Support for continued data collection and analysis concerning mobility patterns and career paths of researchers

Deliverable 5 – Higher Education Sector Report (Indicator report)

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IDEA Consult

in consortium with:

- **Austrian Institute of Economic Research, WIFO**
- **iFQ, Institute for Research Information and Quality Assurance**
- **CHEPS, Center for Higher Education Policy Studies, University of Twente**
- **LaSapienza - University of Rome**
- **CFA, Danish Center for Research and Research Policy, Aarhus University**

and its subcontractors:

- **University of Wolverhampton**
- **Loft33**
- **CheckMarket**
- **Interago**

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EXECUTIVE SUMMARY

This MORE2 Higher Education Institutions (HEI) report presents the results of a survey carried out in the spring of 2012 among researchers in universities and other higher education institutes in the 27 EU Member States, Associated countries (Norway, Switzerland, Iceland) and Candidate countries (Croatia, Turkey, and the former Yugoslav Republic of Macedonia).

A large number of questions related to the careers, working conditions and mobility of researchers were answered by over 11,000 researchers across Europe, resulting in a final usable sample with 10,547 observations (researchers).

This HEI survey was implemented to provide data with a maximum degree of accuracy at both EU and individual country level. To reach this level of accuracy, different strategies were developed and implemented: a statistical sampling strategy, a multichannel data collection approach and a data editing and calibration strategy. Cross-checking researchers' responses shows that the descriptive information is consistent and reliable.

This approach resulted in a dataset that provides estimates on the numbers, mobility patterns, career paths and working conditions of researchers working in HEI institutes, reflecting the proportion of the overall population of researchers working in the HEI sector in the EU27 and the additional countries covered. The survey and analysis thereby contribute to the overall aim of the MORE2 project to provide internationally comparable data, indicators and analysis in order to support further evidence-based policy development on the research profession at European and national level.

Key findings are presented below.

Descriptive data on researchers in Europe

Number: 1,2 million researchers in Higher Education Institutes in EU27

According to Eurostat data, 1.2 million researchers (head count) work in Higher Education Institutes in the 27 EU Member States. There are approximately 500,000 female and 740,000 male researchers. 40% work in the Natural Sciences and Engineering & Technology, 36% in the Social Sciences and Humanities and 24% in Medical Sciences and Agricultural Sciences.

Gender: Underrepresentation of women in the research profession, particularly in later career stages

38% of the total EU27 researcher population are female. The distribution per country shows that the gender distribution in Western European countries is not necessarily more equal than in other regions. The data show that women are underrepresented in higher career stages and in the older age groups, whereas they are over-represented amongst part-time working researchers (confirming the findings in She Figures 2013 and OECD 2012). Moreover, male researchers are, on average, more confident about their future career than are female researchers (81% versus 72% are 'very' or 'somewhat' confident).

Family status: The majority of the researchers live in a couple with children

More than for other employed groups in the labour force, the majority of researchers live as a couple with children. A smaller share of female researchers lives as a couple or has children, as compared to their male counterparts. This relates to the fact that female researchers tend to be, on average, younger and in lower career stages compared to male researchers.

Career stage (first data collection according to definitions of the European Framework for Research Careers): variation across countries

As a first attempt to collect data on the distribution of researchers over career stages, as defined in the European Framework for Research Careers (European Commission, 2011), researchers were asked to select their current career stage from the following:

- R1: First Stage Researcher (up to the point of PhD)
- R2: Recognized Researcher (PhD holders or equivalent who are not yet fully independent)
- R3: Established Researcher (researchers who have developed a level of independence) and
- R4: Leading Researcher (researchers leading their research area or field).

This self-selection exercise was successful in the sense that the indicated career stages correspond well with the researcher's age and post. The R3 researchers are in the majority (32%), followed by R4 (29%), R2 (21%) and R1 (18%).

On the other hand, at country level, large differences exist between the proportion of researchers in post at each career stage and this should be taken into account when interpreting the results. It is important to take these variations into account when interpreting indicators at country level, as they may affect the average working conditions in a country when R1 researchers take up a high proportion of the total population, for example.

Doctoral training

PhD coverage: The vast majority of HEI researchers hold a PhD

EU-wide, 97% of researchers have obtained at least one post-secondary degree and 91% have a PhD or are currently enrolled in a PhD programme.

PhD funding: Primarily funded by own institute

The majority of PhD candidates or recent PhD holders are primarily funded by their own institute (42% as primary and 19% as secondary source of funding) and own funds are the most common secondary funding source (31% as secondary source and 17% as primary source of funding). National government funding comprises the third source of funding, with 31% of PhD researchers identifying this as primary source and 10% as secondary source. 4% of researchers receive funding from a European funding body as their primary source, with another 3% as their secondary source.

High satisfaction with academic features of PhD

Researchers are satisfied with academic aspects of their PhD work, such as their level of independence (72%, e.g. access to and management of project funding and supervision of students) and opportunities for professional development (72%, e.g. training). R2 PhD holders were slightly less satisfied during their PhD than R1 PhD researchers are now (for both items there exists an approximate 4 pp difference). Although differences are small, this observation may point to an

improvement in the situation of PhD researchers, but may equally represent a change of opinion during the transition to the R2 stage.

Structured doctoral training: provided to more than half of PhD researchers

High quality, industry-relevant doctoral training is instrumental in meeting the increased demand for knowledge workers. In this regard, a set of best practice based Principles for Innovative Doctoral Training has been identified and endorsed in Council conclusions[1].

Respondents to the survey were asked about the type of doctoral training received. 57% of PhD candidates and 47% of R2 doctorate holders report that they received 'structured training' during their PhD. In terms of specific training modules, the vast majority (around 85%) received up to two weeks of training per year while about 15% receive over two weeks. Even though there is a leakage between the R1 and R2 stages to other employment types or jobs outside the higher education institutes, the comparison of both groups may indicate developments over time. In this sense, a higher number of researchers appear to be receiving 'structured training' modules.

Scandinavian countries appear to provide relatively more early stage researchers with structured training, as do the Netherlands, the United Kingdom, Bulgaria and the Baltic countries Estonia and Latvia. In contrast, researchers in Germany, France, Romania, Poland and Italy appear less likely to receive such training.

Structured doctoral training: Focus on communication and presentation skills rather than on entrepreneurial skills

Content-wise, training modules in communication and presentation skills is the most common subject (40% have received training in this area). Skills which are more directly related to non-academic positions, such as people management, intellectual property rights and entrepreneurship, are less common features of training programmes in HEI (11%, 10% 8% respectively). Ethics training is provided to over 30% of researchers in Scandinavian countries and the United Kingdom.

Structured doctoral training: 26% receive ECTS credits

26% of PhD researchers who received structured doctoral training have received credits. In some countries, the awareness of the ECTS among researchers appears to be relatively low, with more than 20% not knowing whether or not they received ECTS credits. The share of researchers who receive ECTS credits is substantially higher among R1 researchers than among R2 (34% versus 20%).

Structured doctoral training: 79% of PhD researchers find it (very) useful

PhD candidates and recent PhD holders who have undergone structured training are generally satisfied with its relevance. 59% appreciate it as being 'useful' and another 20% as 'very useful'. Those researchers currently in R1 are more satisfied than with structured training during their PhD than current R2 researchers. (82% versus 76%).

Some country variations are also observed at this level, with the Scandinavian countries ranking first (89% or more are (very) satisfied). Furthermore, over 85% of Portuguese, Estonian and Irish and Hungarian researchers are (very) satisfied.

[1] *Report of Mapping Exercise on Doctoral Training in Europe: Towards a common approach* (European Commission, 2011)

Current employment and working conditions

High levels of satisfaction with academic aspects of current research employment

Researchers are generally satisfied with the different aspects of their current academic position. They are particularly satisfied with academic factors such as intellectual challenge (93%); level of responsibility (89%); reputation of the employer (88%) and independence (87%). Country differences exist in terms of the degree of satisfaction regarding opportunities for advancement, mobility perspectives, social status and remuneration.

Opportunities for advancement: Female researchers are less satisfied than their male counterparts

Gender differences are limited, although women are less satisfied with opportunities for advancement than their male counterparts (7 pp difference with male researchers; mobility perspectives (6 pp difference); job security (6 pp difference) and salary (5 pp difference). This opinion-based data appears to match other fact-based data in the survey which show that women are less likely to be mobile, for example.

Job security: Post-doctoral researchers are the least satisfied about job security

For post-doctoral researchers (R2), job insecurity appears to be the most important barrier to pursuing a research career (ERA public consultation[2]). The MORE2 survey confirms this finding. The data reveal a pronounced difference in satisfaction regarding job security between career stages. During earlier career stages, satisfaction is lower and those in the post-doctoral stage (R2) feel particularly dissatisfied given the uncertainty about their positions during the course of their appointment. Up to 43% of R2 researchers are dissatisfied with job security in their current post, compared to 38% in R1, 25% in R3 and 11% in R4. Linked to this is the fact that these post-docs (R2) are less satisfied with opportunities for advancement (45% dissatisfied in R2 versus 40% in R3 and 33% in R4).

Contractual situation: Precarious contractual situation for 31% of PhD researchers

In general, many researchers work on a fixed-term contract or may have no contract at all. This is most pronounced during earlier career stages R1 and R2. Those with no contracts, 'others' (often student status) and researchers with fixed term contracts of one year maximum, amount to 31% of the R1 PhD researchers, 10% of the R2, 4% of the R3 and 3% of the R4. Moreover, 55% of researchers in R1 with PhD and 47% in R2 also have fixed-term contracts, albeit of a slightly longer duration than 12 months. This highlights the precarious contractual situation of early stage researchers, particularly PhD researchers.

The increasing share of permanent contracts from lower (13% of R1 in PhD) to higher career stages (90% of R4) also suggests that researchers typically find stable positions only relatively late on their career paths, once completing their doctorate.

High teaching load in Eastern European countries

Eastern European countries show the highest proportions of teaching load in terms of time to spend on teaching versus other (research) activities. Nine of them have

[2] EC DG Research and Innovation (2012) Areas of untapped potential for the development of the European Research Area (ERA) – Analysis of the response to the ERA Framework public consultation.

the highest proportion in the category '76-100% working time': between 10 and 30% of researcher in this category versus an EU27 average of 8% in this category. It is clear that the time available for research is rather limited, making those positions less attractive for those who are pursuing a research career.

International mobility

With the focus of this survey being the international mobility of researchers, the level of detail and the scope of the data collected on the topic is highly significant. International mobility is estimated according to a variety of definitions, concepts and for different subgroups. The motives, barriers and effects are also explicitly surveyed and analysed. The richness of this data, accurate at country level, allows extensive analyses and comparisons. Here, we highlight the main findings on the levels of international mobility and go on to analyse the motives, barriers and effects of mobility in the next section.

The underlying survey is not a priori restricted to one definition or concept of mobility, but several concepts are constructed from the data and compared. Estimates are provided for international mobility:

- Currently on-going
- In the last ten years (versus before or never)
- For a duration of more than 3 months and of less than 3 months
- With changes in employer (versus without)
- During PhD, to obtain a PhD or in post-PhD career stages

These estimates are calculated with reference to the country of citizenship as origin and to the country of the most recent highest education as origin.

Subindicators for country, gender, career stages and fields of science are systematically analysed.

The flows of mobility are also presented at EU-level (inward and outward) and at country level within the EU.

An overview of the key findings on international mobility is further discussed for subgroups in the following sections:

- 14% of R2-3-4 researchers moved to another country to obtain their PhD,
- A slightly higher share (18%) of current or recent PhD researchers was mobile during their PhD (returning 'home' to obtain their PhD)
- Around 15% of researchers who currently work in the EU are currently mobile
- Around 30% of researchers were mobile for three months or more in the last ten years during their post-PhD career
- Just over one-third of this mobile group (12% of all researchers) changed employer when moving abroad
- A higher share of researchers (41%) were <3 month mobile (less than three months) in the last ten years during their post-PhD career.

These results correspond with existing literature on the topic to the extent comparison is possible given the use of different scopes and data.

PhD mobility

Two types of PhD mobility are measured: mobility in order to obtain a PhD in another country than the country of highest previous degree (PhD degree mobility); and international mobility of 3 months or more during the PhD. Furthermore, both the perspectives of destination and departure are presented.

14% of both current PhD researchers and post-PhD researchers moved to another country to obtain their PhD

14% of R2-3-4 researchers moved to another country in order to obtain their PhD. 14% of PhD candidates and recent PhD holders indicate that they are/will be internationally PhD degree mobile, i.e. they will obtain their PhD in another country than the one in which they obtained their previous degree (i.e. the degree giving access to the PhD). The current PhD candidates will be more PhD degree mobile than the R2 PhD holders (19% versus 12%).

When analysing countries of departure in terms of citizenship, researchers who are citizens of Malta, Greece, Slovenia, Ireland and Bulgaria are most likely to become PhD degree mobile (30% or more among the R1 and R2 researchers). The destination, in this case, may be in or outside the EU. In terms of departure from the country of highest previous education, researchers are more likely to obtain their PhD in another country after having obtained a bachelor's or master's degree in Greece, Switzerland, Italy, Ireland, the Netherlands (20% or more). This proportion of researchers is lowest in a number of East European countries, and in Belgium, Portugal, Finland and France (8% or less). In Eastern Europe, citizens are more mobile when obtaining a PhD than those researchers who received their highest education there. Outflow thus happens before the highest education phase.

From the perspective of the destinations for PhD degree mobility, the survey shows that small and open economies (Luxembourg, Switzerland, Austria, and Belgium), Scandinavian countries and Anglo-Saxon countries are the most common destinations for researchers with other citizenships to obtain a PhD. In the United Kingdom and Ireland in particular, the difference compared to share based on highest education is considerable. One interpretation is that mobility to these countries takes place before doctoral research - during the masters phase. In this case, the country of PhD is equal to the country of previous education, but the researchers are still counted as being 'foreign' citizens.

18% of current or recent PhD researchers were >3 month mobile during their PhD (returning 'home' to obtain their PhD)

After mapping the level of international mobility undertaken to obtain a PhD, the survey also analyses those researchers who migrated for 3 months or more during a PhD. Around 18% of doctoral candidates and recent PhD holders move for three months or more to another country (not restricted to the EU) during their doctoral research.

Comparison across countries shows that the proportion of >3 month mobility undertaken during the PhD ranges from just over 10% in Luxembourg to more than 55% in Italy. No clear geographical pattern is observed, except that 10 out of EU15 countries are below the EU27 average. Next to Italy, only Denmark and Spain have a PhD mobility rate of higher than 40%. Furthermore, Estonia, Slovakia, Romania and Turkey all have a PhD mobility rate of higher than 30%. Low rates are observed in Luxembourg, Ireland, United Kingdom, Austria, Germany, Poland, Belgium and Sweden (all 11-12%), which are in some cases countries with high levels of PhD degree mobility (Luxembourg, Ireland, Sweden) or are popular destinations for PhD mobility (United Kingdom, Germany).

>3 month mobility in post-PhD career stages

Around 30% of researchers were mobile for three months or more during the last ten years of their post-PhD career

31% of post-PhD researchers in the EU27 have worked abroad (EU or worldwide) as researchers for more than three months at least once during the last ten years. This estimate comes from a direct question in the survey, but is similar to the definition of mobility referring to country of citizenship (30%) or country of previous highest education (28%).

Another 17% have been >3 month mobile but over ten years ago. This means that around 48% of the researcher population has been mobile at least once in their career following their PhD.

Based on a comparison of mobility in the last three years (instead of last ten years), R2 researchers more actively participate in >3 month mobility than their counterparts in later career stages.

Mobility flows reflect economic crisis and historical, linguistic or cultural links

When analysing countries of departure - defined as the country of citizenship - it is largely countries which are suffering significantly amidst the current economic crisis (Greece, Spain, and Italy) which stand out. 7% of all moves are by Greek citizens (compared to 3% of the researchers in the sample begin Greek citizens), another 7% by Italians (compared to 5% Italian citizens in the sample) and 6% by Spanish researchers (compared to 4% Spanish citizens in the sample). Eastern European countries such as Slovenia, Romania, Hungary, Bulgaria and Poland are around 2-3% (but there are for these respective countries also between 2 and 4% researchers with this citizenship in the sample). It is also worth noting that 11% of the moves are by German citizens (compared to 4% of the researchers in the sample being German citizens).

As with >3 month mobility during the PhD, the USA (18% of all moves) and the United Kingdom (11%) stand out as destinations for >3 month mobility during post-PhD careers, as do Germany (11%) and France (8%). The identified mobility flows clearly reflect the influence of historical, cultural or linguistic links with the reporting country. These observations confirm the main findings on destinations in the Careers of Doctorate Holders (CDH) Survey 2009 data (OECD, 2012).

Return mobility: 11% of researchers return to their country of citizenship or that of highest previous education

The survey provides one type of estimate for return mobility, namely that of researchers who, during their post-PhD career, return to work in either their country of citizenship or in the country where they received their most recent and highest education.

According to this definition, 11% of mobile researchers return at least once to their country of citizenship, as do 11% to the country where they received their most recent highest education. The highest shares of this type of return mobility are observed in Ireland (39% according to citizenship and 25% according to highest education) and Denmark (28% and 30%). Of the researchers who obtained their highest education in the Netherlands, 22% return at least once in their post-PhD career while only 11% of mobile Dutch citizens return. A similar relation between both indicators is observed in France, Estonia, Switzerland, Belgium and Norway.

Low average duration and frequency of moves

The average duration of a long term move is relatively low. 44% of the registered international long term moves lasted for 3-6 months. 18% of the moves were longer than 3 years, and another 16% lasted between 6 months and one year. This average remains similar across gender, family status and career stage, but higher for moves with employer change (average duration of 1 to 2 years).

On average, a mobile researcher has moved 1.27 times in the last ten years. Almost three quarters of mobile researchers have moved only once.

Employer mobility

12% of all researchers changed employer when moving abroad

12% of researchers have worked abroad for a new employer (for 3 months or more and at least once in the last ten years). This represents around 40% of all mobile researchers and provides an indication of 'employer' mobility. Employer mobility is concentrated to some extent at a subgroup of researchers who went through a change in employer during more than one of their international moves.

No real variations between fields of science are observed, but female researchers are slightly more inclined towards employer mobility than are their male counterparts (44% versus 39%).

Employer mobility is related to >3 month mobility

Among those researchers currently working in the United Kingdom, Austria, Cyprus, Estonia, Ireland, Finland and Switzerland, the majority of `>3 month mobile respondents[3] have undertaken at least one move with change in employer. Yet in Croatia, Slovenia and Norway less than one quarter changed employer in one of their moves.

Overall there is an inclination towards more employer mobility when the overall degree of >3 month mobility is higher for the country. Most prominent exceptions are the United Kingdom and Estonia, where the degree of employer mobility is relatively high as compared to a relatively low degree of overall >3 month mobility; and Norway and Iceland, where the degree of employer mobility is relatively low as compared to a relatively high degree of overall >3 month mobility.

<3 month mobility in post-PhD career stages

41% of researchers were <3 month mobile in the last ten years during their post-PhD career

41% of post-PhD researchers in the EU27 have worked abroad for under 3 months at least once in the last ten years. Another 13% has been <3 month mobile only more than 10 years ago. This means that more than half (54%) of researchers have worked abroad for under 3 months, regardless of whether or not they have been mobile for >3 months.

[3] The data include all researchers currently in working in a country and who were mobile in the last ten years. The entire mobility experience may concern a move to the country of current employment from abroad (inflow); a move abroad and back to the country of current employment (return mobility); or a multiplicity of moves, ending in the country of current employment. There is thus a mixture of inflow and outflow possible in the mobility indicators on employer mobility and effects (as these concern the entire mobility experience).

At country level, it is noted that differences are not pronounced, but a number of East-European countries rank highly in terms of <3 month mobile researchers: Hungary and Romania, followed by Iceland, Belgium, Denmark and Austria.

No substitution between >3 month and <3 month mobility for family reasons

In general, it could be expected from existing studies (e.g. Ackers 2010) that <3 month mobility would be higher among female researchers or researchers with a family or children, because the personal barriers are lower for short term than for >3 month mobility. The survey data do not confirm this, neither in terms of family status nor gender. Female researchers are, on the contrary, less inclined to short term international mobility during the post-doctoral career stages in the last ten years than their male counterparts (37% versus 43%).

Gender perspective: *Female researchers less likely to be mobile*

For all types of international mobility, there is an indication that female researchers are, to some extent, less mobile than their male counterparts. For current mobility and PhD mobility the differences are limited but in >3 month international mobility during the post-PhD career stage, the gender gap is larger. For male researchers, the share for mobility amounts to 28% compared to 21% for female researchers. The gap is also larger in higher career stages: 5 percentage point difference in R2, 8 in R3 and 9 in R4.

Differences also occur across countries. Male researchers are substantially more >3 month mobile in Cyprus, Germany, Finland, Sweden, Slovenia and Czech Republic (11 to 25 pp difference). On the other hand, female researchers are more >3 month mobile than their male counterparts in Macedonia (FYROM), Belgium, Switzerland, Denmark and Malta.

In contrast, it is interesting to note that female researchers are more likely to be international mobile when it involves a change in employer (44% versus 39%).

Also in terms of the <3 month internationally mobile researchers, there is a difference of 6 pp between men and women. Again, variations occur across countries. Male researchers are considerably more <3 month mobile in Romania, Finland (around 20 pp difference) and also in Sweden, Slovakia, Spain and the United Kingdom (more than 10 pp difference). On the other hand, female researchers are more <3 month mobile than their male counterparts in Portugal, Norway, Malta, Croatia and Macedonia (FYROM) (more than 5 pp difference).

Field of science*: high PhD mobility in Humanities and Social Sciences, high post-PhD mobility in Natural Sciences and Engineering*

Current international mobility, on average 15%, is consistent across the different fields of science. The highest percentage of currently mobile researchers is observed in the Natural Sciences (19%), the lowest being in the Agricultural Sciences (12%).

>3 month mobility during the PhD is most common in the fields of Humanities and Social sciences (25% and 22%) compared with around 16 % in the other fields.

Variation between the fields of science also exists for >3 month international mobility, where the highest share of post-PhD mobile researchers is observed in the Natural Sciences (38%) and is lowest in the Agricultural Sciences (24%). Engineering and Technology is also above the general average (31%). Social Sciences and Humanities are around 30%. However, the highest average number of moves per researcher is found in the Humanities.

When combining >3 month and <3 month mobility profiles, it is found that in the Social Sciences and Humanities, but particularly in Agricultural Sciences, >3 month mobility is relatively less frequent than average, while <3 month mobility is more common. For Social Sciences and Humanities this is to be expected from existing studies, yet is only confirmed by this survey to a limited extent. The Natural Sciences, Humanities and Engineering and Technology are the fields with relatively high rates of both short and >3 month mobility whereas Medical Sciences have relatively low rates of mobility.

Motives for international mobility

Researchers are driven by a mix of motives that compel them to undertake international migration. These motives are the result of a combination of intrinsic and extrinsic motivations and personal factors at any stage of their career.

PhD mobility: primary motives are intrinsic

For PhD degree mobility, virtually all the intrinsic motivations are deemed important, particularly the availability of a PhD position (84% of the R1 and R2 researchers find this important); quality of training and education (76%); and career progression (75%). The extrinsic factors of social security, pensions, and job security are considered less important motives for PhD degree mobility, although there is a 12 pp difference between R1 and R2 researchers. This could imply that job security is becoming more of an issue now than previously, or that priorities have changed after researchers moving to the post-PhD stage.

Mobility during PhD training is also largely motivated by intrinsic factors such as career progression (83%); working with leading experts (82%); and facilities and equipment (78%). Employment-related motives are by definition less important for this type of move.

>3 month post-PhD mobility

Primary motive is career progression

For post-PhD career mobility, the patterns of motives reflect those for PhD degree mobility. For their most recent EU move, researchers most frequently cite career progression as being an important motive (83%); followed by working with leading experts (75%); available funds (70%); facilities & equipment (69%) and positions (69%).

The importance of career progression as a motive for mobility is confirmed in the analysis at the level of the individual moves. For each specific move, the primary motive was given, and career progression was selected in 16% of the cases (compared to 11% for the second motive 'working with leading experts').

Different priorities across career stages are reflected in the motives

The importance attached to varying motives during different career stages reveals changing priorities. R4 researchers have confidence in their research and position and find research autonomy, personal or family reasons and quality of training and culture more important than the average researcher. R2 and R3 researchers primarily seek availability of funds and positions to increase job security. For R2 researchers, career progression and remuneration are also important motives for post-PhD mobility.

Women consider most of the motivational aspects to be more important than do men. Women are more motivated by available funds (10 pp difference between female and male researchers); career progression (+9pp); culture (+7pp) and available positions (+6pp). This pattern follows that of the R3 and particularly R2 researchers, as female researchers are more highly represented in earlier career stages.

Motives for employer mobility: career progression and availability of positions

Career progression remains the main reason for employer mobility. In even more of the moves, it is selected as the single most important motive (24% compared to 16% for overall >3 month mobility). Compared to mobility without a change in employer, the availability of positions is more important when changing employer (15% versus 8%) and working with leading experts is less important (6% versus 11%).

Effects of international mobility

Overall data indicate that researchers consider international mobility in post-PhD career stages to have largely positive effects.

Important output, skills and network effects

The >3 months international mobile researchers feel that the output effects (quality of output, citation impact, patents, number of co-authored publications) are the most important factors related to mobility. On average, 60% perceive these factors as (strongly) increased compared to around 25% of researchers who perceive quality and co-authored publications as (strongly) decreased and 15-17% who cite patents and citation impact as (strongly) decreased. This leaves around 14-21% of researchers who see no change in these factors.

Other important effects are the advancement of research skills (80% increased, 11% unchanged and 9% decreased) and the development of international contacts and networks (74% increased, 7% unchanged and 19% decreased).

Although overall career progression has increased, according to 55% of researchers (compared to 14% unchanged and 31% decreased), other career-related factors are less affected. For example, the ability to obtain international research funding has increased and decreased for the same share of researchers (39-40%). Job options in academia (33% increase versus 48% decrease) or outside (27% increase versus 47% decrease) as well as progression in remuneration (17% increase versus 43% decrease) tend to have decreased for more researchers than increased.

The pattern is very similar for the recently mobile (researchers who were >3 month internationally mobile in the last 5 years).

Higher career effects for highly mobile researchers

The effects on job options and overall career progression are considerably higher for researchers who have worked both in and outside the EU (as compared to those who were only mobile inside the EU or only outside the EU).

Higher effects for female researchers

Concerning gender differences, women are generally much more positive when appreciating the mobility effects than men. Most notably, women score higher on network effects such as 'recognition' in the research community, international and national contacts/networks.

Slightly higher effects when involving a change in employer

When a change in employer is involved in one of the moves of the researcher, effects are similarly ranked but are slightly more positive than in general. For researchers who have changed employer at least once, whilst moving internationally, emphasis is more on job options in academia (increase instead of decrease on average though the effect still remains relatively low) and outside academia, recognition, the ability to obtain international funding and output effects.

International non-mobility in post-PhD career stages

31% of researchers have never been internationally mobile in post-PhD career stages

To estimate the number of 'never mobile' researcher in post-PhD careers stages, both >3 month and <3 month mobility are considered. EU-wide, 31% of all researchers in the post-PhD career stages have never been internationally mobile (neither <3 months nor >3 months).

In Poland, almost two thirds of researchers are never-mobile, and in Latvia the proportion is almost half. On the other hand, countries such as Iceland, Luxembourg and Switzerland have less than 15% of never-mobile researchers.

Barriers to international mobility

PhD mobility: primary barrier is obtaining funding

For mobility during the PhD phase, obtaining funding is the most significant barrier to mobility (64% of researchers). Finding a suitable position follows for more than half of the cases. When comparing levels of consideration given to PhD mobility, personal or family reasons seem to make a substantial difference between making the effort to find a position or not.

Post-PhD mobility

Primary barrier is to obtain funding

Compared to the perceived barriers for R1/2 type of researchers, it appears that barriers are ranked more or less alike (with some exceptions such as potential loss of professional network ranked more highly in post-PhD career stages). Also relating to post-PhD mobility, obtaining funding for mobility/research is the most oft-mentioned barrier for the researcher's most recent move (43%). For around 35% of researchers, finding a suitable position and logistical problems form barriers to international mobility. The least mentioned barriers are transferring research funding, quality of training and education and language/culture (important to between 16% and 24% of researchers).

71% of R4 researchers with long-term mobility experience believe international mobility has become easier over time

On comparing the barriers, as stated by the three research groups R2, R3 and R4, the established R4 researchers experience a higher barrier on obtaining funding for their research as compared to R3 researchers who see this as much less of a barrier (50% versus 38%). R3 researchers generally indicate fewer barriers compared to the other research groups.

Established researchers (R4) with long-term mobility experience believe that it has become easier over time for researchers to become internationally mobile during their career, with women being more positive in this regard. Overall, 71% think that this is the case. Given the large majority, this may well be an indication of gradually decreasing barriers for mobility in the EU.

Employer mobility: personal reasons, suitable position and network are more important barriers

When employment change is involved, a shift can be noted from obtaining funding for mobility (relatively less important) towards personal/family reasons, finding a suitable position and potential loss of contacts with the professional network (relatively more important).

Non-mobile researchers: personal and family reasons are more important

When asked for explicit reasons for non-mobility, researchers rank personal and family reasons as being most important. Funding and logistical problems again appear as the top 3 barriers.

Facilities for research appear less important for non-mobility as when it was a barrier to be overcome in post-PhD mobility; for transferring funding the opposite is seen.

Female researchers find obtaining funding or transferring funding a more important discouraging factor for mobility than do their male counterparts. Male researchers only find the potential loss of contact with the professional network slightly more discouraging.

Researchers with children find logistical problems and personal/family reasons more important, whereas those without children indicate the potential loss of professional network, but also quality of training and finding a suitable position as reasons for discouraging mobility.

Collaboration

77% of EU researchers collaborate internationally

EU-wide, 77% of researchers collaborate internationally: 67% indicate that they collaborate with colleagues from other EU universities or research institutes, and 52% with colleagues from non-EU institutions.

In Greece and Macedonia (FYROM), 90% of researchers collaborate internationally and in Austria, Slovenia, Cyprus and Luxembourg this figure is around 86%. On the other hand, in Latvia, Turkey and Poland, international collaboration is at its lowest (around 60-65%).

More collaboration with academic partners than with non-academic partners

Researchers in HEI tend to collaborate less with the non-academic sector outside their country (19% collaborate with private industry in Europe and 11% outside Europe) than the academic sector abroad.

Differences occur across countries, with higher degrees of collaboration with the non-academic sector undertaken by researchers from Ireland, the United Kingdom and Cyprus, for example.

More collaboration in later career stages

Researchers' career stage is an important factor: those further advanced in their career tend to collaborate more so than those in the earlier stages. For example, 88% of the R4 researchers collaborate internationally compared to 83% in R3, 70% in R2 and 55% in R1.

Impact of >3 month mobility on exchanging knowledge and enhancing collaboration

In line with general expectations, >3 month mobility is interlinked with other forms of mobility and collaboration. Long term (>3 months) and short term (< 3 months) mobility profiles are strongly interrelated. Moreover, long term international mobility is positively related to international collaboration: researchers who have been >3 month mobile have also collaborated more frequently with research partners abroad and outside the EU. This is the case for both academic and non-academic partners.

Mobility is positively correlated with collaboration activities. Around three quarters of the mobile researchers who collaborate internationally indicate that this collaboration is the result of a mobility experience. Intersectoral mobility to private industry is also positively correlated with collaboration with the private sector (10 to 20 pp difference).

Virtual mobility partly substitutes short term mobility

The development of virtual communication/interaction technology appears to be an important aspect of research mobility. For the majority of respondents who indicated that they have been involved in international collaboration, virtual technology helps to reduce international visits (50% for short term and 9% for long term). This can be seen as a growth sector which has an enormous potential impact, and which could add a new dimension to international research mobility. A complete replacement of physical mobility is not anticipated, but it may also advance international collaboration for those who, for whatever reasons (such as family, personal reasons or other barriers), might not be able to engage in international research collaboration.

Intersectoral mobility

Following international mobility and collaboration, intersectoral mobility was extensively surveyed and indicators on intersectoral mobility during the PhD or post doctoral career stages are provided. This not only relates to the private industry but also to private, not-for-profit, public and government sectors.

Intersectoral mobility during PhD: Almost one in four PhD researchers had work experience as researchers outside non-academia

23% of the R1 and R2 researchers were mobile to a sector outside of academia during their PhD (either in or outside the country of their PhD). 4% of researchers were active in private industry and 9% in the private not-for-profit sector, whereas 10% gained access to the public or government sector.

PhD stage: 23% of researchers have been intersectorally mobile

Intersectoral >3 month mobility during the PhD is observed for 23% of researchers; 4% were mobile in the private industry; 9% in private not-for profit and 10% in the public or government sector.

Post-PhD stage: 30% of researchers have been intersectorally mobile, 13% in dual position

During the post-doctoral career stages, 30% of EU researchers have been intersectorally mobile: 12% to private industry, 7% to private not-for-profit sector and 15% to public or government sector[4].

Currently, 13% of researchers work in a dual position of which the lion's share is their primary position in academia, with their secondary position being work in the public or government sector.

3% worked in a dual position in private industry in the last ten years (43% of those who have worked in private industry in the last ten years).

Gender perspective: Differences at country level

There is no significant difference between female (28%) and male (31%) intersectoral mobility shares, except at country level. Female researchers are less likely to be intersectorally mobile in Macedonia (FYROM), Hungary, Germany, Denmark and Bulgaria, with the proportion of women being between 10 and 17 pp below that of men. In France, Ireland and Poland, there is virtually no difference between the sexes. On the other hand, women are more likely to be intersectorally mobile in Cyprus (17%), Turkey (10%) and the United Kingdom (5%).

Over the last ten years, having a dual position in private industry is more common in men than women (7pp difference).

Intersectoral versus international mobility: Similar motives, higher satisfaction about opportunities for advancement, mobility perspectives and salary

Researchers who are currently in a dual position: academia/private industry indicate that they are relatively more satisfied with opportunities for advancement, remuneration, social status, mobility perspectives, dynamism and independence in their current industry post than in their current academic one. On the other hand, the academic position is better evaluated with respect to job security, job location, employer, intellectual challenge and degree of independence.

Furthermore, this group of researchers indicate a similar ranking of motives for intersectoral mobility than for international >3 month mobility. Career progression stands out as an important motive for intersectoral mobility and is (based on information on promotion per move) secured slightly more often than posts involving international moves. Furthermore, intersectoral mobility is more often motivated by remuneration but also by research autonomy.

Female researchers are motivated for intersectoral mobility more so than their male counterparts by the quality of training, education and first-hand experience, also by extrinsic factors like social and job security and by general working conditions.

[4] Multiple destinations are possible per researcher.

Confidence in future prospects for the research career

High levels of confidence

More than three quarters of all researchers currently working in the EU27 are somewhat confident (49%) or very confident (28%) about the future prospects of their research career.

Confidence increases with experience, mobility and higher job security (contract)

Differences occurs between career stages, with the R4 researchers standing out as very confident (41% very and 43% somewhat confident) and R2 researchers as least often feeling very confident (19% very confident and 51% somewhat confident).

Also worth noting is the fact that those who are self-employed and have permanent contracts are the most confident (85% and 81% respectively).

Furthermore, mobile researchers' results seem to indicate that they are relatively more confident about their future career prospects than never->3 month mobile researchers (7 to 9pp difference).

Similarly, EU researchers with non-EU citizenship are more confident than EU researchers with EU citizenship (5pp difference).

Finally, male researchers are more confident about their future career than female researchers (13.4pp difference in 'very confident').

Recruitment process in EU HEI

Two thirds of researchers are satisfied with the recruitment process at their HEI

When asked their opinion about recruitment policies at their institution, around 60-66% of researchers indicated that they were 'satisfied' with levels of openness, transparency and the degree of merit-based recruitment.

Lower satisfaction with recruitment process in early career stages and among female researchers

Those in an early stage of their career are the least satisfied: R2 researchers are the least satisfied with their experiences of transparency and merit-based recruitment, R1 researchers are the least satisfied with levels of openness. Female researchers, who are more represented in early career stages, are similarly less satisfied with the recruitment process (between 6 and 9 pp with male researchers).

Level of satisfaction is country-related

Satisfaction between the three aspects is correlated per country. The United Kingdom has the highest share of satisfied researchers (around 80%) for all three aspects whereas Italy has the lowest shares (between 30 and 45%) for open and transparent recruitment and the one-but-lowest for merit-based recruitment. In Croatia, Bulgaria and Slovenia shares are also low.

Awareness of EU instruments and policy

EURAXESS: 11% awareness, 3% use

Around 11% of the EU researcher population is aware of the services offered by EURAXESS. 3% of researchers have used the services.

The highest levels of awareness (more than 25%) are found in Luxembourg, Croatia, Romania, Macedonia (FYROM). The lowest awareness (less than 8%) is observed in Denmark, Sweden, the Netherlands and France. In terms of use, most countries rank as for awareness. Exceptions are Bulgaria with 16% awareness but also 10% use; and Estonia with 18% awareness but only 2% use.

15% of >3 month mobile researchers know EURAXESS compared to only 10% of non-mobile researchers are familiar with it.

European Charter for Researchers and Code of Conduct for the Recruitment of Researchers (C&C): 20% awareness

The European Charter for Researchers and Code of Conduct for the Recruitment of Researchers (C&C) are known to 20% of the researcher population. The knowledge of these instruments is higher among more senior researchers than among their junior counterparts.

Marie-Curie Actions: 60% awareness, 5% use

Awareness of the Marie-Curie Actions of the Seventh Framework Programme for Research (FP7) is markedly higher: 60% of researchers in Europe are familiar with Marie-Curie Actions. Awareness is higher among more senior researchers.

Around 5% of researchers were actually funded under Marie-Curie Actions (for at least 3 months). 3% are funded as early stage researcher, 2% as experienced researcher and 0.4% as both.

1 INTRODUCTION

1.1 Objectives and set-up of the MORE2 project

As Cañibano et al. (2008)[5] state, "despite numerous recent attempts to measure and assess researcher mobility, there seems to be agreement among scholars and policy makers that the lack of progress in developing innovative empirical approaches is due to inadequate or lack of data".

The study "support for continued data collection and analysis concerning mobility patterns and career paths of researchers" (MORE2), as foreseen under the 2010 People Work Programme of the 7th Framework Programme[6] has the objective:

"To provide internationally comparable data, indicators and analysis in order to support further evidence-based policy development on the research profession at European and national level".

In order to fulfil this overall objective, the project is set up around the following work packages:

I. Survey of researchers currently working in Europe in higher education institutions (HEI) regarding their mobility patterns, career paths and working conditions (WP1);

II. Survey of researchers currently working outside Europe regarding their mobility patterns, career paths and working conditions (WP2);

III. Case study on the working conditions and career paths of early career researchers in selected countries (WP3);

IV. Case study on the remuneration of researchers in selected countries (WP4);

V. Development of a set of internationally-comparable indicators on stocks, flows, working conditions and career paths of European researchers (WP5);

VI. Final report that provides a comparative, policy-relevant analysis of the mobility patterns, working conditions and career paths of European researchers (WP6).

The report at hand is the result of the first work package, the survey of individual researchers currently working in Europe in higher education institutions (in short: the MORE2 HEI survey). The researchers targeted in this survey include those who are currently working in higher education institutes in the EU27, Candidate and Associate countries[7].

The main objective of this first work package is to provide representative data at the level of the countries covered (EU27+6). This implies that the dataset resulting from the survey, when properly weighted, provides data on the numbers of researchers working in HEI institutes, and numbers of mobile or non-mobile researchers or the 'flows' of researchers among countries that reflect the proportion of researchers working in the overall population in the HEI sector in the EU27, and the additional countries covered.

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5 Cañibano C., F. Javier Otamendi and F. Solís (2011):International temporary mobility of researchers: cross-discipline study. Scientometrics, 89, 653-675.

6 http://cordis.europa.eu/fp7/wp-2010_en.html#people

7 Candidate Countries: Croatia, Turkey, the former Yugoslav Republic of Macedonia
Associate Countries: Norway, Switzerland, Iceland

1.2 Report structure

As described more extensively in chapter 3 on the policy context, two main policy lines drive the initiatives with respect to researchers, their careers and their mobility:

1. The attractiveness of researchers' careers
2. The researchers' mobility and removing obstacles which hinder it.

The first is a necessity in order to face global competition and attract talented researchers, and to address ageing in the current research labour force. The attractiveness of the profession is thus an important condition to help maintain and even expand the research labour force in the EU, so reaching the objective of investing an average of 3% of GDP in research[8].

The survey questionnaire was specifically designed in order to provide information on both policy lines. The structure of the HEI report will mainly follow the structure of this questionnaire, therefore including the following chapters:

- Socio-demographic description of the sample and EU researchers
- Education and training
- Current employment characteristics and working conditions
- PhD and doctoral training
- International mobility, both long term and short term, including the estimates, the motives, barriers, effects and analysis of non-mobility
- Collaboration
- Intersectoral mobility
- Other topics such as confidence in future research career; awareness of EU policy initiatives; and satisfaction with recruitment procedures at the HEI
- EU versus non-EU attractiveness of research careers: some factual evidence.

Following this structure, all information is gathered thematically and calculated in great detail so as to provide the maximum information possible from the survey and resulting database.

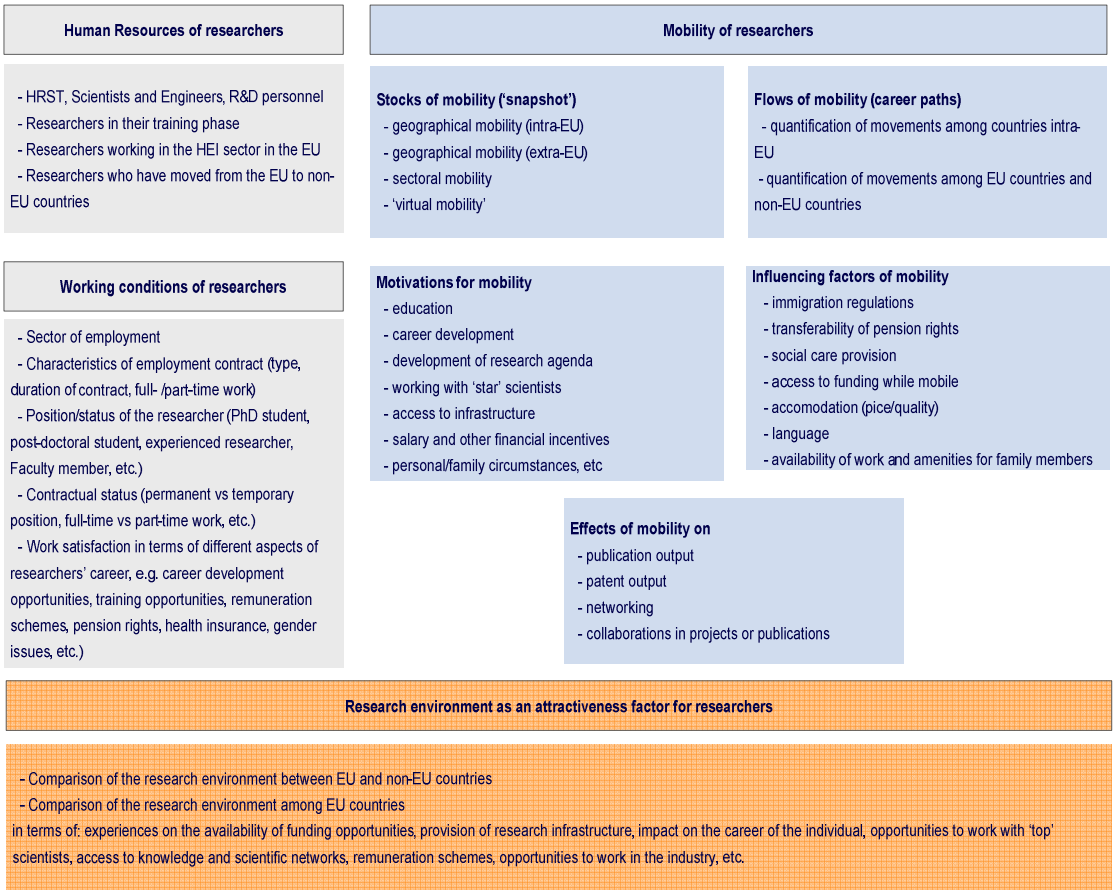
For the final synthesis report on all work packages, the key indicators in these chapters will be translated into the conceptual framework proposed in the study proposal and interim report (cf. **Error! Reference source not found.**).

Three concepts of mobility mentioned and encouraged in the European Charter for Researchers and the Code of Conduct for their recruitment (2005) are thereby addressed explicitly, and one to a limited extent:

- **International mobility** (PhD and last ten years)
- **Intersectoral mobility** (during last ten years and in detail on last move to the private industry sector)
- **Virtual mobility** (as reducing or enhancing factor for international mobility)
- And to a limited extent **inter- and transdisciplinary mobility** (only with respect to change in fields of science between education and career steps, not with respect to (national) change in function, employer…)

[8] COM(2008)317, Barcelona European Council, Presidency Conclusions of 15-16 March 2002

Figure 1: Conceptual framework for the synthesis of the MORE2 data



Source: IDEA Consult in the study proposal and based on MORE1

Both structures inter-relate as follows:

MORE2 survey structure	Conceptual framework
1. Socio-demographics 2. Education 3. PhD and doctoral training	Human resources of researchers • 'Stocks' of researchers • HRST, Scientists and Engineers, R&D personnel • Researchers in their training phase • Researchers working in the HEI sector in the EU • Researchers who have moved from the EU to non-EU countries
4. Current employment and working conditions (including inter- and transdisciplinary mobility)	Employment situation of researchers • Employment sector • Characteristics of employment contract • Position/status of the researcher • Contractual status • Work satisfaction in terms of different aspects of researchers' career Research environment as an attractiveness factor for researchers
5. Academic mobility and career paths (including PhD, including past and current mobility) a. PhD mobility b. Further career mobility c. <3 month mobility d. Non-mobility e. Virtual mobility 6. Collaboration / Virtual mobility 7. Intersectoral mobility	Mobility of researchers • Stocks of mobility ○ International mobility intra-EU ○ International mobility extra-EU ○ Intersectoral mobility ○ Virtual mobility • Flows of mobility ○ Quantification of movements • Influencing factors of mobility • Motivations for mobility • Effects of mobility
8. Awareness of EU policy 9. Comparison research environments (EU – non-EU; EU countries)	Research environment as an attractiveness factor for researchers

1.3 Selection of indicators

The indicators derived from the survey data and which form the basis of the discussion in this report have been developed and selected in agreement with the EC. They are based on:

- Policy initiatives and strategies regarding mobility and career paths of researchers (like the monitoring system developed in the context of the EU researcher partnership objectives)
- Recent academic literature on mobility and career paths of researchers, particularly the main topics, research questions and findings therein
- Previous surveys/studies on mobility and career paths of researchers, particularly indicator definitions therein (e.g. MORE1, Eurostat/OECD Careers of Doctorate Holders – CDH project; EURODOC survey on Doctoral Candidates; Erawatch IPTS survey…)
- Compatibility with previous MORE1 indicators and IISER indicators.

By taking the findings from these sources into account, the selected indicators are intended to provide topical and policy relevant figures on several themes of current interest. To the extent that this is possible, the indicator definitions strive for comparability with previous work.

1.4 Methodology

All detailed indicators and descriptions in this report are the result of a pre-defined and accurately implemented statistical strategy. This strategy is described in detail in the annex report on methodology. However, it is worthwhile outlining the main elements of the approach at this point, as this provides the context for interpretation of the indicators.

- Representative estimates are aimed at country level in the 33 countries (EU27+6). This means that the general indicators, building on the entire sample and expressed per country in the panel, are representative for the researchers' population in the country instead of only for the sample of respondents. For subgroups where a logical routing is also applied, the indicators are representative for the population (i.e. indicators on post-PhD mobility are, logically, not asked of PhD researchers). However, breaking down indicators by one or more levels would create small subgroups for which representativity cannot be checked (e.g. indicators on motives for mobile R1 researchers) or for which larger margins of error affect the results. In this case, the indicators are to be interpreted as valid for the sample.
- In order to obtain representative indicators at country level, weighting procedures are calculated (head count, gender, FTE). The commonly used weighting procedure is based on head count per field of science.
- After weighting, calibration factors are also applied to the raw data. Calibration enables us to correct for non-response bias (arising from self-selection or seasonal effects). It is thus a correction factor to reduce bias and increase accuracy. The calibration is based on 3 specific questions asked in a short non-response survey: one question asks for >3 month mobility, another for <3 month mobility and another for intersectoral mobility.

Unless otherwise indicated, all general indicators reflect the EU27 researcher population. The 3 Candidate and 3 Associate Countries are included systematically as part of the analyses at country level.

Furthermore, all indicators are calculated once for the entire group and subsequently broken down according to the following characteristics:

- Panel country
- Gender
- Family status
- Career stage
- Field of science

The report refers to the results for these subgroups only where relevant.

2 GUIDE TO THE READER

In the next chapter, an overview of recent policy developments is provided. Previously published state of the art research on the topic is outlined in Annex 1.

Chapter 4 details a number of definitions and hypotheses on which the rest of the report is based.

Chapter 5 is the core chapter, which lists all indicators that were estimated in the MORE2 HEI survey of individual researchers in the EU27. Discussion of the indicators is structured thematically around:

- Socio-demographic description of the sample and EU researchers
- Education and training
- Current employment characteristics and working conditions
- PhD and doctoral training
- International mobility, both long term and short term, including the estimates, the motives, barriers, effects and non-mobility analysis
- Collaboration
- Intersectoral mobility
- Other topics such as confidence for future research career, awareness of EU policy initiatives and satisfaction with recruitment procedures at the HEI
- EU versus non-EU attractiveness of research careers: some factual evidence.

After the detailed discussion, we focus on the key conclusions arising from this discussion in chapter 6.

Annex 1, as mentioned, contains state of the art research on mobility and careers in the existing literature. Annex 2 provides detailed tables to the key indicator discussion – where relevant.

The Annex to this report comprises the questionnaire from the survey, and the detailed methodological report (in separate documents). The latter focuses on each of the different aspects of developing the statistical methodology; the sample frame; the data collection, the data editing process and outcomes in statistical terms. Although we provide figures and numbers of observations as far as possible in the indicator report, we refer to the methodological report for more detail on standard errors and general reliability estimations.

3 GENERAL POLICY CONTEXT

The MORE2 HEI report aims to provide accurate evidence for further evidence-based policy making. The topics selected for the survey are based on recent policy developments and perspectives. In this chapter, we outline this recent policy context. Alongside the general policy context within which the MORE2 HEI survey is situated, a number of observations on the research profession and mobility are important as background information for interpretation of the key indicators. For state of the art research on academic studies and their findings, we refer to Annex 1.

3.1.1 EU2020 Strategy and the European Research Area

The number of researchers in Europe, as a share of the population, is visibly below that of the United States and Japan. In the context of reaching the 3% R&D target, the number of researchers required is significantly higher than the current pool and even more newcomers are needed to take the place of those who will retire over the next decade. If there is to be a serious effort to increase R&D in the EU, 1m new researchers, on top of the current 1.5m researcher population, are required. These new researchers need not just to be working in existing disciplines and fields, but also in new and increasingly important interdisciplinary fields related to the grand challenges of the present (demographic ageing, food security etc.).

The EU2020 Strategy builds on Europe's strongest (knowledge) asset, human capital and more precisely, Europe's researcher population. Creation of a European Research Area (ERA) is one of the cornerstones of the EU 2020 strategy[9] (and the Innovation Union initiative in particular) and Europe's future economic competitiveness. In 2007, the ERA concept was put high on the European policy agenda through the publication of the 'ERA Green Paper[10]' and the launch of various related policy initiatives. The European Commission has indicated that the Framework Programme is one of the principal instruments which can make the ERA to become a reality.

The ERA defines a European "internal market" for research where researchers, technology and knowledge circulate freely, effective European level co-ordination of national and regional research activities, programmes and policies, and initiatives are implemented and funded at European level. There should be a single labour market with attractive working conditions for both men and women, with the absence of financial or administrative obstacles to trans-national mobility. Moreover, a full opening of academic research positions and national research programmes across Europe, with a strong drive to recruit researchers internationally, and easy movement between disciplines and between the public and private sectors, should also become a reality.

The MORE2 HEI survey collects evidence on the geographical, intersectoral and virtual mobility steps of researchers, but also maps the opinion of researchers on fair, open and transparent recruitment at their HEI.

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9 European Commission, "Europe 2020 Flagship Initiative – Innovation Union, SEC(2010) 1161 final, Brussels, 6 October 2010.

10 European Commission (2007), The European Research Area: New Perspectives - Green Paper: 04.04.2007, Luxembourg (+ results public consultation).

Promotion of the ERA has been achieved through various instruments and programmes implemented at the EU level, the national level and the regional level. At the EU level, the European Commission has taken the lead by introducing new and adapting existing R&D support schemes. These include: the Framework Programmes and Marie Curie Actions; the adoption and implementation of the European Charter for Researchers; the Code of Conduct for the Recruitment of Researchers; the 'scientific visa' package and the integrated European Researcher Partnership.

3.1.2 Innovation Union Flagship initiative

The "Innovation Union" is one of the seven flagships announced in the Europe 2020 Strategy[11]. Endorsed by the European Council meeting of 4 February 2011[12], it has called for completion of the ERA by 2014 and the development of supporting measures to remove obstacles to mobility and cross-border co-operation. Based on the outcome of several targeted initiatives (cf. infra), the EC Communication of July 17, 2012[13] proposes "A Reinforced European Research Area Partnership for Excellence and Growth" to realise the ERA by 2014. It focuses on:

- More effective national research systems;
- Optimal transnational cooperation and competition (common research agendas, Europe-wide pen competitions and infrastructure for key research)
- An open labour market for researchers (removal of barriers to research mobility, training and attractive careers)
- Gender equality and gender mainstreaming in research and
- Optimal circulation, access to and transfer of scientific knowledge including through digital means.

In terms of these goals, the MORE2 HEI survey offers further insight into researchers' working conditions and satisfaction. Furthermore, information on fair, open transparent recruitment and structured doctoral training is also collected. Additional benefits are also covered in several questions in the survey (e.g. is funding or transferring thereof a barrier or motive to mobility? Is there evidence on job (in)security and career progression for early-stage researchers, collaboration with private industry and intersectoral mobility? etc).

The Innovation Union flagship initiative sets out several major commitments in the area of researchers' mobility and career development:

1. By the end of 2011, Member States should have **strategies** in place to **train** enough researchers to meet their national R&D targets and to promote attractive employment conditions in public research institutions (including giving due attention to gender and dual career considerations).
2. In 2011, further steps were to be proposed in a Communication[14] on the **reform and modernisation of higher education** including support of business-academia collaboration through the creation of "Knowledge Alliances" between education and business. Effort was to be made to develop new curricula addressing innovation skill gaps and to support universities in developing inter-disciplinarity, entrepreneurship and stronger business partnerships.

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11 European Commission, "EUROPE 2020 A strategy for smart, sustainable and inclusive growth", Brussels, 3.3.2010, COM(2010); adopted by the European Council in European Council Conclusions 17 June 2010

12 European Council 4 February 2011 Conclusions, Brussels, 8 March 2011, http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ec/119175.pdf.

13 http://ec.europa.eu/euraxess/pdf/research_policies/era-communication_en.pdf

14 http://ec.europa.eu/education/higher-education/doc/com0911_en.pdf

3. In 2011, the Commission presented an **integrated framework for the development and promotion of e-skills**[15] for innovation and competitiveness. This framework should take into consideration supply and demand factors, pan-European guidelines for new curricula, quality labels for industry-based training, and the need for awareness raising activities.

From this, the focus towards gender, dual careers, intersectoral collaboration and the use of virtual and web-based technologies emerge as highly relevant research topics. Each of these topics is part of the MORE2 HEI survey to collect evidence of the state of play and developments therein.

3.1.3 Important initiatives: a selection

Since the launching of the European Commission's initiative for the creation of the European Research Area (ERA) in 2000, researcher mobility has become a major feature in many EU initiatives. One example is the European career of researchers' project - E*CARE, which was launched in August 2008 with a total duration of three years. Within this project, a survey was carried out on the careers and mobility of researchers in Europe and on the awareness of EU initiatives for building the ERA[16]. Special emphasis was given to the attractiveness of researchers' careers, the remaining problems surrounding researchers' mobility and their impact on further career development.

The ERA Steering Group on human resources and mobility (SGHRM), and more specifically, its working group on skills, developed a European Framework for Research Careers in consultation with stakeholders. In May 2011, this framework was adopted by the SGHRM, "Towards a European Framework for Research Careers" (European Commission 2011, p. 2)[17]. The framework describes four research profiles: 'first stage researcher', 'recognised researcher', 'established researcher' and 'leading researcher'.

These career stages are similarly used in this survey and report.

Furthermore, with the support of the ERA Communication of July 2012, an expert group on the Research Profession was established by DG Research and Innovation. Their report was published in July 2012[18] and recommends:

- A European Monitoring System
- Harmonising career structures
- Harmonising working conditions
- Realising the 5th freedom: essential role of mobility (geographical, intersectoral, virtual and disciplinary)
- Conditions for career development: transparency & open recruitment
- Individual oriented research funding
- Larger use of awards and prizes

This represented an important public consultation aimed at gathering views and evidence from stakeholders on the key obstacles which have to be tackled to

15 European Commission (2007), "e-Skills for the 21st Century: Fostering Competitiveness, Growth and Jobs", COM(2007) 496

16 E*CARE project 2009, Comparative survey analysis on researchers' mobility and career obstacles. Deliverable 1.2. in: Ivancheva L. and Gourova E., 2011, Challenges for career and mobility of researchers in Europe.

17 http://ec.europa.eu/euraxess/pdf/research_policies/Towards_a_European_Framework_for_Research_Careers_final.pdf

18 ERA Expert Group on the Research Profession (2012), Excellence, Equality and Entrepreneurialism. Building Sustainable Research Careers in the European Research Area. Final report prepared for the EC DG Research and Innovation. July 20, 2012.

achieve a well-functioning ERA[19]. It was observed that 80% of respondents believe that research careers in the public sector are comparatively unattractive because of the current uncompetitive working conditions and lack of career prospects. The reasons for these are the underfunding of universities and research institutions; the limited availability of research positions in academia; the relatively low wages in academia and the insufficient cooperation between academia and the private sector. Respondents also report a lack of recognition of the research profession. Yet there is major support among respondents to strengthen the ERA and develop closer involvement of stakeholders therein.

In order to monitor the ERA and its implementation in the Member States, the Commission launched a call for tender for a study which would monitor human resources policies and practices in research and assess the impact of the "Scientific Visa" package' (2010). The purpose of this study is to provide support for a monitoring system on national policies on human resources in research and on their effects at the level of research organisations, foreseen in the 2009 People Specific Programme of the 7th Framework Programme. The first lot within this call is currently being carried out by Deloitte Consulting and is known as the Researchers Report[20]. Their study addresses the creation of a monitoring system to implement the European Partnership for Researchers and subsequently Innovation Union commitments. The study also focuses on the related uptake of the Charter and Code principles, including the development and use of mobility and career indicators and data collection. The resulting Researchers Report was published in November 2012 and will be updated annually in the coming two years.

The second lot within this call focuses on the assessment of the implementation and impact of the "Scientific Visa" package. In 2005, the European Commission adopted the "Scientific Visa" package in order to make scientific careers more attractive and to open up the Community to third-country nationals who might be admitted for the purposes of research. The package includes Directive 2005/71/EC on a specific procedure for admitting third-country nationals for the purposes of scientific research. It also includes Recommendation 2005/761/EC, which aims to facilitate Member States' offering uniform short-stay visas for researchers from third countries travelling within the Community for the purpose of carrying out scientific research. The assessment was carried out by the International Centre for Migration Policy Development (ICMPD).

Important to mention in the context of this report is of course the MORE1 study, the first study on "mobility patterns and career paths of EU Researchers", commissioned by the EC DG Research and Innovation. MORE1 was to provide a detailed study on the mobility patterns and career paths of EU researchers. The final report was published in June 2010 and provided for the first time a full and detailed overview of the mobility patterns of EU researchers and their career paths.

Other important ongoing or recent surveys on the mobility of researchers are the following:

- Survey on the mobility of researchers by the Institute for Prospective Technology Studies (IPTS) of the EU's Joint Research Centre (JRC) under the FP6 ERAWATCH contract. This survey was launched in 10 countries in spring 2012.

[19] EC DG Research and Innovation (2012). Areas of untapped potential for the development of the European REsarch Area (ERA). Analysis of the response to the ERA Framework public consultation.

[20] Deloitte (2012). Researchers' report 2012, European Commission, DG Research and Innovation.

- The international 'Survey on the careers of doctorate holders (CDH)'[21], jointly carried out by Eurostat, the Organisation for Economic Co-operation and Development and UNESCO's Institute for Statistics (UIS). The survey covers most of the Member States of the European Union, of EFTA as well as some of the most important other members of the OECD, such as the United States and Australia. The latest survey was held in 2009 and results were analysed in an OECD paper (2012)[22].
- The EURODOC Survey I was conducted in 2008 and 2009 throughout Europe. The final report analyses the current situation of more than 7,500 doctoral candidates in twelve countries (Austria, Belgium, Croatia, Finland, France, Germany, the Netherlands, Norway, Portugal, Slovenia, Spain and Sweden). This study intends to respond to two main questions: a) what is the actual situation concerning funding, social benefits and working conditions of doctoral candidates; b) what are the differences regarding the different types of doctoral education models across Europe. The findings of this study were published in September 2011, at the Eurodoc General Meeting in Strasbourg[23]. This presentation focused on three main topics: funding, working conditions and mobility of doctoral candidates and junior researchers. These themes are all directly linked to the European Charter of Researchers and to the Code of Conduct for the Recruitment of Researchers published by the European Commission.
- The MAUNIMO (MApping UNIversity MObility)[24] project, which aims to present a university perspective on mobility and the related data collection at institutional level. The project was coordinated by the European University Association and ran from October 2010 to September 2012.

21 CDH survey, Auriol L., B. Felix, M. Schaaper (2010) Mapping careers and mobility of doctorate holders: draft guidelines, model questionnaire and indicators – second edition – the OECD/UNESCO institute for statistics/Eurostat careers of doctorate holders project, STI working paper 2010/1.

22 OECD (2012) Doctoral graduates in times of economic downturn: labour market participation and mobility. OECD: Auriol L., M. Misu & R. Freeman, 11(1).

23 Eurodoc Survey I (2010) The first Eurodoc survey on doctoral candidates in twelve European countries. Descriptive report.

24 www.maunimo.eu

4 DEFINITIONS

4.1 Researchers

The main definitions in use regarding 'research(ers)' derive from the Canberra Manual, covering HRST and the Frascati Manual, covering Research and experimental development and R&D personnel. These definitions are generally accepted and widely applied, including in the MORE1 study by the European Commission[25].

Definitions from the Frascati Manual[26]:

- Research and experimental development (R&D):
  - "Research and experimental development (R&D) comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications."
- R&D personnel:
  - "All persons employed directly on R&D should be counted, as well as those providing direct services such as R&D managers, administrators, and clerical staff."

When defining a researcher, the survey contains the following paragraph in the introduction:

> We specifically target "researchers" within this survey, including people:
>
> - carrying out research OR
> - supervising research OR
> - improving or developing new products/processes/services OR
> - supervising the improvement or development of new products/processes/services.
>
> If you consider yourself to fall into one or more of the above categories, we kindly ask you to complete the questionnaire.

[25] IDEA Consult et al. (2010) Study on mobility patterns and career paths of EU researchers. FINAL REPORT (deliverable 7).

[26] OECD (2002), Frascati Manual: Proposed Standard Practice for Surveys on Research and Experimental Development, OECD, Paris. (Section 2.1 and 5.2.1).

4.3 Mobility

We list below a number of key definitions of researchers' mobility which will be further used in the indicator descriptions (cf. e.g. Inzelt[27]):

- International mobility versus intersectoral mobility:
  Moving to another country versus moving to another sector (though both can occur in the same move)
- PhD mobility versus post-PhD mobility:
  Mobility of researchers enrolled in a PhD programme during their R1 career stage

  versus

  mobility during any of the following research career stages (and despite the fact that selected terminology suggests otherwise) regardless of whether or not the researcher has obtained a PhD
- PhD degree mobility versus >3 month mobility during PhD[28]:
  Mobility with the purpose of obtaining the PhD in another country versus mobility of three months or more during the PhD while still obtaining the PhD in the home country
- >3 month mobility versus <3 month mobility:
  Mobility with duration of 3 months or more versus mobility lasting less than 3 months
- Employer mobility:
  Mobility which includes a change of employer
- Virtual mobility:
  The use of web-based or virtual technology to collaborate internationally (cf. Annex 1 section 2)
- Non-mobility or never-mobile researchers:
  Having never moved another country (neither within the last ten years nor earlier).

In agreement with the EC, a decision was made not to limit the indicators of international >3 month mobility to one definition and to treat mobility as a multi-dimensional concept. We will thus present the number of mobile researchers according to a number of generally used (and accepted) definitions. This will not only increase comparability with other studies, but will also enable an estimation of the effect of the use of these different definitions on the final results. The different definitions of international >3 month mobility are listed in Table 1, together with reference to their application in existing studies.

It should be noted in the sample of the MORE2 HEI data, the potential countries of reference show a high percentage of overlap (Table 2). We thus do not expect major differences in the indicators based on the different definitions.

[27] Inzelt A., Analysis of Researchers' Mobility in the Context of the European Reseach Area, Evaluation FP7 as supporting expert.

[28] The Maunimo project uses the term 'degree mobility' versus '<3 month mobility'. The first includes mobility to obtain a degree in another country, even when only part of the programme is studied abroad (e.g. joint degree). <3 month mobility in this sense is mobility that is not for the purpose of the degree. To avoid confusion in MORE2 with <3 month mobility defined in terms of length of the move, we prefer the term 'during-PhD mobility' in this context. See www.maunimo.eu.

Table 1: Overview definitions of mobility

Definitions	e.g. applied in…	Comment
Move to another country than the country of citizenship		Inzelt[29]: *Foreign students (or foreign researchers) belong to an old statistical classification. […], it includes all non-citizens who are studying or doing research in the country. They may have arrived in the country earlier with other intention as studying or doing research activities […]*
Move to another country than the country of most recent highest educational attainment/graduation	MORE1	Inzelt, based on OECD, Eurostat and UNESCO: *International students are those who are not residents of their country of study or those who received their prior education in another country. Overall, the country of prior education is considered a better criterion for EU countries in order to take account of intra-EU student mobility.*
	MAUNIMO[30]: *Mobile student is a student who studies in a country other than that where he has gained the HE entry qualification, and/or holds permanent residence.*	
Move to another country than the country of residence		Inzelt: *The residence criterion is usually a good proxy in countries that require a student visa to enter the country.*
	CDH[31]	
Moves between any two countries	EURODOC[32] applies the term "abroad" with reference to the country of education or PhD where one was studying at that time	
Direct response of researcher to the question (Q47)[33]: *After your highest educational qualification (PhD or other), how would you typify your international mobility experience?* *I have worked abroad for more than 3 months at least once in the last 10 years* *I have worked abroad for more than 3 months, but this was more than 10 years ago* *I have never worked abroad for more than 3 months*		

Source: IDEA Consult

29 Inzelt A., Analysis of Researchers' Mobility in the Context of the European Reseach Area, Evaluation FP7 as supporting expert.

30 www.maunimo.eu

31 CDH survey, Auriol L., B. Felix, M. Schaaper (2010) Mapping careers and mobility of doctorate holders: draft guidelines, model questionnaire and indicators – second edition – the OECD/UNESCO institute for statistics/Eurostat careers of doctorate holders project, STI working paper 2010/1.

32 Eurodoc Survey I (2010) The first Eurodoc survey on doctoral candidates in twelve European countries. Descriptive report.

33 This definition will overlap the other definitions, but it will at the same time complement the other definitions by implying the definition of what the researcher considers to be international mobility.

Table 2: Overlap between countries of reference in the MORE2 HEI sample (EU27+6)

	Equal to panel country	Equal to citizenship	Equal to highest education	Equal to residence	Equal to current employment
Country of citizenship (first)	82.2%				
Country of highest education	76.5%	80.0%			
Country of residence	96.4%	83.5%	76.8%		
Country of current employment	98.4%	82.2%	76.6%	96.8%	
Country of PhD	80.9%	77.9%	95.3%	80.1%	81.3%

Source: MORE2 Higher Education Survey (2012)

Reading note: For 98.4% of the researchers in the sample, the country of current employment is equal to the panel country.

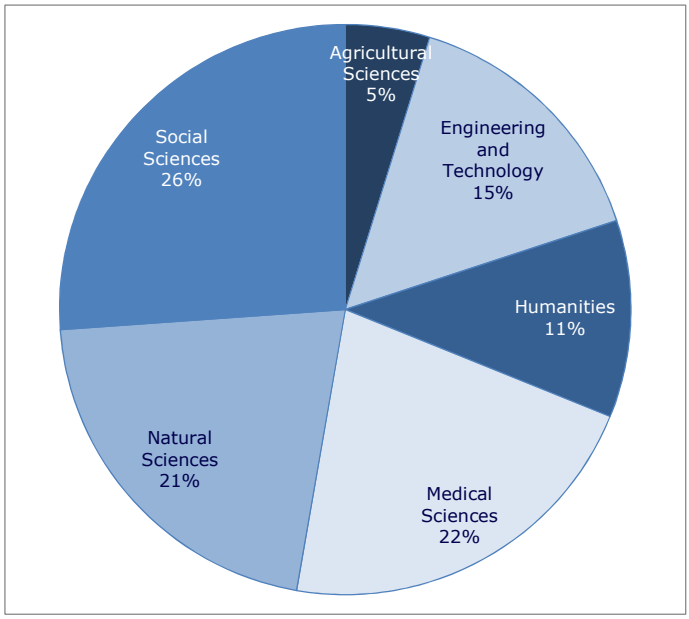
4.5 Fields of science

For the purpose of sample stratification, 3 categories of Fields of Science (FOS) are defined in compatibility with international nomenclatures and in accordance with the EUMIDA and MORE1 databases that are at the basis of the data collection process (cf. Methodological Report that is an Annex to this report). MORE2 follows the same criteria as were applied in MORE1 and selects 3 fields of science which are an aggregation of the six FOS classifications proposed by the OECD in 2006, according to the following scheme:

- FOS 1 (Natural Sciences) and FOS 2 (Engineering and technology) will fall in NATURAL
- FOS 3 (Medical Sciences) and FOS 4 (Agricultural Sciences) will fall in HEALTH
- FOS 5 (Social sciences) and FOS 6 (Humanities) will fall in SOCIAL

For the purpose of reporting, we will however, often break down the indicators to the 6 FOS that were reported by the respondents in the questionnaire. This specific question also allows for a check with the collected panel information. For example, Figure 2 shows the overall distribution in the sample over the 6 fields of science. These percentages are quite close to the overall EU27+6 figures (cf. Table 12 in Annex 1 of the Methodological report, based on 3 aggregated fields of science), which confirm the set-up of the sample strategy with stratification according to fields of science. The proportions in the final sample of the validated units for Natural Sciences and Engineering & Technology are slightly lower, but this does not affect the representation of the sample.

Figure 2: Distribution of the sample of researchers over fields of science (EU27+6)



Source: MORE2 Higher Education Survey (2012)

Note: Share of researchers in the sample (unweighted) per field of science. (n=10,547)

4.6 Career stages

In order to allow for country comparisons in terms of research roles and level of experience, the concept of 'specific career stages' was introduced, according to the four career stages outlined and defined in the European Commission's communication "Towards a European Framework for Research Careers" (European Commission 2011, p. 2).

These four career stages are:

- R1: First Stage Researcher (up to the point of PhD)
- R2: Recognized Researcher (PhD holders or equivalent who are not yet fully independent)
- R3: Established Researcher (researchers who have developed a level of independence) and
- R4: Leading Researcher (researchers leading their research area or field).

According to the definitions given in the EC's communication, the different stages are characterized as follows:

A first stage researcher (R1) will:

- "Carry out research under supervision"
- Have the ambition to develop knowledge of research methodologies and discipline.
- Have demonstrated a good understanding of a field of study.
- Have demonstrated the ability to produce data under supervision.
- Be capable of critical analysis, evaluation and synthesis of new and complex ideas and
- Be able to explain the outcome of research and value thereof to research colleagues".

(see European Commission 2011, p. 7)

Recognized researchers (R2) are PhD holders or researchers with an equivalent level of experience and competence who have not yet established a significant level of independence. In addition to the characteristics assigned to the profile of a first stage researcher, a recognized researcher:

- "Has demonstrated a systematic understanding of a field of study and mastery of research associated with that field.
- Has demonstrated the ability to conceive, design, implement and adapt a substantial program of research with integrity.
- Has made a contribution through original research that extends the frontier of knowledge by developing a substantial body of work, innovation or application. This could merit national or international refereed publication or patent.
- Demonstrates critical analysis, evaluation and synthesis of new and complex ideas.
- Can communicate with his peers - be able to explain the outcome of his research and value thereof to the research community.
- Takes ownership for and manages own career progression, sets realistic and achievable career goals, identifies and develops ways to improve employability.
- Co-authors papers at workshop and conferences."

(see European Commission 2011, p. 8)

An established Researcher (R3) has developed a level of independence and, in addition to the characteristics assigned to the profile of a recognized researcher:

- "Has an established reputation based on research excellence in his field.
- Makes a positive contribution to the development of knowledge, research and development through co-operations and collaborations.
- Identifies research problems and opportunities within his area of expertise Identifies appropriate research methodologies and approaches.
- Conducts research independently which advances a research agenda.
- Can take the lead in executing collaborative research projects in cooperation with colleagues and project partners.
- Publishes papers as lead author, organizes workshops or conference sessions."

(see European Commission 2011, p. 10)

A leading researcher (R4) leads research in his area or field. He or she leads a team or a research group or is head of an industry R&D laboratory. "In particular disciplines as an exception, leading researchers may include individuals who operate as lone researchers." (European Commission 2011, p. 11). A leading researcher, in addition to the characteristics assigned to the profile of an established researcher:

- "Has an international reputation based on research excellence in their field.
- Demonstrates critical judgment in the identification and execution of research activities.
- Makes a substantial contribution (breakthroughs) to their research field or spanning multiple areas.
- Develops a strategic vision on the future of the research field.
- Recognizes the broader implications and applications of their research.
- Publishes and presents influential papers and books, serves on workshop and conference organizing committees and delivers invited talks"

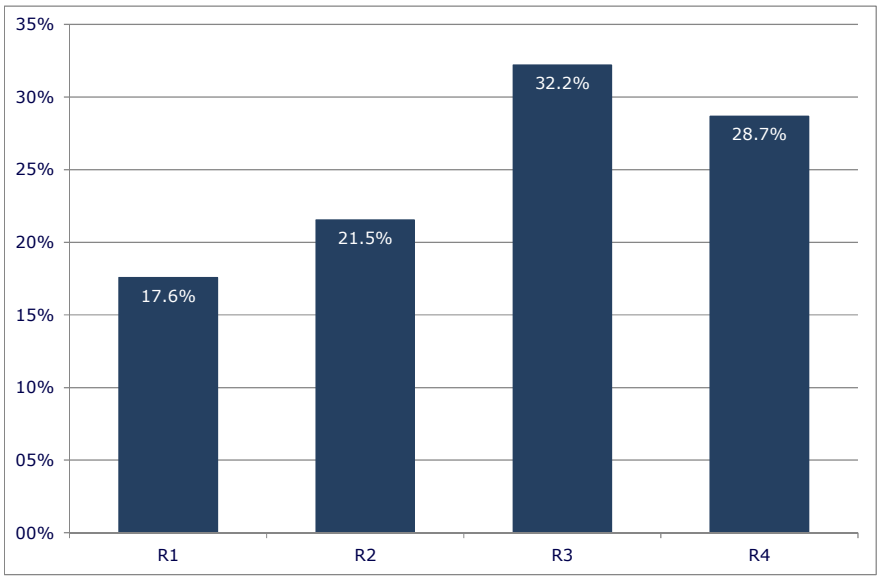
(see European Commission 2011, p. 11)

Researchers in the MORE2 HEI survey were asked to self-select into one of these four stages. As shown in Figure 3 and Table 3, the age structure of the researchers in the four career stages follows a logical pattern, whereby age increases according to the career stage. The doctoral candidates are strongly concentrated under 35 years of age, but there are quite a few over 50. Established researchers are mainly in the 45-64 age group, although some are in the 35-44 category. This is not surprising since in many countries, on average, professors are appointed in their early 40s.

When comparing this self-selected career stage with post, where the researcher fills in their current position, it can be noted that the R1-group consists mainly of PhD students. The R2 & R3 groups are quite heterogeneous, consisting of Post-Docs, Researchers & (Assistant/Associate) Professors. While the Post-Docs are highly represented in the R2 group, the (Assistant/Associate) Professors are represented more in the R3 group. The R4 group is highly populated by researchers at Professor stage. This also follows a logical pattern.

Overall, the independent researchers (R3) constitute the largest group, but the others are well represented, which enables us to reach reliable conclusions about them.

Figure 3: Distribution of researchers over career stages



Source: MORE2 Higher Education Survey (2012)

Note: Share of researchers per current career stage with R1 (doctoral or equivalent), R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers. (n=10,547)

Table 3: Career stages per age group

Age	R1	R2	R3	R4	Total
<35	**73.4%**	**36.7%**	8.8%	1.6%	24.3%
35-44	16.8%	**41.7%**	**45.0%**	17.3%	31.4%
45-54	6.9%	15.8%	**31.5%**	**38.9%**	25.8%
55-64	2.5%	5.0%	13.5%	**33.8%**	15.5%
65+	0.4%	0.8%	1.2%	8.5%	3.0%
Total (n)	*2,190*	*2,169*	*3,336*	*2,852*	*10,547*

Source: MORE2 Higher Education Survey (2012)

Note: With R1 (doctoral or equivalent), R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers. (n=10,547)

The analysis above indicates that conclusions per career stage can be drawn, as the self-selection process is logical. However, caution is still required because career stages are not a classification variable in the sampling strategy as a dimension for representative data analysis (because official totals are not available). As described in the methodological annex report, any variable that is not part of the sample frame and for which no official data are available to verify representativeness may influence the accuracy of the indicators due to self-selection bias. One possible explanation of self-selection bias relating to career stages is, for example, the specific characteristics of PhD researchers within each country, who may have differing levels of involvement and recognition of their research.

At country level, we see substantial differences in the proportion of each career stage in the sample. For example, in Italy only 6% of the researchers in the

sample are R1 whereas in the Netherlands this is 43%. According to the sampling strategy, these percentages should be a reflection of the researcher population in each respective country, but this cannot be verified with validated statistics.

A relevant basis for comparison, however, is the estimate of the proportion of researchers per career stage in the individual country fiches which are provided by country experts and are the result of the third work package of the MORE2 project. For those countries where these estimates are available, differences occur frequently, but the general pattern is still consistent. However, a number of indications of underrepresentation are:

- R1 in Greece: an estimate of 67% of R1 researchers versus 3% in the sample
- R1 in Italy and Portugal: a difference of more than 20% between R1 estimates and R1 in the sample
- R2 in Czech Republic and Latvia: a difference of more than 30% between R2 estimates and R2 in the sample
- R2 in Italy and the Netherlands: a difference of more than 20% between R2 estimates and R2 in the sample
- R3 in Spain: a 29% difference between the R3 estimates and R3 in the sample.

The main indications of overrepresentation in the sample are complementary, namely of R3 and R4 in Greece, Italy and Portugal and of R4 in Spain.

This observation certainly points to a selection bias towards higher career stages, which could be explained by the differences between the position of PhD students as researchers in South European countries versus West or North European ones.

Table 4: Career stages per country

Country	R1	R2	R3	R4	Total n
Austria	17%	25%	30%	28%	524
Belgium	44%	22%	13%	20%	480
Bulgaria	19%	14%	28%	38%	159
Croatia	16%	23%	31%	30%	278
Cyprus	7%	13%	48%	32%	188
Czech Republic	23%	20%	38%	19%	298
Denmark	31%	21%	28%	20%	403
Estonia	17%	14%	39%	30%	257
Finland	29%	21%	27%	23%	312
France	17%	27%	29%	27%	363
Germany	34%	23%	20%	23%	460
Greece	3%	5%	44%	48%	316
Hungary	29%	17%	37%	17%	185
Iceland	27%	5%	31%	38%	88
Ireland	9%	26%	46%	18%	394
Italy	6%	13%	48%	33%	484
Latvia	37%	9%	28%	25%	102
Lithuania	24%	15%	37%	25%	371
Luxembourg	41%	21%	17%	21%	205
Macedonia (FYROM)	8%	10%	32%	49%	143
Malta	8%	14%	50%	28%	184
Netherlands	43%	15%	26%	16%	551
Norway	11%	23%	25%	41%	314
Poland	4%	61%	18%	18%	388
Portugal	19%	23%	30%	27%	370
Romania	9%	27%	38%	26%	301
Slovakia	18%	22%	37%	23%	224
Slovenia	15%	19%	34%	32%	295
Spain	11%	12%	33%	44%	445
Sweden	38%	17%	27%	19%	349
Switzerland	33%	26%	22%	20%	477
Turkey	15%	11%	31%	43%	231
United Kingdom	7%	21%	44%	29%	408
Total	20.8%	20.6%	31.6%	27.0%	***10,547***
EU27	20.9%	20.7%	32.4%	26.0%	***9,016***

Source: MORE2 Higher Education Survey (2012)

Note: With R1 (doctoral or equivalent), R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers. (n=10,547)

5 KEY INDICATORS

5.1 Research population in HEI in Europe

As described earlier, standard statistical methodology is applied in order to report not only on the sample of the survey, but also to extrapolate results accurately to the total population of European academic researchers. The results of the survey are reported as shares and percentages based on this population. To express the results in terms of number of researchers, the shares and percentages are to be multiplied by the population estimates of researchers currently working in EU Higher Education Institutes according to Eurostat data, as presented in Table 5 per country, field of science and gender.

In total, across the 33 countries in the sample, 1.4 million researchers work in Higher Education institutes. In EU27, the population amounts to 1.2 million researchers in HEI, of which there are approximately 500,000 female and 740,000 male researchers. 40% work in Natural Sciences and Engineering&Technology, 36% in Social Sciences and Humanities and 24% in Medical Sciences and Agricultural Sciences.

Table 5: The estimated population of the survey: researchers working in EU higher education institutions (2009).

	Total (in HC)	Natural Sciences and Engineering & Technology	Medical Sciences and Agricultural Sciences	Social Sciences and Humanities	Females	Males
Austria	29,039	12,514	7,440	9,085	10,965	18,074
Belgium	30,354	12,553	8,756	9,045	11,835	18,519
Bulgaria	6,575	2,673	1,028	2,874	2,839	3,736
Croatia	7,466	3,017	2,059	2,390	3,389	4,077
Cyprus	986	485	40	461	360	626
Czech Republic	19,419	7,829	6,803	4,787	6,878	12,541
Denmark	22,928	7,089	9,061	6,778	9,359	13,569
Estonia	4,485	2,316	557	1,612	2,062	2,423
Finland	21,450	7,982	5,360	7,229	9,987	11,463
France	105,508	40,713	26,521	38,274	36,250	69,258
Germany	215,474	90,245	55,373	69,855	74,816	140,658
Greece	23,984	9,255	6,029	8,700	9,106	14,878
Hungary	18,395	6,067	4,422	7,906	6,644	11,751
Iceland	1,504	580	378	546	658	846
Ireland	11,900	5,361	2,174	4,365	4,605	7,295
Italy	77,085	30,890	14,236	31,663	29,170	47,915
Latvia	5,048	2,107	787	2,154	2,631	2,417
Lithuania	10,633	3,911	1,459	5,263	5,663	4,970
Luxembourg	550	252	0	298	197	353
Macedonia (FYROM)	948	382	373	193	466	482
Malta	621	196	134	287	183	438
Netherlands	22,557	7,695	8,233	6,629	8,321	14,236
Norway	21,315	5,570	7,086	8,546	9,392	11,923
Poland	70,592	26,705	16,470	27,417	29,744	40,848
Portugal	57,881	22,175	9,362	26,344	28,715	29,166
Romania	18,137	8,850	4,013	5,274	8,279	9,858
Slovakia	16,485	7,020	3,393	6,072	7,359	9,126
Slovenia	4,231	1,870	1,194	1,167	1,723	2,508
Spain	125,130	53,876	21,969	49,285	49,790	75,340
Sweden	37,566	12,937	10,500	13,961	16,712	20,854
Switzerland	33,603	12,966	8,447	12,190	11,408	22,195
Turkey	83,281	21,282	32,936	29,062	33,802	49,479
United Kingdom	284,277	108,256	72,401	103,619	124,310	159,967
Total	***1,389,407***	***535,619***	***348,994***	***503,331***	***557,618***	***831,789***
EU27	***1,241,290***	***491,822***	***297,715***	***450,404***	***498,503***	***742,787***

Source: Data processing on Eurostat New Cronos database; *FYROM statistical office data

5.2 Socio-demographics

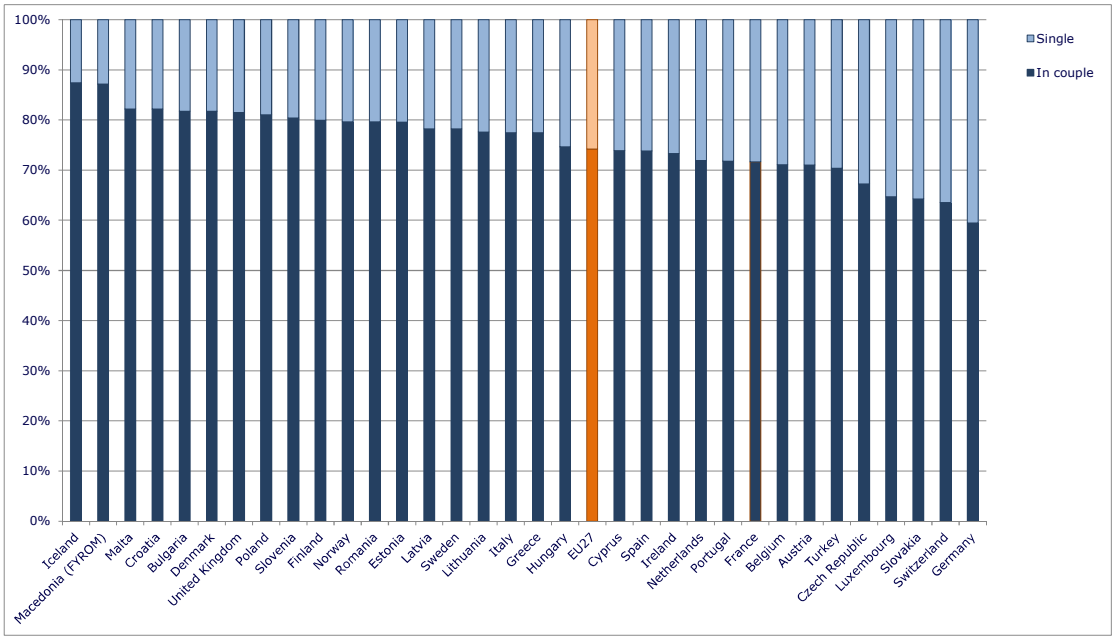
The indicators on socio-demographics give an idea about the characteristics of the researchers in our sample. Using standard statistical methodology also allows us to report on the characteristics representative for the population of European academic researchers.

