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TANDEM

Review on research mobility patterns and their determining factors in TANDEM project countries (D 2.1)

SEVENTH FRAMEWORK PROGRAMME

euraxess
RESEARCHERS IN MOTION

Foreword

Research mobility is not a new topic. For decades it has been an important tool enabling the exchange of knowledge and networking among researches. But what used to be a privilege of few professors is now expected from the increasing number of those working in research. And what used to be an interest of research institutes is now in the centre of regional, national and also the European research policies. Mobility became not only an important element of scientific careers but also a determinant of economic prosperity.

Through its contribution to the excellence of research, mobility also contributes to the general economic growth[1]. In order to avoid that innovative investments and talents will move elsewhere, researchers, as highly qualified workers, should be offered attractive careers and easy mobility across sectors and countries.[2] This message is stressed within the Innovation Union Communication, one of the flagship initiatives of EU 2020 Strategy as well as in other strategic documents on the future of European Research Area and EU as a whole. Similar messages are included in most of the national level strategies, including those of countries involved in the project.

The same strategies not only stress importance of mobility but also point out how its flows should look like in order to maximize its positive impacts. Inward mobility of high-skilled researchers leading to the accumulation of human capital or the "brain gain" in the receiving country used to be the preferred option for developed countries for decades. On the other hand outward mobility enabling people to pursue the professional career abroad and gain new skills seemed to be beneficial for the countries going through the process of transformation. But since many of those researcher didn´t want or couldn´t come back to their home country, brain drain became a serious problem, especially for the countries with less developed research systems. Facing these developments what became the most desirable pattern of research mobility is a brain circulation. Researchers should go abroad, gain new experience and bring it back to their country. However, although this mobility pattern is the most desirable it is far from reality in the most of the ERA countries.

Different tools and approaches have already been created to support such mobility pattern. TANDEM project tries to introduce the other one. Main objective of the project is to develop flexible modular system of Dual Career and Integration Services (DCIS) which could be implemented in different setting and contexts. One of the central questions of the project is also how DCIS could be used to encourage the brain circulation processes. Aim of this review is to provide an input for the formulation of such alternative strategy.

[1] See European Commission (2012): *A Reinforced European Research Area Partnership for Excellence and Growth.* Available online http://ec.europa.eu/euraxess/pdf/research_policies/era-communication_en.pdf
[2] See European Commission (2010): *Europe 2020 Flagship Initiative - Innovation Union*. Available online http://ec.europa.eu/euraxess/pdf/research_policies/Communication_Innovation_Union.pdf

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List of abbreviations

DCIS - Dual Career and Innovation Services
EEA - European Economic Area
HR - Human Resources
GDP - Gross Domestic Product
GERD - The Gross Expenditure o*n* Research and Development
PPS - Purchasing Power Standard/Purchasing Power Parity
R&D - Research and Development

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Summary

Brain circulation describes the situation when researchers go abroad to specialize and then return to their country of origin, bringing back the experience they attained. Brain circulation does not only mean the move of researchers. It also denotes the circulation of knowledge: researchers act as "knowledge carriers" and enable intellectual resources to be shared across states, rather than to be permanently transferred from one state to another. Brain circulation is especially an attractive alternative for the countries currently facing the brain drain as it could enable them to reverse the negative trend and profit from the past outward flows of researchers. One of the objectives of TANDEM project is the formulation of alternative DCIS strategy which could encourage such circular mobility. However if such strategy should be effective it has to take specifics of different national contexts into the account. Providing input for discussion about these specifics and their effect on the design of DCIS services is the main goal of this review. Review is based on the national data summaries provided by all project partners and additional study of available literature and outcomes of previous projects.

The review focuses on three main questions that should help us to design flexible and sustainable strategy of DCIS. First, what are the differences in the capacity of national research system? Answer to this question helps us to be aware of limits of particular research systems and propose realistic and sustainable alternatives of DCIS implementation. Second, what are the patterns of research mobility in project countries? Learning about the flows of mobility enables us to better define the specific goals of the implementation of DCIS strategy with regard to the needs and priorities of individual countries. And third, are there any tools in place upon which we can build? In the most countries it is not necessary to begin from the scratch. There are services and re-integration initiatives already existing and DCIS strategy should build upon them and develop them further.

Considering the limits: research capacity of national R&D systems

Levels of financial and human resources in R&D vary across the countries and regions and considerably determine the possible extent and form of services provided to researchers. Denmark and Switzerland both have well funded research systems and relatively high share of R&D support staff involved in various assistance services for researchers. The other three countries dispose over significantly lower resources but differ with regard to their development. Estonia demonstrates the clear commitment to the development of R&D which is reflected also in the gradual increasing of research funding and investments into the development of human resources in research. Slovakia is facing serious underfunding of research and even if the number of researchers is increasing, share of the support staff remains very low. Greece has to cope with drastic cuts in public spending and sustaining the current state of research system remains the main challenge. That clearly indicates, that while in some countries services can include some resource demanding activities, in others such activities would hardly be possible and alternative approach has to be proposed.

Choosing the right strategy: mobility patterns in project countries

Although all countries wish to encourage the research mobility, its preferred pattern depends on the current state of mobility in each of the countries involved. Switzerland is highly attractive for foreign researchers but also supportive towards outward mobility and has relatively balanced mobility flows. It is the closest to the ideal of "brain circulation". Denmark also has a high research capacity but it is less successful in attracting foreign researchers and outward mobility is higher than the inward flows. However with the targeted strategy, on both national and institutional level, the inflow of internationals has significantly increased over the last few years. Estonia neither faces the high level of brain drain nor attracts many foreigners but also here the trend is positive and share of internationals is increasing. Despite the slight increase in the number of international researchers, brain drain is a more visible problem in Slovakia and it has been a recurrent issue in Greece, where it got even more serious after the country was hit by the crisis. However, not only the flows of mobile researchers but also the share of those who are not involved in mobility is important if the brain circulation is a goal to be pursued. Researchers currently working in Denmark and Switzerland are significantly more mobile than those working in other three countries. The ways of increasing the mobility of all groups of researchers should therefore be considered.

Building upon the existing tools: DCIS and re-integration initiatives in the project countries

Denmark and Switzerland both have advanced integration services located within the universities and research institutions. But while in Denmark all categories of researchers are supported, in Switzerland some of these services are only available to the senior staff. Integration services are becoming also an integral part of the institutional HR policies in Estonia. In Greece and Slovakia they are provided mainly by the EURAXESS network. In Greece, EURAXESS service centres are mostly located within the universities and research centres in Slovakia create fully independent structure. Besides, the traditional integration services assistance for dual career couples is becoming increasingly important. First Dual Career Advice Centre in Switzerland was established twenty years ago in Zürich. Dual Career initiatives in Denmark have been introduced later but currently provide a wide range of services related to dual career issues and also present an example of good practice in this field. Such services have been missing so far in other project countries.

