HAL open science

The gendered diversification of academic career paths in comparative perspective

Nicky Le Feuvre, Pierre Bataille, Sabine Kradolfer, Maria del Rio Carral, Marie Sautier

To cite this version:

Nicky Le Feuvre, Pierre Bataille, Sabine Kradolfer, Maria del Rio Carral, Marie Sautier. The gendered diversification of academic career paths in comparative perspective. Gender and precarious research careers, Routledge, pp.50 - 80, 2019, 9781138708068. hal-03616620

HAL Id: hal-03616620

https://sciencespo.hal.science/hal-03616620v1

Submitted on 22 Mar 2022

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

2 The gendered diversification of academic career paths in comparative perspective

Nicky Le Feuvre, Pierre Bataille, Sabine Kradolfer, Maria del Rio Carral and Marie Sautier

> Higher education has many variants, and the situation of academic staff varies considerably across and within countries.
>
> (Enders and Musselin 2008, p. 142)

Introduction

It is now widely recognised that women's progressive access to the upper reaches of the socio-professional hierarchy usually coincides with major demographic, organisational or socioeconomic transformations at the national and/or occupational levels (Crompton, Lyonette and Scott 2010; Boni-Le Goff and Le Feuvre 2017). The academic profession is no exception to this rule. A ream of research literature has pinpointed the structural changes currently sweeping across higher education (HE) and research institutions (Enders and de Weert 2009a; Fassa and Kradolfer 2013; Fumasoli, Goastellec and Kehm 2015; Herschberg, Benschop and van den Brink 2018; Musselin 2005, 2009, 2017; Teichler, Arimoto and Cummings 2013; Tuchman 2009). As indicated below, these shifts interact with parallel changes to the gender composition of the academic workforce (European Commission 2016) to produce untoward challenges to the academic professional ethos.

As is now well-documented, recent changes to academic working environments have been demographic, organisational and ideological in nature. From a demographic point of view, academic employment has expanded significantly over the past 50 years. This growth has affected all levels of the academic occupational hierarchy, but has often been more spectacular at the junior levels (PhD candidates, postdocs) than amongst tenured professors, leading to a widening of the base of the occupational pyramid (Dubach 2014; Ylijoki 2010). In some countries, this expansion would appear to have reached a peak with the Great Recession, whilst it continues to progress – albeit at a slower rate – in other national contexts (Euraxess 2014). From an organisational point of view, HE and research institutions have lost many of their historically specific attributes, including some forms of self-regulation (Henkel 2009), and have been increasingly subject to the expansion of a range of so-called New Public Management (NPM) initiatives (Ferlie, Musselin and Andresani 2008). Although they are

usually located in the public sector, academic institutions are increasingly being run according to the principles of private enterprise, with a particular emphasis on accountability, competition, transparency, cost-cutting and the maximisation of returns on investment (Deem, Hillyard and Reed 2007). These demographic and organisational evolutions also have an ideological dimension, based on the legitimacy accorded to the introduction of quasi-market conditions to the pursuit of scientific excellence and the management of academic staff at the local, national and trans-national levels.

This somewhat volatile context represents a particular challenge for the comparative analysis of early research careers from a gender perspective. Understanding the multiple and sometimes contradictory forces at work in shaping women's academic careers has progressed significantly over recent years (Ceci *et al.* 2014; de Cheveigné 2009; Glass *et al.* 2013; Hunter and Leahey 2010; Krefting 2008; Marini and Meschitti 2018; Marsh *et al. 2*009; Meulders, O'Dorchai and Simeu 2012; Moss-Racusin *et al.* 2012; Musselin and Pigeyre 2008; Nittrouer *et al*. 2017; Pétursdóttir 2009; Rogers and Molinier 2016; Siemienska and Zimmer 2007; Weisshaar 2017; Van Arensbergen, Van der Weijden and Van den Besselaar 2012; Zippel 2017). However, some studies continue to produce somewhat inconclusive or ambivalent results (Barrett and Barrett 2011; Danell and Hjerm 2013; Ecklund, Lincoln, and Tansey 2012; Miller and Wai 2015; Williams and Ceci 2015). To date, research on women's academic careers has tended to focus on the processes that combine to limit their access to the academic labour market as a whole and/or to the most prestigious HE and research positions. However, as the proportion of female PhDs increases, the international research agenda has tended to shift from concern with women's exclusion from the upper reaches of the academic hierarchy to a growing interest in the conditions under which they have been progressively integrated into a rapidly changing labour market, where formal commitment to gender equality has increased significantly (Brooks and Mackinnon 2001). This shift in focus has implications for the way in which the "women and science question" is framed (Garforth and Kerr 2009; Le Feuvre 2009), particularly in relation to the emerging debate about the quality of academic jobs. Knowledge work in general and the academic career in particular have traditionally been seen as highly desirable areas of employment, associated with a host of material, intrinsic and symbolic rewards, which women were collectively denied (Van den Brink and Benschop 2011; Valian 1999, 2005). However, with the on-going degradation of employment and working conditions in HE and research institutions (Gill 2009), promoting gender equality in academic careers raises new challenges. Should we really be committing resources to encouraging women to invest in academic careers whilst openly recognising that the opportunities for stable employment opportunities in this sector are decreasing? Given potential changes to the relative rewards of academic careers, any serious study of the gendered precariousness of academic employment requires broadening the traditional research perspectives on the "women and science question" in at least three directions.

First, we need to recognise that the global nature of research and the increasing role of international mobility in academic performance indicators (Herschberg, Benschop, and van den Brink 2018) doesn't necessarily imply the harmonisation of academic career models across national borders. As we will argue in more detail below, similar demographic, organisational and ideological changes to academic institutions do not necessarily result in the emergence of a transnational, globalised and unified academic labour market. Not all national academic labour markets reflect global forces of change in exactly the same ways (Enders and de Weert 2009a, 2009b). We therefore need to adopt an analytical approach that is more sensitive to similarities and differences in precariousness that cut across national contexts, gender categories and disciplinary fields (Le Feuvre 2016). Furthermore, within national academic labour markets, different forms of biographically situated working and employment conditions have potentially varied implications for the young researchers concerned and for the gender scripts they adopt.

Second, we need to recognise that PhD holders are not restricted to working in HE and research institutions, although their non-academic employment opportunities may vary considerable by country and disciplinary field. Instead of presuming that academic institutions necessarily offer the most fulfilling and rewarding career options open to PhD holders of both sexes, we need to take the critical analysis of current working conditions in HE and research institutions seriously. This means considering under what circumstances the intense competition for academic jobs modifies the ability of the sector to provide men and women with long-term career prospects. This also requires a critical reappraisal of the so-called "leaky pipeline" perspective (see Chapter 6, this volume). Instead of focussing solely on the factors that hamper women's chances of progressing up the academic career hierarchy, we also need to consider the ability of women to opt out of those labour market niches that fail to provide the independence, rewards and stability to which they now aspire, on a comparable basis to men (Glass *et al.* 2013).

Third, we need to recognise the variability of academic precariousness over time. In other words, we must remember that, in a wide range of countries, PhD holders make up the group that is best and durably protected from the risk of unemployment and precarious employment conditions across the adult life-course (Auriol 2010; Calmand, Prieur and Wolber 2017; Phou 2017). At the same time, we have to admit that this is a group that is increasingly likely to experience a more or less extended period of what could be called *transitional precariousness*, in the form of fixed-term, part-time, low paid, unprotected jobs, before finally gaining access to the permanent and relatively prestigious positions that are commensurate with their qualifications and that they will occupy for the remaining years of their working lives. The time-scale for observing the employment transitions of PhD holders is thus vital to understanding the variability in the precariousness of early academic careers for men and women, across countries and across time.

In response to just some of these challenges, the chapter is structured around two sub-sections. First, we discuss the tensions between global changes in

academic labour markets and the survival of nationally specific career models. Second, we demonstrate the insights to be gained from paying more systematic attention to the varying significance of different forms of precarious employment, both within different academic career models and across biographical time-lines.

Academic labour markets: between global convergence and national specificities

Cross-national comparative research on gender equalities is complex and its epistemological foundations and methodological implications are much debated (Crompton 2001, 2006; Crompton and Le Feuvre 2000). However, these issues are shadowed by the particularities of the academic profession, which is often presented under the guise of a "global labour market". Furthermore, despite recent improvements in the collection of harmonised statistical data (European Commission 2016), much of the "women and science" literature continues to lack a theoretically grounded cross-national analytical perspective (Caprile *et al*. 2012). Indeed, there seems to be an implicit presumption that the organisational structure and requirements of a (successful) academic career must be similar across time and place. The fact that the specificities of national academic labour markets are often overlooked in much of the gender and science research literature has analytical consequences (Le Feuvre 2015), which are compounded by the relative homogeneity of women's access to the most prestigious jobs in the academic hierarchy across national boundaries. Because women represent approximately a quarter of Grade A professorships in most Western societies, there is a marked tendency to presume that this under-representation must be the result of *similar social processes* across national contexts and over time, despite the contrasting levels of feminisation observed in a given country, across disciplinary fields (Table 2.1). Increasing attention to the *internationalisation* of academic occupations and critical appraisal of the widespread adoption of so-called New Public Management (NPM) principles within HE and research institutions has undoubtedly heightened this focus on the *commonalities* of academic careers, to the detriment of factors that are potentially specific to certain national, regional, institutional or disciplinary contexts (Enders, de Boer and Leisyte 2009). From this point of view, the distinction proposed by Simon Marginson (2009) between the "internationalisation" of academic labour markets and their "globalisation" is particularly useful. Marginson identifies three distinct levels of trans-national change to HE and research institutions. First, the formation of a trans-national, global market for academic labour that may "crowd out national labour markets" (globalisation). Second, supra-national initiatives that lead to convergence between national HE systems (internationalisation) and, third, parallel reforms adopted more or less simultaneously by different national governments, but which are integrated differently into existing policies, norms or practices, potentially reducing the similarity of outcomes (nationalisation). According to Marginson, not all aspects of academic life are being globalised,

Table 2.1 Women as a proportion of all researchers and of Grade A positions, by field of science, selected countries, 2013

Country	*Natural Sciences*	*Engineering and Technology*	*Medical Sciences*	*Social Sciences*	*Humanities*
Austria all	29.0	22.0	46.0	49.0	52.0
Austria Grade A	11.7	7.8	14.7	24.1	33.4
Belgium all	33.0	21.0	53.0	49.0	45.0
Belgium Grade A	15.3	9.3	23.3	23.5	30.0
Germany all	28.0	19.0	48.0	36.0	50.0
Germany Grade A	11.6	7.6	11.5	16.0	28.6
Italy all	42.0	26.0	36.0	42.0	52.0
Italy Grade A	21.6	10.4	13.6	24.3	35.9
Netherlands all (2005)	26.0	21.0	39.0	38.0	42.0
Netherlands Grade A (2005)	9.7	9.0	16.4	19.1	25.7
Slovenia all	30.0	24.0	52.0	46.0	51.0
Slovenia Grade A	10.9	11.6	30.7	23.9	29.1
Switzerland all	–	–	–	–	–
Switzerland Grade A	12.9	12.0	20.0	24.4	33.3
UK all	30.0	24.0	52.0	46.0	51.0
UK Grade A	9.0	7.0	23.2	22.7	10.8

Source: European Commission (2016) p. 81 and p. 129. https://data.europa.eu/euodp/data/dataset/she-figures-2015-gender-in-research-and-innovation.

nationalised or internationalised to the same extent. Thus, for example: "Research-related and doctoral activities […] tend to be more globally universal in character than the more nation-bound and locally idiosyncratic processes of academic appointment, promotion, performance management and remuneration" (Marginson 2009, p. 99).

