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The Persisting Glass Ceiling in Academia: a Multidimensional Cross-National Perspective

Cristina Solera and Rosy Musumeci*

1. Introduction

There is strong evidence that research and higher education institutions are gendered settings. Everywhere, women and men tend to concentrate in certain scientific fields and to be differently distributed in the various hierarchical positions. In addition, research and teaching often seem to disregard the importance of the gender dimension in their approach, content and analysis. Yet country differences persist and what accounts for them is still unclear. Indeed, as argued by Le Feuvre (2015), the fact that women are everywhere underrepresented in quite similar proportions at the top of the academic hierarchy has tended to foster the belief that the underlying “causes” are identical across national borders. Thus, although comparative data are more widely available today than in the past, and with a strong rhetoric on the need to take into consideration the multidimensionality of gender inequalities as situated in institutional and cultural contexts, much of the research on women in scientific professions lacks a theoretically grounded cross-national comparative perspective.

In this work we aim to start to fill this gap by providing an updated “state of the art” of both the empirical and theoretical research on gender imbalances in academia in Europe, with a particular focus on the role of the macro level. First, by drawing on European Commission/SHE figures, we shall show women’s shares at higher grades of the academic career and in decision-making bodies, and how such shares vary by country clusters that follow mainstream welfare and gender regime typologies. Second, we shall provide a synthetic overview of the explanations given to date for persisting and changing gender imbalances. We propose a classification along two dimensions: the micro, meso and macro levels, and the cultural and institutional/structural ones. In the third and fourth sections we shall focus on the macro level and come back to data: first, using data from various sources (OECD family database, Eurostat, Eige, and World Values Surveys and

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European Values Studies), we shall show how countries differ in the macro institutional and cultural indicators that the literature has shown to be important in shaping gendered academic careers; secondly, we shall investigate whether there is an association between these macro indicators and the level of the glass ceiling in academia. In the concluding section we shall summarise and discuss the main findings.

2. The current state of gender imbalances in Europe: facts

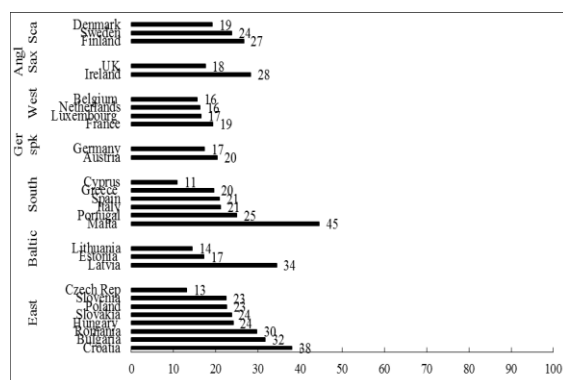
In recent decades, women in all 28 European countries have caught up with or even overtaken men in terms of their level of education (European Commission 2009). However, marked vertical segregation persists throughout women's academic career paths. In line with various studies (Olah 2015; Iacovou and Skew 2011; Burroni 2016), we follow geographical clusters of countries which largely correspond to mainstream welfare and gender regime typologies and we divide figures into 7 subgroups: Scandinavia, Anglosaxon countries, Western Europe, German-speaking countries, Southern Europe, Baltic countries and Eastern Europe.

According to SHE Figures (2015), in 2013 in the EU-28 the proportion of female students and graduates within the first level of academic education exceeded that of male students (55% and 59% respectively), but men outnumbered women among PhD students and graduates (women were 46% and 47% respectively). Furthermore, on average, in 2012 in the EU-28, 33% of all researchers in the higher education sector were women, a figure unchanged since 2009. In the same year, the gender gap was much wider with respect to career advancement. The largest proportion of women was in Grade D positions: 47% as the EU-28 average, with values ranging from 28% in Malta to 67% in Estonia. By contrast, the share of women working as grade A academic staff (full professors and equivalents), on average in EU-28, was only 21%.

These data may depend on the different distribution of female and male researchers in the higher education sector according to age: women researchers are more likely than men to be found in the youngest age groups (in all countries except Latvia), while the opposite is the case in the oldest age groups. Also differences according to the field of science matter: on average, within the EU-28, the largest proportion of women grade A staff is found in the humanities and social sciences (30% and 23.5%, respectively), the smallest in engineering and technology (less than 10%). Taking all fields together, as evident in figure 1 the proportion of women in grade A varies from the minimum of 11%-16% in Cyprus, Czech Republic, Lithuania, Belgium, Netherlands and Luxembourg, rising to mid-levels like the 21% in Spain, Italy, Greece and the 30% in Romania and Bulgaria, until a maximum of 38% in Croatia and 45% in Malta. The two opposite cases of Malta and Cyprus within the same group (Southern Europe) are not the only ones. For example, in the

case of Northern Europe there is a difference of about 7 percentage points between the country presenting the highest value (Finland) and the country presenting the lowest one (Denmark), in the English-speaking countries the gap is around 11 percentage points, in Baltic countries around 20, Eastern Europe 25, South Europe 33. German-speaking countries and Western European countries are the most internally homogenous.

