

# Statistics in Brief

## Doctorate holders and their international careers

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### Highlights

- After five years doctorate holders take jobs outside academics
- Going abroad is a leverage to escape the deadlocks of the domestic labour market

## Doctorate holders and their international careers

### Introduction

This statistics in brief looks at the careers of doctorate holders, and more in particular the way in which doctorate holders try to capitalize the knowledge they acquired during their doctoral training on the labour market. Although conducting research is not exclusively reserved for workers with a doctoral degree, we direct our attention to this particular part of the labour force for practical reasons. The Belgian Science Policy Office participated on several occasions (2006, 2010 and 2013) in a project launched by a consortium of international organisations (Eurostat, OECD and UNESCO) to gather data

on the careers of doctorate holders in several countries. The findings discussed in this report result from analysis based on the Careers of Doctorate Holders (CDH) survey organised in 2013.

This publication focuses on the work-related mobility of doctorate holders. We aim to figure out to what extent workers with a doctoral degree engage in international mobility. Does this occur at the beginning of their career and for how long? In what sector are doctorate holders employed when they move abroad?

### Policy relevance

International mobility of researchers has been a frequently discussed topic in the European Commission's policy strategies (Lisbon Strategy, Europe 2020). European policymakers are convinced of the beneficial role of international mobility of researchers for the economy and the society in general. This led to several initiatives, the most known of which is Euraxess (website: [euraxess.ec.europa.eu](http://euraxess.ec.europa.eu)). This organisation supports researcher mobility and career development, while enhancing scientific collaboration between Europe and the world. It provides practical information for researchers who want to move to another European country and work there as a researcher. The European Commission also adopted a European Charter for Researchers

and a Code of Conduct for the Recruitment of Researchers. The Charter constitutes a framework for researchers, employers and research funders which encourages them to act responsibly and as professionals within their working environment, and to recognise each other as such.

Also at the level of Belgium several initiatives were launched to support doctorate holders in the development of a research career. The foundation of doctoral schools within universities was a first step in this direction. These doctoral schools were originally created to stimulate obtaining a PhD and strengthen useful skills, but their mission extended to smoothen the transition from a doctoral training to a first job.

### Background literature

Research mobility is often considered in the context of the brain gain - brain drain debate. The debate gained momentum because of a

changing international context in which globalisation of the production and trade of goods and services had a profound influence

on the way economies around the world are structured.

While developing countries changed from agrarian societies to industrialized nations, more developed countries transformed their industry-dominated economies into human capital-based knowledge-centred economies. Within this context transfers of human capital are of paramount importance in creating a stable pole of human talent to support economic growth.

The brain drain debate divides academic researchers and policy makers with regard to the consequences for the countries concerned: should the out- and inflow of researchers to and from other countries be considered as positive or negative? Seen in an international context there are no clear winners or losers. Research mobility is not a unidirectional process in which the receiving country sees its labour force being enhanced because of the knowledge these researchers bring with them, and the home country sees its labour force being weakened because of a loss of knowledge to other competitor-countries. According to our analysis researchers are more inclined to move forth and back between their home country and other countries to hone their research skills. The return of abroad residing researchers has a stimulating effect on the home country because the knowledge acquired abroad can be integrated in the research networks of the domestic labour market. Seen in this respect, each move to a foreign country and back to

### **Description of the data set**

Because of the regionalisation of education policy, two data sources are used for the collection of the data. First, a database collected by the Agentschap voor Kwaliteitszorg in Onderwijs en Vorming, and

the home country adds a new piece of knowledge to the human capital of a society. Hanson and Slaughter (2016) demonstrate this by studying the impact of high-skilled workers on the US economy. Because of the import of talented workers the USA gained dominance in technological and scientific fields.

Apart from the societal implications of the outflow of researchers for the country of origin and the receiving country, another strand of literature focuses on the reasons and motives of researchers to go abroad. Nerdrum and Sarpebakken (2006), for example, find three reasons that explain why researchers engage in international mobility: “to keep up to date with the state of the art; to have qualified feedback on the originality, relevance and quality of your own research; and as a source of inspiration.” Our report selects a series of variables from the CDH Survey that might help to explain why doctorate holders choose to stay abroad.

In spite of the fact that international mobility mostly is considered as an inherent part of an academic career having a positive influence on the innovation and research system of the country that receives the inflow of foreign researchers, policy makers should not lose sight of the negative impact it can have on the life-work balance of researchers. Oliver (2012) points in this regard to the existing insufficiencies in European law and policy to support researchers in this respect.

second a database of the CRef (Conseil des Recteurs francophones). These two administrative databases register each person who has obtained a doctoral degree at respectively a Dutch-speaking or a French-

speaking university in Belgium. For the practical organisation of the survey we relied on the services of the National Register to obtain the most recent addresses of the respondents. This public service is authorized to collect and store data with respect to the identity and residency of Belgian citizens.