Across national contexts, academic labour markets obviously do share a number of characteristics. As Jurgen Enders and Christine Musselin have argued:

> While each academic system is embedded in its own national traditions, there are some common realities: increasing financial constraints, processes of differentiation within massified higher education systems, demands for accountability and responsiveness to societal needs, market-like approaches to higher education, and rising international co-operation and competition.
> (2008, p. 145)

Of these global tendencies, the demographic expansion of the academic labour market and its increasing fragmentation are probably most relevant to the issues addressed in this volume.

Demographic expansion and internal labour market segregation

Despite recent improvements in the collection, compilation and dissemination of descriptive data on gendered research careers in the European context (notably

through the European Commission's regularly up-dated *She Figures* publications), we still have limited knowledge of the mechanisms through which women *exit* academic institutions and/or *stagnate* at intermediary levels of the academic hierarchy to a greater extent than their male counterparts (Dubois-Shaik and Fusulier 2015). In the absence of longitudinal data, it remains unclear which precise combination of push and pull factors might lead women: (a) to aspire to an academic career in the first place; (b) to gain access to a stable academic position; (c) to progress up the academic hierarchy or (d) to contribute to a growing "reserve army" of temporary, precarious academic workers. Furthermore, the transnational similarity or societal specificity of these gendering mechanisms remains largely open to conjecture.

Since holding a doctorate is a near-universal pre-requisite for a research career, it is important to stress that the rise in women's educational credentials was achieved during a period of rapid demographic expansion of the higher education systems of the global North. Over the last decade of the twentieth century, the number of new doctoral graduates from universities in OECD countries increased by almost 40 per cent (Auriol, Misu and Freeman 2013, p. 8). However, female PhD holders have not replaced or displaced their male counterparts, since the absolute number of male doctoral graduates has also been increasing over time, albeit at a slower rate than for women (Figure 2.1).

Women now represent between 40 per cent and 60 per cent of all advanced research degree graduates in Europe, and their share of PhDs is particularly high

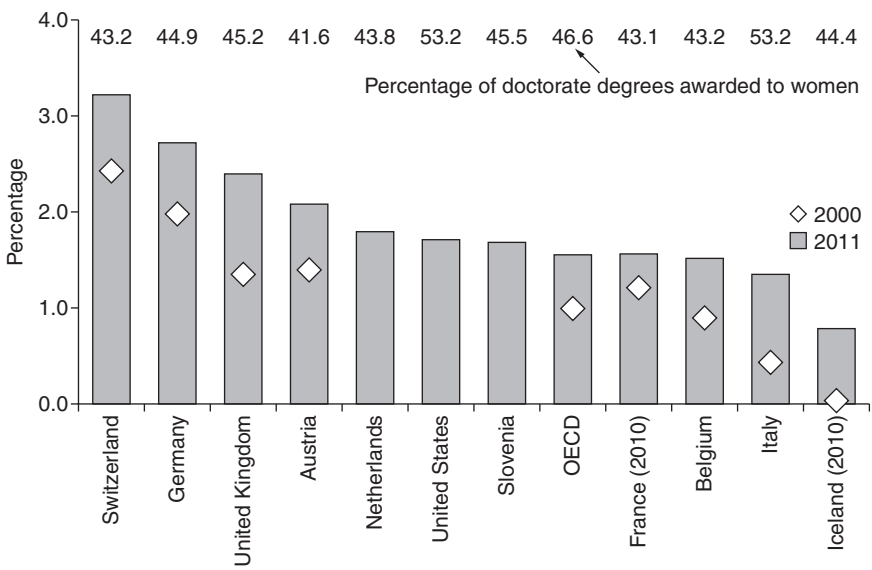

Figure 2.1 Graduate rates at doctoral level 2000 and 2011, as a percentage of the reference cohort, selected OECD countries.

Source: our elaboration based on OECD (2013), *Education at a Glance 2013: OECD Indicators*, OECD Publishing and OECD Education Database, July 2013.

in Iceland, Italy, the Netherlands and Slovenia. However, the overall feminisation of tertiary education has not decreased the horizontal gender segregation within HE and research institutions. Men are still twice as likely as women to earn PhDs in engineering, manufacturing and computing, whereas as women are twice as likely as men to graduate in Education Studies (European Commission 2016). Although women's access to tertiary degrees has increased across the globe, the proportion of PhD holders in the total population and in the labour market continues to vary considerably by country (see Figure 2.2). Thus, the large number of doctoral students trained in Switzerland is reflected in the high proportion of PhD holders in the total Swiss labour force. However, this is largely due to a large share of foreign doctoral graduates, who account for almost half of the PhDs awarded each year (Dubach 2014). Germany, Austria, the US and the UK also have a relatively high proportion of PhD holders in their total labour force, but with varying shares of foreigners amongst this group.

In line with the expansion of PhD studies, the number of people employed in the HE and research sector has also increased dramatically in recent years. But, once again, the demographics of this sector vary considerably across national boundaries. In some countries, the annual expansion of academic employment has continued well beyond the Great Recession, whereas numbers had already started to stagnate before 2008 in other contexts (Table 2.2). Both Switzerland

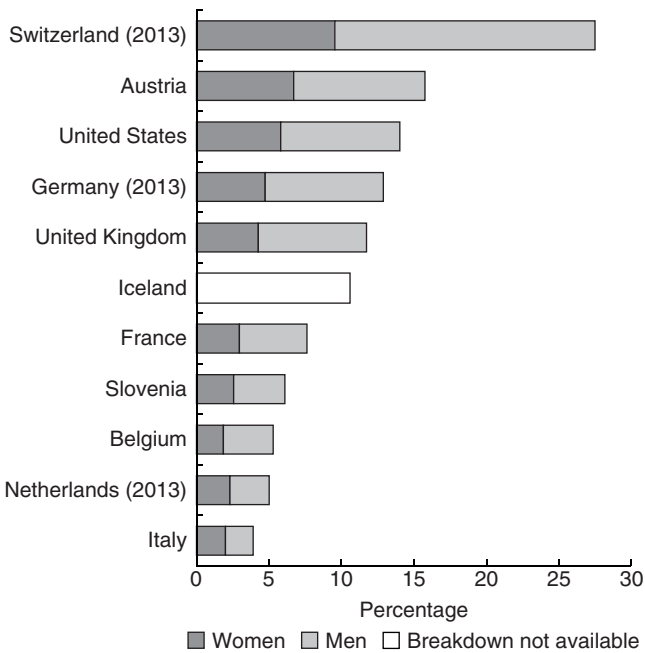

Figure 2.2 Doctorate holders in the working age population, 25–64 years, by sex, 2012.

Source: OECD calculations based on OECD data collection on Careers of Doctorate Holders 2014, www.oecd.org.sti/cdh; and other international sources, June 2015.

Table 2.2 Evolution of number of researchers in the HE sector, by sex, selected countries, 2006–2013

Country	*2006*		*2013*		*Evolution 2006–2013*
	Women	*Men*	*Women*	*Men*	
Austria	8,190	15,419	13,412	20,369	+43.1%
Belgium	9,998	16,831	13,139	18,938	+19.6%
France	37,538	71,225	37,546	75,512	+3.9%
Germany	57,981	126,391	99,207	162,450	+41.9%
Iceland	606	775	976	934	+38.3%
Italy	25,721	46,683	31,325	46,412	+7.4%
Netherlands	7,124	13,728	10,183	14,407	+17.9%
Slovenia	1,374	2,235	1,830	2,480	+19.4%
Switzerland	9,455	20,185[a]	15,037	26,358	+39.7%
United Kingdom	106,839[b]	14,8210	147,457	182,925	+29.5%

Source: Eurostat (own calculation). Last update May 2018.

Notes
a 2012.
b 2005.

and Iceland have an unusually high proportion of HE sector researchers amongst their workforce, whilst the opposite is true of Italy and the Netherlands. Interestingly, there isn't any statistical correlation between the proportion of PhD holders in the total labour force and women's share of doctoral qualifications. The differing density of PhD holders in the labour force would seem to suggest that the degree to which tertiary degrees are a simple prerequisite for an academic career or the extent to which they lead (potentially) to a much wider range of employment opportunities also varies between countries. The very different (relative) size of the academic labour market also suggests that the working conditions and career opportunities of HE teaching and research staff vary considerably according to their national environment (Teichler and Höhle 2013; Kuhm and Teichler 2013). As we will see in more detail later, this question is directly related to the more or less precarious employment perspectives of male and female PhD holders in different national contexts.

