

# morebrain



MOREBRAIN PROJECT

## PILOT MOBILITY SURVEY REPORT



rannís FUNDECYT



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## 1.-INTRODUCTION

Talented researchers are an important asset to all the economies of the world; however, the international distribution of the highly skilled researchers who migrate to acquire new knowledge is not even. Some important factors such as higher salaries, better standard of living, better quality of life, access to advanced technology, better political conditions, and other factors which will be discussed in this report, are used to attract scientific talent from one area to another. This phenomenon is known as "Brain Drain", but it is not a new concept, it has generated many studies, and has given rise to developing new concepts such as "Brain Exchange" or "Brain Circulation".

This report has been developed in the framework of the MOREBRAIN project. The project "MOREBRAIN: Brain Circulation from Brain Drain to Brain Gain", is a collaboration between the Bar-Ilan University EURAXESS Service Centre (Israel), the Foundation for the Development of Science and Technology in Extremadura (Spain), the Icelandic Centre for Research (Iceland), and the Irish Universities Association (Ireland). It is funded within the People part of the 7<sup>th</sup> Framework Programme as a Coordination and Support Action (CSA). The project has identified the main factors that influence researcher mobility through a literature survey and consultation with the EURAXESS service network members. A detailed survey was developed to gather data on researcher mobility. The MOREBRAIN consortium has collaborated with the EURAXESS network members to collect data related to the mobility of researchers located in many European countries which differ in socio-economic aspects as well as research environment and living standards. The project has been effectively promoted through the network members in European countries and the U.S. Thanks to the international collaboration through the network the 'Mobility Survey', developed as part of the project, proved to be a very efficient tool for gathering information on factors influencing mobility decisions of researchers. By understanding reasons for which researchers, of various career stages, decide to pursue their researcher



career abroad we can potentially impact public policy governing mobility, and we see the possibility to convert brain drain into brain gain.

MOREBRAIN's overall objective is to define avenues which will assist in turning the EU into the most competitive and dynamic knowledge based economy and society in the world. To achieve this objective different stages of the project have been developed, that are showed in this preliminary report.

## **2.-BRAIN DRAIN vs. BRAIN CIRCULATION**

To understand the current situation of the researchers migration flow, it is important to review the evolution of the human capital movement known as "Brain Drain" (BD hereafter), and how it has evolved from the 1950s till recent years.

Giannoccolo (2009) reviewed the evolution of the term BD. In this review he found that the definitions from diverse authors emphasized different aspects. Three of these aspects are migration from poorer countries to richer ones, the transfer of technology, and migration caused by differences in salaries and research facilities. As can be understood from the different definitions and different emphases, the concept of Brain Drain is not a simple term, and it must be approached from different points of view.

The evolution of the term is very interesting, and it helps to understand the evolution of the migration flows of capital human.

Findlay (1993 in Breinbauer, 2007) defined the term "Brain Exchange" as a way of the exchange of high qualified researchers among developed countries. Another important concept is the "Brain Overflow", introduced by Baldwin (1970), and means "an over production of high qualified workers in a country that cannot absorb all the talented human capital so they are forced to leave the country".

The figure below, developed by Breinbauer (2007), reflects the evolution of the terms connected with Highly Qualified mobility over second half of the 20<sup>th</sup> century.

Table 1. Evolution of the Brain Drain phenomenon according to Breinbauer (2007)

<b>The origin of the BD – 1950s and 1960s</b>	The main reasons to migrate were political and social issues, and impacted on the sending country's welfare and also on the social structure.
<b>Brain Drain Taxes to compensate reduction on low developed countries welfare and growth- 1970s</b>	Education is crucial on the welfare, and is the main factor involved in innovation, technology, development and growth, so the conclusion on the BD investigations at this time was that the effects of the BD on Education affected the development.
<b>How the BD affects Education, Growth and Commerce – 1980s</b>	The studies during those years showed that the main motivation to migrate to another country was the higher productivity of the skilled researchers and workers in general, in the high developed countries.
<b>BD becomes Brain Gain - 1990s to 2000s</b>	During these years, some authors examined the impact of migration prospects, and concluded that “in a poor economy with an inadequate growth potential, the return of human capital is likely to be low and this would lead to a limited incentive to acquire education, which is the engine of growth.” The positive flow of migration was called “Brain Gain”.

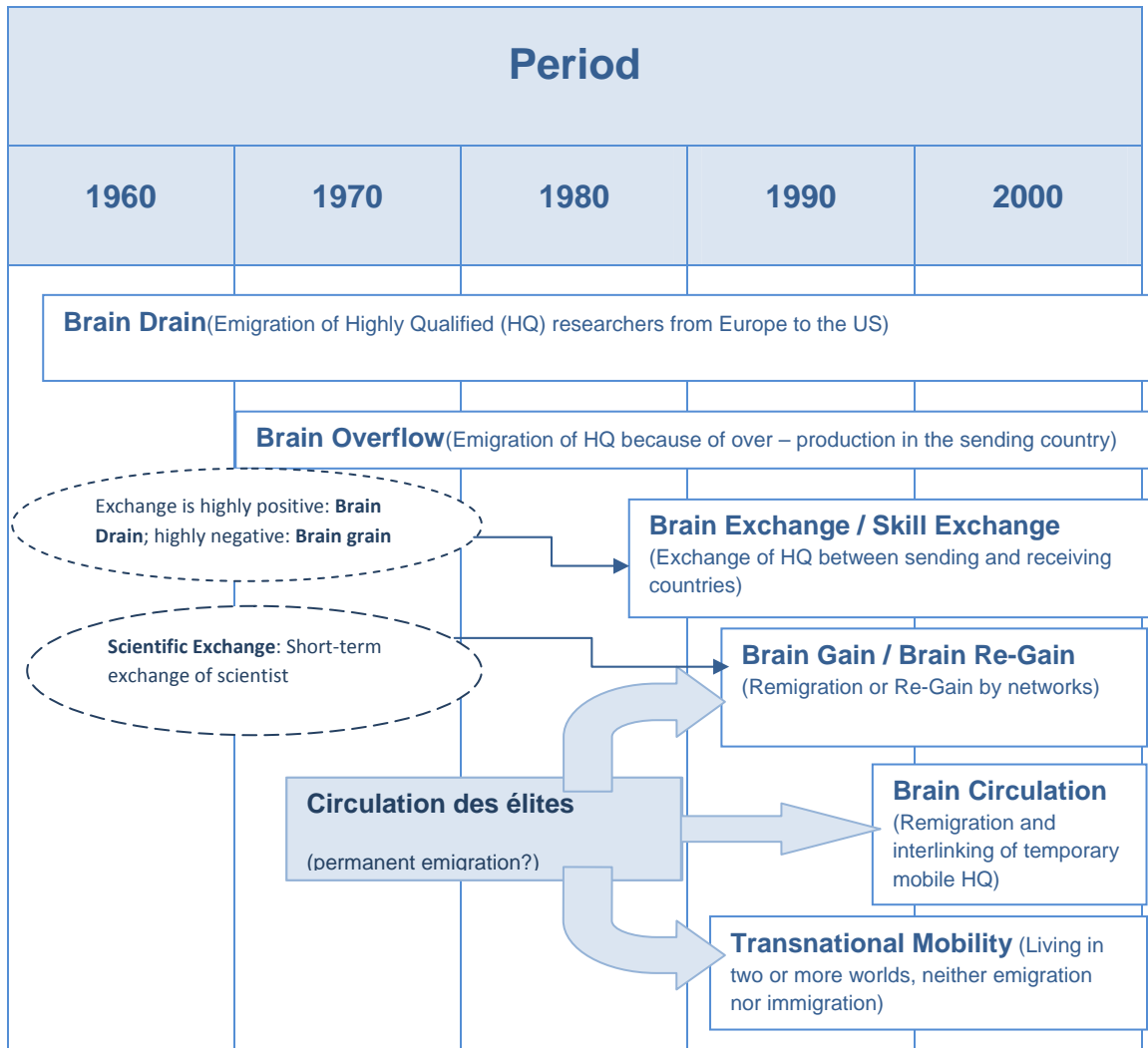
Johnson and Regets (1998), introduced the term “Brain Circulation” (BC hereafter) and contributed with a positive vision of highly qualified mobility flows. Other authors like Casey (2001) assume this positive point of view and states that: *“Brain circulation (...) is presumably a positive form of mobility involving scientists and researchers (as well as other highly skilled professionals) moving in and out of different geographic regions, and hence increasing the diffusion of knowledge. The notion of brain circulation has originated from research focused mostly on research students and scientists from developing countries staying in the US” (Casey, et al. 2001:13).*

If we attend to Iredale (2005), “Brain Circulation” is the final step of the “Migration Transition” for countries.

Table 2. Steps of ‘Migration Transition’ according to Iredale (2005)

<b>First Step</b>	BRAIN DRAIN: Developing and New Industrialized countries are sending high qualified human capital (e. g. Bangladesh).
<b>Second Step</b>	BRAIN DRAIN AND BEGINNING REIMMIGRATION (e.g. China).
<b>Third Step</b>	BRAIN CIRCULATION: emigration, immigration and BC as the integration in the globalized world (e.g. Taiwan).

The phenomenon of mobility is very complex. Actually, traditional BD coexists with BC which is largely assumed to be a positive mobility, because it generates an advantage when the researchers return to their home institutions after moving abroad to study, or take a job. But countries might gain or lose human potential with the researcher migration depending on prolonged stays and nature of the mobility.



*Development of important terms in connection with HQ mobility (Andreas Breinbauer, June 2007)*



### **3.-PUSH AND PULL FRAMEWORK**

Mobility flows of researchers are determined by different elements, that can be mainly classified as push and pull factors. Individuals are “pushed” abroad by more attractive research and career opportunities. They may be “pulled” to remain at home as moving abroad may deprive them of the opportunity for a job at home in the future.

In the MOREBRAIN project, key push and pull factors were evaluated as possible factors through a study of the existing publications in this area; “Literature review on the Mobility of Researchers”. The factors established in the review were extended following discussions with EURAXESS members at the “MOREBRAIN workshop”, that was held in Potsdam in March 17<sup>th</sup> 2009. (as part of the EURAXESS Annual Conference, Potsdam, Germany; March 16–19<sup>th</sup> 2009). More than 30 participants in the conference, from EURAXESS centers from across Europe, chose to be participants in this workshop, to discuss the most important push and pull factors which would be the focus of the mobility questionnaire.



*List of participants in the Morebrain workshop (Potsdam, March 17<sup>th</sup> 2009*

INSTITUTION	COUNTRY	INSTITUTION	COUNTRY
Univ. Algarve	Portugal	M. of Science, Tech & Sport	Israel
Inst. Gulbenkian de Ciencia	Portugal	U of Haifa	Israel
Ministry of Science and Tech Dev	Serbia	Catalan foun. For res. &innov.	Spain
U. of Zaragoza	Spain	FICYT	Spain
TUBITAK	Turkey	Fundacion Madri+d	Spain
Inst. Of Fundamental Tech. Res	Poland	Clermont Uni.	France
Inst. Agrophysics Polish Academy of Sci.	Poland	Innobasque	Spain
U of Lodz	Poland	FECYT	Spain
Tallin U.	Estonia	U. of Nis	Serbia
SAIA	Slovakia	U. of Bergen	Norway
SAIA	Slovakia	U. St. Gallen	Switzerland
CRUI Foundation	Italy	Vilnius academy of Arts	Lithuania
METU	Turkey	U. of Marburg	Germany
Koc Uni.	Turkey	U. of Tartu	Estonia
British Council	UK	U. of national and world economy	Bulgaria
Karolinska Ins.	Sweden	Ass. Chercheurs etrangers a Nantes	France
Agency for mobility and EU Programmes	Croatia		



Picture 1: Workshop at Potsdam (March 19<sup>th</sup> 2009)

The push/pull factors proposed to the participants at the workshop for discussion were as follows:

PULL FACTORS			
Research Infrastructure	Career Opportunities	Social and Economic	Administration and Legal Issues
Excellent research infrastructure	Gaining knowledge and professional experience	Opportunity to see the world and experience a new culture	Reimbursement mechanisms for relocation expenses, compensation for 'extra-territorial costs'
Working at an internationally recognized, prestigious host institution	Enhanced employment prospects	Friendly environment and excellent working conditions	Assistance in acquiring temporary or permanent accommodation
Presence of centres of excellence	Desire to further academic career	Quality of life	Availability of training programmes wide range of socio-economic/cultural issues (taxation, health service, social security etc...)
Presence of research exchange schemes	Establishing scientific contacts abroad	Geographical distance (reducing cost and risk linked to move)	Taxation (exemptions from tax, availability lower tax rate)
Presence of instruments to support foreign post-graduates and researchers	Working with top researchers in a certain field	Location of a research institution (attractive place etc...)	Easy access of researchers' spouses to labour market
Governmental and industrial policies attractive for international researchers	Competitive salaries	Business expansion overseas	Assistance with immigration procedures (presence of Mobility Centres)

PULL FACTORS			
Research Infrastructure	Career Opportunities	Social and Economic	Administration and Legal Issues
Developed information system on availability of research activities, grants or other financial support in the destination country	Clarity and flexibility of a career path	Higher income	
Existence of co-operation agreements with institutes abroad (e.g.: join curricula and mutual recognition of credit points)	Higher level of independence in research and greater academic freedom	Better prospects for family	Transparent immigration procedures favourable for foreign researchers and their families
Effective strategies to attract researchers from abroad in the destination country	Acquiring foreign language skills	Rapid creation of start-of companies	
Internationalised higher education and research system	Good employment contract conditions, pension and other entitlements	Family reasons and personal relationships (e.g.: spouses living in another country)	
Scientific strength of a country of destination in a particular area	Opportunities for permanent or tenured positions or prospects for long-term employment	Presence of compatriots in the destination country	
	Well developed career structure for researchers		
Scientific openness – resulting in publications	Good career opportunities outside the university system		
High quality research	Increased demand for researchers in certain area in the destination country		

PUSH FACTORS			
Research infrastructure	Career Opportunities	Social and Economic	Administration and Legal Issues
Lack of attractive system of research	Lack of research position at home (before and after mobility)	Encouraging policy from governments at home 'to go to richer countries to work'	Age limits/compulsory retirement age limits
Lack of funding for research and research funding agencies	Lack of career opportunities in innovative sectors	Economic instability	Extensive bureaucracy related to funding and other research activities
Poor research infrastructure	Lack of fair recruitment rules (open job competition)	High cost of living in home country	
Lack of attractive institutions	Lack of real job market	Unemployment	
Weakness of certain research areas in the home country	Underdeveloped research career prospects	Political unrest	
Poor linkage or communication between academia/research and industry in the home country	Unclear path of career and tenure	Wars	
Lack of freedom in conducting research	Not competitive salaries	Gender issues	
Presence of developed international linkages, between home institution and an institution abroad	Rigidity in academic hierarchy at home		

PUSH FACTORS			
Research infrastructure	Career Opportunities	Social and Economic	Administration and Legal Issues
	Need for international research experience in order to progress in a research career		
	Advice from supervisor/faculty to go abroad		
	International connections (double supervision scheme for PhD )		

With the inputs collected from all the participants during the workshop, and with the work developed by the project partners, the most relevant push and pull factors were selected to be included in the mobility questionnaire.

