



Report  
2018:4

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Perspectives from Norway, Denmark, Sweden, Finland,  
the Netherlands, Austria and the UK

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# Preface

The higher education sector is increasingly important to society and national economies. Recruitment to academic positions, academic career prospects, and working conditions are critical issues in this regard. Importantly, academic career structures are characterised by different principles for organising academic careers which show distinct national variations. Currently the Norwegian academic career system is under discussion and the Ministry of Education and Research has appointed an expert committee (the Underdal committee) to consider the strengths and weaknesses of the Norwegian academic career system, whether changes are necessary, and to provide recommendations for improvement.

The objective of this report is to provide a comparative knowledge basis for the Underdal committee.

Our work would not have been possible without extensive input and comments from Professor William Locke, University College London; Professor Timo Aarrevaara, University of Lapland; Professor Mats Benner, Lund University; Senior Researcher Kaare Aagaard, Aarhus University; Researcher Inge van der Weijden, Leiden University; and Mag. Elke Welp-Park, University of Klagenfurt.

We also rely heavily on statistical data provided for the purpose of this report by NIFU's R&D statistical network with contact points at the statistical offices and ministries.

Moreover, discussions and meetings with the Norwegian expert committee throughout the process have provided great support for our work.

The work was undertaken by Nicoline Frølich, Kaja Wendt, Ingvild Reymert, Silje Maria Tellmann, Mari Elken, Svein Kyvik, Agnete Vabø and Even Larsen, with Nicoline Frølich as project leader.

Oslo, February 23, 2018

Sveinung Skule  
Director

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# Summary

The higher education sector is increasingly important to society and national economies. Higher education institutions provide key contributions to these processes through their research, education and third mission related activities. The institutions are increasingly expected to cater to a diverse set of expectations from a broad range of external and internal stakeholders. Recruitment to academic positions, academic career prospects, and working conditions are critical issues in this regard. Importantly, academic career structures are characterised by different principles for organising academic careers which show distinct national variation. In the case of Norway, the Ministry of Education and Research has appointed a committee (the Underdal committee) to discuss the strengths and weaknesses of the Norwegian academic career system, whether changes are necessary, and to provide recommendations for improvement. The objective of this report is to provide a comparative knowledge basis for the Underdal committee. The report is based on research literature, secondary sources, statistical data, official documents and expert consultations from selected European countries (Austria, Denmark, Finland, the Netherlands, Norway, Sweden and the UK).

## **Main observations**

Every national higher education system has developed a unique version of an academic career system. This applies to type of academic positions, the relative number of each position, content of academic work related to each position, recruitment procedures, promotion regulations and career paths. In most university institutions, a doctorate is now a formal requirement for being appointed to academic positions. In the non-university higher education sector, a master's degree can be sufficient for appointment to permanent academic positions, but in many countries these institutions prefer to employ people holding a PhD. All higher education systems and institutions have career ladders for academic staff. Within a single higher education system, these ladders may be common to all institutions, or more often, differ between institutions. Typically, universities have other ranking systems while non-university institutions do not.

The recent mergers between universities and university colleges in Norway have prompted discussions regarding the teaching-oriented career ladder. The

countries discussed in this report all have some form of a teaching-oriented career ladder. There is, however, variation in the way this is organised, and the extent to which this follows predetermined institutional categories.

‘Professor of practice’ does not appear to be in widespread usage nor a priority in the countries examined in this exercise, beyond professionally-oriented fields where professional and practice-relevant expertise has always been an important aspect of staff competence.

The situation in Norway is both different and similar to the other countries. The share of basic public funding varies substantially among the countries. In the UK, this share is less than in the other countries at 30 per cent, while Norway is at the other extreme with almost 70 per cent. Such differences are also evident in some of the characteristics of the academic labour market. For example, the share of temporary positions is comparatively low in Norway. Yet, there is increasing competition among young academics for permanent positions also in Norway. Moreover, it should be noted that academic careers are not only embedded in the national higher education system, but in the general labour market tradition and broader legal framework of individual countries. This is an important consideration, not least when the purpose of a career system is also to ensure that academia remains an attractive career for younger scholars. While some of the systems with a very high level of competition and increasing levels of temporary contracts can show high performance and output, this relationship should not be assumed to be causal. It is also possible that this kind of approach can have detrimental effects in the long run. This is particularly the case in countries like Norway, where the labour market conditions in the public sector in general are embedded in a welfare state tradition.

## **Limitations**

This report has taken a broad focus on academic career systems in Austria, Denmark, Finland, the Netherlands, Norway, Sweden and the UK, examining the structure and content of the academic careers system. The expert committee is evaluating a number of dimensions which also have informed the mapping exercise of this report.

These dimensions include the type of higher education system characterising the countries at hand; types of R&D funding and economic conditions; academic career paths; varieties of top tier positions; competence requirements for academic positions; recruitment procedures in particular for top tier positions; share of academic staff at various levels of academic careers; use of temporary positions; mobility between institutions, other sectors outside academia and internationally; professor of practice positions; career opportunities for early stage academics; and tenure track positions.

All in all, the material provides an extensive mapping of the countries' academic career structures. Comparisons of career systems across countries are, however, challenging. Such comparisons usually require in-depth and up-to-date knowledge about each higher education system and its social context. In a number of countries there is lack of research on the non-university higher education sector.

Hence, the data do not enable firm conclusions regarding to what extent, how or why the academic career system of a country affects the national performance in research and higher education. There are many other factors that can affect performance, among other things the amount of funding available and how such funding is distributed, system structure, and historical path dependencies, to name a few. Thus, this report will not provide a definitive answer to the broad mandate of the Underdal committee. However, in line with the objective of this report, it can broaden the perspective on academic career structures by providing a comparative knowledge basis for the discussions of the committee about possible ways forward.

### **Policy context**

Several processes are ongoing both nationally and internationally, with the goal of strengthening the quality of research and education in the university and college sectors, and of intensifying the institutions' contribution to innovation and societal development. The expectations directed at higher education institutions are more complex, more differentiated and perhaps more conflicting. One of the possible tools to handle complexities and contradictions is greater differentiation of the academic career structure, work tasks and working conditions that can support the breadth of the institutions' assignments. In Norway, academic career structure and new merit systems have become one of the focus areas in the further follow-up of the recent white paper on Quality in Higher Education. Among several other measures introduced in the white paper, the Ministry of Education and Research discussed whether changes in the Norwegian system for academic careers were warranted, having examined experiences abroad and the current situation in Norway.

### **Overall observations in more detail**

Unsurprisingly, each national higher education system covered in this report has developed a distinct national academic career system. This applies to type of academic positions, the relative number of each position, content of academic work related to each position, recruitment procedures, promotion regulations, and career paths. Importantly, academic career systems are not static; they are discussed, reformed and changed in the various national contexts.

*Types of higher education systems.* All the countries have different institutional types in their systems. However, there is a variation in how formalised is the

division between universities and other higher education institutions. For example, in the UK the institutions are formally part of the same system (unified), although the pre-1992 division remains to some extent in practice; while in Finland and Denmark, there is a clear binary divide between universities and universities of applied sciences (Finland)/university colleges (Denmark).

*Content of academic work.* In universities, most of the cases indicate many combined teaching and research positions, while in the non-university institutions teaching-oriented positions are typically in the majority. The UK is an important exception, as the university sector also includes a large number of teaching-only positions (often also fixed-term).

*Career ladders.* All higher education systems and institutions have career ladders for academic staff. Within a single higher education system, these ladders may be common to all institutions as in the case of Norway, but more often, differ between types of institutions as well as within the same type of institution. For example, in the UK there is a formal division between teaching and research-only positions, while in Finland the universities of applied sciences have a different career structure from the universities.

*Advancement systems.* Career advancement can be based on promotion or competition. Two transitions are critical, from the PhD to postdoc position(s) and then to obtain a permanent position. In some countries there is strong competition for advancement at all stages of the academic career, but more common are hybrid forms of promotion and competition. Norway is a typical example of a country where promotion is common with the possibility for all tenured academics at lower levels to achieve promotion provided they are found qualified.

*Tenure track models* is a type of advancement system based on promotion in the sense that those who fulfil a specified list of achievement criteria in teaching and research can be promoted to a higher position based on an evaluation of their performance.

*Temporary employment* has been on the rise, but the extent to which it is common varies across countries. This is a contested issue and is viewed by many as a negative development, reducing job security and attractiveness of the academic profession.

In some countries an increasing number of academics working in higher education institutions hold positions that are not part of the regular career structure. This is, for example, the case in Finland and the UK.

The notion of 'researcher' as an alternative career track to regular university posts for externally-funded project workers has appeared on the agenda, or in some instances, re-appeared.

### **A closer look at national variations**

The higher education system in **Norway** is to some extent still a binary system consisting of universities and university colleges. However, due to extensive mergers and the possibility for institutions to apply for university status, the institutional landscape has shifted dramatically. Since 1995, universities and colleges have had a predominantly shared academic career structure with two different career tracks: one research-oriented and the other a teaching-oriented track, and a range of permanent and temporary positions. The typical academic career path in the universities is to move from PhD to postdoc to associate professor, ending with a professor position. Within the university colleges, the main career path has gone from lecturer to senior lecturer, with the docent at the top, but increasingly PhDs are employed following the same career track as in the universities. Both within universities and university colleges there are research-only positions.

**Sweden.** The higher education system is a binary system consisting of research-oriented universities and younger, more education-oriented, colleges. However, individual institutions differ widely, not least in terms of individual employment contracts, sometimes even within individual departments at the same university. The working conditions and the share of teaching and research tasks depend rather more on funding than on the title of the position. The main career path goes from a PhD position to some type of recruitment position, then to a lectorate (associate professor), ending with a professor position. However, in practice there is a variety of pathways up the career ladder. Lecturers may be given the opportunity to apply for promotion to a professor position independent of a vacancy, but this is no longer an unconditional right.

**Denmark.** The higher education system is binary with a sharp division between universities and university colleges. The two types of institutions have separate national memorandums negotiated between the labour unions and the ministry which lay the foundation of the national career system. The division between research and teaching activities among different positions has been a typical debate when negotiating the memorandums for the universities. The latest university memorandum stated that teaching and research were equally important for all faculty members.

At universities, a typical career path is from a PhD to a postdoc position, to an adjunct position (assistant professor), to a lector position (associate professors), ending with a professor position. There are also research-only positions at the universities. The parallel career path at the university colleges is from an adjunct position, to a lector position, ending with a docent position as a parallel to professors at the universities.

**Finland.** The higher education system is binary. The academic career structure in Finland follows a four-tier structure. The lowest tier is the licentiate/PhD candidate; followed by postdoc/senior assistant. These two tiers are normally temporary staff. The third tier is university lecturer (*lehtori*), research positions, and assistant and associate professors. At the highest level, there are professors, and research directors. The four tiers are clearly distinguished.

Staff are expected to engage in both research and teaching, but the way in which these are balanced can vary between institutions. In recruitment processes, universities have full autonomy to design their selection practices, except for professors. Selection practices for academic positions differ greatly across universities (and sometimes within universities).

In the universities of applied sciences, staff categories include senior lecturers, lecturers, full-time teachers, and researchers who are also active in teaching.

The most prestigious category is senior lecturer (*yliopettaja*), responsible for developing the professional field. Lecturers at the UAS resemble lecturers at universities, neither of whom are expected to do research. Teaching is the most important activity for all groups of teachers at the UAS.

**The Netherlands.** The higher education system is a binary system of universities and universities of applied sciences (HBO).

A typical career path in universities follows the trajectory of PhD – other academic posts (including postdoc, researcher and teacher), assistant professor, associate professor and then full professor. In the HBO sector the top post is a 'lector' position. The HBO sector has in recent years become more involved in practice-relevant research, but this function remains comparably modest.

Tenure track has been introduced, but the system remains fragmented, as institutions have different practices for what tenure track entails.

**Austria.** Since 1993, the system has been characterised by a binary structure, when universities of applied sciences (*Fachhochschulen*), and later teacher training schools, were established as higher education institutions. Private universities make up a very small part of the sector.

Academic career paths followed the German career tradition with professorial chairs and the Habilitation until 2002. The Habilitation is no longer a prerequisite for a professorship. Since 2002, staff are employed on private contracts by the universities. Simultaneously senior scientist and senior lecturer positions and tenure track for assistant professors were introduced.

At universities, a typical career path starts with fixed-term contracts related to research and/or teaching, followed by assistant professor, associate professor and full professor. At Fachhochschulen, staff are initially employed as Fachhochschul Lecturer, and, from the fourth year of employment, they are addressed as Fachhochschul Professor.

**UK.** The higher education system is unified and consists of mainly universities and some non-university institutions. The higher education institutions have full autonomy to decide their career structures. Thus, different sets of titles for academic staff and criteria for advancement in the career structure are found in different institutions, especially for academics early in their careers.

Traditionally, the academic career track moved from a lectureship to a senior lectureship, followed by a position as a reader and with professorship as the most senior position. More recently some institutions have introduced American academic titles (full professor, associate professor, assistant professor) in an attempt to internationalise their career structure.

To follow a linear path which moves from lecturer to senior lecturer ('principal lecturer' in post 1992-universities), followed by a position as reader, and then entry into professorship is no longer the reality for most academics. Due to high competitiveness for positions in the UK higher education system, the phase between an obtained PhD and a position as a lecturer has grown longer over the years.

There has been a rise in the number of 'teaching only' contracts at universities, which might be the result of institutional strategies or a wish to perform better in the UK research assessment system. Academics with responsibilities for both teaching *and* research are now a minority.





# 1 Introduction

The higher education sector is increasingly important to society and national economies. Recruitment to academic positions, academic career prospects, and working conditions are critical issues in this regard. International competition for the best and brightest is of real importance. However, international studies of the academic profession and academic working conditions indicate that young academics experience increased competition for permanent positions, heavier workload, and a struggle to find time to research (Barnett, 2008; Gillespie, Walsh, Winefield, Dua, & Stough, 2001; Welch, 2005). Previous studies have indicated that Norway shows a similar development; however, as this report will demonstrate there are important exceptions (Bentley, Kyvik, Vabø, & Waagene, 2010; Vabø & Ramberg, 2009).

Alongside this development, there is an ongoing discussion regarding educational quality in higher education in which attention has been directed amongst others to the pedagogical competence of the academic staff. In its recent white paper on quality in higher education (Meld. St. 16, (2016-2017)), the Norwegian government requires the higher education institutions to develop pedagogical merit systems to encourage more teaching initiatives and to reward important development work. The white paper states that an important objective is to raise the status of educational activity and place greater value on teaching competence throughout the academic career.

Another central issue is the relationship between permanent and temporary employees in universities and other higher education institutions. Internationally, the United States, which for Norway has historically represented an exemplary system of higher education and research, is now characterised by a significant decline in the number of permanent posts and more extensive use of temporary and part-time positions. A similar development has been observed in most European countries (Musselin, 2005, 2009a). A stronger differentiation in recruitment and career conditions between research-oriented and mass-education institutions is an important backdrop for this development in the United States, as in many European countries. In Norway, questions about differentiation of career structure and career conditions in the wake of ongoing mergers between universities and colleges are being discussed.

International comparative studies of the academic profession illuminate that alongside repeated attempts at harmonisation, European countries, through measures linked to the establishment of the European Research Area (ERA), academic career structures and career paths, to a large extent show national variations. This is partially because academic career structures are characterised by different principles for organising academic careers which show distinct national variation. A diversity of conditions; political, economic, systemic, social, demographic and legal, influence the development of the academic career structure. National systems for academic careers vary amongst others in the degree of recruitment from outside; internationally as well as nationally (Afonso, 2016). There is considerable variation in the academic career structure, content of work and tasks, as well as academic titles.

As noted above, the Ministry of Education and Research has established the Underdal committee to examine international experiences and deliberate the situation in Norway. The committee has in its mandate to discuss the following issues:

- Whether the current academic career system can adequately address the multiple functions and roles universities and university colleges have in modern societies. First and foremost, this refers to the relationship between traditional academic competence and other forms of competence that could be the basis for recruitment (i.e. practice, innovation or entrepreneurship-related competence);
- Whether the career system facilitates career trajectories that make this an attractive career choice for both Norwegian and international applicants, and to motivate academic development throughout the whole career.

## 1.1 The objective of this report

The objective of this report is to provide a comparative knowledge basis for the Underdal committee. Based on research literature, secondary sources, statistical data, official documents and expert consultations on the academic career system, career trajectories in selected European countries have been explored.

This report takes a broad focus on the academic career systems in Austria, Denmark, Finland, the Netherlands, Norway,<sup>1</sup> Sweden and the UK.<sup>2</sup>

The expert committee is evaluating a number of issues which also have informed the mapping exercise of this report. These issues include the type of

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<sup>1</sup> However, an overall assessment of the academic career structure preferably, not the least in the case of Norway, should also take into account the research institute sector, which is an important part of the labour market for academics.

<sup>2</sup> These countries are so-called barometer countries, selected by the Ministry of Education and Research in their Research barometer, because they perform well and are not very unlike Norway.

higher education system characterising the countries at hand; R&D statistical information regarding funding and economic conditions; academic career paths; information on top tier positions; competence requirements for academic positions; recruitment procedures, in particular for top tier positions; share of academic staff at various levels of academic careers; use of temporary positions; mobility between institutions, mobility to other sectors outside academia and international mobility; professor of practice positions; career opportunities for early stage academics; and to what extent the various countries have introduced tenure track.

## **1.2 Academic career systems**

Academic careers take place within a complex web of formal and informal rules and regulations, norms and expectations, as well as cultural features of international, national, societal, institutional, professional and disciplinary character. In this report, a few but important components of academic career systems are discussed. Importantly, by the notion of an academic career system we broadly refer to features such as entry requirements; the ranking system; rules and criteria for appointment and promotion; and the type and work content of different positions.

When discussing academic career systems, it is valuable to acknowledge that these social structures embed inherent tensions. Academic career systems are important means to achieve national policy goals for education, research and innovation, based on a diverse range of achievement criteria and pay scales. Academic career systems are also vital to attract talented students and PhDs for research and teaching positions through entailing a predictable future as permanent staff members. Academic career systems are commonly designed to select the most promising young academics from a pool of national and international applicants for permanent employment. Yet, the aim to enhance international mobility and to attract the ‘best and brightest’ may increase the competition for permanent positions nationally. Finally, academic career systems should contribute to retaining excellent staff members and motivating them to enhanced performance in teaching, supervision, research in the academic disciplines and professions, and other duties through promising opportunities for career advancement and progressive pay. These different purposes do not necessarily go well together, yet they co-exist in most systems. The interests of national authorities, higher education institutions, academic staff, and aspiring academics might conflict. This means that career systems can also show some inherent tensions.

In the following we highlight key features of an academic career system which will also be discussed further throughout this report.

### **1.2.1 Entry requirements**

International studies of the academic profession have observed that in most university institutions, a doctorate is now a formal requirement for being appointed to academic positions. However, in many countries universities can also employ lecturers or teaching-only staff based on a master's degree and/or additional practical qualifications. In the non-university higher education sector, a master's degree is normally sufficient for appointment to permanent academic positions, but in many countries these institutions prefer to employ people holding a PhD. Moreover, important national variations exist which will be described in detail in this report.

### **1.2.2 Mobility**

An important distinction between academic career systems is the extent to which mobility throughout the career is facilitated. This refers both to main barriers and facilitators regarding academic career trajectories and mobility within and between different types of institutions nationally and internationally.

Academic advancement and recruitment to academic positions is to a large extent influenced by the promotion system of the country. For example in Germanic *Lehrstuhl* systems, hiring processes traditionally were more 'closed' (Yudkevich, Altbach, & Rumbley, 2015). In other countries systems for promotion based on qualifications have been introduced. However, in many universities, internal recruitment processes based upon personal connections between PhD candidates and their professors have traditionally been common practice. According to Yudkevich et al., 2015, this practice is common globally and might well be a factor in close to half of the world's academic appointments. Over a relatively short period of time, this tradition has, however, been challenged, partly due to a demand by national authorities to advertise vacant positions internationally, and partly due to the development in Europe towards a common labour market for researchers.

### **1.2.3 The ranking systems**

All higher education systems and institutions have career ladders for academic staff. Within a single higher education system, these ladders may be common to all institutions, or more often, differ between institutions. Typically, research universities have other ranking systems while non-university institutions do not. A recent research project on academic work and careers in Europe (Fumasoli, Goastellec, & Kehm, 2015) distinguishes between four main stages in an academic career: doctoral studies, postdoc and junior positions, lower-level senior and

higher-level senior positions. This typology may work well as an analytical device for a comparison of university systems, but falls short if traditional non-university higher education institutions in a broad sample of countries are included.

#### **1.2.4 Career advancement/tenure-track**

We may distinguish roughly between two main career advancement systems: the *competition* model and the *promotion* model (Olsen, Kyvik, & Hovdhaugen, 2005). In the competition model, those aspiring to climb the ladder must apply for a limited number of vacant positions in competition with other applicants. In the promotion model, those who fulfil a specified list of achievements in teaching and research can be promoted to a higher position based on an evaluation of their performance.

The competition for available positions at every career stage has been the traditional model in most European countries (apart from the UK), while the promotion model has been the traditional career system in the USA. According to Altbach (2015, p. 11) the tenure track system in US universities permits entry into the academic profession as an assistant professor 'and a clearly defined path for promotion up the ranks, with rigorous evaluations at several stages, and typically the award of tenure (permanent appointment) after promotion to associate professor on the sixth year.' However, the proportion of tenure track positions has declined substantially to less than half of new appointments (Schuster & Finkelstein, 2006).

#### **1.2.5 Division of tasks – research and teaching**

Comparative studies have shown that conditions of academic work are heavily dependent on national higher education traditions and type of institution. In universities, combined teaching and research positions far outnumber teaching-only positions, while in the non-university institutions teaching-oriented positions are typically in the majority (Kyvik & Lepori, 2010). In addition to variation across institutional categories, the time staff use for research, teaching and other duties varies substantially between different academic ranks, individual staff members, and across countries (Altbach, Reisberg, Yudkevich, Androushchak, & Pacheco, 2012). National differences in the aggregate time used for teaching and research in the university sector are likely to be a combination of differences in institutional expectations of their staff, which partly depends on available funding, professional norms and the proportion of staff in the different academic positions. Typically, full professors formally devote more of their time to research than lower-level staff members (Bentley & Kyvik, 2012).

### 1.2.6 Employment contracts

According to the international literature on the academic profession, an increasing percentage of academic staff are employed on fixed-term contracts (Fumasoli et al., 2015; Yudkevich et al., 2015). Moreover, in many countries an increasing number of academics working in higher education institutions hold positions that are not part of the regular career structure. In most countries, the increase in the number of staff on temporary contracts is a contested development.

### 1.2.7 Homogenisation and diversification of career structures

There is some evidence that institutions with different research and teaching missions have become increasingly similar. There is also evidence that career structures have become more similar across countries. In the university sector, the PhD is becoming a mandatory requirement for entrance into the academic profession, a postdoc position (or phase) is becoming a common step on the academic ladder, and tenure track positions have been introduced in more and more countries, however on a small scale (Fumasoli et al., 2015).

Furthermore, we see a tendency for academic credentials to become inflated. In addition to a doctoral degree, experience from teaching and supervision, one or two postdoc periods along with requirements for international publications as well as research managerial experience seems to have become the new *rite de passage* for achieving tenured positions (Vabø, 2007). At an individual level, more is at stake with regard to what it takes to become a full member of the profession or a principal investigator. It is widely argued that such demanding working conditions cause a leaking pipeline effect, particularly prominent within the STEM fields – as talented researchers, especially women, drop out in favour of alternative careers. Therefore, it is also a societal challenge to create an academic career system without such dysfunctions.

Against this backdrop the proposal of several countries to introduce tenure track models has been promoted.

### 1.2.8 A note on disciplinary differences

Our study focuses on national systems for academic careers; however, it is important to bear in mind that academic careers and criteria for advancement differ largely across disciplines (Fumasoli & Goastellec, 2015). Comparative studies of academic career systems point out that research achievements are essential for advancement in the natural sciences and which also depends largely upon research facilities and research groups. For example, PhD students in the natural sciences often coordinate exercises in the laboratories, but teach courses to a much lesser extent. On another note, medicine is characterised by a stronger

division between clinical work and basic research which pave the way for four different careers and advancement criteria: clinical doctors; professors doing basic research; researchers active in industry research; and a research career in the natural sciences (life sciences). A third example, the professorial chair in the humanities in many European countries, is still important for the academic career of young academics.

## **1.3 Data, methods and design**

This review of academic career systems is conducted in a set of countries that are termed both as relevant and sufficiently comparable to the Norwegian context. These countries were identified in the call for proposals. In this study, each of the countries is viewed as an individual case and includes a general national level description placing the issue of academic careers in a context of key trends in that respective country, with an overview of the structure for academic positions and career trajectories in the country. In addition, a selection of higher education institutions illustrate similarities and differences across and within the various countries.

### **1.3.1 Qualitative data**

Primarily, the national cases are based on documents and official statistics complemented by information obtained from national experts. Relevant documents include legal acts and regulations, policy documents, strategic documents at national level, as well as various regulations, guidelines and procedural descriptions at institutional level.

A set of national level experts commented on the draft case studies, and have also been resource persons to provide additional data and to answer questions. A limited number of brief consultations have been conducted when gaps in the data were identified. This has either been done by phone, Skype, or via e-mail, depending on the nature of the questions.

### **1.3.2 Statistical data**

Statistical data are drawn from a wide range of sources as well as gathered specifically for the purpose of this project.

**National experts:** We have received customised data on academic personnel at different career levels from different statistical offices and national statistical experts on higher education personnel:

- **Austria:** Bundesministerium für Wissenschaft, Forschung und Wirtschaft/Federal Ministry of Science, Research and Economy
- **Denmark:** Uddannelses- og Forskningsministeriet/Ministry of Higher Education and Science and Statistics Denmark
- **Finland:** Statistics Finland
- **Sweden:** Universitetskanslersämbetet/Swedish Higher Education Authority
- **Netherlands:** Rathenau Instituut
- **Norway:** NIFU – Nordic institute for Studies in Innovation, Research and Education
- **United Kingdom:** Higher Education Statistics Agency (HESA)

Statistical data are presented in the statistical appendix, and also embedded in the various national chapters in red text boxes.

**R&D statistics:** Data on R&D statistics are obtained from OECD Main Science and Technology Indicators (MSTI 2017:2) and Eurostat Research and Development Database (headcount). The latest data are from 2015. In addition, NIFU has used preliminary 2016 data from the Nordic countries' producers of R&D statistics. The R&D statistics have been collected in the OECD member countries since the 1960s to provide governments and others with information on resources (expenditure and personnel) used on R&D by different sectors: the business enterprise sector, the government sector, the higher education sector and the private non-profit sector. The production of these statistics is made along common guidelines<sup>3</sup> developed by national experts on science and technology (NESTI). The higher education sector is the most heterogeneous of the R&D performing sectors. For some countries (like Norway) the number of R&D personnel (researchers) and academic personnel will be the same, as all academics are expected to perform R&D. For other countries, the number of academic personnel can be higher, as academic personnel also include people only involved in teaching. Another important element is that personnel involved in R&D at the university hospitals are included in the R&D statistics.

**MORE2:** Study on Mobility Patterns and Career Paths of Researchers from 2013.<sup>4</sup> The study is based on two large-scale surveys among individual researchers and on case-studies. Forty-seven countries are classified along 27 variables to calculate (dis)similarities between the countries when it comes to career paths. A cluster analysis is then used to identify different groups of countries. This information comes from national experts. In our report, we have used MORE data on mobility during PhD, post PhD and on share of part-time work in the higher

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<sup>3</sup> OECD (2015): Frascati Manual 2015. Guidelines for collecting and reporting data on research and experimental development, OECD, Paris.

<sup>4</sup><https://euraxess.ec.europa.eu/content/more2-study-mobility-patterns-and-career-paths-researchers-2013>. Results of the More3 study will be published early in 2018.



education sector. We have also used MORE data regarding 'precarious' working contracts of researchers in the Higher Education Sector (HES).

**The European Tertiary Education Register (ETER)** contains a variety of data on higher education institutions. We have included some data from this source in the study, but as the latest update is for 2014 we have also used other data sources on, for example, the number of higher education institutions where recent reforms have made these numbers outdated for several countries. The data source on number of higher education institutions is therefore updated with input from the statistical experts, web pages of the relevant ministries or more updated national studies.

### 1.3.3 Template for mapping academic career systems

The mapping starts with an examination of national policy documents to broadly identify similarities and differences with the Norwegian context. This concerns core elements such as system structure, main funding approach and national legal framework. Mapping of key policy trends is complemented with the most important national level statistics for higher education and research, i.e. share of public funding and changes over time. The section provides a general backdrop to these national systems and identifies a basis for providing comparisons with Norway with respect to discussions on academic careers.

The mapping at this level covers the following points from the committee's work:

- Whether there is a unitary or binary system and how this is reflected in the academic career system
- Basic funding conditions

The mapping continues by exploring the national system for academic work. This includes for instance the extent to which academic careers are regulated by law (laws related to higher education, as well as general laws and regulations on employment), the identified academic career structures and pathways. The section also covers key changes in recent reforms in terms of academic work.

Furthermore, the section provides an overview of key statistics (including share of academic staff in top tier positions, share of PhD and postdoc positions of total academic staff, share of temporary staff, mobility data).

The mapping at this level covers the following points from the committee's work:

- Career paths: whether there is a single or multiple career path and how these are designed
- Competence requirements for various positions

- Share of academic staff in top tier positions, and which positions these top tier positions include
- Share of academic staff in relation to PhD and postdoc positions
- Use of temporary positions
- Mobility between institutions, mobility to other sectors outside academia and international mobility
- Professor of practice positions
- Career opportunities for PhDs and postdocs
- Elements in the academic career system that focus on recruitment and academic development of early career scholars (i.e. tenure track)

In addition, selected individual higher education institutions are examined. The sample has been guided by a diverse set of criteria aiming at covering the following dimensions:

- Research intensive universities and teaching-oriented institutions
- Universities and other higher education institutions
- Newly merged institutions
- High-performing institutions
- Institutions comparable to Norwegian institutions

Based on this, the following institutions were selected as illustrations (see appendix). It should be underlined that these are examples of types of institutions and are neither representative of their national context nor identical to their Norwegian counterparts. However, these institutions provide a set of examples concerning academic career structures at the institutional level.

Descriptions of individual institutions can be found in the appendix, and examples of career structures are integrated into the text as blue text boxes in the individual national case chapters.

## 1.4 The structure of the report

The report first presents national case studies, followed by a cross-case reflection. An extensive statistical overview is presented in the Statistical appendix. Illustrations from individual institutions are presented in the appendix.

## 2 Norway<sup>5</sup>

### 2.1 The higher education system in Norway

**Institutional overview.** Since 2018 the Norwegian system of higher education consists of 31 institutions: 9 universities, 6 state university colleges, 8 universities of applied sciences (3 private and 5 public), and 8 other higher education institutions (within art, police, defence, nursing). This count is based on the R&D statistics. In addition, there are a few other small HEIs in Norway, but they have very little research activity.

After 2014 the number of institutions decreased in line with politically-initiated merger processes among the state university colleges. Today there are only 6 such institutions left (down from 26). Several of them have submitted applications to attain university status and others are planning to apply. The institutional landscape of the Norwegian HES will continue to change over the next couple of years.

All higher education institutions in Norway receive public funding.

Traditionally, Norway has had a binary system, consisting of universities (including specialised university institutions) and university colleges providing professional programmes predominantly at bachelor's level. However, after the turn of the millennium this divide came under pressure from colleges with university ambitions (Kyvik, 2009). In 2004, the government decided that colleges which fulfil certain minimum standards could apply for accreditation to receive university status (Elken & Frølich, 2016) and three colleges attained this status on their own. Several of the other colleges have attained university status by merging with a university, and most of the remaining university colleges have now merged with other colleges to create larger entities to be able to apply for university status (Kyvik & Stensaker, 2016). Hence, the binary divide has gradually eroded. In 2018, the Norwegian system consists of nine universities (two traditional universities, two that merged with university colleges, one former specialised university institution, and four former university colleges), eight specialised university

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<sup>5</sup> This chapter draws partly on S. Kyvik: The academic career system in Norway (Yudkevich et al., 2015, pp. 173-200).

institutions, six state university colleges and 8 other higher education institutions (art, etc.)

While the binary divide remains in place, in terms of time spent on teaching and research the two sectors are quite similar. As seen in Table 1, there is today no major division regarding time used on research between e.g. professors at universities or other institutions, the latter have even reported that they spend more time on R&D than their professor colleagues at the universities.

**Table 1. Time use in 2016 by type of activity and position. Norwegian higher education sector**

|   | Teaching | Supervision | R&D | Adm. | Other* | Dissemination | Professional activities | (N)   |
|---|----------|-------------|-----|------|--------|---------------|-------------------------|-------|
| <b>Universities</b>                         |          |             |     |      |        |               |                         |       |
| Professor                                   | 31       | 17          | 30  | 16   | 1      | 3             | 1                       | 1 108 |
| Professor II                                | 27       | 17          | 26  | 9    | -      | 2             | 18                      | 49    |
| Docent                                      | 39       | 12          | 29  | 16   | 0      | 3             | 1                       | 56    |
| Associate professor<br>(Førsteamanuensis)   | 42       | 13          | 27  | 14   | 1      | 3             | 1                       | 996   |
| Associate professor<br>(Førstelektor)       | 54       | 5           | 22  | 14   | 1      | 3             | 1                       | 162   |
| Assistant professor<br>(Universitetslektor) | 64       | 2           | 14  | 14   | 1      | 3             | 2                       | 520   |
| Other permanent positions                   | 43       | 4           | 13  | 31   | 0      | 3             | 6                       | 58    |
| Postdoc                                     | 14       | 10          | 64  | 6    | 0      | 3             | 2                       | 208   |
| Researcher                                  | 12       | 13          | 59  | 11   | 0      | 4             | 1                       | 102   |
| PhD   | 20       | 4           | 66  | 5    | 0      | 2             | 2                       | 592   |
| Total                                       | 37       | 11          | 35  | 13   | 0      | 3             | 2                       | 3 858 |
| <b>Other higher education institutions</b>  |          |             |     |      |        |               |                         |       |
| Professor                                   | 32       | 14          | 33  | 14   | 1      | 4             | 1                       | 342   |
| Docent                                      | 40       | 5           | 36  | 11   | 2      | 5             | 1                       | 31    |
| Associate professor<br>(Førsteamanuensis)   | 45       | 9           | 28  | 14   | 0      | 2             | 1                       | 661   |
| Associate professor<br>(Førstelektor)       | 52       | 3           | 24  | 15   | 1      | 3             | 1                       | 249   |
| Assistant professor<br>(Universitetslektor) | 63       | 2           | 15  | 15   | 0      | 3             | 2                       | 778   |
| Other permanent positions                   | 52       | 3           | 14  | 21   | 0      | 2             | 8                       | 85    |
| Postdoc/researcher                          | 37       | 9           | 41  | 8    | 0      | 3             | 2                       | 42    |
| PhD   | 21       | 3           | 68  | 6    | 1      | 1             | 0                       | 165   |
| Total                                       | 48       | 6           | 27  | 14   | 1      | 3             | 2                       | 2 372 |

\*Other category includes museums and artistic work.

Source: NIFU Time use survey 2016, preliminary figures.

**R&D expenditure.** In general, Norwegian R&D expenditure has been lower than in the neighbouring countries over many years. In short this is connected to a business structure within industries that are not very R&D intensive and many small and medium-sized businesses. Total R&D in Norway amounted to 2.04% of GDP in 2016 (preliminary data). This is about EU level and represents a steady increase for Norwegian R&D from 1.5% in 2005.

The Norwegian higher education sector (HES) performs 33% of national R&D (2016). This is higher than in 2005 (31%) and the highest share in the study.

Measured per capita the higher education R&D expenditure (HERD) in Norwegian HES was at 3,600 NOK in 2015. This is about the same level as in Austria, but behind the level in Denmark and Sweden.

From 2005 to 2015 HERD increased by 4.1% per year, this is an increase above the EU 28 and OECD level, only behind Denmark (that had a merging process with research institutes) in this study.

HERD as a share of GDP was 0.6% in Norway in 2015, this is above EU level, but only the UK had a lower share in this study (0.44%).

All institutions have since 1995 been governed by a common Act on Universities and Colleges<sup>6</sup> that provides a common framework for the organisation and governance of these institutions. This act does not contain any direct regulation of the career structure. However, it contains two general chapters on employment and employment conditions. These provisions are supplemented by a more detailed set of regulations concerning appointment and promotion to teaching and research posts, laid down by the Ministry of Education and Research.<sup>7</sup> Beyond these regulations each institution may set its own criteria for each type of post. Research is neither an individual duty nor right, according to national regulation, and the individual institution must distribute the research time among staff. In the traditional research universities, the practice seems to be that staff can use as much time for research as for teaching, irrespective of academic position. As a rule of thumb, professors and associate professors in the universities should teach five hours a week (supervision not included) and use as much time for research as for teaching.

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<sup>6</sup> «Lov om universiteter og høyskoler» (universitets- og høyskoleloven)»  
<https://lovdata.no/dokument/NL/lov/2005-04-01-15>

<sup>7</sup> «Forskrift om ansettelse og opprykk i undervisnings- og forskerstillinger»  
<https://lovdata.no/dokument/SF/forskrift/2006-02-09-129>

**Funding.** With almost 90% of R&D expenditure in HES funded by public sources (87% in 2005), Norwegian HES has the highest share of the countries in the study. Basic funding, or General university funds (GUF) amounts to 69% of total funding (64% in 2005), which is also the highest share of this study. Austria is next at 64%.

Other funding sources then amount to smaller shares as in the other countries of this study. Funding from the business enterprise sector (BES) in Norway is about 3%; this represents a decrease from 5% in 2005. The 2015 share of BES is at the lowest level among the countries in this study, Denmark also has a small share of less than 3%. Funding from abroad amounts to 3% in 2015, the same share as in 2005. This is the lowest share of all other countries in the study; the second lowest share can be found in Austria at 6%.

The private non-profit (PNP) sector funds 3% of R&D in Norwegian HES, the same level as in 2005. Only Austria had a smaller share at 1% PNP funding of HERD in 2015.

## 2.2 The academic career structure

Since 1995, universities and colleges have had a predominantly shared academic career structure with two different career tracks: a research-oriented and a teaching-oriented track, and a range of permanent and temporary positions. The latter includes positions as a PhD candidate, postdoc, and research assistant, although very few are now engaged as assistants. Over the past two decades, most of the research assistant positions (2–4 year fixed-term contracts) have been transformed into fellowships for PhD candidates. Although the career structure has been common across the two sectors, universities have predominantly research track positions while the colleges have a majority of teaching track positions.

### Human resources

*Headcount:* From the R&D statistics we know that 23,400 people (head count) were involved in R&D and teaching in the Norwegian HES in 2015. This is about the same number as in Finland, just behind the Netherlands.

*FTE:* In 2015, researchers in the Norwegian HES conducted almost 11,000 R&D full-time-equivalents (7,500 in 2005). This is the lowest number of FTE among the countries in this study.

### 2.2.1 PhD candidates and postdocs

PhD candidates, of whom two-thirds hold a PhD fellowship, are temporarily employed as academic staff. This means that they have a regular salary,

competitive with the entry-level salary for master's degree holders in the public sector.

Postdoc positions are relatively new in the Norwegian context. The research councils introduced fellowships for postdocs in the late 1980s, while the universities were not allowed to establish such positions until 1997. There has been a sharp increase in the number of postdoc positions over the last decade.

The introduction of organised research training in the 1980s and the subsequent increase in the number of doctoral awards led to a need for temporary postdoc positions to retain talented doctoral graduates in the universities, to further prepare them for an academic career, and to widen the recruitment base for permanent academic positions. In addition, the postdoc position has been regarded as an appropriate means to enhance the quality and internationalisation of Norwegian research through sojourns at foreign universities during the postdoctoral period.

The number of foreign postdocs has increased substantially; partly because salaries for postdocs in Norway are competitive on the international academic market, and partly because many of the foreign PhD candidates who graduated in Norway continue in a postdoc position at a Norwegian university.