Out of a total of 22,362 doctorate holders in the two data sources, the National Register

### **How can one escape the labour market deadlock?**

Studying the Belgian labour market for doctorate holders shows a clear trend: there is an ever growing number of people with a doctoral degree, but the number of positions in higher education remains stable or increases only slightly. Because of this imbalance between supply and demand, most doctorate holders are obliged to make a career switch to other sectors of the labour market. The dominance of the private sector makes this labour market segment the most likely future employer for doctorate holders.

In the following paragraphs, we focus on three sectors: the business enterprise sector, the higher education sector and the government sector. Although survey respondents were also employed in other sectors, such as the private non-profit sector and the education sector outside higher education, we decided not to include these sectors in the analyses because of a limited number of doctorate holders in these sectors.

Because of the availability of new data compared to the previous CDH survey carried out in 2010, we were able to enrich our previous findings with new elements. Our new survey design also included doctorate holders who are no longer resident in Belgium. This group of subjects enabled us to follow a new approach by means of comparing them with the group of doctorate holders that were still

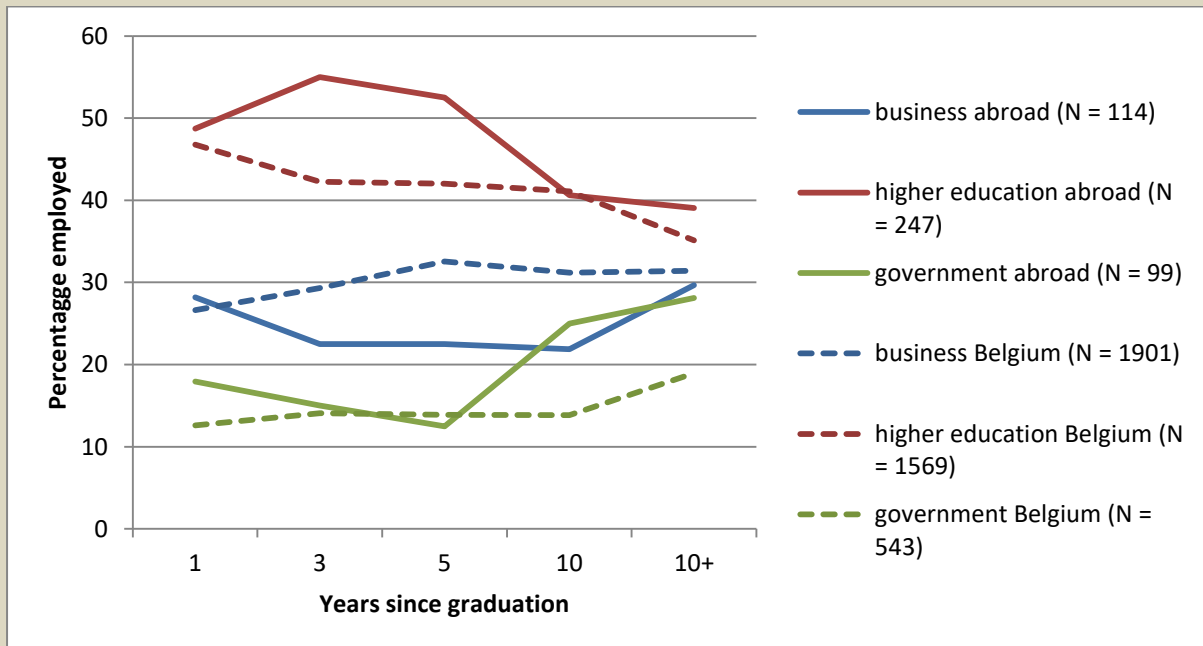
was able to contact 17,031 potential respondents (10,664 in the Flemish provinces, 3,299 in the Walloon provinces, 1,856 in Brussels-Capital and 1,856 abroad) or 76.2% of the survey population. Finally, 5,622 of these returned the survey (33%).

in Belgium at the moment the survey was carried out.

Our first point of analysis focuses on the employment duration in higher education after being awarded a doctoral degree. In view of the limited number of available positions in academics, and the fact that each year a new group of students finishes its doctoral study, the pressure on previous cohorts increases steadily over the years. With this in mind, we look at the ability of doctorate graduates to stay active in higher education and what survival strategies they use to stay in the running.