Figure 1. Proportion of women academic staff in grade A, 2013



Source: European Commission, 2015, *She figures 2015. Gender in Research and Innovation*, Brussels, page 129, table 6.1.

https://ec.europa.eu/research/swafs/pdf/pub_gender_equality/she_figures_2015-final.pdf

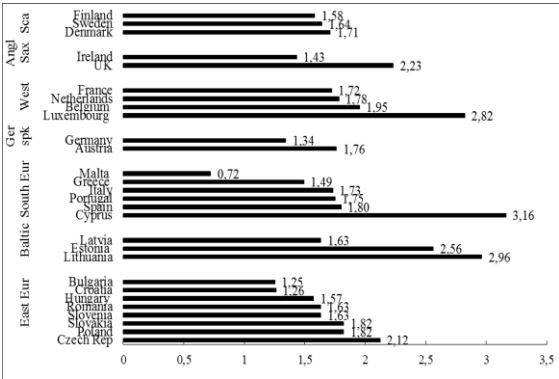
Notes: Within each group the countries are sorted from the country with the lowest value to the country with the highest one.

In general, the overall proportion of women at the top of academic hierarchy depends, on the one hand, on the overall feminisation of academia, that is, the overall proportion of women academic staff regardless of career grade; on the other hand, on the relative size of the academic labour market and the relative importance of tenured full professorships. The less feminised the academic labour-market sector is, the more women that work in it are a highly selective group, having those characteristics that may foster their career advancement such as childlessness. Similarly, the fewer grade A positions are available, the less women are able to enter them, since the route to the top is extremely selective and competition with men is too strong. This is for example the case of Austria, Belgium and the Netherlands, in contrast with Slovenia, and to lesser extent Italy and Switzerland. As Le Feuvre, who wrote the report for the GARCIA EU project on these 6 countries, comments (2015, pag. 21), in these latter countries “the much flatter career structure opens up the opportunity for a larger proportion of all academic staff to – eventually – reach the top. However, even in these less fiercely competitive contexts, women are less than half as likely to achieve the ascension than their male colleagues. They are nevertheless significantly

more likely (at least three times more, in fact) to obtain a full professorship than their Austrian, Belgium or Dutch counterparts”.

An indicator that takes account of the share of women in top positions conditional on their overall presence in the academic labour market is the Glass Ceiling Index (GCI). This can range from 0 to infinity, and the higher the value, the stronger the glass ceiling effect and the more difficult it is for women to move into higher positions (European Commission, 2015, p. 137). As Figure 2 shows, in 2013 women were less represented in grade A than in academia generally in all the countries considered except Malta, where the GCI value was 0.72. The highest GCI was recorded in Cyprus (3.16), Lithuania (2.96) and Luxembourg (2.82), the lowest in Bulgaria (1.25), Croatia (1.26) and Germany (1.34). In the middle, around the EU-28 average (1.75), we find Denmark, France, Italy, Portugal, Austria, the Netherlands. Moreover, in all the countries for which data were available for both 2013 and 2010, the GCI value had declined, signalling that there had been some progress towards reducing the glass ceiling.

Figure 2. Glass Ceiling Index, 2010–2013

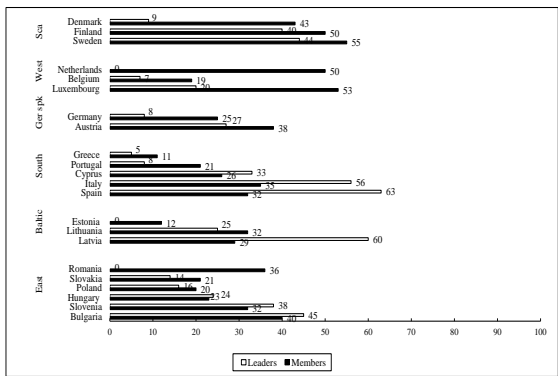


Source: European Commission, 2015, *She figures. Gender in Research and Innovation*, Brussels, page 136, figure 6.6.
https://ec.europa.eu/research/swafs/pdf/pub_gender_equality/she_figures_2015-final.pdf
 Notes: Within each group the countries are sorted from the country with the lowest value in 2013 to the country with the highest one value.

Gender inequalities persist not only in regard to career advancement but also to participation in academic decision-making. These are linked, since underrepresentation in decision-making bodies is a direct effect of women’s exclusion from the top of the academic hierarchy, which provides the pool of potential candidates for leadership positions. As Figure 3 shows, in 2014, the highest shares of women board membership (excluding leaders) – around one out of two – were in the Scandinavian countries and two Western European countries (the Netherlands and Luxembourg)

while the lowest, around one out of ten, were in Greece and Estonia. Women are generally less represented in board leadership in all countries except for nine, where women hold the leadership position on more than half the country’s boards: this is the case of two Southern European countries, Italy (56%) and Spain (63%), and of Latvia (60%). In Estonia, the Netherlands and Romania no women held leadership positions¹. In a further eight countries, women made up less than one fifth of board leaders.

Figure 3. Proportion of women on boards, members and leaders, 2014



Source: European Commission, 2015, *She figures. Gender in Research and Innovation*, Brussels, page 143, figure 6.9.
Notes: Within each group the countries are sorted from the country with the lowest value in 2013 to the country with the highest one.
https://ec.europa.eu/research/swafs/pdf/pub_gender_equality/she_figures_2015-final.pdf
Data unavailable for: Croatia, Czech Republic, France, Ireland, Malta, United Kingdom.