For the researcher population of EU27 countries, an average of around 74% live as a couple and about 26% are single (Figure 4)[34]. This compares to an average of 52% of those employed in the EU27 living as a couple, similar for both men (52%) and women (51%)[35]. The country with the lowest share of researchers living as a couple is Germany, whereas the highest share can be found in Iceland and Macedonia (FYROM).

[34] About 10% of respondents did not disclose their marital status.

[35] Source: Eurostat, 2011 data.

Figure 4: Marital family status per country



Source: MORE2 Higher Education Survey (2012)

Note: Share of researchers per marital family status in panel country. (n=10,547)

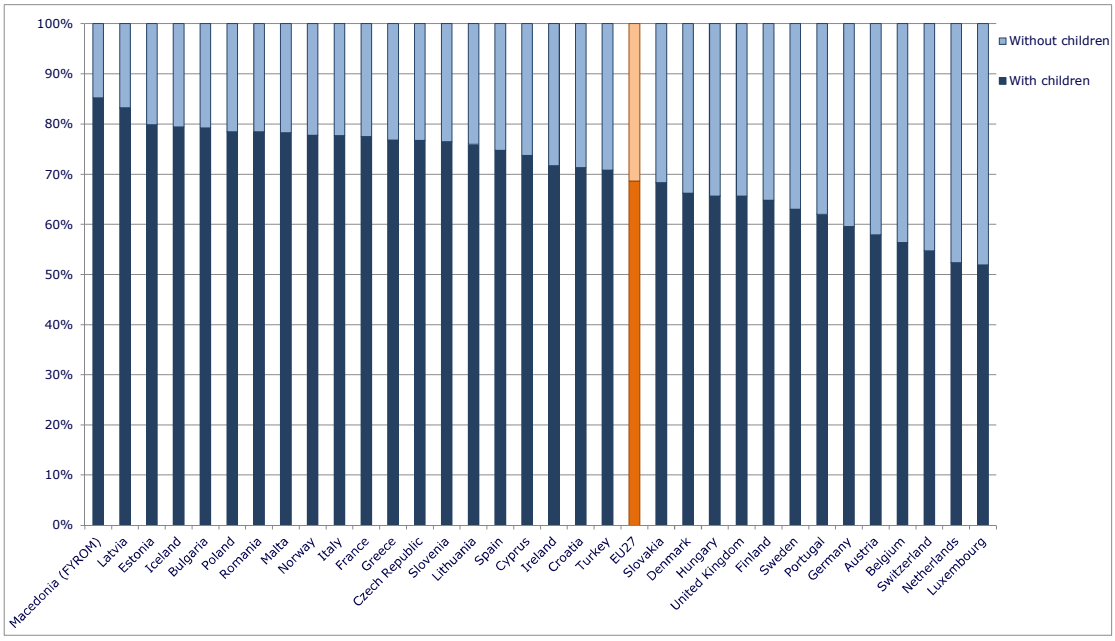
When analysing marital status by gender, we see a small difference between men (70% in a couple) and women (77% in a couple). When analysing marital status in the field of science[36], the proportion of researchers in a couple is highest in the field of Health and Agricultural Sciences (77%), followed by the Natural Sciences and Engineering&Technology (73%) and the Social Sciences and Humanities (73%).

With respect to family situation and children, around 69% of the EU27 researcher population have children (Figure 5). This compares to 46% of all those employed in the EU27 having children, similar for both men (46%) and women (47%)[37]. However, a large proportion of researchers (29%) did not disclose their personal situation. The proportion of researchers with children is highest in Macedonia (FYROM) and lowest in Luxembourg. In general, there is a tendency that researchers in Eastern European countries are more likely to have children.

[36] For the description of the sample and of socio-demographic analysis, we refer to the 3 fields of science a priori defined in the panel for the survey (cf. methodological report). Further analysis of indicators will be based on the 6 fields of science as indicated by the respondents in the survey on their current academic position.

[37] Source: Eurostat, 2011 data.

Figure 5: Family status (children) per country

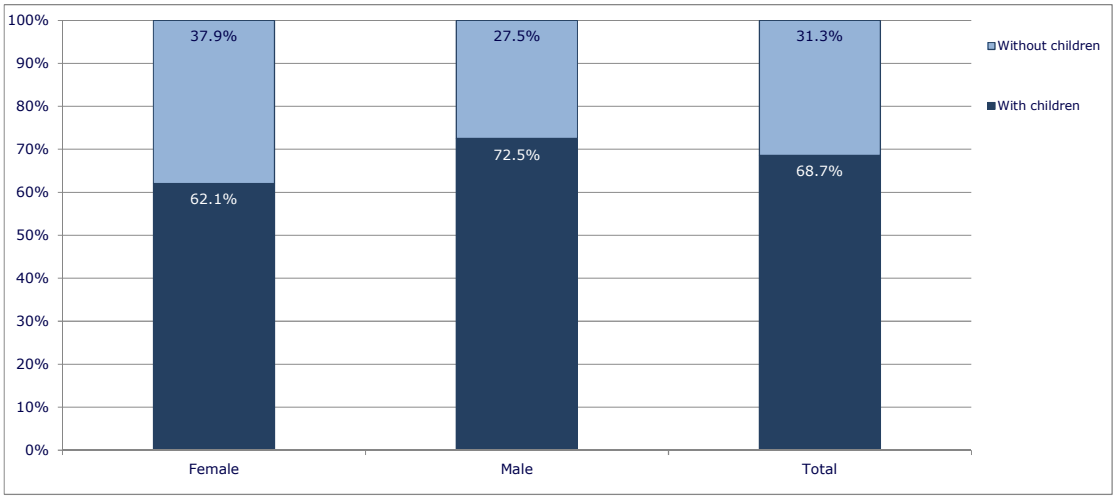


Source: MORE2 Higher Education Survey (2012)

Note: Share of researchers per family status (children) in panel country. (n=10,547)

When looking at family status per gender, we can note that the share of female researchers with children is lower than that for male researchers (Figure 6). This may be related to the fact that female researchers generally tend to be younger and over-represented in lower career stages compared to male researchers (as will be documented below). This fact might also account for the fact that female researchers are in a couple less frequently than their male counterparts.

Figure 6: Family status (children) per gender (EU27)



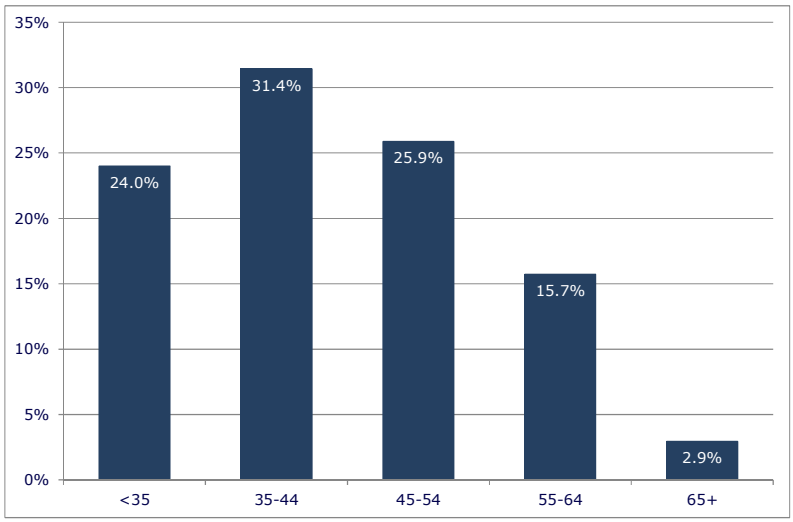
Source: MORE2 Higher Education Survey (2012)

Note: Share of researchers with and without children. (n=9,016)

Comparing family status per field of science, researchers in the Health and Agricultural domain are the most family oriented (75% have children) whereas researchers in Natural Sciences and Engineering & Technology are the least (65% have children).

We now provide an overview of the age structure in the European researcher population. Figure 7 shows that there is a relatively even distribution of the EU27 researcher population across different age groups. It is clear that most researchers are retired by the age of 65. The number of active researchers in the age group 55-64 is also a relatively smaller group than their younger counterparts. This reflects the general age structure of the employed population in the EU27, according to Eurostat[38].

Figure 7: Age structure in EU27 researcher population



Source: MORE2 Higher Education Survey (2012)

Note: Share of EU researchers per age group. (n=8,879)

As mentioned earlier, under section 4.4, researchers were also asked to indicate in which career stage they situate themselves, using this mode of classification:

- R1: First Stage Researcher (up to the point of PhD)
- R2: Recognized Researcher (PhD holders or equivalent who are not yet fully independent)
- R3: Established Researcher (researchers who have developed a level of independence) and
- R4: Leading Researcher (researchers leading their research area or field).

By comparing this self-selected career stage with the function the researcher states as their current position, we can see that the R1-group consists mainly of PhD students. The R2 & R3 groups are quite heterogeneous, consisting of Post-Docs, Researchers & (Assistant/Associate) Professors. While the Post-Docs are highly represented in the R2 group, the (Assistant/Associate) Professors are more strongly represented in the R3 group. The R4 group is highly populated by researchers at Professorial stage.

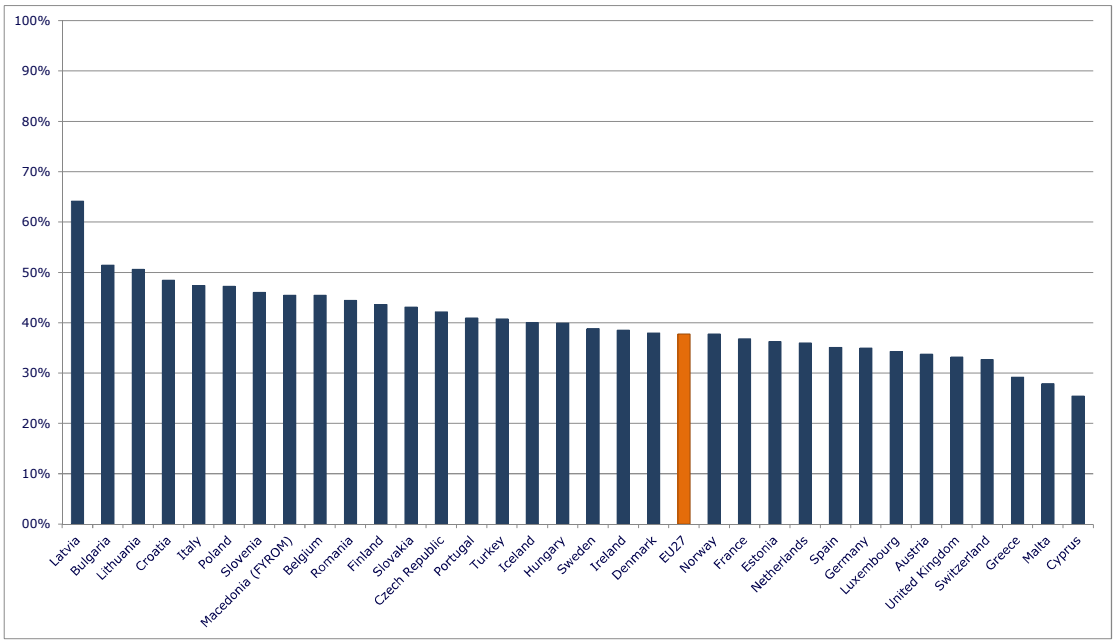
When comparing reported career stages with gender, the representation of women among different career groups clearly drops as we move to the higher career stages (cf. infra in section 5.5.1. on current employment). In the R1 group, 47% of researchers are women (46% in EU27). This percentage continuously drops to 29% in the R4 group (28% in EU27). This drop is also more or less in line with the decline in female representation along the age groups. Whereas 44% of researchers under 35 years of age are women, only 38% are women in the 45-54 years group and 27% in the 55-64 years group.

[38] Among the employed in the EU27 in 2011, 85% is aged between 15 and 54; 14% between 55 and 64 and 2% is older than 65.

With respect to other gender characteristics, the total share of women in the EU27 researcher population is 38%, the figure for men being 62% (Figure 8). The distribution per country shows that the Western European countries are not necessarily the most gender-equal in comparison to Eastern European countries.

This gender distribution compares to 45% females employed[39], 32% female researchers in all sectors and 40% female researchers in the higher education sector in the EU27[40]. At country level, the MORE2 survey data includes relatively fewer female researchers than does the Eurostat indicator (based on the R&D survey data in the higher education sector). This relates primarily to Cyprus (26% compared to 37%); United Kingdom (33% compared to 44%); Estonia (36% compared to 47%); Portugal (41% compared to 49%) and Norway (38% compared to 44%). Conversely, there are more women in the MORE2 survey, primarily in Latvia (64% compared to 52%); Italy (47% compared to 39%); Czech Republic (42% compared to 34%) and Bulgaria (51% compared to 45%).

Figure 8: Female researchers by country



Source: MORE2 Higher Education Survey (2012)

Note: Share of female EU researchers per country. (n=10,547)

Women are also more likely to work part-time in comparison to male researchers (Figure 9).

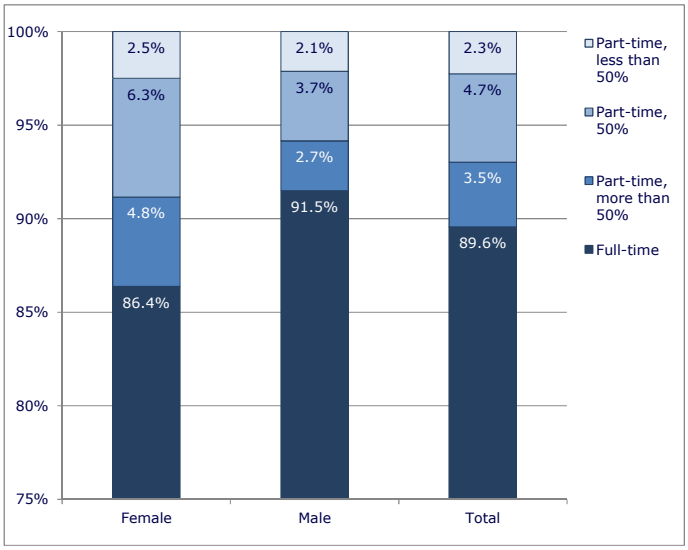
Table 6 distinguishes between the representation of women and men in the different field of sciences in the EU27. Female researchers are more or less equally represented compared to men in Health and Social Sciences, whereas they take up a smaller share in Natural Sciences.

Thus, in terms of gender career profiles, it seems that women are underrepresented in higher career stages and among the older age groups, whereas they are (slightly) more strongly represented among part-time working researchers.

[39] Source: Eurostat, 2011 data.

[40] Source: Eurostat, R&D survey data, 2010 data.

Figure 9: Type of position by gender (EU27)



Source: MORE2 Higher Education Survey (2012)

Note: Distribution of female EU researchers over type of position. (n=8,985)

Table 6: Gender representation per field of science (EU27)

Field of Science	% Female
Health and Agricultural Sciences	44.0%
Natural Sciences and Engineering & Technology	28.7%
Social sciences and Humanities	43.5%
Total	*37.8%*

Source: MORE2 Higher Education Survey (2012)

Note: Share of female researchers per field of science. (n=9,016)

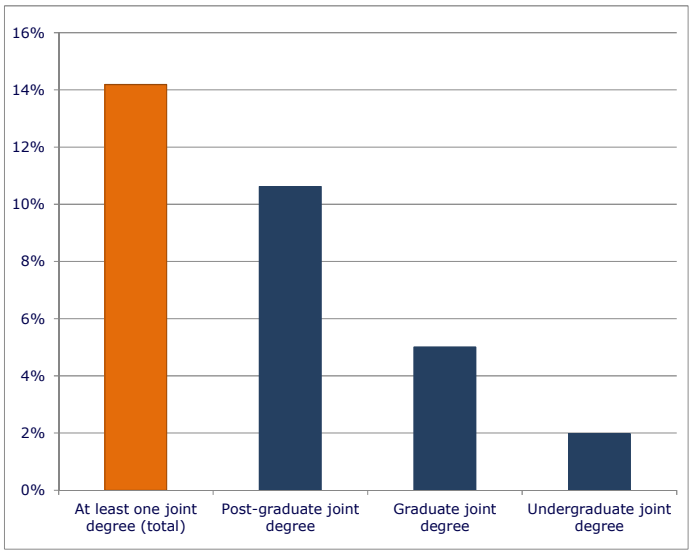
5.4 Education and training

97% of researchers in the EU27 have obtained at least one post-secondary degree[41].

The survey also asked about 'joint degrees', these being defined as degrees for which the student is enrolled in two (or more) programmes at different institutes who share authority. Once completing the full programme, the researcher receives a national degree from each participating institution or one awarded jointly by them.

The total share of researchers with a joint degree in the EU researcher population is around 14% (Figure 10). The number of joint degrees is at its highest for postgraduate studies: 11% of EU27 researchers obtained a joint degree during their postgraduate education. The number of joint degrees decreases with level of education: graduate (around 5%) and undergraduate (around 2%).

Figure 10: Joint degree per type of diploma (EU27)



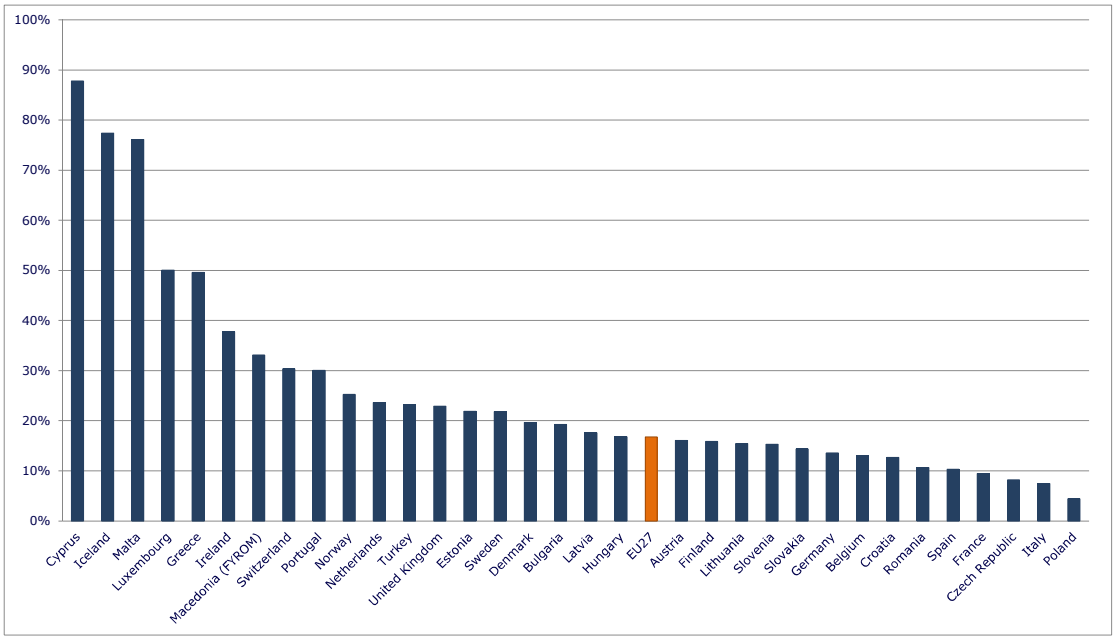
Source: MORE2 Higher Education Survey (2012)

Note: Share of researchers with a joint degree per type of diploma. (n=9,016)

Around 17% of the EU27 researcher population completed (at least one phase of) their graduate or undergraduate level education in a country other than their country of citizenship (Figure 11). Researchers who are located in small countries (such as Cyprus, Iceland, Malta or Luxembourg) are, perhaps not surprisingly, most likely to graduate in a different country when they are in the 'student' stage. In Greece, Ireland and Macedonia, a high share of researchers also obtain their graduate or undergraduate degree in a country other than that of their citizenship - contrary to researchers in Italy and Poland where this type of mobility at the student stage is less likely.

[41] Further details on number of degrees per researcher and per type are omitted from the report because of lack of reliable data. A substantial share of respondents did not provide all degrees, but (probably) only their last and/or highest degree.

Figure 11: Comparison between countries of graduate and undergraduate education and country of citizenship of the researcher population per country



Source: MORE2 Higher Education Survey (2012)

Note: Share of researchers where country of graduation for at least one of their degrees at the graduate or undergraduate level is not equal to their country of citizenship (n=10,148)

5.5 Current employment as a researcher

5.5.1 General information

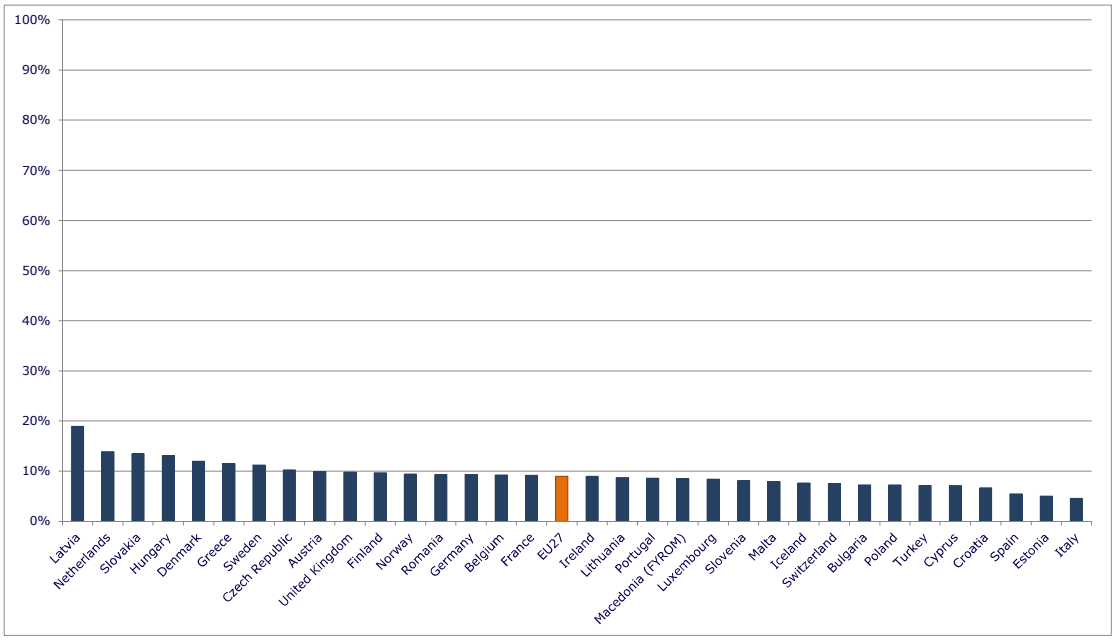
In the questionnaire, researchers were asked to select the main field of research in their current position. Six main fields were identified: Natural Sciences, Engineering & Technology, Medical Sciences, Agricultural Sciences, Social Sciences, and Humanities.

Figure 2 in section 4.4 above illustrated the overall distribution in the sample over the 6 fields of science. Comparing the field of highest education with that of current employment provides information on the discrepancy between both, combining information on both interdisciplinary mobility and lack of employment opportunities in certain fields. Figure 12 presents an overview of this indicator for all countries. The EU27 average is 9% and most countries can be grouped within the 7-10% range. Some countries stand out with a high score: Latvia (19%), the Netherlands (14%), Slovakia (14%) and Hungary (13%).

The OECD (2012)[42] finds similar shares - mainly between 0% and 15% - of academics employed in jobs that are not related to their doctoral degree. For Portugal, the Russian Federation, Croatia, Romania, Bulgaria, Hungary and Turkey, shares are below 5%, while for Belgium, Spain, the Netherlands and Latvia shares are above 15%.

[42] OECD (2012) Doctoral graduates in times of economic downturn: labour market participation and mobility. OECD: Auriol L., M. Misu & R. Freeman, 11(1).

Figure 12: Interdisciplinary difference between highest education and current employment per country



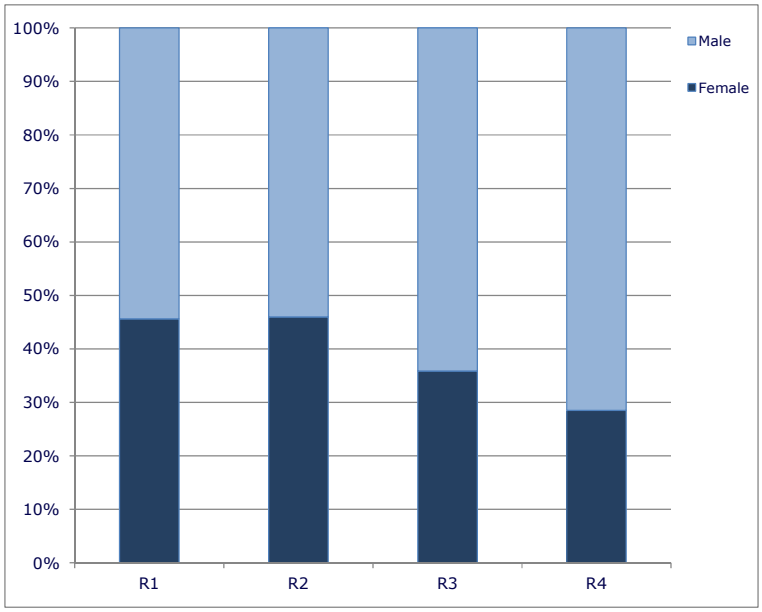
Source: MORE2 Higher Education Survey (2012)

Note: Share of researchers for whom the field of current employment is different from the field of highest education per country (n=10,148)

As mentioned under section 4.4, the share of researchers in each of the four career stages (R1-R4) is well represented, and the age structure of the researchers in the four career stages follows a logical pattern, whereby age increases according to the researcher's career stage.

As mentioned above when explaining the socio-demographic analysis, the distribution of career stages by gender also reflects expectations, with a declining share of female researchers working at the higher career levels. Figure 13 demonstrates that although numbers of women are nearing those of men in the R1 and R2 career group, their numbers fall at the R3 stage to 36% and decrease further to 28% at Professorial level. Every higher career step reflects a lower proportion of women, a gender inequity that is subject of much debate and policy-making at the national and institutional levels, with the aim of enhancing the academic careers of women in the higher ranks. This drop is also more or less in line with the decline in female representation along the age groups. Whereas 44% of researchers under 35 years of age are women, only 38% are women in the 45-54 years group and 27% in the 55-64 years group.

Figure 13: Distribution of researchers over gender per current career stage (EU27)

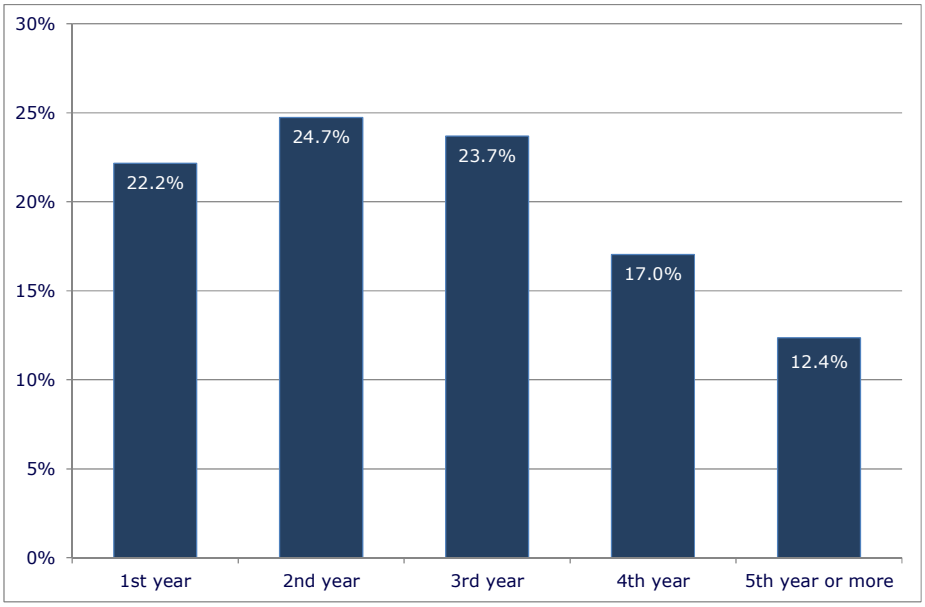


Source: MORE2 Higher Education Survey (2012)

Note: Share of researchers per gender in each career stage with R1 (doctoral or equivalent), R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers. (n=9,016)

Regarding the specific position of R1 first stage researchers (doctoral candidate stage or equivalent, without having undertaken a doctorate) 82% of all R1 researchers in the EU27 population are currently working on their PhD. The other 18% indicate that they are not doing so. Of all R1 researchers, 12% indicate that they are a Professor, which is remarkable given the fact that this is the early career category. The distribution of R1 researchers currently working on their PhD is shown in Figure 14. The candidates are fairly equally divided over the first four years, which is the most frequent length of doctoral training programmes.

Figure 14: Distribution of researchers currently involved in a PhD over year of PhD (EU27)



Source: MORE2 Higher Education Survey (2012)

Note: Share of researchers currently involved in a PhD per year of PhD. (n=1,621)

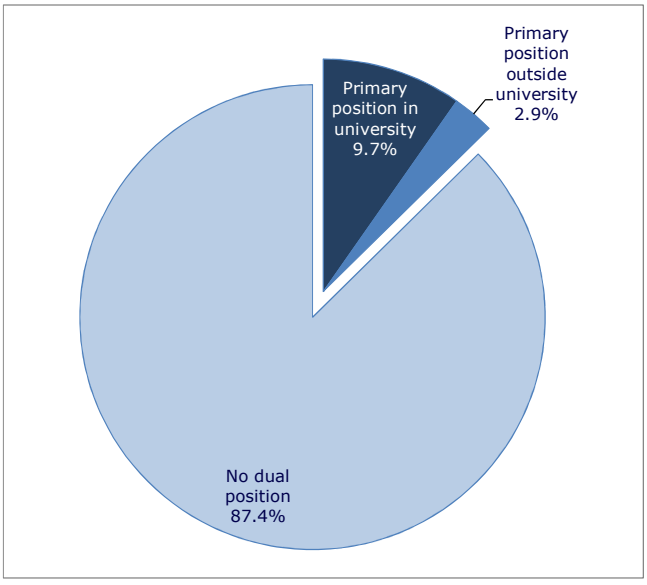
In the questionnaire, researchers were asked whether they are in a so-called 'dual position', that is, employed both by the university (or higher education institutions) and another sector. This question was only answered by the R2, R3 and R4 groups of researchers. Of the EU27 researchers, 13% said they had such a position: 11% for women and 14% for men.

Most of those researchers having a dual position are primarily employed by the university (see Figure 15). Less than 3% of all researchers have a primary position outside the university, although there are efforts in different countries to increase the number of researchers from private industry who can obtain a position at the university on a part-time basis.

Figure 16 shows the distribution of those with a dual position in three main sectors. The vast majority have a dual position in the public or government sector, such as a research based organisation (64% of those with a dual position and 8% of all researchers in EU27). A much smaller group also occupies a position in the private sector (25% of those with a dual position and 3.1% of all researchers in EU27).

Figure 17 illustrates the dual position of researchers in current employment across EU27. The country differences are quite significant, varying from 7% to 40%, with the EU27 average of 13%. Below this average are Western and Southern countries, whereas of the 11 countries with more than 20% dual positions, 9 are Eastern European countries. A possible explanation can be found in the working conditions and particularly the (relatively low) level of remuneration for university researchers in these countries, compared to their counterparts in other parts of Europe.

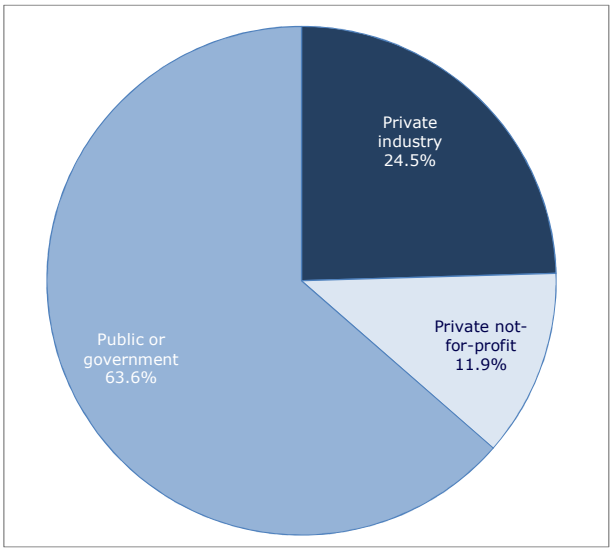
Figure 15: Distribution of researchers over status dual position (EU27)



Source: MORE2 Higher Education Survey (2012)

Note: - Share of researchers per status of the dual position (none, primary or non-primary). (n=8,046)
- Only for R2 (post-doctoral or equivalent), R3 (established) and R4 (leading) researchers.

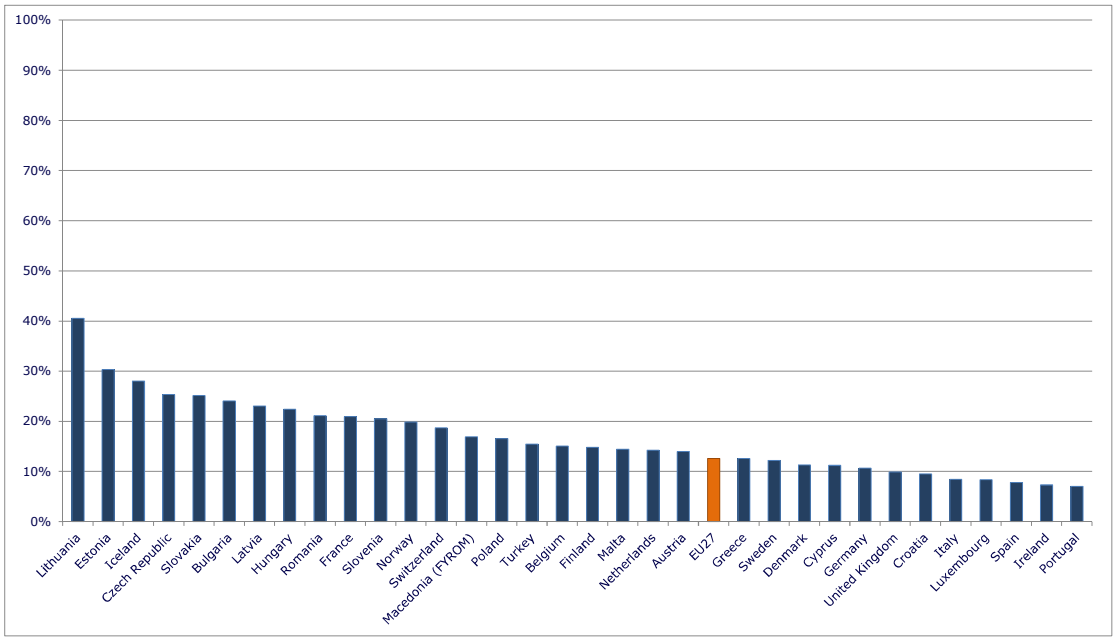
Figure 16: Distribution of researchers currently involved in a dual position over types of positions combined with the HEI position (EU27)



Source: MORE2 Higher Education Survey (2012)

Note: - Share of researchers currently involved in a dual position over the type of position that is combined with the HEI position. (n=1,247)
- Only for R2 (post-doctoral or equivalent), R3 (established) and R4 (leading) researchers.

Figure 17: Dual positions per country



Source: MORE2 Higher Education Survey (2012)

Note: - Share of researchers that are currently involved in a dual position per country. (n=8,375)
- Only for R2 (post-doctoral or equivalent), R3 (established) and R4 (leading) researchers.

Finally, we asked about the average length of a researcher's current post, measured in years and to the present date. Overall, 44% of researchers have been in their current position for ten years or more.

As expected, the average length of a researcher's post increases with career progression. The first stage researchers (mainly doctoral candidates) state an average of four years, which corresponds to the normal duration of doctoral training programmes. The average length of a post for recognised researchers is seven years, whereas the established and leading researchers (R3 and R4) amount to 11 and 17 years respectively. These figures correspond to the previous overview of different age groups whereby promotions are awarded according to seniority. However, in several countries, established researchers will not automatically be promoted to the highest rank. The average duration of current employment for researchers at the post-doctoral stage is as expected. Most of these researchers have temporary and short-term appointments. These posts can be renewed for a new period, but in many countries the total length of the post is pre-defined and limited.

When analysing the gender dimension, it appears that in EU27 the average duration of current employment is 9.6 years for women and 11.4 years for men. This difference can partly be explained by the fact that men are relatively further ahead in the career stages than women. However, the aforementioned fact that the percentage of women dwindles in every subsequent career stage also accounts for this trend.

5.5.2 Working conditions

This section concentrates on working conditions of researchers as far as their appointment and contractual positions are concerned; the employment relationship (civil servant status and employee status); full-time and part-time positions and their teaching load. Researchers' general satisfaction levels as regards working conditions are also included. Other aspects of working conditions such as pay scales, fringe benefits, and social conditions will be covered in the other deliverables of the project.

5.5.2.1 Contractual position

With respect to contractual position, a major distinction can be drawn between permanent/tenured and temporary positions. For the latter, four time periods have been identified: contract under 1 year; 1-2 years; 2-4 years and more than 4 years. Additionally respondents can have no contract at all or be self-employed. In interpreting the data, it is important to note that contractual position does not necessarily relate to 'good' working conditions, as other factors such as salary, career prospects, research autonomy and environment, training, etc also play an important role in the attractiveness of a researcher's career.

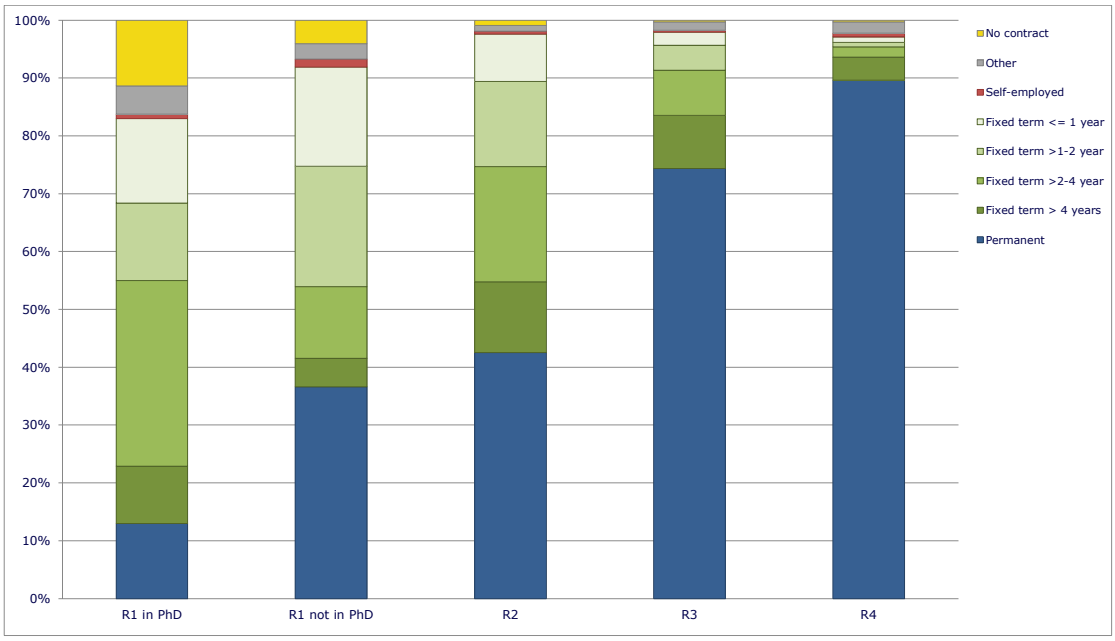
Type of contract per current career stage

Career stage is found to be the most important factor in explaining variances in contract position. Figure 18 illustrates the distribution of types of contract for each of the four career stages. We split the R1 group into those researchers with and without enrolment in a PhD programme. Each subsequent step in the career stage shows a higher proportion of permanent positions. 91% of those in established research positions (R4) have a permanent position. For the independent researcher (R3) this is 76%, whereas the percentage of those in the post-doctoral stage (R2) amounts to 43%. Although the permanency gap between R4 and R2 is quite considerable, R2 researchers do take up relatively longer fixed term appointments (12% of the post-docs have contract over 4 years and 20% a 2-4 year contract).

While the rest of the R1 researchers have similar contractual positions as the R2 researchers, the PhD students in the R1 stage clearly have more limited access to permanent or longer term fixed contracts. The fixed term contract of 2 to 4 years is most common for this group. Furthermore, 11% of PhD researchers have no contract at all, although this figure seems to be underestimated[43]. As a proxy for a a relatively 'unattractive' contractual situation, the categories 'no contract', 'others' (often student status) and 'fixed term contracts of maximum one year' sum up experiences of 31% of R1 PhD researchers.

A similar pattern of higher job security in later career stages is observed in the analysis of employment relationship (e.g. higher share of civil servants in later career stages) in section 5.5.2.4.

Figure 18: Type of contract per current career stage (EU27)



Source: MORE2 Higher Education Survey (2012)

Note: Distribution of researchers over contract type per current career stage with R1 (doctoral or equivalent), R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers. (n=8,986)

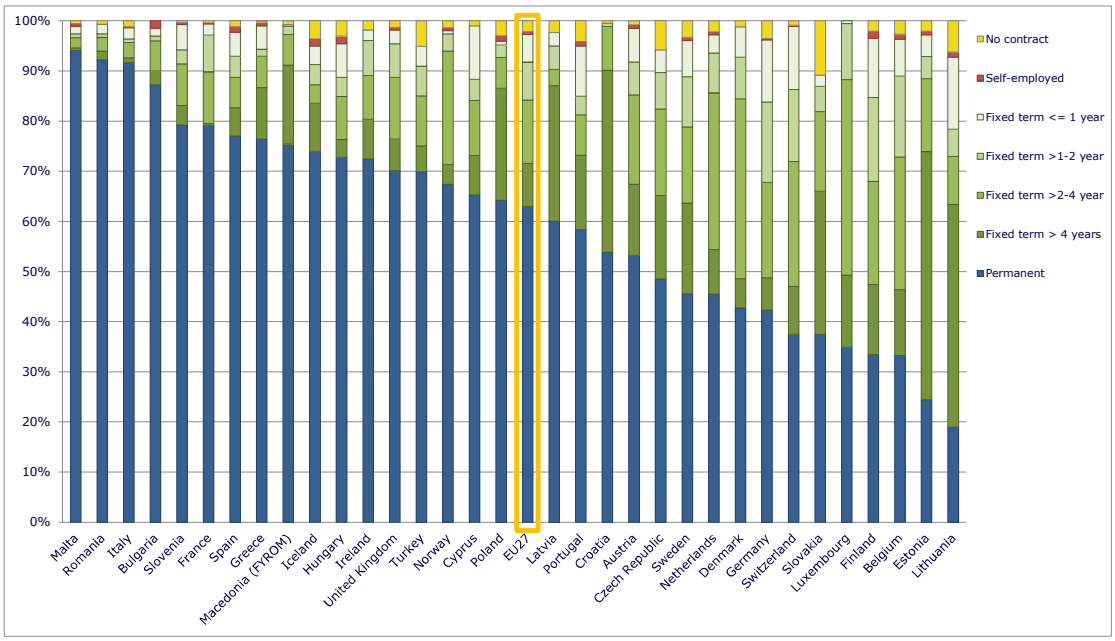
Type of contract per country

Figure 19 shows the overall contractual position of all researchers per country of current employment. It displays a rather diversified pattern. The proportion of permanent positions varies from over 90% for Malta, Romania and Italy to below a third in Belgium (33%), Estonia (24%) and Lithuania (19%) against an EU27 average of 63%. The country differences can, in part, be explained by the distribution and representation of researchers in the different career stages in each country. A country with an overall low share of early-stage researchers in their research population, or one where the younger researchers are underrepresented (cf. section 4.6), will converge to the working conditions of

[43] It should be noted that – even though the academic world was one of the first users of the internet - the frame based on web mails (as any official survey on official register data) may have led to underrepresentation of less visible researchers (who might more frequently work without a contract). Furthermore, different interpretations of the term 'contract' may affect this indicator downwards.

later-stage researchers, i.e. with more permanent and longer term contracts (cf. supra). This is the case for Malta, Romania and Italy, where respectively only 8%, 9% and 6% of the researchers in the sample is in the R1 career stage.

Figure 19: Type of contract per country of current employment



Source: MORE2 Higher Education Survey (2012)

Note: Distribution of researchers over contract type per country of employment. (n=10,547)

Countries which have a relatively high proportion of fixed-term contracts over 4 years are mainly in Eastern Europe: Estonia (50%), Lithuania (44%), Croatia (36%), Latvia (27%) and Poland (22%). For the other fixed-term periods the following are worth mentioning:

- Countries which have higher proportions of fixed-term contracts between 2-4 years are Luxembourg (39%), Denmark (36%), The Netherlands (31%), Belgium (26%), Switzerland (25%) and Norway (23%).
- Relatively more 1-2 year fixed contracts can be found in Finland (17%), Belgium (16%), Germany (16%), Switzerland (14%), Luxembourg, (11%), Sweden (10%) and Denmark (8%).
- Finally, fixed –term contracts less than one year can be found in Lithuania (14%), Switzerland (13%), Germany (12%) and Finland (12%).

For the other type of contract possibilities offered in the questionnaire, namely self-employed and no contract, the percentages are very low. Notably, in Slovakia (11%), Lithuania (6%) and in the Czech Republic (6%) a substantial share of researchers have no contract at all.

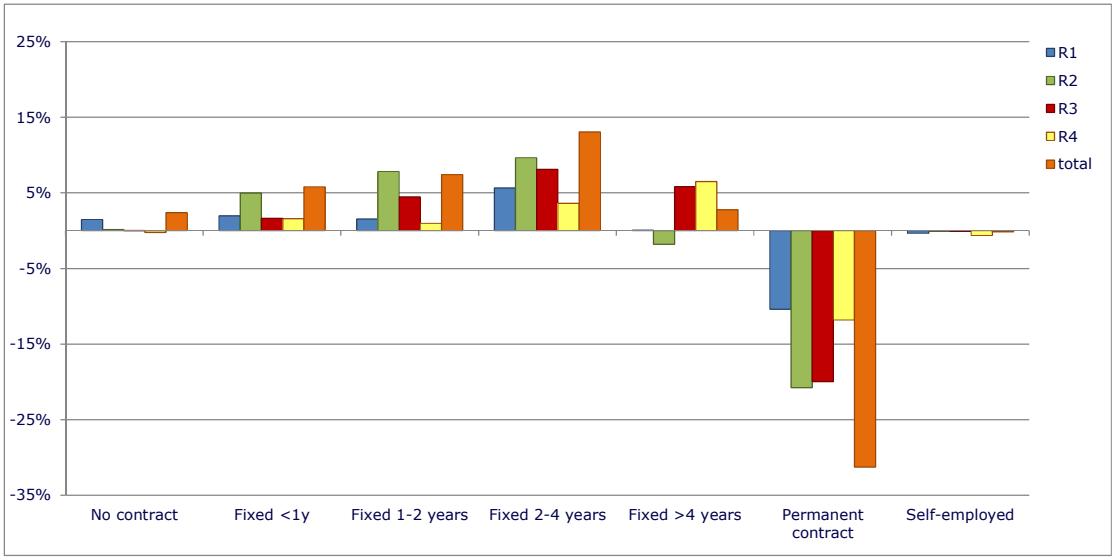
The greater number of fixed-term positions in several countries reflects the general policy changes regarding academic appointments. Even systems with a strong tradition of hiring researchers on a tenured or tenure-track position, or with permanent civil service hiring arrangements similar to tenure, are moving toward more fixed-term appointments. Several countries (in Western Europe) have formally abolished tenure, and have replaced it with term contracts which are renewed as a matter of course[44].

[44] For example, the Education Reform Act of 1988 in the UK removed tenure, which meant that since then all staff appointed or promoted could be dismissed if considered redundant. Other countries have experienced a similar shift from public to private employment contracts whereby

Type of contract for recent employment

Evidence to support this assertion appears when comparing the 'recent contracts' of those starting in their current employment less than 5 years ago across career stages with the entire population. Figure 20 shows that in total (including all career stages) permanent contracts are clearly less common for employment that started less than 5 years ago. Fixed term contracts, particularly those of two to four years, are more common. This pattern is consistent across all career stages[45], although is less pronounced in the R4 stage. Thus, regardless of their career stage, researchers who began their current employment less than 5 years ago are more likely to work with a fixed term contract than in general.

Figure 20: Difference in type of contract for recent employment per current career stage (EU27)



Source: MORE2 Higher Education Survey (2012)

Note: Difference between the share of researchers with a specific contract type of those who are less than five years in their current employment and the total share of researchers with that specific contract type per current career stage. (n=8,766)

Type of contract per gender

Finally, the gender factor is presented in Figure 21 which shows the distribution of the various types of contracts between men and women. More men generally have a permanent position in their current role than do than women (66% respectively 58%), whereas women have more 2-4 fixed term appointments than men (15% against 11%). Regarding the other types of contract, the differences between men and women are fractional.

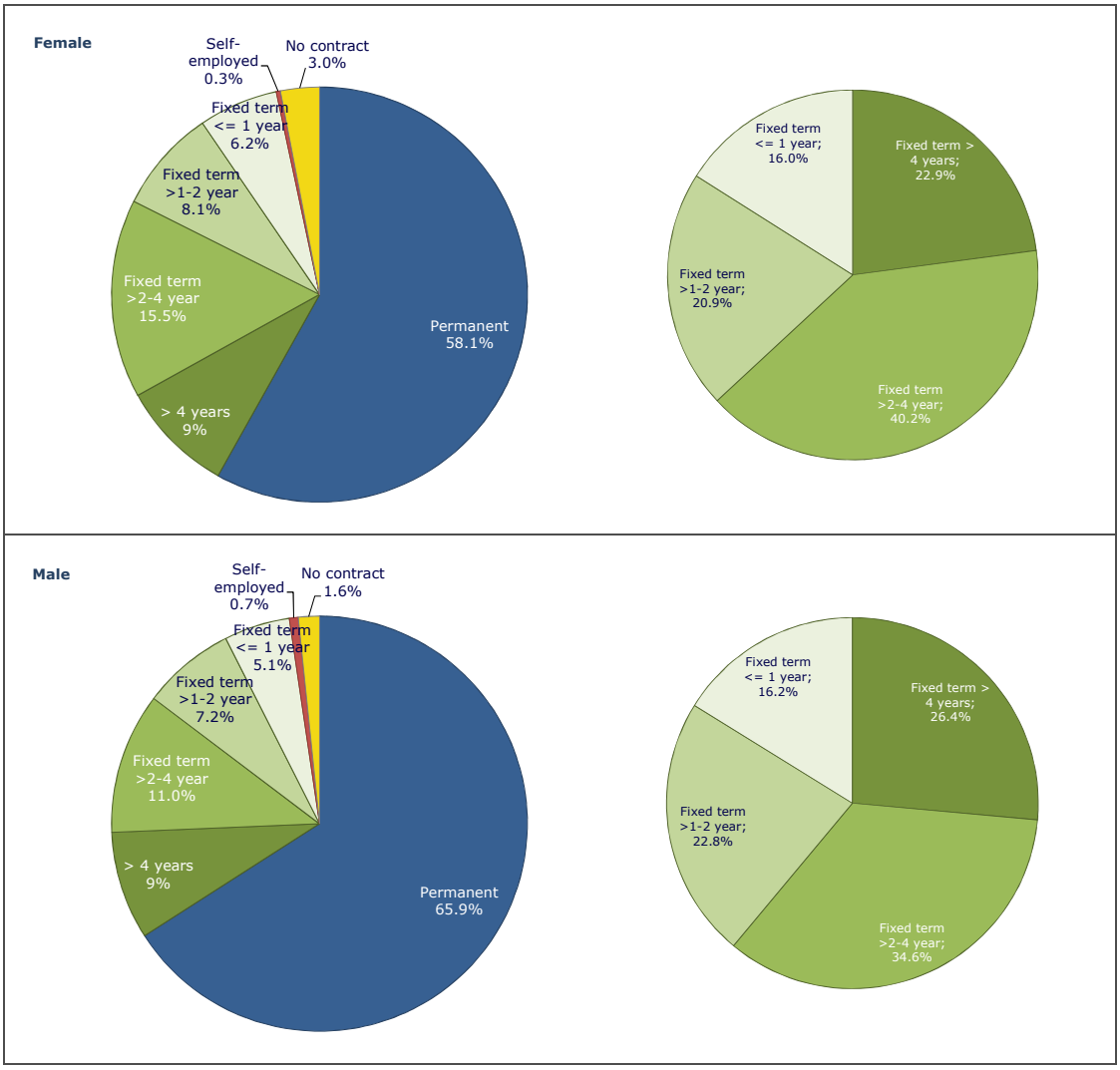
Again, an important factor in explaining gender difference regarding permanent positions is their distribution across the various career stages. Although women equal men in the earlier career stages, the proportion of employed women dwindles with each subsequent career stage, particularly in the tenured positions.

tenure no longer exists because a contract arranged for an indefinite time allows for its termination, in accordance with the conditions as set by national labour legislation. See for an overview of developments in Europe: J. Enders & E. de Weert (2004) *The International Attractiveness of the Academic Workplace in Europe. Gewerkschaft Erziehung und Wissenschaft* (GEW) Frankfurt /Main.

45 It can be noted that the differences in R1 career stages are limited due to the fact that the majority (80%) of researchers in this group only started their current position during the last five years, so the total group is very similar to the subgroup of 'recent contracts'.

Women's progress in a scientific career is slower compared to men and their numbers start to fall when climbing the career research ladder. The previous MORE1 survey also found that women tend to gradually reduce in number as they move from the doctoral stage to the further stages of their career as a researcher.

Figure 21: Type of contract per gender (EU27)



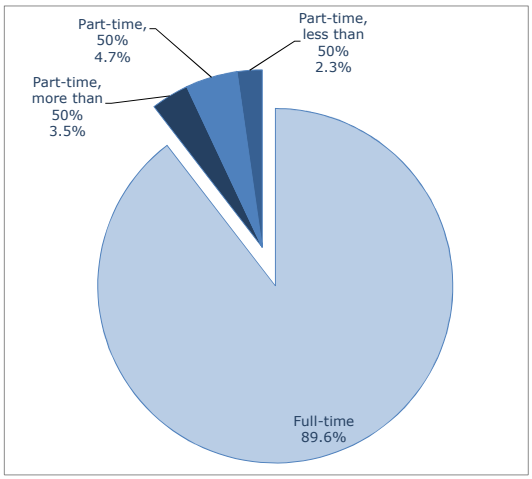
Source: MORE2 Higher Education Survey (2012)

Note: Distribution of researchers over contract type per gender. (n=3,641 for female researchers and n=5,374 for male researchers)

5.5.2.3 Full-time and part-time employment

Figure 22 illustrates the overall distribution of full-time and part-time employment, with full-time employment predominating. The share of researchers who work less than 50% is very low (2%). The gender factor results in a 5 pp difference: 91% of men work full-time against 86% for women in EU27.

Figure 22: Type of position (EU27)

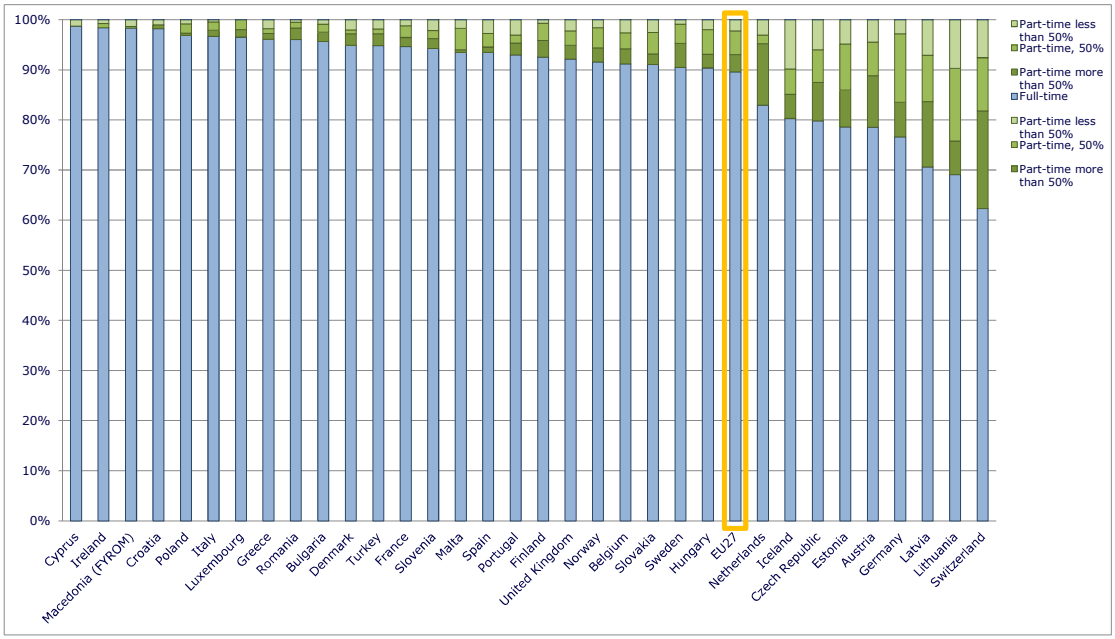


Source: MORE2 Higher Education Survey (2012)

Note: Distribution of researchers over type of position. (n=8,985)

However, there are some country differences, as shown in Figure 23. The overall EU27 average for full-time appointments is 90%. Many countries above this percentage do not differ considerably, although several Eastern European countries are well represented in the top level. Far below the average are Switzerland (62%), Lithuania (69%), Latvia (71%) and Germany (77%). There is a fair proportion of researchers in these countries who are working on a 50% basis.

Figure 23: Type of position per country of current employment (EU27)



Source: MORE2 Higher Education Survey (2012)

Note: Distribution of researchers over type of position per country of current employment. (n=10,546)

5.5.2.4 Employment relationship

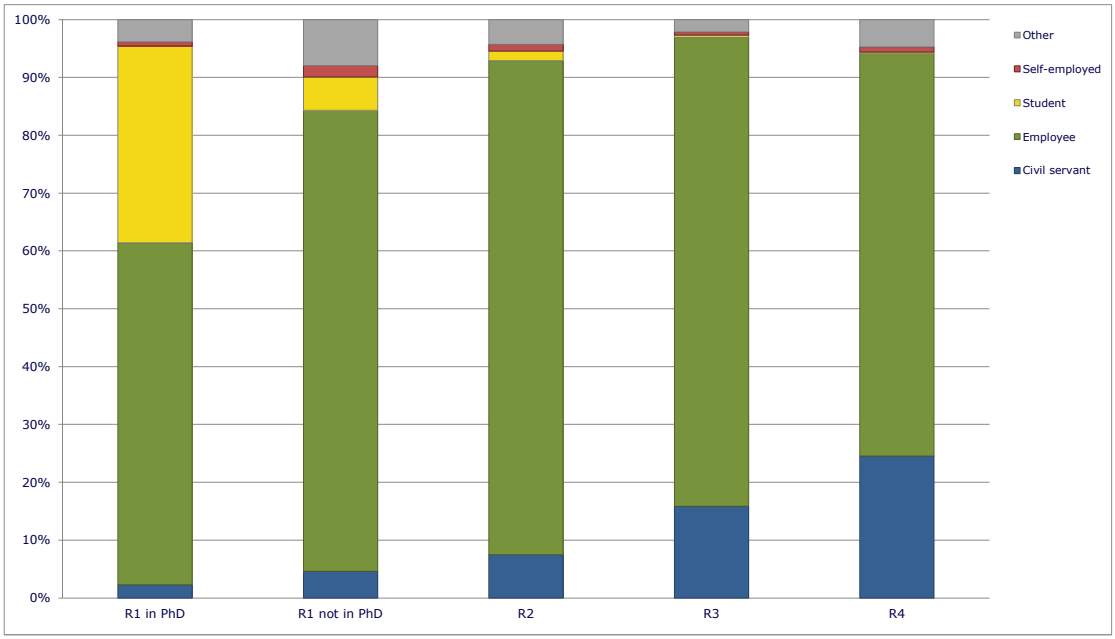
Employment conditions can be regulated by law or by decree, by collective bargaining between representatives of employers and employees at the national or the institutional level, or locally. The basic distinction is a relationship that is associated with a public (civil servant) status and that with a private contractual relationship (employee status). In addition to these two major categories the questionnaire also identified the self-employed and the student status (mainly applied to those in the doctoral training stage).

Employment relationship per current career stage

The extent to which employment status varies during the four career stages is shown in Figure 24. Of those in the doctoral training stage, 34% have student status and over 59% have employee status. The other R1 researchers are closer to the distribution levels for R2 researchers, but still with 6% of students.

In the other career stages, civil servant status increases according the higher career stage and employee status decreases proportionally. This raises the question as to how these figures can be interpreted, particularly the difference between R3 and R4 researchers. Of R4, 26% have civil servant status against 16% of R3, whereas 83% of R3 have employee status against 73% of those in the R4 group. This requires further research: do civil service appointments apply equally to all staff employed at a particular institution, or is can on differentiate between them? A possible difference might also lie in the status of civil servants with permanent and tenured positions, versus those with fixed term contracts. To support the latter hypothesis, we can note that 15% of all civil servants in the EU27 population have a fixed term contract instead of a permanent one.

Figure 24: Employment relationship per current career stage (EU27)



Source: MORE2 Higher Education Survey (2012)

Note: Distribution of researchers over type of employment relationship per current career stage with R1 (doctoral or equivalent), R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers. (n=8,985)

Employment relationship per country

Figure 25 illustrates distribution across countries. Again, the country refers to the country of employment, and country differences are to be interpreted taking into account the relative proportion of researchers in each career stage (cf. section 4.6).

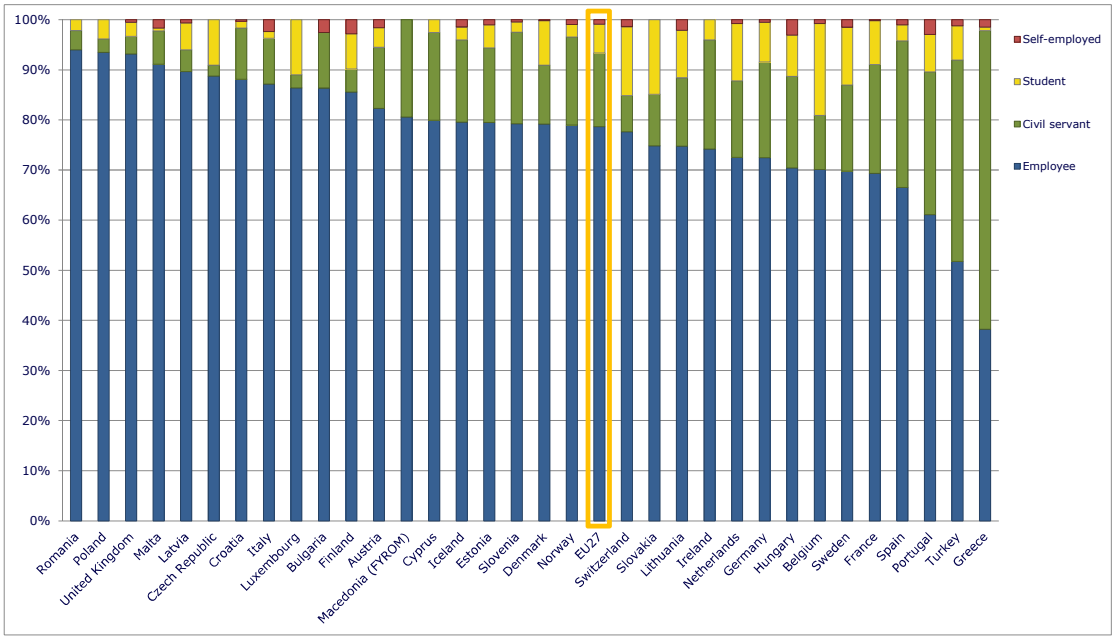
On average, employee status is by far the majority (79%) against 15% civil servant status. Countries with the highest percentage in terms of employee status are Romania (94%), Poland (93%), UK (93%), Malta (91%), Latvia (90%), Czech Republic (89%), Croatia (888) and Italy (87%).

Countries which fall far below the EU27 average are Greece (38%), Turkey (52% and Portugal (61%). Greece is the only country where civil servant status exceeds employee status (60% versus 38%), but as mentioned in section 4.6 there is a potentially significant underrepresentation of those researchers in early career stages in the country sample.

Although Eastern European countries are well represented in the top countries where employee status prevails, a particular pattern does not emerge. The differences between and within countries relate to the extent to which private higher education and research institutions exist in the different national systems.

Relatively speaking, student status is most common in Switzerland (14%), Slovakia (15%) and Belgium (18%).

Figure 25: Employment relationship per country of current employment



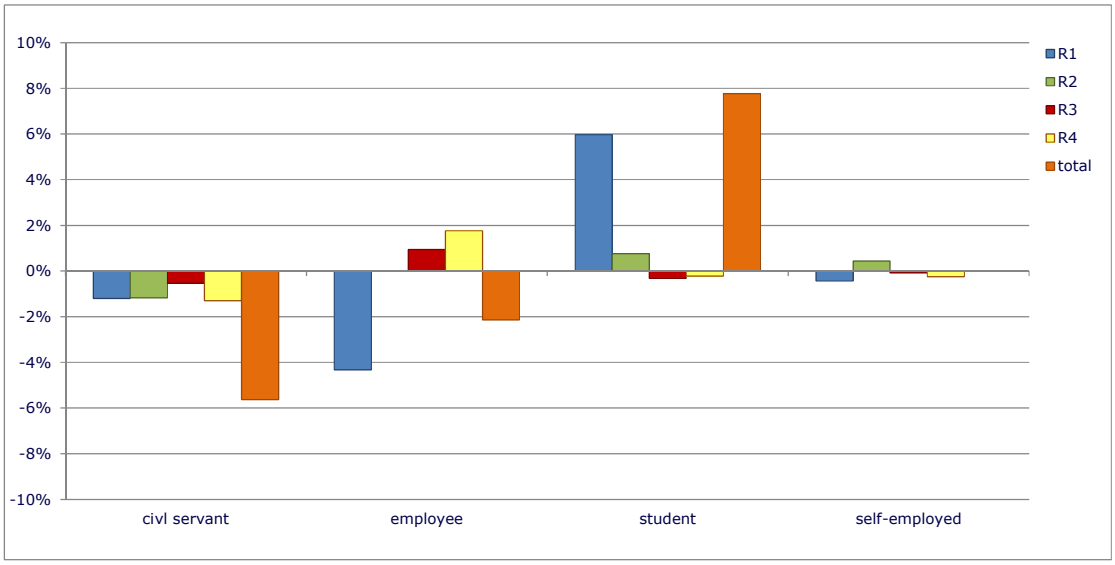
Source: MORE2 Higher Education Survey (2012)

Note: Distribution of researchers over type of employment relationship per country of current employment. (n=10,546)

Employment relationship for recent employment

Another feature under consideration is the duration of current employment. Figure 26 compares the total group of researchers with the group who only started in their current post in the last five years. In general (across all career stages), civil servant positions are less common for recent contracts. This observation further reinforces the indications in section 5.5.2.1 that recent employment relations tend towards less permanent contractual relations. R3 and R4 researchers more frequently work with an employee contract, whereas R1 and R2 with student contracts. The latter is to be interpreted with care however, as the group of R1 contracted in the last 5 years forms 80% of the total group of R1.

Figure 26: Difference in employment relationship for recent employment per current career stage (EU27)



Source: MORE2 Higher Education Survey (2012)

Note: Difference between the share of researchers with a specific employment relationship of those who are less than five years in their current employment and the total share of researchers with that specific employment relationship per current career stage. (n=8,616)

Employment relationship and other factors

Finally, reference can be made to a few other variables in relation to employment status:

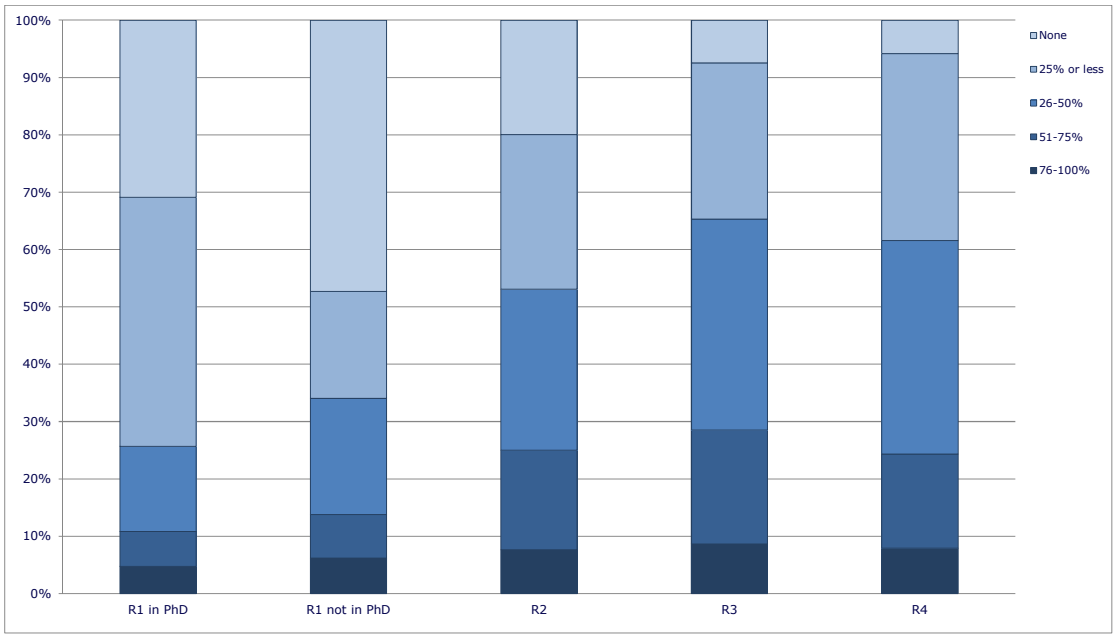
- 96% of civil servants work full-time, for those with employee status this is 90%.
- Permanent contracts are mostly found among those with civil servant status: namely 82% against 63% of those with an employee status. For the latter, fixed term contracts amount to 35%. Students rarely have a permanent contract. They work under fixed term contracts or they have no contract. Of those who are self-employed, 15% have a permanent contract and 20% a fixed term contract. These figures are ambiguous and resist easy interpretation. It might well be that these self-employed researchers will be hired for a fixed term for the duration of a particular research project.
- There are hardly any differences between men and women as far as their employment status is concerned. Only slightly more women have student status (also due to the fact that there exists a higher share of women in lower career stages) and more men are self-employed.

5.5.2.6 Teaching activities

The teaching load on average for EU27 researchers is 8% (for 76-100% of working time), 16% (for 51-75%), 31% (for 26-50%), 31% (for 25% or less) and 14% no teaching load.

The teaching load per career stage is presented in Figure 27. Earlier career stage researchers have a low teaching load and more than a third of those in the doctoral training stage have no teaching load whatsoever. Post-docs also have a relatively low teaching load and can devote most of their time on their research. For the R3 and R4 researchers the differences are minimal - the established researchers devote slightly more time to teaching than do the independent researchers (R3).

Figure 27: Teaching activities per current career stage (EU27)



Source: MORE2 Higher Education Survey (2012)

Note: Distribution of researchers over categories of teaching activities per current career stage. (n=8,985)

Figure 28 presents an overview of researchers' teaching activities in their country of employment across Europe. Against this average, the country percentages differ widely. A few general observations can be made.

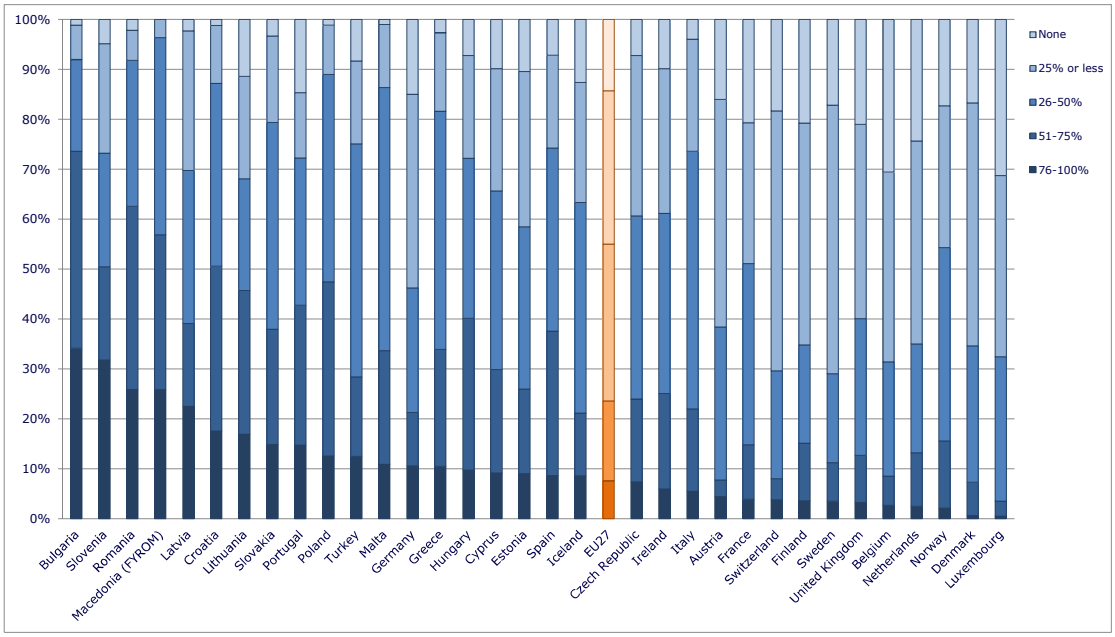
Eastern European countries reflect the highest teaching load. Nine of them have the highest proportion in the category '76-100% working time'. In Bulgaria and Slovenia this is about a third. It is clear that the time available for research is rather restricted.

The category '26-50% working time' devoted to teaching is most common in most countries.

Some countries have a relatively low teaching load (in the category 25% or less): Denmark (49%), Austria (46%), Netherlands (41%), Sweden (54%), Finland (44%). Some countries stand out where there is no teaching load at all: Luxembourg (31%), Belgium (30%), Netherlands (24%), UK (21%), and France (21%). Employment positions at the independent research institutes may account partly for this, but we also note that in Luxembourg, Belgium and the Netherlands R1 researchers make up more than 40% of the sample, which could bias results towards this career stage.

These findings point to the fact that Western European countries are more attractive in terms of the time that can be devoted to research.

Figure 28: Teaching activities per country of current employment



Source: MORE2 Higher Education Survey (2012)

Note: Distribution of researchers over categories of teaching activities per country of current employment. (n=10,546)

Other variables can be taken into account:

- On the distinction between full-time and part-time appointments it appears that those with full-time positions spend relatively more time teaching. Generally, the less the working time, the less the teaching load. It seems that in most countries, a part-time position is mainly seen as being the most suitable for those pursuing research activities.
- The same conclusion applies to employment status. Those in permanent positions spend relatively more time on teaching than those on fixed-term contracts.
- The teaching per starting year of current employment shows a rather consistent picture over the years, but quite rapidly changes from 2005 in favour of a lower teaching load. In the category '25% or less teaching load', this figure is 28% in 2000-2004 and 36% in 2005-2012. 20% of those beginning their current post in 2005-2012 also said that they did not have any teaching, whereas this was 9% in the previous period.

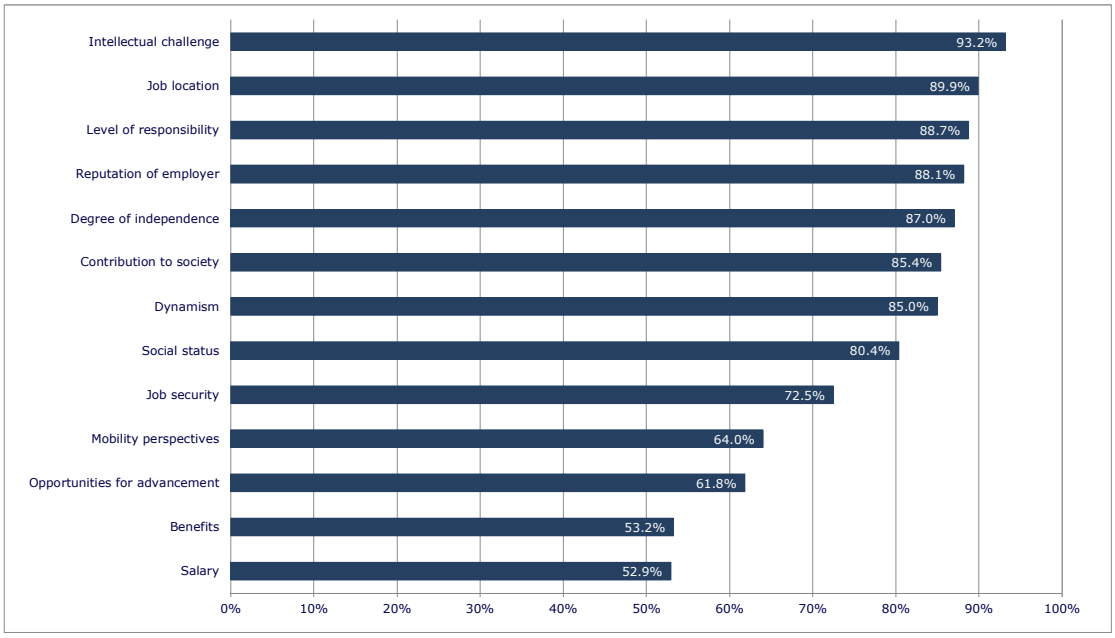
5.5.3 Satisfaction

Figure 29 illustrates researchers' satisfaction with different aspects of their current academic position in the EU27 countries. Researchers are very satisfied with most aspects of their current position - particularly related to academic life - such as intellectual challenge, level of responsibility, independence and reputation of the employer. Researchers are also very satisfied with job location, an important factor which contributes significantly to overall feelings of satisfaction with their current situation.

Ratings for mobility perspectives and opportunities for advancement are relatively lower - but still at 62-64% - while satisfaction in terms of salaries and benefits is

rated last. The question arises as to what extent these ratings are due to mobility effects as such, or whether they should be viewed in the broader context of career opportunities for researchers in general. Would the score for these issues differ between those who are mobile and who are not? It appears that all mobility profiles are relatively satisfied with their mobility perspectives, but the researchers who were >3 month mobile in the last 10 years are in the highest share (68%). Career stage may also be an important factor here (cf. infra).

Figure 29: Degree of satisfaction with different aspects of the current academic position (EU27)



Source: MORE2 Higher Education Survey (2012)

Note: Percentage of researchers who are satisfied with the different aspects of the current academic position (as compared to the researchers answering either satisfied or dissatisfied). (n=9,016)

Satisfaction per current career stage

It can be assumed that satisfaction levels will differ between researchers depending on their career stage. Figure 30 shows the difference between the percentage of researchers satisfied with the different aspects of their current academic position for each career stage and the total percentage satisfied with different aspects of their current academic position (as compared to the number of respondents who replied that they were either satisfied or dissatisfied).

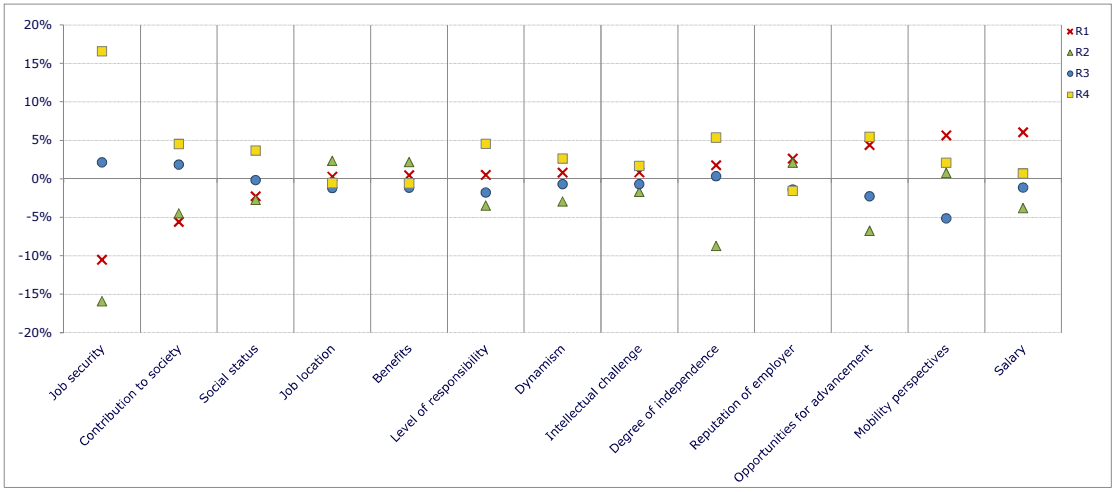
Most pronounced is the difference regarding job security which increases with career stage. This reflects the general employment condition of tenured versus non-tenured positions. This relates particularly to those in the post-doctoral stage (R2) who feel dissatisfied, given the uncertainty about their position in the course of their appointment. Another remarkable outcome is that these post-docs (R2) are more dissatisfied with their degree of independence and with opportunities for advancement. The precarious position of R2 researchers should be of policy concern since this is the most talented group from which R3 and R4 researchers will be recruited in the near future, yet their situation may well discourage them from continuing working in the research profession.

Those in the independent research stage (R3) deviate the least from the average percentages. Only on mobility perspectives are they relatively less satisfied,

whereas doctoral candidates show the highest satisfaction rate in this area. In terms of the other aspects the differences are very small.

For the established researchers job security, opportunities for advancement and degree of independence seem most favourable, however the reputation of employer is slightly below average.

Figure 30: Degree of satisfaction with different aspects of the current academic position per current career stage (EU27)



	R1	R2	R3	R4	*Total*
Job security	61.9%	56.6%	74.6%	89.0%	*72.5%*
Contribution to society	79.8%	80.9%	87.2%	89.9%	*85.4%*
Social status	78.1%	77.6%	80.2%	84.0%	*80.4%*
Job location	90.2%	92.3%	88.7%	89.4%	*89.9%*
Benefits	53.7%	55.4%	52.1%	52.7%	*53.25%*
Level of responsibility	89.2%	85.3%	86.9%	93.3%	*88.7%*
Dynamism	85.8%	82.0%	84.3%	87.6%	*85.0%*
Intellectual challenge	94.0%	91.5%	92.5%	94.9%	*93.28%*
Degree of independence	88.8%	78.3%	87.4%	92.4%	*87.0%*
Reputation of employer	90.8%	90.2%	86.8%	86.6%	*88.2%*
Opportunities for advancement	66.2%	55.1%	59.6%	67.3%	*61.8%*
Mobility perspectives	69.7%	64.8%	58.9%	66.1%	*64.0%*
Salary	59.0%	49.1%	51.8%	53.6%	*52.9%*

Source: MORE2 Higher Education Survey (2012)

Note:
- *Difference between percentage of researchers that are satisfied with the different aspects of the current academic position in each career stage and total percentage of researchers that are satisfied with the different aspects of the current academic position. (n=8,962)*
- *With satisfied compared to the researchers who answered either satisfied or dissatisfied.*
- *With R1=doctoral stage; R2=post-doctoral stage; R3=established researcher; R4=leading researcher.*
- *Reading note: The share of researchers currently in the R4 career stage that is satisfied with job security in their current academic position exceeds the total share of researchers who are satisfied with job security in their current academic position by 16.5 percentage points. The total share is 72.5% whereas the share for R4 researchers is 89.0%.*

Satisfaction per country

The degree of satisfaction may also vary per country of current employment (although one needs to take into account differences in proportions of researchers in each career stage per country). If we determine the percentage of respondents that is satisfied with the aspect as compared to those who replied either satisfied or dissatisfied the following picture emerges.

On 'academic' qualities such as dynamism and intellectual challenge, virtually all countries have a high score, varying between 75% and 97%. There is also considerable agreement regarding level of responsibility (range 78-95%), degree of independence (range 75-93%) and contribution to society (70-90%). On all of these aspects, the Netherlands stands out having the highest score, followed by most of the Scandinavian countries.

More variation was found as regards the following aspects (cf. Table 19 and in Annex 2):

- Opportunities for advancement: Italy (24%), Portugal (40%), Ireland and Romania (both 44%) as the lowest scores, against Estonia and Czech Republic (both 77%), and Bulgaria (74%) as the highest.
- Mobility perspectives: Portugal (46%) and Greece (48%) as the lowest and Latvia (82%), Luxembourg (78%), Slovakia (76%), Denmark (75%), Finland (75%) and Belgium (72%) as the highest score.
- Social status: Slovakia (49%), Hungary (61%) and Croatia (65%) against Iceland (95%), Denmark (90%), Switzerland (89%), Luxembourg (88%), Austria, Belgium, Netherlands and Sweden (all 87%).
- Salaries: Greece (10%), Romania (21%), Poland (23%), Bulgaria (30%), Lithuania (30%), Estonia (31%), and Latvia (36%) have the lowest score and Luxembourg (92%), Belgium (83%) and Switzerland (82%) the highest.
- Benefits: Greece (20%), Romania (27%), Italy (28%), Portugal (29%), Bulgaria (40%), and Lithuania (41%) score the lowest, Luxembourg (90%), Netherlands (77%), Switzerland (70%) and Denmark (70%), show the highest scores.
- Job security: Portugal (58%), Cyprus and Finland (both 61%) and Belgium (63%) score lower, Malta (95 %), France (89%) and Bulgaria (86%) higher.

On the rest of the aspects the differences are quite small, and their range of scores is between 82-94% (job location) and 70-94% (reputation of employer).

A significantly pronounced pattern between the European countries cannot be detected. As expected, satisfaction with salaries in eastern European countries is lower than elsewhere, but on several other aspects the differences are quite small. In terms of 'opportunities for advancement' and 'mobility perspectives' they measure up quite well with many western European countries. In that sense, attempting to assess the attractiveness of a research career per country is a precarious undertaking.

Satisfaction per gender

Finally, satisfaction in these areas differs only to a small extent between men and women. In virtually all areas, women have lower ratings than men: percentage point differences range between +1 (social status) and -7 (opportunities for advancement). Next to the opportunities for advancement, women are also less satisfied with mobility perspectives (6 pp difference with male researchers), job security (6 pp difference) and salary (5 pp difference).