### **2.2.2 Permanent academic positions**

As mentioned, Norwegian higher education institutions have a research-oriented and a teaching-oriented career track. The research-oriented permanent academic positions are associate professor (*førsteamanuensis*) and professor, while lecturer (*universitets-/høgskolelektor*), senior lecturer (*førstelektor*) and docent (*dosent*) are teaching-oriented positions, but with the possibility of doing research. The docent position is a relatively newly-established top position for senior lecturers. The post of assistant professor was removed in 1995, and after this date no new appointments for assistant professors has taken place, but those that already had this title are still entitled to use it. Lecturer and senior lecturer are positions that have not been widely used in the university sector. The position of college teacher is used in practice-related professional programmes, mainly in teacher training and health education, and the holders of this position do not have a master's degree. In addition, the universities (and to a limited extent the university colleges) have positions for full-time researchers, some of whom have permanent employment, while most are on fixed-term contracts.

## **2.3 Appointment and promotion**

The basic criteria for appointment and promotion to teaching and research posts are laid down by the Ministry of Education and Research in the The Norwegian Act

on universities and university colleges (*Universitets- og høyskoleloven, 2005*) and supplemented by more detailed regulation (*Forskrift om ansettelse og opprykk, 2006*). People appointed to any of the positions as professor, associate professor, lecturer, senior lecturer and docent will immediately get permanent employment status.

### 2.3.1 Appointment to academic positions

Hiring procedures for academic staff in public higher education are strictly regulated by the Ministry of Education and Research and the individual institutions. Vacant posts at all levels should normally be advertised internationally, unless the content, subject, or the tasks involved in the vacant position are oriented towards Norwegian conditions.

The Act on universities and university colleges determines that a committee comprising three to five people will be appointed to assess the academic qualifications and personal suitability of candidates for a given position. The committee 'shall conduct an interview and solicit references and shall reach a consensus for recommendation to the faculty'. These requirements may, however, be adjusted for positions that are not professorships.

Hiring procedures for applicants for permanent academic positions are cumbersome; in many instances, more than a year can pass before a vacant position is filled. After the review committee makes its recommendation, the highest ranked applicants should also be assessed after their personal suitability for the post, e.g. in relation to teaching, collaboration and supervision abilities. Consequently, interviews and sometimes trial lectures are conducted.

For the position as professor, the regulation proposes the following criteria: scientific or artistic level in accordance with international or national standards, and documenting relevant practical-pedagogical competence (*Forskrift om ansettelse og opprykk, 2006 §1–2*).

The criterion for the position as associate professor (*førsteamanuensis*) is a PhD, or competence at a similar level documented by scientific work of the same extent/scope and quality. The position has the same criteria for practical-pedagogical competence as the professor post (*Forskrift om ansettelse og opprykk, 2006 §1–4*).

For the position as docent, one must document extensive research and development work at a high level directed at the professional field, comprehensive pedagogical development work and other high quality educational/pedagogical activities (*Forskrift om ansettelse og opprykk, 2006 §1–3*).

The criteria for being employed as senior lecturer (*førstelektor*) is comprehensive scientific or artistic work, which in quality and extent corresponds to the amount of work and the level of a doctoral dissertation. It is also specified



that educational or other pedagogical experience shall be emphasised. As with the previous posts, relevant practical/pedagogical competence is highlighted as a criterion (*Forskrift om ansettelse og opprykk, 2006 §1-5*).

Criteria for the position of lecturer (*høyskolelektor/universitetslektor*) are a higher degree exam, and scientific qualifications beyond a master's degree or relevant professional practice. In addition, relevant practical-pedagogical competence must be documented (*Forskrift om ansettelse og opprykk, 2006 §1-6*).

### 2.3.2 Promotion

Since 1993, associate professors have been entitled to apply for promotion to full professor on the basis of their research competence (Olsen et al., 2005). This reform made it possible to become a full professor in three different ways: 1) by applying for a vacant professorship in open competition and being appointed as the best qualified applicant; 2) by applying for a vacant professorship in open competition, being found competent but not the best qualified by the evaluation committee and then being promoted to full professor at his or her department; and 3), by applying for promotion to full professor on the basis of their research competence and being found competent by a unanimous peer review committee. The latter strategy has now become the most common way of becoming a full professor, while substantially fewer people are appointed to an ordinary professorship, due to there being relatively few vacant positions (Kyvik, 2015). Due to this practice, the percentage of permanent academic staff in the universities and specialist university institutions in full professor positions is now very high (more than 40%).

A similar promotion system applies to the teaching track; lecturers can apply for promotion to senior lecturer, and senior lecturers can apply for promotion to docent according to a set of nationally-defined competence rules.

### 2.3.3 Tenure track

Norway does not have a tenure track system, but has recently introduced a small-scale experiment involving talented young scholars. Due to the surplus of PhD candidates and postdocs, and the increasing competition for vacant university positions, the tenure track system has appeared on the political agenda to cater for the need for a predictable career trajectory. However, until recently, counterarguments to the introduction of such a system have proved stronger. In addition to formal legal objections, it has been argued that the introduction of a tenure track system on top of temporary positions as PhD fellow and postdoc might in fact prolong the period of temporary employment. Moreover, that the selection of new (tenured) staff will take place at too early a stage of the academic

career, leading to less competition for permanent academic positions. Nevertheless, in 2013 the Ministry of Education and Research suggested that 300 tenure track positions could be established for a trial period in the fields of technology, natural science and medicine.

### 2.3.4 Adjunct professors (Professor II)

In Norway, there were in total 1,669 people employed in part-time positions as adjunct professor (*professor II*) at Norwegian higher education institutions in 2016. These people have their principal employment in other higher education institutions, in the business enterprise sector, in the health sector, or in the research institute sector. Many of them have practical experience not covered by the ordinary academic staff.

**Table 2. Adjunct professors (Professor II positions) in Norway in 2016 by field of research and sector of main occupation**

| Main occupation        | Humanities | Social sciences | Natural sciences | Engineering | Medical and health sciences | Agricultural sciences | Total        |
|------------------------|------------|-----------------|------------------|-------------|-----------------------------|-----------------------|--------------|
| University or UAS      | 36         | 175             | 45               | 26          | 52                          | 0                     | 334          |
| Health trust           | 2          | 17              | 14               | 2           | 381                         | 0                     | 416          |
| Institute sector       | 4          | 38              | 91               | 41          | 43                          | 7                     | 224          |
| Business/public sector | 27         | 39              | 38               | 81          | 27                          | 2                     | 214          |
| Abroad                 | 52         | 242             | 72               | 33          | 80                          | 2                     | 481          |
| <b>Total</b>           | <b>121</b> | <b>511</b>      | <b>260</b>       | <b>183</b>  | <b>583</b>                  | <b>11</b>             | <b>1,669</b> |

Source: NIFU Register of Research Personnel

## 2.4 Problems and challenges

In recent years, different actors in the higher education system have for various reasons argued that the academic career system should be reformed.

First, many argue that the number of temporary posts is too high. This situation has various causes, but the following example may illustrate one of the challenges: While there was an increase in the number of permanent academic staff in public universities and colleges over the last decade of about 20 per cent, the number of postdocs increased by approximately 75 per cent (Kyvik, 2015).

Second, there is some discontent with the teaching-oriented career track. Some argue that academic staff themselves prefer the research-oriented track, and that the criteria for promotion from lecturer to senior lecturer and further on to docent

are unclear and are practised differently between institutions. Others argue that in order to conduct research-based teaching, all staff members should be active researchers.

Third, the mergers of universities and colleges with different academic traditions and staff structure have led to some challenges in the distribution of individual working time for research and teaching. Staff members employed by the former university colleges tend to have less research time than their counterparts in university positions, however recent numbers indicate that this is changing.

Fourth, many argue that too many academic staff members do not have good enough pedagogical qualifications, and that teaching skills should be given more weight in decisions on appointment, promotion and pay increases.

Finally, universities (and to some extent colleges) employ an increasing number of full-time researchers, in particular to cover the demand for applied research funded by industry, public agencies, research councils and EU programmes. These positions, which may be permanent, but are more commonly temporary, can be regarded as a third career track. There is, however, no common regulation of criteria for appointment and promotion. Furthermore, there is a debate regarding allocation of teaching tasks to researchers in temporary positions.

## **2.5 Summary**

The Norwegian higher education system is to some extent still a binary system consisting of universities and university colleges. However, due to extensive mergers over the last decades and the possibility for institutions to apply for university status, the institutional landscape has shifted dramatically, and in some years most public higher education institutions will most likely have attained university status. Since 1995, universities and colleges have had a predominantly shared academic career structure with two different career tracks: a research-oriented and a teaching-oriented track, and a range of permanent and temporary positions. The typical Norwegian academic career path in universities is to move from PhD to postdoc to associate professor, ending with a professor position. Within the university colleges, the main career path has gone from lecturer to senior lecturer, with the docent at the top, but increasingly PhDs are employed following the same career track as in the universities. Both within universities and university colleges there are research-only positions.

## 3 Sweden

### 3.1 The Swedish system of higher education

**Institutional overview.** The Swedish system of higher education consists of 35 institutions: 14 public and 2 private universities, 14 university colleges (including 4 university colleges with the right to give PhD education in selected areas) and 5 university colleges of art (Haikola, 2015). Hence, the system is better described as a binary<sup>8</sup> rather than a unified system, since the traditional universities are more research oriented, and the younger institutions have less research funding and are more education oriented (Bauer, 2000; Haikola, 2015). The university title is regulated by the national government. The key difference between the types of institutions is that universities can offer PhD education, something the other institutions cannot (The Higher Education Act (1992:1324)).

There have been two major reforms of the Swedish higher education system since the second world war. The first was launched in 1977 to adapt the system to manage the big increase of students. The reform represented a centralisation of the system, establishing a new central agency *Universitets- och högskoleämbetet* (UHÄ) that regulates the HEIs. The reform also embraced a large number of non-university colleges under the umbrella of higher education, such as teachers' education (Daniel Holmberg & Hallonsten, 2015).

The second large university reform in 1993 on the contrary gave the higher education institutions more autonomy, for instance regarding appointments of professors and career opportunities for teachers (Elken, Frølich, & Reymert, 2016). The reform gave the university colleges the right to apply for university status. This resulted in three new universities in 1999 and one in 2005. Between 1998 and 2000, four university colleges were also given the right to offer PhD education in specific academic fields (Daniel Holmberg & Hallonsten, 2015). These policies increased the research capacity of the university colleges. Nevertheless, in 2004 this policy shifted towards concentration of research funding. Two years later the ministry of education stated that Sweden had enough universities, and

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<sup>8</sup> Since 1977 all higher education institutions in Sweden are called 'högskola'.

instead urged the institutions to collaborate. Despite this encouragement only two mergers took place (Holmberg, 2012; Daniel Holmberg & Hallonsten, 2015). In 2010, the university colleges were given the opportunity to offer PhD education in narrower research areas.

**R&D statistical overview.** Preliminary data show that total R&D in Sweden amounted to almost 3.3% of GDP in 2016. This is among the highest OECD levels, and Swedish R&D intensity has been at this high level for more than 10 years. This is also the highest level among the countries in this study.

In Sweden, the HES performs 27% of national R&D. This share has increased from around 22% in 2005. The Swedish share is well above the EU average, but below the corresponding Norwegian share at 33% of total R&D in HES.

From 2005 to 2015 the Swedish HERD had a real increase of 3.5% per year, this is above the EU average share, but a bit below the corresponding share in Norway at 4.1%. The strongest growth in Swedish HERD was in the middle of the ten-year period, while there was almost no real growth from 2014 to 2015.

Measured per capita the higher education R&D expenditure (HERD) in Swedish HES was at almost 4,100 NOK in 2015, which is the second highest level in the study; only Denmark spent more per capita in 2015. HERD as a share of GDP was 0.88% in 2015, in this study only Denmark had a higher share at 0.99% (Norway 0.60%).

**Funding.** In Sweden, 76% of R&D expenditure in HES is funded by public sources (74% in 2005). This is about the same level as in Denmark and the Netherlands. The share of basic funding (general university funds; GUF) amounted to almost 45% in 2015, in 2005 the share was at 46%. The 2015 GUF level of HERD in Sweden is about the same as in Finland.

Funding from the business enterprise sector (BES) dropped slightly from 5% in 2005 to 4% of total HERD in 2015, which is the same level as in the UK and Finland. Funding from abroad amounted to almost 7% of total higher education sector R&D, which is just below the level in Denmark, Finland and the Netherlands at 8–9% (3% in Norway). The private non-profit sector is still a strong funder of Swedish higher education R&D at 10% in 2015, down from almost 12% in 2005. The Wallenberg foundation, Cancerfonden and the Swedish Foundation for Humanities and Social Sciences (Riksbankens Jubileumsfond) are major private contributors to higher education R&D.

### 3.1.1 National laws and regulations

The Swedish Higher Education Act (2013:1117) contains provisions about the higher education institutions accountable to the government. These provisions are supplemented by the regulations in the Higher Education Ordinance (2014:1096).

Chapter 3 of The Swedish Higher Education Act stipulates that higher education institutions shall employ *professors* and *senior lecturers* to undertake teaching and research. The Government issues regulations on the qualifications and assessment criteria that apply to the employment of professors and senior lecturers. It further specifies that: 'Unless otherwise provided by regulations issued by the Government, each higher education institution shall itself decide which categories of teachers, apart from professors and senior lecturers, it shall employ and the qualifications and assessment criteria to apply to such appointments.' Ordinance (1997:797).

As outlined by The Higher Education Act (2013:1117) professorship is the most senior teaching appointment. Section 3 of the ordinance (2014:1096) emphasises that a person whom has demonstrated both teaching and research or artistic expertise shall be qualified for employment as a professor. The assessment criteria for appointing a professor should be the degree of the expertise required as a qualification for employment. Additionally, it is underlined that teaching experience should be given as much attention as research or artistic expertise. Beyond this the ordinance gives the institutions the right to determine which assessment criteria are applied to the appointment of a professor.

Section 4 of the ordinance (2014:1096) proposes the following criteria for appointing a senior lecturer: teaching expertise and a PhD (or the corresponding research competence or other relevant professional experience). As with the professorship, the assessment criteria for the appointment as senior lecturer shall be the degree of the expertise required for the position. The teaching and scientific or artistic experience should be given equal significance, otherwise the institution can determine the assessment criteria.

The only restriction placed on the positions of adjunct and visiting professor relates to the duration of the employment (Section 11–12 Ordinance, 2014:1096).

Section 12 of the ordinance (2014:1096) stipulates that a teacher can be employed in a career development position for an indefinite period of up to four years, to develop research autonomy and qualifications required for appointment to a teaching post requiring more advanced qualifications. Individuals qualified for this position must hold a PhD or have attained equivalent research competence, preferably within the seven years prior to the expiry of the application period.

Chapter 5 of the ordinance outlines employment regulations for doctoral students and assistants. These regulations are mostly on general terms of employment.<sup>9</sup>

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<sup>9</sup> <https://www.uhr.se/en/start/laws-and-regulations/Laws-and-regulations/The-Swedish-Higher-Education-Act/> and <https://www.uhr.se/en/start/laws-and-regulations/Laws-and-regulations/The-Higher-Education-Ordinance/>

## 3.2 Academic career system

**Human resources.** From the R&D statistics we know that there were 43,900 people (head count) involved in R&D and teaching in the Swedish HES in 2015. In Norway, the corresponding number was 23,000 researchers this year.

FTE (OECD MSTI): In 2015, researchers in the Swedish HES conducted almost 16,800 R&D full-time-equivalents (15,100 in 2005). The corresponding number in Norway was almost 11,000 FTE.

Up until 1995 Sweden had one national career system with considerable rigidity. There were fixed teaching obligations and research time was decided at a national level. There was national regulation of professorships, of educational offer and of promotion. There were several challenges with this system as, for example, lecturers without any research time unable to advance their academic careers.

Since 1997 there has been no central career system for faculty at higher education institutions in Sweden. There is much variation in career systems and the use, content and existence of different positions and titles between the different institutions. At the same time, there is also much variation in working conditions between different individuals with the same positions at the same university. Sometimes we find lecturers that have nearly no time for research and lecturers with barely no teaching duties in the same department at the same university (Benner, 2016). The content of their position and employment contract does not depend on the name of their position but how their position is financed. Many positions are results of pie-like funding arrangements, sometimes recorded to multiple funding sources. The Swedish academic career system might seem unitary on the surface, but in reality there is much variation.

The high degree of institutional autonomy of the career systems has not always been the case in Sweden. In the 1960, there was a shift towards decentralisation, giving the institutions more autonomy to make their own academic career systems. In the '80s, there was a shift towards centralisation, which tried to make the system more homogenous across the HEIs. And in the '90s this policy was turned back towards decentralisation and more autonomy for the institutions again (Benner, 2016).

Even though there is much variation between institutions there is some common ground on the use of titles and appointment categories. The system is the same for the universities and the university colleges (*Högskolor*). *Professor* is both a title and a position in the Swedish system, and is the highest academic rank among faculty. *Docent* is a title but not a position. The title refers to a higher academic competence than PhD, and should reflect a wide academic competence and papers published in international journals. Faculty members could apply for the docent title. The process of application is peer-reviewed and sometimes also

includes giving a lecture. The content and qualification of the title is regulated at an institutional level.<sup>10</sup> *Universitetslektor* is a position at both universities and university colleges, normally with a PhD. The *doctor* title requires a PhD, and *Licenciat* is a title corresponding to half a PhD, which sometimes is given after a mid-evaluation of a PhD programme. *Adjunkt* is a teacher at the HEIs without a PhD.

**Employment regulations at Uppsala University.** Requirements for academic positions including teaching function:

- Professors: 10 weeks of pedagogical education (or equivalent) in addition to other traditional academic credentials. The highest academic position.
- University Lector: a PhD and 10 weeks of pedagogical education or equivalent. Appointment as an associate senior lecturer is used as an entry-level position in a research and teaching career. The second highest academic position.
- Assistant University Lector: a PhD and 5 weeks of pedagogical education, or comparable competence.
- Research assistant: a PhD and 5 weeks of pedagogical education, or comparable competence.
- University Adjunct: a higher education degree and pedagogical skills are required.

The time expected to be used on respectively teaching and research is regulated in the document *Lokalt kollektivavtal om arbetstid och arbetstidsberoende ersättningar för lärare*.<sup>11</sup> The professors are in this agreement entitled to spend no more than 25% of their time on teaching. Lectors should not have more than 70% of teaching, and normally a lector has around 20% of their time to do research. University adjunct should not have more than 80% of teaching, and normally a lector has around 10% of their time to do research. Research assistants should not use more than 15% of their time on teaching activities.

Adjunct positions (*adjugerande*) at these levels have the same basic competence requirements as the equivalent full-time positions.

*Anställningsordningen 2012*

<sup>10</sup> <https://www.uhr.se/publikationer/svensk-engelsk-ordbok/docent>

<sup>11</sup> <https://mp.uu.se/documents/432512/914059/Lokalt+avtal+om+arbetstid+och+arbetstidsberoende+ers+fo%C3%B6r+l%C3%A4rare+2013+2693.pdf/1562a234-5701-4daa-a032-e991de77dec1>



**Employment regulations at Karolinska Institutet.** Include four main categories, professors, lectors, university adjuncts and merit positions.

Professor: the highest academic position at KI and could be an employed temporary position. Includes research, teaching and administrative tasks.

- *Adjungerad* professor – should have their main affiliation outside of academia, and could be employed with a position between 20–50% at KI. Should have the same qualification as other professors.
- Guest professor – employed in a position between 20–100% and should be employed at another university.
- Senior professor – for retired professors.
- Clinical professor – a professor working part-time at a hospital, normally working 30% at a hospital and 70% at KI.

University lecturer: the second highest ranked position at KI. For this position a PhD, and normally a qualification at docent level is required. Includes research, teaching and administrative tasks.

- *Adjungerad* university lecturer – The same qualification as for a university lecturer is required, but with main affiliation outside academia. Could be employed in a position between 20–50%. Should have competence for KI that is not to be found elsewhere.
- Associate university lecturer – This is mainly a teaching position, with only some research tasks. Should hold pedagogical competence of a high level and a PhD.
- Clinical lecturer – is a lecturer working part time at a hospital, normally working 30% at a hospital and 70% at KI.

University Adjunct – Should have pedagogical qualification at a high level, but does not need a PhD degree. If the person holds a PhD they have the right to title themselves as University Adjunct PhD. Teaching, research and administrative tasks are expected of people in this position.

- Assistant University Adjunct – the same qualification as a university adjunct, but with main affiliation outside academia.

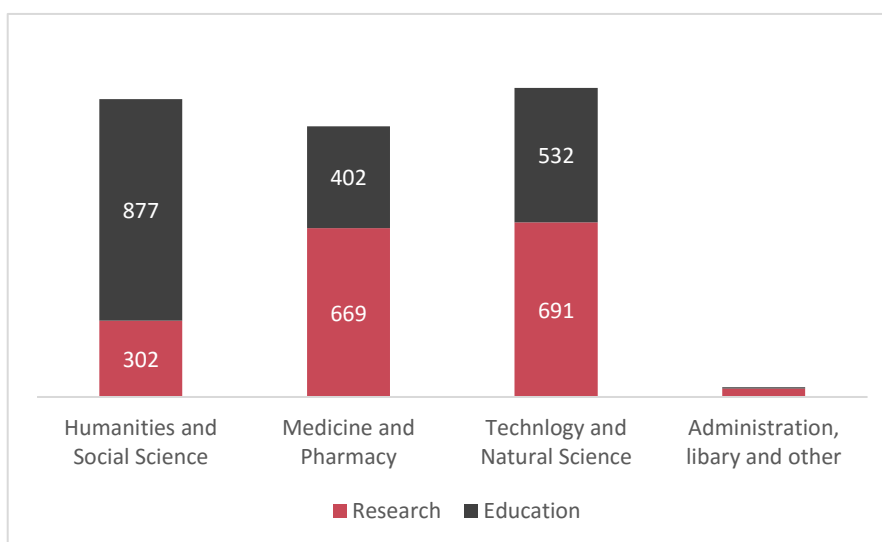
Merit positions:

- Researcher: a position following a position as research assistant with mainly research tasks.
- Research assistant: a temporary merit position with research tasks after PhD, and normally after a postdoc position.
- Postdoc: a temporary merit position with research tasks.

*Anställningsordning för lärare vid Karolinska Institutet 2015*

Vacant jobs should be officially announced. There is a high level of internal recruitment and low level of mobility both between Swedish HEIs, and between Swedish and foreign HEIs (Statens Offentliga utredningar, 2016).

**Two groups of scientific personnel at Uppsala University.** Researchers and teachers. Among the researchers we find leader of a research group (*Forskningsleder*), researcher, research engineer (*forskningsingenjör*), laboratory researcher, and assistant to research activity (*Assiterande forskningsarbeite*). In 2016 there were 1,696 researchers and 1,816 educators of the total of 7,170 employees at the university (*Mangfoldsrapport 2016*).



**Figure 1 Researchers and teachers at different departments at UU 2016.**

Source (*Report of diversity 2016*)

The main career path in Sweden is from a merit position, through a permanent position as lecturer, to professor. There are also other ways to professorship (*Statens Offentliga utredningar, 2016*). Traditionally the Swedish career system has been a dual system, with one group of staff mainly responsible for teaching students and another group of staff primarily responsible for research. This division was established in the 1950s as a response to the massive student expansion and the need for more teaching capacity at the HEIs. The research staff have had less clear working conditions with a larger degree of temporary positions, while the teaching staff had more stable working conditions, but less opportunity to carry out research (Benner, 2016). However, since 1997 the official policy has been that teaching and research are to be seen as inseparable and equally important tasks, and all faculty members are responsible for carrying out the two tasks. However, despite this relatively new policy in the Swedish system the traditional division still presides. As described, the variation in working conditions between people in similar position is large, sometimes even within the same department. There are professors that do not teach, and lecturers that mostly teach without any time to do research. The extent of research tasks in one's position is not determined by the name of the position but by its funding. The

division between teaching staff and research staff could thus be hidden behind the same titles.

In 1997 lecturers were given the opportunity to apply for a higher position independent of any vacancy (Benner, 2016). The application process is peer reviewed where both education experience and research output is evaluated. However today this is no longer an unconditional right.

In the Swedish system there are mostly promotions, seldom competitions, for professorships. There is no national regulation of criteria for promotion, which vary also within universities.

### **3.3 Career opportunities for young faculty**

The postdoctoral phase is viewed as the bottleneck in the Swedish system, and causes uncertainty and difficulties for those who aim for an academic career in a university or college. There are more PhD candidates than there are positions, which makes it difficult for many to advance in the system. The lack of one common career system, and the existence of many different paths to become associate professors and professors, make the Swedish career paths unclear and less transparent both for national and international researchers.

Since 2009 some institutions have implemented tenure tracks. Henningsson et al. (2017) show that tenure track has been applied to qualify for assistant professors, to qualify for associate professors and to qualify for full professors. The reason has been to recruit external talent and young researchers, and to make the career system more transparent. Two of the universities examined in this study also used the tenure track for upgrading staff teaching competence.

The official Swedish report 'Safe and attractive – a research career for the future' (*Statens Offentliga utredningar, 2016*), had a major focus on the uncertainty for young faculty members. The committee opposed the idea that uncertain conditions and a high level of competition among faculty made the researchers more focused and resulted in better research results. Hungry wolves are not the best hunters they claimed, and instead argued that predictable and transparent career paths with good working conditions would attract the best talents, which would result in the best research and teaching of highest quality. A main proposal to improve the uncertain situation for young faculty and solve the bottleneck in the Swedish career system was to introduce 'assistant professor with the right to evaluation for further advancement' as a cornerstone for a tenure track system. The committee argued that a common way for all institutions in Sweden of moving up in the academic career system would make the system more transparent. The proposed tenure track would last for four to six years for researchers with a PhD or equivalent experience of five years. The goal was to improve the participants' teaching skills and research merits, making them more independent and

experienced so as to advance in the system. The appointment should end with a peer-reviewed evaluation of their newly-acquired teaching skills and research merits, and if the candidate is approved as qualified, a permanent position should be offered. This proposal is now being implemented.

### **3.4 Temporary positions**

The share of staff on temporary contracts is greater in the HEIs than in the overall Swedish labour market and among the state employees of which the HEIs are part (*Statens Offentliga utredningar, 2016*). The overall policy in Sweden and in HEIs is that employees have permanent work contracts. However, there are several exceptions for HEIs, for instance when employing PhDs and people in recruitment positions. These exceptions make it easier for HEIs to employ people on temporary contracts. In 2011 the exceptions were limited in order to reduce the number of temporary contracts. However, the number of temporary contracts is still relatively high.

There are more women than men on temporary contracts. This is partly because the staff on temporary contracts are PhDs and staff on different recruitment contracts, where the share of women is higher than at a lector and professor level. The share of people on temporary contracts is also lower at the university colleges since the share of people on lector and adjunct contracts is higher because of their greater education load than the traditional universities (*Statens Offentliga utredningar, 2016*).

### **3.5 Professors of practice**

The opportunity to employ adjunct professors was introduced in order to engage people with experience and qualifications outside academia needed by the HEIs to fulfil their teaching and research obligations. An adjunct professor is a person with his/her main activity outside the university (*Statens Offentliga utredningar, 2016, p. 90*). After some cases of employing adjunct professors without any academic competence at all, the formal requirement for an adjunct professor became exactly the same as for an ordinary professor. Hence, after this adjustment, adjunct professors have been mostly researchers undertaking R&D activities in businesses or organisations, and should thus not be regarded as professors of practice.

Regarding the contact with professional life outside academia, the Swedish system is rather flexible, with long academy-industry, academy-state, and academy-school system relations.

### 3.6 Summary

The Swedish higher education system is a binary system with universities that are more research-oriented, and younger institutions that are more education-oriented. Today the system consists of 16 universities and 14 university colleges.

In Sweden, the institutions have much autonomy to design their own career systems. There is much variation between different institutions, but also between different individual employment contracts, sometimes also within the same department at the same university. Sometimes we find lecturers with nearly no time for research and lecturers who do research most of their time within the same department at the same university. The working conditions and the share of teaching and research tasks do not depend on the title of the position, but more on its funding. A typical career path is to go from a PhD position to a type of recruitment position to get a lectorate (associate professor) position which in the end would qualify for a professor position. But in reality the faculty is moving upwards in the system in very many ways. Lecturers may be given the opportunity to apply for a professor position independent of any vacancy, but this is no longer an unconditional right.

## 4 Denmark

### 4.1 The Danish system of higher education

**Institutional overview.** The Danish higher education system is binary, consisting of research-intense universities and teaching-intensive university colleges. Over recent years there has been a range of mergers of higher education institutions, with the mission to strengthen the system in an international perspective. Today the system consists of 31 higher education institutions: 8 universities, 22 university colleges (including 9 Business academies, *Erhvervsakademier*) and 1 other institution (Probation Learning Centre).

The HEI system experienced almost a decade with a high level of economic growth and funding. In recent years the growth has been replaced by stagnation and cuts in funding, causing challenges for the university career system.

**R&D statistical overview.** Total R&D in Denmark amounts to almost 3% of GDP in 2016 and has been at this high level since 2009. This places Denmark among the countries with the strongest research intensity in the world and right behind Sweden and Austria in this study.

In Denmark, the HES performs almost a third of national R&D. This share increased from around ¼ before 2007 when several research institutions merged into larger universities. This makes the Danish share of national R&D in HES the highest in this study, almost twice as large as the EU average share.

From 2005 to 2015 HERD increased by almost 6% per year, this represents the highest increase in this study. This is connected to the Globalisation Strategy.

Measured per capita the higher education R&D expenditure (HERD) in Danish HES was at almost 4,700 NOK in 2015, which is the highest level in the study.

HERD as a share of GDP was almost 1.0% in 2015 (Norway 0.60%).

**Funding.** In Denmark, 77% of R&D expenditure in HES is funded by public sources (83% in 2005). Only the UK has a lower share of public funding of HERD in this study. The share of GUF amounts to almost 55%; in 2005 the share was at 60%. There has been a shift in Danish HES funding: from basic to external funding, from free research to strategic research, and from smaller to larger grants (Aagaard, 2011).

In both 2005 and 2015, the business enterprise sector (BES) funded less than 3% of total HERD, and funding from abroad amounted to almost 9% which is about the same level as in Finland and the Netherlands. The private non-profit sector has become an important funder of R&D in the Danish HES and accounted for 12% in 2015, up from 8% in 2005. The foundations that have contributed most in recent years are Novo Nordisk Foundation Group, Lundbeck Foundation, the Velux Foundation and the Carlsberg Foundation.

#### 4.1.1 National laws and regulations

The Danish University Act (2011) does not contain direct guidelines on career systems and trajectories in higher education, however it specifies that ‘The minister may lay down rules on employment of academic staff and teachers’ (§29(3)). The memorandums are negotiated between the researchers’ labour union and the ministry. These memorandums have been renegotiated five times since 1993 (Christiansen, 2016). The last negotiation was in 2013, with a directive following in 2015.

The memorandum entitled *Job Structure for Academic Staff at Universities 2013* formed the basis for the subsequent negotiation and the directive from 2015. This memorandum stipulates the job structure and the content and requirement for different positions at universities under the Ministry of Higher Education and Science. The university management defines the specific job content and specifies the tasks in the individual advertisements. The job structure presented in the memorandum contains an exhaustive description of the job categories that apply to the academic staff. The memorandum divides positions into four different levels: 1. Positions below the level of assistant professor; 2. Positions at the level of assistant professor; 3. Positions at the level of associate professor; 4. Positions at the level of professor.

Level 1 consists of PhD fellow (a fixed-term education position), research assistant (fixed-term academic position, the principal duties are research and/or teaching), assistant lecturer (part-time position with teaching duties) and part-time lecturer (part-time position with main emphasis on the performance of qualified teaching duties).

Level 2 contains the positions postdoc and assistant professor/researcher. Applicants for the posts at level 2 must hold an academic qualification at a PhD

level. The post of postdoc is a fixed-term academic position. The post may be filled for a period of up to four years at the same university. The post will normally be heavily weighted in favour of research. However, the university determines the ratio between research, teaching and other duties. The position contains no enhancement of pedagogical competencies; therefore, the post of postdoc does not alone qualify for appointment as associate professor/senior researcher. The post of assistant professor/researcher may take the form of a fixed-term post held for a maximum of four years, or a permanent post where the employee, after a maximum of six years, transfers to a position of associate professor/senior researcher. Provided that the employee is recommended for assessment and is deemed qualified. The university determines the exact ratio between research and teaching.

Positions at level 3 are associate professor and senior researcher. These positions can be attained by employees at the level of assistant professor, provided that the employee is deemed academically qualified, or based on a job advertisement and a succeeding academic assessment. The post of associate professor consists mainly of research and research-based teaching, while the tasks of senior researcher consist of research and research-based public sector consultancy. The university determines the ratio between the various responsibilities.

The level of professor, level 4, distinguishes between professor and professor with special responsibilities. Applicants for a position of professor are assessed based on the qualifications stipulated in the job advertisement. In addition, they must document a high degree of original academic production at international level, which demonstrates that the applicant has contributed to development of the academic discipline. Emphasis must also be placed on the applicant's ability to manage research and other management functions. The professorship mainly consists of research and research-based teaching. Moreover, research-based public sector consultancy, duty to share knowledge with the rest of society, research guidance, supervision and management may be required. The post of professor normally takes the form of a permanent appointment. The qualification requirements for the post as professor with special responsibilities corresponds to those of ordinary professorships. Normally, the post of professor with special responsibilities is established to appoint particularly talented researchers to develop a special field of research or education within one of the university's core activities. This kind of professorship is limited to three to eight years.<sup>12</sup>

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<sup>12</sup> <https://ufm.dk/en/legislation/prevaling-laws-and-regulations/education/files/job-structure-for-academic-staff-at-universities-2013.pdf>



## 4.2 Academic career system

**Human resources.** From the R&D statistics we know that there were 28,100 people (head count) involved in R&D and teaching in the Danish HES in 2014. In Norway, the corresponding number was 23,000 researchers in that year.

*FTE:* In 2015, researchers in the Danish HES conducted almost 16,200 R&D full-time-equivalents (up from 8,200 in 2005). This is well above the number in Norway (almost 11,000 FTE).

Denmark has national guidelines, memorandums that describe the career systems, one for the university sector and one for the university colleges.

### 4.2.1 Universities

The memorandum of the academic career system makes the Danish system more homogenous and standardised across institutions. The old employment contracts reflected heterogeneity to a higher degree, but over the last years, due to these memorandums, the heterogeneity in the system has decreased. Hence the basis of today's career system is better understood by looking into how these memorandums have changed the system. The distribution of teaching and research loads among faculty, temporary positions and career opportunities for young academics have been recurrent topics in the negotiations of these memorandums.

The *1993 directive* aimed to strengthen the teaching focus of the faculty, and divided the staff into three categories: part-time teaching positions, ordinary appointments (adjunct, lector, professors) and supplementary appointments. The supplementary appointments were temporary positions with only research duties. The ordinary positions included both teaching and research activities. The directive also introduced pedagogic competence measures for adjuncts, and teaching requirements to advance to lectors. However research achievements were still the main assessment criteria for advancement to professorship (Christiansen, 2016).

In the *2005 memorandum* the ministry further increased the teaching focus. One of the changes was that temporary and pure research positions were abolished. From now on all positions were to include both teaching and research activities. At the same time the directive introduced temporary ordinary positions (Christiansen, 2016).

The *2005 memorandum* gave the universities more flexibility to make their own position descriptions. An ambition was to make the universities more attractive in the overall labour market and recruit personnel from outside academia. A major change in the career structure was the introduction of a new category, postdocs,

which in fact was a reintroduction of the old supplementary appointments of adjunct researchers. This was a dramatic change in the system. In the next two years more than a thousand researchers were employed in postdoc positions, and the number of employees in ordinary adjunct positions decreased drastically. This was also due to a strong increase in funding. The memorandum also removed teaching requirements for professors and lecturers (Christiansen, 2016). The memorandum was revised again in 2007, after the institutional mergers. This was mainly an adjustment to the recent mergers, and to a lesser extent to changes in the underlying principle of the academic career structures (Christiansen, 2016).

*The memorandum of 2013/15* reintroduced the teaching focus of 1993 and 2000, stating that teaching and research were equally important tasks for all faculty. This was illustrated by the introduction of a six-year tenure track. Moreover, from this point postdocs without teaching experience could not obtain lector positions (Christiansen, 2016). From 2009 to 2015 the proportion of staff at lector level decreased, while the share of staff at adjunct level increased.<sup>13</sup>

#### 4.2.2 University colleges

Similar to the situation in the university sector, there are directives for the career systems at the university colleges in Denmark.<sup>14</sup> The last directive was revised in 2016, and states the conditions, requirements, task and career development opportunities for *adjunkt*, *lector* and *docent*. Compared with the career system at the universities, these positions require fewer research qualifications and only the docent position requires experience comparable to a PhD.

*Adjunkt*: This is a four-year position with the right to promotion evaluation to lector before the end of the term. If the requirement is met the adjunct will be promoted to a lector position. To have an adjunct position requires higher education in the specific field. Relevant non-academic experience could also be considered, so the level of qualification does not only depend on the educational background. The adjuncts are also required to continuously update themselves within their field of practice. The position contains teaching and research tasks, and cooperation with external research groups. In addition, an adjunct should be supervised to qualify for a lector position.

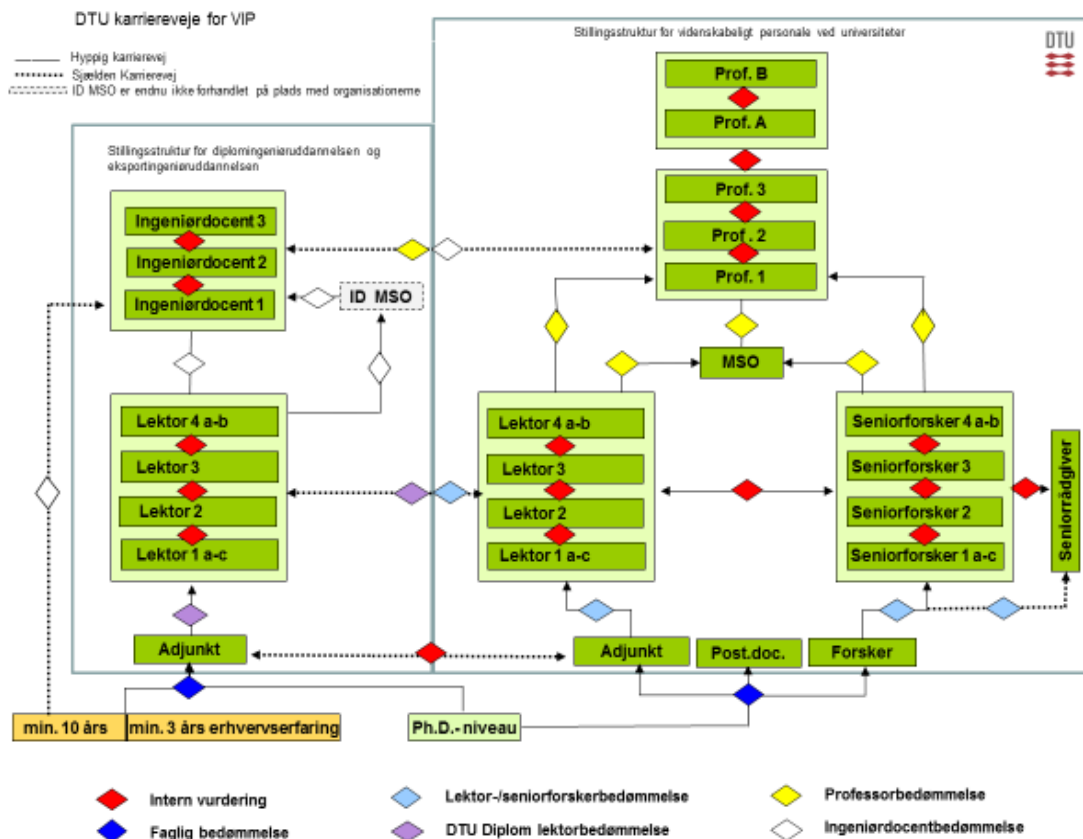
*Lector*: This is a permanent position assigned after a lector evaluation of a candidate's skills, experience, research achievement and educational background. To be hired as a lector one must have advanced teaching skills in one's own field, and the ability to involve relevant international research in the teaching. Lectors have the same tasks as adjuncts.