The final list of push and pull factors included in the questionnaire is as follows:

### **PUSH Factors**

- ❖ Lower salaries.
- ❖ Lower standard of living in your country.
- ❖ Political unrest/wars.
- ❖ Gender issues.
- ❖ Lack of funding.
- ❖ Weakness of home country's research.
- ❖ Lack of employment opportunities.
- ❖ Lack of fair recruitment policies.
- ❖ Extensive bureaucracy.
- ❖ Supervisor's advice.

## **PULL Factors**

- ❖ High Standard of living in a destination country.
- ❖ Higher salaries /remuneration/stipend in a destination country.
- ❖ Family reasons (e.g.: better prospects for family in a destination country, spouse or other family members).
- ❖ Working at prestigious host institution with excellent research facilities and equipment.
- ❖ Career development (gaining knowledge and professional experience, entering new a area of research, establishing scientific contacts abroad,)
- ❖ Acquiring foreign language skills.
- ❖ Good employment contract conditions in terms of social security, pension and other entitlement.
- ❖ Good career opportunities (e.g.: increased demand for researchers in your researcher area in a destination country).
- ❖ Transparent immigration procedures favorable for foreign researchers and their families (work permit, scientific visa,)
- ❖ "Safe return" schemes, possibility of receiving a fellowship after you return from abroad.
- ❖ Possibility to see the world and experience new culture/environment.
- ❖ Personal connections (presence of colleagues, compatriots in a hosting institution/country).

## 4.-THE QUESTIONNAIRE

The online survey was devised and compiled to better understand push and pull factors which influence mobility of researchers. It was designed according to the information compiled in the “Literature Review on the Mobility of Researchers” and also with the evaluation of the push and pull factors by the consortium and participants in the Potsdam Workshop. The MOREBRAIN questionnaire also included a study on the reasons against mobility, a new concept of e-reintegration and co-sharing as well as awareness of Era Link among European researchers in the USA.

The Questionnaire was structured to reflect all targeted areas. The first part of the survey contains background information questions, while the other sections of the survey present questions related to mobility of researchers, e-reintegration and co-sharing. The final part of the survey is aimed at European researchers in the USA and contains several questions related to the awareness of EURAXESS Links USA (former ERA –Link) and quality of this service. The online survey took about 15 minutes to complete. The questionnaire was designed in such a way that it filters respondents into the following mobility groups: currently mobile, mobile in the past, potentially mobile (those who plan mobility in the near future) and not mobile at all (those who are not interested in mobility). Figure 1 below explains the structure of the questionnaire in detail.



## Online Questionnaire




The online questionnaire was associated to this link:

<http://survey.ucd.ie/morebrain/> and was open from 01/02/2011 to 30/06/2011

A demonstration video was created for all respondents who needed assistance, or required further information. This tool was developed to provide assistance in a video format, see following link:

<http://www.euraxess.is/video/>

## Demonstration Video




RESEARCHERS IN MOTION

**EURAXESS ICELAND**

- Home
- R&D in Iceland
- Fellowships and grants
- Incoming researchers
- Outgoing researchers
- EURAXESS in Iceland







VIDEO

Demonstration video



Please answer our very short **questionnaire** about the demonstration video  
To access the Morebrain survey, please [click here](#)

[Print page](#) [Send page](#)



7849 visitors



#### 4.1 Target Group and definitions

The online survey was designed to target researchers in European countries and the USA. Researchers, regardless of their mobility status were asked to complete the online mobility survey. This survey included doctoral candidates (PhD students), post doctoral level researchers and more experienced researchers. Undergraduate students were not taken into account in our study. We also defined the terms 'mobility' and a 'mobile researcher' to better delineate the respondents. Overseas conferences, short visits abroad, which are often an integral and mandatory part of the PhD course, were not considered mobility periods in our study. In our questionnaire, a mobile researcher was defined as 'a researcher who goes abroad to take up a research position'.

The project consortium promoted the online mobility questionnaire through EURAXESS service centres based in their home countries, other European countries and through the EURAXESS Link in America.

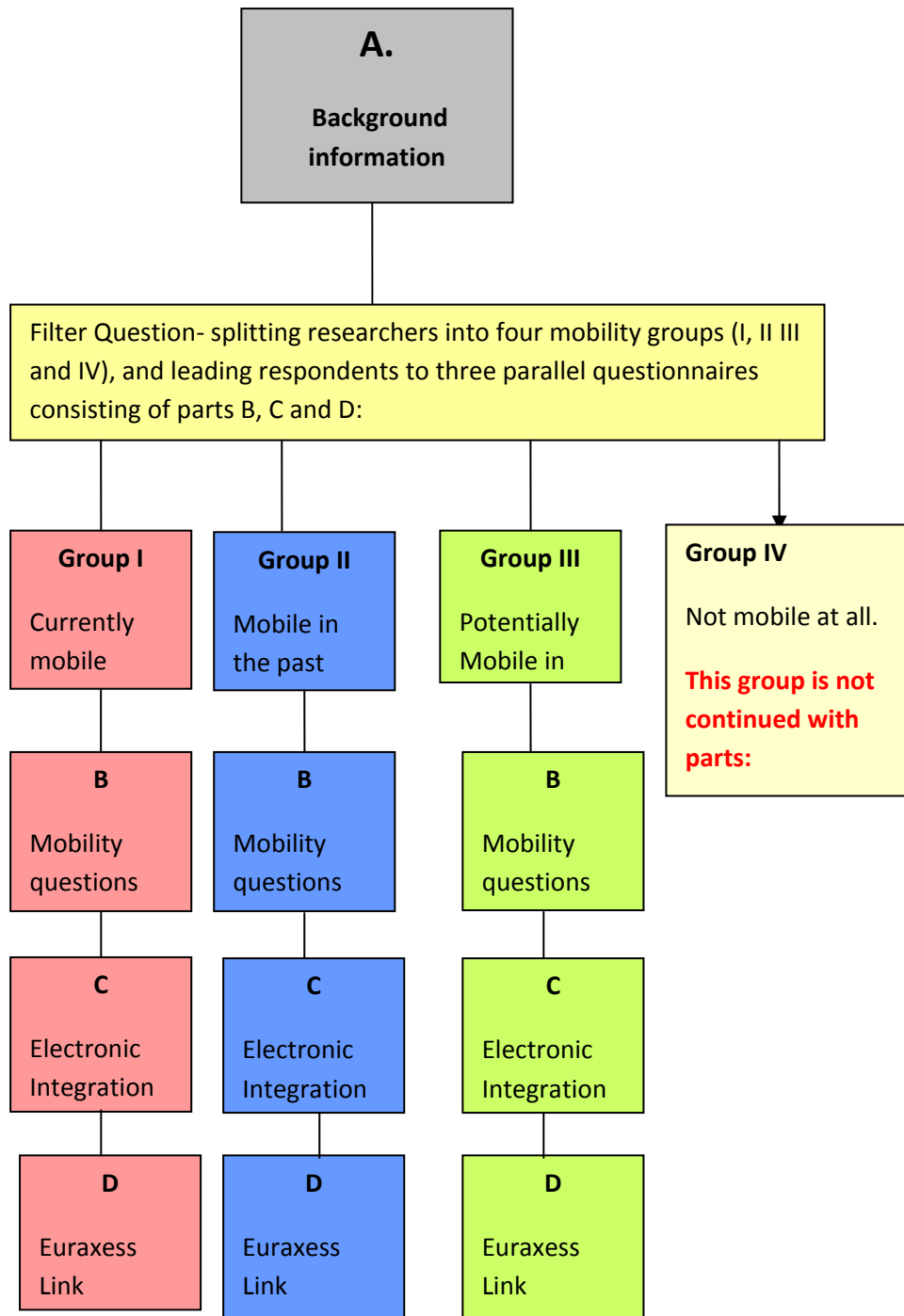
The current report is based on 2,559 valid responses to the questionnaire. Only selected questions were taken into account for this report.

The MOREBRAIN questionnaire captures all of the relevant demographic information that allows us to analyze the responses to the "push/pull" factors.

Although the survey targeted researchers representing a wide range of nationalities one can notice that respondents from certain countries significantly prevailed. This was determined by the methodological approach which was used in the promotion and circulation of our MOBILITY survey. It was the idea of the project consortium to promote the questionnaire through the EURAXESS service centres based not only in their home countries but elsewhere in Europe and U.S. Nonetheless the highest number of respondents came from the countries where the consortium members were based. Direct access to research institutions and researchers in the home

countries of the project members proved to be most effective tool in promoting the online survey.

**Fig.1 Scheme of the questionnaire**



## 4.2 Background information

Over 55 percent of the total questionnaire respondents were between 26 and 38 years of age while researchers between 39-50 years of age represented over 27 percent of the respondents (Figure 2).

**Figure 2. Age of respondent researchers (total)**

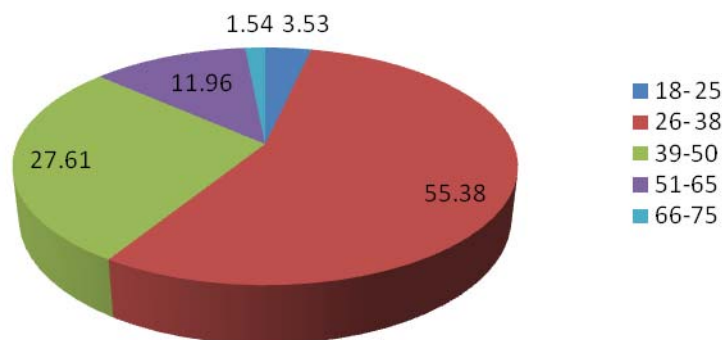
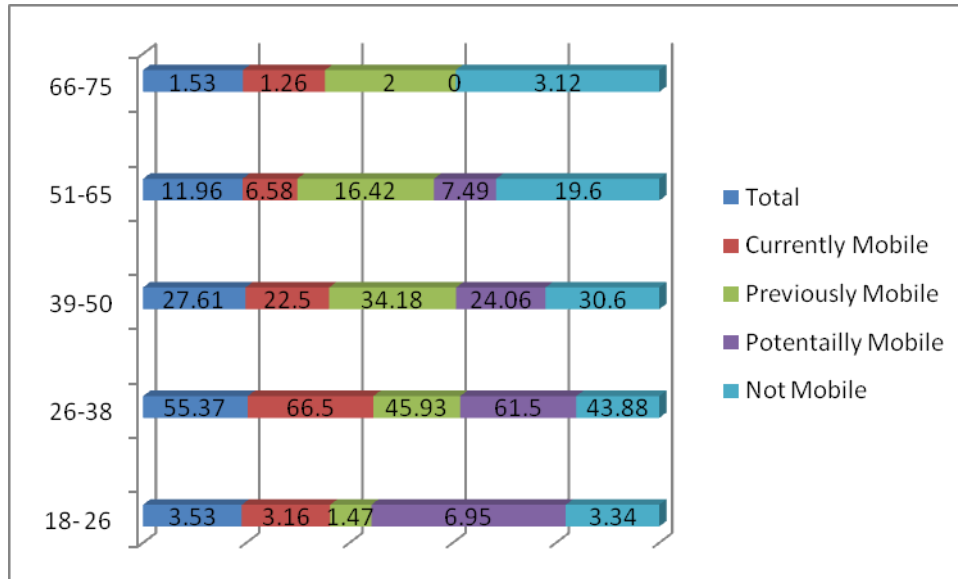


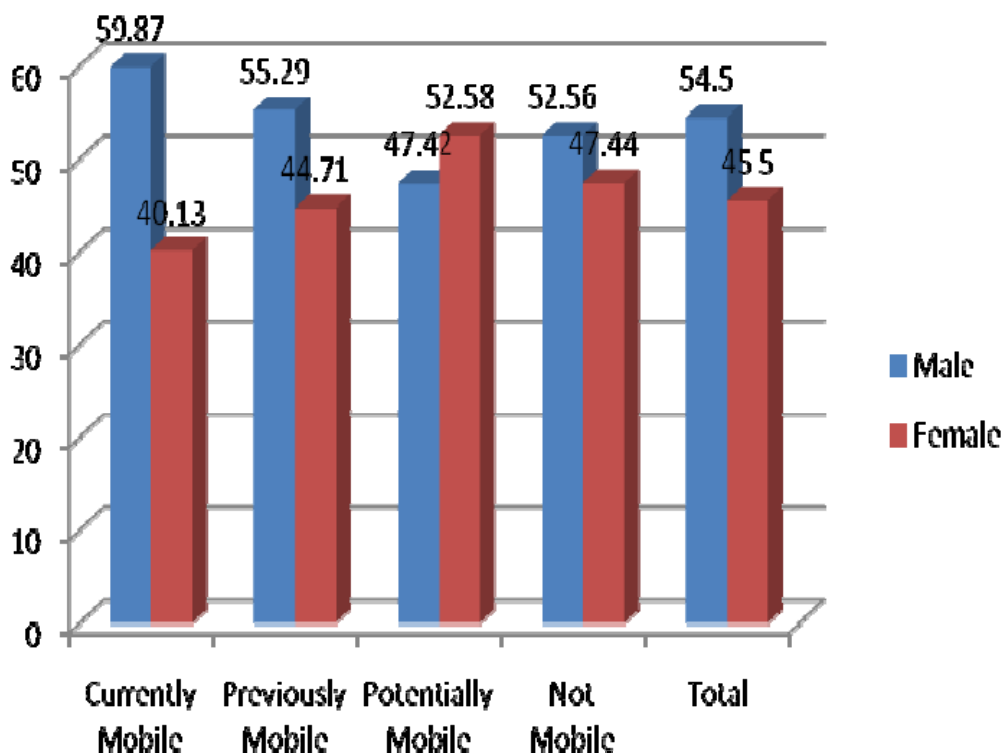
Figure 3 shows that researchers between 26 and 50 years of age prevail in all mobility groups (currently, previously, potentially, not mobile). However, younger group (26-38 years of age) comprise over 60 percent of currently mobile and potentially mobile researchers. A similar trend was noticed by authors of a European Commission study (Rindicte, 2008) who concluded that the share of researchers who are currently mobile is the highest in the age group 25-30. The findings of our survey show that the proportion of researchers who would like to be mobile in the future decreases with the age group, while the proportion that has been mobile increases with the age group (Figure 3). This trend is also evident in the above cited study (Rindicte, 2008).