Another important factor to consider when analysing women's access to academic positions is the ratio of tenured (permanent) positions as a share of the total academic labour market. As indicated in Figure 2.3, this ratio varies considerably between countries and shows no clear sign of convergence over time. Thus, in the EU-28 as a whole, 17 per cent of male academics hold a full professorship, as compared to only 7 per cent of their female counterparts. Although levels of formal tenure for full professors have been decreasing recently, there is still reason to believe that these positions offer high levels of employment security. But the percentage of full professorships in relation to the whole academic sector ranges from almost half of all male researchers in Iceland (and a quarter of all females) to just 11 per cent and 4 percent, respectively, in Austria. National academic labour

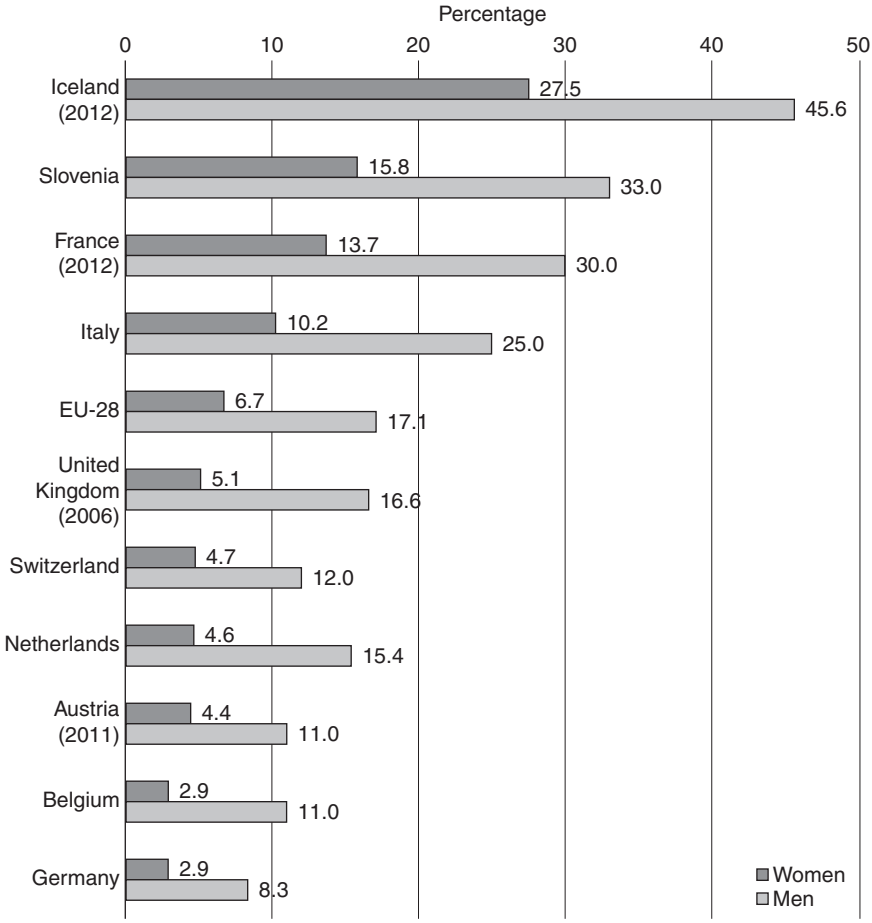

Figure 2.3 Percentage of Grade A staff amongst all academic staff, by sex, selected countries, 2013.

Source: our elaboration on European Commission (2016), *She Figures* 2015, p. 132. https://data.europa.eu/euodp/data/dataset/she-figures-2015-gender-in-research-and-innovation.

markets are not all "bottom heavy" to the same extent and this also has considerable consequences for the relative chance that men and women have of entering the academic sector and/or of reaching the top of the occupational hierarchy. A much flatter career structure opens up the opportunity for a larger proportion of all academic staff to – eventually – reach the top, but probably reduces the relative advantages associated with becoming a (tenured) professor.

Even in these less fiercely competitive contexts, the ratio of PhDs to existing permanent positions and the age profile of today's academic staff are important factors to consider. Of course, the relative shortage or abundance of professorships

in a given national context is subject to considerable change over time and is particularly sensitive to the rate of expansion of tertiary education. Furthermore, the proportion of tenured jobs within the academic sector of a single nation state probably also varies by disciplinary field, although we have not been able to locate any comparative data on this point in the literature.

Even within a very internationalised labour market for academic staff, the total number of research jobs available to PhD holders in their home country will obviously have an impact on the degree of competition likely to be experienced at the point of entry. However, potentially contradictory forces may be at work here. On the one hand, an academic career may remain attractive to PhD holders, despite limited objective chances of receiving tenure, thus limiting investment in the acquisition of "transferrable skills" during the postdoc period (Teelken and Van der Weijden 2018). On the other hand, increased competition for stable academic jobs may reduce aspirations for an academic career, as postdocs adapt their job seeking strategies to the economic realities of their immediate environment, sometimes leading them to accept non-academic jobs that are well below their qualifications (Bozzon, Murgia and Villa 2017).

National academic career models

Beyond the lack of transnational convergence in the demographics of academic labour markets, empirical evidence would seem to suggest that the precise characteristics and requirements of an academic career also vary considerably from one national context to another (Teichler and Höhle 2013). As Christine Musselin has argued: "Salaries, occupational status, recruitment procedures, promotion rules, workload, career paths, etc., tend to vary significantly from one national higher education system to another" (Musselin 2005, p. 135). This French sociologist has identified four aspects of academic labour markets that are particularly sensitive to national variation: (a) selection (recruitment) procedures (e.g. national pre-qualification *versus* direct competition at the institutional level); (b) length and function of the pre-tenure period (e.g. rapid autonomy for young researchers *versus* a prolonged (subordinate) apprentice period); (c) relative importance of internal and external labour markets (e.g. importance and acceptability of "local" (same institution) *versus* national or international career tracks) and (d) relative pay and salary determinants (e.g. relative level of remuneration, in comparison to comparable alternative occupations, and proportion of performance related pay) (Musselin 2005, p. 139). This list of indicators enables Musselin to distinguish between three distinct academic career models, which, she argues, continue to influence conditions of access to employment in HE and research institutions across the world.

The tenure-track model

The *tenure track* academic career model is based on: "an early [competitive] selection of young PhDs, among whom some are offered tenure-track positions,

i.e. time-limited posts leading, at the end of a given period, to a […] procedure to decide whether they will be offered a tenured position" (Enders and Musselin 2008, p. 134). This model is typical of the US academic system and is characterised by an "up or out" selection procedure, whereby those who fail to meet the requirements for tenure within the allocated duration are expected to leave the institution and to seek employment elsewhere. Historically, the tenure-track career model was based on the adoption of a formal or informal *numerus clausus* at the PhD level; the number of doctoral students recruited (and funded) being largely determined by the foreseeable availability of early career positions within the academy. The labour market for PhD students could thus be described as largely "internal" to academic research institutions, as in the US and the UK. Competition, although extremely harsh, was traditionally less about access to the academic labour market per se, than about access to the most enviable and prestigious research institutions; precisely those where the opportunity to develop a competitive research profile was the most promising. Those postdocs who failed to meet the stringent criteria for tenure in one of the highest ranked institutions could still expect to pursue an academic career, albeit in a less prestigious establishment, probably at the cost of a heavier teaching load, more administrative duties, a lower salary and with fewer institutional resources (Jaschik and Lederman 2017). Recent changes to this tenure model of academic careers have notably involved (a) the expansion of PhD certification well beyond the employment capacity of the academic sector; (b) the creation of an increasing number of fixed-term, non-tenure track positions, even within the most prestigious research institutions and (c) the increasing differentiation of temporary teaching-based or research-focussed or administrative positions; thus creating a functional divide within what was previously seen as an integrated profession involving all three aspects of academic work, albeit in varying proportions (Phou 2017). This career model is prevalent in countries characterised by a departmental (as opposed to a chair) structure, where the co-option of new, high performing colleagues is central to strategies to maintain or improve the relative ranking of a collective entity (Institute, Department, Faculty, etc.) within a highly competitive environment (see Fumasoli, Goastellec and Kehm 2015). Among the GARCIA partner countries, this traditionally Anglo-Saxon career model is becoming increasingly prevalent in Iceland and the Netherlands, and is also being adopted in Belgium, particularly in STEM fields.

In parallel to this relatively closed academic labour market, PhD holders also have the option of an early exit from academic institutions, to alternative jobs in public administration, industry or the professions, where doctoral credentials command a certain degree of recognition and reward (Glass *et al.* 2013). As the number of PhD holders has increased beyond the capacity of the academic labour market alone, efforts have been made to promote doctoral studies to a wider audience of potential employers, although with limited success to date (Van der Weijden *et al*. 2016). In addition, there has also been a notable increase in the number of non-academic positions available to PhD holders within HE and research institutions, where the widespread adoption of NPM

principles has led to the development of relatively well-paid, but not always permanent, jobs in research management, quality control, research evaluation and fund-raising.

We would thus expect forms of precariousness that reflect the increasing internal stratification of academic labour markets to be particularly prevalent in countries where the tenure track model of academic careers is dominant. In this case, the extension of the "probationary" or pre-tenure period and the creation of permanently non-permanent teaching, research and administrative positions has introduced a new source of differentiation between what Enders and Musselin (2008) call the "haves and the have nots" of the increasingly "T-shaped" academic labour market (Enders and de Weert 2009b). There is evidence to suggest that in some countries that have adopted the tenure track career model, gender discrimination on the road to tenure persists (Herschberg, Benschop, and van den Brink 2018; Weisshaar 2017), whereas other studies indicate that women's chances of receiving tenure are similar to those of their male counterparts (Phou 2017; Van der Weijden *et al*. 2016). Whatever the case, the process is highly selective. In the Netherlands, for example, it has been estimated that the number of associate professorships available each year is equivalent to approximately 20% of the postdoc population in the country, almost half of whom are non-nationals (Van der Weijden *et al*. 2016). Within this model, postdocs are well aware of the selective nature of the tenure-track, despite the fact that most of them (up to 85 per cent in the Netherlands, for example) aspire to work in the HE and research sector (Van der Weijden *et al*. 2016). Thus, in the tenure-track model, the postdoc period of uncertainty and unpredictability is intense, involving frequent job changes and geographical mobility. However, this period is generally short-lived. After five years as a postdoc, the chances of ever securing a permanent academic position are considerably reduced. This model is thus particularly problematic for women, who may be considering having children precisely within this limited time-frame (at age 35 or thereabouts). However, some authors have suggested that when gender discrimination is particularly rife in the tenure-track selection process, female doctorate holders may develop exit strategies from the academy in order to seek alternative career opportunities to those they are denied in HE and research institutions (Glass *et al.* 2013). In such cases, making sense of the "leaky pipeline" phenomenon becomes even more of a challenge (Dubois-Shaik and Fusulier 2015), since even if they have a marginally better chance of receiving tenure than their female counterparts, the majority of male PhD holders will also end up working outside of the academy.