5.6 PhD and doctoral training

The indicators concerning PhD and doctoral training are targeted at the group of researchers that are or were recently enrolled in such a programme:

- current PhD candidates in the R1 career stage (PhD or equivalent) and
- PhD holders in the R2 career stage (post-doctoral or equivalent).

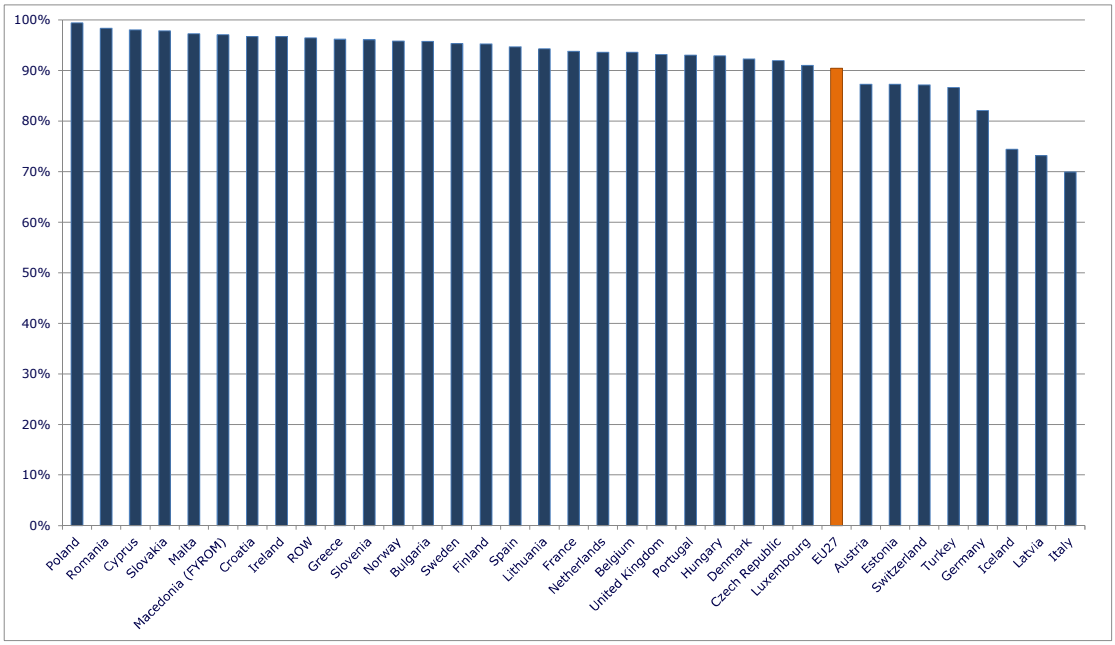
Except for PhD coverage, which is calculated for all career stages, each of the indicators and graphs in this section thus represent this subgroup of researchers.

5.6.1 PhD

5.6.1.1 Doctoral candidates and holders: PhD coverage

82% of all R1 researchers are currently working on their PhD. The total share of researchers with a PhD or who are currently enrolled in a PhD programme is 91%. In Italy, Latvia and Iceland, the coverage is below 75% (Figure 31).

Figure 31: PhD coverage per country of current employment



Source: MORE2 Higher Education Survey (2012)

Note: Share of researchers with a PhD degree or who are currently enrolled in a PhD programme per country of current employment. (n=10,546)

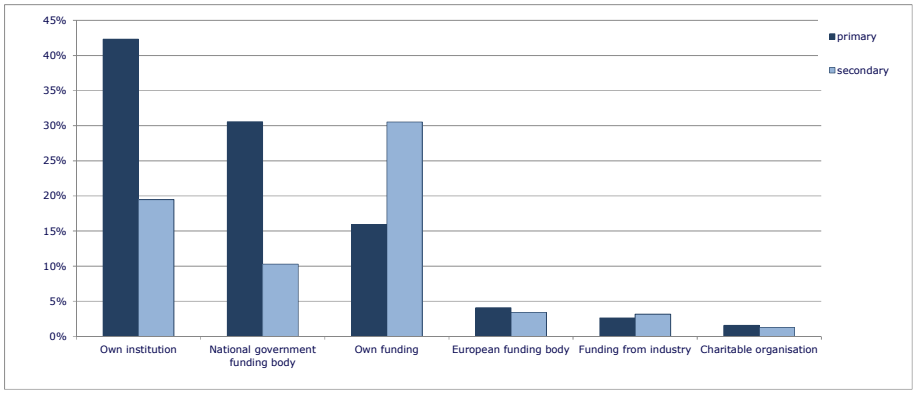
5.6.1.2 PhD funding

The majority of PhD candidates or recent PhD holders are primarily funded by their own institute (42%, Figure 32). Own funds are the most common secondary funding source (31%). Furthermore, of all PhD candidates or recent PhD holders, 16% are funded by their own source and 31% by the national government.

4% of PhD candidates or recent PhD holders receive funding from a European funding body as their primary source and another 3% as the secondary source.

Funding from industry is limited to 3% of PhD candidates or recent PhD holders as their primary source, and slightly more commonly, as the secondary source (3%).

Figure 32: Primary and secondary PhD funding sources (EU27)



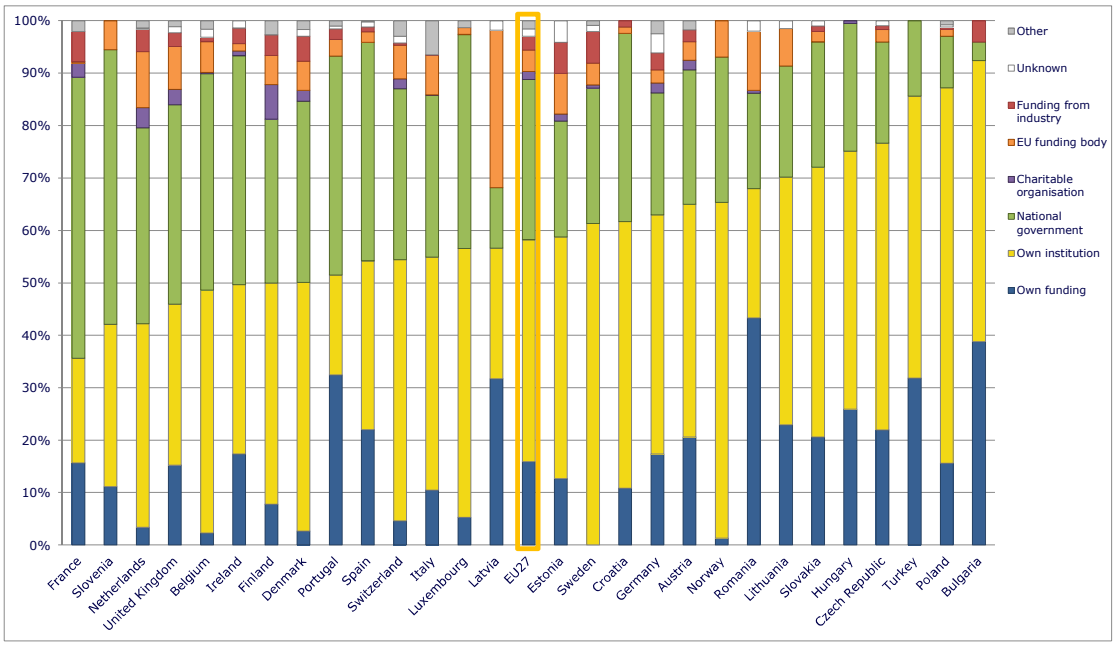
Source: MORE2 Higher Education Survey (2012)

Note: Distribution of R1 PhD candidates and R2 (post-doctoral or equivalent) PhD holders over sources of primary and secondary funding. (n=4,043 for primary funding and n=3,132 for secondary funding)

Variations between countries are presented in Figure 33. More than half of the PhD candidates or recent PhD holders are primarily funded by their own institution in Poland (72%), Norway (64%), Sweden (61%), Czech Republic (55%), Turkey (54%), Bulgaria (54%), Slovakia (52%), Luxembourg (51%) and Croatia (51%). National government funding is prominent in France (54%) and Slovenia (52%). In Romania, Bulgaria, Portugal, Turkey and Latvia own funding is the primary source for between 32% and 43% of PhD candidates or recent PhD graduates.

Finally, it is remarkable that 30% of researchers enrolled in or having recently completed a Latvian PhD programme are primarily funded by an EU funding body. In the Netherlands and Romania, EU funding is the primary support for more than 10% of PhD candidates or recent PhD holders.

Figure 33: Primary PhD funding sources per country of PhD



Source: MORE2 Higher Education Survey (2012)

Note: - Distribution of R1 PhD candidates and R2 (post-doctoral or equivalent) PhD holders over sources of primary funding for their PhD. (n=3,892)
- Countries with less than 30 observations are omitted: Cyprus, Greece, Iceland, Macedonia (FYROM) and Malta.

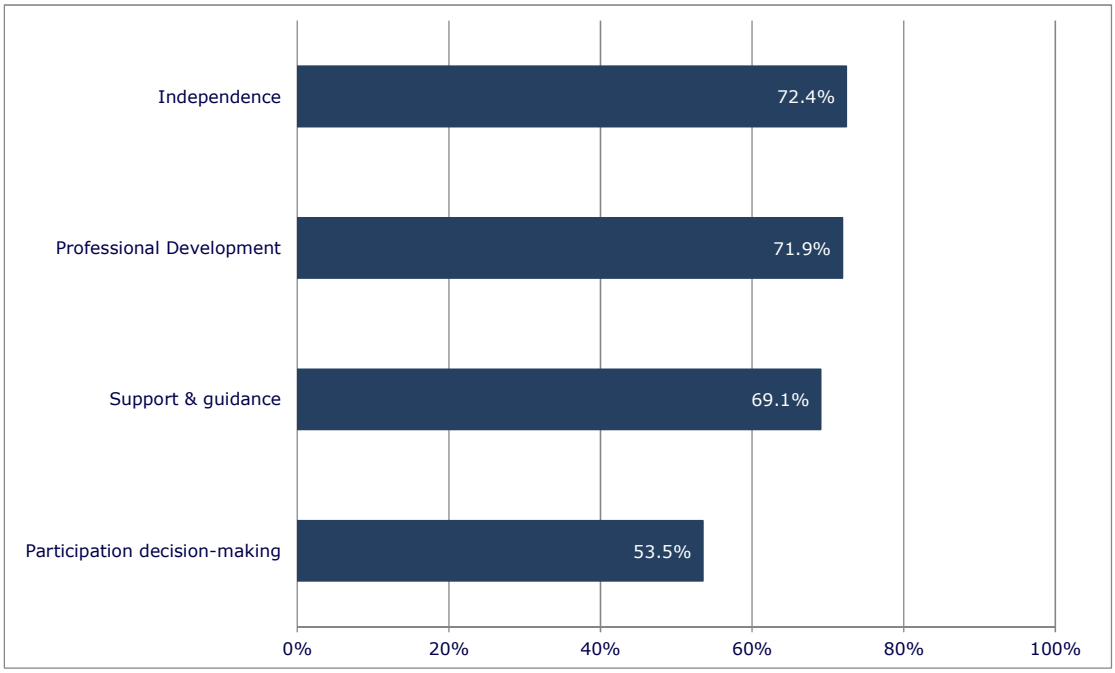
5.6.1.3 Satisfaction with PhD and post-doc position

Approximately three quarters of PhD candidates and R2 (post-doctoral or equivalent) PhD holders are satisfied with the opportunities for professional development (e.g. training) and with the level of independence (e.g. access to and management of project funding and supervision of students) during their PhD (Figure 34).

However, almost one third of researchers are dissatisfied with the support and guidance for their personal and professional development and over 45% are dissatisfied with the possibility to participate in the decision-making process at their institution.

It is remarkable that PhD candidates are relatively more satisfied with each of these aspects as compared to the recent PhD holders. This is particularly notable with respect to the possibility of participating in the decision-making process: 66% of PhD candidates are satisfied, versus only 44% of recent PhD holders.

Figure 34: Satisfaction in PhD position for R1 PhD candidates and R2 PhD holders (EU27)

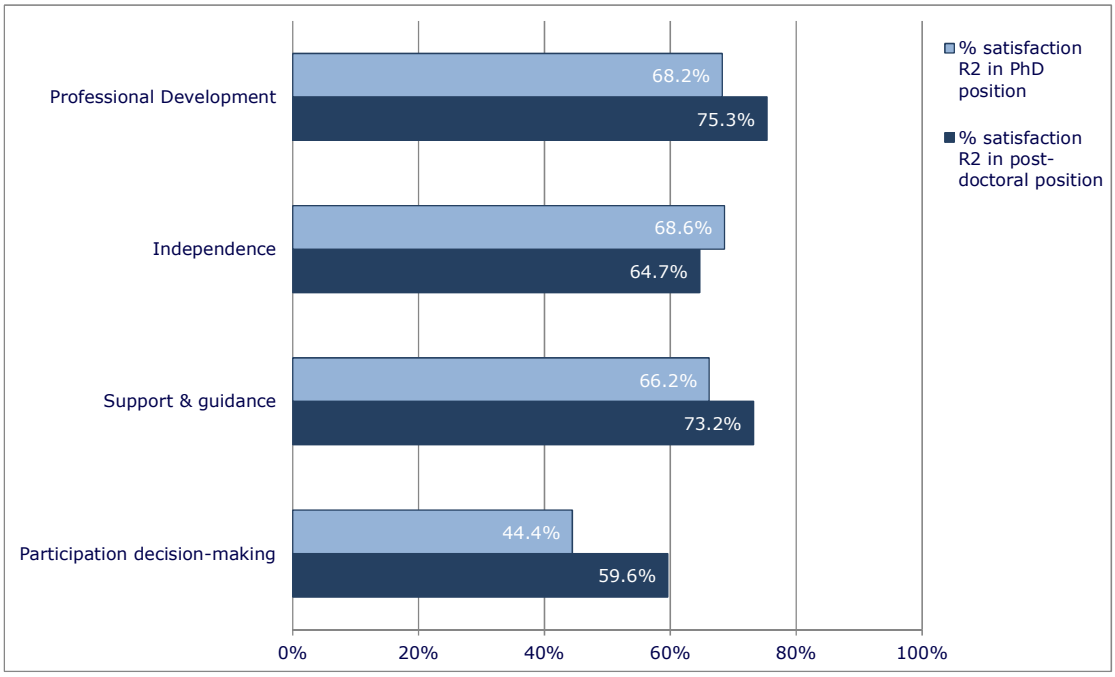


Source: MORE2 Higher Education Survey (2012)

Note: Percentage of PhD candidates and R2 (post-doctoral or equivalent) PhD holders who indicate that they are satisfied with each of the aspects during their PhD (as compared to the R2 researchers indicating either satisfied or dissatisfied). (n=2,122)

When comparing recent PhD holders' degree of satisfaction with these four features of their PhD position versus their view of their post-doctoral position, researchers appear to be relatively more satisfied with their post-doctoral position (Figure 35). This is particularly the case for participation in the decision-making processes at their home institution. However, levels of independence are more highly rated during the PhD than during their post-doctoral position. Overall, R2 PhD holders were slightly less satisfied during their PhD than R1 PhD researchers are now (for both areas around 4 pp difference). Although differences are small, this observation may point to an improvement in the position of PhD researchers.

Figure 35: Comparison satisfaction in PhD position and post-doc position for R2 PhD holders (EU27)



Source: MORE2 Higher Education Survey (2012)

Note: Percentage of R2 (post-doctoral or equivalent) PhD holders who indicate that they are satisfied with each of the aspects during their PhD versus in their post-doctoral position (as compared to the R2 PhD holders indicating either satisfied or dissatisfied). (n=2,122)

5.6.3 Doctoral training

In the context of the European Research Area, doctoral training is high on the agenda of EC policy makers. Based on the 10 "Salzburg principles"[46] and the revisited Salzburg principles II[47], the EC has come to a set of 7 principles for innovative doctoral training[48] beneficial for the quality of doctoral training in Europe:

1) Attractive Institutional Environment
2) Research Excellence
3) Interdisciplinary research options
4) Exposure to non-academia
5) International networking
6) Transferable skills training
7) Quality assurance

Contributors to the ERA public consultation[49] emphasise the importance of high-quality doctoral programmes characterised by interdisciplinary collaboration, workplace experience and high-quality transferable skills.

In this chapter we focus on these aspects and aims by analysing the extent to which researchers receive 'structured training' during their PhD in Europe, the features of such training, as well as its usefulness as perceived by researchers. Further on in the report (section 5.8), we also analyse intersectoral mobility during doctoral training.

5.6.3.1 Researchers receiving structured doctoral training

Respondents to the survey were asked about the type of doctoral training received. Just over half of PhD candidates and recent PhD holders have received 'structured training' during their PhD (51%). There is a 9 pp difference between R2 doctorate holders (47% received training) and current PhD candidates (56% received training). Even though there is a leakage between the R1 and R2 stages to other employment types or jobs outside the higher education institutes, the R2 researchers may be considered to be the 'previous' R1 and carefully comparison of both groups may indicate a positive development over time.

The percentage of PhD candidates and R2 (post-doctoral or equivalent) PhD holders who have received structured training during their PhD varies between 35% in Italy and 79% in Norway (Figure 36). Scandinavian countries such as Norway, Sweden, Denmark and Finland are represented amongst the leaders in terms of structured training, as well as The Netherlands, United Kingdom, Bulgaria and the Baltic countries Estonia and Latvia. Germany, France, Romania, Poland and Italy are at the other end of the spectrum and do not reach 40%. Variations between countries are potentially partially explained by differences in the interpretation of the term 'structured' training.

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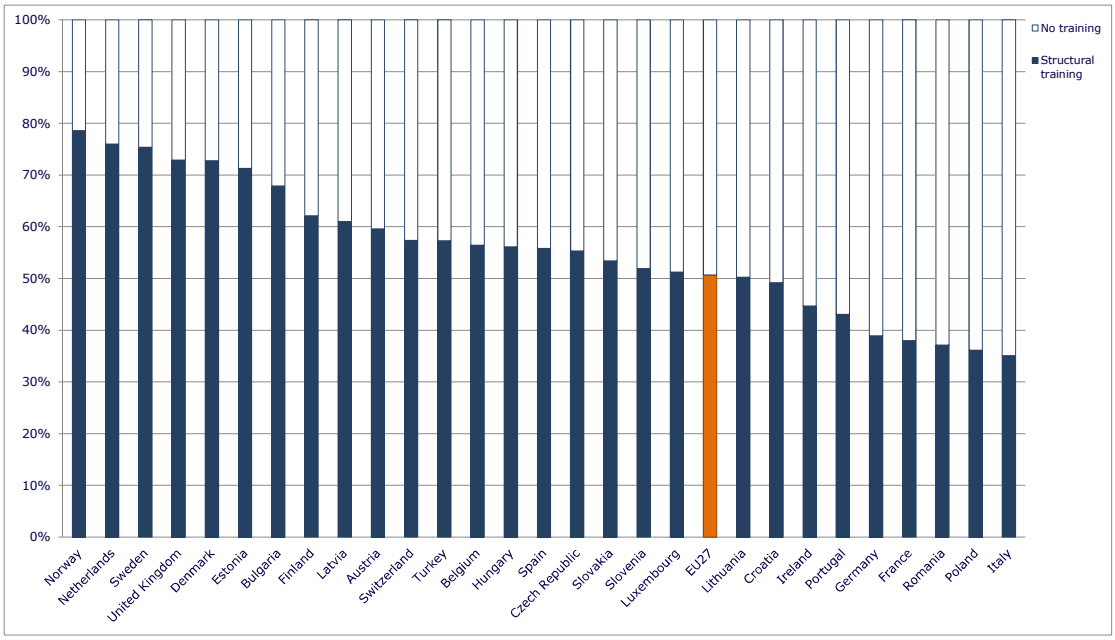
46 http://www.eua.be/eua/jsp/en/upload/Salzburg_Conclusions.1108990538850.pdf

47 http://www.eua.be/Libraries/Publications/Salzburg_II_Recommendations.sflb.ashx

48 Based on the "Report of Mapping Exercise on Doctoral Training in Europe: Towards a common approach" of 27 June 2011(final), adopted by the ERA Steering Group on Human Resources and Mobility. The Principles were defined with the help of experts from university associations; industry and funding organisations. They reflect the Salzburg Principles of EUA, good practice in Member States and the Marie Curie experience. The Principles have been endorsed in the Council conclusions on the modernisation of higher education, Brussels, 28 and 29 November 2011.

49 EC DG Research and Innovation (2012) Areas of untapped potential for the development of the European Research Area (ERA) – Analysis of the response to the ERA Framework public consultation.

Figure 36: Share of researchers receiving structured training during PhD per country of PhD



Source: MORE2 Higher Education Survey (2012)

Note: - Percentage of PhD candidates and R2 (post-doctoral or equivalent) PhD holders who have received structured training during their PhD per country of PhD. (n=3,892)
- Countries with less than 30 observations are omitted: Cyprus, Greece, Iceland, Macedonia (FYROM) and Malta.

5.6.3.2 Modules of structured training

Of all PhD candidates and recent PhD holders, 40% report that they have followed training modules in communication and presentation skills (Figure 37). Project management, time management, grant or proposal writing and ethics are skills in which around one fifth were trained. Skills that are more directly relating to non-academic positions, such as people management, intellectual property rights and entrepreneurship, are less commonly included as training programmes in universities and higher education institutes.

At country level, researchers in the United Kingdom, as well as in Sweden, Turkey, Estonia and Finland appear more likely to receive structured training in all 4 main fields[50]. In Bulgaria, training programmes in management and ethics are relatively common, whereas business skills are less frequently found when compared to other countries, and the training in communication is average.

Overall, the Scandinavian countries have relatively high shares of researchers receiving structured training in most modules, especially in ethics, with Norway ranking first. On the other hand, Norwegian researchers less frequently receive training in business and management skills than in other countries. In Denmark, the extent of training is around the average for management and ethics.

Baltic countries are generally in the upper half of the table, with Estonian researchers frequently trained in most modules. Although around the average for business skills, Lithuanian researchers frequently trained in business skills, on

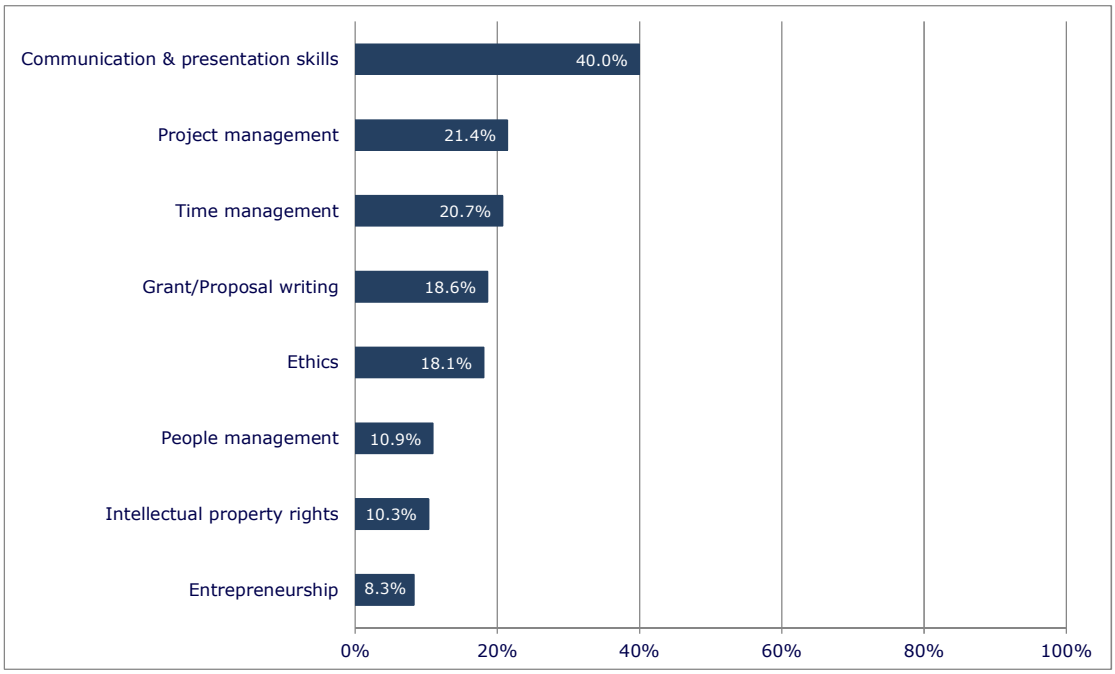
[50] With communication = communication, presentation and grant/proposal writing; management = project, time and people management; ethics = ethics and business skills = intellectual property rights and entrepreneurship.

average for management and ethics and relatively low in communication (compared to other countries). Latvian researchers are trained mainly in management and business skills.

At the other end of the spectrum, researchers in Italy, Germany, Poland, Luxembourg, Portugal and Macedonia (FYROM) report relatively low shares of 'structured training' during their PhD. This applies to all modules. France, Romania and Slovenia also have relatively low shares across the board with the exception of training in business skills. Researchers in Spain are more likely to receive structured training in management but report comparatively less training in other modules. Many South and West European countries thus rank relatively low when compared to other countries, or vary across modules.

Although the general level and extent of structured training seems interrelated across countries in the same region, no clear pattern is detected of certain modules being given more attention per region. One exception is ethics training which is most common in Scandinavian countries and in the United Kingdom and Ireland.

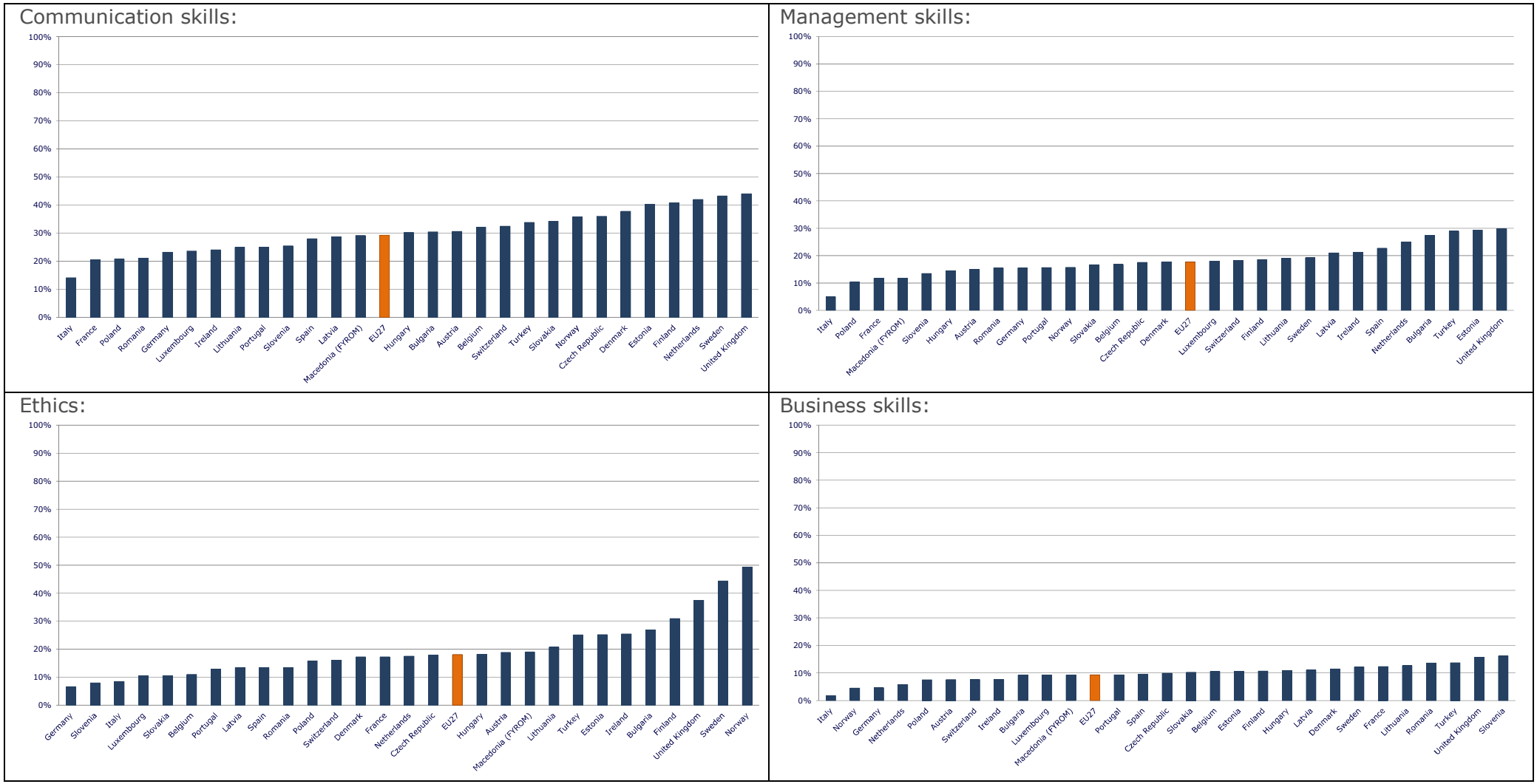
Figure 37: Modules of structured training during PhD (EU27)



Source: MORE2 Higher Education Survey (2012)

Note: Percentage of PhD candidates and R2 (post-doctoral or equivalent) PhD holders who have received structured training during their PhD in the respective skills. (n=2,250)

Figure 38: Modules of structured training during PhD per country of PhD



Source: MORE2 Higher Education Survey (2012)

Note: - Percentage of PhD candidates and R2 (post-doctoral or equivalent) PhD holders who have received structured training during their PhD in the respective skills. (n=4,043)
- Communication skills aggregates communication and presentation skills and grant/proposal writing; Management skills aggregates project management, time management, people management; Business skills aggregates intellectual property rights and entrepreneurship; and Ethics refers to one answering category 'ethics'.

5.6.3.3 Quantity of structured training

The quantity of structured training per year varies. 28% of PhD candidates and recent PhD holders received under two weeks of training per year (15% less than one week; 13% between one and two weeks). Another 6% received between 2 and 3 weeks and 9% more than 3 weeks, amounting to 15% who received more than 2 weeks of training per year. 8% do not know the quantity and 49% did not receive structured training.

No large variations are observed between the current R1 and the current R2 career stages (16% versus 14% training for more than two weeks per year) or between female and male researchers (both 15%). Larger variations occur amongst the different fields of science. Training per year appears to be lowest in Natural Sciences and highest in Social Sciences.

Differences in the share of PhD candidates and recent PhD holders that receive more than two weeks of structured training also vary by country, ranging from 5% in Cyprus to 41% in Macedonia (FYROM). Scandinavian countries as well as Baltic countries and a number of East European countries are above the EU27 average, while West European countries are mainly below (except for the Netherlands and Ireland).

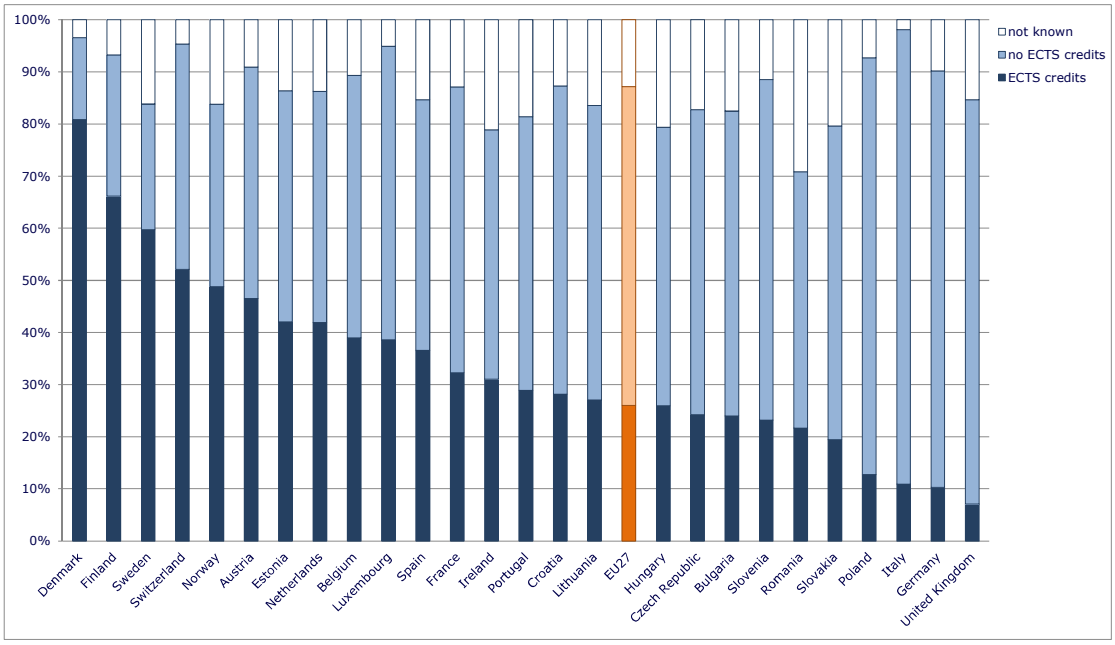
5.6.3.4 ECTS credits for structured training

13% of PhD candidates and recent PhD holders with training (i.e. 7% of total with and without training) do not know whether they have credits for at least one of the training modules they received, according to the European Credit Transfer and Accumulation System (ECTS). The highest levels are in Romania (29%), Ireland (21%), Hungary (21%) and Slovakia (20%).

26% of researchers did receive ECTS credits (13% of total researchers with and without training). The ECTS is most frequently applied in Denmark, where 81% of PhD candidates and recent PhD holders *who have followed structured training* have been given credits for at least one of the training modules they received (Figure 39). Other Scandinavian countries follow with shares higher than 60% (Sweden, Finland) and 49% (Norway). At the other end of the spectrum, four countries have a share of less than 15%: Poland (13%), Italy (11%), Germany (10%) and the United Kingdom (7%).

The share of researchers with ECTS credits is substantially higher among R1 researchers than among R2 (34% versus 20%). The use of the ECTS credits also varies across the fields of science. The share of PhD candidates and recent PhD holders who have followed structured training and who have received ECTS credits for at least one module is highest in the Medical and Agricultural Sciences (30%). The share is similar for both female and male researchers (26% versus 26%).

Figure 39: ECTS credits for structured training during PhD per country of PhD



Source: MORE2 Higher Education Survey (2012)

Note: - Share of PhD candidates and R2 (post-doctoral or equivalent) PhD holders who have received ECTS credits for at least one module of the structured training received during PhD (as compared to the total number that received structured training during PhD). (n=2,249)
- Countries with less than 30 observations are omitted: Cyprus, Greece, Iceland, Latvia, Macedonia (FYROM), Malta and Turkey.

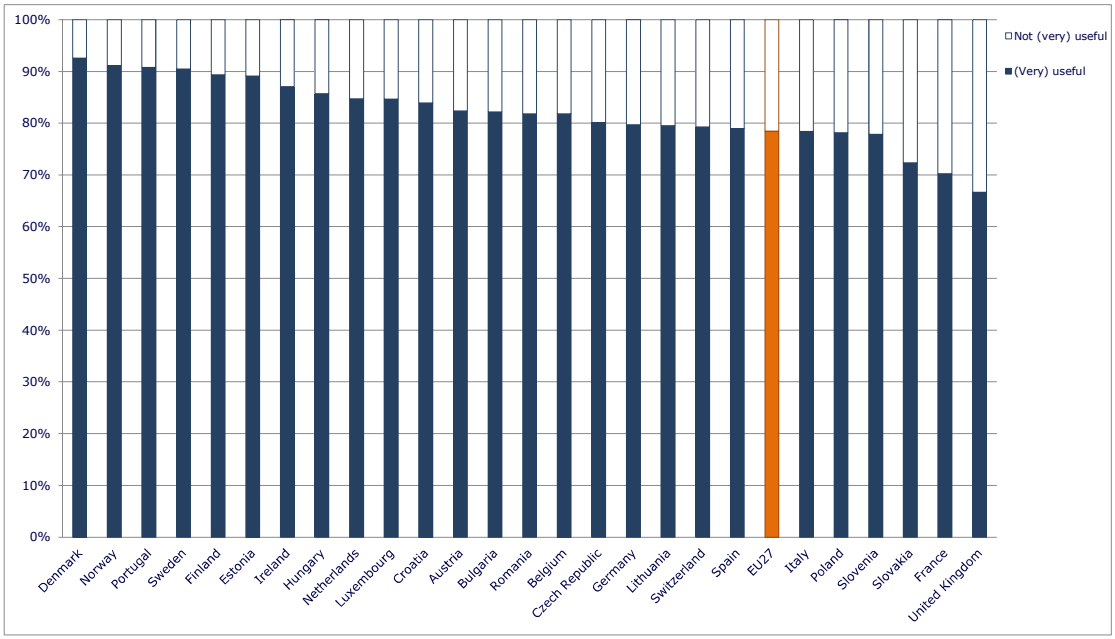
5.6.3.5 Satisfaction with structured training

PhD candidates and recent PhD holders *who have followed structured training* are generally satisfied with its relevance. 59% recognise that it is 'useful' and another 20% as 'very useful'.

During the R1 career stage these levels of satisfaction are higher than during R2 (82% versus 76%). The difference between female and male researchers is limited (80% versus 78%), as it is between fields of science (between 77% and 80%).

In terms of countries where the PhD is undertaken, some variations can be observed, with the Scandinavian countries ranking first in terms of PhD candidates and recent PhD holders who find the structured training (very) useful (Figure 40). It is also noteworthy that more than 85% of Portuguese, Estonian and Irish and Hungarian researchers are satisfied. In the United Kingdom, France and Slovakia, this share is below 75%.

Figure 40: Satisfaction with structured training during PhD per country of PhD



Source: MORE2 Higher Education Survey (2012)

Note: - Share of PhD candidates and R2 (post-doctoral or equivalent) PhD holders who find the structured training received during PhD useful or very useful (as compared to the total number that received structured training during PhD). (n=2,249)
- Countries with less than 30 observations are omitted: Cyprus, Greece, Iceland, Latvia, Macedonia (FYROM), Malta and Turkey.

5.7 International mobility

As stated in section 4.2, existing studies and academic literature have defined international mobility in terms of a number of different definitions and reference points. The academic literature has also shown that the application of one or the other definitions may be the reason for substantial measurement differences. We have therefore chosen not to restrict ourselves to just one definition of mobility, but to compare the outcomes using different concepts.

This approach teaches us that different outcomes occur, but all correspond with each other. Table 7 gives an overview of the results obtained from the MORE2 HEI survey data and Table 8 does the same per country. It is fair to conclude that:

- Around 15% of researchers who currently work in the EU are currently mobile.
- 14% of R2-3-4 researchers moved to another country to obtain their PhD. The share is the same among researchers currently enrolled in a PhD programme or who have recently obtained a PhD and are now in their R2 career stage, implying that such mobility during the PhD phase has not increased.
- A slightly higher proportion (18%) of current or recent PhD researchers were mobile during their PhD (returning 'home' to obtain their PhD).
- Around 30% of researchers were mobile for three months or more in the last ten years during their post-PhD career.
- Just under one-third of this mobile group (12% of all researchers) changed employer when moving abroad.
- A higher share of researchers (41%) were <3 month mobile (less than three months) in the last ten years during their post-PhD career.

It is also important to note that these results are (to the extent that comparison is possible given the use of different scopes and data) in line with existing literature on the topic:

- The 2011 Eurodoc survey finds that between 11% (Croatia) and 32% (Spain) of doctoral students are or were pursuing their doctorate abroad. For countries like Belgium, Portugal and Sweden they reach results which approximate the 15% for PhD degree mobile researchers in the MORE2 HEI sample.
- The MORE1 study shows that more than half (56%) of all EU27 HEI researchers are estimated to have been internationally mobile (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 moved abroad during the last three years. Estimates seem to give lower results in the MORE2 project, which could be due several factors, such as the applied definition (MORE1 defined mobility with reference to country of highest educational level) or weighting procedures at country level.
- The 2009 CDH figures, for example, result in an average of 14% of national citizens with a doctorate who have moved abroad in the previous 10 years (OECD, 2012). This statistic is based on data for returnees only, thus not taking into account those who are currently and may remain abroad. If the latter is calculated in terms of our 16% estimate for current international mobility, we could reach a figure which is close to our estimates of long term post-PhD mobility in the last 10 years.
- Cañibano et al. (2011) research (into Andalusian researchers) short to medium term mobility, defined as research visits abroad of one week to two years duration, and finds a share of 38% mobile researchers, close to the 41% estimate from the MORE2 HEI survey.

We further describe and detail the obtained results in the following sections.

Table 7: Comparison of different international mobility types and definitions (EU27)

Type of international mobility	Reference point	Share mobile researchers
Current mobility	Citizenship	15%
	highest education	15%
R1-R2 PhD degree mobility	direct targeted question (EU27 citizen)	12%
	direct targeted question (highest education in EU27)	13%
R2-3-4 PhD degree mobility	citizenship	13%
	highest education	14%
>3 month mobility during PhD	direct targeted question	18%
>3 month post-PhD mobility in last ten years	citizenship*	30%
	highest education*	28%
	both citizenship and highest education*	27%
	direct targeted question	31%
>3 month post-PhD employer mobility in last ten years	direct targeted question	12%
<3 month mobility in last ten years	direct targeted question	41%

Source: MORE2 Higher Education Survey (2012)

**: The indicators on citizenship and highest education for >3 month international post-PhD mobility are calculated by means of the countries registered in the 'moves' in the questionnaire, compared to either the country of citizenship or the country of highest education. This means we assume that this group of mobile researchers are, by definition, researchers who also respond positively to the direct question "to have worked abroad for more than 3 months in the last ten years". That said, we reweight the share of mobile researchers according to this definition in order to bring the relative size of the sample in line with the number of mobile researchers in the direct question.*

Table 8: Comparison of different international mobility types and definitions per country

Type of international mobility	Current mobility		Overall PhD degree mobility		R1-R2 PhD degree mobility		>3 month mobility during PhD	>3 month post-PhD mobility in last ten years				>3 month post-PhD employer mobility in last ten years	<3 month mobility in last ten years
Reference point	citizenship	highest education	citizenship	highest education	direct targeted question (country of citizenship)	direct targeted question (country of highest education)	direct targeted question	citizenship*	highest education*	both citizenship and highest education*	direct targeted question	direct targeted question	direct targeted question
Austria	24%	23%	12%	14%	13%	15%	12%	44%	41%	39%	45%	26%	52%
Belgium	18%	17%	15%	19%	3%	5%	12%	45%	45%	44%	46%	22%	55%
Bulgaria	1%	11%	8%	12%	31%	10%	15%	-	-	-	18%	5%	41%
Croatia	3%	7%	4%	8%	7%	4%	18%	18%	17%	17%	19%	3%	39%
Cyprus	31%	89%	-	-	10%	-	-	37%	38%	27%	44%	24%	43%
Czech Republic	7%	6%	8%	13%	14%	8%	27%	-	-	-	16%	2%	44%
Denmark	31%	24%	12%	9%	7%	10%	48%	52%	50%	49%	53%	20%	55%
Estonia	12%	26%	8%	14%	11%	10%	37%	26%	24%	24%	27%	14%	48%
Finland	21%	16%	17%	19%	7%	8%	20%	40%	41%	40%	42%	22%	42%
France	14%	8%	14%	12%	7%	8%	17%	26%	25%	25%	26%	7%	33%
Germany	15%	13%	15%	19%	11%	16%	12%	42%	37%	36%	45%	16%	49%
Greece	2%	43%	6%	23%	40%	45%	-	32%	31%	28%	34%	13%	44%
Hungary	5%	10%	8%	8%	17%	14%	22%	34%	33%	33%	34%	16%	61%
Iceland	5%	83%	-	-	-	-	-	-	-	-	49%	15%	55%
Ireland	31%	44%	18%	37%	34%	25%	11%	35%	33%	31%	37%	19%	40%
Italy	2%	6%	7%	12%	25%	27%	56%	25%	24%	24%	25%	8%	37%
Latvia	4%	8%	10%	25%	18%	17%	16%	-	-	-	20%	3%	46%
Lithuania	2%	10%	5%	8%	20%	16%	24%	-	-	-	18%	5%	40%
Luxembourg	76%	86%	-	-	-	-	11%	42%	43%	37%	47%	22%	51%
Macedonia (FYROM)	12%	31%	6%	21%	-	-	-	-	-	-	34%	12%	40%
Malta	7%	79%	9%	-	61%	-	-	23%	22%	21%	24%	8%	37%
Netherlands	37%	25%	36%	30%	29%	25%	18%	45%	43%	42%	46%	22%	47%

Type of international mobility	Current mobility		Overall PhD degree mobility		R1-R2 PhD degree mobility		>3 month mobility during PhD	>3 month post-PhD mobility in last ten years				>3 month post-PhD employer mobility in last ten years	<3 month mobility in last ten years
Reference point	citizenship	highest education	citizenship	highest education	direct targeted question (country of citizenship)	direct targeted question (country of highest education)	direct targeted question	citizenship*	highest education*	both citizenship and highest education*	direct targeted question	direct targeted question	direct targeted question
Norway	32%	27%	19%	19%	9%	15%	21%	43%	41%	41%	43%	10%	43%
Poland	1%	3%	2%	6%	6%	4%	12%	-	-	-	9%	3%	29%
Portugal	7%	28%	5%	10%	24%	7%	23%	26%	25%	24%	27%	7%	45%
Romania	2%	6%	5%	12%	13%	7%	34%	20%	19%	19%	20%	5%	56%
Slovakia	4%	10%	6%	8%	20%	14%	35%	26%	25%	23%	28%	9%	45%
Slovenia	2%	12%	10%	19%	36%	8%	21%	33%	33%	32%	34%	7%	45%
Spain	4%	7%	4%	8%	12%	20%	40%	31%	32%	31%	32%	8%	41%
Sweden	31%	21%	21%	19%	8%	17%	12%	37%	39%	37%	39%	18%	43%
Switzerland	51%	43%	43%	55%	8%	27%	14%	48%	45%	42%	53%	27%	42%
Turkey	3%	19%	3%	8%	19%	11%	33%	27%	27%	24%	29%	8%	38%
United Kingdom	26%	21%	20%	13%	7%	16%	11%	27%	26%	25%	29%	16%	37%
EU27	15%	15%	13%	14%	12%	13%	18%	30%	28%	27%	31%	12%	41%

Source: MORE2 Higher Education Survey (2012)

**: The indicators on citizenship and highest education for >3 month international post-PhD mobility are calculated by means of the countries registered in the 'moves' in the questionnaire, compared to either the country of citizenship or the country of highest education. We therefore assume that this group of mobile researchers are, by definition, researchers who also respond positively to the direct question "to have worked abroad for more than 3 months in the last ten years". That said, we reweight the share of mobile researchers according to this definition to bring the relative size of the sample in line with the number of mobile researchers in the direct question.*

5.7.1 Current international mobility within the EU

Currently, 15% of all researchers currently working in the EU[51] work in a country other than their country[52] of citizenship. The same percentage works in an EU country other than their country of highest education.

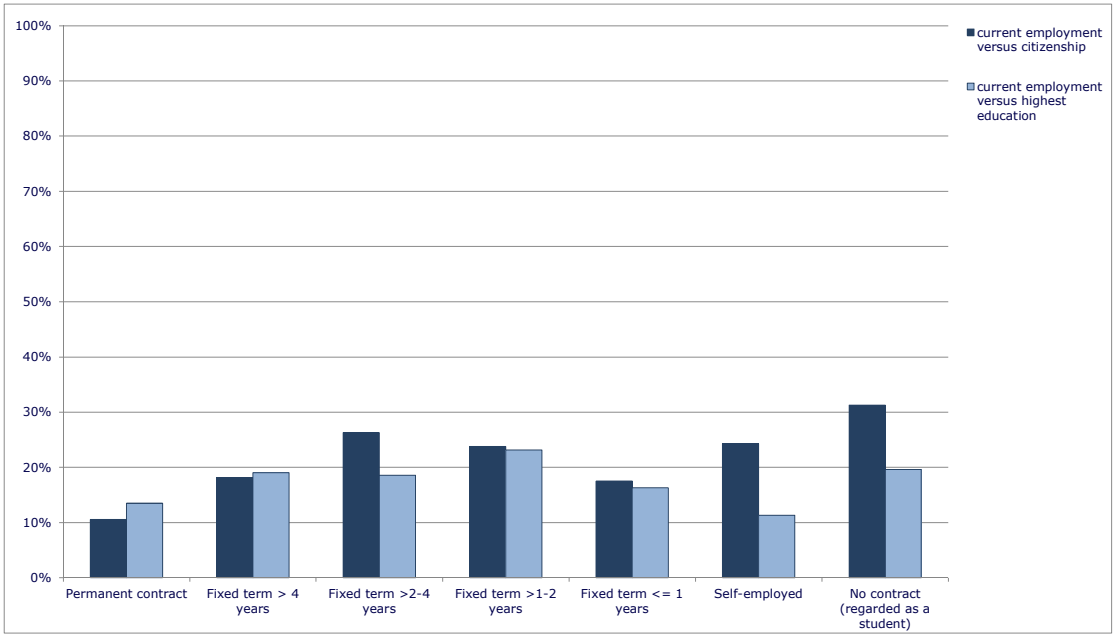
At country level, 76% of researchers employed in Luxembourg have foreign citizenship; followed by Switzerland with 51%; and the Netherlands, Norway, Denmark, Ireland, Sweden and Cyprus with each having approximately one third; and the United Kingdom and Austria with around one quarter of foreign citizens employed. Eastern European countries such as Bulgaria, Poland, Romania, Slovenia, Croatia, and Southern European countries such as Greece, Italy and Spain, have low rates of current mobility of foreign citizens (below 3%).

The share of currently mobile female researchers is similar to that of currently mobile male researchers.

Across the scientific disciplines, one minor difference can be observed: the highest share of currently mobile researchers is 19% in the Natural Sciences versus 12% in the Agricultural Sciences.

Current international mobility is, on average, highest among researchers with a fixed term contract of between 1 and 4 years duration and among researchers without a contract (Figure 41).

Figure 41: Current international mobility within the EU per contract type (EU27)



Source: MORE2 Higher Education Survey (2012)

Note: Share of researchers currently internationally mobile within the EU per contract type and according to two definitions:

- *employed in an EU country other than their country (countries) of citizenship (n=9,016)*
- *employed in an EU country other than their country of highest educational qualification (n=8,688)*

51 Note that those researchers currently working outside the EU – even if EU citizens – are not included in the survey.

52 When a researcher has more than one country of citizenship, the comparison is made with both countries of citizenship (unless explicitly mentioned otherwise).

5.7.2 International PhD degree mobility and >3 month mobility during PhD

'PhD degree mobility' is defined as an international move which a researcher undertakes in order to obtain their PhD in a country other than the reference country. It is distinguished from >3 month mobility during PhD, which occurs when the researcher moves abroad during their PhD but returns to the reference country to obtain the PhD. The reference country can be defined in ways similar to those described in general for international mobility (citizenship, highest education or directly targeted question).

In order to measure PhD degree mobility, we have two options. First, for the R1 and R2 researchers, we have specific information on PhD degree mobility from a directly targeted question in the survey. Second, for those who have already obtained a PhD degree, we can compare country of PhD with country of previous degree for all researchers (R2, R3 and R4).

In order to measure >3 month mobility during the PhD, we only have the first type of information: the directly targeted question in the survey for R1 and R2 researchers.

For this R1-R2 analysis, we again (as in section 5.6 on PhD and doctoral training) refer to the subgroup of researchers that are or were recently enrolled in a PhD programme:

- the current PhD candidates in the R1 career stage (PhD or equivalent) and
- the PhD holders in the R2 career stage (post-doctoral or equivalent).

5.7.2.1 PhD degree mobility of R1-R2 researchers

In this section we analyse the direct question posed to the R1 and R2 researchers on whether or not they did or will obtain their PhD in a country (EU or non-EU) other than the one in which they obtained their previous degree (i.e. the degree giving access to the PhD).

14% of PhD candidates and recent PhD holders indicate that they are/will be internationally PhD degree mobile in this sense. 83% will not be or has not been PhD degree mobile, while 3% do not know at the time of the survey.

The current PhD candidates will be more PhD degree mobile than the R2 PhD holders (19% versus 12%). The share of PhD degree mobile female researchers in R1 or R2 career stage is below that of their male counterparts (13% versus 18%). PhD candidates and recent PhD holders without children (at the time of the survey) are more inclined towards PhD degree mobility than those with children (17% versus 11%). Finally, no real differences are observed across the various scientific disciplines.

Departure

To analyse PhD degree mobility from the point of view of the departure country, the share of researchers who indicate in the direct question that they are PhD degree mobile is calculated by country of citizenship. In other words, in the UK, for example, we estimate how many UK citizen researchers did or will obtain their PhD in a country other than the UK. A similar analysis is also undertaken with respect to country of highest education: what share of the researchers who have obtained their highest previous education in the UK did or will obtain their PhD in a country other than the UK?

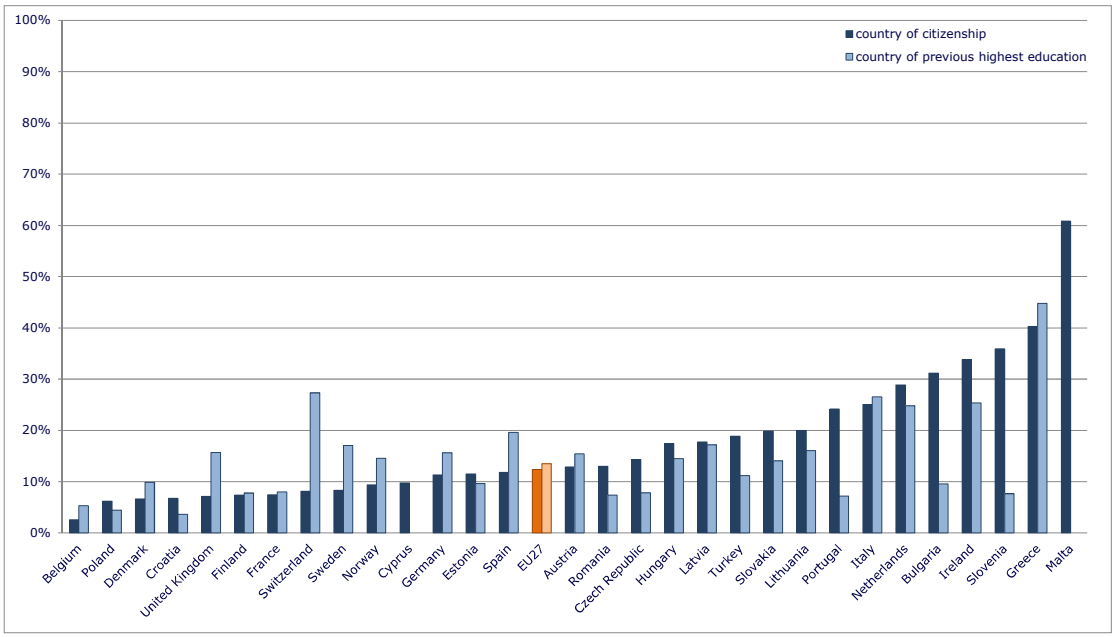
12% of EU27 citizens indicate that they are PhD degree mobile. Figure 42 shows that citizens from Malta, Greece, Slovenia, Ireland and Bulgaria are most PhD

degree mobile (30% or more). Belgium, Poland, Denmark, Croatia, the United Kingdom and France have 7% or less PhD degree mobile citizens.

13% of those who obtained their highest previous degree in one country are PhD mobile. After completing their undergraduate studies (e.g., such as a bachelors or masters degree), researchers in Greece, Switzerland, Italy, Ireland and the Netherlands are more likely (20% or more) to move to another country to obtain a PhD. This share is lowest in a number of East European countries, Belgium, Portugal, Finland and France (8% or less).

When comparing both the analysis at the level of citizenship and highest education, one can observe that in Eastern Europe, researchers who are citizens of the country are more likely to be PhD degree mobile than the researchers obtaining their highest education there. Outflow thus happens before the highest educational phase. The opposite is true of the United Kingdom, Nordic countries and particularly Switzerland. For example, in the United Kingdom, 16% of researchers obtaining their highest education there are PhD degree mobile, while only 7% of citizens are.

Figure 42: International PhD degree mobility of R1 and R2 researchers per country of citizenship and previous highest education (departure)



Source: MORE2 Higher Education Survey (2012)

Note:
- *Share of PhD degree mobile researchers in current R1 (doctoral or equivalent) and R2 (post-doctoral or equivalent) career stages per country of PhD (n=3,892).*
- *With 'PhD degree mobility' defined as obtaining or having obtained a PhD in a country other than the one in which they obtained their previous degree.*
- *Countries with less than 30 observations are omitted: Iceland, Luxembourg and Macedonia (FYROM) for both and Cyprus and Malta also for country of highest previous education.*

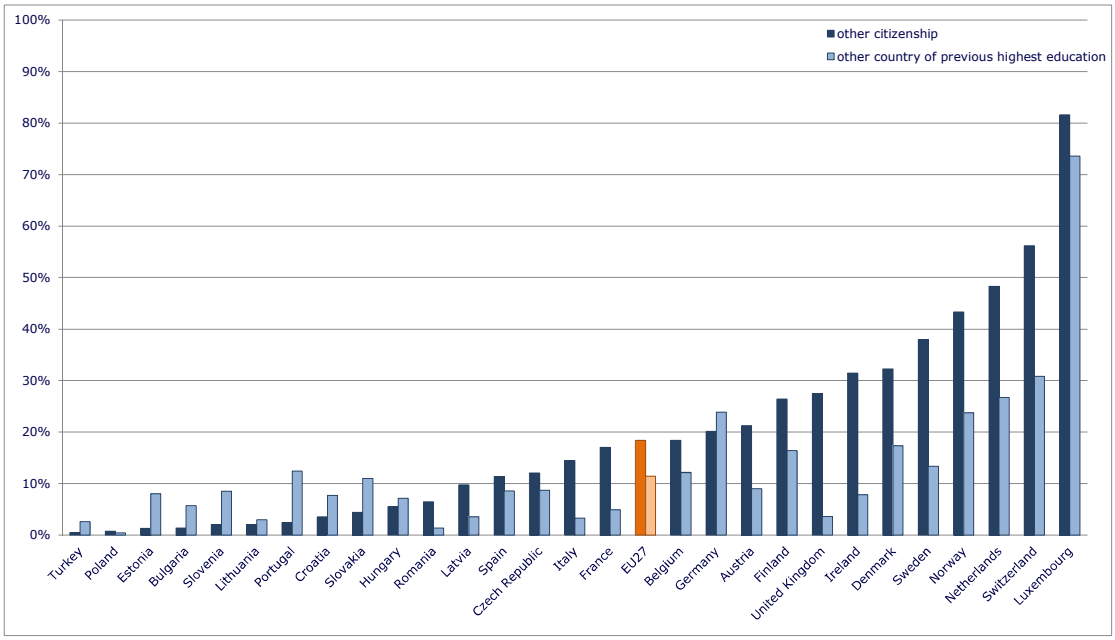
Destination

In order to analyse PhD degree mobility from the point of view of the destination country, the country where the PhD was undertaken is the basis. The study estimates what proportion of researchers did or will obtain their PhD in a specific country, while being citizens of another country. A similar analysis is also presented for researchers who have obtained their highest previous educational qualification in another country.

As shown in Figure 43, small and open economies (Luxembourg, Switzerland, Austria, Belgium), Scandinavian countries and Anglo-Saxon countries are the most common destinations to obtain a PhD for those with other citizenships. When comparing with moves to a country other than the country of their highest educational qualification, the most pronounced differences are found in the United Kingdom and Ireland. One interpretation is that mobility to these countries takes place before PhD stage, e.g. during the masters phase. In this case, the country where the PhD was undertaken is the same as the country of the researcher's previous education, but they are still counted as 'foreign' citizens.

Even though there are differences in the proportions and subsequent ranking of countries, and even if the IISER indicator includes not only degree mobility but mobility during PhD, findings with respect to receiving countries are generally in line with Eurostat Education statistics (as processed in the MORE1 IISER update). There too, the United Kingdom, Austria, Belgium, and to a lesser extent Denmark and Sweden, rank high for this type of indicator (Percentage of doctoral candidates (ISCED 6) with the citizenship of another EU27 member state in the reporting country in the EU27).

Figure 43: International PhD degree mobility of R1 and R2 researchers per country of PhD (destination)



Source: MORE2 Higher Education Survey (2012)

Note:
- *Share of PhD degree mobile researchers in current R1 (doctoral or equivalent) and R2 (post-doctoral or equivalent) career stages per country of PhD (n=3,892).*
- *With 'PhD degree mobility with respect to citizenship' defined as undertaking the PhD in a country other than that of citizenship*
- *And 'PhD degree mobility with respect to previous highest education' defined as having another country of PhD than the country of previous highest education*
- *Countries with less than 30 observations are omitted: Cyprus, Greece, Iceland, Macedonia (FYROM) and Malta.*

5.7.2.2 PhD degree mobility of R2-R3-R4 researchers

Even though the R3-R4 researchers have not been asked to fill in questions about their PhD, an indication of PhD degree mobility for this group can also be calculated by comparing the country of their doctorate with their country of citizenship or highest previous education. This information is also included for the R2 researchers.

This analysis shows that 13% of all R2-3-4 researchers have obtained their PhD in a country other than their country of citizenship and 14% in a country other than their previous (graduate or undergraduate) degree.

Among the R2, R3 and R4 researchers, the share of PhD degree mobile female researchers is only slightly below that of their male counterparts (13% versus 15% according to citizenship and 14% versus 15% according to highest education). Similarly, the differences between the fields of science are not pronounced either, with figures between 12% (Medical Sciences) and 17% (Engineering). When comparing researchers in their current career stage, no substantial differences are observed: R2 has a share of 13%, R3 of 14% and R4 of 13%.

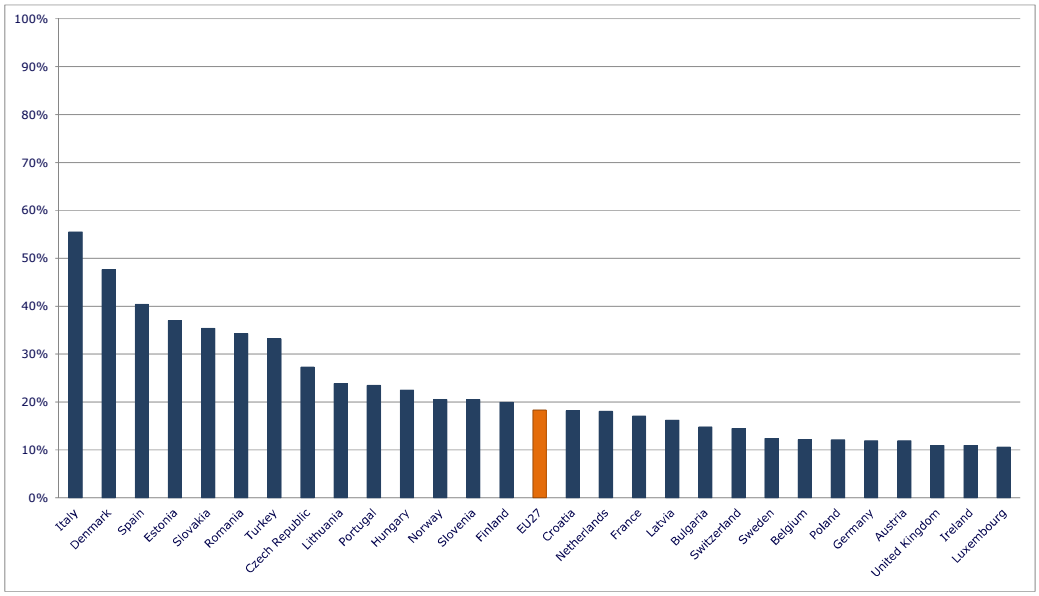
5.7.2.3 Mobility for a limited period during PhD of R1-R2 researchers

In addition to those researchers who move abroad to obtain their PhD, around 18% of doctoral candidates and recent PhD holders move for a limited period (3 months or more) to another country during their PhD. For those who have already completed their PhD (R2), this share amounts to 22%.

The share of female researchers mobile in R1 or R2 career stage who were mobile for a limited period during their PhD is similar to that of their male counterparts (18% versus 19%). >3 month mobility during PhD is most common in the fields of Humanities and Social sciences (25% and 22%) compared to around 16 % in the other fields.

Comparison over countries shows that shares of >3 month mobility during a PhD ranges from just over 10% in Luxembourg to more than 55% in Italy (Figure 44). No clear geographical pattern is observed, except that 10 out of EU15 countries are below the EU27 average. After Italy, only Denmark and Spain have a PhD mobility rate of higher than 40%. Furthermore, Estonia, Slovakia, Romania and Turkey all have a PhD mobility rate of higher than 30%. Low rates are observed in Luxembourg, Ireland, United Kingdom, Austria, Germany, Poland, Belgium and Sweden (all 11-12%), which are in some cases countries with high levels of PhD degree mobility (Luxembourg, Ireland, Sweden) or are popular destinations for PhD mobility (United Kingdom, Germany).

Figure 44: International mobility for a limited period during PhD of R1-R2 researchers per country of PhD

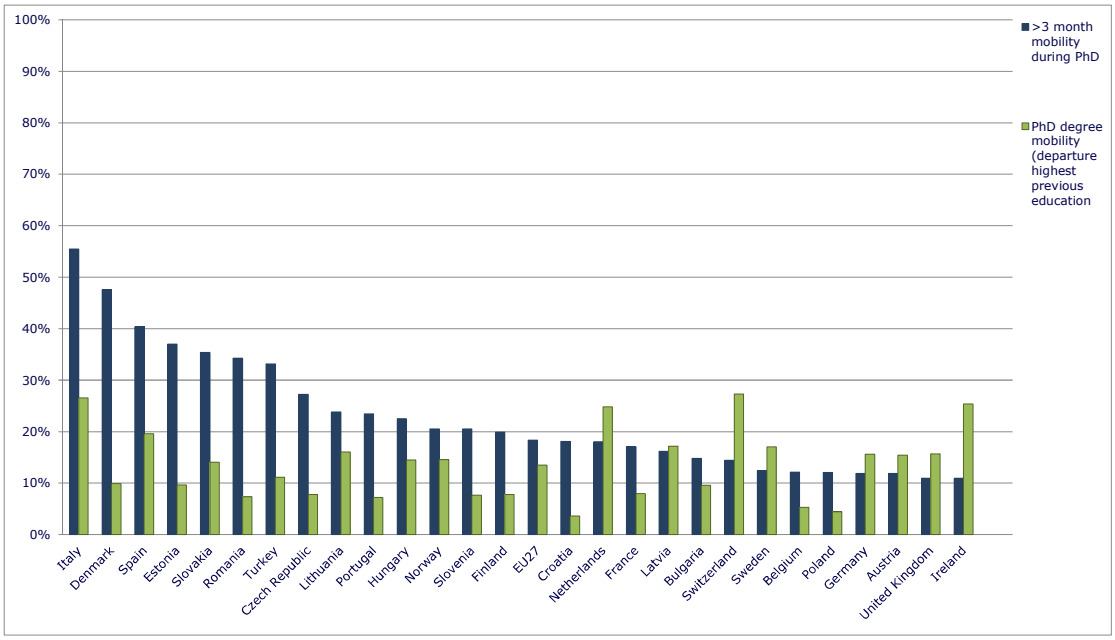


Source: MORE2 Higher Education Survey (2012)

Note: - Share of researchers >3 month mobile during PhD and in current R1 (doctoral or equivalent) and R2 (post-doctoral or equivalent) career stages per country of PhD. (n=3,892)
- With '>3 month mobility during PhD' defined as moving for 3 months or more to a country than the one in which they obtained or will obtain their PhD.
- Countries with less than 30 observations are omitted: Cyprus, Greece, Iceland, Macedonia (FYROM) and Malta.

Combining this result on >3 month mobility during PhD and that regarding PhD degree mobility leads to the observation that for the majority of the countries, both indicators mirror each other (Figure 45). When a high share of researchers is PhD degree mobile, the share of >3 month mobility during PhD is relatively lower. Only in the Netherlands, Switzerland and Ireland does PhD degree mobility exceed >3 month mobility during PhD.

Figure 45: Comparison international >3 month mobility during PhD with PhD degree mobility of R1-R2 researchers



Source: MORE2 Higher Education Survey (2012)

Note:
- *Share of researchers >3 month mobile during PhD per country of PhD in current R1 (doctoral or equivalent) and R2 (post-doctoral or equivalent) career stages. (n=3,892)*
- *Share of researchers that have been PhD degree mobile with respect to country of highest previous education. (n=3,242)*
- *With '>3 month mobility during PhD' defined as moving for 3 months or more to another country than the country where she did or will obtain her PhD.*
- *And PhD degree mobility defined as obtaining or having obtained a PhD in another country than the country of highest previous education.*
- *Countries with less than 30 observations are omitted: Cyprus, Greece, Iceland, Luxembourg, Macedonia (FYROM) and Malta.*

A closer look at the destination countries for >3 month mobility during PhD shows that 66% of those indicated – departing from EU27 – are within the EU27. Yet, at country level, the United States is the most important destination (16%). Table 9 lists the most significant destinations, which are indicated cumulatively 80% of the time by mobile PhD candidates and R2 PhD holders as destinations. The US and UK are on top of the list, followed by Germany, France and Italy.

Table 9: Main destination countries for >3 month mobility during PhD (EU27 departure countries)

	Share (%)	Cumulative share (%)	Origin1 (citizenship)		Origin2		Origin3	
United States	16%	16%	Denmark	*(14%)*	Netherlands	*(14%)*	Spain	*(12%)*
United Kingdom	12%	28%	Denmark	*(14%)*	Italy	*(13%)*	Spain	*(11%)*
Germany	11%	39%	Spain	*(12%)*	Poland	*(11%)*	Netherlands	*(8%)*
France	8%	47%	Romania	*(11%)*	Poland	*(9%)*	Italy	*(9%)*
Italy	6%	53%	Romania	*(24%)*	Spain	*(10%)*	Lithuania	*(7%)*
Netherlands	4%	57%	Slovakia	*(18%)*	Belgium	*(11%)*	Denmark	*(11%)*
Belgium	3%	61%	Belgium	*(14%)*	Denmark	*(10%)*	Spain	*(10%)*
Spain	3%	63%	Italy	*(26%)*	Portugal	*(21%)*	Netherlands	*(16%)*
Switzerland	3%	66%	Italy	*(22%)*	Denmark	*(22%)*	Austria	*(17%)*
Denmark	3%	69%	Latvia	*(18%)*	Sweden	*(18%)*	Estonia	*(12%)*
Austria	2%	71%	Slovakia	*(20%)*	Italy	*(13%)*	Hungary	*(13%)*
Canada	2%	73%	Denmark	*(27%)*	Hungary	*(7%)*	Czech Rep.	*7%)*
Sweden	2%	75%	Denmark	*(21%)*	Finland	*(21%)*	Czech Rep.	*(14%)*
Norway	2%	77%	Denmark	*(17%)*	Netherlands	*(17%)*	Czech Rep.	*(8%)*
Finland	2%	79%	Estonia	*(36%)*	Lithuania	*(27%)*	Slovakia	*(18%)*
Czech Republic	1%	80%	Slovakia	*(56%)*	Estonia	*(11%)*	Poland	*(11%)*

Source: MORE2 Higher Education Survey (2012)

Reading note: Of the total number of EU researchers who were mobile for more than three months during their PhD to the US, subsequently returned to the EU and currently work as researcher in the EU, 14% were Danish, another 14% Dutch and 12% Spanish citizens.

The PhD candidates or R2 doctoral holders indicate between 1 and 7 different countries for their >3 month mobility during their PhD. This number can be considered a lower barrier to number of moves during doctoral study. A large majority has indicated one country (91%), 7% moved to two different countries and another 2% moved to three or more countries.

Of the 121 researchers moving for 3 months or more to the United States, around 1 in 8 came from Denmark, the Netherlands and Spain. 6 to 7% came from Belgium, France, Italy, Portugal and Sweden. In the case of moves to the United Kingdom, the main departure countries for PhD are Denmark, Italy and Spain. 6% came from studying a PhD in Ireland and Portugal. In Annex 2 (Table 20), the full table of departure and destination for >3 month mobility during a PhD is shown. When interpreting these data it is important to note that, given the nature of the survey, it presents only a partial picture of EU doctoral candidates going abroad during their PhD, as it only includes those who currently work as a researcher in the EU. For example, doctoral candidates who left to do their PhD training in the US and did not return are not included in the data.

5.7.3 International mobility in post-PhD career stages

Whereas the previous section focused on international mobility related to the PhD stage, this section deals with international mobility in the further career of the researcher. For simple terminology, we thereby refer to R2 (post-doctoral stage), R3 (established) and R4 (leading) researchers as those in their post-PhD career stages, regardless of whether or not a PhD was obtained.

We note that data allow analysis per country with reference to the current country of employment. Indicators per country are thus based on the current researcher population in that country. No information is available on researchers abroad that have not yet returned or never will return (brain drain).

5.7.3.1 Mobility stock

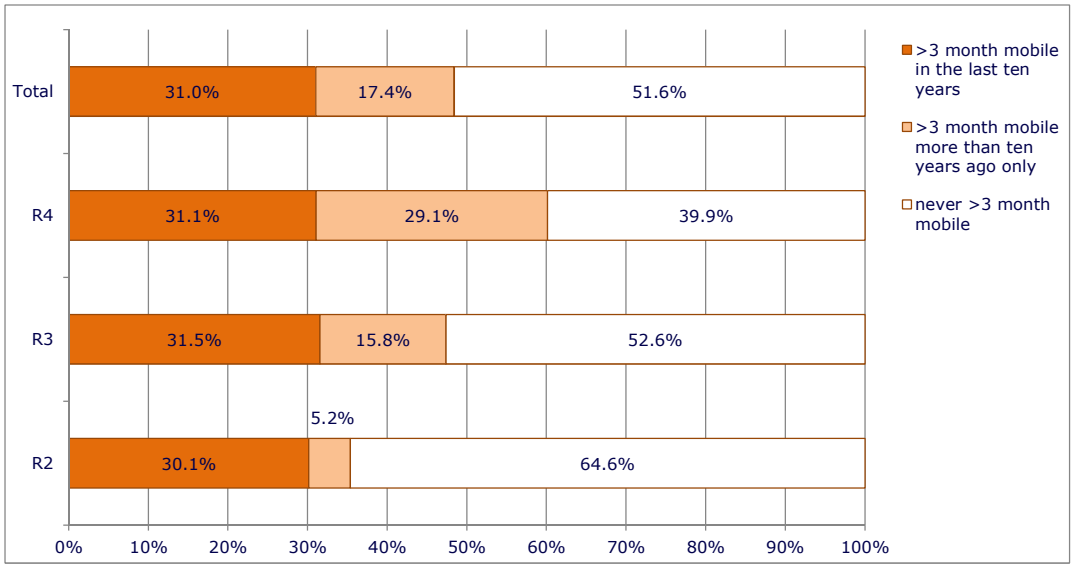
>3 month mobility

31% of post-PhD researchers in the EU27 have worked abroad as researchers for more than 3 months at least once in the last ten years. Another 17% have been >3 month mobile but only more than 10 years ago. This means that around 48% of the researcher population have been mobile at least once in their career following their PhD. For R4 researchers, this is 60%.

The share of researchers who have been mobile in the last ten years is more or less the same in all career stages, as shown in Figure 46. This figure features somewhat against expectations, considering that not all R2 have 10 years of research experience at this point and thus would be expected to have less mobility experience in the last ten years. Comparing this with an estimate *in the last three years*, the pattern is even more pronounced: 48% of R2 versus 29% of R3 and of R4 have been mobile in the last three years.

The effect of career length is a factor in mobility of more than ten years ago, where the length of the career to date is clearly linked with the degree of mobility experience.

Figure 46: International >3 month mobility in post-PhD career stages per current career stage (EU27)



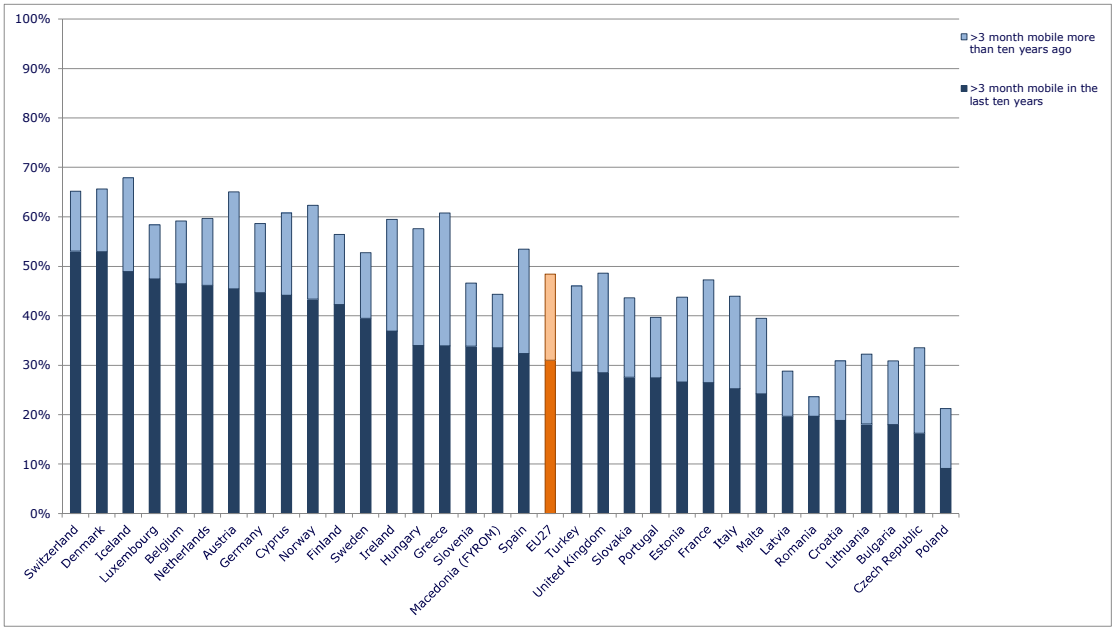
Source: MORE2 Higher Education Survey (2012)

Note: Percentage of R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers who have worked abroad for 3 months or more at least once per mobility profile. (n=7,131)

>3 month mobility in the last ten years per country[53] and FOS

At country level, >3 month international mobility is least common in East-European and Baltic countries (Figure 47). At the other end of the spectrum, more than 50% of post-doctoral researchers in Switzerland and Denmark were >3 month mobile in the last ten years. In Poland, Czech Republic, Greece and France, a relatively large group was only >3 month mobile more than 10 years ago.

Figure 47: >3 month international mobility in post-PhD career stages per country



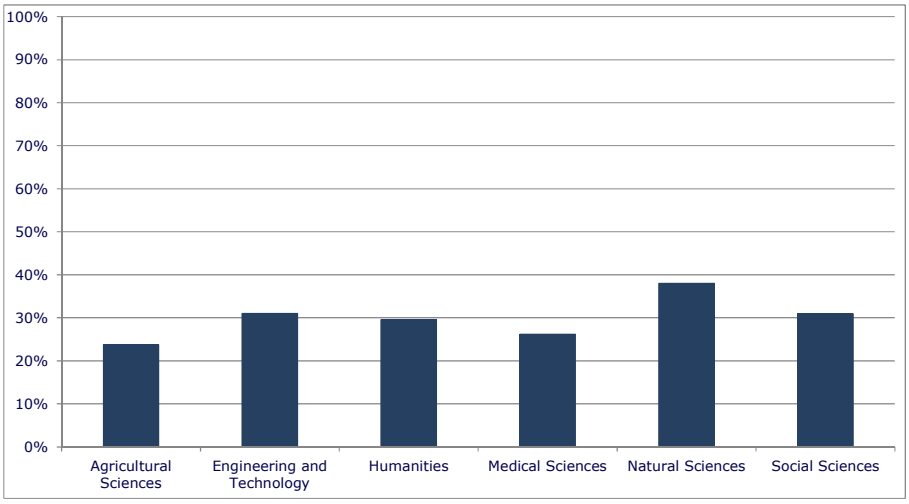
Source: MORE2 Higher Education Survey (2012)

Note: Percentage of R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers who have worked abroad for 3 months or more at least once per panel country. (n=8,357)

Variation also exists between the different fields of science (Figure 48), where the highest proportion of post-doctoral researchers who have been mobile in the last ten years are those working in the Natural Sciences (38%) and the lowest for the in Agricultural Sciences (24%). Results for Engineering & Technology researchers are also above the general average (31%) and figures for researchers from the Social Sciences and Humanities are around 30%.

53 We refer to the 'panel country' of the respondent which was identified during the data collection process. For 85% of respondents this panel country corresponds to their citizenship.

Figure 48: International >3 month mobility in post-PhD career stages per field of science (EU27)



Source: MORE2 Higher Education Survey (2012)

Note: Percentage of R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers who have worked abroad for 3 months or more at least once per field of science. (n=7,131)

>3 month mobility in the last ten years per gender and family status

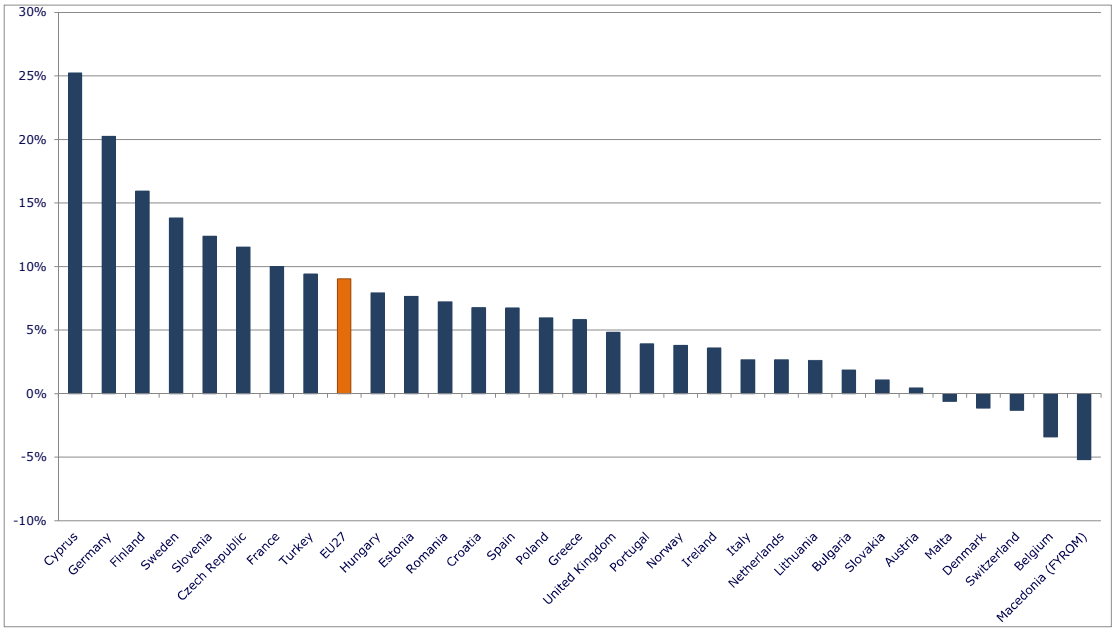
Female researchers are less inclined to >3 month international mobility in post-PhD career stages during the last ten years, as compared with their male counterparts (25% versus 34%). The gap is greater for those at the higher career stages: 7 pp difference in R2, 10 in R3 and 11 in R4. Together with the observation that a gender gap concerning >3 month mobility is nearly non-existant during the PhD phase, this may point towards an improvement of the mobility gender gap over time.

The gender gap exists within all fields of science, being the most pronounced in the Social Sciences and Humanities (24% mobility among female researchers versus 35% among male researchers) and Natural Sciences and Engineering & Technology (26% versus 37%). In Medical and Agricultural Sciences, 25% of female researchers have been >3 month mobile in the last ten years, versus 27% of men.

Variations in this gender gap also occur across countries (Figure 49). Male researchers are substantially more >3 month mobile in Cyprus, Germany, Finland, Sweden, Slovenia and Czech Republic (11 to 25 pp difference). On the other hand, female researchers are more >3 month mobile than their male counterparts in Macedonia (FYROM), Belgium, Switzerland, Denmark and Malta.

>3 month mobility in the last ten years was also more common among single researchers (36% versus 30% couple) and researchers without children (39% versus 28% with children).

Figure 49: Differences in gender for international >3 month mobility in post-PhD career stages per country



Source: MORE2 Higher Education Survey (2012)

Note: - Difference between percentage of male and female researchers in R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) career stage who have worked abroad for 3 months or more at least once in the last ten years. (n=8,357)
- Countries with less than 30 observations for one of the gender categories are omitted: Iceland, Latvia and Luxembourg.

Employer mobility: >3 month international mobility involving a change of employer

12% of researchers have worked abroad for a new employer (for 3 months or more at least once in the last ten years). This represents the activities of around 40% of all internationally mobile researchers and provides an indication of 'employer mobility'.

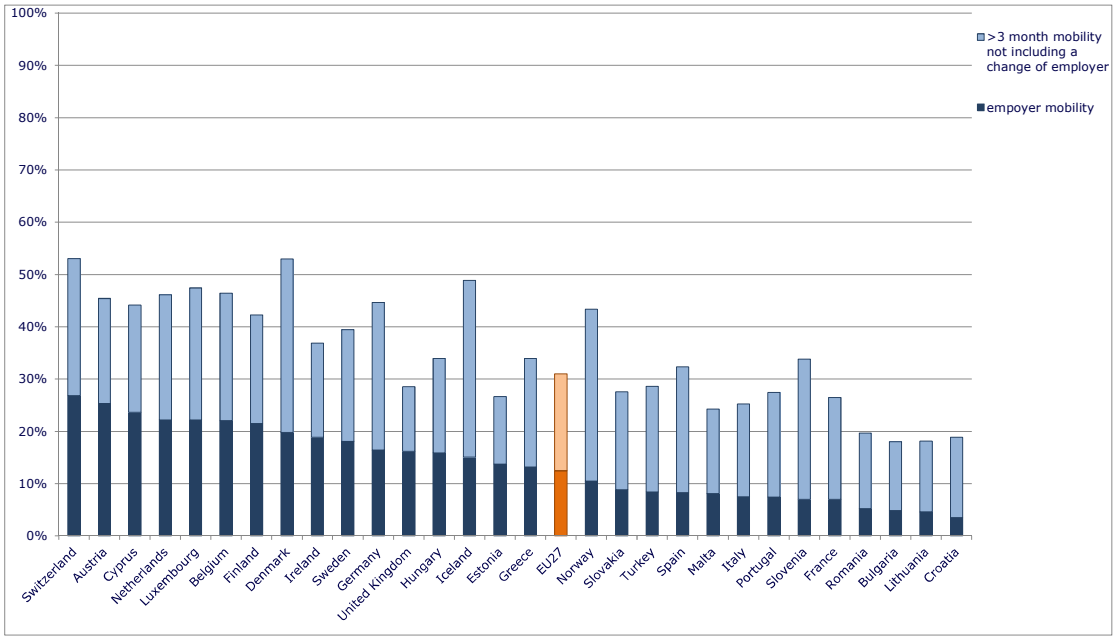
Analysing employer mobility at the level of each individual move instead of at the level of the researcher, we can see that 57% of all moves involved a change of employer (corresponding to the 40% of all internationally mobile researchers). When combining both figures, we note that employer mobility is concentrated, to some extent, to a subgroup of researchers who went through a change in employer in more than one of their international moves.

