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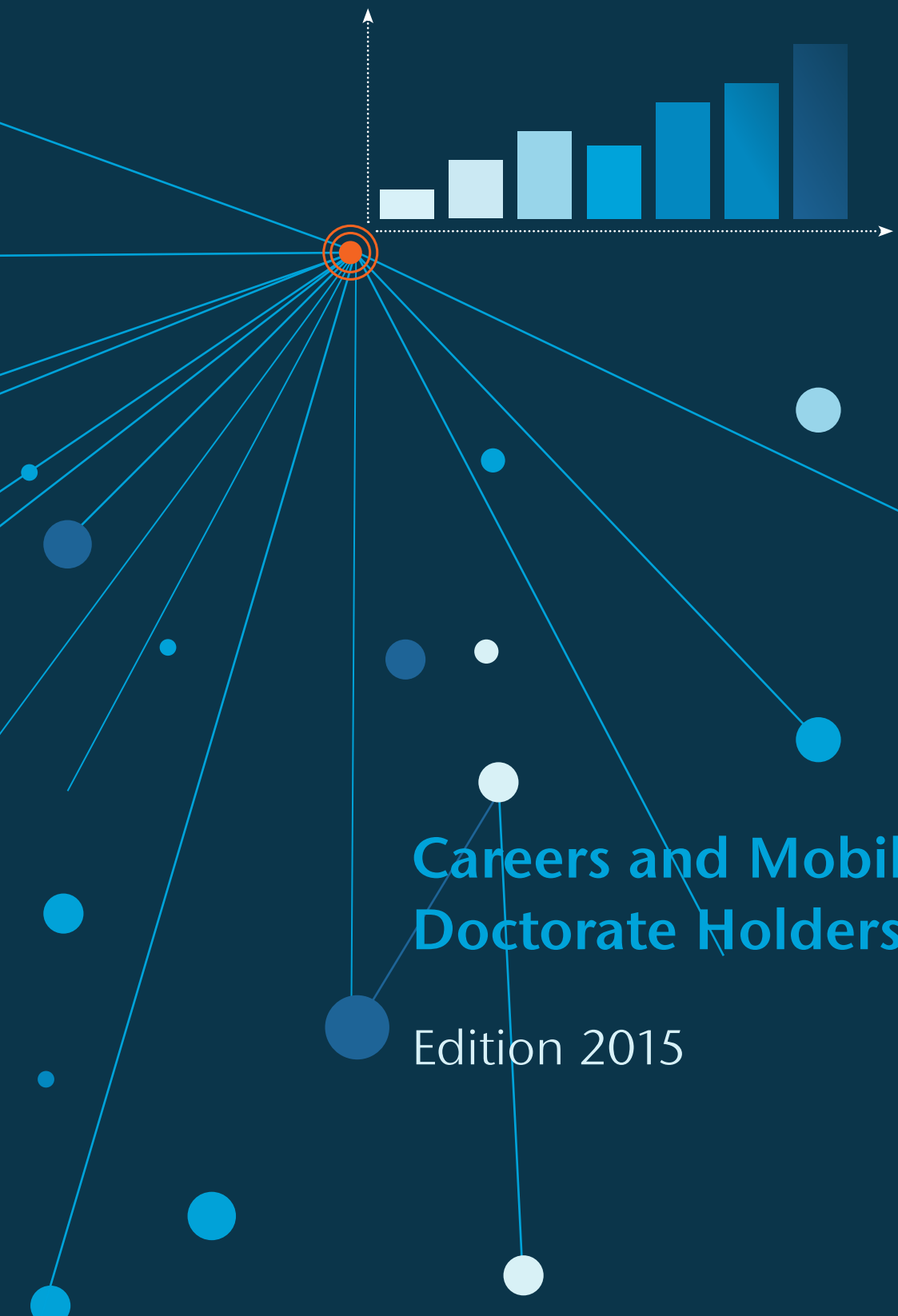

Careers and Mobility of Doctorate Holders in Greece

Edition 2015

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Preface

Despite a number of unfavorable points of the domestic Research, Development and Innovation (RDI) system, such as insufficient funding, lack of links between the academic, research and business communities, as well as the low production of technological and knowledge intensive products, to name a few[1], there are some dimensions of the national system where performance is above average. One such dimension, which has often been noted as one of the country's strengths, is its human capital, with Greece surpassing countries with (overall) better RDI systems. In terms of researchers' employment, according to the National Documentation Centre's (EKT) most recent publication on research and development expenditure and personnel (2015), Greece ranks higher than the European average[2]. In keeping with our objectives to provide a comprehensive account of the national RDI system, by this edition, we highlight one particular element of our national human capital – the doctorate holders.

Given that knowledge and its production is the 'fuel' of the economy, doctorate holders are considered to be valuable in this production process. The knowledge they generate is credited as being one of the central parameters for efficient and sustainable knowledge-based economic development[3]. Consequently, the central aim of this publication is to map the research and professional mobility of doctorate holders.

It is important to stress that the careers of doctorate holders ought not to be confined to academic and research bodies. In today's developed economies, the strong attraction of the private sector, and/or self-employment are now central to the relevant career choices[4]. Equally important, is the issue of the international mobility of doctorate holders. Although mobility is inherent to the continuous development of research skills and networking, under the current condition of fiscal and societal crisis in Greece, there is the danger that this international mobility of the highly educated will result in a permanent brain drain. A further aim of the publication, therefore, is to demonstrate the extent of this trend.

[1] http://ec.europa.eu/growth/industry/innovation/facts-figures/scoreboards/files/ius-2015en. pdf,
[2] "Research & Development Expenditure and Personnel in Greece in 2013", National Documentation Centre, 2015, http://metrics.ekt.gr/en/node/311
[3] Auriol, L. (2010). Careers of Doctorate Holders: Employment and Mobility Patterns. OECD Science, Technology and Industry Working Papers, No. 2010/4. Available from: http://dx.doi.org/10.1787/5kmh8phxvvf5-en
[4] http://www.nature.com/naturejobs/science/articles/10.1038/nj7589-243a

From December 2014 EKT participated in the most recent OECD global survey, the 'International Survey on Careers of Doctorate Holders – CDH'. The survey's year of reference was 2013. EKT was responsible for successfully carrying it out, as the body mandated for producing the official national statistics for Research, Development, Technology and Innovation and for keeping the National Archive of PhD Theses. Starting with this publication, EKT aspires in launching regular publications of similar nature.

The first chapter presents data on the basic characteristics of doctorate holders (age, countries awarding their degrees, scientific field and sources of funding for studies). The second chapter analyses the employment status of doctorate holders (employed / unemployed / inactive), with regard to gender, scientific field, year of graduation, employment sectors, occupation and research activity. The third chapter lists data on professional and international mobility of doctorate holders, the countries and reasons for mobility, as well as intended mobility in 2015. The fourth chapter includes the main methodological notes.

Lastly, on behalf of EKT, I would especially like to thank all the doctorate holders who participated in the survey, since it was the first time that such a survey was conducted in Greece.

Dr Evi Sachini

Director EKT

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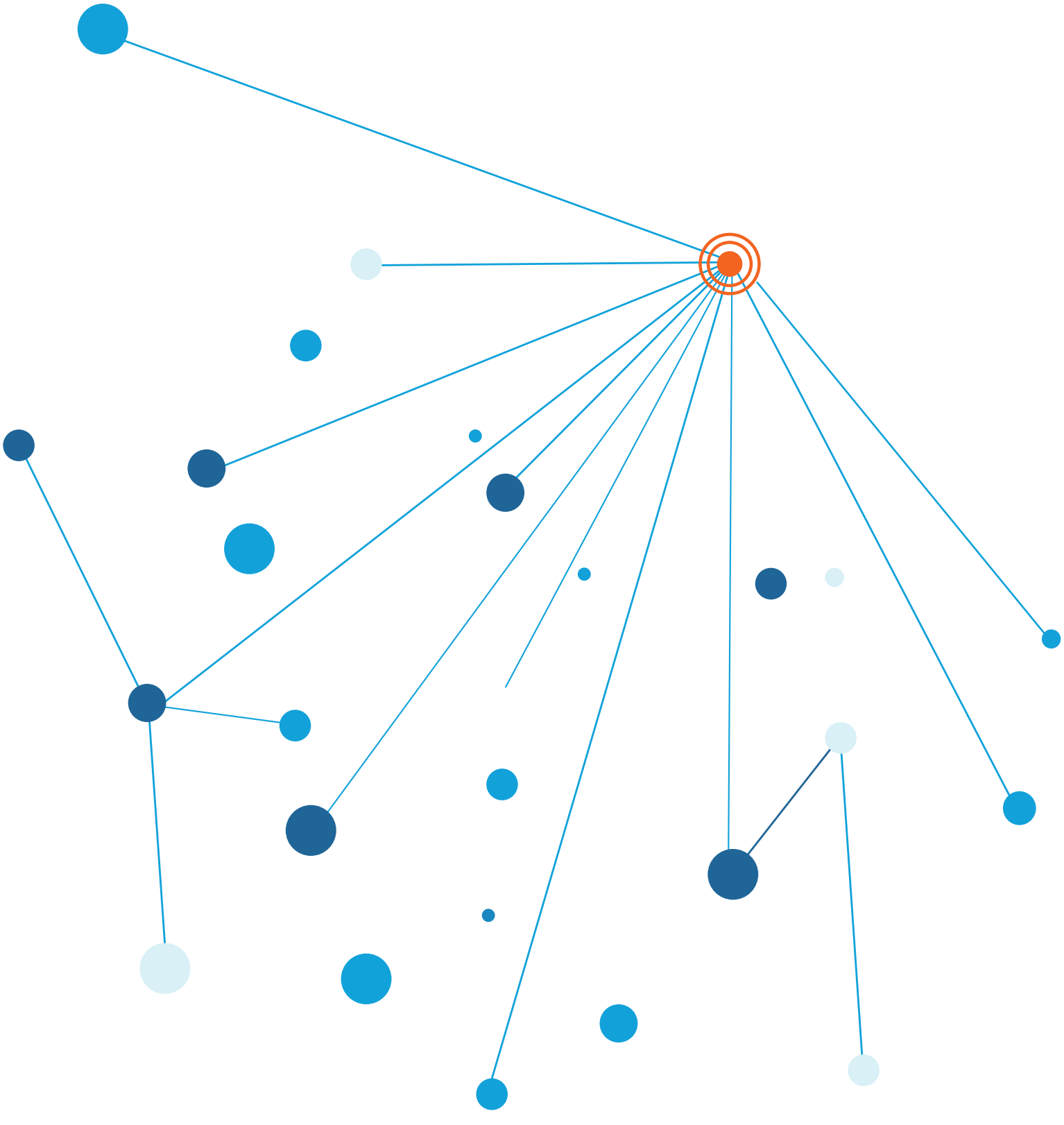
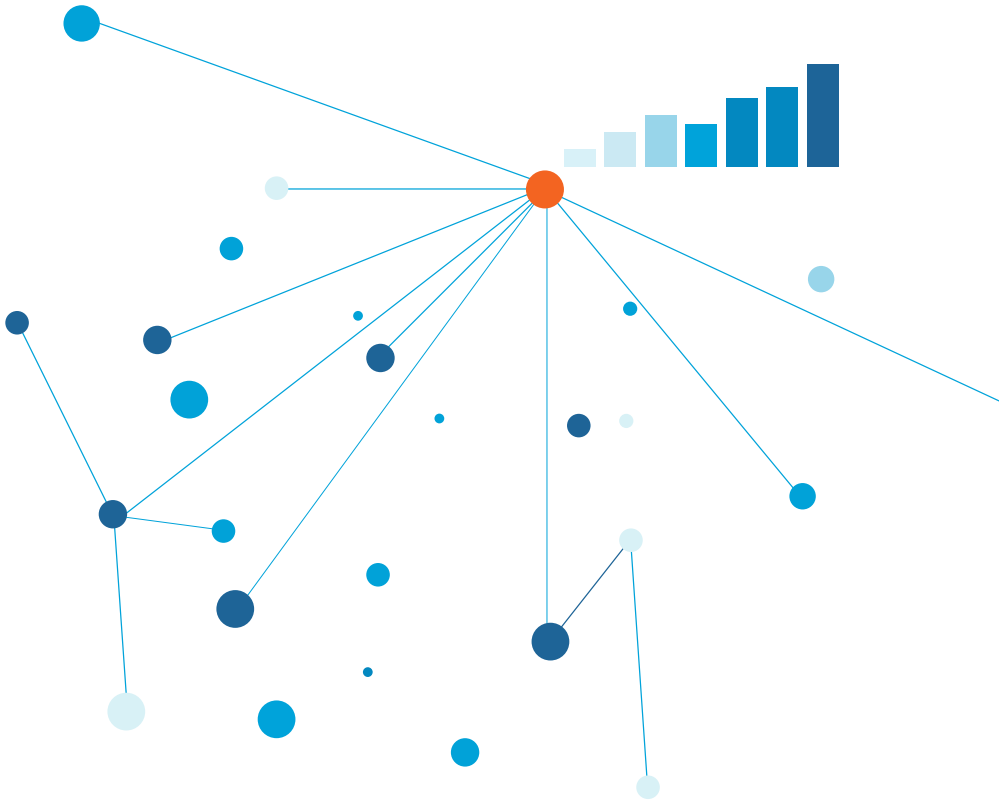




Chapter 1

The profile of doctorate holders

The 'International Survey on Careers of Doctorate Holders – CDH' is the official statistical survey which collects data on doctorate holders and is co-ordinated by the OECD. The aim of the survey is to document and analyse the career path and international mobility of doctorate holders.

The CDH survey was conducted for the first time in Greece by the National Documentation Centre, during the period December 2014-January 2015, with 2013 as the year of reference.

The target population of the CDH survey for 2013 was doctorate holders resident in Greece on December 1st 2013 (permanent resident or not), aged under 70 and having gained their doctorate during the period 1990-2013, regardless of citizenship and employment status (employed or unemployed).

In this first chapter, the results of the survey which refer to the basic characteristics of the doctorates are presented. They include the total number, the graduation age of doctorate holders, the country of doctoral award, the scientific fields of the doctoral theses and sources of funding for the doctoral studies.

The results are presented analytically in the tables and figures which follow later in the chapter and summarised here below as follows:

- The total number of doctorate holders meeting the criteria of the CDH survey for 2013 in Greece was 35,457. This figure meant Greece was 11th out of the 24 countries participating in the CDH survey.
- There were 13,793 women doctorate holders, i.e. 38.9% of the total number. The highest percentage of women doctorate holders (45.1%) was in the ‘under 35’

age group with this number decreasing with the increase in age group, indicating the greater participation of younger women.

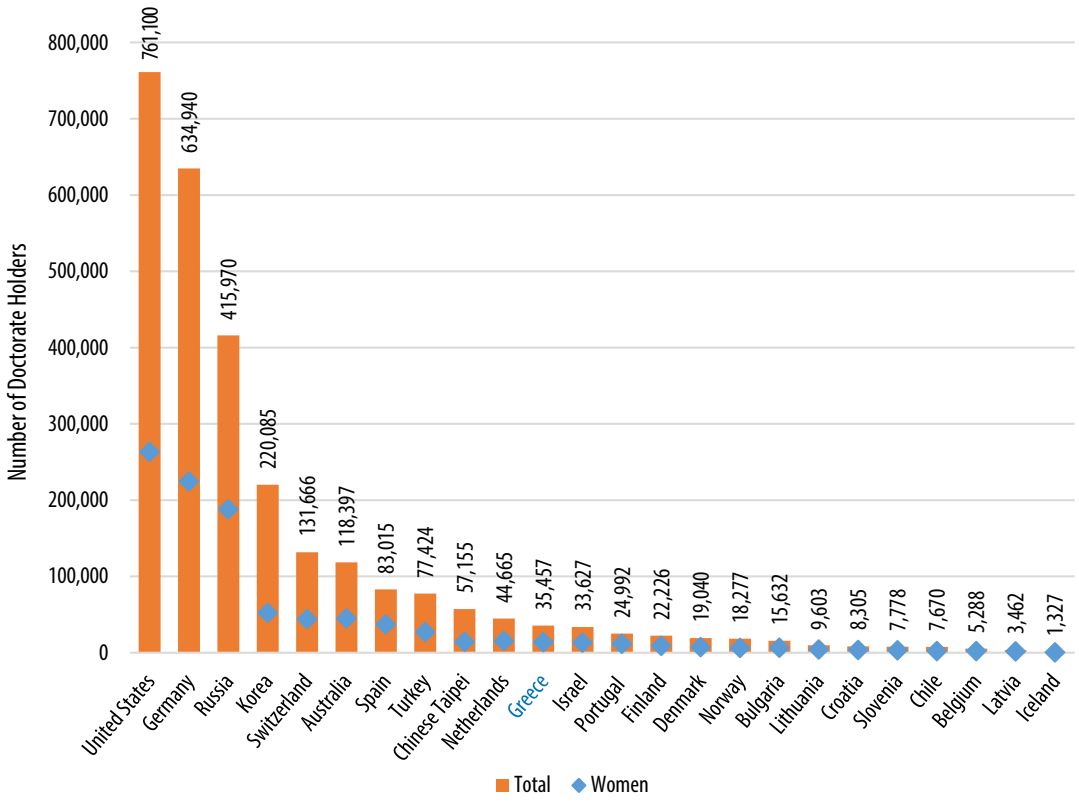
- The majority of doctorate holders, 86.2%, received their doctoral award from Greek universities. 11.2% graduated from other countries in the European Union, the leading countries being the United Kingdom (UK), France and Germany, while 2.4% were from North American countries, mainly the United States of America (USA).
- The most popular scientific fields were 'Medical & Health Sciences' (26.7%) and 'Natural Sciences' (21.9%).
- The main sources of funding for doctoral studies were: 'personal savings and support from spouse, partner or family' (23.6%), 'fellowship or scholarship within Greece' (23.1%), 'other occupation' (21.5%) and 'teaching and/or research assistantship' (17.4%).
- The average age of those gaining a doctorate was 38 and, more precisely, 37 for men and 38 for women. The highest average for the age of graduation was recorded for the scientific fields 'Medical & Health Sciences', the 'Humanities' and 'Social Sciences'.

Number of doctorate holders

In Greece, the total number of doctorate holders meeting the criteria of the International Survey on Careers of Doctorate Holders – CDH, with 2013 as year of reference, was 35,457, of whom 13,793 were women.

Figure 1.1 presents the doctorate holders from countries participating in the CDH survey. Greece[5] was 11th out of the 24 countries. According to OECD data, the number of doctorate holders in the USA and Germany is constantly increasing, putting them in the top places. It is worth noting that in the case of Germany, the number of doctorate holders (total and women) for 2013 was twice that of the 2009 survey.

Figure 1.1. Number of doctorate holders, in Greece and the other survey countries[6]



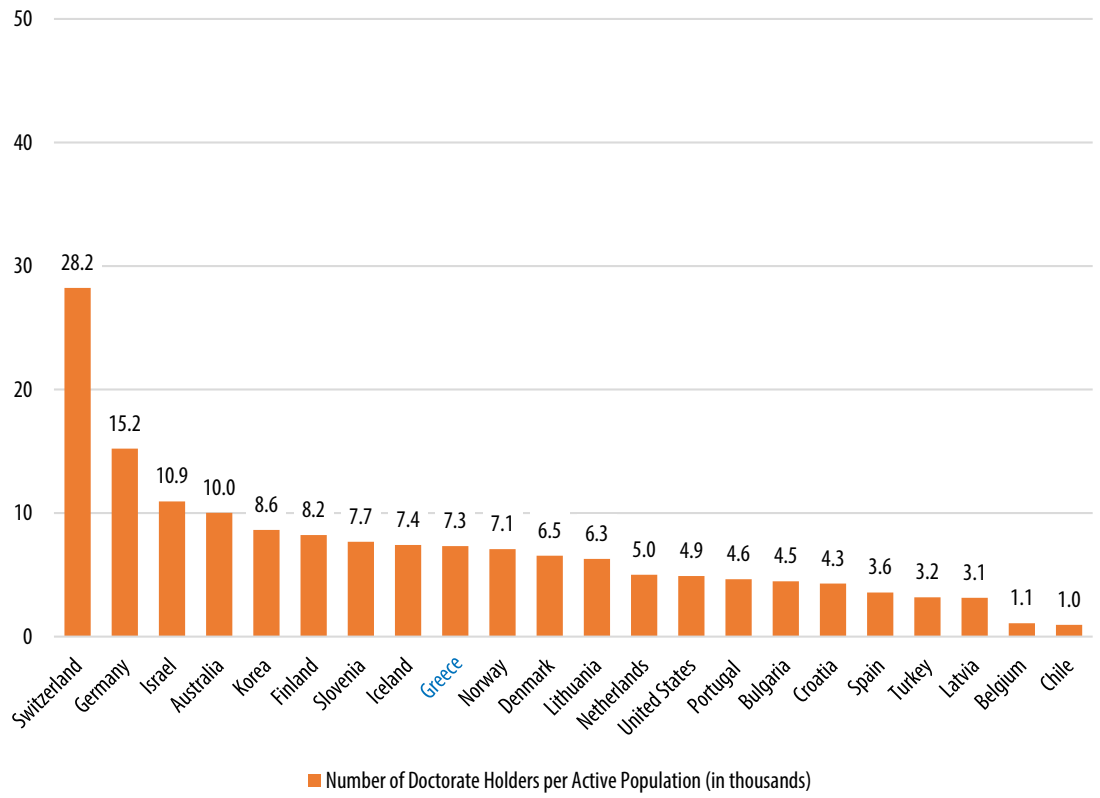
[5] The CDH target population for the reference year 2013 comprised doctorate holders, who satisfied the criteria of the CDH survey as defined in the methodological guidelines described in chapter 4.

[6] Data for the other survey countries is provided by the OECD Directorate for Science, Technology and Industry of the Economic Analysis and Statistics Division. The survey reference year per country is the following:
2013: Greece, Switzerland, Germany, Netherlands, United States
2012: Denmark, Portugal, Slovenia, Taiwan, Korea, Russia
2011: Chile, Australia
2009: Iceland, Norway, Turkey, Israel, Bulgaria, Croatia, Lithuania, Spain, Latvia
2008: Finland

Figure 1.2 presents the number of doctorate holders per thousand of the economically active population in Greece and the other survey countries[7].

Greece, with 7.3 doctorates per thousand economically active population, was placed 9th out of 22 countries. Switzerland was in first place with 28.2 doctorates per thousand economically active population and was followed by Germany (15.2), Israel (10.9) and Australia (10.0).