**Figure 3. Age of respondent by mobility status**



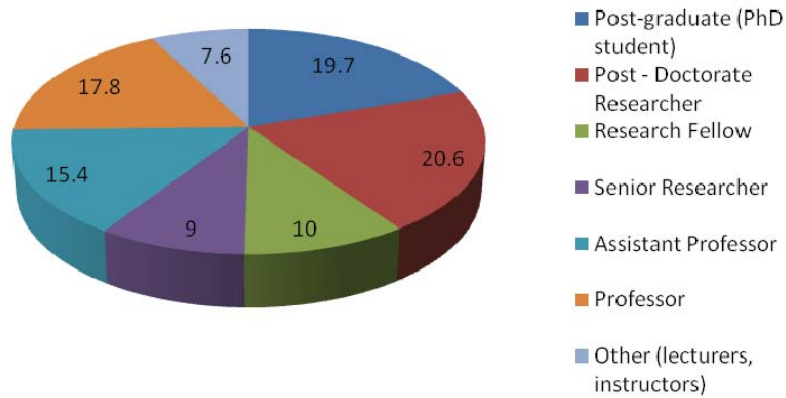
Male researchers slightly predominate in the survey accounting for 54.5% of all respondents. Figure 4 shows the balance of male and female mobility status. Female researchers slightly prevail in the potentially mobile group (52.6%). Females also represent 40% of researchers who are currently mobile.

**Figure 4. Gender of researchers by mobility status**



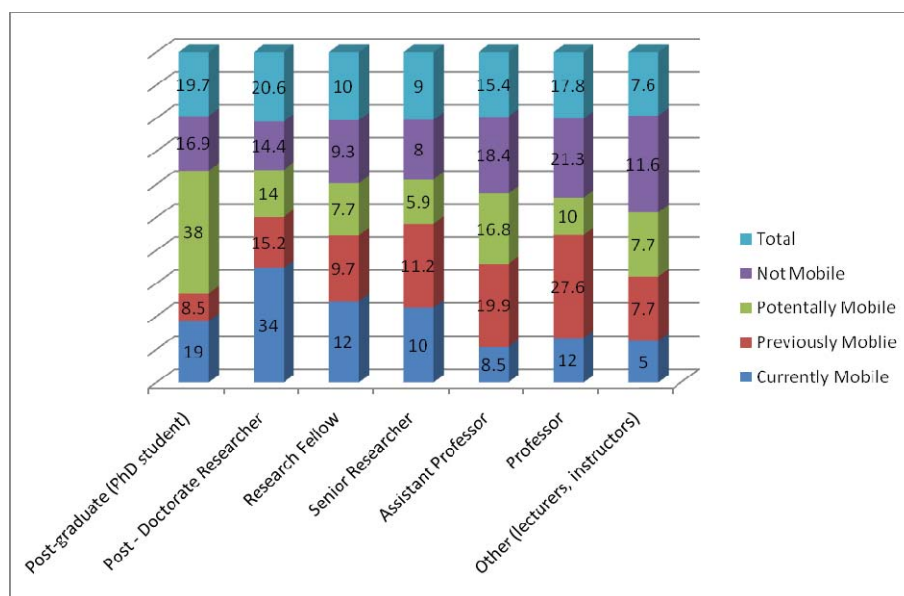
Post doctorate researchers and PhD students account for over 40 percent of the questionnaire respondents (Figure 5). Nearly 18% professors responded to the survey.

**Figure 5. Career stage of researchers**



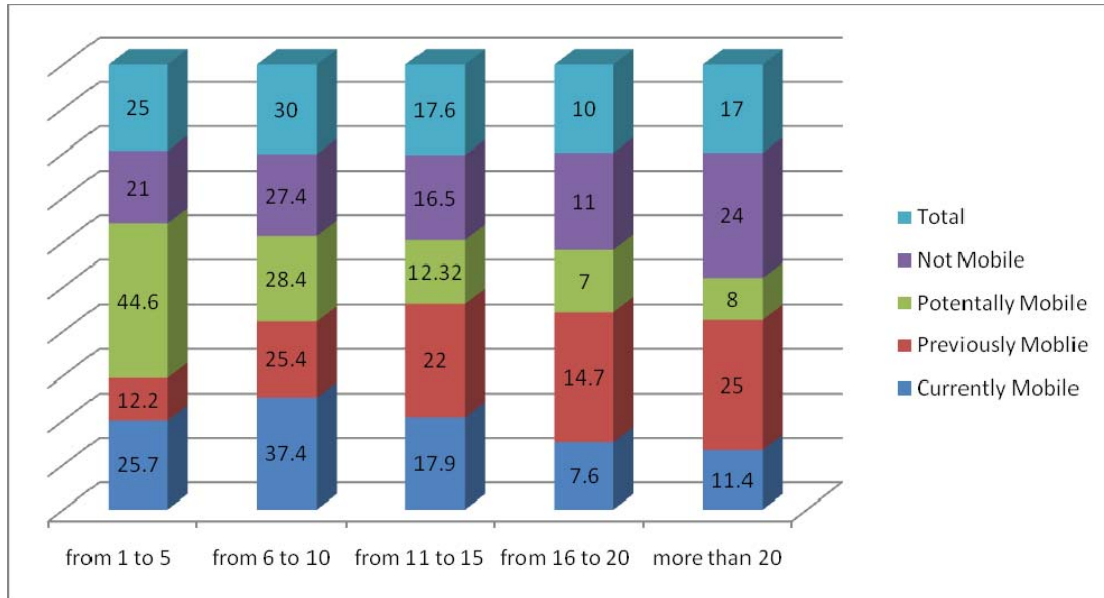
Postgraduate researchers predominate in the potentially mobile group (38%) and their experience ranges from 1 to 10 years (Figure 6 and 7 respectively). Figure 7 shows that over 50 percent of researchers targeted in the survey have up to 10 years of experience.

**Figure 6. Career stage of respondents by mobility status**



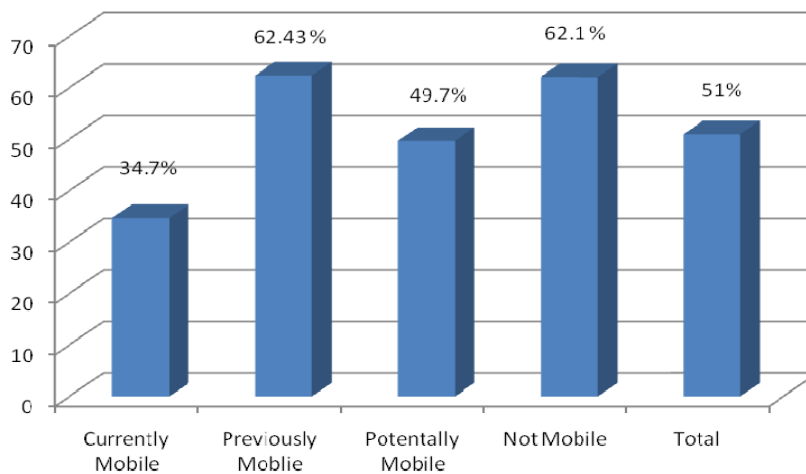


**Figure 7. Years of experience of researchers by mobility status**



62 percent of both previously mobile and non-mobile researchers enjoy tenure track positions (Figure 8) while only 35 percent of currently mobile respondents are permanently employed.

**Figure 8. Researchers with tenure status (permanent employment)**



A vast majority of the respondent mobile researchers work for universities (75%) whereas 16% are employed by private research organisations (Figure 9).

**Figure 9. Hosting institution of mobile researchers**

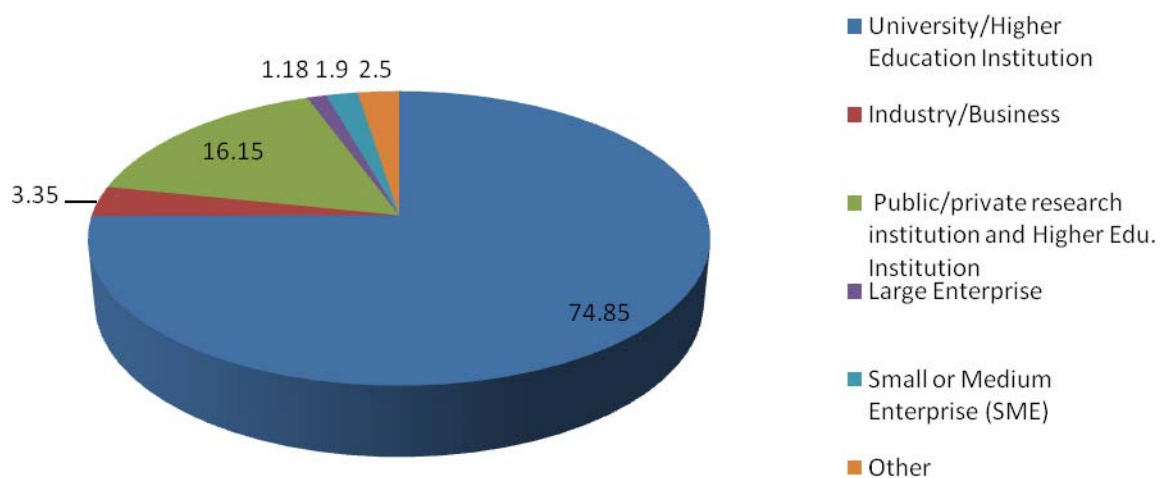


Figure 10 presents countries of origin of the respondent researchers. The questionnaire respondents represented more than 51 nationalities. Most of the researchers were of Portuguese, Italian and Spanish nationality (20%, 11% and 10% respectively). Also a relatively high number of researchers of Israeli, German, Icelandic and Polish nationalities responded to the questionnaire. Portuguese researchers prevail in the non-mobile, potentially mobile and previously mobile group (from 29% to 23%). Italian, Icelandic, German, Spanish and Portuguese researchers dominate in the currently mobile group.

**Figure 10. Country of origin by mobility status of researchers**

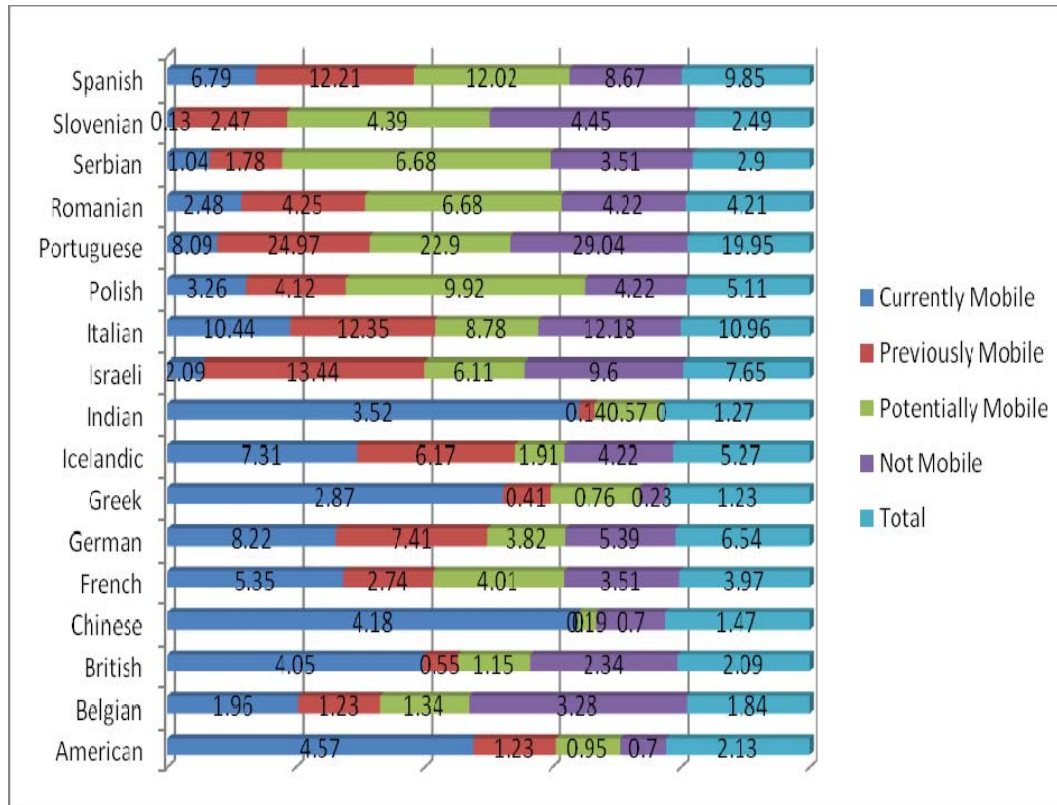
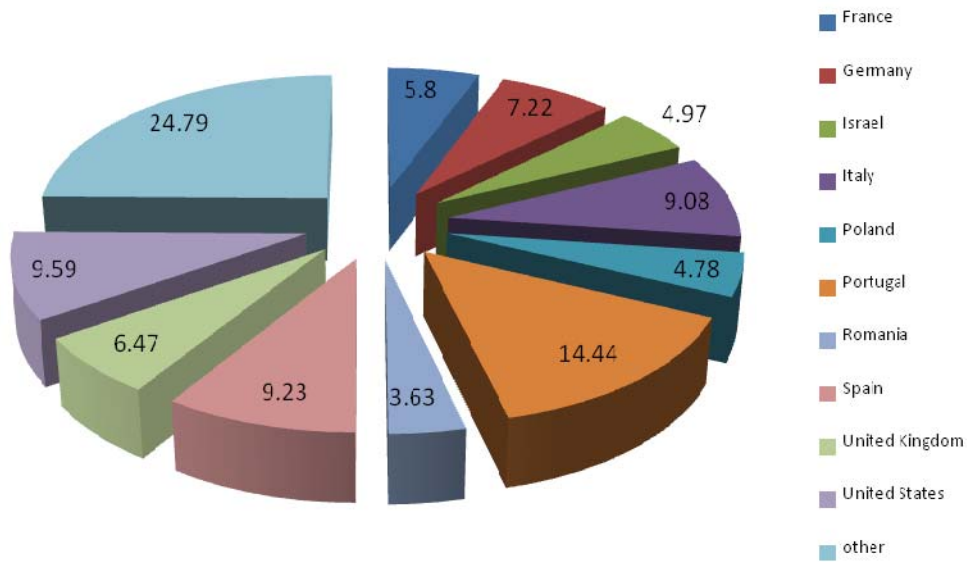