No real variations between the fields of science or gender are observable here, although female researchers are slightly more inclined towards employer mobility than their male counterparts (44% versus 39%).

In the United Kingdom, Austria, Cyprus, Estonia, Ireland, Finland and Switzerland the majority of >3 month mobile respondents have undertaken at least one employer move. Yet in Croatia, Slovenia and Norway less than one quarter changed employer in one of their moves.

Overall, there is an inclination towards more employer mobility when the overall degree of >3 month mobility is higher (Figure 50). Most prominent exceptions are the United Kingdom and Estonia, where the degree of employer mobility is relatively high as compared to a relatively low degree of overall >3 month mobility; and Norway and Iceland, where the degree of employer mobility is relatively low as compared to a relatively high degree of overall >3 month mobility.

Figure 50: International employer mobility as part of >3 month international mobility in post-PhD career stages per country



Source: MORE2 Higher Education Survey (2012)

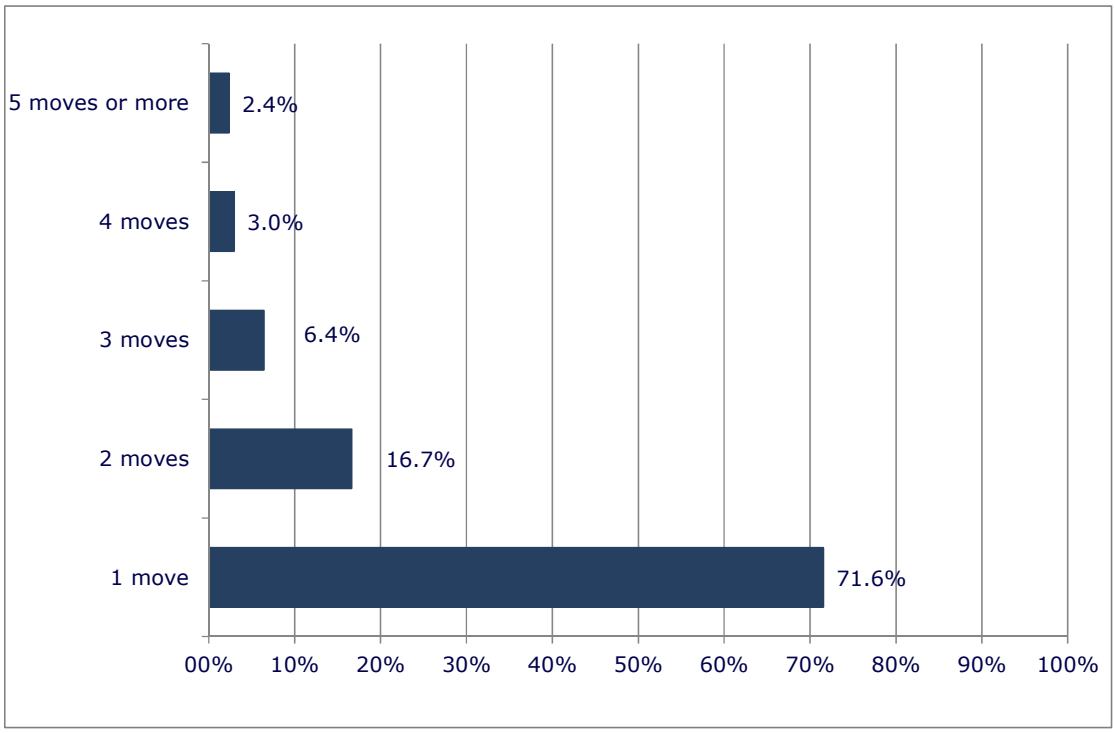
Note:
- *Percentage of researchers in R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) career stage who have changed employer in at least one of their moves as part of the share of researchers that were >3 month internationally mobile. (n=2,403)*
- *With '>3 month internationally mobile researchers' defined as researchers that have worked abroad for 3 months or more at least once in the last ten years.*
- *Countries with less than 30 observations are omitted: Czech Republic, Latvia, Macedonia (FYROM) and Poland.*

5.7.3.3 Mobility frequency

As shown in Figure 51, almost three quarters of mobile researchers have moved only once[54].

The average number of moves in the last ten years per mobile researcher – defined as having undertaken 1 move or more - is approximately 1.27. This is similar across genders and family status. Researchers in the Humanities have the highest average number of moves per researcher (1.9), followed by the Agricultural Sciences (1.7 versus between 1.4 and 1.5 in other fields of science).

Figure 51: >3 month international mobility in post-PhD career stages per number of moves per researcher (EU27)



Source: MORE2 Higher Education Survey (2012)

Note: Distribution of R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers who have worked abroad for 3 months or more at least once in the last ten years over number of moves. (n=1,662)

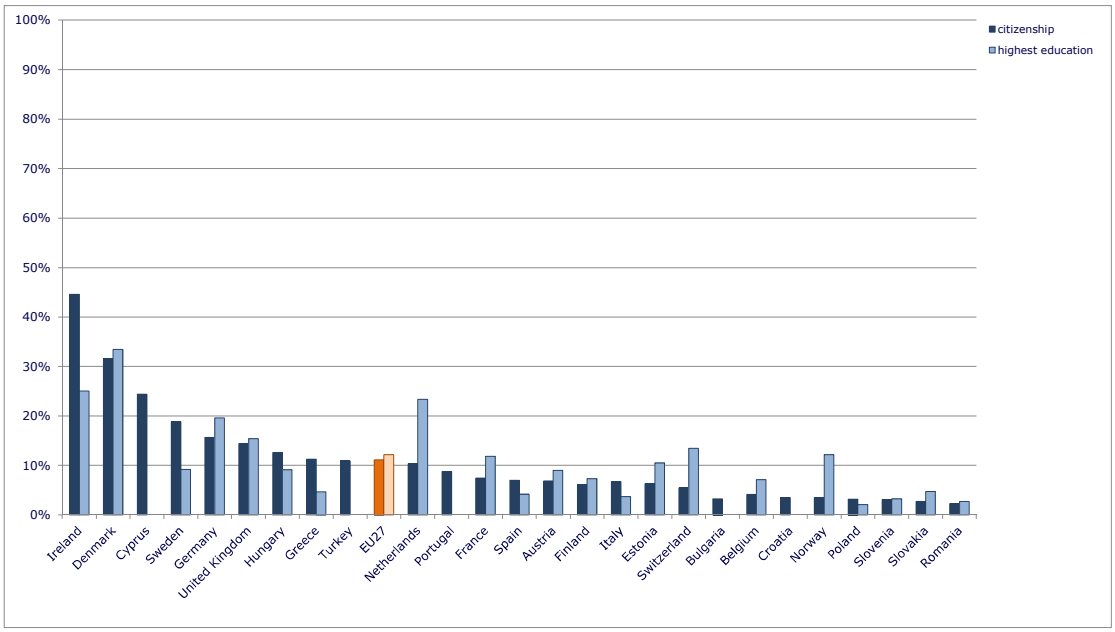
[54] This may be considered an upper barrier when we assume that some researchers, who fill in exactly one move, have excluded earlier moves.

5.7.3.5 Mobility flows: return mobility

In total, 11% of mobile researchers return at least once to their country of citizenship and 11% to their country of most recent highest education.

The highest shares of this type of 'return' mobility are observed in Ireland (39% according to citizenship and 25% according to highest education) and Denmark (28% and 30%). Of the researchers who obtained their highest education in the Netherlands, 22% returns at least once in their post-doctoral career while only 11% of mobile Dutch citizens return. A similar proportion is observed in France, Estonia, Switzerland, Belgium and Norway.

Figure 52: Return mobility to country of citizenship or country of highest education



Source: MORE2 Higher Education Survey (2012)

Note:
- *Share of >3 month internationally mobile R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers that returned to their country of citizenship or country of highest education in at least one move during their post-PhD career stage. (n=1,679 for citizenship and n=1,541 for highest education)*
- *With '>3 month internationally mobile researchers' defined as those researchers who have worked abroad for 3 months or more at least once in the last ten years.*
- *Countries with less than 30 observations are omitted. In the definition with citizenship: Czech Republic, Iceland, Latvia, Lithuania, Luxembourg, Macedonia (FYROM) and Malta; in the definition with highest education: Bulgaria, Croatia, Cyprus, Czech Republic, Iceland, Latvia, Lithuania, Luxembourg, Macedonia (FYROM), Malta, Portugal and Turkey.*

5.7.3.7 Mobility flows: destination countries

In total, 3,281 moves are registered for 2,004 researchers. 62% of these moves took place to an EU27 destination.

As was the case with >3 month mobility during the PhD itself, the main destination country of EU27 researchers who have been mobile in the last ten years of their post-doctoral career, is the United States (Table 10). The countries which follow are mainly European, with the United Kingdom, Germany and France ranking the highest. The first non-EU country after the USA is Canada, in 9th place.

Table 10: Main destination countries for >3 month post-PhD mobility (EU27 citizens)

	Share (%)	Cumulative share (%)	Origin1 (citizenship)		Origin2		Origin3	
United States	18%	18%	Greece	*(11%)*	Italy	*(11%)*	Germany	*(10%)*
United Kingdom	11%	29%	Greece	*(13%)*	Italy	*(11%)*	Spain	*(11%)*
Germany	11%	40%	Germany	*(20%)*	Austria	*(9%)*	Italy	*(7%)*
France	8%	47%	Romania	*(17%)*	Italy	*(10%)*	Greece	*9%)*
Italy	4%	51%	Italy	*(14%)*	Slovenia	*(13%)*	Bulgaria	*(11%)*
Switzerland	4%	55%	Germany	*(36%)*	France	*(11%)*	Italy	*(9%)*
Netherlands	4%	59%	Germany	*(14%)*	Greece	*(10%)*	Belgium	*(10%)*
Austria	3%	62%	Germany	*(31%)*	Slovenia	*(13%)*	Austria	*(11%)*
Canada	3%	65%	Spain	*(13%)*	Austria	*(9%)*	France	*(9%)*
Spain	3%	68%	Spain	*(17%)*	Italy	*(10%)*	Greece	*(9%)*
Belgium	3%	71%	Greece	*(13%)*	Germany	*(12%)*	Italy	*(10%)*
Sweden	2%	73%	Estonia	*(17%)*	Germany	*(13%)*	Spain	*(9%)*
Denmark	2%	75%	Germany	*(19%)*	Denmark	*(16%)*	UK	*(8%)*
Ireland	2%	77%	Ireland	*(27%)*	UK	*(21%)*	Italy	*(13%)*
Norway	2%	79%	Germany	*(26%)*	Lithuania	*(13%)*	Denmark	*(11%)*

Source: MORE2 Higher Education Survey (2012)

Reading note: Of the total number of EU researchers who were mobile to the US for more than three months during post-doctoral career stages and subsequently returned to the EU and currently work as researcher in the EU: 11% are Greek, 11% are Italian and 10% are German citizens.

For many destinations, most EU27 researchers are from Greek, Italian, Spanish and German countries (citizenship). This is also confirmed in Figure 53 and Figure 54, which depict the main flows of mobility in terms of individual moves within the EU (per country) and to outside the EU (per continent) for all (also non-EU27) researchers. Given the structure of the survey, this only includes moves by researchers currently working in the EU. From a global perspective, the dominant destinations in North-America (USA and Canada) stand out. From a European perspective, the primary destinations are also very clear (United Kingdom, Germany and France).

The flows are also interesting to interpret:

- The United Kingdom appears to be an important destination for all regions in Europe.
- Germany, on the other hand, receives mainly East-European and Spanish researchers. The data also include researchers returning to their country of origin: for Germany 20% of the incoming researcher are German citizens.
- France is also an important destination for East-European and Spanish researchers, but also to those from Germany and the Benelux.

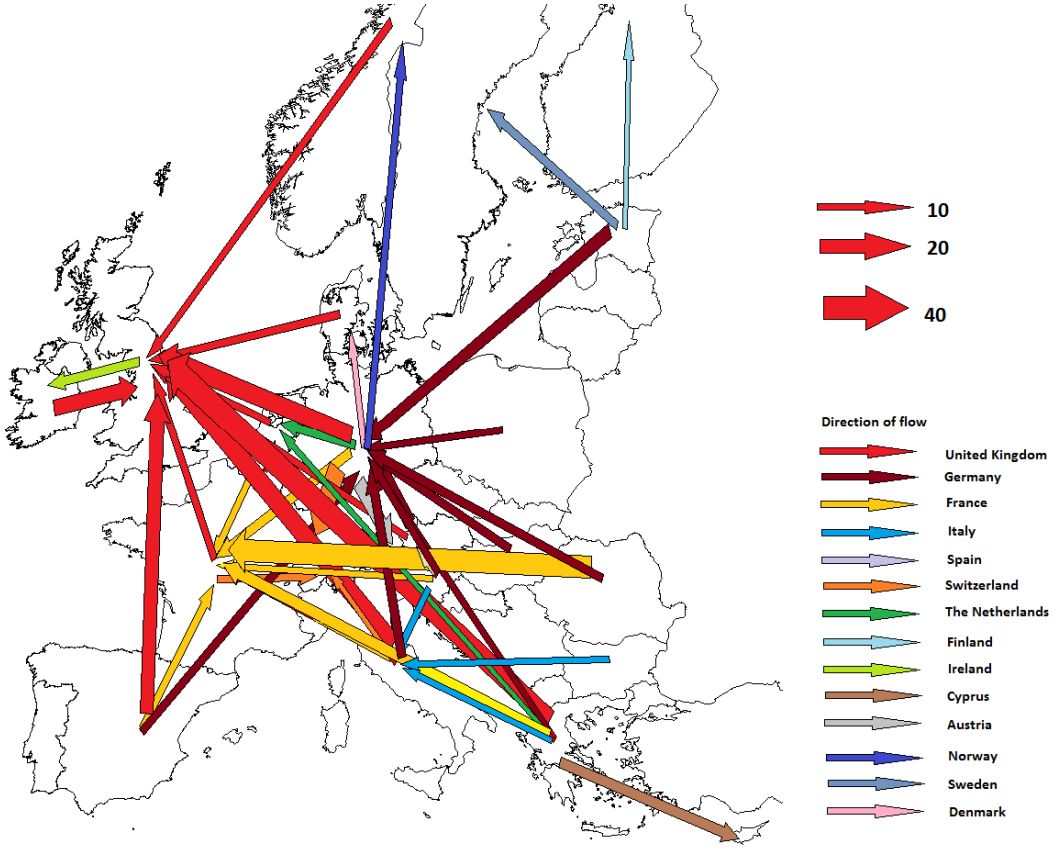
- German and Baltic researchers form the most important flows to northern Europe.
- Important flows also go from Germany to Switzerland and Austria and in the case of Austria, also back again.
- Finally, there is also an exchange between the United Kingdom and Ireland. Moreover, 27% of the incoming researchers in Ireland are Irish citizens.
- After the German and Irish, Spanish and Italian citizens often return to their country of origin (17% and and 14% of the incoming researchers respectively).

These observations are in line with and confirm the three main findings on destination countries, based on the CDH 2009 data (OECD, 2012) which indicate that:

- Europe (as a whole) is the main destination region but that the United States is systematically among the three first destination countries;
- the three largest European countries (France, Germany and the United Kingdom) appear among the favourite destinations;
- in addition to those countries which have strong historical, cultural or linguistic links with the reporting country.

When analysing the countries of departure (defined as country of citizenship in the maps below), countries which are suffering badly under the current economic crisis stand out. 7% of all moves are by Greek citizens (compared to 3% of the researchers in the sample begin Greek citizens), another 7% by Italians (compared to 5% Italian citizens in the sample) and 6% by Spanish researchers (compared to 4% Spanish citizens in the sample). Eastern European countries such as Slovenia, Romania, Hungary, Bulgaria and Poland are around 2-3% (but there are for these respective countries also between 2 and 4% researchers with this citizenship in the sample). It is also worth noting that 11% of the moves are by German citizens (compared to 4% of the researchers in the sample being German citizens).

Figure 53: Map of >3 month international mobility flows in post-PhD career stages within the EU

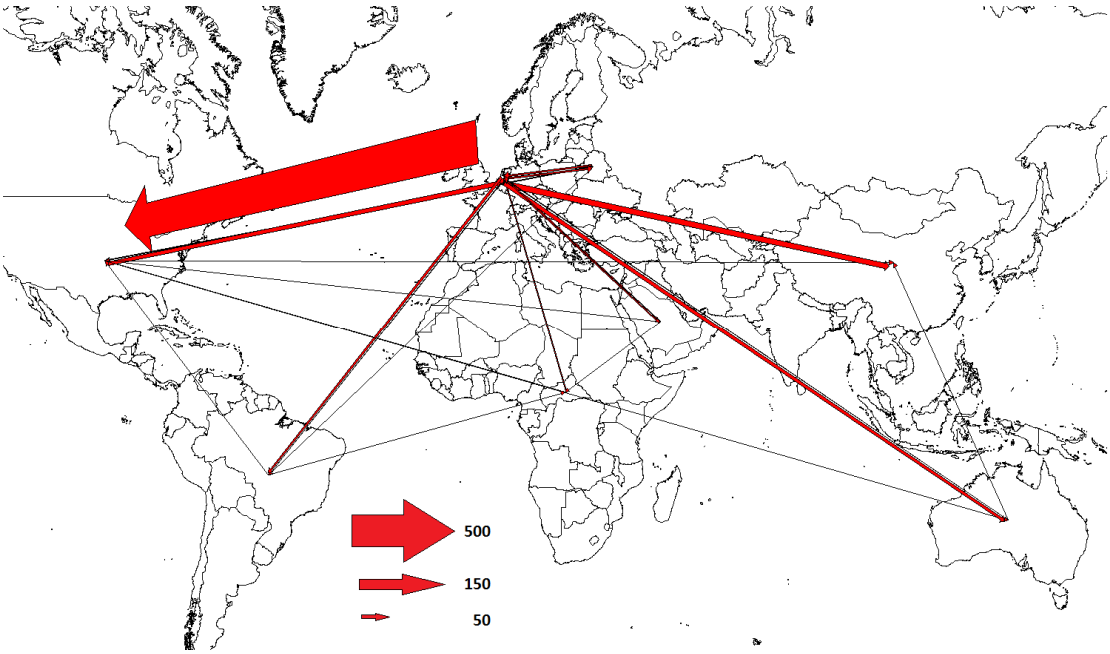


Source: MORE2 Higher Education Survey (2012)

Note: - Counts of moves between countries in the EU27+6. (n=3,281)
- With moves' defined as moves of three months or more in the last ten years to another country than the country of citizenship of the researcher[55].
- With country of departure equal to country of citizenship.
- Only researchers currently working in the EU are represented.
- Only flows of 10 moves or more are represented.

[55] The map based on the mobility definition with reference to country of highest education shows a similar picture.

Figure 54: Map of >3 month international mobility flows in post-PhD career stages from the EU to other continents



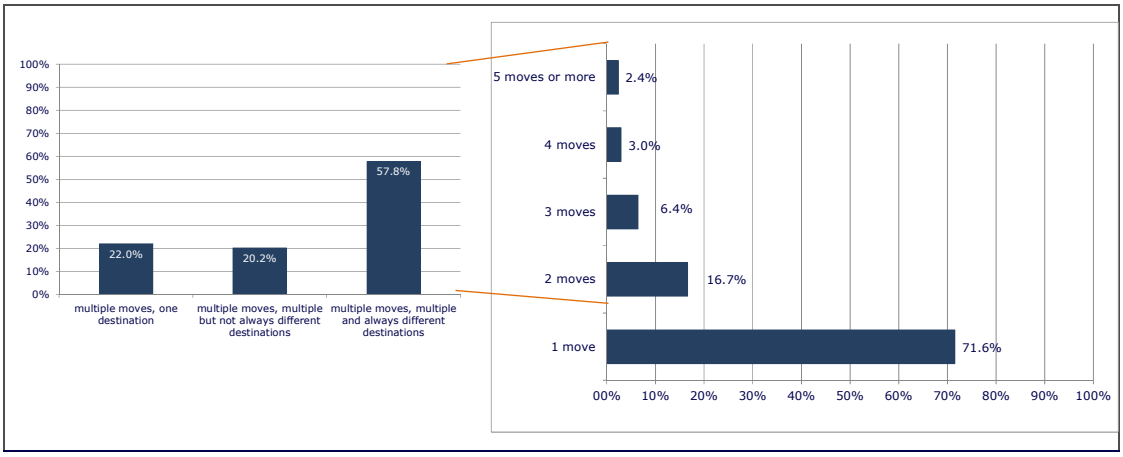
Source: MORE2 Higher Education Survey (2012)

Note: - Counts of moves between EU27+6 and other continents. (n=3,281)
- With moves defined as moves of three months or more in the last ten years to another country than the country of citizenship of the researcher.
- With country of departure equal to country of citizenship.
- Only researchers currently working in the EU are represented, which explains a concentration of arrows departing from EU, corresponding to EU citizens.
- Only (per continent aggregated) flows of 50 moves or more are represented.

No major difference between genders is observed in terms of EU27 versus non-EU27 destinations. R2 researchers relatively more frequently chose EU27 destinations than did R3 and R4 researchers in the sample (74% versus 68% and 67%). These statistics are similar for single researchers versus researchers in a couple (74% versus 68%) and researchers without children versus researchers with children (75% versus 65%).

Further analysing the destinations for all moves (Figure 55, cf. also Figure 51) shows that of the researchers who moved more than once, 42% have moved to the same destination country at least twice and 22% moved to only one country in each of their moves.

Figure 55: Number of moves during long term post-PhD mobility in the last 10 years and destination frequency (EU27)



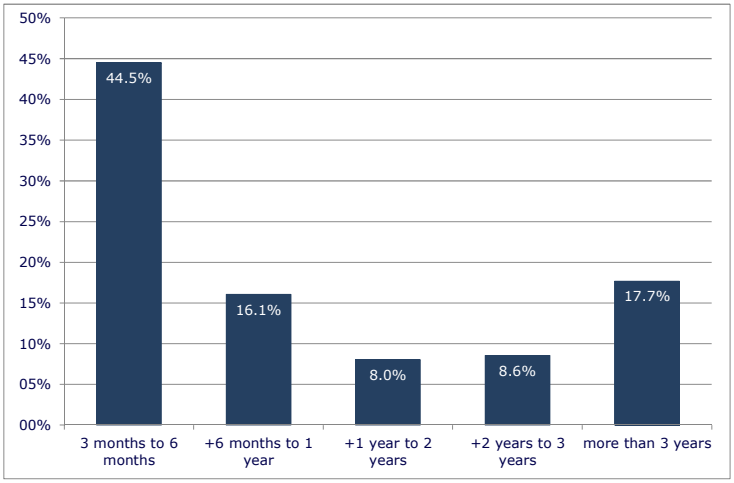
Source: MORE2 Higher Education Survey (2012)

Note: - Distribution of R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers who have worked abroad for 3 months or more at least once in the last ten years over number of moves. (n=1,662)
- Distribution of R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers that have worked abroad for 3 months or more at least once in the last ten years with multiple moves over the frequency categories of destinations. (n=556)

5.7.3.8 Mobility duration

44% of the registered international moves of more than 3 months[56] had lasted for 3-6 months (Figure 56). 26% of moves lasted longer than 2 years. When the move includes a change of employer, the duration is on average higher with around twice as many researchers staying more than 3 years (Figure 57).

Figure 56: Duration per move during long term post-PhD mobility in the last 10 years (EU27)

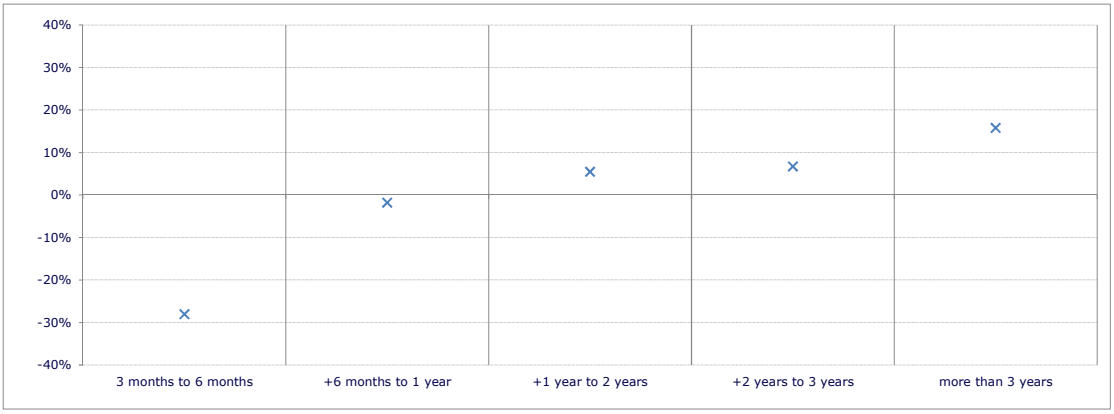


Source: MORE2 Higher Education Survey (2012)

Note: Distribution of moves indicated by R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers who have worked abroad for 3 months or more at least once in the last ten years over duration categories. (n=2,654)

[56] For analysis at the level of the move, the sample is not weighted because no information on the relative population of moves is available per FOS or country. Furthermore, weighting might create a larger imbalance in the information on moves than looking at the sample shares only.

Figure 57: Duration per move with change of employer during long term post-PhD mobility in the last 10 years (EU27)



	With change of employer	*Total*
3 months to 6 months	16.5%	*44.5%*
+6 months to 1 year	14.2%	*16.1%*
+1 year to 2 years	13.5%	*8.0%*
+2 years to 3 years	15.3%	*8.6%*
more than 3 years	33.4%	*17.7%*

Source: MORE2 Higher Education Survey (2012)

Note: - Difference between percentage of moves including an employer change per duration category and percentage total moves per duration category. (n=1,166)
- With 'moves' defined as international steps in the last ten years of R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers to work abroad for 3 months or more.
- Reading note: The share of moves with employer change which were longer than 3 years exceeds the total share of moves with a length of over 3 years by 15.7 pp.

On average, the length of the mobile period is situated mid-way between the category '6 months to one year' and 'one year to two years'. One could thus approximate the average duration of a research trip as one year. This average is similar across all subgroups of genders, family status, career stages and fields of science but higher for moves with employer change (average duration of 1 to 2 years).

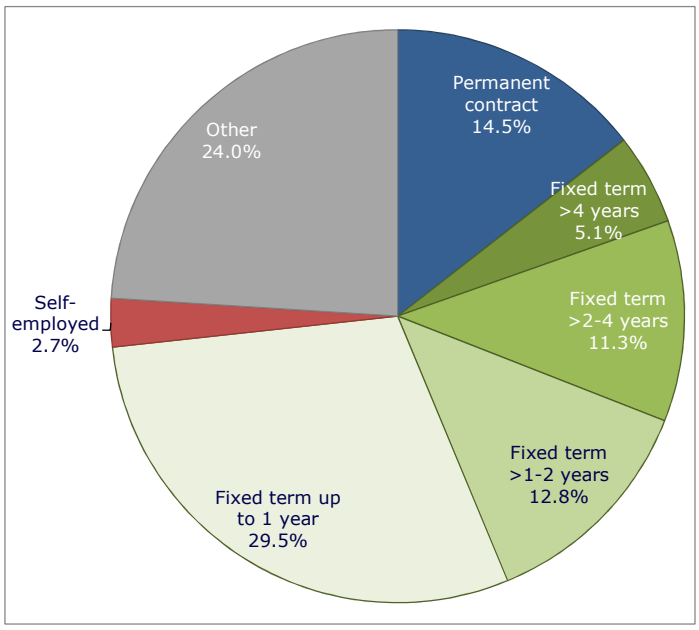
We can note that the higher number of moves experienced by one researcher during the last ten years, the shorter the average duration of each move. However, this result is to be interpreted with caution, as it is possible that this subgroup has registered their moves in more detail than the full sample, thus also including shorter moves.

5.7.3.10 Mobility conditions

Contract

59% of all moves were undertaken with a fixed term contract and 14% with a permanent contract (Figure 58). When the move includes a change in employer, the contract type is more frequently permanent or fixed with a term of more than one year at least (Figure 59). A number of recurring categories under 'other' are: fellowships, scholarships, sabbatical, visit, other agreement, no contract etc.

Figure 58: Contract type per move during long term post-PhD mobility in the last 10 years (EU27)



Source: MORE2 Higher Education Survey (2012)

Note: Distribution of moves indicated by R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers that have worked abroad for 3 months or more at least once in the last ten years over contract types. (n=2,705)

Figure 59: Contract type per move with change in employer during long term post-PhD mobility in the last 10 years (EU27)

	Employer change	*Total*
Permanent contract	18.6%	*14.5%*
Fixed term >4 years	8.6%	*5.1%*
Fixed term >2-4 years	19.6%	*11.3%*
Fixed term >1-2 years	21.0%	*12.8%*
Fixed term up to 1 year	22.5%	*29.5%*
Self-employed	1.8%	*2.7%*

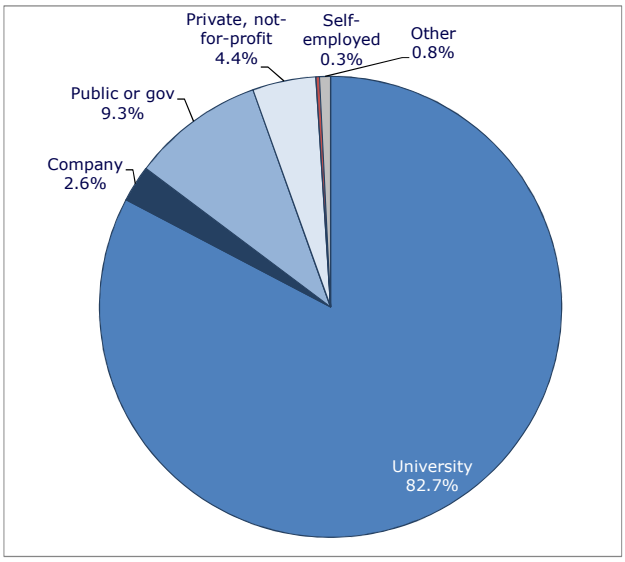
Source: MORE2 Higher Education Survey (2012)

Note:
- *Difference between share of moves including an employer change per contract types and share of total moves per contract type. (n=1,193)*
- *With 'moves' defined as international steps in the last ten years of R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers to work abroad for 3 months or more.*
- *Reading note: The share of moves with employer change that were undertaken with a permanent contract exceeds the total share of moves that were undertaken with a permanent contract by 4.1 pp.*

Destination sector

For all international moves of over 3 months during the last ten years, the main destination is another university (Figure 60). However, the data need to be treated with caution as this question is addressed only to researchers currently working in a university or other HEI in Europe. Accordingly, researchers who have moved to a private company abroad and have not returned to academia are not included, for example.

Figure 60: Destination sector per move during post-PhD mobility in the last 10 years (EU27)



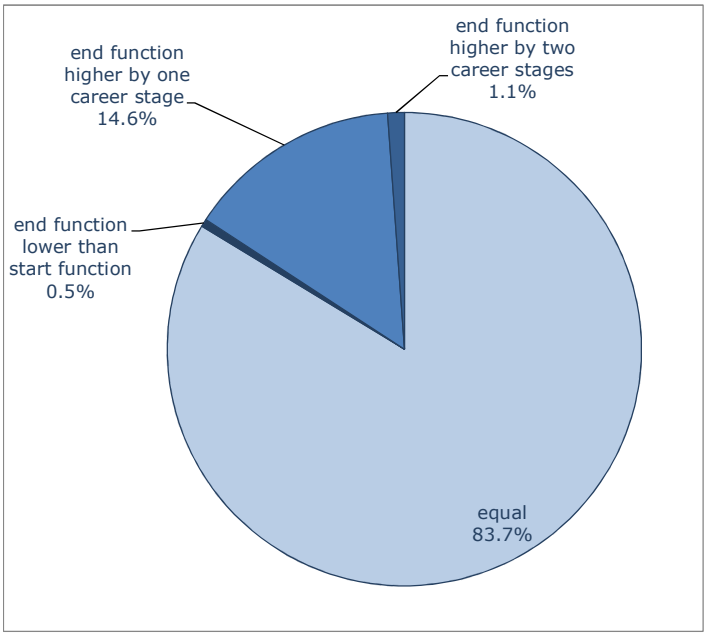
Source: MORE2 Higher Education Survey (2012)

Note: Distribution of moves indicated by R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers that have worked abroad for 3 months or more at least once in the last ten years over destination sectors. (n=2,705)

Career progression

In 84% of researcher moves, the end function equals the start function (Figure 61). 15% of moves include a career progression with one step, and 1% with two steps. Career progression by one step is more frequent when a change of employer is included in the move (Figure 62).

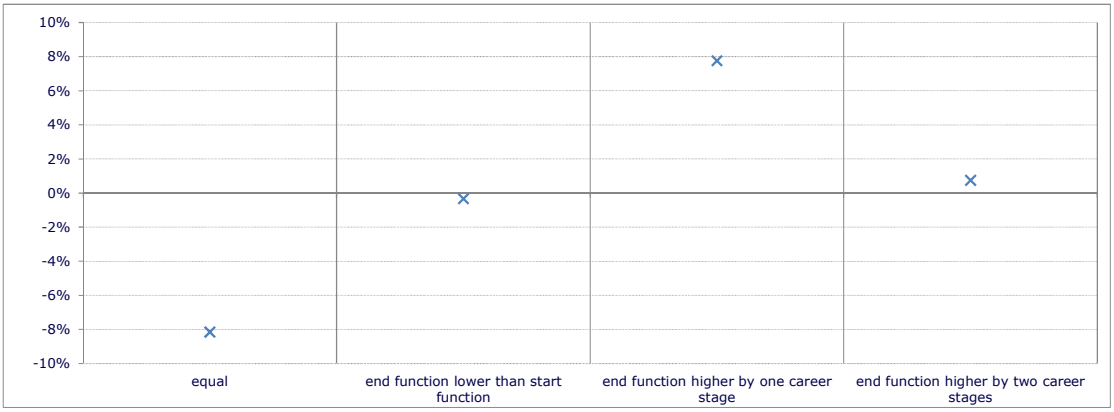
Figure 61: Career progression per move during long term post-PhD mobility in the last 10 years (EU27)



Source: MORE2 Higher Education Survey (2012)

Note: Distribution of moves indicated by R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers that have worked abroad for 3 months or more at least once in the last ten years over shifts in career stage. (n=2,471)

Figure 62: Promotion per move with employer change during long term post-PhD mobility in the last 10 years (EU27)



	Employer change	*Total*
Equal	75.5%	*83.7%*
End function lower than start function	0.2%	*0.5%*
End function higher by one career stage	22.4%	*14.6%*
End function higher by two career stages	1.9%	*1.1%*

Source: MORE2 Higher Education Survey (2012)

Note:
- *Difference between percentage of moves including an employer change per promotion category and percentage total moves per promotion category. (n=1,067)*
- *With moves defined as international steps in the last ten years of R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers to work abroad for 3 months or more.*
- *Reading note: The share of moves with employer change which entail a shift upwards with one career stage exceeds the total share of moves that entail a shift upwards with one career stage by 7.1 pp. The total share is 14.6% whereas the share for moves with a change of employer is 22.4%.*

5.7.4 <3 month international mobility

Mobility of less than 3 months, as well as other forms of collaboration, networking and interaction (cf. next chapters), are increasingly considered complementary to and even a partial replacement for the need for long term international mobility as ways of transferring knowledge and collaboration[57;58;59].

One of the reasons for this transformation in thinking about mobility and interaction is that, increasingly, evidence is being gathered on personal, family-related reasons for non>3 month mobility which indicates that it is easier for researchers to undertake shorter visits or collaborate through virtual tools[60;61]. It is therefore important to analyse whether short term visits do/can replace long term visits and what effect this has on a researcher's career. The latter question is beyond the scope of this study, but we have collected evidence on the combined short and >3 month mobility profile, as well as on the influence of virtual mobility on both.

Furthermore, as was suggested earlier, differences in the culture of mobility may occur across different fields of science[62]. This could be due to a variety of reasons (different needs regarding facilities and equipment; need for physical presence in order to undertake the research; differences in collaboration culture etc.). We therefore also approach <3 month mobility from the perspective of fields of science.

The extent and features of <3 month mobility, as well as its interaction with >3 month mobility, is discussed in the following sections. Further analysis on collaboration and virtual mobility is described in section -.

5.7.4.1 <3 month mobility

41% of post-doctoral researchers in the EU27 have worked abroad for under 3 months at least once in the last ten years. Another 13% were only <3 month mobile over than 10 years ago. This means that more than half (54%) of researchers have worked abroad for under 3 months.

The proportion of researchers who were <3 months mobile during the last ten years varies along career stages: 36% in R2, 41% in R3 and 45% in R4. This variation occurs also because of the typically longer careers of researchers who have reached later stages of their careers, whereas the R2 academics may not yet have been working for 10 years in their research career to this point.

When comparing the various scientific disciplines, Agricultural Sciences has the highest degree of researchers undertaking short term international mobility in the last ten years (Figure 63). 61% have been <3 month mobile. Medical Sciences are below average, with 34% of researchers <3 month mobile during the last ten

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57 Cañibano C., F. Javier Otamendi and F. Solís (2011):International temporary mobility of researchers: cross-discipline study. Scientometrics, 89, 653-675.

58 Ackers, L. (2010). Internationalisation and equality. The contribution of short stay mobility to progression in science careers. Recherches sociologiques et anthropologiques, 1, 83–103.

59 Inzelt A., Analysis of Researchers' Mobility in the Context of the European Research Area, Evaluation FP7 as supporting expert.

60 Ackers, L. (2010). Internationalisation and equality. The contribution of short stay mobility to progression in science careers. Recherches sociologiques et anthropologiques, 1, 83–103.

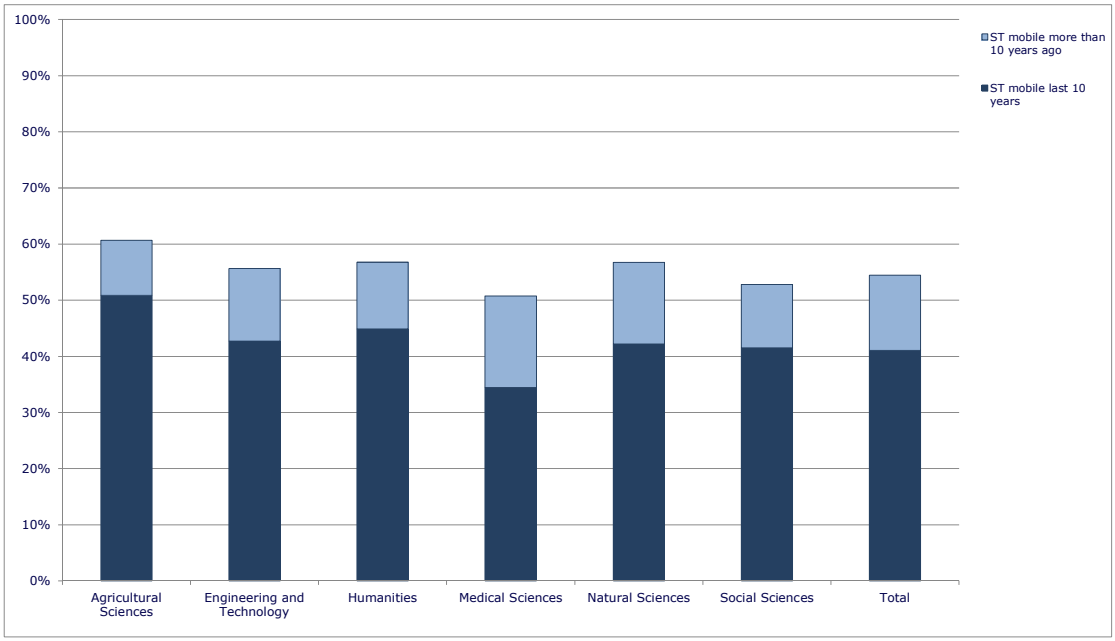
61 Ackers, L. (2008). Internationalisation, mobility and metrics: A new form of indirect discrimination? Minerva, 46, 411–435.

62 Cañibano C., F. Javier Otamendi and F. Solís (2011):International temporary mobility of researchers: cross-discipline study. Scientometrics, 89, 653-675.

years[63]. The percentage of researchers who were <3 month mobile only over ten years ago is, however, highest in this field (16%).

In combination with the long term mobility rates per field of science, it is noted that in the Social Sciences and Humanities, and particularly in the Agricultural Sciences, >3 month mobility occurs relatively less often than the average, while <3 month mobility is more common (Figure 64). For Social Sciences and Humanities this was to be expected from existing studies, yet is only confirmed by the MORE2 data to a limited extent. Both the Natural Sciences and Engineering & Technology are the fields with relatively high rates of both <3 month and >3 month mobility, whereas the Medical Sciences have lower rates than average for both.

Figure 63: <3 month international mobility in post-PhD career stages per field of science (EU27)

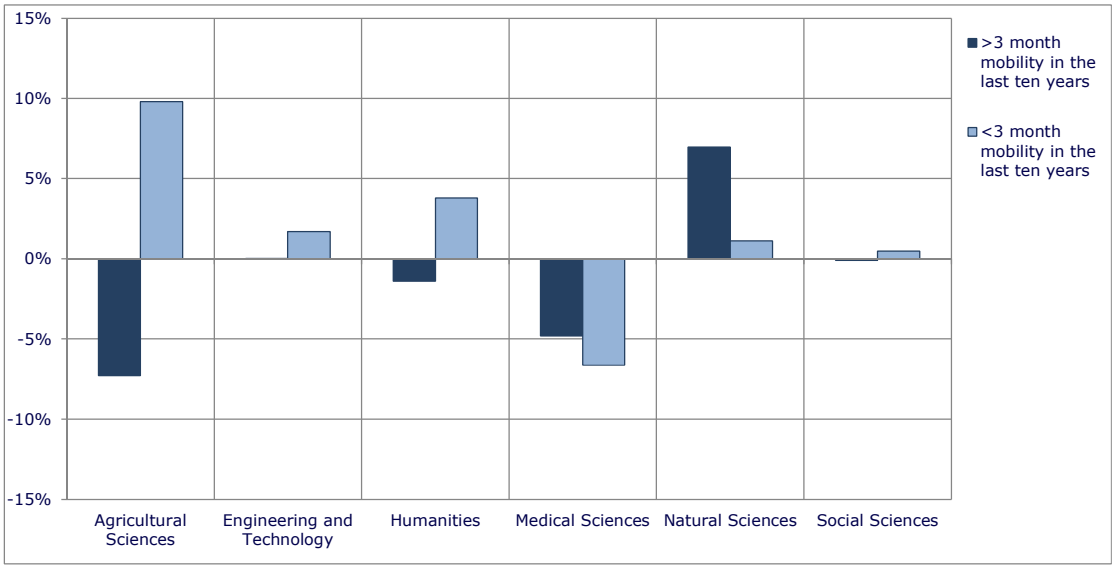


Source: MORE2 Higher Education Survey (2012)

Note: Percentage of R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers who have worked abroad for under 3 months at least once per field of science. (n=7,131)

63 This is broadly (despite difference in scope and definition) consistent with the results of Cañibano et al. (2011) for Andalusian researchers, where the largest proportion of <3 month mobile researchers is found in the social sciences and humanities and the lowest clearly in science and technology of health.

Figure 64: Comparison of <3 month and >3 month international mobility rates in post-PhD career stages per field of science (EU27)



Source: MORE2 Higher Education Survey (2012)

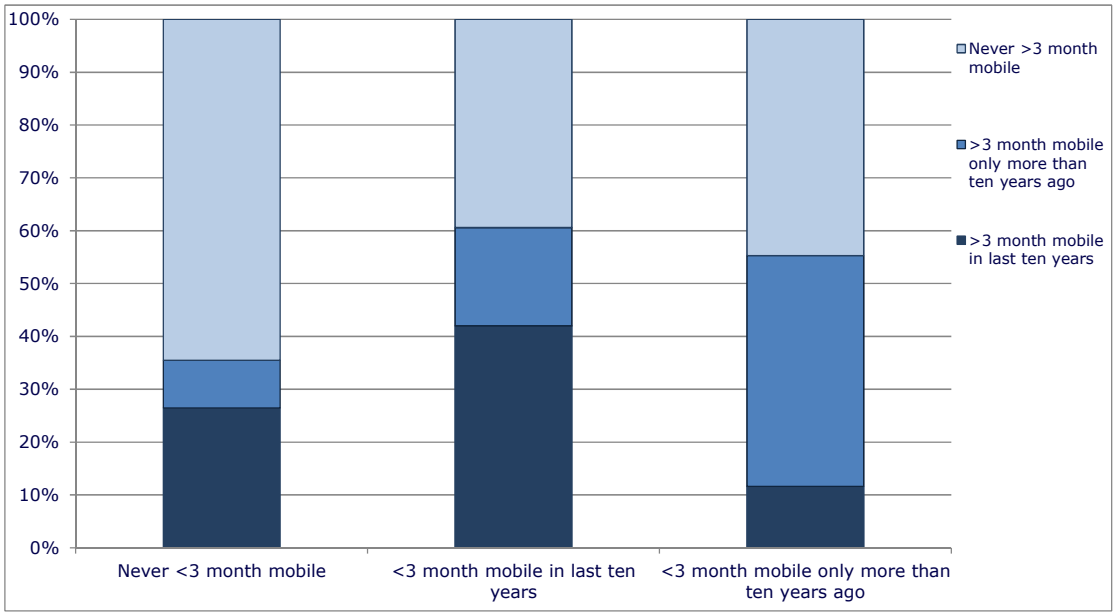
Note: - Difference between percentage of researchers who were short term respectively >3 month mobile per field of science and the total share of short term respectively >3 month mobile researchers. (n=7,131)
- *With '<3 month mobility' defined as international steps in the last ten years of R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers to work abroad for under 3 months.*
- *With '>3 month mobility' defined as international steps in the last ten years of R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers to work abroad for 3 months or more.*
- *Reading note: The share of <3 month mobile researchers in the Agricultural Sciences exceeds the total share of <3 month mobile researchers by 12 pp. The total share is 40.9% whereas the share in the Agricultural Sciences is 52.9%.*

<3 month mobility in the last ten years per >3 month mobility profile

The shorter (<3 month) and longer (>3 month) term mobility profiles, defined according to the three parallel categories (mobile in last ten years, more than ten years ago, never), are strongly interrelated (Figure 65). 64% of researchers who have never been <3 month mobile have never been >3 month mobile either. Of those who were <3 month mobile only more than ten years ago, 42% were also >3 month mobile only more than ten years ago, and 45% have never been >3 month mobile. The one striking exception is that 27% of the researchers who were never <3 month mobile have been >3 month mobile in the last ten years.

Alternatively, the researchers who were >3 month mobile, both in the last ten years or before, are also more inclined to undertake <3 month mobility than the never-mobile (Figure 66).

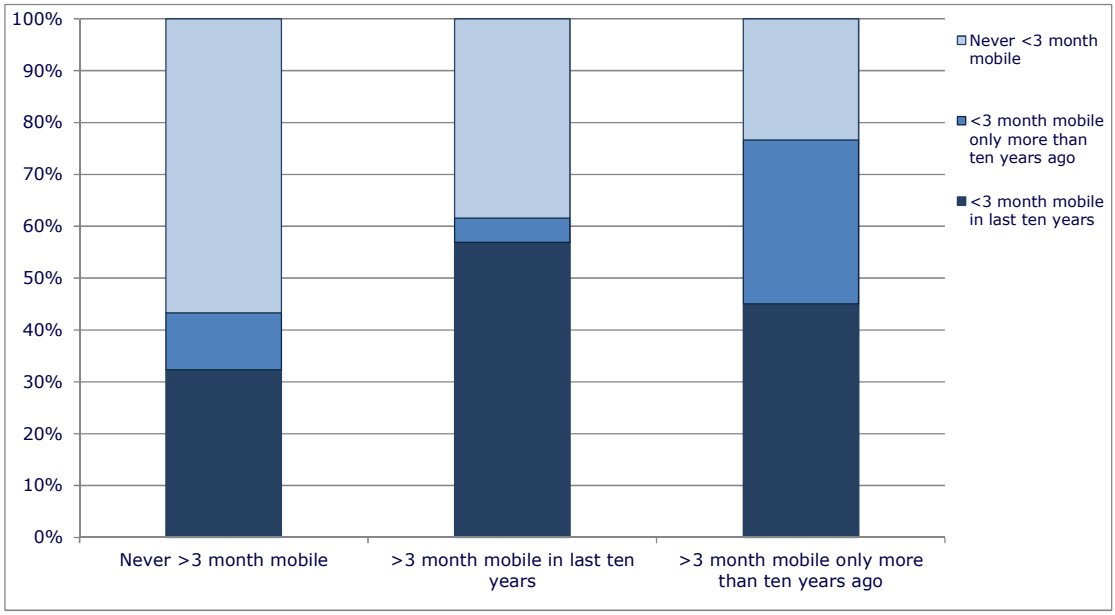
Figure 65: International >3 month mobility in post-PhD career stages per <3 month mobility profile (EU27)



Source: MORE2 Higher Education Survey (2012)

Note: Distribution over >3 month mobility categories of R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers per <3 month mobility category. (n=7,131)

Figure 66: International <3 month mobility in post-PhD career stages per >3 month mobility profile (EU27)



Source: MORE2 Higher Education Survey (2012)

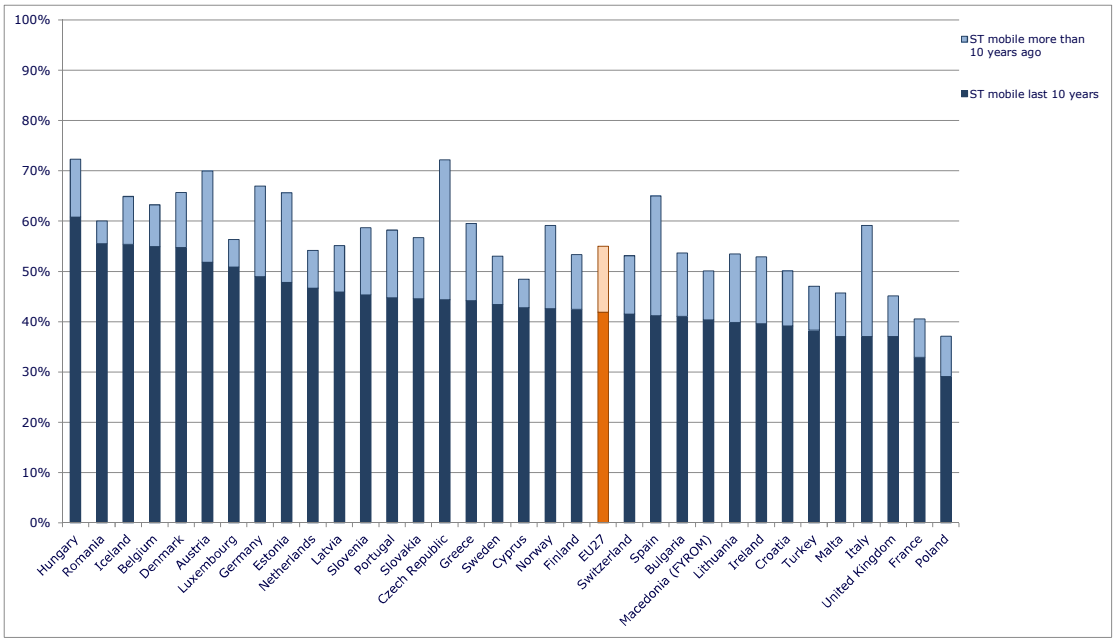
Note: Distribution over <3 month mobility categories of R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers per >3 month mobility category. (n=7,131)

5.7.4.2 <3 month mobility in the last ten years per country[64;65]

At country level, it is noted that differences are not pronounced, with most countries around the 41% EU average. Yet several countries have more than 50% of <3 month mobile researchers in the past ten years, with a number of East-European countries on top of the list: Hungary and Romania, followed by Iceland, Belgium, Denmark and Austria (Figure 67). Romania also has the lowest relative share of researchers who were only <3 month mobile more than ten years ago as compared to the share of researchers <3 month mobile in the last ten years. <3 month mobility thus appears to be a rather recent phenomenon in Romania.

At the other end of the spectrum, less than 50% of post-doctoral researchers in Poland, France and the United Kingdom have ever been <3 month mobile. This was also the case in Malta, Turkey and Cyprus but in these countries the <3 month mobility in the last ten years is closer to the EU27 level. In Czech Republic, Italy and Spain, a relatively large group was only <3 month mobile more than 10 years ago.

Figure 67: <3 month international mobility in post-PhD career stages per country



Source: MORE2 Higher Education Survey (2012)

Note: Percentage of R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers who have worked abroad for under 3 months at least once. (n=8,357)

64 We refer to the panel country of the respondent which was identified during the data collection process. For 85% of respondents this panel country corresponds to their citizenship.

65 As a caveat to the analysis, we note that the questionnaire referred to 'short term mobility' as 'working abroad for under 3 months at a time'. The discussion of the results should take into account the potential for different interpretation of this definition across countries.

5.7.4.4 <3 month mobility in the last ten years per gender and family status

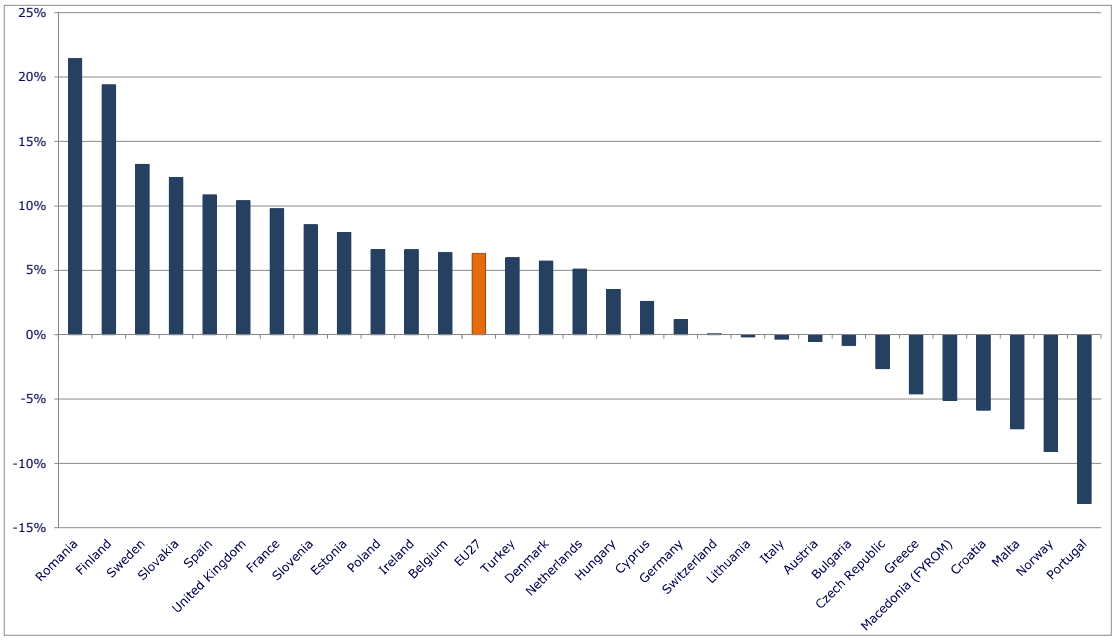
Female researchers are less inclined to undergo <3 month international mobility during post-doctoral career stages during the last ten years than their male counterparts (37% versus 43%). Variations also occur across countries (Figure 68). Male researchers are more <3 month mobile in Romania, Finland (around 20 percentage points difference) and also in Sweden, Slovakia, Spain and the United Kingdom (more than 10 pp difference). On the other hand, female researchers are more frequently <3 month mobile than their male counterparts in Portugal, Norway, Malta, Croatia and Macedonia (FYROM) (more than 5 pp difference).

Comparing this gender difference for <3 month mobility with that for >3 month mobility (cf. section 5.7.3.1, Figure 49), a number of countries appear to have higher rates of >3 month mobility among men but balanced or higher rates of <3 month mobility of women: Cyprus, Germany, Czech Republic and Croatia. Other countries have balanced or higher rates of female >3 month mobility combined with higher rates of male <3 month mobility: Slovakia, Denmark, and Belgium.

In terms of family status, there is no evidence of differences in <3 month mobility in the last ten years between single researchers and researchers in couple (41% both) and only a small difference occurs between researchers with or without children (40% versus 43%).

In general, no clear evidence can be derived from the data to support the hypothesis that family status or gender would influence the <3 month mobility profile.

Figure 68: Differences in gender for <3 month international mobility in post-PhD career stages per country



Source: MORE2 Higher Education Survey (2012)

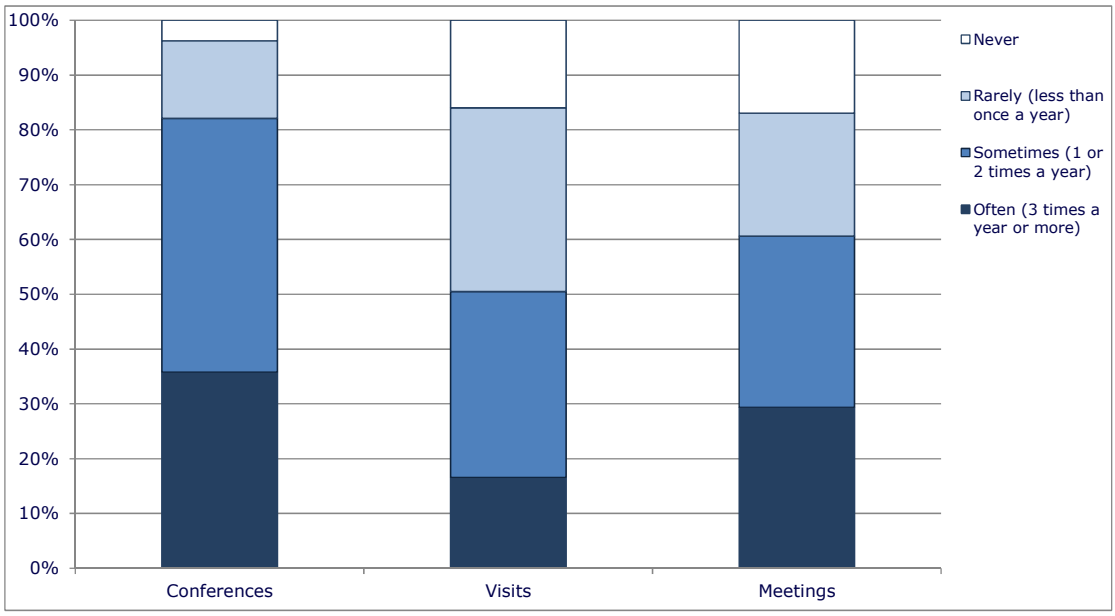
Note: - Difference between percentage of male and female researchers in R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) career stage who have worked abroad for under 3 months at least once in the last ten years. (n=8,357)
- Countries with less than 30 observations for one of the gender categories are omitted: Iceland, Latvia and Luxembourg.

5.7.4.6 <3 month mobility in the last ten years: types, frequency and career stages

Virtually all <3 month mobile researchers (96%) have attended international conferences during their post-doctoral career (Figure 69). This corresponds to 40% of all researchers. 84% of the <3 month mobile have made short international visits (35% of all researchers) and 83% (35% of all researchers) have been to short international meetings in the last ten years. Comparing these shares per citizenship to check for potential language or other issues in interpreting the question produces no large differences, except for Bulgaria (overall lower than other citizenships), Germany (62% for visits) and Romania (48% for meetings).

Conferences also account for the most frequent short term moves, with 85% of the post-doctoral researchers who attend conferences doing so at least once a year. The figures stand at 73% for meetings and 60% for visits.

Figure 69: <3 month international mobility in post-PhD career stages per type and frequency (EU27)



Source: MORE2 Higher Education Survey (2012)

Note: - Percentage of researchers in R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) career stage who have worked abroad for under 3 months at least once in the last ten years, distributed over types of <3 month mobility and their frequency. (n=3,127)
- One researcher may have indicated more than one type of <3 month mobility, and is then counted in each of the according categories in the graph. Per type, the respondent could only indicate one frequency category.

The largest differences between career stages exist for conferences. During the last ten years, R4 researchers have more frequently attended conferences than have those in preceding career stages: the proportion of R4 researchers who often attend conferences stands at 8.8 pp higher than the total share over all career stages (Figure 70).

The share of R2 researchers who participate in international conferences, visits or meetings is lower than that for any other career stage, and on average, over all career stages. This relates particularly to international visits and international meetings.

Figure 70: <3 month international mobility in post-PhD career stages per type, frequency and career stage (EU27)

Source: MORE2 Higher Education Survey (2012)

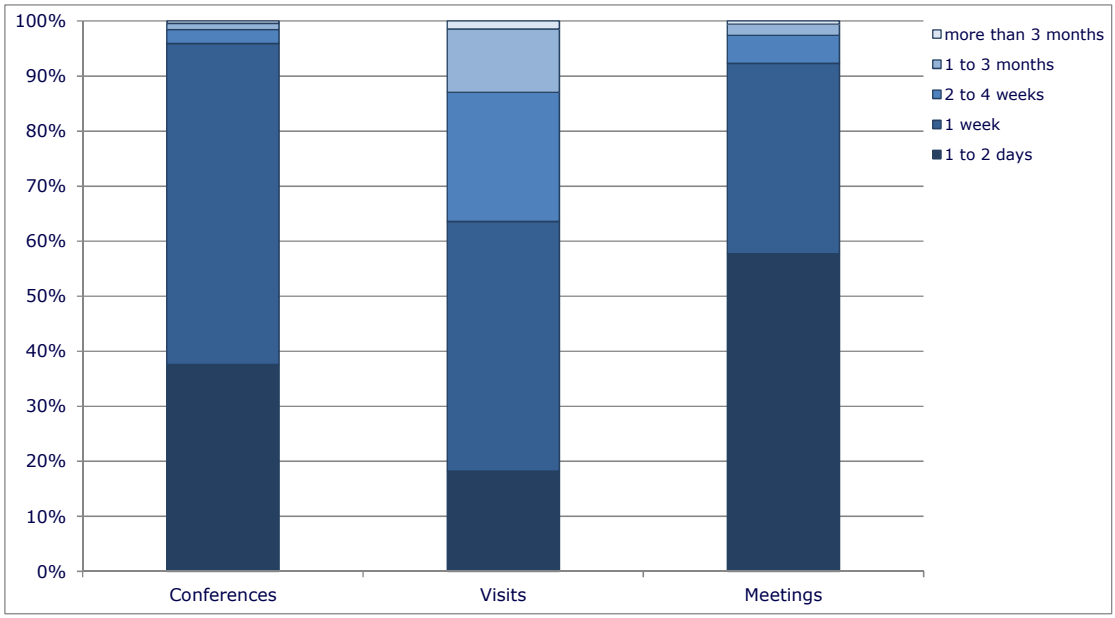
Note: - Difference between percentage of researchers per current career stage participating in each type of <3 month mobility with the specified frequency and total percentage of researchers participating in each type of <3 month mobility with the specified frequency. (n=3,127)

- *With R1=doctoral stage; R2=post-doctoral stage; R3=established researcher; R4=leading researcher.*
- *Reading note: The share of R2 researchers who never participate in international visits for under 3 months per year exceeds the total share of researchers that never participate in international visits for under 3 months per year by moves with employer change that entail a shift upwards with one career stage exceeds the total share of moves that entail a shift upwards with one career stage by 6.8 pp. The total share is 15.9% whereas the share of R2 researchers is 22.7%.*

5.7.4.7 <3 month mobility in the last ten years: types and duration

While the vast majority of international meetings and conferences last up to one week, the pattern for international 'visits' varies: 64% last up to one week, 23% between 2 and 4 weeks and 11% of 1 to 3 months (Figure 71).

Figure 71: <3 month international mobility in post-PhD career stages per type and duration (EU27)



Source: MORE2 Higher Education Survey (2012)

Note: - Percentage of researchers in R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) career stage who have worked abroad for under 3 months at least once in the last ten years, distributed over types of <3 month mobility and their duration. (n=3,032 for conferences, n=2,765 for visits, n=2,609 for meetings)

- One researcher may have indicated more than one type of <3 month mobility, and is then counted in each of the according categories in the graph. Per type, the respondent could only indicate one duration category.

5.7.5 Motives for international mobility

This section discusses how researchers perceive their motivations when they decided to be internationally mobile. Motivations are analysed for:

- PhD degree mobility (importance of motives)
- >3 month mobility during PhD (importance of motives)
- International >3 month mobility in post-PhD career stages
    - Main motive for each of the individual moves
    - Importance of motives for the last move to the EU

A list of 13 factors was presented for each type of mobility (plus the 'other' category). Generally, a distinction can be made between intrinsic motivations (e.g. the desire to perform an activity because of inherent interests and the desire to improve) and extrinsic (financial or to gain employment). Personal motives are treated as a separate category.

- Intrinsic motives
    - Availability of a suitable PhD position
    - Career progression (positive impact on your future career)
    - Facilities and equipment for your research
    - Working with leading experts (star scientists)
    - Research autonomy
    - Quality of training and education
- Extrinsic motives
    - Availability of research funding
    - Remuneration (salary, other financial incentives etc.)
    - Social security and pension system
    - Job security
    - Working conditions
- Personal motives
    - Culture and/ or language
    - Personal or family reasons

These are no exclusive or opposite motives: the intrinsic motivations frequently need to be externally and financially induced in order to engage in international mobility. Yet such a broad division can be helpful to unearth a general pattern.

5.7.5.1 Motives for PhD degree mobility

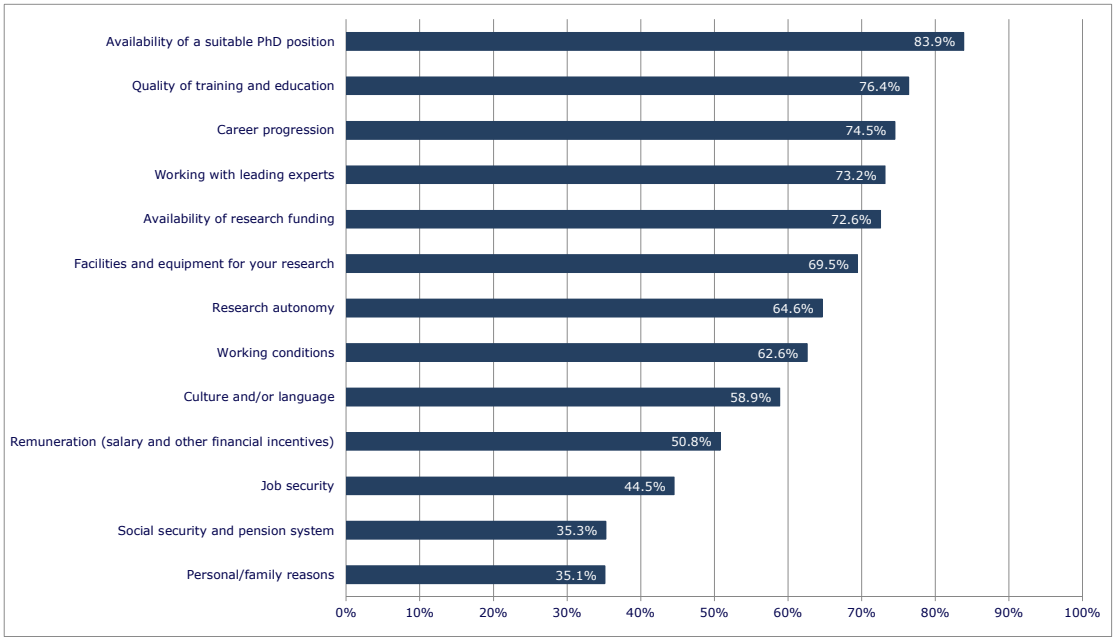
This section discusses the question: what motivations push researchers to obtain a PhD in another country? First, we put this question to researchers in their doctoral training stage (R1) and those in the post-doctoral stage (R2), who indicated that they did or will obtain their doctorate in another country. They were asked to indicate whether a particular reason is important or unimportant.

Figure 72 gives an overview of the results. Virtually all the intrinsic motivations are situated in the upper segment where - apart from the PhD position as such - around 75% see PhD degree mobility as important for the quality of their training, education and career progression.

The extrinsic factors are considered to be much less important, presumably because a PhD position seldom provides job security or social security and remuneration is generally low - factors which would not encourage candidates to

pursue a PhD anyway. Personal reasons such as culture and language are still considered to be important for more than half of respondents, who indicate that it is seen attractive to acquire international experience and to be exposed to other cultures. Over a third of the respondents consider personal/ family reasons to be important, and reasons which cannot be overlooked. Below, we discuss whether this varies between different disciplinary areas.

Figure 72: Importance of motives for international PhD degree mobility (EU27)



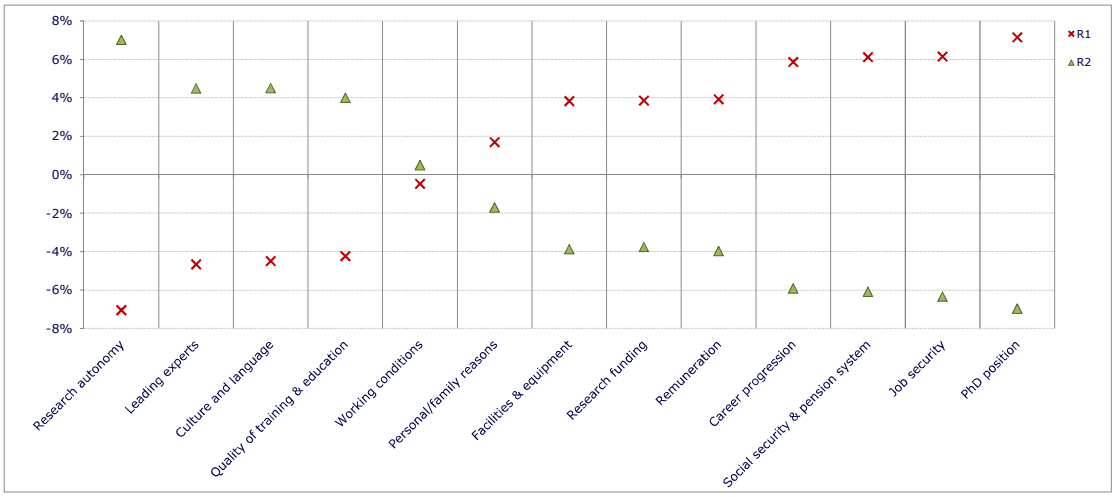
Source: MORE2 Higher Education Survey (2012)

Note: - Share of PhD degree mobile researchers in current R1 (doctoral or equivalent) and R2 (post-doctoral or equivalent) career stages who feel the reason important (versus not important) for their PhD degree mobility (n=653).
- With 'PhD degree mobility' defined as obtaining or having obtained a PhD in another country.

Motives for PhD degree mobility per current career stage

If we compare the answers for R1 and R2 separately, some interesting observations emerge (Figure 73). The post-doctoral researchers attach more value to intrinsic motivations such as research autonomy, leading experts and quality of training & education, in to addition culture and language. This may be a reflection on their past experience, which differ to their original reason for PhD degree mobility. For the current PhD researchers, most other motives are more important, and the differences are most strikingly visible in terms of extrinsic motivations such as available positions, remuneration, job security and social security and the pension system. Current PhD candidates attach far more value to these aspects than their predecessors in their current research career. These differences between the two career groups indicate that the researcher's career stage does affect their perspective in this area.

Figure 73: Importance of motives for >3 month international PhD degree mobility per current career stage (EU27)



	R1	R2	*Total*
Research autonomy	57.6%	71.7%	*64.6%*
Leading experts	68.5%	77.7%	*73.2%*
Culture and language	54.4%	63.4%	*58.9%*
Quality of training & education	72.1%	80.4%	*76.4%*
Working conditions	62.1%	63.1%	*62.6%*
Personal/family reasons	36.8%	33.4%	*35.1%*
Facilities & equipment	73.3%	65.6%	*69.5%*
Research funding	76.4%	68.8%	*72.6%*
Remuneration	54.7%	46.8%	*50.8%*
Career progression	80.4%	68.6%	*74.5%*
Social security & pension system	41.4%	29.2%	*35.3%*
Job security	50.7%	38.2%	*44.5%*
PhD position	91.0%	76.9%	*83.9%*

Source: MORE2 Higher Education Survey (2012)

Note:
- *Difference between percentage of PhD degree mobile researchers per current career stage that find the motive important (versus not important) for their PhD degree mobility and the total share of PhD degree mobile researchers that find it important (n=653).*
- *With R1=doctoral stage and R2=post-doctoral stage.*
- *With 'PhD degree mobility' defined as obtaining or having obtained a PhD in another country.*
- *Reading note: The proportion of R2 PhD degree mobile researchers who find research autonomy important exceeds the corresponding share of R1 PhD degree mobile researchers by 14.1 pp. The R2 share is 71.7% whereas the R1 share is 57.6%.*

Motives for PhD degree mobility per gender and family status

The assumption, also supported by the research literature (cf. Annex 1 section 3.1) is that motives are influenced by the personal characteristics of the respondents. Here we focus on family status (single/ couple, with or without children), and gender.

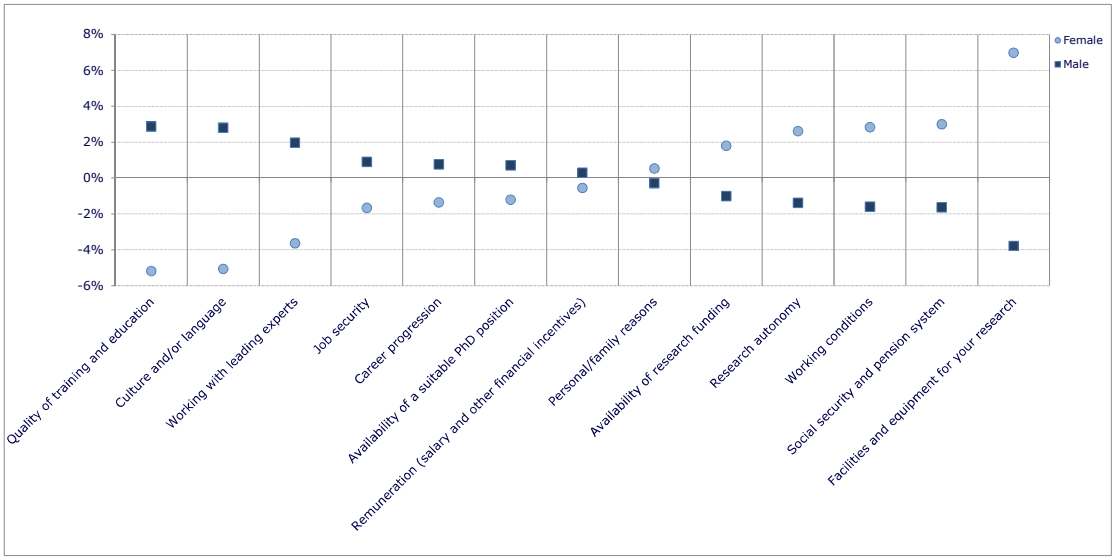
The main difference between single researchers and researchers in a couple show that researchers in couple attach more importance to family and personal reasons and career progression, whereas single researchers are more driven by social security and pensions, job security, facilities, equipment and research funding. These observations are difficult to explain, but are presumably due to the fact that researchers in a couple have a partner with whom they can combine the employment risks.

Motives also differ depending on whether respondents have children or not. It appears that those without children score higher on extrinsic motives

(remuneration, research funding, PhD position, job security, career progression, social security & pensions and working conditions). Also remarkable is the higher score for those without children on personal or family reasons (more than 8 pp difference). Those with children, on the other hand, tend to be driven more by intrinsic motives: leading experts, quality of training and education and culture and language. Overall the differences are rather diverse and general conclusions cannot be drawn.

Finally, Figure 74 illustrates the difference between the genders. Generally, gender does not matter very much in this context, and only for some factors. Men attach more value to the quality of training and education, career progression and working with leading experts whereas for women facilities and equipment and social security are relatively important motives. Personal and family reasons hardly differ between the genders, and neither do several other factors.

Figure 74: Importance of motives for international PhD degree mobility per gender (EU27)



	Female	Male	*Total*
Quality of training & education	71.2%	79.2%	*76.4%*
Culture and language	53.8%	61.7%	*58.9%*
Leading experts	69.5%	75.1%	*73.2%*
Job security	42.9%	45.4%	*44.5%*
Career progression	73.1%	75.3%	*74.5%*
PhD position	82.7%	84.6%	*83.9%*
Remuneration	50.2%	51.1%	*50.8%*
Personal/family reasons	35.7%	34.8%	*35.1%*
Research funding	74.3%	71.5%	*72.6%*
Research autonomy	67.3%	63.3%	*64.6%*
Working conditions	65.4%	61.0%	*62.6%*
Social security & pension system	38.3%	33.6%	*35.3%*
Facilities & equipment	76.4%	65.7%	*69.5%*

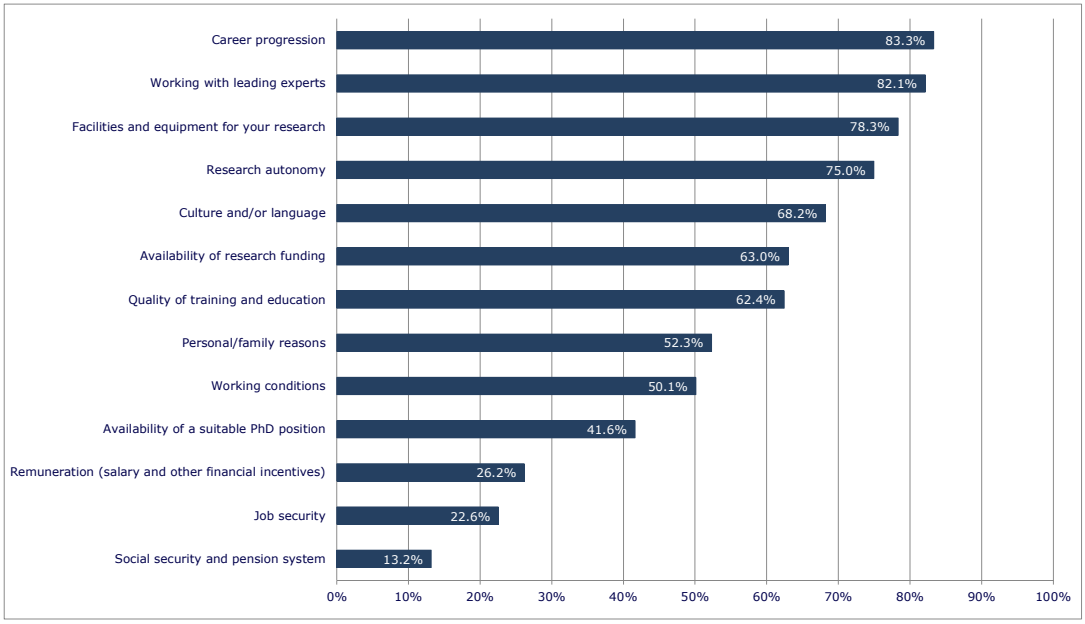
Source: MORE2 Higher Education Survey (2012)

Note:
- *Difference between percentage of PhD degree mobile researchers per gender that find the motive important (versus not important) for their PhD degree mobility and the total share of PhD degree mobile researchers that find it important (n=653).*
- *With 'PhD degree mobility' defined as obtaining or having obtained a PhD in another country.*
- *Reading note: The proportion of female PhD degree mobile researchers who find facilities and equipment for research important exceeds the share of male PhD degree mobile researchers that finds this important by 9.7 pp. The share is 76.4% for female researchers and 66.7% for male researchers.*

5.7.5.2 Motives for >3 month mobility during PhD

The list of motives was also presented to the group of researchers (R1 and R2) who indicated that they did not or will not obtain their PhD in another country but did move for three months or more to another country. The results are presented in Figure 75.

Figure 75: Importance of motives for >3 month international mobility during PhD (EU27)



Source: MORE2 Higher Education Survey (2012)

Note: - Share of researchers who have been mobile during their PhD in current R1 (doctoral or equivalent) and R2 (post-doctoral or equivalent) career stages that find the motive important (versus not important) for their >3 month mobility during PhD (n=552).
- With '>3 month mobility during PhD' defined as moving to another country than the country of PhD for three months or more.

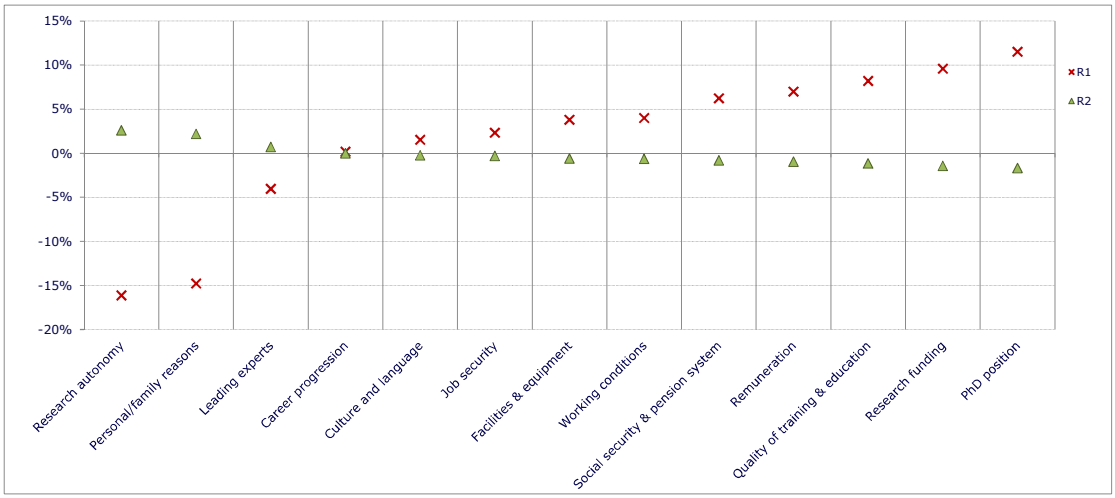
This group is primarily motivated by intrinsic factors such as career progression (83%), working with leading experts (82%), and facilities and equipment (78%). Career progression may include various aspects such as international experience and developing international contacts in the respective field.

If we compare the importance of motives for this group of researchers with the responses above of those who indicated that they did or will obtain their PhD in another country, there are some obvious outcomes. Since the former group already possess a PhD position in their home country, they do not attach much value to this position. Quite low scores are also given to external motivations such as social security and pensions, job security, remuneration, working conditions.

Motives for >3 month mobility during PhD per current career stage

A comparison between PhD candidates (R1) and post-docs (R2) is presented in Figure 76. The R1 type of researcher attaches relatively more value to PhD position, social security, research funding, quality of training and education and remuneration. For the R2 type of researcher, personal/ family reasons, research autonomy, and access to leading experts are more important. Although both types were asked for their motives for mobility during their PhD, these differences may point to the different current career stages: those in the post-doctoral career stage are more interested in developing their own research area, where some research autonomy and contact with leading researchers is quite important.

Figure 76: Importance of motives for >3 month international mobility during PhD per current career stage



	R1	R2	*Total*
Research autonomy	58.8%	77.5%	*75.0%*
Personal/family reasons	37.5%	54.5%	*52.3%*
Leading experts	78.1%	82.8%	*82.1%*
Career progression	83.5%	83.3%	*83.3%*
Culture and language	69.7%	67.9%	*68.2%*
Job security	24.9%	22.2%	*22.6%*
Facilities & equipment	82.1%	77.7%	*78.3%*
Working conditions	54.1%	49.4%	*50.1%*
Social security & pension system	19.4%	12.3%	*13.2%*
Remuneration	33.1%	25.2%	*26.2%*
Quality of training & education	70.6%	61.2%	*62.4%*
Research funding	72.6%	61.5%	*63.0%*
PhD position	53.1%	39.9%	*41.6%*

Source: MORE2 Higher Education Survey (2012)

Note: - Difference between proportion of researchers who have been mobile during their PhD per current career stage who find the motive important (versus not important) for their >3 month mobility during PhD and the total share of researchers who have been mobile during their PhD and who find it important (n=552).
- *With R1=doctoral stage and R2=post-doctoral stage.*
- *With '>3 month mobility during PhD' defined as moving to another country than the country of PhD for three months or more.*
- *Reading note: The share of R1 researchers who have been mobile during their PhD that find the availability of a position important exceeds the R2 share by 13.2 pp. The R1 share is 53.1% whereas the R2 share is 39.9%.*

Motives for >3 month mobility during PhD per gender and family status

Some of the results regarding personal characteristics can be outlined briefly and compared with the previous section regarding family status, children and gender.

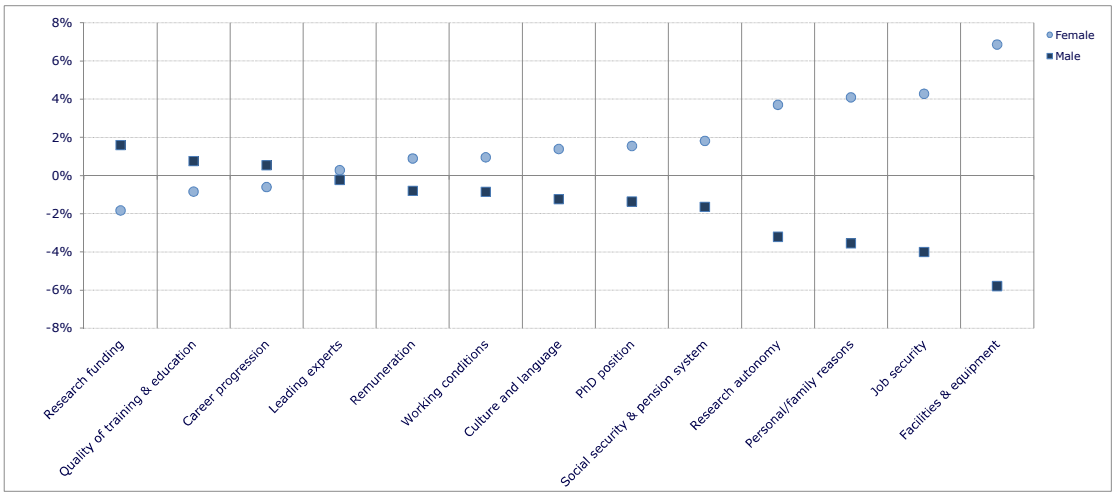
Calculating the difference between the percentage who find the motive important for mobility during the PhD per family status and whether or not they have children, and the total percentage who find the motive important for mobility during the PhD (as compared to the number of respondents who replied either important or unimportant) leads to the following observations:

- Overall, researchers in a couple have lower scores on almost all motives when compared to singles. Singles, in particular, attach stronger value to working conditions, job security, social security, PhD position and research funding than do couples.