Project countries also dispose over different tools supporting the reintegration of researchers into their home country. All project countries offer a possibility of re-integration grants in one or another form. They also create the online platforms for the communication with professionals living in working abroad. While in Denmark and Estonia these platforms have a broad focus and target all groups of highly qualified graduates and workers, Switzerland also offers an example of platforms and networks specifically focusing on researchers abroad. So far, none of the countries uses the existing integration initiatives to provide assistance to returning researchers. But since they are many times coming back with partners of another nationality and children born into another culture, especially the dual career advice could be of high relevance to them.

1. Concepts and notions

Following chapter describes the main concepts used in this review and if necessary, explains the way how they are operationalised for the purpose of this review.

Research mobility:

Research mobility is the broad concept, which can include not only move in the geographical sense but also the move between the economic sectors (intersectoral mobility), scientific disciplines (interdisciplinary mobility) or within the virtual space.[3] However this review will only focus on mobility in the sense of geographical international cross-border move taking place both within and outside European Economic Area (EEA) and lasting for at least three months. Both employment mobility (in the sense of having a regular employment contract in another country) and mobility having form of staff exchanges or scholarship stays will be taken into the account. These forms of mobility require that researcher has to integrate her- or himself into the new society and culture and as such can be effectively targeted by the integration services.[4]

Brain circulation:

There are several definitions of what the brain circulation is. In the broad sense it is the concept describing *training and career paths* in which students or workers go abroad to specialize and then return to their country of origin bringing their experience with them.[5] Alternatively brain circulation can also be defined as a fluid movement of people between countries, including temporary or long-term movement which may be beneficial to all involved, if occurring voluntarily and linked to the labour needs of countries of origin and destination.[6] Within the brain circulation concept researchers (or other highly skilled professionals) act as „knowledge carriers" and thus enable intellectual resources to be shared across states, rather than be permanently transferred from one state to another[7]. That means brain circulation is usually not a one-off activity but can and should be but repeated.

Researchers:

Definitions of who should be considered a researcher vary across the countries but currently most of them derive from the broadly accepted OECD definition included in the Frasciati manual. According

[3] Neither of these forms should be considered more important and any mobility experience should be considered as a valuable contribution to the professional development of a researcher. See European Commission (2005) *The European Charter for Researcher. Available online* http://ec.europa.eu/euraxess/pdf/brochure_rights/am509774CEE_EN_E4.pdf

[4] Virtual mobility which is possible due to online technologies is also an increasingly important and can substitute for a geographic mobility in some cases as due to technologies such as teleconferences many common activities do not require a physical presence of a team on one place.

[5] See OECD (1997): *International movements of the highly skilled*. Available online http://www.oecd-ilibrary.org/content/workingpaper/104411065061

[6] IOM (2011): *Key Migration Themes*. Available online http://www.iom.int/cms/en/sites/iom/home/about-migration/key-migration-terms-1.html

[7] Aspen Institute Italia (2012): *Brain Drain, Brain Exchange and Brain Circulation: The case of Italy viewed from a global perspective.* Available online http://www.lse.ac.uk/businessAndConsultancy/LSEEnterprise/pdf/Brain-Drain-%28English%29.pdf

to this "r*esearchers are professionals engaged in the conception or creation of new knowledge, products, processes, methods and systems and also in the management of the projects concerned. (...) Managers and administrators engaged in the planning and management of the scientific and technical aspects of a researcher's work also fall into this category. Postgraduate students at the PhD level engaged in R&D should be considered as researchers."* [8] It should be stressed the higher education teachers and PhD student are considered as researchers for the purpose of this study. On the other hand it is necessary to differentiate between researchers and R&D personnel also including other categories of employees such as technicians and other support staff.

Dual Career and Integration Services (DCIS):

Integration services refer to the various activities and initiatives developed to help newcoming international employees become comfortable in their new locations and include services such as the assistance with legal requirements, social and health insurance, housing or taxation but also more "soft" activities such as providing networking opportunities, language courses or cultural orientation. Since researchers are often members of dual-career couples, where both partners pursue a career, employment needs of the spouse or partner is an important consideration for the specific subgroup of integration services which is becoming increasingly important: assistance to dual career couples[9].

Dual Career Couple:

General definition describes "dual career couple" as a couple in which both partners pursue a career. Other definitions are more specific. According to some of them term "dual career couple" refers only to the couples in which both partners are involved in an upward mobile professional trajectory. In the strict sense *dual career couples are defined by the fact that both partners are highly qualified, and follow their career path while not renouncing having children and a satisfying family life.* On the other hand "dual career couple" may also refer to the pair in which one partner only wants to stay in the labour market and does not inevitably require the career growth. [10] We will refer to the latter definition in this review.

[8] OECD (2002): *Frascati Manual: Proposed Standard Practice for Surveys on Research and Experimental Development.* Available online http://www.oecd-ilibrary.org/science-and-technology/frascati-manual-2002_9789264199040-en

[9] See Wolf, L. - Wendel, S. (2003): *The Two-Body Problem: Dual-Career-Couple Hiring Practices in Higher Education*

[10] See Saraceno, C .(2007).: *Introduction to the special issue: Dual-career couples. .* Available online http://www.zeitschrift-fuer-familienforschung.de/pdf/2007-3-saraceno.pdf

2. Considering the limits: research capacity of national R&D systems

This chapter aims to point out the differences among the research systems in project countries and discuss which implications this differences have for the design of modular DCIS system. The focus will be mainly on two aspects of capacity of national R&D systems: (1) availability of funding and (2) availability of human resources with regard to both extent and structure of these sources.

Table 1: Resources in R&D: selected indicators

	Denmark	Estonia	Greece	Slovakia	Switzerland
Total researchers (head counts) *(*2011)	56`771	7`646	45`239	24`711	45`874 (2008)
Share of the R&D personnel on labour force (2011)	1,92%	0,82%	0,74%	0,68%	NA
Proportion of female researchers (2011)[11]	33,1%	43,7%	36,7%	42,6%	30,2% (2008)
Proportion of women in grade A **academic** positions (2010)[12]	15%	17,2 % (2004)	NA	22,7% (2011)[13]	25,09%
Number of new doctoral graduates (ISCED 6) per thousand population aged 25-34 (2010)[14]	2,1	0,9	1,2	3,1	3,7
Share of GERD (gross domestic expenditures on R&D) on the overall GDP (2011)	2,98%	2,37%	0,67%	0,68%	2,87% (2008)
Total intramural R&D expenditure (GERD) by sectors of performance – per inhabitant in PPP in EUR (2011)	814,10	362,20	126,5	118,9	957,4 (2008)
Net yearly salary of researcher in terms of PPP (2006)[15]	24`917 EUR	13`777 EUR	12`173 EUR	24`326 EUR	46`432 EUR

Source: Eurostat 2013

[11] Expressed in headcounts

[12] European Commission (2012): She Figures: Gender in research and innovation. Available online http://ec.europa.eu/research/science-society/document_library/pdf_06/she-figures-2012_en.pdf

[13] An increase of over the 10% could be observed between the years 202 and 2011.

