The gender pay gap in research

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ABSTRACT:

The gender wage gap is in a sense the final and most synthetic indicator of all inequalities between male and female researchers that structure the labour market. Of all countries observed in She Figures 2009, there is none where female wages are equal to men's, despite the almost universal existence of legislation to impose gender wage equality. In brief, this paper will test whether the gender pay gap is wider in those occupations that are most open to high-level female researchers, and whether it is smaller in public enterprise and in full-time research jobs,

Introduction

Over the last decades, the rising proportion of women in higher education and highly skilled employment has triggered a major structural change on the labour market. However, this phenomenon has not translated into a similar participation of women in traditionally male-dominated scientific and professional fields. Science and research are still characterised by vertical and horizontal gender segregation. Gender inequalities persist in education (the gender ratio differs across fields of study). This is called horizontal segregation. Vertical segregation refers to the fact that women work in lower hierarchical positions than men even if they have equal qualifications. The existence of a "glass ceiling" or a "sticky floor" affects women trying to progress to senior positions. It affects all occupational sectors even those which are dominated by women. The absence of women in leadership positions tends to be more acute in science and technology occupations than in other fields (Osborn et al. 2000).

The gender pay gap among scientists can be seen as partly a consequence of these two types of gender segregation. Vertical segregation has a direct impact on the gender pay gap because of the fact that women are under-represented in leadership positions. Horizontal segregation also has an impact on the gender wage gap since women are under-represented in the most prestigious and well paid occupations and sectors.

Research on the gender pay gap in scientific professions is scarcely developed. It is rather a new topic of study. Research took off as of the end of the 90s, except for the Nordic countries. The topic is thus very recent and this for three reasons. First, there is a lack of available official data on gender income differences. Second, in an important number of research institutions wages are entirely determined by rank and seniority. Third, in some countries, in some cultures, earned wages are a taboo (Palasik 2009 for Hungary, de Cheveigné and Muscinési 2009 for France).

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An overview at EU level

She Figures 2009 analyses the gender pay gap in scientific and research professions at EU level. It presents the gender pay gap by selected occupations for employees in private or public enterprise and in both together, for the years 2002 and 2006. Moreover, it analyses the gender pay gap by age group. No distinction is made between full-time and part-time working scientific professionals. Data on the gender pay gap by educational attainment are also missing.

At EU level (see table 1), it appears that the gender pay gap is larger for high qualified professions. Given that the gender pay gap tends to increase with the level of education, it is larger in science and research occupations than in the labour market as a whole. Moreover, the She Figures 2009 results show that the gender pay gap is greater in occupations where highly qualified female professionals are better represented.

Cross-country differences

European Structure of Earnings (ESES) data can be used to compute the gender pay gap in 23 European countries. The ESES is a valuable source of data for the analysis of wage differences in scientific and technological employment and, in particular, among "human resources in science and technology" (HRST). (1)

The EU-27 average for the gender pay gap in the ISCO88 major group 1 of legislators, senior officials and managers, which stood at 30% in 2006, masks important cross-country differences as the gap ranges between 4% in Romania and 34% in Germany. The gender wage gap among professionals (ISCO88 major group 2) varies between 1% in Belgium and 27% in Hungary and Estonia with an EU-27 average for this occupational group of 31%. Finally, among associate professionals (ISCO88 major group 3), the gender pay gap varies between 8% in Luxembourg and 36% in Cyprus whereas on average throughout the EU-27 it stood at 26% in 2006.

The general country ranking according to the gender pay gap among legislators, senior officials and managers (ISCO88 major group 1) essentially reflects the gender pay differences among corporate managers (ISCO88 subcategory 1.1). On the contrary, among legislators and senior officials, the spread in pay inequality is much larger and an inverse pay gap (with women earning more than men) is even observed in 5 countries. Among managers of small enterprises, the gender pay gap is much larger than in the ISCO88 major group 1 as a whole in a number of countries and much smaller in others.

The gender wage gap among professionals (ISCO88 major group 2) varies between 1% in Belgium and 27% in Hungary and Estonia. This range and spread of the gender wage gap is observed in all four occupational subcategories but the country ranking changes across these subcategories.

