2,220	Only those who have been internationally mobile
Q89 Immigration regulations	2,224	Only those who have been internationally mobile
Q90	2,366	Only those who have been internationally mobile
Q91	2,366	Only those who have been internationally mobile
Q92 Personal/family factors	1,931	Only those who have been internationally mobile
Q92 My quality of life (or that of my family)	1,929	Only those who have been internationally mobile
Q92 My training and development goals	1,924	Only those who have been internationally mobile
Q92 My career progression goals	1,922	Only those who have been internationally mobile
Q92 My personal research agenda (i.e. the content and direction of my research)	1,921	Only those who have been internationally mobile
Q92 Desire to return to a country in which I have previously lived/worked	1,911	Only those who have been internationally mobile
Q93	1,804	Only those who have been internationally mobile
Q94 Access to the facilities / equipment necessary to my research	1,870	Only those who have been internationally mobile
Q94 Access to suitable research collaborators	1,870	Only those who have been internationally mobile
Q94 Possibility of links with companies and users of research	1,842	Only those who have been internationally mobile
Q94 General level of research funding nationally	1,861	Only those who have been internationally mobile
Q94 Ability to access fund-	1,861	Only those who have been

ing for your own research		internationally mobile
Q94 Availability of career opportunities	1,855	Only those who have been internationally mobile
Q94 More attractive salary and incentives	1,860	Only those who have been internationally mobile
Q94 More attractive working conditions	1,859	Only those who have been internationally mobile
Q94 More attractive pension and social care provision	1,848	Only those who have been internationally mobile
Q94 More attractive labour regulations (e.g. working week, health and safety laws)	1,850	Only those who have been internationally mobile
Q94 Immigration regulations	1,846	Only those who have been internationally mobile
Q95 Immigration regulations (e.g. getting a work visa)	1,853	Only those who have been internationally mobile
Q95 Obtaining funding for mobility	1,857	Only those who have been internationally mobile
Q95 Finding a suitable work/visitor position	1,854	Only those who have been internationally mobile
Q95 Language	1,843	Only those who have been internationally mobile
Q95 Social/cultural integration in the host/destination country	1,843	Only those who have been internationally mobile
Q95 Integration into a new 'research system'	1,852	Only those who have been internationally mobile
Q95 Making child care arrangements	1,846	Only those who have been internationally mobile
Q95 Other caring responsibilities	1,831	Only those who have been internationally mobile
Q95 Maintaining existing personal relationships	1,850	Only those who have been internationally mobile
Q95 Finding suitable accommodation	1,836	Only those who have been internationally mobile
Q95 Maintaining continuity of / transferring pension rights or contributions	1,844	Only those who have been internationally mobile
Q95 Maintaining continuity of/ transferring health insurance	1,849	Only those who have been internationally mobile
Q96	2,583	Only those who have been internationally mobile
Q97	569	Only those who have been internationally mobile
Q99 Personal/family factors	1,846	Only those who have never been internationally mobile
Q99 My quality of life (or that of my family)	1,825	Only those who have never been internationally mobile
Q99 My training and development goals	1,806	Only those who have never been internationally mobile
Q99 My career progression	1,806	Only those who have never been internationally mobile

goals		
Q99 My personal research agenda (i.e. the content and direction of my research)	1,810	Only those who have never been internationally mobile
Q100 Access to the facilities / equipment necessary to my research	1,804	Only those who have never been internationally mobile
Q100 Access to suitable research collaborators	1,805	Only those who have never been internationally mobile
Q100 Possibility of links with companies and users of research	1,786	Only those who have never been internationally mobile
Q100 General level of research funding nationally	1,799	Only those who have never been internationally mobile
Q100 Ability to access funding for your own research	1,795	Only those who have never been internationally mobile
Q100 Availability of career opportunities	1,797	Only those who have never been internationally mobile
Q100 Attractive salary and incentives	1,797	Only those who have never been internationally mobile
Q100 Attractive conditions at work	1,795	Only those who have never been internationally mobile
Q100 Attractive pension and social care provision	1,792	Only those who have never been internationally mobile
Q100 Attractive labour regulations (e.g. working week, health and safety laws)	1,793	Only those who have never been internationally mobile
Q100 Immigration regulations	1,795	Only those who have never been internationally mobile
Q101 Immigration regulations (e.g. getting a work visa)	1,781	Only those who have never been internationally mobile
Q101 Obtaining funding for mobility	1,777	Only those who have never been internationally mobile
Q101 Finding a suitable work/visitor position	1,770	Only those who have never been internationally mobile
Q101 Language	1,761	Only those who have never been internationally mobile
Q101 Social/cultural integration in the host/destination country	1,773	Only those who have never been internationally mobile
Q101 Integration into a new 'research system'	1,771	Only those who have never been internationally mobile
Q101 Making child care arrangements	1,765	Only those who have never been internationally mobile
Q101 Other caring responsibilities	1,757	Only those who have never been internationally mobile
Q101 Maintaining existing personal relationships	1,769	Only those who have never been internationally mobile
Q101 Finding suitable accommodation	1,747	Only those who have never been internationally mobile
Q101 Maintaining continuity of / transferring pension rights or contributions	1,763	Only those who have never been internationally mobile

Q101 Maintaining continuity of/ transferring health insurance	1,767	Only those who have never been internationally mobile
Q102	1,949	Only those who have never been internationally mobile
Q103	1,949	Only those who have never been internationally mobile
Q104 Personal/family factors	1,625	Only those who have never been internationally mobile
Q104 My quality of life (or that of my family)	1,617	Only those who have never been internationally mobile
Q104 My training and development goals	1,616	Only those who have never been internationally mobile
Q104 My career progression goals	1,617	Only those who have never been internationally mobile
Q104 My personal research agenda (i.e. the content and direction of my research)	1,603	Only those who have never been internationally mobile
Q104 Desire to return to a country in which I have previously lived/worked	1,599	Only those who have never been internationally mobile
Q105 Lack of access to the facilities / equipment necessary to my research	1,553	Only those who have never been internationally mobile
Q105 Lack of suitable research collaborators	1,558	Only those who have never been internationally mobile
Q105 Lack of links with companies and users of research	1,534	Only those who have never been internationally mobile
Q105 General level of research funding nationally	1,556	Only those who have never been internationally mobile
Q105 Ability to access funding for your own research	1,537	Only those who have never been internationally mobile
Q105 Lack of availability of career opportunities	1,536	Only those who have never been internationally mobile
Q105 Poor conditions at work	1,540	Only those who have never been internationally mobile
Q105 Poor salary and incentives	1,541	Only those who have never been internationally mobile
Q105 Poor pension and social care provision	1,532	Only those who have never been internationally mobile
Q105 Unattractive labour regulations (e.g. working week, health and safety laws)	1,533	Only those who have never been internationally mobile
Q105 Immigration regulations	1,533	Only those who have never been internationally mobile
Q106	1,678	Only those who have never been internationally mobile
Q107	1,678	Only those who have never been internationally mobile
Q108 Access to the facilities / equipment necessary to my research	1,311	Only those who have never been internationally mobile
Q108 Access to suitable research collaborators	1,317	Only those who have never been internationally mobile

Q108 Possibility of links with companies and users of re-search	1,297	Only those who have never been internationally mobile
Q108 General level of re-search funding nationally	1,304	Only those who have never been internationally mobile
Q108 Ability to access funding for your own research	1,295	Only those who have never been internationally mobile
Q108 Availability of career opportunities	1,294	Only those who have never been internationally mobile
Q108 More attractive salary and incentives	1,304	Only those who have never been internationally mobile
Q108 More attractive conditions at work	1,300	Only those who have never been internationally mobile
Q108 More attractive pension and social care provision	1,286	Only those who have never been internationally mobile
Q108 More attractive labour regulations (e.g. working week, health and safety laws)	1,295	Only those who have never been internationally mobile
Q108 Immigration regulations	1,290	Only those who have never been internationally mobile
Q109 Immigration regulations (e.g. getting a work visa)	1,284	Only those who have never been internationally mobile
Q109 Obtaining funding for mobility	1,287	Only those who have never been internationally mobile
Q109 Finding a suitable work/visitor position	1,290	Only those who have never been internationally mobile
Q109 Language	1,276	Only those who have never been internationally mobile
Q109 Social/cultural integration in the host/destination country	1,282	Only those who have never been internationally mobile
Q109 Integration into a new 'research system'	1,289	Only those who have never been internationally mobile
Q109 Making child care arrangements	1,283	Only those who have never been internationally mobile
Q109 Other caring responsibilities	1,277	Only those who have never been internationally mobile
Q109 Maintaining existing personal relationships	1,286	Only those who have never been internationally mobile
Q109 Finding suitable accommodation	1,275	Only those who have never been internationally mobile
Q109 Maintaining continuity of / transferring pension rights or contributions	1,283	Only those who have never been internationally mobile
Q109 Maintaining continuity of/ transferring health insurance	1,278	Only those who have never been internationally mobile
Q110	1,949	Only those who have never been internationally mobile
Q111	320	Only those who have never been internationally mobile

ANNEX 4 ESTIMATES OF PROPORTIONS AND ERROR MARGINS OF INTERNATIONALLY MOBILE RESEARCHERS BY COUNTRY AND SCIENTIFIC FIELD

Table A4-1. International mobility during the researcher career.

	Per cent mobile	Variance	Error margins (+/-) – 95% confidence interval
EU27	0.5614	0.0000580	0.0149
Country			
Austria	0.5131	0.0013615	0.0723
Belgium	0.5241	0.0006694	0.0507
Bulgaria	0.5279	0.0184059	0.2659
Cyprus	0.5000	0.0025475	0.0989
Czech Republic	0.4398	0.0036659	0.1187
Denmark	0.4435	0.0031174	0.1094
Estonia	0.4264	0.0120537	0.2152
Finland	0.3320	0.0013087	0.0709
Germany	0.5038	0.0003196	0.0350
Greece	0.7334	0.0017031	0.0809
Hungary	0.5687	0.0032793	0.1122
Ireland	0.6075	0.0060125	0.1520
Italy	0.5988	0.0008168	0.0560
Latvia	0.6588	0.0320661	0.3510
Lithuania	0.4380	0.0034899	0.1158
Luxembourg	0.8571	0.0038639	0.1218
Malta	0.6522	0.0035132	0.1162
Netherlands	0.5847	0.0059359	0.1510
Poland	0.5494	0.0007695	0.0544
Portugal	0.7039	0.0009337	0.0599
Romania	0.4414	0.0074225	0.1689
Slovakia	0.3981	0.0047697	0.1354
Slovenia	0.3975	0.0002636	0.0318
Spain	0.6073	0.0004905	0.0434
Sweden	0.5587	0.0024769	0.0975
United Kingdom	0.4916	0.0005094	0.0442
Field of science			
Natural Sciences and Technology	0.5861	0.0001225	0.0217
Medical Sciences and Agriculture	0.5151	0.0001132	0.0209
Social Sciences and Humanities	0.5653	0.0002531	0.0312

Notes:

1) The figures in this table present estimates based on the entire set of respondents.

2) France is excluded from this table and from all the figures and tables in Chapters 4 and 5, since there are reasons to believe that the estimates of mobility shares for France significantly “overestimate” the mobility patterns of the “real” French researcher population.

ANNEX 5 METHODOLOGICAL NOTE: ROBUSTNESS OF THE ANALYSIS

In this note we shall mainly treat three issues of considerable importance for the validity and robustness of the Mobility Survey analysis of the Higher Education Sector. These are:

1. Due to the low response rate from French researchers and due to the somehow different methodology of retrieving e-mail addresses for researchers in France compared to all other EU27 Member States, in the first part of this note we compare the profile of the French responders with responders from other countries. We find significant differences in the profile of the French researchers, which both may explain their higher rates of international mobility and – to our opinion - justifies a separate analysis on the EU26, i.e. all Members States minus France.
2. We recalculated weighted and representative overall international mobility rates for EU26, i.e. without France. **We show in section 3 of this Annex (see Table A5-6) that the effect of removing French responders from the sample for the overall international mobility rates of researchers in Member States is marginal; with France included we find that 56 per cent of all researchers have been internationally mobile at least once during their career as researchers, while without France this mobility rate drops to about 53.6 per cent. This result is robust in the sense that it is attached to low error margins (lower than $\pm 2\%$).** Of course as we explain in the section below, error margins attached to estimates of overall mobility rates at the country levels differ greatly, and for some countries the error margins are so large that the results are less valuable than for others.
3. We provide an in-depth statistical analysis of all factors which are significant in explaining mobility patterns for the representative sample of the researchers in EU26 (without France). This has been done for all types of mobility investigated in the Mobility Survey of the Higher Education Sector, that is, overall international mobility, job-change across country borders, research visits to other countries, intersectoral mobility and in-trasectoral mobility.

Before dealing separately with these three issues, it is pertinent to provide a short account of the “meaning” of the minimum number of respondents in “representative” samples, as this question has been several times asked regarding our estimates of the rates of international mobility by country.

On the “minimum number” of responses

The fundamental purpose of sampling theory is to provide a solid scientific framework through which analyses based on a sample can be *generalized to the relevant population with a measurable degree of validity (i.e. error margins)*. This purpose is achieved through the construction of a probabilistic frame which connects the estimators derived from the sample with the population parameters they estimate.

The validity of the estimators is guaranteed as long as the probabilistic frame is valid. We sometimes refer to such samples as “representative” of the population, a term that is, scientifically speaking, ill-defined. In the present study a series of scientific problems have arisen. We will mention two major ones:

1. *The sampling frame was not really available:* No list of the target population existed (i.e. actual lists of all researchers in the EU27, by country and by scientific fields), nor a clear satisfactory method to reach the members of the population. The sampling method used was the best under the circumstances. Yet some issues were not resolved.

Namely the validity of the estimators when the estimation was carried out in subsamples of the original sample.

2. *The high non-response rate:* It is logical to assume that the non-response was informative, i.e. that the non-responders differed systematically from the responders in the value of the prime parameter under investigation, which was the overall international mobility rate. It is logical to suspect that non-responders had a lower propensity to be mobile, and thus more reluctant to answer the questionnaire. But there are also reasons to believe that non-mobile researchers who desire to be mobile in the future have more incentives to answer the questionnaire than other researchers. In the absence of non-response analysis, there is no way to estimate the magnitude of the resultant over- or underestimation of mobility.

These two issues are directly related to the question of *minimum sample size necessary to publish valid estimators* from the strata. We are not aware of any scientific paper proposing the minimum sample size for valid estimation. First of all what is meant by valid? The sampling theory provides with a measure of the "poorness" of such estimators, namely, the error margins, which in some occasions could render the mobility estimates useless. If validity means unbiasedness, then no estimator in this study is valid, since the only applicable sampling methods yields biased estimators, and their bias is increased because of the informative non-response.

Then again the issue may not be addressed in such terms. The estimation error generating processes are continuous in nature, as a function of the sample size. What is the meaning of a minimum sample size? Does it mean that a sample size of 39 observations will yield unreliable estimators, while one of 40 will yield reliable ones? There can be no scientific justification of this in the same way that a difference is statistically significant when the p-value is 0.04999 and not significant when it is 0.050001.

As in the hypothesis testing problem, faced with the necessity to derive a "rule" we agree on a cutoff (which for example in regression analyses this is customarily one per cent or five per cent significant level), thus using it as a "definition" (=axiom), similarly in the present problem we need to agree on a cutoff, based on experience. Such an agreement has been made and the cutoff was set at 40 responses. In some public opinion pool studies this cutoff threshold is set on 60 responses. We don't think that this is necessary, since public opinion polls and marketing surveys are of different nature than our study (and the population sampled).

Giving all these considerations, we do have two options: either not report all estimates which are based on 40 responses or less, or to report all estimates with their error margins. We choose the last option (with the exception of France), but the reader must keep in mind that point estimates are meaningless without their corresponding error margins (see Annex 4).

Differences between French responders and responders from the rest of EU

We find significant differences between responders from France compared with responders from other EU27 member states with respect to gender, current status as a researcher, field of science, marital status and whether a researcher has formal collaboration with academic or business sector researchers from other countries. We compare the sample of French responders with the samples of responders from Germany, Spain, Italy and United Kingdom.

We also find significant differences between France and EU27 as a whole, and between France and EU26 (i.e. EU27 but without France) as a whole, with respect to the same key characteristics mentioned above.

Table A5-1 displays observed shares of researchers in EU27 by gender based on the Mobility Survey of the Higher Education Sector, without using the proportion method described in Chapter 2 (i.e. without weighting the responses). In the same table we also present estimated confidence intervals (calculations based on the two binomial proportion comparison method in Bhattacharyya and Johnson (1977, p. 308-312)). The third last column shows the difference between the share of researchers in France and the other EU27 member states (EU26).

For example, for France and Germany we find that the difference between the two groups of respondents is 71 % male responders from France versus 67 % males from Germany, that is, a difference of 4 %. Based on the proportion comparison method, we have then estimated a 95 % confidence interval for this difference in the two last columns for each group. For France and Germany a 95 % confidence interval for the difference 4 % is (-3 % to 12 %). Hence the difference in the percentage of males between these two countries is, theoretically, not statistically significant, but since males tend to have higher international mobility rates, larger shares of males among French responders tend to increase the overall international mobility rates for this country.

Note that all differences in this annex are statistically significant at the 5 per cent level (since we use a 95 % confidence interval).

Table A5-1: Observed shares of researchers in the higher education sector in EU27 by gender. Differences between France and other selected EU27 countries in the Mobility Survey.

			95 % confidence interval		
Gender	Per cent		Difference	Lower bound	Upper bound
	France	Germany			
Male	71 %	67 %	4 %	-3 %	12 %
Female	29 %	33 %	-4 %	-12 %	3 %
Total number of researchers	224	536			
			95 % confidence interval		
Gender	Per cent		Difference	Lower bound	Upper bound
	France	Spain			
Male	71 %	64 %	7 %	0 %	14 %
Female	29 %	36 %	-7 %	-14 %	0 %
Total number of researchers	224	570			
			95 % confidence interval		
Gender	Per cent		Difference	Lower bound	Upper bound
	France	Italy			
Male	71 %	62 %	9 %	2 %	16 %
Female	29 %	38 %	-9 %	-16 %	-2 %
Total number of researchers	224	590			

	France	United Kingdom			
Male	71 %	59 %	12 %	5 %	19 %
Female	29 %	41 %	-12 %	-19 %	-5 %
Total number of researchers	224	578			
	France	EU26			
Male	71 %	62 %	9 %	2 %	15 %
Female	29 %	38 %	-9 %	-15 %	-2 %
Total number of researchers	224	4 314			

Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The table is based on the following question in the Mobility Questionnaire of the Higher Education Sector (Question 8): "What is your gender?" (see Annex 2).
- 2) The table is only based on persons less than or equal to 70 years, in order to exclude retired researchers from the sample.
- 3) None of the shares of EU27 researchers in the table are calculated by using the proportion method described in Chapter 2.
- 4) In the table we have applied the two binomial proportion comparison method in Bhattacharyya and Johnson (1977, p. 308-312).
- 5) EU26 consists of all EU27 member states but without France.