One of those survival strategies could be to escape the Belgian labour market deadlock by migrating to another country. In recognition that other countries are also confronted with the same labour market situation, we cannot exclude the fact that some domains of expertise offer more employment opportunities in bigger countries with a larger and more specialised network of universities and government-funded research institutes. So, the first figure shows the effect over time of a move abroad on the possibility to stay in academics.

**Figure 1: sector of employment over time since graduation for Belgian and foreign residents (source: Belspo CDH survey 2013).**



Note: the private non-profit sector and the education sector outside higher education are not included in this figure.

Belgian and foreign residents were treated as separate groups. For both groups a relative distribution over the different sectors was calculated in order to parcel out the effect of differences in absolute figures between the sectors. At a first glance, this figure shows a common pattern in employment over labour market segments. PhD graduates in higher education, independent of the fact if they work in Belgium or abroad, are confronted with a limited number of vacant positions in academics. The period between three to five years after graduation seems to be a breaking point, indicating that after this period a growing number of PhD graduates has to search for a job outside academics. In most cases this will be a job in the private business sector. As already mentioned this is due to the fact that most jobs in the labour market are created by the business sector. When we switch our attention to the relative percentages indicated on the vertical axis we obtain a more promising outlook for those doctorate holders that took the risk to move abroad. After more than ten years since

graduation, doctorate holders in higher education working abroad were able to reverse the negative trend of employment opportunities for those staying in Belgium. Over one third (35%) of doctorate holders resident in Belgium are employed in academics, while 39% of the foreign residing doctorate holders are still working in higher education.

When testing the effect of employment sector on the probability of staying abroad, a statistically significant effect is found. Doctorate holders in higher education and government are significantly more often working abroad than their counterparts in the business sector (both proportion tests were significant at the 1% level). This effect could only be found over the complete time span since graduation, but not for each of the cross-sectional time periods.

These findings do not only point out why going abroad is a better way to continue an academic career. Because a foreign experience is often a prerequisite to get an

academic job, people who have the ambition to develop an academic career are also more willing to invest in a stay abroad because it

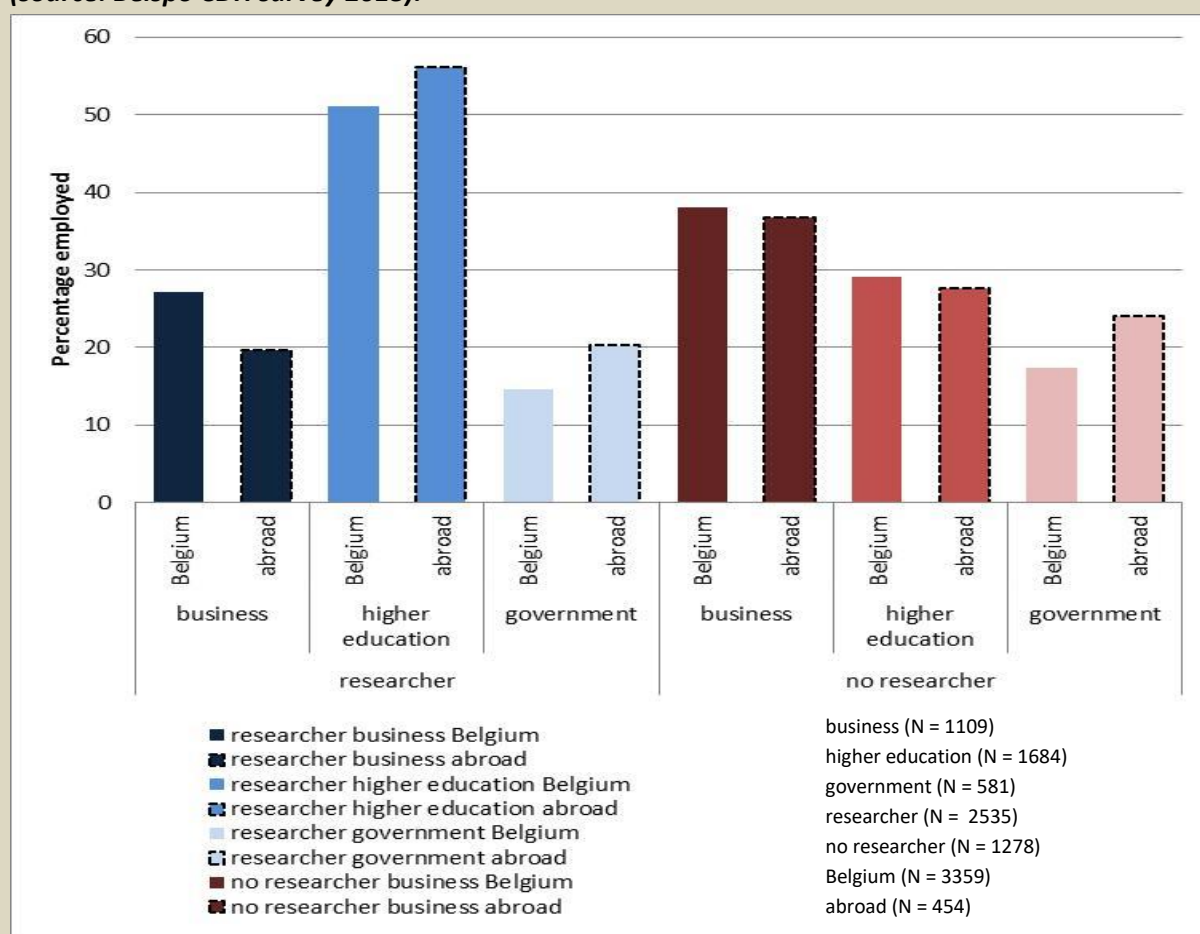
increases their chances of building an academic career in the home country.