Figure 1.2. Number of doctorate holders per thousand economically active population, in Greece and the other survey countries[8]



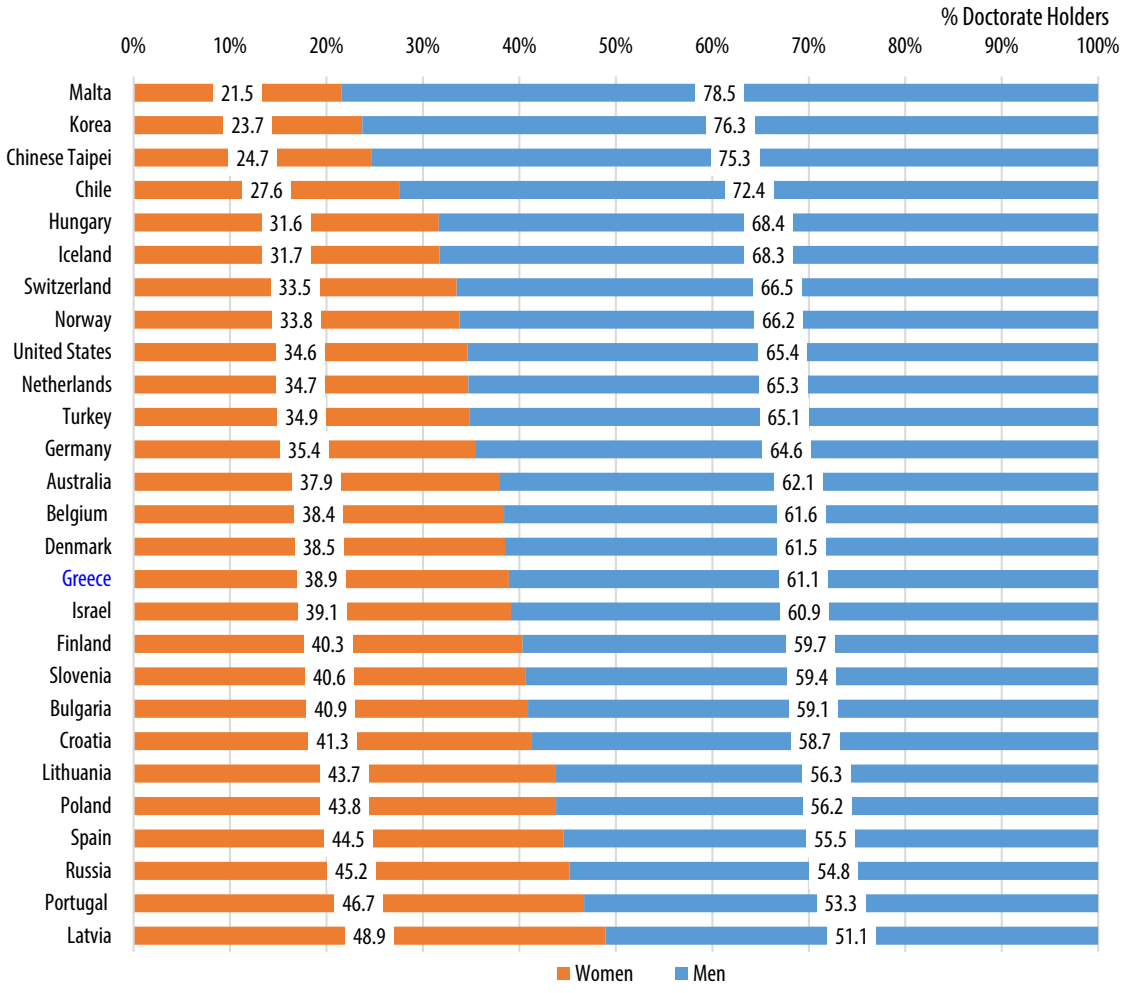
[7] Data for the economically active population are provided by the databases of the OECD Labour Force Statistics and Eurostat: Labour Force Survey. Data for Russia and Taiwan is not provided. The economically active population is the fraction of the population that is either employed or actively seeking employment.

[8] Data for the other survey countries is provided by the OECD Directorate for Science, Technology and Industry of the Economic Analysis and Statistics Division. The survey reference year per country is the following:
2013: Greece, Switzerland, Germany, Netherlands
2012: Denmark, Portugal, Slovenia
2009: Bulgaria, Iceland, Spain, Norway, Turkey, Croatia, Lithuania, Latvia
2008: Finland

The participation of women in doctoral studies is lower than that of men in all countries in the CDH survey (Figure 1.3).

The percentage of women doctorate holders in Greece stands at 38.9%, the highest percentage is in Latvia (48.9%) and the lowest (21.5%) in Malta. The same trend was evident in the percent of women personnel involved in Research and Development (R&D) in the EU28[9], with Latvia in second place (53.7%) and Malta in 26th place (28.6%).

Figure 1.3. Doctorate holders (%) by gender, in Greece and the other survey countries[10]



[9] Sachini E., Malliou N., Samara M., (2014), Women Participation in Research and Development in Greece in 2011, National Documentation Centre

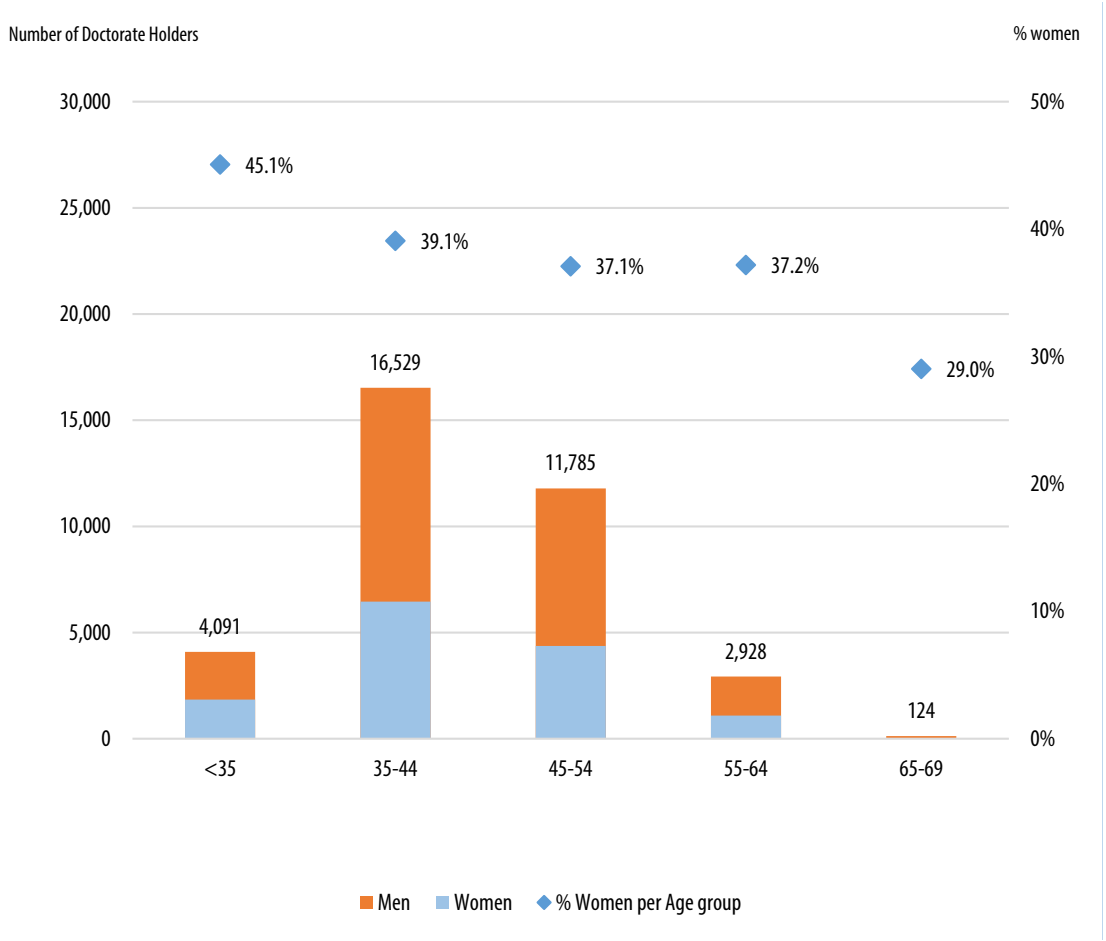
[10] Data for the other survey countries is provided by the OECD Directorate for Science, Technology and Industry of the Economic Analysis and Statistics Division. The survey reference year per country is the following:
2013: Greece, Switzerland, Germany, Netherlands, United States
2012:Belgium, Denmark, Portugal, Slovenia, Taiwan, Korea, Russia
2011: Australia, Chile
2009: Malta, Hungary, Iceland, Norway, Turkey, Israel, Bulgaria, Croatia, Lithuania, Spain, Latvia
2008: Finland, Poland

Age of doctorate holders

The highest percentage of doctorate holders meeting the survey criteria is found in the '35-54' age group (Figure 1.4).

The highest percentage of women doctorate holders (45.1%) belonged to the 'under 35' age group. This percentage decreases with the increase in age group, indicating the greater interest and participation of younger women in doctoral studies.

Figure 1.4. Doctorate holders by gender and age group

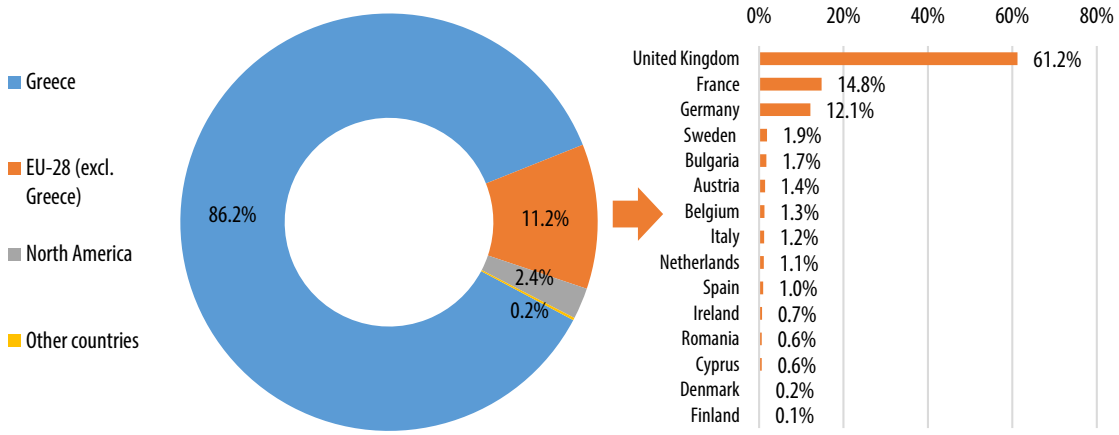


Country of doctoral award

The vast majority of doctorate holders, 86.2%, obtained their degrees from Greek universities (Figure 1.5). 11.2% graduated from other countries within the European Union, while 2.4% graduated from North American countries, mainly the USA.

With regard to the EU28, the highest percentage (61.2%) graduated in the UK, followed by France (14.8%) and Germany (12.1%).

Figure 1.5. Doctorate holders (%) by region and country of doctoral award

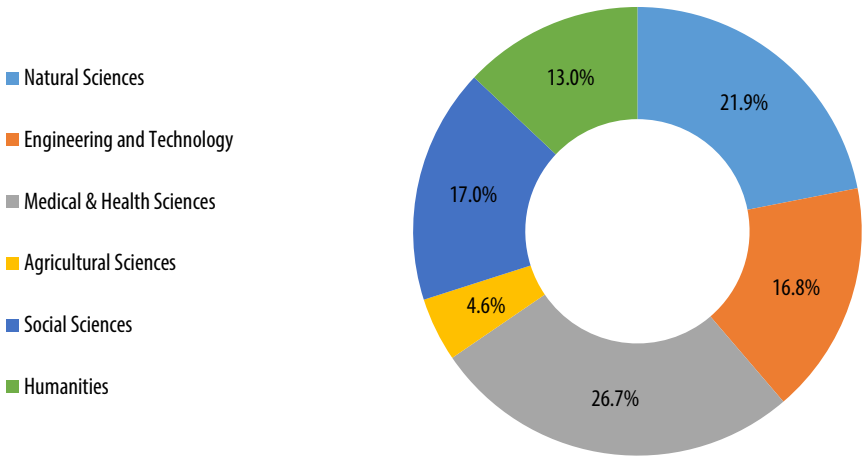


Scientific fields of doctoral degrees

Figures 1.6 and 1.7 present the distribution of doctoral degrees in the six scientific fields[11] for Greece and the other countries in the survey.

The most popular scientific fields were 'Medical & Health Sciences' (27.6%) and 'Natural Sciences' (21.9%). The distribution is similar to that observed in the National Archive of PhD Theses maintained by EKT[12].

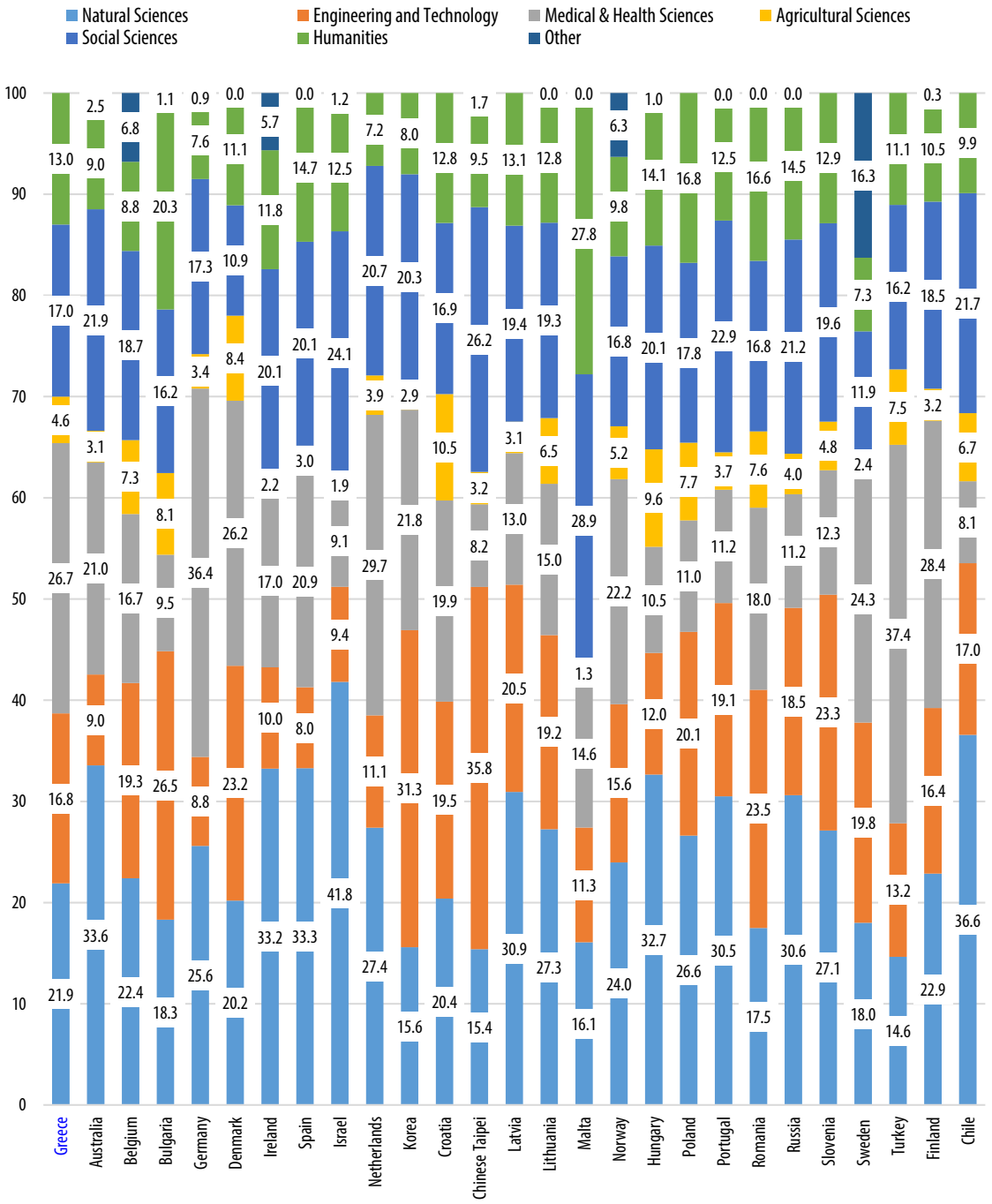
Figure 1.6. Doctoral degrees (%) by scientific field



[11] The distribution in 6 scientific fields is based on the Frascati Manual (Revised Fields of Science, 2007). The sub-categories of the scientific fields are presented in Chapter 4-Methodology.

[12] http://www.didaktorika.gr/eadd/browse?type=subject

Figure 1.7. Doctoral degrees (%) by scientific field, in Greece and the other survey countries[13]

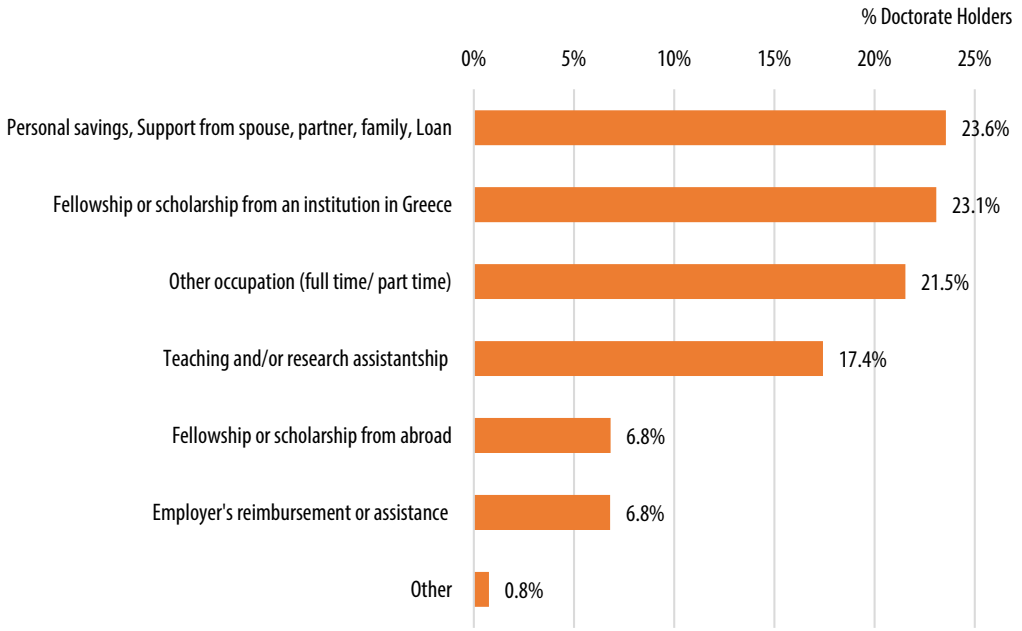


[13] Data for the other survey countries is provided by the OECD Directorate for Science, Technology and Industry of the Economic Analysis and Statistics Division. The reference year of each country is the following:
2013: Greece, Germany, Netherlands
2012: Belgium, Denmark, Taiwan, Korea, Portugal, Russia, Slovenia
2011: Chile, Australia
2009: Bulgaria, Iceland, Spain, Israel, Croatia, Lithuania, Latvia, Malta, Norway, Hungary, Sweden, Turkey
2008: Finland, Romania, Poland

Sources of funding of doctoral studies

When asked about funding of their doctoral studies, the doctoral holders replied they depended on 'personal savings and financial support from spouse, partner or family' (23.6%), 'fellowship or scholarship within Greece' (21.3%), 'other occupation (full/part time)' (21.5%) and 'teaching and/or research assistantship' (17.4%) (Figure 1.8).

Figure 1.8. Doctorate holders (%) by primary source of funding during completion of doctorate

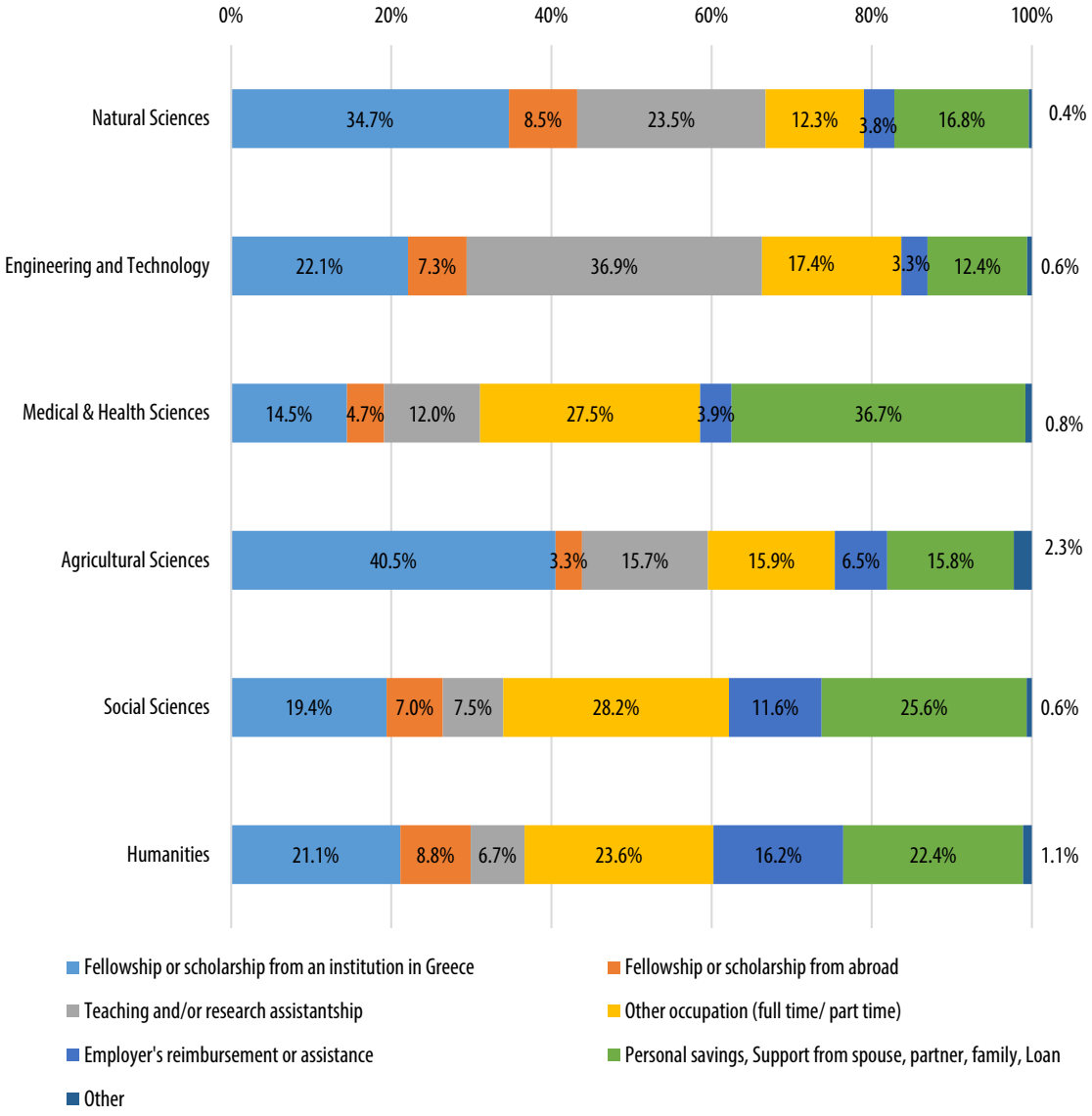


The main source of funding varied across scientific fields (Figure 1.9).