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<sup>13</sup> <https://ufm.dk/en>

<sup>14</sup> <https://www.retsinformation.dk/pdfPrint.aspx?id=183358>

*Docent*: This is the highest position in this hierarchy, and is either permanent, or a temporary position of up to 6 years. The position requires special qualifications at an international level within fields that are of special interest to the institution. The competence level should be parallel to a PhD, consisting of a combination of relevant education background, practice, teaching and research experience. The docent should be able to independently plan, manage and evaluate research. Docents are also expected to teach and develop teaching methods, be responsible for research, improve the education at the institution, cooperate with relevant groups of professions and research groups, and have leadership responsibilities.



**Figure 2. Career tracks at DTU**

Source: DTU website

**Career system at DTU:** The career system consists of two separate career tracks. One consistent with the national guidelines for career systems at universities, the other equivalent to the guidelines for university colleges. The latter career track is affiliated with the engineering programmes at DTU, and the former is associated with the rest of the academic personnel at the university.

Within the career track for the engineering programme, both work experience (minimum three years) and a PhD qualifies candidates for positions at the adjunct level. The next level is a lector position divided into lector 1 to 4, whereas the top level is an engineering docent position differentiating between docent 1 to 3. A minimum of 10 years of work experience can also qualify candidates for engineering docent positions. Internal assessments determine advancement within each level, while promotion to a higher level is determined by a DTU diploma lector assessment or engineering docent assessment. See Figure 2 on previous page for an overview.

### 4.3 Career opportunities for young faculty members

There has been a strong growth of PhD candidates over the last years, but no similar growth of positions above PhD level. The majority of new PhDs thus have to find employment outside the academic system. The strong economic growth in the higher education sector has been replaced by stagnation which has led to challenges for the university career system. Especially there are bottleneck situations for young faculty members in temporary positions with uncertain career prospects.

Denmark has a strong focus on early career paths for young faculty members. As discussed, the introduction of postdocs in 2005 had a major impact on the Danish system. In 2007, permanent positions based on achievement were also introduced. They also increased the HEIs' possibility to offer researchers several temporary positions (*Statens Offentlige utredninger, 2016*).

The new tenure track was introduced by the universities of Aarhus and Copenhagen in 2013. This tenure track was a six-year long contract leading to a permanent position as associate professor if the research requirements were achieved. The University of Copenhagen's goal was that 80 per cent of the participants in tenure track should achieve permanent positions as associate professor. This arrangement differs from ordinary postdoc arrangements as a temporary research position without any permanent post at the end of the period (*Statens Offentlige utredninger, 2016*).

**Example:** Aarhus University strategy emphasises how they have a specific focus on early career and talent development, offering support for early career researchers. This is especially referred to in the University's own strategy (Strategy 2020),<sup>15</sup> as one of the main priorities in the university mission.

## 4.4 Mobility

The extent to which Danish PhD students stay in Denmark or go abroad after their dissertation varies between the different academic fields. It is much more common for PhDs in the natural sciences to work abroad than those in social sciences. It is worth mentioning that Aarhus University currently is considering requiring that only staff who have been abroad for at least one year in their postdoc period should be offered tenured positions.

## 4.5 Temporary positions

The extent of temporary positions has grown a lot during the last decade – not least because of increased funding allocated as competitive grants, but also as a consequence of the political ambition to double the PhD intake over the last ten years. The most typical temporary positions are PhD students, postdocs, adjuncts, teaching assistants and academic assistants.

## 4.6 Professors of practice

There is a formal type of position labelled *Erhvervsprofessor* – professor of practice – inspired by the so called *Erhvervs PhDs*. This type of professor position is however rarely seen in practice.

## 4.7 Summary

National memorandums negotiated between the labour unions and the ministry, lay the foundation of a national career system in Denmark. The HEI system is binary with a sharp division between universities and university colleges. The two types of institutions also have their own national memorandum. The division between research and teaching activities among different positions has been a typical debate when negotiating the memorandums for the universities. The latest university memorandum in 2013/15 was a reintroduction of the teaching focus of

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<sup>15</sup> [http://www.au.dk/fileadmin/www.au.dk/om\\_au/ledelse/STRAT2020\\_UK\\_FINAL\\_WEB.pdf](http://www.au.dk/fileadmin/www.au.dk/om_au/ledelse/STRAT2020_UK_FINAL_WEB.pdf)

1993 and 2000, stating that teaching and research were equally important for all faculty.

At universities, a typical career path is from a PhD position to a postdoc position, to an adjunct position (assistant professor), to a lector position (associate professors), ending with a professor position. There are also research-only positions at the universities. The parallel career path at the university colleges is from an adjunct position, to a lector position, ending with a docent position as parallel to professors at the universities.

## 5 Finland

### 5.1 The Finnish system of higher education

**Institutional overview.** The Finnish higher education system consists of universities and universities of applied sciences (UAS). A total of 14 universities (plus the Finnish National Defence University) and 24 UAS operate under the Ministry of Education and Culture's administrative branch<sup>16</sup> (plus Åland University of Applied Sciences and the Police University College). This means that there are in total 15 university-type institutions, and 26 UAS-level institutions.

The Finnish higher education system has a binary structure (Börjesson, Ahola, Helland, & Thomasen, 2014). Compared with the binary systems in some of the other case countries, the UAS sector in Finland is relatively new. UAS were introduced only in the 1990s through merging secondary education and higher vocational schools, and were at the time labelled polytechnics. The sector grew rapidly and obtained a solid position as an alternative to university education. Finnish UAS and universities are described as 'different but equal' (Ahola, 1997; Välimaa & Neuvonen-Rauhala, 2010). A key difference is that postgraduate degrees (including the old licentiate degrees) can be earned only in the university sector (Börjesson et al., 2014). Universities' tasks are to conduct research and provide undergraduate and graduate education based on this. The UAS conduct research and development in areas that support instruction and facilitate regional development. They train professionals in response to labour market needs, engage in R&D which supports teaching and promotes regional development. However, given that UAS have acquired R&D tasks as well as master's degrees, the distinction between UAS and universities has become less strict.

In recent years there have been structural changes in the higher education sector, resulting in a reduced number of universities and universities of applied sciences (UAS). The University reform of 2010 recommended among other actions a reduction in the number of institutions in order to reduce fragmentation of

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<sup>16</sup> <http://minedu.fi/en/heis-and-science-agencies>

research and teaching, and in this manner enhance international competitiveness of Finnish higher education.

**R&D statistical overview.** Preliminary 2016 figures show that total R&D in Finland amounted to 2.75% of GDP in 2016. This is among the highest OECD levels, but in Finland this means a small decrease since 2005 (3.3%) and the top years 2009 and 2010 at 3.8%. There has been a major slowdown in Finnish GDP and even a real decrease in total R&D expenditure since 2009.

In Finland, the HES performs a quarter of national R&D. This share has increased from around 20% in 2005. The increase was strongest in recent years in this period. The Finnish share of R&D in HES is on the same level as the Austrian share, among the lowest in the study, but higher than EU level at less than 18%.

From 2005 to 2015 HERD increased by 1.5% per year, this is the about the same share as in the Netherlands (1.4%) which represents the lowest increase in this study. In fixed prices HERD was higher in the middle of the ten-year period. The general slowdown in the economy and in public spending is an important explanation of this.

Measured per capita the higher education R&D expenditure (HERD) in the Finnish HES was at almost 2,900 NOK in 2015, which is the second lowest level in the study (the UK spends less). A few years ago, the level in Finland was almost the same as in Norway.

HERD as a share of GDP was 0.7% in 2015 (Norway 0.6%).

**Funding.** In Finland, 82% of R&D expenditure in HES is funded by public sources (81% in 2005). The share of GUF amounts to almost 48%; in 2005 the share was 45%.

Also in Finland, there have been (with the university reform of 2010) measures to make Finnish HEI expand their funding base; they were made independent legal entities and there has been strong focus on increasing scientific publishing. In recent years the weakening of the country's economy has caused a reduction in basic funding that represents a major challenge to the sector experiencing many researchers looking for jobs abroad.

Funding from the business enterprise sector (BES) dropped from 7% in 2005 to 4% of total HERD in 2015 which is the same level as in the UK and Sweden. Funding from abroad amounted to almost 9% which is about the same level as in Denmark and the Netherlands (3% in Norway). The private non-profit sector funds 4% of R&D in Finnish HES (3% in 2005).

### 5.1.1 National laws and regulations

The Finnish higher education system used to be a state-controlled system, but has now followed the example of the reform trends in other European countries,



emphasising steering at a distance and autonomy on the one hand, and emphasising performance on the other. It is a predominantly public system that has been going through a series of change processes in recent years. Dramatic changes took place in Finnish higher education policy during the 1990s, also linked to the recession that the country had been experiencing (Hölttä & Malkki, 2000). The shift towards more autonomy started with the Universities Act of 1997. An accompanying trend has been the emphasis on performance, also at individual level. Since 2005, the universities have been operating with a reward-based salary system. Recent changes have further intensified the competitive aspects in the system.

One of the key reforms in recent years has been the reform of ownership of universities (2010) and the UAS (2013). The underlying aim was to promote a more entrepreneurial approach among the universities (Aarrevaara, Dobson, & Elander, 2009). The new Universities Act was enacted in 2009 and entered into force in 2010. Prior to the new reform, universities used to be state-owned institutions, and academic staff were civil servants. As a result of the reform, from 2010 universities became either independent corporations under public law or foundations under private law (EUI, 2016b). Currently, two universities are foundations under private law (also known as ‘foundation universities’). The UAS went through a similar reform process a few years later, resulting in a changed legal status. The UAS are now considered as limited companies, with multiple owners (municipality, region, private) (Elken et al., 2016).

A consequence of these two reforms is that academic staff are no longer civil servants. Instead, individual academic staff have a formal contractual employment relationship with their institution. In the main legislation for universities (Universities Act 558/2009 and Decree 770/2009<sup>17</sup>) provisions exist for mission, organisation, and for students. Universities have wide procedural autonomy in their internal administration and economic matters.

In general, the sector is described as highly autonomous. With regard to academic staff, the Universities Act (558/2009) specifies that universities employ professors, other teaching and research staff, and other personnel. However, ‘further provisions on the qualification requirements of staff and the procedures for recruitment are specified in the university rules of procedure’ (The Universities Act (558/2009) (Chapter 4. Section 31).

## **5.2 Academic career system**

Traditionally, the Finnish system built on the Germanic chair system, with influential professorial chairholders in the various departments. At the universities, academic staff have been traditionally divided into professors, other teachers, and researchers. The Universities Act (558/2009) provides only that

universities have professors, other teaching and research staff, and other personnel. Further provisions on competencies and recruitment are given in the ordinances of each university (Ahola, Hedmo, Thomsen, & Vabø, 2014).

**Human resources.** From the R&D statistics we know that 22,300 people (head count) were involved in R&D and teaching in the Finnish HES in 2014. In Norway, the corresponding number was 23,000 researchers this year.

FTE: In 2015, the researchers in the Finnish HES conducted almost 12,400 R&D full-time-equivalents (this is about the same level as in 2005). The corresponding number in Norway was almost 11,000 FTE.

The current academic career structure in Finland follows a four-tier structure that was introduced in 2010. The lowest tier is the licentiate/PhD candidate; followed by postdoc/senior assistant. These two tiers are normally temporary staff. The third tier is university lecturers (*lehtori*),<sup>17</sup> research positions, and assistant and associate professors. At the highest level, there are professors and research directors. The four tiers are clearly distinguished and described in more detail below:

At the first level, assistant positions (assistant/research assistant) are normally held by PhD students who perform a variety of tasks for professors and lecturers. Teaching is often a main task in these positions (EUI, 2016b). In Finland, doing a PhD is a requirement for an academic career and structured doctoral programmes have recently been established (Brechelmacher, Park, Ates, & Campbell, 2015; Hakala, 2009). The standard time to complete the degree has been reduced to 4 years.

At the second level, postdocs and senior assistants are normally expected to do both teaching and research. In order to be eligible, a completed PhD degree is expected, as well as demonstration of teaching skills. The latter can be demonstrated by referring to experience with teaching or by courses in pedagogical skills (EUI, 2016b). At this level, positions are predominantly temporary.

At the third level, the lecturer position is a teaching-oriented faculty position usually with more than 50 per cent of the time devoted to teaching (EUI, 2016b). However, a certain amount of research is also expected from lecturers. While the position is a predominantly teaching position, a PhD degree is nevertheless expected. It is commonplace to have experience as temporary staff before getting a lecturer position. In the recruitment process, trial lectures are used as a part of the appointment process (EUI, 2016b). Tenure track positions exist, but only for a small share of the staff.

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<sup>17</sup> Yliassistentti was a term in the old system that is sometimes translated as assistant professors, but some universities would not use this translation.

At the highest tier of positions are the professor and research director level positions. A good record of research and publication output is expected in order to be competitive at this level. However, given that the tier below (lecturer) requires a high level of teaching, this can be difficult in the Finnish context (EUI, 2016b). To obtain a professorship, usually open calls are used, followed by a review process. It is possible to advance without an open call, but such a promotion still needs to go through a review process. However, closed calls can also be used in some circumstances (Universities act, section 33, point 2):

*Professorship duties must be publicly announced vacant when recruiting a person for an employment relationship that is effective until further notice. The professorship may be filled by invitation without public notice of vacancy when an academically distinguished person is being invited to take the position or a candidate is appointed to the position for a fixed period. Only a candidate who indisputably fulfils the qualification requirements may be appointed to the position by invitation.*

While the aim was to create more transparency, a recent evaluation in 2015–2016 showed that the four-tier model had not made academic careers more predictable<sup>18</sup> for academic staff, as transitions from one tier to another are often through open competition. Only a small share of positions are included in the tenure track system. However, more importantly, the four-tier model is practised and understood quite differently by different institutions. As a result, the rules of competition within the system can become rather unclear, and the criteria for advancement are not always clear for the individual staff (for an example of the formal criteria, see the following illustration from the University of Helsinki).

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<sup>18</sup> <https://www.uta.fi/ajankohtaista/uutinen/tutkijoiden-uramalli-ei-parantanut-urakehitysta>

#### **Criteria for advancement at University of Helsinki<sup>19</sup>**

- Level 1, doctoral student: a second cycle degree with an approved research proposal, as well as ability and motivation to complete their postgraduate studies.
- Level 2, postdoctoral researcher: a doctoral degree, to be able to do independent scholarly work and also show relevant teaching skills. Postdoc positions are normally held for 3-5 years. To be appointed as a university instructor, relevant second cycle degree and teaching experience needs to be demonstrated. In this case, pedagogical experience is valued. In general, university instructor positions are used in a limited manner for some practical positions.
- Level 3, university lecturer or clinical instructor: a doctoral degree and an ability to provide high quality teaching and supervision. To be appointed as a university researcher or equivalent, a doctoral degree and evidence of scholarly research are required, as well as the teaching skills necessary for the position. It is expected that people at this level are able to lead a research group and apply for external research funding.
- Level 4, professor position: a doctoral degree and top-level scholarly output, experience in supervision of scientific research, and ability to provide top-level teaching and supervision. Academic leadership ability is expected. For research director and senior curator positions, qualifications equivalent for professor position are expected, while specific attention is put on academic leadership experience and research work, success in external funding and evidence of international cooperation.

Assistant professor positions are used as the first contract of the tenure track system, whereas associate professor positions are the second contract in tenure track system. At the University of Helsinki, these two positions are only used for fixed-term contracts that are part of the tenure track path, with an expectation to lead towards full professorship.

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<sup>19</sup> <http://www.helsinki.fi/recruitment/qualifications.html>

In 2010 the University Act was changed and 'docent' became an academic title (not a position). (see text box for examples).

**University of Helsinki** has granted about 4,400 docent titles. The title is granted by the chancellor and proposed by the faculty, based on applications. The applicant should possess extensive knowledge in her or his field (comparable to at least two doctoral dissertations), the ability for independent research documented by publications, excellent teaching skills assessed by independent assessors. The key task of docents is to teach and supervise. Docents have the right to supervise licentiate and doctoral theses. Docents at the university of Helsinki often work as researchers. The title of docent signifies to the academic community that the docent is an expert in research and teaching of their field.<sup>20</sup> Every year, around 180 new docentships are granted.

**University of Lapland** also has a range of docent positions.<sup>21</sup> The rules state that it is possible to become a docent if the appointee shows: thorough knowledge of their field; publications or other means of independent research or artistic work; and good teaching skills. Docent status is granted upon application to the faculty or responsible teaching unit, who will make an evaluation of the necessity of docentship for their profile. The rector makes the final decision regarding the number of docents. Docents are used in research projects, groups and in both basic and postgraduate education.

The composition of the teaching staff at the UAS differs significantly from the universities. Staff categories include senior lecturers, lecturers, full-time teachers and researchers who are also active in teaching. The most prestigious category of the teaching staff at the UAS is senior lecturer (*yliopettaja*), responsible for developing the professional educational field, but they can also have tasks related to research. The UAS aim at recruiting PhD candidates or holders of licentiate degrees to the position of senior lecturer. The lecturers at the UAS resemble the lecturers at universities, neither of whom are expected to do research. Teaching is the most important activity for all groups of teachers at the UAS.

In general, the two sectors differ substantially in the requirements for promotion. While research merits weigh heavily in the university sector, in the UAS sector it is teaching or practice competence that is valued.

### 5.3 Temporary employment

Temporary employment is regulated by the Employment Contracts Act which states that fixed-term contracts can be used on justified grounds (i.e. PhD position) and should generally be considered an exception.<sup>22</sup> Yet, positions at the two lowest

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<sup>20</sup> <https://www.helsinki.fi/en/university/docents>

<sup>21</sup> <https://www.ulapland.fi/FI/Yliopisto/Toihin-yliopistoomme>

<sup>22</sup> [https://tieteentekijoidenliitto.fi/en/employment/fixed-term\\_employment\\_contracts](https://tieteentekijoidenliitto.fi/en/employment/fixed-term_employment_contracts)

tiers are predominantly temporary and a number of employees on the highest tier can also end up with fixed-term contracts. The issue of temporary employment is considered contentious in the system.

This temporary status also defines work conditions in academia. The issue is also closely related to availability of tenure track positions, and also the kind of incentives provided by the professor of practice model (see section 6.7.).

## 5.4 Teaching and research

Staff at universities are expected to engage in both research and teaching, but the way in which these are balanced can vary between institutions. Statistics Finland data indicate that academic staff at universities spend 44 per cent of their time on teaching, 40 per cent on research and 16 per cent on administrative work, with great institutional and disciplinary variety (EUI, 2016b). Regarding actual working tasks, the division between teaching and research in the different staff categories has become increasingly blurred (Ahola et al., 2014). Institutions have also various internal initiatives for rewarding teaching excellence.

**Teaching Academy at the University of Helsinki.** To reward excellent teaching, the university appoints every year 20 fellows to the 'Teachers Academy' which is a multidisciplinary collegial network.<sup>23</sup> The fellows receive a personal two-year grant, and their home unit receives a grant for development efforts – this funding must be used for professional development and development projects of teaching.

Membership is based on application, where application must include a teaching portfolio, a CV and recommendations from students and colleagues. In the portfolio the candidates must present, describe and analyse their competence and teaching innovation projects. The criteria that are emphasised are teaching experience, pedagogical courses, ability to produce learning material, development of teaching and other investments related to teaching activities. Assessment is not made on a one-size-fits-all way, but aims to value different forms and models of being a good teacher.

In recruitment processes, universities have full autonomy to design their selection practices, except in respect of professors. Selection practices for academic positions differ greatly across universities (and sometimes within universities) (Kivistö, 2017).

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<sup>23</sup> <https://www.helsinki.fi/en/university/teachers-academy>

**The use of teaching portfolios at the University of Lapland.** For teaching-intensive positions, applicants are asked to provide a portfolio that documents their teaching activity, its quality and merit. The specific criteria are determined locally. For example, for the language centre, the following structure is suggested:<sup>24</sup> teaching philosophy; teaching history/teaching experience; self-evaluation of teaching; feedback from students and colleagues; learning material produced; activity in higher education pedagogy; development of teaching.

## 5.5 Mobility

There are comparatively low levels of mobility between the UAS and the university sector, as the career advancement demands in the two sectors are different. In order to advance in the university system, there is heavy emphasis on research production. There is also comparatively little transfer between industry, public administration, and academia.

## 5.6 Professors of practice

The system with ‘professor of practice’ has been introduced in some institutions. There are no coherent national rules for this system, but the University of Aalto has a large number of such positions (about half of all professor of practice positions in the whole system).

In 2017, Aalto revised its rules for the use of the term, and the term is now described for positions where this title ‘acts as a mechanism through which practical expertise and societal knowledge transfers to the university community. The position provides an opportunity to engage qualified, business or public sector leaders and experts with academic background to Aalto University for special purposes. The emphasis in the work profile is teaching. The Dean is responsible for specifying the requirements for Professor of Practice positions’.<sup>25</sup> What this suggests is that there can also be variation in how different faculties organise their professor of practice systems. Given the specificities of disciplinary demands, this can also be seen as somewhat expected.

Given also the autonomy of institutions in Finland, there is variation in how they use this term. The idea of professor of practice was to attract people from work life and public administration. Many of these positions are in the technical disciplines, as these positions are funded by industry. However, given that these are primarily fixed-term contracts, there are doubts whether there are the right

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<sup>24</sup><https://www.ulapland.fi/InEnglish/About-us/Vacancies/Teaching-Portfolio-Guidelines/Teaching-Portfolios,-Language-Centre>

<sup>25</sup> [http://www.aalto.fi/en/about/newsletter\\_news/2017-01-10-021/](http://www.aalto.fi/en/about/newsletter_news/2017-01-10-021/)

kind of incentives in the system to attract the top people from the field of practice. As a consequence, differentiation between professor of practice and ordinary professors can in some cases become somewhat blurred, as both positions have teaching tasks, and they also compete with other ordinary professors for external funding for research. As an example, at the University of Helsinki, the first professors of practice were hired in autumn 2017.<sup>26</sup> Their requirements refer to a PhD, professional merits and expertise outside academia. The positions are also teaching-oriented and fixed-term.

Overall, one can argue that while the position exists in the system and there are some institutions which have a substantial number of such positions, there is no clear and comprehensive system for this function.

## 5.7 PhD education

Historically, Finland had the German-style doctoral training with high emphasis on the dissertation, and relatively unstructured PhD programmes. This situation changed in the mid 1990s with the introduction of a nationwide graduate school system that contributed to a more systematic and structured PhD education (Hakala, 2009). In general, there are a limited number of jobs in academia and the means to advance can also take place through informal processes, and with a range of short-term contracts (EUI, 2016b).

## 5.8 Tenure track

In Finland, elements of a tenure track system more or less loosely based on the US tenure track have recently been established (Brechelmacher et al., 2015). The intention is to bridge the gap between fixed-term university assistant positions and professorships by introducing a trial period from assistant to associate and full professor (Brechelmacher et al., 2015). According to Kivistö (2017) tenure track positions are rather rare (only 5–10% of all vacancies) and there is great variation across universities how the tenure track system is applied (Kivistö, 2017). There is no comprehensive tenure track system, but individual tenure track paths in different universities. Moreover, given a considerable number of fixed-term contracts in the system, these positions can also create a sense of unfairness in situations where the rationale for this existing in some cases and not in others remains unclear.

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<sup>26</sup> <https://www.helsinki.fi/en/news/higher-education-science-policy/first-new-professors-of-practice-appointed-at-the-university-of-helsinki>



**The University of Helsinki** has a tenure track system which was introduced in 2012. Those appointed to a tenure track system are employed as assistant professors on a fixed-term contract of 3–5 years, with a set of pre-determined success criteria. If these criteria are met, another fixed-term contract can be provided as an associate professor, after which, a permanent position as a professor may be obtained.

## 5.9 Summary

Finland has a binary system with 15 university-level and 25 universities of applied sciences-type institutions. The UAS sector was introduced during the 1990s and now has a substantial share of the students.

The system is a predominantly public system, where the most significant recent reform concerned the formal status of institutions. Since 2010, universities are independent corporations under public law or foundations under private law, and since 2013 a reform of the UAS sector was also carried out, so UAS are now considered limited companies.

Formally, there is a four-tier system for academic careers in all Finnish institutions. However, the overall system is being practised differently in the different institutions. Institutions have high autonomy in their internal career systems. A typical career path is from PhD to postdoc, then to university lecturer and finally professor. In UAS, the typical path is from lecturer to senior lecturer. In general, research merits count most in the university sector, and teaching and practice merits in the UAS sector.

The system is marked by a substantial share of fixed-term contracts, primarily on the two lower tiers, but also among the higher tiers. About half of the positions are temporary.

There are also a range of professor of practice positions, with Aalto University having a substantial share. This position has a somewhat blurry boundary with ordinary professors.

Some institutions are also experimenting with various tenure track options, but the general share of such positions is small.

## 6 The Netherlands

### 6.1 The Dutch system of higher education

**Institutional overview.** The Dutch higher education system currently comprises a total of 57 higher education institutions: 14 universities and 43 HBO institutions.<sup>27</sup> The two sectors have significant differences (Vossensteyn, 2017). They have different objectives, admission requirements, programme duration and degree titles. This difference in orientation continued after the introduction of the bachelor's-master's degree structure in 2002 and the Bologna process.

Dutch higher education has a binary structure, with research-oriented education (*wetenschappelijk onderwijs*) and higher professional education (*hogere beroepsonderwijs*). Research-oriented education is primarily offered at research universities (*universiteiten*) and higher professional education at universities of applied sciences (*hogescholen, HBO*).

The HBO formally became a part of higher education with the HBO Act in 1986. Since 2008, HBOs may use the term 'university of applied science'. HBO education is usually closer to the practice field and is offered in seven different sectors – economics, health care, agriculture, teacher training, social work, arts and engineering. The relationship between universities and HBO has been the subject of continuous debate (Egbert de Weert & Leijnse, 2010). Despite the binary policy, both types of institutions are covered by the same law. The main difference is the status of research and the provision of postgraduate education. Traditionally, the HBO sector was teaching only. In recent years, HBOs have developed a practice-oriented research profile, a process supported by the government (Egbert de Weert & Leijnse, 2010; Egbert de Weert & van der Kaap, 2014).

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<sup>27</sup> <https://www.government.nl/topics/secondary-vocational-education-mbo-and-higher-education/higher-education>

**R&D statistical overview.** Total R&D in the Netherlands amounted to almost 2.0% of GDP in 2015. This is about EU level and represents an increase from 1.8% in 2005.

In the Netherlands, the HES performs almost one third of national R&D. This is about the same share as in 2005, in 2009 and 2010 the share was 40%. The Dutch share of R&D in HES is about the same level as in Denmark and Norway.

From 2005 to 2015 HERD increased by 1.4% per year, this is the lowest increase in this study (in Finland 1.5%).

Measured per capita the higher education R&D expenditure (HERD) in Dutch HES was at almost 3,100 NOK in 2015. This is about the same level as in Finland (2,900 NOK) and above the UK at less than 1,800 NOK.

HERD as a share of GDP was 0.64% in 2015 (Norway 0.60%).

**Funding.** In the Netherlands, 77% of R&D expenditure in HES is funded by public sources (83% in 2005). This is about the same level as in Denmark and Sweden. There is no information about the share of basic funding/general university funds (GUF) for the Netherlands, but from annual reports there is information about less block funding over the years.

Funding from the business enterprise sector (BES) was about 8% in both 2005 and 2015; this is the highest level among the countries in this study and roughly about twice as high as the level in the other countries (Austria at 5%). Funding from abroad has increased from less than 4% to 8% during the last ten years and is almost the same level as in Denmark and Finland (Norway at 3%). The PNP sector funds 7% of R&D in Dutch HES (6% in 2005).

### 6.1.1 National law and regulations

In general, the last 25 years of system development have been marked by a changing role of state steering. The Netherlands has been the context in which concepts such as 'steering at a distance', 'network governance' and 'NPM' have been extensively used to describe the change processes that have emphasised a managerial perspective (Egbert de Weert & van der Kaap, 2014). These changes are also noticed by academic staff within the system; they experience emphasis on performance in funding procedures, and increased pressure to obtain external funding (Egbert de Weert & van der Kaap, 2014). However, academic staff in public higher education institutions remain civil servants.

According to the law, the institutional boards of universities have full autonomy to determine personnel policy and carry out personnel management (Vossensteyn, 2017).

Recent policy discussions with relevance for the academic career structure include PhD supervision regulation, gender issues, teaching careers and labour market prospects of researchers and doctoral candidates.

## 6.2 Academic career system

**Human resources.** Headcount: From the R&D statistics we know that there were 25,400 people (head count) involved in R&D and teaching in the Dutch HES in 2014. In Norway, the corresponding number was 23,000 researchers this year. During the work on these data we have found that the total number of people involved in higher education was 59,000. Half of them work at universities and the other half at universities of applied sciences (*Hogescholen*), see also the Statistical overview in the appendix.

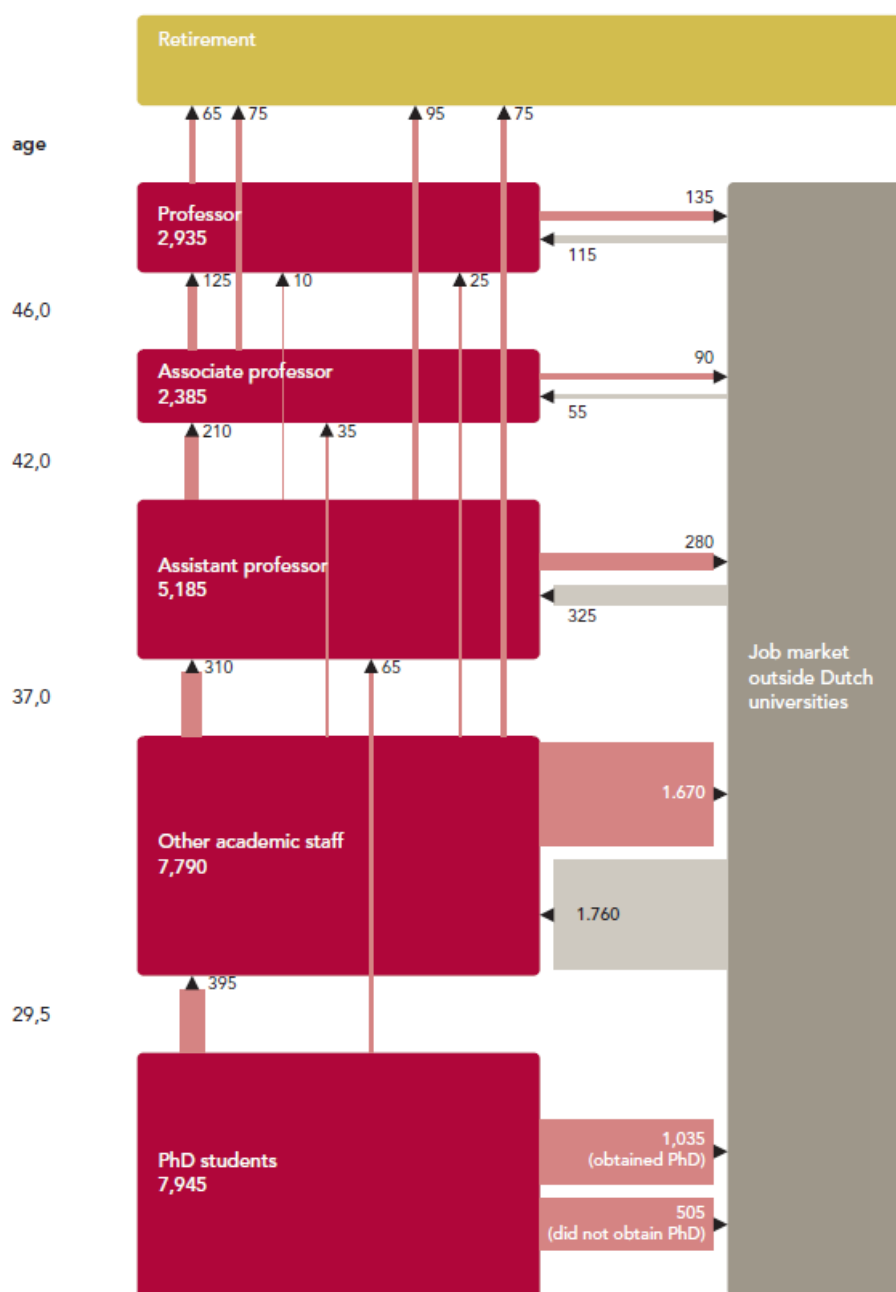
FTE: In 2015, researchers in the Dutch HES conducted almost 22,300 R&D full-time-equivalents (17,900 in 2005). The corresponding number in Norway was almost 11,000 FTE. This means that a researcher performs a much higher share of R&D in the Netherlands than in the other countries.

In general, the basic underlying idea of the Dutch academic career system combines elements of the Anglo-Saxon model, with a high emphasis on competition, while also having emphasis on high job security (EUI, 2016a). Yet, in recent years the share of temporary staff has increased. There is also increasing emphasis on excellence and ability to acquire external research funding.

While universities have autonomy to determine their recruitment practices, they also must have a Recruitment Regulation based on the Dutch recruitment code as regulated by the NVP: The Dutch Association for Personnel Management & Organisation Development. Selection practices for academic positions differ across universities (and sometimes across faculties) (Vossensteyn, 2017). Dutch Universities categorise their personnel according to the *Universitair Functie Ordenen* (UFO: University Job Classification) system, based on the collective labour agreement of universities (Goede, Belder, & Jonge, 2013).

The main levels of the career trajectory include five steps: appointed PhD students, other academic staff (teachers and postdoc researchers), assistant professor, associate professor, and professor. Moreover, there are specific subdivisions within each of these. About 35 per cent of other academic staff are postdoc researchers and the number of postdocs is increasing (Goede et al., 2013). In general, there has been an increase of PhD students and PhD degree holders while the number of available permanent academic positions in universities has remained unchanged. As a result, competition for promotion and tenure has become much more intense. This also means that the postdoc position has expanded, shifting from a short-term entrance trajectory into multiple consecutive

temporary contracts. The average duration of a postdoc period is now approaching 48 months. On average, it takes 16.5 years to become a professor – the average graduation age for PhD candidates is 29.5, and for professorship is 46 (Rathenau Institute, 2016).



**Figure 3. Dutch career system**

Source: Figure prepared by Rathenau Institute, based on data from VSNU (WOPI, PhD student data) CBS (MUP)

The basic principle is that the system is highly open and dynamic, with a strong selection mechanism at different levels (Goede et al., 2013). An important career point is what happens after the PhD, when selection for the next stage takes place. Nevertheless, about 20 per cent of the other academic staff are recruited from within the institution. The next step – from other academic staff (including postdoc and teacher positions) to assistant professor takes somewhat more time. Here, also a process of selection takes place – two thirds leave the university sector (with widely varying destinations). From there on, the career steps are quicker. The assistant professor position is considered ‘intermediary’, but also after this a proportion of staff leave the sector. The associate professor level is described as the most closed, where a large segment comes from the Dutch system and even the same university. The final step is full professorship (Goede et al., 2013).

Until recently, it was only full professors who had the right to engage in PhD supervision, a system arguably not sustainable, considering the growth in PhD student numbers, and stagnating numbers of full professors. In February 2017, a new law was passed bringing the Dutch practice more in line with international standards. As a result, PhD supervision can also be conducted by assistant and associate professors. It has been noted that this would in effect better reflect already existing practice, and allow assistant and associate professors to obtain recognition for their work with supervision.<sup>28</sup>

In addition to ordinary professors, universities also have professors by special appointment (see section 6.7). Moreover, some Dutch universities have also instituted University Professorships appointing scientific ambassadors for the university, rather than representing a department. The Royal Netherlands Academy of Arts and Sciences can sponsor an established professor to be an Academy Professor. In addition, members of the Royal Academy are selected full professor.

The HBO sector uses various categories, and institutions also have their own categories for positions. In most cases, the senior ranks consist of lector and senior lector/researcher. The lower tier positions often include college teacher, lecturer and various forms of instructor positions, and about half of the staff can be found at the lower tier in the HBO sector (Egbert de Weert & van der Kaap, 2014). Those holding a lectorate in a specific field also perform research relevant to the professional field. Currently, there are 600 lectorates with 650 lectors in the 37 HBO institutions (de Jonge, 2016a).

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<sup>28</sup> <https://www.scienceguide.nl/2017/03/expansion-of-right-to-award-a-phd/>

## 6.3 Mobility

Generally, the academic labour market is flexible and open, and marked by mobility out and into academic careers (de Jonge, 2016b). The important transitioning point of post-PhD is also illustrated by the fact that as many as 70 per cent of PhD graduates leave academia. It should be noted that some of them come back after a period of time (Goede et al., 2013). Half of all professorial positions (chairs) change every seven years, and only one in four professors leaves their position for retirement, about the same proportion leaving for another position at a university (i.e. another chair or a managerial position), and about half move outside of the Dutch university system (de Jonge, 2016b). It has, however, been noted that rising standards are making it increasingly difficult to return from other sections of the labour market (Tilväxtanalys, 2015), and mobility between the university and HBO sector is rather low.

In general, the system is very international. About half of the PhD candidates are international and the proportion of non-Dutch academics has risen steadily in recent years (Rathenau Institute, 2016). The general inflow and mobility of young talent has been the basis for creating new instruments for career development, e.g. talent programmes (Goede et al., 2013). These used to be primarily externally funded and temporary (the Innovational Research Incentives Scheme). There has, however, been a rather low success rate for these grants, with about 17 per cent success. As a consequence, a more recent development has also emphasised tenure track programmes (Goede et al., 2013).

This high competitiveness and high mobility means that the issue of labour market prospects is important for early career staff. More recently, the Collective Labour Agreement for Dutch Universities (CLA NU) also includes a statement regarding this issue. This means that institutions are committed to provide support for improving the labour market prospects of researchers with temporary contracts. This includes training in grant writing during working hours, and assurance to obtain necessary teaching qualifications. Moreover, better career counselling support will be provided, including job-to-job guidance.

## 6.4 Temporary positions

Recent data suggest that temporary positions are increasing in the system. A larger number of researchers are now employed on temporary contracts. In 2003, 53 per cent of staff were on temporary contracts, rising to 61 per cent by 2016 (Rathenau Institute, 2017). As a consequence, job security and career prospects have been weakened, creating further uncertainty in a context of high competition and emphasis on excellence.

## 6.5 Tenure track

The basic principle of tenure track is that there is a clear career path of multiple years, where there are predetermined advancement criteria (Goede et al., 2013). The core aim is to keep talent and attract new international talent. The principal idea is that evaluation at fixed points of time is the basis for advancement, where positive evaluation eventually leads to tenure. Various types of tenure tracks are employed (Goede et al., 2013):

- The associate professor track – for postdocs who start with a temporary assistant professor appointment, potentially leading to a permanent associate professor appointment if positive evaluation is obtained after four/six years
- The professor track – a potential continuation of an associate professorship, or a means to recruit external talented associate professors, who can be promoted to professor position if receiving a positive evaluation
- As an instrument to attract more female talent (Goede et al., 2013)

According to Vossensteyn (2017) the Dutch policies for tenure track consist of a number of core elements: academic independence and visibility aims to signal that tenure track academics are independent researchers and not assistants. Furthermore, there are clear career prospects in the sense that a tenure track leads to a permanent position. After a tenure track the candidate by a positive evaluation will become either assistant professor or associate professor, both with the possibility of promotion to a professorial post. Importantly, a tenure track does not necessarily culminate in tenure and monitoring of the candidate during the tenure track is applied. Yet, candidates who fail to obtain tenure will be assisted in searching for a suitable position outside academia. There is also an element of facilitation and encouragement of development of the tenure candidates in terms of offer of various courses, mentoring and guidance. The aim is for tenure track candidates to develop their full academic potential. By means of clear criteria, interim feedback and regular evaluations, tenure candidates are offered continuing insight into their stage of development. Finally tenure track policies aim to promote equal opportunities for an academic career by workforce diversity, in terms of gender and cultural background (Vossensteyn, 2017).