[14] Source: Researcher Report 2013. Available online http://ec.europa.eu/euraxess/index.cfm/services/researchPolicies

[15] Source: European Commission (2007): *Remuneration of researchers in public and private sector.* Available online http://ec.europa.eu/euraxess/pdf/research_policies/final_report.pdf

Financial resources

Project countries are situated on the two ends of the spectrum with regard to the share of funds spent on R&D. Switzerland and Denmark[16] rank among the countries with the highest shares of their GDP spent on R&D (over 3% in 2012). On the other hand Slovakia and Greece both belong among the EU countries with lowest expenditures on R&D. Only 0,81% of GDP in Slovakia and 0,69% of GDP in Greece was spent on R&D in 2012. However, not only the actual level of spending is important but also the targets for the future. Greece, being hit by the crisis and drastic cuts in public spending, does not set any specific target, Slovakia, with relatively steady economic development only strives for 1% share until 2020. Estonia is, as it will be on several other occasions described in this review, a specific case. Although it has a similar economic and historical background as Slovakia its approach toward R&D is considerably different. Share of GDP spent on R&D was 2,18% in 2012 and increase of more than 1% occurred between year 2009 and 2012. Estonia is also heading for the European goal and would like to achieve the share of 3% by 2020.

Much of the increase in the spending on R&D in Estonia can be attributed to the higher engagement of business sector. Structure of R&D funding became similar to those in Denmark and Switzerland where business sector is the main provider of funding for R&D. While this is not a very surprising fact in the cases of Switzerland and Denmark, high involvement of private sector in Estonia makes it an exemption among the post-communist countries in Eastern and Central Europe. Public sector and public funding clearly dominate the research landscape in this region and Slovakia is a good example of this situation: research is mainly located within the public universities and research institutions and main source of its funding are public sources. Public sector is also dominant in R&D in Greece both as a place where most of expenditures on R&D are exerted and as a source of funding for R&D.

Concerning the sources of public funding in Greece, Slovakia and Estonia the role of EU Structural Funds should also be mentioned. EU Structural Funds had and will have an important role in the development of R&D systems in all three countries. With regard to the research mobility they play a manifold role. They are mainly used to build and develop the R&D infrastructure. Estonia and Greece also use them to fund the national mobility schemes. And they are the principal source of funding for the development of support infrastructure and services for R&D in Slovakia. The role of Structural Funds in R&D could be even more important in the new programming period 2014-2020 since synergies between Horizon 2020 and Structural Funds should be fostered.[17]

Availability of R&D funding is reflected also in the remuneration of researchers. Not surprisingly, private sector is more generous when it comes to remuneration of researchers in all project

[16] Beside the information about these separate areas determining the character and capacity of national research systems, we can also have a look at comprehensive evaluations assessing the general research and innovation capacity of countries such as Innovation Union Scoreboard. **Denmark is one of innovation leaders** and shows a performance well above that of the EU average. Estonia is together with countries such as Netherlands, Luxembourg, UK or Austria among the innovation followers which show a performance close to that of the EU average. Greece and Slovakia are moderate innovators with innovation performance below that of the EU average. See: European Comission (2013) *Innovation Union Scoreboard.* Available online http://ec.europa.eu/enterprise/policies/innovation/facts-figures-analysis/innovation-scoreboard

[17] See e.g. how Structural Fund could be used to support the „Smart Specialisation" of regions and what is the role of highly qualified workers, including researchers in this process http://ec.europa.eu/regional_policy/sources/docgener/panorama/pdf/mag44/mag44_en.pdf

countries. But the level of average pay differs considerably. Irrespective of the sector, researchers in Switzerland have the highest net income not only among the partner countries but also within the European Economic Area. Researchers in Denmark also enjoy high incomes. However they become less competitive if compared in real terms: if calculated in PPS researchers in Denmark have an income comparable to this of Greek researchers.[18] Estonia and Slovakia are on the other end of the remuneration spectrum in both nominal and real terms.

Human resources

Another aspect of R&D capacity we will focus on is the availability of human resources and their structure. Considerable differences between the project countries can be observed. Denmark with almost 13 researchers per 1000 of labour force (in headcounts), has the highest share of researchers in the population. Estonia with 5,9 and Slovakia with 5,6 of labour force population working as researchers are slightly below the EU average which is 6.6. Greece with slightly more than 4 researchers per 1000 of labour force is on the other end of the spectrum but the number of researchers has considerably increased over the last few years.[19] Comparable data for Switzerland is not available. Beside the share of the researchers, proportion of PhD holders is also an important indicator as it foreshadows the further development in the size of the researchers´ population. Switzerland and Slovakia have the highest share of PhD holders in the population aged 25-64 (3,7 and 3,1). Concerning the Slovakia this share is a recent development and a result of relatively sharp increase, which will be difficult to sustain. On the other hand, share of PhD holders in population aged 25-64 is below 1% in Estonia without any significant increasing tendencies over the last years.

Overall population of researchers increased in all project countries over the last ten years. Most of this increase falls on business and enterprise sector in Denmark and Estonia, while in Slovakia and Greece mainly the higher education sector created new jobs for researchers with employment in business sector stagnating. Generally largest share of researchers' works in the business sector in Denmark. Higher education sector is the main employer of researchers in all other countries. But again share of researchers working in business sector is higher in Estonia than is the average in the region and government sector does not play such an important role as it does in Greece and Slovakia.

While in case of most indicators Switzerland and Denmark show the better results the opposite is true for gender structure of researchers´ population. Over 40% of the researchers in Slovakia and Estonia are women. On the other hand women only represent slightly more than 30 % of researchers in Denmark and Switzerland. High share of women in Estonia and Slovakia can mainly be attributed to the post-socialist background of these countries. Former socialist regimes were pushing for gender equality, however only in the quantitative sense without creating the conditions for equality in opportunities and outcomes. (so called "pseudoemancipation"). Despite the higher share of women

[18] If income before taxation is compared Denmark ranks considerably higher. See European Commission (2007): *Remuneration of researchers in public and private sector.* Available online http://ec.europa.eu/euraxess/pdf/research_policies/final_report.pdf High level of taxation and costs of living are among the main factors that might discourage researchers to move to Denmark In order to eliminate this barrier Denmark introduced reduced tax scheme for foreign researchers and key employees.