Figure 11 shows that the majority of respondents, regardless of mobility status, received their PhD in Portugal, Spain, Italy, UK and Germany (from 14% to 6%) and this corresponds to the nationalities of the majority of the questionnaire respondents. Nonetheless 9.6% of the respondents received their PhD in the USA and confirming the fact that America is on the list of preferred destination countries for researchers even at early stages of their career. This trend is particularly striking in the currently mobile group; the majority of researchers (over 16% of those who are currently mobile) received their doctoral degree in the USA (Figure 12). Attractiveness of the U.S for young researchers was also emphasised by Moguerou (2004), who found that the U.S was a leading destination for DFG-funded post-docs from Germany in 2007. The same author also found that French post-docs in the U.S demonstrated higher productivity (measured by publications and attendance in conferences) than their post-doc colleagues at home.

**Figure 11. Country where researchers received their PhD**



**Figure 12. Country where mobile researchers received their PhD**

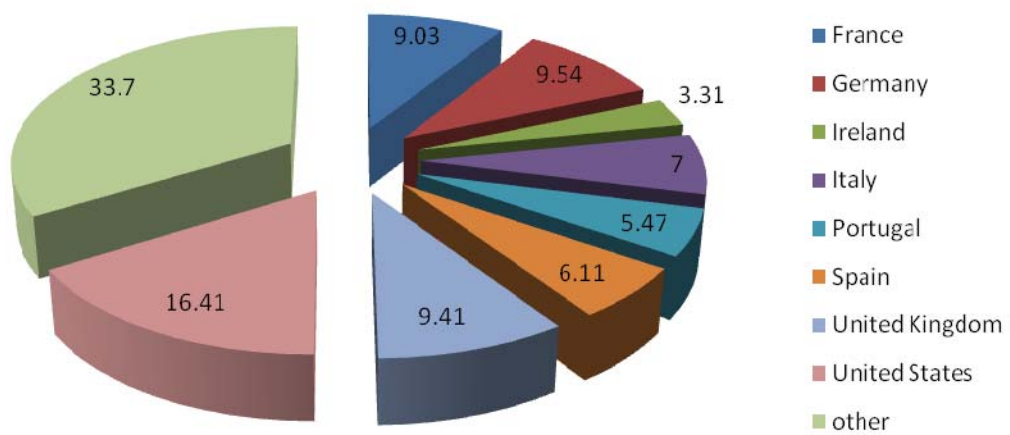
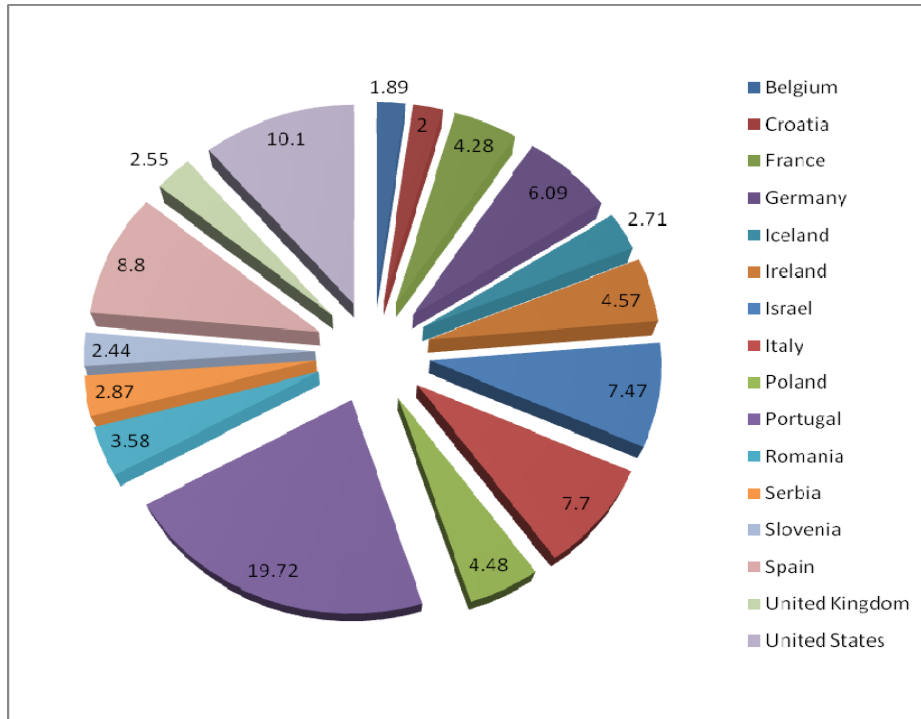
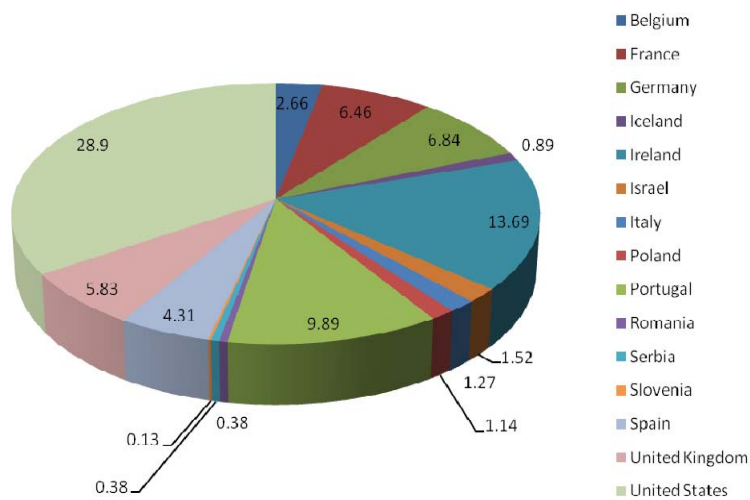


Figure 13 presents the current destination countries of the total respondent researchers. It is clear from the graph that the majority of the respondents are currently working in Portugal (over 19%) while quite a substantial group of the overall respondents are staying in the USA (10%), followed by Italy (7.7%), Israel (7.5%), Germany (6%) and France (4.5%). However, as you can see from Figure 14, the majority of those who are currently mobile, prefer the USA (29%) , followed by Ireland (13%), Portugal (10%), Germany (6.8%) and France (6.5%). This finding corresponds with the researchers' preferences regarding their favourite destination country. Figure 15 shows that mobile (currently and in the past) researchers generally prefer the USA as a country of destination. Over 30% of those who are currently mobile, or have experienced mobility, pointed this country as a favourite destination, although some researchers prefer European countries such as the UK (14%); 6-7% prefer Germany and France. The same mobility pattern was concluded in a survey by the European Commission (RindicatE/E-carriers survey, 2008), which found that the highest mobility among currently mobile researchers happened within the EU countries. Nonetheless several studies carried out recently list several reasons for the attraction of the U.S universities in comparison to universities in the EU. According to the findings of Breinbauer (2007) the U.S universities are often described as having more prestige, a less hierarchic academic environment, better funding and greater visibility.

**Figure 13. Country of destination of the respondent researchers**



**Figure 14. Country of current destination of the respondent currently mobile researchers**



**Figure 15. Preferred destination countries of the respondent researchers**

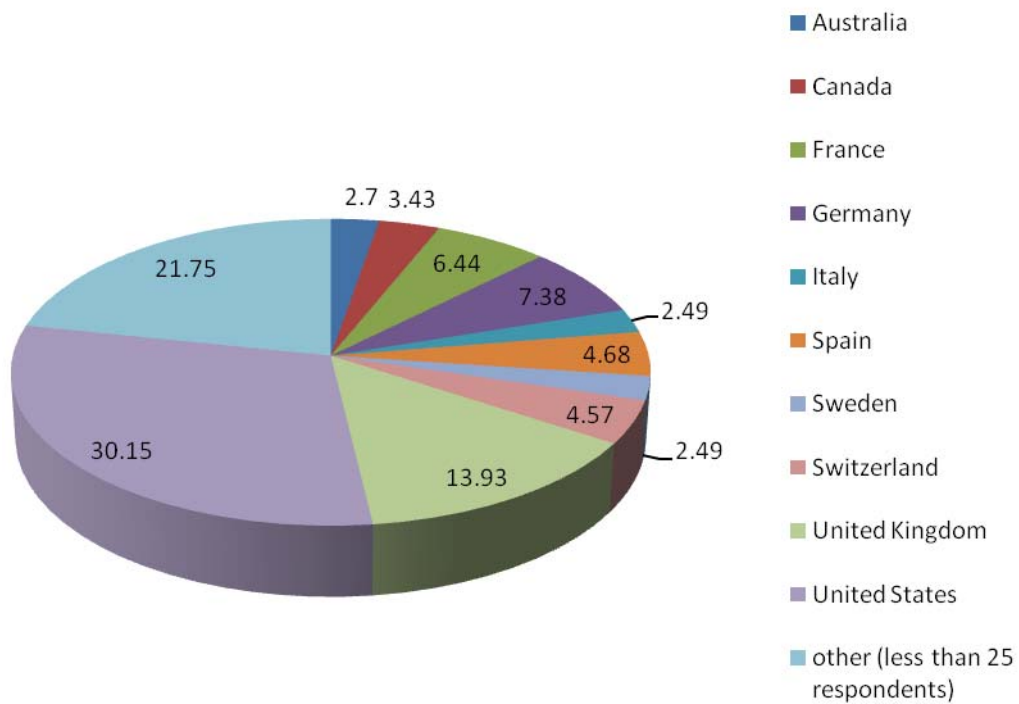
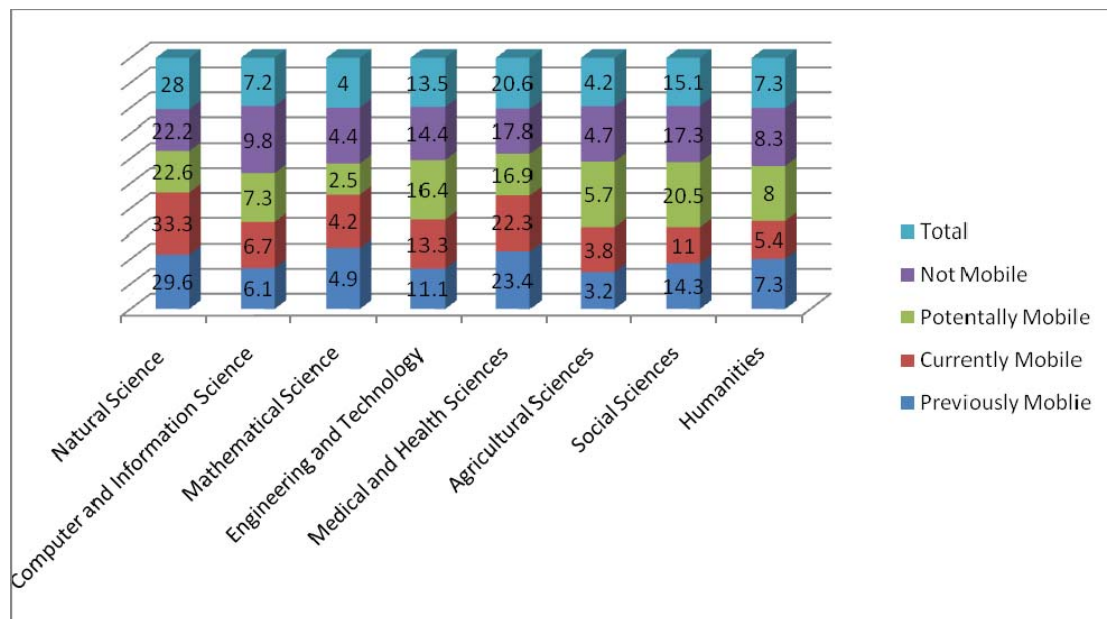


Figure 16 shows that natural science was listed as a main field of research by the majority of the respondent researchers regardless of their mobility status. This was followed by medical and health sciences. The least number of researchers work in agricultural science and mathematical science areas. This finding of our survey corroborates results of a study by Sastry (2005) who found that the biological and physical sciences were the most mobile disciplines with 37% of the UK immigrants. Also in the Rindicate/E-carriers study (Rindicate, 2008) the highest proportion of scientists was in life sciences research (30%).