Evaluation of the tenure trackers includes the candidates' own reflections upon their own performance with regard to the following (Vossensteyn, 2017):

- develop and improve courses, modules and/or teaching programmes
- produce cohesive research projects that contribute to a research programme with academic and societal relevance as well as supervision of PhDs and junior researchers
- managerial and administrative tasks that go beyond an academic department (Vossensteyn, 2017)



**Delft University tenure track.** The university has a career development system for talented young academics as well as a tenure track development programme supporting young academics. The aim of the tenure track is to offer a career path for talented young academics for them to become internationally recognised.<sup>29</sup>

## 6.6 Teaching and research

All staff have both teaching and research time, but the individual institutions can decide how they assign these tasks (EUI, 2016a). Earlier, there used to be a standard division of 40-40-20 (teaching, research and administration), which has now been replaced with a more flexible approach, where it is assumed that while both teaching and research are both important, there might be different proportions of these for each faculty member (Egbert de Weert & van der Kaap, 2014). Yet, the survey among academics showed that most staff still engage in both tasks in a relatively even manner, and functional differentiation (i.e. providing some staff opportunities to focus only on research) is only used for limited time periods. However, sector-specific patterns are clear – in universities staff have a clear research function, and in HBO staff predominantly engage in teaching. However, also for the latter, the research function has been increasing (Egbert de Weert & van der Kaap, 2014). A recent study indicates that full professors feel that they spend more time on overseeing other people's research than conducting their own research (de Jonge, 2016b). Moreover, the status of teaching also appears to be a continued discussion. In 2014, VSNU arranged a teaching careers conference, where a range of discussions took place on how to improve the quality and position of teaching in higher education.<sup>30</sup>

Recent data also suggest that there is an emerging discussion on workload. While no systematic study has been conducted on this issue, there are clear indications that workload is increasing: there has been a high increase in terms of education output (both master's and PhD level graduates, as well as research output in terms of publications) and an increasingly competitive funding environment, combined with a body of academic staff that has been growing much more slowly (de Jonge, 2016b).

## 6.7 Professors by special appointment

Special endowed chairs at Dutch universities can be funded through external funds, i.e. private company or foundation (Dutch: *bijzonder hoogleraar*, literally

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<sup>29</sup> <https://www.tudelft.nl/en/about-tu-delft/working-at-tu-delft/scientists/>

<sup>30</sup> [http://www.vsnul.nl/en\\_GB/lookingback-oc.html](http://www.vsnul.nl/en_GB/lookingback-oc.html)

‘extraordinary/special professor’).<sup>31</sup> These ‘professors by special appointment’ are often appointed on a fixed-term and part-time basis. The underlying rationale for such appointments can be idealistic, or it can be a means to assure more research in a field of interest. This category of positions has not been without controversy, and the appropriate scope of these positions has been debated in the system. The number of such positions has been increasing. Data from Rathenau show that while in 2016 there were 4,654 ‘ordinary’ professors employed in universities and university medical centres, there were 1,361 professors by such special appointment and the number has been slightly increasing. Many of these positions can be found in the area of life sciences, medicine and health care (38% of these positions in 2016) and in science and technology (14%) and humanities (12%). (de Jonge, 2016b).

## 6.8 Gender balance

In general, there are relatively few female full professors in the Dutch university system, as women hold just under 20 per cent of the professor chairs, being comparatively low also compared internationally (de Jonge, 2016b). Increase of female share among professors has been only marginal. While the percentage of female graduates is about 50 per cent, the share of women decreases sharply at each career step: from 43 per cent to 39 per cent to 26 per cent of PhD candidates, assistant professors and associate professors, respectively. As a result, the issue of gender balance has been also high on the agenda in discussions of academic careers. One of the proposed instruments is the Johanna Westerdijk Year in 2017.

**Johanna Westerdijk** was the first female professor in the Netherlands, and she held her inaugural address at Utrecht University on the 10th of February 1917. Several institutions and organisations are commemorating her contributions. Moreover, the ministry made a one-off sum of €5m to appoint 100 new female professors during the Westerdijk year in 2017. The Dutch Research Council (FWO) obtained the task to fulfil this programme on behalf of the ministry, resulting in the Westerdijk Talent Scheme programme. In this, universities can apply for grants to appoint female professors. To obtain 100 *additional* female professors, these positions excludes female professors who already have part time or full-time professorships.

A tenure track system has also been viewed as an instrument to attract and maintain more female talent (Goede et al., 2013).

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<sup>31</sup> <https://www.nuffic.nl/en/study-and-work-in-holland/dutch-education-system/nuffic-glossary/bijzonder-hoogleraar>

## 6.9 Summary

The Dutch system is a binary system of universities and HBO. It is a generally high performing system in terms of research output, but in recent years the intensifying emphasis on competitive mechanisms has raised some concerns.

A typical career path follows the trajectory of PhD – other academic posts (including postdocs, researchers and teachers), assistant professor, associate professors and then full professors. In the HBO sector the top position is a ‘lector’ position.

The system is generally very open and flexible, with a high level of mobility at all levels of the career. Moreover, the system is characterised by high selectivity at each career tier. The HBO sector has in recent years also become more involved in practice-relevant research, but this function remains comparatively modest.

Professors by special appointment are externally-funded positions, often part-time and temporary. These are often people external to the university.

The tenure track system is practised in different ways, and on different transition points.

# 7 Austria

## 7.1 The national system of higher education

**Institutional overview.** Austria has a binary higher education system consisting of universities and universities of applied sciences (*Fachhochschulen*) and teacher training colleges (*Pädagogische Hochschulen*). Austria has 22 public universities, 13 private universities, 21 Fachhochschulen and 14 teacher training colleges (*Pädagogische Hochschulen*).<sup>32</sup> Despite the establishment of Fachhochschulen and private universities, public universities still account for the major part of post-secondary education in Austria, with 80% of the student population being enrolled in public universities (Pechar & Park, 2017). Six of these are classic universities, offering a broad spectrum of disciplines and educational opportunities (Wolfensberger, 2014), whereas the other universities are more specialised.

Universities in Austria traditionally have been excessively regulated by the state through formal rules and legal acts. This system of a state controlled homogenous higher education sector was gradually replaced by a system with more autonomous and diverse institutions after 1975. The most fundamental change in the sector was introduced with the establishment of universities of applied sciences (*Fachhochschulen*) as late as in 1993 as a result of the University of Applied Sciences Studies Act (Pausits & Huisman, 2016; Pechar, 2005). Until then, vocational training had been offered in upper secondary schools, and was not recognised as being part of the higher education system. The Act of 1993 thus reformed the Austrian higher education system into a binary system. Whereas universities for the most part are under federal responsibility, provinces play a supplementary role for Fachhochschulen, both as funders and as representatives on boards of the institutions (Pechar & Park, 2017).

Since the establishment of Fachhochschulen in 1993, the number of such institutions and the size of the student population enrolled in Fachhochschulen has increased significantly. Fachhochschulen are not public institutions, but are owned by quasi-private associations or corporations and governed by

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<sup>32</sup> <https://bmbwf.gv.at/wissenschaft-hochschulen/>

professional management which employ and appoint their own academic and non-academic staff (Pechar, 2005). A few years later, in 2000, comprehensive teacher training was also upgraded to higher education institutions.

In 1999, the University Accreditation Act was enacted, and this allowed for the recognition of private universities in Austria. Private universities are granted accreditation by the Agency for Quality Assurance and Accreditation in Austria. Accreditation must be renewed regularly, and can be revoked. Private universities usually specialise in areas such as design or theology (Wolfensberger, 2014).<sup>33</sup>

The 2002 University Act also introduced changes to the higher education system by creating a common legal basis for universities for the sciences and for the arts. Until 2002, public universities were regarded as state agencies. In the former system, all issues regarding teaching and research were decided by each professorial chairholder in charge of their own specialised field of research (Pechar, 2005). This changed with the introduction of the new University Act of 2002, which awarded the universities autonomy as full legal entities, yet subject to new control mechanisms such as global budgets and performance agreements (Wadsack & Kasparovsky, 2004).

**R&D statistical overview.** Total R&D in Austria amounts to 3.12% of GDP which is among the highest in the world and second behind Sweden in this study.

In Austria, the HES performed about a quarter of the national R&D both in 2005 and 2015. This is about EU average level, but below Norway (31%). The R&D expenditure at the UAS amounted to about €104m, of which 13% came from the business enterprise sector, 6.4% from the EU (at universities the respective shares were almost 5% and almost 4%). At the UAS internships at firms and 1–2 semesters abroad are included.

From 2005 to 2015 HERD increased by almost 4% per year; this is about the level in Norway at 4.1%.

Measured per capita the higher education R&D expenditure (HERD) in Austrian HES was at 3,600 NOK in 2015, which is about the same level as in Norway.

HERD as a share of GDP was 0.76% in 2015 (Norway 0.60%).

Following the University Act of 2002, funding of universities is allocated mainly on the basis of negotiations of their performance agreements, yet with a substantial part being allocated in line with a formula based on performance indicators (Wadsack & Kasparovsky, 2004).

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<sup>33</sup> [https://link.springer.com/chapter/10.1007/978-3-319-12919-8\\_13](https://link.springer.com/chapter/10.1007/978-3-319-12919-8_13)

**Funding.** In Austria, 85% of R&D expenditure in HES is funded by public sources. Only Norway has a higher share in this study. The share of GUF amounts to almost 64%, this is rather high in international comparison. In 2004, the GUF share in Austrian HES was 70%.

In 2013, the business enterprise sector (BES) funded 5% of total HERD (only the Netherlands is higher at 8%), and funding from abroad amounted to 6% (only Norway has a lower share at 3%). The private non-profit sector was a minor funder of HERD at 1%.

### 7.1.1 National laws and regulations

With the enactment of the Universities Act of 2002, the employment status of academics in Austria changed from being civil servants to being employed by the institutions on private contracts (Pechar, 2005). Those employed earlier than 2002 still hold the status of civil servants. The new university act sparked lengthy debates over the academic career structure in Austria, but the debate settled in 2010 with the enforcement of the Collective Agreement between the trade union and the Federation of Autonomous Universities in Austria. The agreement specifies in detail the academic career structure in Austrian universities.

With regard to academic staff in Fachhochschulen, there are no specific statutory regulations, and private law contracts are the only basis of employment. Fachhochschulen operate as private limited companies, with each institution having its own career system.

Also in universities, staff are employed by the institutions on private contracts following the Universities Act of 2002 (Pechar, 2004), yet those employed earlier than 2002 still hold the status of civil servants. The employment relations of academic staff in universities are regulated on the basis of collective agreements between the trade union and the Federation of Autonomous Universities (Dachverband der selbständigen Universitäten). Moreover, part 3 of Austria's Universities Act (120/2002) briefly describes the responsibilities of the different university positions. Different sections describe respectively: research fellows, specialist trainees, university professor, research, art and teaching staff, general university staff, assistant lecturers, professors emeritus, retired professors and various administrative positions. The chapter also contain an appointment procedure for university professors.

## 7.2 Academic career system

Although Fachhochschulen were established as higher education institutions following the University of Applied Sciences Studies Act of 1993, the career tracks

of universities and Fachhochschulen are not integrated. The two sectors accordingly have different systems for employment and promotion.

**Human resources.** There were about 33,800 people (head count) working as researchers in the Austrian HES in 2014. National numbers show that at the universities about 36,600 people worked as scientific or artistic staff. Academic staff at the UAS amounted to 18,000 people and they had a stronger growth than at the universities during the last 10 years (29,000–36,000 vs 8,300–17,800). At the private universities 2,400 people worked.

*FTE:* From the R&D statistics we know that in 2015 researchers in the Austrian HES conducted almost 13,500 full-time-equivalents (up from almost 9,000 in 2005). This is well above the number in Norway (almost 11,000 FTE).

### 7.2.1 Academic staff within universities

Academic staff at universities are employed on private contracts by the institutions, but their terms of employment are regulated by a collective agreement, the Kollektivvertrag,<sup>34</sup> which is in alignment with the University Act, which provides detailed prescriptions for each category of academic staff. It also introduced new features to the academic career structure in Austria. Most notably, a tenure track position, modelled after the American tenure track was introduced, as well as the roles of senior scientist and senior lecturer.

The agreement regulates a set of different academic positions, and differentiates between research and teaching-intensive positions below professor level:

- **Universitätsprofessoren/-innen (professors):** these are normally permanent positions, with a responsibility to do research and teaching/supervision within a specific subject, as well as to engage in administrative tasks at the university
- **Assoziierte Professoren/-innen (associated professors):** are staff who have been evaluated as eligible for the position after fulfilling the so-called 'Laufbahnstelle' as an Assistenzprofessor/-in
- **Assistenzprofessoren/-innen (assistant professors):** staff who are employed on a temporary basis with the prospect of permanent contract as an assoziierte professor/-in if the scholar reaches the goals decided in a so-called qualifications agreement (see below for further explanation of this tenure track position). In addition to engaging in research tasks, Assistenzprofessoren/-innen take part in teaching and administrative tasks at the institution
- **Senior scientists:** staff who, after completing a master's study or doctorate/PhD study are accepted for a non-temporary academic position. This also includes

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<sup>34</sup> [https://www.vetmeduni.ac.at/fileadmin/v/betriebsrat/Dokumente/KVUni\\_2017.pdf](https://www.vetmeduni.ac.at/fileadmin/v/betriebsrat/Dokumente/KVUni_2017.pdf)

staff who, on the basis of a permanent employment relationship, work on scientific projects financially supported by third parties

- Senior lecturers: Staff with similar competence as senior scientist, but with predominantly teaching tasks
- Universitätsassistenten/-innen (university assistants): a position after the completion of a master's study or PhD. The position serves to deepen and expand the technical and scientific/artistic training of the candidate, and in the case of acceptance as a postdoc also preparation for the application to a professorship
- Projektmitarbeiter/-innen: academic staff employed on fixed-term contracts to contribute on projects funded by third parties. They can also be involved in teaching
- Lektoren/-innen: part-time employees, employed only for teaching purposes

### 7.2.2 Academic staff within Fachhochschulen

Although the career structure of Fachhochschulen is not regulated, most Fachhochschulen have over time introduced procedures for employment and career paths of teaching and research staff in accordance with the advice of the Fachhochschul Council. Following this, the initial occupational title is: Fachhochschul Lecturer (up to the third year of an employment relation), and from the fourth year, the employee is addressed as Fachhochschule Professor.<sup>35</sup> Generally stated, teaching staff should have scientific, practical, pedagogical-didactic and/or researcher qualifications and skills. Over the years, several Fachhochschulen have also introduced internal career paths, yet these differ between institutions.

Many staff in Fachhochschulen have worked outside of academia for several years before entering the Fachhochschulen sector. The sector also has a large proportion of part-time staff, who are external lecturers that work mainly in other sectors, but who contribute a few hours of teaching at the Fachhochschule on a regular basis.

## 7.3 Temporary positions

One trend observed in the aftermath of the introduction of the new career structure and employment status of academics in Austria is the increase of precarious work conditions in academia. According to Pechar and Park (2017), workers employed on fixed-term contracts within the framework of externally-

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<sup>35</sup> [http://www.wissenschaftsrat.ac.at/news/Empfehlung\\_Fachhochschulen.pdf](http://www.wissenschaftsrat.ac.at/news/Empfehlung_Fachhochschulen.pdf)



funded projects are the fastest growing group of academic staff in the last ten years.

In later years there has also been a rise in the use of part-time lecturers, employed on fixed-term contracts to teach one/two/three classes per semester. The original idea behind the introduction of these positions was that they should be occupied by people with their main position outside of academia. However, more and more people take on a larger number of classes and have this as their main source of income, resulting in unintended precariousness.

## 7.4 Promotion

Appointment to professorships is based on competition; all professorships should be advertised internationally, and applicants are assessed by a committee of four which assesses the suitability of candidates for the advertised position. A separate appointment committee is established (which includes both senior staff and at least one student) to present a reasoned shortlist of three candidates to the rector, who makes the final selection of the candidate for a professorship. If a professor is to be appointed for a period of less than two years, this procedure does not apply.

The Austrian career system has traditionally included the Habilitation (*venia docendi*), which has been a special characteristic of German-speaking university systems. Habilitation is awarded by a Habilitation Committee set up by the university Senate on the basis of research achievements after the doctorate and the production of a research monograph. As such, it is a recognition of excellent scientific qualifications. But Habilitation also involves an enabling exam for academic teaching and for professorial positions. After being awarded the Habilitation, the academic is at the same time awarded the academic degree of a Privatdozentin or Privatdozent respectively (abbreviated PD), which implies that one is entitled to give lectures at universities. However, the title is not connected to any salaried position.

The status of the Habilitation was widely debated in connection with the reform of the higher education legislation in 2002. Yet it was maintained, and similarly, the quality standards of the doctoral training were raised (Pechar et al., 2012).<sup>36</sup> Still, admission to doctoral training remains open, yet in order to proceed after some given time, the candidate must pass an assessment of their research proposal in order to proceed with the doctoral training and thesis writing with a supervisor (ibid.).

Today, Habilitation is not a necessity for a professorship, as institutions may grant candidates professorships without Habilitation. Although having a

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<sup>36</sup>[http://www.pedocs.de/volltexte/2013/7030/pdf/cepsj\\_20012\\_4\\_Pechar\\_Ates\\_Andres\\_The\\_new\\_doctorate.pdf](http://www.pedocs.de/volltexte/2013/7030/pdf/cepsj_20012_4_Pechar_Ates_Andres_The_new_doctorate.pdf)

habilitation opens more opportunities, there may still be a long way to secure employment for these candidates (Kwiek and Antonowicz, 2014).

## 7.5 Tenure track

In 2010, Austria introduced a system which resembles that of a tenure track. This is found in the position of assistant professors, which are 'Laufbahnstellen'. They are advertised internationally, and a PhD is in most cases a prerequisite for applying for this position. These positions should be reserved for candidates with potential for high scientific performance. After entering the position, a qualification agreement (*Qualifizierungsvereinbarung*) is offered if the scientific performance of the candidate suggests that the required qualification can be reached. If the goals in the agreements are met within the timespan of the position, the candidate is offered a permanent position as associate professor without having to apply for the position. If not, employment is terminated. The progress of the candidate should be evaluated on an annual basis. Completion of the Habilitation is in many cases part of the Qualification Agreement.

While the tenure track position was introduced to bridge the way to professorial positions, it is reported that it in effect has introduced a new layer in the career structure. The recruitment processes for these positions have become very competitive, and it is becoming difficult to differentiate between the competence and performance of an associate professor and a full professor. Although the formal status of associate professors ranks lower than full professors, the difference has been alleviated by including associate professors in the voting group of ordinary/full professors in 2015 (Pechar and Park, 2017).

## 7.6 Summary

Several reforms in the Austrian higher education system over the past 25 years have brought about major changes to the composition of institutions as well as the career structure of academic staff. Since 1993, the system has been characterised by a binary structure, when Fachhochschulen, (universities of applied sciences) and later teacher training schools were established as higher education institutions. Private universities are also established, but make up a very small part of the sector. The sectors remain however largely divided, with apparently little mobility and with different career structures. R&D in the sector is increasing, and they still have a fairly large share of public funding.

Academic career paths in Austria followed the German career tradition with professorial chairs and Habilitation as special features until the University Act, enacted in 2002, introduced changes to the academic career structure and staff employment status. Following the new act, academics' status as civil servants

came to an end, and staff are now employed on private contracts by the universities. New positions as senior scientist and senior lecturer, were introduced, as well as a tenure track option found in the position as assistant professor. Habilitation is no longer a prerequisite for becoming a professor.

The typical career paths of academics at the universities now follow a path which typically starts with fixed-term contracts related to research and/or teaching, followed by assistant professor, associate professor and full professor. The share of academics on fixed-term contracts has increased considerably over the past decade.

## 8 UK

### 8.1 The national system of research and higher education

**Institutional overview.** The university sector in the UK has a history dating back to the medieval period, with the universities of Oxford and Cambridge as the first universities. Up until the 1960s, when polytechnics were established, there were universities and a range of colleges, institutes of HE and specialist institutions. The 'binary divide' between research-oriented and civic universities on the one side, and college-based vocational or professional educations and polytechnics with a more applied profile on the other side, existed until 1992, when the Further and Higher Education Act was passed. Following that act, all directly-funded higher education institutions in the United Kingdom were brought together within a single sector, subject to the same funding and quality assurance arrangements. Polytechnics were given the choice whether to call themselves universities. Moreover, institutions, and not the state, award degrees to students. Pre-1992 universities already awarded their own degrees. There are in total 161 higher education institutions in UK, the majority, 128 are universities, while 33 are other higher education institutions, many of which are colleges within art, music and theatre.

Although the binary divide within the higher education system was dissolved in terms of HEIs' autonomy and degree awarding powers, the sector remains complex and varied in terms of the legal basis of higher education institutions. Higher education institutions are independent, autonomous bodies, and the organisation and constitution of each institution reflects their origin and distinct founding arrangements. A main divide can however be found between pre-1992 universities, which commonly hold a status as chartered institutions, and post-1992 universities, which were statutory corporations following the Education Reform Act of 1988.<sup>37</sup> While often grouped together, pre-1992 universities are marked by large institutional differences, which to some degree can be traced back to their historic origins. In particular, a divide can be seen between the pre-20th century universities, which were awarded status as higher education institutions

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<sup>37</sup> <http://researchbriefings.files.parliament.uk/documents/SN06631/SN06631.pdf>

by royal charter; the redbrick universities, which refer to so-called civic universities with an emphasis on practical knowledge which were awarded university status before WW1; and the technical universities awarded university status after the second world war. Pre-1992 universities include institutions such as Oxford and Cambridge, 'redbrick' or civic universities established in early 20<sup>th</sup> century, such as Manchester and Bristol, more recent public research universities such as East Anglia and Lancaster, and technical universities such as Brunel, and City University London. Post 1992-universities comprise former polytechnics and principally colleges of higher and further education, including institutions such as Oxford Brookes and the University of Gloucestershire. These later institutions are commonly established as statutory corporations. A few universities, such as the London School of Economics, are established as companies limited by guarantee.

Several universities in the UK have formed groups, based on common interests and academic profile. The Russell Group includes only research-intensive universities established pre-1992 with medical schools, and they present themselves as 'leading UK universities which are committed to maintaining the very best research, an outstanding teaching and learning experience and unrivalled links with business and the public sector'.<sup>38</sup> Twenty-four universities are organised under the Russell Group umbrella, including Oxford and Cambridge, University of Edinburgh, University of Manchester, University of London, and the London School of Economics and Political Science. The University Alliance comprises 18 universities with a technical/professional profile, and includes, among others, the University of Brighton, the Open University and Oxford Brooks University.

The political responsibility for higher education in the UK is devolved to the administrations in England, Scotland, Wales and Northern Ireland, resulting in a divergence of educational policy between the four countries. Each has its own funding body, created following the Further and Higher Education Act of 1992. The funding bodies (HEFCE, HEFCW, SFC and DELNI) have more widespread regulatory powers. The Quality Assurance Agency for Higher Education (QAA) is contracted by the national funding bodies to review the quality of education in their HEIs.

In England, the Higher Education Funding Council (HEFCE) has been responsible for the distribution of public funding to universities and colleges of higher and further education.<sup>39</sup> In 2017–2018, 133 higher education institutions in England received an element of direct public funding through HEFCE.<sup>40</sup> Most of the funding from HEFCE is so-called recurrent funding, and is allocated on the

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<sup>38</sup> <http://www.russellgroup.ac.uk/about/>

<sup>39</sup> From April 2018 in England, the regulator will be the Office for Students (HEFCE is being abolished) and UK Research and Innovation.

<sup>40</sup> [http://www.hefce.ac.uk/media/HEFCE,2014/Content/Pubs/2017/201704/HEFCE\\_Funding\\_Guide\\_2017-18\\_.pdf](http://www.hefce.ac.uk/media/HEFCE,2014/Content/Pubs/2017/201704/HEFCE_Funding_Guide_2017-18_.pdf)

basis of formulae taking into account certain factors for each institution, including the number and type of students, the subjects taught, and the amount and quality of research undertaken. In total, however, only about a quarter of universities' incomes comes directly from government sources.

**R&D statistical overview.** Total R&D in the UK amounted to 1.7% of GDP in 2015. This is below EU average and the lowest share among the countries in this study. The research intensity in the UK has been at this level for several years (1.6% in 2005). The UK belongs to the former R&D superpowers: in 2005 the country was ranked fifth among all R&D spending countries in the world; this rank had fallen to eighth in 2015 as new R&D performers like China have a stronger growth in R&D.

In the UK, the HES performs 26% of national R&D. This share has been stable over the last ten years. The UK share is at the same level as in Sweden and below the corresponding Norwegian share at 31% of total R&D in HES.

From 2005 to 2015 the UK HERD had a real increase of 1.9% per year, in this study only Finland had a weaker real growth in the period. In the UK, the HERD growth was strongest at the start of the period, and again in 2015, while there was a real decrease in some of the years between.

Measured per capita the higher education R&D expenditure (HERD) in the UK HES spent less than 1,8000 NOK per capita in 2015, which is the lowest level in the study; Norway spent more, at 3,600 NOK per capita in 2015.

HERD as a share of GDP was 0.44% in 2015. This is the lowest level among the countries in this study (Norway 0.60%).

Funding of research is mainly channelled through direct government sources, about two thirds in 2014–2015. Other major sources of research funding were UK charities (13%) and EU sources (11%). Funding of teaching is, on the other hand, heavily reliant on student fees, which for 2014–2015 amounted to 44 per cent of the total income of higher education institutions in the UK.<sup>41</sup>

As we will turn to below, the extensive dependence of universities upon performance-based funding such as the Research Assessment Exercise (now Research Excellence Framework), is an important backdrop for the characteristics of the British academic career structure.

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<sup>41</sup><http://www.universitiesuk.ac.uk/policy-and-analysis/reports/Documents/2016/university-funding-explained.pdf>

**Funding.** In the UK, 62% of R&D expenditure in the HES is funded by public sources (69% in 2005). This is by far the lowest level of public funding among the countries in this study. The share of GUF amounts to less than 30% in 2015, in 2005 the share was at 45%. The 2015 GUF level of HERD in Norway was at 69%.

Funding from the business enterprise sector (BES) was at just over 4% in 2015, about the same level as in 2005 and at the same level as in Finland and Sweden. Funding from abroad amounted to almost 16% of total higher education sector R&D, which is the highest share among the countries in this study, almost twice as high as the share in Denmark, Finland and the Netherlands (3% in Norway). About half of the funding from abroad in the UK higher education was EU funding in 2015.

The PNP sector has become a strong funder of higher education R&D in the UK at almost 14% in 2015, up from 1% in 2005.

## 8.2 Academic career system

**Human resources. Headcount:** From the R&D statistics we know that there were about 342,000 people (head count) working as researchers in the UK HES in 2014.\* In Norway, the corresponding number was 23,000 researchers this year.

**FTE:** In 2015, the researchers in the UK HES conducted almost 169,000 full-time-equivalents (141,800 in 2005). The corresponding number in Norway was almost 11,000 FTE in 2015.

*\* There are some doubts as to whether this in the UK has been counted in the same manner as in the other countries in this study.*

The institutional autonomy of higher education institutions is protected by the United Kingdom's Higher Education and Research Act 2017, which explicitly states that this autonomy contains the freedom 'to determine the criteria for the selection, appointment and dismissal of academic staff and apply those criteria in particular cases'.<sup>42</sup> Accordingly, academic job titles and criteria for employment and promotion are decided by the single institutions, and it is the executive at the institutions that develops the scheme. The rules for career advancement at the institution have to be approved by the council or board of governors.

As a result of the extensive autonomy of higher education institutions in the UK, different sets of titles for academic staff and criteria for advancement in the career structure are found in different institutions, especially for academics early in their careers. See text box for an example from the University of Cambridge.

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42 <https://www.legislation.gov.uk/ukpga/2017/29/contents>

**Titles at the University of Cambridge.** The University of Cambridge uses typical English academic job titles, and has titles referring to both research-focused positions, and for positions more involving teaching. They furthermore distinguish between having a personal lectureship or professorship, which is awarded following internal promotion, and having a chair, which is awarded after open recruitment.

In addition to the typical senior level positions, colleges also offer several different fixed-term fellowships, stipendiary fellowships and college-funded Junior Research Fellowship and Early Career Research Fellowships, which are postdoc positions appropriate to the start of an academic career.

Research promotions and academic promotions on a senior level follow different schemes and criteria. For the sake of simplicity, the two schemes are combined here:<sup>43</sup>

- **Research Associate.** For researchers with some research experience who have normally been awarded a doctoral degree. Their research activity will provide substantial scope for academic judgment, originality, interpretation and presentation of results
- **Lecturer.** Lecturers have both teaching and research obligations
- **Senior Research Associate.** For researchers with at least three years' experience as a postdoctoral research associate, or equivalent. They will have demonstrated a high level of competence and an independent standing as researchers
- **Senior Lecturer.** Only lecturers may be considered for promotion to senior lectureships. This position was created 'to reward sustained excellence in teaching, sustained supportiveness in administration and organisational tasks, and achievement in research'.<sup>44</sup> They are research active, and conduct a minimum of 30 hours teaching per year
- **Principal Research Associate.** A title at an equivalent level to reader
- **Reader.** For applicants coming from a lectureship or senior lectureship. Readers should have achieved international *recognition* in the relevant subject with reference to: (i) originality (ii) contribution to the advancement of knowledge, and (iii) reputation
- **Director of Research.** This appointment is at a level equivalent to professor. Directors of research may be considered for promotion to or may be appointed on recruitment
- **Professor.** Professors must have established *leadership* in the relevant subject with reference to originality, contribution to the advancement of knowledge and reputation. There must also be an effective contribution to teaching and administration, such as establishments of research group and/or research facilities, or more widening participation activity

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<sup>43</sup> Descriptors are found at <https://www.cam.ac.uk/research-staff/employment-and-career-management/employment-and-career-management-scheme/researchers-employment-policies-and-protocols/job-titles-and-duties>

<sup>44</sup>[https://www.hr.admin.cam.ac.uk/files/sap\\_2016\\_procedures\\_and\\_guidance\\_manual\\_-\\_final\\_20\\_aug\\_15\\_updated\\_5\\_oct15.pdf](https://www.hr.admin.cam.ac.uk/files/sap_2016_procedures_and_guidance_manual_-_final_20_aug_15_updated_5_oct15.pdf)



Traditionally, the academic career track in the UK moved from a lectureship to a senior lectureship, followed by a position as a reader and with professorship as the most senior position. More recently, however, particular institutions have introduced American academic titles (full professor, associate professor, assistant professor) in an attempt to internationalise their career structure. These include the University of Oxford, UCL, the University of Warwick, the University of Nottingham, the LSE and the University of Leeds (which has also adopted a tenure track-style programme (see below).

To follow a linear path which moves from lecturer to senior lecturer ('principal lecturer in post 1992-universities'), followed by a position as reader, and then entry into professorship (Brennan et al., 2007;<sup>45</sup> Strike, 2010)<sup>46</sup> is no longer the reality for most academics, and the assumption that they will follow a linear path is the cause of much frustration and disappointment among younger scholars. Traditionally, a newly-graduated PhD candidate entered a position as lecturer, which is the most junior traditional 'independent' position which undertakes both research and teaching, yet often with a primary responsibility in teaching. Due to the high competitiveness for positions in the UK higher education system, the phase between an obtained PhD and a position as a lecturer has grown longer over the years, and lecturers now normally spend several years in fixed-term postdoc-level positions before obtaining a permanent academic position.

The postdoc career stage in the UK now typically includes teaching-intensive positions such as temporary lecturer, or teaching fellow, which are full members of academic staff, but mainly involved in teaching, mostly part-time and fixed-term. Research-intensive positions at postdoc level are typically fixed-term positions funded from specific research projects led by a senior researcher. Another opening is junior research fellowships, which are similar to postdocs, but more independent, and both more competitive and prestigious. These are often funded by the UK Research Councils or charities.

There has been a rise in the number of 'teaching only' contracts at universities, which might be the result of institutional strategies or a wish to perform better in the UK research assessment system (the Research Excellence Framework, or REF). Academics with responsibilities for both teaching *and* research are now a minority, since the year of submissions to the 2014 REF.

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<sup>45</sup><https://kobra.bibliothek.uni-kassel.de/bitstream/urn:nbn:de:hebis:34-2008060221806/1/wb66.pdf>

<sup>46</sup>[https://books.google.no/books?hl=no&lr=&id=2dSLAgAAQBAJ&oi=fnd&pg=PA77&dq=career+paths+academia+uk&ots=PXAz9nR9af&sig=H3nKrzdy7wS9IeEusEslbf-rmY&redir\\_esc=y#v=onepage&q&f=false](https://books.google.no/books?hl=no&lr=&id=2dSLAgAAQBAJ&oi=fnd&pg=PA77&dq=career+paths+academia+uk&ots=PXAz9nR9af&sig=H3nKrzdy7wS9IeEusEslbf-rmY&redir_esc=y#v=onepage&q&f=false)

**Career structure at the University of Cambridge.** The University states that it ‘aims to select and recruit researchers with the highest potential to achieve excellence in research.’<sup>47</sup> It has a dual employment system, in the sense that academics are either employed by the university or the colleges, which have different employment conditions. The university employs academic staff (with ‘university’ as a prefix in the job title), whereas the colleges employ their own staff, who are normally involved in teaching activities (typically college-funded Teaching Officers). The University and colleges do, however, have a shared career structure and shared procedures for employment and promotion of staff to senior levels. Colleges are expected to have some discretion in interpreting the content of the recruitment and promotion procedures decided by the University, as it is the head of department who oversees the processes of employment and promotion.

### 8.3 The promotion system

There is no automatic advancement through the different steps of the career ladder. Academic staff might begin and end their careers as lecturer (Brennan, Locke and Naidoo, 2007). To advance from lecturer to senior lecturer and then reader, one has to apply for an advancement at the institution, or alternatively, apply for a vacant position in competition with others, including external applicants. The criteria for advancement or appointment are decided by the institutions, but often require results in both teaching and research.

Once appointed to a permanent position as a lecturer, advancement to a position as a senior lecturer is obtainable upon internal nomination/application for promotion or by applying for a vacant position. The difference between a senior lecturer and a reader is minor in terms of remuneration, yet a position as a reader normally involves a stronger research focus (Brennan et al., 2007). In recent years, the title of reader has been abolished at several institutions.

Professor is the most senior academic job title, and is typically referred to as ‘having a chair’ in a specific field or discipline. The chair can be either personal or established. In the former case, it is tied to the individual who holds the chair, whereas in the latter, the chair is independent of the person who currently holds it.

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<sup>47</sup> <https://www.cam.ac.uk/research-staff/employment-and-career-management/employment-and-career-management-scheme/selection-and-recruitment-of-researchers>

**Promotion system at the University of Cambridge.** Promotion is not automatic, and requires the recommendation of a superior. For promotion to professorial positions, employees must apply following a procedure which was introduced in 2013 to standardise the different processes for senior researcher promotions which were in operation across the University. For promotions at lower levels, local procedures are followed. In both cases, committees evaluate the quality of the applicant's work and contribution in relation to the predefined criteria. These cover contributions in research and teaching as well as general contributions. Whereas research is included as a basis for promotion regardless of where it has been undertaken, teaching is only taken into consideration if carried out in previous academic employment at Cambridge. A general contribution refers to contributions made outside the University.

A division is found between those employed on open-ended (permanent) contracts, and those with a fixed-term (temporary) contract, usually financed through externally-funded projects. The maximum length of a fixed-term contract is four years, and on prolongation after four years, the contract is converted to an open-ended contract.

## 8.4 Tenure track

The UK academic career model has been described as a probation-on-the-job-model (Schiewer et al., 2014). This model is based on an early entry into a post-PhD lectureship, which is given on the condition of a two to three-year probationary period converted into a permanent contract period if the candidate has fulfilled a set of predefined criteria. This is in contrast to the tenure track model, which offers the prospect of a tenured *higher*-level position.

Tenure (in the US sense) was abolished by the Conservative government of Margaret Thatcher in 1988. There are still 'permanent' or 'open-ended' (as distinct from fixed-term) posts, but the protections from redundancy have all but disappeared in most UK universities.

Recently, several higher education institutions have however launched tenure track-style initiatives to attract high quality researchers (THE, 2014).<sup>48</sup> One such is the University of Leeds' '250 minds' initiative, which recruited academics within selected fields to undergo a five-year structured development programme with the ambition to establish the fellows in their discipline. Upon success, fellows enter a permanent position as an associate professor.

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<sup>48</sup> <https://www.timeshighereducation.com/features/how-to-give-the-next-generation-of-scholars-a-career-boost/2017878.article>

## 8.5 Payment

Staff in UK higher education are not civil servants, and their payment structure is regulated by the national 'framework agreement' negotiated by employers' and trade unions' representatives in 2003.

## 8.6 Teaching and research

While there is no legal requirement for academic staff in higher education to undertake professional development in teaching, there is an expectation that they will do so, expressed in the Quality Code of for Higher Education, operated by the QAA. Several local initiatives have been launched to increase the status of teaching in UK higher education institutions. Initiatives are also found at national level. The Higher Education Academy aims to support and enhance the quality of higher education in the UK. The HEA is about to be merged with the Leadership Foundation for Higher Education (LFHE) and the Equality Challenge Unit (ECU). The HEA was established in 2003 as a national body for enhancing learning and teaching in higher education. It is funded by the four HE funding bodies in England, Northern Ireland, Scotland and Wales and by subscription from universities and colleges. In addition to providing training for teaching in higher education, it has developed a voluntary scheme (the UK Professional Standards Framework) which describes the competencies and values expected of teaching staff in higher education. The framework includes a professional recognition scheme, which demonstrates the level of competence in teaching. Professional recognition depends on individual staff having completed accredited programmes run by their own HEI, or providing evidence of a track record of experience recognised as meeting the UKPSF. They can then apply to become an HEA Fellow on the following incremental scale:

- Associate Fellow (AFHEA)
- Fellow (FHEA)
- Senior Fellow (SFHEA)
- Principal Fellow (PFHEA)

Each of the fellowships is mapped against nationally recognised 'Standards Descriptors' for teaching and supporting learning in higher education.

**Appointments based on merit outside academia.** Some colleges at the University of Cambridge, including Corpus Christi College, St Catharine's College and Downing College, host *Fellow Commoners* who are appointed for a limited period on basis of their achievements in their own field outside of academia. Hence, they are not academics, but are invited to the college to bring a different perspective to the college community. They typically contribute with talks, advice to students and workshops.

## 8.7 Entrepreneurialism

Increasingly, there are promotion criteria for professorial positions that recognise teaching and enterprise achievements, but the numbers actually achieving this are still small. Research remains the main way of achieving professorial status.

## 8.8 Academic careers in the context of social and professional ageing

As is the case in many countries, in the UK it also appears to be taking longer for so called early career academics to achieve a permanent post that includes research – one might say that the ‘apprenticeship’ stage – from being a PhD student to become a principal investigator has been prolonged. Several fixed terms as a postdoc have become a necessity for achieving a permanent post.

## 8.9 Summary

Recent debate about the career structure in the UK has been dominated by issues such as the need for achieving recognition for contributions to university success in addition to research (i.e. teaching, knowledge exchange, enterprise (consultancy) or the need for developing separate career pathways: academic (research & teaching), research, teaching, etc.). Furthermore, support for early career academics is much debated, recognition for professional services staff increasingly undertaking aspects of academic work as well as increased flexibility (teaching-only, part-time, fixed-term contracts) and ways of achieving reductions in staff costs.

An institutional hierarchy, with basically major differences in resources and conditions between universities, combined with national policies characterised by privatisation and market competition in research and higher education, is an important backdrop for understanding the distinctive features of the British academic career system. According to Brennan, Locke, and Naidoo (2007), the tools of the principals have been those of funding formulae and evaluation

mechanisms, creating a highly competitive situation both between institutions and individuals. The dynamics of the institutional status hierarchy are illustrated by the fact that academic staff – to the extent they are mobile at a national level – tend to move to other universities of a similar status (i.e. between Russell Group universities, between post-1992 universities, etc.).

There are major differences in working conditions between institutions – and it depends on whether the university had been a polytechnic or was a university before the 1992 Act. Famous universities such as Oxford and Cambridge – with large private and public endowments – are certainly not representative of the UK system of higher education as a whole (Locke and Bennion, 2011). Historically inherited institutional differences are reproduced and reinforced by national policies such as the RAE/REF and national and global rankings. According to one of our informants the RAE/REF has produced a ‘transfer system’ (as in football) for top researchers. The new rules (for REF 2021) are likely to continue this.

In addition to the National Framework for pay (2004), the teaching equivalent of the REF, the Teaching Excellence Framework (TEF) – as well as particular elements of this, especially the National Student Survey (NSS) – is also affecting the occupational structure and academic careers.

Hence, successful parts of the system are highly competitive, with recruitment on a global scale, particularly among researchers who can attract substantial research funds.

## 9 Cross-national observations and concluding remarks

The objective of this report is to provide a comparative knowledge basis on academic careers for a national committee commissioned by the Norwegian Ministry of Education and Research – the Underdal committee. Based on research literature, secondary sources, statistical data, official documents and expert consultations, academic career systems and career trajectories in selected European countries (Austria, Denmark, Finland, the Netherlands, Norway, Sweden and the UK) have been explored.