The survivor model

A second academic career pattern identified by Christine Musselin is described as a survivor model and is typical of countries where the Humboldt tradition of academic chairs rather than departments is strong (e.g. Austria, Germany, Switzerland and Belgium). In this case,

> After their PhD, candidates for an academic career must […] wait many years to obtain a permanent position. Only those overcoming the long period of selection and […] competition involving many candidates, among whom only one or a few […] have a chance to survive.
>
> (Enders and Musselin 2008, p. 135)

The survivor model of academic careers is thus based on a long tradition of informal career management principles that are not directly related to the introduction of NPM principles (Enders, de Boer and Leisyte 2009). The only "permanent" positions in the system are those located at the very pinnacle of the academic hierarchy and reaching them has always involved occupying a succession of fixed-term and institutionally subordinate positions, and was historically dependent on securing external funding. In parallel to a small number of full professorships, which in some Swiss universities, for example, are themselves based on fixed-term (six year), renewable contracts, academic labour markets based on the survivor model have always offered a majority of fixed-term, often part-time, positions with relatively decent pay, but a lack of academic freedom or promotion prospects. Likewise, it has been standard practice to fund such positions solely on the basis of teaching or research, making it extremely difficult for their incumbents to build up the integrated academic profile required of full professors without multiplying their employment contracts and extending their working hours (Brechelmacher *et al*. 2015). Not surprisingly, this model of academic career was historically very masculinised, with women representing less than 10 per cent of professorships in many German-speaking countries well into the 2000s (European Commission 2013). However, somewhat surprisingly, the numerous fixed-term, part-time positions that existed within these academic institutions in the past were occupied by men, some of whom were dependent on inherited wealth or even on a "breadwinning spouse" in order to maintain themselves on a highly precarious and unpredictable academic career track, in the hope of one day reaching the "Eldorado" of a full professorship (Schultheis 2000). At the end of the nineteenth century, Emile Durkheim referred to these precarious middle range positions (*mittelbau*) as the "academic proletariat" of the German university system (Schultheis 2000), and there were almost no women around at the time.

In parallel to the shared belief of access to a professorship as something analogous to "conquering Everest", this Humboldt career model was historically associated with a greater visibility of PhD holders in the non-academic labour market. Far from being reserved for individuals with academic career aspirations, doctoral studies were considered useful for a wide range of other professional and managerial occupations, where individuals could use their academic titles as a source of prestige and recognition. In Switzerland, for example, a doctorate in Law was considered a pre-requisite for training as a lawyer in several cantons (Boni-Le Goff *et al.* 2018), whereas this was rarely the case elsewhere.

In the early 2000s, some countries who had had a survivor career model (e.g. Germany and, to a certain extent, Switzerland) undertook a series of structural

reforms, in order to introduce permanent or semi-permanent positions – inspired by the US tenure-track model – at an intermediate level of the academic hierarchy. In some cases, these so-called "C grade professorships" were reserved for female candidates, as a strategy to reduce the drastic under-representation of women at the top of the academic hierarchy (Beaufays and Kraïs 2005). By all accounts, the results of this reform have been modest (BuWIN 2008, 2013), although some studies do show a spectacular improvement in women's relative chances of becoming a professor in specific disciplines, such as sociology in Germany (Lutter and Schröder 2014). However, a recent report on junior scholars in Germany has stressed the difficulties young doctorate holders face in planning an academic career, notably due to the specificities of this particular career model, including "the bottleneck caused by the plethora of junior scholars on the one hand, and the relatively small number of professorships to be filled or becoming vacant on the other" (BuWiN 2017, p. 5). Similar accounts have been published about the situation in Switzerland (Dubach 2014) and Austria (Holzinger and Hafellner 2015; Schwabe 2011).

In the survivor career model countries, one would expect precariousness to appear under rather different guises than under the tenure-track model. Aspiring academics are likely to accept extremely short-term, part-time, low paid forms of academic employment, sometimes in combination with equally unstable or unpredictable jobs outside of academia. The ultimate aim of these so-called "crumb jobs" is simply to enable prospective academics to "keep a foot" (or toe) in the academic labour market long enough to build up (essentially, in their own time and with their own funds) a research and teaching portfolio that could one day qualify them for a permanent academic position, usually not in the institution where they completed their PhD. As the latest *She Figures* show, part-time employment rates in academic jobs are particularly high – for men and for women – in those countries characterised by the survivor career model (see Figure 2.4). This undoubtedly reflects the precarious employment conditions usually reserved for PhD students and postdocs. However, it appears that working part-time may not have the same implications for male and female PhD holders. Although many of the intermediate, non-tenured academic jobs may formally be part-time, aspiring professors are actually expected to combine several such positions and, effectively, to invest in their career well beyond the duration of a full-time working week. Thus, those (mostly female) junior researchers who work *only* on a part-time basis (whilst taking on most of the unpaid domestic and childcare duties at home) are ultimately disqualified from the highly competitive academic career track. Under such gruelling and long-winded recruitment procedures, it is hardly surprising that many postdocs ultimately decide to give up the wait for a permanent position and to "voluntarily" leave the academic labour market for good (Chlosta *et al*. 2010). This decision is often facilitated by the relative ease with which their doctoral qualifications are recognised and rewarded on the non-academic labour market; something which appears to be far more problematic in countries that are characterised by the third and final academic career model.

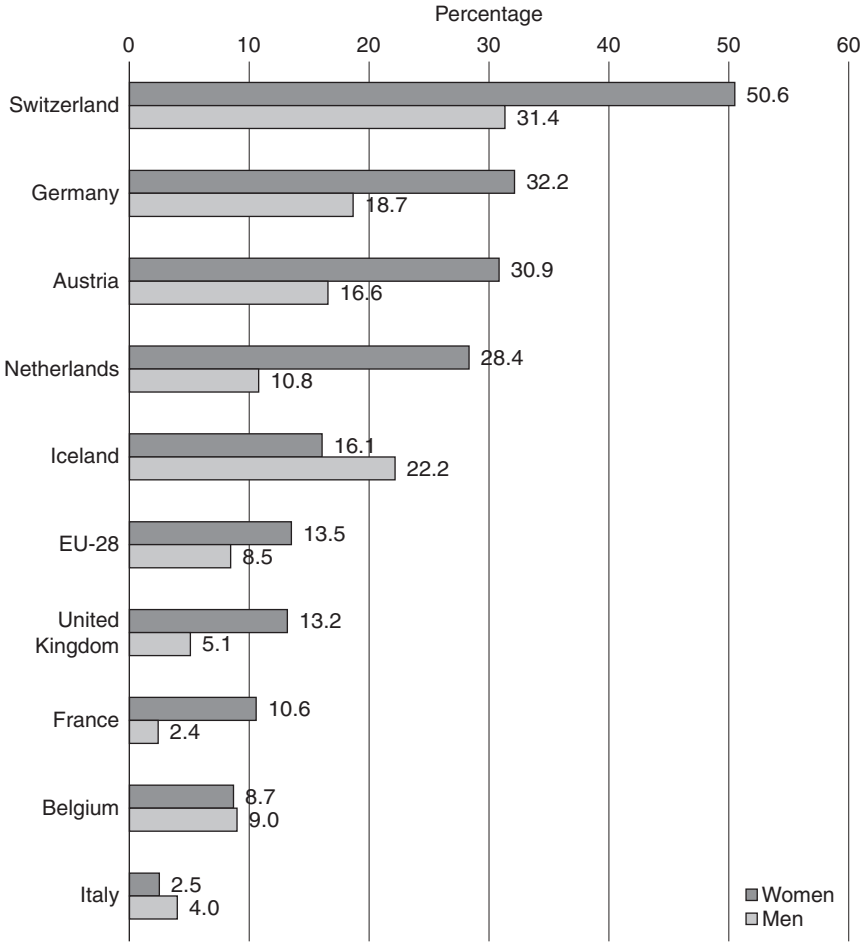

Figure 2.4 Part-time employment rate of researchers in the higher education sector, by sex, selected countries, 2012.

Source: European Commission/*She Figures*, 2016, p. 102. https://data.europa.eu/euodp/data/dataset/she-figures-2015-gender-in-research-and-innovation.

The protective pyramid model

The third academic career pattern identified by Musselin is the protective pyramid model, which is prevalent in countries where academics have historically had civil servant status (e.g. France, Italy, Spain, Slovenia). These countries are usually characterised by nationally organised accreditation procedures. In this case,

> access to a permanent position occurs quite early after a highly selective tournament. There then exist different categories of permanent positions

> organised hierarchically with procedures allowing promotion of some from one category to another. There is no assurance that those entering the pyramid can rise to the top: this very much depends on the growth rate of the overall pyramid and the age/seniority of those on the top.
>
> (Enders and Musselin 2008, p. 135)

This model often includes a national accreditation process between the PhD defence and access to the first permanent academic positions. Based on more or less sophisticated peer-review procedures (Marini and Meschitti 2018), this career model is the most directly dependent on national-level decision-making processes and is the least closely tied to the Human resource (HR) policies and practices of local institutions (universities, faculty departments, research centres, etc.). Thus, academics in countries organised along these lines are more likely to identify with their disciplinary field than with their employing institution, whereas the opposite is true for their those working in countries characterised by the tenure-track career model, like the US (Musselin 2005).

This particular career model is also associated with an internally segmented academic labour market, but where it has traditionally been possible to remain at intermediate levels (equivalent to Reader or Senior Lecturer) for an indefinite period of time (contrary to the historical tenure-track career model), and with a stable and permanent employment contract (contrary to the traditional survivor model). Progression to the higher stages of the career ladder is subject to a new round of examination and accreditation and to the availability of professorial positions at the local or national level. However, the career structure in countries like this tends to be rather flat, with little subordination of the lower ranks of academics to their professorial counterparts and with relatively modest pay gaps at different points in the socio-professional hierarchy. Apart from PhD supervision (for which an additional form of accreditation may be required), lower level academic positions offer relatively similar levels of access to research funds, teaching loads and administrative responsibilities as those at the top of the academic hierarchy (tenured professorships). The stability of these intermediate, permanent non (full) professorial positions, as well as the academic freedom traditionally associated with public-sector employment in those countries characterised by the protective pyramid model has contributed to specific forms of gender segregation and career progression. In France, for example, women have made very significant inroads into the lower levels of the academic hierarchy in almost all disciplinary fields, but their progression onto full professorships has been slower and more varied across disciplines (Hermann 2017; Le Feuvre 2017). As we have seen, within this career model, the fact that women tend to remain longer than men at the Senior Lecturer level can in no way be associated with a "precarious" career path, since these are tenured positions, offering a large degree of professional autonomy and academic freedom, as well as relatively comfortable pay levels. This stands in sharp contrast to the pressure and uncertainty experienced by many of their Grade B counterparts in countries characterised by a survivor career model.