[19] Deloitte (2013): *The Researchers Report 2013.* Available online http://ec.europa.eu/euraxess/index.cfm/services/researchPolicies (national reports)

in R&D they were and still are mostly placed on the lower levels of academic and research hierarchies and phenomenon of "gender scissors" is clearly visible in those countries too. What might also be interesting in this regard is that while in western countries lack of women in research and academia is partially explained by the fact that such careers do not allow to reconcile the work and family life well in post-socialist region it is exactly the opposite: many women stay in academia because it enables them to better reconcile these two spheres of life. However, in such case mobility is not an option. This, again, has an impact on their career opportunities as mobility is considered to be one of preconditions of career growth.[20]

Table 2: Sectoral structure of R&D in project countries (2011)

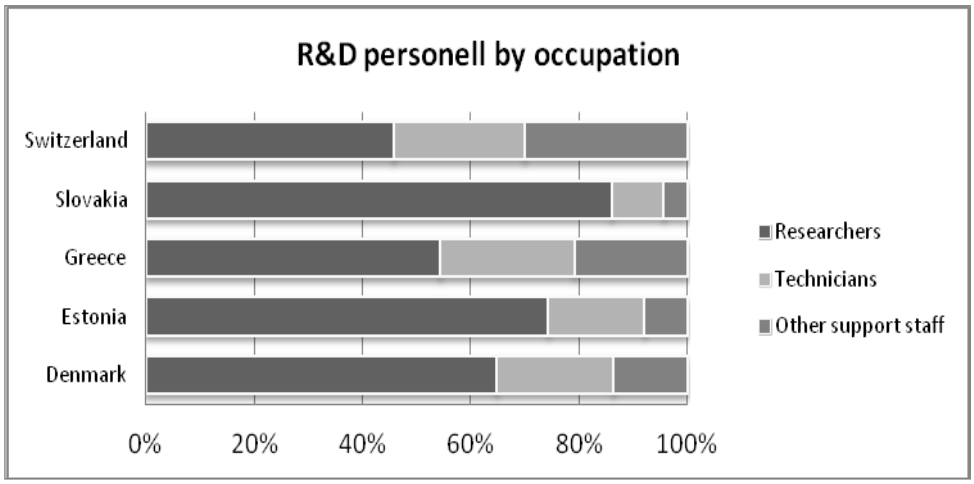
Sector	Indicator	Denmark	Estonia	Greece	Slovakia	Switzerland (2008)
Business enterprise export	% Expenditures	65,77%	63,29%	34,33%	37,00%	73,52%
	% Employees (head count)	49,08%	28,43%	12,95%	10,96%	24,50%
	% of women researchers	23,9%	28,9%	28,2%	21,8%	18,7%
Government sector	% Expenditures	2,01%	8,02%	23,88%	28,0%	0,7%
	% Employees (head count)	3,68%	9,59%	13,47%	14,24%	2,25%
	% of women researchers	33,8%	61,1%	40,8%	45,3%	34,3%
Higher education sector	% Expenditures	31,54%	27,85%	40,30%	35,0%	24,0%
	% Employees (head count)	46,82%	60,66%	72,6%	74,31%	73,25%
	% of women researchers	41,6%	46,6%	38,0%	45,1%	34,8%
Private non-profit sector	% Expenditures	0,34%	0,84%	1,49%	24,0%	1,74%
	% Employees (head count)	0,42%	1,32%	0,98%	0,0%	NA
	% of women researchers	60,7%	52,5%	51,1%	35,0%	NA

Source: Eurostat 2013

Finally, with regard to the purpose of this review not only number of researchers plays an important role but also the share of other employees who are not involved in research directly but taking part on the whole range of support and coordination activities We will therefore differentiate between the "researchers" and "R&D personnel" including both researchers and other occupations such as technicians and other support staff. As the following figure shows, the structure of R&D personnel in project countries is rather different.

[20] See e.g. Felt, U. (2009) *Knowing and living in academic research.* Available online http://sciencestudies.univie.ac.at/fileadmin/user_upload/dep_sciencestudies/pdf_files/pdfs_abgeschlossene_projekte/felt__knowing_and_living_in_academic_research.pdf

Chart 1: R&D personnel by occupation (2011)



Source: Eurostat 2011

While in Switzerland researchers compose less than half of the overall R&D personnel in Slovakia they stand for more than 80% of R&D personnel and share of the support staff does not exceed 10%. Based on this we can expect that while in Switzerland and Denmark researchers can focus on research and other activities are handled by the support staff, in Slovakia and Estonia researchers are also expected to overtake a substantial part of different coordination and support tasks. This considerably influences the possible design of DCIS module structure.

3. Choosing the right strategy: mobility patterns and their development

Capacity of the national research systems represents both the push and pull factor with regard to the research mobility. It is therefore not surprising that it is reflected also in the extent of the countries´ attractiveness for international researchers. Switzerland and Denmark rank at the top positions in the level of internationalisation of their R&D sectors not only among the project countries but also in the broader European (and even global) context. Other project countries are considerably less successful in this field. However the picture of mobility patterns is more complicated and several other aspect have to be taken into account.

Table 3: Internationalisation of R&D: selected indicators

Indicator	Denmark	Estonia	Greece	Slovakia	Switzerland
Non-EU doctoral candidates as a percentage of all doctoral candidates (2010)[21]	15,4%	1,50%	1,00	1,4%	48,2%
Doctoral candidates (ISCED 6) with a citizenship of another EU-27 Member State, EU-27 (2010)[22]	12,4 %	5,20 %	7,3%	6,3 %	36,3 (2010)
Share of foreigners in the labour force (employment over 15)[23]	6,4 % (3,4%)	14,4% (14,1%)	3%	7,6 % (6,1)	23,7 % (7,3%)
Women researchers having spent a period of at least three months as researchers in another country, EU-27, (2010)[24]	40%	40%	75%	50%	NA
Post- PhD researchers who have spent a period of at least three months as researchers in another country in last ten years, EU-27, (2012) [25]	53 %	26,6 %	33,9%	27,6%	53,1%
Job-to-job mobility [26]	8,9%	5,2%	3,4%	3,1%	4,9%

Switzerland is traditionally one of the most attractive countries not only for the researchers. With almost quarter of the employees not being Swiss nationals it has the highest foreign-labour *share* in

[21] Source: Researcher Report 2013 (country reports). Available online http://ec.europa.eu/euraxess/index.cfm/services/researchPolicies
[22] Source: Researcher Report 2013 (country reports). Available online http://ec.europa.eu/euraxess/index.cfm/services/researchPolicies
[23] Source: Eurostat 2013
[24] Source: MORE Study 2010
[25] Source: Researcher Report 2013 (country reports). Available online http://ec.europa.eu/euraxess/index.cfm/services/researchPolicies
[26] Source: Eurostat 2013 (Annual data on job-to-job mobility of HRST, employed, 25-64 years old). With an exemption of Estonia is job-to job mobility of women higher than a job-to job mobility of men.