The Underdal committee has in its mandate to explore whether changes in the Norwegian system for academic careers are warranted, having examined experiences abroad and the current situation in Norway.

At a macro level, the committee addresses whether the current Norwegian academic career system can adequately address the multiple functions and roles universities and university colleges have in modern societies. More specifically, the committee is discussing the relationship between traditional academic competence and other forms of competence that could be the basis for recruitment (i.e. practice, innovation or entrepreneurship-related competence).

At a micro level, the mandate of the committee is to explore whether the Norwegian career system facilitates career trajectories that make this an attractive career choice for Norwegian and international applicants, and the extent to which this system motivates academic development throughout the whole career. This report cannot fully answer the broad mandate of the Underdal committee. However, in line with the key aim of this report, it provides a comparative knowledge base for the committee's discussions on strengths and weaknesses of the Norwegian system.

This report has taken a broad focus on academic career systems in Sweden, Denmark, Finland, the Netherlands, Norway, Sweden and the UK, examining the structure and content of the various systems. The expert committee is evaluating a number of dimensions which have informed the mapping exercise of this report. These dimensions include the type of higher education system characterising the countries at hand; R&D statistical information regarding funding and economic

conditions; academic career paths; information on top tier positions; competence requirements for academic positions; recruitment procedures in particular for top tier positions; share of academic staff at various levels of academic careers; use of temporary positions; mobility between institutions, other sectors outside academia and internationally; practice professor positions; career opportunities for early stage academics; and tenure track positions. In the following some main general observations are highlighted. Thereafter, a number of comparative observations are presented, structured according to the dimensions underlying the mapping exercise.

Importantly, an overall assessment of academic career structures should in some cases, not least in Norway, take into account that the research institute sector and the health sector are important parts of the labour market for academics. In Norway there is significant mobility of academic staff between these sectors and in recent years several mergers have taken place. It has not been part of this project to go through the entire research sector within the framework of this project. However, it should be kept in mind that aiming to link academic fields with practice fields and research expertise depends also on how academic careers between these two sectors are facilitated.

## 9.1 Main general observations

- Unsurprisingly, each national higher education system covered in this report has developed a distinct national academic career system. This applies to type of academic position, the relative number of each position, content of academic work related to each position, recruitment procedures, promotion regulations, and career paths.
- All of the countries have different institutional types in their systems. However, there is a variation in how formalised this division is. For example, in the UK the institutions are formally part of the same system (unified), while in practice the pre/post1992 division remains to some extent; in Finland, there is a clear binary divide between universities and universities of applied sciences. In most cases the different types of institutions also have to some extent different career structures. All higher education systems and institutions have career ladders for academic staff. Within a single higher education system, these ladders may be common for all institutions, as in the case of Norway, but more often differ between types of institutions as well as within the same type of institution.
- Academic career systems are not static, they are continually discussed, reformed and changed in the various national contexts.
- There are mainly two main career advancement systems: the competition model and the promotion model. However, in practice most countries have a hybrid type of career advancement system. In the competition model, those



aspiring to climb the ladder must apply for a limited number of vacant positions in competition with other applicants at each stage of the career system. In the promotion model, those who fulfil a specified list of achievements in teaching and research can be promoted to a higher position based on an evaluation of their performance. An example of this model is tenure track. However, as the national cases show, elements of tenure track can be introduced in various ways.

- In university systems, there are still many combined teaching and research positions, while in the non-university institutions teaching-oriented positions are typically in the majority. The UK is an important exception, as it also includes a large number of teaching-only positions (often also fixed-term).
- Temporary employment has been on the rise, but the extent to which it is used in the different countries varies. In all systems, PhD and postdoc positions are temporary. The extent to which temporary employment can also be found at other levels varies. This is a contested issue, viewed by many as a negative development, reducing job security.
- Moreover, in some countries an increasing number of academics working in higher education institutions hold positions that are not part of the regular career structure. This is, for example, the case in Finland and the UK.
- The notion of ‘researcher’ as an alternative career track to regular university posts for externally-funded project workers has appeared on the agenda or in some instances, re-appeared.
- Comparisons of career systems across countries are challenging. Such a comparison usually requires in-depth and up-to-date knowledge about each higher education system and its social context. In a number of countries there is lack of research on the non-university higher education sector.

## 9.2 Unitary or binary higher education systems

In the countries covered by this study, the higher education system has undergone major changes over time, including through mergers and upgrading of colleges to universities. Yet, a notable feature of most of the countries analysed in this report is the binary structure, e.g. national higher education institutions consisting of universities and other higher education systems. In all countries, there is still a distinction between universities and various types of non-university higher education institutions, but there are in part large variations in the balance between the two categories. In the United Kingdom, the large majority have university status, but there are still a number of independent colleges.

Importantly, there are national variations regarding the extent to which research is conducted in the non-university sector (Kyvik & Lepori, 2010). While national policies across Europe have stated that UAS should have the right to

perform research, the national variations are strongly present in our countries. For example, in Finland the UAS had an explicit research mandate from the start. As a result, the research base of UAS is much stronger than in their Danish counterparts, university colleges. In most countries, the research orientation is stronger in engineering and technology than in nursing, teacher training and social work. Norway differs from this pattern with a more equal research orientation across UAS educational programmes.

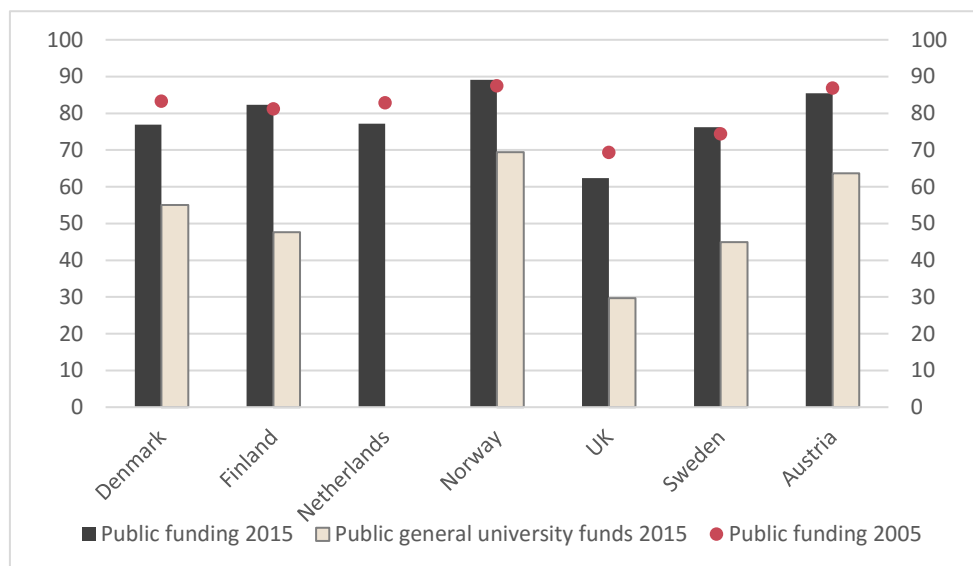
**Table 3. Type of higher education system**

|                        |  |
|------------------------|--|
| <b>Norway</b>          | Traditionally a binary system, however due to upgrading of university colleges to universities and recent mergers between universities and university colleges the distinction between universities and university colleges is changing. |
| <b>Sweden</b>          | Binary system divided into universities and university colleges.   |
| <b>Denmark</b>         | A binary system with a clear division between research-intensive universities and vocational and teaching-oriented colleges.   |
| <b>Finland</b>         | Binary system with a clear distinction between universities and universities of applied sciences.  |
| <b>The Netherlands</b> | A binary system with a distinction between research universities and universities of applied sciences.   |
| <b>Austria</b>         | A binary system with a distinction between research universities and universities of applied sciences.   |
| <b>UK</b>              | A unified but stratified university system since 1992, with a divide between pre- and post-1992 universities. International rankings and REF have heavily influenced the stratification of the system.                                   |

This study has described the current higher education systems of Norway, Sweden, Denmark, the Netherlands, Austria and the UK. The types and numbers of higher education institutions have been described. However, no strong conclusions can be drawn regarding the implementation of structural reforms on academic career structures. Due to the recent mergers, the institutional landscape in Norway consists of institutions 'containing' research-intensive universities and teaching-oriented university colleges. These mergers are for example different from the Danish mergers which were mergers between universities and research institutes. A recent analysis of structural reforms in higher education (Boer et al., 2017) describes structural reforms amongst others in Austria, the Netherlands, Denmark and Finland. A brief overview of the reforms show that the aims and scopes of the reforms differ as well as the extent to which the reform were directed at the non-university sector or the university sector. Yet, the influence of structural reforms on academic career structure as well as potential challenges related to integrating previous university colleges' and universities' career ladders is less researched. A sideways look at the UK seems to suggest that while the higher education system is unified, the academic career structure remains diverse within and across institutions. However, the situation in the UK is very different from the other countries in this study.

### 9.3 Economic conditions for the institutions

The relationship between the economic conditions for the institutions and the academic career structure is not straightforward. However, the overall numbers indicate that higher education institutions (HEI) in the selected countries account for between a quarter to a third of total national R&D expenditure. HEI have a special responsibility for basic research and the education of the academic workforce in their countries, and have traditionally had a high share of public funding to fulfil their mission. For many countries, the share of public funding has decreased in recent years, and HEI have sought other and additional funding sources; funding from the business enterprise sector, from abroad and other national funding sources like medical funds. In 2015, the share of public funding varied between 60 per cent in the UK and almost 90 per cent in Norway. The share of basic funding (general university funds) varies among the countries. In the UK this share is less than in the other countries at 30 per cent, while Norway is at the other extreme at almost 70 per cent.



**Figure 4. Higher education expenditure on R&D share of public funding. 2005, 2015**

Source: OECD MSTI 2017:2

### 9.4 Academic career paths

In all our countries, there are ongoing discussions about how academic career structures, skills and working conditions can be differentiated and adapted to new challenges in terms of high-quality requirements and relevance in research and teaching. A number of common challenges can be noted across countries, including career possibilities for early-stage academics, precarious working conditions, and low mobility across types of institutions.

In addition to the common challenges, national variations are striking. The data gathered for this project show that there are large differences between the selected countries when it comes to the division of academic personnel by the A, B, C and D career levels. Among the universities Norway has the largest share at the top academic level (professors) with 21 per cent, and Austria the smallest share at 7 per cent; the other countries differ between 11 and 14 per cent. Both Sweden and Norway have a rather small share of personnel in the C category. Sweden and Finland have a large share of personnel at the lowest career level D.

Previous studies of the academic profession have observed that within the universities across Europe an academic career follows four main steps: doctoral studies, postdoc and junior positions, lower-level senior and higher-level senior positions (Fumasoli et al., 2015). However, there is large variation in type of positions at these four stages as well as large variation in the relative number of persons at each level of the career system. Another notable feature is the status of PhD candidates: in some countries such as Norway and the Netherlands PhD candidates can be employees of the university, while in other countries they have the status of students.

**Table 4. Career paths in higher education in selected countries.**

|                 |  |
|-----------------|--|
| Norway          | Traditionally main distinction between a research-based career at universities and a teaching-based career at university colleges  |
| Sweden          | Formally one career structure across type of institutions, but institutions have great autonomy in deciding on the academic career structure   |
| Denmark         | A clear division between research-intensive universities and vocational and teaching-oriented colleges with each their career structure  |
| Finland         | Main distinction between teaching-oriented career path at UAS, and research-oriented at universities   |
| The Netherlands | Traditionally a binary system with a clear distinction between research-oriented career paths at universities and teaching-oriented careers in the universities of applied sciences. |
| Austria         | Main distinction between teaching-oriented career paths at UAS, and research-oriented career path at universities.   |
| UK              | Institutions have great autonomy regarding academic career structures. Increasing share of teaching-only positions in universities.  |

Norway distinguishes between a research-oriented and a teaching-oriented career track which is common to both universities and university colleges. The research-oriented permanent academic positions are associate professor (*førsteamanuensis*) and professor, while lecturer (*universitets-/høyskolelektor*), senior lecturer (*førstelektor*) and docent (*dosent*) are teaching-oriented positions, but with the possibility of doing research. The docent position is a relatively newly established top position for senior lecturers. The post of assistant professor was removed in 1995, and after this date no new appointments for assistant professors

has taken place, but those that already had this title are still entitled to use it. Lecturer and senior lecturer are positions that have not been widely used in the university sector. The position of college teacher is used in practice-related professional programs, mainly in teacher training and health education, and the holders of this position do not have a master's degree. In addition, the universities (and to a limited extent the university colleges) have positions for full-time researchers, some of which have permanent employment, while most are on fixed-term contracts.

In *Sweden*, traditionally one group of staff had the main responsibility for teaching and another had mainly responsibility for research. Since 1997 the policy has been that the two tasks should be seen as equally important and all faculty staff members should be responsible for carrying out both tasks. However, the traditional division between two groups of staff remains in practice. Importantly, the division is not reflected in the titles of the positions, since the content of the positions more depend on its funding than on the title, resulting in large variation between and within institutions. In some cases there are people in lecturer positions with no time for research, and lecturers with the opportunity to devote themselves to research within the same department at the same university.

In *Denmark*, national guidelines describe the academic career system, one for the university and one for the university colleges. At the universities, the academic career structure consists of research assistants and assistant lecturers; PhD candidates; postdocs; adjuncts and researchers; lecturers, senior researchers; and at the top of the career ladder, professors. At Danish university colleges, the hierarchy consists of adjuncts; lecturers; and docents.

The academic career structure in *Finland* follows a four-tier structure. The lowest tier is the licentiate/PhD candidate; followed by postdoc/senior assistant. These two tiers are normally temporary staff. The third tier is university lecturers (*lehtori*),<sup>49</sup> research positions, and assistant and associate professors. At the highest level, there are professors and research directors. At the Finnish universities, academic staff have been traditionally divided into professors, other teachers, and researchers. Academic staff are expected to engage in both research and teaching, but the way in which these are balanced can vary between institutions. In the UAS, the most prestigious category of the teaching staff is senior lecturer (*yliopettaja*), responsible for developing the professional field. The UAS aim at recruiting PhD candidates or holders of licentiate degrees to the position of senior lecturer. The lecturers at the UAS resemble lecturers at universities, neither of whom are expected to do research. Teaching is the most important activity for all groups of teachers at the UAS. Staff categories include senior lecturers, lecturers, full-time teachers and researchers who are also active in teaching.

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<sup>49</sup> Yliassistentti was a term in the old system that is sometimes translated as assistant professors, but some universities would not use this translation.

In *the Netherlands*, a typical university career path follows the trajectory of PhD – other academic posts (including postdoc researchers and teachers), assistant professor, associate professor and then full professor. In the HBO sector the top position is ‘lector’. In general, institutions have a high degree of autonomy in their definitions of their career structures. The HBO sector has in recent years also become more involved in practice-relevant research, but this function remains comparably modest.

In *Austria*, academic staff at universities and UAS follow different career paths, and have different employment regulations. Academic staff at Austrian universities are employed on private contracts by the institutions. The career path follows from PhD to assistant professor, which is a tenured position leading to the position of associate professor, and ultimately the position of professor. In addition to these positions, senior lecturers’ and senior researchers’ positions have been introduced for staff with a PhD engaged in primarily research or teaching. In the Austrian Fachhochschulen the academic staff consists of Fachhochschul Lecturer and Fachhochschule Professor. Many staff have worked outside of academia for several years before entering the Fachhochschulen sector.

In the *UK*, HEI have full autonomy to decide the career paths at each institution. Thus, different sets of titles for academic staff and criteria for advancement in the career structure are found in different institutions, especially for academics early in their careers. Traditionally, the academic career track in the UK moved from a lectureship to a senior lectureship, followed by a position as a reader and with professorship as the most senior position. More recently, however, particular institutions have introduced American academic titles (full professor, associate professor, assistant professor) in an attempt to internationalise their career structure. To follow a linear path which moves from lecturer to senior lecturer (‘principal lecturer’ in post 1992 universities), followed by a position as reader, and then entry into professorship is no longer the reality for most academics. Due to the high competitiveness for positions in the UK higher education system, the phase between an obtained PhD and a position as a lecturer has grown longer over the years. There has been a rise in the number of ‘teaching only’ contracts at universities, which might be the result of institutional strategies or a wish to perform better in the UK research assessment system (the Research Excellence Framework or REF). Academics with responsibilities for both teaching *and* research are now a minority, since the year of submissions to the 2014 REF.

## 9.5 Top positions

Across Europe it has been noted that the academic labour market is becoming more and more competitive, not only at the lower stages of the career path (Kwiek & Antonowicz, 2015). For example, in the UK it has been questioned if one should

describe a typical academic career as ending with the full professor position, since so few people will obtain a professorship during their career. Also Fumasoli et al. (2015) noted that a professorship is becoming increasingly difficult to achieve during a career. At the same time, new positions and pathways have been created, such as assistant and junior professorships and non-tenured professorships. A notable feature for example in the UK is people engaged in professional positions but also doing teaching and research. This may be due to HEIs avoiding the inclusion of these staff in the submission to the REF, as they are less likely to have been able to develop a strong publications track record.

**Table 5. Type of top positions and share of academic staff (incl. PhD candidates) in top positions by type of institution. 2015/2016.**

|                        | Type of top positions  | Share of academic staff in top positions |
|------------------------|--|--|
| <b>Norway</b>          | Professor; docent  | Universities: 21%; UAS: 14%; Total: 19%  |
| <b>Sweden</b>          | Professor  | Total: 13%                               |
| <b>Denmark</b>         | Universities: professor;<br>colleges: professor and docent                         | Universities: 11%; UAS: 2%; Total: 9%    |
| <b>Finland</b>         | Universities: professor;<br>UAS: senior lecturer                                   | Total: 13%                               |
| <b>The Netherlands</b> | Universities: professor;<br>UAS: lecturer/senior lecturer                          | Universities: 11%; UAS: 7%; Total: 11%   |
| <b>Austria</b>         | Universities: university professor;<br>UAS: <i>Leiter, Fachhochschul Professor</i> | Total: 7%                                |
| <b>UK</b>              | Full professor, reader   | Total: 13%                               |

*Source: National statistical experts*

## 9.6 Temporary positions

The share of temporary positions is far more common at more junior positions of the academic career ladder, while senior positions are more often permanent. The use of temporary positions is generally increasing in Europe, however Sweden and Norway are exceptions with small increases of permanent positions.

**Table 6. Share of temporary positions in the academic workforce 2015/2016 or latest year of available data.\***

| Country         | Share of temporary position   |
|-----------------|---|
| Norway          | 18% in 2016 (Tilstandsrapport for høyere utdanning 2017)  |
| Sweden          | 28% in 2016 (SCB)   |
| Denmark         | –   |
| Finland         | 70% of teaching and research staff at universities (Confederation of Finnish Industries (EK) data on wages) |
| The Netherlands | 42% in 2016 (Wopi, VSNU)  |
| Austria         | 75% in 2015/2016 (Federal Ministry of Science, Research and Economy)  |
| UK              | 35% in 2015/2016 (26% of full-time staff) (HESA)  |

*Source: National statistical sources, specified in the Table*

In Norway, the share of academic staff working in temporary positions has decreased from 21 per cent in 2006 to 18 per cent in 2015. Two-thirds of the staff in temporary positions are block-funded.

In total, 75 per cent of Austrian academic personnel were engaged in temporary positions; among full professors the share was 6–7 per cent. The civil servant positions are expiring, and in these positions the share of temporary employment is very small. In general – as for many countries – the higher up on the academic ladder, the share of temporary positions is decreasing.

In the UK, 34 per cent of academic staff were employed on fixed-term contracts in 2015/2016. This goes for 26 per cent of full-time staff.

In the Netherlands, there has been an increase in the share of fixed-term contracts for academic staff from 39 per cent in 2009 to 42 per cent in 2016. PhD candidates are up to 100 per cent fixed-term, the share drops higher up the academic ladder; at professor level 6 per cent have fixed-term contracts, while 3 per cent of senior lecturers have this kind of temporary contract.

Also in Denmark, the most typical temporary positions are junior positions as PhD students, postdocs, adjuncts, teaching assistants and academic assistants. It is regulated that temporary contracts can only be renewed twice, in total three such periods and 8 years as a maximum. There are two categories of professors in Denmark, one working on indefinite contracts and the other with fixed-term contracts.

28 per cent of academic personnel in Sweden had a fixed-term position in 2016. The total share of fixed-term employment in Sweden has decreased slightly since 2011.

As in most countries, researchers in Finland often work in temporary researcher or teaching posts for several years before being appointed to more permanent or long-term posts as lecturer or senior assistant.



## 9.7 International mobility

For all countries except the UK, the language represents a challenge when it comes to attracting foreign academics. During the last years it has become more common to offer educational programmes and teaching in English, and native language skills have become less important. The value of international collaboration in the field of research, combined with the desire to attract the best academic workforce has led to a clear increase in the share of foreign academics in the countries of our study.

**Table 7. International mobility of academic workforce at PhD<sup>1</sup> and post-PhD level<sup>2</sup> in 2012. International workforce in 2015 or latest year of available data.<sup>3</sup>**

| Country         | International mobility                                     | International workforce   |
|-----------------|--|---|
| Norway          | 20% international mobility during PhD;<br>43% for post-PhD | 27% of HES workforce are immigrants, 37% of PhD-graduates are non-Norwegian citizens (around 20% at full professor and associate professor level) |
| Sweden          | 13% international mobility during PhD;<br>38% for post PhD | 32% of academic personnel had a foreign background. 34% of PhD graduates are non-Swedish citizens   |
| Denmark         | 47% international mobility during PhD;<br>53% for post PhD | 21% of new positions in 2011–2013 from foreign universities or research institutes. 36% of PhD graduates from non-Danish citizens                 |
| Finland         | 20% international mobility during PhD;<br>41% for post PhD | 20% foreigners of the teaching and research staff employed in Finnish universities. 21% of PhD graduates from non-Finnish citizens                |
| The Netherlands | 19% international mobility during PhD;<br>46% for post PhD | 30% of HES workforce were foreigners, 43% of awarded PhD  |
| Austria         | 12% international mobility during PhD;<br>45% for post PhD | 27% of academic workforce from abroad, 30% of PhD candidates  |
| UK              | 12% international mobility during PhD;<br>28% for post PhD | 31% of academic staff has a non-UK nationality  |

<sup>1</sup> In the MORE2 survey two types of international PhD mobility are measured: mobility in order to obtain a PhD in a country other than the country of highest previous degree (PhD degree mobility); and mobility during the PhD of at least three months to another country but with a return 'home' to obtain their PhD.

<sup>2</sup> Researchers who are currently mobile or who were mobile within the last ten years for a period of at least 3 months.

<sup>3</sup> Different definitions and years from national sources.

Source: MORE2 data (international mobility among PhD, and post-PhD careers 2012) and national sources on share of workforce from abroad: Netherlands: 2011, VSNU(WOPI). Sweden: 2016 SCB. Finland: 2014 European University Institute. UK: HESA, 2015/2016. Norway: NIFU, 2014. Denmark: Data collected from universities by Ministry of Higher Education and Science 2014. Data on citizenship for PhD graduates for Denmark from NORBAL 2015.

During the PhD phase, international mobility is especially high in Denmark at 47 per cent, followed by Norway, Finland and the Netherlands, while Austria and the UK have a lower mobility rate at 12 per cent. For post-PhD careers, there are fewer differences among the countries; around 40–50 per cent were mobile, with an

exception for the UK at 28 per cent. Again, we find the highest mobility in Denmark at 53 per cent.

In Europe, the most common method of recruitment is public call, where the institutions themselves govern the process with a large degree of autonomy. An open recruitment process also goes for the majority of the countries in this study. In some countries legislation varies with the type of institutions. In Austria, junior positions are recruited through public calls, while assistant and associate professor through career advancement, and professors through a mix of the two. At university colleges of teacher education there is a selection process at all levels. In some countries, like Norway and Austria, temporary positions do not always have to be published. But usually positions are announced internationally and the share of foreigners in the academic workforce is substantial and increasing in the countries of our study.

In Norway, 28 per cent of R&D personnel in the higher education sector (HES) had non-Norwegian citizenship in 2016. This number has increased clearly over many years. Norway is one of few countries without student fees and with attractive working conditions for PhD students, hence the share of foreign students is rather high, at around 37 per cent of awarded doctoral degrees.

In the Netherlands, 23 per cent of the academic workforce in 2003 were foreigners and 36 per cent of the PhD students were foreigners, in 2011 the share of foreigners was 30 per cent of the workforce and 43 per cent of PhD students. At professor and associate professor level the share is stable at around 15 per cent.

The academic faculty members with a foreign background comprised 18 per cent in the Swedish university sector in 2006 and 32 per cent in 2016. The number of foreign PhD students has doubled over the last ten years and 36 per cent of those rewarded a PhD in 2015 had a foreign background. The number of foreign doctoral students decreased from 40 to 38 per cent between 2014 and 2015.

In Austria, international mobility is increasingly seen as an integrated part of an academic career.

In the UK 31 per cent of academic staff had non-UK nationality in 2015/2016. The majority came from other EU countries.

In Denmark, 21 per cent of all new positions at professor, associate professor or assistant professor level in 2011–2013 came from a foreign university or research institute according to data from the universities collected by the Ministry of Higher Education and Science in 2014.

## 9.8 National mobility

National mobility covers mobility between different sectors and mobility between the higher education institutions. Unfortunately, again there is not so much comparable data on national mobility. For all countries, there seems to be a

tendency of higher mobility for temporary positions. As soon as people receive a permanent position the mobility rate tends to decrease.

In the Netherlands, the academic job market is rather dynamic. Each year on average 32 per cent of postdocs and teachers move jobs, around 15 per cent of assistant professors and 14 per cent of associate professors. As the universities of applied sciences (UAS) are conducting more research in recent years, and with a closer approach between the career ladder of universities and UAS, mobility is expected to increase within the Dutch higher education sector in the coming years.

In spite of a very similar system of career titles between the universities and universities of applied sciences in Norway, the mobility between these two academic sectors is low, especially at the top academic level. During the last 8 years only 7 per cent of professors annually came from another higher education institution. The share of professors recruited from their own academic institution is rather high at professor level in Norway. An average of 62 per cent came from their own institution over the last 8 years.

A linking of data from the NIFU Register of Research personnel and Statistics Norway a few years ago<sup>50</sup> concluded that compared with other countries, Norway seems to have a relatively high sector mobility. Sector mobility from the higher education sector to business and public sector was not insignificant and not only from recruitment positions. The proportion of R&D personnel with a PhD in the business enterprise sector increased from 6 per cent in 2007 to 8 per cent in 2012.

## 9.9 Professor of practice

In the Norwegian context, the discussion of practice professor (or professor of practice) must be understood in the light of ambitions to strengthen the relationships between higher education institutions and society at large. However, the title practice professor or professor of practice is not common in the countries of this study. Although the academic career structure is increasingly characterised by diversification, the research talent and resources are the most important 'assets' defining the institutional priorities in. Our investigation finds for instance that professor of practice is not a widespread or up and coming arrangement beyond the professional subjects where teachers from the field of practice have always been an important part of the teaching staff.

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<sup>50</sup> Presented in Kunnskapsdepartementet (2014): Forskningsbarometeret, p. 67.

**Table 8. Professor of practice.**

|                        |   |
|------------------------|---|
| <b>Norway</b>          | The introduction of the title professor of practice or practice professor is currently under discussion.  |
| <b>Sweden</b>          | Has been introduced, but after some cases of employing adjunct professors without sufficient academic competence the formal requirement for an adjunct professor became the very same as for an ordinary professor. This new requirement has in practice stopped the opportunity to hire practice professors.                     |
| <b>Denmark</b>         | A formal type of position labelled ' <i>Erhvervsprofessor</i> ' exists, but is rarely in use.   |
| <b>Finland</b>         | Some institutions have introduced professors of practice to engage qualified, business or public sector leaders and experts with academic background for special purposes.  |
| <b>The Netherlands</b> | Not formalised as such. Professors of special appointment can be funded by industry, but the system is different from professors of practice.   |
| <b>Austria</b>         | No formal position at this level.   |
| <b>UK</b>              | No formal position at this level. But there are examples of promotion criteria for professorial positions that recognise enterprise activities, and of positions such as the Fellow Commoners at Cambridge colleges who are appointed for a limited period on basis of their achievements in their own field outside of academia. |

## 9.10 Career opportunities for PhDs and postdocs

Across Europe there is in some countries fierce competition for PhD positions, while less in others (Fumasoli et al., 2015). To an increasing extent PhD qualifications are becoming part of the entry requirements to an academic career. Yet, many consider the phase after completion of the PhD as the most challenging step of the academic career path (Brechelmacher et al., 2015). This is due to the imbalance between the number of newcomers and the decreasing number of available positions at the next career levels (Fumasoli et al., 2015).

After the PhD, postdoc positions are becoming more common across all disciplinary fields. Originally postdoc positions were a more common feature of the natural sciences (Fumasoli et al., 2015). Yet, the postdoc phase is also challenging; in many countries a permanent academic position is very hard to obtain.

The primary status of PhD candidates is that of a student in almost all European countries. Norway is an exception with its good working conditions, and to some degree Netherlands where PhD candidates used to be employed by the universities but where there is a change to greater use of engagement as a student rather than an employee, which is cheaper, but more uncertain for the candidate. In most countries doctoral candidates are treated differently from bachelor's and master's students, and often have a contract. In 25 per cent of European countries, it is possible to prepare a PhD without any formal PhD status. The PhD level is critical for an academic career: the PhD is very often the first step of the career ladder, but does not have to be. It differs whether it is a legal requirement for

further advancement. In the UK, Finland and the Netherlands a doctoral degree is not a legal requirement for assessing certain academic staff. In some countries, like Denmark, most academics at the universities needs to hold a PhD; this applies only to some categories at other higher education institutions. One thing is the legal requirement; with the increasing number of PhD candidates, one can expect that it is increasingly common to have a PhD when a person is moving up the career ladder.

**Table 9. Career opportunities for early-career academics.**

|                        |  |
|------------------------|--|
| <b>Norway</b>          | Academic career prospects for PhD candidates and postdocs have become less certain, due to competition for permanent positions, and because the average age for obtaining a permanent position has increased. On the other hand, young academics who have obtained a permanent position as an associate professor have good career prospects, due to changes the opportunity to apply for promotion to full professor irrespective of vacant professorships. This situation also applies to lecturers, who may apply for promotion to senior lecturer and docent on the basis of their qualifications. |
| <b>Sweden</b>          | The postdoctoral phase is regarded as the bottleneck in the Swedish system, and causes uncertainty and difficulties for young faculty members after finishing their PhD. on their way to a limited number of permanent jobs as teachers and researchers at the HEIs.   |
| <b>Denmark</b>         | PhD uptake more than doubled in the period from 2004 to 2010. In the present situation, the majority of new PhDs have to find employment outside the academic system.  |
| <b>Finland</b>         | Standard time for a PhD has been reduced to four years and a more systematic PhD education has been introduced. Some tasks (i.e. development of research merits) are now expected to take place during the next stage (in the Finnish system, senior assistant/postdoc).   |
| <b>The Netherlands</b> | Increasing number of PhD holders while the number of permanent academic positions in universities remain more or less the same. There is intensified competition for tenure, and a postdoc position increasingly becomes a requirement for obtaining a permanent position in universities. A postdoc function in the Netherlands is no longer a short-term entrance trajectory into the university but is more likely to be a longer-lasting experience. Their career prospects within the academy are challenging.  |
| <b>Austria</b>         | First step of an academic career often part-time lecturers with precarious working conditions; or so-called project workers employed to contribute on projects funded from third parties. Project workers grew most rapidly since 2005.  |
| <b>UK</b>              | The period from an obtained PhD to a permanent position as lecturer, which used to serve as the typical first stage of an academic career, has lengthened severely over the years. Many work on fixed-term postdocs or teaching-only contracts for a long period of time.  |

Career progression in academia sometimes follows not only predefined steps in terms of academic achievements, but also in terms of the duration of experience within a specific staff category.<sup>51</sup> The obligation to teach generally applies only for certain PhD categories.

In the wake of the expansion of PhD candidates we find that academic careers, are characterised by inflation in fixed employment criteria. It appears to be taking

<sup>51</sup> European Commission (2017): p. 40.

longer for so called early career academics to achieve a permanent post that includes research – one might say that the ‘apprenticeship’ stage – from being a PhD student to become a principal investigator has been prolonged. Several fixed terms as a postdoc have become a necessity for achieving a permanent post. This potentially and truly ‘leaking pipeline’ is partly characterised by leakage of talents for research (only partially empirically), investigated, which in Norway, like many other countries, has contributed to debate about the need for tenure track.

## 9.11 Tenure track

**Table 10. Tenure track.**

|                        |  |
|------------------------|--|
| <b>Norway</b>          | Some tenure track positions have been introduced for a trial period in the fields of technology, natural sciences economics and medicine.  |
| <b>Sweden</b>          | Tenure track positions are being implemented. In 2016 a proposal was launched to introduce ‘assistant professor with the right to evaluation for further advancement’ as a cornerstone for a Swedish tenure track system. The appointment should end with a peer-reviewed evaluation of teaching skills and research merits, and if the candidate was approved as qualified, a permanent position should be offered.   |
| <b>Denmark</b>         | A six-year ‘tenure-track-adjunktur’ has been introduced by the University of Aarhus and the University of Copenhagen. The tenure track is a six-year contract leading to a permanent position as associate professor if research achievements are fulfilled.   |
| <b>Finland</b>         | In Finland, a tenure track system more or less loosely based on the US American tenure-track has recently been established. However, tenure track positions are rather rare and there is great variation across universities how the tenure track system is applied.   |
| <b>The Netherlands</b> | Various types of tenure tracks are employed in the Netherlands. The associate professor track – for postdocs who start with a temporary assistant professor appointment, potentially leading to a permanent associate professor appointment if positive evaluation is obtained after four/six years. The professor track – a potential continuation of an associate professorship, or a means to recruit external talented associate professors, who can be promoted to professor position if receiving a positive evaluation. |
| <b>Austria</b>         | Austria has a system which resembles that of a tenure track. This is found in the position as a Assistenzprofessoren/-innen, which are ‘Laufbahnstellen’ leading to a position as Assoziierte Professor/-innen. A PhD is a prerequisite for applying for this position, which has become very competitive.   |
| <b>UK</b>              | Tenure (in the US sense) was abolished by the Thatcher government in 1988. Yet universities have full autonomy to introduce tenure track positions at their institutions.  |

The introduction of tenure track models can, according to Brechelmacher et al. (2015), be seen as an attempt to structure the postdoc phase. The introduction of these positions has been described as incentives for universities and disciplines to rethink the internal structure of academic careers (Fumasoli et al., 2015). Tenure track positions are also described as a means to clarify academic career trajectories (Fumasoli et al., 2015). However, the competition for tenured positions as well as professorships is fierce in most countries (Fumasoli et al., 2015).

We observe that in most of our countries some form of a tenure track model has been put in place.

## 9.12 Concluding remarks

To some extent it is tempting to ask if Norway in this case is the egalitarian extreme. The Norwegian pay scale is often described as more compressed than other countries and Norway to a great extent has a system with equal balance between time for research and time for teaching. At least Norway and the UK could be considered two extreme cases, in particular with regard to the academic career system.

Importantly, the debate regarding academic career structures in different European countries shows many similarities. However, this study amply has shown national distinctiveness and that academic positions and working conditions to a lesser extent are identical across the countries.

To conclude, the higher education sectors are increasingly important to society and national economies. Recruitment to academic positions, academic career prospects, and working conditions are critical issues in this regard. International comparative studies of the academic profession have illuminated how, despite repeated attempts at harmonisation across European countries [e.g. through measures linked to the establishment of the European Research Area (ERA)], academic career structures and career paths remain embedded in national systems and show substantial national variations. This is also natural, given that academic careers are inherently embedded in the specific traditions of national higher education systems. Despite increased attempts of European coordination in higher education and research, European higher education systems remain nationally embedded endeavours. Instruments designed to harmonise and standardise European higher education are translated rather than transferred to national and institutional contexts (Chou & Real-Dato, 2014; Musselin, 2009b). Thus, even when specific ideas for academic careers start to travel (i.e. the concept of tenure track), they take distinct national shape. In some instances, they also overlap with already existing practices, creating co-existing parallel career systems (e.g. some UK universities adopting practices from the U.S.). The sample of countries of this report does not provide reasons to compare the countries on an analytical basis, hence conclusions regarding the relation between productiveness of the national R&D systems and their distinct academic career structures cannot be drawn on a firm basis.

Thus, the overall picture in this report is that of diversity – both across and within systems. National systems for academic careers vary amongst others by the degree of recruitment from outside; internationally as well as nationally (Afonso, 2016). There is considerable variation in the academic career structure, content of

work and tasks as well as academic titles – across countries, and also across the binary divide within the same country. In this report, a few but important components of academic career systems have been discussed. For example, the ranking system after the postdoc level varies across countries. In UK the traditional ranking system had four levels, in the Dutch system it has three levels and in Norway two. Yet the influence of the differences in ranking systems is less explored. On another note, compared with the other countries Norway has a rather generous promotion system.

When discussing academic career systems, it is valuable to acknowledge that these social structures embed inherent tensions. Academic career systems remain important means to achieve national policy goals for education, research and innovation, based on a diverse range of achievement criteria and pay scales. They are also vital to attract talented students and PhDs for research and teaching positions through entailing a predictable future as permanent staff members. Finally, they represent a means to keep academic staff, create a productive work environment with incentives for excellence and performance in both research, teaching, and other tasks. The interests of national authorities, higher education institutions, academic staff, and aspiring academics might not necessarily be the same. These different purposes can also be contradictory, but co-exist in most systems, and such tensions cannot necessarily be entirely relieved through changes of the formal career structure.

In general terms, every national higher education system has developed a particular version of an academic career system. This applies to type of academic positions, the relative number of each position, content of academic work related to each position, recruitment procedures, appointment and promotion regulations, career paths, etc. However, some of these aspects might be more or less formalised and steered in a systematic manner. The national case studies show variations in which aspects of the career systems are formalised, and the degree to which such formalisation can be observed. In addition, most countries in this study distinguish between universities (offering traditional academic studies and research training) and other higher education institutions (offering mainly short-term and more practical oriented training).

Moreover, it should be noted that academic careers are not only embedded in the national higher education system, but the general labour market tradition and broader legal framework of individual countries. This is an important consideration, not least when the purpose of a career system is also to assure that academia remains an attractive career for younger scholars. While some of the systems with very high level of competition and increasing levels of temporary contracts can show high performance and output, this relationship should not be assumed to be causal. It is also possible that this kind of approach can have detrimental effects in the long run. This is particularly the case in countries like



Norway, where the labour market conditions in the public sector in general are embedded in a welfare state tradition.

As also indicated in the introduction, academic career systems are dynamic systems. They vary across countries and over time, and represent a result of an ongoing negotiation between various actors within the system. Comparisons of systems are complicated, as one can identify similar titles with different content, or similar content of a position with different titles. The division of tasks varies horizontally (in terms of combined, teaching or research-focused positions), as well as vertically (between various steps in the career ladder). The situation is a result of deliberative reform efforts, path dependencies and also various external influences and scripts regarding the appropriate profile for academic staff.

In this report we have only just touched upon academic career systems in six European countries in addition to Norway. This mapping of national systems is primarily focused on formal systems, supplemented by secondary data about practices when this is available. Our national experts filled some of this gap. However, the report does not fully explore the disciplinary and professional dimensions of career structures, nor does it provide detailed, systematic and comprehensive information about the experiences of academic staff who work in these systems. Yet, we believe that this report can provide a solid baseline for the discussion of the status of academic careers in Norway and whether, and if so how, the career system might be improved.

## 10 Statistical appendix

This report shows and confirms how higher education systems are very heterogeneous, a similar picture also emerges in the available statistical overview. Due to historical, economic and political differences higher education institutions are organised in many ways (OECD, Frascati manual 2015: 34). This is also reflected in the statistics that are available on the academic career systems which are seldom straight forward comparable.

The institutions have a variety of career systems rooted in different historical starting points and degrees of institutional freedom and legislation which makes a one-to-one comparison between different, even neighbouring countries, difficult.