We see from Table A5-2 that France has a higher share of responders in the "other researcher" category and lower shares of doctoral/PhD students and postdoctoral researchers than Germany, Spain and EU26. This again results to higher international mobility rates for France, since researchers in the "other researcher" category tend to be more senior and hence had the chance to experience at least one international job-change or research visit than their younger fellows.

France has also a lower share of postdoctoral researchers than Italy, but we find no significant differences between these two countries with respect to the shares of doctoral/PhD students and researchers in the "other researcher" category. Further, France has a higher share of researchers in the "other researcher" category and a lower share of postdoctoral researchers than United Kingdom, but we find no significant differences in the share of doctoral/PhD students between these countries.

Table A5-2: Observed shares of researchers in the higher education sector in EU27 by current status as a researcher. Differences between France and other selected EU27 countries in the Mobility Survey.

95 % confidence interval					
Current status as a researcher	Per cent		Difference	Lower bound	Upper bound
	France	Germany			
Doctoral/PhD student	4 %	13 %	-9 %	-13 %	-4 %

Postdoctoral researcher	14 %	43 %	-28 %	-36 %	-21 %
Other researcher category	82 %	45 %	37 %	29 %	45 %
Total number of researchers	224	536			
	France	Spain			
Doctoral/PhD student	4 %	18 %	-14 %	-20 %	-9 %
Postdoctoral researcher	14 %	38 %	-24 %	-31 %	-17 %
Other researcher category	82 %	43 %	39 %	31 %	46 %
Total number of researchers	224	570			
	France	Italy			
Doctoral/PhD student	4 %	2 %	2 %	-1 %	4 %
Postdoctoral researcher	14 %	21 %	-6 %	-12 %	0 %
Other researcher category	82 %	77 %	5 %	-2 %	11 %
Total number of researchers	224	590			
	France	United Kingdom			
Doctoral/PhD student	4 %	5 %	-1 %	-4 %	3 %
Postdoctoral researcher	14 %	29 %	-15 %	-22 %	-8 %
Other researcher category	82 %	66 %	16 %	9 %	23 %
Total number of researchers	224	578			

	France	EU26			
Doctoral/PhD student	4 %	13 %	-9 %	-13 %	-4 %
Postdoctoral researcher	14 %	35 %	-21 %	-27 %	-15 %
Other researcher category	82 %	52 %	30 %	23 %	37 %
Total number of researchers	224	4 314			

Source: The Mobility Survey of the Higher Education Sector.

Notes:

1) The table is based on the following question in the Mobility Questionnaire of the Higher Education Sector (Question 34): "Which of the following categories do you consider best describes your current status as a researcher?" (see Annex 2).

2) The table is only based on persons less than or equal to 70 years, in order to exclude retired researchers from the sample.

3) None of the shares of EU27 researchers in the table are calculated by using the proportion method described in Chapter 2.

4) In the table we have applied the two binomial proportion comparison method in Bhattacharyya and Johnson (1977, p. 308-312).

5) EU26 consists of all EU27 member states but without France.

It follows from Table A5-3 that France has a higher share of respondents in the Natural Sciences and Technology, and a lower share of those in the Social Sciences and Humanities, compared with Germany, Spain, Italy, United Kingdom and EU26. France has also a lower share of researchers in the Medical Sciences and Agriculture compared with Germany, Italy and EU26. Even though these differences are not statistically significant, since researchers in the Natural Sciences and Technology tend to have higher shares of international mobility than researchers within the other two research fields, it becomes clear that unbalances also in this dimension (scientific field) lead to higher mobility rates among French responders compared to all others.

Table A5-3: Observed shares of researchers in the higher education sector in EU27 by field of science. Differences between France and other selected EU27 countries in the Mobility Survey.

				95 % confidence interval	
Field of science	Per cent		Difference	Lower bound	Upper bound
	France	Germany			
Natural Sciences and Technology	71 %	38 %	34 %	26 %	42 %
Medical Sciences and Agriculture	7 %	16 %	-10 %	-15 %	-4 %

Social Sciences and Humanities	22 %	46 %	-24 %	-32 %	-17 %
Total number of researchers	224	536			
	France	Spain			
Natural Sciences and Technology	71 %	53 %	19 %	11 %	26 %
Medical Sciences and Agriculture	7 %	9 %	-3 %	-7 %	2 %
Social Sciences and Humanities	22 %	38 %	-16 %	-23 %	-9 %
Total number of researchers	224	570			
	France	Italy			
Natural Sciences and Technology	71 %	55 %	16 %	8 %	24 %
Medical Sciences and Agriculture	7 %	12 %	-5 %	-9 %	0 %
Social Sciences and Humanities	22 %	33 %	-11 %	-18 %	-4 %
Total number of researchers	224	590			
	France	United Kingdom			
Natural Sciences and Technology	71 %	34 %	38 %	30 %	46 %
Medical Sciences and Agriculture	7 %	10 %	-4 %	-8 %	1 %
Social Sci-	22 %	56 %	-34 %	-42 %	-26 %

ences and Humanities					
Total number of researchers	224	578			
	France	EU26			
Natural Sciences and Technology	71 %	46 %	26 %	19 %	32 %
Medical Sciences and Agriculture	7 %	13 %	-6 %	-11 %	-2 %
Social Sciences and Humanities	22 %	41 %	-20 %	-26 %	-13 %
Total number of researchers	224	4 314			

Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The table is only based on persons less than or equal to 70 years, in order to exclude retired researchers from the sample.
- 2) None of the shares of EU27 researchers in the table are calculated by using the proportion method described in Chapter 2.
- 3) In the table we have applied the two binomial proportion comparison method in Bhattacharyya and Johnson (1977, p. 308-312).
- 4) EU26 consists of all EU27 member states but without France.

Table A5-4 shows that among the French responders there is a higher share of married or cohabiting researchers, and a lower share of single researchers, than responders from Germany and Spain. France also has a lower share of single researchers than EU26. Again these differences are not statistically significant, but isolated as a single factor the overrepresentation of married researchers would probably have no effect on overall mobility rates, but probably it affects negatively the shares of the French respondents reporting that they have been mobile the last three years.

Table A5-4: Observed shares of researchers in the higher education sector in EU27 by marital status. Differences between France and other selected EU27 countries in the Mobility Survey.

				95 % confidence interval	
Marital status	Per cent		Difference	Lower bound	Upper bound
	France	Germany			
Married or	79 %	70 %	10 %	3 %	16 %

co-habiting					
Single	16 %	26 %	-10 %	-16 %	-3 %
Prefer not to disclose	5 %	4 %	0 %	-3 %	4 %
Total number of researchers	224	536			
	France	Spain			
Married or co-habiting	79 %	72 %	7 %	0 %	14 %
Single	16 %	24 %	-9 %	-15 %	-2 %
Prefer not to disclose	5 %	3 %	2 %	-1 %	5 %
Total number of researchers	224	570			
	France	Italy			
Married or co-habiting	79 %	76 %	4 %	-3 %	10 %
Single	16 %	19 %	-4 %	-10 %	2 %
Prefer not to disclose	5 %	5 %	0 %	-3 %	3 %
Total number of researchers	224	590			
	France	United Kingdom			
Married or co-habiting	79 %	77 %	2 %	-4 %	9 %
Single	16 %	18 %	-3 %	-8 %	3 %
Prefer not to disclose	5 %	5 %	0 %	-3 %	3 %
Total number of researchers	224	578			
	France	EU27			

Married or co-habiting	79 %	75 %	4 %	-1 %	10 %
Single	16 %	21 %	-5 %	-11 %	0 %
Prefer not to disclose	5 %	4 %	1 %	-2 %	4 %
Total number of researchers	224	4 538			
	France	EU26			
Married or co-habiting	79 %	75 %	5 %	-1 %	10 %
Single	16 %	21 %	-6 %	-11 %	0 %
Prefer not to disclose	5 %	4 %	1 %	-1 %	4 %
Total number of researchers	224	4 314			

Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The table is based on the following question in the Mobility Questionnaire of the Higher Education Sector (Question 12): "What is your marital status?" (see Annex 2).
- 2) The table is only based on persons less than or equal to 70 years, in order to exclude retired researchers from the sample.
- 3) None of the shares of EU27 researchers in the table are calculated by using the proportion method described in Chapter 2.
- 4) In the table we have applied the two binomial proportion comparison method in Bhattacharyya and Johnson (1977, p. 308-312).
- 5) EU26 consists of all EU27 member states but without France.

Finally, if we compare France with Germany, Spain, France, Italy, United Kingdom and EU26, Table A5-5 suggest that France has *(i)* a relatively higher (but not statistically significant) shares of researchers who only collaborate with academic researchers from other countries, *(ii)* a relatively higher share of researchers who collaborate with both academic and industrial researchers from other countries, and *(iii)* a relatively lower share of researchers with no formal collaboration with academic or business sector researchers from other countries. This is probably the result of the method we applied as a last resort for identifying e-mail addresses from France (i.e. French researchers retrieved from the lists of participants in the Fifth and Sixth Framework programmes) and it clearly suggests that the set of French responders belongs to the "experienced" and "well connected" researchers subset of the overall set of French researchers in the higher education sector.

Table A5-5: Observed shares of researchers in the higher education sector in EU27 by whether they have formal collaboration with academic or business sector researchers from other countries. Differences between France and other selected EU27 countries in the Mobility Survey.

				95 % confidence interval	
Formal collaboration	Per cent		Difference	Lower bound	Upper bound
	France	Germany			
Yes, only with academic researchers from other countries	52 %	41 %	11 %	3 %	19 %
Yes, only with industrial researchers from other countries	0 %	1 %	-1 %	-2 %	0 %
Yes, with academic and industrial researchers from other countries	35 %	16 %	19 %	13 %	26 %
No collaboration with other countries	13 %	43 %	-30 %	-37 %	-22 %
Total number of researchers	222	530			
		France	Spain		
Yes, only with academic researchers from other countries	52 %	38 %	13 %	6 %	21 %
Yes, only with industrial researchers from other countries	0 %	1 %	-1 %	-2 %	0 %
Yes, with academic and industrial researchers from other countries	35 %	22 %	14 %	7 %	20 %
No collaboration with other	13 %	39 %	-26 %	-34 %	-19 %

countries					
Total number of researchers	222	555			
	France	Italy			
Yes, only with academic researchers from other countries	52 %	38 %	14 %	6 %	21 %
Yes, only with industrial researchers from other countries	0 %	1 %	-1 %	-2 %	0 %
Yes, with academic and industrial researchers from other countries	35 %	19 %	16 %	10 %	23 %
No collaboration with other countries	13 %	42 %	-29 %	-36 %	-22 %
Total number of researchers	222	575			
	France	United Kingdom			
Yes, only with academic researchers from other countries	52 %	32 %	20 %	12 %	27 %
Yes, only with industrial researchers from other countries	0 %	1 %	-1 %	-2 %	0 %
Yes, with academic and industrial researchers from other countries	35 %	15 %	21 %	14 %	27 %
No collaboration with other countries	13 %	53 %	-39 %	-47 %	-32 %
Total number of researchers	222	571			

	France	EU26			
Yes, only with academic researchers from other countries	52 %	40 %	11 %	5 %	18 %
Yes, only with industrial researchers from other countries	0 %	1 %	-1 %	-2 %	0 %
Yes, with academic and industrial researchers from other countries	35 %	19 %	16 %	11 %	22 %
No collaboration with other countries	13 %	40 %	-27 %	-33 %	-20 %
Total number of researchers	222	4 231			

Source: The Mobility Survey of the Higher Education Sector.

Notes:

- 1) The table is based on the following question in the Mobility Questionnaire of the Higher Education Sector (Question 44): "Does your current work as a researcher involve some form of formal collaboration (i.e. contractually based collaboration) with academic or business sector researchers from other countries?" (see Annex 2).
- 2) The table is only based on persons less than or equal to 70 years, in order to exclude retired researchers from the sample.
- 3) None of the shares of EU27 researchers in the table are calculated by using the proportion method described in Chapter 2.
- 4) In the table we have applied the two binomial proportion comparison method in Bhattacharyya and Johnson (1977, p. 308-312).
- 5) EU26 consists of all EU27 member states but without France.

Representative overall international mobility rates for EU26

Table A5-6: Recalculated estimates for overall international mobility rates in EU26, excluding France, with error margins.

International mobility during the researcher career			
	Percent mobile	Variance	ERROR MARGINS (+/- 95 per cent confidence intervals)
EU-26	53.6 %	0.0068	1.6 %
COUNTRY			
Austria	51 %	0.0013615	7.2 %
Belgium	52 %	0.0006694	5.1 %
Bulgaria	53 %	0.0184059	26.6 %
Cyprus	44 %	0.0036659	11.9 %
Czech Republic	50 %	0.0025475	9.9 %
Denmark	44 %	0.0031174	10.9 %
Estonia	43 %	0.0120537	21.5 %
Finland	33 %	0.0013087	7.1 %
Germany	50 %	0.0003196	3.5 %
Greece	73 %	0.0017031	8.1 %
Hungary	57 %	0.0032793	11.2 %
Ireland	61 %	0.0060125	15.2 %
Italy	60 %	0.0008168	5.6 %
Latvia	66 %	0.0320661	35.1 %
Lithuania	44 %	0.0034899	11.6 %
Luxembourg	86 %	0.0038639	12.2 %
Malta	65 %	0.0035132	11.6 %
Netherlands	58 %	0.0059359	15.1 %
Poland	55 %	0.0007695	5.4 %

Portugal	70 %	0.0009337	6.0 %
Romania	44 %	0.0074225	16.9 %
Slovakia	40 %	0.0047697	13.5 %
Slovenia	40 %	0.0002636	3.2 %
Spain	61 %	0.0004905	4.3 %
Sweden	56 %	0.0024769	9.8 %
United Kingdom	49 %	0.0005094	4.4 %
FIELD OF SCIENCE			
HEALTH	47 %	0.0001429	2.3 %
NATURAL	56 %	0.0001543	2.4 %
SOCIAL	55 %	0.0002763	3.3 %

Note that BG, EE and LT estimates are attached to very high error margins.

Note: Overall international mobility rates count both incidences of job mobility and research visits of three months duration or more. These must have occurred at least once in the researcher's career.

Table A5-6 provides new calculations of estimates for overall international mobility rates by country and by scientific field. These calculations are based on weights derived from population data without France.

Compared with the equivalent Table in Annex 3 (mobility rates including France), we find that the overall international mobility rate for EU26 is 2.5 percentage points lower than that for the EU27. This difference between mobility rates with and without France is actually significant, since the error margins for the EU27/EU26 mobility rates are very low (+/- 1.6 percent).

The analysis so far suggests that mobility rates without including French respondents results to more accurate estimations than those found in Annex 3.

In the last part of this note, we shall therefore conduct a logit analysis on the "weighted" values of the sample without France.

Logit analysis based on all responses excluding France

As a preliminary comment regarding the use of logistic regression in the context of this analysis, we note that the logistic regression is usually applied on observations selected with Simple Random Sampling (SRS). It could be also applied to data selected with Stratified Random Sampling (StRS), if the sampling rate is the same in all strata. The same set up can be achieved in the case of disproportional allocation of the sample into the strata, if inverse weighting is used, assigning in each sample observation in stratum h , weight $w_h = \frac{N_h n}{N n_h}$, thus making the sampling allocation again proportional to the population strata.

In the present study, the sampling method was *stratified cluster sampling*. As the sample observations within each stratum were selected via a two stage algorithm, i.e. first a sample of clusters was selected and then a sample of observations from each cluster was selected, i.e. the sample within each stratum was not a simple random one. Furthermore, since the number of observations within each population cluster was unknown prior to the selection of the clusters for the sample, it was not possible to use an allocation scheme, which would accurately maintain the proportionality of the sample strata to the population ones.

As a result, the application of the logistic regression method can be questioned. Nonetheless, as the sample was weighted, using the inverse weights described in Chapter 2, we believe that the possible estimation errors are not significant. We should also point out that the results of the logistic regression are both logical and in agreement with the results of the corresponding cross tabulations. The latter is a confirmation of the validity of the regression results. Even if one was to question the *magnitude* of the relation between the various probabilities modeled as dependent variables to the particular explanatory ones, the *existence* of the relation should not be in doubt.

We examine all six key mobility indicators produced in the MORE study. These are:

1. Overall international mobility rates
2. International research job-changes
3. Research visits of three months duration or more
4. International mobility the last three years
5. Intersectoral mobility (from business sector to the higher education sector)
6. Intersectoral mobility (job changes within the higher education sector)

Logit analysis of the overall mobility rates

In order to assess the factors influencing overall international mobility, a logistic regression model and stepwise method was used to select the variables to be entered in the model from all the variables deemed as factors enhancing or inhibiting researcher mobility. Table A5-7 presents the variables used in the regression model and the last column signals which of these variables have a significant explanatory power for the mobility patterns observed. We remind the reader that this analysis has been done on the basis of responses from all EU27 countries except France.

Table A5-7: Results from the logit stepwise method. Variables included in the model.