- Those without children attach less value to: quality of training, social security, culture and language, remuneration.
- Regarding career progression the difference is the largest: those without children are less career-oriented than those with children.
- There is little evidence that living in couple or without children results in higher importance being given to family and security related motives. The differences are so small that family status does not appear to be an important factor in the considerations for >3 month mobility during PhD.

Figure 77 illustrates the difference between genders. Except for research funding, quality of training and education and career progression (where the differences are in any case marginal) men perceive all these reasons as being less important than do women. Facilities and equipment, personal and family reasons, and job security are considerably more important for female researchers, and women also attach more value to several intrinsic motivations than men.

Figure 77: Importance of motives for >3 month international mobility during PhD per gender (EU27)



	Female	Male	*Total*
Research funding	61.2%	64.6%	*63.0%*
Quality of training & education	61.6%	63.2%	*62.4%*
Career progression	82.7%	83.8%	*83.3%*
Leading experts	82.4%	81.9%	*82.1%*
Remuneration	27.1%	25.4%	*26.2%*
Working conditions	51.1%	49.2%	*50.1%*
Culture and language	69.6%	67.0%	*68.2%*
PhD position	43.2%	40.3%	*41.6%*
Social security & pension system	15.0%	11.5%	*13.2%*
Research autonomy	78.6%	71.7%	*75.0%*
Personal/family reasons	56.4%	48.8%	*52.3%*
Job security	26.8%	18.5%	*22.6%*
Facilities & equipment	85.2%	72.5%	*78.3%*

Source: MORE2 Higher Education Survey (2012)

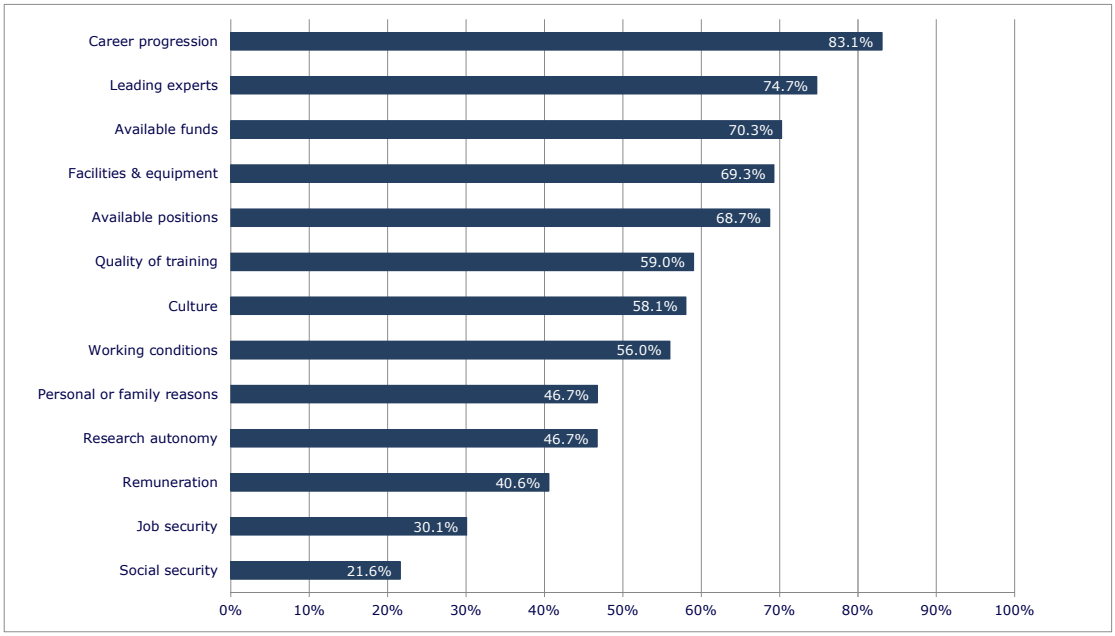
Note: - Difference between share of researchers that have been mobile during their PhD per gender who find the motive important (versus not important) for their >3 month mobility during PhD and the total share of researchers that have been mobile during their PhD and that find it important (n=522).
- With '>3 month mobility during PhD' defined as moving to another country than the country of PhD for three months or more.
- Reading note: The share of female researchers that have been mobile during their PhD who finds the availability of facilities and equipment for research important exceeds the share of male researchers by 12.7 pp. The share for female researchers is 85.2% whereas the share for male researchers is 72.5%.

5.7.5.3 Motives for >3 month post-PhD career mobility: Motives last EU move

As mentioned earlier, >3 month international mobility during the post-PhD career stages is analysed in two ways. First, in this section, the importance of the motives for the last EU move is analysed (in relation to the analysis on motives for PhD mobility). Second, in the next section, the main reason for each individual move by the researchers is considered.

Figure 78 shows the share of researchers who identify a motive as being important for their last move to the EU. Career progression is most frequently identified as being an important motive, followed by access to leading experts, facilities and equipment, available funds and positions. There is a similar emphasis on research and career-related motives as was the case for PhD degree mobility.

Figure 78: Importance of motives for the last >3 month EU move of the respondent in post-PhD career (EU27)



Source: MORE2 Higher Education Survey (2012)

Note: Share of researchers who have been >3 month mobile in the EU in post-PhD career that find the motive important (versus not important) for their most recent EU move (n=1,002).

Motives for last EU move for >3 month post-PhD career mobility per current career stage

More detailed information can be obtained by comparing the importance of motives between the three career stages. Figure 79 illustrates a very diverse pattern. The established researchers (R4) are the clearest in their views. Their research autonomy stands out as a major factor (+7 pp) as well as personal or family reasons (+7pp), quality of training and culture (both +6pp) and career progression (+5pp). For other aspects they are far under the average: career progression (-9pp), available positions (-7pp), available funds (-6pp) and remuneration (-4pp).

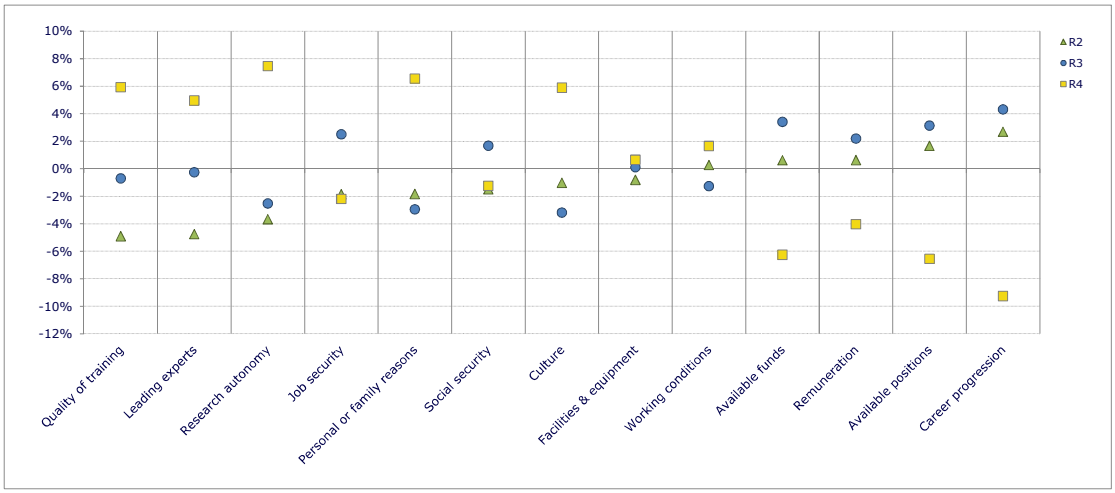
Some of these outcomes are understandable. Established researchers usually have a leading role in their research area or field and if a foreign position is available they are primarily attracted by the autonomy offered. The quality of

training and education might not directly apply to them, but to the overall quality offered at the institution, including the involvement of other researchers at the post-doctoral and PhD level. This in turn is also very attractive to high-potential students. Career progression, available funds and remuneration as such do not seem to be important for established researchers, presumably since these conditions are often adequately met by the receiving institution. It is not clear, however, how the lesser importance given to availability of funds harmonizes with research autonomy, as these funds would presuppose autonomy. One interpretation is that the availability of research funds is taken as given, and is therefore not considered a motivating factor, but the accepted conditions under which they can carry out their research. Autonomy is what primarily drives the established researchers.

This differs for the other two types of researchers. For the independent researchers (R3), career progression (+4pp) and available funding and positions (+3pp) are more important motives for international mobility within the EU. These researchers move to where these conditions are met. The most important motives for post-doctoral researchers are the possibilities for career progression (+3pp) and available positions (+2pp) and hardly by the quality of training (-5pp), leading experts (-5pp) or research autonomy (-4pp).

Thus, the degree of importance which the three career types attach to the different motives reflects the researchers' differing career phases. They display variations in priorities. The established researcher can be more self-confident because of her/his reputation achieved in a research field, whereas the other two groups are primarily pulled in directions where funds are available.

Figure 79: Importance of motives for the last long term EU move by the respondent in post-PhD career per current career stage (EU27)



	R2	R3	R4	*Total*
Quality of training	54.1%	58.3%	64.9%	*59.0%*
Leading experts	70.0%	74.5%	79.7%	*74.7%*
Research autonomy	43.1%	44.2%	54.2%	*46.7%*
Job security	28.3%	32.6%	27.9%	*30.1%*
Personal or family reasons	44.9%	43.8%	53.3%	*46.7%*
Social security	20.1%	23.3%	20.4%	*21.6%*
Culture	57.0%	54.9%	64.0%	*58.1%*
Facilities & equipment	68.5%	69.4%	69.9%	*69.3%*
Working conditions	56.3%	54.8%	57.7%	*56.0%*
Available funds	70.9%	73.7%	64.0%	*70.3%*
Remuneration	41.2%	42.8%	36.5%	*40.6%*
Available positions	70.4%	71.9%	62.2%	*68.7%*
Career progression	85.8%	87.4%	73.8%	*83.1%*

Source: MORE2 Higher Education Survey (2012)

Note: - Difference between share of researchers who have been >3 month mobile in the EU in post-PhD career per current career stage who find the motive important (versus not important) for their most recent EU move and the total share of researchers that have been mobile during their PhD that have been >3 month mobile in the EU in post-PhD career and that find it important (n=1,113).
- *With '>3 month international mobility' defined as moves to work abroad in the last ten years for three months or more.*
- *Only for R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers.*
- *Reading note: The share of R2 researchers that have been mobile >3 month mobile in the EU in post-PhD career who finds remuneration important exceeds the total share of researchers that have been mobile >3 month mobile in the EU in post-PhD career and that finds this important by 0.6 pp. The total share is 40.6% whereas the share of R2 researchers is 41.2%.*

Motives for last EU move for >3 month post-PhD career mobility per gender and family status

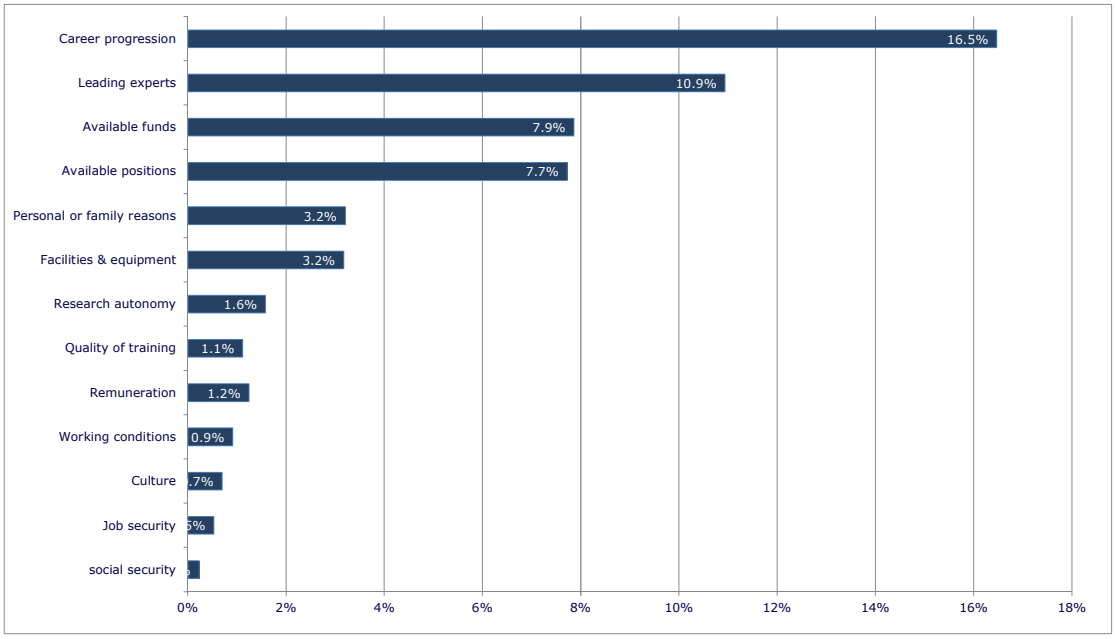
With respect to gender and family status, we find the following:

- The difference between researchers living either as single or in a couple is that the latter attach more importance to all aspects, with the exception of career progression. It might well be that the age factor plays a role here.
- The variable with or without children does not really matter.
- Women consider most of the aspects as being more important than do men, except for social security and working with leading experts. Women who are mobile are particularly motivated by available funds (+10pp), career progression (+9pp), culture (+7pp) and available positions (+6pp).

5.7.5.4 Motives for >3 month post-PhD career mobility: Main motives per move

Figure 80 presents the share of moves for which the motive was mentioned as being the most important. Career progression is by far the most frequently cited important reason for mobility (16%). This is followed by three others: access to leading experts (11%), available positions (8%), and available funds (8%). Remuneration, working conditions, culture, job security and social security are rarely mentioned as being the main motive. Researchers mainly assume that their mobility will lead to better career opportunities, either on an international scale or as an experience which will enhance their opportunities when they return back to their home country. The fact that importance as main motive is ranked even higher than the general importance rating (cf. next section) shows that career progression alone is by far the most important reason to move.

Figure 80: Distribution of individual post-PhD career mobility steps over motives mentioned as main motive for this specific step (EU27)



Source: MORE2 Higher Education Survey (2012)

Note: - Share of individual post-PhD career mobility steps for which the motive is indicated as main motive (n=2,703).
- Only for R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers.

Main motives per move for >3 month post-PhD career mobility per current career stage

This priority list may differ if researchers are compared according to the different stages of their career. Figure 81 shows the difference between the percentage of specific career mobility steps for which the reason was identified as being the most important motive per career stage (R2, R3 and R4) and the total percentage of specific career mobility steps for which the motive was identified as being the most important. The differences between the career stages remain limited for each motive (maximum 4 pp deviation from the total average).

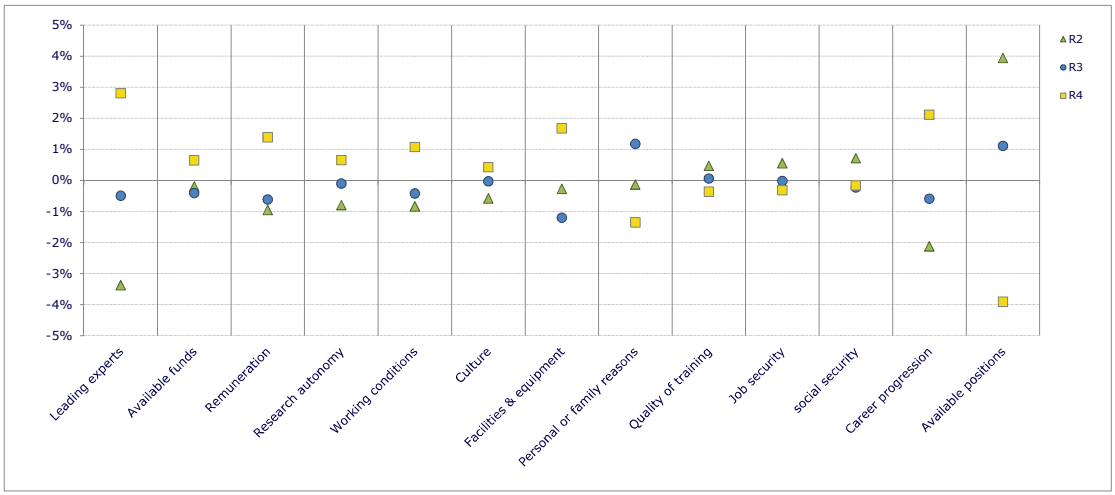
Leading researchers (R4) are, to some extent, more highly driven by contact with leading experts as well as by the availability of research funds, facilities and equipment, compared to the other two career stages. Remuneration is also a

motive which cannot be ignored and is a factor that can be attractive to high level researchers. They also attach relatively more value to career progression than do researchers at a lower career stage. Although the opposite might be expected, the already established researchers continue to look for possibilities for career enhancement - it was at least the main motive for one of their moves.

When comparing R2 and R3 researchers, it appears that they agree on most reasons for an international move. Notable differences are that post docs are less motivated by searching for leading experts than are the independent researchers and more so by available positions.

Personal or family reasons also have slightly different importance to researchers in different career stages. Established researchers are generally older, when family circumstances are less binding than for those in the earlier stages of their careers, who often have younger, dependent children.

Figure 81: Importance of motives for individual post-PhD career mobility steps in post-PhD career per current career stage (EU27)



	R2	R3	R4	*Total*
Leading experts	7.6%	10.4%	13.7%	*10.9%*
Available funds	7.7%	7.5%	8.5%	*7.9%*
Remuneration	0.3%	0.6%	2.6%	*1.2%*
Research autonomy	0.8%	1.5%	2.2%	*1.6%*
Working conditions	0.1%	0.5%	2.0%	*0.9%*
Culture	0.1%	0.7%	1.1%	*0.7%*
Facilities & equipment	2.9%	2.0%	4.8%	*3.2%*
Personal or family reasons	3.1%	4.4%	1.8%	*3.2%*
Quality of training	1.6%	1.2%	0.7%	*1.1%*
Job security	1.1%	0.5%	0.2%	*0.5%*
social security	0.9%	0.0%	0.1%	*0.2%*
Career progression	14.3%	15.9%	18.6%	*16.5%*
Available positions	11.7%	8.8%	3.8%	*7.7%*

Source: MORE2 Higher Education Survey (2012)

Note: - Difference between share of individual moves in post-PhD career for which the motive is indicated as main motive per current career stage and the total share of individual moves in post-PhD for which the motive is indicated as main motive. (n=2,703).
- *With 'moves' defined as >3 month international mobility, namely moves to work abroad in the last ten years for three months or more.*
- *Only for R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers.*
- *Reading note: The share of individual moves during post-PhD career for which the availability of positions is indicated as main motive by current R2 researchers exceeds the total share for all current career stages of individual moves in post-PhD career for which the availability of positions is indicated as main motive by 4 pp. The total share is 7.7% whereas the share for R2 researchers is 11.7%.*

Main motives per move for >3 month post-PhD career mobility per gender and family status

When comparing the primary reason for single researchers to move, as opposed to those in a couple, differences are small for most motives but pronounced for a number of others. Researchers in a couple are more highly motivated by leading experts and career progression and to a lesser extent by personal and family reasons than are singles. Single researchers are more strongly motivated by available positions.

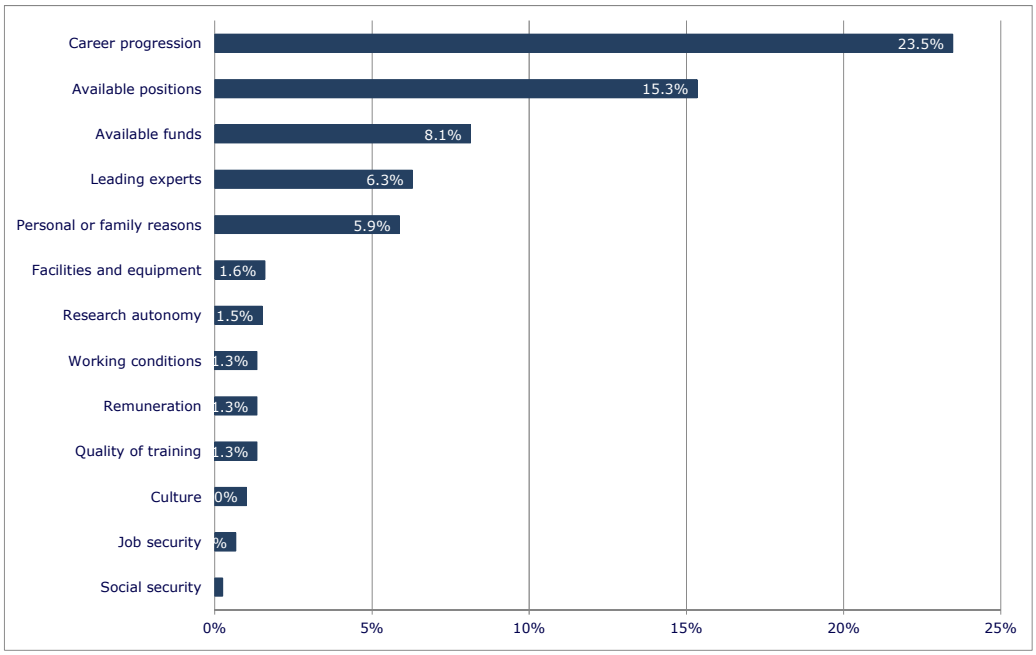
This corresponds well with family status (children). Those without children rank the availability of positions and career progression relatively more frequently as their main motive. Those with children rank access to leading experts and personal and family reasons slightly higher. There are no differences for any of the other motives. Concerning gender, differences are small and for each factor within the range of -1 or +1.5 pp differences.

5.7.5.5 Motives for >3 month post-PhD **employer** mobility: main motives per move

'Employer mobility' refers to all moves that include a change of employer. Reasons for this type of change are expected to deviate from the overall type of motives. In this section we present the indicators for employer mobility.

Figure 82 shows that working with leading experts (6% versus 11%) is seen less as a main reason for an international move of more than 3 months with a change in employer than without a change of employer. Availability of positions, on the other hand, becomes more important (15% versus 8%). Interestingly, job security or social security are regarded equally as minimally important.

Figure 82: Distribution of individual post-PhD career mobility steps over motives mentioned as main motive for this specific step (EU27)



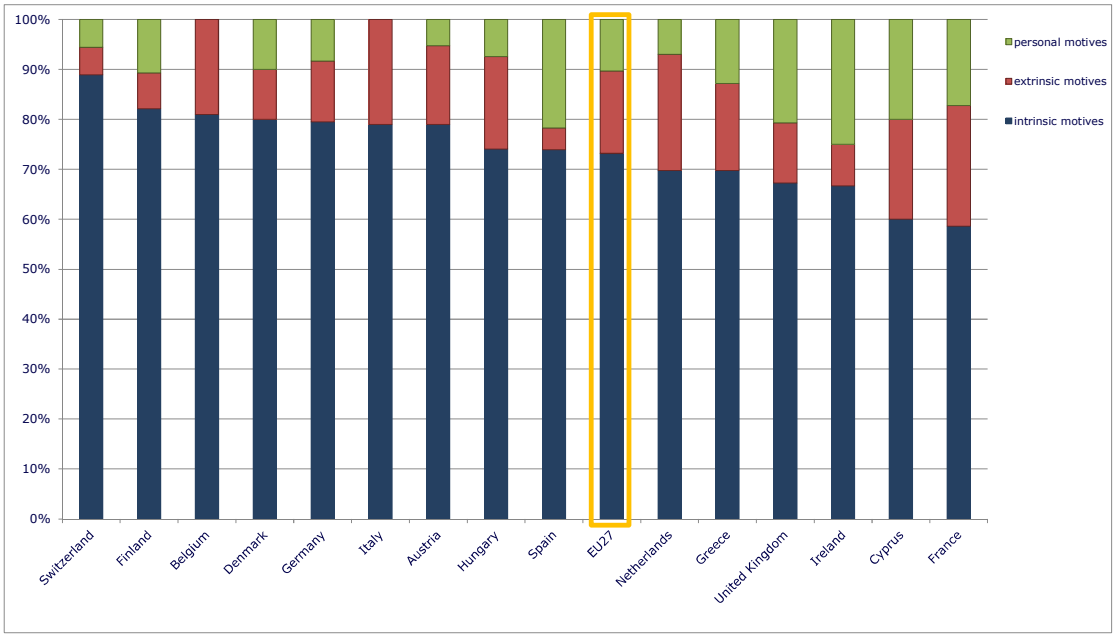
Source: MORE2 Higher Education Survey (2012)

Note: - Share of individual post-PhD career mobility steps with a change of employer for which the motive is indicated as main motive (n=1,193).
- Only for R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers.

When comparing motives per citizenship of the researchers as a proxy of origin (Figure 83), we find that intrinsic motives are most mentioned by Swiss, Finish and Belgian citizens, whereas extrinsic motives are further mentioned by French, Dutch and Italian citizens. Personal reasons also play a dominant role for more than 20% of researchers with citizenship in Ireland, Spain, the United Kingdom or Cyprus.

Conversely, when looking at the country of destination (Figure 84), moving to the United Kingdom, the Netherlands or Austria is more driven by intrinsic motives than other moves (more than 75%). Extrinsic motives play a role in moving to Norway, Belgium and Greece (more than 30%) and personal reasons are more commonly mentioned for moves to Greece and Cyprus (more than 20%).

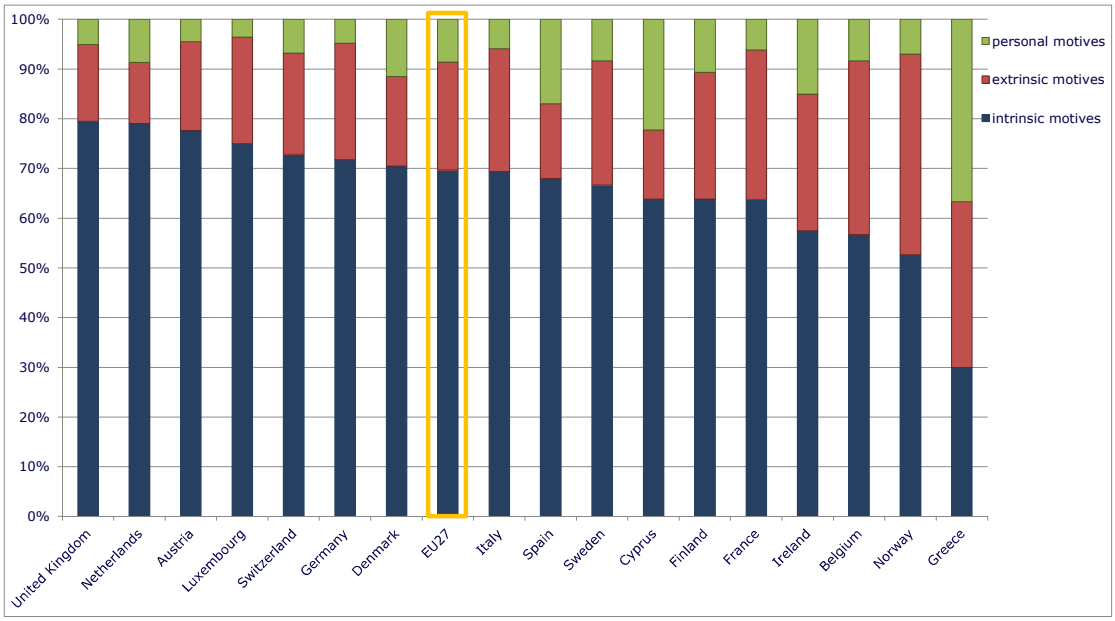
Figure 83: Distribution of individual post-PhD career mobility steps over motives mentioned as main motive for this specific step per country of citizenship



Source: MORE2 Higher Education Survey (2012)

Note: - Share of individual post-PhD career mobility steps with a change of employer for which the motive is indicated as main motive per country of citizenship (n=1,190).
- Only for R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers.
- Countries with less than 30 observations are omitted: Bulgaria, Croatia, Czech Republic, Estonia, Iceland, Latvia, Lithuania, Luxembourg, Macedonia (FYROM), Malta, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Sweden, Turkey.

Figure 84: Distribution of individual post-PhD career mobility steps over motives mentioned as main motive for this specific step per destination country



Source: MORE2 Higher Education Survey (2012)

Note: - Share of individual post-PhD career mobility steps with a change of employer for which the motive is indicated as main motive per destination country (n=1,967).
- Only for R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers.
- Countries with less than 30 observations are omitted: Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Iceland, Latvia, Lithuania, Macedonia (FYROM), Malta, Poland, Portugal, Romania, Slovakia, Slovenia, Turkey.

Across career stages, similar patterns in main motives for employer mobility exist. Only the availability of positions and research funding become less important for R4 researchers (5% versus 9% in R3 and 10% in R2 for funding and 11% versus 14% and 23% for positions). Personal and family reasons are less important for R2 researchers (2% versus 8% in R3 and 6% in R4).

Across genders and family status, the motives are also very similar. The only observations we can make here are that researchers who live in a couple and researchers without children are more likely to move for reasons of career progression than others; and that researchers without children are more likely to move also for reasons of finding a suitable position.

5.7.6 Effects of international mobility

In order to investigate the effects of mobility a list of 15 items were presented. Respondents could assess these using a five-point scale in order to determine the extent to which each of these factors has increased or decreased. The items are mainly career-related, but can be divided broadly into five main groups:

- *Output effects*

  (quality of output e.g. publications, number of patents, citation impact of the publications, number of co-authored publications)

- *Career-related effects*

  (career progression, job improvement, job options inside and outside academia)

- *Financial effects*

  (progression in salary and financial conditions; ability to obtain national or international research funding)

- *Network effects*

  (national and international contacts, recognition in the research community)

- *Personal effects*

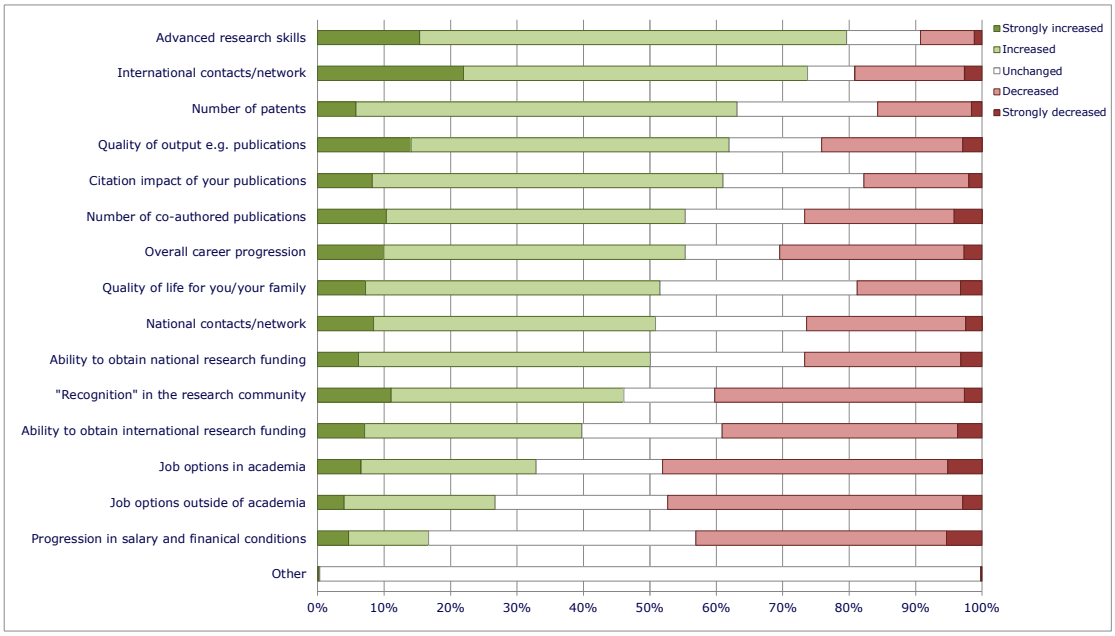
  (quality of life, family).

Interpretation of the causality between mobility and any of these effects remains ambiguous. For example, a higher research output of a mobile researcher may be due to the mobility effect, but could just as well be attributed to the fact that the mobile researcher is a high performer regardless. Nevertheless, asking the researcher about their own perception as to what extent their mobility has an effect on any of these issues can still provide some insight into the occurrence of a mobility effect.

5.7.6.2 Overall effects

Figure 85 presents the R2, R3 and R4 researchers' perceptions as regards the effects of their overall mobility experience. These statistics refer to researchers who have worked abroad for more than three months during the last ten years. It shows that the output effects are regarded as being the most important factor influenced by researcher's entire mobility experience: on average 62% perceive these as (strongly) increased, with the highest percentage being for advanced research skills (80%). International contacts/networks also has a relatively high score (74%), which has strongly increased for more than a fifth of all respondents.

Figure 85: Effects of the entire mobility experience on the researcher's career (EU27)



Source: MORE2 Higher Education Survey (2012)

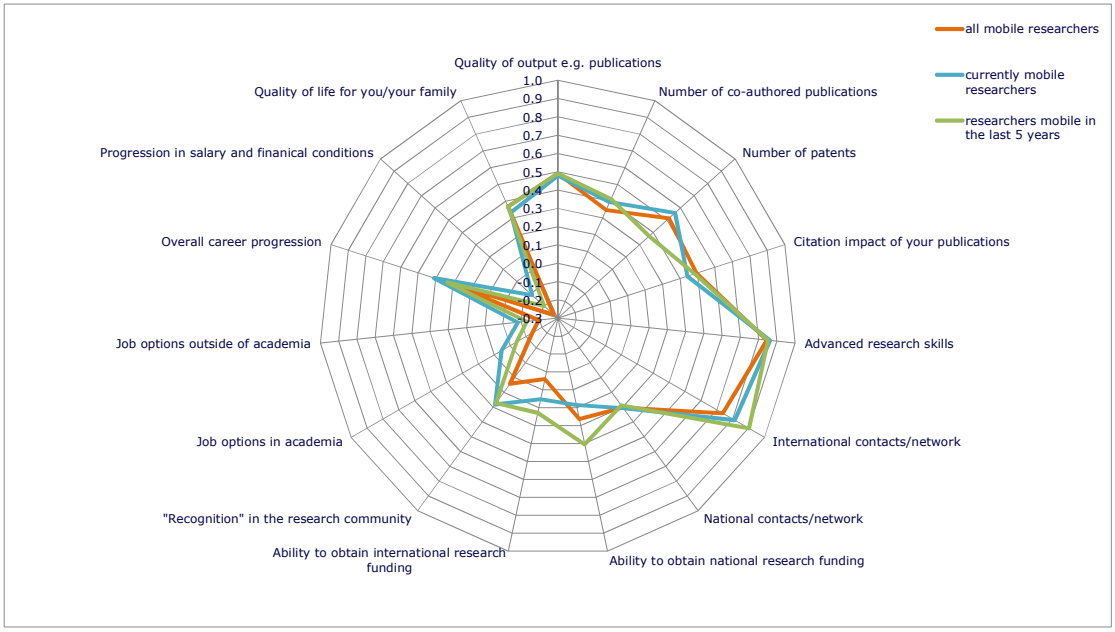
Note:
- *Share of mobile researchers who indicate that the effect of the entire mobility experience on a specific aspect of her career to be a (strong) increase, (strong) decrease or unchanged. (n=1,660)*
- *With 'mobility' defined as having worked abroad for more than three months at least once in the last ten years.*
- *Only for R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers.*

The career-related factors receive lower scores. Although the overall career progression has increased for 60% of researchers, the ability to obtain international research funding amounts to 40%, while for job options in academia or outside academia as well as progression in salary and financial conditions, the scores are much lower, with around 45% of researchers who perceive these as having decreased or strongly decreased.

5.7.6.4 Effects for the recently mobile

Focussing on the recently mobile (in the last 5 years) and currently mobile subgroups of researchers shows that the reported effects are similar to the general average (Figure 86). The recently mobile put more emphasis on international contacts and networking, career progression, job options both in and outside of academia, and the ability to obtain international funding and recognition in the research world. Those researchers mobile during the last five years also find the ability to obtain national research funding an important effect of international mobility. The currently mobile state that this is less important to them. The opposite is observed for patenting.

Figure 86: Effects of the entire mobility experience on the researcher's career for the recently mobile (EU27)



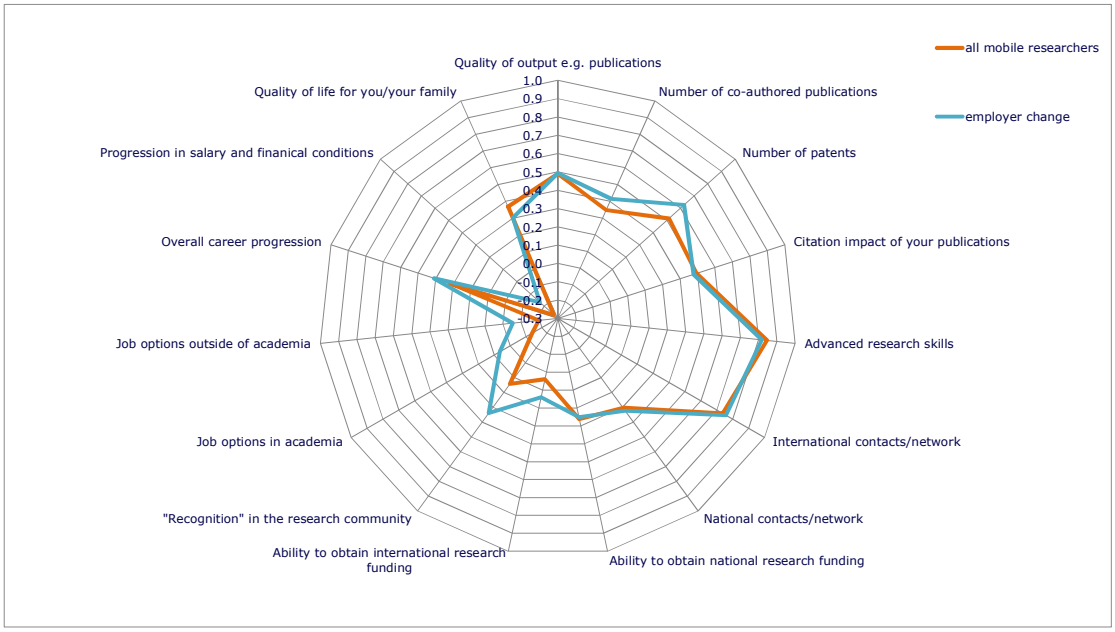
Source: MORE2 Higher Education Survey (2012)

Note: - Average effect on the specific aspect of her career for the groups of all, currently and recent mobile (in the last five years). (n=707)
- With average calculated by assigning values to each category: 2= strongly increased; 1=increased; 0=unchanged; -1=decreased; -2=strongly decreased.
- Only for R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers.

5.7.6.6 Effects for employer mobility

When a change in employer is involved for at least one of the researcher's moves, the effects (of the entire mobility experience) is more pronounced in terms of output, financial and career-related effects. Specifically, the job options in and outside academia, as well as the ability to obtain funding and the recognition in the research community are rated more highly by this subgroup of researchers. Only quality of life and advanced research skills are considered to be less positively affected by those experiencing a change in employer.

Figure 87: Effects of the entire mobility experience on the researcher's career when at least one change in employer (EU27)



Source: MORE2 Higher Education Survey (2012)

Note:
- *Average effect on the specific aspect of her career for the groups of all researchers versus researchers with at least once employer mobility. (n=797)*
- *With average calculated by assigning values to each category: 2= strongly increased; 1=increased; 0=unchanged; -1=decreased; -2=strongly decreased.*
- *With mobility defined as having worked abroad for more than three months at least once in the last ten years and employer mobility as mobility involving a change in employer.*
- *Only for R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers.*

5.7.6.8 Effects per country

In the analysis of effects per country, two factors play a role. First, it is possible that researchers answer in a generally more positive or negative way when considering the effects that individual countries' had upon their research career. The overall level of effects indicated per country thus shows the countries' reference level. Second, the pattern of different types of effects compared to each country's reference level shows the relative importance of each type of effect in that country.

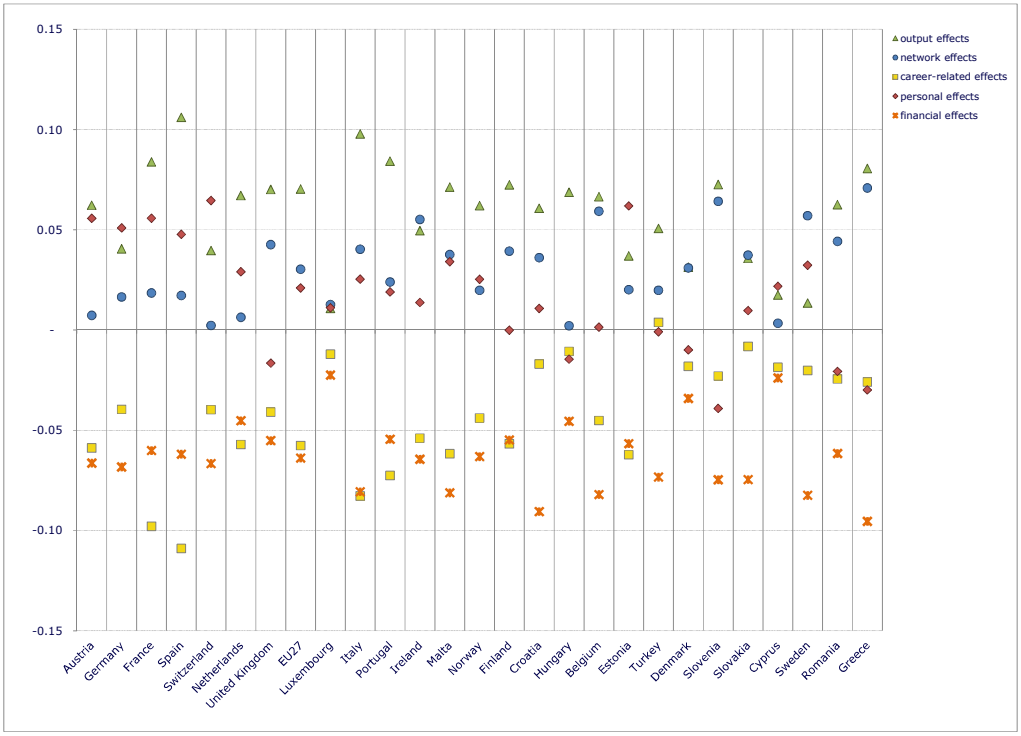
The overall reference level is highest in Cyprus, Greece, Romania and Hungary. The lowest reference level is found in Austria, Germany, France and the United Kingdom.

When compared to the country average of each individual country (Figure 88), output, personal and network effects are important in the majority of countries, whereas career-related effects and financial effects are below average in most countries. Exceptions are:

- Personal effects are below average in the United Kingdom, Croatia, Denmark, Slovenia, Romania and Greece
- Career-related effects are above average in Turkey.

Furthermore, the output effects are highest in Spain, Italy, Portugal and France and lowest in Sweden and Cyprus. The network effects are highest in Greece, Sweden, Slovenia, Belgium and Ireland and lowest in Switzerland and Hungary. The career-related effects are highest in Turkey, Slovakia and Hungary and lowest in Spain and France. The personal effects are highest in Switzerland, Estonia, France, Austria and Germany and lowest in Slovenia and Greece. The financial effects are highest in Luxembourg and Cyprus and lowest in Greece and Croatia.

Figure 88: Effects of the entire mobility experience on the researcher's career per country



Country	output effects	network effects	career-related effects	personal effects	financial effects	*average country*
Austria	0.61	0.56	0.49	0.61	0.49	*0.55*
Germany	0.59	0.57	0.51	0.60	0.48	*0.55*
France	0.64	0.57	0.45	0.61	0.49	*0.55*
Spain	0.66	0.57	0.45	0.60	0.49	*0.56*
Switzerland	0.61	0.57	0.53	0.64	0.51	*0.57*
Netherlands	0.64	0.58	0.51	0.60	0.52	*0.57*
United Kingdom	0.62	0.59	0.51	0.53	0.49	*0.55*
Luxembourg	0.61	0.61	0.58	0.61	0.57	*0.60*
Italy	0.67	0.62	0.49	0.60	0.50	*0.58*
Portugal	0.69	0.62	0.53	0.62	0.55	*0.60*
Ireland	0.63	0.63	0.52	0.59	0.51	*0.58*
Malta	0.67	0.64	0.54	0.64	0.52	*0.60*
Norway	0.68	0.64	0.58	0.65	0.56	*0.62*
Finland	0.68	0.65	0.55	0.61	0.55	*0.61*
Croatia	0.67	0.65	0.60	0.62	0.52	*0.61*
Hungary	0.72	0.65	0.64	0.63	0.60	*0.65*
Belgium	0.66	0.65	0.55	0.59	0.51	*0.59*
Estonia	0.67	0.65	0.57	0.70	0.58	*0.63*
Turkey	0.69	0.65	0.64	0.63	0.56	*0.63*
Denmark	0.66	0.66	0.61	0.62	0.60	*0.63*
Slovenia	0.67	0.66	0.58	0.56	0.52	*0.60*
Slovakia	0.67	0.67	0.63	0.65	0.56	*0.64*
Cyprus	0.69	0.68	0.66	0.70	0.65	*0.68*
Sweden	0.64	0.69	0.61	0.66	0.55	*0.63*
Romania	0.71	0.69	0.63	0.63	0.59	*0.65*
Greece	0.74	0.73	0.63	0.63	0.56	*0.66*
EU27	*0.64*	*0.60*	*0.51*	*0.59*	*0.51*	*0.57*

Source: MORE2 Higher Education Survey (2012)

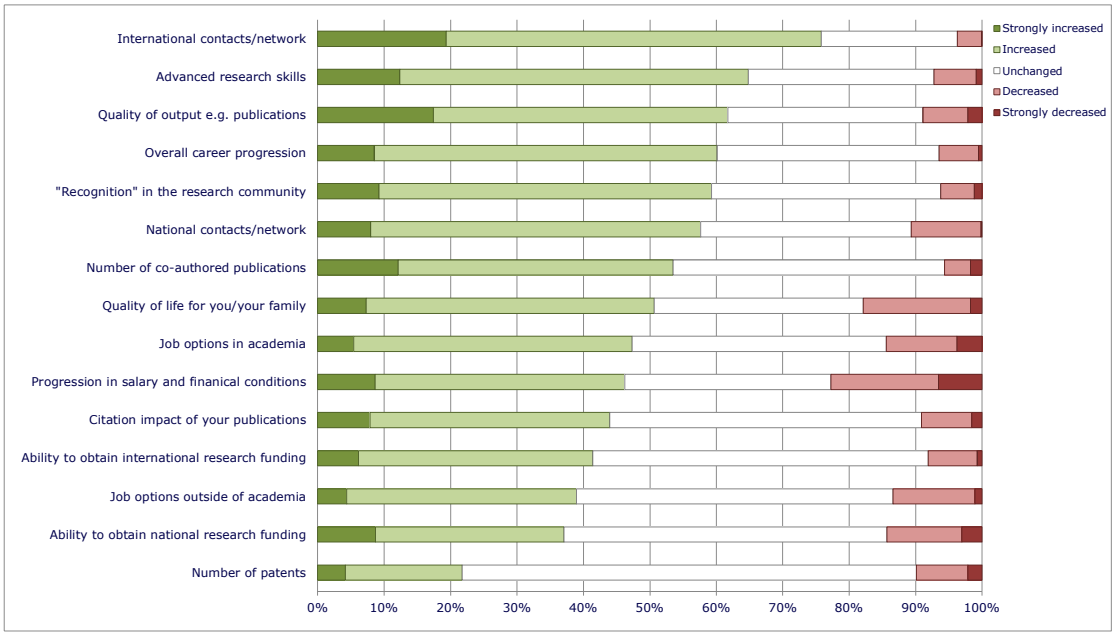
Note:
- *Difference between the average country value for a specific effect and the average country value for all effects. (n=1,660)*
- *With the average calculated by assigning values to each category: 2= strongly increased; 1=increased; 0=unchanged; -1=decreased; -2=strongly decreased.*
- *With mobility defined as having worked abroad for more than three months at least once in the last ten years.*
- *Only for R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers.*
- *Countries with less than 30 observations are omitted: Bulgaria, Czech Republic, Iceland, Latvia, Lithuania, Macedonia (FYROM) and Poland.*

5.7.6.10 Effects on non-EU citizens currently working in the EU

The same list of mobility effects was presented to non-EU citizens currently working in the EU (Figure 89). Comparing these results with those of the overall group of those who are mobile, we can see that the non-EU citizens assess their mobility experience as having a higher positive effect in most areas. Most notable are the career effects such as job options both in academia and beyond: salary progression; and recognition in the research community and national contacts/network show substantially higher increases. Only in a few areas, such as the ability to obtain international or national research funding and – significantly - the number of patents, non-EU citizens indicate that the effects are lower than for the overall group of mobile researchers. This tends towards a positive view of the career possibilities for non-Europeans who are currently working in the EU.

Compared to EU citizens who are currently mobile (i.e. by definition in the EU) it is observed that these researchers pay more attention to output-related effects of patenting (3rd ranking instead of last) and citation impact (6th ranking instead of 11th) and less to remuneration (16th ranking instead of 10th).

Figure 89: Effects of the current stay in the EU for non-EU citizens



Source: MORE2 Higher Education Survey (2012)

Note: - Share of non-EU citizens currently working in the EU who recognises the effect on this specific aspect of her career to be a (strong) increase, (strong) decrease or unchanged due to her current stay in the EU. (n=481)
- With 'mobility' defined as having worked abroad for more than three months at least once in the last ten years.

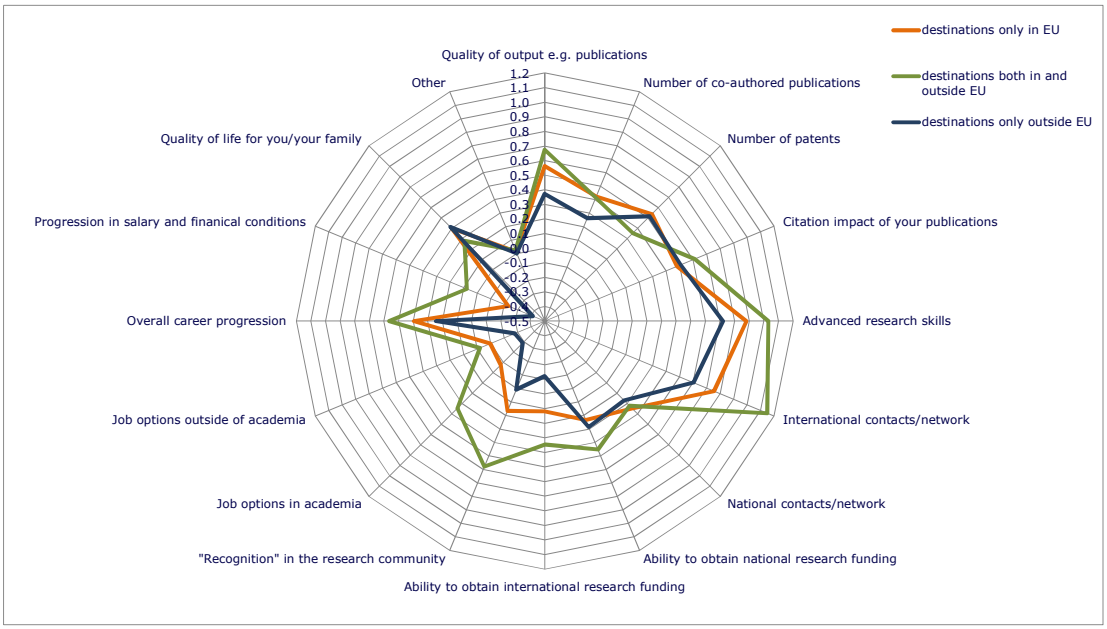
5.7.6.12 Effects for different destination regions

A similar pattern is visible from the radar graph in Figure 90, which depicts the comparison between the mobility effects on three categories of respondents: those being mobile only in EU, those mobile both in and outside EU and those only mobile outside EU[66]. This shows a rather consistent picture: those who are mobile both in and outside EU show higher levels of recognition of the effect of their mobility experience than do the other two groups. There are also substantially higher scores for the network effects such as recognition in the research community, and access to international contacts/network. It seems that the higher the number of research trips made to different locations both inside and outside the EU, the greater the exposure to larger groups of active researchers in different places, thus resulting in higher mobility effects. The difference in terms of job options -particularly in academia - is substantial as well as in terms of researcher's overall career progression.

The score is negative for only 2 items when compared to the total, namely the number of patents and quality of personal life.

On comparing the other two groups, it appears that those only mobile in the EU regard their mobility effects more favourably than their counterparts who are only mobile outside the EU. This relates to the output effects, the network effects such as recognition in the research community and career effects.

Figure 90: Effects of the entire mobility experience on the researcher's career per destination region



Source: MORE2 Higher Education Survey (2012)

Note:
- *Average effect for mobile researchers on the specific aspect of the career due to the entire mobility experience per destination region. (n=1,213 for destination only within EU, n=237 for destinations in and outside EU and n=550 for destinations only outside EU)*
- *With average calculated by assigning values to each category: 2= strongly increased; 1=increased; 0=unchanged; -1=decreased; -2=strongly decreased.*
- *With 'mobility' defined as having worked abroad for more than three months at least once in the last ten years.*
- *Only for R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers.*

66 The data analysed in this section include the full sample and thus refers to EU27+6.

5.7.6.13 Effects per gender

The gender factor makes a difference in terms of mobility effects. Overall, women are much more positive in recognising the effects of their mobility experience than men. Men only score more highly in terms of the citation impact of publications and quality of life, but the difference for these issues is very marginal. For all the other factors, women seem to benefit more from international migration than men. Most notably, women score higher on network effects such as 'recognition' in the research community, international and national contacts/ networks. Other differences in favour of women are the ability to obtain national research funding, salary, job options in academia, patents, and advanced research skills.

5.7.6.14 Effects per current career stage

Researchers may also assess the effects of their overall mobility experience differently, depending on which career stage they are currently employed. It is worthwhile researching whether those in the early stages benefit primarily in terms of career advancement, or whether the more established researchers see greater impacts in terms of financial and network effects. The available data do not allow analysis of mobility experience effects during a specific career stage. However, the data do enable us to analyse researchers' opinions on the effects of their entire past mobility experience according to the stage they are currently in.

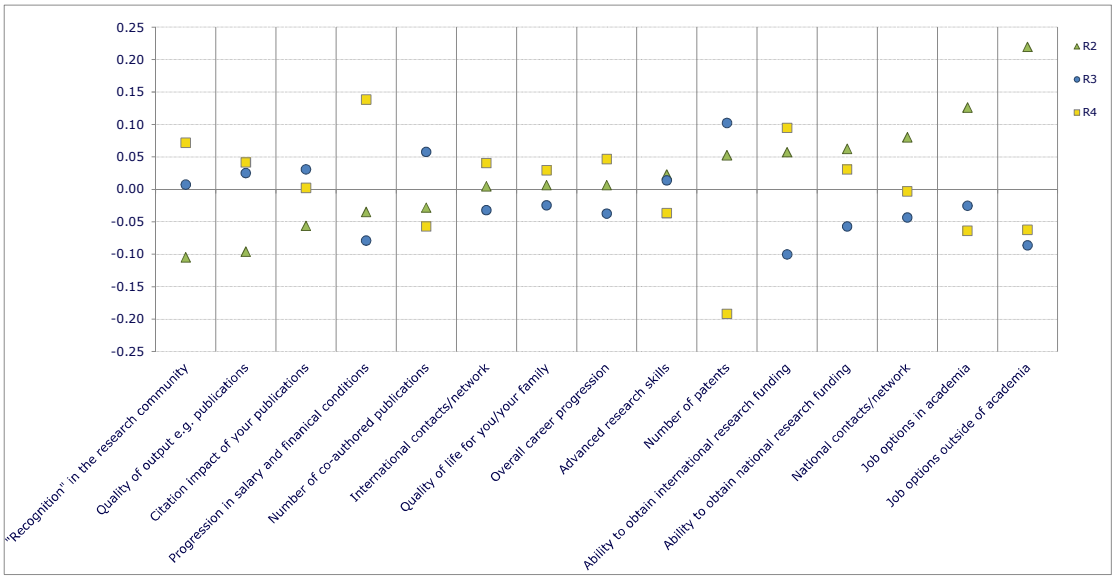
Figure 91 illustrates the difference between the average effect of the entire mobility experience per current career stage (R2, R3 and R4) within the context of the total average effect of the entire mobility experience on a researcher's career. The overall pattern varies widely and there are hardly any consistent patterns visible between the three types of researchers.

The leading researchers (R4) score above average on most of these factors. They score higher on quality of output; recognition in the research community; career progression; salary and financial conditions and the ability to secure international research funding. We therefore see a mix of output, career-related and network effects. The number of patents, however, is remarkably low and some career-related items are below average, such as job options in or outside academia. This might be related to other personal factors such as age or the nature and motives for mobility.

The R2 researchers score relatively lower on output items such as quality of output, number of co-authored publications, citation impacts as well as recognition in the research community. It can be expected that R2 researchers would score lower as regards these kinds of issues than R3 and R4 academics, who are much further ahead in their career. It is quite interesting to note that R2 researchers are above average as far as career-related effects are concerned, namely job options in and outside of academia. The network effects and financial effects (the ability to obtain national and international research funding) are also positive.

Researchers in the independent research stage (R3) show overall scores below the average. They seem to benefit less from the effects of international mobility, when compared to the two other groups of researchers. The financial mobility effects are relatively low, such as progression in salary and financial conditions and the ability to obtain national and international research funding. Only a few output effects (number of co-authored publications, citation impact and number of patents) are above average.

Figure 91: Effects of the entire mobility experience on the researcher's career per current career stage (EU27)



	R2	R3	R4	*Total*
"Recognition" in the research community	0.04	0.15	0.21	*0.14*
Quality of output e.g. publications	0.39	0.51	0.53	*0.49*
Citation impact of your publications	0.44	0.53	0.50	*0.49*
Progression in salary and financial conditions	-0.31	-0.35	-0.13	*-0.27*
Number of co-authored publications	0.32	0.40	0.29	*0.35*
International contacts/network	0.74	0.71	0.78	*0.74*
Quality of life for you/your family	0.37	0.34	0.40	*0.37*
Overall career progression	0.33	0.28	0.37	*0.32*
Advanced research skills	0.87	0.86	0.81	*0.85*
Number of patents	0.57	0.62	0.32	*0.52*
Ability to obtain international research funding	0.10	-0.06	0.13	*0.04*
Ability to obtain national research funding	0.33	0.21	0.29	*0.26*
National contacts/network	0.38	0.26	0.30	*0.30*
Job options in academia	-0.01	-0.16	-0.20	*-0.14*
Job options outside of academia	0.02	-0.28	-0.26	*-0.20*

Source: MORE2 Higher Education Survey (2012)

Note:
- *Difference between the average effect for mobile researchers on the specific aspect of the career due to the entire mobility experience per current career stage and the total average effect for mobile researchers on the specific aspect of the career due to the entire mobility experience. (n=1,660)*
- *With average calculated by assigning values to each category: 2= strongly increased; 1=increased; 0=unchanged; -1=decreased; -2=strongly decreased.*
- *With 'mobility' defined as having worked abroad for more than three months at least once in the last ten years.*
- *Only for R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers.*
- *Reading note: The average effect for mobile R2 researchers on job options outside academia due to the entire mobility experience exceeds the average effect of all R2,3,4 researchers on this aspect by 0.22. The total average effect is -0.20 (unchanged to decreased) whereas the average effect for R2 is 0.02 (unchanged to slightly increased).*

A comparison of these overall values with the values for the recently mobile (in the last five years) shows - in broad terms - a similar but more pronounced pattern. The effects are similar for both groups concerning quality of life; advanced research skills; international networking; national funding; job options and overall career progression. The pattern is more pronounced for the recently mobile as regards recognition, progression in salary, patenting and quality of output. However, the R4 recently mobile researchers are above average for the number of co-authored publications and citation impact, whereas the overall R4

group is below average. On the contrary, the R3 recently mobile researchers indicate a smaller effect concerning citation impact than the overall R3 group. The R2 researchers appear to benefit more in terms of national networking when they have been mobile during the last five years; the R4 less so.

5.7.7 International non-mobility

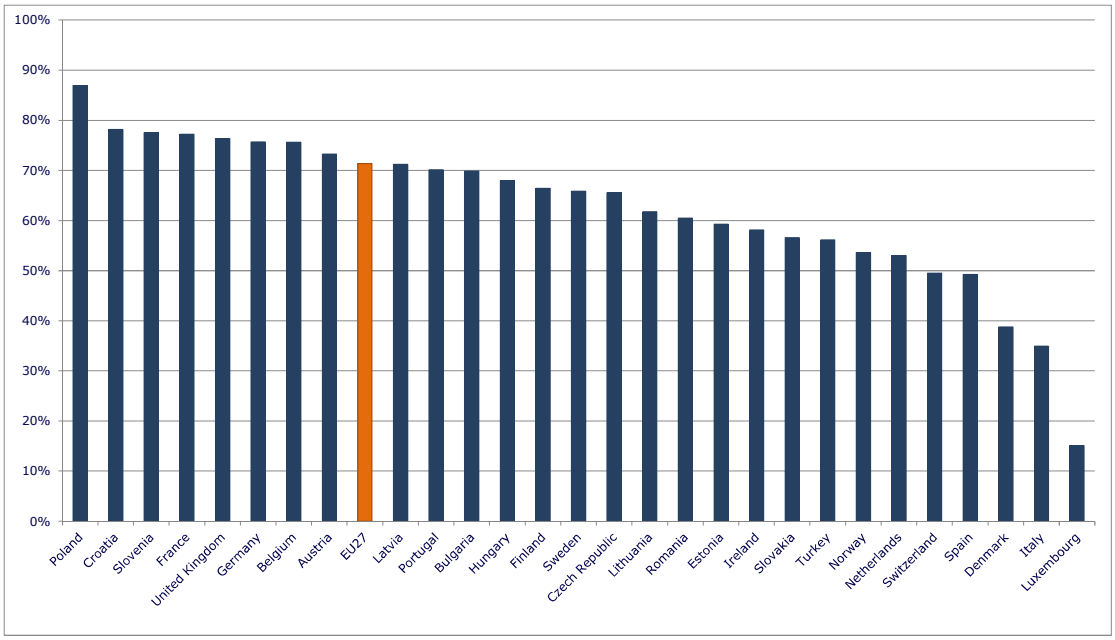
5.7.7.1 PhD non-mobility

'PhD non-mobility' is defined as the experience of a researcher who has undergone neither PhD degree mobility nor >3 month mobility during PhD. This is the subgroup of researchers which was further questioned on their non-mobility.

However, as Figure 92 shows regarding the percentage of never-mobile researchers per country of PhD, the interpretation of this statistic is slightly more complex. The bars represent those researchers who obtained/will obtain their PhD in the country but who were never mobile for or during the PhD process. The complementary group are those who obtained/will obtain their PhD in the country and have been mobile. By definition, this only refers to >3 month mobility during PhD as the PhD degree mobile researchers will obtain their PhD in another country and are thus not attributed to their 'home' country as country of PhD. The share is thus expressed relative to a total that excludes the PhD degree mobile researchers. This is only the case in this graph, and no longer applies when aggregating at EU level for analysis of e.g. career stages.

There are several country differences with scores above the EU27 average (71%) and only a few under 50%. A clear distinction between regional areas or larger countries cannot be made.

Figure 92: Share of never-mobile researchers for PhD degree or during PhD per country of PhD



Source: MORE2 Higher Education Survey (2012)

Note:
- *Share of R1 PhD candidates and R2 (post-doctoral or equivalent) PhD holders that were never PhD degree mobile nor mobile during their PhD per country of PhD. (n=3,758)*
- *With 'PhD degree mobility' defined as obtaining or having obtained a PhD in another country.*
- *With '>3 month mobility during PhD' defined as moving for 3 months or more to another country than the country where she did or will obtain her PhD.*
- *Countries with less than 30 observations are omitted: Cyprus, Greece, Iceland, Macedonia (FYROM) and Malta.*

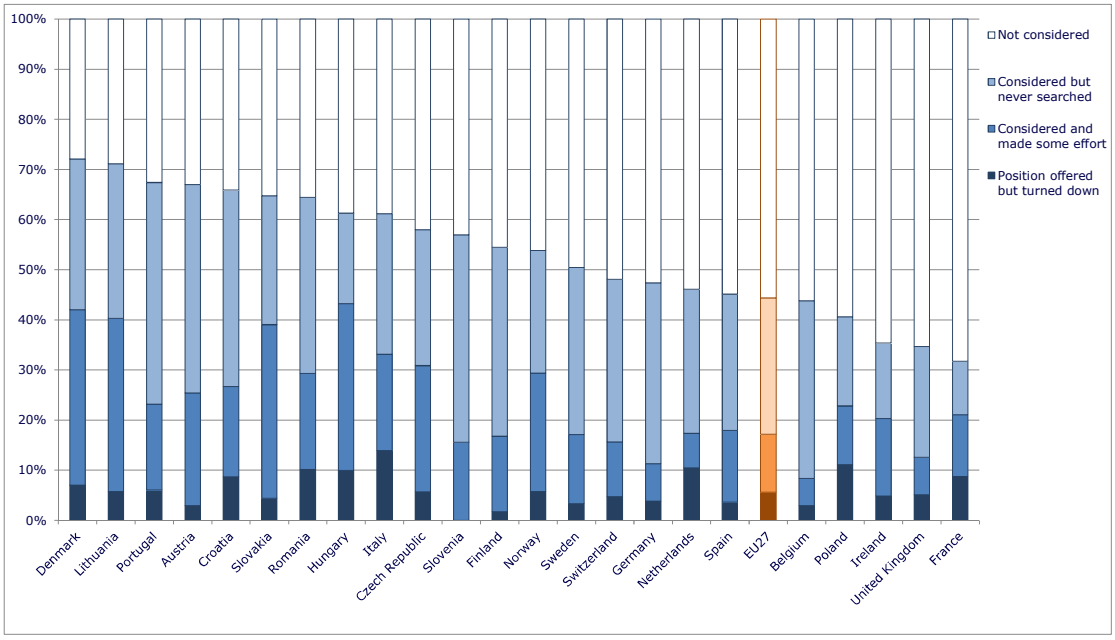
PhD non-mobility for R1 and R2 researchers hardly differs. R2 researchers have been equally mobile during their PhD research period than those currently in the PhD stage. Their non-mobility is 70%, compared to 73% for current PhD candidates.

5.7.7.2 Level of consideration given to PhD mobility among the never-mobile

Furthermore, we asked R1 and R2 researchers - who indicated that they did not or will not obtain their PhD in another country and did not move for three months or more to another country - about the extent to which they considered this decision. Figure 93 presents the country differences. A general pattern is that Western and Scandinavian countries show relatively the highest proportion of respondents who never considered mobility (45% and above) whereas the Eastern European countries are well represented in the lower scores. A similar country pattern appears for those countries where mobility is considered but never sought out.

For those who considered mobility and undertook some effort to achieve it, the proportions are the highest for Hungary, Slovakia, Lithuania, Czech Republic and Denmark. Finally, for those who were offered a position in another country but turned it down, some countries stand out: Italy, Hungary, Romania, the Netherlands, Poland, Croatia and France.

Figure 93: Level of consideration of PhD mobility among the never-mobile per country of PhD



Source: MORE2 Higher Education Survey (2012)

Note: - Distribution of R1 PhD candidates and R2 (post-doctoral or equivalent) PhD holders that were never PhD degree mobile nor mobile during their PhD per country of PhD regarding levels of consideration of mobility for part or all of their PhD. (n=1,752)
- With 'PhD degree mobility' defined as obtaining or having obtained a PhD in another country.
- With '>3 month mobility during PhD' defined as moving for 3 months or more to another country than the country where she did or will obtain her PhD.
- Countries with less than 30 observations are omitted: Cyprus, Greece, Iceland, Macedonia (FYROM) and Malta.

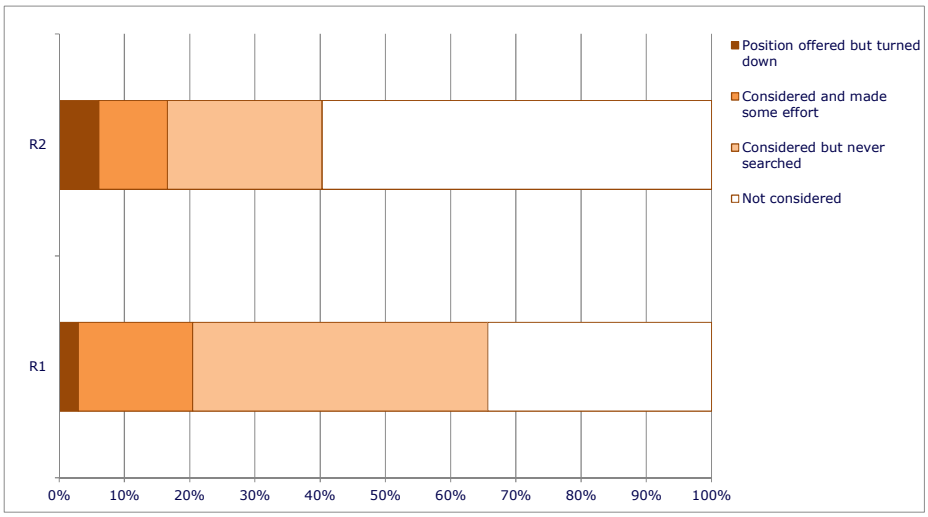
The degree of consideration per current career stage is presented in Figure 94. R1 researchers (PhD) show much higher levels of (66%) of consideration than do R2 researchers (40%). On the other hand more R2 researchers were in a position to be mobile, but they turned the offer down.

The results on personal characteristics are the following:

- There is no difference between researchers in couple and singles regarding any of the levels of consideration.

- Those with children relatively more frequently turned their offer down whereas those without children more frequently considered mobility but never searched for a concrete opportunity.
- Gender has hardly any effect; the outcomes on all forms of consideration are the same for men and women.

Figure 94: Level of consideration of PhD mobility among the never-mobile per current career stage (EU27)



Source: MORE2 Higher Education Survey (2012)

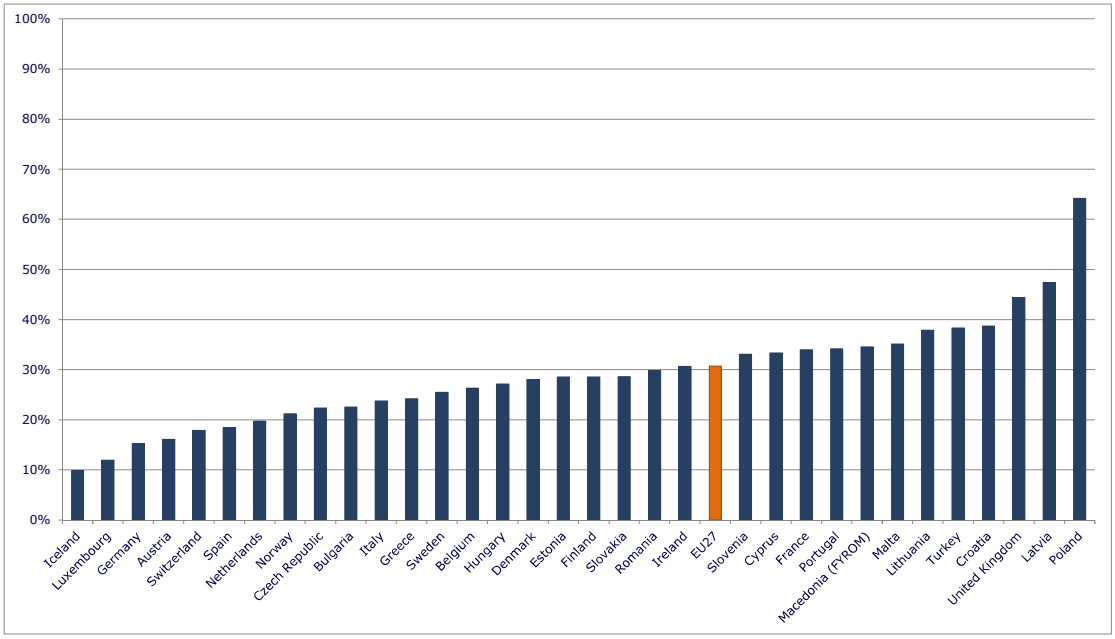
Note: - Distribution of R1 PhD candidates and R2 (post-doctoral or equivalent) PhD holders that were never PhD degree mobile nor mobile during their PhD per current career stage over levels of consideration of mobility for part or all of their PhD. (n=1,516)
- With 'PhD degree mobility' defined as obtaining or having obtained a PhD in another country.
- With '>3 month mobility during PhD' defined as moving for 3 months or more to another country than the country where she did or will obtain her PhD.

5.7.7.4 Post-PhD career non-mobility

The proportion of researchers who have never been internationally mobile for three months or more per country is complementary to the >3 month mobile (in the last ten years or before) researchers, thus amounting to 52%. It is, however, also interesting to combine the indicators on >3 month and <3 month mobility and analyse which share of researchers has never been mobile for any given duration. This indicator is presented in Figure 95 with respect to citizenship.

31% of EU27 researchers have never been internationally mobile. In Poland, almost two thirds of researchers have never been mobile; in Latvia the figure is almost half; and around %40 in the United Kingdom. On the other hand, countries such as Iceland, Luxembourg and Switzerland, have less than 15% of never mobile researchers.

Figure 95: Share of never-mobile researchers in post-PhD career per country of citizenship



Source: MORE2 Higher Education Survey (2012)

Note: - Share of researchers who were never >3 months international mobile nor <3 months international mobile in post-PhD career stages per country of citizenship. (n=6,897)
- Only for R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers.

5.7.7.5 Level of consideration of post-PhD >3 month mobility among never-mobile

Table 11 shows the country variations for levels of consideration of >3 month mobility for R2, R3 and R4 researchers, next to the overall levels of mobility and non-mobility per country. In Poland and Latvia, more than 40% of all researchers have never considered becoming internationally mobile. In Czech Republic, Malta, France, Luxembourg, Estonia and Lithuania this is more than one quarter of all researchers.

In Romania, Croatia, Bulgaria, Lithuania, Macedonia (FYROM) and Portugal, over 40% of all researchers have (to some extent) considered moving abroad for over 3 months even though they have never actually been mobile. 8% of Slovak and Estonian researchers have been offered a position but turned it down and were never mobile during their post-PhD career. The figure is 7% in Italy, Belgium and Czech Republic. It is not clear how this can be interpreted. It might well be that

positions are turned down when more attractive posts are offered in the researcher's own country or when barriers to mobility are such that a researcher might turn down an offer.

Table 11: Level of consideration of post-PhD >3 month mobility per country

	Never-mobile	*Not considered*	*Considered but never searched*	*Considered and made some effort*	*Position offered but turned down*	Mobile (last ten years or before)
Austria	35%	*14%*	*9%*	*9%*	*2%*	65%
Belgium	41%	*17%*	*11%*	*6%*	*7%*	59%
Bulgaria	69%	*23%*	*27%*	*15%*	*4%*	31%
Croatia	69%	*20%*	*29%*	*16%*	*4%*	31%
Cyprus	39%	*15%*	*13%*	*7%*	*4%*	61%
Czech Republic	66%	*32%*	*14%*	*13%*	*7%*	34%
Denmark	34%	*12%*	*14%*	*5%*	*3%*	66%
Estonia	56%	*26%*	*14%*	*9%*	*8%*	44%
Finland	44%	*10%*	*20%*	*11%*	*3%*	56%
France	53%	*27%*	*13%*	*6%*	*6%*	47%
Germany	41%	*24%*	*9%*	*5%*	*3%*	59%
Greece	39%	*8%*	*20%*	*7%*	*4%*	61%
Hungary	42%	*13%*	*12%*	*12%*	*6%*	58%
Ireland	41%	*15%*	*14%*	*7%*	*4%*	59%
Italy	56%	*18%*	*20%*	*11%*	*7%*	44%
Latvia	71%	*43%*	*23%*	*4%*	*1%*	29%
Lithuania	68%	*25%*	*29%*	*11%*	*3%*	32%
Luxembourg	42%	*27%*	*6%*	*6%*	*2%*	58%
Macedonia (FYROM)	56%	*14%*	*24%*	*15%*	*1%*	44%
Malta	61%	*28%*	*24%*	*5%*	*3%*	39%
Netherlands	40%	*15%*	*13%*	*7%*	*6%*	60%
Norway	38%	*16%*	*13%*	*4%*	*4%*	62%
Poland	79%	*44%*	*23%*	*8%*	*4%*	21%
Portugal	60%	*19%*	*27%*	*12%*	*3%*	40%
Romania	76%	*22%*	*35%*	*15%*	*4%*	24%
Slovakia	56%	*21%*	*17%*	*10%*	*8%*	44%
Slovenia	53%	*19%*	*20%*	*9%*	*4%*	47%
Spain	48%	*22%*	*17%*	*5%*	*4%*	52%
Sweden	47%	*19%*	*17%*	*8%*	*3%*	53%
Switzerland	35%	*20%*	*7%*	*4%*	*4%*	65%
Turkey	54%	*20%*	*18%*	*12%*	*4%*	46%
United Kingdom	51%	*23%*	*16%*	*7%*	*6%*	49%
EU27	**52%**	***23%***	***16%***	***7%***	***5%***	**48%**

Source: MORE2 Higher Education Survey (2012)

Note: - Distribution of never-mobile researchers in post-PhD career over levels of consideration of mobility in post-PhD career per country. (n=4,522)
- Only for R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers.
- Countries with less than 30 observations are omitted: Iceland.

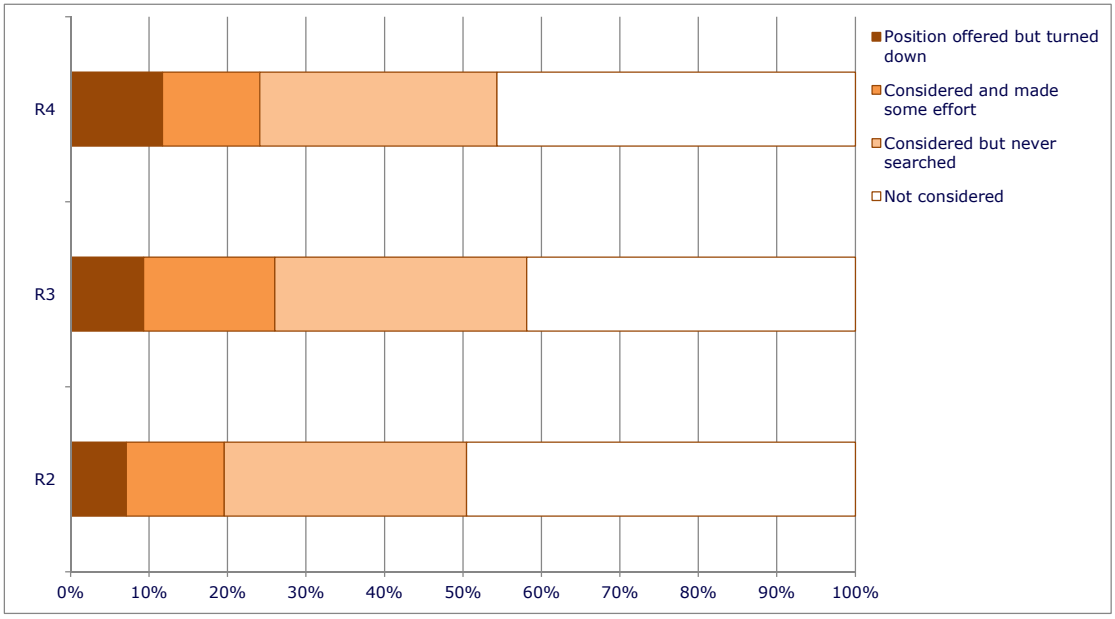
Figure 96 shows the degree of consideration given per current career stage. R3 researchers show slightly higher levels. Another observation is that the proportion of those who were offered a position in another country but turned it down increases slightly according to career stage. Established researchers feel more able to turn down an offer and may also be offered more positions than those in the lower stage.

Differences by personal characteristics:

- Family status does not matter. Singles and researchers in couple show a very similar pattern.
- Those without children show higher degrees of consideration and made some effort to become mobile compared to those with children. Proportionally, those with children have turned down more offers.

- Men and women overall have similar score, with 55% having considered mobility. Men proportionally were offered a position in another country more frequently but subsequently turned it down, compared to women.

Figure 96: Level of consideration of post-PhD >3 month mobility among never-mobile per current career stage



Source: MORE2 Higher Education Survey (2012)

Note: - Distribution of never-mobile researchers in post-PhD career over levels of consideration of mobility in post-PhD career per current career stage. (n=3,910)
- Only for R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers.

5.7.8 Barriers to international mobility

The MORE1 study had no section specifically devoted to barriers as such. These were included in the "influencing factors and motivations" section. Nevertheless these influencing factors can be seen as factors inhibiting mobility and the international career development of researchers. Our survey explicitly asked about the barriers for non-mobility and a list of items was presented which can be summarised under the following main categories:

- *Professional factors*: obtaining funding for the mobility/research; potential loss of contact with the professional network; finding a suitable (research) position; quality of training and education; access to facilities and equipment for research; obtaining funding for return mobility; level of remuneration.
- *Practical factors*: logistical problems (finding adequate accommodation, child-care or schooling for children).
- *Personal factors*: personal/ family reasons; language and/ or culture; finding a job for partner.
- *Administrative or formal/legal factors*: obtaining a visa or work permit; transferring research funding to another country; transfer of pension/ social security rights.

We analyse these barriers from three angles:

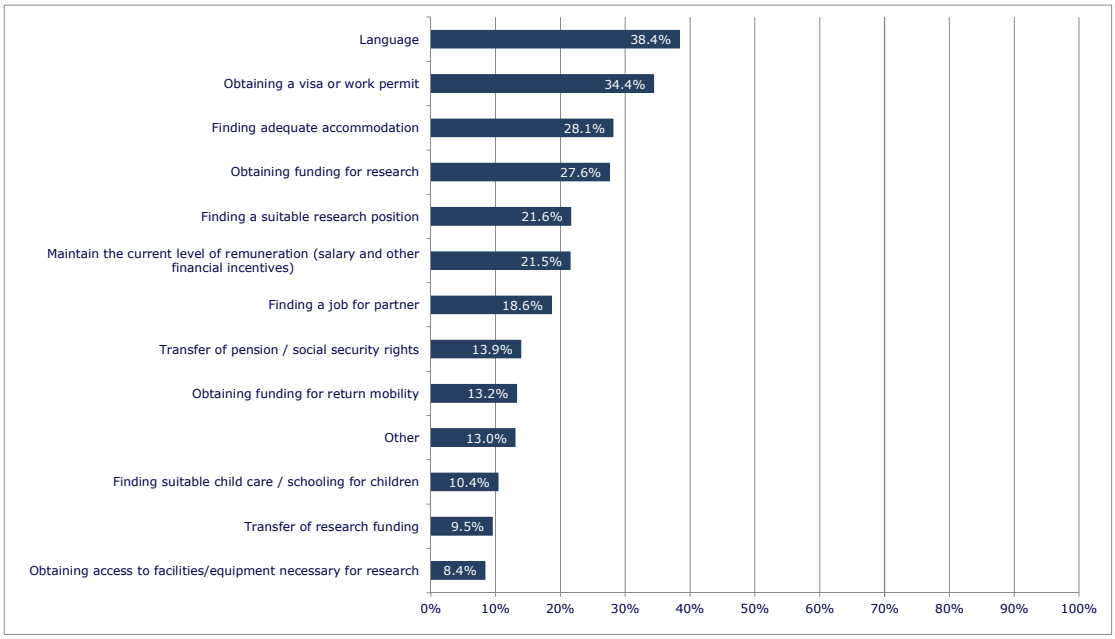
- The barriers experienced as difficulties in moving to the EU by non-EU researchers currently working in the EU.
- The barriers indicated which actually stop the researcher from undertaking part or all of their PhD in another country.
- The barriers experienced as important to overcome by researchers in their last move.
- The barriers indicated which actually discourage the researcher from becoming internationally mobile.

5.7.8.1 Barriers to EU mobility for non-EU researchers

Figure 97 shows the percentage of non-EU27 researchers currently working in the EU (27+3 candidate countries) for whom the specific factor was a difficulty in his/her move to Europe. Respondents could tick more than one option. It appears that close to 40% of the respondents identify language as being the most difficult factor facing them in a move to Europe. The question was not phrased in terms of abandoning the decision to move, but language can clearly be seen as a crucial hindrance for mobility to the EU.

Obtaining a visa or work permit, finding adequate accommodation and obtaining funding for research are also considered to be relatively significant difficulties which affect a potential move to Europe. It is quite remarkable that personal and administrative factors are experienced much less as problems. It is not clear whether this is not a real barrier or whether there is less value attached to it (for example when researchers are less concerned with the transfer of pension and social security rights or whether there exist fair arrangements in a particular country).

Figure 97: Importance of barriers for non-EU27 researchers currently working in the EU27+3

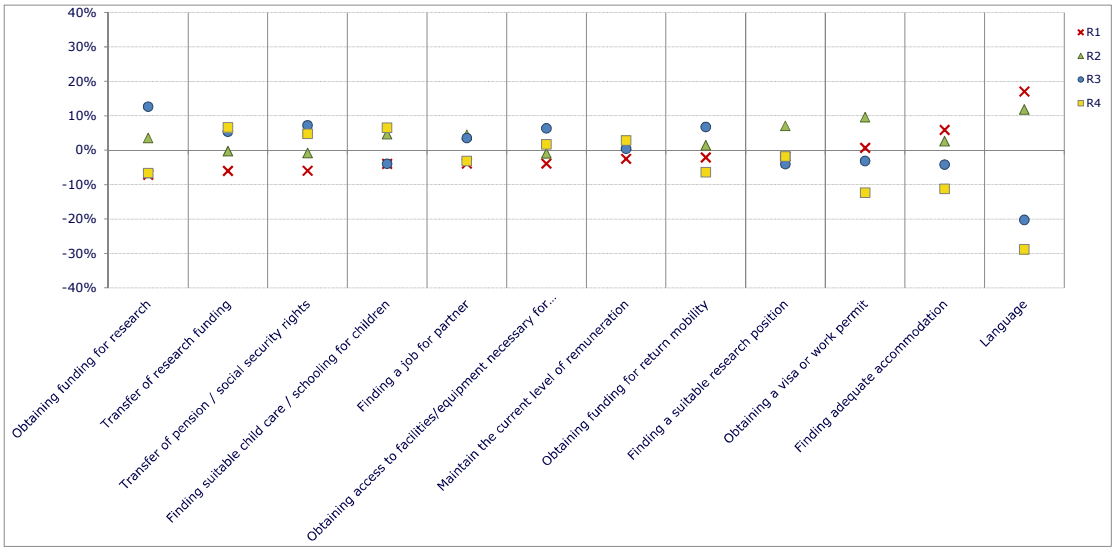


Source: MORE2 Higher Education Survey (2012)

Note: - Share of non-EU27 researchers (citizenship) currently working in the EU27 or Candidate Countries (current employment) for who the specific factor was a difficulty in their move to the EU. (n=481)
- Multiple barriers per respondent are possible.