In the French case, for example, it would be misleading to suggest that those women who remain in tenured Grade B positions throughout their working lives have somehow "leaked" from the academic pipeline. They haven't. They may not have reached the peak of the academic hierarchy, they may indeed have access to fewer material and symbolic resources than their professorial peers, but they nevertheless continue to influence the daily workings of academic institutions, including the definition of teaching and research programmes, the recruitment of future colleagues, the supervision of male and female graduate students and even the management of large research programmes.

In this particular career model, young researchers are more directly dependent on national or regional level policies than on the HR strategies of particular HE and research institutions. Furthermore, there is not a clear hierarchy of employer institutions, since working conditions are defined quite homogeneously for all those who share the same occupational status, irrespective of the prestige of their employer. This means that any decision to reduce the resources available to HE and research institutions will have a blanket effect on a whole generation of prospective academics. Thus, in Italy, a country with extremely high youth unemployment rates, the decision to cut the national HE budget by replacing only half of the retiring tenured academic staff has had a huge impact on the internal career structure of all public universities (Bozzon *et al*. 2017). Between 2008 and 2013, the number of teaching and research staff in Italian universities increased by 5.2 per cent, while the number of permanent academic positions (full, associate and assistant professors) fell by 18.5 per cent. This drop is almost exclusively due to the non-replacement of retirees and is particularly visible at the very top of the occupational hierarchy (–26.6 per cent for full professors, –15.4 per cent for associate professors, –13.4 per cent for assistant professors). In parallel, the number of non-permanent research positions has increased by a staggering 71.2 per cent (Bozzon *et al.* 2015, pp. 36–37). In 2013, non-permanent positions accounted for 37 per cent of the teaching and research staff in Italian universities; a figure that rose to 50 per cent if PhD students were included in the calculations. More than 60 per cent of these fixed-term positions are research fellows, who are often not covered by Italian labour laws and employment rights. Indeed, only 10 per cent of these fixed-terms contracts provide standard employment conditions (Bozzon *et al.* 2015, pp. 36–37). Furthermore, women are slightly under-represented amongst the most stable of these precarious academic positions (43.3 per cent of fixed-term researchers), whereas they represent half of the fixed-term research fellows and scientific collaborators (ibid.).

Given the relatively low number of PhD graduates in these countries, there is no tradition of doctoral employment in non-academic jobs, leaving a relatively small number of postdocs with little option for exit to alternative, non-academic jobs and with limited opportunities for "protective" forms of employment in the HE and research sector (Bozzon *et al*. 2017). So, although highly qualified PhD holders within this third career model are always better protected against the risk of unemployment than other groups of young knowledge workers, they are

nevertheless affected by what Robert Castel (2007) has called the *precariat*, a phase of capitalism where jobs lose their capacity to provide workers with a living wage and with a full range of social protection, including unemployment benefit, health care and pension rights (Armano and Murgia 2013).

In a number of countries, research has shown the national accreditation procedures to be relatively egalitarian from a gender point of view (Marini and Meschitti 2018), whilst the local recruitment procedures to professorships may introduce some form of gender bias (ibid.), or not (Musselin and Pigeyre 2008).

As several authors have argued, despite the overriding structural challenges facing HE and research institutions, there is a degree of "path dependency" in the type of academic career model that prevails in a given national context. Few countries have abandoned their traditional academic career models, although most have aimed to "modernise" those elements of their national career systems that are perceived as the most problematic in the new academic environment (Enders and Musselin 2008, p. 135). Although all of the academic career models listed above are currently undergoing a degree of restructuring, there is no clear sign of convergence around a single career model: "national labour markets are not so much being displaced as subordinated and stratified" (Marginson 2009, p. 110). In sum, whatever the definition of precariousness used in studies of academic employment (see Chapter 1, this volume), it is important to note that the reference point for current changes is likely to influence the subjective experiences of the young academics concerned and the theoretical interpretation of the increased diversification of career trajectories within a given (national) career model.

Mapping the gendered diversification of academic career paths

Considering the gendered employment prospects of early career stage academics immediately raises an analytical challenge: acquiring the qualification required for entrance into the academic profession significantly reduces the risk of unemployment over the entire life-course, but the positive effect of a PhD on male and female employment rates doesn't automatically guarantee protection against various forms of precariousness employment or vulnerability, at least in the short term. In reality, a limited number of studies have shown that the relative position of academic occupations in the socio-professional hierarchy is highly variable from one national context to the next, as are the monetary and other rewards associated with working in public or private sector research institutions (European Commission/CARSA 2007; Studer 2012). Thus, it is not only important to consider the employment and working conditions of early career stage academics in comparison to those in other labour market sectors, it is also vital to consider their evolution over the life-time, from a biographical perspective. These distinct career models have very direct consequences for the interaction of professional and family events (Dubois-Shaik and Fusulier 2017), since they each imply relatively specific biographical time-lines. For example, the OECD

Careers of Doctorate Holders (CDH) study shows that the median age at PhD graduation ranges from 29 years old in Belgium to more than 39 years in the Czech Republic (Auriol 2010, p. 6).

Gendered academic labour markets in comparative perspective

One of the most important points to take into consideration when comparing the precariousness of PhD holders must certainly be the alternative employment opportunities available to them – or not – at the local, national and international level. The consequences of the demographic, organisational and ideological transformations of academic labour markets outlined above will clearly vary considerably according to the national economic climate, and particularly the levels of unemployment or precarious employment facing the younger generations of university-educated men and women in different national contexts. Indeed, gendered patterns of youth unemployment and labour market discrimination may influence the relative likelihood that men and women in certain national contexts will envisage studying for a PhD and/or aiming for an academic career in the first place. Thus, in the Swiss case, Matthias Studer (2012) has shown that the proportion of women who decide to embark on a PhD after their Master's Degree varies considerably according to the alternative employment opportunities available in the local labour market for graduates from particular fields of study. The more limited the non-academic employment possibilities in a given field, the higher the proportion of women amongst graduate students. At this early stage in their life-course, women thus tend to protect themselves from the risk of discrimination in the local labour market by staying in the (relatively) "safe haven" of the academy. Their excellent educational results enable them to compete successfully with their male counterparts for publicly-funded PhD positions, particularly in the humanities and life sciences. In his study, Studer found no significant gender differences in the success rate or duration of doctoral studies (once disciplinary field had been controlled for), a finding often replicated elsewhere. However, in a country with very low youth unemployment rates,[1] female PhD graduates in Switzerland are significantly less likely than their male counterparts to obtain a professorship within the 10 years following their doctorate, particularly in those disciplinary fields where they were well represented.

The internal structure of the Swiss academic labour market shows that the number and relative weight of the *Mittelbau* increased considerably over the period under study. Growth was particularly rapid in those jobs where the chances of being engaged on a fixed-term contract are higher than in any other case. This group, which includes doctoral students employed as teaching assistants and postdocs, represented almost half of the academic population in Swiss universities in 2014, as against 40 per cent in 1980. This increase is partly due to the fact that the number of (funded) PhD positions has doubled since 1990 (SERI 2015, p. 32). However, the number of fixed-term postdoc positions has also increased, to approximately 8000 in 2011 (SERI 2015, p. 25). Over the same

period, the more stable category of full professors decreased by 5 per cent. The Swiss academic career structure has thus become increasingly "bottom heavy" over time: in 1980 there were four (temporary) assistantships or scientific collaborator positions for every full professorship. By 2014, this ratio was eight temporary positions for every full professorship (SERI 2015).

However, cross-national comparative data on the gendered configuration of precarious employment contracts (Figure 2.5) can be misleading. Although they may enable us to gauge the extent to which women are particularly vulnerable to unfavourable employment conditions, as is clearly the case in Austria, Belgium and Switzerland, these figures fail to account for the fact that access to any kind of funding during the PhD phase of an academic career may vary significantly, by country and by disciplinary field. Thus, in Iceland, for example, PhD students in

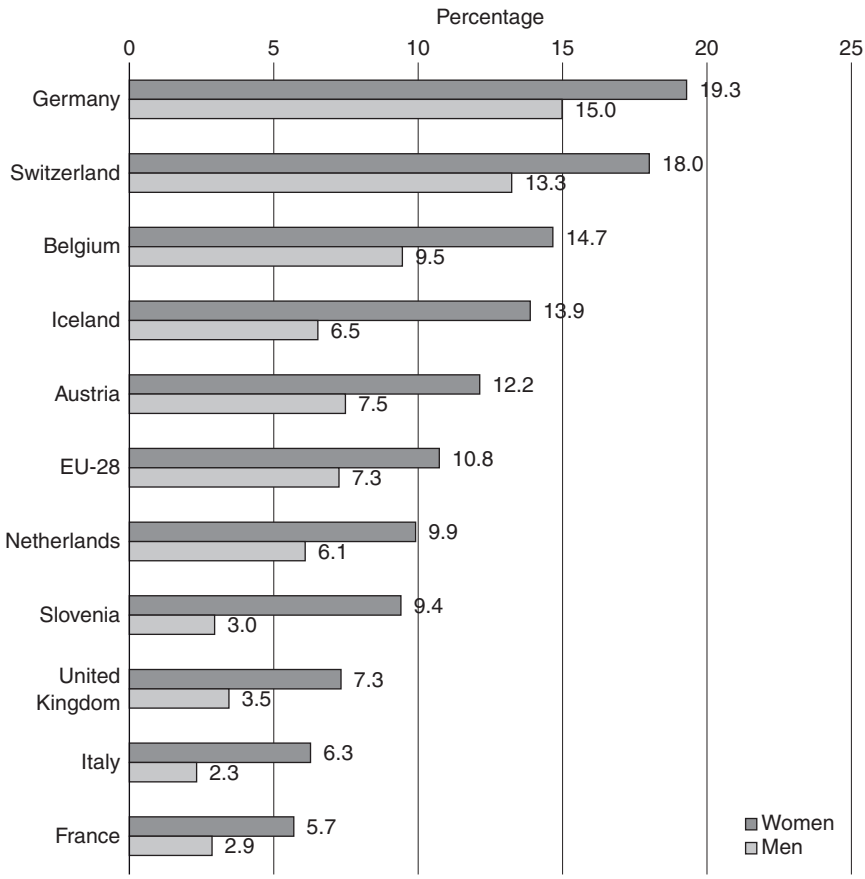

Figure 2.5 "Precarious" working contracts of researchers in the higher education sector out of total research population, by sex, selected countries, 2012.