In this statistical appendix, we start by presenting the different sources of data. The starting point is data on R&D in the higher education sector. They represent data collected by common guidelines (OECD Frascati Manual), then we present statistics on the number and type of higher education institutions and academic personnel, on mobility and temporary positions. Statistics include data collected especially for this project, as well as data from the MORE2 project and data from other studies that attempt to systemise academic careers.<sup>52</sup>

There are many more studies on universities than on other higher education institutions like the universities of applied sciences. Also, when it comes to statistics, there are less available data on the universities of applied sciences and other university colleges.

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<sup>52</sup> Leru (2014): Tenure and Tenure Track at Leru Universities: Models for Attractive Research Careers in Europe. Advice Paper No. 17 – September 2014. European Commission (2017): Modernisation of Higher Education in Europe: Academic Staff – 2017, Eurydice report. MORE2 (2013): Support for continued data collection and analysis conserving mobility patterns and career paths of researchers. Working conditions and career paths of early career researchers Cross-Country Report. (WP3). <https://www.eui.eu/ProgrammesAndFellowships/AcademicCareersObservatory/AcademicCareersbyCountry>

## 10.1 Data sources

**National experts:** We received customised data on academic personnel at different career levels from different statistical offices and national statistical experts on higher education personnel:

- **Austria:** Bundesministerium für Wissenschaft, Forschung und Wirtschaft/ Federal Ministry of Science, Research and Economy
- **Denmark:** Uddannelses- og Forskningsministeriet/ Ministry of Higher Education and Science and Statistics Denmark
- **Finland:** Statistics Finland
- **Sweden:** Universitetskanslersämbetet/Swedish Higher Education Authority
- **Netherlands:** Rathenau Instituut
- **Norway:** NIFU – Nordic institute for Studies in Innovation, Research and Education
- **United Kingdom:** Higher Education Statistics Agency (HESA)

The statistical network has also given valuable information on where to find national data on temporary employment, mobility and mobility of academic staff, and have provided advice on a number of questions regarding the interpretation of the data.

**R&D statistics:** Data on R&D statistics are obtained from OECD Main Science and Technology Indicators (MSTI 2017:2) and Eurostat Research and Development Database (headcount). The latest data are from 2015. In addition, NIFU has used preliminary 2016 data from the Nordic countries' producers of R&D statistics. The R&D statistics have been conducted in the OECD member countries since the 1960s to provide governments and others with information on resources (expenditure and personnel) used on R&D by different sectors; the business enterprise sector, the government sector, the higher education sector and the private non-profit sector. The production of these statistics is made by common guidelines<sup>53</sup> developed by national experts on science and technology (NESTI). The higher education sector is the most heterogeneous of the R&D performing sectors. For some countries (like Norway) the number of R&D personnel (researchers) and the academic personnel will be the same, as all academics are expected to perform R&D. For other countries, the number of academic personnel can be higher, as academic personnel also include people only involved in teaching. Another important element is that the personnel involved in R&D at the university hospitals are included in the R&D statistics.

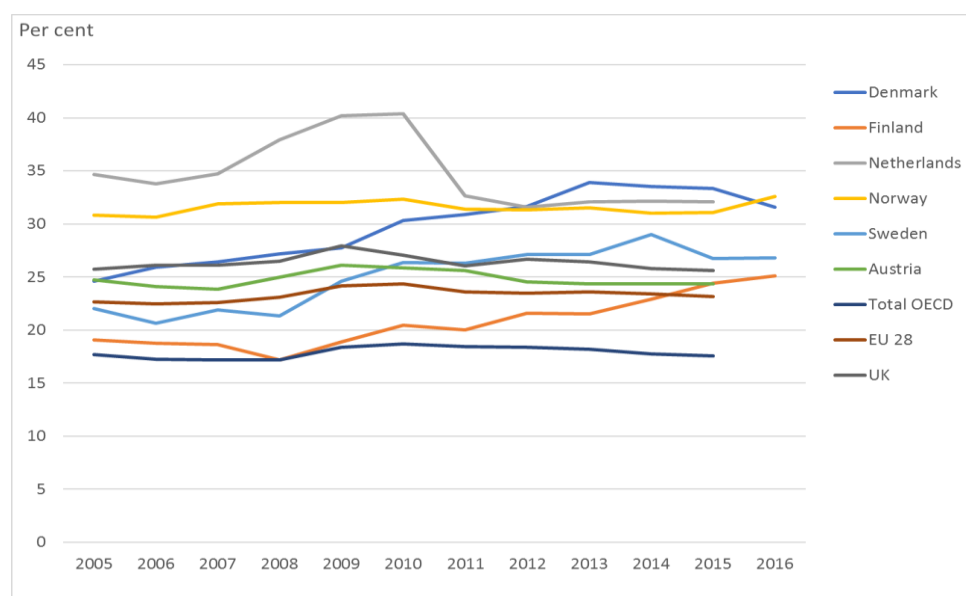
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<sup>53</sup> OECD (2015): Frascati Manual 2015. Guidelines for collecting and reporting data on research and experimental development, OECD, Paris.

**MORE2:** Study on Mobility Patterns and Career Paths of Researchers from 2013.<sup>54</sup> The study is based on two large-scale surveys among individual researchers and on case-studies. 47 countries are classified along 27 variables to calculate dissimilarities between the countries when it comes to career paths. A cluster analysis is then used to identify different groups of countries. This information comes from national experts. In our report, we have used MORE data on mobility during PhD, post-PhD and on share of part-time work in the higher education sector. We have also used MORE data regarding ‘precarious’<sup>55</sup> working contracts of researchers in the Higher Education Sector (HES).

**The European Tertiary Education Register (ETER)** contains a variety of data on higher education institutions. We have included some data from this source in the study, but as the latest update is for 2014 we have also used other data sources, for example for a number of higher education institutions where recent reforms have made these data outdated for several countries. The data source on the number of higher education institutions is therefore updated with input from the statistical experts, web pages of the relevant ministries or more updated national studies.

## 10.2 R&D statistics



**Figure 5. R&D in the Higher education sector as a share of total R&D, 2005–2016.**

Source: OECD MSTI 2017:2 and national R&D statistics for Nordic countries (preliminary 2016)

<sup>54</sup><https://euraxess.ec.europa.eu/content/more2-study-mobility-patterns-and-career-paths-researchers-2013>. Results of the MORE3 study will be published early in 2018.

<sup>55</sup> In MORE2 researchers with ‘precarious working contracts’ are defined as those with no contracts, fixed-term contracts of up to one year, or other contracts associated with student status.

Compared with overall OECD numbers the share of R&D performed in the higher education sector (HES) is high among the countries in this study. As shown in Figure 1, Norway now has the highest share at 33 per cent (preliminary 2016 data), followed by The Netherlands (2015) and Denmark both of which have shares over 30 per cent, Austria (2015) has the lowest share at 24 per cent. Denmark has the strongest increase in the share of R&D performed in HES, mainly due to mergers of several research institutes into universities in 2007.

Related to the number of inhabitants, Denmark has the highest R&D expenditure per capita at just over 4,000 NOK in 2015. Denmark is followed by Sweden and Norway, while UK spends least at 1,500 NOK per capita. When it comes to annual growth in R&D expenditure in HES, again Denmark is at the top at 6.0 per cent annual growth in the 2005–2015 period (fixed 2010-prices). Norway follows at 4.1 per cent, while the Netherlands, Finland and UK all have growth rates below 2 per cent.

Measured as a share of GDP, Denmark is at the top of R&D expenditures in HES of almost 1 per cent in 2015. Sweden follows at almost 0.9 per cent. Norway scores relatively low on this indicator at 0.6 per cent. Only the UK has a lower share at 0.4 per cent.

**Table 11. R&D statistics for higher education sector for selected countries. 2005–2015/2016.\***

|                   | 2005                | 2015/2016   | 2005                          | 2015         | 2005-2015        | 2005        | 2015        |
|-------------------|---------------------|-------------|-------------------------------|--------------|------------------|-------------|-------------|
| Country           | Share of R&D in HES |             | HERD/Capita Fixed<br>2010 NOK |              | Annual<br>growth | HERD/GDP    |             |
| Denmark           | 24.6                | 31.6        | 2,350                         | 4,017        | 6.0              | 0.59        | 0.99        |
| Finland           | 19.0                | 25.1        | 2,206                         | 2,451        | 1.5              | 0.63        | 0.71        |
| Netherlands       | 34.7                | 32.1        | 2,417                         | 2,664        | 1.4              | 0.62        | 0.64        |
| <b>Norway</b>     | <b>30.8</b>         | <b>32.0</b> | <b>2,373</b>                  | <b>3,163</b> | <b>4.1</b>       | <b>0.46</b> | <b>0.60</b> |
| UK                | 25.7                | 32.6        | 1,347                         | 1,513        | 1.9              | 0.40        | 0.44        |
| Sweden            | 22.0                | 26.8        | 2,722                         | 3,532        | 3.5              | 0.74        | 0.88        |
| Austria           | 24.7                | 24.3        | 2,150                         | 2,969        | 3.8              | 0.59        | 0.76        |
| <i>Total OECD</i> | <i>17.7</i>         | <i>17.6</i> | <i>1,202</i>                  | <i>1,432</i> | <i>2.6</i>       | <i>0.38</i> | <i>0.42</i> |
| <i>Total EU</i>   | <i>22.6</i>         | <i>23.2</i> | <i>1,102</i>                  | <i>1,440</i> | <i>3.0</i>       | <i>0.38</i> | <i>0.45</i> |

\* Some preliminary 2016 data for the Nordic countries are included.

Source: OECD MSTI 2017:2

The UK is obviously at the top in absolute numbers when it comes to full-time equivalent (FTE) researchers at almost 170,000 in 2015, followed by the Netherlands, Sweden, Denmark, Austria, Finland and then Norway at just under 11,000. More comparable is the number of FTE researchers compared with the size of the population.

**Table 12. R&D FTE in HES by selected country. Total FTE researchers and per million capita. 2005 and 2015.**

| Country       | 2005         |              | 2015          |              |
|---------------|--------------|--------------|---------------|--------------|
|               | FTE          | FTE/Capita   | FTE           | FTE/Capita   |
| Denmark       | 8,242        | 1,521        | 16,190        | 2,849        |
| Finland       | 12,879       | 2,455        | 12,240        | 2,233        |
| Netherlands   | 17,928       | 1,099        | 22,300        | 1,317        |
| <b>Norway</b> | <b>7,512</b> | <b>1,625</b> | <b>10,976</b> | <b>2,114</b> |
| UK            | 141,762      | 2,347        | 168,682       | 2,591        |
| Sweden        | 15,125       | 1,675        | 16,814        | 1,716        |
| Austria       | 8,962        | 1,090        | 13,454        | 1,559        |
| Total EU      | 551,645      | 1,115        | 713,088       | 1,399        |

Source: OECD MSTI 2017:2

In the same way as with R&D expenditure, Denmark has the highest share of R&D FTE in the population with more than 2,800 FTE per million capita. UK has the second highest share at almost 2,600 FTE researchers per million capita, followed by Finland, Norway, Sweden, Austria and the Netherlands. All countries, except the Netherlands, scores higher than the EU level.

Denmark has the strongest increase in research intensity of HES FTE in the population measured in this way.

**Table 13. R&D expenditure by share of public funding and general university funds (GUF). Selected countries 2005 and 2015 or last year of available data.**

| Country       | 2005                    | 2015        | 2005         | 2015        |
|---------------|-------------------------|-------------|--------------|-------------|
|               | Share of public funding |             | Share of GUF |             |
| Denmark       | 83.2                    | 76.9        | 60.2         | 55.0        |
| Finland       | 81.2                    | 82.3        | 44.6         | 47.6        |
| Netherlands   | 82.8                    | 77.1        | ..           | ..          |
| <b>Norway</b> | <b>87.4</b>             | <b>89.1</b> | <b>63.6</b>  | <b>69.4</b> |
| UK            | 69.3                    | 62.4        | 34.6         | 29.7        |
| Sweden        | 74.4                    | 76.2        | 46.4         | 44.9        |
| Austria       | 86.9                    | 85.4        | 69.8         | 63.7        |

Source: OECD MSTI 2017:2 and Eurostat

When it comes to funding the R&D expenditure in the higher education sector, we see from Table 13 that Norway has the highest share of public funding at almost 90 per cent, and that this share has even increased from 2005. The lowest share of public funding can be found in the UK. Student payment and other external funding sources are the explanation for this.

Both Finland and Sweden have had a small increase in the share of public funding in the 10-year period. For Finland, this might have to do with the general

difficult economic situation. For Sweden, we see that since the basic funding/general university funds (GUF) is decreasing this implies that other public external funding sources contribute more in 2015 than in 2005.

Norway has the highest share of public general university funds (GUF) at 69 per cent, followed by Austria at almost 64 per cent. UK has less than 30 per cent. In the other countries the share is around 50 per cent. For most EU and OECD countries the share of basic funding has declined in recent years, reflecting the stronger share – and probably influence – of other public and private funding sources. To fund their activities higher education institutions are more exposed to and have gained increased opportunities to apply for other types of funding from public sources (research councils, other ministries), the business enterprise sector, different foundations, and from abroad (EU framework programme).

Among the countries in this study, the UK HES had the highest share of funding from abroad at 16 per cent, while Norway has only 3 per cent funding from abroad. Funding from the business enterprise sector was highest in the Netherlands at 8 per cent, followed by Austria at 5 per cent, while the other countries had 3–4 per cent funding from this sector.

### 10.3 Higher education institutions and academic personnel

The countries in our study differ when it comes to number of institutions, types and funding. Compared with the population size the higher education *institutional density* is highest in Norway and lowest in the UK.

The European Tertiary Education Register (ETER) contains a variety of data on higher education institutions. The latest update was for 2014. As an introduction to this section we include some figures from this database as data are collected and grouped by common guidelines. Later in the chapter we present latest available data collected nationally.

#### 10.3.1 ETER data

The classification as *university*<sup>56</sup> applied to 17 per cent of Norwegian institutions and 80 per cent of the UK institutions in 2014. Sweden also has a high share of universities (88%), followed by Austria (49%), while Finland, Denmark and the Netherlands all have around 1/3 universities among their higher education institutions.

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<sup>56</sup> UNI (university): These HEIs display a largely academic orientation (without excluding some focus on applied research), have the right to award doctorates and can bear the full name of 'University' (including variants like technological university etc.). In general, awarding doctorates should be the main criterion to classify HEIs in this category, even if a few doctoral-awarding HEIs might be included in the two following categories: university of applied sciences and other institutions.

When it comes to the division by main *funding category*, almost all institutions in the UK are classified as private, government dependent (more than 50% from government funding or teaching staff paid by a government agency). This category is the largest also in the Netherlands at 70 per cent. In Denmark, Sweden and to a bit lower extent in Norway the higher education institutions are public, this also goes for 46 per cent of Austrian HES. Austria also has the highest share of private institutions at 25 per cent, for the other countries this is a small category.

**Table 14. Number of higher education institutions in 2014 by main type of funding.**

| Country         | Institutions (N) | Private (%) | Private gov dependent (%) | Public (%) |
|-----------------|------------------|-------------|---------------------------|------------|
| Austria         | 69               | 25          | 29                        | 46         |
| Denmark         | 33               | 0           | 3                         | 91         |
| Finland         | 41               | 0           | 51                        | 49         |
| The Netherlands | 56               | 9           | 70                        | 21         |
| <b>Norway</b>   | <b>48</b>        | <b>6</b>    | <b>21</b>                 | <b>73</b>  |
| Sweden          | 37               | 0           | 16                        | 84         |
| UK              | 161              | 1           | 99                        | 0          |

<sup>1</sup> For 6 Danish institutions information on funding is missing.

<sup>2</sup> Private = more than 50% private funding.

Source: ETER

### 10.3.2 Number of higher education institutions and academic personnel

For many of the countries in this study there have been mergers, new institutions and changes in the category to which the institutions belong. Due to this we have updated the information on the institutional landscape with latest available national sources. Norway has had the largest changes with its ongoing merging process of the higher education sector where several former universities of applied sciences have gained university status by fulfilling academic criteria, hence the number of institutions has decreased from 48 in 2014 to 31 in 2017. Since January 2018 Norway has 9 universities and 22 other higher education institutions that are covered by the R&D statistics.



**Table 15. Higher education institutions in selected countries, by main type of institution. 2017/2018 or latest available data.**

| Country         | Universities | Other     | Total     |
|-----------------|--------------|-----------|-----------|
| Austria         | 35           | 35        | 70        |
| Denmark         | 8            | 23        | 31        |
| Finland         | 14           | 23        | 37        |
| The Netherlands | 14           | 43        | 57        |
| <b>Norway</b>   | <b>9</b>     | <b>22</b> | <b>31</b> |
| Sweden          | 16           | 19        | 35        |
| UK              | 128          | 33        | 161       |

Source: National statistical experts, ministries, internet

Austria: 13 of the universities are private. Other institutions include universities of applied sciences, university colleges of teacher education.

Denmark: Other institutions include 22 university colleges (among them business academics (Erhvervs-akademi) and HE institutions within architect, art, music).

Finland: Other includes universities of applied sciences, formerly polytechnics.

Netherlands: Other includes universities of applied sciences (Hogeschole).

Norway: The newest university (OsloMet) received its university status 10 January 2018. Other institutions include universities of applied sciences, university colleges and other higher education institutions.

Sweden: 2 of the universities are private. Other includes 14 University colleges and 5 university colleges of art.

UK: Other includes university colleges (many within art).

**Table 16. Number of academic personnel for selected countries by universities and other higher education institutions 2015/2016.**

| Country         | Universities | Other  | Total          | Share at universities |
|-----------------|--------------|--------|----------------|-----------------------|
| Austria         | 36,100       | 18,300 | <b>54,400</b>  | 66                    |
| Denmark         | 19,050       | 2,500  | <b>21,550</b>  | 88                    |
| Finland         | 22,450       | 3,900  | <b>26,350</b>  | 85                    |
| The Netherlands | 29,100       | 29,700 | <b>58,800</b>  | 49                    |
| Norway          | 15,350       | 6,900  | <b>22,250</b>  | 69                    |
| Sweden          | 39,100       | 7,150  | <b>46,250</b>  | 85                    |
| UK              | 194,800      | 6,500  | <b>201,300</b> | 97                    |
| Total           | 355,950      | 74,950 | 430,900        | 83                    |

Source: National statistical experts, ministries, internet

Austria (2015): at the universities 2400 people belong to the private universities.

Denmark (2015): other includes all other institutions than universities.

Netherlands (2015): personnel at clinical medical centres are included in the numbers.

Finland and Norway: 2016.

Sweden: Official Swedish statistics. Data on other research/teaching staff at HEIs extracted by Swedish Higher Education Authority (UKÄ)

Table 16 gives an overview of the academic personnel in the countries of this study. These are the best available data we have been able to collect. There might be some differences when it comes to type of personnel included, but support personnel mainly involved in administrative and technical tasks should be

excluded. Where to put the limit here will probably vary slightly between the countries. For the Netherlands 1,400 professors at University Medical Centres (UMC) are included. Staff at university hospitals are not included in the numbers. Table 16 shows that in total over 80 per cent of the academic personnel work at the universities. This share is strongly affected by the UK, where 97 per cent work at institutions classified as universities. The Netherlands has the smallest share of academic personnel at the universities with 49 per cent. Austria and Norway have 66 and 69 per cent respectively, while Denmark, Finland and Sweden have over 80 per cent of their academic personnel at universities.

## **10.4 Academic personnel by level of seniority**

An important part of the mapping of data was undertaken by communicating directly with the team of national statistical experts included from our international network of statistical experts involved in the work of on R&D statistics. The statistical experts came from different institutions, some exclusively involved in the data extraction (HESA in UK), some belonging to the Government (Austria) and some from research administration (Sweden).

The statistical experts were asked to provide overviews of the academic personnel in the country at hand in a four-level grading system – academic personnel by level of seniority which is referred to as A, B, C and D, where A is the top academic level and D is the first level after master’s thesis where research is conducted. The classification system of academic seniority is based on the OECD/She Figures classification and the EU framework, and contains both elements of formal criteria and degree of independence, see Table 17. The experts received this Table for explanation/model criteria of the data we wanted.

We asked the experts to give us information on academic positions in 2005 and 2015 by type of institution (universities and others) and by position (professor, associate professor, assistant professor, PhD, etc.). The experts were asked to indicate whether there is a common career track in their country with elements of both research and teaching or separate career tracks, and they were also asked not to include personnel who are mainly administrative.

**Table 17. Four level academic seniority. Model criteria.**

| Grade          | OECD Frascati and She Figures  |   | EU Framework   |
|----------------|--|---|--|
|                | Explanation  | Example   |  |
| <b>Grade A</b> | The single highest grade/post at which research is normally conducted  | Professor, Director of research                         | R4: Leading Researcher (researchers leading their research area or field)                |
| <b>Grade B</b> | Researchers working in positions not as senior as top position (A) but more senior than newly qualified doctoral graduates (ISCED level 8).                    | Senior researcher or principal investigator             | R3: Established Researcher (researchers who have developed a level of independence); and |
| <b>Grade C</b> | The first grade/post into which a newly qualified doctoral graduate would normally be recruited.   | Researcher, investigator or post-doctoral fellow        | R2: Recognised Researcher (PhD holders or equivalent who are not yet fully independent); |
| <b>Grade D</b> | Either doctoral students at the ISCED level 8 who are engaged as researchers, or researchers working in posts that do not normally require a doctorate degree. | Ph.D. students or junior researchers (without a Ph.D.). | R1: First Stage Researcher (up to the point of PhD);                                     |

Source: NIFU based on categories developed from the OECD, She Figures, Eurostat

Despite common instructions, the data we received had a degree of diversity reflecting the heterogeneity of the higher education systems. This illustrates the challenges embedded in collecting statistical information on this topic. We received data from 2005 and 2015 only for Sweden, the Netherlands and Norway. For the other countries, the data were not comparable over time (changes in institutions, categorisation of personnel, etc.). For Finland, Denmark and Austria we received only the latest available data. For Austria and Finland, we only received data including the university staff. In general, it is our impression that data availability is more modest when it comes to the higher education institutions other than the universities.

The information on different positions at each career level also differed among the countries and is reflected in the statistics presented in the report.

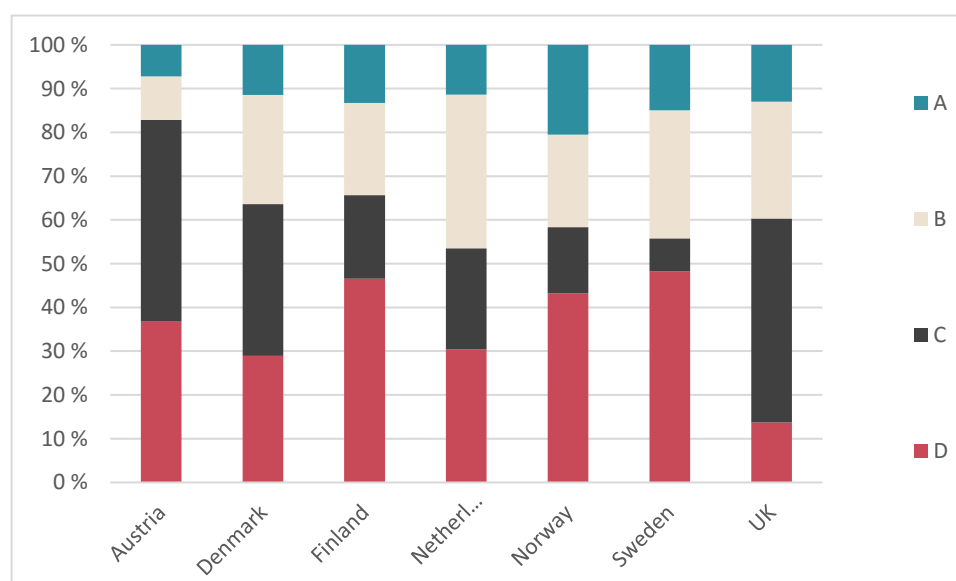
In addition to the categorisation of the academic personnel in the four grades, statistical experts also furnished detailed information regarding academic careers. We have used their input in different parts of this report.<sup>57</sup>

<sup>57</sup> We received no answers for the specific questions from Denmark or UK. UK data are purchased from HESA – the Higher Education Statistics Agency.

#### Questions for statistical experts

- *Promotion*: How are personnel promoted from B to A (competition or national rules of promotion or both or other)?
- *Career tracks*: Are there two career tracks in your country (one more research based and one more education based, or is it a unified system)?
- *Reforms*: Could you give a short comment whether there have been any large reforms regarding the higher education system or academic career structure during the last 10-20 years?
- *'Professor of practice'*: Is there a position at the A level that is more directed towards innovation/entrepreneur professor?
- *Temporary positions*: Could you comment on the extent of temporary positions in your higher education system; what positions are typically temporary?

Based on the data collected from the national statistical experts, Figure 6 and Figure 7 can be presented. As shown in the figures there are large differences between the selected countries when it comes to the division of academic personnel by the A, B, C and D career levels.

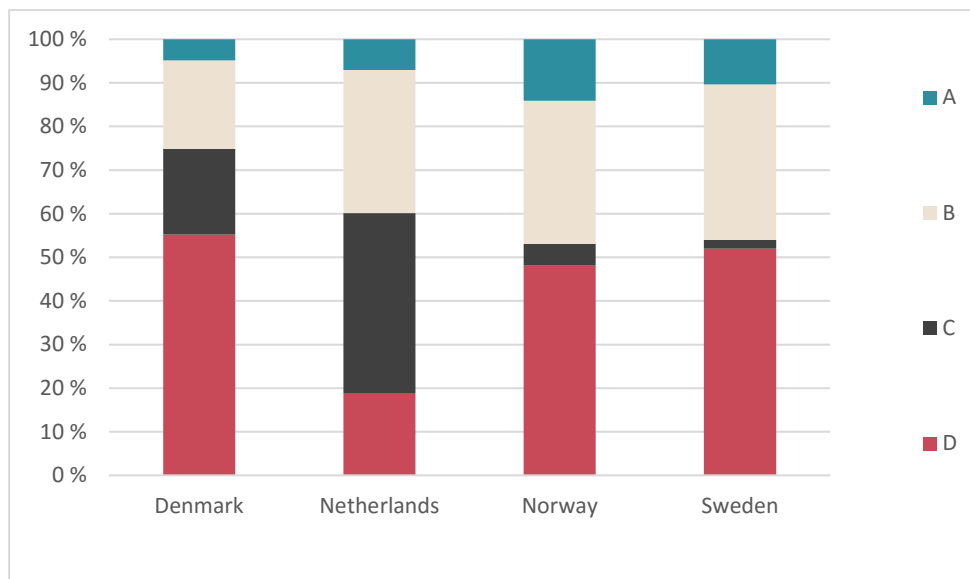


**Figure 6. Academic personnel at universities in selected countries 2015/16 by seniority grade A, B, C, D.\***

\* Grade A is the top academic level (typical professor level), while Grade D is the entry level.

Note: University hospitals are not included. In the UK, the division of personnel by career level has been challenging as the data have only been available at contract level, see table in fact sheets of this report, for categories. For the Netherlands health sciences are excluded (but Medical centres are included).

Source: National sources, Official statistics, processed data. Sweden: Official Swedish statistics. Statistics Sweden/Swedish Higher Education Authority (UKÄ). Denmark: Ministry of Higher Education and Science and Statistics Denmark. Netherlands: Rathenau. Finland: Statistics Finland. Norway: NIFU. Austria: Federal Ministry of Science, Research and Economy. UK: HESA.



**Figure 7. Academic personnel at other higher education institutions (excl. universities) in selected countries 2015/16. by seniority grade A, B, C, D.\***

\* Grade A is the top academic level (typical professor level), while Grade D is the entry level.

Source: National sources, Official statistics, processed data. Sweden: Official Swedish statistics. Data on other research/teaching staff at HEIs extracted by Swedish Higher Education Authority (UKÄ). Denmark: Ministry of Higher Education and Science and Statistics Denmark. Netherlands: Rathenau. Finland: Statistics Finland. Norway: NIFU. Austria: Federal Ministry of Science, Research and Economy. UK: HESA.

Among the universities Norway has the largest share at the top academic level (professors) with 21 per cent, and Austria the smallest share at 7 per cent. The other countries differ between 11 and 14 per cent. Sweden and to some extent Norway have a rather small share of personnel in the C category. Sweden and Finland have a large share of personnel at the lowest career level D.

At the other institutions, the variety among the four countries with data is also large. Again, Norway has the largest share (14 per cent) of staff at the top academic level; grade A, while the corresponding share in Denmark is two per cent. The entry level is rather small in Denmark and the Netherlands, while both Norway and Sweden have a small share of positions at the next level; grade C (post-doc-level).

There have been several attempts to shed light upon the career structure in different European countries by conducting international comparisons (see footnote at the start of this statistical overview where a few of these studies are listed).

In general, it has been observed that two key transition points in career progression are critical; one after defending the doctoral thesis (how to get employment in academia), which within this framework would be to move from grade D to grade C, and the other the process of obtaining a full professorship (e.g. to move from grade B to grade A).

Data from the MORE2 study are highly relevant for our comparative study of career systems. In the following we refer to this study to illustrate similarities and differences regarding academic personnel in our countries. The countries were grouped in different clusters based on common characteristics regarding:

- the age range at which positions are obtained
- the typical type of contract awarded
- the task division between research and teaching
- the level of researchers' autonomy
- the type of funding typically associated with different positions
- whether tenure track options are available at this career stage

Not surprisingly a general finding from the MORE2 study was that where stable working conditions can be obtained at early career stage, researchers tend to be younger when they obtain their first permanent contract.

Below we report findings regarding academic personnel at the different levels of seniority.

**Grade D.** European researchers at this first career stage are typically around 30 years or even younger, they are employed based on block-funded temporary contracts with low autonomy and tenure track options hardly exist.

There are however variations across our countries. In Denmark, Sweden and the UK, researchers at this level typically are under 30–35 years. They are most often block-funded on temporary contracts, with rather low autonomy, and there are hardly any tenure track options. Typically, researchers at this level have both research and teaching obligations.

Austria, Finland and Norway belong to another group. At grade D these researchers are often under 30 years, they share many similarities with the group above, but they are primarily engaged in research-only activities.

At level D, researchers in the Netherlands have many similarities with the two groups above, but staff might already have tenure track options.

**Grade C.** This group mainly consists of researchers in their early 30s who are employed on block-funded temporary contracts, engaged in both teaching and research, with low levels of autonomy. At this level, researchers in Denmark fit this description; in addition, the researchers are not offered tenure track.

Researchers in Austria and Norway also fit with the general characteristics of the career level, but in contrast to Denmark the countries offer elements of tenure-track to some extent to their researchers.

In Finland, Sweden and the UK researchers are a bit older when they reach level C; 36–40 years and they are more frequently exposed to competitive funding, more specialised in either research-oriented or teaching-oriented positions.

In the Netherlands, there is greater age variation of researchers at this career level. They are more frequently exposed to competitive funding compared with the other clusters, more frequently have permanent contracts, and their positions include tenure track options.

**Grade B.** At this level, the MORE study found a clear dividing line between countries regarding type of contract, task division and level, but there are no main features characterising the career level.

For the UK, the majority of researchers entering this career level are between 36 and 45 years old. They are mostly on temporary contracts, have mostly still low level of autonomy, and are in positions focusing either on research or teaching.

In Denmark, the Netherlands, and Sweden the researchers are typically 31–40 years old at this career level. Moreover, temporary and permanent contracts are equally distributed, careers are mostly both teaching and research oriented, the researchers have middle to high level of autonomy, there are tenure track options and there is mostly block funding.

In Austria researchers are older than in the group above (41–45 years). The researchers are mostly on permanent contracts (differs from the group above in this respect), research and teaching oriented, middle to high level of autonomy, some have and some do not have tenure track options.

**Grade A.** In general, the MORE study found that this level was characterised by researchers in their 40s on permanent contracts and engaged in research and teaching.

In Denmark and Sweden researchers that enter this level are 46–50 years old, mostly in permanent positions, mostly involved in both teaching and research, with middle to high levels of autonomy, employed on block-funding and without tenure track option.

Researchers in Austria, Norway and the UK belong to a group of 36–55-year-olds, where researchers are on permanent contracts, both research and teaching oriented, mostly with a high level of autonomy and block funding.

Researchers in Finland and the Netherlands belong to a group of 41–50-year-olds, they are mostly on permanent contracts, research and teaching oriented, mostly middle level of autonomy, block funding and tenure track option.

**Between steps.** The primary status of PhD candidates is that of a student in almost all European countries. Norway is an exception with its good working conditions, see below, and to some degree the Netherlands where PhD candidates used to be employed by the universities. In the Netherlands, there have been changes towards more use of engagement as a student rather than an employee, which is cheaper, but more uncertain for the candidate. In most countries, doctoral candidates are treated differently from bachelor's and master's students; and often have a contract. In 25 per cent of European countries it is possible to prepare

a PhD without any formal PhD status. The PhD level is critical for an academic career. The PhD is very often the first step of the career ladder, but does not have to be. It differs whether it is a legal requirement for further advancement. In the UK, Finland and the Netherlands a doctoral degree is not a legal requirement for assessing certain academic staff. In some countries, like Denmark, most academics at the universities need to hold a PhD; this applies only to some categories at other higher education institutions (Modernisation: 32). One thing is the legal requirement, with the increasing number of PhD candidates, one can expect that it is increasingly common to have a PhD when a person is moving up the career ladder.

Career progression in academia sometimes follows not only predefined steps in terms of academic achievements, but also in terms of the duration of experience within a specific staff category.<sup>58</sup> The obligation to teach generally applies only for certain PhD categories.

The postdoctoral phase is considered the hardest and most crucial during the academic career. The phase is often linked to project-based temporary positions and contracts. Qualification requirements to achieve the next career step are formalised to varying degrees. In many countries, a certain number of years at a certain career stage before moving to following stage is mandatory.

## **10.5 Mobility**

The mobility of academic staff can be measured both between the different types of higher education institutions in a country, between the different sectors within a country or as international mobility. In general, there are no common administrative data sources on mobility. We have to use different sources that may deviate in scope and definitions. But for all countries it is a topic of high interest, and different countries have made attempts to link data and track the academic staff. In this section, we present survey data from the MORE2 study on mobility and different national sources.

### **10.5.1 International mobility**

For all countries except the UK, language represents a challenge when it comes to attracting foreign academics. During recent years it has become more common to offer educational programmes and teaching in English. The value of international collaboration in the field of research, combined with the desire to attract the best academic workforce has led to a clear increase in the share of foreign academics in the countries of our study.

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<sup>58</sup> Eurydice Report (2017) p. 39–40.



To shed light upon academic mobility we use different data sources. From the MORE data (survey) we know that during the PhD period international mobility (see definition in Table) is especially high in Denmark at 47 per cent, followed by Norway, Finland and the Netherlands, while Austria and the UK have a lower mobility rate at 12 per cent. For post-PhD careers, there are fewer differences among the countries; around 40–50 per cent were mobile, with an exception for the UK at 28 per cent. Again, we find the highest mobility rate in Denmark at 53 per cent.

**Table 18. International mobility of academic workforce at PhD<sup>1</sup> and post-PhD level<sup>2</sup> in 2012. International workforce in 2015 or latest year of available data.<sup>3</sup>**

| Country         | International mobility                                  | International workforce   |
|-----------------|---|---|
| Norway          | 20% international mobility during PhD; 43% for post-PhD | 27% of HES workforce are immigrants, 37% of PhD graduates are non-Norwegian citizens (around 20% at full professor and associate professor level) |
| Sweden          | 13% international mobility during PhD; 38% for post PhD | 32% of academic personnel had a foreign background. 36% of PhD graduates are non-Swedish citizens   |
| Denmark         | 47% international mobility during PhD; 53% for post PhD | 21% of new positions in 2011–2013 from foreign universities or research institutes. 36% of PhD graduates from non-Danish citizens                 |
| Finland         | 20% international mobility during PhD; 41% for post PhD | 20% foreigners of the teaching and research staff employed in Finnish universities. 21% of PhD graduates from non-Finnish citizens                |
| The Netherlands | 19% international mobility during PhD; 46% for post PhD | 30% of HES workforce were foreigners, 43% of awarded PhD  |
| Austria         | 12% international mobility during PhD; 45% for post PhD | 27% of academic workforce from abroad, 30% of PhD candidates  |
| UK              | 12% international mobility during PhD; 28% for post PhD | 31% of academic staff have non-UK nationality   |

<sup>1</sup> In the MORE2 survey two types of international PhD mobility are measured: mobility in order to obtain a PhD in a country other than the country of highest previous degree (PhD degree mobility); and mobility during the PhD of at least three months to another country but with a return 'home' to obtain their PhD.

<sup>2</sup> Researchers who are currently mobile or who were mobile within the last ten years for a period of at least 3 months.

<sup>3</sup> Different definitions and years from national sources.

Source: MORE2 data (international mobility among PhD, and post-PhD careers 2012) and national sources on share of workforce from abroad: Netherlands: 2011, VSNU(WOPI). Sweden: UKÄ and SCB 2016, UF 23 SM 1701. Finland: 2014 European University Institute. UK: HESA, 2015/2016. Norway: NIFU, 2014. Denmark: Data collected from universities by Ministry of Higher Education and Science 2014. Data on citizenship for PhD graduates for Denmark from NORBAL 2015.

In Europe, the most common way of recruitment is public call, where the institutions themselves govern the process with large degree of autonomy (Eurydice: 47). An open recruitment process also goes for the majority of the countries in this study. In some countries legislation vary with the type of

institutions. In Austria, junior positions are recruited through public vacancy, while assistant and associate professor are through career advancement, and professors through a mix of the two. At university colleges of teacher education there is a selection process at all levels. In some countries, like Norway and Austria, temporary positions do not always have to publish vacancies. But usually positions are announced internationally and the share of foreigners in the academic workforce is substantial and increasing in the countries of our study.

In Norway, 28 per cent of R&D personnel in the higher education sector (HES) had non-Norwegian citizenship in 2016. This number has increased clearly over many the years.

Norway is one of few countries not charging student fees. The working conditions for PhD students are good, their wages correspond with the public sector, they are employed by the higher education institutions and get social benefits (pension, maternity leave, etc.). This is attractive to foreign students. For the last four years a rather stable share of 37 per cent of awarded doctoral degrees were non-Norwegian citizens.

In the Netherlands, 23 per cent of the academic workforce in 2003 were foreigners and 36 per cent of the PhD students were foreigners, in 2011 the share of foreigners was 30 per cent of the workforce and 43 per cent of the PhD students. At professor and associate professor level the share is stable at around 15 per cent.

The academic faculty with a foreign background comprised 18 per cent in the Swedish university sector in 2006 (Academic career structure) and 32 per cent in 2016 (UKÄ and SCB, 2016). The number of foreign PhD students has doubled over the last ten years, and 36 per cent of those awarded a PhD in 2015 had a foreign background (*Universitetskanslersämbetet* and SCB). The number of foreign doctoral students decreased from 40 to 38 per cent from 2014 to 2015. A possible explanation for this may be the introduction of student fees for foreign students.

In Denmark, 21 per cent of all new positions at professor, associate professor or assistant professor level in 2011–2013 came from a foreign university or research institute according to data from the universities collected by the Ministry of Higher Education and Science in 2014. The share of non-Danish citizenship among awarded PhDs were rather high at 36 per cent in 2015 (NOFRBAL).

In the Nordic countries and the Netherlands there are many PhD students from China and Germany and the neighbouring countries.

In Austria, international mobility is increasingly seen as an integrated part of an academic career. 19 per cent of the personnel are characterised as mobile with more than a 5-day stay in another country for teaching or research activities.<sup>59</sup> The share of foreigners among awarded PhDs has increased from 27 per cent in 2009/2010 to 30 per cent in 2012/2013. The share of foreign students is higher at the universities (25 per cent) than at the *Fachhochschulen* (8 per cent), the

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<sup>59</sup> Universitätsbericht (2014): 34.

private universities (4 per cent), and at the *Pedagogische Hochschulen* (1 per cent). In 2013 the share of foreigners in the academic staff of Austrian universities was 27 per cent, and among professors even 35 per cent.

In the UK, 31 per cent of academic staff had non-UK nationality in 2015/2016. The majority came from other EU countries.

## 10.5.2 National mobility

National mobility covers mobility between different sectors and mobility between the higher education institutions. Unfortunately, there are not so many comparable data on national mobility, but there are some single studies of linking the data. For all countries, there seems to be a tendency of higher mobility for temporary positions. As soon as people receive a permanent position the mobility rate tends to decrease; see also the country chapters.