Europe. Share of foreigners between the R&D staff is even higher: in 2008 32% of R&D employees in private business sector were foreigners and 36 % of those R&D employees at the universities[27] 36.9% of international researchers are coming from Germany. Switzerland is also not so diverse in that sense: 59.4% of all foreigners come from the 4 countries: Germany is followed by US and neighbouring countries.[28] Additionally, more than 47 % PhD students are from abroad. Switzerland clearly profits from high share of internationals as for example the vast majority of principal researchers on the Swiss R&D institutions winning the ERC grants are non-Swiss.[29]

While in Switzerland high share of foreign researchers is the outcome of long-term development, in Denmark it is the result of targeted strategy pursued over the last few years by both the state and universities[30] and private research institutes.[31] More than a third of the 3,300 professors and lecturers hired between 2007 and 2009 were foreign nationals. Six out of ten positions of professor, associate and assistant professor level which was occupied in 2007-2009 had at least one international applicant and majority of position (97%, 91% and 80%) were advertised internationally. The percentage of doctoral candidates who were citizens of another EU-27 Member State was 12.4%, the percentage of non-EU doctoral candidates as a percentage of all doctoral candidates was 15.4% in 2010,.[32] Western Europe, Northern America and Asia are the main regions from which researchers come to Denmark. Only 15% of foreign researchers coming from Europe originate from Central and Eastern Europe.[33] However, for most international researchers the choice to live and work in Denmark is temporary. More than half of them indicate that they might move to their home country or another country in the future.[34]

Increase in the level of foreign researcher can be observed also in Estonia. In 2011 the number of foreign researchers in Estonian government, higher education and private non-profit sectors was more than 5 times higher than in 2004[35]. The increase can be explained by Estonia joining EU in 2004 and the different national funding schemes. If we have a look at the staff in 6 major Estonian public universities number of foreign lecturers has increased approx. 2 times while the number of foreign researchers has increased almost 6 times since 2006. Also, the fraction of foreign academic staff has increased: for lecturers the change is from 3% to 7% and for researchers from 2% to 10% of total

[27] Source: Federal Statistical Office (FSO) 2013
[28] See Franzoni, Ch. – Scellator. G. (2012): Foreign-born scientists: mobility patterns of 16 countries. Available online http://www.nature.com/nbt/journal/v30/n12/pdf/nbt.2449.pdf
[29] Source: Database of ERC funded projects http://erc.europa.eu/erc-funded-projects)
[30] This trend is clearly illustrated by the example of the largest universities in the country. The number of international staff members at the Copenhagen University has increased from 677 to 1,366 from 2008 to 2013 and foreign researchers' constitute almost the fifth of university staff. Most of them come from Germany, Sweden, Italy UK and France. Between non-EU countries China, USA and India dominate. Similarly University of Aarhus hosts more than 800 foreign researchers and Danish technical university hosts more than 1300 foreign researchers. See http://cphpost.dk/news/national/foreign-researchers-flocking-denmark
[31] See http://cphpost.dk/news/national/foreign-researchers-flocking-denmark
[32] Researchers report 2013
[33] Source: Researcher Report 2013 (country reports). Available online http://ec.europa.eu/euraxess/index.cfm/services/researchPolicies
[34] See Oxford Research A/S & Copenhagen Post (2010): *The Expat Study 2010*. Available online: http://www.nyidanmark.dk/NR/rdonlyres/CEE6FC87-31AC-42ED-ADEE-E6F2B5557416/0/THEINTERNATIONALRESEARCHERSTUDY2010.pdf
[35] Source: Statistics Estonia 2013

employment in give category. Despite the relatively low share of foreign employees in R&D this number has been steadily increasing over the last 10 years. As for the share of doctoral candidates 5.2% in 2010 were citizens of another EU-27 Member State and 1.5% came from outside the EU.[36]

Greece also has a relatively low share of foreigners in the labour force. Information on inward mobility of researchers and the number of foreign researchers and academic staff holding permanent positions is not available. As for the percentage of doctoral candidates (ISCED 6) with citizenship of another EU-27 member state they represented 7.3% of all PhD candidates in Greece in 2010. The percentage of non-EU doctoral candidates as a percentage of all doctoral candidates was 1.0%. Drastic public cuts and austerity measures caused a serious brain drain from the country and this trend is intensifying. According to Nature News & Comment magazine *in 2010, about 120.000 Greek scholars lived and worked elsewhere, about one-tenth of the total. The number is now estimated at 150.000. The young, skilled workforce, a key factor for economic development, is disappearing exactly when society needs it most*.[37]

Relatively low share of foreign researchers but slightly increasing trend in the development of this share is also the case for Slovakia. Only 1,36% of researchers working in Slovakia came from the other EU countries and 0,6 % came from outside of EU in 2012. Share of foreigners is a little bit higher in the Higher Education sector. Over 10 % of researchers and more than 11% of full professors on Slovak universities are foreigners. Most of the foreigners at Slovak universities come from neighbouring countries mainly the Czech Republic, followed by Poland and Hungary and it can be expected that considerable part of them do not live in Slovakia and commute from their domestic university. Most non-EU employees come from the USA and Russia. 6.3%, of doctoral candidates had a citizenship of another EU-27 member state in 2010, most of them from Czech Republic. Only 1.4% of PhD students came from outside EU.

With regard to the internationalisation of the research and brain circulation, not only the share of foreigners among the employees but also the international experience obtained by the domestic researchers is important. Outward mobility is therefore equally important and inevitable part of the brain circulation process. Here again, both Switzerland and Denmark rank the highest not only among the project countries but also within the EEA. According to the latest MORE II study, Switzerland together with Denmark has the highest share of researchers who spent more than 3 months within the last ten years: more than a half of researchers working in Denmark[38] and Switzerland have this experience. Relatively high share of Greek researchers has been mobile too, however only slightly more than 30% was mobile in last ten years. Most Slovak and Estonian researchers remain without the mobility experience and only slightly more than 30% of researchers currently working in Slovakia and Estonia took part in the mobility longer than three months within the last ten years. Distribution of mobility experience between men and women is almost balanced

[36] Source: Researcher Report 2013 (country reports). Available online http://ec.europa.eu/euraxess/index.cfm/services/researchPolicies

[37] See: Trachana, V.: *Austerity led brain drain is killing Greek science.* Available online http://www.nature.com/news/austerity-led-brain-drain-is-killing-greek-science-1.12813

[38] High propensity to mobility does not only concern the international mobility. According to MORE Study (2010), Denmark has a highest share of researches who worked as researchers in both private and public sector.

in Denmark, Switzerland and Slovakia. More men than women are involved in the international mobility in Greece and Estonia.

Comparable data about the researchers leaving the project countries for the purpose of employment or living abroad for a longer period of time are not available without further research. However one of the ERAWATCH studies presents such comparison confronting the dominant mobility patterns with research capacity of the countries. [39]

Table 4: Research capacity vs. mobility flows in the project countries

Research capacity	Country	Inward mobility	Outward mobility	Mobility outcomes
High	Switzerland	High	High	Outward mobility equals inward mobility
	Denmark	Low	Medium	Outward mobility greater than inward mobility
Medium	Estonia	Low	Low	Outward mobility equals inward mobility
Low	Slovakia	Low	Medium	Outward mobility greater than inward mobility
	Greece	Low	High	Outward mobility greater than inward mobility

Source: Fernández-Zubieta, Guy (2010)

According to this study only Switzerland is close to the ideal of brain circulation. It is highly attractive for foreign researchers but also supportive towards outward mobility and has relatively balanced mobility flows. Denmark, also having high research capacity, is relatively successful in attracting foreign researchers but its outward mobility is higher than the inward flows. Estonia as a country with medium research capacity neither faces the high level of brain drain nor attracts many foreigners. Brain drain is a more visible problem in two project countries with low research capacity. Especially for Greece brain drain is the recurrent issue even intensified by crisis.[40]