3. The multidimensionality of gender (im)balances: micro-meso-macro interplays

There are a number of theories about why women continue to be under-represented in high-grade jobs and in decision-making arenas. They attribute the “causes” either to individuals and their level and type of human capital or their lack of ambition (Polachek 1981), to exclusionary male networks (Wass and McNabb 2006), to organisational discriminatory practices (Powell and Graves 2003), or to overall more or less women-friendly macro contexts. There is also increasing awareness that employment-related behaviours and outcomes have a multitude of interrelated causes, so that only a systematic holistic approach is fruitful (Avveduto et al. 2015). Gender presents the same multidimensionality. According to Risman (2004), gender can be defined as a social structure which differentiates opportunities and constraints based on sex-category. This has consequences at three different levels: at the individual level, for the development of gendered

¹ In this and the previous cases, the proportions are calculated on a small number of institutions.

selves; during interaction, because men and women face different cultural expectations; at the institutional level, where explicit regulations on resources distribution and material goods are gender specific. Similarly, according to Connell (2002), four domains interact to form the gender order of a society: production relations, power, emotional relations, and symbolic relations.

The focus on how gender operates as a social structure or social order is crucial also for capturing “the glass ceiling” and the “leaky pipeline” that women continue to face in academic careers. In universities, especially those in STEM disciplines, which are male-dominated professional contexts, organisational cultures, structures and practices tend to be highly gendered (Acker 1990; Holt and Lewis 2010). Academic institutions, in fact, are not neutral arenas in which pre-existing gendered relations are played out; rather, they are crucial in ongoing constructions and reconstructions of gendered identities, experiences and relationships. At the same time, gender plays a part in the production and reproduction of organisational hierarchies and cultures (Garforth and Kerr 2009). Gender and organisation then work together to generate structures of “advantage and disadvantage, exploitation and control, action and emotion, meaning and identity” (Acker 1990: 146). As many authors argue, these gendered organisations are based on and produce a notion of ideal workers as those who demonstrate “commitment” by unbroken career trajectories, constant availability and visibility (Lewis and Humbert 2010). Also definitions of excellence and of the weight given to research over teaching match with hegemonic masculinities and with unconditional worker models (Rees 2011). These notions and practices at meso level are also embedded in macro contexts: in type of employment and labour-market regulations and policies, research and education policies, equal opportunities laws, as well as social policies. Women and men acting in specific organisations embedded in specific larger contexts face a complexity of structural constraints; they are confronted with hegemonic discourses in societies, in families, in networks that shape their preferences, strategies, and narratives on them. Yet they have spaces of agency: in the way that they understand and respond to the system processes, norms and unwritten rules that enhance or constrain opportunities for career advancement, they “do” and “undo” gender and science (Deutsch 2007; Herman et al. 2012).

Drawing from the literature across various disciplines and various perspectives, in what follows we examine in more detail theories that have focused on each of these levels, micro, meso and macro, pointing out their arguments but also the criticisms brought against them, in the direction of better acknowledgment of the multidimensionality and intersectionality of the construction of gender inequalities.

Starting from theories on the micro level, it is widespread the idea that individuals make their choices in work and family careers as well as in other spheres of their lives by relying on both cultural and material resources. Among cultural resources, those that psychologists call *gender stereotypes* are crucial. According to the role congruity theory (Eagly and Karau 2002), people with jobs that have stereotypes consistent with their own gender will be evaluated more positively than those whose gender is inconsistent with the job stereotype (Davison and Burke 2000). Stereotypes also comprise the different investments that men and women are supposedly ready to make in different roles, as well as their ability to manage multiple roles. As argued by the stereotype threat theory, stereotypes can cause individuals enough discomfort to induce them to drop out of the domain and redefine their professional identities. When the domain is one as fundamental as mathematics, domain avoidance essentially precludes careers in science, engineering, and technology.

Differences in *preferences and psychological attitudes* are also considered by economists, yet with a stronger emphasis on individual rather than social processes and “responsibilities”. Traditional economic theory explains the male/female gap in labour-market outcomes as imputable to differences in productivity or to gender discriminations: women invest less in human capital, work fewer hours, are less work committed, or, alternatively, they suffer from taste or statistical discrimination (Becker 1957). A recent strand of the literature moves beyond these accounts by focusing on psychological attitudes: there is evidence that women are more adverse to risk, are less competitive, have a lower degree of self-confidence and suffer more from receiving negative feedbacks (De Paola and Scoppa 2015; Eckel and Grossman 2008).