In the Netherlands, the academic job market is rather dynamic. Each year on average 32 per cent of postdocs and teachers move jobs, around 15 per cent of assistant professors and 14 per cent of associate professors. The inflow and outflow of Dutch academics is rather large (Rathenau, 2013).

In the Netherlands, the universities of applied sciences (UAS) are conducting more research in recent years and with an upcoming closer approach between the career ladder of universities and UAS, mobility is expected to increase within the Dutch higher education sector in the coming years.

In spite of a very similar system of career titles between the universities and universities of applied sciences in Norway, the mobility between these two academic sectors is low, especially at the top academic level. Data from the Norwegian Register of Research personnel at NIFU show that during the last 8 years only 7 per cent professors annually came from another higher education institution (5 per cent in 2016).

Compared with other countries, Norway seem to have relatively high sector mobility. A linking of data from NIFU Register of Research personnel and Statistics Norway a few years ago<sup>60</sup> showed that sector mobility from the higher education sector to business and public sector is not insignificant and not only from recruitment positions. The proportion of R&D personnel with a PhD in the business enterprise sector increased from 6 per cent in 2007 to 8 per cent in 2012.

The share of professors recruited from their own academic institution is rather high at professor level in Norway. The numbers show that an average of 62 per cent have come from their own institution over the last 8 years (71 per cent in 2016).

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<sup>60</sup> Presented in Kunnskapsdepartementet (2014): *Forskningsbarometeret*, p. 67.

## 10.6 Temporary positions

The share of temporary positions is far more common at more junior positions of the academic career ladder, while senior positions are more often permanent. The use of temporary positions is increasing in Europe,<sup>61</sup> however Sweden<sup>62</sup> and Norway<sup>63</sup> are exceptions with small increases of permanent positions.

**Table 19. Share of temporary positions in the academic workforce 2015/2016 or latest year of available data\***

| Country         | Share of temporary position   |
|-----------------|---|
| Norway          | 18% in 2016 (Tilstandsrapport for høyere utdanning 2017)  |
| Sweden          | 28% in 2016 (SCB)   |
| Denmark         | –   |
| Finland         | 70% of teaching and research staff at universities (Confederation of Finnish Industries (EK) data on wages) |
| The Netherlands | 42% in 2016 (Wopi, VSNU)  |
| Austria         | 75% in 2015/2016 (Ministry)   |
| UK              | 35% in 2015/2016 (26% of full-time staff) (HESA)  |

Source: National statistical sources, see Table.

In Norway, the share of academic staff working in temporary positions has decreased in recent years from 21 per cent in 2006 to 18 per cent in 2015. Two-thirds of the staff in temporary positions are block-funded.

In Austria, it is the temporary professors (5/6 years, according to § 99) (*Universitätsbericht*) that have increased most recent years, but they are still a small share of total professors. In total, 75 per cent of Austrian academic personnel were engaged in temporary positions; among full professors (§ 98), the share was 6–7 per cent. The civil servant positions are expiring, and in these positions the share of temporary employment is very small. In general, the higher up the academic ladder in Austria, the share of temporary positions is decreasing. The fact sheets include the share of temporary employment for each position.

In the UK,<sup>64</sup> 34 per cent of academic staff were employed on fixed-term contracts in 2015/2016. This goes for 26 per cent of full-time staff.

In the Netherlands<sup>65</sup> there has been an increase in the share of fixed-term contracts for academic staff from 39 per cent in 2009 to 42 per cent in 2016. PhD candidates are at 100 per cent fixed-term, the share drops higher up the academic ladder; at professor level 6 per cent have fixed-term contracts, while 3 per cent of senior lecturers have this kind of temporary contract.

<sup>61</sup> Euridice (2017): 12.

<sup>62</sup> SCB (2016): Higher Education. Employees in Higher Education 2016.

<sup>63</sup> Kunnskapsdepartementet (2017): Tilstandsrapport for høyere utdanning.

<sup>64</sup> HESA.

<sup>65</sup> Wopi, VSNU.

In Denmark, the most typical temporary positions are PhD students, postdocs, adjuncts, teaching assistants and academic assistants. It is regulated that temporary contracts can only be renewed twice, with a total of three such periods and 8 years as a maximum. There are two categories of professors in Denmark; one working with indefinite contracts and the other with fixed-term contracts.

28 per cent of academic personnel in Sweden had a fixed-term position in 2016. The total share of fixed-term employment in Sweden has decreased slightly since 2011.

As in most countries, researchers in Finland often work in temporary researcher or teaching posts for several years before being chosen for more permanent or long-term posts as lecturer or senior assistant. Figures based on data on wages from the Confederation of Finnish Industries (EK)<sup>66</sup> show that at the universities as many as 70 per cent of teaching and research staff have temporary positions in 2016, the share of temporary university personnel in other assignments is almost 17 per cent. At teacher training schools, the share of temporary positions is 22 per cent.

Data on precarious working contracts (short-term, student, or no contract) of researchers in the higher education sector are included in the fact sheets. The share of researchers on such contracts were in 2012 highest in Finland at 15 per cent and lowest in Norway at 2 per cent (MORE2).

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<sup>66</sup> [http://www.sivistystyönantajat.fi/tiedostopankki/659/tilastojulkaisu\\_2016\\_yliopistot.pdf](http://www.sivistystyönantajat.fi/tiedostopankki/659/tilastojulkaisu_2016_yliopistot.pdf)

**Table 20. Academic Career structure at Universities**

|         | <b>Austria</b>  | <b>Denmark</b>   | <b>Finland*</b>                                | <b>the Netherlands</b>  | <b>Norway</b>  | <b>Sweden</b>                                     | <b>UK**</b>  |
|---------|---|--|--|---|--|---|--|
| A       | University professor  | Professor  | Professor                                      | Professor   | Professor  | Professor   | Full professor                                     |
| A       | University professor up to 5/6 years  | Professor with special Responsibilities ( <i>Professor med særlige opgaver</i> ) | Senior lecturer (ed)                           |   | Docent ( <i>Dosent</i> )   |   | Reader   |
| B       | Associate professor ( <i>Assoziierte/r Professor/in</i> )   | Lektor (Associate professor)   | Lecturers, senior assistants                   | Associate professors  | Associate professor ( <i>førsteamanuensis</i> )                                    | Senior lecturers ( <i>Lektor</i> )                |  |
| B       | Assistant professor ( <i>Assistenz-professor/in</i> )   | Senior researchers/advisors  |  | Assistant professors (university lecturers)                             | Dean, head of department   | Other research/teaching staff with a doctorate    | Principal/Senior Lecturer, Senior Research Fellow. |
| B       | University docent ( <i>Univ.Dozent</i> )  |  |  | 'Other scientific personnel' in permanent position. 'Docent'            |  |   | Lecturer A   |
| C       | Senior Scientist/Artist   | Assistant professors ( <i>Adjunkt</i> )  | Assistants, full-time teachers                 | 'Other scientific personnel' on temporary contract' 'Docent' (teaching) | Postdoc  | Career-development positions                      | Junior Research fellow                             |
| C       | University assistant ( <i>Universitätsassistent/in</i> )  | Postdoc  |  |   | Specialist positions (Physicians, dentists etc.)                                   |   | Lecturer B   |
| C       | Physician in specialist training ( <i>Ärztin/Arzt in Facharztausbildung</i> )   | Researcher ( <i>forsker</i> )  |  |   | Senior researcher (with PhD)   |   | Postdoc  |
| C       | Academic staff engaged in research, the arts and teaching (expiring category) ( <i>Wiss./künstl. Mitarbeiter/in</i> ) |  |  |   |  |   |  |
| D       | Academic staff engaged in research, the arts and teaching (expiring category) ( <i>Wiss./künstl. Mitarbeiter/in</i> ) | PhD  | Researchers working on PhD (doctoral students) | PhD (employed by the university)  | Lecturer ( <i>universitets-lektor</i> ); Assistant professor ( <i>amanuensis</i> ) | Third-cycle students                              | Research assistant                                 |
| D       | Lecturer ( <i>Lehrbeauftragte/r</i> )   | Research assistant ( <i>forskningsassistent</i> )                                |  | Instructeur/tutor (teaching)  | PhD  | Lecturers ( <i>Adjunkt</i> )                      | PhD candidate                                      |
| D       | (Senior) Lecturer ( <i>Lektor/in</i> )  |  |  |   | Researchers (without PhD)  | Other research/teaching staff without a doctorate |  |
| Source: | Federal Ministry of Science, Research and Economy   | Statistics Denmark   | Statistics Finland (+Ministry of Education)    | Rathenau (WOPI)   | NIFU   | Swedish Higher Education Authority (UKÄ)          | HESA   |

Red= expiring categories

\* 4 step career model introduced.

\*\*These are traditional titles, some institutions are now using American titles.

**Table 21. Academic Career structure at Universities of applied sciences**

| Austria   |   |   | Denmark                                |   | Finland                                     |  | Norway   |
|---|---|---|--|---|---|--|--|
|   | Position                                      | Comment   | Position                               | Comment   |   | Comment  |  |
| A   | Leiter  |   | Professor                              | From data we know there are such positions                                    |   | Highest level at UAS, resp. to develop professional area, within teaching/research, want to recruit licentiate/PhD | Professor  |
| A   | Fachhochschul Professor                       | From the fourth year. Berufungsverfahren not legally regulated. UAS/funders decide who to appoint. Often other criteria than at univ. | Docent                                 | Permanent or temporary up to 6 years  | Senior lecturer (ed)                        |  | Docent ( <i>dosent</i> )   |
| B   | Fachhochschul Lecturer                        | Up to the third year of an employment relation. PhD required  | Lektor (associate professor)           | After Lector evaluation   |   |  | Associate professor ( <i>førsteamanuensis</i> )                              |
| B   | Hochschullehrer                               |   | Senior researchers/advisors            | <i>Seniorforsker/rådgiver</i>   | Lecturer                                    | Resemble univ position   |  |
| C   |   |   | External Lector                        | Part-time, especially qualified teaching with praxis experience up to 3 years |   |  | Senior researcher (with PhD)   |
| C   | Part time lecturer ( <i>Lehrbeauftragte</i> ) | Often half time, (20 hours), hired, other time in own company   | Postdoc                                | Postdoc   | Full time lecturer/researcher               |  | Postdoc  |
| C   |   |   | Researcher                             | <i>Forsker</i>  |   |  |  |
| D   | Part time lecturer ( <i>Lehrbeauftragte</i> ) | Often from outside academic with practical experience, 2-4 h  | PhD                                    | PhD   | Hour-teacher                                | Full-time and part-time  | PhD; Researcher without PhD  |
| D   | Projektmitarbeiter                            |   | Research assistant                     | <i>Forskningsassistent</i>  |   |  | Assistant professor ( <i>amanuensis</i> )                                    |
| D   | Assistent                                     |   | Assistant professor ( <i>adjunkt</i> ) | Max 6 years. Possible to make PhD   |   |  | College teacher ( <i>høgskolelærer</i> ); Lecturer ( <i>høgskolelektor</i> ) |
| Source: Federal Ministry of Science, Research and Economy |   |   | Statistics Denmark                     |   | Statistics Finland (+Ministry of Education) |  | NIFU   |

*Austria: Until now UAS had wide autonomy regarding career development, more common univ/UAS acad career expected, not only positive because praxis-bezug might be lost. For a UAS career, some practical experience is recommended. Generally stated, teaching staff should have scientific, practical, pedagogical-didactic and/or researcher qualifications and skills. Many staff have worked outside of academia for several years before entering the Fachhochschulen sector. The Fachhochschule sector also has a large proportion of part-time staff, who work mainly in other sectors, but who contributes with a few hours of teaching at the Fachhochschule at a regular basis. No PhD at the UAS, but can take degree at univ. (Data only on two broad categories: academic staff and teaching and research assistants).*

*Denmark: in Bekendtgørelse av stillingsstruktur: Professionshøjskolerne: 4 categories of personnel are discussed: Docent, Lecturer, External lecturer and Adjunct. From the statistics, we know there are also positions like professor, postdoc and PhD.*

*Finland: In addition many project and specialist positions (we have overview of all job titles for 4,600 people, half of them are 'Lecturer'), but not so much information on UAS titles by level.*

# Fact sheets

## Higher education in Norway



**Binary system:** Traditionally Norway has had a binary higher education sector with universities (including specialised university institutions) and (state) university colleges. Over the years there has been a strong academic drift among the university colleges; now research is a large part of their activities.

### Types of institutions (2018):

**9 Public universities;** 15,400 academic personnel

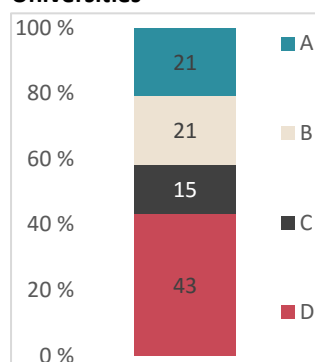
**8 Universities of applied sciences** (5 public and 3 private)

**6 State university colleges** (a few years ago there were 26 such institutions) :

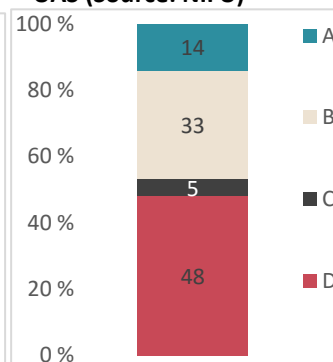
**10 other higher education institutions** (art, police, defence, nursing)

### Academic personnel in Norway by Grade. 2016.

#### Universities



#### UAS (Source: NIFU)



**Laws/regulations:** Since 1995 all institutions have been governed by a common Act on Universities and Colleges; a framework and governance with general instructions on employment and employment conditions, supplemented by more detailed regulations concerning appointment and promotion to teaching and research posts (Ministry of Education and Research). Beyond these regulations each institution may set their own criteria for each type of post.

**Temporary employment:** Norwegian researchers have about 8% part-time employment, which is lower than EU average. Only about 2% have precarious working conditions in HES (MORE2). Share of academic staff in temporary positions decreased in recent years from 21% in 2006 to 18% in 2015. 2/3 of the staff in temporary positions are block-funded.

**Mobility:** Large share of professors recruited from own institution. Non-Norwegian citizens: 27% of academic workforce, 37% of awarded PhD from abroad (good working conditions for PhD) and around 20% at professor and associate professor level.

**Practice professor:** No such position.

**R&D facts:** HES account for 33% of R&D expenditure in Norway (preliminary 2016), which is the highest share in the study. R&D expenditure at 3,600 NOK per capita, it is about the same level as in Austria, but behind Denmark and Sweden. Strong annual real growth of HE R&D expenditure at 1.5%. Highest share of public funding (90%) and basic funding (69%) in the study.

### Typical career path (higher education): research fellow=>- post.doc => associate professor => professor

| Grade      | Norway  | Head-count | Characteristics   |
|------------|---|------------|---|
| A          | Professor                                       | 3,863      | 3,024 at universities                                   |
| A          | Docent  | 171        | 79 at universities, teaching-based career               |
| A          | Research professor/senior researchers           | 86         | Externally paid researchers, 44 at universities         |
| B          | Associate professor ( <i>førsteamanuensis</i> ) | 4,067      | 2,941 at universities                                   |
| B          | Dean, head of department                        | 478        | 304 at universities                                     |
| B          | Senior lecturer ( <i>førstelektor</i> )         | 970        | 409 at universities, teaching-based career              |
| C          | Postdoc   | 1,496      | 1,398 at universities                                   |
| C          | Senior researcher                               | 945        | With PhD, 815 at universities                           |
| C          | Specialist positions                            | 230        | Psychologists, physicians, dentists, etc                |
| D          | Researchers                                     | 319        | Without PhD   |
| D          | Research fellow                                 | 5,091      | 4,300 at universities. 60 PhD in teaching-based career. |
| D          | Research assistant                              | 297        | 257 at universities                                     |
| D          | Lecturer  | 3,848      | Teaching-based career track                             |
| D          | Assistant professor ( <i>amanuensis</i> )       | 61         | Teaching-based career track                             |
| D          | Univ./college teacher                           | 337        | 141 at universities                                     |
| Total 2016 |   | 22,259     |   |



## Higher education in Austria

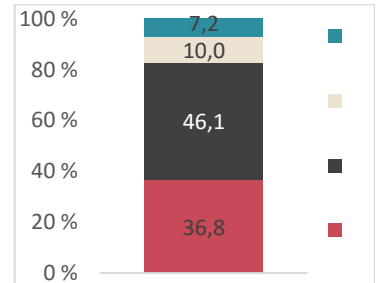


**Binary system:** 'Lehre und Forschung' strongly connected. Universities; research focus. UAS are more targeted towards practice. Universities with long history, UAS established 1993.

### Types of institutions:

22 Public universities; 33,700 academic personnel  
 21 Universities of applied sciences (Fachhochschulen); 18,300 (stronger growth than universities)  
 13 Private universities; 2,400 academic personnel, some funding from Länder  
 14 University colleges of teacher education (Pädagogische Hochschulen)

**Academic personnel (at universities) in Austria by Grade. 2015/2016.**  
 (Source: Fed. Ministry of Science, Research and economy)



**Laws/regulations:** Different laws and ministries for different types of institutions. 2002 University act, redefined relationship university state; fully autonomous, in position to access new funding sources. *Kollektivvertrag 2009*: regulates working conditions for academic personnel at universities. Introduces a new career model with elements of tenure track. Habilitation no longer prerequisite for professorship.

**Temporary employment:** Higher level of permanent positions at higher seniority level, some expiring categories are exceptions (civil servants). MORE2-survey show that Austrian researchers have the highest share of part-time employment (24%) in the study. In total 9% have precarious working conditions in HES.

**Mobility:** Kollektivvertrag has been criticised for granting 'in-house careers'. Austria, Sweden and UK have the lowest share of international mobility during PhD period at around 12%. Men more mobile. At post-PhD career, mobility is rather high at 45% and gender differences are small (MORE 2). All tenure positions to be advertised internationally. PhD normally required. More university-UAS mobility expected with more common academic career. 27% of academic workforce from abroad.

**Practice professor:** No such position. Lecturers (Lehrbeauftragte) have part-time occupation and many have another main occupation outside academia and who only teach 1-2 hours per week. They work as a kind of buffer to make sure there are enough teachers within a certain field of science.

**R&D facts:** HES account for €2,400m = 24% of R&D in Austria, low and stable share. Rather high growth at almost 4% annually last 10 years. 3,600 NOK/capita (only Sweden and Denmark higher in study). High but decreasing share of basic funding (64%). The R&D expenditure at the UAS amounted about €104m, higher shares from business enterprise sector and EU than at universities.

| Typical career path (university): university assistant - assistant professor - associate professor - university professor |           |        |  |  |
|---|-----------|--------|--|--|
| Austria   | Headcount | % temp | Characteristics  |  |
| A Universitätsprofessor/in  | 2,146     | 6      | Berufungsverfahren. Special responsibility for certain sc. field; teaching, research, supervision, evaluations, adm work, Weiterbildung                              |  |
| A Universitätsprofessor/in bis 5/& Jahre  | 323       | 100    | Substitute, externally funded or scientific reasons  |  |
| B Universitätsdozent/in   | 2,191     | 2      | Expiring category, not tenured position  |  |
| B Associate professor (Assoziierte/r Professor/in)  | 614       | 1      | When qualifications OK, apply for professor; rights similar to univ-professor. Appointment by committee set up by univ. senate                                       |  |
| B Assistant professor (Assistenzprofessor/in (KV))  | 628       | 55     | Acad personnel with Qualifizierungsvereinbarung with university, postdoc position for 6 years, when evaluation positive, automatic progress to assoziierte professor |  |
| C Senior Scientist/Artist (KV)  | 697       | 21     | Also people working on externally-funded projects  |  |
| C University assistant (Universitätsassistent/in (KV))  | 4,855     | 92     | To qualify for academic career 6 years to finish PhD   |  |
| C Physician (Ärztin/Arzt in Facharztausbildung)   | 1,020     | 100    | Specialist training  |  |
| C Wiss./künstl. Mitarbeiter/in gem. §26/27  | 9,265     | 95     | Several categories   |  |
| D Senior Lecturer (KV)  | 942       | 38     | Teaching mainly  |  |
| D Lektor/in   | 6,027     | 98     | Teaching only, part-time   |  |
| D Lehrbeauftragte/r   | 3,783     | 100    | Teaching only, main other occupation   |  |
| D Wiss./künstl. Mitarbeiter/in m/o selbst. Lehre  | 1,890     | 26     | Expiring category, not tenured position  |  |
| Total 2015/2016   | 34,381    | 75     |  |  |

## Higher education in Denmark



Binary system: Interaction research and teaching. Division between more research-intensive universities and vocational and teaching-oriented college sector.

### Types of institutions:

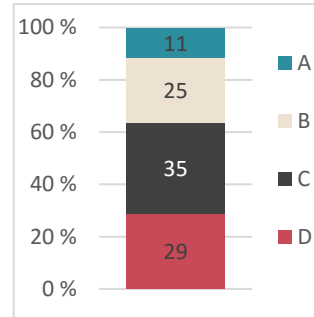
8 Universities: 19,000 academic staff

22 other institutions (university colleges=*Profesjonshøyskoler*, Business academies = *Erhvervsakademi*, and institutions within architect, art, music): 2,500 academic staff

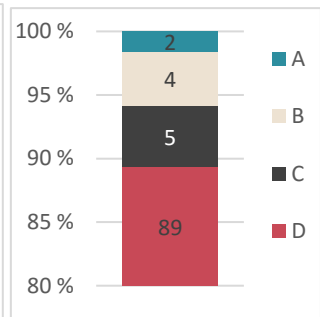
**Laws/regulations:** Institutional autonomy, but must follow general regulations concerning teacher qualifications, award structures, study programmes and quality assurance. Circular on academic staff, many revisions. In practice Danish HES is rather strongly regulated.

### Academic personnel in Denmark by Grade. 2015.

#### Universities



#### Other institutions.



Source: Statistics Denmark

**Career system:** Careers require high international level (ranking). Elements of tenure-track since 2007. Permanent posts also for lower faculty positions. Number of postdocs increasing (adjunct level). Main barrier step from adjunct/postdoc to lecturer. Difficult with time for own research at postdoc level.

**Practice professor:** No such position.

**Temporary employment:** Higher level of permanent positions at higher seniority level. More surveys show that Danish researchers have the lowest share of part-time employment (5%) in the study. In total, almost 10% had precarious working conditions in HES (2012).

**Mobility:** Denmark has the highest share of international mobility during PhD period at around 47%. Men more mobile. Also at post-PhD career the mobility is the highest in DK at 53% with small gender differences (MORE2). 21% of new positions 2011–2013 from foreign institutions.

**R&D facts:** Denmark and Norway had the highest share of R&D in HES in the study (1/3). There has been strong R&D growth (merging process of 2007). Denmark had the highest share of higher education R&D/GDP in the study at 0.99% in 2015 and the highest amount per capita at 4,800 NOK. Share of basic funding 55%, declining clearly last 10 years.

### Typical career path in higher education: PhD - Assistant professor/researcher - Associate professor/Senior researcher - Professor/Professor with special responsibilities

| Grade | Denmark  | Headcount | Characteristics   |
|-------|--|-----------|---|
| A     | Professor  | 2,217     | Usually fixed position, may be temporary if guest and specific project, positions are advertised, highest international level, incl professor with specific responsibilities, (Docent between prof and lector)              |
| B     | Associate professor ( <i>lektor</i> ), sen advisor   | 4,866     | Applicants assessed on basis of qualifications in advertisement. Appointment depends on research as ass-professor/researcher/post-doc. Must have received supervision, pedagogical competencies and teaching qualification. |
| C     | Assistant professor ( <i>adjunkt</i> ), incl doctors | 4,346     | Must hold PhD, permanent/fixed-term (4+4 y max), if perm > associate professor/senior researcher/advisor after 4 y.   |
| C     | Researchers  | 2 380     |   |
| D     | PhD and scholarship                                  | 5,915     | Of these 135 scholarships   |
| D     | Candidate grade other institutions                   | 1,751     | Not at universities   |
| D     | Other pers., med.-long education, researchers        | 90        | Not at universities   |
| Total |  | 21,565    |   |

## Higher education in Finland



**Binary system:** Universities and UAS are equal but different: Universities conduct research and provide education based on this. UAS established in the 1990s (merging of secondary education higher vocational schools, polytechnics); more practical orientation with education + research in areas that support instruction and facilitates regional development.

### Types of institutions:

14 Universities; 20,945 academic personnel

25 Universities of applied sciences; 4,600 academic personnel

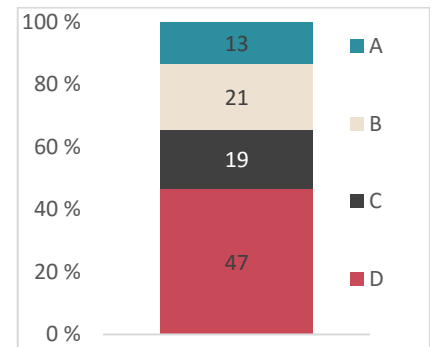
### Laws/regulations:

HEI operate under Ministry of Education and Culture. University reform of 2010; ownership reform gave more autonomy. Univ. either independent corporations under public law or foundations under private law (2 foundation univ.). UAS are now limited companies, with multiple owners (municipality, region, private).

### Academic personnel (at universities) in Finland by Grade.

2015/2016.

(Source: Statistics Finland)



**Career system:** Academic career structure since 2010; 4 levels: D: Licentiate/PhD Candidate; followed by C: Postdoc/Senior Assistant (6 y). B: University lecturers (*lehtori*), research positions, assistant and associate professors (5 y). A: At the highest level; Professors and Research Directors. Licentiate (2 years before PhD). HEI autonomy to promote their personnel. Elements of tenure-track, varies between institutions. Helsinki: Assistant Professor, Associate Professor and Full Professor.

**Temporary employment:** Temporary positions regulated by Employment Contracts Act. About half of staff on temporary contracts. 2 lowest tiers mostly temporary, some at higher tiers. An issue in Finnish HES. According to MORE2-data; Finland has highest share of temporary positions at 15%. Relatively low share has part time-employment (8%).

**Practice professor:** Some universities have introduced this. No official statistics yet.

**Mobility:** Lowest share foreign PhD. International mobility rate among PhD; 20% and for post-PhD career 41%. Policy to promote staff mobility in higher education. Little mobility between universities and UAS as career advancement demands are different. 20% of acad. workforce foreigners, 21 % of PhD graduates from non-Finnish citizens.

**R&D facts:** Lowest share of R&D in HES in the study (25%), low growth (1.5% - economic recession), highest HERD as share of GDP (1%) and per capita (4,700 NOK). Public funding at 82%, basic funding 48% (research council fund more).

| Position, univ.                                   | Headcount     | Comment  |
|---|---------------|--|
| Grade A Total<br>Professor                        | 2,783         | Managerial experience, responsible international tasks, working experience outside home org, tasks remarkably wide-ranging; planning, coordination, managing broad entities. Test lecture. Appointment system; can take years.   |
| Grade B Total<br>Lecturers<br>Senior assistants   | 4,415         | Third step, international experience, more independent and financial responsible. Cooperation with other org and link to surrounding innovation environment strengthens. Researchers in early 40s, heavy teaching load, difficult to have time for highly qualified research. More permanent positions |
| Grade C Total<br>Assistants<br>Full time teachers | 3,996         | Second stage researcher, doctoral degree prerequisite, respective for planning and implementing research and/or educational activities independently. International interaction.   |
| Grade D Total<br>Researchers<br>PhD               | 9,751         | First stage researchers: write thesis, may incl adm and basic studies education. Few jobs at next level. Often informal process of career advancement at first tiers.  |
| <b>Total</b>                                      | <b>20,945</b> |  |

## Higher education in the Netherlands



**Binary system:** Distinction between research oriented education mainly at universities and higher professional education at UAS (Hogescholen) that are closer to practice, but with more research recent years

### Types of institutions:

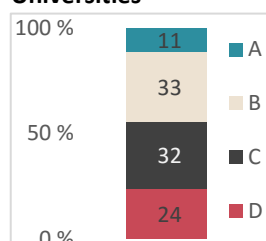
14 Universities; 29,100 academic personnel

43 Universities of applied sciences (*Hogescholen*); 29,700

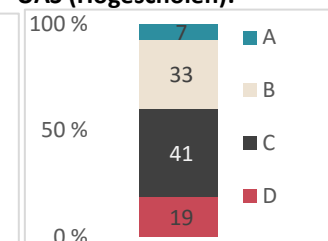
**Laws/regulations:** According to the law, the institutional board of universities have full autonomy to determine the personnel policy and carry out the personnel management. No national rules regarding the promotion of personnel from associate professor (*universitair hoofddocent*) to professor (*hoogleraar*), but Recruitment Regulation based on the Dutch recruitment code.

### Academic personnel, Netherlands by Grade. 2015.

#### Universities



#### UAS (Hogescholen).



Source: Rathenau

**Career system:** Often start as a PhD student, advancement via temporary postdoc/junior lecturer position, to become a lecturer, associate professor and then professor. Promotion to professor may also involve network, experience in lecturing, acquisition, supervising PhD students, and management competencies. An advisory commission nominates/ appoints the professor (chair). Open or more closed recruitment, or special appointment by an external organisation. At universities, there is one unified system, where research and higher education are combined in career tracks. The balance between the two components may differ per faculty/position/ appointment. At UAS a larger percentage of the employees is involved in education (*docenten*) and engagement in research activities is generally lower, often concentrated in the 'lectorates' where Lecturers have a 100% research function. Elements of tenure track from PhD.

**Practice professor:** No such position.

**Mobility:** Highest share of foreign PhD 42%. International mobility rate among PhD 19%. 46% at post-PhD careers. In general, open and flexible academic labour market. 70% of PhD leave academia. 30% of HE workforce from abroad.

**Temporary employment:** Combining elements of Anglo-Saxon model: high competition with emphasis on job security. Proportion of permanent staff has fallen recent years. Increasing part of research funding based on contracts and grants. The professors, senior lecturers and support staff in universities are often in permanent posts. Growth in students demands temporary lecturers. High share of part-time employment among HE researchers at 20% (MORE 2).

**R&D facts:** High share of Dutch R&D in HES (32%). Low growth last 10 years (1.4%). Middle size of R&D/capita at 3,600 NOK. HERD as share of GDP at 0.64%. No information of basic funding, but public funding decreasing (77%).

**Typical career path university and UAS (red).** Typical career path (university): university assistant - assistant professor - associate professor - university professor

| Grade | Netherlands                                    | Head-count | % temp- | Characteristics                                   |
|-------|--|------------|---------|---|
| A     | Professor                                      | 3,148      | 6       | 41-50 years, Medium level of autonomy (MORE2)     |
| A     | Professors at University Medical Centres (UMC) | 1,363      | 6       |   |
| A     | Professors at UAS                              | 658        | 6       | At research based UAS                             |
| A     | Docent, Pay grade 13+                          | 1,428      |         | Ed-based, UAS, increasingly more time on research |
| B     | Associate professors                           | 2,393      | 4       |   |
| B     | Assistant professors (university lecturers)    | 5,233      | 31      |   |
| B     | Other scientific personnel                     | 2,132      | 0       | Permanent contract                                |
| B     | Docent, Pay grade 12                           | 9,754      |         | Education-based career, UAS                       |
| C     | Other scientific personnel                     | 6,421      | 100     | Temporary contract, often competitive funding     |
| C     | Docent, Pay grade 11                           | 12,234     |         | Education-based career, UAS                       |
| D     | PhD  | 8,432      | 100     | Tenure-track option from this stage               |
| D     | Instructeur/tutor, pay grade 10                | 3,336      |         | Education-based career, UAS                       |
| D     | Instructeur/tutor, pay grade 9                 | 969        |         | Education-based career, UAS                       |
| D     | Instructeur/tutor, pay grade 8 or lower        | 1,301      |         | Education-based career, UAS                       |
|       | Total 2015                                     | 58,802     |         |   |
|       | Universities                                   | 29,122     |         |   |
|       | Universities of applied sciences               | 29,680     |         |   |

Figures excl. the field of health sciences (break in time series data, due to the gradual transfer of the personnel of university medical centres).

## Higher education in Sweden



**Binary system:** HEIs have considerable autonomy in creating their own career tracks; may choose to provide both research/education based career tracks. Universities generally offer traditional academic programmes while other institutions provide education that is more geared towards practical training or more specialised.

### Types of institutions:

14 Public universities, 2 Private universities

14 Universities colleges (4 with the right to give PhD education in selected areas)

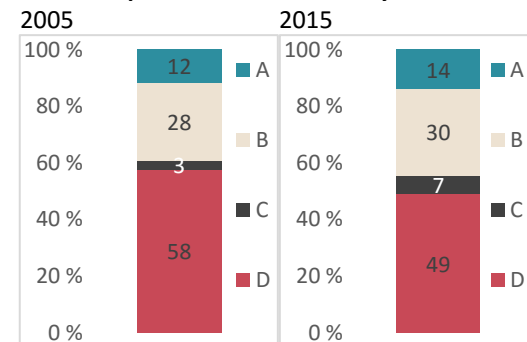
5 University colleges of art

Total academic staff 2015: 46,400

Laws/regulations: Jurisdiction of Ministry of Education and Research (except Swedish University of Agricultural sciences).

The Swedish Higher Education Act (2013:1117). Autonomy reform 2011; relatively large autonomy for HEI.

### Academic personnel in Sweden by Grade.



(Source: Official Swedish statistics)

**Career system:** Positions are usually publicly announced and positions filled through competition. Local merit-based promotion at HEI level also occurs. PhD not required for appointment as lecturer (*adjunkt*). Staff in permanent positions used to be eligible to apply for promotion to S Lecturer or Professor on basis of individual research competence and teaching skills. This is no longer unconditional right. Mostly promotion, seldom competition for chairs. The few postdoc-positions are a possible bottleneck in system.

**Practice professor:** There were attempts to introduce this, but they were no success; unqualified personnel was hired. Same requirements as for other professors, but the arrangement is terminated.

**Temporary employment:** Temporary research and teaching staff diminished from 34% in 2008 - 28% in 2016 (FTE). Career development positions regulated as temporary positions. These are 2 years (postdoctoral positions) or 4 years (associate senior lecturers and postdoctoral research fellows). For other research/teaching staff with a PhD, the share of temporary positions was 28% in 2016 (70% 2008) and other research/teaching staff without a PhD where the share was 51% in 2016 (69% in 2008). 10% part-time employment.

**Mobility:** At permanent positions mobility between institutions is low. Not very high international mobility at PhD level (12%). In post-PhD careers mobility is higher at 38% (MORE2). 32% of academic workforce with foreign background.

**R&D facts:** High HES R&D per capita (4,100 NOK). 27% of R&D is conducted in HES. Annual real growth high at 3.5%. Second highest HERD as share of GDP (0.88%). 76% government funding, low share basic funding at 45%. The high share of external funding at the universities also gives elements of praxis-contact.

**Typical career path: Doctoral student - Early career academic => Senior lecturer => Professor**

**Typical career path (university): Doctoral student - Early career academic => Senior lecturer => Professor**

| Grade           | Sweden                                    | Head-count | Characteristics   |
|-----------------|---|------------|---|
| A               | Professors                                | 6,428      | Career advancement decided at univ. Different ways to be professor  |
| B               | Senior lecturers                          | 9,843      | Mostly permanent positions  |
| B               | Other research/teaching staff with PhD    | 4,301      | Both permanent and fixed positions  |
| C               | Career-development positions              | 3,098      | New positions since 2011. Post.doc formally since 2008 max 2 years, can be extended. 2017: if 4 years employment; right to be tried for lecturer. Few positions, relatively high age. |
| D               | Third-cycle students                      | 11,022     | Doctoral grants now replaced by doctoral studentships (kind of employment).   |
| D               | Lecturers                                 | 6,271      | Both teaching and research at D-level, no tenure track  |
| D               | Other research/teaching staff without PhD | 5,452      |   |
| Total 2015/2016 |   | 46,415     |   |

## Higher education in the UK

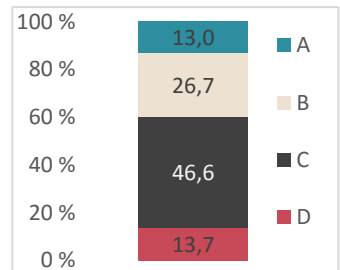


**Unified system:** Dominance of universities. Increase in teaching-only and research-only positions.

**Types of institutions:** 128 Universities: 194,800 academic personnel  
33 University colleges (many within arts): 6,500 academic personnel

**Laws/regulations:** Further and Higher Education act of 1992 and Higher Education and Research Act 2017, which protects institutions' autonomy 'to determine the criteria for the selection, appointment and dismissal of academic staff and apply those criteria in particular cases'. Strongly influenced by the Research Excellence Framework (REF) assessment every 7 years.

**Academic personnel UK Higher education by Grade. 2015/2016. (Source: HESA)**



**Career advancement:** Average age for completing PhD is 26–27 years. Variety of postdoc/research assistant positions. Often series of those. Lack of positions. Research and teaching assistants and Lectures are junior positions. For senior positions (senior lecturer, reader, professor) additional responsibility for conducting/supervising research/and or teaching.

**Mobility:** Strong mobility within the academic system, because of many temporary positions. High share of non-UK citizens; 28% in 2015 (engineering and technology). Austria, Sweden and UK have the lowest share of international mobility during PhD period at around 12%. At post-PhD career mobility is also low in the UK at 27%, men are a bit more mobile (MORE 2). 31% of academic staff with non-UK nationality.

**Temporary employment:** Possible for relatively junior academic staff to get permanent lectureship, unique. Postdocs and assistantships are temporary. From Lecturer level, most university positions are permanent (3 years' probation). Of total academic staff 67% are working full-time, the rest part-time. 66% have open-ended/permanent contract.

**Practice professor:** No such position. But institutions have full autonomy to introduce such positions if desired. **Differentiated positions:** Almost 50% of staff in mixed research/teaching positions. 24% research only and 26% teaching only.

**R&D facts:** 26% of UK R&D is performed in HES. Low R&D activity in HES as share of GDP (0.44%). Annual real growth not so strong (1.9%). Lowest share per capita (1,800 NOK). Lowest and decreasing basic funding (30%).

**Typical career path: 1) Teaching assistant => T. fellow => Lecturer => Senior lecturer => Principal lecturer => Professor /Function head/Head of School => Senior management**

**2) Typical career path 2: Research assistant => R. fellow => Senior fellow researcher => Principal research fellow => Professor/Head of School => Senior management**

| Grade        | Contract level UK  | Head-count     | % temp.   | Purpose   |
|--------------|--|----------------|-----------|---|
| A            | F1 Professor   | 19,974         |           | Senior academic appointments may carry the title of Professor but not departmental line management responsibility   |
| A            | Senior management and Head of Schools/Senior function head   | 6,160          | 9         | Highest management level, may also incl professor   |
| B            | F2 Function head   | 226            |           | Full managerial responsibility for activities and input into policy formation. Staff responsibility   |
| B            | J0 Team Leader (Professional, Techn, Adm), Lecturer, Senior Lecturer, Senior Research Fellow.                          | 53,556         | 15        | Management of a team. Specialists with experience or seniority but limited management resp. Substantial responsibility for students.  |
| C            | I0 Non-Academic section manager, Senior/principal lecturer, Reader, Principal Research fellow.                         | 28,362         |           | Management of a significant professional activity, department or project. Incl acad subject specialists, acad programme coordinators and/or acad staff with high level expertise/knowledge. |
| C            | K0 Senior Professional(Technical), Lecturer, Research fellow, Researcher (senior research assistant), Teaching fellow. | 65,462         | 41        | To operate at experienced, professional level in a single area of work without supervision. Responsible for less experienced staff. Significant responsibility for students.                |
| D            | L0 Senior Administrative staff (Professional/technical) Research assistant, Teaching assistant.                        | 24,434         |           | This is a standard 'Officer' level. Assistant/ instructor role. In some professional areas entry level.   |
| D            | M0 Assistant professional staff, Administrative staff  | 2,606          |           | Entry level   |
| D            | Simple/Routine task provider/Junior adm staff  | 600            | 72        | Entry level   |
| <b>Total</b> |  | <b>201,379</b> | <b>34</b> |   |



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# Overview of institutional illustrations

## Uppsala University

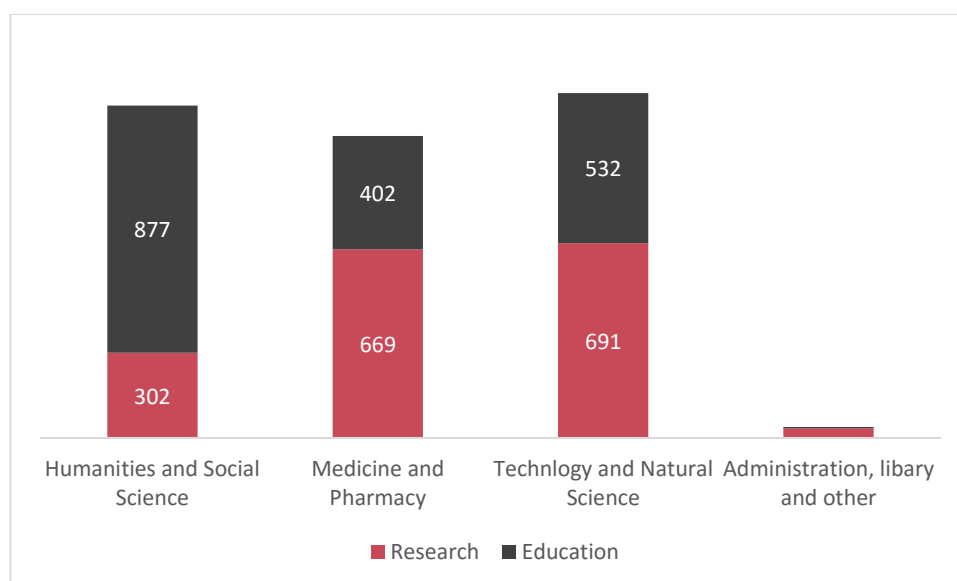
Uppsala University (UU) is the oldest university in Sweden, founded in 1477. The university has three disciplinary domains: Humanities and Social Science, Medicine and Pharmacy and Science and Technology, with nine faculties (Arts, Educational Science, Languages, Law, Medicine, Pharmacy, Science and Technology, Social Science and Theology). Uppsala was ranked as number 63 on the Shanghai Ranking, and is the second highest ranked university in Sweden after Karolinska Institutet.