Source: European Commission/*She Figures*, 2016: p.104. https://data.europa.eu/euodp/data/dataset/she-figures-2015-gender-in-research-and-innovation.

the male-dominated STEM are far more likely to have an employment contract with a university – even on a fixed-term and/or part-time basis – than their counterparts in the humanities and social sciences, where a larger proportion of PhD students are effectively "self-funded", either by working in fixed-term academic (usually teaching) jobs or by working elsewhere (Steinthorsdóttir *et al*. 2018).

As other studies on the gendered configuration of precarious early academic careers have shown (Bataille, Le Feuvre, and Kradolfer 2017), the nature of societal level gender arrangements can also affect the ability or willingness of male and female researchers to accept precarious employment conditions over an extended period of time. Thus, in Switzerland, a country with a *modified male breadwinner* model of gender arrangements (Bühlmann, Elcheroth, and Tettamanti 2009), male PhD holders (particularly in male-dominated fields) only remain in the academy if they are ensured of obtaining a tenured position within what they consider to be a "reasonable" length of time. This usually corresponds to their likely entry into parenthood, requiring them to adopt a "male/primary breadwinning" role. Female PhDs, on the other hand, are more willing to accept a succession of fixed-term research and/or teaching contracts, often on a part-time basis and with no immediate prospect of tenure. This is particularly the case in the most feminised fields of study, where the relatively numerous, alternative (non-academic) employment opportunities are judged to be less intrinsically satisfying and/or family-friendly than the available fixed-term, often part-time research and/or teaching positions. Since mothers of young children are not expected or encouraged to work full-time in the Swiss context (Bütler 2006), the expansion of temporary, non-tenured employment opportunities within the academic sector has led to a rather paradoxical situation. With the support of their male partners working full-time, in well-paid jobs, Swiss female PhD holders manage to maintain themselves within the academic sector, even during their child-rearing years, thanks to a continued supply of temporary, part-time, subordinate and competitively-funded research positions, which provide minimum levels of social protection. However, due to the extended time commitment expected of tenured professors, they generally fail to progress up the academic hierarchy and/or to achieve financial and intellectual autonomy (Bataille, Le Feuvre, and Kradolfer 2017). Those women who do eventually receive tenured academic positions in Switzerland are often recruited internationally (only half of all university professors in the country are Swiss; see Goastellec and Pekari 2013), after having previously worked (continuously and full-time) in other national academic labour markets. As Matthias Studer has noted, in the most feminised fields of study, female PhD holders in Switzerland often experience their first risk of unemployment or involuntary underemployment up to 10 years after they obtained their initial postdoc appointment, only once they are no longer eligible for many of the fixed-term positions that had paved their entry into an (ultimately diverted or dead-end) academic career path. It is thus with a considerable time lag that these highly experienced academics are required to look outside the academy for a permanent job that is compatible with their family obligations and with their past work experience (Studer 2012).

In countries where the under 25s have borne the brunt of the Great Recession, the logic behind the development of precarious jobs within academic institutions is rather different. In Italy, for example, various recent labour market reforms have resulted in a significant increase in the share of precarious jobs, particularly amongst the younger generations and for women. About one in four people aged 15 to 34 has a temporary or collaboration contract, with the proportion increasing to 31.7 per cent amongst university graduates (Bozzon *et al.* 2015, pp. 8–10). A third of workers aged 35 to 49 years are also recruited to these kinds of precarious jobs. University graduates are much harder hit by the recession in Italy than in most other EU countries; the employment rate for recent graduates was below 70 per cent in 2014. Graduates in the Humanities and in the Sciences have experienced huge labour market transition problems: 12 months after graduation, unemployment rates stand at more than 40 per cent, as compared to less than 10 per cent in the Health sciences and about 30 per cent in Engineering. Within this difficult context, male graduates tend to fare better than their female counterparts: five years after graduation, almost 80 per cent of them have a permanent contract, compared to 67 per cent of the women graduates. Their average wages are also 22 per cent higher than those of similarly qualified women (Bozzon *et al.* 2015, pp. 8–10).

Academic labour markets in biographical perspective

However, despite rather alarming media references to the "wasted generation" of PhD holders in many national contexts, the reality is a little more complex. Conclusions as to the relative employment and working conditions of PhD holders fluctuate wildly according to the time-scale of measurement and observation. For example, data from the French Ministry of Education show that, between 1992 and 2013, the number of temporary workers in HE and research institutions increased by 111 per cent, as compared to +39 per cent for professorships and +74 per cent for senior lecturers (*Maîtres de conférences*). Since 2004, the number of permanent academic positions available to new recruits has fallen slightly. This had led to fears about the precariousness of early academic careers in a country where the unemployment rate for PhD holders was actually higher than that of Masters graduates; something rarely observed elsewhere. However, more recent longitudinal studies have changed this vision of PhD holders as "over qualified" and poorly adapted to the labour market. When the labour market transition of highly qualified male and females is observed over a longer period of time than was previously the case, the relative disadvantage of PhD holders disappears. Overall, about 42 per cent of people who received a PhD in France in 2010 were working in the HE and research sector five years later. Among this population, the share of permanent public-sector academic positions increases over time, from 11 per cent in the year following graduation to 36 per cent five years after the PhD. Thus, approximately two years after the PhD defence, the number of permanent public sector academic positions was higher than the number of fixed-term positions (Calmand, Prieur, and Wolber 2017, p. 2). As suggested by the figures in Table 2.3, competition for academic

Table 2.3 Employment trajectory of PhD holders five years after doctorate defence (generation 2010), by disciplinary field, France, 2015

Employment profile at PhD+ five years	*Maths Physics Chemistry*	*Engineering Computer Studies*	*Health and Life Sciences*	*Law Economics Business Social Sciences*	*Arts and Humanities*	*Total*
1 Rapid access to a stable position in a public sector HE/research institution[a]	18	26	7	30	26	20
2 Delayed access to a stable position in a public sector HE/research institution	12	9	9	14	14	11
3 Temporary/fixed-term position in a public sector HE/research institution	10	6	24	7	5	11
4 Rapid access to a stable non-academic position in the public sector	6	2	7	11	18	8
5 Temporary/fixed-term non-academic position in the public sector	2	1	9	8	10	6
6 Rapid access to a stable R&D position in the private sector	27	30	15	3	2	17
7 Rapid access to a stable non-R&D position in the private sector	13	19	9	17	11	14
8 Not in employment or only in temporary jobs	12	7	19	9	15	13
Unemployment rate in 2015	4	4	12	6	9	

Source: Calmand, Prieur and Wolber 2017, p. 2.

Note

a Permanent research position reached by September 2011.

positions and opportunities for non-academic jobs also vary considerably by disciplinary field. Thus, in 2013, the ratio of newly recruited senior lecturers (*Maîtres de conférences*) to qualified PhD holders was 1:25 in Health and Life sciences, as compared to 1:6 overall. Interestingly, this study reported no significant gender differences in the employment transitions of French PhD holders; women were proportionally represented in all the categories of employment, including permanent academic positions.

Conclusions

Somewhat paradoxically, the fact that women are *universally* under-represented in practically the same proportions at the top of the academic professional hierarchy in every national context, and the fact that academic institutions are currently undergoing apparently global influences, has tended to foster the belief that the pattern of precariousness of early career stage academic jobs must be relatively similar across national boundaries (Le Feuvre 2016). Although we have no desire to deny the potentially common experiences of women in academia in different national (or local) contexts, this chapter reflects our conviction that research on gendered academic careers would benefit from a more *sophisticated conceptually comparative perspective*. As we have demonstrated here, women (and men) in the early stages of an academic career may not be facing exactly the same structural and normative opportunities and constraints in all national or regional contexts. In this chapter, we have focussed on just some of the societal communalities and specificities that can be observed with regard to precariousness among early career stage academics.

First, we have argued that, despite convergent international trends in favour of accountability and competition in academic evaluation procedures, what it means to be an academic and the criteria used to select and promote members of this occupation still manifest a considerable degree of national (or local) specificity. Academic career models continue to demonstrate a high level of path dependency (Enders and Musselin 2008). The proportion of fixed-term and precarious jobs, along with the percentage of permanent and tenured positions is highly variable, both between countries, between disciplines and over time. It would therefore be misleading to compare women's early stage career trajectories across countries without taking the structural, nationally specific characteristics of the academic labour market into consideration.

Second, academic occupations do not occupy the same position in the socio-economic hierarchy in all national contexts. The relative attractiveness of a research career, in comparison to the alternative employment opportunities open to male and female PhD holders, can't be presumed to be equivalent across national boundaries, or even across disciplines. Indeed, the relative rewards and opportunities offered by academic careers must be analysed in relation to the specific internal structure of the academic labour market (duration of the pre-tenure career stage, requirement to be geographically mobile, relative levels of pay and other perks, length of the working week, opportunities for flexible

employment practices, etc.) and in relation to the dominant model of gender relations (sexual division of paid and unpaid labour, availability of affordable childcare solutions, moral stigmatisation or acceptance of full-time working mothers and/or of family-committed fathers, tolerance of homosexuality and/or non-normative living arrangements, etc.).

So, just as there is not a universal set of gender norms that influence women's access to scientific jobs and their ability to progress (or not) up the academic hierarchy, so there is not a universal academic career structure that condemns all young PhD holders to a long-term future of professional uncertainty and vulnerability. Gender regimes and academic labour markets need to be carefully contextualised before descriptive data on the current precariousness of academic labour markets can be analysed and interpreted correctly. Although we would not go so far as to suggest that increasing rates of feminisation are necessarily a reflection of worsening of employment conditions in the academic sector (Bourdieu 1998), it is nevertheless important to remember that female PhD holders can sometimes represent what the Polish sociologist Renata Siemienska (2001) has called "winners amongst losers". In those cases where early career academic jobs can be equated to a form of *precariat*, we obviously need to revise the celebratory discourse that traditionally accompanied any increase in the feminisation rates of academic occupations.

However, the main conclusion to be drawn from this study is that the PhD holders who are now confronted with unprecedented levels of competition for access to academic labour markets are not experiencing the same level of precariousness, or indeed the same consequences of precarious employment conditions, across all countries and all disciplinary fields. Likewise, the reactions of those confronted with precarious employment and working conditions are likely to vary significantly (Vallas and Christin 2018), by national context, disciplinary field and according to societal gender configurations.