Variable name	Explanation	Codification	Included in the final model
Dependent variable	International mobility	1=Yes, 0=No	YES
var8	Gender	1=male, 2=female	YES (-)
var12	Marital status	1=married, 0=single	NO
var13	Children	1=yes, 0=no	NO
var26	Exchange student	1=yes, 0=no	YES (+)
var42	Tenure	1=yes, 0=no	NO
var44	Full time	1=yes, 0=no	NO
motiv_1_1	Personal/family factors	1=important, 0=not important	YES (-)
motiv_1_2	My quality of life (or that of my family)	1=important, 0=not important	YES (+)
motiv_1_3	My training and development goals	1=important, 0=not important	YES (+)
motiv_1_4	My career progression goals	1=important, 0=not important	YES (+)
motiv_1_5	My personal research agenda	1=important, 0=not important	YES (+)
motiv_2_1	Lack of access to the facilities / equipment necessary to my research	1=important, 0=not important	NO
motiv_2_2	Lack of suitable research collaborators	1=important, 0=not important	YES (-)

motiv_2_3	Lack of links with companies and users of research	1=important, 0=not important	YES (-)
motiv_2_4	General level of research funding nationally	1=important, 0=not important	NO
motiv_2_5	Ability to access funding for own research	1=important, 0=not important	YES (-)
motiv_2_6	Lack of availability of career opportunities	1=important, 0=not important	YES (-)
motiv_2_7	Poor salary and incentives	1=important, 0=not important	YES (+)
motiv_2_8	Poor conditions at work	1=important, 0=not important	YES (-)
motiv_2_9	Poor pension and social care Provision	1=important, 0=not important	YES (-)
motiv_2_10	Unattractive labour regulations	1=important, 0=not important	YES (-)
motiv_2_11	Immigration regulations	1=important, 0=not important	YES (+)
motiv_4	Are you open to the possibility of being mobile in the future?	1=yes, 0=no	YES (+)
motiv_5_1	Personal/family factors	1=important, 0=not important	NO
motiv_5_2	My quality of life (or that of my family)	1=important, 0=not important	NO
motiv_5_3	My training and development Goals	1=important, 0=not important	YES (-)

motiv_5_4	My career progression goals	1=important, 0=not important	YES (-)
motiv_5_5	My personal research agenda (i.e. the content and direction of my research)	1=important, 0=not important	NO
motiv_5_6	Desire to return to a country in which I have previously lived/worked	1=important, 0=not important	YES (+)
motiv_6_1	Lack of access to the facilities / equipment necessary to my research	1=important, 0=not important	NO
motiv_6_2	Lack of suitable research collaborators	1=important, 0=not important	YES (+)
motiv_6_3	Lack of links with companies and users of research	1=important, 0=not important	YES (-)
motiv_6_4	General level of research funding nationally	1=important, 0=not important	NO
motiv_6_5	Ability to access funding for your own research	1=important, 0=not important	NO
motiv_6_6	Lack of availability of career opportunities	1=important, 0=not important	YES (+)
motiv_6_7	Poor salary and incentives	1=important, 0=not important	NO
motiv_6_8	Poor conditions at work	1=important, 0=not important	NO
motiv_6_9	Poor pension and social care Provision	1=important, 0=not important	NO
Austria - UK	26 dummy variables (one for each country, excluding France)	1=if from country, 0=if not	7 countries included (AT, EL, IT, LT, PT, ES all + / SK -)
age	Age (in years) in 2009		YES (+)

Phd-holder	A dummy variable for PhD as the highest degree	1=yes, 0=no	YES (+)
ma	A dummy variable for Master's as the highest degree	1=yes, 0=no	NO
nodegree	A dummy variable for BA or below as the highest degree	1=yes, 0=no	NO
health	A dummy variable for the field of science = Health Sciences	1=yes, 0=no	NO
natural	A dummy variable for the field of science = Natural Sciences	1=yes, 0=no	YES (+)
social	A dummy variable for the field of science = Social Sciences	1=yes, 0=no	NO
Other researcher	A dummy variable	1 = "other researcher", 0 = otherwise	YES (+)

Table A5-7 shows that almost all of the results are as expected. Regarding the negative coefficients in the answers of questions 83 and 100, notice that the probability modeled is the one to BE MOBILE. Thus, the negative coefficients imply that researchers who consider the particular factor important are less mobile.

The most noteworthy observations from the logit regression results are:

- Male researchers have been more mobile than female researchers.
- Older researchers are more mobile (as expected) as well as researchers classified as "other" and PhD-holders.
- Researchers with prior exchange experience as students are more mobile than those with no exchange student experience.
- Researchers who consider personal/family factors important are less mobile, while the ones who value more career-related factors and quality of life are more mobile.
- Training, career progression and personal research agenda are all positively correlated with overall international mobility. Thus, it appears that international mobility has been a part of a planned career track for many researchers.
- The results of question group 89/105 (future motivation factors) seem logical. Researchers who are looking for collaborators and career opportunities are more likely to be mobile.

Logit analysis of the overall international job-change rates

Table A5-8: Results from the logit stepwise method, international job-change rates. Variables included in the model.

Variable name	Explanation	Codification	Included in the final model
Dependent variable	A move to employer in another country	1=Yes, 0=No	YES
var8	Gender	1=male, 2=female	YES (-)
var12	Marital status	1=married, 0=single	NO
var13	Children	1=yes, 0=no	NO
var26	Exchange student	1=yes, 0=no	YES (+)
var42	Tenure	1=yes, 0=no	NO
var44	Full time	1=yes, 0=no	YES (-)
motiv_1_1	Personal/family factors	1=important, 0=not important	YES (-)
motiv_1_2	My quality of life (or that of my family)	1=important, 0=not important	YES (+)
motiv_1_3	My training and development goals	1=important, 0=not important	YES (+)
motiv_1_4	My career progression goals	1=important, 0=not important	YES (+)
motiv_1_5	My personal research agenda	1=important, 0=not important	YES (+)
motiv_2_1	Lack of access to the facilities / equipment necessary to my research	1=important, 0=not important	NO

motiv_2_2	Lack of suitable research col- laborators	1=important, 0=not important	YES (-)
motiv_2_3	Lack of links with companies and users of research	1=important, 0=not important	NO
motiv_2_4	General level of research fund- ing nationally	1=important, 0=not important	NO
motiv_2_5	Ability to access funding for own research	1=important, 0=not important	NO
motiv_2_6	Lack of availability of career opportunities	1=important, 0=not important	YES (+)
motiv_2_7	Poor salary and incentives	1=important, 0=not important	YES (+)
motiv_2_8	Poor conditions at work	1=important, 0=not important	YES (-)
motiv_2_9	Poor pension and social care provision	1=important, 0=not important	YES (-)
motiv_2_10	Unattractive labour regulations	1=important, 0=not important	YES (-)
motiv_2_11	Immigration regulations	1=important, 0=not impor- tant	YES (+)
motiv_4	Are you open to the possi- bility of being mobile in the future?	1=yes, 0=no	YES (+)
motiv_5_1	Personal/family factors	1=important, 0=not important	NO
motiv_5_2	My quality of life (or that of my family)	1=important, 0=not important	NO
motiv_5_3	My training and develop- ment goals	1=important, 0=not impor- tant	YES (-)
motiv_5_4	My career progression goals	1=important, 0=not important	NO

motiv_5_5	My personal research agenda (i.e. the content and direction of my research)	1=important, 0=not important	NO
motiv_5_6	Desire to return to a country in which I have previously lived/worked	1=important, 0=not important	YES (+)
motiv_6_1	Lack of access to the facilities / equipment necessary to my research	1=important, 0=not important	NO
motiv_6_2	Lack of suitable research collaborators	1=important, 0=not important	NO
motiv_6_3	Lack of links with companies and users of research	1=important, 0=not important	YES (-)
motiv_6_4	General level of research funding nationally	1=important, 0=not important	NO
motiv_6_5	Ability to access funding for your own research	1=important, 0=not important	NO
motiv_6_6	Lack of availability of career opportunities	1=important, 0=not important	YES (+)
motiv_6_7	Poor salary and incentives	1=important, 0=not important	YES (+)
motiv_6_8	Poor conditions at work	1=important, 0=not important	NO
motiv_6_9	Poor pension and social care provision	1=important, 0=not important	NO
Austria - UK	26 dummy variables (one for each country, excluding France)	1=if from country, 0=if not	6 countries included (AT, DE, NL, IE, SE, UK all + / RO, SK, SL all -)
age	Age (in years) in 2009		NO
Phd-holder	A dummy variable for PhD as the highest degree	1=yes, 0=no	NO

ma	A dummy variable for Master's as the highest degree	1=yes, 0=no	YES (-)
No-degree	A dummy variable for BA or below as the highest degree	1=yes, 0=no	NO
health	A dummy variable for the field of science = Health Sciences	1=yes, 0=no	NO
natural	A dummy variable for the field of science = Natural Sciences	1=yes, 0=no	YES (+)
social	A dummy variable for the field of science = Social Sciences	1=yes, 0=no	YES (-)
Other researcher	A dummy variable	1 = "other researcher", 0 = otherwise	YES (+)

Overall, 1,268 of 4,528 respondents (28%) reported that they had at least one incidence of research visits in their career as researchers.

Table A5-8 shows again that many of the results are as expected. The most noteworthy observations from the logit regression results are:

- Male researchers have had several employers from at least two different countries than female researchers.
- Researchers with prior exchange experience as students are more mobile.
- Researchers who consider personal/family factors important are less mobile, while the ones who value more career-related factors and quality of life are more mobile.
- Training, career progression and personal research agenda are all positively correlated with overall international mobility. Thus, it appears that international job-changes are a part of a planned career track for many researchers.
- Researchers in the Natural Sciences and Technology tend to have more international job-changes than others. Conversely, researchers in the Social Sciences and Humanities do not often experience international job-changes in their careers.

Logit analysis of the research visits

Table A5-9: Results from the logit stepwise method, research visits rates. Variables included in the model.

Variable name	Explanation	Codification	Included in the final model
Dependent variable	A research visit to another country without a change of employer	1=Yes, 0=No	YES
var8	Gender	1=male, 2=female	NO
var12	Marital status	1=married, 0=single	NO
var13	Children	1=yes, 0=no	NO
var26	Exchange student	1=yes, 0=no	YES (+)
var42	Tenure	1=yes, 0=no	NO
var44	Full time	1=yes, 0=no	NO
motiv_1_1	Personal/family factors	1=important, 0=not important	YES (-)
motiv_1_2	My quality of life (or that of my family)	1=important, 0=not important	NO
motiv_1_3	My training and development goals	1=important, 0=not important	YES (+)
motiv_1_4	My career progression goals	1=important, 0=not important	YES (+)
motiv_1_5	My personal research agenda	1=important, 0=not important	YES (+)
motiv_2_1	Lack of access to the facilities / equipment necessary to my research	1=important, 0=not important	NO

motiv_2_2	Lack of suitable research collaborators	1=important, 0=not important	NO
motiv_2_3	Lack of links with companies and users of research	1=important, 0=not important	YES (-)
motiv_2_4	General level of research funding nationally	1=important, 0=not important	YES (+)
motiv_2_5	Ability to access funding for own research	1=important, 0=not important	YES (-)
motiv_2_6	Lack of availability of career opportunities	1=important, 0=not important	YES (-)
motiv_2_7	Poor salary and incentives	1=important, 0=not important	YES (+)
motiv_2_8	Poor conditions at work	1=important, 0=not important	YES (-)
motiv_2_9	Poor pension and social care provision	1=important, 0=not important	NO
motiv_2_10	Unattractive labour regulations	1=important, 0=not important	YES (-)
motiv_2_11	Immigration regulations	1=important, 0=not important	NO
motiv_4	Are you open to the possibility of being mobile in the future?	1=yes, 0=no	YES (+)
motiv_5_1	Personal/family factors	1=important, 0=not important	NO
motiv_5_2	My quality of life (or that of my family)	1=important, 0=not important	NO
motiv_5_3	My training and development goals	1=important, 0=not important	YES (-)
motiv_5_4	My career progression goals	1=important, 0=not important	YES (-)

motiv_5_5	My personal research agenda (i.e. the content and direction of my research)	1=important, 0=not important	NO
motiv_5_6	Desire to return to a country in which I have previously lived/worked	1=important, 0=not important	YES (+)
motiv_6_1	Lack of access to the facilities / equipment necessary to my research	1=important, 0=not important	YES (+)
motiv_6_2	Lack of suitable research collaborators	1=important, 0=not important	YES (+)
motiv_6_3	Lack of links with companies and users of research	1=important, 0=not important	NO
motiv_6_4	General level of research funding nationally	1=important, 0=not important	YES (-)
motiv_6_5	Ability to access funding for your own research	1=important, 0=not important	NO
motiv_6_6	Lack of availability of career opportunities	1=important, 0=not important	YES (+)
motiv_6_7	Poor salary and incentives	1=important, 0=not important	NO
motiv_6_8	Poor conditions at work	1=important, 0=not important	NO
motiv_6_9	Poor pension and social care provision	1=important, 0=not important	YES (-)
Austria - UK	26 dummy variables (one for each country, excluding France)	1=if from country, 0=if not	8 countries included (AT, BE, DE, SK, SE, UK all - / LT, ES +)
age	Age (in years) in 2009		YES (+)
Phd-holder	A dummy variable for PhD as the highest degree	1=yes, 0=no	YES (+)

ma	A dummy variable for Master's as the highest degree	1=yes, 0=no	NO
No-degree	A dummy variable for BA or below as the highest degree	1=yes, 0=no	NO
health	A dummy variable for the field of science = Health Sciences	1=yes, 0=no	YES (-)
natural	A dummy variable for the field of science = Natural Sciences	1=yes, 0=no	NO
social	A dummy variable for the field of science = Social Sciences	1=yes, 0=no	NO
Other researcher	A dummy variable	1 = "other researcher", 0 = otherwise	YES (+)

Overall, 1,953 of 4,528 respondents (43%) reported that they had at least one incidence of research visits in their career as researchers. Hence we can conclude that research visits is a much more common international mobility form than job changes across countries.

Table A5-9 shows again that many of the logit regression results are as expected. The most noteworthy observations from the logit regression results are:

- Gender is not a factor explaining variation of this type of mobility. This result is unexpected and may suggest that hindrances for mobility are related to more permanent forms of international mobility (job changes) than research visits.
- Researchers with prior exchange experience as students are more mobile.
- Researchers who consider personal/family factors important are less mobile.
- Training, career progression and personal research agenda are all positively correlated with overall international mobility. Thus, it appears that research visits are a part of a planned career track for many researchers.
- The general level of research funding nationally is a positive and significant explanatory variable for research visits.
- It is interesting to observe that countries with generally good research framework conditions appear as negative explanatory factors of research visit behavior.
- As expected, older researchers, the "other researcher" category and PhD-holders are characteristics affecting positively the occurrence of research visits.
- Researchers in the Medical Sciences and Agriculture tend to not prioritise research visits.

Logit analysis of recent international researcher mobility

Table A5-10: Results from the logit stepwise method, recent mobility (the last three years). Variables included in the model.

Variable name	Explanation	Codification	Included in the final model
Dependent variable	Have you been internationally mobile the last three years?	1=Yes, 0=No	YES
var8	Gender	1=male, 2=female	YES (-)
var12	Marital status	1=married, 0=single	NO
var13	Children	1=yes, 0=no	YES (-)
var26	Exchange student	1=yes, 0=no	YES (+)
var42	Tenure	1=yes, 0=no	YES (-)
var44	Full time	1=yes, 0=no	NO
motiv_1_1	Personal/family factors	1=important, 0=not important	YES (-)
motiv_1_2	My quality of life (or that of my family)	1=important, 0=not important	YES (+)
motiv_1_3	My training and development goals	1=important, 0=not important	YES (+)
motiv_1_4	My career progression goals	1=important, 0=not important	YES (+)
motiv_1_5	My personal research agenda	1=important, 0=not important	YES (+)
motiv_2_1	Lack of access to the facilities / equipment necessary to my research	1=important, 0=not important	NO

motiv_2_2	Lack of suitable research collaborators	1=important, 0=not important	NO
motiv_2_3	Lack of links with companies and users of research	1=important, 0=not important	NO
motiv_2_4	General level of research funding nationally	1=important, 0=not important	NO
motiv_2_5	Ability to access funding for own research	1=important, 0=not important	NO
motiv_2_6	Lack of availability of career opportunities	1=important, 0=not important	NO
motiv_2_7	Poor salary and incentives	1=important, 0=not important	YES (+)
motiv_2_8	Poor conditions at work	1=important, 0=not important	YES (-)
motiv_2_9	Poor pension and social care provision	1=important, 0=not important	YES (-)
motiv_2_10	Unattractive labour regulations	1=important, 0=not important	YES (-)
motiv_2_11	Immigration regulations	1=important, 0=not important	NO
motiv_4	Are you open to the possibility of being mobile in the future?	1=yes, 0=no	YES (+)
motiv_5_1	Personal/family factors	1=important, 0=not important	YES (-)
motiv_5_2	My quality of life (or that of my family)	1=important, 0=not important	NO
motiv_5_3	My training and development goals	1=important, 0=not important	YES (-)
motiv_5_4	My career progression goals	1=important, 0=not important	NO

motiv_5_5	My personal research agenda (i.e. the content and direction of my research)	1=important, 0=not important	NO
motiv_5_6	Desire to return to a country in which I have previously lived/worked	1=important, 0=not important	YES (+)
motiv_6_1	Lack of access to the facilities / equipment necessary to my research	1=important, 0=not important	NO
motiv_6_2	Lack of suitable research collaborators	1=important, 0=not important	NO
motiv_6_3	Lack of links with companies and users of research	1=important, 0=not important	NO
motiv_6_4	General level of research funding nationally	1=important, 0=not important	NO
motiv_6_5	Ability to access funding for your own research	1=important, 0=not important	NO
motiv_6_6	Lack of availability of career opportunities	1=important, 0=not important	NO
motiv_6_7	Poor salary and incentives	1=important, 0=not important	YES (+)
motiv_6_8	Poor conditions at work	1=important, 0=not important	NO
motiv_6_9	Poor pension and social care provision	1=important, 0=not important	NO
Austria - UK	26 dummy variables (one for each country, excluding France)	1=if from country, 0=if not	2 countries included (AT +, SK -)
age	Age (in years) in 2009		YES (+)
Phd-holder	A dummy variable for PhD as the highest degree	1=yes, 0=no	YES (+)
ma	A dummy variable for Master's as the highest degree	1=yes, 0=no	NO
No-degree	A dummy variable for BA or below as the highest degree	1=yes, 0=no	NO

health	A dummy variable for the field of science = Health Sciences	1=yes, 0=no	YES (-)
natural	A dummy variable for the field of science = Natural Sciences	1=yes, 0=no	YES (-)
social	A dummy variable for the field of science = Social Sciences	1=yes, 0=no	NO
Other re-searcher	A dummy variable	1 = "other re-searcher", 0 = otherwise	NO

Overall, 1,280 of 4,528 respondents (28%) reported that they had at least one incidence of research visits in their career as researchers. Hence we can conclude that research visits is a much more common international mobility form than job changes across countries.

Table A5-10 displays many of expected results. The most noteworthy observations from the logit regression results are:

- Male researchers are still significantly more mobile the recent three years than their female counterparts. Thus, despite the fact that the levels of gender differences regarding international mobility the last three years are reduced compared to gender difference levels for overall international mobility (i.e. during the researcher's whole career), the logit analysis justify the constant policy focus on this issue.
- Researchers with prior exchange experience as students have also been more internationally mobile as researchers the last three years.
- Conversely, children and tenure positions tend to be characteristics which reduce the levels of recent international mobility among researchers.
- Researchers who consider personal/family factors important are less mobile, while the ones who value more career-related factors and quality of life are more mobile.
- Training, career progression and personal research agenda are all positively correlated with overall international mobility. Thus, it appears that international job-changes are a part of a planned career track for many researchers.
- As expected, older researchers and PhD-holders are characteristics affecting positively the occurrence of recent international researcher mobility.
- One unexpected result is that researchers in the Natural Sciences and Technology together with researchers in the Medical Sciences and Agriculture tend to be less internationally mobile the last three years.

Logit analysis of intersectoral mobility

In the cases of inter- and intrasectoral mobility we did not include the so-called motivation variables (variables 1_1 to 6_9), since these variables were specifically linked to questions on motives and barriers for international researcher mobility.

Table A5-11: Results from the logit stepwise method, intersectoral mobility (between the higher education sector and the business sector). Variables included in the model.