As sociologists and heterodox economists have pointed out, these individual-level traits contributing to gender gaps are *not context-less*: both preferences and psychological attitudes are socially constructed. In polemic with Hakim’s Preference Theory (Hakim 2000), various scholars show that preferences are not fixed, but change over the life course in response to new experiences, also when these new experiences originate more from constraints than choices (Bertolini and Musumeci 2015). Moreover, preferences are formed within relationships in an active interpretation of others’ expectations, of own and other’s material resources, of prevalent cultural models, of how these are institutionalised in policies and framed in discourses (Crompton and Harris 1998; Walters 2005; Tomlinson 2006). For example, in a recent study Winslow (2010) shows that women faculty members devote a greater amount of their time to teaching and have larger mismatches compared to men, gaps that cannot be entirely explained by pre-existing attitudes, education or institutional locations. Gender-differentiated preferences in part reflect the constraints that women face in obtaining positions compared to men, and the tendency to accommodate preferences to the options

that they perceive as realistic rather than vice versa. These positive beliefs concerning options and attributions for success are themselves shaped by cultural norms on gender and excellence (Correll 2004). Moreover, a number of studies demonstrate that positive beliefs on options and constraints also affect women's self-perceptions: women faculty feel less included, respected, valued as researchers (Cress and Hart 2009; Fox 2010), while at the same time, they tend to be less self-confident and, because of what has been called the "impostor syndrome", to follow male models of behaviour and look for men's approval more than for women's solidarity (Zoppe 2015)

As social stratification scholars underline, it is not only cultural resources that matter: since people are differently located in the social structure, in *primis* in the occupational structure, actors' abilities to act upon preferences and overcome constraints vary (Crompton 2008). As economists phrase it, these different locations imply different opportunity costs in leaving or changing a job, for example in the case of childbirth: women and men with high human capital are more willing to adhere to the "unconditional worker model" in order to reach high-paid/high-status positions and not to give up on their investments. As sociologists phrase it, moral rationalities may go together with instrumental forms of rationality: men and women investing strongly in human capital and labour-market careers are those who also adhere to a normative model that considers work as central to their own identity and conception of wellbeing (Duncan and Irwin 2004). Women and men's labour-market adjustments, especially those around parenthood, depend not only on their own *resources of income and time*, but also on those with whom they have linked lives, *in primis* their partners and their families, with their specific gender and intergenerational relations.

Moving to theories on the meso level, crucial for promoting equality between women and men in research and innovation is a supportive *organisational culture*. According to Thompson and colleagues (1999), culture can be described as more or less family-supportive on the basis of: i) the demand for time that the organisation makes on the workers (Hall 1990); ii) the negative consequences in terms of career because of the use of traditional forms of institutional support for conciliation (Bailyn 1993); iii) the presence of managerial support (Kossek and Nichols 1992; Frone et al. 1997). The implementation of a family-supportive culture can be threatened by "barriers" (Bruck and Allen 2003), including gender roles. Organisations with prevailing "masculine ethics" tend to reinforce a work model based on *images and stereotypes of masculinity* (Rapoport et al. 2002) and refer to characteristics such as assertiveness, competition, hyper-investment business. The ideal worker is someone who works intensely, gives up family and leisure time, moves nationally and internationally, and does not ask for permission to manage caring tasks, typically done by men (Williams 2000). As a result, family-friendly organisational policies are conceived primarily as existing to "help" women, leaving the idealised male model of work and the

actual gender allocation within families intact (Lewis and Smithson 2001). Put in Acker's terms (1990), assumptions about gender and family obligations are embedded in the structure and policies of organisations.

There is substantial evidence that academia is built on a male worker norm. The likelihood of successful marching through the lock-step life course of a traditional academic career is much greater for those not encumbered by family demands (Mason and Goulden 2002), and women faculty members report being looked down upon as less qualified or less committed academics if they have children (Cress and Hart 2009). The ideal worker model is indeed widely regarded as consistent with that of the traditional ideal father, while it conflicts with the ideology of motherhood. As a consequence, women, especially mothers, are caught in a double bind between demonstrating competence and commitment in a masculine manner, while also doing femininity or being obliged to "undo their gender" or the "in/visibility paradox" (Powell et al. 2009). These processes contribute to structural constraints on women's advancement by concealing direct and indirect discriminatory practices (Benshop 2009).

The implementation of a family-supportive culture can be threatened also by another type of "barrier": perceived unfairness. This can lead to the phenomenon of resentment from colleagues and superiors that has been called "*work-family backlash*" (Korabik and Warner 2009). Resentment is due to sometimes having to work more hours to cover the absences of colleagues for family reasons, and to the greater difficulty of access to forms of benefits by those who do not have family needs. The backlash may in fact impede the use of family-friendly initiatives and impact on both women's and men's career choices. Also crucial is how much and how *decision makers* rely on stereotypes. When people are motivated to *make accurate and accountable decisions*, they invest more time in information processing, pay attention to a wider range of potentially useful information, and engage in the deeper processing of information, which can reduce or eliminate the influence of cognitive biases (Lerner and Tetlock 1999). Another situation that may motivate decision-makers to make careful judgments occurs when they become aware of, or are reminded of, *fairness norms* (Fiske 1993). Non-transparent and mysterious promotional procedures and criteria obscure assumptions on ideal scientists, ideal workers, ideal academics. Yet without explicit training in unconscious gender bias, these assumptions remain viewed as gender-neutral, and thus go unchallenged (Herman et al. 2012). *The content of the information* can also affect the amount of gender bias in decision-making. Numerous studies have shown that when information on a trait or role is vague or ambiguous, decision-makers rely heavily on stereotypes (Kunda and Thagard 1996).