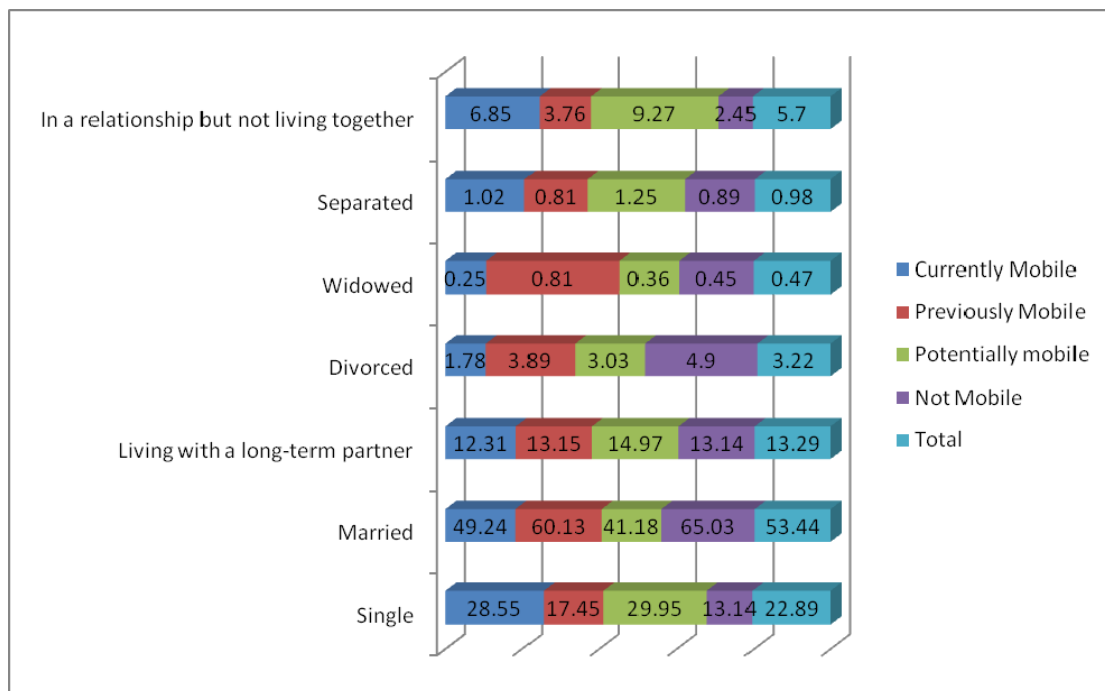
**Figure 16. Present major field of research by mobility status of the respondent researchers**



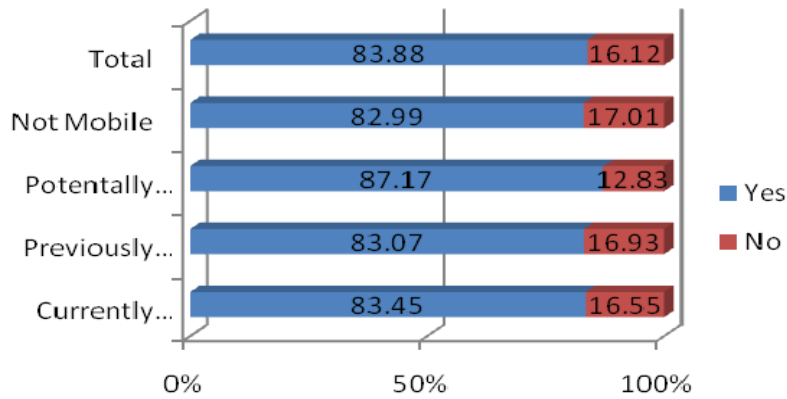


The marital and family status of the respondent researchers is presented below (Figures: 17, 18, 19 and 20). It is evident from the graphs that most of the researchers participating in the survey are married and live together with their families, regardless of their mobility status. Most of them (84%) also have children living with them (Figure 18). Figure 20 shows that having a partner who is also a researcher might have encouraged mobility in the currently mobile group (41 percent of those who are currently mobile have a partner who is also a researcher).

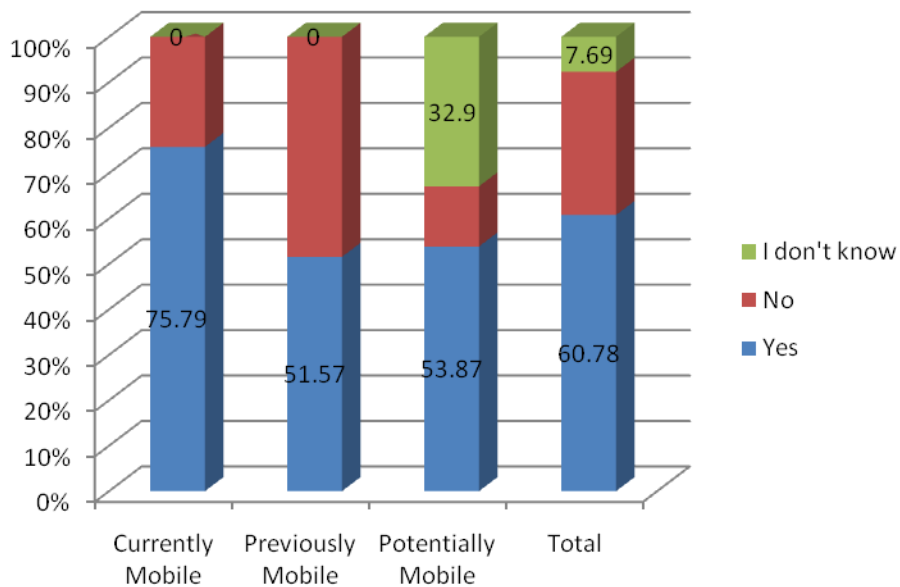
**Figure 17. Marital status of the respondent researchers by their mobility status**



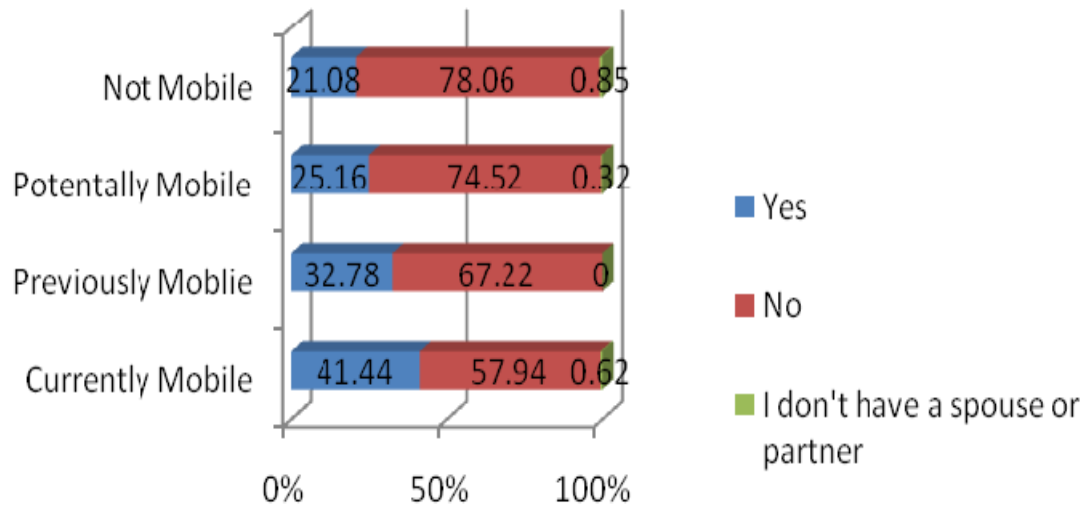
**Figure 18. Do you have dependent children living with you now?**



**Figure 19. Would/Has your spouse/partner follow(ed) you abroad?**



**Figure 20. If you have a spouse/partner is she/he also a researcher?**



### 4.3 Mobility Factors: PUSH FACTORS

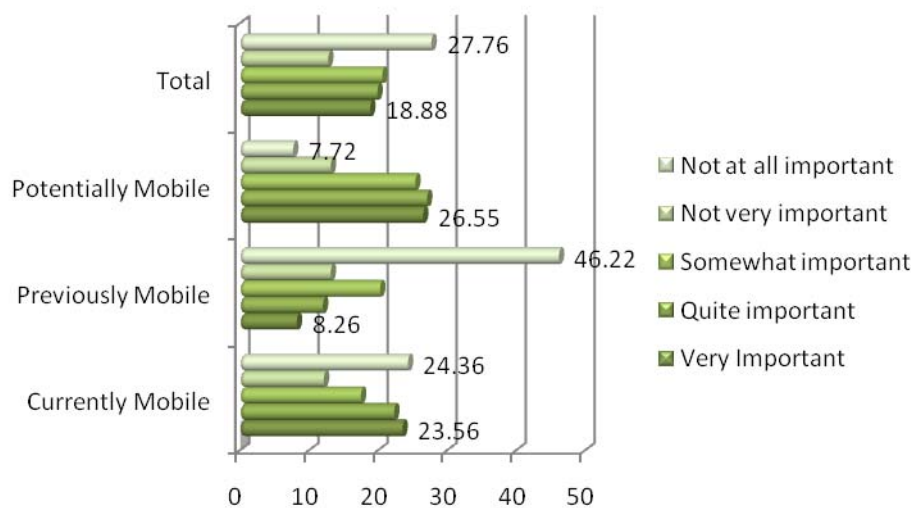
The response to a range of push factors was studied in the survey. Figures from 21 to 26 displays push mobility factors in respect to the mobility status of respondent researchers. We see that currently mobile and those who would like to be mobile in the near future identify a broad range of adverse conditions in their home countries motivating them to move abroad, such as lower salaries, lack of funding and employment opportunities, lack of fair recruitment policies, extensive bureaucracy and weakness of home country research. This group (currently and future mobile) of respondents more strongly expresses the concern over lack of funding and employment opportunities as well as extensive bureaucracy in their home country than those who have returned home from their research stay overseas. The salary issue appeared to have no impact on mobility decision of over 46% of previously mobile researchers. The findings of the study revealed that factors directly related to research career conditions have the most powerful impact on mobility decisions of the respondents. Figure 27, presenting impact of push factors on mobility of the respondents, clearly shows that lack of employment perspectives, funding opportunities, weakness of home country research as well as problems related to bureaucracy were listed among the main concerns of the researchers surveyed. The least important factors influencing mobility decisions of the researchers include: gender issues, political reasons as well as lower standard of living.

The following push factors were chosen for the purpose of the survey:

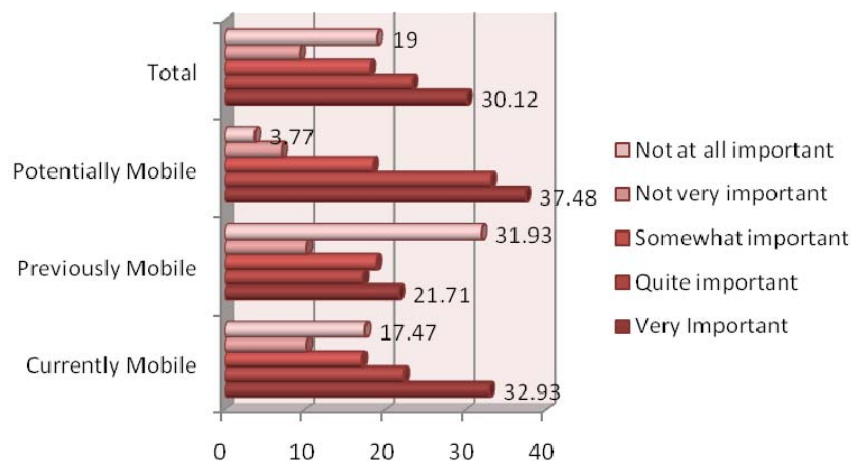
- 1) Lower salaries/remuneration/stipend in your country
- 2) Lower standard of living in your country
- 3) Political unrest/wars
- 4) Gender issues
- 5) Lack of funding for research and research funding agencies

- 6) Weakness of your research area in your home country caused by e.g.: unfavorable policy towards your research area (e.g.: stem cells) or other reasons
- 7) Lack of employment opportunities in your research field in your country
- 8) Lack of competition- based internationally open recruitment
- 9) Extensive bureaucracy or rigidity in academic hierarchy in your home country institutions
- 10) Advice from supervisor/faculty to go abroad

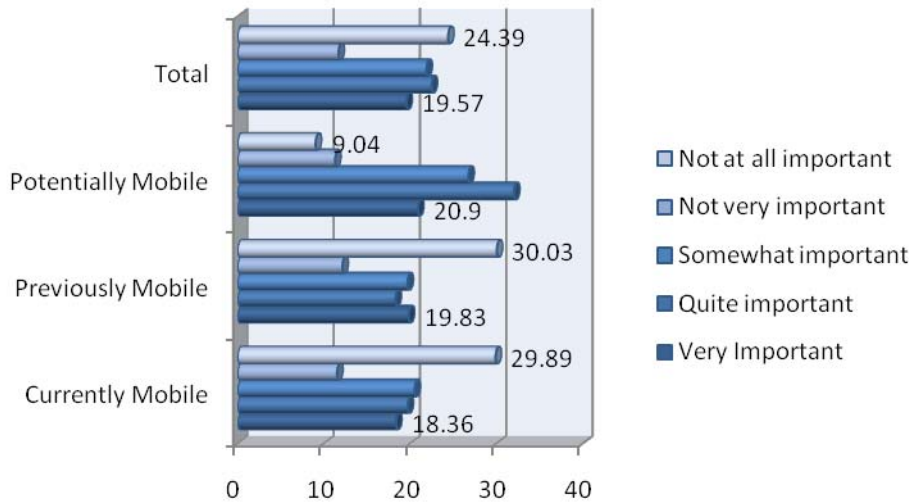
**Figure 21. Lower salaries by researchers' mobility status**



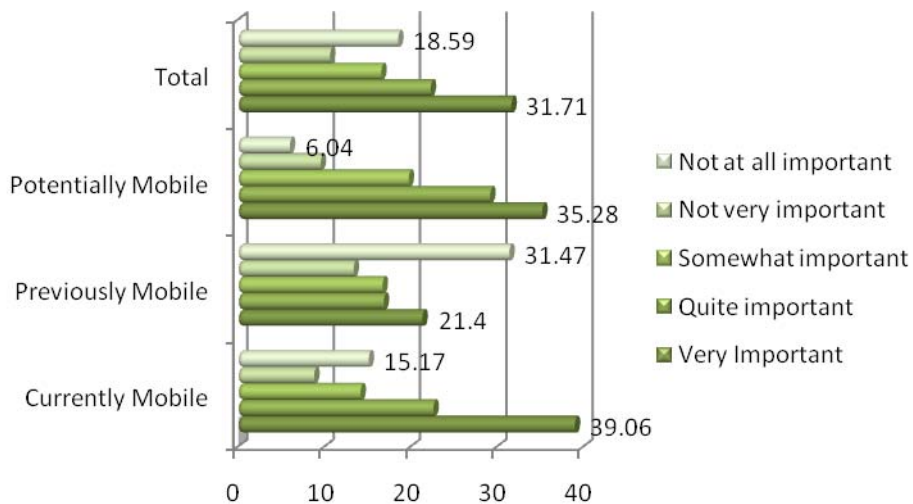
**Figure 22. Lack of funding opportunities by researchers' mobility status**