Figure 98 shows the difference between career stages. Language has the largest variation, whereby those further advanced in their career stage are hindered less than early stage researchers. They may have acquired better language skills in the course of their career and may, in their working environment, be more exposed to an international network of researchers than lower level career researchers who operate more within the local environment of their host country.

Figure 98: Barriers for non-EU27 researchers currently working in the EU 27+3 per current career stage



	R1	R2	R3	R4	*Total*
Obtaining funding for research	20.5%	31.1%	40.2%	20.9%	*27.6%*
Transfer of research funding	3.5%	9.2%	14.9%	16.1%	*9.5%*
Transfer of pension / social security rights	8.0%	13.1%	21.1%	18.7%	*13.9%*
Finding suitable child care / schooling for children	6.4%	15.1%	6.4%	16.9%	*10.4%*
Finding a job for partner	14.7%	23.1%	22.2%	15.5%	*18.6%*
Obtaining access to facilities/equipment necessary for research	4.4%	7.4%	14.7%	10.1%	*8.4%*
Maintain the current level of remuneration	19.0%	22.9%	21.9%	24.3%	*21.5%*
Obtaining funding for return mobility	11.1%	14.6%	19.9%	6.8%	*13.2%*
Finding a suitable research position	19.8%	28.7%	17.6%	19.8%	*21.6%*
Obtaining a visa or work permit	35.0%	43.9%	31.2%	22.0%	*34.4%*
Finding adequate accommodation	34.0%	30.7%	23.9%	16.9%	*28.1%*
Language	55.4%	50.2%	18.1%	9.5%	*38.4%*

Source: MORE2 Higher Education Survey (2012)

Note: - Difference between share of non-EU27 researchers (citizenship) currently working in the EU27 or Candidate Countries (current employment) for whom the specific factor was a difficulty in their move to the EU per current career stage and the total share over all career stages. (n=481)
- *More than one factor could be chosen by one respondent.*
- *Reading note: The share of non-EU27 researchers currently working in the EU27+3 in the R1 career stage and for whom language was a difficulty in their move to the EU exceeds the total share by 17 pp. The total share is 38.4%, whereas the share for R1 is 55.4%.*

The gender factor matters regarding finding a suitable research position, obtaining funding for research and finding a job for one's partner. In terms of these issues, women faced more difficulty with their move to Europe than men.

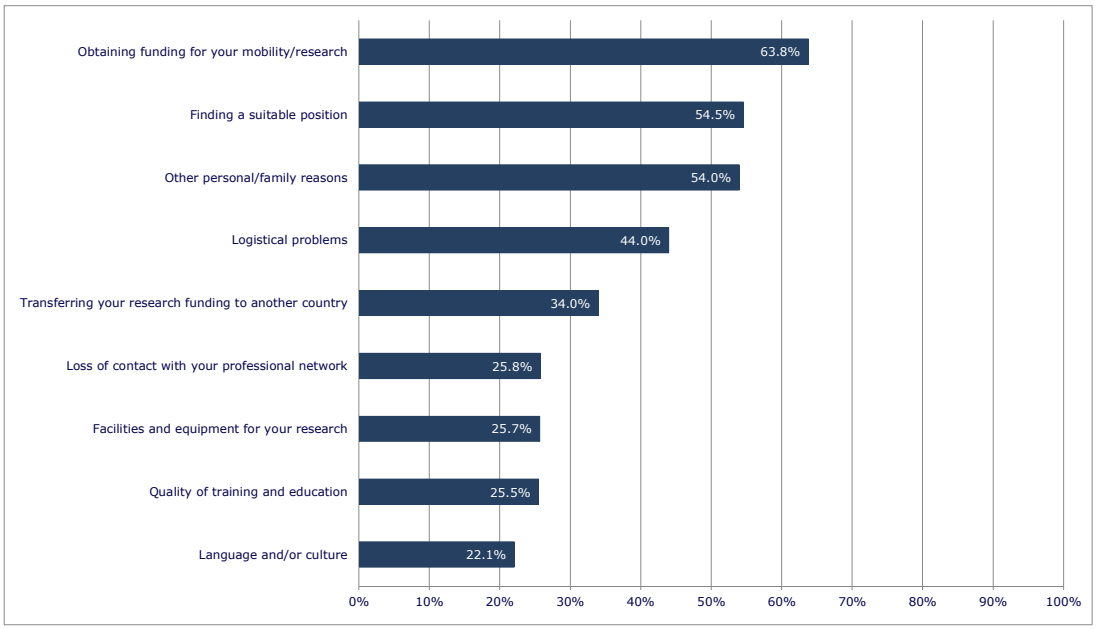
In the extra EU-survey these outcomes will be placed in the context of the attractiveness of working as a researcher in the EU. We now turn to the barriers to mobility inside the EU.

5.7.8.2 PhD mobility barriers

The list of possible barriers was presented to R1 and R2 researchers who have not worked abroad to undertake their PhD degree, or travelled during their doctorate but who did consider a move, to some extent. This analysis is thus based on those barriers indicated which might actually prevent the researcher from completing part or all of their PhD in another country.

Figure 99 illustrates the proportion of respondents in this category, indicating the importance versus unimportance of each of the barriers to mobility for undertaking a Phd abroad, or being internationally mobile while studying for the doctorate. Obtaining funding for the mobility/research is the most important barrier, yet a third of researchers do not consider this to be as a barrier and probably make use of funding facilities either in their home or host country. Finding a suitable position follows for half of the cases, although 45% of all respondents still do not consider this to be a significant barrier. At the lower end, language and/or culture is hardly rated as a barrier, with more than 75% of researchers rating these factors as unimportant.

Figure 99: Importance of barriers to non-PhD-mobility (PhD degree and during PhD) (EU27)

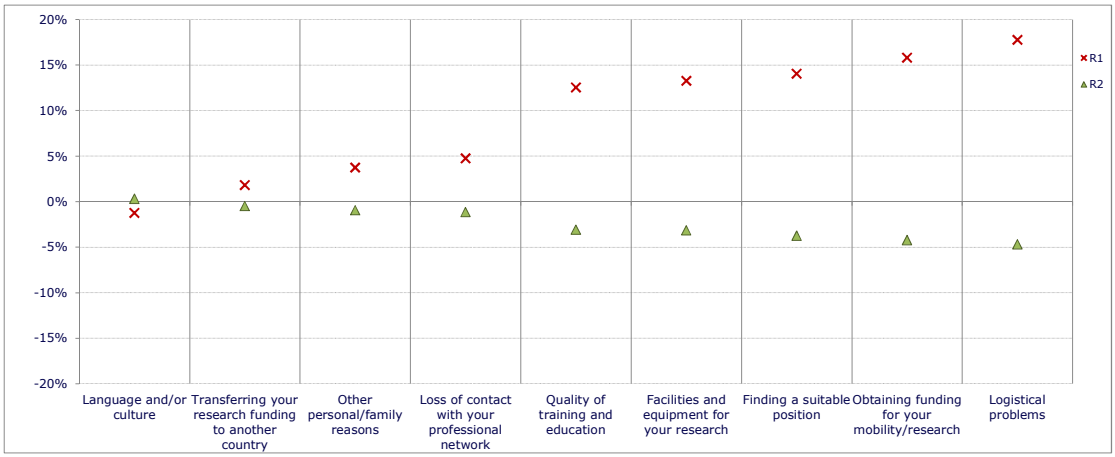


Source: MORE2 Higher Education Survey (2012)

Note:
- *Share of never-mobile R1 PhD candidates and R2 (post-doctoral or equivalent) PhD holders with some consideration of PhD mobility that indicate the barrier as important for non-PhD-mobility. (n=825)*
- *With 'non-PhD-mobile' defined as never having been PhD degree mobile nor mobile during their PhD.*
- *With 'some consideration of PhD mobility' defined as not having indicated to have never considered it (thus having considered it but made no effort; having considered it and searched and having turned down a concrete offer).*

Figure 100 shows the difference between the percentage of researchers who regard the barrier to be an important factor for PhD non-mobility per current career stage (R1 and R2) and the total percentage who find it to be an important factor for PhD non-mobility (this does not include non-mobility during the R2 career stage). The main differences between the two groups concern professional factors (apart from logistical problems). For the PhD candidates, the barriers are higher regarding the quality of training and education, the facilities and equipment for the research, finding a suitable position, and obtaining funding for mobility/ research (generally a 16-22 point percentage difference with R2).

Figure 100: Importance of barriers to non-PhD-mobility (PhD degree and during PhD) per current career stage (EU27)



	R1	R2	*Total*
Language and/or culture	20.8%	22.4%	*22.1%*
Transferring your research funding to another country	35.8%	33.5%	*34.0%*
Other personal/family reasons	57.7%	53.0%	*54.0%*
Loss of contact with your professional network	30.5%	24.6%	*25.8%*
Quality of training and education	38.0%	22.4%	*25.5%*
Facilities and equipment for your research	39.0%	22.5%	*25.7%*
Finding a suitable position	68.6%	50.8%	*54.5%*
Obtaining funding for your mobility/research	79.6%	59.6%	*63.8%*
Logistical problems	61.7%	39.3%	*44.0%*

Source: MORE2 Higher Education Survey (2012)

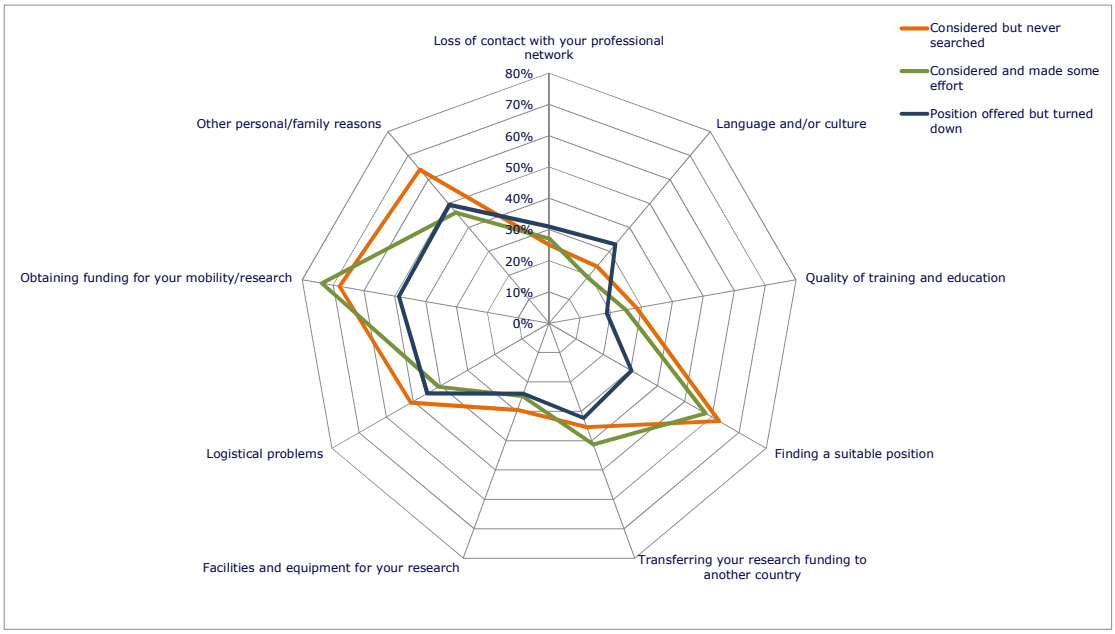
Note: - Difference between share of never-mobile R1 PhD candidates and R2 (post-doctoral or equivalent) PhD holders with some consideration of PhD mobility that indicate the barrier as important for non-PhD-mobility per current career stage and total share over R1 and R2 career stages. (n=825)
- *With 'non-PhD-mobile' defined as never having been PhD degree mobile nor mobile during their PhD.*
- *With 'some consideration of PhD mobility' defined as not having indicated to have never considered it (thus having considered it but made no effort; having considered it and searched and having turned down a concrete offer).*
- *Reading note: The share of never-mobile R1 PhD candidates with some consideration of PhD mobility that identify the logistical problems as being important for non-PhD-mobility exceeds the R2l share by 22.4 percentage points. The R1 share is 61.7% whereas the share for R1 is 39.3%.*

The gender factor does not matter for most of the perceived barriers. There are a few differences: men find the potential loss of contact with their professional network and language and/ or culture an important barrier for non-PhD mobility (respectively 8 and 9 pp. difference) than women, who see more barriers regarding personal and or family reasons (17pp difference).

The radar graph in Figure 101 illustrates the different barriers related to the degree of consideration given to mobility. Obtaining funding for research, finding a suitable position and logistics are the most pronounced, although for those who were offered a position but turned it down this, is for obvious reasons, much less an important barrier.

There is considerable agreement about the barriers between those who considered mobility but never looked for a concrete opportunity and those who underwent some effort to find a position. Only for personal and family reasons there is a difference: these reasons may pose a sufficient barrier to prevent researchers from searching for an international research opportunity.

Figure 101: Importance of barriers to non-PhD-mobility (PhD degree and during PhD) per level of consideration of PhD mobility (EU27)



Source: MORE2 Higher Education Survey (2012)

Note: - Distribution of never-mobile R1 PhD candidates and R2 (post-doctoral or equivalent) PhD holders with some consideration of PhD mobility that indicate the barrier as important for non-PhD-mobility over level of consideration. (n=825)

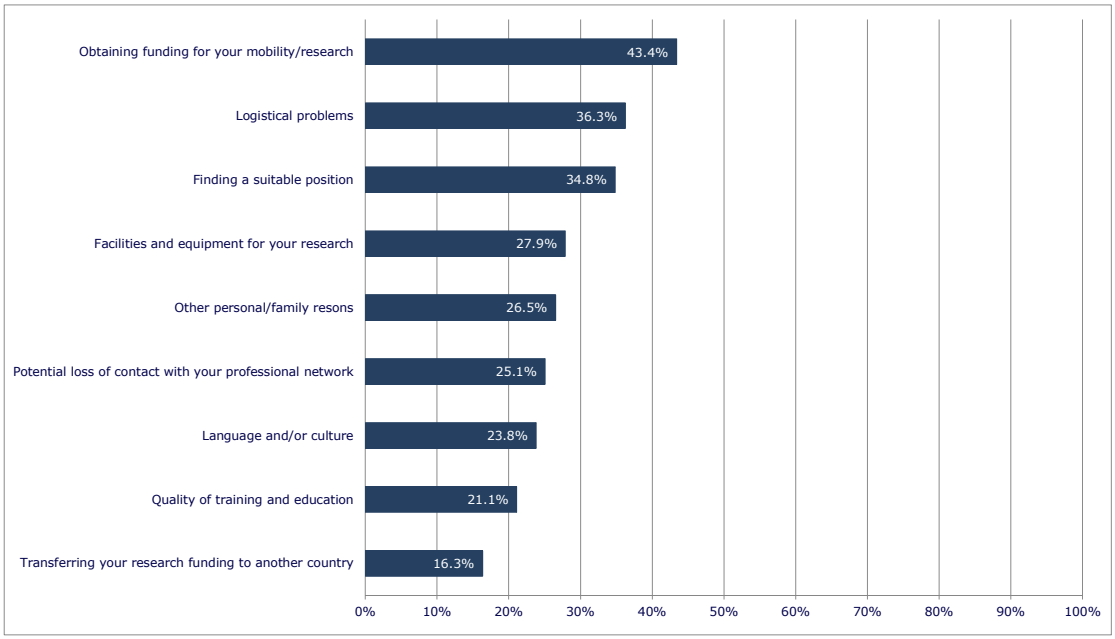
- *With 'non-PhD-mobile' defined as never having been PhD degree mobile nor mobile during their PhD.*
- *With 'some consideration of PhD mobility' defined as not having indicated to have never considered it (thus having considered it but made no effort; having considered it and searched and having turned down a concrete offer).*

5.7.8.3 Post-PhD career mobility barriers

Figure 102 illustrates the perceived importance of barriers to mobility for internationally mobile researchers during the post-PhD career stages (R2, R3 and R4) who have worked abroad for more than three months at least once in the last ten years. These barriers apply to the last move of the respondent.

Obtaining funding for the mobility/research is the most frequently cited barrier (43%), but the others are all below 40%. Transferring research funding to another country is only important to 16% of the researchers. Comparing this figure with the perceived barriers for R1/2 researchers who have not worked abroad during their PhD, it appears that barriers are ranked very similarly (with some exceptions such as transferring research funding being more important in R1 and R2 career stages and facilities and equipment more important in post-PhD career stages).

Figure 102: Importance of barriers to last move in post-PhD career mobility (EU27)

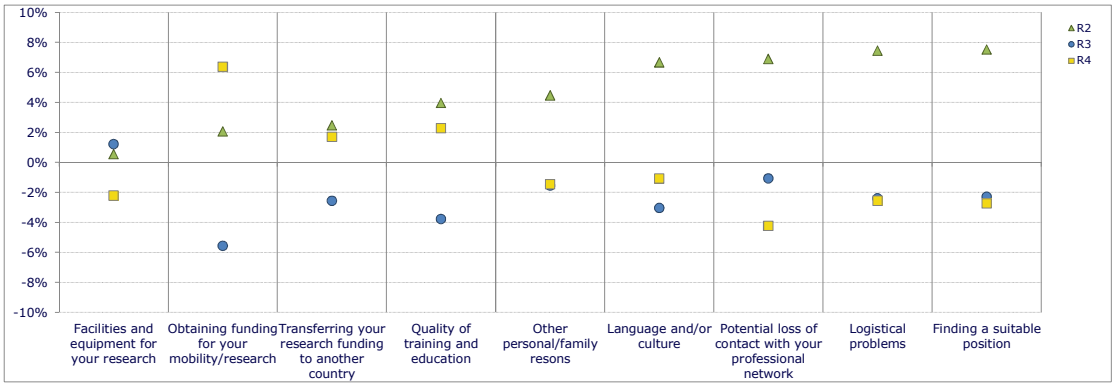


Source: MORE2 Higher Education Survey (2012)

Note: - Share of mobile researchers who indicate the specific barrier as being important to their last move. (n=2,003)
- With 'mobility' defined as having worked abroad for more than three months at least once in the last ten years.
- Only for R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers.

There are interesting differences to note between the R2, R3 and R4 career stages. Figure 103 shows that established researchers overall have an average score, but experience higher barriers when trying to obtain funding for their mobility or research, when compared to R3 researchers who experience this as being much less of a barrier. R3 researchers do not seem to experience many barriers, particularly when compared to those in lower career stages. This group of independent researchers are probably older and have acquired greater international experience and more language exposure which enables them to cope better with problems that accompany international mobility.

Figure 103: Importance of barriers to last move in post-PhD career mobility per current career stage (EU27)



	R2	R3	R4	*Total*
Facilities and equipment for your research	28.4%	29.1%	25.7%	*27.9%*
Obtaining funding for your mobility/research	45.4%	37.8%	49.8%	*43.4%*
Transferring your research funding to another country	18.8%	13.8%	18.0%	*16.3%*
Quality of training and education	25.1%	17.3%	23.4%	*21.1%*
Other personal/family reasons	31.0%	25.0%	25.1%	*26.5%*
Language and/or culture	30.5%	20.8%	22.7%	*23.8%*
Potential loss of contact with your professional network	32.0%	24.0%	20.8%	*25.1%*
Logistical problems	43.7%	33.9%	33.7%	*36.3%*
Finding a suitable position	42.4%	32.5%	32.1%	*34.8%*
Facilities and equipment for your research	28.4%	29.1%	25.7%	*27.9%*

Source: MORE2 Higher Education Survey (2012)

Note:
- *Difference between share of mobile researchers who indicate the specific barrier as important to their last move per current career stage and total share for all R2,3,4 career stages. (n=1,160)*
- *With 'mobility' defined as having worked abroad for more than three months at least once in the last ten years.*
- *Only for R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers.*
- *Reading note: The share of mobile R2 researchers who point to the potential loss of contact with their professional network as being an important barrier for the last move exceeds the total share of mobile researchers that indicate the potential loss of contact with their professional network as being an important barrier for the last move by 6.9 pp. The total share is 25.1% whereas the share for R2 is 32.0%.*

As regards the personal characteristics of respondents, the following results are notable:

- Family status reveals a very coherent pattern. Only regarding personal/family reasons and logistical issues do researchers in a couple experience more barriers than singles.
- There is no difference between researchers with children and those without children regarding the barriers posed by personal/family reasons and logistical problems. One might expect that researchers with children would experience more barriers in these areas. A major difference is the fact that those without children find the potential loss of contact with their professional network and finding a suitable position as representing important barriers than do those without children.
- The gender factor shows a very consistent pattern: women perceive more barriers to their last move in all areas than their male counterparts. There is an overall upward shifted curve for female researchers, with the highest percentage differences being for facilities and equipment; the potential loss of contact with their professional network; transferring research funding to another country, and finding a suitable position.

When a change in employment is involved, a shift can be observed from obtaining funding for mobility (relatively less important) towards personal/family reasons, finding a suitable position and potential loss of contacts with the professional network (relatively more important).

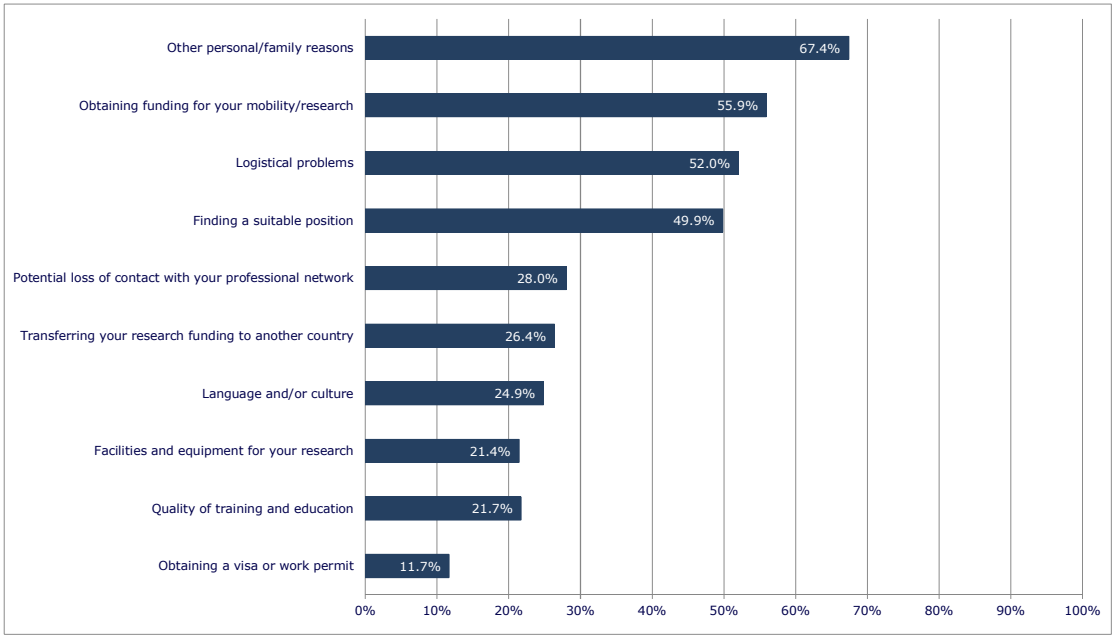
When analysing the difference per destination region between EU27 and non-EU27 countries, it appears that the largest difference concerns obtaining a visas or work permits (18 pp difference). As can be expected for non-EU27 destination countries, this is felt to be a major barrier. EU27 destination respondents perceive the potential loss of contact with their professional network (11pp), facilities and equipment for research (10pp), and finding a suitable position (9pp) as being relatively more important barriers. Given the geographical differences, the opposite finding would be more likely.

Finally, established researchers (R4) with long-term mobility experience were asked whether, in their view, it has become easier over time for researchers to become internationally mobile during their career. Overall, 71% thought that this was indeed the case – women a little more so than men – whereas 19% said no and 9% did not know. This large proportion of reasearchers seems to indicate that some progress has been made in removing or alleviating some of the barriers to mobility.

5.7.8.4 Barriers as reasons for international non-mobility during post-PhD career

When asked for explicit reasons for their non-mobility, researchers rank personal and family reasons as most important (Figure 104). While this is an important barrier to overcome when embarking upon an international research period, it is an even more important factor which convinces researchers not to travel. Funding and logistical problems again appear in the top 3 barriers. Facilities for research appear to be less important for non-mobility as when it was a barrier to overcome in mobility. For transferring research funding to another country, the opposite is observed.

Figure 104: Importance of barriers as reasons for international non-mobility in post-PhD career (EU27)



Source: MORE2 Higher Education Survey (2012)

Note: - Share of never-mobile researchers who indicate that the specific barrier is important in discouraging them from becoming internationally mobile and pursuing this path further. (n=2,303)
- *With 'non-mobility' defined as never having worked abroad for more than 3 months (not even more than ten years ago).*
- *Only for R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers who have considered working abroad as a researcher for more than 3 months since completing higher education (PhD or other) but never were mobile.*

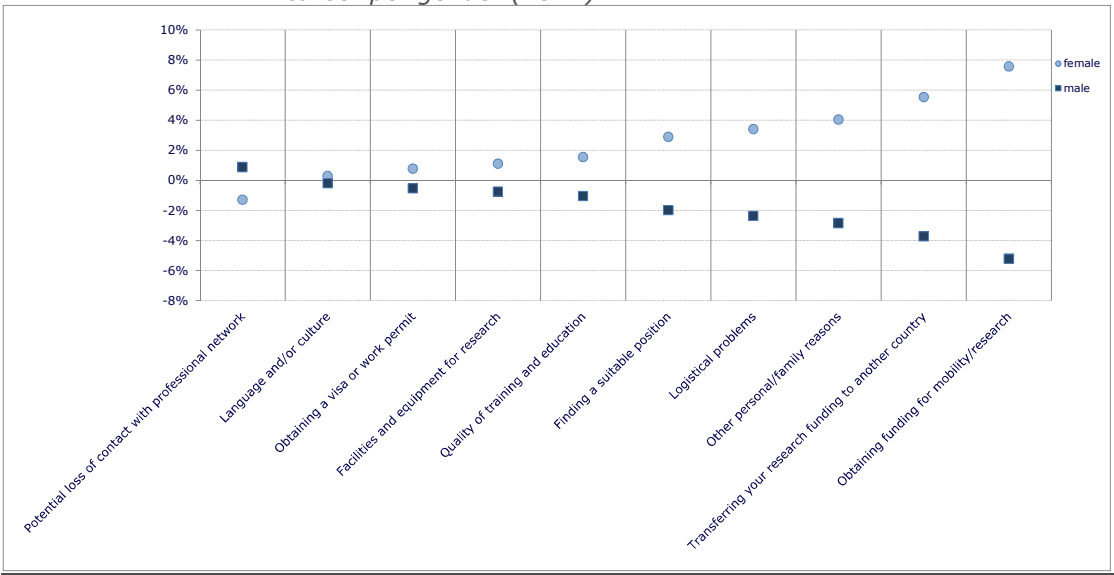
Analysis of differences between the genders shows that female researchers deviate most from the total estimate when funding is concerned (Figure 104). They find obtaining funding or transferring funding a more important discouraging factor for mobility than their male counterparts. Male researchers only find the potential loss of contact with the professional network slightly more discouraging.

Differences between career stages are within a +9 to -12 pp deviation range. R2 researchers appear more inclined to identify funding issues (both obtaining and transferring) and job positions as reasons for non-mobility, whereas R4 researchers attach more importance to facilities and equipment, language and/or culture and transferring funding. R3 researchers appear to regard the different barriers as generally less important, aside from personal/family reasons and logistical problems.

The latter are those barriers which are most frequently indicated by researchers in a couple versus those who are single. Single researchers attach more value to the

potential loss of contact with the professional network. A similar difference occurs between researchers with or without children. Those with children find logistical problems and personal/family reasons to be more important, whereas those without children indicate losing their professional network, concerns about quality of training and finding a suitable position as reasons which discourage mobility. This is consistent with the barriers overcome in mobility as described in the previous section.

Figure 105: Importance of barriers as reasons for international non-mobility in post-PhD career per gender (EU27)



	Female	Male	*Total*
Potential loss of contact with professional network	26.7%	28.9%	*28.0%*
Language and/or culture	25.1%	24.7%	*24.9%*
Obtaining a visa or work permit	12.5%	11.1%	*11.7%*
Facilities and equipment for research	22.6%	20.7%	*21.4%*
Quality of training and education	23.3%	20.7%	*21.7%*
Finding a suitable position	52.7%	47.9%	*49.9%*
Logistical problems	55.4%	49.7%	*52.0%*
Other personal/family reasons	71.4%	64.6%	*67.4%*
Transferring your research funding to another country	31.9%	22.6%	*26.4%*
Obtaining funding for mobility/research	63.5%	50.7%	*55.9%*

Source: MORE2 Higher Education Survey (2012)

Note: - Difference between share of never-mobile researchers who indicate the specific barrier as important in discouraging them from becoming internationally mobile per current career stage and total share for all R2,3,4 career stages. (n=2,303)

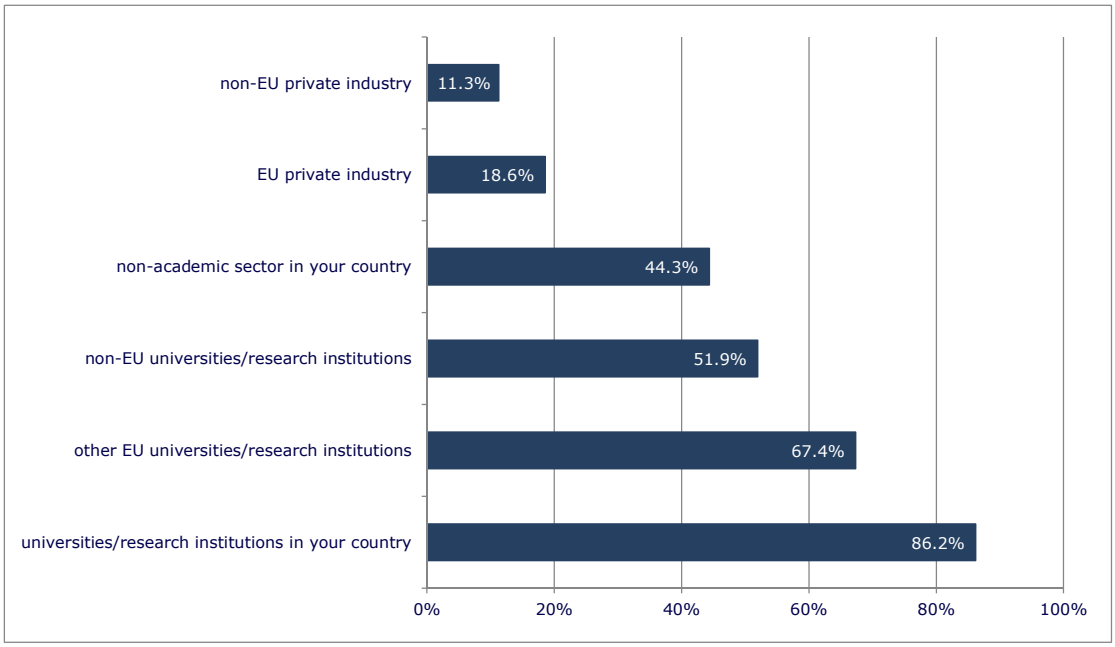
- *With 'non-mobility' defined as never having worked abroad for more than 3 months (not even more than ten years ago).*
- *Only for R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers who have considered working abroad as a researcher for more than 3 months since completing higher education (PhD or other) but never were mobile.*
- *Reading note: The share of never-mobile male researchers who indicate the potential loss of contact with the professional network as an important barrier in discouraging them from becoming internationally mobile exceeds the share of female researchers by 2.2 pp. The share for male researchers is 28.9% whereas the share for female Collaboration*

5.7.9 Collaboration activities

Taken as a group, 93% of all researchers reported that they were involved in active research collaboration, with 77% doing so internationally.

Figure 106 shows the percentage of researchers who collaborate within various employment sectors in their own country, both inside and outside the EU. 86% collaborate with colleagues working in academia within their own country; 67% with colleagues working at other EU universities or research institutes, and 52% with colleagues working at non-EU universities or research institutions. Less research collaboration takes place with non-academic institutions, and with the private industry within or outside the EU.

Figure 106: Share of researchers participating in each type of collaboration (EU27)

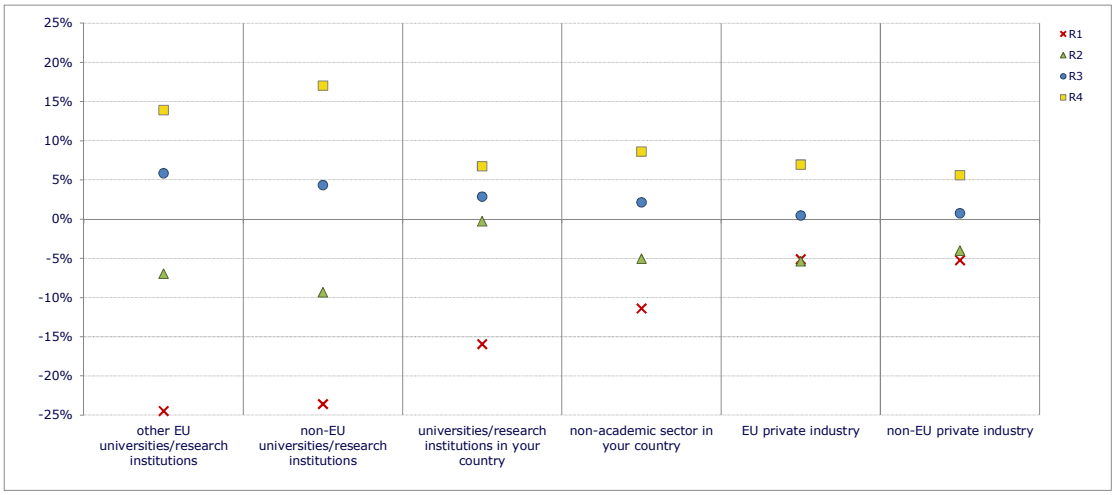


Source: MORE2 Higher Education Survey (2012)

Note: - Share of researchers that indicate to participate to the specific type of collaboration. (n=9,016)
- Multiple collaboration types per respondent are possible.

This pattern varies depending on the respondents' career stage (Figure 107). It appears the more experienced tend to collaborate more than those who are in the earlier stages of their research career. This follows the findings based on the CDH 2009 data (OECD working paper on micro data, 2012). The same situation corresponds to international collaboration behaviour, as well as to intersectoral collaboration behaviour. It is interesting to note that R1 (PhD) researchers show relatively lower levels of collaboration with universities or research institutes both inside and outside Europe, whereas the differences between the research career categories decrease in the case of collaboration with private industry. This convergence between researchers is due to the fact that collaboration with the non-academic and particularly the private sector is relatively small for all groups.

Figure 107: Share of researchers participating in each type of collaboration per current career stage (EU27)



	R1	R2	R3	R4	*Total*
Other EU universities/research institutions	42.9%	60.4%	73.2%	81.2%	*67.4%*
Non-EU universities/research institutions	28.3%	42.6%	56.3%	69.0%	*51.9%*
Universities/research institutions in your country	70.3%	85.9%	89.1%	92.9%	*86.2%*
Non-academic sector in your country	32.9%	39.3%	46.5%	53.0%	*44.3%*
EU private industry	13.5%	13.2%	19.1%	25.5%	*18.6%*
Non-EU private industry	6.0%	7.3%	12.0%	16.9%	*11.3%*
International collaboration	55.2%	70.0%	82.7%	87.8%	*76.5%*

Source: MORE2 Higher Education Survey (2012)

Note: - Difference between share of researchers participating in each type of collaboration per current career stage and total share for all career stages. (n=9,016)
- Multiple collaboration types per respondent are possible.
- 'International collaboration' is defined as collaboration with at least one type of partner outside the own country.
- Reading note: The share of R4 researchers who collaborate with non-EU universities or research institutes exceeds the total share of researchers who collaborate with non-EU universities or research institutes by 17.1 pp. The total share is 51.9%, whereas the share for R4 is 69.0%.

Regarding country differences, it appears that over 90% of the respondents from France, Greece, Italy, Poland and the United Kingdom indicated that they collaborate with colleagues from universities or research institutions located in the EU.

Only respondents from Luxembourg reported that they collaborate more with colleagues from universities and research institutes in a third EU country (80%) than from a university or research institute located in their country of employment (69%). Collaboration with other EU universities or research institutes is particularly popular among researchers from Austria, Cyprus, Greece, Macedonia (FYROM) and Luxembourg, where more than 80% of the respondents in each country reported that they collaborate with colleagues from those institutions.

Collaboration with non-EU academic institutions is more frequent amongst researchers from Macedonia (FYROM), Denmark, France, Norway, and the United Kingdom than amongst researchers from other EU countries.

Research collaboration with the non-academic sector is relatively more frequent among researchers from Ireland, the United Kingdom and Cyprus than among researchers from other EU countries, regardless of whether their partners are located in or outside the EU.

A relatively low proportion of respondents from Belgium, Bulgaria, Denmark, Hungary, Italy, Lithuania, Norway, and Portugal reported collaborative research with colleagues from non-academic sectors located either locally or globally.

Table 12: Share of researchers participating in each type of collaboration per country of current employment

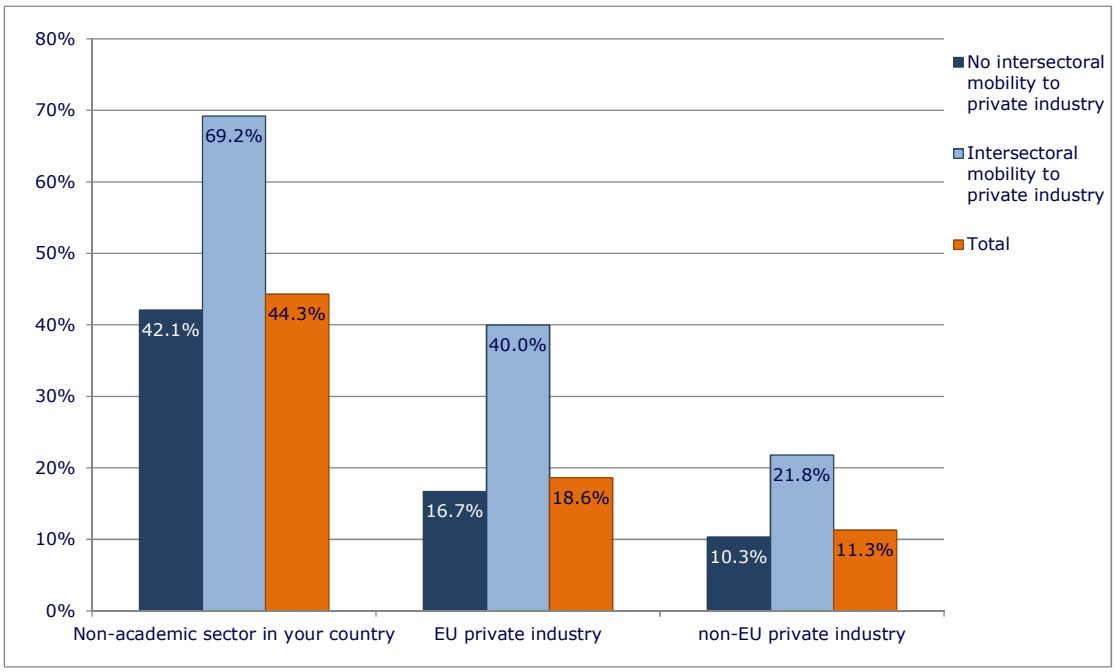
	Academia in own country	Academia in other EU country	Academia in non-EU country	Non-academia in own country	Non-academia in other EU country	Non-academia in non-EU country	International collaboration
Austria	83.2%	82.8%	57.6%	42.9%	23.4%	12.2%	86.5%
Belgium	79.2%	71.2%	50.6%	36.7%	18.0%	8.8%	78.4%
Bulgaria	82.2%	64.3%	38.9%	39.8%	13.0%	5.9%	71.4%
Croatia	85.9%	64.1%	40.4%	49.3%	11.5%	9.3%	73.8%
Cyprus	80.7%	80.4%	46.0%	47.9%	27.1%	12.8%	85.7%
Czech Republic	86.8%	62.0%	38.4%	50.8%	17.3%	6.4%	68.9%
Denmark	83.0%	73.7%	60.3%	40.8%	16.1%	8.4%	81.5%
Estonia	83.4%	74.0%	44.6%	52.8%	17.1%	5.7%	79.8%
Finland	83.4%	76.2%	51.5%	40.3%	19.2%	8.6%	80.8%
France	90.2%	71.3%	62.2%	49.8%	21.1%	10.4%	81.5%
Germany	79.1%	56.9%	47.0%	34.3%	18.2%	12.2%	68.3%
Greece	92.8%	83.8%	48.6%	52.0%	22.0%	10.2%	89.9%
Hungary	83.0%	65.9%	37.2%	40.0%	17.4%	9.5%	73.6%
Iceland	84.0%	70.4%	57.7%	64.4%	21.5%	9.4%	79.9%
Ireland	79.6%	75.5%	55.2%	55.0%	25.6%	18.1%	82.4%
Italy	92.2%	67.6%	48.6%	31.6%	12.7%	7.8%	74.2%
Latvia	79.9%	52.4%	26.6%	46.3%	14.3%	6.9%	59.5%
Lithuania	80.3%	62.0%	40.8%	41.3%	12.8%	6.3%	68.6%
Luxembourg	68.7%	80.6%	47.7%	37.3%	19.9%	7.4%	85.6%
Macedonia (FYROM)	84.8%	80.8%	76.2%	59.1%	17.9%	20.5%	89.5%
Malta	76.0%	78.7%	44.1%	46.0%	16.2%	8.6%	83.8%
Netherlands	83.5%	71.1%	57.0%	43.4%	21.0%	9.4%	78.8%
Norway	85.0%	75.5%	60.7%	40.2%	14.8%	8.4%	82.6%
Poland	90.6%	55.8%	32.5%	45.1%	13.6%	6.6%	65.6%
Portugal	87.4%	69.7%	43.9%	38.9%	10.2%	5.0%	77.3%
Romania	82.4%	67.0%	41.3%	55.5%	19.4%	9.0%	74.2%
Slovakia	81.9%	71.8%	39.1%	48.1%	17.6%	9.7%	75.3%
Slovenia	87.6%	78.8%	55.8%	57.3%	22.3%	8.4%	86.3%
Spain	82.9%	62.2%	47.5%	46.1%	14.3%	7.2%	73.1%
Sweden	76.0%	65.9%	52.4%	41.7%	20.7%	10.9%	75.9%
Switzerland	82.4%	63.7%	48.0%	35.6%	21.3%	14.0%	74.3%
Turkey	81.4%	47.9%	37.2%	33.2%	15.7%	15.0%	60.8%
United Kingdom	92.5%	73.8%	64.4%	53.0%	23.6%	17.9%	83.6%
EU27	***85.8%***	***66.1%***	***51.1%***	***44.3%***	***18.6%***	***11.3%***	***76.5%***

Source: MORE2 Higher Education Survey (2012)

Note: - Share of researchers participating in each type of collaboration per country of current employment. (n=10,547)
- Multiple collaboration types per respondent are possible.

Finally, research collaboration with non-academic sectors is also correlated with intersectoral mobility to private industry. Figure 108 shows that the share of intersectorally mobile researchers who collaborate with private industry partners is, for each type, considerably higher than the total or share of researchers who have never been mobile in order to work for private industry.

Figure 108: Intersectoral mobility to private industry and collaboration with the non-academic sector (EU27)



Note: - Share of researchers who have been intersectorally mobile to private industry (versus not) that indicate to participate to the specific type of collaboration with the non-academic sector. (n=9,016)
- Multiple collaboration types per respondent are possible.
- Reading note: Of those who have been intersectorally mobile to private industry, 69.2% have collaborated with the non-academic sector in the own country, compared to 42.1% of those who have not been intersectorally mobile to private industry.

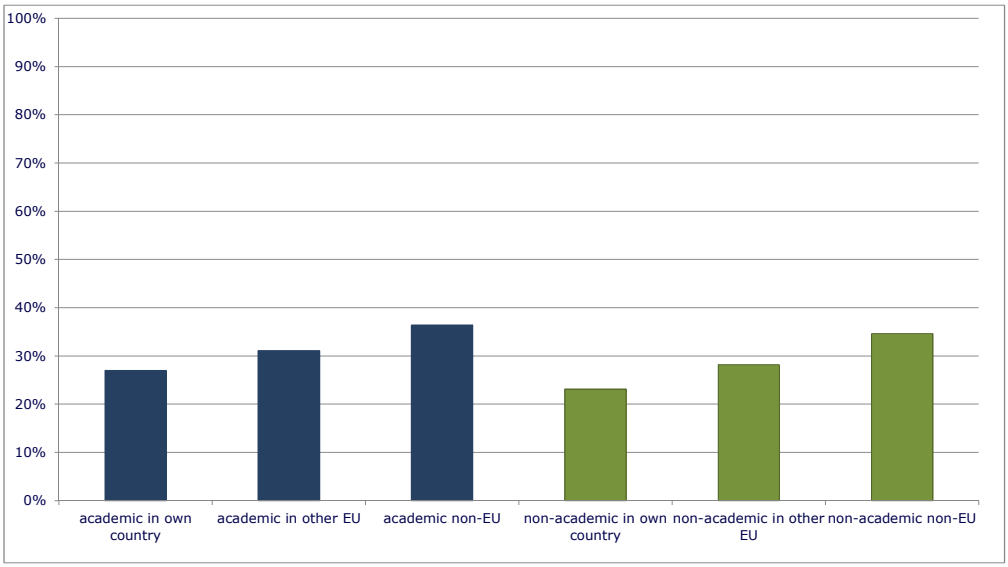
5.7.10 >3 month mobility in the last ten years in relation to collaboration

As virtually all researchers report some form of research collaboration with other researchers (93%), the share of researchers in collaboration who have been >3 month mobile during the last ten years is close to the overall average, at 31%.

Despite the fact that the >3 month mobility and the research collaboration profiles are collected and drafted separately (with the first referring to any longer term mobility in the last ten years and the second to the partners with whom the researcher collaborates at the moment of the survey), it is worthwhile comparing them both to see whether a pattern occurs. This comparison shows that >3 month international mobility is positively related to the distance of the research collaboration partners. This is the case for both academic and non-academic partners. However, mobility is overall slightly lower for researchers collaborating with non-academic partners.

This finding confirms observations in previous studies that there is a positive correlation between degree of mobility and participation in projects with international funding. Moreover, this finding also indicates that mobility provides greater opportunities for successful future participation in transnational project collaborations (Cañibano et al., 2008[67]). Mobility is therefore considered a means of achieving international research collaboration (Ackers, 2008[68]).

Figure 109: International >3 month mobility in post-PhD career stages per type of collaboration partners (EU27)



Source: MORE2 Higher Education Survey (2012)

Note: - Percentage of researchers in R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) career stage who have worked abroad for 3 months or more at least once in the last ten years, distributed over types of collaboration partners. (n=7,131)
- One researcher may have indicated more than one type of collaboration partner, and will then be counted in each of the relevant categories in the graph.

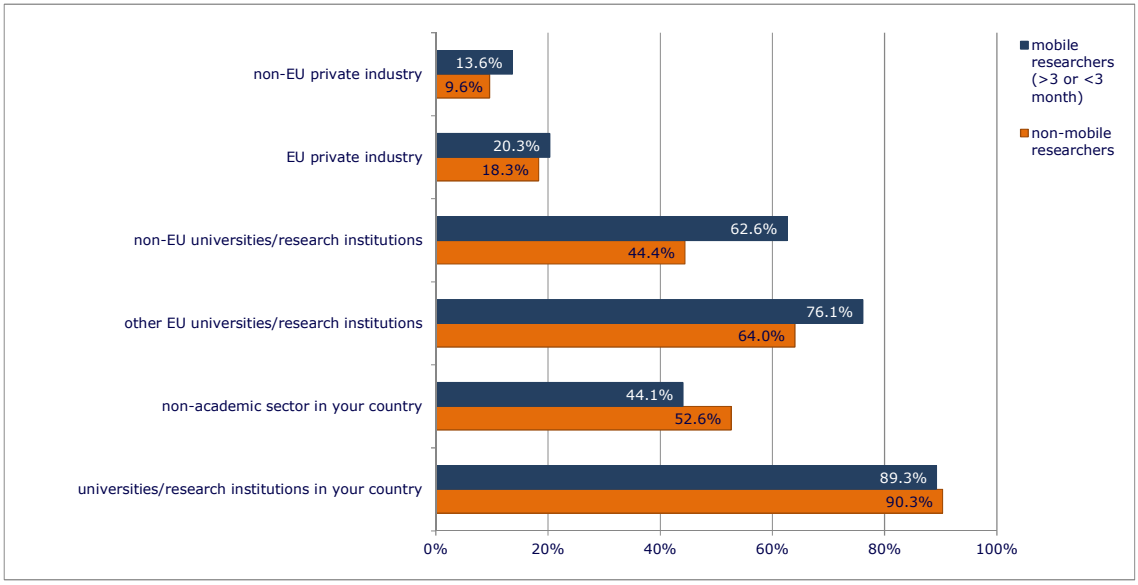
[67] Cañibano C., F. Javier Otamendi and F. Solís (2011): *International temporary mobility of researchers: cross-discipline study*. Scientometrics, 89, 653-675.

[68] Ackers, L. (2008). *Internationalisation, mobility and metrics: A new form of indirect discrimination*? Minerva, 46, 411–435.

5.7.11 Non-mobility in relation to collaboration

Defining non-mobile researchers as those who have been abroad for neither >3 month nor <3 month to work as a researcher (in the last ten years and before), we find that the non-mobile are less involved in international collaboration than the mobile population. They do tend to collaborate more within their own country, the difference with the mobile researchers is notable for collaboration with the non-academic sector in their own country (9 pp difference). Concerning international collaboration, the indicator for non-mobile researchers amounts to 72%, compared to 85% for the mobile and 77% in total.

Figure 110: Share of researchers participating in each type of collaboration, for the not >3 month nor <3 month mobile researchers and the other, mobile, researchers (EU27)



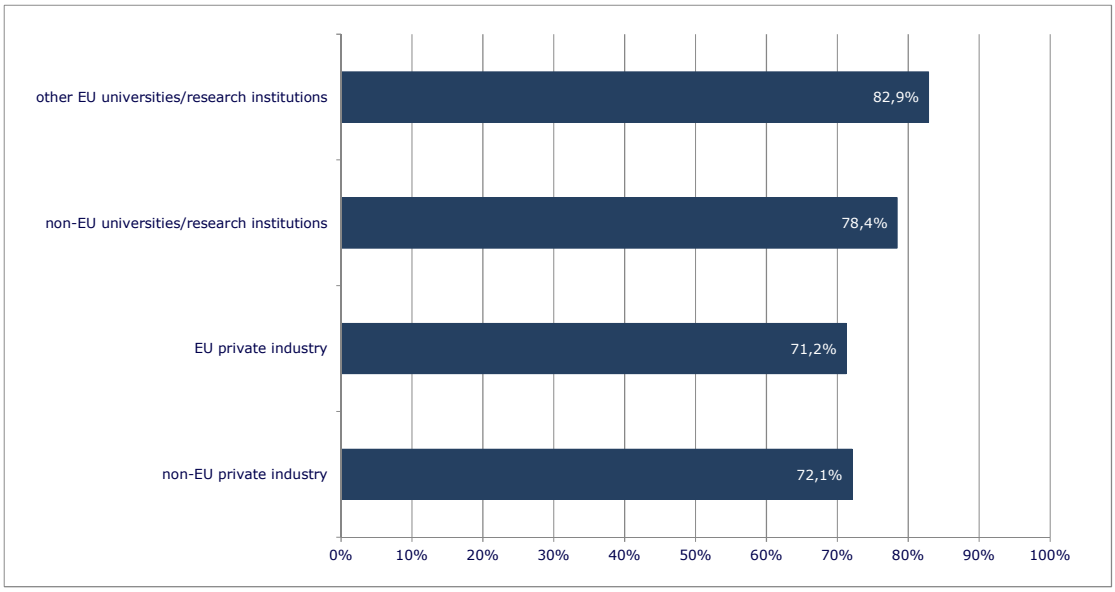
Source: MORE2 Higher Education Survey (2012)

Note: - Share of researchers in R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) career stage who indicate that they participate in the specific type of collaboration, for the not >3 month nor <3 month mobile researchers and for the other, >3 month or <3 month mobile, researchers. (n=5,099 for the mobile and n=2,032 for the non-mobile researchers)
- Multiple collaboration types per respondent are possible.

5.7.12 Collaboration as a result of mobility

Apart from research collaboration as such, it is important to know to what extent collaboration with other partners is the result of a researcher's mobility experience. In sum, the mobile respondents who indicated that they collaborate internationally with other partners were asked whether this is the case. As Figure 111 shows, more than 70% of the researchers indicate that their collaboration with a specific type of international partner is the result of their mobility experience. This mobility effect varies little in terms of the different types of partners involved. The effect is only slightly higher for academic partners than for private industry partners. This confirms the findings based on the CDH 2009 data (OECD working paper on micro data, 2012) that international mobility during the last ten years has a positive effect on international collaboration.

Figure 111: International collaboration as a result of mobility per type of collaboration for the >3 month international mobile researchers (EU27)

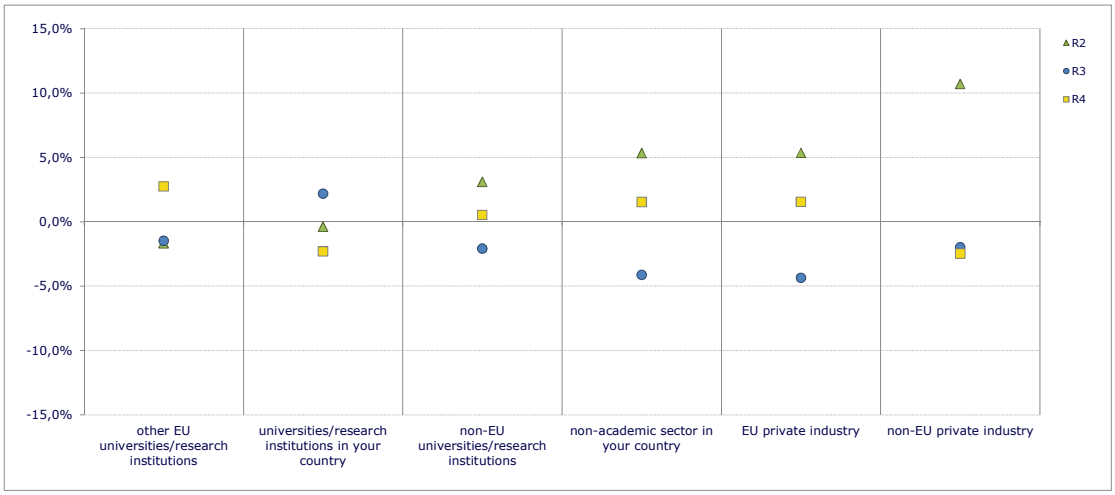


Source: MORE2 Higher Education Survey (2012)

Note: - Share of mobile researchers who collaborate internationally with the specific type of partner and for who the collaboration with this specific type of partners was the result of their mobility experience. (n=1,914)
- With 'mobility' defined as having worked abroad for more than three months at least once in the last ten years.
- Multiple collaboration types per respondent are possible.

Figure 112 depicts the difference between the percentage of mobile researchers who collaborate with different types of partners as an effect of mobility for each career stage, and the total percentage who work with different types of partners as an effect of mobility. It appears that mobility has a greater effect on collaboration with private industry for R2 researchers than for the others, especially the R3 researchers. In fact, R3 researchers are below the total average for all categories (with the exception of HEI institutions in the own country).

Figure 112: Collaboration as a result of mobility per type of collaboration and current career stage for the >3 month international mobile researchers (EU27)



	R2	R3	R4	*Total*
other EU universities/research institutions	81,2%	81,4%	85,6%	*82,9%*
non-EU universities/research institutions	59,1%	61,7%	57,2%	*59,5%*
universities/research institutions in your country	81,5%	76,3%	79,0%	*78,4%*
EU private industry	57,7%	48,2%	53,9%	*52,3%*
non-academic sector in your country	76,6%	66,9%	72,8%	*71,2%*
non-EU private industry	82,8%	70,1%	69,6%	*72,1%*

Source: MORE2 Higher Education Survey (2012)

Note: - Difference between share of mobile researchers who collaborate internationally with the specific type of partner and for who the collaboration with this specific type of partners was the result of their mobility experience for all current career stages. (n=8,355)
- *With 'mobility' defined as having worked abroad for more than three months at least once in the last ten years.*
- *Multiple collaboration types per respondent are possible.*
- *Reading note: The share of collaborating R4 researchers for whom collaboration with non-EU universities or research institutes is the result of a mobility experience exceeds the total share of researchers for whom the collaboration with non-EU universities or research institutes is the result of a mobility experience by 2.7 pp. The total share is 69.0% whereas the share for R4 is 71.7%.*

5.7.13 Virtual mobility

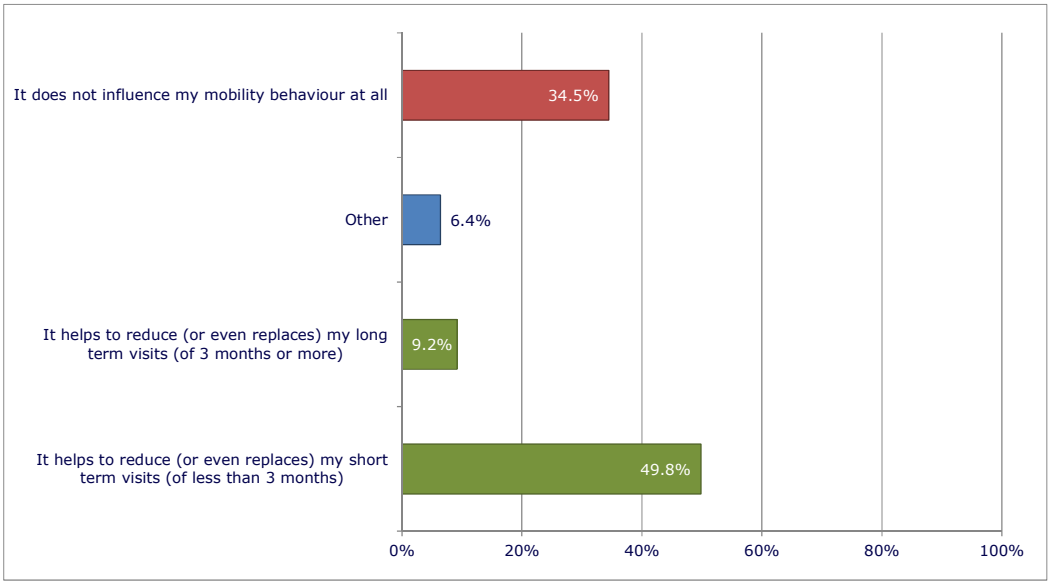
Virtual mobility is increasingly conceived as an additional tool in international research collaboration and new technologies enable researchers in many fields to collaborate with foreign researchers without the necessity for travel. Although "pure" virtual mobility programs are in fact rare, as Inzelt[69] claims (Finland's MOTIVE program with China; Sweden's Global Links for Strong Research and Innovation Milieus VINNOVA), many tools exist which are within the reach of researchers. Interestingly, they could increase or avoid short-term visits, medium term stages or long-term in-migration or out-migration events through different mechanisms.

Respondents who indicated at least once that they were engaged in international collaboration (i.e only that outside of their own country) were asked whether the use of web-based or virtual technology in international collaboration affects mobility behaviour and decisions.

[69] Inzelt A., Analysis of Researchers' Mobility in the Context of the European Reseach Area, Evaluation FP7 as supporting expert.

Figure 113 shows that 59% of internationally collaborating researchers indicate that web-based or virtual technology influences their mobility behaviour, as compared to 35% who note that it does not influence their mobility at all. 50% of respondents reported that virtual technologies in international research collaboration (IRC) influenced their mobility behaviour and decisions, as it helped to reduce (or even replace) their short them visits (of less than 3 months). In contrast, only 9% think that it helps to reduce (or replace) their long term visits (3 months or more).

Figure 113: Influence of the use of web-based or virtual technology in international collaboration on mobility behaviour and decisions (EU27)



Source: MORE2 Higher Education Survey (2012)

Note: - Share of researchers for who the use of web-based or virtual technology in international collaboration has the indicated influence (reduce <3 month mobility, reduce >3 month mobility, no influence, other). (n=5,959)
- Only for respondents that collaborate with international partner (outside own country, both academic and non-academic).

The perception of the impact of virtual technologies on international mobility varies across the career research stages. The more experienced the respondent, the more influence is attributed to virtual technologies. Furthermore, R1 researchers do not feel that their short term visits are reduced or replaced as a consequence of using virtual technologies as much as do researchers at a more senior career stage. They are 8 pp less likely than the total to respond that their IRC via virtual technology helps to reduce (or even replace) their short term visits. Moreover, they are 9 pp more likely to feel that IRC through virtual technology does not influence their mobility behaviour at all.

While >3 month mobile researchers (who spent three months or more abroad in the last ten years) are more likely to take the view that virtual technologies do not influence mobility behaviour, short term mobile researchers (spent less than 3 months abroad in the last 10 years) are more likely to see virtual technologies as facilitators of short term visits. Little evidence is found though that virtual technology would affect researchers differently according to their long or <3 month mobility profile.

No major differences on the perception of the role of virtual technology on mobility behaviour are identified based on the respondents' gender.

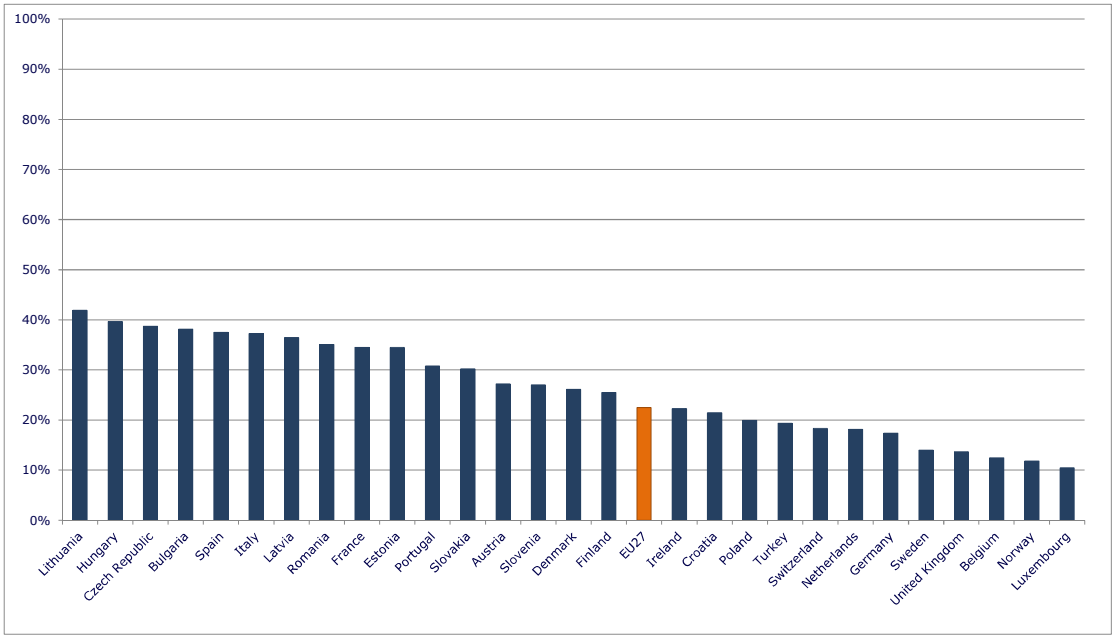
5.8 Intersectoral mobility

5.8.1 Intersectoral >3 month mobility during PhD

PhD candidates and R2 (post-doctoral or equivalent) PhD holders were asked about intersectoral mobility during their PhD. 23% of these researchers indicated that they have been mobile to a sector outside academia, in or outside their country of PhD (Figure 114). Eastern and Southern European countries have relatively high levels of intersectoral mobility during PhD research. One explanation could be a difference in the interpretation of the phrase 'work placement', e.g. as 'work'. However, when comparing the top-ranked countries' levels of mobility to private industry, this hypothesis is not confirmed. Only Spain has relatively high levels of mobility to private industry during doctoral study.

The most frequent type of mobility is to the public or government sector (10% of all R1 and R2 researchers), followed by the private not-for-profit sector (9%) and private industry (4%). The proportion of PhD researchers who embark upon international migration logically increases as the PhD develops. Of the current first-year PhD students, 12% have been intersectorally mobile, whereas from the current fifth-year (or higher) PhD students, 19% have been mobile. The shares are not significantly different for male and female researchers.

Figure 114: Work placement or internship in the non-academic sector during PhD (per country of PhD)



Source: MORE2 Higher Education Survey (2012)

Note: - Percentage of R1 PhD candidates and R2 (post-doctoral or equivalent) PhD holders researchers who indicate that they have undertaken a work placement outside of their university or higher education institution. (n=3,892)
- Countries with less than 30 observations are omitted: Cyprus, Greece, Iceland, Macedonia (FYROM) and Malta.

5.8.2 Intersectoral mobility in post-PhD career

5.8.2.1 Intersectoral mobility stock

With respect to post-PhD intersectoral mobility, the survey asked whether the respondent had ever worked as a researcher in the non-university/higher education sector (e.g. companies, NGOs, charities, non-university research institutes, governmental bodies/agencies). This question is concerned with determining the level of intersectoral mobility, regardless of whether it was international or not. However, as the sample focuses on researchers currently working in HEI in Europe, the share of researchers who have moved to the non-university sector and have not returned to EU academia to now is not included in the analysis below.

In this respect, we find that 30% of EU27 researcher population has been 'intersectorally' mobile (Table 13). Most have been active in the public or government sector (15% of all R2, R3 and R4 researchers). A smaller share has been active in the private, not-for-profit sector (7%) or in private industry (12%). Combining the private industry and private not-for-profit sector into one private destination sector (19%) yields results comparable to the MORE1 estimate of 17% of all EU27 researchers having been employed as a researcher in both the public and the private sector during their research career.

Furthermore, we find that the share of researchers who have ever had intersectoral mobility experience increases through the career stages, which is logical, given the correlation between higher career stages, age and experience.

In the total EU27 sample, female researchers are slightly below their male counterparts (28% versus 31% of the male researchers). More pronounced patterns are found at country level: female researchers are less likely to be intersectorally mobile in Macedonia (FYROM), Hungary, Germany, Denmark and Bulgaria with the share of intersectorally mobile women between 17 and 10 percentage points below that of men. The smallest differences occur in France, Ireland and Poland (around 0pp difference). On the other hand, women are more likely to be intersectorally mobile in Cyprus (17pp), Turkey (10pp) and the United Kingdom (5pp).

There is no significant difference in intersectoral mobility in terms of long term international mobility profiles.

Table 13: Intersectoral mobility per country and destination sector

	Intersectoral mobility	To public/ government sector	To private not-for-profit sector	To private industry
Austria	33%	16%	10%	12%
Belgium	29%	12%	8%	13%
Bulgaria	50%	32%	22%	16%
Switzerland	33%	14%	5%	15%
Cyprus	38%	13%	18%	16%
Czech Republic	37%	22%	8%	12%
Germany	33%	18%	8%	11%
Denmark	38%	25%	9%	13%
Estonia	28%	14%	6%	11%
Spain	28%	15%	6%	12%
Finland	30%	16%	4%	12%
France	17%	4%	3%	10%
Greece	42%	23%	13%	16%
Croatia	33%	19%	7%	14%
Hungary	44%	28%	14%	18%
Ireland	31%	12%	8%	16%
Iceland	49%	34%	6%	23%
Italy	24%	15%	9%	6%
Lithuania	42%	25%	14%	10%
Luxembourg	38%	18%	9%	15%
Latvia	45%	29%	12%	14%
Macedonia (FYROM)	47%	24%	23%	19%
Malta	34%	20%	12%	12%
Netherlands	38%	20%	12%	12%
Norway	32%	19%	8%	10%
Poland	40%	23%	8%	15%
Portugal	24%	12%	11%	6%
Romania	31%	17%	12%	11%
Sweden	30%	20%	3%	11%
Slovenia	37%	19%	10%	14%
Slovakia	28%	17%	9%	9%
Turkey	25%	18%	7%	5%
United Kingdom	30%	13%	6%	14%
EU27	***30%***	***15%***	***7%***	***12%***

Source: MORE2 Higher Education Survey (2012)

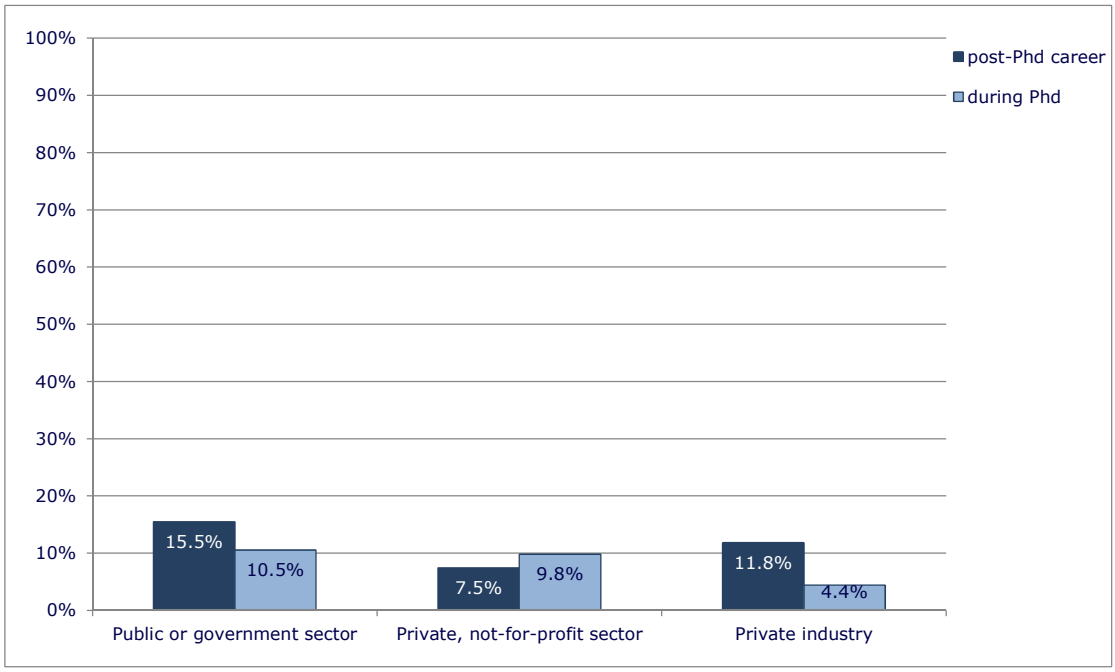
Note: - Percentage of researchers who have been intersectorally mobile (to one of the destination sectors). (n=1,999)
- With >3 month mobility during PhD only for R1 PhD candidates and R2 (post-doctoral or equivalent) PhD holders and post-PhD only for R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers.
- Multiple destination sectors per respondent are possible.

5.8.2.2 Destination sector

In Figure 115, destination sectors are analysed for both PhD and post-PhD intersectoral mobility. The share of intersectorally mobile researchers who indicated that private industry was one of their destination sectors during post-PhD mobility is considerably higher than the share for >3 month mobility during PhD. In contrast, the intersectoral mobility share with the private, not-for-profit sector is lower.

Comparing the destination sectors between fields of science (Figure 116) shows that mobility to private industry is below average for the Natural Sciences and Engineering & Technology during the PhD, while it is substantially above during post-PhD mobility. The Medical and Agricultural Sciences frequently go to the private not-for profit sector during a PhD, while their main destination sector in post-PhD stages is the public or government sector.

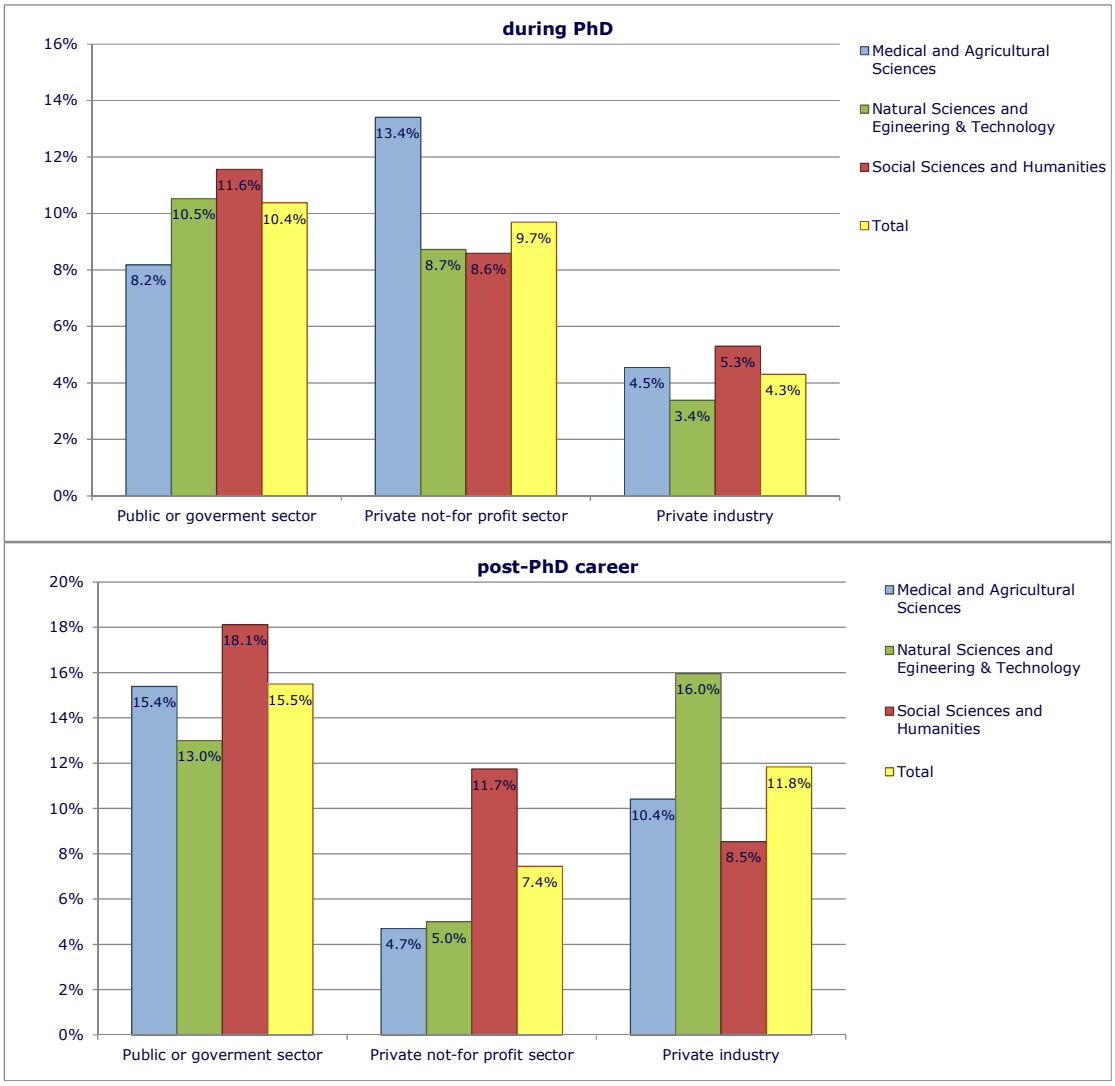
Figure 115: Intersectoral mobility per destination sector (EU27)



Source: MORE2 Higher Education Survey (2012)

Note:
- *Share of intersectoral mobile researchers who indicate the sector as being (one of) their destination sectors for >3 month mobility during PhD and mobility in post-PhD career stages. (n=1,999 for post-PhD and n=874 for PhD mobility)*
- *With 'intersectoral >3 month mobility during PhD' defined as undertaking a work placement or internship outside the university or HEI and 'post-PhD intersectoral mobility' defined as having worked as a researcher (excluding PhD) outside the university or HEI sector.*
- *With >3 month mobility during PhD only for R1 PhD candidates and R2 (post-doctoral or equivalent) PhD holders and post-PhD only for R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers.*
- *Multiple destination sectors per respondent are possible.*

Figure 116: Intersectoral mobility per destination sector and per field of science (EU27)



Source: MORE2 Higher Education Survey (2012)

Note: - Share of intersectoral mobile researchers for each field of science that indicate the sector as (one of) their destination sectors for >3 month intersectoral mobility during PhD and mobility in post-PhD career stages. (n=1,999 for post-PhD and n=874 for PhD mobility)
- With 'intersectoral >3 month mobility during PhD' defined as undertaking a work placement or internship outside the university or HEI and 'post-PhD intersectoral mobility defined' as having worked as a researcher (excluding PhD) outside the university or HEI sector.
- With >3 month mobility during PhD only for R1 PhD candidates and R2 (post-doctoral or equivalent) PhD holders and post-PhD only for R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers.
- Multiple destination sectors per respondent are possible.

We further analyse intersectoral mobility to the specific subsectors of private industry in the following sections.

5.8.2.3 Dual position

In the questionnaire researchers were asked whether their intersectoral mobility to private industry involved a so-called 'dual position', defined as being employed both in the university (or higher education institutions) and private industry.

12% of researchers have worked in private industry and 6% did so at least once in the last ten years. 2% of researchers currently work in private industry, with 1% in a dual position (or 49% of those who currently work in private industry).

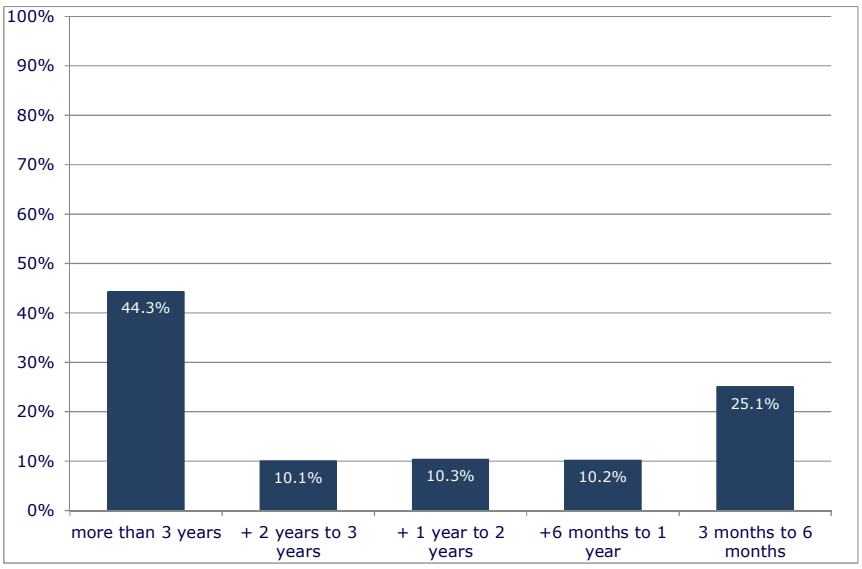
This share is considerably higher for men than for women. 45% of the male and 38% of the female researchers who have worked in private industry at least once in the last ten years have worked in a dual position during this mobility period.

For around two thirds (66%) of the current dual position researchers in private industry, their research position is their primary employment.

5.8.2.4 Duration

The duration of involvement in the industry sector was most often either long (more than 3 years) or short (3 to 6 months). (Figure 117)

Figure 117: Private sector employment duration (EU27)



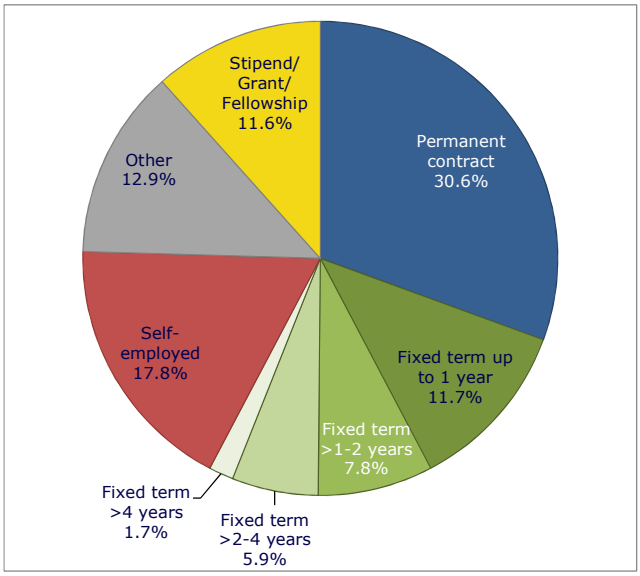
Source: MORE2 Higher Education Survey (2012)

Note: Distribution over duration of private industry employment (n=372)

5.8.2.5 Type of contract

The distribution per type of contract (Figure 118) is varied. 31% of private industry assignments for researchers fall under a permanent contract. A smaller share of assignments relate to self-employment, with a stipend, grant or fellowship or under a fixed term contract (usually under 2 years).

Figure 118: Private sector employment – type of contract (EU27)



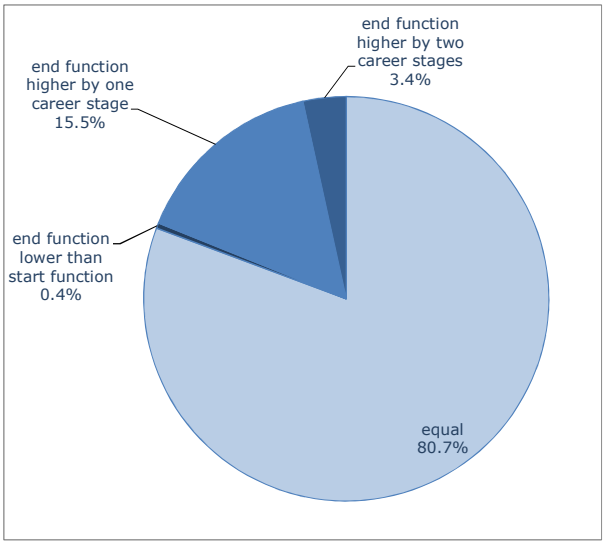
Source: MORE2 Higher Education Survey (2012)

Note: Distribution over private industry employment contract (n=393)

5.8.2.6 Career progression

Most researchers who are involved in private industry employment do not achieve actual career progression (expressed in the R1 to R4 career stages) during this period (Figure 119), but the share is slightly higher than for career progression in international moves. Around 81% of researchers active in private industry indicate that they consider themselves to be in the same career stage after their experience compared to before it. 15% do make progress, compared to 16% during an international move (cf. section 5.7.3.9).

Figure 119: Career progression in private industry employment (EU27)



Source: MORE2 Higher Education Survey (2012)

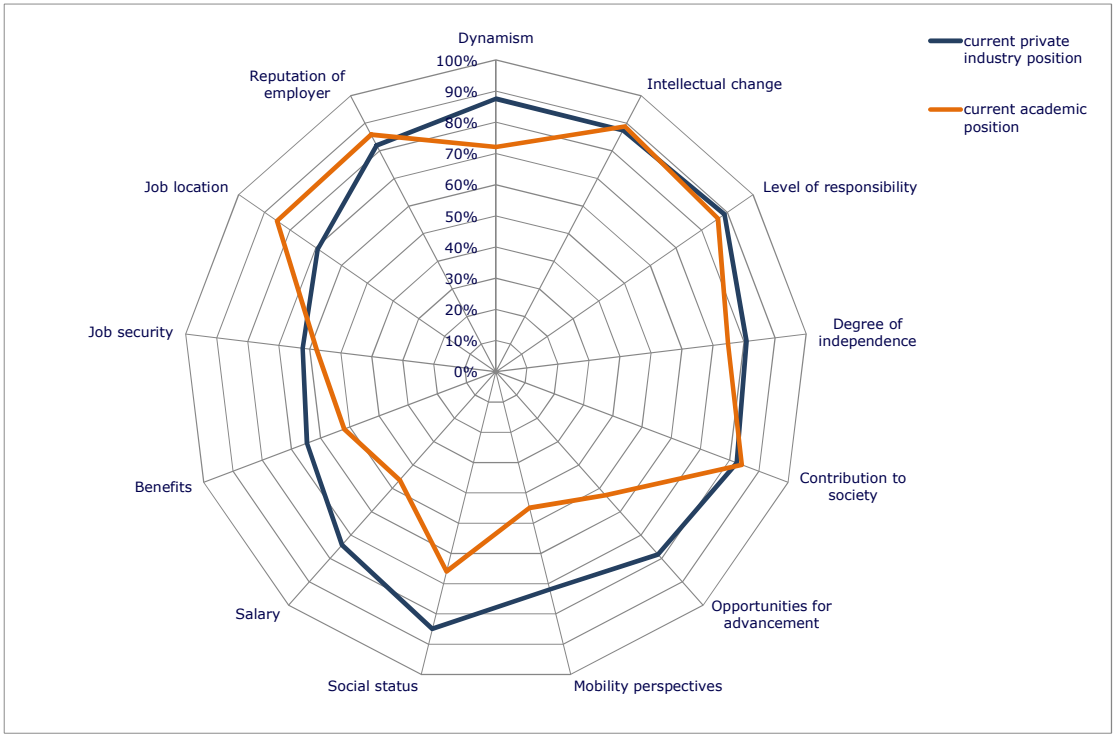
Note: Share of researchers that shifted between career stages during private sector employment (n=226)

5.8.2.7 Satisfaction with private industry employment

When comparing all researchers' intersectoral mobility to private industry with their current academic position, their academic role is viewed positively. However, when limiting the analysis to their current ongoing employment only, thus comparing two ongoing positions, this positive bias fades.

Overall, most current dual researchers seem to be relatively satisfied both with their current private industry employment as well as with their current academic position. Private industry employment ranks slightly higher for issues such as salary, benefits, social status, mobility perspectives, opportunities for advancement and dynamism. On the other hand, their academic position is better evaluated with respect to job location, reputation of employer, intellectual challenge and contribution to society (Figure 120).