[39] Zubieta Fernandéz, A – Guy, K (2010) *Developing the European Research Area: Improving Knowledge Flows via Researcher Mobility.* Available online http://erawatch.jrc.ec.europa.eu/erawatch/export/sites/default/galleries/generic_files/JRC58917.pdf

[40] See: Trachana, V.: *Austerity led brain drain is killing Greek science.* Available online http://www.nature.com/news/austerity-led-brain-drain-is-killing-greek-science-1.12813

4. Building upon the existing tools: DCIS and re-integration initiatives

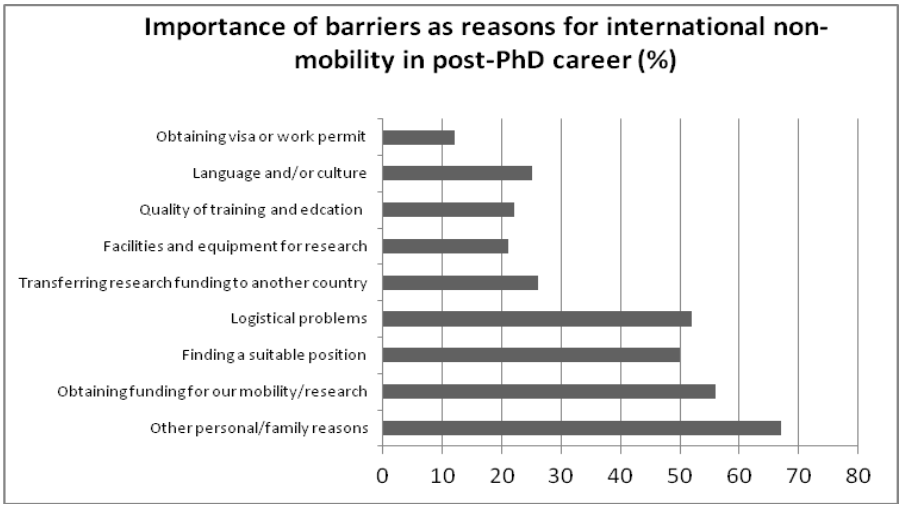
When developing the DCIS strategy it is not necessary to start from the scratch. There are various tools and initiatives already in place and DCIS strategy should build upon them and develop them further. Following chapter explains why such initiatives evolved and describes both integration services and tools that project countries use to encourage the brain circulation and attract their researchers back.

Dual Career and Integration Services

Integration services[41] refer to the various activities and initiatives developed to help newcoming international employees become comfortable in their new locations and include services such as the assistance with visa and residence permit, social and health insurance, housing or taxation, childcare but also more "soft" activities such as providing networking opportunities, language courses or cultural orientation. Some of those services are more important by the time researchers start their mobility, another are crucial in order to retain them in the country. Generally they help to minimise the barriers of becoming mobile and increase motivations for staying in the new country or being involved in further mobility.

TANDEM survey explored which problems and barriers do mobile researchers consider as most challenging.[42] These influence the researchers´ wellbeing while being mobile and are therefore decisive for both attracting and retaining the international researchers. However with regard to the aim of this review it is also important to find out what are the barriers that non-mobile researchers perceive as the main factors which discouraged them from being mobile.

Chart 2: Importance of barriers as reasons for international non-mobility in post-PhD career



Source: MORE II study (2013)

[41] Originally such services were a domain of business companies which had to take care of their highly mobile expats. But since academics belong among the most mobile professional groups increasing number of universities and research institutions started to offer similar service to their international employees and fellows too.

[42] Results of the survey can be fond on the webpage of TANDEM project http://www.euraxess-tandem.eu/publications/

Irrespective of the type of mobility, researchers rank personal and family reasons as the most important barriers for pursuing an international career according to the MORE II study. For those who are not involved in the mobility such issues belong among the most serious concern and barriers. This is true for both job mobility and research visits.[43] Similar trends were confirmed by the earlier E-care research according to which family and other personal connections also ranked as the most important discouraging factor, followed by complex administration of relocation. [44].

Services that would help the researchers to overcome this kind of barrier could therefore considerably contribute to increase in the mobility and brain circulation. As TANDEM survey results suggest such services would also be welcomed by already mobile researchers. However, creating the general conditions for the relocation of the researcher's family based on the expectation that researcher career is the main decisive factor in the relocation process is not enough. Currently most of the academics have a partner also pursuing their own careers (from here more specific term of "dual-career academic couples."). Employment needs of the spouse or partner is therefore an important consideration. The question how to help researchers to find solutions which on the one hand support their career progress but on the other hand do not require that careers of their partners suffer becomes increasingly relevant and is addressed by development of specific category of integration services: dual career services[45].

Specific services for such couples include activities such as the assistance with the job search (within the universities/research institutions or outside the academia, in the industry, own business) or support with the child-care search (or very often also the elderly care). [46] In many cases providing the assistance to the partners might mean management of "expectations" as they need to be introduced to the specific of the local labour market. *A*ssistance in making contacts inside and outside the institutions or socio-cultural integration of partners and family are also a part of such services. "Simple" task of helping the researcher´s partner will therefore require the whole range of different activities.

Especially the US universities very early identified the importance of "dual career issue" as one of the crucial aspects of hiring top researcher and dual career policies are currently an integral part of most of the renowned US universities hiring strategies. Such assistance is particularly relevant strategy for the recruitment and retention of female researchers. Women, even those with strong career prospects, usually tend to prefer the career of their partners and considerable share of women actively refuse job offers if their partner cannot find a satisfactory position.[47]

Creation of dual career services in Europe is a relatively recent development; however there are already several countries with well developed strategies such as Switzerland, Denmark, France or Germany. ETH Zurich, one of the project partners, hosts the first centre providing this kind services in Switzerland (next year the dual career advice will celebrate its 20th year of functioning).

[43] See: Idea Consult (2013): *Final Report: More 2* Available online http://ec.europa.eu/euraxess/pdf/research_policies/20130911_Researchers%20Report%202013_FINAL%20REPORT.pdf

[44] See *Comparative Survey Analysis on Researchers' Mobility and Career Obstacles* (2010) Available online http://www.ecare-project.eu/dat/FA71CFD1/file.pdf?635216321131140000

[45] See Wolf, L. - Wendel, S. (2003): *The Two-Body Problem: Dual-Career-Couple Hiring Practices in Higher Education*

[46] This can also concern single researchers who can also have family concerns, such as parenting a child or caring for an aging relative.