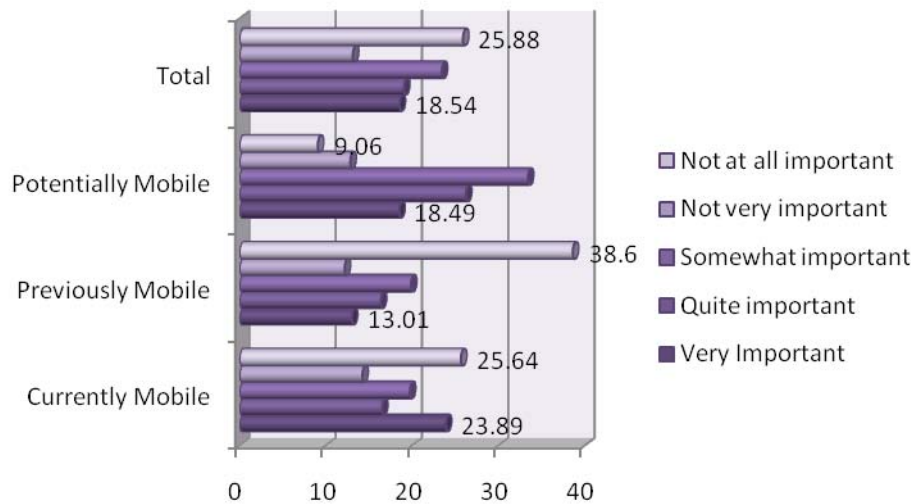
**Figure 23. Weakness of home country research by researchers' mobility status**



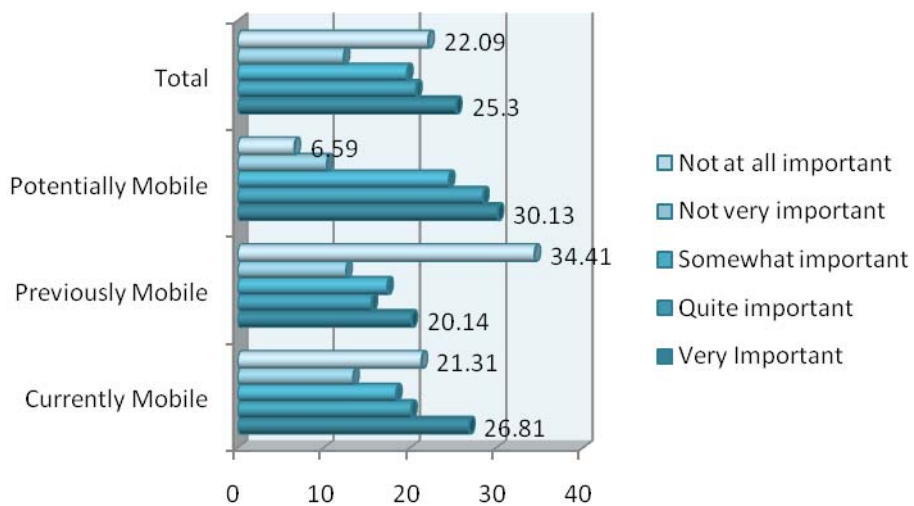
**Figure 24. Lack of employment opportunities by researchers' mobility status**



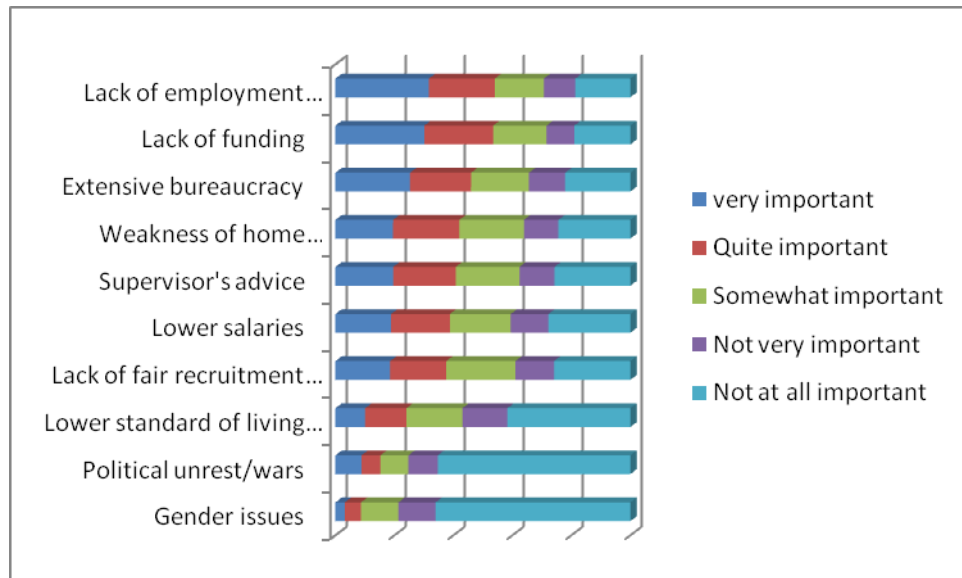
**Figure 25. Lack of fair recruitment policies by researchers' mobility status**



**Figure26. Extensive bureaucracy by researchers' mobility status**



**Figure 27. Impact of Push Factors on mobility decisions of respondents**





#### **4.4 Mobility Factors: PULL FACTORS**

An impact of a range of Pull Factors on researchers' mobility decision has been also been studied.

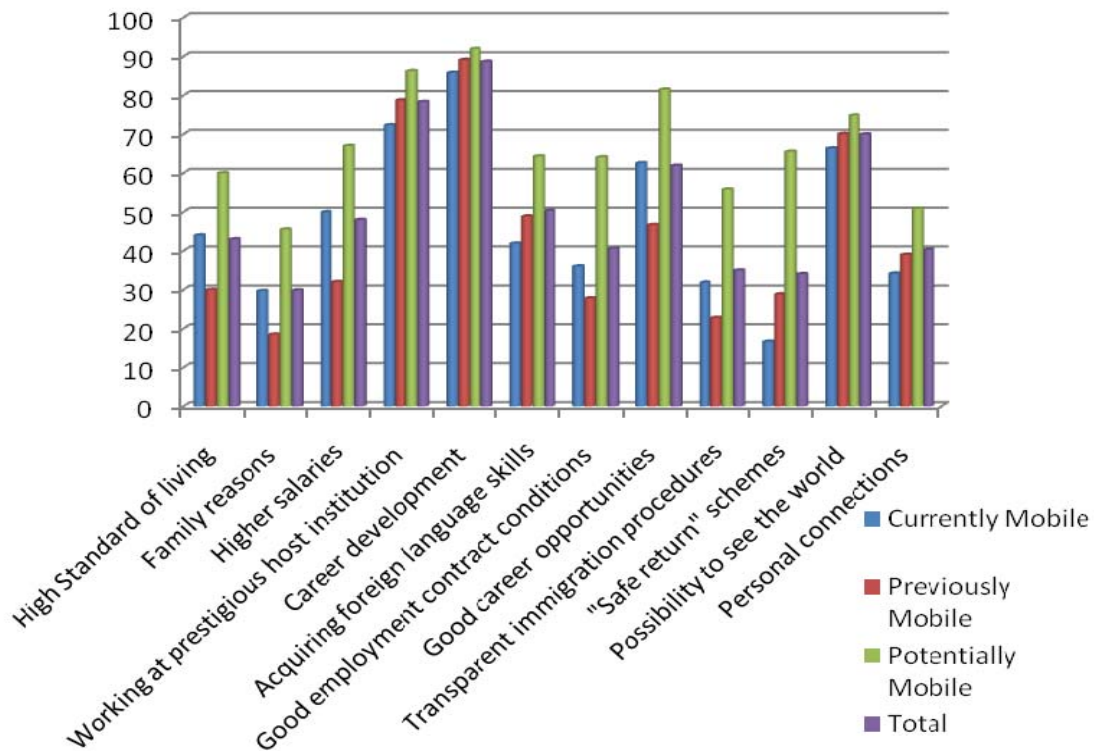
The following driver factors have been chosen for the survey:

- 1) High standard of living in a destination country
- 2) Higher salaries /remuneration/stipend in a destination country
- 3) Family reasons (e.g.: better prospects for family in a destination country, spouse or other family members living abroad)
- 4) Working at prestigious host institution with excellent research facilities and equipment
- 5) Career development (gaining knowledge and professional experience, entering new area of research, establishing scientific contacts abroad, working with top class researchers)
- 6) Acquiring foreign language skills
- 7) Good employment contract conditions in terms of social security, pension and other entitlements
- 8) Good career opportunities (e.g.: increased demand for researchers in your research area in a destination country)
- 9) Transparent immigration procedures favorable for foreign researchers and their families (work permit, scientific visa etc...)
- 10) 'Safe return' schemes, possibility of receiving a fellowship after you return from abroad
- 11) Possibility to see the world and experience new culture/environment
- 12) Personal connections (presence of colleagues, compatriots in a hosting institution/country)

Figure 28 displays pull factors with respect to the mobility status of the respondents.

Responses of those researchers who find the factors important and very important were totalled up in the graph.

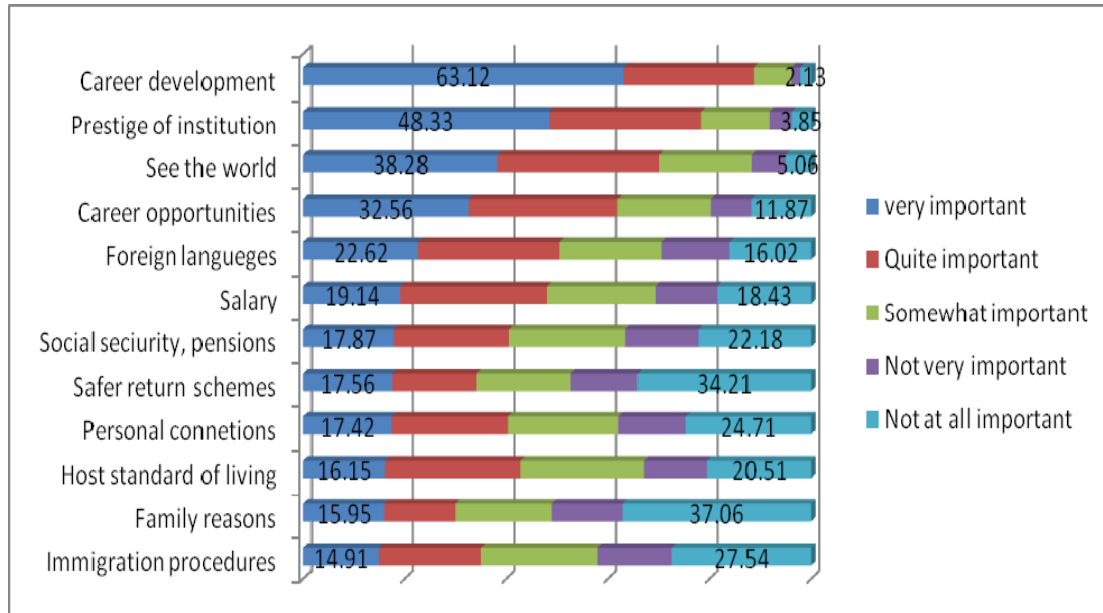
**Figure 28. The researchers' mobility status by pull factors of a country of destination.**



It is evident from the graph that researchers who would like to be mobile in the near future find all the listed factors more attractive than those who are currently mobile or were mobile in the past. Higher salaries and higher standard of living, good employment conditions as well as transparent immigration procedures would positively impact mobility decisions of over 60 percent of those researchers who plan mobility in the near future. This trend is

slightly less evident for the currently mobile group, while researchers who were mobile in the past did not find factors which related to the quality of living especially important in their mobility decision. Pull factors related to the quality of the research career, such as working in a prestigious host institution or gaining professional experience were ranked very high by 70-90% of the respondents regardless of their mobility status. Good research career perspectives appear to have the strongest positive impact on the mobility decision of all researchers regardless of their mobility status (Figures 28, 29). The strong impact of a good research career opportunity or high reputation of the foreign institution on the mobility decision has been demonstrated by many studies carried out in the 'brain drain' area. Backhaus et al (2002) found that the most important relocation reason for researchers abroad is the scientific reputation of the host country institution (80% of Germans abroad and 70% of foreigners in Germany cited this factor). A study by the ENWISE project found that the most important reason for choosing a host institution was the reputation and prestige factor (Linkova, 2003). The pilot study carried out in Ireland (Cleary and McGuinness, 2006) revealed that the most important motive in mobility was the quality of the research environment in Ireland (rated by 42.3% as very important). Personal reasons, safe return schemes (in the home country) as well as social security and standard of living in a host country were ranked as not at all important incentives by 37-20% of respondents in our survey (Figure 29).