### Working abroad as a researcher

In this section we add another dimension to the analysis by drawing a distinction between doctorate holders who remain involved in research activities after graduation, and those who switched to other types of professions that are no longer classified as research intensive jobs. Figure 2 is constructed by considering each group and location separately and calculating their relative distributions over the different sectors. Presenting the data in this way allows us to take into account the impact of professional

research activities on migration movements and employment sector. We observe that researchers, irrespective if they chose to work abroad or not, are more often employed in higher education compared to the two other employment sectors. When doctorate holders do not perform research, they are more often employed in the business sector. When putting employment sectors for researchers in relation to the option to work abroad or not, it appears that especially higher education - but also the government sector - offer an

**Figure 2: sector of employment for researchers or other professions working in Belgium or abroad (source: Belspo CDH survey 2013).**



Note: the private non-profit sector and the education sector outside higher education are not included in this figure.

attractive career opportunity for doctorate holders who are actively looking for research opportunities abroad (this is confirmed with proportion tests at the 1% significance level). This contrasts with the business sector: doctorate holders who work in this sector are more often employed as a researcher in Belgium than abroad. When doctorate holders do no longer pursue a research career, they are more likely to opt for a job in the business sector (almost 40%), irrespective if they are located abroad or in Belgium. A

## Conclusion

Doctorate holders in Belgium who have the ambition to pursue a research career are sometimes pushed abroad because of an insufficient number of jobs available on the Belgian labour market. Although we expected this phenomenon to be especially acute in the higher education sector, because of the growing number of doctoral degrees awarded and a more or less stagnant demand for labour, we found a similar phenomenon in the government sector. For those no longer involved in research, the private business sector seems to offer more job positions abroad than the other sectors. Therefore, the outflow of doctorate holders is certainly not limited to the higher education sector, all be it for different reasons.

A difference in the international mobility strategy of individuals can have a complementary effect at a sector level. While international experience in the higher education is considered as a decisive requirement for a tenure track position, international mobility of personnel in the business sector is seen an integral part of their business model. Firms are increasingly aware of the fact that not all countries are equally specialised in all types of scientific and technological knowledge. Knowledge

substantial share of doctorate holders without a research interest finds employment in the government sector abroad (about 25% of those working abroad). This might be an indication that there are more research-intensive jobs in the business sector than in the other two sectors. This supports our idea that doctorate holders in the other two sectors who prefer a research job must be prepared to go abroad.

becomes more specialised, resulting in a growing number of scientific and technological disciplines. Add to this the fact that research infrastructures, instruments and equipment becomes more and more capital-intensive, and one has to conclude that not all countries can be forerunners in all types of technological and scientific fields. To adapt to this new reality, businesses try to tap into these different knowledge sources by maintaining links with research groups around the globe (Crisuolo, 2005). By adopting this strategy they hope to stay in touch with the latest developments in science and technology.

Although the European Commission stimulates member states to spend 3% of their GDP on research and development, policymakers who have the ambition to turn the Belgian economy into a knowledge-based system must also take into the account the effects of labour market dynamics. Monetary and fiscal incentives must keep pace with the creation of attractive research careers for domestically trained researchers. When doctorate holders with research ambitions feel restricted in their possibilities to develop a research career in their country of birth, they will search for job offers abroad. And this

brain drain narrative is certainly not limited to flows of researchers from Europe to the US. Even between European countries there is a

fierce competition for the most talented researchers within specific fields of specialisation.

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**Further information:**

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- general information: [www.belspo.be](http://www.belspo.be)
- general online statistics: [www.innovationdata.be](http://www.innovationdata.be) or <http://www.stis.belspo.be/en/statisticsWelcome.asp>

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