The gender pay gap among associate professionals is somewhat greater than among professionals. It ranges between 8% in Luxembourg and 36% in Cyprus. Belgium and

Luxembourg are to be found among those countries with the lowest level of gender wage inequality in both the categories of professionals and associate professionals. At the bottom of the ranking, i.e. among those countries with the largest gender pay gap, the addition of some new countries is observed for associate professionals compared with the ranking for professionals. Indeed, associate female professionals are disproportionately disadvantaged compared with female professionals in Cyprus, Portugal and Poland. (2)

A first issue to be observed is the wider gender pay gap in those occupations that are most open to high-level female researchers. Women's pay is more behind men's in female-dominated occupations in Romania, Luxembourg, Bulgaria, Cyprus, France, the Netherlands, and Sweden. In those countries, it probably holds true that the few men who work in female-dominated occupations hold the highest responsibility posts and are thus comparatively better rewarded. In Belgium, Latvia, Lithuania, Norway, Hungary, Slovakia, the UK, the Czech Republic, Estonia, Finland and Germany, the gender pay gap is higher in male-dominated occupations. This could point towards a situation where the organisational culture shows resistance towards integrating women. The reference model in this occupation is defined in terms of masculine attributes. Women are consequently employed at lower levels and in lower pay jobs.

Secondly, it must be noted that the total gender pay gap turns out slightly bigger in the private sector than in the reduced public sector (excluding public administration and defence and compulsory social security). A dampening effect of the public sector on the gender pay gap is observed in Poland, Cyprus, Belgium, Italy and Portugal and to a lesser extent also in Greece, Spain, France and Luxembourg. On the contrary, in countries such as Romania, Bulgaria, Finland, and Hungary, the inverse is found: the gender pay gap is smaller in the private than in the public sector. The gender pay gap is of equal size in both sectors in the Netherlands and Estonia.

Finally, it is important to compare the size of the gender pay gap between part-time and full-time working HRST. In most countries, the full-time gap exceeds the part-time gap. There are just 6 countries where a clear wage penalty can be associated with part-time employment: Luxembourg, France, Belgium, the UK, Finland and the Netherlands. Although there seems to be a relationship between the gender imbalance in part-time employment and the size of the part-time wage penalty, there are 5 countries where this finding is invalidated. Indeed, Germany, Spain, Sweden, Norway and Estonia are also marked by a large gender balance in part-time employment but still the gender pay gap amongst full-timers is much larger than amongst part-timers.

TABLE 1: GENDER PAY GAP IN % BY SELECTED OCCUPATIONS IN PRIVATE AND PUBLIC SECTOR, EU-27, 2002 AND 2006

				2002	2006
		ISCO CODES			
EU-27	100		Legislators, senior officials and managers	29	30
		110	Legislators, senior officials and managers	u	u
		120	Corporate managers	28	30
		130	Managers of small enterprises	u	u
	200		Professionals	34	31
		210	Physical, mathematical and engineering science professionals	25	23
		220, 230, 240	Life science, health, teaching and other professionals	38	34
	300		Technicians and associate professionals	28	26
		310	Physical and engineering science associate professionals	27	25
		320, 330, 340	Life science, health associate, teaching associate professionals and other associates professionals	31	28

Source: She Figures 2009 (p.90), on the basis of the Structure of Earnings Surveys 2002 and 2006 (Eurostat)
Notes: 'u': unreliable due to small sample size
GPG (unadjusted) = The unadjusted Gender Pay Gap (GPG) represents the difference between average gross hourly earnings of male paid employees and of female paid employees as a percentage of average gross hourly earnings of male paid employees

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TABLE 2: GENDER PAY GAP IN % FOR EMPLOYEES IN PRIVATE AND PUBLIC SECTOR FOR OCCUPATIONS 100, 200 AND 300 AND THEIR SUBCATEGORIES, 2006