[47] See Schiebinger, L. (2008). *Dual Career Couples: what universities need to know.* Available online http://gender.stanford.edu/sites/default/files/DualCareerFinal_0.pdf

Good practice: supporting networking of foreign researchers

One of the most effective ways to make the integration into the new country easier for researchers is to introduce them into the networks of others facing the similar situation or locals that want to actively get involved in the assistance to internationals. Some of such networks can be organised from bottom by the internationals themselves, another are initiated by the receiving institutions. E.g. universities in Denmark establish such networks and clubs and actively promote them as an important part of their strategy (see e.g. http://ism.ku.dk/ism-network/ or http://ias.au.dk/uic/.) Through this network, universities encourage researchers to participate in different meetings and events with both professional and leisure time character. Due to the participation in the networks researchers learn more about the university, city, country, its people and culture.

Apart from networking the internationals, opportunities for meeting the locals can also be very beneficial for the integration process. University of Copenhagen organises the International Mentor network which enables the internationals to meet their colleague (and maybe his or her family) in a new and different way http://ism.ku.dk/mentor_network/.

Organising and keeping such physical network might require both financial and human resources which are not always available. In such cases, internet offers the whole range of online tools which research institutions can use to communicate with international researchers, or through which they can provide them with an access to the networks of other researchers. Universities have several possibilities: they can use any of the existing social networks such as FACEBOOK or LinkedIn or establish their own on-line platforms. The crucial point is letting the people know about the existence of such forums and keep it up to date. Practical information related to issues such as accommodation, administrative issues but also information about various activities organised at the university and outside it, all these are more than useful for foreigners coming to a new country. These tools also make it easier for researchers to find someone they can ask the questions they have. Where universities do not have their own capacities to keep such platforms updated, they can use the services of EURAXESS. EURAXESS service centre usually actively use FACEBOOK as the networking tool (see the examples of Estonia, Greece and Slovakia).

Online tools and social networks can not only be used to enable exchange between the incoming internationals. They can also be used to keep in touch with the researchers who are leaving the country and to enable them to network with their fellows who are also abroad. Some countries already have official online platforms hosted by public institutions that aim to attract their researchers back to the country. Switzerland has several such platforms: Swiss Talents http://www.swisstalents.org/ , the network of highly skilled professionals living abroad, who are Swiss or have strong ties to Switzerland, is a good example of such activities.

Dual career initiatives in Denmark have started later but currently provide wide range of services related to DC issues and also present an example of good practice in this field. Such services have been missing so far in other project countries. However in Estonia they are increasingly becoming a part of HR policies. In Greece and Slovakia such activities have more incremental character and are usually provided on the ad hoc basis by members of receiving departments.

For countries not yet having DCIS services in place, modular system of DCIS designed within the TANDEM project provides an important framework for their development. The question however is not only what kind of assistance should be provided but also who could be the carrier of the services. EURAXESS network could play a crucial role in the development of such services in those countries.

Table 5: Dual career and integration services and their providers in the project countries

Country	General characteristic of integration services	Dual career couples services
Denmark	Integration services are well developed and provide a broad extent of assistance. Beside the practical issues strong focus is on the social and cultural integration of internationals. Centralised welcome offices and specialised departments of the universities are carriers of the services.	Yes, as an integral part of services provided by the university based mobility centres. Offered to all international researchers.
Estonia	EURAXESS plays an important role but other institutional tools and mechanisms are also developed. Both foreign departments and HR department of universities and research institutions are involved. EURAXESS service centres are based directly on the main research institutes and universities.	No, but at some universities they are progressively incorporated into the regular HR policies towards international staff.
Greece	Well developed network of EURAXESS centres is the main provider of integration services for foreign researchers. EURAXESS service centres are based directly on the research institutions and universities usually as a part of EU project departments. Main focus of assistance is on the legal and practical issues related to the relocation.	No, situations are solved on ad hoc basis.
Slovakia	EURAXESS is the main institutionalised integration initiative. EURAXESS service centres are located outside the universities and research institutions. Within the universities and research institutions assistance is strongly decentralised and services are mostly provided on the ad hoc basis by the employees of hosting department.	No, situations are solved on the ad hoc basis.
Switzerland	Integration services are provided by the centralised departments of universities and research institutions. Provided assistance has a broad scope. EURAXESS is incorporated within the existing integration support structures.	Yes, highly professionalised, but mostly offered to the senior researchers only (not accessible for postdocs).

Source: EURAXESS Extranet and internet research

Re-integration assistance

Brain circulation is currently an increasingly popular term all around the world. What has been regularly mentioned in different national and EU strategies is eagerly put in place by emerging research regions such as South Korea, India and China. These countries have already started promoting active strategies that could help them to benefit from the previous brain drains and are now attracting their "brains" back. Several universities in emerging economies have succeeded in building their teaching and research capacity by relying extensively on their ability to attract and keep foreign academics, often through direct recruitment from their diasporas. Recruiting academics from diaspora and other countries seems to be a successful strategy to help the universities and research institutions skip the historical stages of institutional development.[48]

But brain circulation is not the only alternative for the countries developing their research capacities. Countries such as Germany are now also hoping to benefit from the possible return of highly qualified professionals. Attracting researchers back home is not an easy task and it requires targeted strategy and creation of specific means. Germany offers an example of such comprehensive approach. Most countries, including the TANDEM project countries, however do not have such elaborated strategies in this field and mainly use two categories of tools to attract the researchers back: First one is providing funding and creating job opportunities via e.g. re-integration grants. Second one is establishing and sustaining the networks of researchers working and living abroad.

Providing personalised assistance to the returning researchers is currently not a widely practiced option. Such services are being developed e.g. in emerging economies where job counselling centres for returnees are being established.[49] But also in Germany assistance to the returning professionals and their families is a part of the strategy. Examples of services aiming specifically at the reintegration of returnees is also provided by the activities of International Migration Organisation (IOM). Their activities focus on facilitation of return and reintegration and include reintegration assistance in the form of job counselling, referrals, vocational training and support for micro-enterprises. Even though these are mainly implemented within the less developed countries and without the specific focus on the highly qualified workers, they can provide some interesting input also for the introduction of similar services in different contexts.

All TANDEM project countries offer a possibility of re-integration grants in one or another form. Mainly the post-docs and excellent experienced researchers can benefit from the variety of funding opportunities. Private sector is strongly involved in this kind of initiatives in Denmark and Switzerland too. Some project countries also create online platforms for the communication with professionals living and working abroad. Most of these platforms have a broad focus and do not target researchers specifically. Only Switzerland offers examples of several platforms and networks specifically focusing on researchers abroad.