Variable name	Explanation	Codification	Included in the final model
Dependent variable	Which of the following career paths best describe your situation please consider only changes of employer not research visits	1= I have been employed as a researcher in both the public and the private sector, 0= I have always been employed as a researcher in the public sector	YES
var8	Gender	1= male, 2= female	YES (-)
var12	Marital status	1=married, 0=single	NO
var13	Children	1=yes, 0=no	YES (+)
var26	Exchange student	1=yes, 0=no	NO
var42	Tenure	1=yes, 0=no	NO
var44	Full time	1=yes, 0=no	NO
Austria - UK	26 dummy variables (one for each country, excluding France)	1=if from country, 0=if not	DK, FI, DE all + / HU, PT, SK all -
age	Age (in years) in 2009		NO
Phd-holder	A dummy variable for PhD as the highest degree	1=yes, 0=no	NO
ma	A dummy variable for Master's as the highest degree	1=yes, 0=no	NO
No-degree	A dummy variable for BA or below as the highest degree	1=yes, 0=no	NO

health	A dummy variable for the field of science = Health Sciences	1=yes, 0=no	YES (-)
natural	A dummy variable for the field of science = Natural Sciences	1=yes, 0=no	NO
social	A dummy variable for the field of science = Social Sciences	1=yes, 0=no	NO
Other researcher	A dummy variable	1 = "other researcher", 0 = otherwise	NO

Overall, 717 of 4,528 respondents (16%) reported that they have been employed both in the public and the private sector as researchers.

Table A5-11 shows that female researchers are negatively associated with intrasectoral mobility while the occurrence of children is positively related with the intersectoral mobility. The latter finding opens for speculative explanations suggesting that children is a motive for shifting employer from the private to the public sector (or even vice versa). The point here is, however, that this finding renders a further and more qualitative investigation of how family characteristics affect career choices between the private and public R&D sectors worthwhile.

As expected, countries such as Denmark, Germany and Finland are positively associated with intersectoral mobility, confirming the general impression that the research systems in these countries are in general flexible and, in particular, stimulate intersectoral mobility.

Researchers in the Medical Sciences and Agriculture are significantly less involved in intersectoral mobility than other researchers. There are probably much less opportunities for researcher positions in the business sector in the Medical Sciences and Agriculture compared with the Natural Sciences and Technology.

Logit analysis of intrasectoral mobility

Table A5-12: Results from the logit stepwise method, intrasectoral mobility (between the higher education sector and the business sector). Variables included in the model.

Variable name	Explanation	Codification	Included in the final model
Dependent variable	During your employment career as a researcher have you worked for more than one public research organization?	1= yes, 0=no	YES
var8	Gender	1= male, 2=female	YES (-)
var12	Marital status	1=married, 0=single	NO
var13	Children	1=yes, 0=no	NO
var26	Exchange student	1=yes, 0=no	YES (+)
var42	Tenure	1=yes, 0=no	NO
var44	Full time	1=yes, 0=no	NO
Austria - UK	26 dummy variables (one for each country, excluding France)	1=if from country, 0=if not	AT, DK, DE, LT, NL, SE, UK all + / SL and RO -
age	Age (in years) in 2009		YES (+)
Phd-holder	A dummy variable for PhD as the highest degree	1=yes, 0=no	YES (+)
ma	A dummy variable for Master's as the highest degree	1=yes, 0=no	NO
No-degree	A dummy variable for BA or below as the highest degree	1=yes, 0=no	NO
health	A dummy variable for the field of science = Health Sciences	1=yes, 0=no	YES (-)
natural	A dummy variable for the field of science = Natural Sciences	1=yes, 0=no	NO
social	A dummy variable for the field of science = Social Sciences	1=yes, 0=no	NO

Other re- searcher	A dummy variable	1 = "other re- searcher", 0 = otherwise	YES (+)
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Overall, 2,571 of 4,528 respondents (57 %) reported that they have worked as researchers in more than one public research organization.

Table A5-11 shows that female researchers are negatively associated with intersectoral mobility. This result is cementing findings in almost all other types of mobility and suggests that female researchers are for whatever reasons much less flexible in their careers compared to their male colleagues.

We have not a good explanation for why student exchange is a factor positively related to intrasectoral mobility, other than the fact that international mobility between universities may also be classified as intrasectoral mobility and as we have seen earlier researchers with past experiences as exchange student tend to be more internationally mobile than other researchers.

As expected, the research systems of Denmark, Germany, Austria, Sweden and Nederland seem to stimulate intrasectoral mobility.

As also in the case of intersectoral mobility, researchers in the Medical Sciences and Agriculture are significantly less involved in intrasectoral mobility occurrences compared to researchers in other research fields.

ANNEX 6: DETAILS OF THE CHAPTER 6 ANALYSIS

INHIBITING FACTOR REFERENCE TABLE

SECTION A - Q95 CONSIDERATIONS/FACTORS INFLUENCING FUTURE MOTIVATION TO BE MOBILE – PREVIOUSLY-MOBILE RESEARCHERS
(Figure 55, Figure 59)

	Would not affect my decision to be mobile	Could be a minor concern	Could be a major concern	Would be a severe obstacle to mobility	subtotal	n=	Not applicable
Immigration regulations eg getting a work visa	54.5%	27.5%	12.1%	5.8%	100.0%	1625	240
Obtaining funding for mobility	15.6%	22.9%	40.8%	20.7%	100.0%	1798	71
Finding a suitable position	12.6%	17.1%	43.6%	26.7%	100.0%	1791	74
Language	58.5%	26.0%	11.9%	3.6%	100.0%	1712	143
Social/cultural integration into a new country	53.3%	33.3%	11.1%	2.3%	100.0%	1761	94
Integration into a new research system	45.7%	36.4%	14.8%	3.1%	100.0%	1800	65
Making childcare arrangements	42.7%	18.5%	23.9%	14.9%	100.0%	1367	490
Other caring responsibilities	47.3%	23.5%	19.5%	9.7%	100.0%	1426	416
Maintaining existing personal relationships	28.7%	34.9%	26.3%	10.1%	100.0%	1769	92
Finding suitable accommodation	28.6%	40.0%	25.3%	6.1%	100.0%	1802	46
Maintaining continuity/transferring pension rights/contributions	37.8%	30.1%	23.9%	8.2%	100.0%	1679	177
Maintaining continuity of/transferring health insurance	39.4%	29.6%	23.3%	7.7%	100.0%	1692	169

SECTION B - Q109 CONSIDERATIONS/FACTORS INFLUENCING MOTIVATION TO BE MOBILE IN THE FUTURE – ‘NON-MOBILE’ RESEARCHERS (Figure 57, Figure 60)

Immigration regulations eg getting a work visa	49.7%	28.7%	15.7%	5.9%	100.0%	1169	116
Obtaining funding for mobility	7.3%	18.0%	47.1%	27.6%	100.0%	1259	29
Finding a suitable position	5.8%	9.6%	52.9%	31.7%	100.0%	1253	38
Language	39.3%	30.4%	22.2%	8.1%	100.0%	1221	56
Social/cultural integration into a new country	37.9%	37.0%	21.6%	3.5%	100.0%	1255	28
Integration into a new research system	26.1%	39.9%	29.7%	4.3%	100.0%	1266	24
Making childcare arrangements	41.2%	15.5%	22.2%	21.2%	100.0%	1047	237
Other caring responsibilities	34.5%	26.0%	25.6%	13.9%	100.0%	1102	176
Maintaining existing personal relationships	19.5%	30.4%	33.8%	16.3%	100.0%	1246	41
Finding suitable accommodation	20.3%	36.8%	34.9%	8.0%	100.0%	1250	26
Maintaining continuity/transferring pension rights/contributions	31.8%	31.9%	26.8%	9.6%	100.0%	1222	62
Maintaining continuity of/transferring health insurance	31.7%	31.2%	28.6%	8.5%	100.0%	1216	63

SECTION B - Q101 INHIBITING FACTORS AND BARRIERS TO MOBILITY IN THE PAST FOR ‘NON-MOBILE’ RESEARCHERS (Figure 56, Figure 61)

Immigration regulations eg getting a work visa	76.2%	14.8%	4.9%	4.1%	100.0%	1557	232
Obtaining funding for mobility	29.4%	21.1%	28.5%	20.9%	100.0%	1690	95
Finding a suitable position	26.4%	20.6%	34.8%	18.2%	100.0%	1692	86
Language	42.6%	32.8%	16.2%	8.4%	100.0%	1703	66
Social/cultural integration into a new country	53.3%	30.5%	13.0%	3.2%	100.0%	1699	82
Integration into a new research system	46.6%	33.3%	15.8%	4.3%	100.0%	1692	87
Making childcare arrangements	42.1%	13.9%	20.7%	23.3%	100.0%	1491	282
Other caring responsibilities	39.7%	19.8%	21.7%	18.8%	100.0%	1527	238
Maintaining existing personal relationships	25.3%	25.9%	29.9%	18.9%	100.0%	1694	83
Finding suitable accommodation	48.1%	31.7%	16.2%	4.1%	100.0%	1664	91
Maintaining continuity/transferring pension	49.9%	27.2%	16.3%	6.6%	100.0%	1645	125

rights/contributions							
Maintaining continuity of/transferring health insurance	52.3%	27.8%	13.7%	6.1%	100.0%	1652	122

SECTION A - Q85 OBSTACLES TO MOBILITY EXPERIENCED IN THE PAST BY PREVIOUSLY MOBILE RESEARCHERS (Figure 58, Figure 62)

Immigration regulations eg getting a work visa	65.9%	18.0%	12.5%	3.7%	100.0%	2238	234
Obtaining funding for mobility	41.6%	22.8%	24.3%	11.3%	100.0%	2234	220
Finding a suitable position	53.4%	23.1%	17.4%	6.0%	100.0%	2294	150
Language	55.3%	25.7%	15.1%	3.9%	100.0%	2366	71
Social/cultural integration into a new country	54.2%	28.4%	13.9%	3.6%	100.0%	2395	52
Integration into a new research system	48.3%	31.7%	16.1%	3.9%	100.0%	2375	79
Making childcare arrangements	63.2%	14.3%	12.8%	9.7%	100.0%	1498	938
Other caring responsibilities	63.8%	17.7%	12.9%	5.6%	100.0%	1576	847
Maintaining existing personal relationships	40.2%	26.5%	23.5%	9.8%	100.0%	2307	139
Finding suitable accommodation	39.3%	31.5%	21.6%	7.7%	100.0%	2364	70
Maintaining continuity/transferring pension rights/contributions	56.0%	16.4%	14.5%	13.0%	100.0%	1836	605
Maintaining continuity of/transferring health insurance	58.4%	18.6%	13.6%	9.4%	100.0%	2001	450

Table 17: Personal and family factors as an influence on mobility
(Group A - previously mobile researchers)

	In relation to most recent instance of mobility (n=2546)	In relation to further possible mobility in the future (n=1943)
Unimportant	21.8%	13.1%
Not very important	19.5%	9.9%
Important	32.7%	36.6%
Highly important	25.9%	40.4%

Source: Mobility Survey of the Higher Education Sector

Notes:

- 1) The table is based on Questions 82 and 92 in the Mobility Questionnaire (See Annex 2).

Table 18: Personal and family factors as an influence on mobility by gender
(Group A - previously mobile researchers),

	In relation to most recent instance of mobility (n=1705)	In relation to further possible mobility in the future (n=1305)
MALE		
Unimportant	21.6%	14.2%
Not very important	20.8%	11%
Important	33.1%	37.7%
Highly important	24.5%	37.1%
FEMALE	(n=841)	(n=638)
Unimportant	22.4%	10.8%
Not very important	16.9%	7.7%
Important	32%	34.3%
Highly important	28.8%	47.2%

Source: Mobility Survey of the Higher Education Sector

Notes:

- 1) The table is based on Questions 82 and 92 in the Academic Mobility Questionnaire (See Annex 2).

Table 19: Personal and family factors as an influence on further possible mobility for female researchers with and without children
(Group A - previously mobile researchers)

	Female researchers with children (n=318)	Female researchers without children (n=320)
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Unimportant	9.4%	12.2%
Not very important	6.3%	9.1%
Important	28.3%	40.3%
Highly important	56.0%	38.4%

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The table is based on Question 92 in the HE Mobility Questionnaire (See Annex 2).

Table 20: Personal and family factors as an influence on mobility
(Group B – non-mobile respondents)

	<i>In relation to previous decision not to become mobile (n=1854)</i>	<i>In relation to possible mobility in the future (n=1627)</i>
Unimportant	11.4%	8.8%
Not very important	13.8%	14.6%
Important	33.1%	34.5%
Highly important	41.8%	42.2%

Source: The Mobility Survey of the Higher Education Sector

- 1) The table is based on Questions 99 and 104 in the HE Mobility Questionnaire (See Annex 2).

Figure 65(below): Personal and family factors and openness to future mobility
(Group B – non-mobile researchers), n=2544

Source: The Mobility Survey of the Higher Education Sector

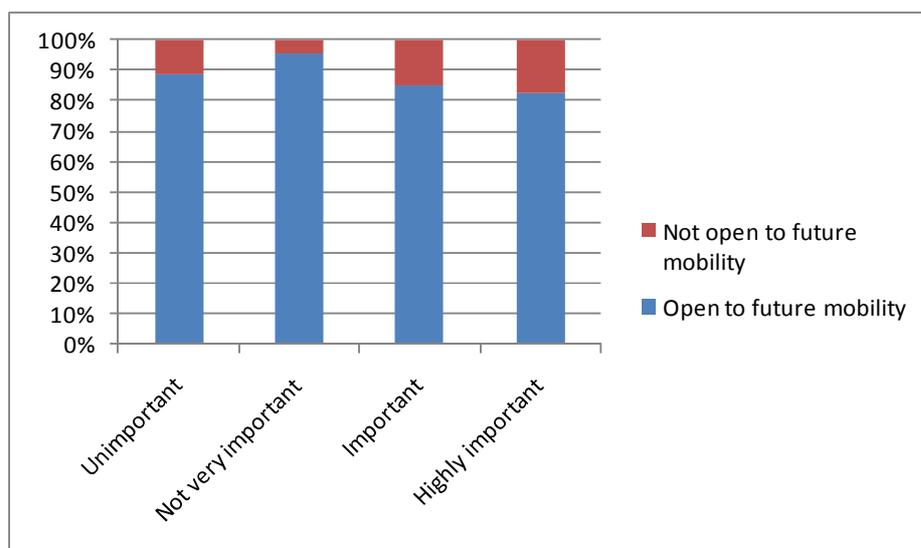


Figure 66 (below, left): Personal and family factors and openness to future mobility – married or co-habiting researchers (Group B – non-mobile researchers), n=1376

Source: The Mobility Survey of the Higher Education Sector

Figure 67 (below, right): Personal and family factors and openness to future mobility –

single researchers (Group B – non-mobile researchers), n=406

Source: The Mobility Survey of the Higher Education Sector

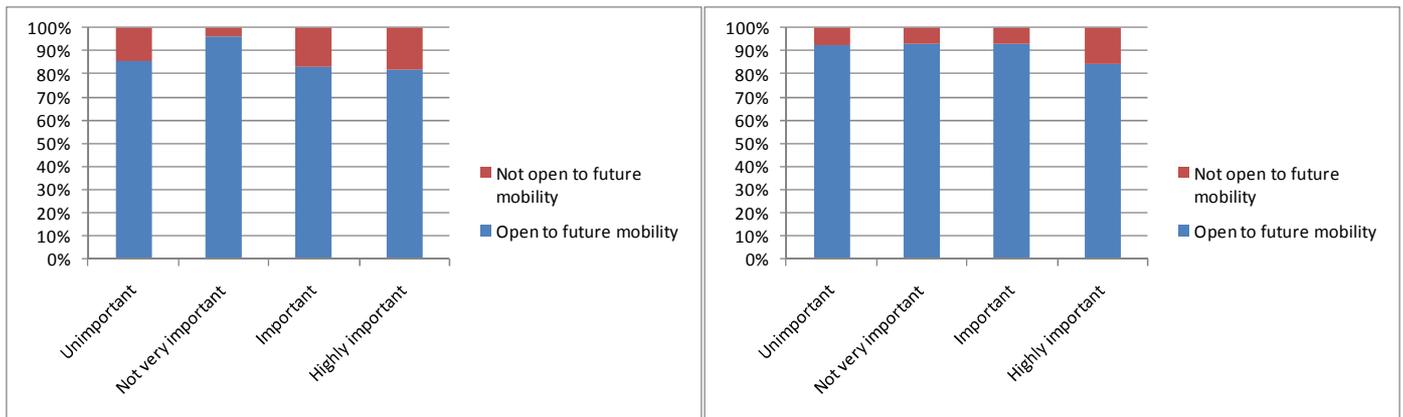


Figure 68 (below, left): Personal and family factors and openness to future mobility – researchers with children (Group B – non-mobile researchers), n=1166

Source: The Mobility Survey of the Higher Education Sector

Figure 69 (below, right): Personal and family factors and openness to future mobility – researchers without children (Group B – non-mobile researchers), n=685

Source: The Mobility Survey of the Higher Education Sector

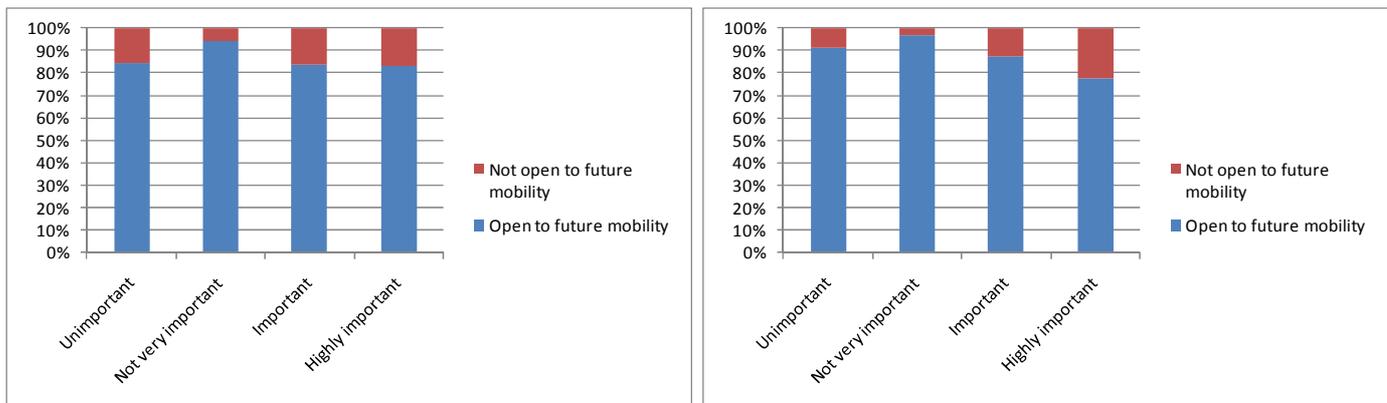


Table 21: Quality of life factors as an influence on mobility
(Group A - previously mobile researchers)

	In relation to most recent instance of mobility (n=2547)	In relation to further possible mobility in the future (n=1942)
Unimportant	17.0%	8.3%
Not very important	18.3%	8.3%
Important	41.8%	44.3%
Highly important	22.9%	39.0%

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The table is based on Questions 82 and 92 in the HE Mobility Questionnaire (See Annex 2).