More analytically, in the field of 'Natural Sciences' and 'Agricultural Sciences', the main source of funding was 'fellowship or scholarship within Greece'. In the field of 'Medical & Health Sciences' the main source was 'personal savings and financial support from spouse, partner or family'.

In the case of 'Engineering & Technology' graduates depended on 'teaching and/or research assistantship', as part of European projects, for example, while in the 'Social Sciences' and the 'Humanities' the main source of funding was from 'other occupation, full or part- time'.

Figure 1.9. Doctorate holders (%) by primary source of funding during completion of doctorate, across scientific fields of doctoral degree



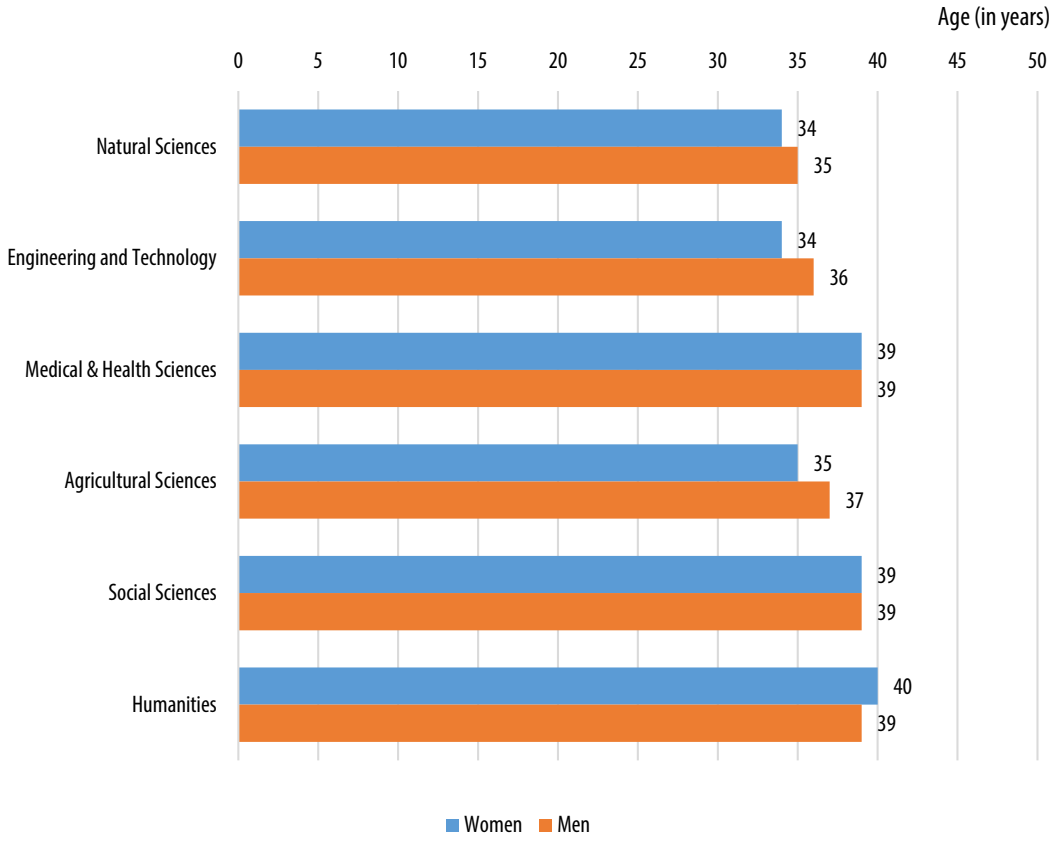
Graduation age of doctorate holders

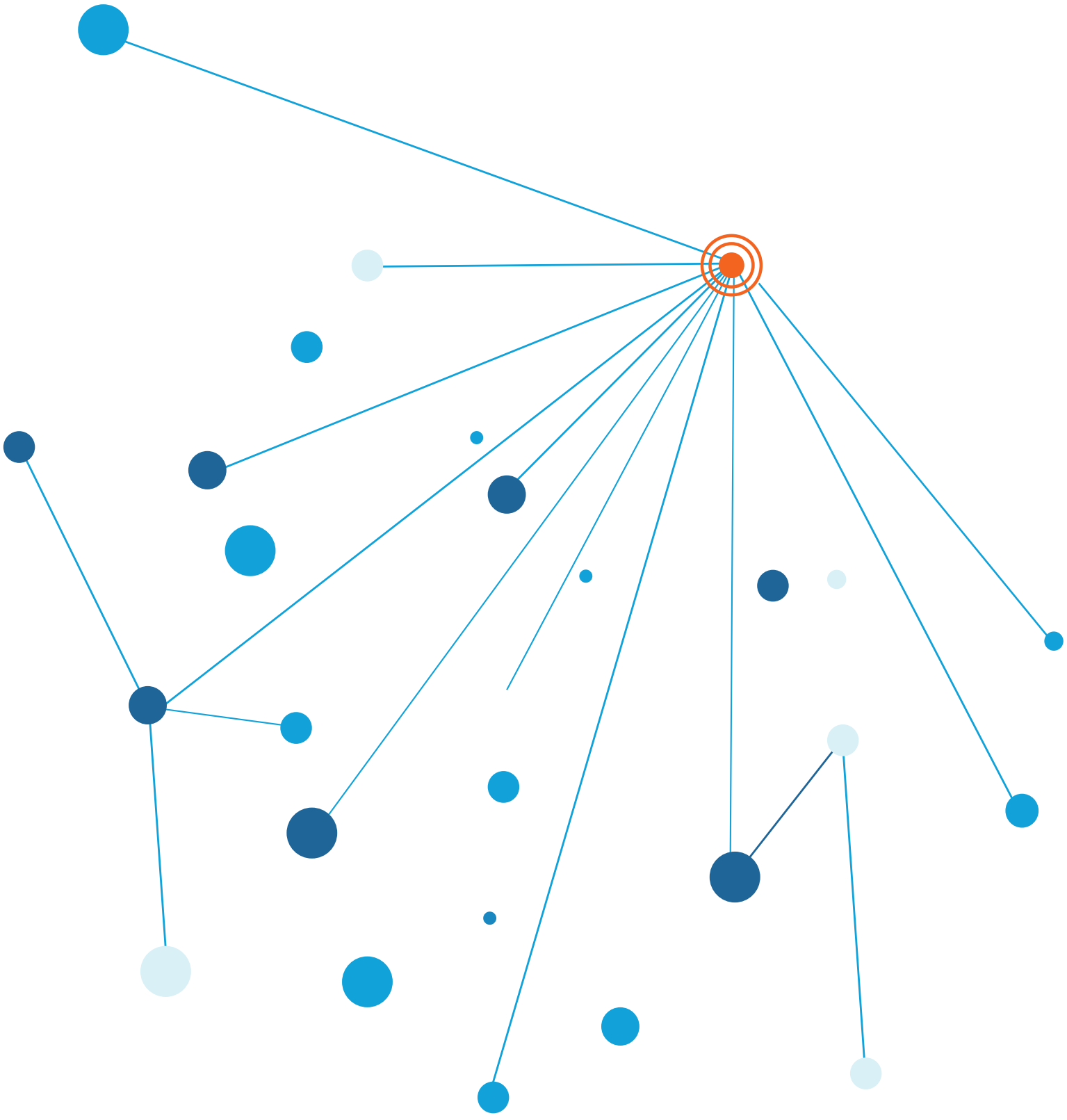
The age a degree is obtained is considered to be an important parameter of doctoral studies and was recorded in the CDH survey for doctorate holders having received their degree during the period 2010-2013. The average age recorded in the CDH survey for Greece was 38.

This average age varied depending on gender and scientific field, as can be seen in Figure 1.10. In the case of men, the average age was 37, while for women, it was 38. The highest averages were in the 'Humanities', 'Medical & Health Sciences' and the 'Social Sciences'. For men, the highest average age in all the above fields was 39.

For women, it was 40 in the 'Humanities'. According to the corresponding data for the other countries in the CDH survey, the age at which doctorates were obtained was younger, beginning from 31 years of age (Switzerland).

Figure 1.10. Age (median) at graduation of recent doctorate holders (graduates during the years 2010-2013) by sex and scientific field of doctoral degree





Chapter 2

Careers of doctorate holders

This chapter focuses on the professional situation of doctorate holders, addressing the question what do researchers do after obtaining their doctorate degree.

The first area to be examined is the employment status of the doctorate holders (employed / unemployed / inactive), for Greece and the other survey countries, as well as with regard to parameters, such as gender, scientific field and year of graduation.

In the case of employed doctorate holders, the analysis covers the type of employment (employees / self-employed), the profession engaged in, the relation to the scientific field of doctorates and the sectors of employment. Also noted is the level of satisfaction with various aspects of employment. Finally, data regarding research activity in their professional career is presented.

The results are presented analytically in the tables and figures which follow later in the chapter and summarised here below as follows:

- In 2013, the vast majority of doctorate holders, 94.8%, were employed (employees or self-employed). In comparison with the other countries in the CDH survey, Greece had the highest percentage of unemployed doctorate holders (3.5%).
- The percentage of those unemployed was lower for men than women: 3% and 4.3% respectively.
- The highest percentage of those unemployed were in the 'Humanities' (5.7%), 'Agricultural Sciences' (5.6%) and 'Natural Sciences' (4.3%).
- With regard to age, the highest percentage of unemployment (12.2%) was recorded for those under 35. The closer to the time of graduation, the higher the number of those unemployed. This rate reached its peak for those graduated in 2013 (10%) and 2014 (13.4%).

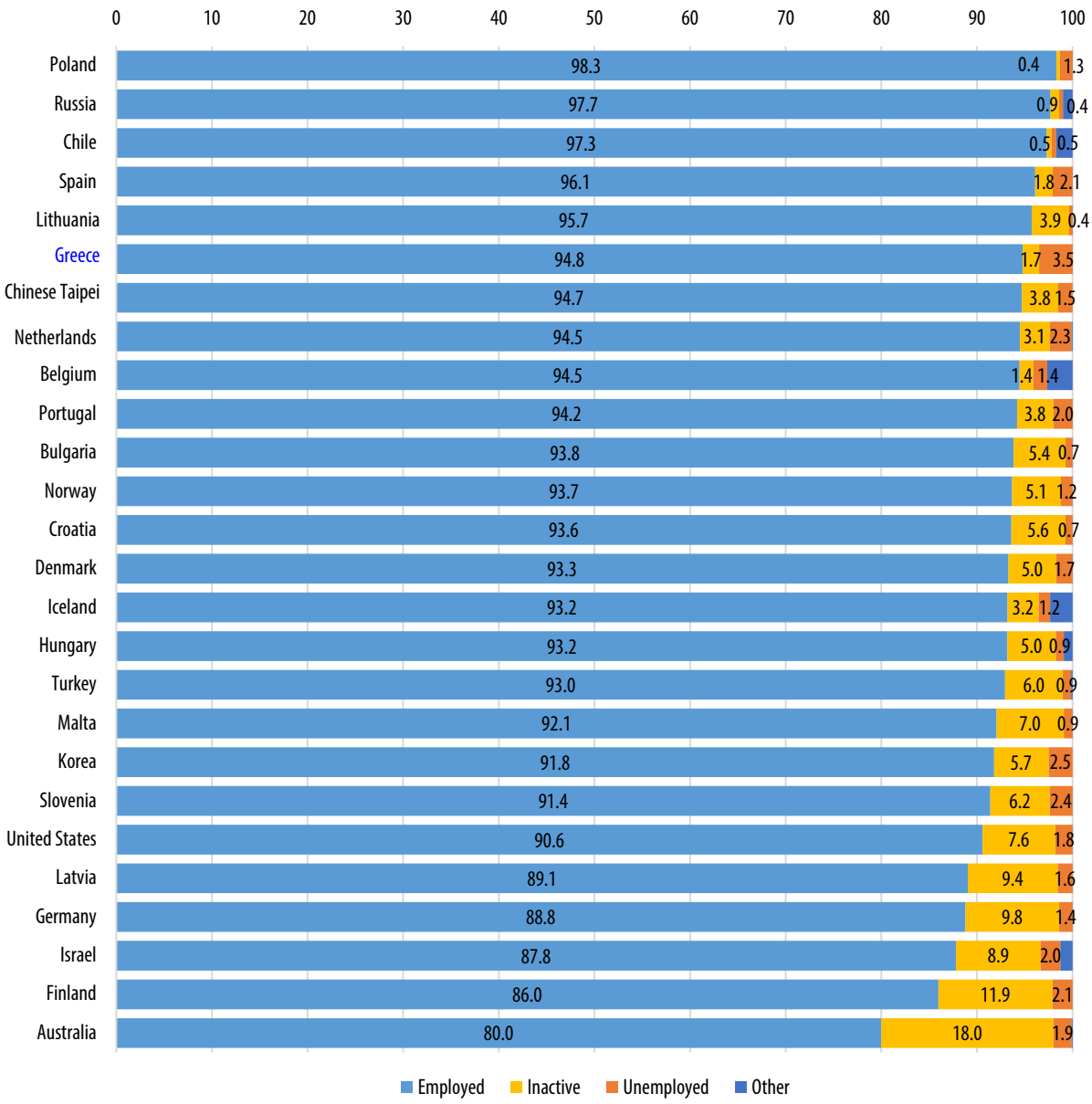
Employed doctorate holders:

- Employed doctorate holders were mostly full-time employees (84.1%), 12.0% were self-employed and 3.8% were part-time employees.
- The highest percentage of employees (89.9%) was recorded for the 'Humanities' and the highest percentage of self-employed (18.0%) for 'Engineering and Technology'.
- The highest percentage for the self-employed (28.6%) and for part-time employed (10.0%) was recorded amongst the younger doctorate holders. This percentage decreased as the age groups increased and moved into full-time positions. The exception was the high percentage (22.8%) of those self-employed in the '65-69' age group.
- The main profession, with 45.6% of the employed doctorate holders, was teaching. This was followed by professions in the 'sciences and engineering' with 20.6% and in 'health' with 17.1%.
- As far as the sector of employment is concerned, the majority of doctorate holders (57.0%) was employed in the higher education sector, 20.6% in the government sector and 8.7% in the business sector.
- The profession is linked to the scientific field of the doctorate holder: for example, the majority (58.3%) of graduates in 'Medical & Health Sciences' were professionals in health. 58.7% of employed doctorate holders stated that their work was related with the subject of their doctoral degrees.
- The majority of those employed (77.2%), stated they were very satisfied (17.1%) or somewhat satisfied (60.1%) with their principal job.
- The main factors for satisfaction were 'contribution to society', 'job location' and 'level of responsibility'. In contrast, financial remuneration, in the form of salary and benefits, provided the least satisfaction.
- Regarding the continuation of research in their careers, 81.1% of employed doctorate holders stated that they were involved in research activities. This was most common in higher education sector where the figure for both men and women was over 90%. In contrast, the number of those continuing research in the business sector was far lower, 50.3% for men and 41.8% for women.

Employment status

The vast majority of doctorate holders in Greece (94.8%) were employed (employees or self-employed) during the year of reference 2013. Nonetheless, in comparison with the other countries in the CDH survey, Greece had the highest number of unemployed doctorate holders (3.5%) (Figure 2.1).

Figure 2.1. Doctorate holders (%) by employment status,[14] in Greece and the other survey countries[15]

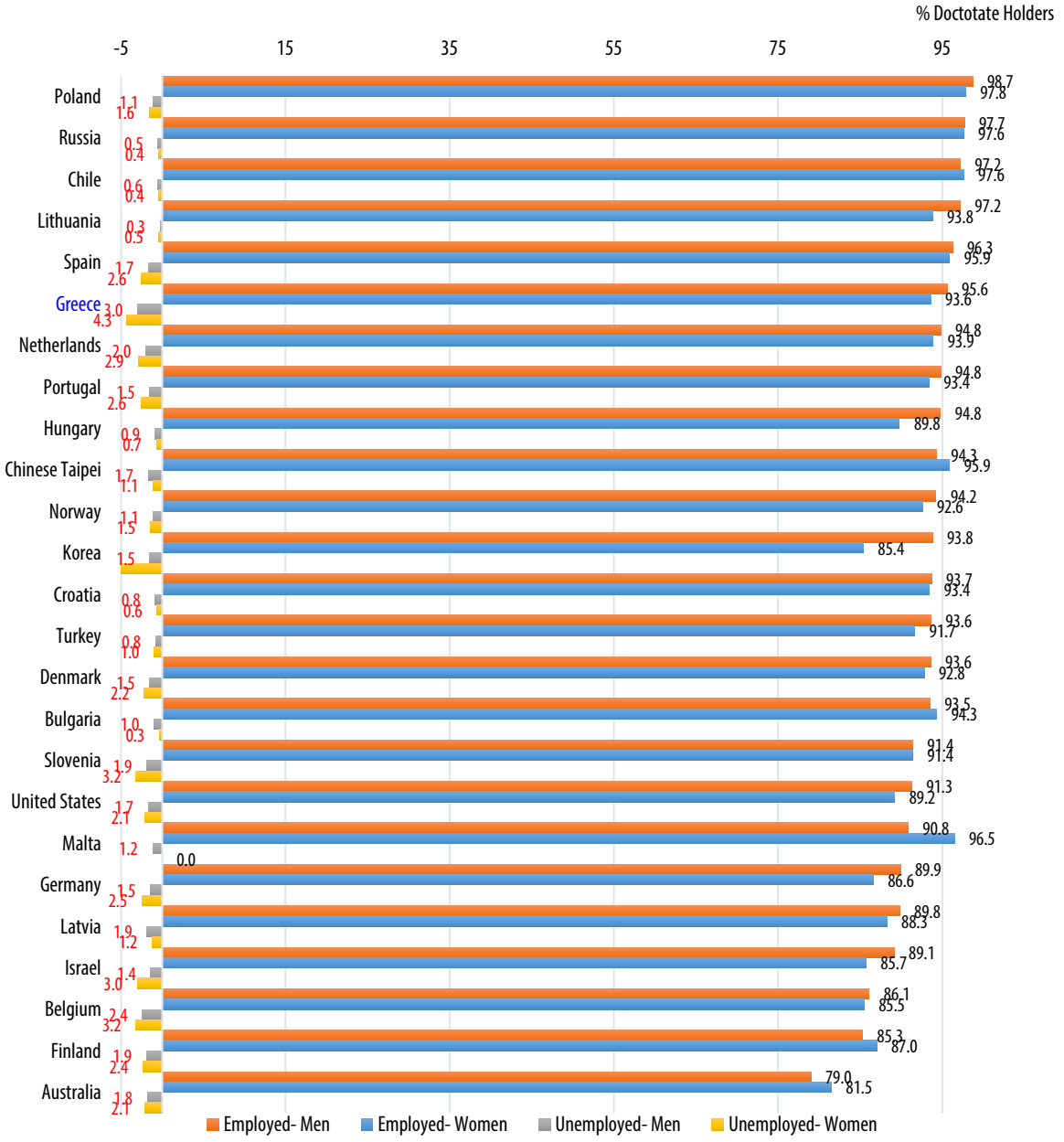


[14] Analysis of the employment status follows the International Labour Organisation categories and is provided in Chapter 4 – Methodology.

[15] Data for the other survey countries is provided by the OECD Directorate for Science, Technology and Industry of the Economic Analysis and Statistics Division. The reference year of each country is the following:
2013: Greece, Germany, Netherlands, United States
2012: Taiwan, Korea, Russia, Belgium, Portugal, Slovenia, Denmark
2011: Chile, Australia
2009: Iceland, Spain, Latvia, Lithuania, Israel, Bulgaria, Croatia, Norway, Hungary, Turkey, Malta
2008: Finland, Poland

The percentage of employed doctorate holders was larger for men than women for all survey countries – except for Taiwan, Bulgaria, Malta and Finland (Figure 2.2).

Figure 2.2. Men and women doctorate holders (%) by employment status (employed and unemployed), in Greece and the other survey countries[16]



[16] Data for the other survey countries is provided by the OECD Directorate for Science, Technology and Industry of the Economic Analysis and Statistics Division. The reference year of each country is the following:
2013: Greece, Germany, Netherlands, United States
2012: Taiwan, Korea, Russia, Belgium, Portugal, Slovenia, Denmark
2011: Chile, Australia
2009: Spain, Latvia, Lithuania, Israel, Bulgaria, Croatia, Norway, Hungary, Turkey, Malta
2008: Finland

In Greece, the percentage of employed men was 95.6% and of employed women was 93.6% while that of the unemployed was 3.0% for men and 4.3% for women.

Regarding the employment status of doctorate holders in Greece for the six scientific fields (Figure 2.3), the highest percentages of unemployment were in the 'Humanities' (5.7%), 'Agricultural Sciences' (5.6%) and 'Natural Sciences' (4.3%).

The largest percentage of inactive doctorate holders was in the 'Humanities' (3.0%) and 'Natural Sciences' (2.4%).