UU has 6,857 employees (5,944 full-time equivalents), among 4,718 academic staff and 2,289 PhD students. 1,140 of the 1,838 teachers (1,562 FTE) have a PhD. The UU has 716 Professors (584 FTE), most in Science and Technology. The university has 43,591 registered students, most of them in Humanities and social science, and a turnover of €701m.

The university states that it has a special focus on faculty at early stage and international researchers, and states that they are offering them special help to settle.

## Two groups of scientific personnel

The university has two categories of scientific personnel: researchers and teachers. Among the researchers we find leader of a research group (*Forskningsleder*), researcher, research engineer (*forskningsingenjör*), laboratory researcher, and assistant to research activity (*Assiterande forskningsarbete*). In 2016 there were 1,696 researchers and 1,816 educators among the total of 7,170 employees at the university (Mangoldsrapport 2016).



**Figure 8. Researchers and teachers at different departments at UU 2016.**

Source (Report of diversity 2016)

## The university's employment regulations

The University's appointment procedures (*Anställningsordningen*) regulate the teaching positions at the institution and has been adopted by the rectorate in 2012.<sup>67</sup> This is in accordance with Swedish law, that states that the HEIs are to employ professors and lectors, but it is up to the institutions themselves to decide on career regulations. The positions in this case are:

- **Professors** – The highest academic competence of the position at UU. To become professor, 10 weeks of pedagogic education, or comparable competence, is required in addition to the normal academic requirement for professors. There are also positions as *Guest professors* and *Adjungerade professor* at UU.
- **University Lector** – The second highest position in the academic hierarchy. To become a lector a PhD and 10 weeks of pedagogic education, or comparable competence, is required. *Adjungerade Lector* is also a position of similar

competence as a university lector. Appointment as an associate senior lecturer is used as an entry-level position in a research and teaching career.

- **Assistant University Lector** – To have this position a PhD and 5 weeks of pedagogic education, or comparable competence, is required.

<sup>67</sup>[http://regler.uu.se/digitalAssets/92/c\\_92570-l\\_3-k\\_anstallningsordning-for-uu-rev-20160616.pdf](http://regler.uu.se/digitalAssets/92/c_92570-l_3-k_anstallningsordning-for-uu-rev-20160616.pdf)

- **Research assistant** – To have this position a PhD and 5 weeks of pedagogic education, or comparable competence is required.
- **University Adjunct** – For this position only a higher education degree and pedagogic skills are required. Adjugerande/professional University adjunct is a position of the same competence.

Adjunct positions (*adjugerande*) on these levels have the same basic competence requirements as the equivalent full-time positions. However, there could be exceptions for teaching competence. Hence, experience from outside academia is not a substitution, but an additional requirement to this title.

There is no similar document as *Anställningsordningen* for researchers. Quite a few researchers are also hired on fixed-termed contracts, although some hold permanent positions (which are normally permanent as long as the researcher receives external funding).

There is a collective agreement regulation for the position of postdoc (at national level), limited to two years.

The time expected to be used on teaching and research respectively is regulated in the document '*Lokalt kollektivavtal om arbetstid och arbetstidsberoende ersättningar för lärare*'.<sup>68</sup> The professors are in this agreement entitled to devote no more than 25 per cent of their time to teaching. Lectors should not have more than 70 per cent of teaching, and normally a lector has around 20 per cent of their time to do research. A university adjunct should not have more than 80 per cent of teaching, and normally a lector has around 10 per cent of their time to do research. Research assistants should not use more than 15 per cent of their time in teaching activities.

## The Linnæus University

The Linnæus University was established in 2010 by a merger of the former Växjö University and Kalmar University, and hence has two campuses. The former Växjö University achieved university status in 1999, and Kalmar was entitled to issue doctoral degrees in natural science the same year, but did never achieve a university title. Today the merged university has about 14,000 full-year students, 2,100 employees, 325 doctoral students, 156 professors and a revenue of 1,654 million SEK.

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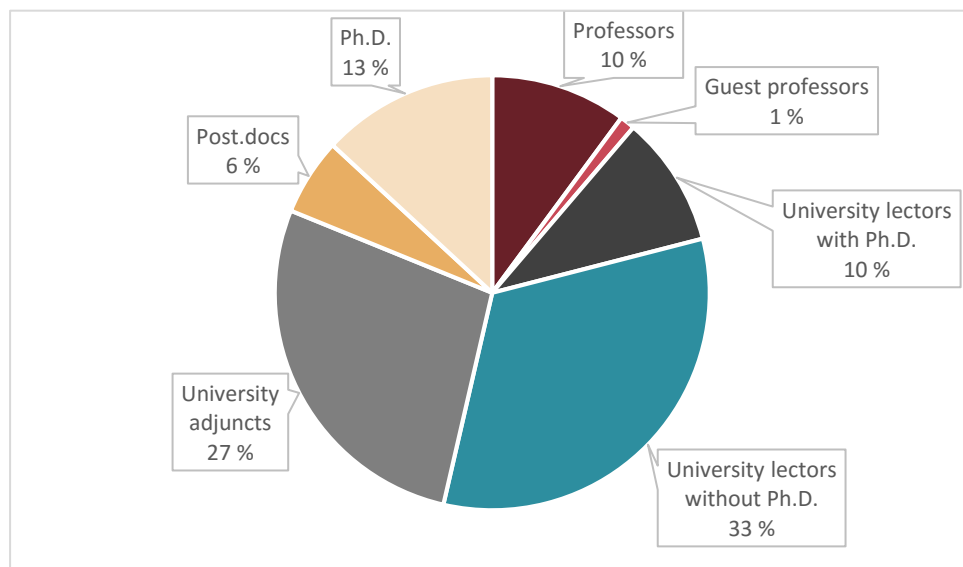
<sup>68</sup><https://mp.uu.se/documents/432512/914059/Lokalt+avtal+om+arbetstid+och+arbetstidsberoende+ers+f%C3%B6r+l%C3%A4rare+2013+2693.pdf/1562a234-5701-4daa-a032-e991de77dec1>

## The university's employment regulations

According to Swedish law the career structure at Linnæus University is regulated by 'Anställingsordning'<sup>69</sup> adopted by the rectorate in 2013 and state the following positions:

- **Professor** – In addition to the normal requirements of a professor, teaching competence should be well documented in order to evaluate its quality.
- **Lector** – A PhD is normally a requirement for a Lector position, however in fields where PhD education is not offered, strong and long work experience in the field could give exception from the PhD requirement (page 9). Teaching competence should be well documented in order to evaluate its quality.
- **University Adjunct** – Master's degree and pedagogic competence is required.

Of the university's 1,695 FTE, 53 per cent are women, and 892 teachers. Seven out of ten hold a PhD. There are 115 professors, only 25 per cent women. Most of the staff are university lecturers and university adjuncts. Only 104 of the 452 university lecturers hold a PhD. Two out of ten are in a PhD or postdoc position.



**Figure 9. Academic staff at Linnæus University (FTE) by positions in 2016.**

Source: The annual report of 2016.

<sup>69</sup>

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## The Karolinska institutet

The Karolinska institutet (KI) is a medical university, one of the largest and most prestigious universities in its field. Medical research at Karolinska counts for more than 40 per cent of all academic medical and life science research in Sweden, and the university is the highest-ranked university in the country. The university was founded in 1810, but has roots back to the 15<sup>th</sup> century. It is situated in the Stockholm urban area; in 1972 the university also established second campus in Flemingsberg in the south of Sweden.

The university has 5,973 full-time students (2016) and 2,267 PhD candidates, which represent 12 per cent of all Swedish PhD candidates, 5 334 full time employees (2016) and a turnover of 6,667 million SEK. The academic staff are highly qualified. Nine out of ten of the teaching staff hold a doctoral degree.

## The university's employment regulations

The '*Anställningsordning för lärare vid Karolinska Institutet*' adopted by the rectorate in 2015<sup>70</sup> regulate the career structure at the university. Academic staff are divided into four main categories: professors, lectors, university adjuncts and merit positions. Parallel to this hierarchical structure we find *adjungerade* positions alongside the different categories. These positions are for people mainly affiliated outside academia, but who should have the same academic competence as their counterparts. Hence the affiliation and experience outside academia is an additional requirement, not a substitution of other experience. There is also a parallel structure with *clinical professor* and *clinical lector*. These are teachers who work part-time at KI and part-time at a hospital. The normal distribution is 30 per cent at a hospital and 70 per cent at KI. The positions given at KI are as follows:

**Professor** – the highest academic position at KI and could be an employed temporary position. Teaching, research and administrative tasks are expected of people in this position. A professor could be headhunted for academic reasons; however, this is only used in very special situations.

- **Adjungerad professor** – should have their main affiliation outside of academia, and could be employed with a position between 20–50 per cent at KI. Should have the same qualification as other professors.
- **Guest professor** – employed in a position between 20–100 per cent and should be employed at another university.
- **Senior professor** – for retired professors.
- **Clinical professor** – a professor working part-time at a hospital, normally working 30 per cent at a hospital and 70 per cent at KI.

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<sup>70</sup> [http://ki.se/sites/default/files/anstallningsordning\\_3.pdf](http://ki.se/sites/default/files/anstallningsordning_3.pdf)

**University lector** – the second highest ranked position at KI. For this position a PhD and normally a qualification at a docent level is required. Teaching, research and administrative tasks are expected of people in this position.

- **Adjungerand university lector** – the same qualification as for a university lector is required, but with main affiliation outside academia. Could be employed in a position between 20–50 per cent. Should have competence for KI that is not to be found elsewhere.
- **Associate university lector** – this is mainly a teaching position, with only some research tasks. Should hold pedagogic competence at a high level and a PhD.
- **Clinical lector** – a lector working part-time at a hospital, normally working 30 per cent at a hospital and 70 per cent at KI.

**University adjunct** – should have pedagogic qualification at a high level, but does not need a PhD degree. If the person holds a PhD they have the right to title themselves as University Adjunct PhD. Teaching, research and administrative tasks are expected of people in this position.

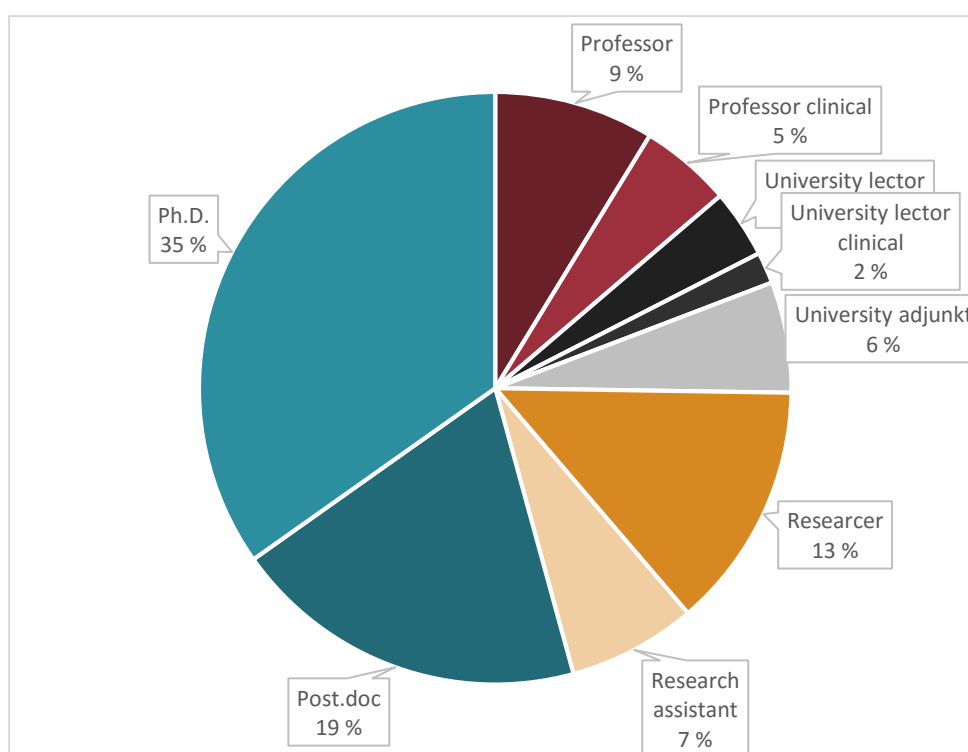
- **Assistant university adjunct** – the same qualification as a university adjunct, but with main affiliation outside academia.

**Postdocs** – a temporary merit position with research tasks.

**Research assistants** – a temporary merit position with research tasks after PhD, and normally after a postdoc position.

**Researcher** – a position after a position as research assistant with mainly research tasks.

Looking into the KI's annual report of 2016 we see that a large share of the academic personnel are PhD candidates. The number of PhD candidates has increased from 600 to 900 from 2013 to 2016. Four out of ten are also staff with only research tasks (postdocs, research assistant and researchers). If one excludes PhD candidates, half of the staff with teaching task are professors.



**Figure 10. Share of academic staff in different categories in 2016.**

Source: Annual report of KI 2016. N = 2678

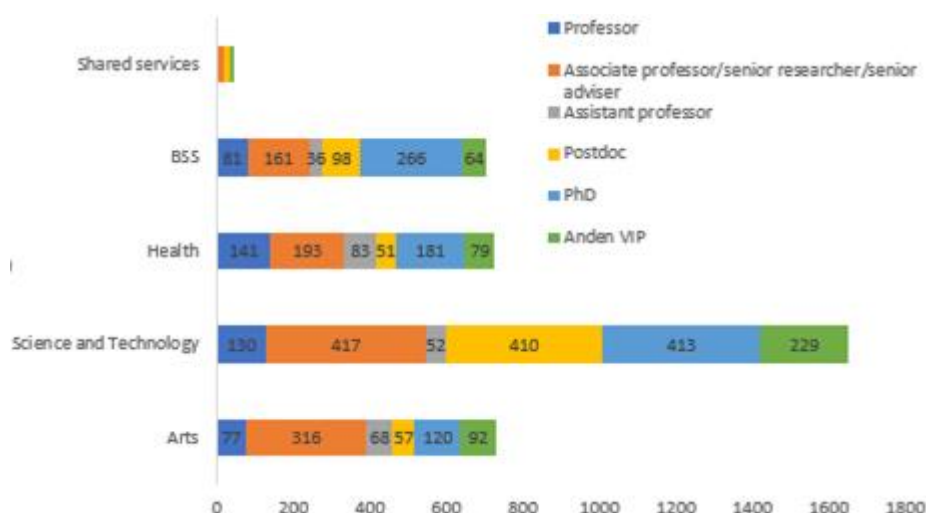
## Aarhus University

Aarhus University was established in 1928, and is the second oldest university in Denmark. The university has 42,500 students and 11,550 employees, among them 6,000 researchers (equivalent to 4,300 full-time, including 2,000 PhD students), and a turnover of 6,278 million DKK (2015). Most of the students are situated in Aarhus, but there are also some in Copenhagen and Herning. The University is ranked as number 65 in the Shanghai Ranking in 2017 and thus the second highest ranked university in Denmark, only exceeded by the University of Copenhagen, ranked at number 30.

The university has four faculties: The Faculty of Art, Aarhus Business school, The Faculty of Health, and The Faculty of Science and Technology; eight interdisciplinary centres and seven museums. Fourteen out of 40 Danish Centres of Excellence are located at Aarhus University, as well as three Danish-Chinese research centres funded by the Danish national Research Foundation. The Research is partly organised in departments and partly in research centres.

Recently the university has been through several mergers. In 2006 the Institute of Business and Technology in Herning (HIH) became part of Aarhus University; and in 2007 the Aarhus School of Business, the Danish Institute of Agricultural

Sciences, the National Environmental Research Institute and the Danish University of Education did the same. In 2012, the Engineering College of Aarhus became part of Aarhus University.



**Figure 11. Number of full-time employed academic staff in 2016 by faculty and job category.**

Source: Aarhus University Home Page<sup>1</sup>

The university has 11,550 employees including 4,300 full-time researchers. In the figure below we show the number of full-time employed academic staff in 2016 by faculty and job category. In addition to the academic faculty there are also 494 part-time academic staff. The majority of the staff are situated at the faculty of Science and Technology, however most professors are found at the Health department.

The University of Aarhus refers to the general national regulation of career structure for its own career structure. In addition, Aarhus states that it has a specific focus on early career and talent development, offering support for early career researchers. This is especially referred to in the University's own strategy (Strategy 2020),<sup>71</sup> as one of the main missions of the university.

## Technical University of Denmark

The Technical University of Denmark (DTU) was founded in 1829 and is a technical university of natural science, engineering and technics with education in engineering. The university has three campuses, and test facilities in all parts of Denmark. The three campuses are located near Copenhagen. The university

<sup>71</sup> [http://www.au.dk/fileadmin/www.au.dk/om\\_au/ledelse/STRAT2020\\_UK\\_FINAL\\_WEB.pdf](http://www.au.dk/fileadmin/www.au.dk/om_au/ledelse/STRAT2020_UK_FINAL_WEB.pdf)

consists of 19 different departments, five centres and five affiliated companies. Innovation is an integral part of DTU's education and research. In 2016 the University had 144 notifications of inventions and 67 start-ups. The university houses the largest science park in Denmark. The university has 11,000 students. The students come from 99 different countries and 28 per cent are women.

The university has 5,995 full-time equivalents (FTE), where 38 per cent are women and 31 have an international background with 106 nationalities. 59 per cent of the faculty are under the age of 50. Of these, there are 2,117 researchers and educators and 1,217 PhDs (FTE). The University has an annual income of €670m.

## Career tracks and career system

The document entitled *Cirkulære om ansættelsesvilkår for videnskabeligt personale ved Universitet*,<sup>72</sup> adopted by 'Moderniseringsstyrelsen', constitutes the framework for the academic career system at DTU. This document differentiates between four levels of academic positions: 1. Positions under adjunct level; 2. Positions at adjunct level; 3. Positions at lector level; 4. Positions at professor level. The main positions at the university are adjunct/researcher, lector/senior researcher, professor with special tasks, and professor.

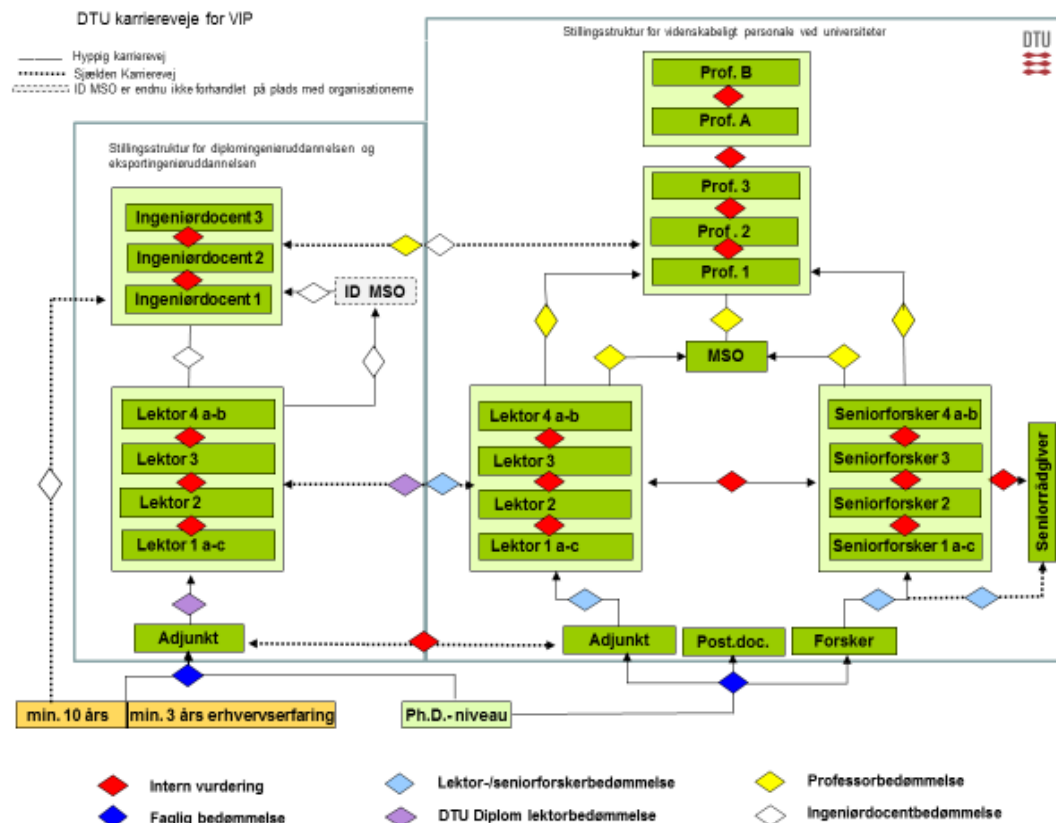
DTU has two separate career tracks. One consistent with the national guidelines for career systems at universities, the other equivalent to the guidelines for university colleges. The latter career track is affiliated with the engineering programmes at DTU, and the former is associated with the rest of the academic personal at the university.

Within the career track for the engineering programme, both work experience (minimum three years) and a PhD qualifies candidates for positions at the adjunct level. The next level is a lector position divided into lector 1 to 4, whereas the top level is an engineer docent position differentiating between docent 1 to 3. A minimum of 10 years' work experience can also qualify candidates for engineer docent positions. Internal assessments determine advancement within each level, while promotion to a higher level is determined by a DTU diploma lector assessment or engineering docent assessment.

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<sup>72</sup>

[http://hr.modst.dk/Service%20Menu/Love%20regler%20og%20aftaler/Circular/2015/~/\\_media/Circular/2015/044-15.ashx](http://hr.modst.dk/Service%20Menu/Love%20regler%20og%20aftaler/Circular/2015/~/_media/Circular/2015/044-15.ashx)



**Figure 12. DTU career tracks**

Source: DTU website

In the career track for academic personnel at the university, the adjunct level is divided into three positions, adjunct, postdoc and scientist, all requiring a PhD. The adjunct position is more teaching intensive than the other two. The positions at lector level are separated into two main tracks, one lector and one senior researcher track, both divided into a four-scale ladder. The lector positions are more teaching-intensive than the senior researcher positions, whereas the senior researcher positions are more research-intensive. The next level for both these tracks are professor positions. Positions at professor level have five steps, first from professor 1 to 3, whereas the last two steps are professor A and B. In addition, there is a position for professor with special tasks between the lector and professor level. Internal assessment determines advancement within each level, while more extensive assessment is needed for promotions to a higher level.

## University of Helsinki

Founded in 1640, the University of Helsinki is the oldest institution of academic education in Finland. The university is also the largest in Finland consisting of an international scientific community of 40,000 students and researchers. The university typically ranks among the top 100 in international rankings of universities.<sup>73</sup> The university is a multi-campus university organised in 11 faculties. Four campuses are in Helsinki, the City Centre, Kumpula, Meilahti and Viikki; in addition the university has research stations in Hyytiälä, Värriö, Kilpisjärvi and Kenya.<sup>74</sup>

The University of Helsinki has an ambitious aim of strengthening its international profile, where its current strategic plan puts emphasis on raising the share of international teaching and research staff to 30 per cent by 2020, and of its PhD students to 35 per cent. Moreover, there are aims related to supporting career advancement of successful young scholars.

Staff at the university in 2016 counted 7,553 people of which academic staff were 61.2 per cent. In 2016, all in all 4,612 people formed part of the teaching and research staff which is divided into four levels:

- Level 4: 599 professors, research directors and senior curators;
- Level 3: 1,262 university lecturers, clinical teachers, university researchers, senior researchers, research co-ordinators, intendants, assistant professors (tenure track);
- Level 2: 941 postdoctoral researchers, university instructor;
- Level 1: 1 585 doctoral students, specialising as physician/dentist/veterinarian, research and teaching assistants;

In addition, 234 people formed part of 'other teaching and research staff'.<sup>75</sup>

Criteria for advancement include:<sup>76</sup>

- Level 1: To be appointed as a doctoral student, the candidate needs to hold a second cycle degree and have an approved research proposal, as well as ability and motivation to complete their postgraduate studies.
- Level 2: To be appointed as a postdoctoral researcher, the appointee needs to have a doctoral degree, to be able to do independent scholarly work and also show relevant teaching skills. Postdoc positions are normally held for 3–5 years. To be appointed as a university instructor, a relevant second cycle degree and teaching experience need to be demonstrated. In this case, pedagogical

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<sup>73</sup> <https://www.helsinki.fi/en/university/the-university-of-helsinki-in-brief>

<sup>74</sup> <https://www.helsinki.fi/en/university/the-university-of-helsinki-in-brief>

<sup>75</sup> <https://www.helsinki.fi/en/university/the-university-of-helsinki-in-brief>

<sup>76</sup> <http://www.helsinki.fi/recruitment/qualifications.html>

experience is valued. In general, university instructor positions are used in a limited manner for some practical positions.

- Level 3: To be appointed as a university lecturer or clinical instructor, an appointee needs to have a doctoral degree and an ability to provide high quality teaching and supervision. To be appointed as a university researcher or equivalent, a doctoral degree and evidence of scholarly research are required, as well as the teaching skills necessary for the position. It is expected that people on this level are able to lead a research group and apply for external research funding.

Assistant professor positions are used as the first contract of the tenure track system, whereas associate professor positions are the second contract in the tenure track system. At the University of Helsinki, these two positions are only used for fixed-term contracts that are part of the tenure track path, with an expectation to lead towards full professorship.

- Level 4: For a professor position, the appointee needs to have a doctoral degree and a top level scholarly output, experience in supervision of scientific research, and ability to provide top level teaching and supervision. Academic leadership ability is expected.

For research director and senior curator positions, qualifications equivalent to a professor position are expected, while specific attention is put on academic leadership experience and research work, success in external funding and evidence of international cooperation.

## **Tenure track**

The University of Helsinki also has a tenure track system which was introduced in 2012. Those who are appointed to a tenure track system are employed as assistant professors on a fixed-term contract of 3–5 years, with a set of pre-determined success criteria. If these criteria are met, another fixed-term contract can be provided as an associate professor, after which, a permanent position as a professor may be obtained.

## **Docent**

In 2010 the University Act was changed and docentship became an academic title, thus docents do not have to have an employment relationship with the university. The University of Helsinki has about 4,400 docents. One becomes docent at the university of Helsinki by application. The title is granted by the chancellor and proposed by the faculty. To become docent the applicant should possess extensive knowledge in her or his field (comparable to at least two doctoral dissertations),



the ability for independent research should be demonstrated by publications, and the applicant should have good teaching skills which should be demonstrated on a topic in their field assessed by independent academic assessors.

The key task of docents is to teach and supervise. Docents have the right to supervise Licentiate and doctoral theses. Docents at the university of Helsinki often work as researchers. The title of docent signifies to the academic community that the holder is an expert in research and teaching of their field.<sup>77</sup>

## Teaching and research

All staff are expected to engage in both teaching and research. This is particularly emphasised for junior scholars, to make sure that junior staff obtain sufficient teaching experience. For permanent staff, sabbaticals are offered for supporting research production. The university also has a system for advancing pedagogical skills with the support of the Centre for Research and Development of Higher Education.

To reward excellent teaching, the university appoints every year 20 fellows to the ‘Teachers Academy’ which is a multidisciplinary collegial network.<sup>78</sup> The fellows receive a personal two-year grant, and their home unit receives a grant for development efforts – this funding must be used for professional development and development projects of teaching.

Membership is based on application, which must include a teaching portfolio, a CV and recommendations from students and colleagues. In the portfolio the candidates must present, describe and analyse their competence and teaching innovation projects. The criteria that are emphasised are teaching experience, pedagogical courses, ability to produce learning material, development of teaching and other investments related to teaching activities. Assessment is not made in a one-size-fits-all way, but aims to value different forms and models of being a good teacher.

## University of Lapland

The university of Lapland was founded 1979, and is situated in the city of Rovaniemi. With its location on the Arctic Circle the university has key research competence in Arctic affairs and tourism research. The university consists of four faculties: Art and Design, Education, Law, and Social Sciences. In addition, the university houses the Arctic Centre, a multidisciplinary Arctic research centre.

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<sup>77</sup> <https://www.helsinki.fi/en/university/docents>

<sup>78</sup> <https://www.helsinki.fi/en/university/teachers-academy>

The University of Lapland has nearly 5,000 students and around 650 employees, of whom about 10 per cent are professors. A key principle of the personnel policy is an equal division of tasks for staff.

The university of Lapland also uses a four-tier career system for academic staff. In appointment procedures, different approaches are used, sometimes including invitations.

The general principle is that all academic staff both teach and do research. In positions that are mainly research positions, the teaching hours and content are agreed on separately; such positions are e.g. research professor, senior researcher and university researcher. The employees themselves are responsible for their working time and for working according to the plan. (The general guidelines of the working plan, University of Lapland)

## Teaching portfolio

For teaching intensive positions, applicants are asked to provide a portfolio that documents their teaching activities, and their quality and merit. The specific criteria are determined locally. For example, for the language centre, the following structure is suggested:<sup>79</sup>

- Teaching philosophy
- Teaching history/teaching experience
- Self-evaluation of teaching
- Feedback from students and colleagues
- Produced learning material
- Activeness in higher education pedagogy
- Development of teaching
- Other activities connected with teaching work

## Docent

University of Lapland also has a range of docents.<sup>80</sup> It is possible to become a docent if the appointee shows: thorough knowledge of their field; publications or other means of independent research or artistic work; and good teaching skills. Docent status is granted upon application to the faculty or responsible teaching unit, which will evaluate the necessity of docentship for their profile. The rector makes the final decision regarding the number of docents. Docents are used in research projects, groups and in both basic and postgraduate education.

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<sup>79</sup><https://www.ulapland.fi/InEnglish/About-us/Vacancies/Teaching-Portfolio-Guidelines/Teaching-Portfolios,-Language-Centre>

<sup>80</sup> <https://www.ulapland.fi/FI/Yliopisto/Toihin-yliopistoomme>

## Delft University of Technology

TU Delft is organised in eight faculties which include about 40 technological and scientific disciplines. TU Delft aims to remain a technology university with a leading global reputation based on a full range of high-quality disciplines, courses and unique facilities in the engineering sciences. TU Delft also aims at maintaining its role as a producer of excellent practical knowledge and as an innovative partner. Most of the research at TU Delft is framed around answering utility-driven questions.<sup>81</sup> Moreover, TU Delft wants to recruit from the world's best scientists as well as among the most gifted students. An important part of TU Delft's strategy is to strengthen the interaction between education, research and valorisation, which they call the 'knowledge triangle'.<sup>82</sup> In 2017, the university established a Diversity office to enhance emphasis on issues of diversity and inclusion.

Employees can put together their own remuneration packages, as the university operates with Individual Terms and Conditions of Employment Options. There are also formalised opportunities for staff development, including also personal development.<sup>83</sup>

### Board of professors

At TU Delft the board of professors advises the executive board amongst others regarding appointment and reappointment of professors; criteria and procedures for the promotion or reappointment of academic staff; and career policies as well as labour conditions for academic staff. The board of professors reviews the selection of guest lecturers, research fellows and proposals for royal honours for professors and senior lectures.<sup>84</sup>

### Tenure track

The university has a career development system for talented young academics as well as a tenure track development programme supporting young academics. The aim of the tenure track is to offer a career path for talented young academics for them to become internationally recognised.<sup>85</sup>

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<sup>81</sup> <https://www.tudelft.nl/en/research/organisation/>

<sup>82</sup> <https://www.tudelft.nl/en/about-tu-delft/towards-a-new-strategy/>

<sup>83</sup> <https://www.tudelft.nl/en/about-tu-delft/working-at-tu-delft/coming-to-the-netherlands-tu-delft/good-reasons-to-work-at-tu-delft/>

<sup>84</sup> <https://www.tudelft.nl/en/about-tu-delft/organisation/board-of-professors/>

<sup>85</sup> <https://www.tudelft.nl/en/about-tu-delft/working-at-tu-delft/scientists/>

## **Brunel University**

Brunel University is a public research university situated in Uxbridge in West London. It was founded in 1966 in the aftermath of the Robbins Report of 1963 which recommended immediate expansion of universities, and that all Colleges of Advanced Technology should be given the status of universities. Previously, Brunel was a college of advanced technology, offering education for technicians and engineers. Its origins are found in Acton College, which can be traced back as far as 1899.

While the main activities of Brunel still centre around engineering, technology and the natural sciences, the University has, in recent decades, expanded its activities to encompass training in health and sports sciences, geography and the humanities. The University is organised as three colleges – Engineering, Design and Physical Sciences; Business, Arts and Social Sciences; and Health and Life Sciences – and three major research institutes – Energy Futures and Environment; Health and Societies; and Materials and Manufacturing.

The university has 12,746 students and 532 academic staff.

## **The University of Cambridge**

The University of Cambridge is one of the world's oldest universities. It was founded in 1209, and has been organised in different colleges since the first college was founded in 1284. It now comprises 31 Colleges and 150 Departments, Faculties, Schools and other institutions. As a governance structure, The University of Cambridge is accordingly a collegiate university, in which responsibilities are divided between the central administration and the colleges. The governing body and principal electoral constituency of today's University is the Regent House, which has more than 3,800 members. The Council is the principal executive and policy making body of the university, and reports to the Regent House. It has the overall responsibility for administration, including general procedures and guidance for academic employment. Each college has its own statutes and regulations, as well as internal procedures. Additionally, senior fellows have the right to provide input and vote on a range of matters, including the election of Council members and the Board of Scrutiny.

The University of Cambridge is a prestigious, research-intensive university, and is commonly ranked among the top ten higher education institutions in global university rankings. It is considered as highly elitist and competitive in terms of both the admission of students and the employment of staff. The University recruits students and staff from an international pool of applicants and scholars and, according to THE (2018), 35 per cent of the student population are international students.

In the academic year 2015–16, 11,147 staff were employed at the University. Of these, 1,686 were academic, 2,017 were academic-related, whereas 3,950 were categorised as doing contract research. The remaining staff were clerical and secretarial, manual and domestic, and technical staff. The student population was nearly identical in size as the overall staff population, and counted 11,888 students in the academic year 2015–16.<sup>86</sup>

## **The academic career structure at Cambridge**

The University states that it ‘aims to select and recruit researchers with the highest potential to achieve excellence in research.’<sup>87</sup> It has a dual employment system, in the sense that academics are either employed by the university or the colleges, which have different employment conditions. The university employs academic staff (with ‘university’ as a prefix in the job title), whereas the colleges employ their own staff, who are normally involved in teaching activities (typically College-funded Teaching Officers). The University and colleges do, however, have a shared career structure and shared procedures for employment and promotion of staff to senior levels. It is expected that the colleges have some discretion in interpreting the content of the recruitment and promotion procedures decided by the University, as it is the head of department who oversees the processes of employment and promotion.

Promotion at Cambridge is not automatic, and requires the recommendation of a superior. For promotion to professorial positions, employees must apply following a procedure which was introduced in 2013 to standardise the different processes for senior researcher promotions which were in operation across the University. For promotions at lower levels, local procedures are followed. In both cases, committees evaluate the quality of the applicant’s work and contribution in relation to the predefined criteria. These cover contributions in research and teaching as well as general contributions. Whereas research is included as a basis for promotion regardless of where it has been undertaken, teaching is only taken into consideration if carried out in previous academic employment at Cambridge. A general contribution refers to contributions made outside the University.

A division is found between those employed on open-ended (permanent) contracts, and those with a fixed-term contract (temporary), usually financed through externally-funded projects. The maximum length of a fixed-term contract is four years, and on prolongation after four years, the contract is converted to an open-ended contract.

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86 Numbers retrieved from the University of Cambridge’s homepage: <https://www.prao.admin.cam.ac.uk/data-analysis-planning/facts-figures/facts-and-figures-2017>

87 <https://www.cam.ac.uk/research-staff/employment-and-career-management/employment-and-career-management-scheme/selection-and-recruitment-of-researchers>

## Titles

The University of Cambridge uses the typical English academic job titles, and they have titles referring to both research-focused positions, and for positions involving more teaching. They furthermore distinguish between having a personal lectureship or professorship, which is awarded following internal promotion, and having a chair, which is awarded after open recruitment.

In addition to the typical senior-level positions, colleges also offer several different fixed-term fellowships, stipendiary fellowships and college-funded Junior Research Fellowship and Early Career Research Fellowships, which are postdoc positions appropriate to the start of an academic career.

Research promotions and academic promotions at senior level follow different schemes and criteria. For the sake of simplicity, the two schemes are combined here:<sup>88</sup>

- **Research Associate** – For researchers with some research experience who have normally been awarded a doctoral degree. Their research activity will provide substantial scope for academic judgment, originality, interpretation and presentation of results.
- **Lecturer** – Lecturers have both teaching and research obligations.
- **Senior Research Associate** – For researchers with at least three years' experience as a postdoctoral research associate, or equivalent. They will have demonstrated a high level of competence and an independent standing as researchers.
- **Senior Lecturer** – Only lecturers may be considered for promotion to senior lectureships. This position was created 'to reward sustained excellence in teaching, sustained supportiveness in administration and organisational tasks, and achievement in research'.<sup>89</sup> They are research active, and conduct a minimum of 30 hours teaching per year.
- **Principal Research Associate** – A title at an equivalent level to reader.
- **Reader** – For applicants coming from a lectureship or senior lectureship. Readers should have achieved international *recognition* in the relevant subject with reference to: (i) originality (ii) contribution to the advancement of knowledge (iii) reputation.
- **Director of Research** – This appointment is at a level equivalent to professor. Directors of research may be considered for promotion to or may be appointed on recruitment.

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<sup>88</sup> Descriptors are found at <https://www.cam.ac.uk/research-staff/employment-and-career-management/employment-and-career-management-scheme/researchers-employment-policies-and-protocols/job-titles-and-duties>

<sup>89</sup>[https://www.hr.admin.cam.ac.uk/files/sap\\_2016\\_procedures\\_and\\_guidance\\_manual\\_-\\_final\\_20\\_aug\\_15\\_updated\\_5\\_oct15.pdf](https://www.hr.admin.cam.ac.uk/files/sap_2016_procedures_and_guidance_manual_-_final_20_aug_15_updated_5_oct15.pdf)

- **Professor** – Professors must have established *leadership* in the relevant subject with reference to originality, contribution to the advancement of knowledge and reputation. There must also be an effective contribution to teaching and administration, such as establishments of research group and/or research facilities, or more widening participation activity.

Some colleges, including Corpus Christi College, St Catharine's College and Downing College, host **Fellow Commoners** who are appointed for a limited period on basis of their achievements in their own field outside of academia. Hence, they are not academics, but are invited to the college to bring a different perspective to the college community. They typically contribute with talks, advice to students and workshops.

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