Table 22: Quality of life factors as an influence on mobility
(Group B - non-mobile researchers)

	In relation to previous decision <u>not</u> to become mobile (n=1833)	In relation to possible mobility in the future (n=1619)
Unimportant	16.4%	6.8%
Not very important	21.5%	13.5%
Important	39.7%	50%
Highly important	22.4%	29.7%

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The table is based on Questions 99 and 104 in the HE Mobility Questionnaire (See Annex 2).

Table 23: Training and development goals as an influence on mobility
(Group A - previously mobile researchers)

	In relation to most recent instance of mobility (n=2548)	In relation to further possible mobility in the future (n=1937)
Unimportant	4.3%	7.3%
Not very important	7.9%	12.9%
Important	42.2%	49%
Highly important	45.7%	30.8%

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The table is based on Questions 82 and 92 in the HE Mobility Questionnaire (See Annex 2).

Table 24: Training and development goals as an influence on mobility
(Group B – non-mobile researchers)

	<i>In relation to previous decision not to become mobile</i> (n=1814)	<i>In relation to possible mobility in the future</i> (n=1619)
Unimportant	26.5%	6.6%
Not very important	30.4%	15.3%
Important	32.9%	54.0%
Highly important	10.3%	24.2%

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The table is based on Questions 99 and 104 in the HE Mobility Questionnaire (See Annex 2).

Table 25: Career progression goals as an influence on mobility
(Group A – previously mobile researchers)

	<i>In relation to most recent instance of mobility</i> (n=2551)	<i>In relation to further possible mobility in the future</i> (n=1933)
Unimportant	4.3%	8.9%
Not very important	12.7%	15.2%
Important	39.9%	44.8%
Highly important	43.1%	31.1%

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The table is based on Questions 82 and 92 in the HE Mobility Questionnaire (See Annex 2).

Table 26: Career progression goals as an influence on mobility
(Group B – non-mobile researchers)

	<i>In relation to previous decision not to become mobile</i> (n=1814)	<i>In relation to possible mobility in the future</i> (n=1620)
Unimportant	24.9%	7.9%
Not very important	29.8%	19.6%
Important	32.9%	46%
Highly important	12.4%	26.4%

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The table is based on Questions 99 and 104 in the HE Mobility Questionnaire (See Annex 2).

Table 27: Personal research agenda (content and direction of research) as an influence on mobility (Group A - previously mobile researchers)

	In relation to most recent instance of mobility (n=2550)	In relation to further possible mobility in the future (n=1933)
Unimportant	2.7%	3.1%
Not very important	10.2%	10.7%
Important	41.8%	45.9%
Highly important	45.3%	40.3%

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The table is based on Questions 82 and 92 in the HE Mobility Questionnaire (See Annex 2).

Table 28: Personal research agenda as an influence on mobility (Group B - non-mobile researchers)

	In relation to previous decision <u>not</u> to become mobile (n=1819)	In relation to possible mobility in the future (n=1606)
Unimportant	24.0%	5.7%
Not very important	27.2%	16.9%
Important	34.9%	49.6%
Highly important	13.9%	27.8%

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The table is based on Questions 99 and 104 in the HE Mobility Questionnaire (See Annex 2).

Table 29: Lack of availability of career opportunities at home as a PUSH factor for mobility (Group A - previously mobile researchers)

	In relation to most recent instance of mobility (n=2427)	In relation to further possible mobility in the future (n=2246)
Unimportant	38.2%	29.5%
Not very important	18.9%	21.7%
Important	24%	28.8%
Highly important	19%	20.1%

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The table is based on Questions 83 and 89 in the HE Mobility Questionnaire (See Annex 2).

Table 30: Availability of career opportunities elsewhere as a PULL factor for mobility (Group A - previously mobile researchers)

	In relation to most recent instance of mobility (n=2426)	In relation to further possible mobility in the future (n=1867)
Unimportant	24.5%	19.4%
Not very important	18.3%	19.4%
Important	34.1%	37%
Highly important	23.2%	24.3%

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The table is based on Questions 84 and 94 in the HE Mobility Questionnaire (See Annex 2).

Table 31: Availability of career opportunities at home as a STAY factor in past decisions not to be mobile and as a PUSH factor in future orientation to mobility (Group B – non-mobile researchers)

	In relation to previous decision <u>not</u> to become mobile (STAY) (n=1805)	In relation to possible mobility in the future (PUSH) (n=1538)
Unimportant	19.5%	21.3%
Not very important	26.8%	27%
Important	37.5%	34.7%
Highly important	16.2%	17.0%

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The table is based on Questions 100 and 105 in the HE Mobility Questionnaire (See Annex 2).

Table 32: Availability of career opportunities elsewhere as a PULL factor in future orientation to mobility (Group B – non-mobile researchers), n=1295

Unimportant	15.6%
Not very important	22.6%
Important	39.6%
Highly important	22.2%

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The table is based on Question 108 in the HE Mobility Questionnaire (See Annex 2).

Table 33: Poor salary and incentives at home as a PUSH factor for mobility
(Group A - previously mobile researchers)

	<i>In relation to most recent instance of mobility</i> (n=2428)	<i>In relation to further possible mobility in the future</i> (n=2252)
Unimportant	46.8%	33.4%
Not very important	22.7%	22.4%
Important	18.6%	28.3%
Highly important	11.9%	15.9%

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The table is based on Questions 83 and 89 in the HE Mobility Questionnaire (See Annex 2).

Table 34: More attractive salary and incentives elsewhere as a PULL factor for mobility (Group A - previously mobile researchers)

	<i>In relation to most recent instance of mobility</i> (n=2432)	<i>In relation to further possible mobility in the future</i> (n=1872)
Unimportant	37.6%	23.1%
Not very important	24.1%	23.1%
Important	24.1%	32.4%
Highly important	14.2%	21.4%

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The table is based on Questions 84 and 94 in the HE Mobility Questionnaire (See Annex 2).

Table 35: Salary and incentives at home as a STAY factor in past decisions not to be mobile and as a PUSH factor in future orientation to mobility
(Group B - non-mobile researchers)

	<i>In relation to previous decision not to become mobile (STAY)</i> (n=1805)	<i>In relation to possible mobility in the future (PUSH)</i> (n=1534)
Unimportant	26.1%	26.6%
Not very important	37.1%	27.3%
Important	27%	31.2%
Highly important	9.8%	15%

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The table is based on Questions 100 and 105 in the HE Mobility Questionnaire (See Annex 2).

Table 36: More attractive salary and incentives elsewhere as a PULL factor in future orientation to mobility (Group B – non-mobile researchers), n=1305

Unimportant	19.8%
Not very important	26.7%
Important	35.8%
Highly important	17.7%

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The table is based on Question 108 in the HE Mobility Questionnaire (See Annex 2).

Table 37: Poor working conditions at home as a PUSH factor for mobility (Group A - previously mobile researchers)

	In relation to most recent instance of mobility (n=2420)	In relation to further possible mobility in the future (n=2245)
Unimportant	49.5%	39.2%
Not very important	22.3%	23.3%
Important	18.2%	25.7%
Highly important	10%	11.8%

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The table is based on Questions 83 and 89 in the HE Mobility Questionnaire (See Annex 2).

Table 38: More attractive working conditions elsewhere as a PULL factor for mobility (Group A - previously mobile researchers)

	In relation to most recent instance of mobility (n=2426)	In relation to further possible mobility in the future (n=1871)
Unimportant	30%	20.7%
Not very important	20.9%	21.4%
Important	32.4%	38.3%
Highly important	16.7%	19.6%

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The table is based on Questions 84 and 94 in the HE Mobility Questionnaire (See Annex 2).

Table 39: Working conditions at home as a STAY factor in past decisions not to be mobile and as a PUSH factor in future orientation to mobility (Group B – non-mobile researchers)

	<i>In relation to previous decision not to become mobile (STAY)</i> (n=1803)	<i>In relation to possible mobility in the future (PUSH)</i> (n=1542)
Unimportant	22.3%	31.7%
Not very important	29.4%	29.8%
Important	35.2%	27.6%
Highly important	13.1%	11.0%

Source: The Mobility Survey of the Higher Education Sector

Notes:

1) The table is based on Questions 100 and 105 in the HE Mobility Questionnaire (See Annex 2).

Table 40: More attractive working conditions elsewhere as a PULL factor in future orientation to mobility (Group B – non-mobile researchers), n=1301

Unimportant	19.7%
Not very important	24.6%
Important	38.2%
Highly important	17.5%

Source: The Mobility Survey of the Higher Education Sector

Notes:

1) The table is based on Question 108 in the HE Mobility Questionnaire (See Annex 2).

Table 41: Lack of access to necessary research equipment or facilities as a PUSH factor for mobility (Group A – previously mobile researchers)

	<i>In relation to most recent instance of mobility</i> (n=2441)	<i>In relation to further possible mobility in the future</i> (n=2253)
Unimportant	46.4%	31.5%
Not very important	18.5%	21%
Important	23%	32.3%
Highly important	12.1%	15.2%

Source: The Mobility Survey of the Higher Education Sector

Notes:

1) The table is based on Questions 83 and 89 in the HE Mobility Questionnaire (See Annex 2).

Table 42: Access to necessary research equipment or facilities as a PULL factor for mobility (Group A - previously mobile researchers)

	In relation to most recent instance of mobility (n=2441)	In relation to further possible mobility in the future (n=1882)
Unimportant	16.7%	9%
Not very important	12.4%	11%
Important	43.1%	47.6%
Highly important	27.9%	32.5%

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The table is based on Questions 84 and 94 in the HE Mobility Questionnaire (See Annex 2).

Table 43: Access to necessary research equipment or facilities as a STAY factor in past decisions not to be mobile and lack of access as a PUSH factor in future orientation to mobility (Group B - non-mobile researchers)

	In relation to previous decision <u>not</u> to become mobile (STAY) (n=1813)	In relation to possible mobility in the future (PUSH) (n=1555)
Unimportant	29.5%	27.7%
Not very important	28.9%	29.5%
Important	31.7%	33%
Highly important	9.9%	9.8%

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The table is based on Questions 100 and 105 in the HE Mobility Questionnaire (See Annex 2).

Table 44: Access to necessary research equipment or facilities as a PULL factor in future orientation to mobility (Group B - non-mobile researchers), n=1312

Unimportant	9.5%
Not very important	12.9%
Important	52.3%
Highly important	25.3%

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The table is based on Question 108 in the HE Mobility Questionnaire (See Annex 2).

Table 45: Lack of suitable research collaborators as a PUSH factor for mobility (Group A - previously mobile researchers)

	In relation to most recent instance of mobility (n=2434)	In relation to further possible mobility in the future (n=2256)
Unimportant	43.6%	25.3%
Not very important	20.5%	21.7%
Important	24.9%	37.7%
Highly important	11.1%	15.3%

Source: The Mobility Survey of the Higher Education Sector

Notes:

1) The table is based on Questions 83 and 89 in the HE Mobility Questionnaire (See Annex 2).

Table 46: Access to suitable research collaborators as a PULL factor for mobility (Group A - previously mobile researchers)

	In relation to most recent instance of mobility (n=2449)	In relation to further possible mobility in the future (n=1882)
Unimportant	11.5%	4.9%
Not very important	12.2%	7.8%
Important	42.8%	49%
Highly important	33.5%	38.3%

Source: The Mobility Survey of the Higher Education Sector

Notes:

1) The table is based on Questions 84 and 94 in the HE Mobility Questionnaire (See Annex 2).

Table 47: Access to suitable research collaborators as a STAY factor in past decisions not to be mobile and lack of access as a PUSH factor in future orientation to mobility (Group B - non-mobile researchers)

	In relation to previous decision <u>not</u> to become mobile (STAY) (n=1814)	In relation to possible mobility in the future (PUSH) (n=1560)
Unimportant	22.5%	21.9%
Not very important	27.3%	26.2%
Important	36.8%	39.5%
Highly important	13.5%	12.4%

Source: The Mobility Survey of the Higher Education Sector

Notes:

1) The table is based on Questions 100 and 105 in the HE Mobility Questionnaire (See Annex 2).

Table 48: Access to suitable research collaborators as a PULL factor in future orientation to mobility (Group B – non-mobile researchers), n=1318

Unimportant	4.5%
Not very important	8.3%
Important	52.7%
Highly important	34.5%

Source: The Mobility Survey of the Higher Education Sector

Notes:

1) The table is based on Questions 108 in the HE Mobility Questionnaire (See Annex 2).

Table 49: A desire to return to a country in which the researcher has previously lived or worked as an influence on mobility (Group A – previously mobile researchers)

	<i>In relation to most recent instance of mobility</i> (n=2540)	<i>In relation to further possible mobility in the future</i> (n=1923)
Unimportant	41.7%	33.2%
Not very important	25.1%	24.9%
Important	22.3%	28.9%
Highly important	10.9%	13.1%

Source: The Mobility Survey of the Higher Education Sector

Notes:

1) The table is based on Questions 82 and 92 in the HE Mobility Questionnaire (See Annex 2).

Table 50: A desire to return to a country in which the researcher has previously lived or worked as an influence on possible future mobility (Group B – non-mobile researchers), n=1602

Unimportant	50.4%
Not very important	20.8%
Important	18.9%
Highly important	9.8%

Source: The Mobility Survey of the Higher Education Sector

Notes:

1) The table is based on Question 104 in the HE Mobility Questionnaire (See Annex 2).

Table 51: Unattractive labour regulations as a PUSH factor for mobility
(Group A - previously mobile researchers)

	In relation to most recent instance of mobility (n=2421)	In relation to further possible mobility in the future (n=2233)
Unimportant	63%	57.8%
Not very important	23.4%	24.1%
Important	9.7%	13.1%
Highly important	3.9%	4.9%

Source: The Mobility Survey of the Higher Education Sector

Notes:

1) The table is based on Questions 83 and 89 in the HE Mobility Questionnaire (See Annex 2).

Table 52: More attractive labour regulations as a PULL factor for mobility (Group A - previously mobile researchers)

	In relation to most recent instance of mobility (n=2422)	In relation to further possible mobility in the future (n=1861)
Unimportant	56.2%	46.7%
Not very important	27.5%	29.4%
Important	11.7%	17.3%
Highly important	4.7%	6.6%

Source: The Mobility Survey of the Higher Education Sector

Notes:

1) The table is based on Questions 84 and 94 in the HE Mobility Questionnaire (See Annex 2).

Table 53: Labour regulations as a STAY factor in past decisions not to be mobile and as a PUSH factor in future orientation to mobility
(Group B - non-mobile researchers)

	In relation to previous decision <u>not</u> to become mobile (STAY) (n=1801)	In relation to possible mobility in the future (PUSH) (n=1537)
Unimportant	30.3%	40.4%
Not very important	36.8%	32.7%
Important	25.1%	21.3%
Highly important	7.8%	5.6%

Source: The Mobility Survey of the Higher Education Sector

Notes:

1) The table is based on Questions 100 and 105 in the HE Mobility Questionnaire (See Annex 2).

Table 54: *More attractive labour regulations as a PULL factor in future orientation to mobility (Group B – non-mobile researchers), n=1296*

Unimportant	32%
Not very important	37%
Important	23.8%
Highly important	7.2%

Source: The Mobility Survey of the Higher Education Sector

Notes:

1) The table is based on Question 108 in the HE Mobility Questionnaire (See Annex 2).

Table 55: *Immigration regulations as a PUSH factor for mobility (Group A – previously mobile researchers)*

	<i>In relation to most recent instance of mobility</i> (n=2413)	<i>In relation to further possible mobility in the future</i> (n=2237)
Unimportant	71.5%	75.2%
Not very important	18.3%	15.6%
Important	6.7%	6.6%
Highly important	3.5%	2.5%

Source: The Mobility Survey of the Higher Education Sector

Notes:

1) The table is based on Questions 83 and 89 in the HE Mobility Questionnaire (See Annex 2).

Table 56: *Immigration regulations as a PULL factor for mobility (Group A – previously mobile researchers)*

	<i>In relation to most recent instance of mobility</i> (n=2410)	<i>In relation to further possible mobility in the future</i> (n=1858)
Unimportant	69%	64%
Not very important	20.8%	21.5%
Important	8%	11%
Highly important	2.2%	3.6%

Source: The Mobility Survey of the Higher Education Sector

Notes:

1) The table is based on Questions 84 and 94 in the HE Mobility Questionnaire (See Annex 2).

Table 57: Immigration regulations as a STAY factor in past decisions not to be mobile and as a PUSH factor in future orientation to mobility (Group B – non-mobile researchers)

	<i>In relation to previous decision not to become mobile (STAY)</i> (n=1803)	<i>In relation to possible mobility in the future (PUSH)</i> (n=1536)
Unimportant	56.8%	63.9%
Not very important	29.5%	23.8%
Important	9.9%	10%
Highly important	3.8%	2.3%

Source: The Mobility Survey of the Higher Education Sector

Notes:

1) The table is based on Questions 100 and 105 in the HE Mobility Questionnaire (See Annex 2).

Table 58: Immigration regulations as a PULL factor in future orientation to mobility (Group B – non-mobile researchers), n=1291

Unimportant	55.2%
Not very important	27.8%
Important	13%
Highly important	4%

Source: The Mobility Survey of the Higher Education Sector

Notes:

1) The table is based on Question 108 in the HE Mobility Questionnaire (See Annex 2).

Table 59: Pension and social care provision as a PUSH factor for mobility (Group A - previously mobile researchers)

	<i>In relation to most recent instance of mobility</i> (n=2413)	<i>In relation to further possible mobility in the future</i> (n=2229)
Unimportant	58.2%	48.8%
Not very important	22.5%	24.6%
Important	13.5%	18.7%
Highly important	5.8%	8%

Source: The Mobility Survey of the Higher Education Sector

Notes:

1) The table is based on Questions 83 and 89 in the HE Mobility Questionnaire (See Annex 2).

Table 60: Pension and social care provision as a PULL factor for mobility (Group A - previously mobile researchers)

	<i>In relation to most recent instance of mobility</i> (n=2418)	<i>In relation to further possible mobility in the future</i> (n=1860)
Unimportant	51.4%	40.3%
Not very important	28.4%	29.2%
Important	14.4%	21.2%
Highly important	5.8%	9.4%

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The table is based on Questions 84 and 94 in the HE Mobility Questionnaire (See Annex 2).

Table 61: Pension and social care provision as a STAY factor in past decisions not to be mobile and as a PUSH factor in future orientation to mobility (Group B - non-mobile researchers)

	<i>In relation to previous decision <u>not</u> to become mobile (STAY)</i> (n=1800)	<i>In relation to possible mobility in the future (PUSH)</i> (n=1534)
Unimportant	27.8%	35.6%
Not very important	34.1%	31.5%
Important	28.6%	24.6%
Highly important	9.5%	8.3%

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The table is based on Questions 100 and 105 in the HE Mobility Questionnaire (See Annex 2).