Figure 2.3. Doctorate holders (%) by employment status (employed, unemployed, inactive), across scientific fields of doctoral degree

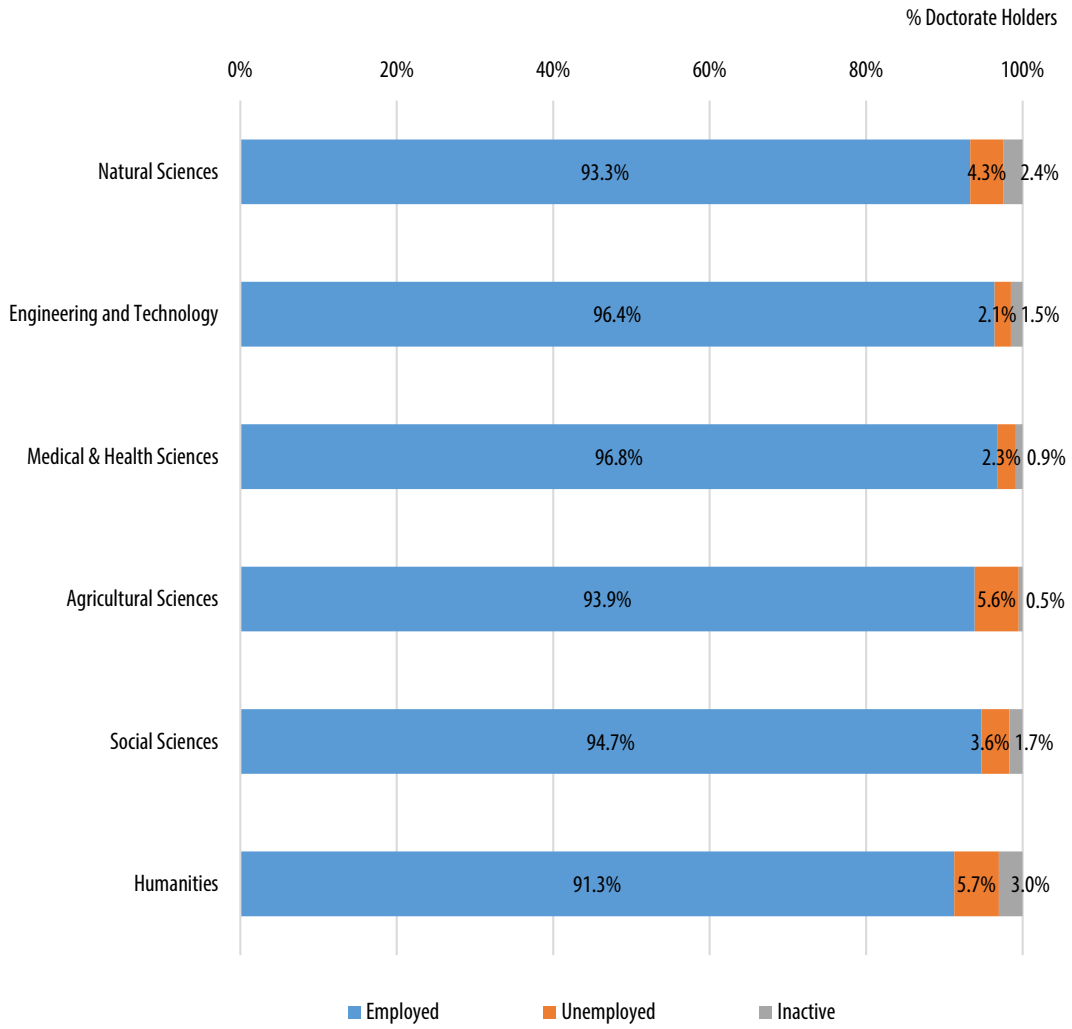


Table 2.1 presents the percent of unemployed doctorate holders in Greece and the other CDH survey countries by scientific field. In most of the countries 'Humanities' rank higher than the other scientific fields.

Table 2.1. Unemployed doctorate holders (%) by scientific field of doctoral degree, in Greece and the other survey countries

	Reference year	Natural Sciences	Engineering and Technology	Medical and Health Sciences	Agricultural Sciences	Social Sciences	Humanities	Unknown
Greece	2013	4.3	2.1	2.3	5.6	3.6	5.7	..
Australia	2011	2.3	2.4	1.0	2.7	1.8	2.1	2.7
Belgium	2012	3.5	1.0	1.8	3.6	3.6	4.5	1.1
Bulgaria	2009	0.8	0.6	1.1	0.0	0.0	1.5	..
Denmark	2012	2.0	1.5	1.0	2.9	1.3	3.0	..
Spain	2009	2.8	1.5	1.2	4.6	1.4	2.4	..
Israel	2009	2.2	..	2.4	9.9	1.0	3.7	..
Netherlands	2103	3.1	2.4	1.6	…	2.0	3.3	..
Croatia	2009	0.4	0.0	1.5	1.0	1.1	0.5	..
Korea	2012	1.9	1.2	1.8	2.6	4.7	4.8	…
Latvia	2009	1.8	0.7	1.3	2.8	1.5	2.4	..
Lithuania	2009	0.2	0.3	0.6	0.0	0.3	0.7	..
Malta	2009	1.4	1.9	1.6	0.0	0.9	0.0	..
Norway	2009	1.0	1.1	1.0	1.2	0.9	2.2	2.9
Hungary	2009	0.5	0.9	1.1	0.0	0.0	2.8	5.6
Poland	2008	2.1	0.8	0.7	1.7	0.4	1.8	..
Portugal	2012	2.5	1.3	1.7	0.7	1.5	3.5	..
Russia	2012	0.0	0.5	0.0	1.6	0.6	1.0	
Turkey	2009	0.7	0.8	0.8	1.7	1.2	0.2	..
Finland	2008	3.1	1.4	0.8	3.4	2.3	3.6	8.8
Chile	2011	0.5	0.4	0.0	2.6	0.4	0.0	
Taiwan	2012	2.5	1.2	1.1	4.9	1.1	1.2	3.2
United States	2013	2.0	1.7	1.8	1.3	1.5	1.6	..

The highest percentage of unemployed doctorate holders (12.2%) was recorded for those under 35 (Figure 2.4).

Figure 2.4. Doctorate holders (%) by employment status (employed, unemployed, inactive), across age groups

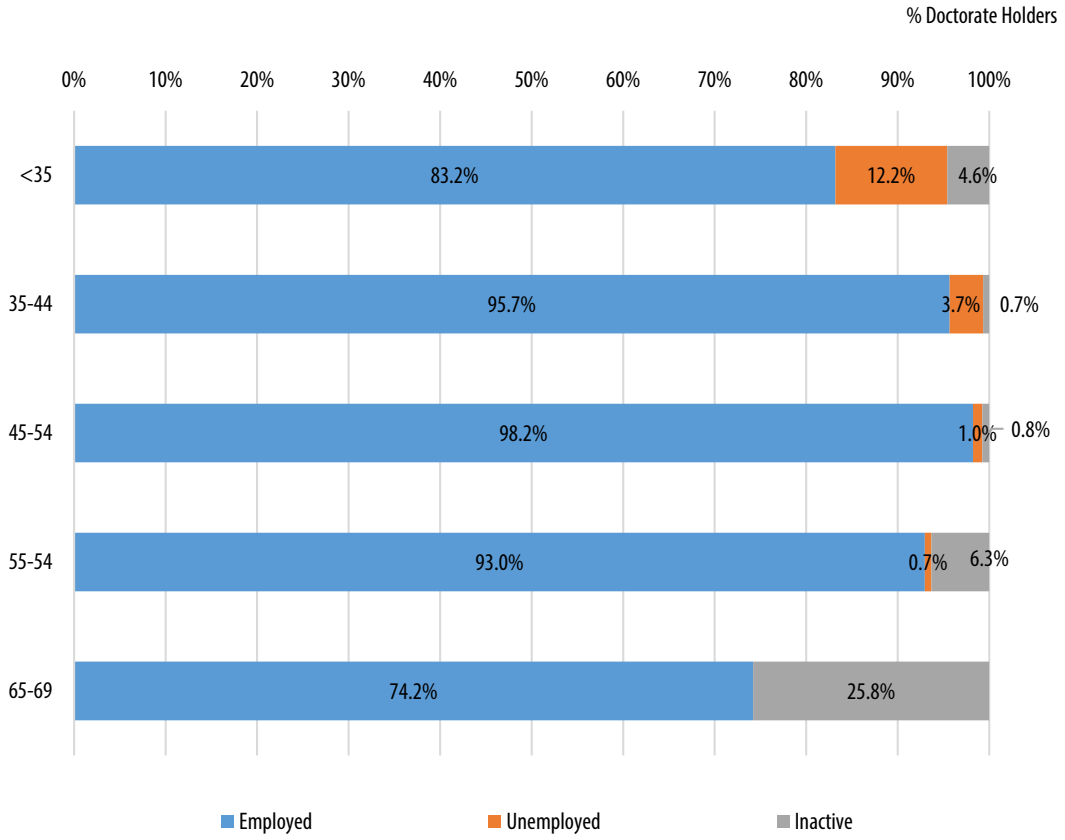
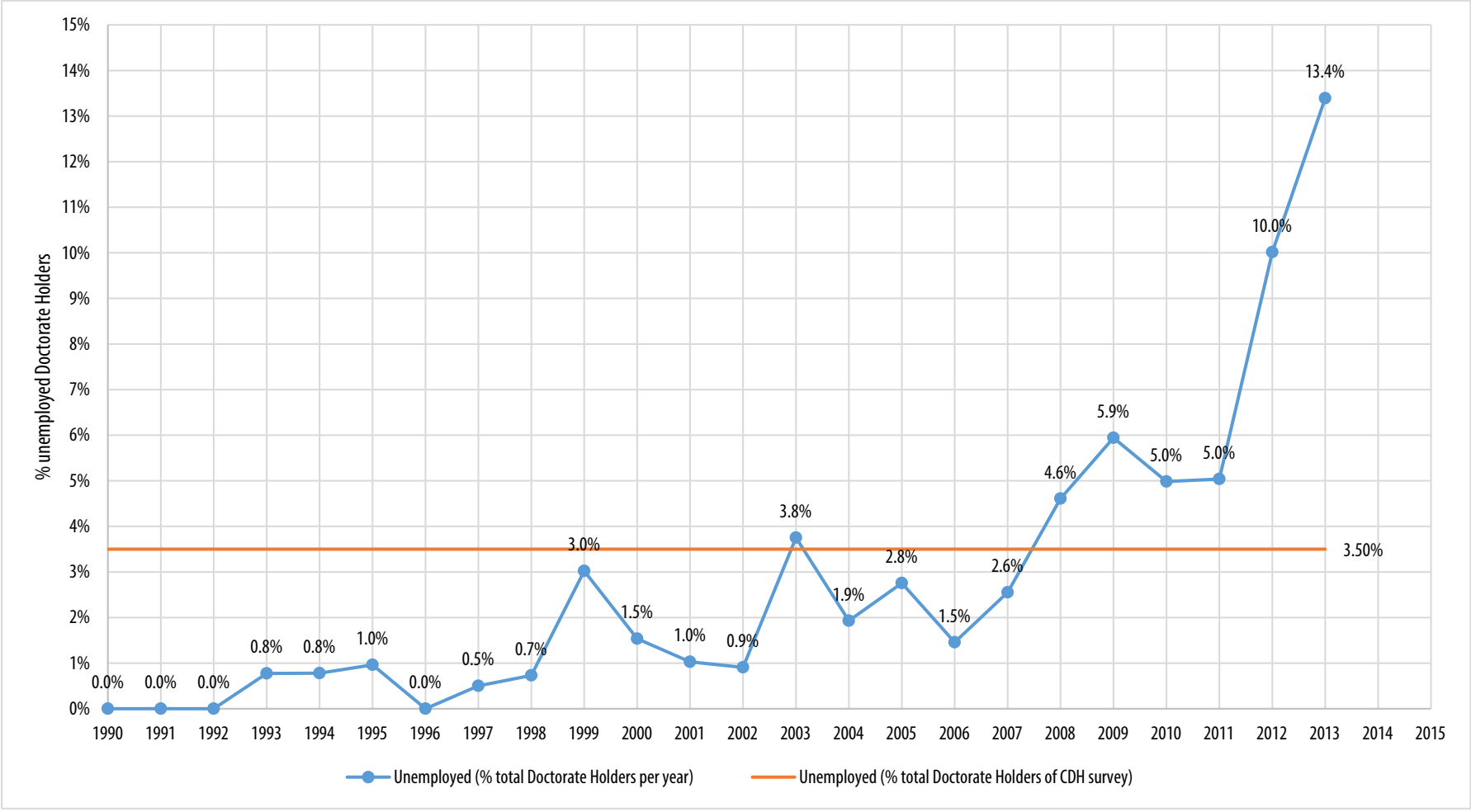


Figure 2.5 presents the percent of unemployed doctorate holders in relation to the year of graduation.

Overall, unemployment increases the closer to the graduation, reaching a peak in 2013 (10.0%) and 2014 (13.4%).

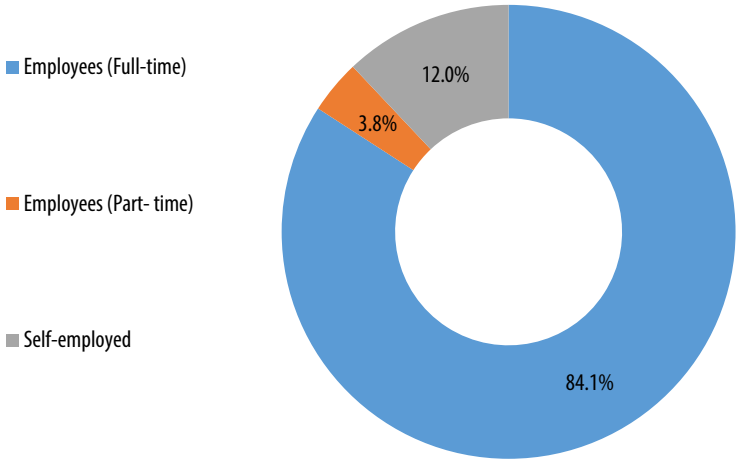
Figure 2.5. Unemployed doctorate holders (%) in 2013 by year of doctoral award (1990 -2013)



Employees and self-employed

Employed doctorate holders were mostly full-time employees (84.1%), self-employed (12.0%) and part-time employees (3.8%) (Figure 2.6).

Figure 2.6. Employed doctorate holders (%) by situation in employment and working time (full-time employees, part-time employees, self-employed) [17]



The percentage of self-employment was 13.7% for men and 9.4% for women.

The analysis of the type of employment (full/part-time employment or self-employment) by scientific field (Figure 2.7) shows that the highest percentage of fulltime employment (89.9%) is in 'Humanities' and the highest percentage of self-employment (18.0%) in 'Engineering and Technology'.

The younger doctorate holders, aged under 35, made up the group with the highest percentage of self-employed (28.6%) and part-time employed (10.0%) (Figure 2.8). Part-time and self-employment decreases as age groups increase. A high percentage of self-employment (22.8%) is again observed in the '65-69' age group.

[17] Employee: An employee is a person who enters an agreement, which may be formal or informal, with an enterprise to work for the enterprise in return for remuneration in cash or in kind.
Self-employed workers are persons who are the sole owners, or joint owners, of the unincorporated enterprises in which they work, excluding those unincorporated enterprises that are classified as quasi-corporations.

Figure 2.7. Employed doctorate holders (%) by situation in employment and working time (full-time employees, part-time employees, self-employed), across scientific fields of doctoral degree

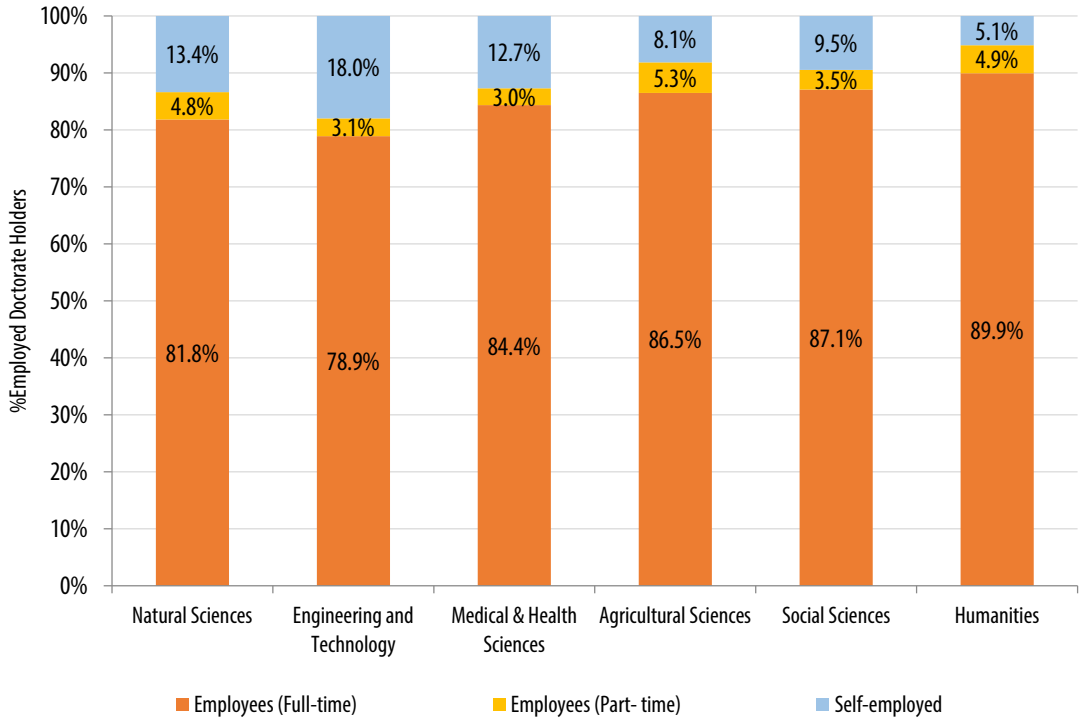
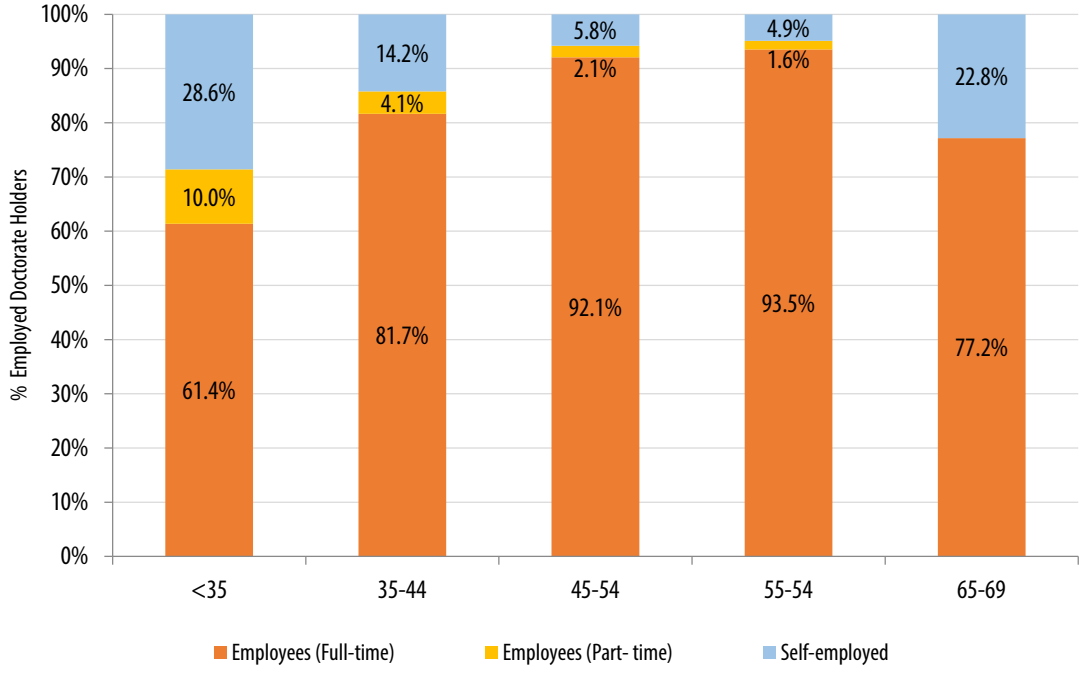


Figure 2.8. Employed doctorate holders (%) by situation in employment and working time (full-time employees, part-time employees, self-employed), across age groups

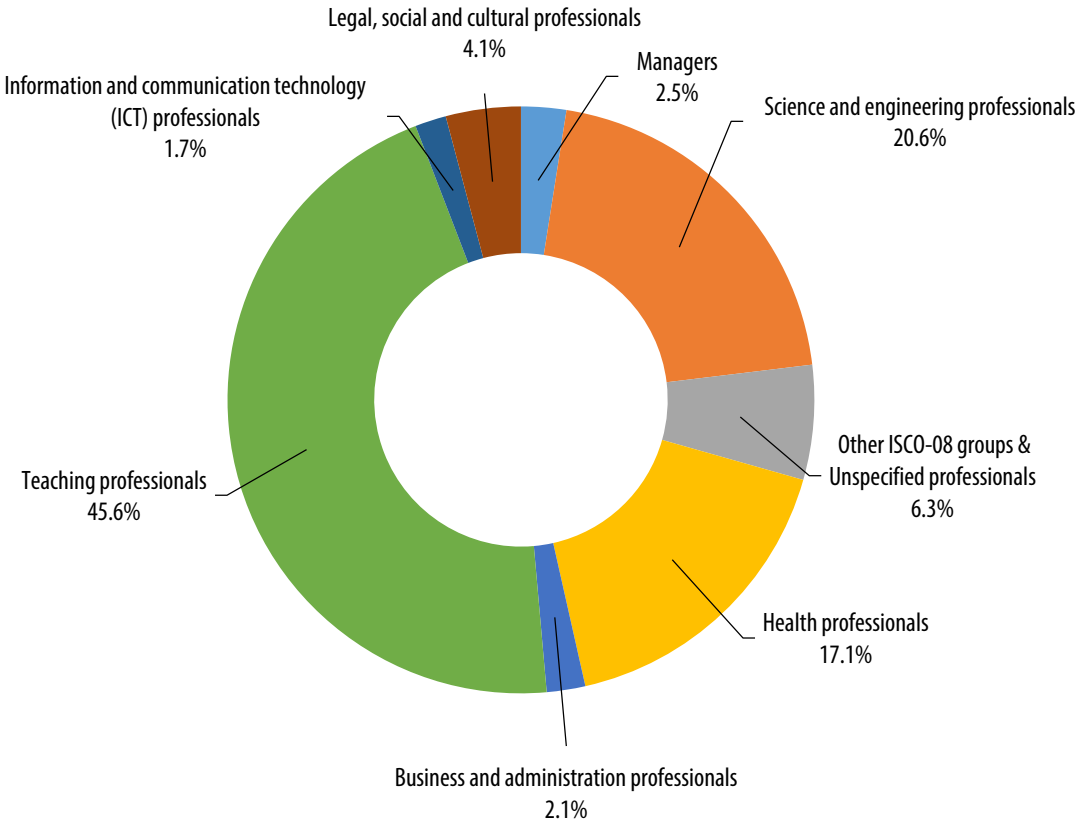


Occupation and sector of employment

The profession within which doctorate holders were employed (employees and self-employed) is analysed following the International Standard Classification of Occupations[18] and presented in Figure 2.9.