In most national contexts, the academic profession is becoming increasingly fragmented and internally segmented. Although there is clearly a gender dimension to this re-segregation, it would be misleading to conclude that this is a case of *plus ça change, plus c'est la même chose* (Le Feuvre 2010). In a context where the promotion of gender equality has been fully integrated into the rhetoric of NPM monitoring and benchmarking activities, the gendered reconfiguration of academic careers will certainly depart from a straightforward binary divide and will require the elaboration of analytical tools that are able to capture the complex and partly contradictory processes at work.

Note

1 See: http://ec.europa.eu/eurostat/web/macroeconomic-imbalances-procedure/youth-unemployment-rate.

References

Armano, E. and Murgia, A. (2013). The precariousness of young knowledge workers: a subject-oriented approach. *Global Discourse*. http://dx.doi.org/10.1080/23269995.2013.865313.

Auriol, L. (2007). *Labour Market Characteristics and International Mobility of Doctorate Holders: Results for Seven Countries*. OECD STI Working papers 2007/2.

Auriol, L. (2010). *Careers of Doctorate Holders: Employment and Patterns*. OECD Science, Technology and Industry Working Papers, No. 2010/04, Paris: OECD Publishing.

Auriol, L., Misu, M. and Freeman, R. A. (2013). *Careers of Doctorate Holders: Analysis of Labour Market and Mobility Indicators*. OECD Science, Technology and Industry Working Papers, No. 2013/04, Paris: OECD Publishing.

Barrett, L. and Barrett, P. (2011). Women and academic workloads: career slow lane or cul-de-sac? *Higher Education*, 61, 141–155.

Bataille, P., Le Feuvre, N. and Kradolfer, S. (2017). Should I stay or should I go? The effects of precariousness on the gendered career aspirations of postdocs in Switzerland. *European Educational Research Journal*, Special Issue: Work–Life Interferences in Scientific Careers, 16(2–3), 313–331.

Beaufays, S. and Kraïs, B. (2005). Femmes dans les carrières scientifiques en Allemagne, les mécanismes cachés du pouvoir. *Travail, genre et sociétés*, 14, 49–68.

Bourdieu, P. (1998). *La domination masculine*. Paris: Seuil.

Boni-Le Goff, I. and Le Feuvre, N. (2017). Professions from a gendered perspective. *Oxford Research Encyclopedia of Business and Management*, Oxford: Oxford University Press. http://business.oxfordre.com/view/10.1093/acrefore/9780190224851.001.0001/acrefore-9780190224851-e-89?print=pdf.

Boni-Le Goff, I., Le Feuvre, N, Mallard, G. and Lépinard, E.(2018). Do gender regimes matter? A study of early legal careers in France and Switzerland. In M. Choroszewicz and T. L. Adams (eds), *Gender, Age and Inequality in the Professions*. London: Routledge (in press).

Bozzon, R., Donà, A., Villa, P., Murgia, A. and Poggio, B. (2015). Background policy report on Italy. In N. Le Feuvre (ed.), *Contextualizing Women's Academic Careers: Comparative Perspectives on Gender, Care and Employment Regimes in Seven European Countries*. Trento: *GARCIA Working Papers 2*, 3–60. http://garciaproject.eu/?page_id=52.

Bozzon, R., Murgia, A., Poggio, B. and Rapetti, E. (2017). Work-life interferences in the early stages of academic careers: the case of precarious researchers in Italy. *European Educational Research Journal*, 16(2–3), 332–351.

Bozzon, R., Murgia, A. and Villa, P. (2017). Precariousness and gender asymmetries among early career researchers: A focus on STEM fields in Italy. *Polis*, XXXI(1), 127–156.

Brechelmacher, A., Park, E., Ates, G. and Campbell, D. F. J. (2015). The rocky road to tenure. Career paths in academia, In T. Fumasoli, G. Goastellec and B. M. Kehm (eds), *Academic Work and Careers in Europe: Trends, Challenges, Perspectives.* Dordrecht: Springer, pp. 13–40.

Brooks, A. and Mackinnon, A. (2001). *Gender and the Restructured University. Changing Management and Culture in Higher Education*, Buckingham: Open University Press.

Bühlmann, F., Elcheroth, G. and Tettamanti, M. (2009). The division of labour among European couples: the effects of life course and welfare policy on value-practice configurations. *European Sociological Review*, 26(1), 49–66, doi.org/10.1093/esr/jcp004.

Bütler, M. (2006). *Le rendement effectif du travail pour les familles avec des petits enfants*. St Gallen: Département d'économie publique, St Gallen University.

BuWiN – Bundesbericht Wissenschaftlicher Nachwuchs (2008). *1st National Report on Junior Scholars in Germany*. Bielefeld: Consortium for the National Report on Junior Scholars.

BuWiN – Bundesbericht Wissenschaftlicher Nachwuchs (2013). *2nd National Report on Junior Scholars in Germany*. Bielefeld: Consortium for the National Report on Junior Scholars.

BuWiN – Bundesbericht Wissenschaftlicher Nachwuchs (2017). *3rd National Report on Junior Scholars in Germany*. Bielefeld: Consortium for the National Report on Junior Scholars.

Calmand, J., Prieur, M. H. and Wolber, O. (2017). Les débuts de carrière des docteurs: une forte différenciation des trajectoires. *CEREQ Bref*, 357.

Caprile, M., Addis, E., Castaño, C., Klinge, I., Larios, M. and Meulders, D. (2012). *Meta-Analysis of Gender and Science research. Synthesis Report*. Brussels: European Commission, DG Research and Innovation.

Castel, R. (2007). Au-delà du salariat et en-deçà de l'emploi? L'institutionnalisation du précariat, In S. Paugam (ed.), *Repenser la solidarité: l'apport des sciences sociales.* Paris: Presses universitaires de France, pp. 416–433.

Ceci, S. J., Ginter, D. K., Kahn, S. and Williams, W. M. (2014). Women in academic science: a changing landscape. *Psychological Science*, 15(3), 75–141.

Chlosta, K., Pull, K., Fiedler, M. and Welpe, I. (2010). Should I stay or should I go? Warum nachwuchswissenschaftler in der Betriebswirtschaftslehre das Universitassystem verlassen, *Zeitschrift fur Betreibswirtschaft*, 80(11), 1207–1229.

Crompton, R. (2001). Gender, comparative research and biographical matching. *European Societies*, 3(2), 167–190.

Crompton, R. (2006). Some issues in cross-national comparative research methods: a comparison of attitudes to promotion and women's employment in Britain and Portugal. *Work, Employment and Society*, 20(2), 403–414.

Crompton, R. and Le Feuvre, N. (2000). Gender, family and employment in comparative perspective: the realities and representations of equal opportunities in Britain and France. *Journal of European Social Policy*, 10(4), 334–348.

Crompton, R., Lyonette, C. and Scott, J. (eds) (2010). *Gender Inequalities in the 21st Century. New Barriers and Continuing Constraints*. London: Edward Elgar.

Danell, R. and Hjerm, M. (2013). Career prospects for female university researchers have not improved. *Scientometrics*, 94(3), 999–1006.

De Cheveigné, S. (2009). The career paths of women (and men) in French research. *Social Studies of Science*, 39, 113–136.

Deem, R., Hillyard, S. and Reed, M. (2007). *Knowledge, Higher Education, and the New Managerialism*. Oxford: Oxford University Press.

Dubach, P. (2014). *La relève scientifique dans les universités suisses: indicateurs statistiques concernant les conditions de travail et les perspectives de carrière*. Bern: SERI.

Dubois-Shaik, F. and Fusulier, B. (eds) (2015). *Academic Careers and Gender Inequality: Leaky Pipeline and Interrelated Phenomena in Seven European Countries*. GARCIA Working Paper 5, http://garciaproject.eu/?page_id=52.

Dubois-Shaik, F. and Fusulier, B. (2017). Understanding gender inequality and the role of the work/family interface in contemporary academia. An introduction. *European Educational Research Journal*, Special Issue Work–Life Interferences in Scientific Careers, 16(2–3), 1–7.

Ecklund, H. E., Lincoln, A. E. and Tansey, C. (2012). Gender segregation in elite academic science. *Gender and Society*, 26(5), 693–717.

Enders, J. and de Weert, E. (eds) (2009a). *The Changing Face of Academic Life. Analytical and Comparative Perspectives*. Basingstoke: Palgrave Macmillan.

Enders, J. and de Weert, E. (2009b). Towards a T-shaped profession: academic work and career in the knowledge society. In J. Enders and E. de Weert (eds), *The Changing Face of Academic Life. Analytical and Comparative Perspectives*. Basingstoke: Palgrave Macmillan, pp. 251–272.

Enders, J. and Musselin, C. (2008). Back to the future? The academic professions in the 21st Century. In OECD (ed.), *Higher Education in 2030. Volume 1: Demography*, Paris: OECD.

Enders, J., de Boer, H. and Leisyte, L. (2009). New Public Management and the academic profession: the rationalization of academic work revisited. In J. Enders and E. de Weert (eds), *The Changing Face of Academic Life. Analytical and Comparative Perspectives*. Basingstoke: Palgrave Macmillan, pp. 36–57.

Euraxess (2014). *Researcher Country and Synthesis Reports*. Brussels: DG Research. https://euraxess.ec.europa.eu/content/researcher-report-2014.

European Commission (2013). *She Figures 2012. Statistics and Indicators on Gender Equality in Science*. Brussels: DG Research and Innovation.

European Commission (2016). *She Figures 2015. Statistics and Indicators on Gender Equality in Science*. Brussels: DG Research and Innovation.

European Commission/CARSA (2007). *Remuneration of Researchers in the Public and Private Sectors*. Brussels: DG Research and Innovation. www.carsa.es.

EUROSTAT (2017). *Tertiary Education Statistics*. http://ec.europa.eu/eurostat/statistics-explained/index.php/Tertiary_education_statistics.

Fassa, F. and Kradolfer, S. (2013). The gendering of excellence through quality criteria: the case of the Swiss national science foundation professorships in Switzerland. *Tertiary Education and Management*, 19(3), 189–204.

Ferlie, E., Musselin, C. and Andresani, G. (2008). The steering of higher education systems: a public management perspective. *Higher Education*, 56(3), 325–348.

Fumasoli, T., Goastellec, G. and Kehm, B. (eds) (2015). *Academic Work and Careers in Europe: Trends, Challenges, Perspectives*. Dordrecht: Springer.