Table 62: Pension and social care provision as a PULL factor in future orientation to mobility (Group B - non-mobile researchers), n=1287

Unimportant	31%
Not very important	36.6%
Important	23.9%
Highly important	8.5%

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The table is based on Question 108 in the HE Mobility Questionnaire (See Annex 2).

Table 63: General level of research funding nationally as a PUSH factor for mobility (Group A - previously mobile researchers)

	<i>In relation to most recent instance of mobility</i> (n=2435)	<i>In relation to further possible mobility in the future</i> (n=2258)
Unimportant	42.7%	20.2%
Not very important	19.3%	19%
Important	25.8%	40.4%
Highly important	12.2%	20.4%

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The table is based on Questions 83 and 89 in the HE Mobility Questionnaire (See Annex 2).

Table 64: General level of research funding nationally as a PULL factor for mobility (Group A - previously mobile researchers)

	<i>In relation to most recent instance of mobility</i> (n=2432)	<i>In relation to further possible mobility in the future</i> (n=1873)
Unimportant	28.7%	13.3%
Not very important	22.2%	16.9%
Important	36.1%	47.2%
Highly important	13%	22.6%

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The table is based on Questions 84 and 94 in the HE Mobility Questionnaire (See Annex 2).

Table 65: General level of research funding nationally as a STAY factor in past decisions not to be mobile and as a PUSH factor in future orientation to mobility (Group B - non-mobile researchers)

	<i>In relation to previous decision not to become mobile (STAY)</i> (n=1808)	<i>In relation to possible mobility in the future (PUSH)</i> (n=1558)
Unimportant	23.1%	15.5%
Not very important	29%	20.8%
Important	35%	44.4%
Highly important	13%	19.3%

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The table is based on Questions 100 and 105 in the HE Mobility Questionnaire (See Annex 2).

Table 66: General level of research funding nationally as a PULL factor in future orientation to mobility (Group B – non-mobile researchers), n=1305

Unimportant	11.1%
Not very important	20%
Important	48.9%
Highly important	20%

Source: The Mobility Survey of the Higher Education Sector

Notes:

1) The table is based on Question 108 in the HE Mobility Questionnaire (See Annex 2).

Table 67: Ability to access funding for respondent's own research as a PUSH factor for mobility (Group A - previously mobile researchers)

	In relation to most recent instance of mobility (n=2425)	In relation to further possible mobility in the future (n=2247)
Unimportant	39.4%	19.2%
Not very important	18.7%	17.4%
Important	27.9%	39.1%
Highly important	14%	24.4%

Source: The Mobility Survey of the Higher Education Sector

Notes:

1) The table is based on Questions 83 and 89 in the HE Mobility Questionnaire (See Annex 2).

Table 68: Ability to access funding for respondent's own research as a STAY factor in past decisions not to be mobile and as a PUSH factor in future orientation to mobility (Group B – non-mobile researchers)

	In relation to previous decision <u>not</u> to become mobile (STAY) (n=1803)	In relation to possible mobility in the future (PUSH) (n=1539)
Unimportant	19.6%	13.8%
Not very important	24.1%	17.2%
Important	39.2%	47.2%
Highly important	17%	21.7%

Source: The Mobility Survey of the Higher Education Sector

Notes:

1) The table is based on Questions 100 and 105 in the HE Mobility Questionnaire (See Annex 2).

Table 69: General level of research funding nationally as a PULL factor for mobility (Group A - previously mobile researchers)

	<i>In relation to most recent instance of mobility</i> (n=2432)	<i>In relation to further possible mobility in the future</i> (n=1873)
Unimportant	28.7%	13.3%
Not very important	22.2%	16.9%
Important	36.1%	47.2%
Highly important	13%	22.6%

Source: The Mobility Survey of the Higher Education Sector

Notes:

1) The table is based on Questions 84 and 94 in the HE Mobility Questionnaire (See Annex 2).

Table 70: Ability to access funding for respondent's own research as a PULL factor in future orientation to mobility (Group B - non-mobile researchers), n=1296

Unimportant	10.5%
Not very important	17.7%
Important	47.5%
Highly important	24.3%

Source: The Mobility Survey of the Higher Education Sector

Notes:

1) The table is based on Question 108 in the HE Mobility Questionnaire (See Annex 2).

Table 71: Links with companies and users of research as a PUSH factor for mobility (Group A - previously mobile researchers)

	<i>In relation to most recent instance of mobility</i> (n=2422)	<i>In relation to further possible mobility in the future</i> (n=2238)
Unimportant	60.3%	48.1%
Not very important	21%	25.6%
Important	14.9%	20.6%
Highly important	3.8%	5.7%

Source: The Mobility Survey of the Higher Education Sector

Notes:

1) The table is based on Questions 83 and 89 in the HE Mobility Questionnaire (See Annex 2).

Table 72: Links with companies and users of research as a PULL factor for mobility (Group A - previously mobile researchers)

	In relation to most recent instance of mobility (n=2425)	In relation to further possible mobility in the future (n=1854)
Unimportant	42.1%	31.8%
Not very important	24.7%	25.1%
Important	23.8%	30.3%
Highly important	9.4%	12.8%

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The table is based on Questions 84 and 94 in the HE Mobility Questionnaire (See Annex 2).

Table 73: Links with companies and users of research as a STAY factor in past decisions not to be mobile and as a PUSH factor in future orientation to mobility (Group B - non-mobile researchers)

	In relation to previous decision not to become mobile (STAY) (n=1795)	In relation to possible mobility in the future (PUSH) (n=1536)
Unimportant	34.5%	31.9%
Not very important	31.2%	32%
Important	26.8%	29.6%
Highly important	7.5%	6.6%

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The table is based on Questions 100 and 105 in the HE Mobility Questionnaire (See Annex 2).

Table 74: Links with companies and users of research as a PULL factor in future orientation to mobility (Group B - non-mobile researchers), n=1298

Unimportant	21.3%
Not very important	26.2%
Important	37.7%
Highly important	14.9%

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The table is based on Question 108 in the HE Mobility Questionnaire (See Annex 2).

Table 75: Have you actively considered being mobile in the future?

	Previously mobile researchers (n=2613)	Previously 'non-mobile' researchers (n=1959)	All researchers
Yes	68%	55.2%	62.5%
No	32%	44.8%	37.5%

Source: The Mobility Survey of the Higher Education Sector

Notes:

1) The table is based on Questions 87 and 102 in the HE Mobility Questionnaire (See Annex 2).

Table 76: Are you open to the possibility of being mobile in the future?

	Previously mobile researchers (n=2613)	Previously 'non-mobile' researchers (n=1959)	All researchers
Yes	91.1%	85.8%	88.8%
No	8.9%	14.2%	11.2%

Source: The Mobility Survey of the Higher Education Sector

Notes:

1) The table is based on Questions 88 and 103 in the HE Mobility Questionnaire (See Annex 2).

Table 77: Openness to future mobility by active consideration of future mobility (all researchers), n=4572

	Open to future mobility	Not open to future mobility
Have actively considered future mobility (n=2858)	98.8%	1.2%
Have not actively considered future mobility (n=1714)	72.3%	27.7%

Source: The Mobility Survey of the Higher Education Sector

Table 78: Male researchers who have actively considered future mobility

	Previously mobile researchers (n=1745)	Previously 'non-mobile' researchers (n=1139)	All male researchers
Yes	68.4%	56.3%	63.6%
No	31.6%	43.7%	36.4%

Source: The Mobility Survey of the Higher Education Sector

Table 79: Female researchers who have actively considered future mobility

	Previously mobile researchers (n=868)	Previously 'non-mobile' researchers (n=820)	All female researchers
Yes	67.2%	53.8%	60.7%
No	32.8%	46.2%	39.3%

Source: The Mobility Survey of the Higher Education Sector

Table 80: Male researchers who are open to the possibility of being mobile in the future

	Previously mobile researchers (n=1745)	Previously 'non-mobile' researchers (n=1139)	All male researchers
Yes	91.3%	85.3%	88.9%
No	8.7%	14.7%	11.1%

Source: The Mobility Survey of the Higher Education Sector

Table 81: Female researchers who are open to the possibility of being mobile in the future

	Previously mobile researchers (n=868)	Previously 'non-mobile' researchers (n=820)	All female researchers
Yes	90.7%	86.6%	88.7%
No	9.3%	13.4%	11.3%

Source: The Mobility Survey of the Higher Education Sector

Table 82: Married or co-habiting researchers who have actively considered future mobility

	Previously mobile researchers (n=1978)	Previously 'non-mobile' researchers (n=1455)	All married or co-habiting researchers
Yes	66.1%	54%	60.9%
No	33.9%	46%	39.1%

Source: The Mobility Survey of the Higher Education Sector

Table 83: Single researchers who have actively considered future mobility

	Previously mobile researchers (n=534)	Previously 'non-mobile' researchers (n=430)	All single researchers
Yes	75.3%	60.7%	68.8%
No	24.7%	39.3%	31.2%

Source: The Mobility Survey of the Higher Education Sector

Table 84: Married or co-habiting researchers who are open to the possibility of being mobile in the future

	Previously mobile researchers (n=1978)	Previously 'non-mobile' researchers (n=1455)	All married or co-habiting researchers
Yes	90.3%	84.3%	87.7%
No	9.7%	45.7%	12.2%

Source: The Mobility Survey of the Higher Education Sector

Table 85: Single researchers who are open to the possibility of being mobile in the future

	Previously mobile researchers (n=534)	Previously 'non-mobile' researchers (n=430)	All single researchers
Yes	94.2%	90.9%	92.6%
No	5.8%	9.1%	7.3%

Source: The Mobility Survey of the Higher Education Sector

Table 86: Researchers with children who have actively considered future mobility

	Previously mobile researchers (n=1592)	Previously 'non-mobile' researchers (n=1229)	All researchers with children
Yes	63.9%	52.7%	59.0%
No	36.1%	47.3%	40.9%

Source: The Mobility Survey of the Higher Education Sector

Table 87: Researchers without children who have actively considered future mobility

	Previously mobile researchers (n=1021)	Previously 'non-mobile' researchers (n=730)	All researchers without children
Yes	74.2%	59.5%	68.1%
No	25.8%	40.5%	31.9%

Source: The Mobility Survey of the Higher Education Sector

Table 88: Female researchers with children who have actively considered future mobility

	Previously mobile researchers (n=435)	Previously 'non-mobile' researchers (n=467)	All female researchers with children
Yes	60.9%	53.3%	57%
No	39.1%	46.7%	43%

Source: The Mobility Survey of the Higher Education Sector

Table 89: Female researchers without children who have actively considered future mobility

	Previously mobile researchers (n=433)	Previously 'non-mobile' researchers (n=353)	All female researchers without children
Yes	73.4%	54.4%	64.9%
No	26.6%	45.6%	35.1%

Source: The Mobility Survey of the Higher Education Sector

Table 90: Researchers with children who are open to the possibility of being mobile in the future

	Previously mobile researchers (n=1592)	Previously 'non-mobile' researchers (n=1229)	All researchers with children
Yes	89%	84.5%	87.0%
No	11%	15.5%	12.9%

Source: The Mobility Survey of the Higher Education Sector

Table 91: Researchers without children who are open to the possibility of being mobile in the future

	Previously mobile researchers (n=1021)	Previously 'non-mobile' researchers (n=730)	All researchers without children
Yes	94.4%	87.9%	91.7%
No	5.6%	12.1%	8.3%

Source: The Mobility Survey of the Higher Education Sector

Table 92: Female researchers with children who are open to the possibility of being mobile in the future

	Previously mobile researchers (n=435)	Previously 'non-mobile' researchers (n=467)	All female researchers with children
Yes	88.7%	86.1%	87.3%
No	11.3%	13.9%	12.6%

Source: The Mobility Survey of the Higher Education Sector

Table 93: Female researchers without children who are open to the possibility of being mobile in the future

	Previously mobile researchers (n=433)	Previously 'non-mobile' researchers (n=353)	All female researchers without children
Yes	92.6%	87.3%	90.1%
No	7.4%	12.7%	9.8%

Source: The Mobility Survey of the Higher Education Sector

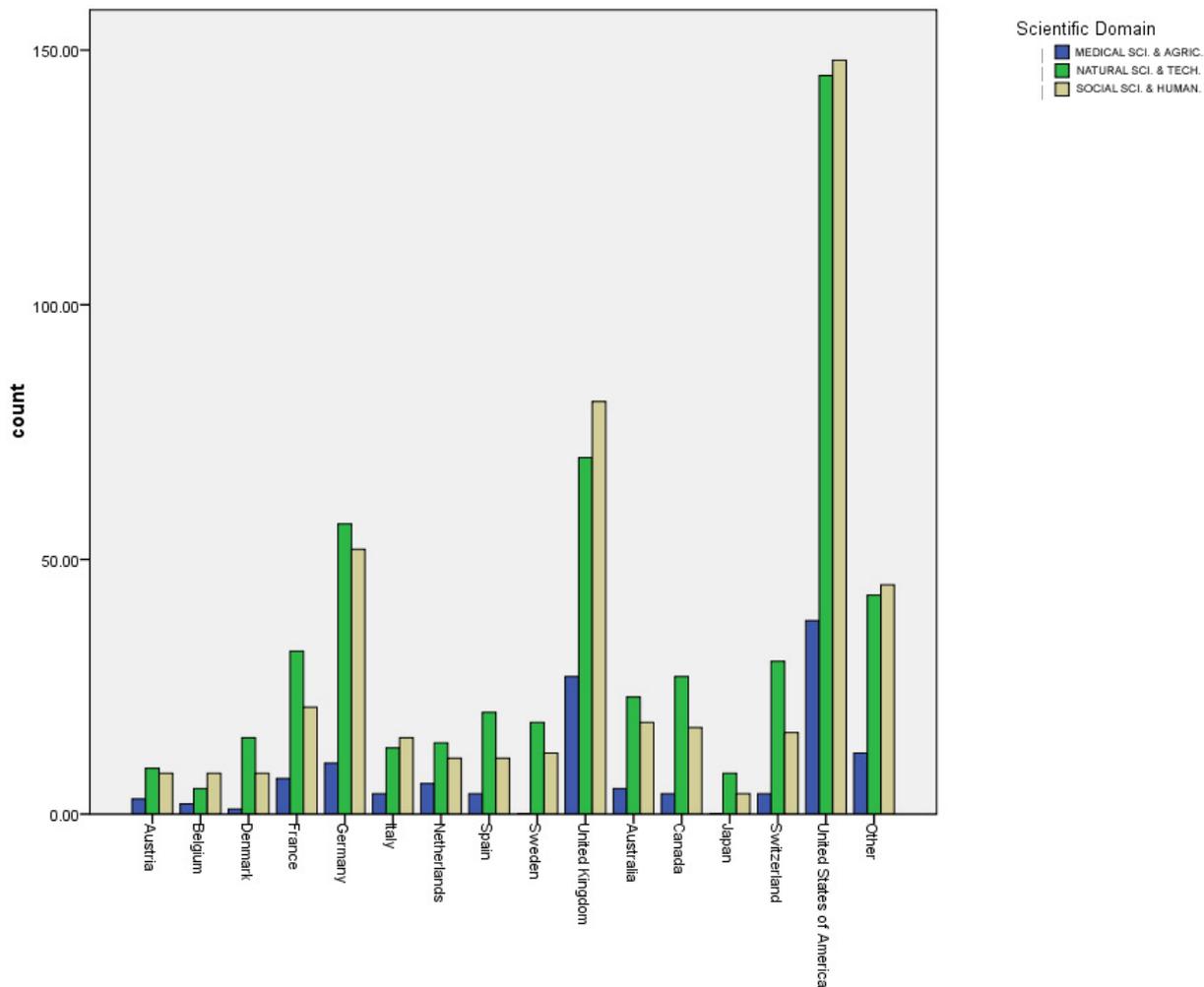


Figure 70 (above): Most commonly nominated countries where availability of career opportunities is an “important” or “highly important” pull factor for all researchers by researcher’s field of science⁴

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The figure presents results for both Groups of respondents (i.e. Group A + Group B).
- 2) The graph shows only countries accounting for at least 1 per cent of valid nominations for that question, with the ‘other’ category representing the remaining countries.

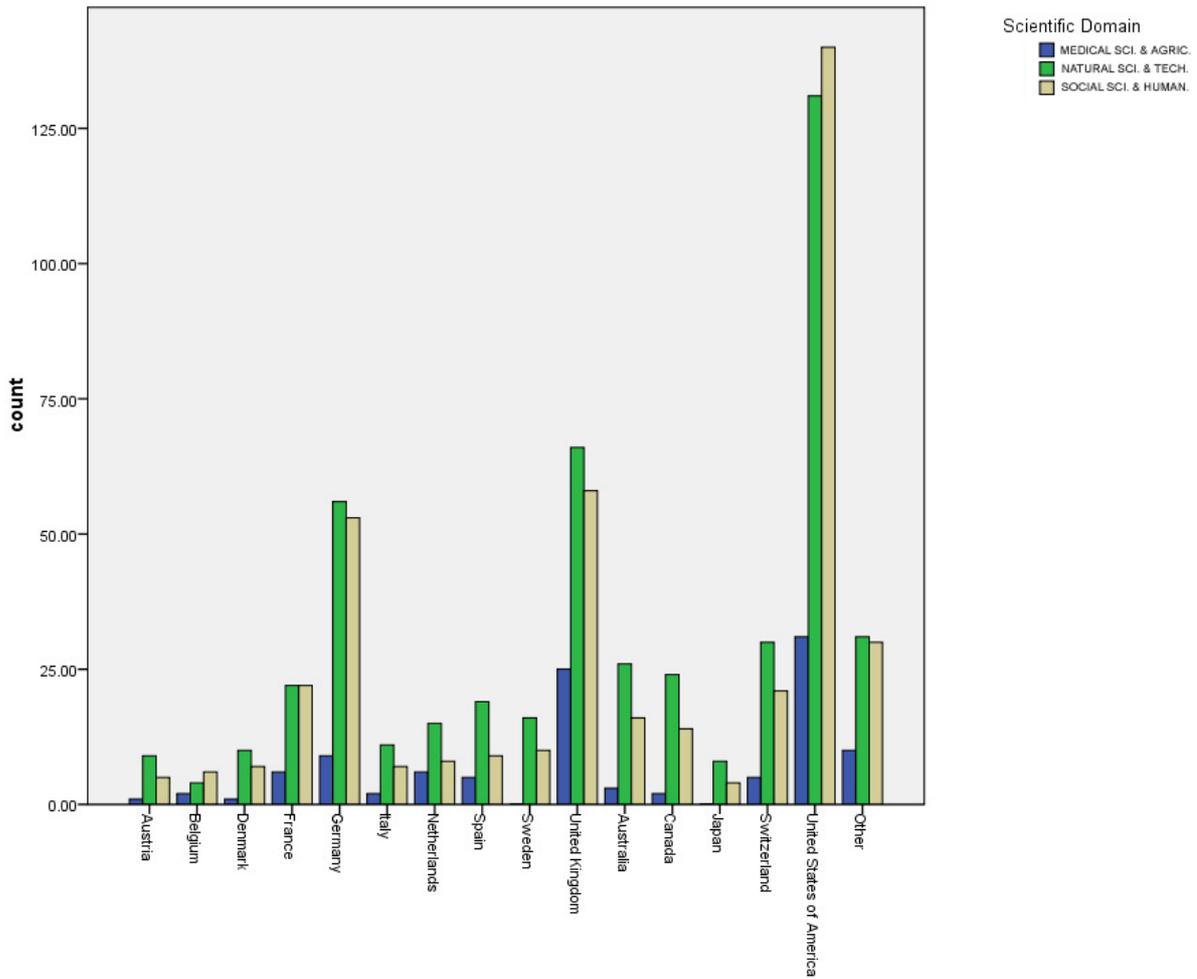


Figure 71 (above): Most commonly nominated countries where more attractive salary and incentives are an "important" or "highly important" pull factor for all researchers by researcher's field of science

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The figure presents results for both Groups of respondents (i.e. Group A + Group B).
- 2) The graph shows only countries accounting for at least 1 per cent of valid nominations for that question, with the 'other' category representing the remaining countries.