The main profession for doctorate holders was teaching (45.6%), followed by professions in science and engineering (20.6%) and health (17.1%).

Figure 2.9. Employed doctorate holders (%) (employees, self-employed) by occupation (ISCO-08)

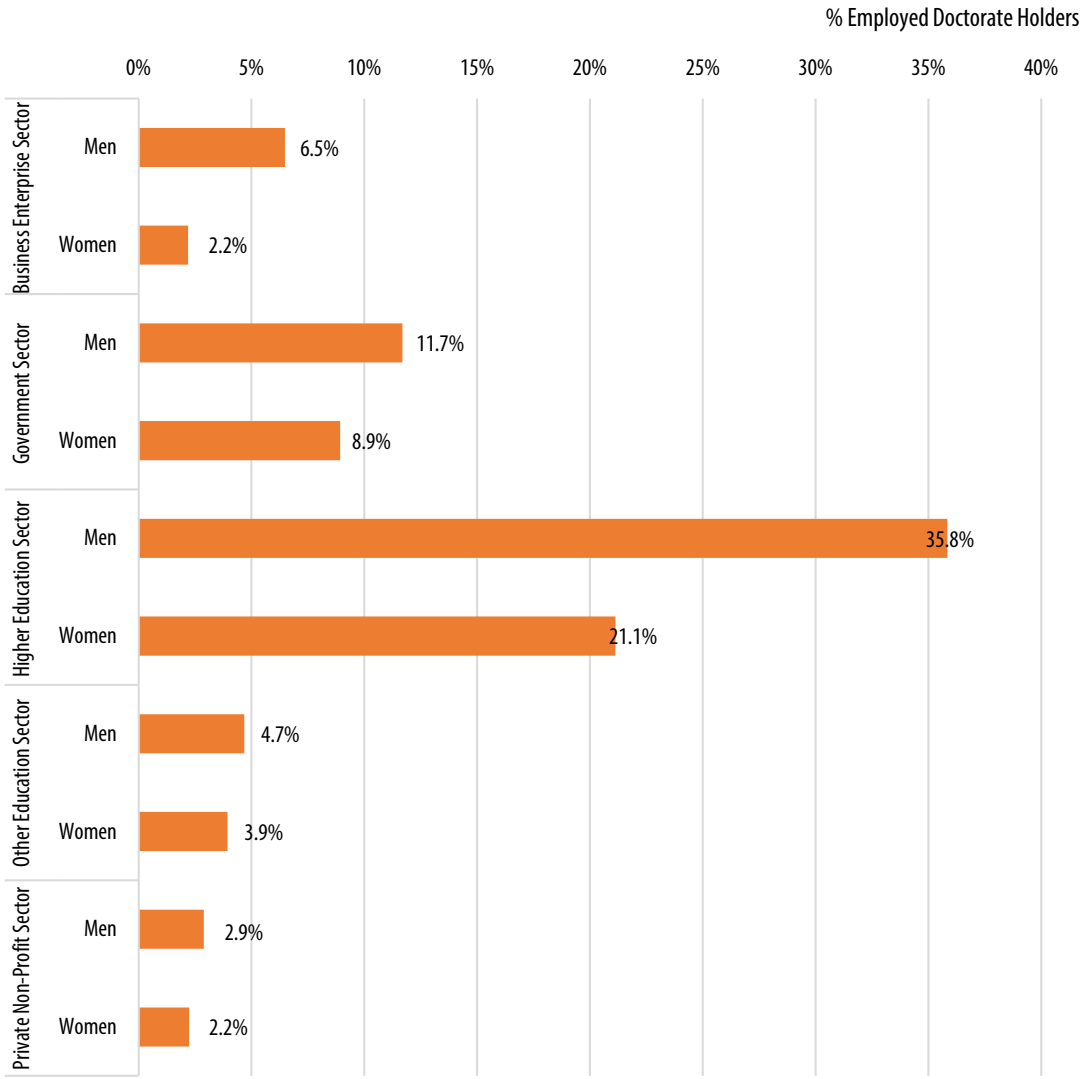


[18] International Standard Classification of Occupations 2008 (ISCO-08) published by the International Labour Organisation (http://www.ilo.org/public/english/bureau/stat/isco/isco08/). An analysis is provided in Chapter 4-Methodology.

The largest percentage (56.9%) of employed doctorate holders was concentrated in the higher education sector, of which 35.8% were men and 21.1% women (Figure 2.10).

The percentage of doctorate holders working in the government sector was 20.6%- 11.7% for men and 8.9% for women. In the business sector, it was 8.7%- 6.5% for men and 2.2% for women.

Figure 2.10. Employed doctorate holders (%) (employees, self-employed) by gender and sector of employment[19]

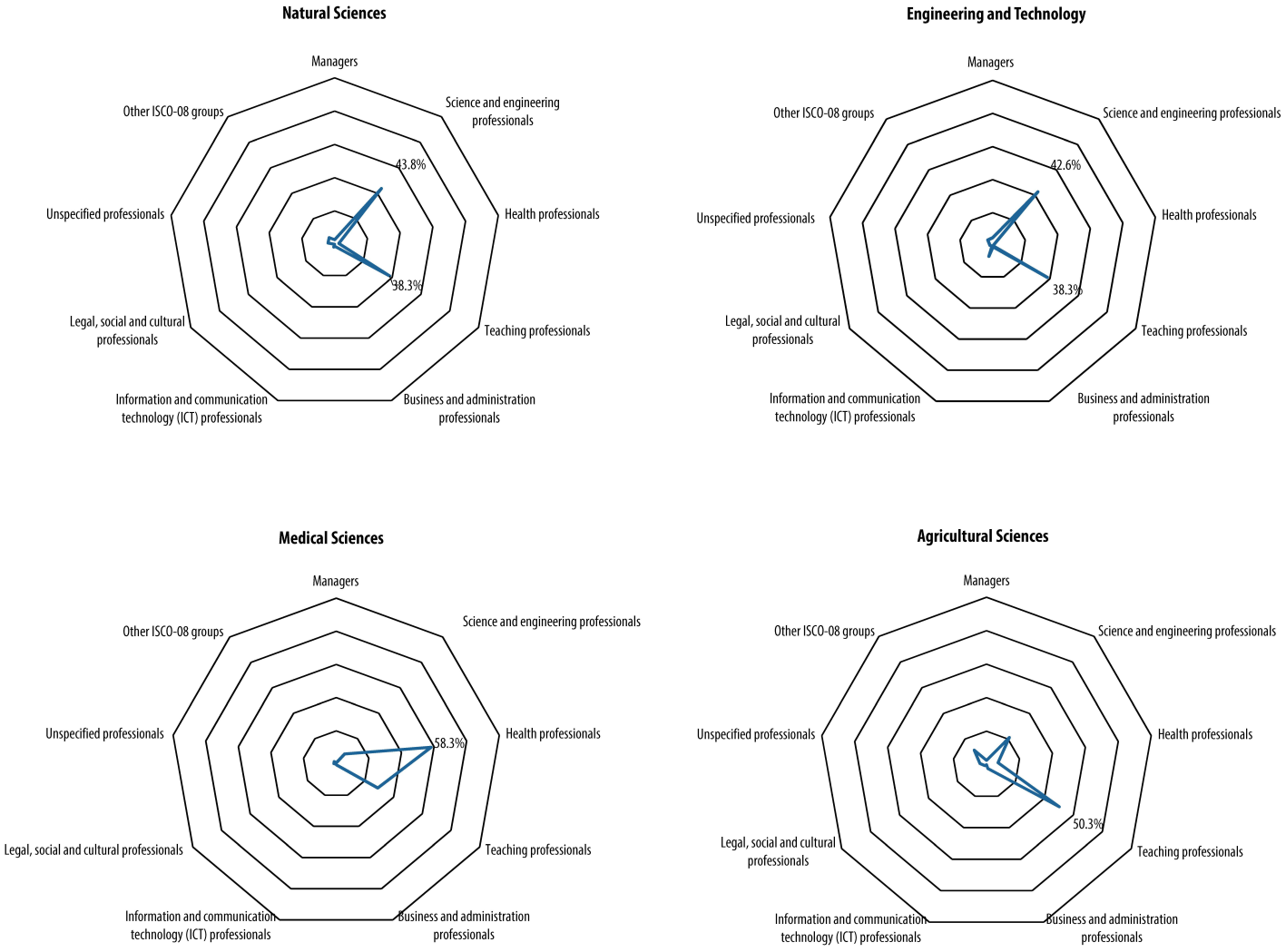


[19] Information on the sectors of employment is available in Chapter 5, Methodological Notes.

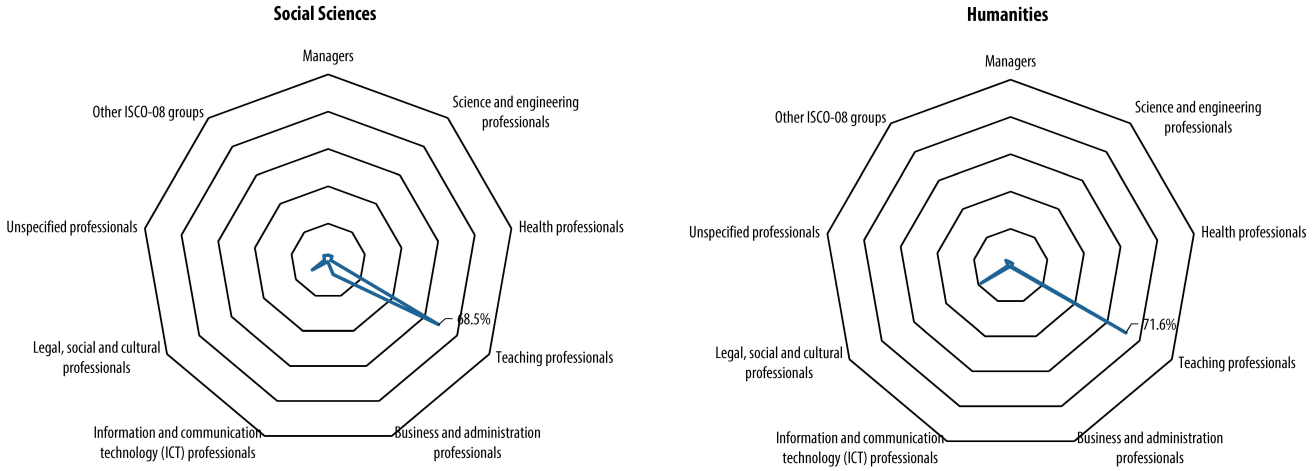
Relation of employment with doctoral degree and level of satisfaction

The profession[20] of doctorate holders (employees and self-employed) is closely related with the scientific field of their doctorate. For example, as can be seen in figure 2.11, the majority of graduates with doctorates in 'Medical and Health Sciences' worked as 'health professionals'.

Figure 2.11. Employed doctorate holders (%) by occupation, across scientific fields of doctoral degree



[20] International Standard Classification of Occupations ISCO 2008, as in Figure 2.9.



Most employed doctorate holders (58.7%), acknowledged there was a direct relation between their work and the subject of their doctoral studies (Figure 2.12). There was no significant difference between men and women.

Figure 2.12. Perception of employed doctorate holders (%), regarding the job relation to the doctoral degree (related, partly related, not related)

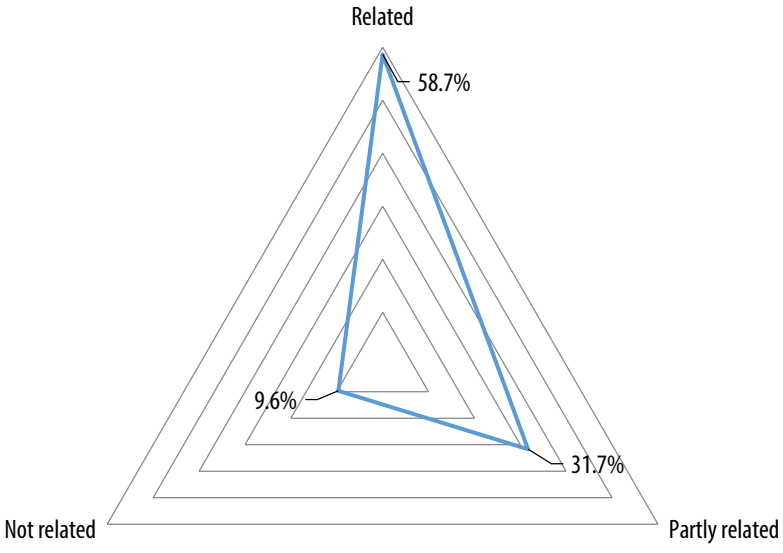


Table 2.2 presents the degree of relation between the employment of doctorate holders and the subject of their doctoral study for the CDH survey countries. As the table shows, the percentages differ, with Chile having the highest percentage and the Netherlands the lowest.

Table 2.2. Perception of employed doctorate holders, men and women, regarding the job relation to the doctoral degree (related, partly related, not related), in Greece and the other survey countries

	Reference Year	Related		Partly related		Not related	
		Women	Men	Women	Men	Women	Men
Greece	2013	56.9	59.8	32.5	31.2	10.6	9.0
Belgium	2012	37.8	44.1	31.4	31.4	30.8	24.5
Bulgaria	2009	84.0	85.1	9.5	11.5	6.6	3.3
Germany	2011	21.5	26.2	37.8	38.4	11.6	29.1
Switzerland	2013	71.1	69.4	15.3	18.4	13.2	12.3
United States	2013	69.0	64.9	24.2	26.9	6.8	8.1
Iceland	2009	67.2	55.9	28.2	31.2	4.7	12.9
Spain	2009	60.1	66.4	22.5	18.9	17.4	14.6
Israel	2009	59.0	62.2	28.1	23.5	13.0	14.4
Netherlands	2013	18.2	21.5	49.9	48.9	31.7	29.3
Croatia	2009	72.1	74.6	24.6	20.8	3.3	4.6
Latvia	2009	47.8	42.8	36.7	33.9	15.6	23.4
Lithuania	2009	51.9	48.4	35.7	39.2	12.4	12.4
Malta	2009	77.6	78.5	15.9	14.2	6.5	7.3
Hungary	2009	75.0	83.3	20.6	12.0	4.4	4.7
Poland	2008	78.5	75.5	15.7	18.3	5.8	6.2
Portugal	2012	68.3	73.3	28.7	24.3	3.0	2.4
Romania	2008	80.2	81.7	14.5	14.1	5.3	4.2
Russia	2012	76.5	73.1	18.9	21.0	3.1	4.4
Slovenia	2012	69.7	69.9	22.0	22.1	8.4	8.1
Turkey	2009	86.8	85.9	9.5	10.3	3.7	3.8
Chile	2011	88.3	90.0	9.0	8.1	2.7	1.8

The great majority of employed doctorate holders (77.2%), stated they were very (17.1%) or somewhat (60.1%) satisfied with their employment (Figure 2.13).

The main factors for satisfaction were 'contribution to society', 'job location' and 'level of responsibility' (Figure 2.14). In contrast, least satisfaction derived from financial remuneration in the form of salary and benefits provided.

Figure 2.13. Employed doctorate holders (%) by level of satisfaction with their employment

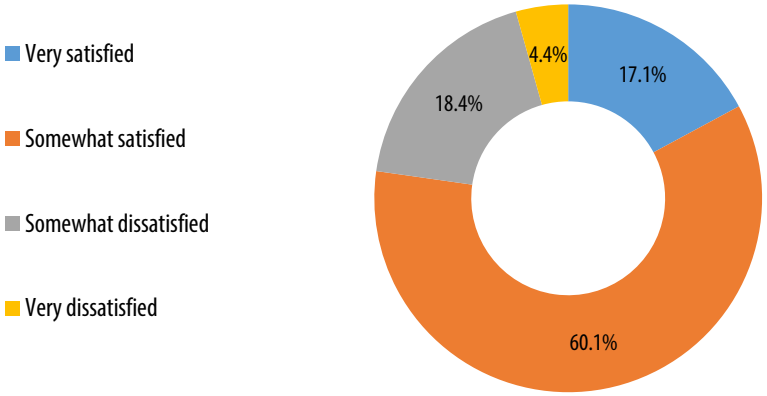
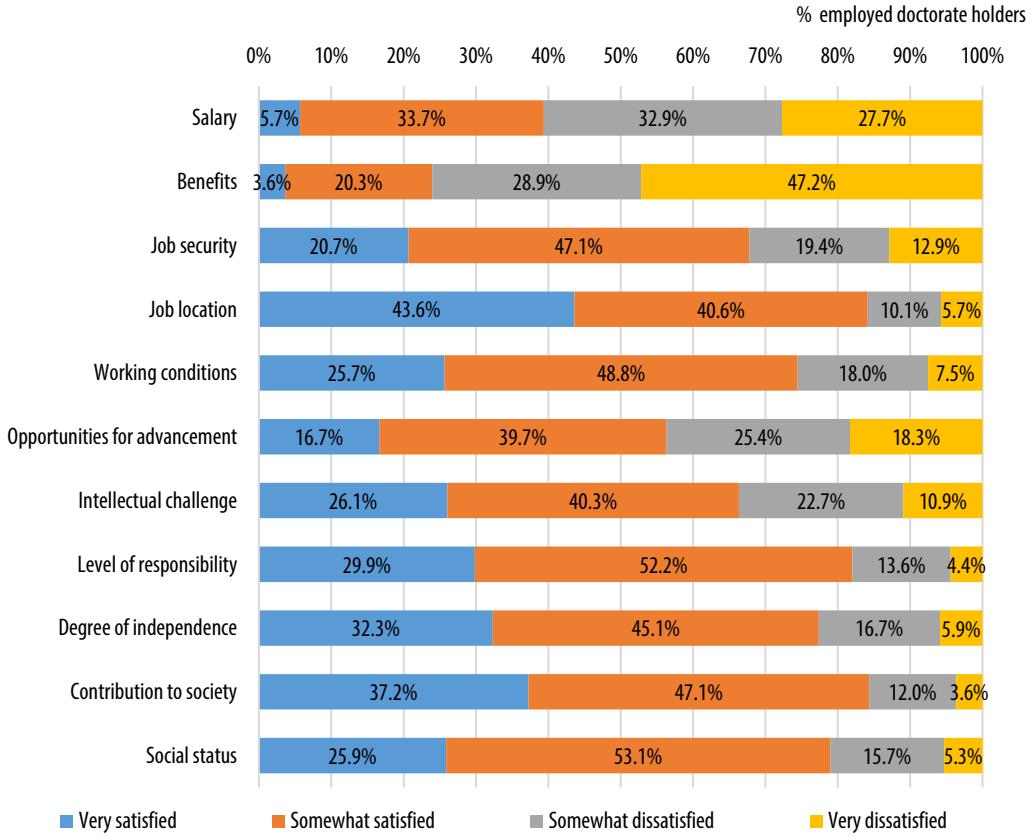


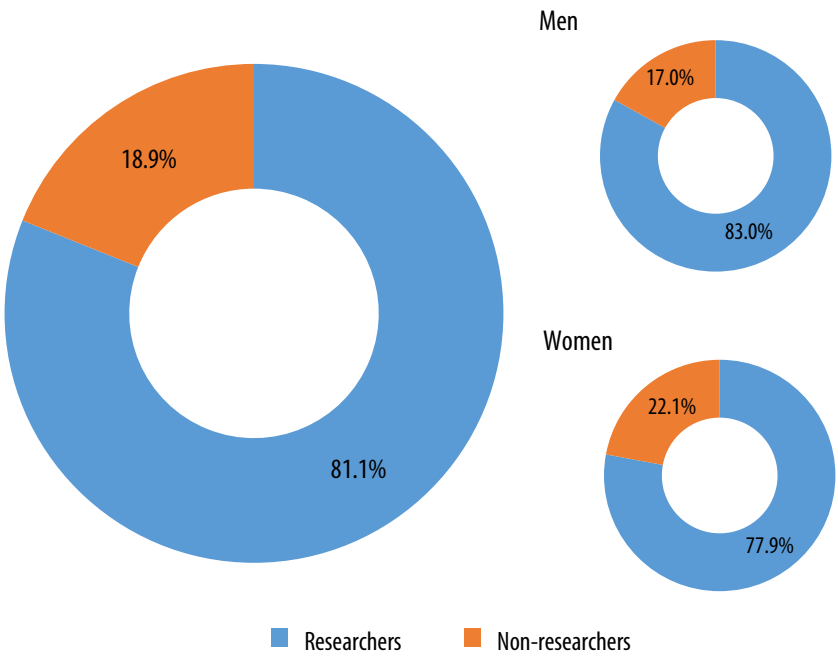
Figure 2.14. Criteria and level of satisfaction for employed doctorate holders



Research activity

In Greece, 81.1% of employed doctorate holders were involved in research activities (Figure 2.15). The percentage of men researchers was 83.0%, a little higher than that of women.

Figure 2.15. Doctorate holders (%) by research status,[21] men and women



There was little difference in the proportion of men doctorate holders-researchers across scientific fields; the highest percentage (85.3%) was in 'Natural Sciences' (Figure 2.16).

For women the differences were slightly greater with the highest percentage (85.5%) also being in 'Natural Sciences', while the lowest percentage of women-researchers was recorded in 'Social Sciences' and 'Medical and Health Sciences' (74.4% and 74.8% respectively).

The 'higher education sector' presented the largest percentage of doctorate holders in research, over 90% for men as well as women (Figure 2.17). There was a clearly lower percentage of doctorate holders-researchers in the business sector, 50.3% men and 41.8% women.