Looking finally at theories on the macro level, crucial are those analysing welfare regimes. Welfare regimes, that is, the interaction among labour market, family and state while producing and distributing different types of resources, have indeed been shown to importantly influence the ways in which women and men design their life courses, including their labour-market careers, the rationalities that they show and give (instrumental or moral rationalities) and the consequences of such choices, strategies and narratives (Mayer and Muller 1986; Saraceno and Keck 2011; Hochschild 1989; Jacob and Gerson 2005). As many scholars argue, crucial in shaping cross-country differences in women's employment and occupational patterns over the life course is in particular the *package of reconciliation policies* offered: how they design the four pillars (cash for care, services, leaves, working time flexibility), their relative weight and combination (more services, more money, more time), their orientation (that is, the extent to which they "defamilialize" caring responsibilities and child costs, and the extent to which they do so by tackling also gender allocations within families, inducing a "re-familialization" of men). Social policies and the organization of the labour market may also influence men's employment and occupational patterns over the life course, encouraging their reconciliation of care and work: policies can do so by reducing working hours for all, giving also fathers, and not just mothers, the right to leave and working time flexibility, that is, contrasting the "unconditional worker ideal model" and promoting a 'dual earner-dual carer' family model (Gornick and Meyers 2003; Smith 2008; Lewis 2009; Anxo et al. 2011; Aassve et al. 2014; Saraceno and Keck 2011).

Thus, the institutional context affects the possibility to practise different models of gender, work and care, or simply to follow one's own preferences, be they for the 'traditional' or 'innovative' models. The implementation or otherwise of a specific policy, in fact, assumes and produces specific definitions of who deserves support, why and to what extent, and therefore on the "good" form of gender, family and work relations (Pfau-Effinger 2005; Szinovacz and Davey 2008). The *discourse* on the policies implemented further contributes to normative constructions. As for example Garforth and Kerr argue (2009), the hegemonic discourse of gender equality policies in academia emphasises organisational barriers to women's participation and advancement, and the need to change the cultures of science and research. Yet, by doing so, it re-inscribes as natural and normal the notion of a linear path based on the traditional masculine professional career, and it focuses on organisational structures (such as employers' recruitment and promotion methods) and on individual biographies (women's work life-balances to become better workers), pushing culture away from the analysis.

Among structural factors, there is evidence that also the gender composition of committees matters in maintaining the 'glass ceiling', in both the private and public sector. This may come

about through three mechanisms. First, the absence of women at the top means that there are fewer role models to help change social norms, thereby encouraging women not to identify themselves as less suitable for higher ranks due to an inherent *notion that associates masculine characteristics with leadership* (Bosak and Sczesny 2008). Second, men in top positions may be less sensitive to policies that can help women get to the top (such as more flexible working hours: Duflo and Chattopadhyay 2004). Third, if evaluators tend to prefer same-sex candidates (Zinovyeva and Bagues 2010), women who achieve top-level positions may hire more women than their (male) counterparts. If this is the case, equal opportunities laws, and in particular *gender quotas regulations* at both meso and macro level, are also important.

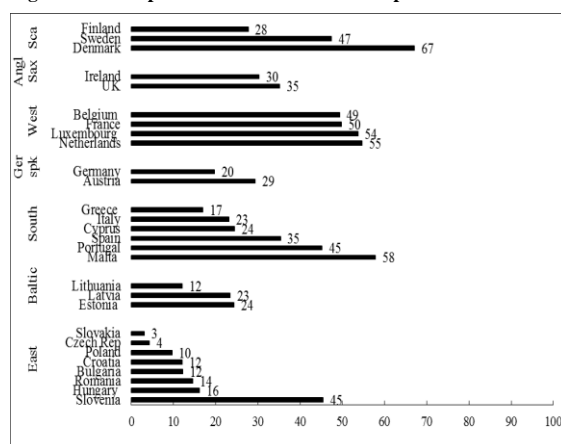
Women are barred from recognition and reward also by the extensive practice of part-time and non-tenured positions (Glazer-Raymo 2008) and fixed-term and hourly-paid contracts (Bryson, 2004; Knights & Richards 2003), to which women are more exposed than men. Hence, also *labour-market regulations and policies*, in general, and laws governing recruitment, retention and promotion in academia, in particular, are features of the macro context with which organisations and individuals have to deal. As underlined by Le Feuvre (2015), contextualising women's academic careers requires looking at multiple domains and multiple indicators within domains, in order to recognise and try to capture not single institutions but regimes, that is, the systematic relations among institutions. Besides care and work-life policies, and labour-market policies, two further domains are important: *general equal opportunity/anti-discrimination laws and education, research and innovation policies*. Also crucial are two structural labour-market dimensions: *the organisational characteristics of academic careers* in different national contexts, and *the relative attractiveness of academic occupations* in terms of pay, stability, welfare benefits and career prospects compared to alternative professions.

4. *Academia in context: institutional and cultural data*

A large body of literature on women and employment, including women in Science, is mainly concerned with women's choices, barriers and deficits but it fails to address the societal and institutional factors that are at play. Although the research on this topic is generally situated, the data presented are rarely fully contextualised by means of a sophisticated conceptually comparative approach and the inclusion of macro data in the analysis. In this section we try to contextualise the progressive evaporation of women through successive academic career stages by showing the profiles of EU-28 countries according to some institutional and cultural indicators emphasised as relevant in the literature discussed in the previous section. More precisely, to measure

defamilialising reconciliation policies, we use participation rates among children aged 0-2 years in childcare and pre-school services; to measure public investment in education and research, we use the share of GDP allocated to expenditure on research and development in the higher education sector; to measure prevalent gender norms, we use the share of the population supporting the equal rights of women and men to participate in the labour force; to measure gender divisions within the family, we show the percentage of male workers aged at least 15 years old caring for and educating their children or grandchildren, every day for one hour or more; finally, to measure the overall gender regime, we use the gender equality index elaborated by the European Institute of Gender Equality. Unfortunately, reliable cross-country comparative data on the structures, opportunities and conditions of academic careers are not available.