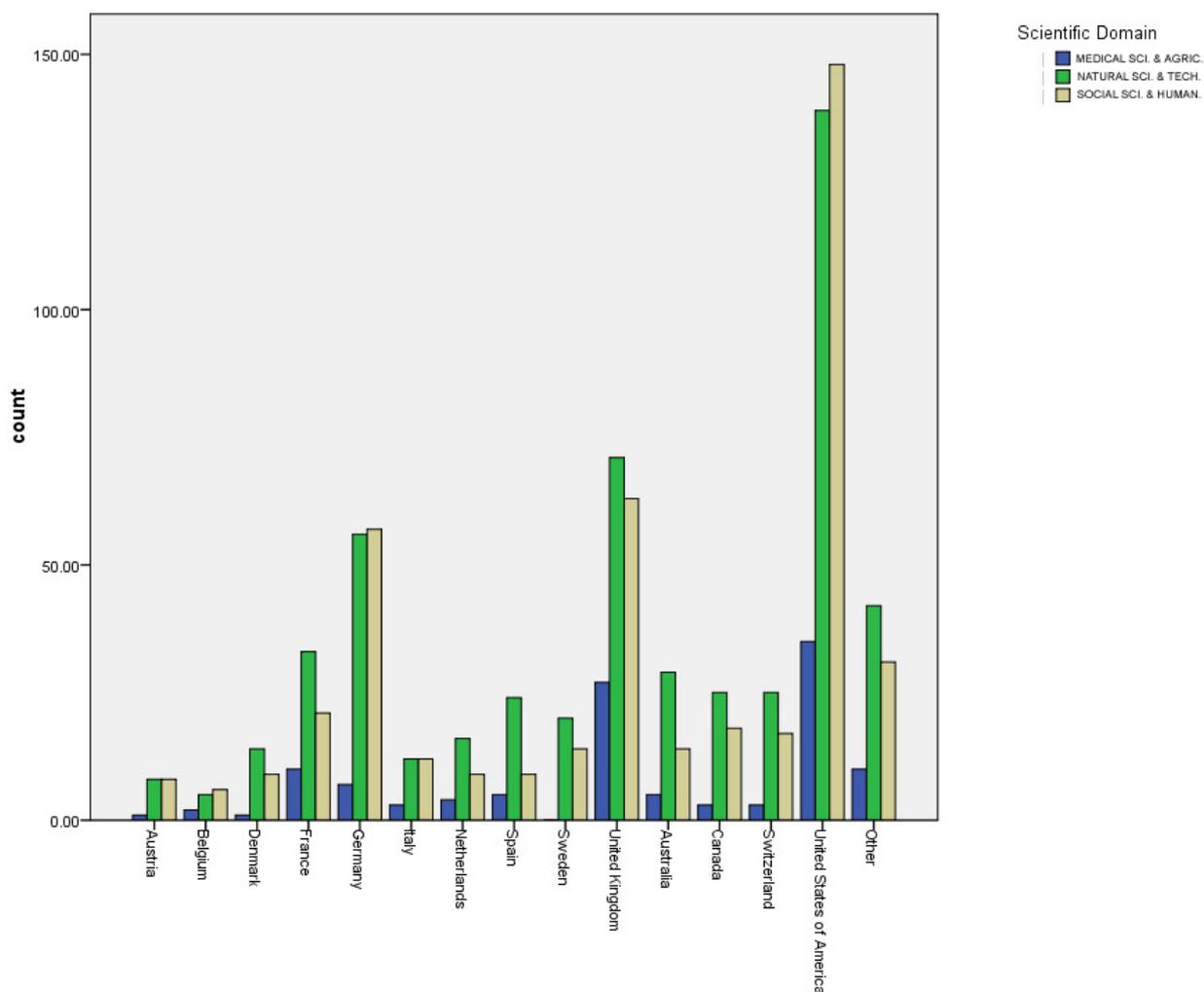


Figure 72 (above): Most commonly nominated countries where more attractive working conditions are

an "important" or "highly important" pull factor for all researchers by researcher's field of science

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The figure presents results for both Groups of respondents (i.e. Group A + Group B).
- 2) The graph shows only countries accounting for at least 1 per cent of valid nominations for that question, with the 'other' category representing the remaining countries.

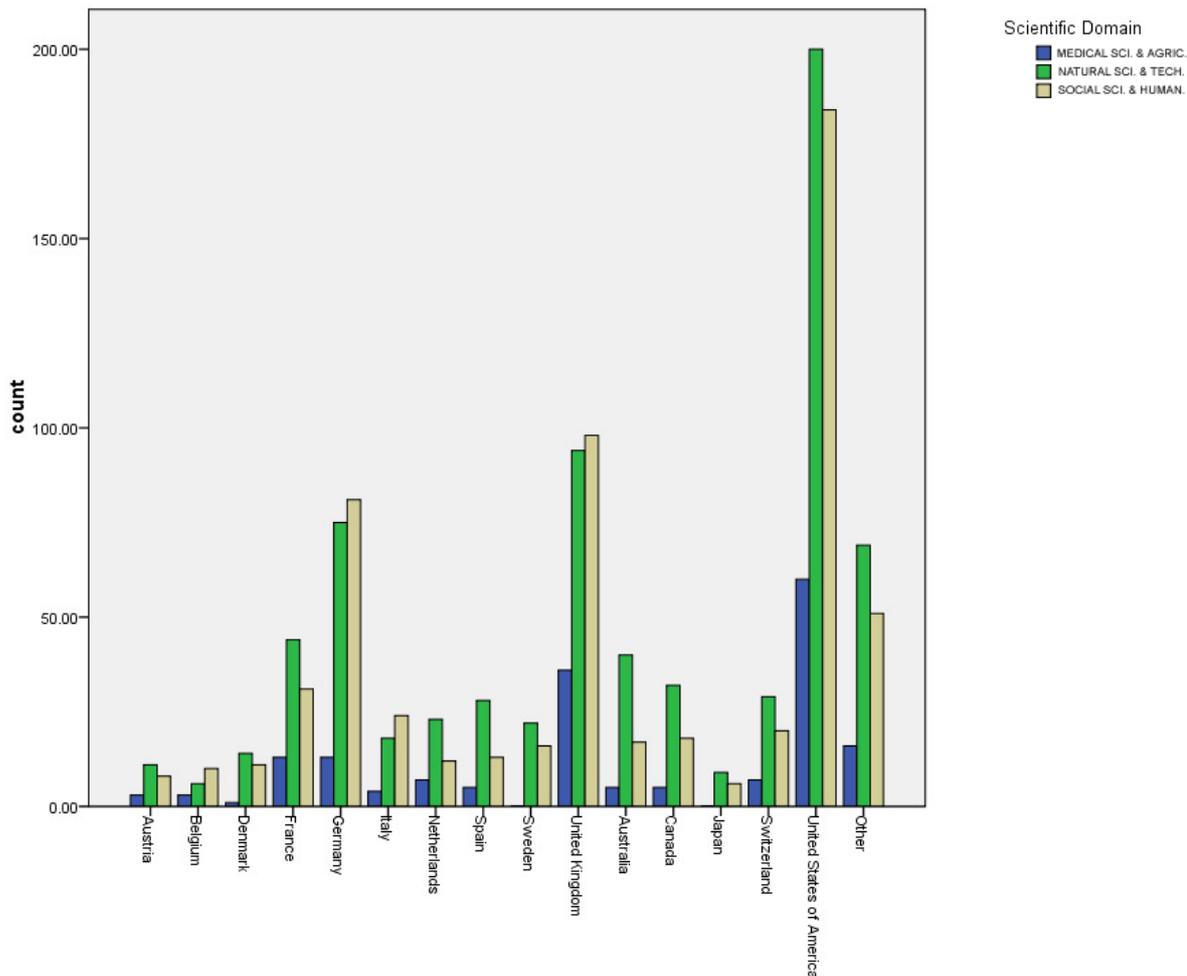


Figure 73 (above): Most commonly nominated countries where better availability of research facilities and equipment is an "important" or "highly important" pull factor for all researchers by researcher's field of science

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The figure presents results for both Groups of respondents (i.e. Group A + Group B).
- 2) The graph shows only countries accounting for at least 1 per cent of valid nominations for that question, with the 'other' category representing the remaining countries.

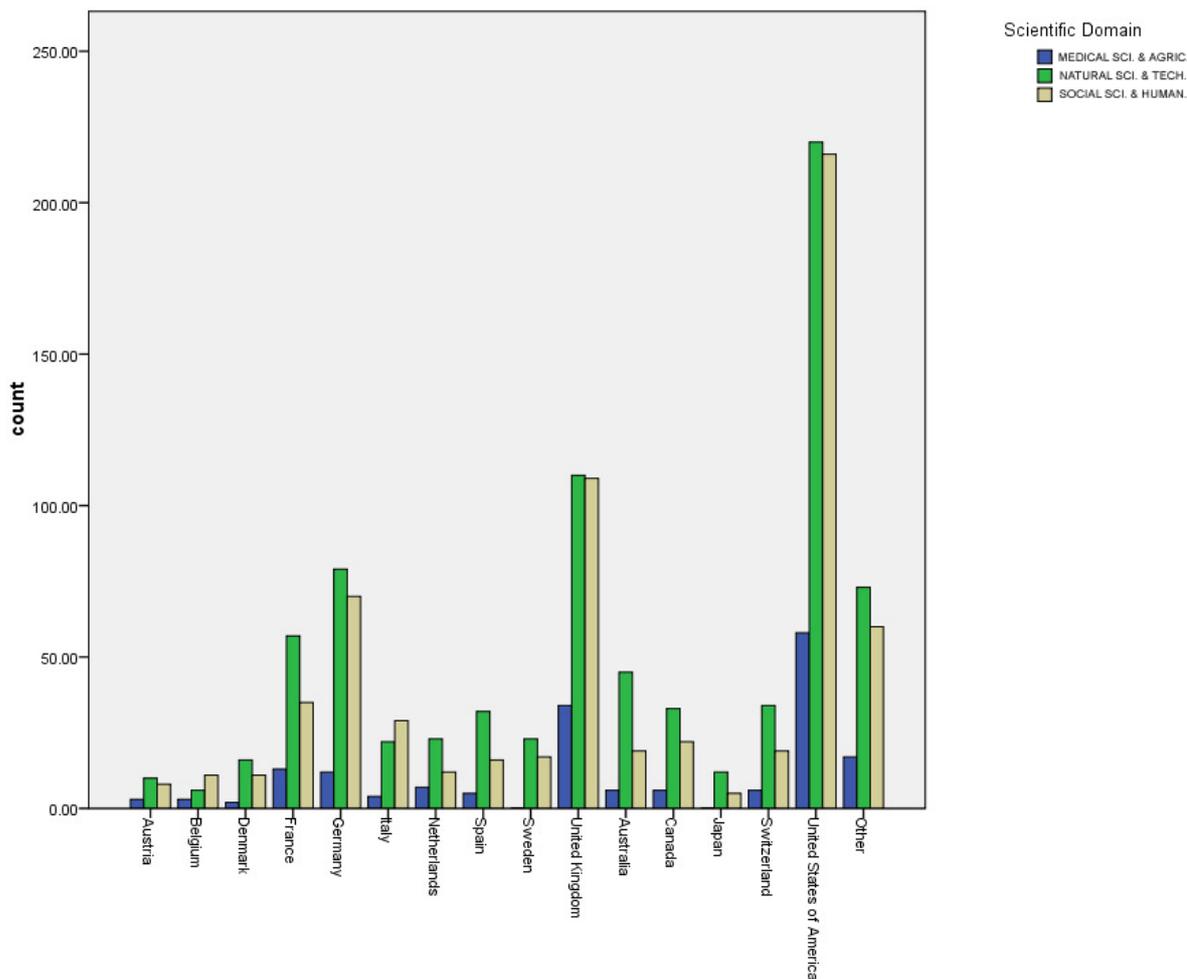


Figure 74 (above): Most commonly nominated countries where better availability of research collaborators is an "important" or "highly important" pull factor for all researchers by researcher's field of science

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The figure presents results for both Groups of respondents (i.e. Group A + Group B).
- 2) The graph shows only countries accounting for at least 1 per cent of valid nominations for that question, with the 'other' category representing the remaining countries.

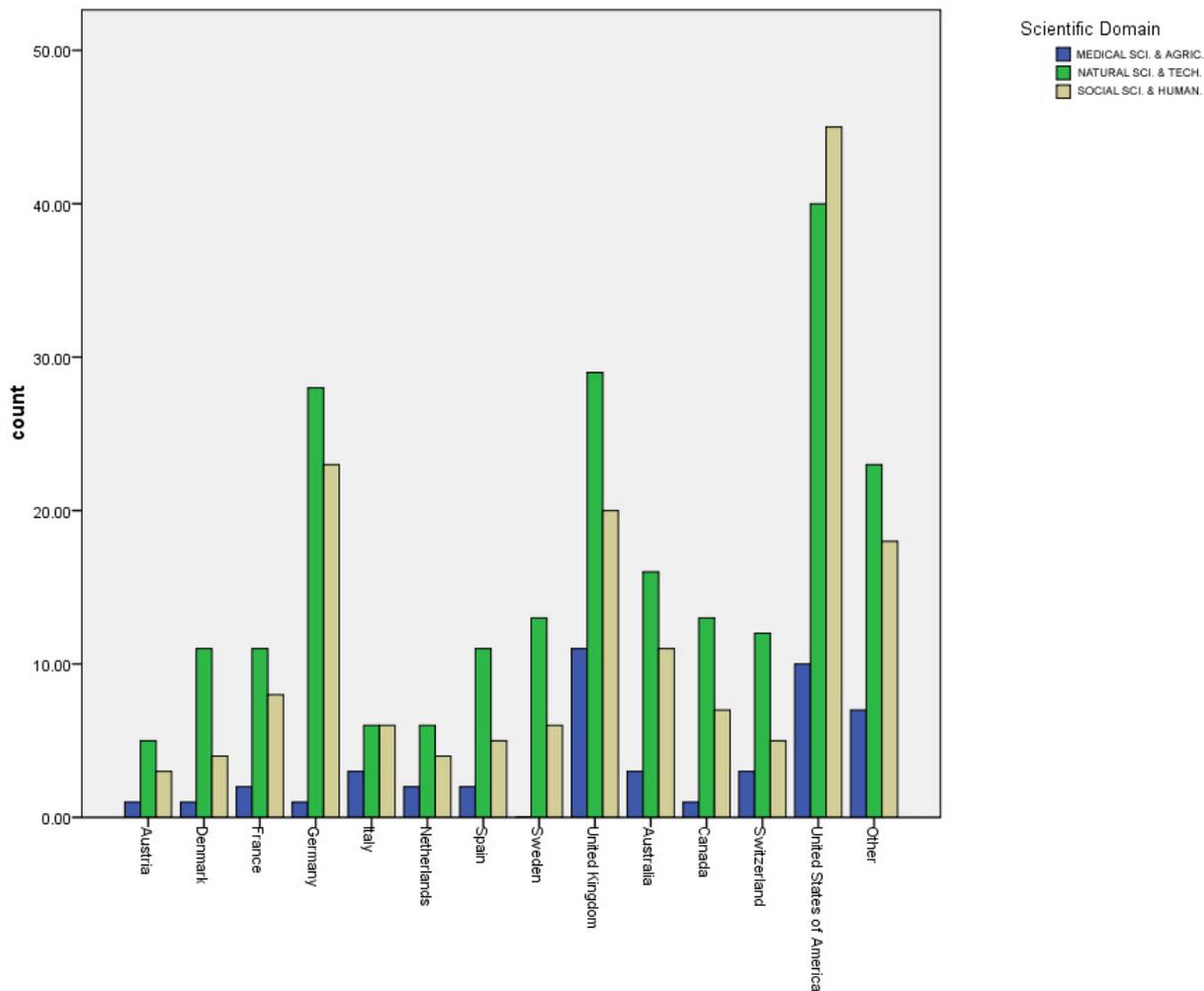


Figure 75 (above): Most commonly nominated countries where more attractive labour market regulations are an “important” or “highly important” pull factor for all researchers by researcher’s field of science

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The figure presents results for both Groups of respondents (i.e. Group A + Group B).
- 2) The graph shows only countries accounting for at least 1 per cent of valid nominations for that question, with the ‘other’ category representing the remaining countries.