[21] Researchers are professionals engaged in the conception or creation of new knowledge, products, processes, methods and systems and also in the management of the projects concerned.
Source: Frascati Manual (OECD, 2002)

Figure 2.16. Doctorate holders employed as researchers (%) by scientific field of doctoral degree and gender

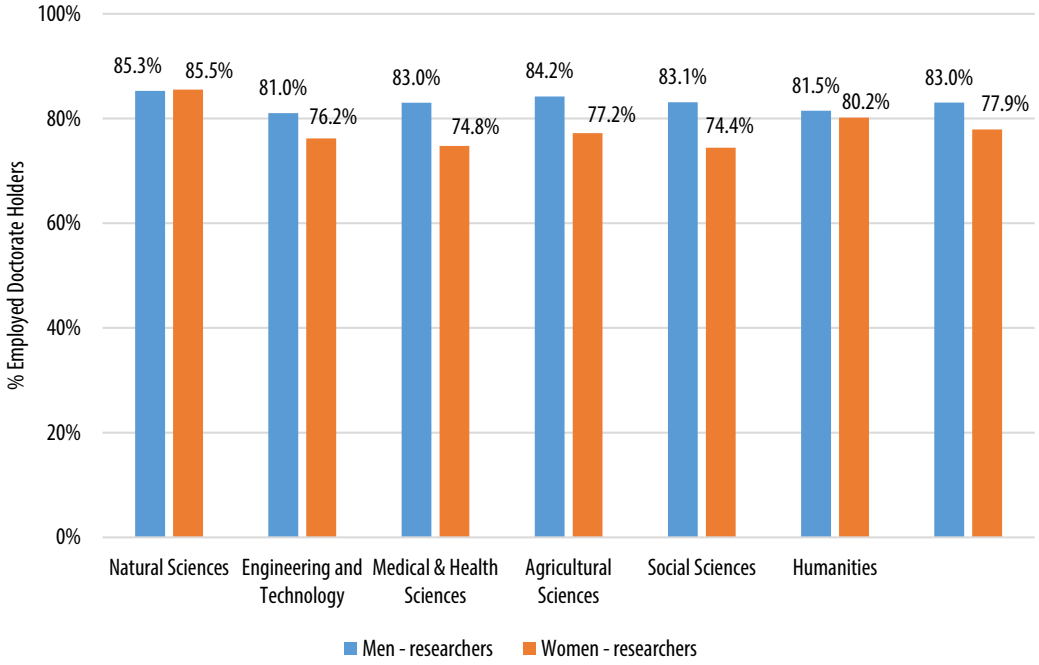
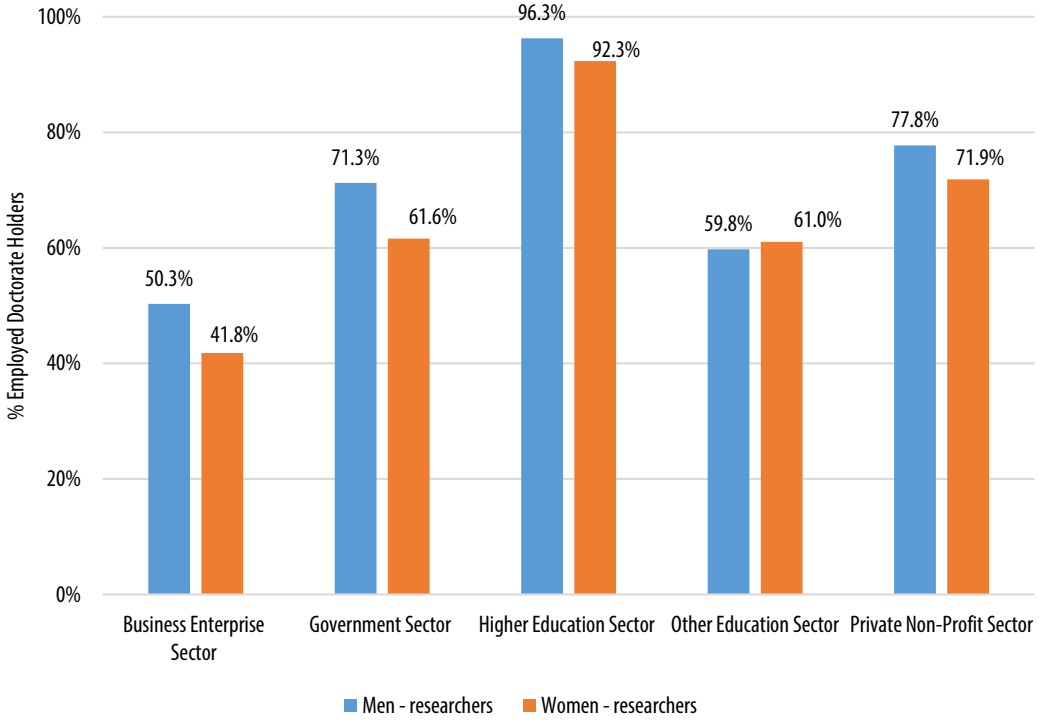


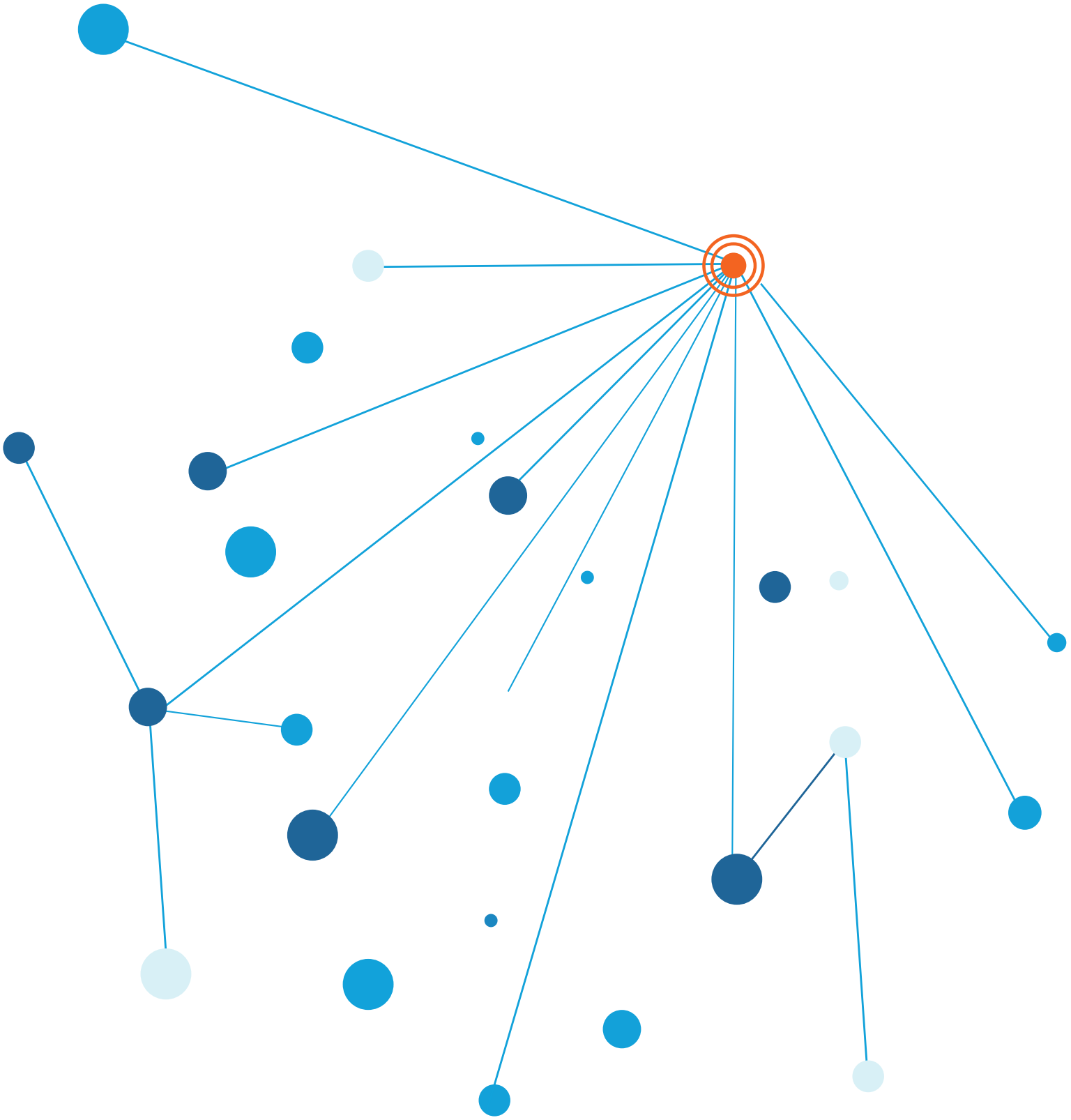
Figure 2.17. Doctorate holders employed as researchers (%) by sector of employment and gender

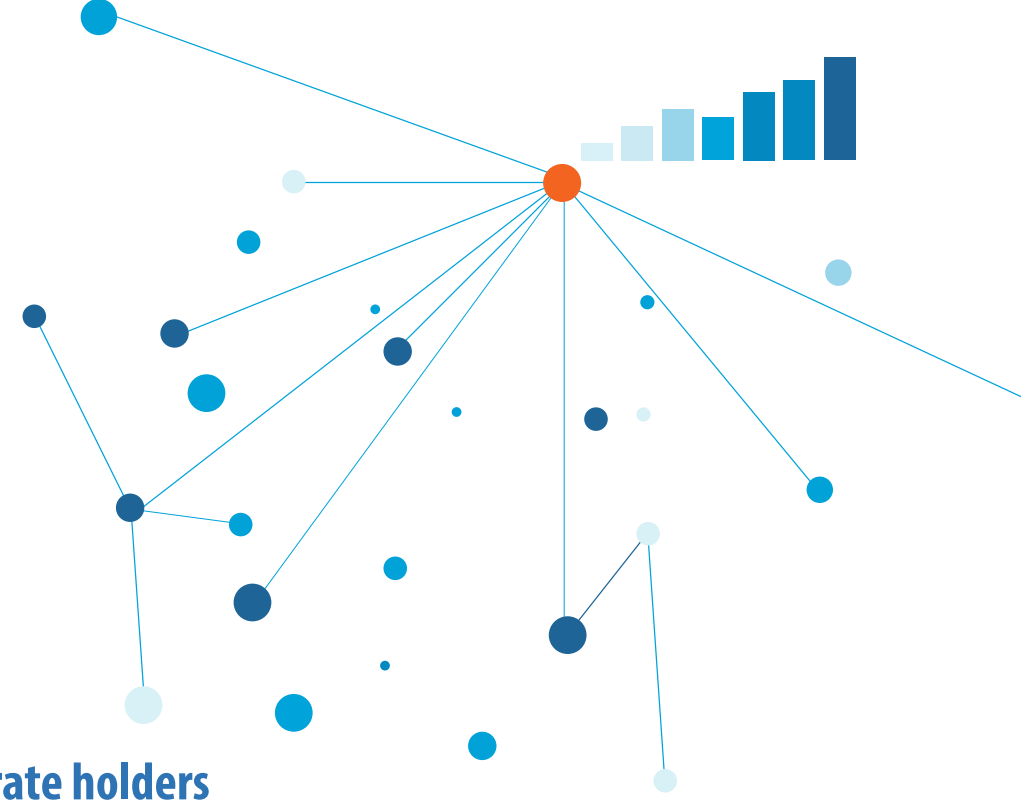


In the majority of countries taking part in the CDH survey, the higher education sector had the largest percentage of employed doctorate holders in research positions, exceeding 60%. This was followed by the government sector which appeared to be the second choice of doctorate holders employed in research activities.

Table 2.3. Doctorate holders employed as researchers (%) by sector of employment, in Greece and the other survey countries

	Reference Year	Business Enterprise Sector		Government Sector		Higher Education Sector		Private Non-Profit Sector	
		Researchers	Non-researchers	Researchers	Non-researchers	Researchers	Non-researchers	Researchers	Non-researchers
Greece	2013	48.1	51.9	67.1	32.9	94.8	5.2	75.2	24.8
Belgium	2012	37.7	52.8	32.2	56.6	19.6	72.1	45.8	40.2
Bulgaria	2009	35.2	64.8	88.2	11.8	87.4	12.4	42.5	20.1
Germany	2011	6.5	93.5	36.4	63.5	69.3	30.7	…	…
United States	2013	60.3	39.6	62.4	37.5	65.0	35.0	58.0	42.3
Spain	2009	26.5	73.5	46.5	53.5	86.0	14.0	63.2	36.8
Netherlands	2013	84.9	15.1	75.8	24.2	90.9	9.1	74.5	25.5
Croatia	2009	43.9	56.1	78.2	21.8	93.1	6.9	52.7	47.3
Korea	2012	35.6	64.4	68.9	31.1	48.4	51.6	45.7	54.3
Taiwan	2012	38.5	60.9	80.0	19.6	93.9	6.1	28.8	69.7
Latvia	2009	53.0	47.0	82.7	17.3	91.8	8.2	100.0	0.0
Lithuania	2009	43.9	56.1	66.6	33.4	91.3	8.7	63.9	36.1
Malta	2009	41.2	58.8	53.1	46.9	88.7	11.3	47.2	52.8
Norway	2008	..	..	..	..	..	..	..	..
Hungary	2009	63.8	36.2	87.5	12.5	88.8	11.2	63.3	36.7
Poland	2008	22.7	77.3	100.0	0.0	96.5	3.5	54.7	45.3
Portugal	2012	56.0	44.0	78.3	21.7	92.2	7.8	93.6	6.4
Romania	2008	45.6	54.4	40.6	59.4	60.0	40.0	27.4	72.6
Russia	2012	42.4	57.6	71.1	28.9	17.7	82.3	48.8	51.2
Slovenia	2012	76.3	23.7	82.8	17.8	93.0	7.0	63.4	…
Turkey	2009	16.2	83.8	26.5	73.5	77.2	22.8	18.4	81.6
Chile	2011	0.00	100.0	36.4	63.5	69.3	30.7	…	….





Chapter 3

Mobility of doctorate holders

The chapter provides data on the career and international mobility of doctorate holders.

For the purpose of recording the **job mobility** of doctorate holders, the CDH survey targeted those who had changed employment in the ten years prior to the survey reference year, namely the period between January 2004 and December 2013.

The full results are presented analytically in the tables and figures of this chapter and are summarized as follows:

- In Greece, approximately four out of ten doctorate holders (37.1%) changed employment during the period January 2004-December 2013. This percentage puts Greece in the fourth place after Poland, the Netherlands and Israel.
- The highest mobility was recorded in the other education sector (39.7%) and the government sector (39.6%).
- Patterns of doctorate holders' mobility varied for researchers and non-researchers across the different sectors of employment. In the private non-profit and the other education sector, researchers showed a higher mobility compared to non-researchers. In the government sector there were no major differences while in the business and the higher education sector the majority of mobile doctorate holders were non-researchers.
- The higher education sector was clearly the most popular choice for employed doctorate holders who changed sector of employment during the decade January 2004-December 2013.

The analysis of **international mobility** focuses on Greek doctorate holders (with Greek nationality). According to the CDH survey methodology, doctorate holders are mobile internationally if they stayed or lived in a country other than that of his or her usual residence for a period of at least 3 months, before or during the length of

their studies during the decade prior to the reference period, namely January 2004-December 2013. Excluded is time spent abroad for tourism or other purposes not related to their research.

The full results of the survey are presented in the tables and figures of this chapter and are summarized as follows:

- Greece presents a high percentage of doctorate holders with international mobility (18.9%) and was in 5th place following Malta, Hungary, Spain and Portugal.
- The United Kingdom (UK), United States of America (USA) and Germany were the most common destination countries for mobile Greek doctorate holders.
- In comparison with other CDH survey countries, Greek doctorate holders had more frequent and longer periods of stay in foreign countries. More analytically, the percentage of Greek doctorate holders who had stayed abroad 2-4 times (38.7%) and 5 times or more (4.9%) is higher than the other CDH survey countries. Similarly, along with Israel and Lithuania, Greece had the most doctorate holders staying in other countries for 5-10 years.
- The mobility of doctorate holders differed with the employment status (employed – unemployed and inactive) and the type of activity (research/non-research). There was a high rate of mobility (25.0%) amongst unemployed doctorate holders, the majority of whom, as seen in chapter 2, belonged to the age class under 35 years old. Similarly, there was a high rate of mobility (20.7%) amongst those who were employed (whether employees or self-employed) in research.
- The highest rate of mobility was recorded for the private non-profit sector (23.9%) and the higher education sector (22.5%).
- With regard to scientific fields, the highest rate of mobility was in the 'Medical and Health Sciences' (23.9%) and the 'Natural Sciences' (22.6%).
- Greek doctorate holders became mobile for two basic reasons: their research activity (for example, concluding or continuing doctoral studies or creating their own research teams), (38.0%), or their career (seeking/finding work, post-doctoral research) (28.1%).
- The CDH survey also examined the intended mobility of Greek doctorate holders in 2015. According to the results, the percentage of those intending to move to another country came to 10.2%, with the main destination countries being the United Kingdom (UK), United States of America (USA) and Germany. 10.4% of doctorate holders employed as researchers planned to leave Greece, while for non-researchers, it was 6.3% and for the unemployed – inactive, it was 21.2%. Academic and other job related or economic factors were the main reasons for the mobility intentions of Greek doctorate holders in 2015.

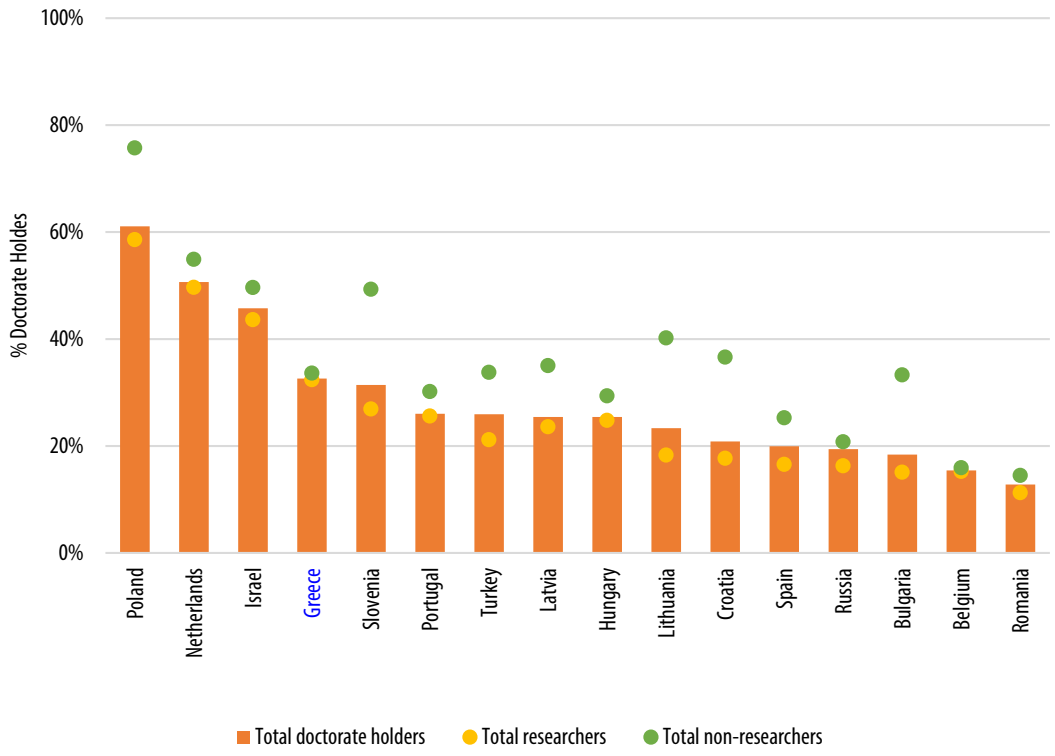
Job mobility

The findings of the CDH survey in Greece indicate that four out of ten doctorate holders (37.1%) had changed employment in the ten years prior to the year of reference, namely from January 2004 to December 2013.

This percentage puts Greece in fourth place following Poland, the Netherlands and Israel. The lowest rate of mobility was recorded for Bulgaria, Belgium and Romania.

For most countries, the rate of job mobility of doctorate holders in research positions (researchers) was lower than for those not involved in research (non-researchers). For Greece, the rate of mobility for both categories was almost the same, as it was for Belgium, Russia and Romania.

Figure 3.1. Employed doctorate holders with job mobility (%) over the last 10 years[22], in Greece and the other survey countries

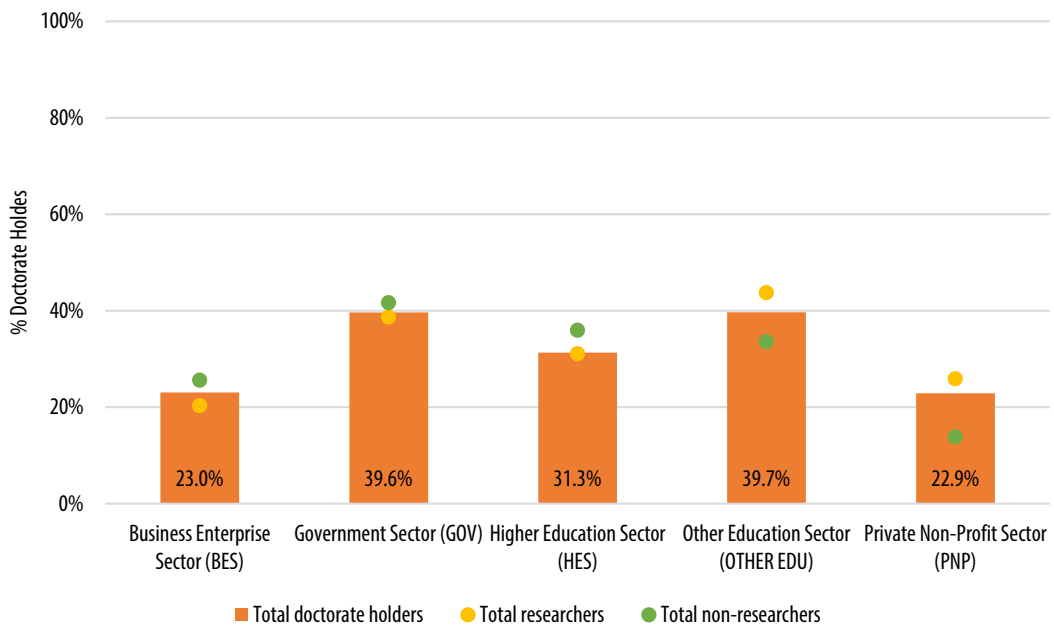


The highest rate of career mobility was for those employed in the other education sector, where 39.7% of doctorate holders had changed job during the period January 2004-December 2013, and in the government sector, where the respective percentage was 39.6% (Figure 3.2).

[22] The reference year is 2013 for Greece and 2009 for the other countries in the survey, while in Romania the year of reference is 2008.