[48] *See Salmi, J. (2012) Attracting talent in a global academic world: How emerging research universities can benefit from brain circulation.* Available online http://academicexecutives.elsevier.com/articles/attracting-talent-global-academic-world-how-emerging-research-universities-can-benefit

[49] See World Economic Forum (2011). *Global Talent Risk – Seven Responses.* Available online. http://www3.weforum.org/docs/PS_WEF_GlobalTalentRisk_Report_2011.pdf

Table 6: Tools aiming at attracting researchers back

Country	Availability of Funding	Networking
Denmark	Yes, but not exclusively oriented on the reintegration. Both publicly and commercially funded schemes are available. Business sector is strongly involved in the funds providing. (See e.g. activities of Novo Nordisk Fonden http://www.novonordiskfonden.dk/en)	Generally oriented online network for Danes worldwide is available: http://www.danes.dk/
Estonia	Yes, but not exclusively oriented on the reintegration. (See e.g "Mobilitas" programme allocating support for bringing top level researchers to Estonia for 3-5 years or post-doctoral funding instrument are available: http://www.etf.ee/index.php?page=256)	Generally oriented programme *Talendid koju* aiming at how to attract back talented young Estonians who have moved abroad to study and/or work. The programme brings together these young talents and Estonian employers through online environment www.talendidkoju.ee. The campaign was launched by the Estonian Chamber of Commerce and Industry
Greece	Yes, but not exclusively oriented on the reintegration. (E.g. Heraclitus II action aiming at the development of high quality human capital for research and innovation through PhD studies, training of researchers, attracting of high quality researchers from abroad: http://www.espa.gr/en/Pages/Default.aspx)	Greek Diaspora is well networked and there are several general and also research oriented Greek associations in many countries. Based on a research conducted by WebInUnion Project, 7 Greek research oriented associations were identified only in USA.
Slovakia	Yes, but only on the institutional level. Currently there is not any nation-wide scheme operated by national funding agency. Slovak Academy of Sciences introduced its own re-integration funding-scheme.	Mainly informal networks. Generally oriented Associations of Slovaks living abroad could also be used to reach the researchers:. http://www.uszz.sk/sk/usa.
Switzerland	Yes, for example Ambizione, programme aiming to encourage young scientist to return from a stay abroad. Ambizione would like to attract the best, next-generation foreign talents to carry out research work in Switzerland. A SNSF professorship focuses on the more experienced researchers with the same aim. Scheme is not exclusively oriented on the researchers' reintegration. : http://www.snf.ch/E/funding/individuals/ambizione/Pages/default.aspx	MyScience portal - online platform for Swiss researchers abroad giving an overview of science and research *in* Switzerland and assembling scientific news and events, practical information on employment, funding and daily life in Switzerland and also job and continuing education portals. More info at *http://www.myscience.ch/en/*

Source: National Data Reviews

And finally we should also ask the question: Would it actually make sense to provide DCIS services also to the researchers that are coming back to the country they used to live in? Some of those who return never worked at research institutions in their country and might appreciate individual mentoring. Others who are not yet back but considering the return and do not have a chance to find out about the research opportunities in their home countries. And last but not least many of those

returning to their home countries are coming back with partners of another nationality and children who were born into another culture. For this group especially dual career initiatives certainly would be of interest. These seem to be exactly the situations which could be effectively addressed by the integration services.

Good practice: complex strategies for attracting researchers home

When thinking of the brain drain we mainly have the countries with less developed research systems in mind. However the countries that can offer an excellent research environment are also interested in how to encourage the brain circulation and get some of their best researchers back. Germany is a good example of such approach. Germany invests considerable amount of money into the support of outward mobility. However many German researchers who leave to get a foreign, experience stay abroad. Few years ago Germany decided to change this situation and get some of the best German researchers working abroad back to the country. Since then the whole range of various activities has been developed and several actors from public, non-profit and business sectors joined the activities. Several public and non-profit organisations (such as „Die German Scholars Organization“) started to systematically develop activities that should attract German researchers back from abroad.

Not surprisingly the crucial issue is the availability of funding and job opportunities. Germany offered the whole range of postdoctoral and reintegration scholarships even before, but currently there are also possibilities determined specifically to the German researchers working abroad such as scholarship offered by the German Scholars Organisation (see e.g. http://www.gsonet.org/ge/supportProgramms.php). Not all scholarship programmes are addressed to the individual researchers directly. Universities and research institutions can also apply if they want to attract such researchers. Networking also plays an important role. GAIN - network of German scientists and scholars in North America - provides a good example for it. GAIN is a joint initiative of several German institutions. The GAIN office is located at the German House in the DAAD office in New York. Since its founding in 2003, GAIN has established itself as a platform for networking and podium helping the German scientists to articulate their interests. It also carries out the whole range of activities such as events and publications fostering the flow of information in both directions across the Atlantic.

GAIN activities include:

- **Annual meetings** bringing together the researchers with scientific organizations, universities, research institutions and businesses.
- Workshops and **webinars** with expert on co-operation and return opportunities.
- Monthly **newsletter** focusing on the current research opportunities and developments in Germany, Europe and North America.
- **Personal counselling** for young researchers on the current research opportunities in Germany.
- **Online directory** of German scientists in the U.S. & Canada which makes it easier for the GAIN community to network with each other.
- More than 30 round tables and **local networks** forming the popular platform for networking and personal interaction.

More information about the activities of network can be found on http://www.gain-network.org

One of the interesting examples of regional initiative can be found here http://www.work-in-bavaria.de/en/employees/work/return-to-bavaria/

5. Conclusion

Finally we should get back to the three questions introduced at the beginning of the review and discuss what the implications of described specifics for the design of modular system of DCIS are. Following conclusions do not present the ready answers. They rather suggest questions that should be considered when creating the modules and putting them together into the nation specific strategies.

Considering the limits: research capacity of national R&D systems

Differences in the research capacities in project countries are quite significant and should be reflected in the design of modular structure of DCIS. Denmark and Switzerland dispose over sufficient resources – both human and financial -, other three countries have to rely on much more restricted budgets and limited support staff. Therefore while in some countries services can include resource demanding activities, in others such activities would be hardly possible and an alternative approach has to be proposed. But there are also other questions that should be discussed. For example which opportunities could the structural funds bring for the development of DCIS in Estonia, Slovakia and Greece? How could the increasing involvement of business sector in Estonia be used in the development and later also in the provision of DCIS services? Could they participate somehow? Or how should different position of female researchers in the participating countries be reflected?

Choosing the right strategy: mobility patterns in project

Even though all countries want to use DCIS to further encourage the research mobility, what it specifically means for them differs. Switzerland being close to the ideal of brain circulation might want to focus on increasing the quality of services. For Denmark the crucial question is not only how to attract but also retain the more international researchers in the country over the longer periods of time. Both Estonia and Slovakia should strive to foster the brain circulation. But it does not only mean increasing inward mobility. Supporting the outward mobility of the researchers who are currently working at their universities and research institutions is also an important challenge. And both Slovakia and Greece should search for the possibilities how to exploit the potential of the growing research community of their nationals living and working abroad.

Building upon the existing tools: DCIS and re-integration initiatives in the project countries

All project countries currently provide integration assistance to the international researchers, but its extent and actors involved are very different. Dual career advice is a completely new field in some countries. This leads us to the two basic questions which should be considered when designing the national strategies. First, which services need to be introduced or further developed? And second who could be their carrier and therefore who is the main target group for the recommendations on the practical implementation of DCIS strategy? In some countries these will be the universities and research institutions, in others EURAXESS might play a pioneering role.

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work package of the TANDEM project. Review is based on the national data summaries provided by all project partners. For more information about the second work package, please, contact Janka Kottulová (janka.kottulova@saia.sk).