**Figure 29. Impact of Pull Factors on mobility decisions of respondents**



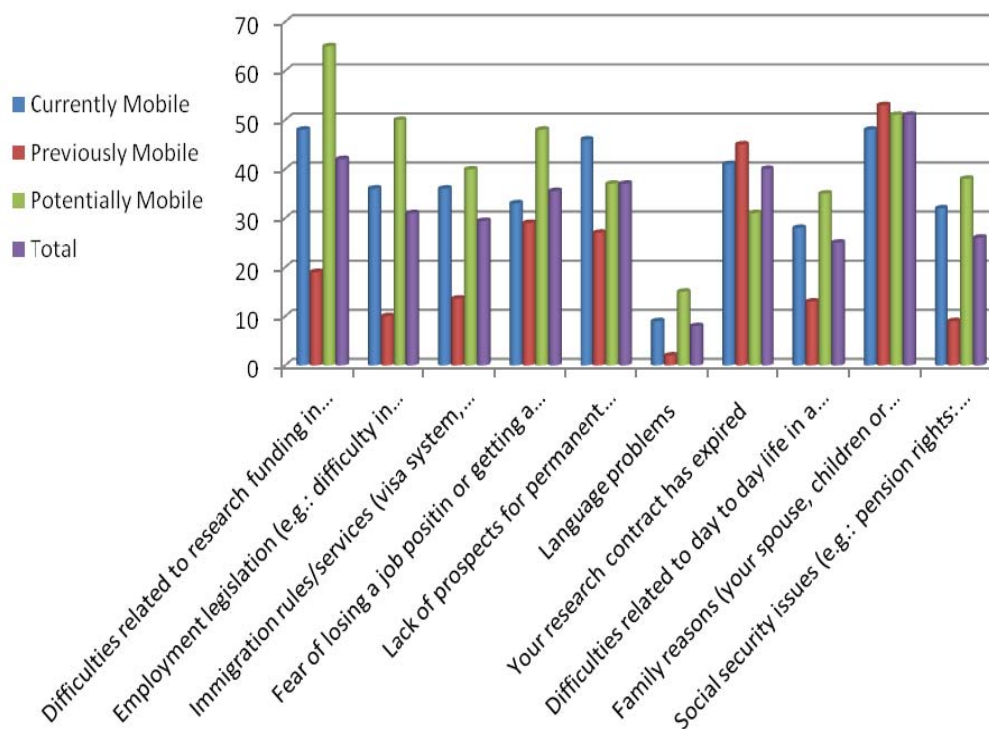
#### 4.5 Mobility and barriers (Reasons against mobility)

Figure 30 displays the following inhibiting factors with respect to the mobility status of respondent researchers:

- 1) Difficulties related to research funding in a visiting country (e.g.: continuation of financial support in a visiting country, lack of trans-national portability of grants/funding)
- 2) Employment legislation (e.g.: difficulty in getting employment permits for spouses)
- 3) Immigration rules/services (visa system, residency rights in a visiting country)
- 4) Fear of losing job position or getting a new position in your home country, lack of recognition of mobility experience in career development in your home country
- 5) Lack of prospects for permanent employment abroad

- 6) Language problems
- 7) Your research contract has expired
- 8) Difficulties related to day to day life in a visiting country (e.g.: childcare and schooling for your children at a visiting country, social life, cost of living, accommodation, culture, religion, climate)
- 9) Family reasons (your spouse, children or other relatives left at home country)
- 10) Social security issues (e.g.: pension rights: maintaining/ transferring; health care insurance: maintaining/transferring; tax related problem)

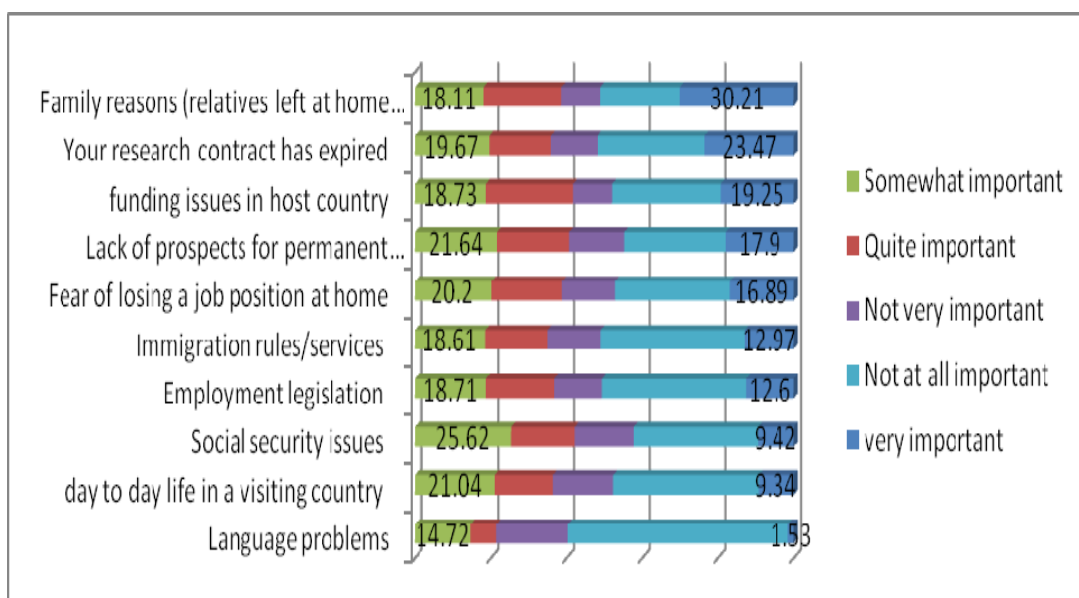
**Figure 30. Reasons against mobility by mobility status of the researchers**



It is evident from the chart that those who would like to be mobile in the future identify a broad range of perceived mobility barriers. These include funding opportunities, employment legislation, and fear of losing a job position or getting a new position in their home country, lack of recognition of mobility experience in career development at home, immigration law. Family reasons are factors of primary importance for all researchers regardless of their mobility status. Research funding, difficulties related to employment legislation as well as permanent employment prospects, immigration rules, social security issues or day to day life issues seem to be not perceived as significant mobility barriers by those who have been mobile in the past. The importance of family issues is a leading reason against mobility for over 50% of respondents (Figure 31).

The same chart (Figure 31), which presents impact of different barriers inhibiting researchers' decisions to move abroad irrespective of their mobility status, shows that fear related to employment and career would prevent 17%-25% of researchers from moving abroad to a great extent.

**Figure 31. Impact of mobility barriers on respondents' decisions to move abroad**

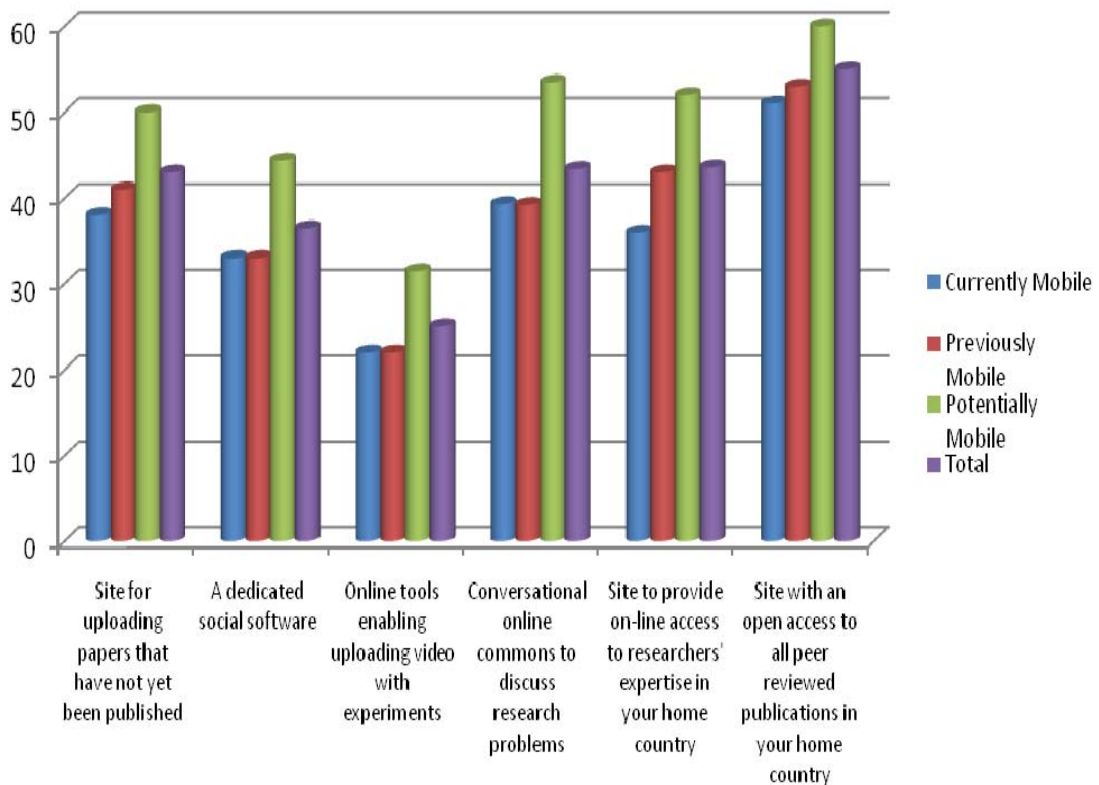


#### 4.6 E–Reintegration and Co-sharing

New concepts of e- reintegration and co-sharing have been introduced in the survey. These concepts refer to the ability of a researcher to conduct research in a facility away from their home countries and be electronically connected to their home country research institutions. Figure 32 shows that the proposed means of e-reintegration are not perceived absolutely necessary in maintaining research collaboration with home countries by the researchers. Up to 40% of currently mobile and previously mobile researchers expressed high and very high interest in sites with access to not yet published papers, social software to discuss research issues, sharing ideas or posting requests or sites providing access to home country researchers' expertise. However, potentially mobile researchers expressed slightly higher interest in access to the above mentioned online facilities. An option of maintaining research collaboration through an open access to websites with all home country peer reviewed publications was found especially valuable, and would be used to a high extent by 50- 60 percent of researchers in our survey.

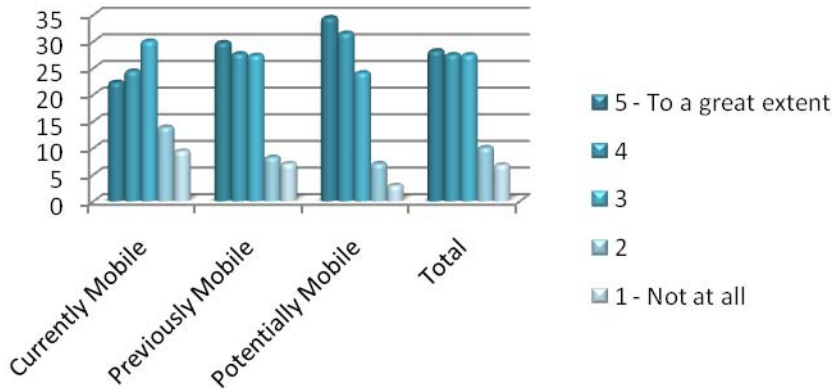
The online tools enabling uploading video demonstrating experiments and work notes of home country researchers were found the least helpful in keeping overseas research collaboration by all respondents. In general 60% of researchers in our survey think that use of electronic means can positively impact creative scientific collaboration while less than 10% of respondents find it unimportant (Figure 33). Figure 34 presents the respondents' interest in sharing work time between a home institution and an institution abroad. Over 40 percent of those researchers who are currently working abroad appreciate the idea of co-sharing to a greater extent. Generally researchers representing all respondents are interested in spending partial time in their home country while working abroad most of the time. A vast majority of the researchers, regardless of their mobility status, think that sharing their working time between their home country and the visiting country institution would increase creative scientific collaboration to some extent (Figure 35).

**Figure 32. Need of E-reintegration by mobility status of the researchers.**  
 The responses of researchers who would like to use electronic means to the high and the highest extent have been totalled up and presented in the following graph.

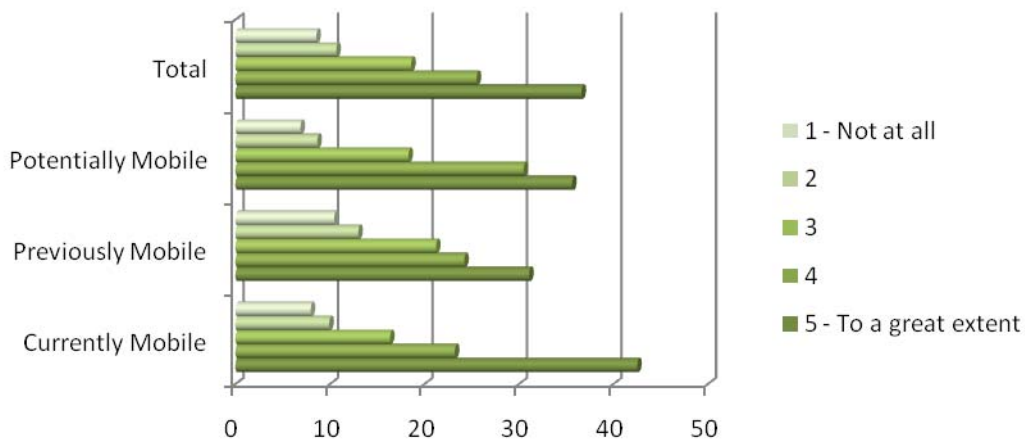




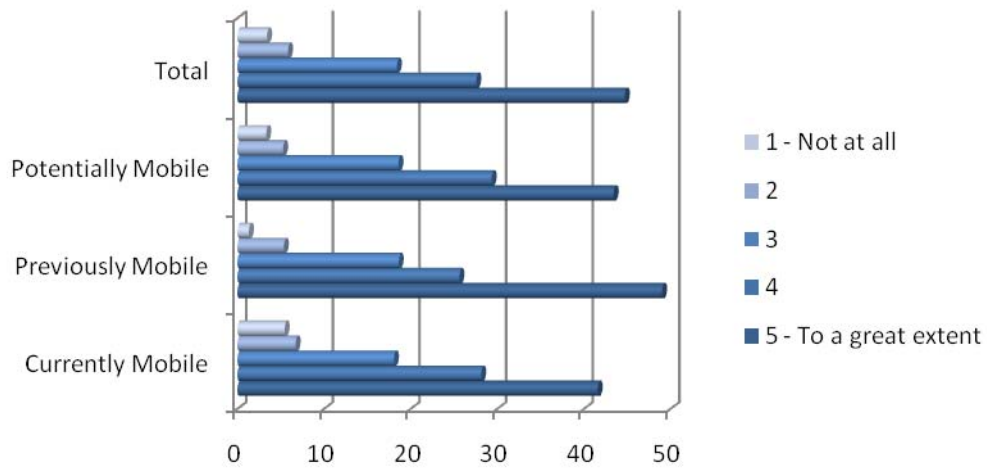
**Figure 33. In your opinion, would the electronic means increase creative scientific collaboration?**