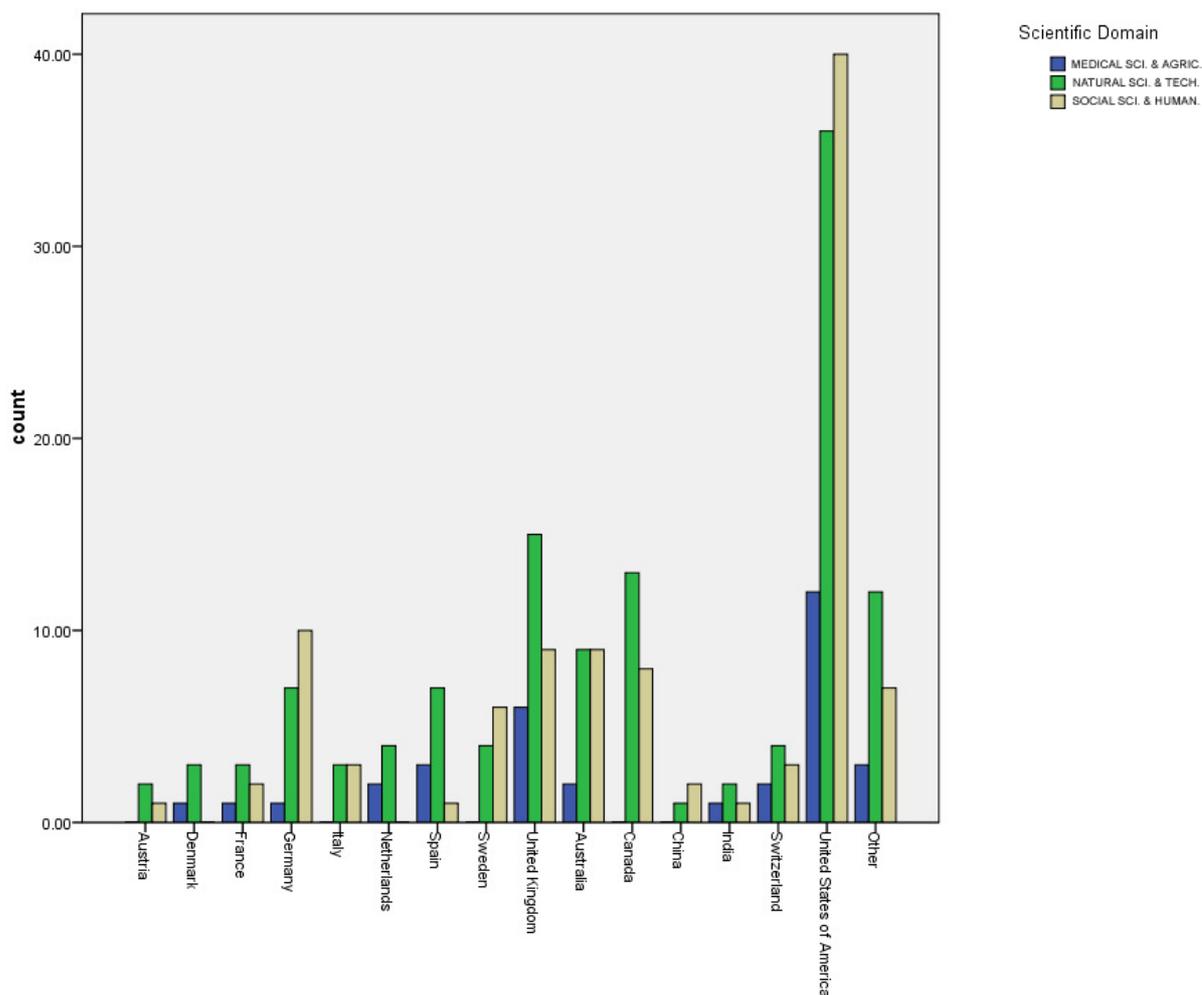


Figure 76 (above): Most commonly nominated countries where more attractive immigration regulations are an "important" or "highly important" pull factor for all researchers by researcher's field of science

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The figure presents results for both Groups of respondents (i.e. Group A + Group B).
- 2) The graph shows only countries accounting for at least 1 per cent of valid nominations for that question, with the 'other' category representing the remaining countries.

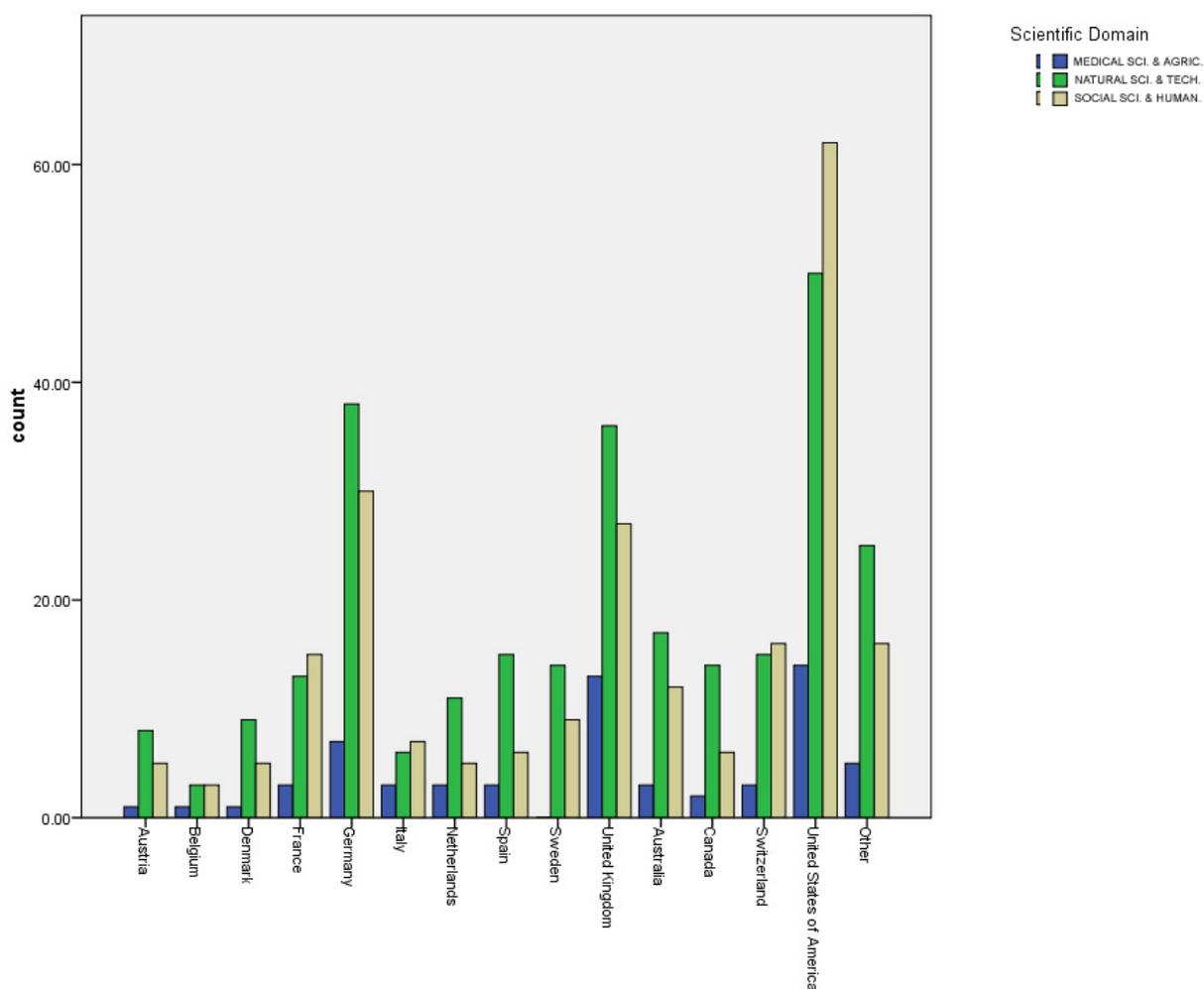


Figure 77 (above): Most commonly nominated countries where more attractive pension and social care provision is an “important” or “highly important” pull factor for all researchers by researcher’s field of science

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The figure presents results for both Groups of respondents (i.e. Group A + Group B).
- 2) The graph shows only countries accounting for at least 1 per cent of valid nominations for that question, with the ‘other’ category representing the remaining countries.

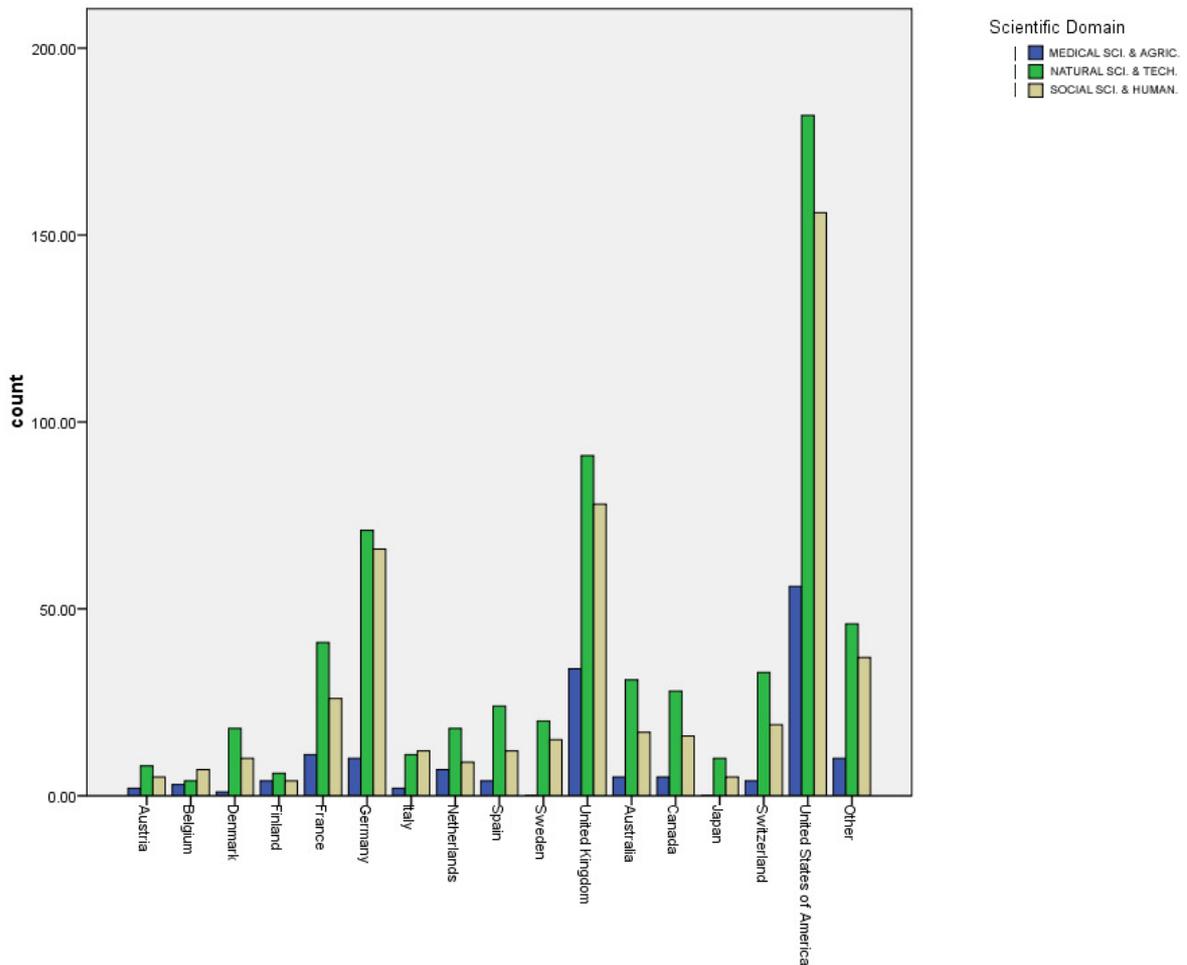


Figure 78 (above): Most commonly nominated countries where level of national research funding is an “important” or “highly important” pull factor for all researchers by researcher’s field of science
 Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The figure presents results for both Groups of respondents (i.e. Group A + Group B).
- 2) The graph shows only countries accounting for at least 1 per cent of valid nominations for that question, with the ‘other’ category representing the remaining countries.

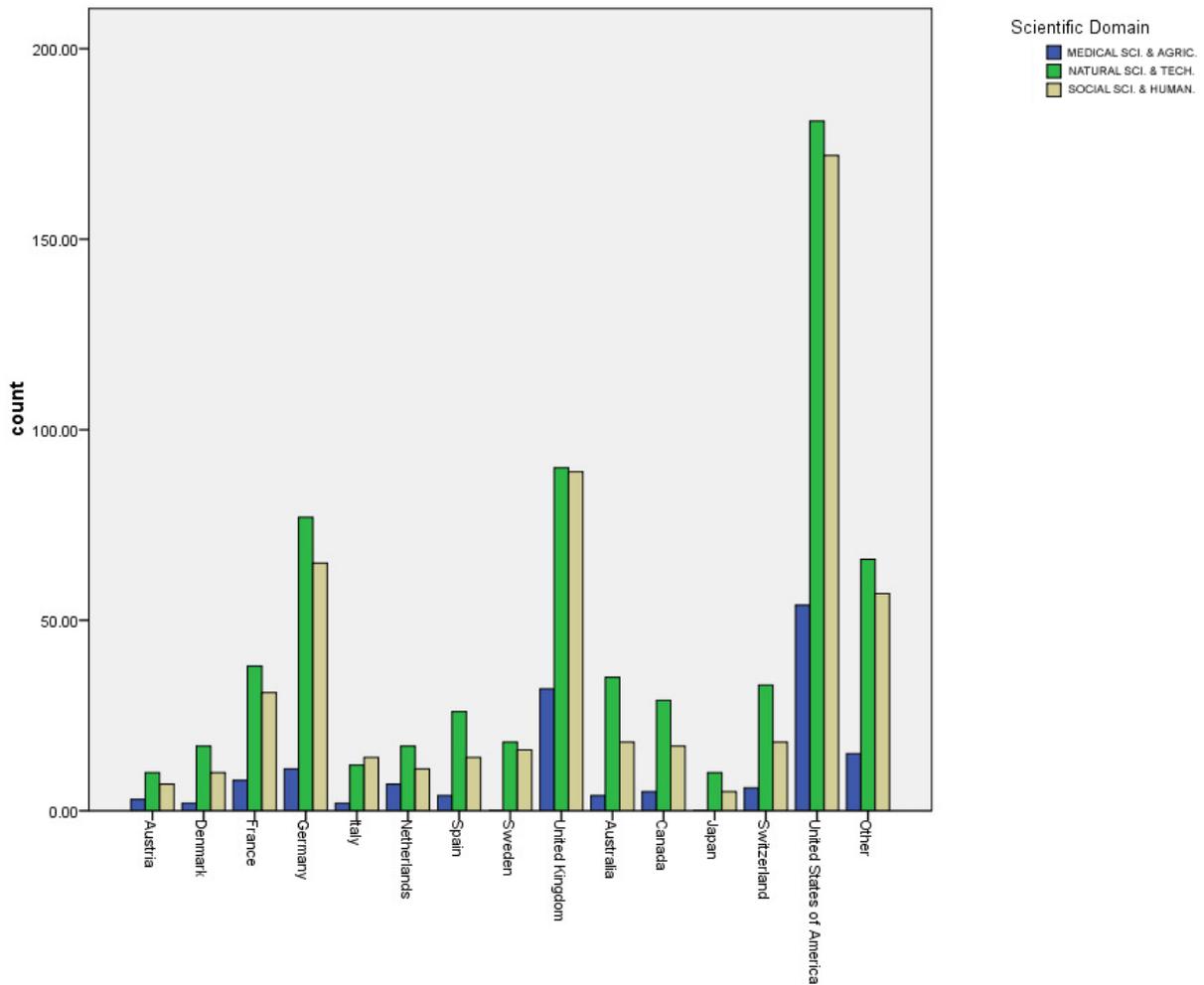


Figure 79 (above): Most commonly nominated countries where accessibility of research funding (the ability to access funding for the respondent's own research) is an "important" or "highly important" pull factor for all researchers by researcher's field of science

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The figure presents results for both Groups of respondents (i.e. Group A + Group B).
- 2) The graph shows only countries accounting for at least 1 per cent of valid nominations for that question, with the 'other' category representing the remaining countries.

3)

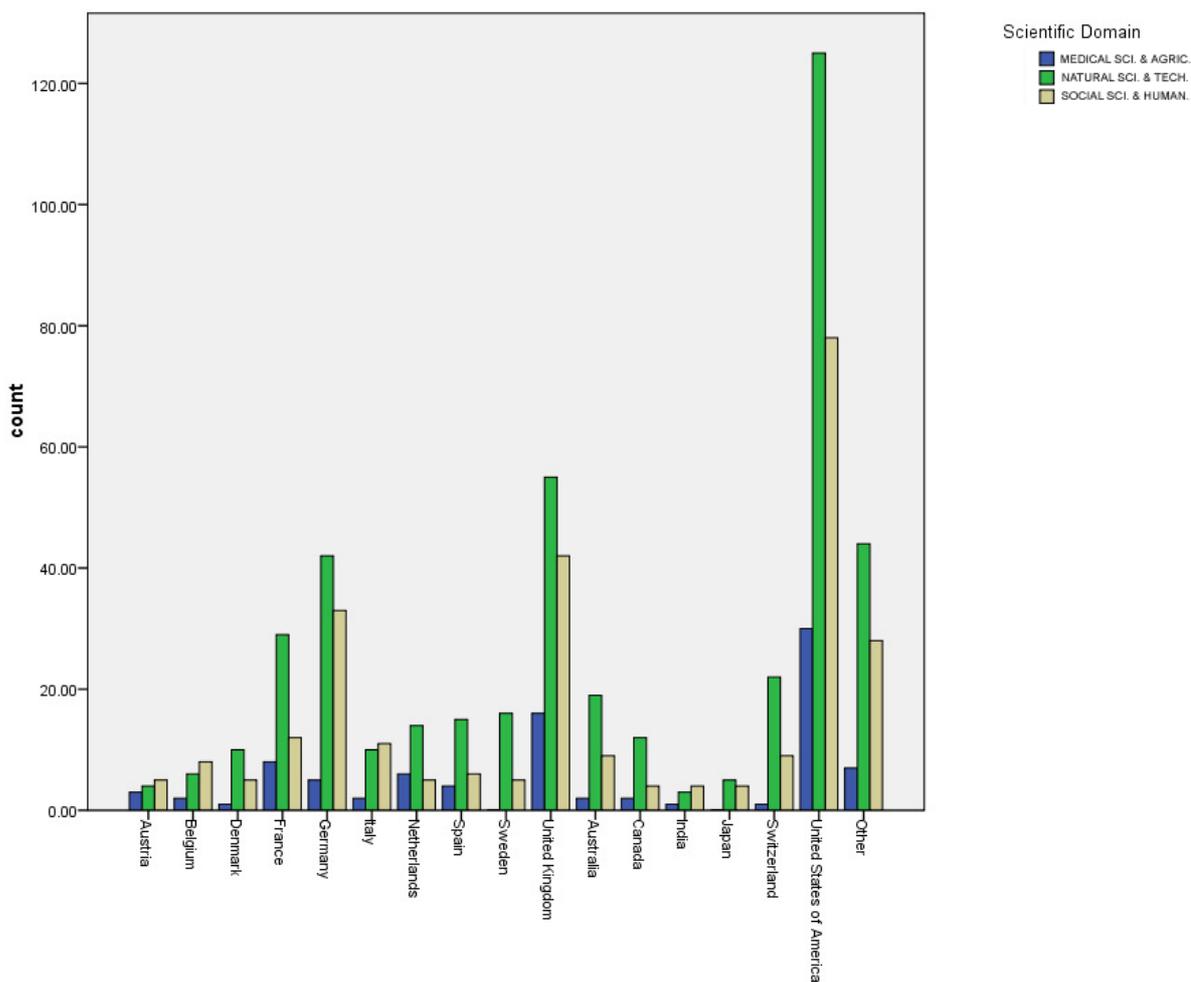


Figure 80 (above): Most commonly nominated countries where the prospect of better links with companies and other research users is an "important" or "highly important" pull factor for all researchers by researcher's field of science

Source: The Mobility Survey of the Higher Education Sector

Notes:

- 1) The figure presents results for both Groups of respondents (i.e. Group A + Group B).
- 2) The graph shows only countries accounting for at least 1 per cent of valid nominations for that question, with the 'other' category representing the remaining countries.