Figure 4. Participation rates in childcare and pre-school services for 0-2 year olds, 2013

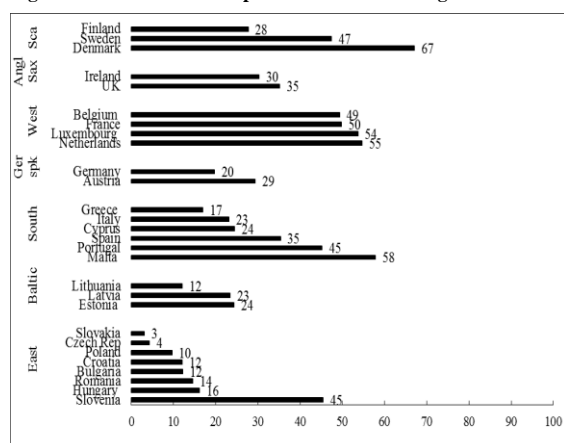


Source: OECD Family database, Chart PF3.2.A. <http://www.oecd.org/els/family/database.htm>

Starting from the institutional factors, Figure 4 draws on the OECD family database and shows the participation rates in childcare and pre-school services for 0-2 year olds in 2013. Although participation rates depend not only on state investment in childcare services but also on leaves design (especially in terms of length, replacement rate, concrete entitlement possibilities for working parents), on country-specific cultural beliefs about what is best for the child, as well as on the availability and appropriateness of informal in-home types of care (typically provided by grandmothers), it is widely accepted that they are a good indicator of reconciliation policies in support of mothers' employment. Unlike leaves or part-time opportunities, childcare services have a not ambivalent effect on women's labour-market attachment and advancements (Naldini and Saraceno 2011; Musumeci and Solera 2013).

As known from the now voluminous “gender and welfare” literature (O’Connor 1996; Sainsbury 1994; Orloff 1993), the proportion of children aged under 3 years enrolled in childcare and pre-school services is comparatively very high (at least 45%) in the Scandinavian countries (except Finland), in the Netherlands and in French-speaking countries. These are countries with also high participation rates in formal childcare services for 3-6 year old children and high public spending in this sector (Naldini and Saraceno 2011). Other countries present similar levels: Portugal and Malta, among the Southern European countries, and Slovenia, among the Eastern ones, constituting exceptions among these country-groups. Southern European countries, in fact, are generally characterized by low levels of services for children under 3 (ranging from 16.9% in Greece to 35.3% in Spain); Eastern European countries present even lower rates (3.1-16.1%). Also in Baltic countries the rates are low, and in English-speaking countries no more than one child out of three is enrolled in a formal service.

Figure 5. Gross domestic expenditure on R&D - Higher education sector, 2013 (% of GDP)



Source: Eurostat (online data, code: tsc00001).

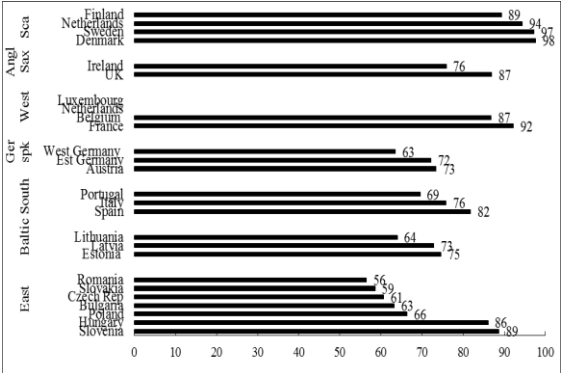
Notes: Within each group the countries are sorted from the country with the lowest value to the country with the highest one.

Moving from reconciliation to education and research policies, Figure 5 shows again that, according to Eurostat, the countries spending most on Research and Development in the higher education sector are the Scandinavian ones (in particular Denmark with 0.97). Also Austria, among the German-speaking countries, and Estonia, among the Baltic ones, show levels of expenditure amounting to more than 0.70% of their GDP. By contrast, the country-groups that spend least are the Southern (with the exception of Portugal, which spends 0.51) and the Eastern European ones (with the exception of Czech Republic with 0.52). In the former case, the range is 0.27-0.35; in

the latter, 0.06-0.27. A low public effort in the education and research field is also evident, among the Western European countries, in Luxembourg, among the English-speaking countries in Ireland, and, among the Baltic ones in Latvia.