**Figure 34. As a mobile researcher, to which extent would you be interested in spending partial time in your home country while working abroad most of the time?**



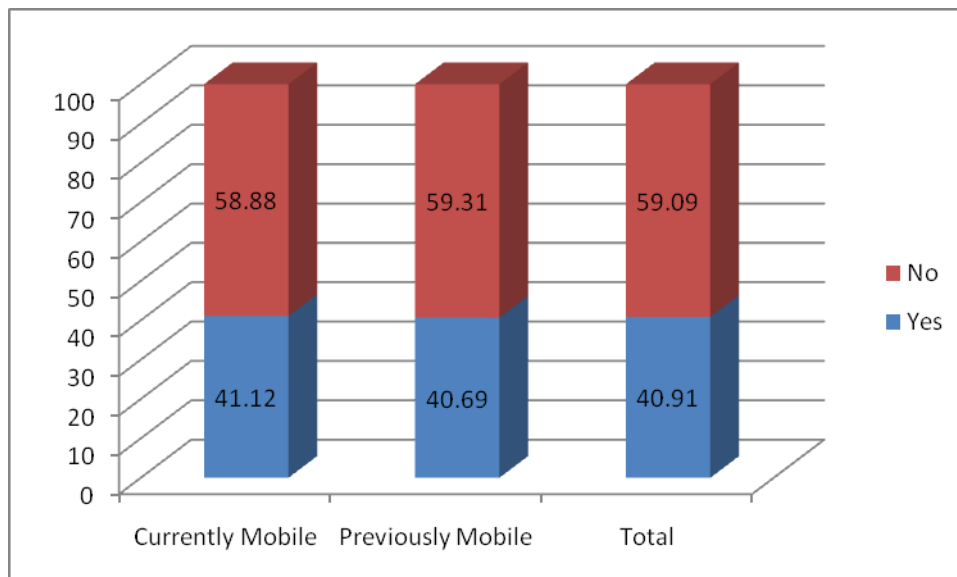
**Figure 35. In your opinion would sharing your working time between the institution in your home country and the visiting country institution increase creative scientific collaboration?**



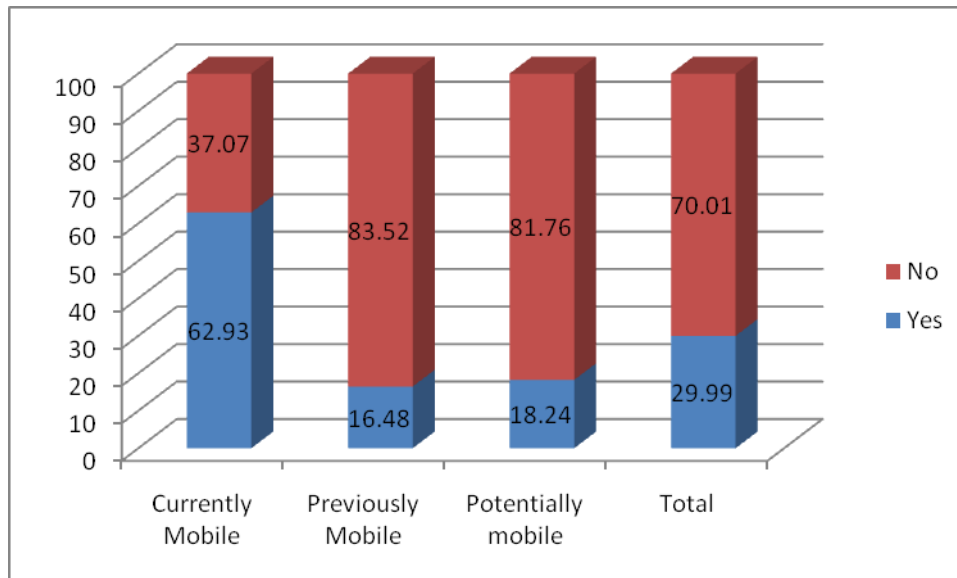
#### 4.7 EURAXESS Links USA

The final section of the questionnaire examined the use of EURAXESS Links (formerly known as ERA-Link USA) - a networking tool for European researchers in the USA. EURAXESS Links provides information about research in Europe, European research policy, opportunities for research funding, for international collaboration and for trans-national mobility. Awareness of this online tool as well as usefulness of the service offered was examined only among those European researchers who spent at least some time at researcher institutions in the USA. Figure 36 shows that 40 percent of the questionnaire respondents have chosen USA as a destination at some stage of their research career. The use of EURAXESS Links is quite limited among those who have ever been European researchers in the USA, as a vast majority of them (70-83 percent) have not heard about the EURAXESS Links at all (Figure 37). Nonetheless, the EURAXESS Links networking tool appears to be widely popular among currently mobile researchers, who have been to the USA, as over 63 percent of them have heard about it. Over 86 percent of currently mobile researchers who are aware of the EURAXESS Link service declared their membership of this network (Figure 38). The use of various forms of the online service offered by EURAXESS Links was also examined through the survey. It is evident from figure 39 that the Newsletter has been used extensively by the majority (55-73 percent) of the service users regardless of their mobility status. The results show that funding alerts seemed to be quite attractive for over 30 percent of the respondents while other services were moderately used, with helpdesk being the least valuable of all the services listed. The EURAXESS Links website is considered useful by 50 percent of potentially mobile network members.

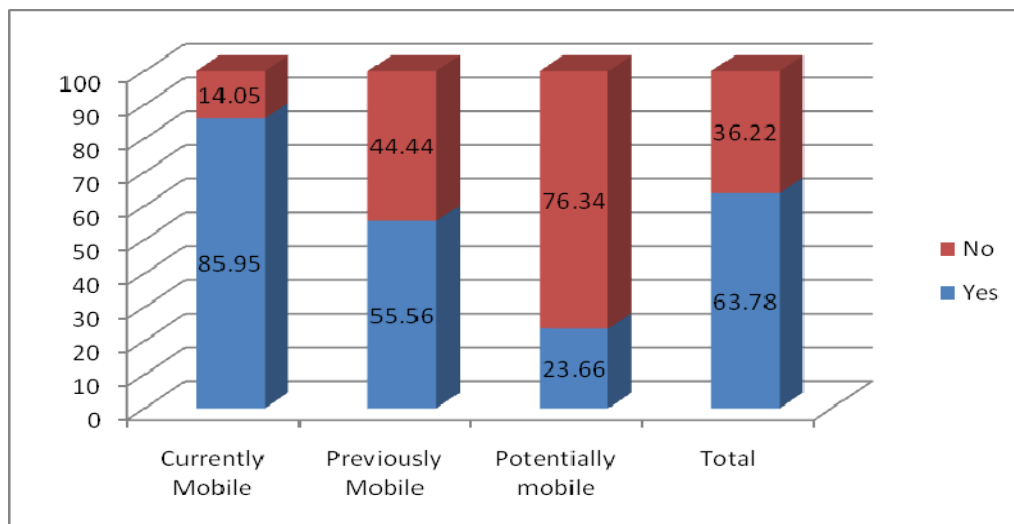
**Figure 36. Have you ever been a European researcher in the USA?**



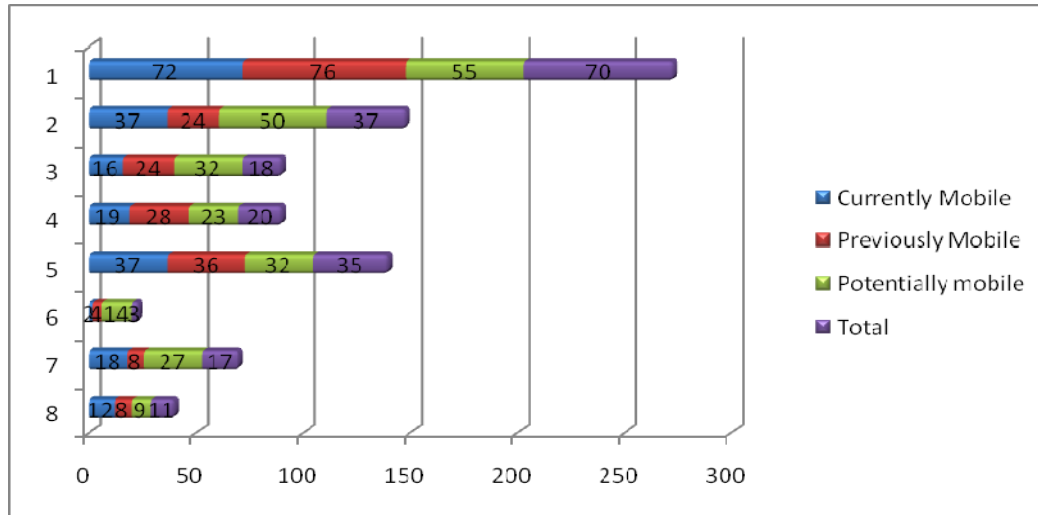
**Figure 37. Have you heard about the Network of European Researchers Abroad, EURAXESS Links USA**



**Figure 38. Are you a member of Network of European Researchers Abroad, EURAXESS Links USA?**



**Figure 39. Use of EURAXESS Links USA service**



**1 Newsletter**

**2 Website**

**3 Events**

**4 Job Fairs**

**5 Funding alerts**

**6 Help Desk**

**7 Networking with other scientists**

**8 None of the above**

## 4.8 Summary of Results

It is evident from the results that young researchers under the age of 40 are the most interested in mobility. The findings of this study show a strong share of female researchers in the male dominated area of the 'mobility world' and their desire for pursuing research careers abroad (female researchers prevail in the potentially mobile group (52.6%). Most of the mobile researchers are married and live together with their families abroad. PhD researchers dominate in the potentially mobile group of respondents and post-doc researchers dominate in the currently mobile group of respondents. Most mobile researchers prefer the U.S as their research destination although, some respondents are in favour of European universities located in UK, Germany or France.

### *Push, Pull factors*

The MOREBRAIN project examined the causes that influence people to move to another country to conduct their research and factors which encourage people to return. By understanding the factors which influence researchers' mobility decisions, we can try to influence public policy governing mobility, and take some steps to convert brain drain into brain gain.

The results of the survey revealed a clear distinction between researchers who have experienced mobility in the past and those who are currently mobile or are planning mobility in the future. The push factors in areas such as lack of funding/employment opportunities, low incomes, bureaucracy, weakness of home country research have a strong impact on the mobility decision of the researchers. Lack of certain basic conditions such as employment prospects or researcher funding opportunities appeared to impact the mobility decision of all respondents to a great extent. The influence of the above mentioned



push factors correlate with the nature of the strongest pulls identified in this research. The most effective pull factors relate to the quality of the research environment abroad. These include the following: career development, working at a prestigious host institution as well as good career opportunities.

Interestingly, those researchers who would like to be mobile and have not had any mobility experience in the past find the pull factors listed in the survey much more attractive than the mobile group (currently and in the past).

### *Co-sharing and Reintegration*

The era of globalization and fast emergence of the technologies provide new communication opportunities for the researchers. The project examined to what extent the researchers who work away from the home country want to maintain their connections with their country of origin by use of the electronic means.

The vast majority of the researchers, regardless of their mobility status, expressed high interest in co-sharing their working time between the visiting country institution and their home research organisation. An open access to peer reviewed publications was ranked as a leading e-tool in maintaining scientific bounds with home countries.

The survey explored the use of electronic communication tools to increase the connection between mobile researchers and their home countries and the results have shown that most of the researchers think that use of electronic means can positively impact creative scientific collaboration.

The MOREBRAIN project is a pilot study to check whether there is a brain drain in Europe, what are the push and pull factors for this brain drain and how can we use electronic tools to turn brain drain in to brain grain. The main





results of the survey show that mobile researchers prefer the U.S as their destination country. The strongest push factors are lack of employment prospects and researcher funding opportunities and the strongest pull factors are career development, working at prestigious host institution as well as good career opportunities abroad. All respondents expressed interest in co-sharing their working time between visiting country institution and their home research organisation that would increase research collaboration. Majority of currently mobile researchers (60 percent) with current or past research experience in the USA are or have been members of the ERAXESS Links USA. The newsletter seems to be the most useful service offered by this Network to the members of the European researchers in the USA.



## 5.-CONCLUSIONS

The MOREBRAIN preliminary report attempts to portray the current status of researcher mobility in Europe and to present ways of preventing European brain drain. The MOREBRAIN team was able to reach many mobile researchers and collect data from researchers in different career stages, and in various stages of mobility (currently mobile, previously mobile, etc...). The preliminary data gathered in the MOREBRAIN questionnaire is beneficial for gaining an understanding of the motivations of European researchers to relocate to other European countries and abroad.

The report results show that the lack of certain basic conditions such as employment prospects or researcher funding opportunities appear to impact the mobility decision of all respondents to a great extent. In addition, the most effective pull factors relate to the quality of the research environment abroad including career development, working at a prestigious host institution, as well as career opportunities. We suggest taking these results into consideration when trying to create incentives for researchers, either to stay in their home country, or to be mobile.

At the time the MOREBRAIN project began there was one Euraxess Links office in the U.S. (ERA-Links USA). The MOREBRAIN questionnaire examined the awareness of the Euraxess Links online tool, as well as the usefulness of the service offered by the office, among those European researchers who spent at least some time at researcher institutions in the USA. By now there are five different countries with Euraxess Links representatives. We urge them to consider the results of the MOREBRAIN pilot mobility survey when devising strategies for attracting foreign researchers to Europe and for encouraging European researchers to return.

The results indicate that it would be beneficial continue to study the European brain drain in the framework of the new concepts of e-reintegration and co-sharing positions. These new concepts, which were positively accepted by



respondents in this research, should be fine-tuned and presented for analysis to a wider audience.

Further research should also be devoted to the topic of researcher quality, i.e. publications and citations, employment status, and funded research. It appears that the best researchers are leaving Europe and not returning. This issue must be examined empirically.

An in depth examination of the concepts of e-reintegration and co-sharing, and of the quality issues, would require a large scale pan-European project with a greater budget. Such an analysis will enable broadening the scope of what has been examined to date, and allow a deeper and wider understanding of these important topics.

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