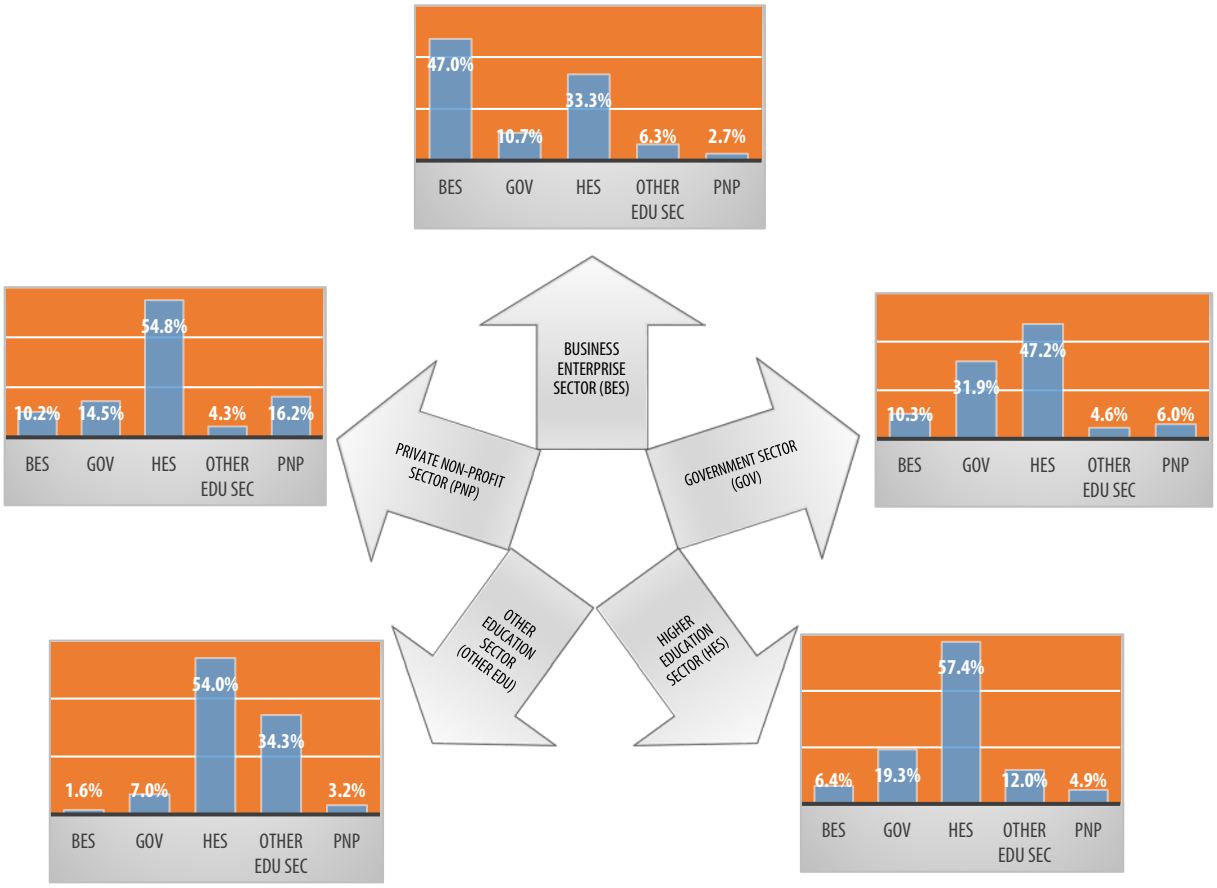
Figure 3.2 presents the rate of mobility of doctorate holders in research positions (researchers) or those not involved in research (non-researchers) by employment sector. In the private non-profit sector and the other education sector, more doctorate holders in research positions (researchers) moved to other employment positions, in the government sector the percentages were similar, while in the business and higher education sector, doctorate holders not involved in research (non-researchers) were the ones to be more mobile.

Figure 3.2. Employed doctorate holders with job mobility (%) over the last 10 years by sector of employment



The higher education sector was the most popular choice for doctorate holders who changed employment during the period January 2004-December 2013 (Figure 3.3). From the government sector, 47.2% of those changing employment moved to the higher education sector, 33.3% of the business sector also moved to higher education, while for the other two sectors the relative percentage was approximately 54%. It was further noted that 57.4% of those who changed employment in the higher education sector actually remained in that sector.

Figure 3.3. Analysis of inter- and intra-sectoral mobility of doctorate holders: sector of destination for employed doctorate holders who changed job



International mobility

Being internationally mobile plays a significant role in the evolution of the research careers of doctorate holders and networking with the international research community. The analysis which follows in this sub-section concentrates on Greek doctorate holders.

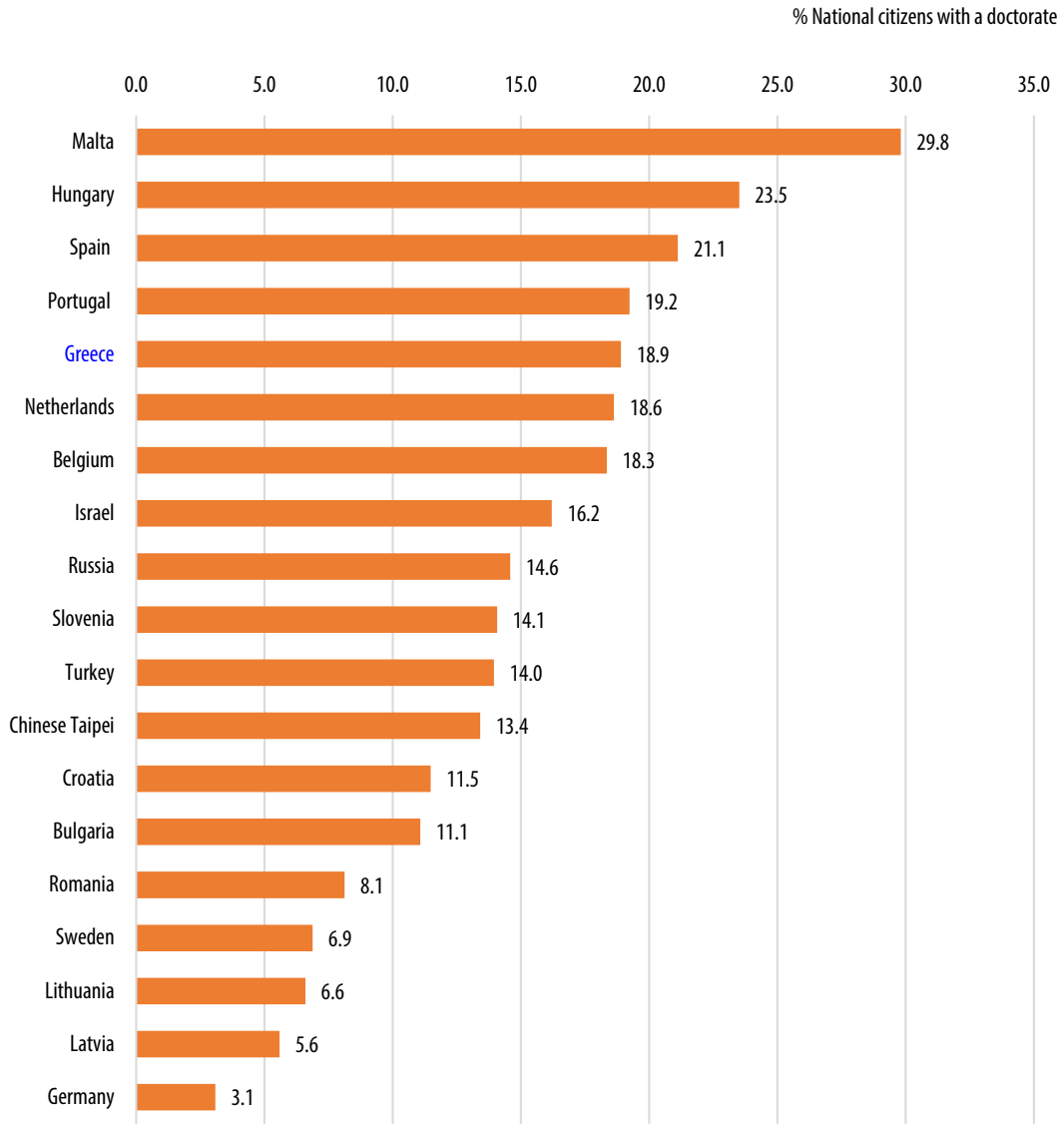
The CDH survey definition of international mobility: doctorate holders who have stayed or lived in a country other than that of their usual residence for a period of at least 3 months, for the purpose of research, before or during their study period and during the ten-year period January 2004-December 2013, with the exception of cases where the movement to that country was for tourism or other reasons unconnected with research.

Figure 3.4 presents percentages for internationally mobile doctorate holders from Greece and the other survey countries. During the ten-year period January 2004-

December 2013, 18.9% of Greek doctorate holders were internationally mobile for research purposes related to their doctorate. As a result, Greece was ranked 5th following Malta, Hungary, Spain and Portugal.

The percentage of doctorate holders who were internationally mobile was 20.0% for men and slightly lower for women, 17.8%.

Figure 3.4. Internationally mobile doctorate holders (%), in Greece and the other survey countries[23]

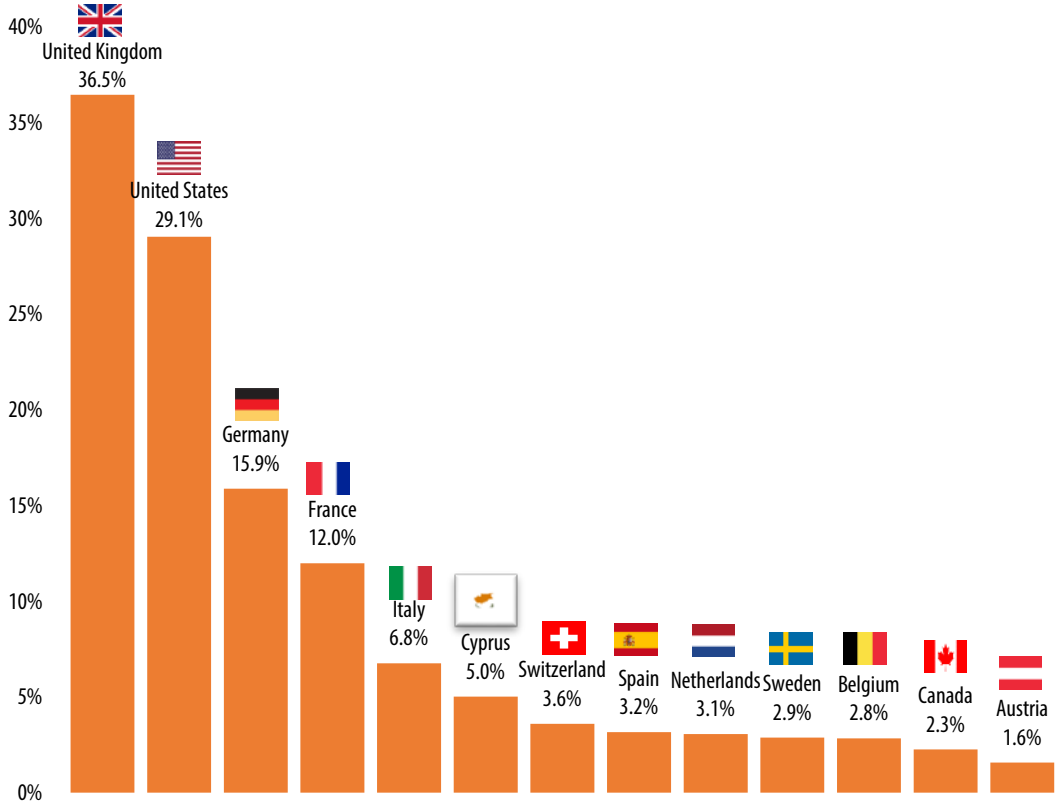


[23] The reference year is 2013 for Greece and 2009 for the other countries in the survey, while in Romania the year of reference is 2008.

Figure 3.5 shows that the most common destinations for Greek doctorate holders were the UK and the USA, at 36.5% and 29.1% respectively. These were followed by Germany (15.8%) and France (12.0%).

According to the indicators of the report 'Analysis of Researchers' Mobility in the context of the European Area' which was published by the World Economic Forum and presented the European countries attracting the most talented people from the global research community, Sweden, the UK, Germany and France hosted the largest foreign doctoral population. This conclusion was confirmed by the previous survey on the career of doctorate holders (2009) [24], which showed that the main destinations for doctoral graduates are, on a European level, the UK, Germany and France and, on a global level, the USA.

Figure 3.5. Previous country of stay for mobile doctorate holders having returned or arrived in Greece



In comparison with other CDH survey countries, Greek doctorate holders had more frequent and longer periods of stay in foreign countries. Analytically, the percentage of Greek doctorate holders who had stayed abroad 2-4 times (38.7%) and 5 times or more (4.9%) is higher than the other CDH survey countries (Figure 3.6). Similarly, along with Israel and Lithuania, Greece had the most doctorate holders staying in other countries for 5-10 years (Figure 3.7).

[24] http://www.oecd.org/sti/inno/CDH%20FINAL%20REPORT-.pdf

Figure 3.6. Frequency of international mobility of doctorate holders, in Greece and the other survey countries[25]

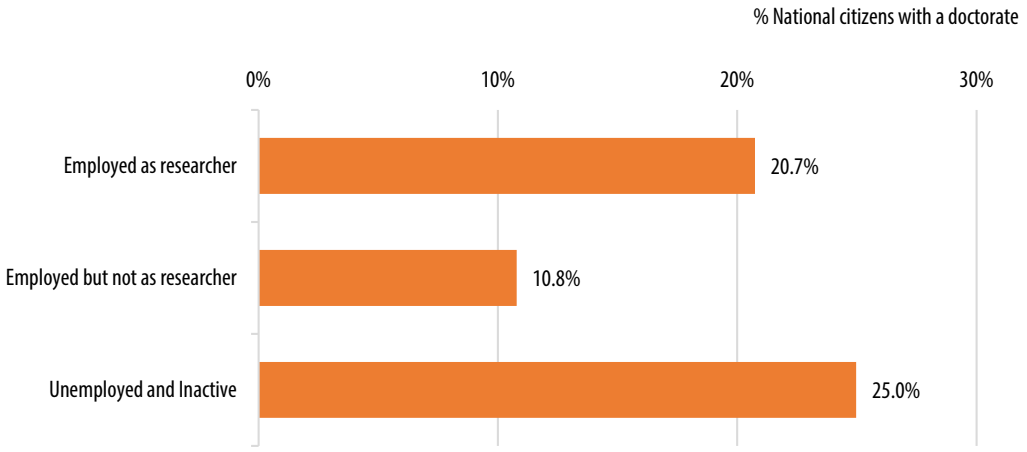
[25] The reference year is 2013 for Greece and 2009 for the other survey countries.

Figure 3.7. Cumulative length of stays abroad in the last 10 years for internationally mobile doctorate holders in Greece and the other survey countries[26]

[26] The reference year is 2013 for Greece and 2009 for the other survey countries.

The mobility of doctorate holders differed with the employment status (employed –unemployed and inactive) and the type of activity (research/non-research) (Figure 3.8). There was a high rate of mobility (25.0%) amongst unemployed doctorate holders, the majority of whom, as seen in chapter 2, belonged to the age class under 35 years old. Similarly, there was a high rate of mobility (20.7%) amongst those who were employed (whether employees or self-employed) in research.

Figure 3.8. Internationally mobile doctorate holders (%) by employment and research status



Mobility was highest in the private non-profit and the higher education sectors, 23.9% and 22.5% respectively.

Figure 3.9. Internationally mobile doctorate holders (%) by sector of employment

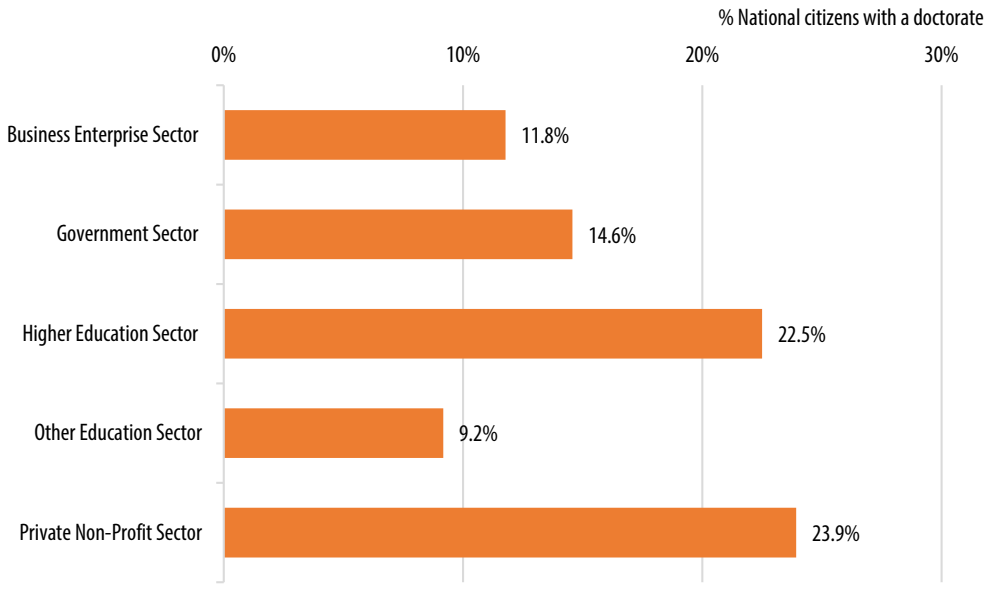
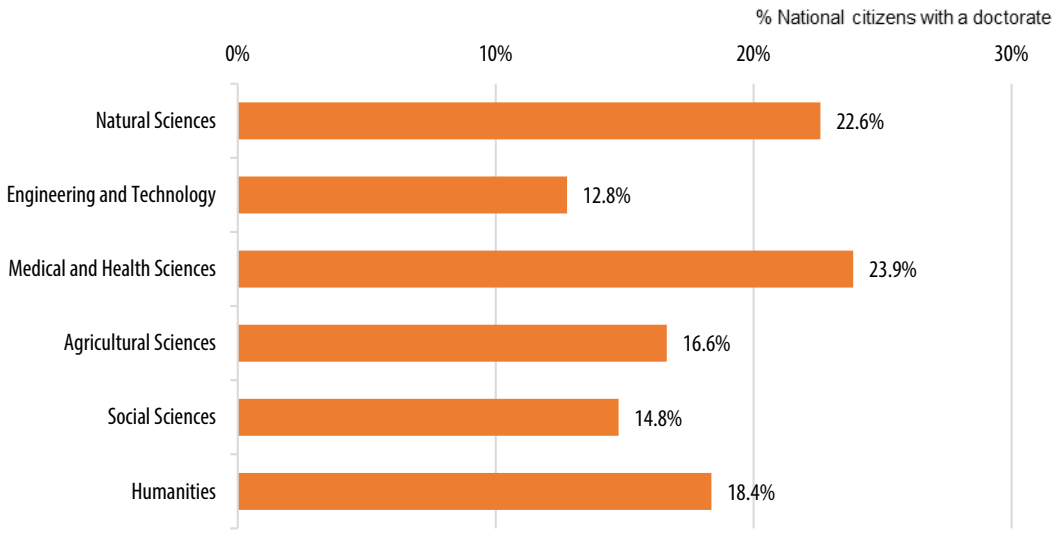


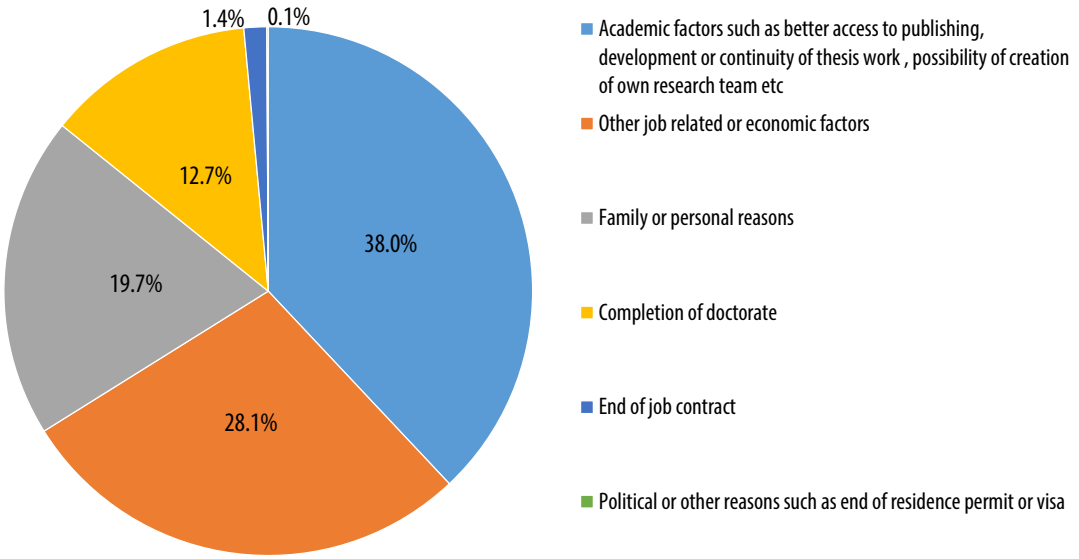
Figure 3.10 shows the rate of mobility for different scientific fields. The highest percentage was recorded for 'Medical & Health Sciences' (23.9%) and 'Natural Sciences' (22.6%).

Figure 3.10. Internationally mobile doctorate holders (%) by scientific field of doctoral degree



Greek doctorate holders were mobile for two basic reasons: their research activity (for example, continuing or concluding doctoral studies, creating own research group), 38.0%, or their career (seeking/finding work, post-doctoral research), 28.1% (Figure 3.11).

Figure 3.11. Internationally mobile doctorate holders: reasons for mobility



The CDH survey also examined the intended mobility of Greek doctorate holders in 2015. According to the findings, the percentage of those intending to move to another country came to 10.2%, with the main destination countries being the UK, USA and Germany (Figures 3.12 & 3.13).