On the cultural side, by drawing from the cross-country study by Arpino et al. (2015), we use a measure of gender equity based on the following question included in World Values Surveys and European Values Studies: ‘When jobs are scarce, men should have more right to a job than women’. After coding the variable into a binary response (0 = ‘agree’ or ‘neither’ and 1 = ‘disagree’) and limiting the sample to respondents of childbearing age (14–50 years), Arpino et al. calculate the share of the population with gender-equal attitudes by country. As evident in Figure 6, and in line with approaches in the “gendering welfare regimes” literature that claim the importance of cultural models (e.g. Pfau-Effinger 2010), gender equity values are more widespread among the Scandinavian countries followed by the United Kingdom and Western European countries. Also Spain (81.78) among the Southern European countries and Hungary and Slovenia among the Eastern ones present values higher than 80. Hungary and Slovenia are exceptions among the rest of Eastern Europe, where the share of the population supporting the equal participation of women and men in the labour market is the lowest in EU, ranging between 56 and 66 per cent.

Figure 6. Share in the population 14-50 years old with gender-equal attitudes, 2006-2009



Source: WVS-EVS in Arpino et al. (2015, table S1, additional tables and graphs).
Notes: Within each group the countries are sorted from the country with the lowest value to the country with the highest one. Data unavailable for: Cyprus, Greece, Malta and Luxembourg.

As well conceptualised in many feminist accounts of gender inequality, the revolution is “stalled” (Hochschild and Machung 1989) because it has stopped at the threshold of the home: women’s participation in paid work has increased without a parallel participation by men in domestic and care work towards the so-called “dual earner-dual carer” model (Gornick and Meyers

2003). By looking at the sub-domain of time of the Gender Equality Index of EIGE (specifically, at the percentage of male workers aged at least 15 years old declaring that they care for and educate their children or grandchildren every day for one hour or more), it emerges that everywhere the amounts of time spent by women and men in the EU on activities other than economic differ greatly, with women still being the main providers of care. On EU-28 average, female workers caring for and educating their children or grandchildren every day for one hour or more (15+ workers) are 41.1% versus 24.9% among men. Focusing on men, in all the Eastern European countries the percentage of male workers providing care on an everyday basis is no higher than 20, as in Greece and Austria. The majority of Southern, Anglo-saxon and Western countries present percentages ranging approximately from 20 to 30. The highest presence of caring men is in Denmark, Netherlands, Latvia, Estonia and Hungary, crossing across country clusters. However, data referring only to men may be misleading if they are not compared with those for women. The gender gap between female and male proportions of “caring workers”, regardless of the working hours (we do not know if workers are part-time or full time), varies widely across countries, in correspondence with well-known gender and welfare regimes: the group with the lowest gender gap is the Scandinavia one (range 3.8-4.2 percentage points), while the group with the largest gender gap is Eastern Europe (range 18.3-30.4, excluding Hungary). Values very similar to those of the Eastern group appear in the Southern group (with the exception of Malta, where the gender gap is comparatively low: 13.3%). In the middle we find Western European countries, with a gender gap around 20% (except the Netherlands, 12.9%), and English-speaking and Baltic countries, with a gender gap less than 15% (except Lithuania, 19.8%) (European Institute for Gender Equality 2013).

In addition and in interaction with employment and care regimes, gender regimes are also important, meaning with gender regime a multidimensional model of gender relations that recognise, à la Risman and Connell (see previous section), that gender is a social structure, thus includes domains such as care, employment, but also polity and civil society. Differently from gender equity, which reflects subjective views, gender equality measures outcomes in different domains (Fraser 1994; McDonald 2013). The “classic” tool for measuring gender equality is a Gender Equality Index like the one proposed by the European Institute of Gender Equality, which combines various gender indicators into a single summary measure and consists of six domains: work, money, knowledge, time, power, health. In 2010 in EU-27 the Gender Equality Index varied from 74.3 in Sweden to 35.3 in Romania. Scandinavian countries exhibited the highest scores, ranging from 74.3 in Sweden to 73.4 in Finland. By contrast all the Baltic countries, and all Eastern and Southern countries, except Slovenia and Spain, presented low scores (less than 50). In the

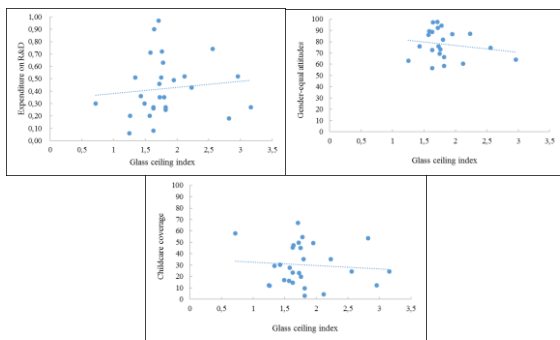
middle were the English-speaking, Western European and German-speaking countries (European Institute for Gender Equality 2013).

5. The glass ceiling in academia and the macro context: what association?

How are these cultural and institutional indicators of the macro context correlated with women's outcomes in academic careers, i.e. with their share of top positions? What can be hypothesised to account for the high or low correlation observed? Merging section 2 with section 4, Figure 7 shows bivariate associations between the glass ceiling index as shown in Figure 2 and childcare service coverage, expenditure on R&D, prevalent gender role attitudes, as shown in Figures 4 to 6.