Figure 120: Comparison satisfaction in current private sector versus academic position (EU27)



Source: MORE2 Higher Education Survey (2012)

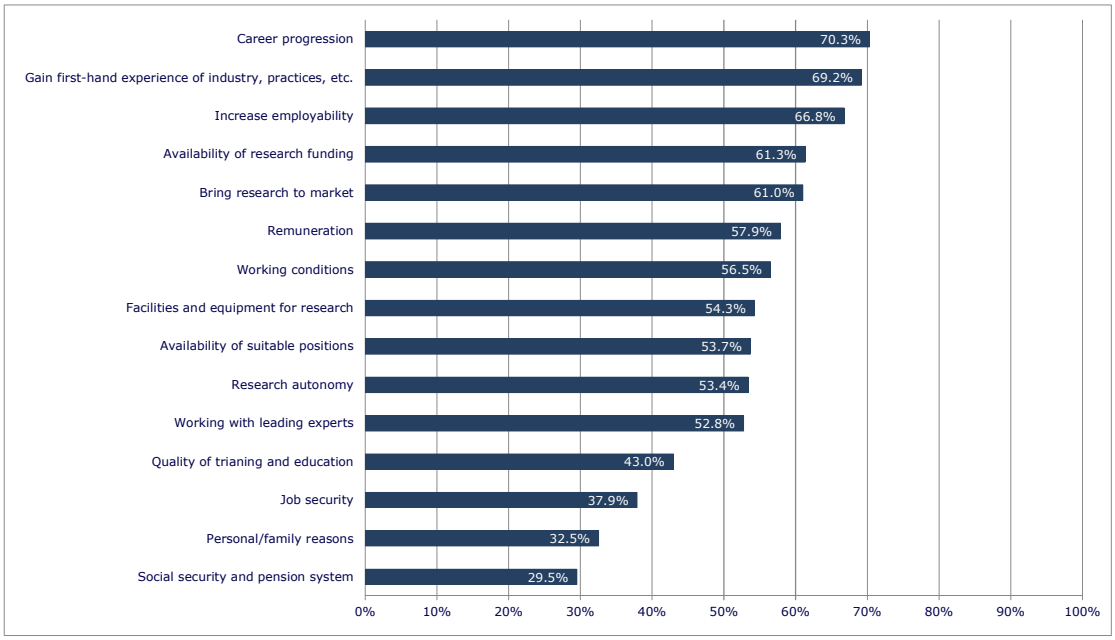
Note: Share of researchers who indicate that they are satisfied (versus dissatisfied) with their current private industry position, when compared with their current academic position (n=116).

5.8.2.8 Motives for employment in private industry

As regards the reasons for making a move to the private industry sector, researchers indicated that achieving career progression and gaining first-hand experience of industry, practices, etc. were the most important (Figure 121). This corresponds with motives given for international mobility, where career progression and working with leading experts are considered to be most important (cf. section 5.7.5.3).

Moreover, increasing employability, availability of research funding and bringing research to market were also considered to be important factors by more than 60% of the private sector mobile researchers.

Figure 121: Motives for private sector employment (EU27)



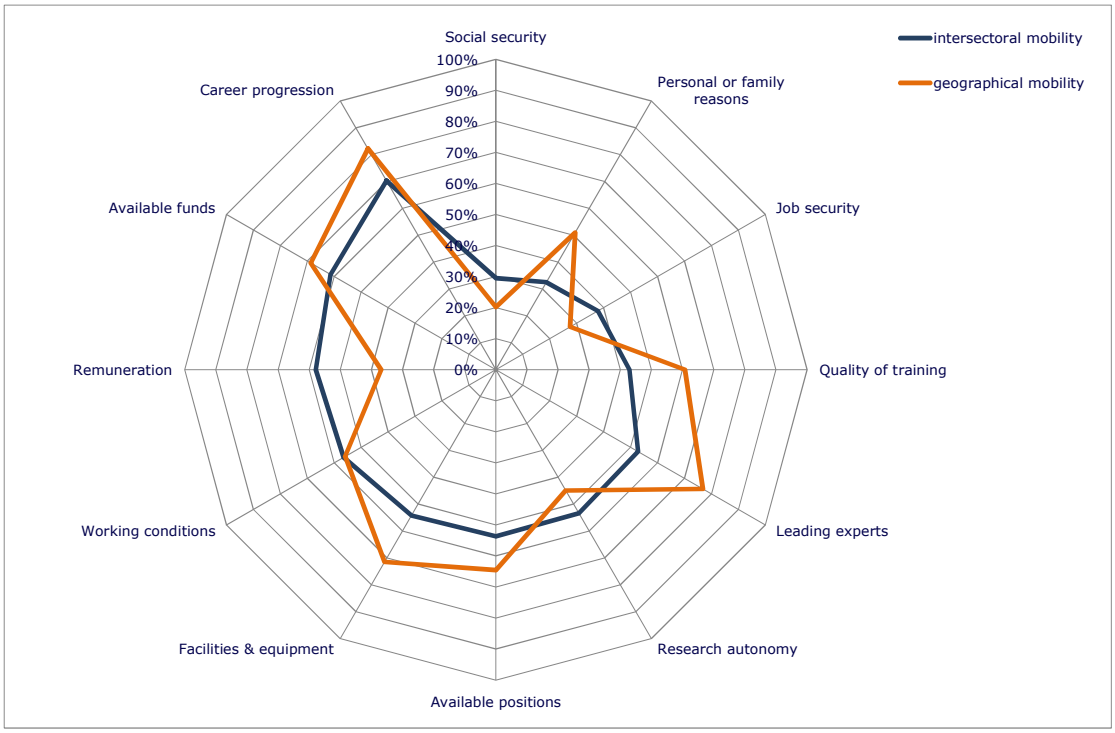
Source: MORE2 Higher Education Survey (2012)

Note: Share of researchers who indicate these motives to be important (versus unimportant) for their private sector mobility (n=392)

Least important motives for moving to private sector employment were job security, personal/family reasons and social security and pension system - factors which are not major reasons for international mobility.

In general, the ranking of the motives for private industry mobility on the one hand and >3 month international mobility on the other is fairly similar. However, variation occurs in terms of the intensity of feeling associated with these reasons for both groups. In Figure 122, we compare the importance of the motives for these researchers. On the one hand, intersectoral mobility is more often motivated by remuneration, social security, job security or even research autonomy. On the other hand, embarking on international mobility is relatively more motivated by access to research funds, career progression, facilities and equipment, available academic positions, doing research with leading experts, quality of training and personal or family reasons.

Figure 122: Mobility motives for intersectoral mobility and for long term international mobility (EU27)



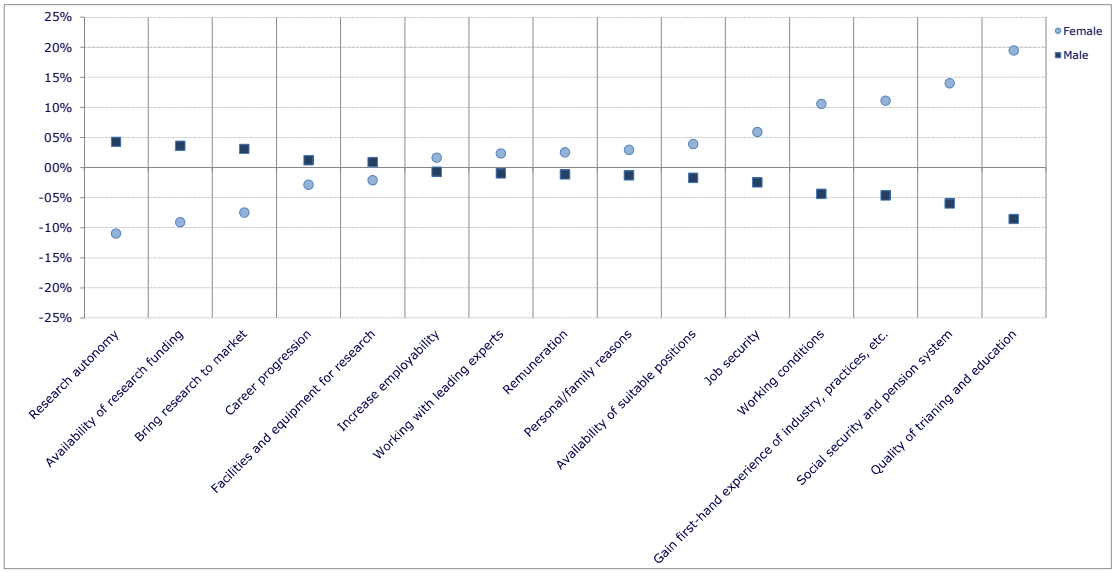
Source: MORE2 Higher Education Survey (2012)

Note: share of researchers who indicated these motives to be important (vs. unimportant) for intersectoral mobility (n=392) vs. international mobility (n=1,348)

When evaluating the most important motives for moving to the private sector across a number of family characteristics (in couple & with/without children), a number of motivations seem to be more important for single researchers without children. These are availability of research funding, availability of suitable positions and facilities and research equipment. On the other hand, some motivations are more important for researchers with children; such as research autonomy, personal/family reasons, social security and remuneration.

For male versus female researchers, the reasons for a move to the private industry sector also seem to vary systematically (Figure 123). Female researchers are more motivated by quality of training and education and first-hand experience, by extrinsic factors such as social and job security and by general working conditions.

Figure 123: Private sector mobility motives per gender



	Female	Male	*Total*
Research autonomy	44.2%	56.9%	*53.4%*
Availability of research funding	51.6%	65.1%	*61.3%*
Bring research to market	54.0%	64.0%	*61.0%*
Career progression	68.3%	71.2%	*70.3%*
Facilities and equipment for research	54.4%	54.2%	*54.3%*
Increase employability	72.1%	64.5%	*66.8%*
Working with leading experts	58.1%	50.6%	*52.8%*
Remuneration	63.9%	55.1%	*57.9%*
Personal/family reasons	35.1%	31.4%	*32.5%*
Availability of suitable positions	59.5%	51.1%	*53.7%*
Job security	45.8%	34.5%	*37.9%*
Working conditions	68.3%	51.7%	*56.5%*
Gain first-hand experience of industry, practices, etc.	82.7%	63.6%	*69.2%*
Social security and pension system	44.5%	23.2%	*29.5%*
Quality of training and education	66.8%	32.7%	*43.0%*

Source: MORE2 Higher Education Survey (2012)

Note: - Difference between percentage who finds the motive important for their mobility to the private industry in the last ten years per gender and total percentage who finds the motive important for their mobility to the private industry in the last ten years (as compared to the number of respondents who replied either important or unimportant). (n=388)

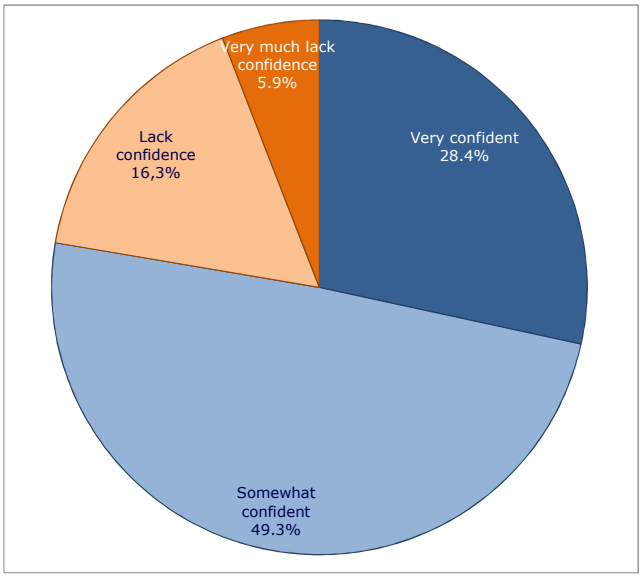
- Reading note: The share of female researchers that find quality of training and education important exceeds the share of male researchers by 34.1 pp.

5.9 Other topics

5.9.1 Confidence in future prospects for the research career

EU researchers are generally quite confident about the future prospects of their research career. Figure 124 shows that most researchers are somewhat confident and most others are very confident. Only a smaller share of around 22% lack confidence in their future career prospects.

Figure 124: Distribution over confidence level about future research career (EU27)



Source: MORE2 Higher Education Survey (2012)

Note: Share of research population that indicated different confidence levels about their future career prospects (n=9,016)

Taking a closer look at the confidence levels per career stage reveals that it is mainly experienced (R4) researchers who are 'very confident' about their career prospects (Figure 125). The R1 & R3 researchers are more frequently 'somewhat' confident than the other groups. The R2 researchers seem to be most often lacking in confidence, relative to the other career stages.

Further comparing confidence about future career prospects with the contract type in current employment shows that the self-employed and researchers with permanent contracts are the most confident (85% and 81% respectively), followed by the fixed term contracts of more than 4 years. The least confident are the researchers without contract (62% are somewhat or very confident) or with a fixed term contract of less than one year (68%).

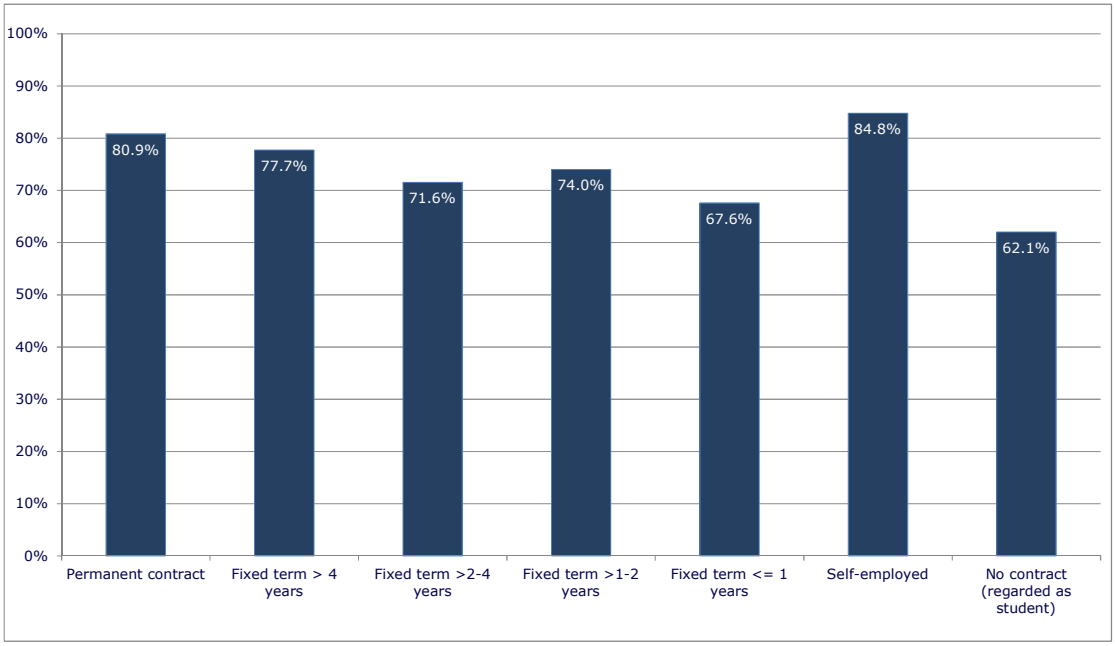
Figure 125: Confidence in future career prospects per current career stage (EU27)

	R1	R2	R3	R4	*Total*
Very confident	24.4%	19.4%	26.4%	40.6%	*28.4%*
Somewhat confident	53.2%	50.8%	51.3%	43.1%	*49.3%*
Lack confidence	16.0%	22.5%	16.3%	12.1%	*16.4%*
Very much lack confidence	6.4%	7.4%	6.0%	4.2%	*5.9%*

Source: MORE2 Higher Education Survey (2012)

Note: - Difference between share of researchers per confidence level for each current career stage and total share of researchers per confidence level. (n=9,016)
- Reading note: The share of R4 researchers who are very confident about their future career prospects exceeds the total share of researchers who are very confident by 12.2 pp.. The total share is 28.4% whereas the share for R4 researchers is 40.6%.

Figure 126: Confidence in future career prospects per contract type (EU27)

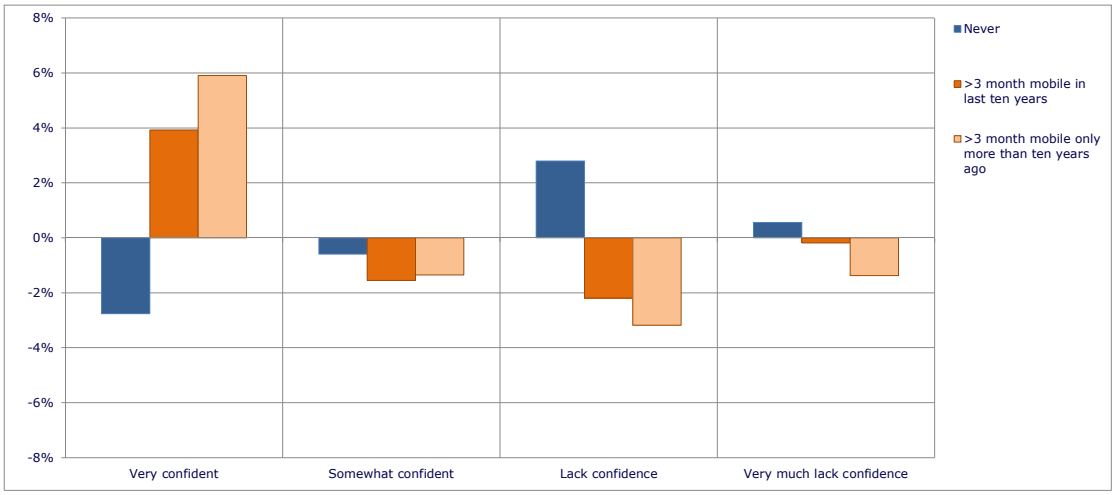


Source: MORE2 Higher Education Survey (2012)

Note: Difference between share of researchers per confidence level for each contract type in the current employment and total share of researchers per confidence level. (n=9,016)

The responses for mobile researchers indicate that they are be relatively more confident about future career prospects than never->3 month mobile researchers (Figure 127). The group of researchers who were >3 month mobile over 10 years ago are the most confident group of EU researchers. This may be interrelated with the presence of experienced R4 researchers in this group.

Figure 127: Confidence in future career prospects per long term international mobility profile (EU27)

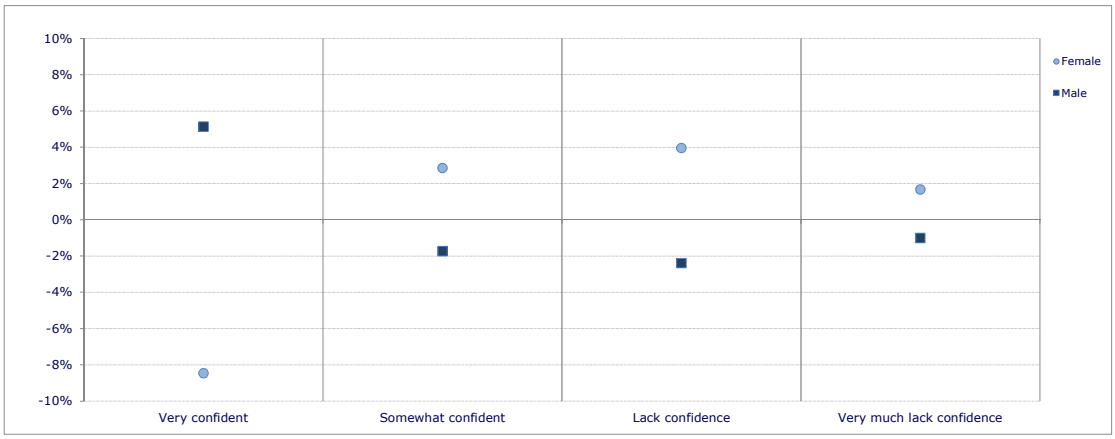


Source: MORE2 Higher Education Survey (2012)

Note: - Difference between share of researchers per confidence level for each >3 month mobility profile and total share of researchers per confidence level. (n=7,131)
- With '>3 month international mobility' defined as moves to work abroad in the last ten years for three months or more.
- Only for R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers.

Furthermore, EU researchers with non-EU citizenship are more confident about their future career in comparison with EU researchers with EU citizenship (5pp difference). It is also noteworthy that male researchers are more confident about their future career than female researchers (Figure 128).

Figure 128: Confidence in future career prospects per gender (EU27)



	Female	Male	*Total*
Very confident	19.9%	33.5%	*28.4%*
Somewhat confident	52.1%	47.5%	*49.3%*
Lack confidence	20.4%	14.0%	*16.4%*
Very much lack confidence	7.6%	4.9%	*5.9%*

Source: MORE2 Higher Education Survey (2012)

Note: - Difference between share of researchers per confidence level for each current career stage and total share of researchers per confidence level. (n=9,016)
- Reading note: The share of male researchers who are very confident about their future career prospects exceeds the share of female researchers who are very confident by 13.6 pp.

5.9.2 Awareness of EU instruments and policy

Around 11% of the EU researcher population is aware of the services offered by EURAXESS (Figure 107). This share is slightly higher in the R2 group than in the others, but the difference is not very significant: among R2 – 13% and among R1 – 10%. 3% of researchers have used the services.

The highest levels of awareness are observed in Luxembourg, Croatia, Romania, and Macedonia (FYROM) with shares higher than 25%. The lowest levels can be observed in Denmark, Sweden, the Netherlands and France with shares below 8%. In terms of use, most countries rank similarly. Exceptions are Bulgaria with 16% awareness but with 10% usage; and Estonia with 18% awareness but only 2% usage.

There is some difference in familiarity with EURAXESS between the mobile and never-mobile researchers. While 15% of >3 month mobile researchers (within the last 10 years) know EURAXESS, only 10% of non->3month mobile researchers are familiar with it.

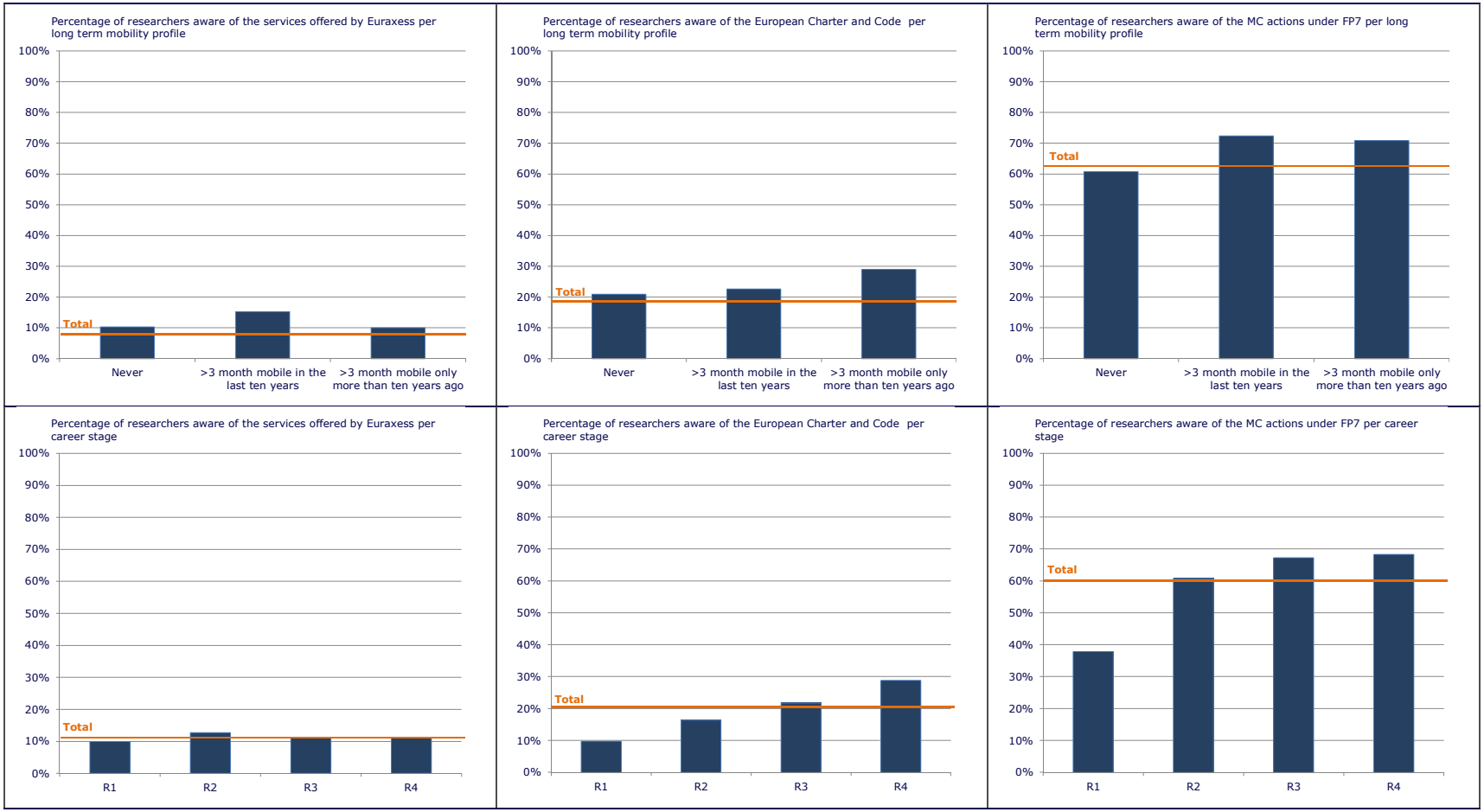
The European Charter for Researchers and Code of Conduct for the Recruitment of Researchers (C&C) are known to 20% of the researcher population. Knowledge of these instruments is higher among more senior researchers than among their junior counterparts.

Moreover, it is also clear that awareness of these instruments is slightly higher among the mobile research population than among the never->3 month mobile, especially for those who were only mobile more than ten years ago, who are again, by definition, the more experienced researchers.

Awareness of the Marie-Curie Actions of the Seventh Framework Programme for Research (FP7) is markedly higher than for the EURAXESS services or C&C. Of the EU33 research population, 60% is familiar with the Marie-Curie Actions. As with the C&C, awareness is higher among more senior researchers and among more mobile research profiles.

Around 5% of researchers were actually funded under Marie-Curie Actions (for at least 3 months). 3% are funded as early stage researcher, 2% as experienced researcher and 0.4% as both. Awareness of Marie-Curie Actions among male and female researchers is similar, but men (6%) are slightly more likely to have been funded than women (4%).

Figure 129: Awareness of EU policy initiatives: Euraxess, European Charter and Code, Marie Curie actions



Source: MORE2 Higher Education Survey (2012)

Note: - Share of researchers who are aware of the policy action per type of long term international mobility profile (n=7,131) and per current career stage (n=9,016).
- With long term international mobility defined as moves to work abroad in the last ten years for three months or more.
- Only for R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) researchers.

5.9.3 Satisfaction with recruitment process in HEI

When asked their opinions about recruitment policies at their institution, around 60-66% of researchers indicated that they were 'satisfied' with the levels of openness, transparency and the degree of merit-based recruitment (Table 14).

Table 14: Satisfaction with recruitment process at home research institution (EU27)

	R1	R2	R3	R4	% satisfied
open recruitment	56.1%	58.6%	60.1%	63.3%	60.0%
transparent recruitment	62.3%	60.6%	65.0%	68.8%	64.6%
merit-based recruitment	67.3%	60.1%	66.9%	67.9%	65.7%

Source: MORE2 Higher Education Survey (2012)

Note: % of researchers that were satisfied (vs. not satisfied) with the researcher recruitment process (n=9,016)

In general, R4 researchers are more satisfied with the different aspects of the recruitment process in HEI than are researchers in other career stages. R2 researchers are the least satisfied with transparency and merit-based recruitment, but R1 researchers are the least satisfied with openness.

Between the genders, female researchers are generally less satisfied with the recruitment process (between 6 and 9 pp difference with their male counterparts).

Finally, when comparing satisfaction with the different aspects of the recruitment process in HEI across countries, it is clear that satisfaction between the three aspects is correlated per country (Table 15). The United Kingdom has the highest proportion of satisfied researchers in terms of all three features; whereas Italy has the lowest shares for open and transparent recruitment and the one-but-lowest for merit-based recruitment. In Luxembourg, Ireland and Estonia, the proportion of satisfied researchers are also generally high, but in Croatia, Bulgaria and Slovenia, shares are overall low.

Table 15: Satisfaction with recruitment process at home research institution per country

	Open	transparent	merit-based
Austria	55.2%	55.6%	58.3%
Belgium	64.6%	60.3%	65.6%
Bulgaria	46.2%	51.3%	44.3%
Croatia	43.3%	50.3%	47.5%
Cyprus	54.0%	62.0%	61.7%
Czech Republic	52.4%	66.5%	59.0%
Denmark	64.7%	57.9%	72.0%
Estonia	63.3%	75.9%	69.7%
Finland	55.7%	57.2%	70.1%
France	56.6%	53.6%	58.5%
Germany	61.6%	64.7%	62.6%
Greece	45.0%	63.7%	61.0%
Hungary	46.1%	51.2%	52.7%
Iceland	51.7%	60.1%	61.1%
Ireland	71.3%	70.4%	68.8%
Italy	30.6%	46.2%	45.4%
Latvia	61.2%	60.0%	61.1%
Lithuania	45.9%	47.7%	52.8%
Luxembourg	72.2%	68.7%	75.8%
Macedonia (FYROM)	45.6%	54.3%	56.5%
Malta	54.8%	66.8%	69.1%
Netherlands	62.7%	65.0%	73.2%
Norway	62.0%	66.7%	69.5%
Poland	61.5%	68.1%	59.5%
Portugal	45.9%	55.8%	56.6%
Romania	51.1%	52.0%	51.9%
Slovakia	51.6%	58.4%	54.7%
Slovenia	41.1%	52.8%	52.4%
Spain	51.5%	63.4%	64.5%
Sweden	63.8%	62.9%	71.4%
Switzerland	66.1%	65.7%	68.7%
Turkey	48.8%	56.9%	51.4%
United Kingdom	77.5%	80.4%	83.1%
EU27	***60.0%***	***64.6%***	***65.7%***

Source: MORE2 Higher Education Survey (2012)

Note: % of researchers who were satisfied (vs. not satisfied) with the researcher recruitment process (n=9,016)

5.10 EU and non-EU comparison – attractiveness of EU research careers

In this final section of our analysis of key indicators from the MORE2 HEI survey, we bring together all information from this survey which relates to the attractiveness of the EU research system[70]. It should be noted that this information is not complete, nor does it distinguish between the United States and other destinations of mobility, and should therefore be interpreted with care.

On the other hand, although it is difficult to measure directly, any evidence is important as it concerns issues at the heart of the EU researcher policy. Attractiveness of EU research careers is a key determining factor in achieving the necessary growth in numbers of researchers in Europe (ERA Communication July 2012; Expert Group on the Research Profession July 2012): there is a risk of missing out if barriers and bottlenecks are not identified and tackled[71;72].

In the recent ERA public consultation[73], a number of barriers are identified as threatening the attractiveness of EU research careers (Table 16). A number of these can also be tracked, to some extent, in the MORE2 HEI survey data. From this perspective, and to provide some indications as to the relative attractiveness of the EU for researchers from the MORE2 HEI survey data, three types of analysis are undertaken:

1. First, we analyse the information on the (dis)satisfaction of researchers with their current academic position which (in the survey's methodology) is an EU position. This analysis is used to provide an insight into the relative strength of different aspects of the EU research system.
2. Second, we analyse the information gained from the directly targeted question which compares a number of aspects of the research system outside and inside the EU. Researchers eligible to respond to this question are:
   - Researchers with non-EU citizenship currently working in the EU and
   - Researchers with EU citizenship who indicate that one of their long term international moves was to a country outside the EU.

   We thus analyse the answers given by two groups of researchers to one question, in order to compare the research systems in and outside the EU.
3. Third, we compare the general barriers and motives to move to an EU versus a non-EU destination:
   - indirectly for the entire group of researchers from which data was collected (so regardless of whether or not they have experienced both types of moves) and
   - directly for the subgroup which was mobile both in and outside the EU.

Based on this analysis, Table 16 provides an overview of the interrelation between aspects of the MORE2 HEI survey and the ERA public consultation findings. The features which are perceived as better or more attractive in the EU are marked in green, and those which are felt to be more attractive outside the EU are in red. Even though each of the MORE2 questions was asked with its own independent

[70] Throughout this section, the indicators are based on the full sample (EU27+6).

[71] JRC-IPTS (2011) Barriers and bottlenecks to making research careers more attractive and promoting mobility. EC, JRC-IPTS, ERAWATCH: Fernández-Zubieta A. and R. van Bavel.

[72] Veugelers, R. (2011) A G2 for science. Policy Briefs, 519, Bruegel.

[73] EC DG Research and Innovation (2012) Areas of untapped potential for the development of the European Research Area (ERA) – Analysis of the response to the ERA Framework public consultation.

purpose rather than to provide information solely on this topic, the combination of all types of information may result in a raw picture, a number of indications, regarding the attractiveness of the EU research system.

From this table we can see that career progression and availability of facilities and equipment for research are the most consistently cited but that also remuneration is a potential threat to the attractinvess of the EU research environment. This may be due to the response patterns of different subgroups, which would simultaneously indicate the relative value attached to each aspect by the different types of researchers. Also a distinction between the US and other destination regions would allow further analysis of the potential threats and the relative attractiveness of the EU research environment.

Table 16: Threats to the attractiveness of EU research careers from ERA public consultation

	ERA public consultation	MORE2 data on **satisfaction** in current academic position	MORE2 data on **comparison research systems** in and outside EU	MORE2 data on **motives** for international mobility to EU versus non-EU		MORE2 data on **barriers** for international mobility to EU versus non-EU
1.	Lack of career prospects	Opportunities for advancement	Career progression Job security	Career progression Job security	Career progression Job security	
2.	Underfunded universities and research institutions		Research funding	Research funding	Research funding	Transferring your research funding to another country Obtaining funding for your mobility/research
	Availability of research positions		Availability of suitable positions	Availability of suitable positions	Availability of suitable positions	Finding a suitable position
	Wages	Salary Benefits	Remuneration (salary and other financial incentives) Social security and pension plan	Remuneration Social security and pension system	Remuneration Social security and pension system	
	Insufficient cooperation between academia and the private sector		Industry collaboration			
3.	Insufficient possibilities for participation in decision-making processes	Level of responsibility Degree of independence Open, transparent, merit-based recruitment process	Independence (autonomy) as a researcher	Research autonomy	Research autonomy	
	Lack of cooperation between research departments in academia and public research organisations					
	Lack of equipment and infrastructure for performing top-level research		Research facilities and equipment	Research facilities and equipment	Research facilities and equipment	Facilities and equipment for your research

Source: IDEA Consult based on ERA public consultation (2012)

5.10.1 Satisfaction with current academic position

As Figure 29 in section 5.5.3 shows, salary and other benefits rank low as features of the current academic position with which researchers are satisfied. Only just over half of researchers (who indicate either satisfied or dissatisfied) are satisfied with these aspects. The factor ranked third lowest is opportunities for advancement. On the other hand, satisfaction with independence and responsibility is rather high (87% and 89%). Satisfaction levels regarding openness, transparency and the degree of merit-based recruitment is between 61-66% (Table 14 in section 5.9.3).

Linking this to the results of the ERA public consultation, it is indeed confirmed that remuneration and career progression are issues which concern a large group of researchers and which could constitute a barrier to the attractiveness of EU research careers. Independence and responsibility are not regarded as barriers to attract researchers to the EU in the MORE2 HEI survey.

5.10.2 Direct comparison of research systems

In section 5.7.6.9 - analysis of the mobility effects as perceived by non-EU citizens who currently work in the EU - a rather positive view is presented as regarding the career options for this group. This is most notably the case with respect to career-related effects.

However, when comparing the response patterns for the direct questions on comparing research systems in and outside the EU, this picture is not quite so clear-cut.

Overall, researchers in the target group for direct comparison of research systems (both EU citizens who previously worked outside the EU and non-EU citizens who currently work inside the EU) appreciate the non-EU research system as being better than the EU system. A substantial group of one third to one half of the researchers appreciate both systems equally.

Remarkable observations are (Table 17):

- Professional factors are regarded as being better outside the EU, according to over 40% of the respondents[74], with between 30 and 40% of researchers considering them to be the same, and between 20 and 25% regarding them as worse. Specifically, these statistics relate to: remuneration (with a difference of 24 pp between those indicating 'better' versus 'worse'); research excellence (20 pp difference and 41% similar); career progression (19 pp. difference and 35% similar) and availability of suitable positions (18 pp. difference and 40% similar). Furthermore, availability of funding, teaching load and industry collaboration are more highly appreciated in the non-EU research system (17 pp. difference each and 33%, 47% and 41% similar respectively).
- The social security provisions is recognised as being worse outside the EU by more than 40% of the respondents – a 13 pp difference for 'better outside the EU'. Job security is also slightly better in the EU (2 pp difference).

[74] This share is compared to the total number of respondents who answered either better, worse or similar. The answering category NA (not applicable) is thus not included in this analysis.

Table 17: Comparison appreciation of the non-EU and EU research systems

	Better	Similar	Worse
Research funding	42.5%	32.5%	25.1%
Availability of suitable positions	39.1%	39.9%	21.0%
Career progression	42.0%	34.7%	23.3%
Job security	27.0%	44.3%	28.7%
Industry collaboration	38.3%	40.7%	21.0%
Research facilities and equipment	41.3%	35.5%	23.2%
Quality of training and education	28.7%	49.4%	21.9%
Teaching obligations	35.1%	46.6%	18.3%
Research excellence	39.3%	40.9%	19.8%
Independence (autonomy) as a researcher	34.0%	46.7%	19.3%
Quality of life	35.0%	39.7%	25.3%
Remuneration (salary and other financial incentives)	47.2%	29.7%	23.1%
Social security and pension plan	27.1%	32.6%	40.4%

Source: MORE2 Higher Education Survey (2012)

Note: - Percentage of researchers who indicate a factor to be better when working outside the EU than when working inside the EU as a researcher (as compared to the researchers indicating either better, worse or similar). (n=435 for non-EU researchers and n=756 for EU researchers)
- For the subgroup of both non-EU researchers currently working in the EU and EU researchers having previously worked outside the EU.

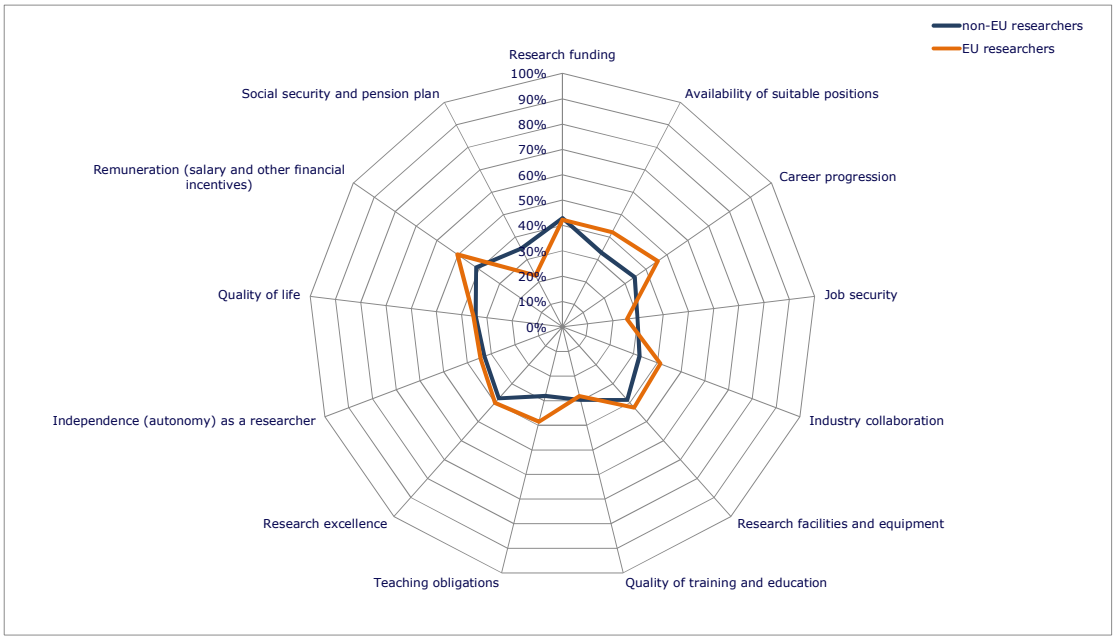
Figure 130 compares the response patterns of EU versus non-EU citizens. Whilst interesting, this figure has to be interpreted with care as regards features which are not equally accessible to the different subgroups. For example, EU social security is appreciated more highly by EU citizens, but this also relates to the fact that not all non-EU researchers can benefit equally from it. The emphasis placed on this issue is therefore smaller for non-EU researchers.

However, the largest differences occur for the same professional factors which are generally are appreciated as being better outside the EU: remuneration; career progression; availability of suitable positions; industry collaboration and teaching obligations. EU citizens more frequently consider these factors to be better outside the EU, which does confirm the earlier findings. These findings can subsequently be interpreted as relevant 'push factors' which encourage EU researchers to work outside the EU.

Variations also occur across career stages. Although the number of observations is limited per career stage, a number of differences are observed (Figure 131):

- R3 and R4 researchers have a more pronounced appreciation of the research system outside the EU than their R2 counterparts.
- As mentioned earlier, the professional aspects of the research system are generally appreciated as being better outside the EU and it appears that this is increasingly so during subsequent career stages.
- Personal and formal/legal areas such as quality of life, job security and social security are less often appreciated as being better by those researchers in the later career stages.

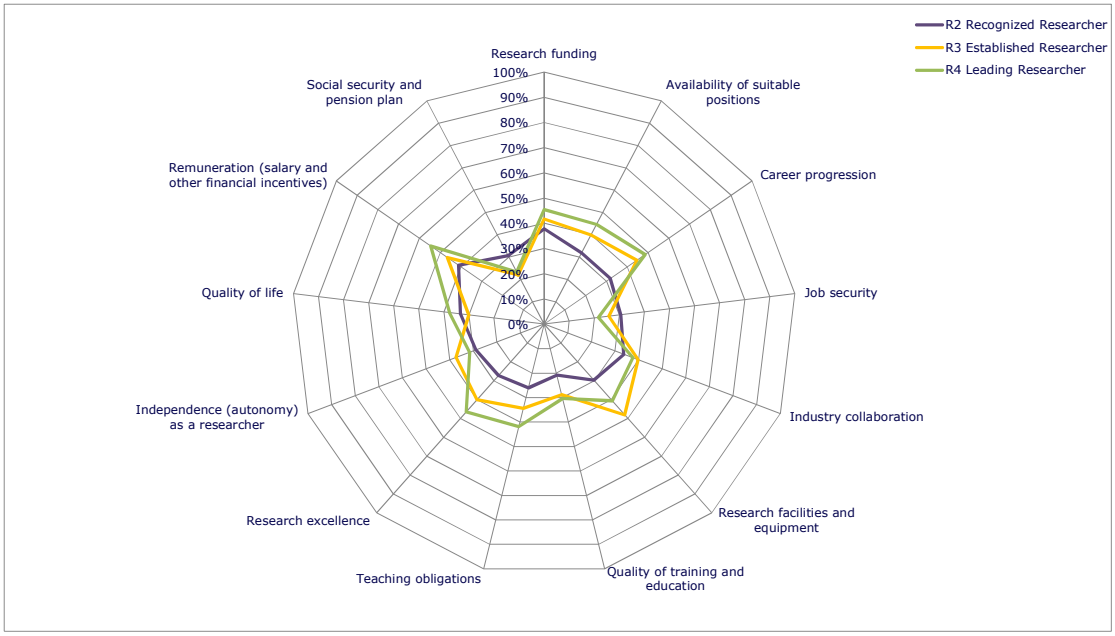
Figure 130: Comparison between working outside the EU and working inside the EU as a researcher per region of citizenship



Source: MORE2 Higher Education Survey (2012)

Note: Percentage of researchers with EU versus non-EU citizenship who indicate a factor to be better when working outside the EU than when working inside the EU as a researcher (as compared to the researchers indicating either better, worse or similar). (n=435 for non-EU researchers and n=756 for EU researchers)

Figure 131: Comparison between working outside the EU and working inside the EU as a researcher per current career stage



Source: MORE2 Higher Education Survey (2012)

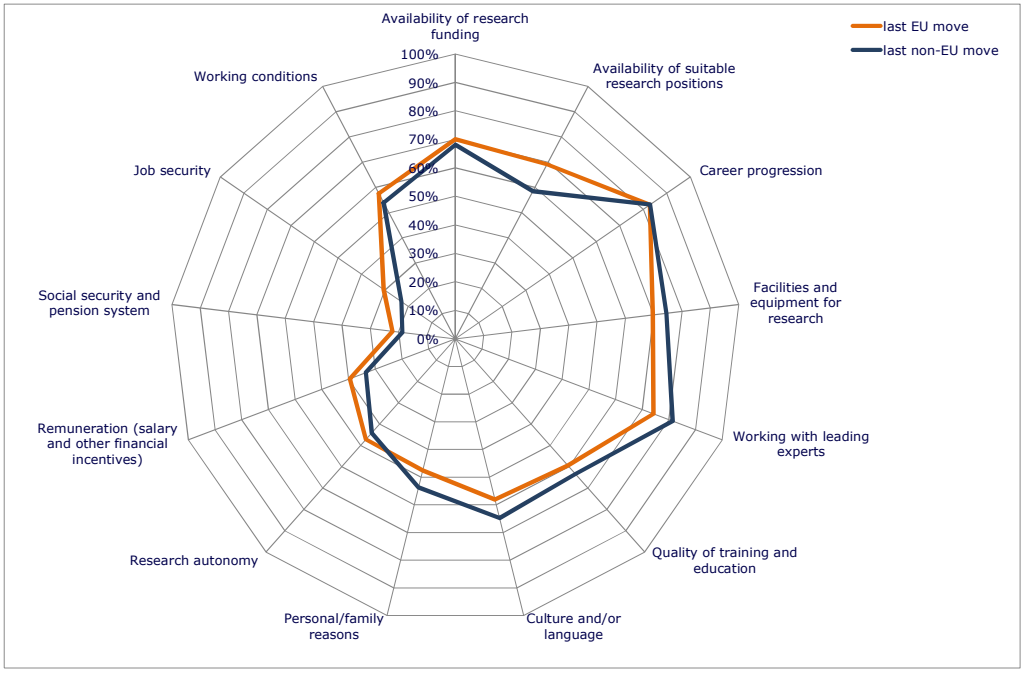
Note: Percentage of researchers in R2 (post-doctoral or equivalent), R3 (established) or R4 (leading) career stage who indicate a factor to be better when working outside the EU than when working inside the EU as a researcher (as compared to the researchers indicating either better, worse or similar). (n=117 for R2, n=81 for R3 and n=41 for R4)

5.10.3 Indirect and direct comparison of barriers and motives for mobility

5.10.3.1 Indirect comparison of motives

Figure 132 shows that motives for most recent EU and non-EU moves are very similarly rated. There is no contradictory evidence that the EU is less attractive in terms of job security, social security or remuneration. All of these motives are more important in a move to or within the EU than they are to a non-EU destination. Availability of funding or positions and career progression also correspond with this pattern. The only support for the findings from the ERA public consultation is the higher weighting given to facilities and access to leading experts in move to a non-EU destination.

Figure 132: Motives for long term international mobility in the last ten years to destinations in and outside the EU



Source: MORE2 Higher Education Survey (2012)

Note: - Share of mobile researchers who indicate that the motive is important when making their mobility decision for their last move in or outside the EU (as compared to researcher answering either important or not important). (n=1,348 for last EU move and n=774 for last non-EU move)
- With 'mobility' defined as long term international mobility in the last ten years, i.e. having moved abroad for three months or more in the last ten years during post-PhD career.

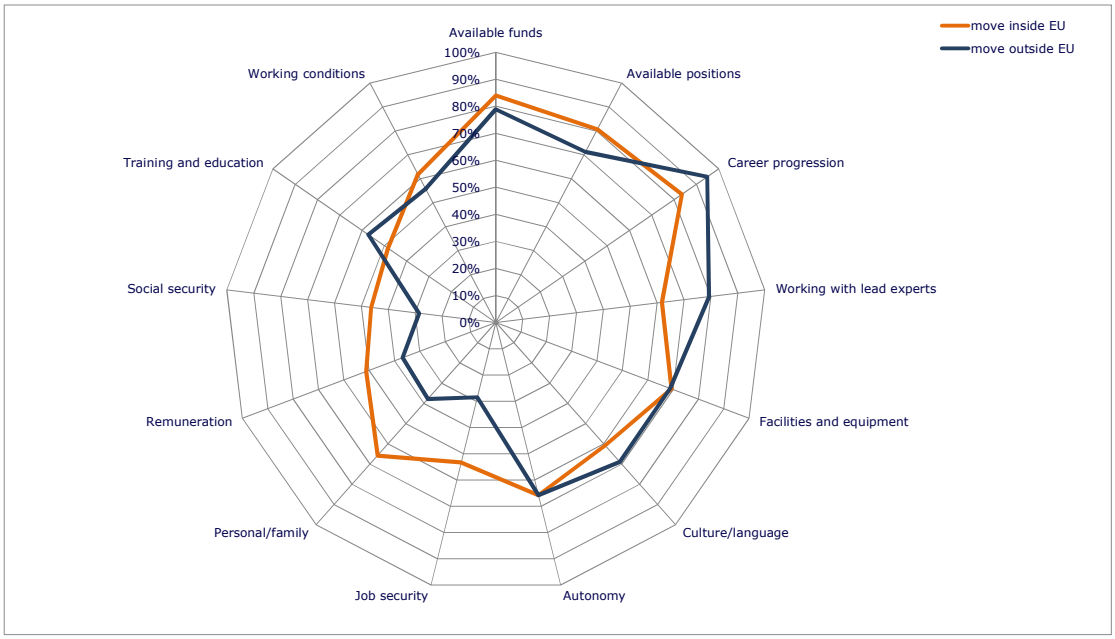
5.10.3.2 Direct comparison of motives

For the subgroup of researchers who were mobile both outside and inside the EU[75], motives for mobility in both moves are compared as a means of assessing what attracts an individual researcher to both research systems. This analysis concerns the group of EU citizens whose last move was within EU and who also indicated that one of their previous moves was outside the EU. Information on the EU thus concerns the last move only. Given that this analysis is based on fewer than 100 observations, results should be interpreted with care.

This comparison confirms the conclusions drawn in the previous sections: moves outside the EU are more frequently driven by professional factors, while moves within the EU are motivated by social security, job security and personal reasons (Figure 133). Working conditions, funds and autonomy in research are similar for both decisions. However, in terms of reasons for mobility, remuneration plays a more important role for mobility within the EU. Despite the fact that remuneration may be more highly valued in the non-EU research systems, it is not the main reason for a stay of over 3 months outside the EU.

Nevertheless, comparing the top 5 motives for both types of moves shows that the same motives appear to dominate both decisions (Table 18). The difference thus lies mainly in the intensity with which the reasons are felt to be important.

Figure 133: Comparison importance of motives for >3 month mobility to a destination within versus outside the EU



Source: MORE2 Higher Education Survey (2012)

Note: - Percentage of researchers who moved both within and outside the EU who indicate a factor to be an important motive in their decision to move for 3 months or more to a destination in the specific region (as compared to the researchers indicating either important or not important). (n=91)
- This concerns the group of EU citizens whose last move was within EU and who indicated that one of their other moves was outside the EU.

[75] Due to the set-up of the questionnaire, data within this subgroup was only collected for EU citizens whose *last* move was within EU and who indicated that one of their other moves was outside the EU.

Table 18: Top 5 motives for >3 month mobility to a destination within versus outside the EU

rank	move inside EU		move outside EU	
1	Available funds	83.9%	Career progression	94.9%
2	Career progression	83.4%	Working with lead experts	79.3%
3	Available positions	80.6%	Available funds	78.9%
4	Facilities and equipment	69.3%	Available positions	71.3%
5	Personal/family	65.8%	Culture/language	68.9%
6	Autonomy	65.8%	Facilities and equipment	68.8%
7	Working conditions	61.9%	Autonomy	65.8%
8	Working with lead experts	61.8%	Training and education	57.2%
9	Culture/language	60.8%	Working conditions	55.8%
10	Job security	53.4%	Personal/family	37.9%
11	Remuneration	51.1%	Remuneration	36.8%
12	Training and education	48.4%	Social security	28.5%
13	Social security	46.4%	Job security	28.5%

Source: MORE2 Higher Education Survey (2012)

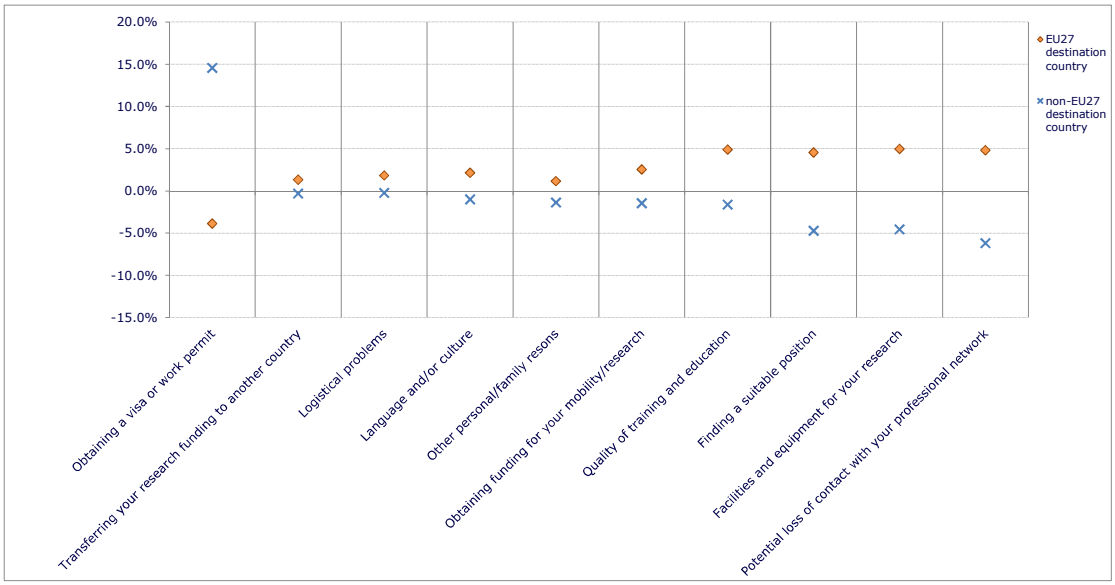
Note: - Percentage of researchers who moved both within and outside the EU who indicate a factor to be an important motive in their decision to move for 3 months or more to a destination in the specific region (as compared to the researchers indicating either important or not important). (n=91)
- This concerns the group of EU citizens whose last move was within EU and who indicated that one of their other moves was outside the EU.

5.10.3.3 Indirect comparison of barriers

When analysing the difference between EU27 and non-EU27 destinations, it appears that the largest difference concerns obtaining a visa or work permit. As can be expected for non-EU27 destination countries, this is felt to be a major barrier.

In relative terms, EU27 destination respondents perceive the potential loss of contact with their professional network, facilities and equipment for research, and finding a suitable position and quality of training and education as representing more significant barriers. Given the geographical differences, the opposite finding would be more likely, although the result is in line with a number of barriers to EU attractiveness identified in the ERA public consultation (cf. supra Table 8). Transfer of research funding or funding for mobility are similarly appreciated as barriers to both destination regions.

Figure 134: Barriers to long term international mobility in the last ten years to destinations in and outside the EU



	EU27 destination	non-EU27 destination	*Total*
Obtaining a visa or work permit	12.1%	30.5%	*15.97%*
Transferring your research funding to another country	17.7%	16.0%	*16.34%*
Logistical problems	38.1%	36.0%	*36.27%*
Language and/or culture	26.0%	22.8%	*23.82%*
Other personal/family reasons	27.7%	25.2%	*26.54%*
Obtaining funding for your mobility/research	45.9%	41.9%	*43.38%*
Quality of training and education	26.0%	19.5%	*21.12%*
Finding a suitable position	39.4%	30.1%	*34.84%*
Facilities and equipment for your research	32.9%	23.3%	*27.88%*
Potential loss of contact with your professional network	29.9%	18.9%	*25.08%*

Source: MORE2 Higher Education Survey (2012)

Note:
- *Difference between percentage of mobile researchers who indicate the barrier to be important in their mobility decision for a destination in or outside the EU and the total percentage of mobile researchers who indicate that the barrier is important to their mobility decision (as compared to researcher answering either important or not important). (n=1,843)*
- *With 'mobility' defined as long term international mobility in the last ten years, i.e. having moved abroad for three months or more in the last ten years during post-PhD career.*
- *Reading note: The proportion of mobile researchers who find the availability of facilities and equipment for research important as barrier for moves to EU destinations exceeds the share for non-EU destinations by 9.6 pp. The share for EU destinations is 32.9% whereas the share for non-EU destinations is 23.3%.*

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ANNEX 1: STATE OF THE ART RESEARCH ON MOBILITY AND CAREERS IN RESEARCH

1. Career paths and working conditions for researchers

Although the focus of other work packages in the MORE2 study, the career paths and working conditions of individual researchers are an important chapter in the HEI survey. Surveying these themes not only enables us to put other indicators in context, but also provides evidence regarding important aspects of the research career which can be incorporated into the wider strategy of increasing the number of researchers in the EU. We therefore refer to the state of play for these themes in the following sections. We first discuss national differences in the career paths of researchers and the increasing importance of non-linear career trajectories. We then go on to provide an outline of the general working conditions of researchers, and for early-stage researchers in particular.

1.1. National differences in researchers' career paths

Traditionally, research career paths are strongly embedded in the system and organized via academic-disciplinary units. Peers have a decisive influence on recruitment and research careers; promotion occurs through the ranks and is based upon research performance. Where recruitment and promotion are left to a small group of peers, the process of entering the community of scholars is a rather closed and hierarchical system. There is considerable variation between the length of the different vertical stages and the number of hurdles which exist to move researchers from one stage to another. These hurdles create many uncertainties for academics and tend to undermine the attractiveness of pursuing an academic career. A good understanding of these trajectories is important if the objectives of underlying study are to be met.

Behind this general picture, career paths differ according to particularities of national research systems, the functioning of national labour markets for researchers, and disciplinary cultures and features. Several studies point out how recruitment and promotion procedures, remuneration, workloads, career paths and working conditions differ considerably from one country to another. Among the variables which account for these differences, three dimensions are notable for the current project.

1) **The national legislation regarding employment relationships and the institutional framework within which these relationships are organised and regulated**. There are important differences between countries where academic staff have 'career' civil servant status as is most common in continental Europe (in the sense of tenured positions) and those who have 'non-career' public employee status. The latter approach, most common in Anglo-Saxon countries, is more likely to result in flexible employment practices and to facilitate professional and organisational

change[76]. Furthermore, academic labour markets - including working conditions and salaries - can be regulated by government laws and decrees, sometimes leading to strict career ladders, or occasionally being determined at the national or local level.

2) **Career models can broadly be distinguished between the 'chair' and the 'department-college' model.** In the 'chair' model - which is prevalent in continental Europe - there is a sharp distinction between the professoriate holding tenured positions as chair-holders and the large group of other (untenured) academics. The latter go through a rather long contract-style career based on a series of fixed-term appointments after obtaining a stable post. Professorial appointments are seen as big jumps in status, prestige, independence and resources.

   In the departmental-college model (mostly in the Anglo-Saxon world), career progression is regulated more on the internal labour market within the tenure track. Academic faculty from lower ranks to professors essentially have the same tasks, so admission into the regular staff structure of tenured positions comes earlier and further career steps within academia are set more regularly. Academics are eligible for a tenure-track position relatively early on, in which they have the opportunity to demonstrate that they are good enough to obtain tenure. The phenomenon of the tenure-track is becoming more accepted in European research systems.

3) **The balance between internal and external labour markets.** Labour markets are understood in terms of recruitment procedures, processes allocating individuals to positions and organising career paths. Within internal markets, career trajectories take place within a HE institution where rules and incentives are the determining factors. In external labour markets, career development is dependent on the success in being hired for vacant positions in institutions other than one's own. This balance is not necessarily determined at national level, but can lead to institutional or faculty differentiation within one system, depending on the position of the institution in the national and international market as well as in terms of its history and culture. Some institutions mainly play on the external labour market via international recruitment, while others are linked more to the internal labour market. Science and engineering faculty generally seems to be more linked with the external labour market than other disciplines.

These factors differ according the particular point/stage a researcher is at during his career.

1.2. Linear and multiple career paths

Views on careers assume a relatively linear career path, emphasizing vertical progression through positions which have increased responsibility, work complexities and rewards. This corresponds with definitions of vertical success: climbing the corporate pyramid, more attractive working conditions and higher remuneration. Progression is based on frequent upward moves entailing international mobility.

In the literature on careers we observe a major shift away from this traditional conceptualisation of careers towards more 'protean' types of careers involving

[76] Farnham, D. (2009): Employment Relations in Europe: a Comparative and Critical Review. In: Enders, J./ de Weert, E. (eds.): *The Changing Face of Academic Life. Analytical and Comparative Perspectives*. Basingstoke: Palgrave Macmillan. p: 195-217.

more flexible and mobile patterns. Hall and Moss[77] argue that in contrast to the traditional career, the protean career involves relationships that are driven by the individual, not the organization and is subject to reinvention by the person from time to time, as the individual and their environment are subject to change. The protean career is unique to the individual and can be understood in various ways - as personal achievement, feelings of pride, or family happiness. Commitment to an organization is less important in the protean career as organisations pursue more transactional relations with their employees who, in turn, are encouraged to pursue more self-interested careers.

This view of working life may be applicable to the position of researchers throughout the various stages of their careers. Various subjective aspects of protean careers are encountered, such as continuous learning, involvement in challenging research groups rather than working on an individual project, and opportunities for knowledge/skill enhancement. These are the type of challenges researchers regard positively and that therefore - to some extent – compensate for the often precarious employment conditions of early stage researchers.

This 'flexicurity' involving confidence about future prospects and developing a portfolio of research competences and results may well function as a mechanism by which early stage researchers decide for, or against, a researcher career.

1.3. Working conditions for researchers

The MORE1 study has shown that 'good working conditions' are a very important influencing factor for researchers' job mobility[78]. We discuss below the important topics which warrant further investigation. First, we outline the working conditions for researchers on a general level. We then go on to discuss the specific working conditions which are important to doctoral candidates and post-doctoral researchers.

1.3.1. General working conditions for researchers

National research systems differ in terms of: the resources provided; the actors providing research funds and those undertaking research and the means used to fund research etc. For example, expenditure on R&D varies considerably between countries, and only a few European countries are on the point of reaching the 3% Lisbon objective. While, in some countries, research is primarily conducted at universities (e.g. in Italy, the UK, Switzerland and the Netherlands), non-university public research institutions play a crucial role in Germany, for example (Max Planck Society, Fraunhofer Society, Helmholtz Association and Leibniz Society) and France (CNRS).[79]

Aside from national funding and performing systems, country-specific forms of employment structures also have an impact on researchers' working conditions. The employment structure defines the social security / pension provisions as well as the researcher's employment status, i.e. the different legal status of

[77] Hall D.T. & J.E. Moss (1998). The new protean career contract: Helping organizations and employees adapt. Organizational Dynamics, 26(3), pp22-37.

[78] European Commission (2010): MORE. Study on mobility patterns and career paths of EU researchers. p: 99.

[79] http://cordis.europa.eu/erawatch/index.cfm?fuseaction=about.home#RI

researchers (civil servant vs. employee status)[80]. The role of researchers as civil servants is imbued with duties of loyalty to the state in return for a high social status, (relatively) high remuneration and job security. For instance, in France, both at HEIs and at the CNRS, the bulk of scientific staff has the status of civil servants. However, in Germany, tradition dictates that only professors can receive this privilege.

A multiplicity of studies relates a researcher's working conditions to type of contract (full-time vs. part-time) as well as to the length of contract (fixed-term vs. permanent).[81] For instance, in the UK, the majority of professors, senior lecturers / readers and lecturers have a permanent position. Lecturers and senior lecturers can upgrade their position and their range of responsibilities considerably by changing university. According to a current survey, most scientists at UK universities are satisfied with their work-life balance and they believe that higher education institutions are committed to equality and diversity[82]. Another important factor for high levels of job satisfaction, and hence for 'good working conditions', is remuneration. In this regard, the UK and Switzerland are among the few countries that can compete with the USA[83] and, although not exclusively for this reason, attract scientists from all over the world. Apart from contract and remuneration, the research infrastructure in terms of the equipment – i.e. staff, technology, rooms / laboratories – as well as the teaching and administrative load researcher are faced with, are relevant aspects as far as working conditions and consequent job satisfaction are concerned.[84]

Europe, to a large extent, is also faced with a chronic gender imbalance among scientists. The proportion of women entering the higher education system increasingly exceeds that of men, but women are still outnumbered by their male counterparts in more highly ranked positions. There is an increasing drop-out rate of women as they climb higher up the research career ladder – a period which often coincides with the phase of having children. Hence, the gender issue has to be kept in mind in terms of all aspects of research career development in Europe, especially when it comes to working conditions (family support such as maternity leave, childcare facilities or dual career perspectives).

Thus, national research systems determine the conditions under which research can be realized and can also structure the career paths of researchers. Hence, the framework conditions for research (resources provided (GERD as a percentage of GDP), the main sources of research funding, the relation between basic funding and third-party-funding as well as country-specific funding schemes and the

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80 Farnham, D. (2009): *Employment Relations in Europe: a Comparative and Critical Review*. In: Enders, J./ de Weert, E. (eds.): The Changing Face of Academic Life. Analytical and Comparative Perspectives. Basingstoke: Palgrave Macmillan. p: 195-217

81 e.g.: Enders, J. (ed.) (2001): *Academic staff in Europe. Changing Contexts and Conditions*. Westport, Connecticut/London: Greenwood Press; Kreckel, R. (ed.) (2008): Zwischen Promotion und Professur. Das wissenschaftliche Personal in Deutschland im Vergleich mit Frankreich, Großbritannien, USA, Schweden, den Niederlanden, Österreich und der Schweiz. Leipzig: Akademische Verlagsanstalt

82 Careers Research and Advisory Centre (2009): Careers in Research Online Survey. 2009. Analysis of aggregated UK results. p: 3. Available at:

http://www.vitae.ac.uk/CMS/files/upload/CROS_2009_October.pdf

83 European Commission (2007): Remuneration of Researchers in the Public and Private Sectors. p: 161. Available at: http://ec.europa.eu/euraxess/pdf/research_policies/final_report.pdf

84 See for example: Enders, J./ de Weert, E. (eds.) (2009). *The Changing Face of Academic Life. Analytical and Comparative Perspectives*. Houndsmill, Basingstoke: Palgrave; Locke, W./ Teichler, U. (eds.) (2007): The Changing Conditions for Academic Work and Careers in Selected Countries. Kassel: INCHER; Kreckel, R. (ed.) (2008): Zwischen Promotion und Professur. Das wissenschaftliche Personal in Deutschland im Vergleich mit Frankreich, Großbritannien, USA, Schweden, den Niederlanden, Österreich und der Schweiz. Leipzig: Akademische Verlagsanstalt

performing sector) need to be addressed. In addition, the employment conditions such as type of contract, remuneration, and composition of the workload as well as the research infrastructure provided are factors affecting both researchers' career paths and mobility.

1.3.2. Working conditions for early-stage researchers

Traditionally, working conditions for doctoral candidates differ considerably within national research systems, particularly in terms of the institutional framework (fellowship vs. salary, remuneration, teaching and administrative load).[85] In recent years, changes to the structure of doctoral education are now under way across Europe. There is no longer any question of whether or not Bologna reforms will be implemented, but rather a shift to consideration of the conditions in which implementation is taking place[86]. For example, in Germany, the 'new system' has been introduced in parallel to the existing one. E.g. the traditional system of doctoral education at German universities is complemented by a diverse range of coordinated programs[87].

In some countries, seniority and hierarchy play a significant role in entering and advancing in academia. Hence, the academic career of a young researcher depends considerably upon her/his tutor (academic standing, internationalization). For instance, in Italy, full professors are very powerful in managing and controlling academic positions. A young researcher, however brilliant he/she is, is highly dependent on his tutor and has hardly any chance of being promoted without the support of their professor.

The entry into academia as a young researcher usually requires some form of post-graduate training, but typically demands that individuals complete a doctoral degree. In this context, it is important to acknowledge that a doctorate can imply different things. Although a research degree enables young academics to undertake independent research and teaching and to be valued as full-fledged member of scientific staff in France, the UK and the Netherlands, PhD holders depend strongly on their professors in Germany, Italy and in (the German-speaking part of) Switzerland. Traditionally, in Germany, France and (the German-speaking part of) Switzerland, a habilitation is required in order to get a professorship. A habilitation may establish the quality of a young scientist, but it also means that postdoctoral candidates are dependent for a long period of time. This long-lasting lack of autonomy is connected with substantial uncertainty and can involve many haphazard career steps. In Germany and Switzerland there are hardly any tenured positions available until professorship is reached—rarely before the age of 40. Moreover, while in Germany regulations prohibit internal promotion to a professorship, in other countries this may be the main route to a permanent position (for instance in the Netherlands).

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85 For an overview on national specifics of doctoral education see: Maresi, N./ Heggelund, M. (ed.): *Toward a Global PhD? Forces & Forms in doctoral education worldwide*: Washington: Washington Press 2008

86 CHEPS (2002): Science, Training and Career. *Changing modes of knowledge production and labour markets*. Enschede: University of Twente; Crosier, D. et al. (2007): Trends V: Universities shaping the European Higher Education Area. European University Association AREA. Available at: www.eua.be

87 The iFQ has initiated a longitudinal survey on doctoral candidates (ProFile – Doctoral Candidates Panel). The project started by addressing the question of whether the introduction of structured doctoral programs at German universities is changing the career patterns of doctorate holders. For further information see:

http://www.research-information.de/Projekte/ProFile/projekte_profile_lang.asp

In addition to fixed term positions, third-party funded researcher positions or fellowships, some national research systems also offer attractive well-paid permanent positions for post-docs aside from the professorship, such as the "lecturer" post in the UK and the "maître de conferences" in France. Normally, these positions involve a tenure track program and offer the possibility of undertaking independent research and teaching. Hence, doctorate-holders are not considered a researcher in training, but as a valued colleague within the staff body. A lecturer position is usually tenured after a probationary period of three years, and a career as senior lecturer is generally perceived to be a welcome and attractive career opportunity in academia. Thus, the risk of an "all or nothing situation" for post-docs, as in Germany or Switzerland, is minimised to a significant extent in the UK. Although British, French and Dutch universities maintain chair positions, their power is notably diluted in comparison to other countries. The non-professorial research staff is less dependent and more actively involved in departmental decision-making. This demonstrates that the employment structure influences the working conditions to the extent that it creates different degrees of "steepness" at various points in academic careers.

2. International research collaboration, visits and virtual technology

Part of the analysis of research careers and mobility involves international research collaboration. The MORE1 survey samples show that researchers are increasingly collaborating with those from other countries, with a higher concentration of internationally mobile researchers among the 'academic' researchers who collaborated with researchers in other countries (62% against 56% in the entire sample). Other data sources, notably the US National Science Foundation (NSF) confirms this level of international collaboration: the number of international articles with authors from at least two countries more than doubled in share between 1988 and 2003 from 8% to 20%. Intercontinental co-authorship increased as a percentage of total article output for the US (from 17% to 27%), for the EU (from 18% to 26%), and for Asia (from 16% to 19%), resulting in an increasing level of international independence in the research enterprise[88].

Collaboration can take many practical forms, such as visits or the use of virtual and web-based technologies. The interlinkage with mobility is important but not well documented to date. Increasingly, empirical studies and the academic literature more generally, are shifting towards the effects of research collaboration but also to the impact of and on researchers' mobility.

Collaboration, also in the form of short term visits or virtual mobility, is increasingly being viewed within the context of long term international mobility. These forms of collaboration are considered complementary to - and even partially as - a replacement for the need for long term international mobility, as forms of knowledge transfer and collaboration[89;90;91]. One of the reasons for this development in thinking about mobility and interaction is that, increasingly, evidence is gathered on personal, family-related reasons for non->3 month mobility and that these are less a barrier for shorter visits or collaboration through virtual tools[92;93].

The conceptualization of "virtual mobility" as a type of (international) mobility (and not as an outcome of research as is commonly meant) is an interesting and relatively unexplored notion. Although one can intuitively argue that while virtual (electronic) access to research resources or the informal exchange of data between individuals located in two different countries is intrinsically embedded in every research process and therefore should/could not be observable, formal international research collaboration on the production of ideas (co-authorship), products (joint ventures, prototypes, patents) or services (outsourcing, consultancy) leading to actual knowledge exports could in fact be of particular interest as a worthwhile area of study. New technologies enable researchers in many fields to gather data remotely, reducing the need to spend extended periods of time in host institutions. Only shorter periods where researchers operate in a 'shuttle' fashion would suffice for discussion of projects or findings, thus

88 NSF-NSB (2008) Science and Engineering Indicators 2008, National Science Board. Arlington, VA. *National Science Foundation, Division of Science Resources Statistics*.

89 Cañibano C., F. Javier Otamendi and F. Solís (2011):International temporary mobility of researchers: cross-discipline study. Scientometrics, 89, 653-675.

90 Ackers, L. (2010). Internationalisation and equality. The contribution of short stay mobility to progression in science careers. Recherches sociologiques et anthropologiques, 1, 83–103.

91 Inzelt A., Analysis of Researchers' Mobility in the Context of the European Reseach Area, Evaluation FP7 as supporting expert.

92 Ackers, L. (2010). Internationalisation and equality. The contribution of short stay mobility to progression in science careers. Recherches sociologiques et anthropologiques, 1, 83–103.

93 Ackers, L. (2008). Internationalisation, mobility and metrics: A new form of indirect discrimination? Minerva, 46, 411–435.

combining physical mobility with other modes of virtual communication[94]. Inzelt[95] also states that "virtual mobility is increasingly taking precedence over other forms of mobility". Although "pure" virtual mobility programs are, in fact, rare (Finland's MOTIVE program with China; Sweden's Global Links for Strong Research and Innovation Milieus VINNOVA), many tools exist which are within the reach of the scientists. Furthermore, two recent initiatives in this field are worthy of mention: 'Enhanced Science' and 'Science Across Virtual Institutes'.

Enhanced Science

A relatively new development is 'enhanced science' (eScience) - a new form of research and development whereby people, knowledge and data are connected. For example, ICT techniques used to search different databases at the same time; advanced computer simulations or communication techniques by which experts across distance can share knowledge. eScience is an open way of doing scientific research which enhances the quality and speed of multidisciplinary research by combining and analysing large numbers of databases. eScience is not only considered important for academic researchers, but also for the business community, since the dissemination of knowledge between industry and research institutes is essential for innovation. Initiatives such as the Nordic biobanks in the Nordic countries and the recently established Netherlands eScience Center (SURF/NWO) will push eScience further. This process constitutes 'data flirting' rather than 'data sharing'. It seems that these European initiatives are more science-driven than tech-driven. In the USA, eScience is more focused on the development of innovative knowledge applications into manageable models to be used by SME's.

Science Across Virtual Institutes (SAVI)

In Oct 2011, the National Science Foundation initiated SAVI as an innovative concept which could to foster interaction between scientists and educators around the globe. It was based on the principle that scientific advances can be accelerated by scientists, engineers and educators working together wherever they are. SAVI focuses on interactions between cohesive teams of researchers across international borders and takes advantage of existing U.S. and foreign investments in frontier research by leveraging complementary strengths and sharing unique research infrastructure. Virtual institutes are intended to serve as research hubs in which new ideas originate; multidisciplinary research is fostered; diversity is valued, and long-term professional networks are developed between U.S. researchers and students and their international counterparts.

NSF will support U.S. participants, while their international partners will be supported by their own national or regional funding sources. SAVI is expected to create new opportunities for NSF-funded scientists to collaborate across institutional, national, disciplinary and cultural barriers.

The impact of SAVI is expected to be felt in:

- Creating virtual institutes through networking among NSF-funded, U.S. researchers and international collaborators that have complementary strengths and common interests;

[94] Ackers H. L., Gill B., 2008, *Moving People and Knowledge: Understanding the Processes of Scientific Mobility within an Enlarging Europe*, Cheltenham, Edward Elgar.

[95] Inzelt A., Analysis of Researchers' Mobility in the Context of the European Reseach Area, Evaluation FP7 as supporting expert.

- Facilitating science, technology, engineering and maths (STEM) research and education partnerships among NSF-funded research centers/ institutes – both virtual and real – and their international counterparts;
- Providing students, postdocs and junior faculty opportunities for research experiences abroad that lead to long-lasting international collaborations and networks;
- Strengthening connections between NSF and counterpart STEM research funding organisations around the globe by leveraging each other's investments in fundamental research, research facilities, and human resource development, both physically and virtually, to work collaboratively on problems of mutual interest.

Virtual institutes in all fields of science and engineering are currently under consideration. Early projects include the Virtual Institute for Mathematical and Statistical Sciences (VI-MSS), which connects two exciting NSF-funded national research institutes with several Indian research bodies, capitalizing on the strength of each in different facets of research. Another is the Physics of Living Systems Student Research Network (PoLS SRN). Network participants come from 11 U.S. institutions and institutions from Brazil, France, Germany, Israel, Singapore and the United Kingdom.

Virtual mobility has an enormous potential impact. It adds a new dimension to researcher mobility alongside the international travel, and can further broaden our definition and understandings of mobility.

In the MORE2 HEI survey, a number of questions are asked in order to ascertain the extent and effects of international collaboration in its different forms, and more specifically, to collect first hand evidence on virtual mobility. Short term international mobility, collaboration and virtual mobility are also analysed in relation to long-term international mobility.

3. International mobility: motives, barriers and effects

3.1. Motivations for researcher mobility

Several studies have examined mobility patterns and the underlying motivations of researchers. Ackers (2008)[96] identifies the existence of scientific networks, individual motivation, and willingness to take risks as being the most important factors for mobility. Increased professional autonomy, transparency of employment procedures, the existence of career systems and financial benefits are also important motivating factors. These and other factors can be identified at three levels: (1) at the national-structural level of the global research system (2) at the institutional level of disciplines and scientific careers, and (3) at the individual level of personal conditions and constraints. These three levels are often interrelated.

3.1.1. National-structural level

The scarcity of employment opportunities in the national S&T system and (expected) income differentials between what can be earned abroad with respect to the earnings at home have driven many to opt for international mobility. Pertinent issues are the lack of financial resources and funding system in general (moving from one small research grant to another), limited research facilities and equipment and limited opportunities for postgraduate education. Among the EU27 there are important differences in terms of their attractiveness for researchers and doctoral students: the size of flow is significantly different, and the host countries in the EU27 vary by 'sending' regions and scale of intra-European flows.

Several studies (e.g. Mahroum 2000[97]; Szelenyi et al 2007[98]; Delicado 2010[99]) have indicated that PhD training is by far the main exit route for researchers in several European countries (Portugal, Greece, Eastern European countries). PhD students comprise 62% of the respondents. 76% of senior researchers currently working abroad also obtained their PhDs, and many of whom mentioned postgraduate education as one of the main motivations for leaving[100] (Delicado 2010).

Regarding motivational factors to return to one's home country, the assumption holds that after a period of being abroad, researchers will return when social and economic conditions at home are perceived to be sufficiently favourable. Several European countries have developed repatriation programmes aiming to motivate researchers and scientists to return to their home country, mainly through financial incentives and employment opportunities.

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96 Ackers, L. (2008). Internationalisation, mobility and metrics: A new form of indirect discrimination? Minerva, 46, 411–435.

97 Mahroum, S. (2000). Highly skilled globetrotters: Mapping the international migration of human capital. R&D Management, 30(1), 23–31.

98 Szelenyi, K. (2007) Students without borders? Migratory decision-making among international graduate students in the US. In; M.P. Smith & A. Favell (eds.) *The human face of global mobility*, New Brunswick: Transaction Publishers, 181-209.

99 Delicado, A. (2010) Going abroad to do Science: Mobility trends and motivations of Portugese researchers. Science Studies, Vol. 23. no.2, 36-59.

100 Delicado, A. (2010) Going abroad to do Science: Mobility trends and motivations of Portugese researchers. Science Studies, Vol. 23. no.2, 36-59.

To date, impact studies show that there is little success with schemes to lure researchers back to their home countries[101;102]. An important factor when assessing the effects of these programmes is the fact that the original reasons why individual researchers left may still exist once the doctorate is complete, which leaves open the possibility that repatriated researchers may be likely to migrate again at a later stage. Consequently, these programmes will have little long-term impact. On the other hand, if the researcher initially intended to return, providing incentives to will not add much value. Ideally, programmes should be targeted at those individuals who would only return if an incentive was offered. Identifying these individuals would increase our understanding of the effectiveness of repatriation programmes.

3.1.2. Institutional level

International mobility is increasingly becoming part of the research career system. Research institutions - particularly in the sciences subjects - encourage their own PhD graduates to go abroad as part of enhancing their future career prospects. Researchers are pushed towards a "stint abroad" as a means to generate or take part in transnational networks, increasing their chances of obtaining a research position in their home country/institution or elsewhere. In this way, the international mobility of researchers has increasingly become an integral part of academic careers[103;104;105;106]. Similarly, Ivancheva & Gourova (2011)[107] state that participation in international education and training, including the various international exchange schemes and fellowships, has encouraged young researchers to work abroad (Baruch).

Temporary mobility has become more important in recent years as scientists – and particularly PhD students and post-docs (early careers) - gain experience abroad and then return to exploit the knowledge gained in their home country.

Improving the career development and mobility of individual scientists (and the possibility of staying for a longer time abroad and becoming real cosmopolitans) are essential for 'brain circulation'. This concept implies linkages between national science and innovation systems[108], thus is not only relevant to individual career development, but also contributes to the overall production and exchange of knowledge and subsequently potentially increases wellbeing[109;110]. In a similar

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101 Thorn, K., Holm-Nielsen, L.B., (2006). International Mobility of Researchers and Scientists: Policy Options for Turning a Drain into a Gain, UNU World Institute for Development Economics Research (UNU-WIDER), Research paper series 2006/83.

102 Ma, Wanhua (2011) Contributions of Foreign Experts to Chinese Academic Development: A case study of Peking University. Center for International Higher Education, Peking University.

103 Enders, J. & E. de Weert (2004) Science, training and Career: Changing Modes of Knowledge Production and Labour Markets. Higher Education Policy, 17: 135-52.

104 Ackers, L. (2008). *Internationalisation, mobility and metrics: A new form of indirect discrimination*? Minerva, 46, 411–435.

105 Cox, D., Verbeek, A. (2008). Evidence on the Main Factors Inhibiting Mobility and Career Development of Researchers, Report for the European Commission, Brussels.

106 Edler, J., H. Fier, et al. (2011). "International scientist mobility and the locus of knowledge and technology transfer." Research Policy 40(6): 791-804.

107 Ivancheva, L. and E. Gourova (2011). "Challenges for career and mobility of researchers in Europe." Science and Public Policy 38(3): 185-198.

108 Saxenian, A. (2002). "Brain Circulation: How High-Skill Immigration Makes Everyone Better Off." Brookings Review 20(1): 28-31.

109 Edler, J., H. Fier, et al. (2011). "International scientist mobility and the locus of knowledge and technology transfer." Research Policy 40(6): 791-804.

110 Edler, J., H. Fier, et al. (2006) "International scientist mobility and the locus of knowledge and technology transfer." Research Policy 40(6): 791-804.

vein, Freeman (2010)[111] presents data on the mobility of scientists, arguing that it creates benefits as regards the speed and breadth of knowledge production as well as contributing positively to the global transfer of knowledge. At the same time, these benefits are accompanied by challenges for advanced Western countries as they compete with emerging economies such as China and India.

The existence of research career systems might explain why scientists tend to go abroad earlier than engineers and technicians who have more employment opportunities after graduation outside the academic system and may follow another career trajectory. The motivation to go abroad from a career perspective does not necessarily imply that the actual mobility experience has the desired outcomes. Researchers can perceive the situation differently. Intrinsic motivation factors such as the content of the research as such or seeking connection with centres of scientific excellence or just the academic adventure (no matter whether at a prestigious institution or not) may well be important reasons for research abroad.

International mobility and career prospects are not always positively related and are in some national contexts the reverse effect can be seen. For example, Cruz-Castro et al (2009)[112] question the assumption (mainly based on US evidence) that mobility enhances the academic career. In the Spanish context, they found that non-mobile careers are a strong predictor of the timing of rewards in terms of obtaining early permanent positions. These findings must be interpreted in the context of organizational and institutional features of the Spanish academic system which promotes the development of internal academic research job markets. The lack of recognition of mobility experiences during recruitment and career development may explain the relatively lower motivation among the younger generation in those countries. This position should be investigated more fully.

3.1.3. Personal factors

Personal characteristics are important for mobility decisions, and include issues such as family situation, personal preferences and aspirations, interest in particular countries, (social, cultural, political) curiosity in understanding other cultures, personal histories or past experiences in foreign countries, and having family ties or friends in foreign countries. Personal histories can be complex and highly individual: whether a researcher has developed intensive international relationships, previous stays abroad for study or personal travel in the past, participation in Erasmus exchange programmes, involvement in international research projects, personal contacts gained during conferences etc.

Reasons to embark on a period of international mobility differ extensively according to age, gender and marital status. The career stage of the researcher may well play a crucial role.

Decisions to go abroad are often motivated by opportunities to improve the lives of family members - particularly educational opportunities for children. Factors involved when deciding whether to stay or to return to the home country involved family concerns such as having parents at home and attitudes of spouses or

[111] Freeman, R.B. (2010). Gobalization of scientific and engineering talent: international mobility of students, workers, and ideas and the world economy. Economics of Innovation and New Technology 19 (5), 398–406.

[112] Cruz-Castro, L. and L. Sanz-Menendez (2009) "Mobility versus job stability: Assessing tenure and productivity outcomes." Research Policy 39(1): 27-38.

partners[113]. A study among Chinese migrants shows how career pathways follow international businesses linked to their families and family networks[114].

Regarding gender, men tend to have left the country during an earlier career phase than women, which is suggestive of women's slightly more cautious approach to international migration. Avveduto et al (2004)[115] noted that women are underrepresented in international mobility, referring to the general notion that women still adhere to the stereotype of having to choose a career or a family. It is possible that the many initiatives taken both at national and international levels will reverse this trend. However, Avveduto suggests that even when the increasing participation of women in higher education and the growth of women in S&T subjects are taken into account, the issue of international mobility remains biased towards male researchers. This questions how the gender factor varies with employment conditions and motivational factors.

In addition to these subjective issues, a number of useful distinctions can be drawn. One important issue is whether researchers constitute a distinct group or whether there are intergroup differences as to what motivates them to move. Mahroum (2000)[116] found large inter-group differences as to what motivates people to move overseas. Engineers and technicians, for example, are reportedly pulled and pushed primarily by economic factors: they go where their skills are most needed and rewarded. In contrast, mobility among scientists is motivated more at institutional level in terms of their future academic career developments and the content and research conditions of their work. Economic considerations appeared far down the list of priorities.

Another issue is the preference for particular countries. Since English-speaking countries are very attractive to foreign researchers, this has been attributed to the level of international recruitment and diversity of the workforce. Speaking about the UK, Ackers (2008)[117] notes the "melting pot for different nationalities to get together - it draws from a global market - that's the wealth of the UK'.