Figure 3.12. Internationally mobile doctorate holders: mobility intentions in 2015

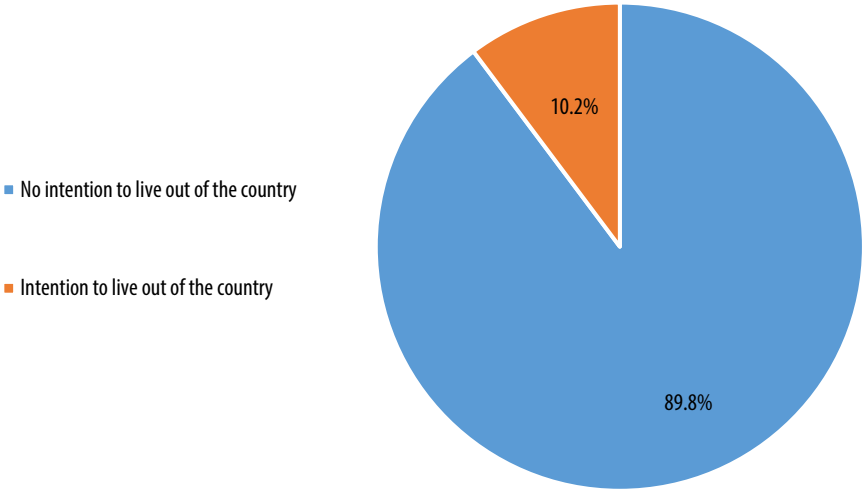
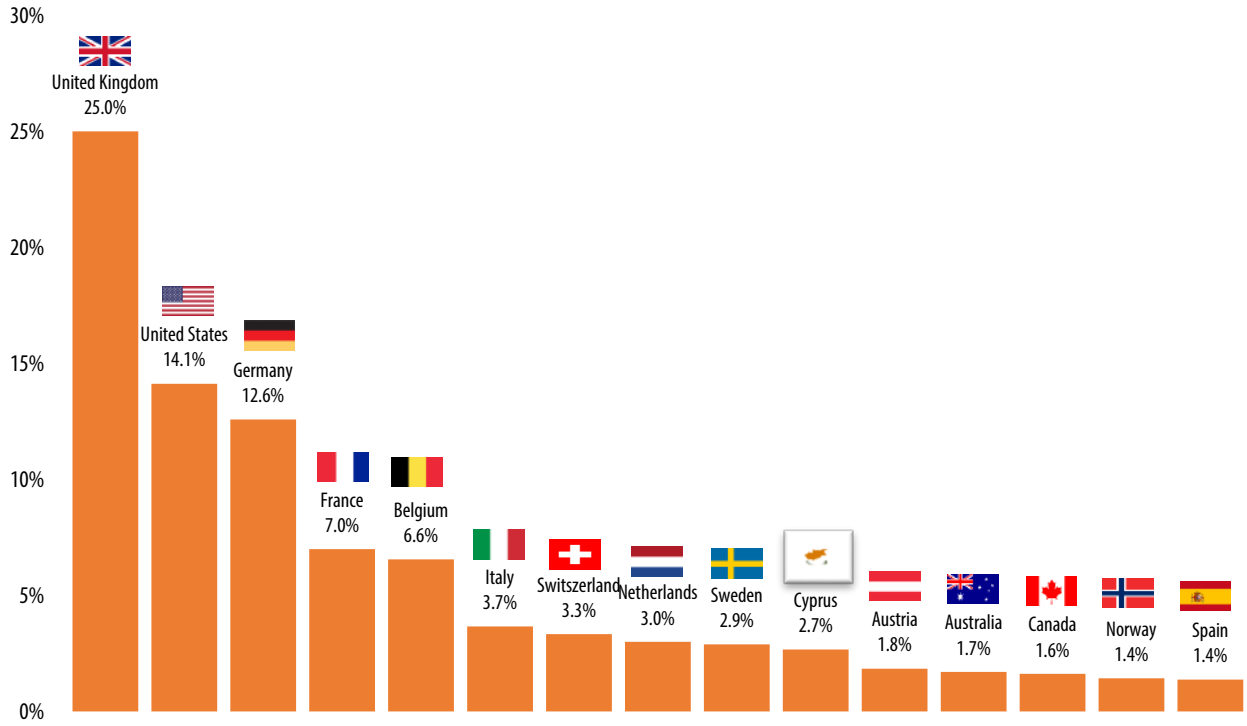


Figure 3.13. Distribution (%) of doctorate holders with mobility intentions in 2015 by country of intended destination



10.4% of doctorate holders employed in research intended to leave Greece, while for those not involved in research, the percentage was 6.3% (Figure 3.14). For the unemployed–inactive, the percentage was 21.2%. Academic factors and other job related or economic factors were the main reasons for international mobility in 2015 (Figure 3.15).

Figure 3.14. Doctorate holders with mobility intentions in 2015 (%) by employment and research status

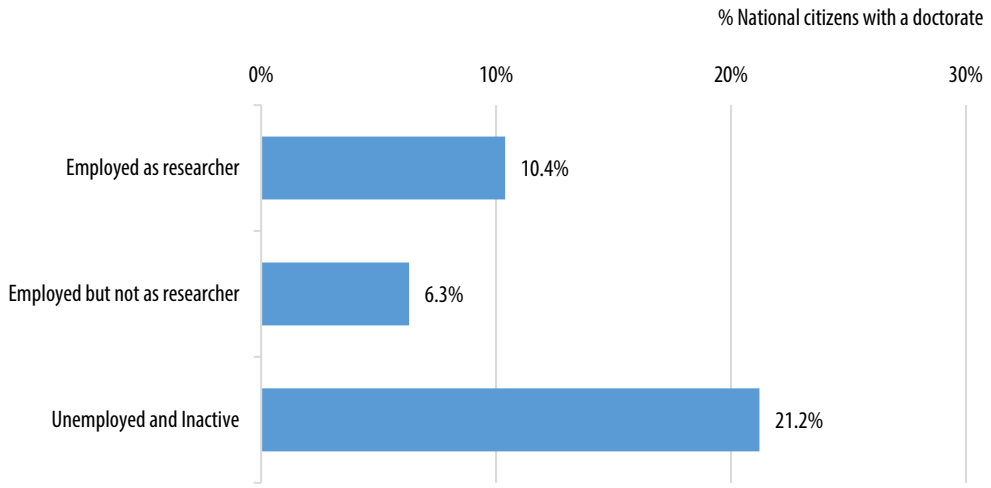
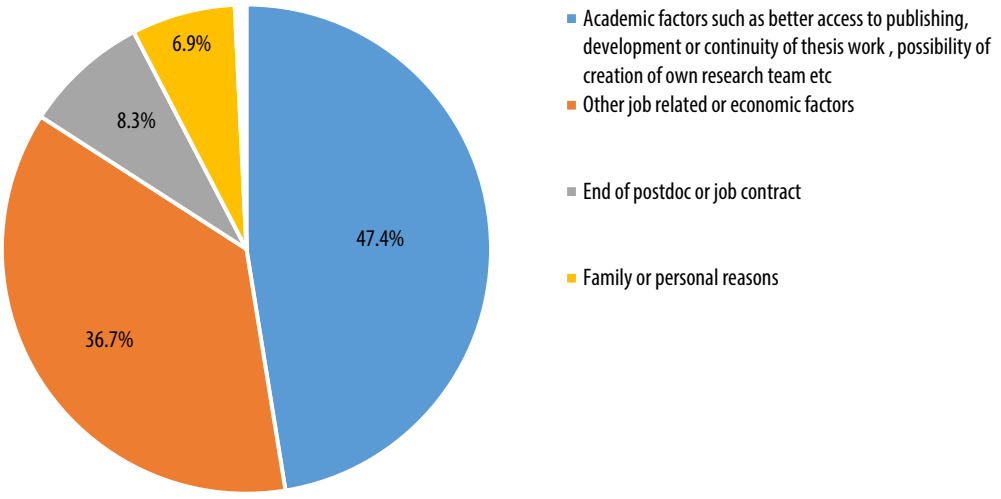
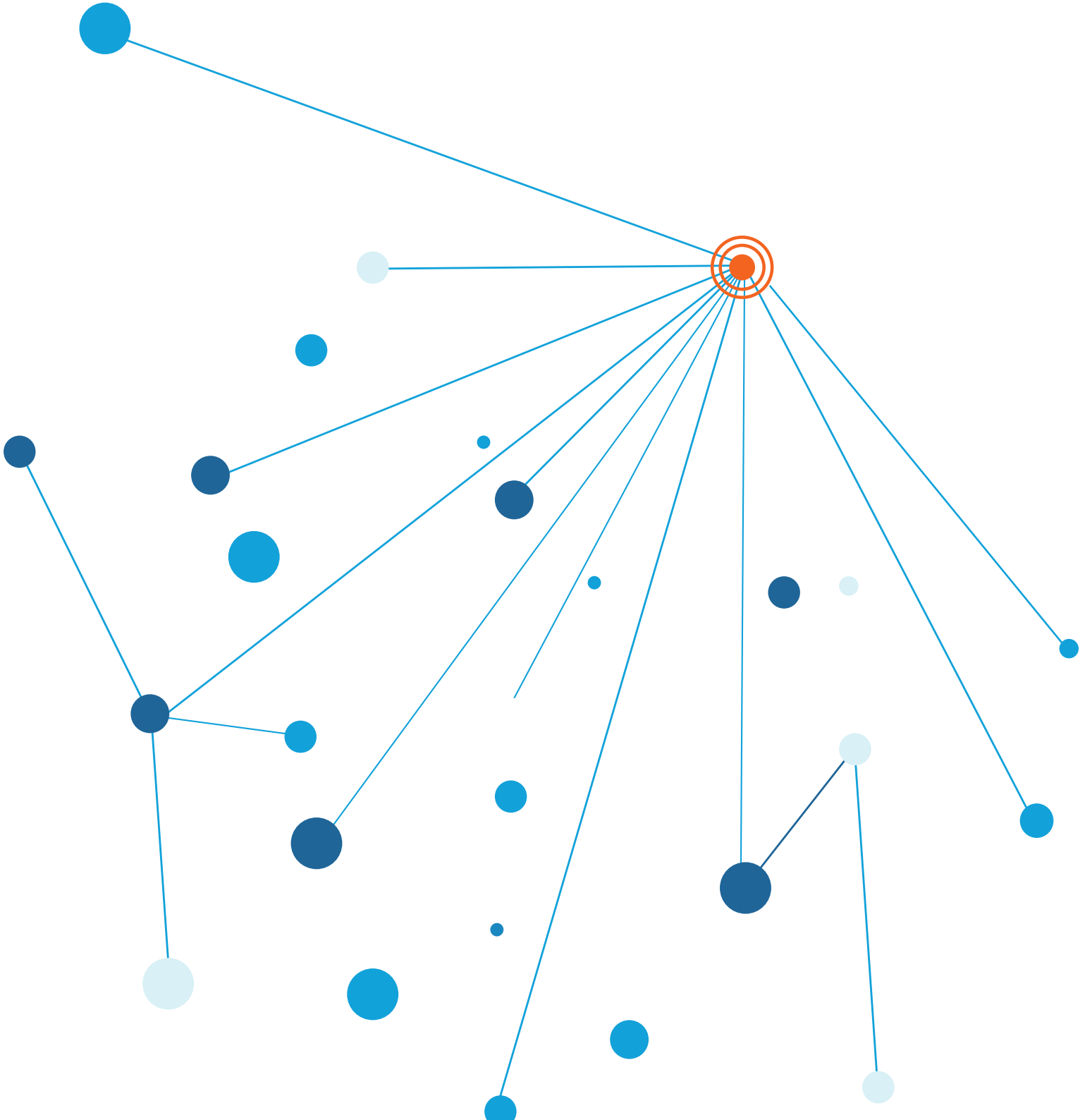
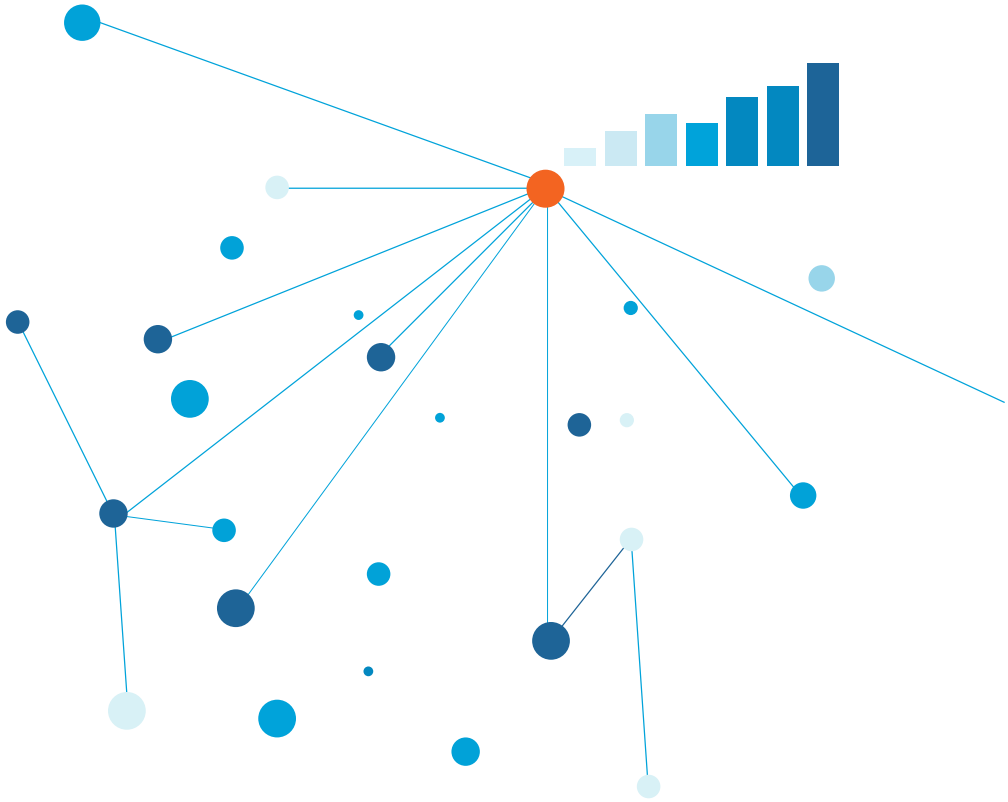


Figure 3.15. Doctorate holders with mobility intentions in 2015: reasons for mobility







Chapter 4

Methodology

Survey objective

Statistics on the careers of doctorate holders produce indicators for personal characteristics, education, employment status, career and international mobility. Data for these indicators are collected via the International Survey on Careers of Doctorate Holders – CDH which is co-ordinated by the Organisation for Economic Co-operation and Development (OECD).

The survey is conducted in compliance with the OECD methodological guidelines using standardized terms and a common model questionnaire. This information is available in the CDH survey methodological guidelines[27], which was drawn up jointly by Eurostat, the OECD and UNESCO.

CDH survey is realized by the National Documentation Centre (EKT), as the body producing the official national statistics for Research, Development, Technology and Innovation and the body responsible for the National Archive for PhD Theses (law n.1566/1985).

The survey was conducted for the first time in Greece during the period December 2014-January 2015, with 2013 being the year of reference.

[27] "Mapping Careers and Mobility of Doctorate Holders: Draft Guidelines, Model Questionnaire and Indicators", 3rd ed., 2012, OECD Publishing (http://www.oecd-ilibrary.org/science-and-technology/mapping-careers-and-mobility-of-doctorate-holders_5k4dnq2h4n5c-en)

Target population

The CDH target population for the reference year 2013 comprised doctorate holders, irrespective of citizenship and employment status (employed and unemployed), who satisfied the following criteria:

- Residents in Greece on 1st December 2013
- Under the age of 70 years old (in 2013)
- Year of doctoral award was during the period 1990-2013

The total population of doctorate holders was established using the National Archive for PhD Theses, maintained by EKT. The Hellenic National Academic Recognition Information Center (Hellenic NARIC) provided additional data, mainly for those awarded doctorate degrees by foreign countries. Following adjustments to meet the survey criteria, the total population of the CDH 2013 was 35,457 doctorate holders.

Conducting the survey

The CDH survey was sample-based and used data on 13,025 doctorate holders applying stratified random sampling for the following characteristics of the population:

- Scientific field of doctoral degrees
- Year of doctoral award
- Gender of doctorate holders

Data was collected during the period December 2014-January 2015 via electronic questionnaire using EKT's specially designed IT systems. Similarly, organisations employing doctorate holders (universities, technological educational institutes, government research centres, and businesses active in R&D) were kept informed to encourage participation in the survey.

The statistical methodology used in order to process and analyse the data of the approximate 4,500 collected questionnaires, was that recommended by OECD.

Basic terms and definitions

Terms and definitions used were those set out in the survey methodological guidelines and are summarised below.

Scientific fields of doctoral degrees

Doctoral degrees were categorised using the six scientific fields and 42 subfields specified by Frascati Manual (Revised Fields of Science, 2007).

Fields of Science and Technology	Sub-field
Natural Sciences	• Mathematics • Computer and information sciences (excluding • hardware development and social aspects) • Physical sciences • Chemical sciences • Earth and environmental sciences • Biological sciences (excluding medical and • agricultural sciences) • Other natural sciences
Engineering & Technology	• Civil engineering • Electrical engineering, electronic engineering, • information engineering • Mechanical engineering • Chemical engineering • Materials engineering • Medical engineering • Environmental engineering • Environmental biotechnology • Industrial biotechnology • Nanotechnology • Other engineering and technologies (food, beverages and other)
Medical & Health Sciences	• Basic medicine • Clinical medicine • Health sciences • Medical biotechnology • Other medical sciences (forensic and other medical sciences)
Agricultural Sciences	• Agriculture, forestry and fisheries • Animal and dairy science • Veterinary science • Agricultural biotechnology • Other agricultural sciences
Social Sciences	• Psychology • Economics and business • Educational sciences • Sociology • Law • Political science • Social and economic geography • Media and communications • Other social sciences
Humanities	• History and Archaeology • Languages and literature • Philosophy, ethics and religion • Arts (arts, history of arts, performing arts, • music) • Other humanities

Employment status

Definitions for employment status are adapted from the International Labour Organisation (ILO)[28] as follows:

Employed:

The employed comprise all persons above a specified age who during a specified brief period, either one week or one day, were in the following categories:

- **At work**: persons who during the reference period performed some work for a wage or salary, or persons who during the reference period performed some work for profit or family gain, in cash or in kind.
- **With a job but not at work**: persons who, having already worked in their present job, were temporarily not at work during the reference period and had a formal attachment to their job. This formal attachment should be determined in the light of national circumstances, according to one or more of the following criteria: the continued receipt of wage or salary; an assurance of return to work following the end of the contingency, or an agreement as to the date of return; the elapsed duration of absence from the job which, wherever relevant, may be that duration for which workers can receive compensation benefits without obligations to accept other jobs.
- **With an enterprise but not at work**: persons with an enterprise, which may be a business enterprise, a farm or a service undertaking, who were temporarily not at work during the reference period for any specific reason.

Employee[29]:

An employee is a person who enters an agreement, which may be formal or informal, with an enterprise to work for the enterprise in return for remuneration in cash or in kind.

Self-employed[30]:

Self-employed workers are persons who are the sole owners, or joint owners, of the unincorporated enterprises in which they work, excluding those unincorporated enterprises that are classified as quasi-corporations.

Unemployed:

The unemployed comprise all persons above a specified age who during the reference period were:

- **Without work**, that is, were not in paid employment or self-employment during the reference period.

[28] Resolutions Concerning Economically Active Population, Employment, Unemployment and Underemployment Adopted by the 13th International Conference of Labour Statisticians, October 1982, para. 9.
[29] Source: System of National Accounts, 1993 Glossary, OECD
[30] Source: System of National Accounts, 1993 Glossary, OECD

- **Currently available for work**, that is, were available for paid employment or self-employment during the reference period; and
- **Seeking work**, that is, had taken specific steps to seek paid employment or self-employment. The specific steps may include registration at a public or private employment exchange; application to employers; checking at worksites, farms, factory gates, market or other assembly places; placing or answering newspaper advertisements; seeking assistance of friends or relatives; looking for land, building, machinery or equipment to establish own enterprise; arranging for financial resources; applying for permits and licenses, etc.

Inactive:

The "population not currently active", or, equivalently, persons not in the labour force, comprises all persons who were not employed or were unemployed and hence not currently active because of:

(a) Attendance at educational institutions.
(b) Engagement in household duties.
(c) Retirement or old age, or
(d) Other reasons such as infirmity or disablement, which may be specified.

Sector of employment

Definitions of sectors of employment are adapted from the Frascati Manual: Proposed Standard Practice for Surveys on Research Experimental Development (2002) as follows:

- The higher education sector is composed of:
  - All universities, colleges of technology and other institutions providing tertiary education, whatever their source of finance or legal status.
  - It also includes all research institutes, experimental stations and clinics under the direct control of or administered by or associated with higher education institutions.
- The other education sector is composed of all institutions providing pre-primary, primary or secondary education, whatever their source of finance or legal status.
- The government sector includes:
  - All departments, offices and other bodies which furnish, but normally do not sell to the community, those common services, other than higher education, which cannot otherwise be conveniently and economically provided, as well as those that administer the state and the economic and social policy of the community. (Public enterprises mainly engaged in market production and sale of goods and services are included in the business enterprise sector.)
  - Non-profit institutions controlled and mainly financed by government, not administered by the higher education sector.
- The business enterprise sector includes:
  - All firms, organisations and institutions whose primary activity is the market production of goods or services (other than higher education) for sale to the general public at an economically significant price.
  - The private non-profit institutions mainly serving them.
- The private non-profit sector includes:
  - Non-market, private non-profit institutions serving households (i.e. the general public).
  - Private individuals or households.

Occupation

The International Standard Classification of Occupations – ISCO-08 is adopted as follows.

1. MANAGERS	
Individuals that plan, direct, coordinate and evaluate the overall activities of enterprises, governments and other organisations, or of organizational units within them, and formulate and review their policies, laws, rules and regulations.	
2. PROFESSIONALS	
Individuals that increase the existing stock of knowledge; apply scientific of artistic concepts and theories; teach about the foregoing in a systematic manner; or engage in any combination of these activities.	
2.1. Science and engineering professionals	Physical and earth science professionals
	Mathematicians, actuaries and statisticians
	Life science professionals
	Engineering professionals (excluding electro-technology)
	Electro-technology engineers
	Architects, planners, surveyors and designers
	unspecified
2.2. Health professionals	Medical doctors
	Nursing and midwifery professionals
	Traditional and complementary medicine professionals
	Paramedical practitioners
	Veterinarians
	Other health professionals
	unspecified
2.3. Teaching professionals	University and higher education teachers
	Vocational education teachers
	Secondary education teachers
	Primary school and early childhood teachers
	Other teaching professionals
	unspecified
2.4. Business and administration professionals	Finance professionals
	Administration professionals
	Sales, marketing and public relations professionals
	unspecified
2.5. Information and communication technology professionals	Software and applications developers and analysts
	Database and network professionals
	unspecified
2.6. Legal, social and cultural professionals	Legal professionals
	Librarians, archivists and curators
	Social and religious professionals
	Authors, journalists and linguists
	Creative and performing artists
	Unspecified
3. Other ISCO-08 groups	

Researcher

According to the Frascati Manual – Proposed Standard Practice for Surveys on Research Experimental Development (2002):

- **Researchers** are professionals engaged in the conception or creation of new knowledge, products, processes, methods and systems and also in the management of the projects concerned.

International Mobility

The OECD's 'Recommendations on Statistics of International Migration, Revision (UN, 1998) states that:

- An **internationally mobile advanced research qualification holder** is an advanced research qualification holder who, since the award of his/her advanced research qualification, has stayed or lived in a country other than that of his or her usual residence for a period of at least 3 months, except in cases where the movement to that country was for purposes of recreation, holiday, visits to friends and relatives, medical treatment or religious pilgrimage.

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