Welfare and gender regime typologies have been based on policies able to impact on class or gender inequalities captured by concepts such as decommodification (Esping-Andersen 1990), autonomy (Orloff 1993), or de-familisation (Saraceno and Keck 2011). Various studies have shown that these institutional-centred regimes are associated with different outcomes when looking at economic growth or social cohesion (Burroni 2016), at income inequality (Kammer et al. 2012), at family formation patterns (Iacovou and Skew 2011; Olah 2015). As evident in Figure 7, the same seems not to hold when considering gender outcomes in academia: the share of women breaking the glass ceiling and reaching grade A positions is quite independent of availability of childcare services, state financial effort in research and development and gender norms.

Figure 7. The association between the glass ceiling index in academia and some institutional and cultural macro indicators



Different reasons may account for this nearly correlation². First, it can be easily argued that there is a methodological problem: unidimensional measures of the context and a simple bivariate exercise do not make it possible to capture the complex interplay between the macro and the micro, between the institutional/structural and the cultural. This is certainly true. Yet a straightforward association is absent also when a composite outcome-centred index like the EIGE index is used, or an institutional-centred regime approach, as underlying in the division of figures for geographical clusters in Section 2. Thus, other kinds of explanation are required. One can refer to the exclusion of important contextual dimensions: Le Feuvre (2015), for example, suggests that cross-country analytical frameworks and empirical data have tended to neglect the role of the structures, opportunities and conditions of academic careers. Despite convergent international trends in favour of transparency and accountability in academic evaluation procedures, what it means to be an academic and the criteria used to select and promote members still manifest a considerable degree of national (or local) specificity. Moreover, the share of fixed-term and precariousness positions also varies. Finally, academic occupations do not occupy the same position in the socio-economic hierarchy in all national contexts. The relative attractiveness of a scientific career, in comparison to the alternative employment opportunities open to male and female PhD graduates, depends on the specific internal structure of the academic labour market (proportion of fixed-term or permanent positions, duration of the pre-tenure career stage, relative levels of pay and other perks, length of working week, opportunities for flexible employment practices, etc.).

Thus a second explanation for the absent correlation may lie in the absence of comparable data on these structural national characteristics of the academic labour market, which may weaken the observation and understanding of cross-national variations in women's access to top positions. Another possible explanation may reside in the unit and level of analysis. Considering nations, and not regions within nations, may be misleading in those countries with strong internal geographical divisions, like Italy for example. Moreover, the academic context seems to follow its own logic, written and unwritten rules, processes whereby only analyses that combine qualitative and quantitative data, putting men and women in those organisations under the microscope, can capture how the macro context, with its complex institutional and cultural settings, is interpreted and is "done" or "undone" by meso and micro actors.

6. Conclusion

² More precisely, the correlation between glass ceiling index and social expenditure on research and development is equal to 0,11; glass ceiling with gender-equal attitudes -0,18; glass ceiling with childcare availability -0,086.

Despite the progress that has been made in recent years and the increasing attention received since the Lisbon Agenda and the creation of the European Research Area in 2000, achieving gender equality in various workplaces and professions, including research, remains a major challenge not only for equal opportunities but also for overall general efficiency and excellence. This challenge is based on the now widespread conviction that women are not mainly “responsible” for their disadvantaged positions; rather, they are embedded in gendered social structures that hinder equality, so that contrasting actions have to be systemic and multidimensional. Construction of gender inequalities at different phases of careers and in different spheres, in fact, comes about at different levels: at the micro individual level, at the meso level of the organisation, at the macro level of the country in which individuals and organisations are embedded. Moreover, the potential dimensions involved at each level are multiple. Although today the large bulk of “gender and science” research recognises the multidimensional and intersectional nature of gender imbalances and locates the data collected within national and local contexts, there is still a lack of conceptually comparative research perspectives.

In this paper, we have tried to start filling this gap by conducting a theoretical “state of the art” review along two dimensions: attention to the micro, meso or macro levels; and attention to the institutional/structural and the cultural ones, or their interplay. Comparative figures on the share of women in top academic positions have been grouped by geographical-welfare and gender regime clusters, and then they have been contextualised with more specific data on relevant features of these regimes, such as the degree of defamilising social policies, the degree of welfare effort in education and research, prevalent gender norms, overall gender equality. Women represent about 20% of grade A professorships in most Western European societies, but with still high cross-country variation. However, unlike what has been found for other outcomes such as poverty, inequality, female employment, fertility or economic growth, this variation in the glass ceiling in academia seems not to be directly correlated to gender, care and employment regimes, because the ranking of countries according to women’s presence in the academic career hierarchy does not correspond to the ranking of countries according to specific institutional or cultural macro features, or according to overall packages that the regime distinction in Scandinavian, Angloaxon, Mediterranean, etc., groups should capture.

With a very rough exercise like the one proposed here (simply univariate or bivariate), little can be said as conclusive. Multidimensional measurements of the macro context and cluster analyses, or multilevel analyses properly controlling for self-selection of women into the academic career (a self-selection that may be different in different contexts, and may explain why traditional countries like Italy are more gender balanced in academia than progressive countries like Sweden)

are necessary. However, our review of the theoretical debate and our simple evidence on the absence of any statistical correlation are interesting because they suggest that academia is a very specific context and that only a holistic research design, that compares researchers in different organisations in different countries and, through sophisticated conceptually comparative frameworks, combines qualitative with quantitative measures along various dimensions, enables better accounts of its specificity, capturing both commonalities and differences across countries.

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