Universities in the USA are particularly attractive because of their flexible and open career structure. The tough but transparent and fair career structure provided by the US tenure track system, which lays out a clear path for career advancement, is especially attractive for talented young researchers[118]. In European countries the rather rigid and lengthy career structure based on hierarchy and seniority are often seen as a less motivating factor. These standard claims should be researched more fully and differentiated by country.

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113 Carr, S. C., K. Inkson, et al. (2005). "From global careers to talent flow: Reinterpreting 'brain drain'." Journal of World Business 40(4): 386-398.

114 Granrose, C. S., & Chua, B. L. (1996). Global boundaryless careers: Lessons from Chinese family businesses. In M. B. Arthur, & D. M. Rousseau (Eds.), The boundaryless career: A new employment principle for a new organizational era (pp. 201–217). Oxford: Oxford University Press.

115 Avveduto, S. (2004). International Mobility of PhDs. National Research Council. Rome: Institute for Studies on Scientific Research and Documentation.

116 Mahroum, S. (2000). Highly skilled globetrotters: Mapping the international migration of human capital. R&D Management, 30(1), 23–31.

117 Ackers, L. (2008). Internationalisation, mobility and metrics: A new form of indirect discrimination? Minerva, 46, 411–435.

118 Thorn, K., Holm-Nielsen, L.B., (2006). International Mobility of Researchers and Scientists: Policy Options for Turning a Drain into a Gain, UNU World Institute for Development Economics Research (UNU-WIDER), Research paper series 2006/83.

The internal structure of research systems (hierarchical organisation, recruitment policies and procedures, qualification requisites, formal and informal networks) is country specific, influencing researchers' career trajectories[119].

All the factors mentioned above constitute a dynamic whole and any combination of them could affect a researcher's decision as to whether to leave and where to go. There will always be a combination of motives and perceptions to consider.

3.2. Barriers and facilitating factors for researcher mobility

A report to the EC DG Research and Innovation drafted by a consortium led by IDEA consult in 2004[120] presented evidence on the main factors inhibiting the mobility and career development of researchers in Europe. The study focused on unsatisfactory arrangements and practices concerning social security schemes including statutory and supplementary pension rights and unemployment benefits; unattractive employment conditions; the lack of competition-based internationally open recruitment; the lack of recognition of mobility in recruitment and career development; a lack of trans-national portability of grants/funding; a lack of adequate training and skills development for researchers; lack of funding for mobility; salary; quality and cost of accommodation; personal relationships; child care arrangements; immigration rules; and the nature of contracts. These factors were defined as the result of policy and scholarly debates at EU level and were investigated using a survey administered in eight European countries, which yielded 3,365 valid responses. Based on this analysis, all the aspects identified have a significant part to play in explaining different characteristics and responses obtained from the sample.

In the study published by Ivancheva & Gourova (2011)[121], evidence was found referring to the following discouraging factors: family and other personal connections; complex administration of relocation (e.g. formal/legal issues, social and health insurance; employment permit, housing, transportation, etc.); lack of support from home institution (e.g. fear of losing current position, duties at home institution, etc.); lack of available research job opportunities abroad/fellowships for stay abroad; lack of information/uncertainty; language barriers; cultural barriers; age limitations and adaptation problems; and financial problems. Some factors were important for respondents from some countries but not for others.

In MORE1 (2010)[122] there was no section which was specifically designed to study 'barriers', as such. These factors were included in the 'influencing factors and motivations' section. The study focused on three types of barriers/facilitating factors of international and job mobility. These were: practical factors, professional factors and personal factors. In investigating practical/personal factors influencing international mobility, the MORE1 study focused on the social security system; the administrative barriers for migration; language; quality and cost of accommodation; child care arrangements; permission for partner to work and social integration at host country. Professional factors observed included obtaining funding, and maintenance of professional and personal network of contacts. In investigating factors influencing job mobility, the survey addressed

119 Enders, J. & E. de Weert (2004) Science, training and Career: Changing Modes of Knowledge Production and Labour Markets. Higher Education Policy, 17: 135-52.

120 Rindicate (2008), Evidence on the main factors inhibiting mobility and career development of researchers, Brussels.

121 Ivancheva, L. and E. Gourova (2011). "Challenges for career and mobility of researchers in Europe." Science and Public Policy 38(3): 185-198.

122 IDEA Consult et al. (2010) Study on mobility patterns and career paths of EU researchers. FINAL REPORT.

issues related to professional factors such as job satisfaction, and good working conditions/climate. Personal factors included good work-life balance; job changes of partner/life satisfaction of partner; maintaining family and personal relationships and life satisfaction of children.

Finally, a recent public consultation on the challenges facing the European Research Area[123] investigated the following barriers: portability of publicly funded grants; lack of resources to support mobility; lack of diffusion and transparency of recruitment procedures; complexity of immigration rules and procedures; lack of autonomy of universities and research institutions to recruit researchers and set wages; high administrative burdens to settle in a host country; lack of information on social security and pension rights and difficulty of getting recognition for diplomas from other countries. Other factors identified by the study of factors which hamper mobility included fragmentation of the information and procedures to access to mobility grants; lack of harmonization and difficulty in the transferability of social benefits such as retirement and medical and disability benefits, lack of harmonization of the research careers taxonomy; attractiveness; skills; gender balance; disability and mobility. The study refers to progress made recently in the EU regarding the efforts towards the harmonization of research careers across countries led by SGHRM.

At the ERA Conference 2012 it was pointed out that facilitating factors concern the opportunity and security to engage in large-scale ambitious research projects and to award large-scale multipurpose grants which provide the stability and freedom that scientists need to conduct quality research. This also facilitates the establishment of networks and research environments where scientists collaborate[124]. This is quite different to many procedures, where researchers have to apply for several relatively small grants to cover different cost categories. Another facilitating factor is the portability of research grants when researchers go abroad and are allowed to use the grant of their home institution. There exists minimal literature in this area, but it nevertheless concerns an important dimension when viewed from the international policy perspective.

3.3. The effects of researcher mobility

Researchers' mobility implies both positive and negative effects, both for the individuals themselves and for their families, as well as for the countries involved. Furthermore, there are also opportunity costs associated with not moving for voluntary or involuntary reasons[125]. How do we account for the overall effects? Are benefits larger than costs? For whom? When? Why? How? The following is a synthesis of what we currently know and do not know (enough of or at all), as regards the effects of researchers' international mobility.

123 EC DG Research and Innovation (2012). Areas of untapped potential for the development of the European REsarch Area (ERA). Analysis of the response to the ERA Framework public consultation.

124 Thorn, K., Holm-Nielsen, L.B., (2006). International Mobility of Researchers and Scientists: Policy Options for Turning a Drain into a Gain, UNU World Institute for Development Economics Research (UNU-WIDER), Research paper series 2006/83.

125 Regets, M. (2007). "Brain Circulation: The Complex National Effects of High-Skilled Migration." Presentation at the OECD Committee For Scientific and Technology (CSTP) and Steering and Funding of Research Institutions (SFRI) Workshop on the International Mobility of Researchers. OECD, Paris. March 28th, 2007 Retrieved Feb. 9, 2012, from http://www.oecd.org/dataoecd/59/57/38387715.pdf.

3.3.1. Working and career conditions and prospects

Prospects for professional advancement

Many authors have established empirically that international mobility improves researchers' careers in the sense that it increases diversification of their research knowledge and experience[126;127;128].

From this perspective, Van Bouwel et al. (2011)[129] studied survey responses from 1,576 European-born researchers with PhD degrees and found that researchers who move from Europe to North America or to another European country experience positive effects in terms of their career progression.

Ivancheva and Gourova (2011)[130] studied survey responses of 869 researchers from eight European countries and found that for 55% of the respondents, being internationally mobile contributed to improving their personal development and professional profile, including an improvement in their language capabilities and job opportunities.

Ersoy and Gunel (2011)[131] studied pre-service teachers who went to Turkey through the Erasmus program. According to the authors, these students stated that "this experience helped them to improve their knowledge of different cultures, increase their self-confidence, change their world view, and become more open-minded individuals".

In contrast, Cruz-Castro and L. Sanz-Menendez (2010)[132] question the assumption that mobility enhances the research career. Based on data from survey responses and publications of 1,583 academic scientists in Spain, they found that home-grown staff do not get tenure with less scientific merits than PhDs from other institutions, and that non-mobile careers are a strong predictor of the timing of rewards in the form of early permanent positions. They warn that their findings "must be interpreted in the context of organizational and institutional features of the Spanish academic system that promote the development of internal academic research job markets".

Moreover, Van Bouwel et al. (2011)[133] found that mobility affects career progress and career opportunities differently, depending on the regions involved. They found that researchers who move from Europe to North America experience considerable positive effects on career progress; that mobility within Europe also has positive career effects, although the perceived effects are not as high as for

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126 Davenport, S. (2004). "Panic and panacea: brain drain and science and technology human capital policy." Research Policy 33(4): 617-630.

127 Van Bouwel, L., E. Lykogianni, et al. (2011). Mobility of European researchers to the US: student mobility vs. researcher mobility. Science and Technology Indicators Conference 2011 on Actors and networks in European Science. 7-9 September. E. N. o. I. Designers. Rome.

128 Ivancheva, L. and E. Gourova (2011). "Challenges for career and mobility of researchers in Europe." Science and Public Policy 38(3): 185-198.

129 Van Bouwel, L., E. Lykogianni, et al. (2011). Mobility of European researchers to the US: student mobility vs. researcher mobility. Science and Technology Indicators Conference 2011 on Actors and networks in European Science. 7-9 September. E. N. o. I. Designers. Rome.

130 Ivancheva, L. and E. Gourova (2011). "Challenges for career and mobility of researchers in Europe." Science and Public Policy 38(3): 185-198.

131 Ersoy, A. and E. Gunel (2011). "Cross-Cultural Experiences through Erasmus: Pre-Service Teachers' Individual and Professional Development." Egitim Arastirmalari-Eurasian Journal of Educational Research 11(42): 63-78.

132 Cruz-Castro, L. and L. Sanz-Menendez (2010). "Mobility versus job stability: Assessing tenure and productivity outcomes." Research Policy 39(1): 27-38.

133 Van Bouwel, L., E. Lykogianni, et al. (2011). Mobility of European researchers to the US: student mobility vs. researcher mobility. Science and Technology Indicators Conference 2011 on Actors and networks in European Science. 7-9 September. E. N. o. I. Designers. Rome.

North America; and that returning from North America to Europe leads to a slight loss of career opportunities.

A more pessimistic picture is painted by Lianos (2007)[134] who studied migration flows of university graduates to Greece, and concludes that over-education among immigrants is about twice as high in comparison with Greeks.

Research Productivity

In particular, international mobility is perceived as having positive impacts on researchers' productivity, both in terms of both quantity and quality. Jonkers, K. and R. Tijssen (2008)[135] studied the performance of 76 PIs in the field of plant molecular life science affiliated with leading Chinese institutions and found that international experience was a strong predictor of scientific output as measured by number of publications indexed by ISI Thompson.

De Filippo et al. (2009)[136] analyzed data from 1,800 researchers affiliated with a Spanish university using an institutional database, three relevant bibliographic databases and a select number of interviews with researchers. They found that mobile researchers have higher levels of productivity and impact factor, a greater number of citations per document and a lower percentage of non-cited documents.

However, it seems that the effect of mobility on productivity varies across countries/regions. Van Bouwel et al. (2011)[137] found, in the aforementioned analysis, that European researchers who went to the USA were more likely to perceive an improvement in their career productivity than European researchers who went to another European country and even more so than those returning to Europe from the USA, who in fact perceive a decrease in their productivity.

Furthermore, Cañibano et al. (2008)[138] studied a random sample of CVs from researchers applying to the Spanish Ramon y Cajal program and found that "most internationally mobile researchers seem to have better access to international funding sources and networks, which does not, however, imply that they are the most quantitatively productive as far as publications and patents are concerned".

Finally, Sandstrom (2009)[139] claims that the degree of mobility affects research performance differently. According to the author, "while it is clear that the most mobile and the least mobile researchers represent opposites also in citation performance we should acknowledge that for the large majority, with a low and medium mobility, there is no linear pattern of performance".

Networking

A large number of studies have found strong positive relationships between mobility and networking (Davenport 2004; Canibano et al. 2008; Jonkers and Tijssen 2008; De Filippo et al. 2009; Joens 2009; Melkers and Kiopa 2010;

134 Lianos, T. P. (2007). "Brain drain and brain loss: Immigrants to Greece." Journal of Ethnic and Migration Studies 33(1): 129-140.

135 Jonkers, K. and R. Tijssen (2008). "Chinese researchers returning home: Impacts of international mobility on research collaboration and scientific productivity." Scientometrics 77(2): 309-333.

136 De Filippo, D., E. Sanz Casado, et al. (2009). "Quantitative and qualitative approaches, to the study of mobility and scientific performance: a case study of a Spanish university." Research Evaluation 18(3): 191-200.

137 Van Bouwel, L., E. Lykogianni, et al. (2011). Mobility of European researchers to the US: student mobility vs. researcher mobility. Science and Technology Indicators Conference 2011 on Actors and networks in European Science. 7-9 September. E. N. o. I. Designers. Rome.

138 Cañibano C., F. Javier Otamendi and F. Solís (2011):International temporary mobility of researchers: cross-discipline study. Scientometrics, 89, 653-675.

139 Sandstrom, U. (2009). "Combining curriculum vitae and bibliometric analysis: mobility, gender and research performance." Research Evaluation 18(2): 135-142.

Patricio 2010; Furukawa, Shirakawa et al. 2011; Ivancheva and Gourova 2011). Specifically, mobility is said to improve visibility, contacts, the amount and diversity of co-authorships, access to new international/global knowledge networks and communities of practice, etc.

In this sense, Joens (2009)[140] studied survey data from more than 1,800 former visiting academics to Germany who came from 93 countries, and claims that "this brain circulation launched a cumulative process of subsequent academic mobility, and collaboration that contributed significantly to the reintegration of Germany into the international scientific community, after the Second World War and enabled the country's rise to the most important source for international co-authors of US scientists and engineers in the twenty-first century."

Melkers & Kiopa (2010)[141] studied survey responses from 1,598 scientists working in Research I universities across six disciplines in the USA, and found that non-U.S. citizens with a permanent or temporary U.S. resident visa are more likely to have close international collaborative relationships than native-born U.S. citizens or naturalized U.S. citizens. They also found that U.S. academic faculty mobilize different collaborative resources from international partners, versus their domestic collaborators.

Access to Research Funding

Mobility is also widely believed to be positively associated with better access to research funding (Canibano et al. 2008; Van Bouwel et al. (2011); Ivancheva and Gourova 2011).

Relatively underexplored effects regarding working/career conditions

In order to gain a better understanding of the effects of international mobility on working/career conditions, more studies dealing with before/after comparisons as well as analysis exploring with/without mobility effects are needed. In addition, issues such as net salary and suitability of infrastructure (i.e. work station with computer and/or basic research tools) are also necessary. The study of other issues related with networking effects could be in worthwhile[142;143], including the percentage of times a researcher works in collaborative projects; the size of her network (i.e. number of partners); the diversity of her networks (i.e. percentage of partners from a sector different from her own); her ties with her home country and with other countries (i.e. percentage of time working with partners from her home country); her degree of cosmopolitanism (i.e. percentage of partners from a third country); and her ability to network (i.e. financial support to attend conferences or meetings), amongst other issues.

140 Joens, H. (2009). "'Brain circulation' and transnational knowledge networks: studying long-term effects of academic mobility to Germany, 1954-2000." Global Networks-a Journal of Transnational Affairs 9(3): 315-338.

141 Melkers, J. and A. Kiopa (2010). "The Social Capital of Global Ties in Science: The Added Value of International Collaboration." Review of Policy Research 27(4): 389-414.

142 Bozeman, B. and E. Corley (2004). "Scientists' collaboration strategies: implications for scientific and technical human capital." Research Policy 33(4): 599-616.

143 Bozeman, B., J. S. Dietz, et al. (2001). "Scientific and technical human capital: an alternative model for research evaluation." International Journal of Technology Management 22(7-8): 716-740.

3.3.2. Socio-economic impacts

Knowledge and Technology Transfer

Although the study of the impacts of mobility on knowledge and technology transfer is a relatively old topic which largely interests scholars claiming the spill-over effects of science and technology[144;145;146;147;148,] very few empirical studies testing such assumptions have been undertaken. Recently, Edler et al. (2011)[149] studied survey responses from 958 scientists from Germany and found that "most mobile scientists engage in knowledge and technology transfer (KTT) to firms both in the host and in their home country, suggesting that KTT activities to firms abroad do not substitute or crowd out, but complement KTT to firms in the home country".

Regional Development

Mobility is claimed to positively affect regional development[150;151;152]. According to Saxenian (2002), immigrants strongly contribute to the development of areas such as Silicon Valley where "more than a quarter of Silicon Valley's highly skilled workers are immigrants, including tens of thousands from lands as diverse as China, Taiwan, India, the United Kingdom, Iran, Vietnam, the Philippines, Canada, and Israel.".

However, mobility is also judged to have had mixed and dynamic effects on regional development by creating, improving, or weakening corridors of knowledge production and exchange. Leung (2011) studied the impact of international mobility among Chinese and German scholars and conclude that "mobility can, through interacting with factors ranging from unforeseen events to framework conditions, lead to chains of events that produce, reshape, strengthen, weaken or even erase corridors of knowledge production and exchange".

Moreover, mobility has also been associated with inequality. According to Williams (2009)[153], who analyses urban development in European cities, mobility may contribute to uneven regional development and polarization in cities.

However, it is still little understood how the effects of mobility on local scientific and technological capability are measured by host-team research productivity and

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144 Jaffe, A. B. and M. Trajtenberg (1996). "Flows of knowledge from universities and federal laboratories: Modeling the flow of patent citations over time and across institutional and geographic boundaries." Proceedings of the National Academy of Sciences of the United States of America 93(23): 12671-12677.

145 Mansfield, E. (1998). "Academic research and industrial innovation: An update of empirical findings." Research Policy 26(7,8): 773-776.

146 Salter, A. J. and B. R. Martin (2001). "The economic benefits of publicly funded basic research: a critical review." Research Policy 30(3): 509-532.

147 Rogers, E. M. (2003). Diffusion of Innovations. New York, Free Press.

148 Kale, D., D. Wield, et al. (2008). "Diffusion of knowledge through migration of scientific labour in India." Science and Public Policy 35(6): 417-430.

149 Edler, J., H. Fier, et al. (2011). "International scientist mobility and the locus of knowledge and technology transfer." Research Policy 40(6): 791-804.

150 Saxenian, A. (2002). "Brain Circulation: How High-Skill Immigration Makes Everyone Better Off." Brookings Review 20(1): 28-31.

151 Leung, M. (2011). "Of corridors and chains: translocal developmental impacts of academic mobility between China and Germany." International Development Planning Review 33(4): 475-489.

152 Trippl, M. and G. Maier (2011). Knowledge Spillover Agents and Regional Development. Innovation, Growth and Competitiveness. P. Nijkamp and I. Siedschlag, Springer Berlin Heidelberg: 91-111.

153 Williams, A. M. (2009). "INTERNATIONAL MIGRATION, UNEVEN REGIONAL DEVELOPMENT AND POLARIZATION." European Urban and Regional Studies 16(3): 309-322.

orientation. In fact, Ordonez (2008)[154] studied 1,889 research teams in Colombia and found that teams hosting foreign researchers are neither more productive nor more likely to work on local issues than comparable teams.

Social recognition of mobile researchers

Very few studies have been undertaken on the effects of mobility on the social recognition of the mobilized researcher in their home country. This could be particularly important for researchers coming from less developed countries within Europe[155]. Alaminos, et al. (2010)[156] studied Spanish migration of highly skilled individuals to France, Germany, Italy and Britain, and found a strong relationship between spatial mobility (migration of Spaniards) and its impact on the upward social mobility subsequently experienced.

Relatively underexplored effects regarding socio-economic impacts

Estimations of the (opportunity) costs in the short/long term at the individual and macro levels of moving and not moving remain understudied.

3.3.3. Other relatively underexplored effects of mobility

Very little research has been undertaken on the living conditions of researchers before and after mobility in terms of their perception of the quality of life for themselves, for their partners, and for their children. Such research would therefore consider factors associated with their material and (i.e. immigration status, tax incentives, quality of social security services, etc.) and emotional lives (i.e. social life, family relations, etc.)

In addition to the specific themes and needs regarding the effects identified, it would be interesting to deepen our knowledge of the differences between mobile and non-mobile researchers in Europe and from Europe by gender and age, considering the following demographic descriptive indicators:

- Marital status (i.e. percentage married or living with a partner)
- Family status (i.e. percentage with children living with them)
- Position/occupation (i.e. percentage tenured faculty)
- Citizenship status (i.e. percentage of foreign born researchers with citizenship status in their working country)
- Disciplinary mobility (i.e. percentage of those who changed field because of mobility)
- Sector mobility (i.e. percentage of those who changed sector because of mobility)
- Career stage (i.e. percentage of early career researchers)
- Duration (i.e. percentage that moved more than 5 years ago)
- Frequency (i.e. percentage that move more than 5 times a year)
- Origin (i.e. percentage from France)
- Destination (i.e. percentage in France)

[154] Ordonez, G. (2008). International Research Collaboration, Research Team Performance, and Scientific and Technological Capabilities in Colombia -A Bottom-Up Perspective. PhD Dissertation. in Public Policy. Georgia Institute of Technology - Georgia State University. Atlanta, GA.

[155] Ivancheva, L. and E. Gourova (2011). "Challenges for career and mobility of researchers in Europe." Science and Public Policy 38(3): 185-198.

[156] Alaminos, A., M. C. Albert, et al. (2010). "Social mobility of Spanish emigrants in Europe." Revista Espanola De Investigaciones Sociologicas(129): 13-35.

ANNEX 2: DETAILED TABLES INDICATORS

Table 19: Degree of satisfaction with different aspects of the current academic position per country of employment (% of respondents satisfied versus dissatisfied)

	Dynamism	Intellectual challenge	Level of responsibility	Degree of independence	Contribution to society	Opportunities for advancement	Mobility perspectives
Austria	86.5%	94.0%	91.1%	86.1%	85.7%	54.0%	64.7%
Belgium	87.4%	95.6%	90.7%	93.0%	80.2%	59.9%	72.4%
Bulgaria	83.9%	86.3%	88.6%	74.6%	82.2%	73.5%	51.8%
Croatia	81.1%	81.5%	83.5%	82.8%	65.2%	65.2%	59.6%
Cyprus	82.7%	79.4%	86.9%	78.3%	72.6%	57.3%	59.4%
Czech Republic	80.6%	90.7%	90.3%	86.2%	81.7%	76.8%	71.1%
Denmark	87.7%	95.9%	95.1%	91.4%	90.2%	65.8%	75.2%
Estonia	89.2%	94.8%	94.3%	93.0%	81.6%	77.0%	67.3%
Finland	86.7%	94.3%	92.1%	87.9%	80.9%	59.3%	74.8%
France	89.0%	93.9%	91.2%	89.6%	90.2%	56.6%	62.6%
Germany	86.1%	94.0%	91.9%	84.7%	83.5%	65.9%	71.0%
Greece	77.1%	89.1%	89.2%	86.3%	80.2%	61.6%	47.7%
Hungary	77.0%	86.6%	87.4%	79.2%	77.9%	58.1%	64.2%
Iceland	91.1%	86.5%	93.2%	96.4%	90.1%	76.0%	67.1%
Ireland	83.4%	90.8%	87.9%	88.0%	88.6%	44.4%	59.0%
Italy	73.6%	86.2%	78.3%	82.6%	80.3%	23.9%	35.3%
Latvia	85.6%	92.2%	88.2%	82.9%	82.4%	72.3%	81.5%
Lithuania	78.3%	87.2%	88.0%	77.6%	80.3%	61.4%	61.6%
Luxembourg	90.2%	92.5%	88.0%	90.7%	85.8%	52.5%	78.3%
Macedonia (FYROM)	82.6%	83.7%	90.1%	78.2%	72.4%	72.8%	58.8%
Malta	86.7%	92.4%	87.1%	86.9%	86.2%	67.7%	65.9%
Netherlands	93.2%	97.1%	92.8%	93.1%	86.4%	69.7%	71.0%
Norway	85.1%	94.1%	94.5%	89.5%	86.2%	70.2%	71.2%
Poland	77.7%	92.8%	88.8%	73.6%	81.8%	70.8%	66.3%
Portugal	80.5%	90.9%	88.1%	81.9%	80.5%	40.1%	45.9%
Romania	77.9%	85.5%	86.6%	77.3%	75.4%	44.3%	53.3%
Slovakia	78.1%	87.2%	84.2%	82.0%	71.4%	65.2%	75.6%
Slovenia	90.5%	92.4%	91.6%	87.7%	75.0%	60.8%	65.3%
Spain	81.4%	94.2%	88.2%	89.7%	87.1%	63.6%	53.9%
Sweden	90.6%	94.3%	92.1%	90.7%	85.7%	69.2%	74.4%
Switzerland	88.3%	96.6%	89.9%	86.8%	86.3%	66.8%	73.5%
Turkey	76.4%	76.3%	85.4%	72.8%	72.9%	66.1%	60.7%
United Kingdom	90.1%	95.4%	87.0%	92.2%	90.6%	71.8%	71.5%
Other	*88.5%*	*99.4%*	*84.2%*	*77.4%*	*86.3%*	*89.1%*	*79.2%*
Total	***84.5%***	***92.2%***	***88.6%***	***86.2%***	***84.6%***	***62.5%***	***64.2%***

[continued]

	Social status	Salary	Benefits	Job security	Job location	Reputation of employer
Austria	87.5%	64.9%	59.8%	69.9%	94.1%	83.9%
Belgium	87.8%	82.5%	65.6%	62.6%	91.9%	94.5%
Bulgaria	66.2%	30.1%	40.0%	85.6%	89.1%	83.0%
Croatia	64.7%	48.5%	50.2%	73.4%	92.1%	75.1%
Cyprus	91.6%	74.1%	57.6%	60.6%	84.6%	75.4%
Czech Republic	74.0%	45.6%	47.3%	75.0%	93.9%	84.6%
Denmark	90.1%	76.6%	70.4%	65.5%	89.8%	91.0%
Estonia	75.0%	31.4%	45.4%	75.0%	94.4%	92.3%
Finland	84.2%	58.5%	63.2%	60.6%	88.9%	87.7%
France	84.9%	48.7%	44.5%	89.2%	92.3%	91.2%
Germany	87.3%	62.9%	61.9%	68.0%	90.5%	91.6%
Greece	73.3%	10.4%	20.4%	67.0%	82.2%	80.5%
Hungary	60.5%	29.3%	43.5%	69.3%	89.9%	78.3%
Iceland	95.2%	37.7%	54.0%	73.0%	93.0%	85.6%
Ireland	85.7%	75.0%	66.2%	77.7%	91.8%	85.9%
Italy	74.0%	41.2%	28.5%	84.8%	80.4%	81.8%
Latvia	77.3%	35.7%	42.6%	73.1%	89.6%	84.4%
Lithuania	73.2%	29.6%	40.9%	69.6%	92.9%	84.0%
Luxembourg	87.9%	92.4%	90.4%	68.4%	86.8%	74.3%
Macedonia (FYROM)	69.4%	45.3%	40.4%	85.9%	84.6%	83.9%
Malta	87.5%	61.5%	59.4%	94.5%	92.9%	90.6%
Netherlands	86.8%	74.4%	77.1%	72.4%	91.3%	94.7%
Norway	82.1%	64.2%	64.6%	83.0%	91.0%	88.6%
Poland	78.4%	23.0%	50.6%	80.1%	94.1%	92.2%
Portugal	69.6%	26.8%	29.1%	58.2%	88.6%	80.5%
Romania	71.2%	20.8%	27.0%	77.3%	91.7%	87.5%
Slovakia	49.1%	38.3%	37.2%	67.6%	87.9%	70.3%
Slovenia	69.2%	46.0%	47.7%	72.8%	92.8%	76.7%
Spain	70.7%	33.7%	40.2%	77.4%	91.1%	85.4%
Sweden	87.5%	71.4%	65.6%	71.2%	92.0%	90.1%
Switzerland	88.8%	81.8%	70.3%	68.9%	93.0%	93.4%
Turkey	80.7%	35.7%	58.1%	84.8%	85.4%	82.0%
United Kingdom	83.4%	70.1%	68.6%	67.8%	89.0%	89.7%
Other	*79.7%*	*74.0%*	*71.8%*	*80.8%*	*85.1%*	*96.5%*
Total	***80.5%***	***52.8%***	***54.1%***	***73.3%***	***89.7%***	***87.9%***

Source: MORE2 Higher Education Survey (2012)

Table 20: Geographical flows PhD degree mobility

Country of citizenship = departure country	Austria	Belgium	Bulgaria	Croatia	Cyprus	Czech Republic	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Iceland	Ireland	Italy	Latvia	Lithuania	Luxem-bourg
Austria	344	0	0	0	0	0	2	0	0	2	7	0	0	0	0	1	0	0	1
Belgium	0	392	0	0	0	0	0	0	2	6	4	0	0	0	0	2	0	1	3
Bulgaria	0	0	146	0	0	0	0	0	1	3	6	0	1	0	0	1	0	2	1
Croatia	2	0	0	251	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0
Cyprus	0	2	2	0	25	1	0	0	0	5	2	15	0	0	1	0	0	0	0
Czech Republic	0	0	0	0	0	263	1	1	0	1	3	0	0	0	0	0	0	0	0
Denmark	0	1	0	0	0	0	247	0	1	0	1	1	0	0	0	0	0	0	0
Estonia	0	0	0	0	0	0	0	182	6	0	2	0	2	0	0	0	0	1	0
Finland	0	0	0	0	0	0	2	0	239	1	0	0	0	0	0	0	0	0	0
France	0	2	0	0	0	0	0	0	1	345	2	0	0	0	3	3	0	1	15
Germany	21	1	0	1	0	1	8	0	4	9	491	0	0	0	1	1	0	0	24
Greece	0	5	1	0	2	0	0	0	0	21	17	198	0	0	0	1	0	0	2
Hungary	3	1	0	0	0	1	1	0	3	0	4	0	160	0	0	0	1	0	0
Iceland	0	0	0	0	0	0	2	0	0	2	1	0	0	27	0	0	0	0	0
Ireland	0	1	0	0	0	0	0	0	1	0	0	0	0	0	194	2	0	1	0
Italy	11	6	0	1	0	0	9	1	1	7	6	0	2	0	3	362	1	0	4
Latvia	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	76	0	0
Lithuania	0	1	0	0	0	0	1	2	1	1	4	0	0	0	0	2	2	317	0
Luxembourg	2	11	0	1	0	0	0	0	0	5	2	0	0	0	0	0	0	0	22
Macedonia (FYROM)	1	0	0	5	0	0	0	0	1	1	0	0	2	0	0	1	0	0	0
Malta	0	0	0	0	0	0	0	0	1	4	3	0	0	0	2	9	0	0	0
Netherlands	1	5	0	0	0	0	2	0	1	0	4	0	0	0	0	1	0	1	1
Norway	0	0	0	0	0	0	3	0	1	2	2	0	0	0	0	0	1	0	0
Poland	3	1	0	0	0	1	2	0	0	3	4	0	0	0	0	2	1	0	4
Portugal	0	2	0	0	0	1	1	0	3	11	4	0	0	0	2	1	0	0	2
ROW	6	14	0	5	0	3	32	0	21	22	41	3	0	1	15	3	2	1	13
Romania	1	1	0	0	0	0	1	0	3	3	1	0	4	0	0	0	0	0	1
Slovakia	0	0	0	0	0	19	2	0	0	0	3	0	0	0	0	0	0	0	0
Slovenia	5	0	0	2	0	0	0	0	1	1	3	0	0	0	0	3	0	0	1
Spain	0	7	0	0	0	0	3	0	3	7	5	0	0	0	1	0	0	0	0
Sweden	1	0	0	1	0	0	3	0	2	0	1	0	0	1	1	1	0	0	0
Switzerland	1	0	0	0	0	0	0	0	1	2	9	0	0	1	0	2	0	0	1
Turkey	4	1	2	0	0	0	1	0	0	3	3	1	0	0	2	1	0	0	0
United Kingdom	0	0	1	0	0	0	2	1	2	2	3	0	2	0	11	0	0	0	0
Total moves to this destination	*406*	*454*	*152*	*267*	*27*	*290*	*325*	*188*	*300*	*471*	*640*	*218*	*173*	*30*	*236*	*399*	*84*	*325*	*95*
% moves to this destination	*4%*	*4%*	*2%*	*3%*	*0%*	*3%*	*3%*	*2%*	*3%*	*5%*	*6%*	*2%*	*2%*	*0%*	*2%*	*4%*	*1%*	*3%*	*1%*
Total moves to this destination by EU27 citizens	392	439	150	6	27	287	287	188	276	437	582	214	171	1	219	392	81	324	81
% moves to this destination by EU27 citizens	*5%*	*5%*	*2%*	*0%*	*0%*	*3%*	*3%*	*2%*	*3%*	*5%*	*7%*	*3%*	*2%*	*0%*	*3%*	*5%*	*1%*	*4%*	*1%*

Country of citizenship = departure country	Macedonia (FYROM)	Malta	Netherlands	Norway	Poland	Portugal	ROW	Romania	Slovakia	Slovenia	Spain	Sweden	Switzerland	Turkey	United Kingdom	Total moves by this citizenship	*% moves by this citizenship*	Total moves to EU27 by this citizenship	*% moves to EU27 by this citizenship*
Austria	0	0	2	0	1	1	5	2	0	1	0	0	2	0	4	375	*4%*	368	*4%*
Belgium	0	0	6	1	0	0	6	0	0	0	0	0	0	0	1	424	*4%*	417	*5%*
Bulgaria	1	0	0	0	1	0	3	0	1	0	2	1	0	0	5	175	*2%*	171	*2%*
Croatia	0	0	1	0	0	0	2	0	0	2	0	0	1	0	3	266	*3%*	12	*0%*
Cyprus	0	0	0	0	1	0	51	0	0	0	0	0	1	2	37	145	*1%*	91	*1%*
Czech Republic	0	0	0	0	0	0	2	0	5	0	0	0	1	0	1	278	*3%*	275	*3%*
Denmark	0	0	2	1	0	0	3	0	0	0	0	4	1	0	1	263	*3%*	258	*3%*
Estonia	0	0	0	0	0	0	20	0	0	0	0	7	0	0	5	225	*2%*	205	*2%*
Finland	0	0	0	1	0	0	3	0	0	0	0	6	0	1	1	254	*3%*	249	*3%*
France	0	0	4	1	0	2	6	0	0	1	1	3	15	0	4	409	*4%*	387	*5%*
Germany	1	0	29	7	0	0	15	0	0	1	3	15	52	0	16	701	*7%*	625	*7%*
Greece	0	0	5	0	0	0	55	0	0	0	0	0	3	0	67	377	*4%*	319	*4%*
Hungary	0	0	1	1	1	0	3	5	0	0	0	2	0	0	3	190	*2%*	186	*2%*
Iceland	0	0	2	9	0	0	21	0	0	0	0	7	1	0	8	80	*1%*	22	*0%*
Ireland	0	0	1	0	0	0	23	0	0	0	0	1	1	0	57	282	*3%*	258	*3%*
Italy	0	0	20	2	0	2	9	0	0	0	1	1	19	0	16	484	*5%*	453	*5%*
Latvia	0	0	1	0	0	0	2	0	0	0	0	0	0	0	3	83	*1%*	81	*1%*
Lithuania	0	1	0	2	1	0	20	0	0	0	0	3	0	0	0	358	*4%*	336	*4%*
Luxembourg	0	0	0	0	0	0	0	0	0	0	0	0	2	0	5	50	*0%*	47	*1%*
Macedonia (FYROM)	110	0	0	0	1	0	13	0	0	0	0	0	0	0	1	136	*1%*	8	*0%*
Malta	1	46	1	0	1	0	14	0	1	0	0	0	0	0	88	171	*2%*	156	*2%*
Netherlands	0	0	343	1	0	0	10	0	0	0	2	3	1	0	4	380	*4%*	368	*4%*
Norway	0	0	0	182	0	0	8	0	0	0	1	6	0	0	4	210	*2%*	20	*0%*
Poland	0	0	4	1	379	1	3	1	1	0	0	2	1	0	2	416	*4%*	411	*5%*
Portugal	0	0	6	2	0	264	13	1	0	1	17	2	0	0	28	361	*4%*	346	*4%*
ROW	1	0	84	20	1	6	183	2	4	2	7	36	38	1	29	596	*6%*	347	*4%*
Romania	0	0	6	1	0	0	11	281	0	2	1	0	3	0	0	320	*3%*	305	*4%*
Slovakia	0	0	4	1	1	0	2	0	199	0	0	0	1	0	0	232	*2%*	228	*3%*
Slovenia	0	0	0	0	0	0	8	0	0	254	0	1	1	0	4	284	*3%*	273	*3%*
Spain	0	0	9	2	0	1	8	0	0	0	405	2	4	0	9	466	*5%*	452	*5%*
Sweden	0	0	1	6	0	0	6	1	0	0	0	238	0	0	1	264	*3%*	250	*3%*
Switzerland	0	0	2	1	0	0	1	0	0	0	0	0	194	0	4	219	*2%*	22	*0%*
Turkey	0	0	4	0	0	0	21	0	0	0	0	2	3	163	14	225	*2%*	38	*0%*
United Kingdom	0	0	2	1	0	1	22	0	0	0	0	4	1	1	335	391	*4%*	366	*4%*
Total moves to this destination	*114*	*47*	*540*	*243*	*388*	*278*	*572*	*293*	*211*	*264*	*440*	*346*	*346*	*168*	*760*	*10,090*		8,350	*100%*
% moves to this destination	*1%*	*0%*	*5%*	*2%*	*4%*	*3%*	*6%*	*3%*	*2%*	*3%*	*4%*	*3%*	*3%*	*2%*	*8%*	*100%*		*83%*	
Total moves to this destination by EU27 citizens	3	47	447	31	386	272	323	291	207	260	432	295	109	4	697	8,358		7,881	
% moves to this destination by EU27 citizens	*0%*	*1%*	*5%*	*0%*	*5%*	*3%*	*4%*	*3%*	*2%*	*3%*	*5%*	*4%*	*1%*	*0%*	*8%*	*100%*		*94%*	

Source: MORE2 Higher Education Survey (2012)

Reading note: 375 moves or 4% of all moves are by Austrian citizens; 368 moves or 4% of all moves to EU27 destinations are by Austrian citizens; 406 moves or 4% of all moves are to Austria, 392 moves or 5% of all moves by EU27 citizens are to Austria. 344 moves are by Austrian citizens to Austria as country of PhD. Of all 10,090 moves, 8,350 or 83% were to EU27 countries; of all 10,090 moves, 8,358 or 83% were by EU27 citizens.

Table 21: Geographical flows >3 month mobility during PhD

Country of PhD = departure countries	Albania	American Samoa	Angola	Antarctica	Argentina	Australia	Austria	Bangladesh	Belarus	Belgium	Brazil	Bulgaria	Cambodia	Canada	China	Costa Rica	Croatia	Cuba	Cyprus	Czech Republic	Denmark	Ecuador	Finland	France	Germany	Ghana	Greece	Hong Kong	Hungary	Iceland
Austria	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	5	0	0	0	0	0
Belgium	0	0	0	1	0	0	1	0	0	3	0	0	1	0	0	0	0	0	0	0	1	0	0	3	2	0	0	0	0	0
Bulgaria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2	0	0	0	0	0
Croatia	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2	0	0	0	0	0
Czech Republic	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	3	2	0	1	0	2	0
Denmark	0	0	0	0	0	2	0	0	0	2	0	0	0	4	2	0	0	0	0	0	1	0	0	2	5	0	0	0	0	0
Estonia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	4	2	2	0	0	0	0	0
Finland	0	0	0	0	0	0	1	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0
France	0	0	0	0	0	0	1	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	2	3	0	0	0	0	0
Germany	0	1	0	0	0	0	1	0	1	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0
Greece	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0
Hungary	0	0	0	0	0	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	3	0	1	0	0	0
Iceland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2
Ireland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0
Italy	0	0	0	1	0	1	2	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	5	3	0	0	0	0	0
Latvia	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
Lithuania	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	3	3	2	0	0	0	0	0
Luxembourg	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
Macedonia (FYROM)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Malta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Netherlands	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	2	6	0	0	1	0	0
Norway	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Poland	0	0	0	0	0	0	1	0	0	1	0	0	0	1	0	0	1	0	0	1	0	0	1	5	8	0	0	0	0	0
Portugal	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	4	1	0	0	1	0	0
Other	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	4	0	0	0	1	1
Romania	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	6	4	0	1	0	3	0
Slovakia	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	5	1	0	2	2	3	0	0	0	2	0
Slovenia	0	0	0	0	0	0	1	0	0	2	0	0	0	1	1	0	0	0	0	1	1	0	0	1	3	0	0	0	0	0
Spain	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	3	9	0	0	0	0	0
Sweden	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	0	1	0	0
Switzerland	0	0	0	0	1	2	0	0	0	1	1	0	0	2	1	0	0	0	0	0	1	0	0	1	4	0	0	0	0	0
Turkey	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0
United Kingdom	0	0	0	0	0	0	0	0	0	1	1	1	0	1	1	0	0	0	2	0	1	0	0	3	1	1	2	0	0	0
Total moves to this destination	1	1	1	2	1	8	18	1	1	23	3	3	1	18	7	1	1	1	4	9	20	2	12	58	84	1	7	3	8	3
% moves to this destination	*0%*	*0%*	*0%*	*0%*	*0%*	*1%*	*2%*	*0%*	*0%*	*3%*	*0%*	*0%*	*0%*	*2%*	*1%*	*0%*	*0%*	*0%*	*1%*	*1%*	*3%*	*0%*	*2%*	*8%*	*11%*	*0%*	*1%*	*0%*	*1%*	*0%*
Total moves to this destination from EU27	0	1	1	2	0	5	15	1	1	21	2	3	1	15	6	1	1	0	4	9	17	1	11	53	73	1	6	3	7	0
% moves to this destination from EU27	*0%*	*0%*	*0%*	*0%*	*0%*	*1%*	*2%*	*0%*	*0%*	*3%*	*0%*	*0%*	*0%*	*2%*	*1%*	*0%*	*0%*	*0%*	*1%*	*1%*	*3%*	*0%*	*2%*	*8%*	*11%*	*0%*	*1%*	*0%*	*1%*	*0%*

Country of PhD = departure countries	India	Indonesia	Ireland	Israel	Italy	Japan	Kenya	Kyrgyzstan	Lithuania	Luxembourg	Macedonia (FYROM)	Malawi	Malta	Mexico	Morocco	Netherlands	New Zealand	Norway	Pakistan	Peru	Poland	Portugal	Romania	Russia	Serbia and Montenegro	Slovakia	Slovenia	South Africa	South Korea	Spain
Austria	0	0	0	0	2	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0
Belgium	0	0	1	0	2	0	1	0	0	0	0	0	0	0	0	3	0	1	0	0	0	0	1	1	0	0	0	1	0	0
Bulgaria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Croatia	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1
Czech Republic	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1
Denmark	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	3	1	2	0	0	0	0	0	0	0	0	0	2	0	1
Estonia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Finland	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
France	0	1	0	0	2	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Germany	1	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	1	0	1	0	0	0	1	0	0
Greece	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hungary	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0
Iceland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Ireland	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Italy	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	5
Latvia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Lithuania	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0
Luxembourg	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Macedonia (FYROM)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Netherlands	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	1	0	1	0	0	1	1	3
Norway	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Poland	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0
Portugal	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	4
Other	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1	0	2	0	0	0	1	1	0	0	0	0	0	0	0
Romania	0	0	0	0	10	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Slovakia	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	1	0	0	0	0	1	0	0	0	1
Slovenia	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spain	0	0	2	0	4	1	0	0	0	0	0	0	0	0	0	2	0	0	0	1	2	2	0	1	0	0	0	0	0	0
Sweden	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0
Switzerland	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Turkey	0	0	0	0	3	0	0	0	0	1	0	0	1	0	0	1	0	1	0	0	1	0	0	1	0	0	0	0	0	0
United Kingdom	2	0	0	0	2	0	0	1	0	1	0	0	2	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	2
Total moves to this destination	4	3	7	2	50	7	1	1	1	6	1	1	5	1	1	31	4	16	1	1	8	10	3	9	2	2	4	7	2	21
% moves to this destination	*1%*	*0%*	*1%*	*0%*	*6%*	*1%*	*0%*	*0%*	*0%*	*1%*	*0%*	*0%*	*1%*	*0%*	*0%*	*4%*	*1%*	*2%*	*0%*	*0%*	*1%*	*1%*	*0%*	*1%*	*0%*	*0%*	*1%*	*1%*	*0%*	*3%*
Total moves to this destination from EU27	4	2	7	1	42	7	1	1	0	5	1	0	3	1	1	28	3	12	1	1	7	9	2	8	2	2	2	6	2	19
% moves to this destination from EU27	*1%*	*0%*	*1%*	*0%*	*6%*	*1%*	*0%*	*0%*	*0%*	*1%*	*0%*	*0%*	*0%*	*0%*	*0%*	*4%*	*0%*	*2%*	*0%*	*0%*	*1%*	*1%*	*0%*	*1%*	*0%*	*0%*	*0%*	*1%*	*0%*	*3%*

Country of PhD = departure countries	Suriname	Sweden	Switzerland	Syria	Taiwan	Thailand	Turkey	United Kingdom	United States	Venezuela
Austria	0	0	3	0	0	0	0	4	4	0
Belgium	0	0	0	0	0	0	0	4	7	0
Bulgaria	0	0	0	0	0	0	0	1	0	0
Croatia	0	0	0	0	0	0	0	2	1	0
Czech Republic	0	2	0	0	0	0	0	2	1	0
Denmark	0	3	4	1	0	0	0	11	15	0
Estonia	0	1	0	0	0	0	0	2	3	0
Finland	0	3	1	0	0	0	0	2	3	0
France	0	0	2	0	0	0	0	4	7	0
Germany	0	0	1	0	0	0	0	4	3	1
Greece	0	0	0	0	0	0	0	2	0	0
Hungary	0	1	0	0	0	0	0	0	2	0
Iceland	0	0	0	0	0	0	0	0	0	0
Ireland	0	0	0	0	0	0	0	5	1	0
Italy	0	1	4	0	0	0	0	10	7	0
Latvia	0	0	0	0	0	0	0	1	2	0
Lithuania	0	1	0	0	0	1	0	2	0	0
Luxembourg	0	0	0	0	0	0	0	0	1	0
Macedonia (FYROM)	0	0	0	0	0	0	0	1	0	0
Malta	0	0	0	0	0	0	0	0	0	0
Netherlands	1	1	1	0	0	0	1	4	15	0
Norway	0	0	0	0	0	0	0	4	2	0
Poland	0	0	1	0	0	0	0	1	4	0
Portugal	0	0	0	0	0	0	0	5	8	0
Other	0	2	2	0	0	0	0	0	5	0
Romania	0	0	0	0	0	0	0	3	0	0
Slovakia	0	0	1	0	0	0	0	1	1	0
Slovenia	0	0	0	0	0	0	0	2	0	0
Spain	0	0	0	0	0	0	0	9	13	0
Sweden	0	0	0	0	0	0	0	0	7	0
Switzerland	0	0	3	0	0	1	0	0	6	0
Turkey	0	0	0	0	1	0	0	2	2	0
United Kingdom	0	1	0	0	0	0	0	1	1	0

Source: MORE2 Higher Education Survey (2012)

Table 22: Geographical flows >3 month mobility in post-PhD career stages

Country of citizenship = departure countries	Afghanistan	Albania	American Samoa	Angola	Argentina	Armenia	Australia	Austria	Belgium	Bolivia	Bosnia and Herzegovina	Brazil	Bulgaria	Burkina Faso	Cambodia	Cameroon	Canada	Central African Republic	Chile	China	Colombia	Costa Rica	Croatia	Cyprus	Czech Republic	Republic of the Congo	Denmark	Egypt	El Salvador	Equatorial Guinea	Estonia
Algeria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Argentina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Armenia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Australia	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Austria	0	1	0	0	0	0	12	10	1	0	0	0	0	1	0	0	7	1	0	1	0	0	2	0	0	0	2	0	0	0	1
Bahamas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bangladesh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bassas da India	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Belarus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Belgium	1	0	0	0	0	0	5	0	4	0	0	1	0	0	0	0	5	0	0	0	0	0	1	0	0	1	2	0	0	0	0
Bosnia and Herzegovina	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brazil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Bulgaria	0	0	0	0	0	0	0	4	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cameroon	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Canada	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0
China	0	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Colombia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Croatia	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
Cyprus	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	2	0	0	0	0	0	0	14	0	0	0	0	0	0	0
Czech Republic	0	0	0	1	0	0	0	2	1	0	0	0	0	0	0	0	3	0	0	2	0	0	0	0	3	0	0	0	0	0	0
Denmark	0	0	0	0	0	0	1	2	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	10	0	0	0	0
Egypt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estonia	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	3
Finland	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	4	0	0	0	1
France	0	1	0	0	0	0	1	3	3	1	0	1	0	0	0	0	7	0	0	0	0	0	0	1	0	0	2	0	0	1	1
Germany	0	0	1	0	0	0	4	27	8	0	0	3	0	0	0	0	5	0	0	5	0	0	0	0	0	0	12	0	0	0	4
Greece	0	0	0	0	0	0	0	1	9	0	0	0	1	0	0	0	5	0	0	0	0	0	0	19	0	0	2	0	0	0	0
Hong Kong	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hungary	0	0	0	0	0	0	0	3	3	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0	1	0	0	0
Iceland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	0	0	0	0	4	0	0	0	0
India	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Iran	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ireland	0	0	0	0	0	0	6	0	1	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	2	0	0	0	0
Israel	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Italy	0	0	0	0	0	0	2	5	7	0	0	1	0	0	0	0	3	0	0	1	0	0	0	0	0	0	2	0	0	0	1
Japan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jordan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Latvia	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lebanon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Country of citizenship = departure countries	Afghanistan	Albania	American Samoa	Angola	Argentina	Armenia	Australia	Austria	Belgium	Bolivia	Bosnia and Herzegovina	Brazil	Bulgaria	Burkina Faso	Cambodia	Cameroon	Canada	Central African Republic	Chile	China	Colombia	Costa Rica	Croatia	Cyprus	Czech Republic	Republic of the Congo	Denmark	Egypt	El Salvador	Equatorial Guinea	Estonia
Lithuania	1	0	0	0	0	1	0	0	2	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Luxembourg	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macedonia (FYROM)	0	1	0	0	0	0	1	6	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	1	0	0	0	0
Malaysia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malta	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	3	0	0	1	0	0	0	0	1	0	0	0	0	0	0
Mexico	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moldova	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
Morocco	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Netherlands	0	0	0	0	0	0	6	2	7	0	0	1	0	0	0	0	0	0	0	0	0	0	2	1	1	0	3	0	0	0	0
New Zealand	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nigeria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Norway	0	0	0	0	0	0	2	1	1	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0
Philippines	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poland	1	0	0	0	0	0	1	3	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	3	0	0	0	0
Portugal	0	0	0	1	0	0	1	0	4	0	0	7	0	0	0	0	2	0	0	0	0	0	0	0	0	0	4	0	0	0	0
Romania	0	0	0	0	0	0	0	2	5	0	0	0	0	0	0	0	3	0	1	0	0	0	0	1	2	0	2	0	0	0	0
Russia	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Slovakia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	6	0	0	0	0	0	0
Slovenia	0	0	0	0	1	0	1	11	0	0	0	0	0	0	0	0	2	0	0	1	0	0	2	0	0	0	2	0	0	0	0
South Africa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spain	0	0	0	0	0	0	0	4	2	0	0	5	0	0	0	0	10	0	2	0	1	0	0	0	0	0	1	0	1	0	1
Swaziland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sweden	0	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	3	0	0	0	0
Switzerland	0	0	0	0	0	0	3	2	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0
Turkey	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	2	0	0	0	0	0	0	2	0	0	1	0	0	0	0
Ukraine	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
United Kingdom	0	0	0	0	1	0	3	3	3	0	0	0	0	0	0	0	6	0	0	2	1	1	0	1	0	0	5	0	0	0	1
United States	0	0	0	0	0	0	1	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	0	6	0	0	0	0
Venezuela	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vietnam	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total moves to this destination	3	3	1	3	2	1	61	106	87	1	2	21	3	1	1	1	90	1	5	14	3	1	11	42	19	1	84	1	1	1	15
% moves to this destination	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*2%*	*3%*	*3%*	*0%*	*0%*	*1%*	*0%*	*0%*	*0%*	*0%*	*3%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*1%*	*1%*	*0%*	*3%*	*0%*	*0%*	*0%*	*0%*
Total moves to this destination by EU27 citizens	3	2	1	2	2	1	50	87	69	1	1	20	3	1	1	0	78	1	5	13	2	1	8	37	15	1	63	1	1	1	13
% moves to this destination by EU27 citizens	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*2%*	*3%*	*3%*	*0%*	*0%*	*1%*	*0%*	*0%*	*0%*	*0%*	*3%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*1%*	*1%*	*0%*	*2%*	*0%*	*0%*	*0%*	*0%*

Country of citizenship = departure countries	Ethiopia	Finland	France	Gaza Strip	Georgia	Germany	Ghana	Greece	Guinea-Bissau	Hong Kong	Hungary	Iceland	India	Indonesia	Ireland	Israel	Italy	Japan	Jordan	Kazakhstan	Kenya	Latvia	Lebanon	Libya	Lithuania	Luxembourg	Macedonia (FYROM)	Malaysia	Malta	Mexico	Morocco
Algeria	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Argentina	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Armenia	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australia	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Austria	0	1	12	2	0	25	0	0	0	0	0	0	1	0	0	0	3	1	0	0	0	0	0	0	0	1	0	0	0	1	0
Bahamas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bangladesh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bassas da India	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Belarus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Belgium	0	2	13	0	0	5	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Bosnia and Herzegovina	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brazil	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bulgaria	0	0	7	0	0	9	0	3	0	0	1	0	0	0	1	0	12	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Cameroon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Canada	0	0	3	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
China	0	1	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Colombia	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Croatia	0	0	2	0	0	8	0	1	0	0	2	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cyprus	0	0	2	0	0	5	0	4	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Czech Republic	2	0	4	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Denmark	0	1	2	0	0	5	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Egypt	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estonia	0	11	3	0	0	18	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Finland	0	5	2	0	0	4	0	0	0	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
France	0	1	8	0	0	9	0	1	0	0	1	0	0	0	2	0	8	3	0	0	0	0	1	0	0	5	0	0	0	0	0
Germany	0	6	16	0	0	57	0	0	0	1	1	1	1	3	2	4	8	4	0	1	0	0	0	0	2	8	0	0	1	1	0
Greece	0	3	19	0	0	12	0	17	0	0	0	0	0	0	1	1	11	2	0	0	0	0	0	0	0	1	1	0	1	0	0
Hong Kong	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hungary	0	1	2	0	0	13	0	1	0	0	5	0	0	0	1	1	6	5	0	0	0	0	0	0	0	0	0	0	0	1	0
Iceland	0	0	1	0	0	1	0	0	0	0	0	4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
India	0	0	0	0	0	3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Iran	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ireland	0	2	3	0	0	5	0	0	0	1	0	0	1	0	15	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Israel	0	0	0	0	0	4	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Italy	0	2	20	0	0	20	0	2	0	0	2	0	2	0	7	1	15	5	0	0	0	0	0	1	0	4	0	0	0	0	1
Japan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Jordan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Latvia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lebanon	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lithuania	0	1	9	0	1	7	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	0	0	1	0	0	0	0	0	0

Country of citizenship = departure countries	Ethiopia	Finland	France	Gaza Strip	Georgia	Germany	Ghana	Greece	Guinea-Bissau	Hong Kong	Hungary	Iceland	India	Indonesia	Ireland	Israel	Italy	Japan	Jordan	Kazakhstan	Kenya	Latvia	Lebanon	Libya	Lithuania	Luxembourg	Macedonia (FYROM)	Malaysia	Malta	Mexico	Morocco
Luxembourg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0
Macedonia (FYROM)	0	3	2	0	0	2	0	0	0	0	0	0	1	0	0	1	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0
Malaysia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malta	0	1	4	0	0	5	0	0	0	0	0	0	1	0	2	0	2	0	0	0	0	0	0	0	0	0	0	1	1	0	0
Mexico	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moldova	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Morocco	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Netherlands	0	2	5	0	0	9	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	3	0	0	0	0	0
New Zealand	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nigeria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Norway	1	1	6	0	0	4	0	0	0	1	0	1	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Philippines	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poland	0	0	4	0	0	10	0	0	0	0	0	0	0	0	1	0	4	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Portugal	0	0	3	0	0	6	0	0	1	0	0	0	0	0	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Romania	0	1	35	0	0	14	0	1	0	0	0	0	0	0	3	0	3	1	0	1	0	0	0	0	0	0	0	0	0	0	0
Russia	0	1	1	0	0	1	0	0	0	0	0	0	0	0	4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Slovakia	0	1	3	0	0	3	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	1	0	0	0	0	0	0
Slovenia	0	1	10	0	0	14	0	0	0	0	0	0	0	0	0	0	14	1	0	0	0	0	0	0	0	1	0	0	0	0	0
South Africa	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spain	0	4	15	0	0	15	0	0	0	0	0	0	0	0	1	0	6	1	0	0	0	0	0	0	0	0	0	0	0	1	0
Swaziland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sweden	0	2	2	0	0	2	1	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Switzerland	0	1	6	0	0	5	0	0	0	0	0	0	2	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0
Turkey	0	1	2	0	0	5	0	2	0	0	2	0	0	0	0	0	2	4	0	1	0	0	0	0	0	0	0	0	0	0	0
Ukraine	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
United Kingdom	0	2	2	0	0	9	0	1	0	0	2	2	1	0	12	0	8	6	0	0	1	0	0	0	0	3	0	0	0	0	0
United States	0	2	2	0	0	9	0	1	0	1	0	0	0	0	9	0	1	1	0	0	0	0	0	0	1	2	0	0	1	0	0
Venezuela	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vietnam	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total moves to this destination	3	61	239	2	1	340	1	35	1	4	16	10	12	3	75	8	130	46	1	4	1	1	1	1	5	37	2	1	4	8	1
% moves to this destination	*0%*	*2%*	*7%*	*0%*	*0%*	*10%*	*0%*	*1%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*2%*	*0%*	*4%*	*1%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*1%*	*0%*	*0%*	*0%*	*0%*	*0%*
Total moves to this destination by EU27 citizens	2	50	205	2	1	287	1	30	1	2	12	5	8	3	56	7	111	34	1	3	1	1	1	1	4	34	1	1	3	5	1
% moves to this destination by EU27 citizens	*0%*	*2%*	*8%*	*0%*	*0%*	*11%*	*0%*	*1%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*2%*	*0%*	*4%*	*1%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*1%*	*0%*	*0%*	*0%*	*0%*	*0%*

Country of citizenship = departure countries	Mozambique	Nepal	Netherlands	Netherlands Antilles	New Zealand	Nigeria	Norway	Papua New Guinea	Peru	Poland	Portugal	Romania	Russia	Saudi Arabia	Senegal	Serbia and Montenegro	Singapore	Slovakia	Slovenia	South Africa	South Korea	Spain	Sri Lanka	Sudan	Sweden	Switzerland	Syria	Taiwan	Tajikistan	Tanzania	Thailand
Algeria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0	0	0	0	0	0
Argentina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Armenia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Austria	0	0	1	0	2	1	2	0	0	0	0	0	0	0	0	0	1	0	0	1	0	2	0	0	2	7	0	0	0	0	0
Bahamas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bangladesh	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bassas da India	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Belarus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Belgium	0	0	10	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	1	0	0	2	2	0	0	0	0	0
Bosnia and Herzegovina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brazil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bulgaria	0	0	3	0	0	0	0	0	0	0	2	0	1	0	0	0	0	6	0	0	0	2	0	0	1	3	0	0	0	0	0
Cameroon	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Canada	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	2	1	0	0	0	0	0
China	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0
Colombia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
Croatia	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	2	2	0	0	1	0	0	0	1	0	0	0	0	0
Cyprus	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0
Czech Republic	0	0	2	0	0	0	0	0	0	1	1	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
Denmark	0	0	1	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	4	2	0	0	0	0	0
Egypt	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estonia	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	11	1	0	0	0	0	0
Finland	0	0	3	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	6	2	0	0	0	0	0
France	0	0	2	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	6	0	0	2	12	0	0	0	0	0
Germany	0	0	14	0	4	1	14	1	0	0	1	0	0	0	0	0	0	0	0	1	0	4	0	0	8	39	0	0	0	0	0
Greece	0	0	10	0	0	0	1	0	0	1	0	0	0	0	0	2	0	0	0	0	0	7	0	0	2	3	0	2	0	0	0
Hong Kong	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hungary	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	3	0	0	0	0	0
Iceland	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	0	0	0	0	0
India	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0
Iran	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
Ireland	0	1	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Israel	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Italy	0	0	8	0	0	0	0	0	0	3	0	0	3	0	0	0	1	0	1	1	1	8	0	0	3	10	0	0	0	0	0
Japan	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
Jordan	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Latvia	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lebanon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Country of citizenship = departure countries	Mozambique	Nepal	Netherlands	Netherlands Antilles	New Zealand	Nigeria	Norway	Papua New Guinea	Peru	Poland	Portugal	Romania	Russia	Saudi Arabia	Senegal	Serbia and Montenegro	Singapore	Slovakia	Slovenia	South Africa	South Korea	Spain	Sri Lanka	Sudan	Sweden	Switzerland	Syria	Taiwan	Tajikistan	Tanzania	Thailand
Lithuania	0	0	0	0	0	0	7	0	0	0	0	2	5	0	0	0	0	0	0	0	0	0	0	0	2	1	0	1	2	0	0
Luxembourg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macedonia (FYROM)	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malaysia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Mexico	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moldova	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Morocco	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Netherlands	0	0	9	0	0	0	3	0	0	2	1	0	0	0	0	0	0	1	0	0	0	3	0	0	3	4	0	0	0	0	0
New Zealand	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Nigeria	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Norway	0	0	6	0	2	0	5	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3	0	0	2	2	0	0	0	0	0
Philippines	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Poland	0	0	2	0	0	0	1	0	0	1	0	0	0	0	0	0	0	2	0	0	0	4	0	0	2	4	0	0	0	0	0
Portugal	1	0	3	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	7	0	0	2	2	1	0	0	1	0
Romania	0	0	1	0	0	0	1	0	0	1	1	3	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	0	0	0	0
Russia	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0
Slovakia	0	0	5	0	1	0	5	0	0	3	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	2	0	0	0	0	0
Slovenia	0	0	2	0	0	0	3	0	0	2	0	0	0	0	0	1	0	0	2	0	0	3	2	0	3	1	0	2	0	0	0
South Africa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spain	0	0	4	0	1	0	0	0	3	0	5	0	1	0	0	0	0	0	0	0	0	13	0	0	6	5	0	0	0	0	0
Swaziland	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sweden	0	0	5	0	1	0	5	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2	0	1	3	0	0	0	0	1	0
Switzerland	0	1	4	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4	0	0	0	0	1
Turkey	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	0	0	0	1	1	1	0	0	0
Ukraine	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
United Kingdom	0	0	4	0	3	0	3	0	0	2	1	0	1	0	0	0	0	0	0	0	0	6	0	0	1	2	0	0	0	1	0
United States	0	0	5	0	3	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0
Venezuela	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vietnam	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Total moves to this destination	1	2	124	1	21	4	73	1	3	18	21	5	14	1	1	5	5	18	8	9	1	90	2	1	88	129	2	6	2	3	1
% moves to this destination	*0%*	*0%*	*4%*	*0%*	*1%*	*0%*	*2%*	*0%*	*0%*	*1%*	*1%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*1%*	*0%*	*0%*	*0%*	*3%*	*0%*	*0%*	*3%*	*4%*	*0%*	*0%*	*0%*	*0%*	*0%*
Total moves to this destination by EU27 citizens	1	1	97	0	16	2	54	1	3	17	20	5	13	0	0	3	4	15	3	8	1	78	2	1	64	109	1	5	2	3	0
% moves to this destination by EU27 citizens	*0%*	*0%*	*4%*	*0%*	*1%*	*0%*	*2%*	*0%*	*0%*	*1%*	*1%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*1%*	*0%*	*0%*	*0%*	*3%*	*0%*	*0%*	*2%*	*4%*	*0%*	*0%*	*0%*	*0%*	*0%*

Country of citizenship = departure countries	Timor-Leste	Tunisia	Turkey	Ukraine	United Arab Emirates	United Kingdom	United States	Vietnam	West Bank	Zambia	Total moves by this citizenship	*% moves by this citizenship*	Total moves to EU27 by this citizenship	*% moves to EU27 by this citizenship*
Algeria	0	0	0	0	0	0	1	0	0	0	5	*0%*	4	*0%*
Argentina	0	0	0	0	0	0	0	0	0	0	2	*0%*	2	*0%*
Armenia	0	0	0	0	0	0	0	0	0	0	2	*0%*	2	*0%*
Australia	0	0	0	0	0	1	0	0	0	0	6	*0%*	3	*0%*
Austria	0	0	1	0	0	11	27	0	1	0	145	*4%*	72	*4%*
Bahamas	0	0	0	0	0	0	0	0	0	0	2	*0%*	0	*0%*
Bangladesh	0	0	0	0	0	0	0	0	0	0	1	*0%*	1	*0%*
Bassas da India	0	0	0	0	0	0	0	0	0	0	1	*0%*	1	*0%*
Belarus	0	0	0	0	0	0	0	0	0	0	1	*0%*	0	*0%*
Belgium	0	0	0	0	0	8	26	0	0	0	94	*3%*	49	*2%*
Bosnia and Herzegovina	0	0	0	0	0	0	0	0	0	0	2	*0%*	2	*0%*
Brazil	0	0	0	0	0	0	0	0	0	0	2	*0%*	2	*0%*
Bulgaria	0	0	1	0	0	3	4	0	0	0	68	*2%*	58	*3%*
Cameroon	0	0	0	0	0	0	0	0	0	0	7	*0%*	7	*0%*
Canada	0	0	0	0	0	1	3	0	0	0	22	*1%*	13	*1%*
China	0	0	0	0	0	1	2	0	0	0	17	*1%*	12	*1%*
Colombia	0	0	0	0	0	0	1	0	0	0	6	*0%*	4	*0%*
Croatia	0	0	0	0	0	4	4	0	0	0	41	*1%*	34	*2%*
Cyprus	0	0	0	0	0	7	12	0	0	0	54	*2%*	34	*2%*
Czech Republic	0	0	0	0	0	2	2	1	0	0	36	*1%*	25	*1%*
Denmark	0	0	0	1	0	10	8	1	0	1	64	*2%*	38	*2%*
Egypt	0	0	0	0	0	0	0	0	0	0	3	*0%*	3	*0%*
Estonia	0	0	1	1	0	4	4	0	0	0	69	*2%*	60	*3%*
Finland	0	0	0	0	0	7	13	0	0	0	64	*2%*	40	*2%*
France	0	1	0	0	0	14	24	0	0	0	125	*4%*	70	*3%*
Germany	0	0	1	0	0	26	48	0	0	0	348	*11%*	205	*10%*
Greece	0	0	1	0	0	37	56	0	0	0	228	*7%*	154	*8%*
Hong Kong	0	0	0	0	0	0	0	0	0	0	1	*0%*	1	*0%*
Hungary	0	0	0	0	0	7	10	0	0	0	74	*2%*	49	*2%*
Iceland	0	0	0	0	0	2	7	0	0	0	30	*1%*	12	*1%*
India	0	0	0	0	0	1	1	0	0	0	14	*0%*	11	*1%*
Iran	0	0	0	0	0	0	0	0	0	0	3	*0%*	1	*0%*
Ireland	0	0	0	0	0	21	20	0	0	0	86	*3%*	51	*3%*
Israel	0	0	0	0	0	2	1	0	0	0	13	*0%*	9	*0%*
Italy	0	0	2	0	1	33	52	0	0	0	231	*7%*	143	*7%*
Japan	0	0	0	0	0	0	1	0	0	0	5	*0%*	2	*0%*
Jordan	0	0	0	0	0	0	0	0	0	0	2	*0%*	1	*0%*
Latvia	0	0	0	0	0	0	2	0	0	0	5	*0%*	3	*0%*
Lebanon	0	0	0	0	0	0	1	0	0	0	3	*0%*	2	*0%*
Lithuania	0	0	0	0	0	5	11	0	0	0	65	*2%*	32	*2%*

Country of citizenship = departure countries	Timor-Leste	Tunisia	Turkey	Ukraine	United Arab Emirates	United Kingdom	United States	Vietnam	West Bank	Zambia	Total moves by this citizenship	*% moves by this citizenship*	Total moves to EU27 by this citizenship	*% moves to EU27 by this citizenship*
Luxembourg	0	0	0	0	0	2	3	0	0	0	12	*0%*	9	*0%*
Macedonia (FYROM)	0	0	1	0	0	2	4	0	0	0	37	*1%*	20	*1%*
Malaysia	0	0	0	0	0	2	0	0	0	0	2	*0%*	2	*0%*
Malta	0	1	1	0	0	9	6	0	0	0	44	*1%*	28	*1%*
Mexico	0	0	0	0	0	1	1	0	0	0	3	*0%*	2	*0%*
Moldova	0	0	0	0	0	0	1	0	0	0	4	*0%*	3	*0%*
Morocco	0	0	0	0	0	3	1	0	0	0	6	*0%*	5	*0%*
Netherlands	0	0	0	0	1	10	27	1	0	0	110	*3%*	64	*3%*
New Zealand	0	0	0	0	0	0	0	0	0	0	2	*0%*	1	*0%*
Nigeria	0	0	0	0	0	0	0	0	0	0	2	*0%*	1	*0%*
Norway	0	0	0	0	0	11	22	0	0	0	82	*2%*	41	*2%*
Philippines	0	0	0	0	0	0	0	0	0	0	1	*0%*	0	*0%*
Poland	0	0	1	1	0	8	6	0	0	0	64	*2%*	48	*2%*
Portugal	2	0	0	0	0	9	15	0	0	0	82	*2%*	47	*2%*
Romania	0	0	0	0	0	4	17	0	0	0	107	*3%*	80	*4%*
Russia	0	0	0	0	0	0	5	0	0	0	24	*1%*	18	*1%*
Slovakia	0	0	0	0	0	3	5	0	0	0	45	*1%*	28	*1%*
Slovenia	0	0	0	0	0	7	19	0	0	0	108	*3%*	72	*4%*
South Africa	0	0	0	0	0	0	0	0	0	0	4	*0%*	4	*0%*
Spain	0	0	0	1	0	31	47	0	0	0	187	*6%*	108	*5%*
Swaziland	0	0	0	0	0	0	0	0	0	0	1	*0%*	0	*0%*
Sweden	0	0	0	0	0	2	9	0	0	0	49	*1%*	26	*1%*
Switzerland	0	0	0	0	0	7	18	0	0	0	65	*2%*	31	*2%*
Turkey	0	0	6	0	0	6	14	0	0	0	62	*2%*	29	*1%*
Ukraine	0	0	0	0	0	0	0	0	0	0	1	*0%*	1	*0%*
United Kingdom	0	0	3	0	0	12	19	0	0	0	134	*4%*	78	*4%*
United States	0	0	0	0	0	12	18	0	0	0	93	*3%*	61	*3%*
Venezuela	0	0	0	0	0	0	1	0	0	0	1	*0%*	0	*0%*
Vietnam	0	0	0	0	0	0	0	0	0	0	2	*0%*	0	*0%*
Total moves to this destination	2	2	19	4	2	348	599	3	1	1	3,281	*100%*	2,019	*100%*
% moves to this destination	*0%*	*0%*	*1%*	*0%*	*0%*	*11%*	*18%*	*0%*	*0%*	*0%*	*100%*		*62%*	
Total moves to this destination by EU27 citizens	2	2	12	4	2	292	492	3	1	1	2,698		1,671	
% moves to this destination by EU27 citizens	*0%*	*0%*	*0%*	*0%*	*0%*	*11%*	*18%*	*0%*	*0%*	*0%*	*100%*		*62%*	

Source: MORE2 Higher Education Survey (2012)

Table 23: Geographical flows employer mobility in post-PhD career stages

Country of citizenship = departure countries	Afghanistan	Angola	Armenia	Australia	Austria	Belgium	Bosnia and Herzegovina	Brazil	Bulgaria	Canada	Chile	China	Colombia	Costa Rica	Croatia	Cyprus	Czech Republic	Denmark	Estonia	Finland	France	Germany	Greece	Hong Kong
Algeria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Argentina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Armenia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0
Australia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Austria	0	0	0	6	8	1	0	0	0	0	0	0	0	0	1	0	0	0	1	1	5	19	0	0
Belarus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Belgium	0	0	0	0	0	3	0	0	0	1	0	0	0	0	1	0	0	1	0	1	2	0	0	0
Bulgaria	0	0	0	0	2	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	5	0	0
Cameroon	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Canada	0	0	0	1	1	1	0	0	0	2	0	0	0	0	0	1	0	0	0	0	2	1	0	0
China	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	0
Colombia	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0
Croatia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0
Cyprus	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	12	0	0	0	0	1	2	3	0
Czech Republic	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
Denmark	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	8	0	1	1	4	0	0
Estonia	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	3	0	3	0	0
Finland	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	3	1	4	2	1	0	0
France	0	0	0	0	3	3	0	0	0	3	0	0	0	0	0	1	0	1	0	1	4	5	1	0
Germany	0	0	0	0	23	6	0	0	0	5	0	3	0	0	0	0	0	11	4	2	11	43	0	1
Greece	0	0	0	0	1	3	0	0	0	2	0	0	0	0	0	10	0	0	0	1	6	6	15	0
Hungary	0	0	0	0	1	2	0	0	0	2	1	0	0	0	0	0	0	0	0	1	2	6	0	0
Iceland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
India	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
Iran	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ireland	0	0	0	3	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	3	1	0	0
Israel	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0
Italy	0	0	0	1	2	5	0	0	0	0	0	0	0	0	0	0	0	2	1	0	9	13	0	0
Japan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jordan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Latvia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Country of citizenship = departure countries	Afghanistan	Angola	Armenia	Australia	Austria	Belgium	Bosnia and Herzegovina	Brazil	Bulgaria	Canada	Chile	China	Colombia	Costa Rica	Croatia	Cyprus	Czech Republic	Denmark	Estonia	Finland	France	Germany	Greece	Hong Kong
Lithuania	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5	1	0	0
Luxembourg	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macedonia (FYROM)	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Malaysia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malta	0	0	0	0	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	2	0	0
Mexico	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Moldova	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Morocco	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Netherlands	0	0	0	2	1	5	0	0	0	0	0	0	0	0	2	1	0	3	0	1	2	5	0	0
New Zealand	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Nigeria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Norway	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Poland	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	5	0	0
Portugal	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	3	0	0	1	2	0	0
Romania	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0	1	6	3	0	0
Russia	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	1	0	0
Slovakia	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	1	2	0	0
Slovenia	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	4	0	0
Spain	0	0	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	5	3	0	0
Sweden	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	3	0	2	2	2	0	0
Switzerland	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	2	0	1	4	3	0	0
Turkey	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0
Ukraine	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
United Kingdom	0	0	0	1	3	3	0	0	0	4	0	0	0	1	0	1	0	4	1	2	2	5	1	0
United States	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	1	1	6	0	1	2	6	1	0
Vietnam	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total moves to this destination	1	1	1	18	55	45	1	2	1	34	3	3	1	1	9	29	2	51	12	28	89	165	21	1
% moves to this destination	*0%*	*0%*	*0%*	*1%*	*4%*	*3%*	*0%*	*0%*	*0%*	*2%*	*0%*	*0%*	*0%*	*0%*	*1%*	*2%*	*0%*	*4%*	*1%*	*2%*	*6%*	*11%*	*1%*	*0%*
Total moves to this destination by EU27 citizens	1	1	1	14	50	37	1	2	1	31	3	3	0	1	6	25	1	40	10	22	74	142	20	1
% moves to this destination by EU27 citizens	*0%*	*0%*	*0%*	*1%*	*4%*	*3%*	*0%*	*0%*	*0%*	*3%*	*0%*	*0%*	*0%*	*0%*	*1%*	*2%*	*0%*	*3%*	*1%*	*2%*	*6%*	*12%*	*2%*	*0%*

Country of citizenship = departure countries	Hungary	Iceland	India	Indonesia	Ireland	Israel	Italy	Japan	Jordan	Kazakhstan	Lithuania	Luxembourg	Macedonia (FYROM)	Malta	Mexico	Nepal	Netherlands	New Zealand	Nigeria	Non indica	Norway	Papua New Guinea	Poland	Portugal	Romania
Algeria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Argentina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Armenia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australia	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Austria	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	2	0	0	0	0
Belarus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Belgium	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	5	0	0	0	0	0	0	0	0
Bulgaria	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
Cameroon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Canada	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0
China	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Colombia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Croatia	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cyprus	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Czech Republic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Denmark	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	4	0	0	0	0
Estonia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Finland	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	1	0	0	2	0	0	0	0
France	0	0	0	0	0	0	1	2	0	0	0	2	0	0	0	0	1	1	0	0	0	0	0	0	0
Germany	0	1	1	1	2	3	2	0	0	1	1	8	0	1	0	0	10	1	0	0	12	1	0	1	0
Greece	0	0	0	0	1	0	2	1	0	0	0	1	0	0	0	0	7	0	0	0	0	0	0	0	0
Hungary	4	0	0	0	0	0	4	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0
Iceland	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
India	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
Iran	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ireland	0	0	0	0	13	0	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
Israel	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Italy	1	0	0	0	4	0	6	1	0	0	0	1	0	0	0	0	4	0	0	1	0	0	0	0	0
Japan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jordan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Latvia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Lithuania	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1

Country of citizenship = departure countries	Hungary	Iceland	India	Indonesia	Ireland	Israel	Italy	Japan	Jordan	Kazakhstan	Lithuania	Luxembourg	Macedonia (FYROM)	Malta	Mexico	Nepal	Netherlands	New Zealand	Nigeria	Non indica	Norway	Papua New Guinea	Poland	Portugal	Romania
Luxembourg	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0
Macedonia (FYROM)	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Malaysia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malta	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Mexico	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moldova	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Morocco	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Netherlands	0	0	0	0	1	0	1	1	0	0	0	3	0	0	0	0	6	0	0	0	2	0	0	0	0
New Zealand	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nigeria	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Norway	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	0	0	0
Poland	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0
Portugal	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0
Romania	0	0	0	0	2	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Russia	0	0	0	0	3	0	1	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0
Slovakia	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	4	0	0	0	1	0	1	0	0
Slovenia	0	0	0	0	0	0	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Spain	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3	0	0	0	0	0	0	0	0
Sweden	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	1	0
Switzerland	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0
Turkey	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ukraine	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
United Kingdom	0	2	0	0	10	0	0	5	0	0	0	3	0	0	0	0	4	2	0	0	2	0	2	1	0
United States	0	0	0	0	7	0	0	0	0	0	1	2	0	1	0	0	4	3	0	0	1	0	0	0	0
Vietnam	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Total moves to this destination	6	7	4	1	54	4	29	17	1	3	4	29	1	3	3	1	65	9	1	1	38	1	5	9	2
% moves to this destination	*0%*	*0%*	*0%*	*0%*	*4%*	*0%*	*2%*	*1%*	*0%*	*0%*	*0%*	*2%*	*0%*	*0%*	*0%*	*0%*	*5%*	*1%*	*0%*	*0%*	*3%*	*0%*	*0%*	*1%*	*0%*
Total moves to this destination by EU27 citizens	6	5	2	1	40	3	23	12	1	2	3	26	0	2	2	1	54	6	0	1	29	1	5	8	2
% moves to this destination by EU27 citizens	*1%*	*0%*	*0%*	*0%*	*3%*	*0%*	*2%*	*1%*	*0%*	*0%*	*0%*	*2%*	*0%*	*0%*	*0%*	*0%*	*5%*	*1%*	*0%*	*0%*	*2%*	*0%*	*0%*	*1%*	*0%*

Country of citizenship = departure countries	Russia	Saudi Arabia	Slovakia	Slovenia	South Africa	Spain	Sweden	Switzerland	Tajikistan	Tanzania	Turkey	Ukraine	United Kingdom	United States	Total moves by this citizenship	*% moves by this citizenship*	Total moves to EU27 by this citizenship	*% moves to EU27 by this citizenship*
Algeria	0	0	0	0	0	0	2	0	0	0	0	0	0	1	3	*0%*	2	*0%*
Argentina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	*0%*	1	*0%*
Armenia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	*0%*	2	*0%*
Australia	0	0	0	0	0	0	0	0	0	0	0	0	1	0	4	*0%*	2	*0%*
Austria	0	0	0	0	0	0	1	5	0	0	1	0	5	8	66	*5%*	42	*4%*
Belarus	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	*0%*	0	*0%*
Belgium	0	0	0	0	0	1	2	1	0	0	0	0	5	9	34	*2%*	21	*2%*
Bulgaria	0	0	0	0	0	1	0	3	0	0	0	0	3	1	22	*2%*	18	*2%*
Cameroon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	*0%*	2	*0%*
Canada	0	0	0	0	0	0	1	1	0	0	0	0	1	1	16	*1%*	10	*1%*
China	0	0	0	1	0	0	1	0	0	0	0	0	0	1	11	*1%*	9	*1%*
Colombia	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	*0%*	1	*0%*
Croatia	0	0	0	0	0	0	0	0	0	0	0	0	1	1	6	*0%*	4	*0%*
Cyprus	0	0	0	0	0	1	0	0	0	0	0	0	5	7	36	*2%*	24	*2%*
Czech Republic	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	*0%*	3	*0%*
Denmark	0	0	0	0	0	0	3	1	0	0	0	0	5	3	34	*2%*	24	*2%*
Estonia	0	0	0	0	0	1	4	1	0	0	0	0	3	1	21	*1%*	19	*2%*
Finland	0	0	0	0	0	2	6	0	0	0	0	0	4	8	41	*3%*	28	*3%*
France	0	0	0	0	0	0	1	4	0	0	0	0	6	7	47	*3%*	30	*3%*
Germany	0	0	0	0	1	1	5	32	0	0	0	0	20	22	236	*16%*	151	*16%*
Greece	0	0	0	0	0	3	0	3	0	0	0	0	14	25	101	*7%*	70	*7%*
Hungary	0	0	2	0	0	0	0	2	0	0	0	0	3	5	38	*3%*	27	*3%*
Iceland	0	0	0	0	0	0	1	1	0	0	0	0	0	2	9	*1%*	2	*0%*
India	0	0	0	0	0	0	2	0	0	0	0	0	1	1	10	*1%*	8	*1%*
Iran	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	*0%*	0	*0%*
Ireland	0	0	0	0	0	0	0	0	0	0	0	0	13	6	44	*3%*	31	*3%*
Israel	0	0	0	0	0	0	0	1	0	0	0	0	2	0	9	*1%*	8	*1%*
Italy	0	0	0	0	0	3	2	7	0	0	1	0	15	18	97	*7%*	68	*7%*
Japan	0	1	0	0	0	0	1	0	0	0	0	0	0	1	3	*0%*	1	*0%*
Jordan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	*0%*	1	*0%*
Latvia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	*0%*	1	*0%*
Lithuania	1	0	0	0	0	0	0	1	1	0	0	0	3	1	20	*1%*	12	*1%*
Luxembourg	0	0	0	0	0	0	0	0	0	0	0	0	1	3	9	*1%*	6	*1%*

Country of citizenship = departure countries	Russia	Saudi Arabia	Slovakia	Slovenia	South Africa	Spain	Sweden	Switzerland	Tajikistan	Tanzania	Turkey	Ukraine	United Kingdom	United States	Total moves by this citizenship	*% moves by this citizenship*	Total moves to EU27 by this citizenship	*% moves to EU27 by this citizenship*
Macedonia (FYROM)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	8	*1%*	3	*0%*
Malaysia	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	*0%*	2	*0%*
Malta	0	0	0	0	0	0	0	0	0	0	0	0	3	1	11	*1%*	7	*1%*
Mexico	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3	*0%*	2	*0%*
Moldova	0	0	0	0	0	0	1	0	0	0	0	0	0	1	3	*0%*	2	*0%*
Morocco	0	0	0	0	0	0	0	0	0	0	0	0	2	1	4	*0%*	3	*0%*
Netherlands	0	0	0	0	0	1	0	2	0	0	0	0	7	13	59	*4%*	37	*4%*
New Zealand	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	*0%*	1	*0%*
Nigeria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	*0%*	1	*0%*
Norway	0	0	0	0	1	0	1	1	0	0	0	0	3	2	14	*1%*	7	*1%*
Poland	0	0	1	0	0	2	1	1	0	0	0	0	3	2	21	*1%*	16	*2%*
Portugal	0	0	0	0	0	2	2	0	0	0	0	0	6	2	28	*2%*	23	*2%*
Romania	0	0	0	0	0	1	0	2	0	0	0	0	1	5	27	*2%*	18	*2%*
Russia	0	0	0	0	0	2	2	0	0	0	0	0	0	3	20	*1%*	16	*2%*
Slovakia	0	0	1	0	0	0	0	1	0	0	0	0	0	2	18	*1%*	12	*1%*
Slovenia	0	0	0	2	0	0	0	0	0	0	0	0	0	6	19	*1%*	11	*1%*
Spain	0	0	0	0	0	7	1	2	0	0	0	1	6	10	43	*3%*	27	*3%*
Sweden	0	0	0	0	0	1	3	0	0	0	0	0	2	3	26	*2%*	20	*2%*
Switzerland	0	0	0	0	0	0	1	4	0	0	0	0	4	5	32	*2%*	19	*2%*
Turkey	0	0	0	1	0	0	0	0	0	0	4	0	2	3	15	*1%*	6	*1%*
Ukraine	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	*0%*	1	*0%*
United Kingdom	0	0	0	0	0	1	1	1	0	1	3	0	11	10	87	*6%*	55	*6%*
United States	1	0	0	0	0	0	3	2	0	0	0	0	7	8	62	*4%*	45	*5%*
Vietnam	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2	*0%*	0	*0%*
Total moves to this destination	2	1	4	4	2	30	48	82	1	1	9	1	172	213	1,442.00	*100%*	962	*100%*
% moves to this destination	*0%*	*0%*	*0%*	*0%*	*0%*	*2%*	*3%*	*6%*	*0%*	*0%*	*1%*	*0%*	*12%*	*15%*	*100%*		*67%*	
Total moves to this destination by EU27 citizens	1	0	4	2	1	28	32	69	1	1	5	1	144	179	1,190		801	
% moves to this destination by EU27 citizens	*0%*	*0%*	*0%*	*0%*	*0%*	*2%*	*3%*	*6%*	*0%*	*0%*	*0%*	*0%*	*12%*	*15%*	*100%*		*67%*	

Source: MORE2 Higher Education Survey (2012)