Garforth, L. and Kerr, A. (2009). Women and science: what's the problem? *Social Politics*, 16(3), 380–403.

Gill, R. (2009). Breaking the silence: the hidden injuries of neo-liberal academia. In R. Flood and R. Gill (eds), *Secrecy and Silence in the Research Process: Feminist Reflections*. London: Routledge, pp. 1–21.

Glass, J. L., Sassier S., Levitte Y. and Michelmore K. M. (2013). What's so special about STEM? A comparison of women's retention in STEM and professional occupations. *Social Forces*, 92(2), 723–756.

Goastellec, G. and Pekari N. (2013). The internationalization of academic markets, careers and profession. In U. Teichler and E. A. Höhle (eds), *The Work Situation of the Academic Profession in Europe: Findings of a Survey in Twelve Countries.* Dordrecht: Springer, pp. 229–248.

Henkel, M. (2009). Policy change and the challenge to academic identities. In J. Enders and E. de Weert (eds), *The Changing Face of Academic Life. Analytical and Comparative Perspectives*. Basingstoke: Palgrave Macmillan, pp. 78–95.

Hermann, C. (2017). *Enquête sur le statut des chercheur.e.s et enseignant.e.s – chercheur.e.s dans divers pays d'Europe*, Report from the European Platform of

Women Scientists (EPWS) to the French Ministry of Higher Education, Research and Innovation, Paris.

Herschberg, C., Benschop, Y. and van den Brink, M. (2018). Selecting early-career researchers: the influence of discourses of internationalization and excellence on formal and applied selection criteria in academia, *Higher Education*, 1–19 https://doi.org/10.1007/s10734-018-0237-2.

Holzinger, F, and Hafellner, S. (2015). Background policy report on Austria. In N. Le Feuvre (ed.), *Contextualising Women's Academic Careers: Comparative Perspectives on Gender, Care and Employment Regimes in Seven European Countries*. *GARCIA Working Papers 2*, http://garciaproject.eu/?page_id=52, 243–285.

Hunter, L. A. and Leahey, E. (2010). Parenting and research productivity: new evidence and methods. *Social Studies of Science*, 40(3) June, 433–451.

Jaschik, S. and Lederman, D. (2017). *Making the Cut: Getting Hired in Higher Education Today*. Inside Higher Education webinar, 30 March. http://event.on24.com/wcc/r/1389569/BC957FD93199D8AF17A1DC5E6893B2D8?mode=login&email=nicky.lefeuvre@unil.ch.

Krefting, L. A. (2008). Intertwined discourses of merit and gender: evidence from academic employment in the USA. *Gender, Work and Organizations*, 10(2), 260–278.

Le Feuvre, N. (2009). Exploring women's academic careers in cross-national perspective: lessons for equal opportunity policies. *Equal Opportunities International*, 28(1), 9–23.

Le Feuvre, N. (2010). Feminising professions in Britain and France: how countries differ. In R. Crompton, C. Lyonette and J. Scott (eds), *Gender Inequalities in the 21st Century. New Barriers and Continuing Constraints*. London: Edward Elgar, pp. 126–149.

Le Feuvre, N. (ed.) (2015). *Contextualising Women's Academic careers: Comparative Perspectives on Gender, Care and Employment Regimes in Seven European Countries*. GARCIA Working Paper 1. http://garciaproject.eu/wp-content/uploads/2014/07/GARCIA_report_wp1D1.pdf.

Le Feuvre, N. (2016). "Femmes et sciences": Apports et écueils des comparaisons internationals. In R. Rogers and P. Molinier (eds), *Les femmes dans le monde académique: Perspectives comparatives*. Rennes: Presses universitaires de Rennes, pp. 65–79.

Le Feuvre, N. (2017). La féminisation des enseignant·e·s-chercheur.e.s en France: entre conformité et transgression de genre. In H. Buisson-Fenet (ed.), *École des filles, école des femmes. L'institution scolaire face aux parcours, normes et rôles professionnels sexués*. Bruxelles: de Boeck supérieur, pp. 207–220.

Lutter, M. and Schröder, M. (2014). *Who Becomes a Tenured Professor and Why?* Panel data evidence from German sociology, 1980–2013, Max Planck Discussion Paper 14/19. Cologne: Max Planck Institute for the Study of Societies. November.

Marginson, S. (2009). The academic profession in the global era. In J. Enders and E. de Weert (eds), *The Changing Face of Academic Life. Analytical and Comparative Perspectives*. Basingstoke: Palgrave Macmillan, pp. 96–113.

Marini, G. and Meschitti, V. (2018). The trench warfare of gender discrimination: evidence from academic promotions to full professor in Italy. *Scientometrics*, 115(2), 989–1006.

Marsh, H. W., Bornmann, L., Daniel, H.-D., Mutz, R. and O'Mara, A. (2009). Gender effects in peer reviews of grant proposals: a comprehensive meta-analysis comparing traditional and multilevel approaches. *Review of Educational Research*, 79(3), 1290–1326.

Meulders, D., O'Dorchai, S. and Simeu, N. (2012). *Alma Mater, Homo sapiens II – Les inégalités entre femmes et hommes dans les universités francophones de Belgique*. Brussels: Editions DULBEA.

Miller, D. and Wai, J. (2015). The bachelor to PhD STEM pipeline no longer leaks more women than men: a 30-year analysis. *Frontiers in Psychology*, 6. www.ncbi.nlm.nih.gov/pmc/articles/PMC4331608/.

Moss-Racusin, C. A., Dovidio, J. F., Brescoll, V. L., Graham, M. J. and Handelsman, J. (2012). Science faculty's subtle gender biases favour male students. *PNAS*. www.pnas.org/content/early/2012/09/14/1211286109.

Musselin, C. (2005). European academic labour markets in transition. *Higher Education*, 49, 135–154.

Musselin, C. (2009). *The Markets for Academics*. London: Routledge.

Musselin, C. (2017). *La Grande course des universités*. Paris: Presses de Sciences Po.

Musselin, C. and Pigeyre, F. (2008). Les effets du recrutement collégial sur la discrimination: Le cas des recrutements universitaires. *Sociologie du travail*, 50, 48–70.

Nittrouer, C. L., Hebl, M. R., Ashburn-Nardo, L., Trump-Steele, R. C., Lane, D. and Valian, V. (2017). Gender disparities in colloquium speakers at top universities. *PNAS* early edition.

Pétursdóttir, G. (2009). *Within the Aura of Gender Equality: Icelandic Work Cultures, Gender Relations and Family Responsibility, a Holistic Approach*. PhD thesis. University of Iceland, Faculty of Political Science.

Phou, K. (2017). *Profile of Early Career Doctorates in 2015*. National Science Foundation *NSF_InfoBrief*, 17–303, 1–6.

Rogers, R. and Molinier, P. (eds) (2016). *Les femmes dans le monde académique: Perspectives comparatives*, Rennes: Presses universitaires de Rennes.

Schultheis, F. (2000). Chacun sa chimère, le privatdozent, ou l'"illusio" académique faite homme. In M. O. Gonseth, J. Hainard and R. Kaehr (eds), *La grande illusion.* Neuchâtel: Musée d'ethnographie, pp. 41–55.

Schwabe, M. (2011). The career paths of doctoral graduates in Austria. *European Journal of Education*, 46(1), 53–168.

SERI (2015). *L'enseignement supérieur et la recherche en Suisse*. Bern: Swiss State Secretariat for Education, Research and Innovation.

Siemienska, R. (2001). Women in the academe in Poland: winners among losers? Conference paper 01/04 of the EU Research Training Network "Women in European Universities", University of Meunster, pp. 1–13.

Siemienska, R. and Zimmer, A. (eds) (2007). *Gendered Career Trajectories in Academia in Cross-National Perspective.* Warsaw: Scholar.

Studer, M. (2012). *Étude des inégalités de genre en début de carrière académique à l'aide de méthodes innovatrices d'analyse de données séquentielles*, PhD Thesis, Geneva University.

Steinthorsdóttir, F., Brorsen Smidt, T., Pétursdóttir, G. M., Einarsdóttir, T. and Le Feuvre, N. (2018). The gender bias of new managerialism in the academy, *Gender, Work & Organization*, early on-line publicaton, doi:10.1111/gwao.12286.

Teelken, C. and Van der Weijden, I. (2018). The employment situations and career prospects of postdoctoral researchers. *Employee Relations*, 40(2), 396–411.

Teichler, U. and Höhle, E. A. (eds) (2013). *The Work Situation of the Academic Profession in Europe: Findings of a Survey in Twelve Countries.* Dordrecht: Springer.

Teichler, U., Arimoto, A. and Cummings, W. K. (eds) (2013). *The Changing Academic Profession. Major Findings of a Comparative Survey*. Dordrecht: Springer.

Tuchman, G. (2009). *Wannabe U. Inside the Corporate University*. Chicago, IL: Chicago University Press.

Vallas, S. and Christin, A. (2018). Work and identity in an era of precarious employment: how workers respond to "personal branding" discourse. *Work & Occupations*, 45(1), 3–37.

Valian, V. (1999). *Why So Slow? The Advancement of Women*. Cambridge, MA: MIT Press.

Valian, V. (2005). Beyond gender schemas: improving the advancement of women in academia. *Hypatia*, 29(3), 198–213.

Van Arensbergen, P., Van der Weijden, I. and Van den Besselaar, P. (2012). Gender differences in scientific productivity: a persisting phenomenon? *Scientometrics*, 93, 857–868.

Van den Brink, M. and Benschop, Y. (2011). Gender practices in the construction of academic excellence: sheep with five legs. *Organization*, 19(4), 507–524.

Van der Weijden, I., Teelken, C., de Boer, M. and Drost, M. (2016). Career satisfaction of postdoctoral researchers in relation to their expectations for the future. *Higher Education*, 72(1), 25–40.

Weisshaar, K. (2017). Publish *and* perish? An assessment of gender gaps in promotion to tenure in Academia. *Social Forces*, 96(2), 529–560.

Williams, W. M. and Ceci, S. J. (2015). National hiring experiments reveal 2:1 faculty preference for women on STEM tenure track. *PNAS* 121(17), 5360–5365.

Ylijoki, O. H. (2010). Future orientations in episodic labour: short-term academics as a case in point. *Time and Society*, 19(3), 365–386.

Zippel, K. (2017). *Women in Global Science. Advancing Academic Careers through International Collaboration*. Stanford, CA: Stanford University Press.