	Wage gap in total sample	**Legislators, senior officials and managers**	*legislators and senior officials*	*corporate managers*	*managers of small enterprises*	**Professionals**	*physical, mathematical and engineering science professionals*	*life science and health professionals*	*teaching professionals*	*other professionals*	**Associate professionals**	*physical and engineering science associate professionals*	*life science and health associate professionals*	*teaching associate professionals*	*other associate professionals*
BE	12,87%	14,13%	na	13,15%	28,02%	0,81%	10,85%	19,39%	7,58%	20,37%	9,53%	15,15%	3,27%	4,46%	14,43%
IT	14,02%	10,96%	-29,90%	10,62%	17,35%	11,05%	11,49%	20,36%	19,60%	19,47%	13,19%	14,92%	28,83%	9,09%	26,37%
RO	14,17%	4,10%	10,27%	4,94%	5,16%	6,11%	5,81%	4,74%	11,74%	-1,72%	14,70%	19,97%	4,64%	12,62%	9,31%
PL	17,03%	30,95%	-15,58%	31,02%	19,29%	2,41%	4,17%	18,38%	-0,31%	19,43%	22,56%	23,24%	26,23%	2,03%	23,64%
LU	17,12%	22,34%	na	20,80%	29,80%	2,52%	5,85%	26,03%	20,18%	12,42%	7,73%	14,94%	5,50%	11,63%	9,75%
LV	18,23%	11,79%	-0,73%	15,44%	9,35%	16,36%	18,21%	14,40%	9,75%	24,53%	22,05%	28,81%	-13,42%	5,76%	15,41%
UK	18,80%	25,68%	3,47%	26,49%	20,99%	8,21%	10,20%	19,18%	7,37%	18,55%	15,39%	10,77%	1,47%	5,99%	24,12%
PT	20,28%	20,95%	26,04%	20,82%	50,58%	9,59%	12,07%	16,42%	9,04%	22,89%	26,79%	14,77%	2,42%	21,79%	28,09%
LT	21,51%	23,24%	9,08%	26,75%	14,03%	10,08%	13,66%	26,55%	9,31%	5,50%	22,32%	24,90%	-20,81%	-7,92%	16,06%
CY	22,86%	6,40%	-5,00%	6,44%	na	6,63%	12,18%	22,93%	13,80%	16,15%	35,98%	66,28%	14,93%	26,70%	18,49%
NO	23,05%	22,94%	17,14%	22,82%	21,05%	17,34%	11,15%	27,25%	6,09%	17,57%	20,90%	12,50%	4,05%	5,11%	20,32%
ES	23,60%	33,45%	na	32,32%	46,88%	17,28%	23,13%	28,13%	6,39%	28,23%	23,86%	22,20%	5,27%	34,69%	22,92%
EL	24,87%	22,35%	-48,25%	24,54%	12,48%	16,15%	3,40%	15,40%	9,88%	18,41%	21,48%	24,19%	-0,96%	-24,40%	21,65%
SE	25,06%	26,05%	2,33%	23,68%	24,47%	19,28%	7,67%	30,33%	8,37%	22,26%	22,65%	10,54%	3,45%	2,47%	23,46%
FR	25,13%	28,55%	31,71%	28,79%	22,20%	21,47%	11,70%	10,37%	12,88%	25,67%	11,92%	7,63%	4,55%	8,14%	20,59%
DE	25,74%	34,23%	25,36%	32,66%	na	22,60%	21,08%	25,45%	12,19%	27,17%	29,51%	22,43%	16,96%	26,63%	30,92%
FI	25,90%	28,90%	32,12%	29,42%	11,18%	17,84%	7,19%	28,02%	16,52%	22,43%	21,84%	8,81%	6,94%	na	26,21%
NL	26,18%	28,40%	11,40%	27,20%	33,32%	21,77%	4,17%	31,49%	17,10%	25,75%	24,83%	29,15%	8,06%	28,92%	23,42%
BG	29,47%	10,30%	24,30%	10,78%	5,36%	24,11%	15,81%	11,53%	18,20%	14,21%	28,31%	19,36%	11,05%	-2,45%	18,10%
EE	30,38%	23,19%	32,56%	26,95%	23,06%	26,59%	26,17%	19,82%	21,09%	24,81%	28,96%	35,94%	13,30%	9,09%	25,51%
HU	32,22%	25,78%	14,32%	26,92%	22,90%	26,70%	13,98%	6,15%	14,08%	18,72%	26,66%	23,70%	8,08%	-3,36%	22,58%
CZ	32,32%	25,17%	37,57%	25,42%	33,67%	22,92%	19,60%	17,34%	13,58%	22,96%	25,77%	16,54%	11,19%	21,85%	25,39%
SK	33,23%	26,30%	45,40%	29,01%	12,18%	23,97%	18,92%	13,52%	9,45%	6,41%	27,03%	21,91%	17,45%	3,87%	22,87%

Source: ESES 2006, own calculations

NOTES

(1) HRST were defined as belonging to either one of the three broad ISCO88 occupational groups 1 (Legislators, senior officials and managers), 2 (Professionals), or 3 (Technicians and associate professionals) and having either one of the three highest levels of educational attainment ISCED97 5B (programmes generally more practical/technical/occupationally specific than ISCED 5A), ISCED97 5A (tertiary programmes to provide sufficient qualifications to enter into advanced research programmes and professions with high skills requirements) or ISCED97 6 (tertiary programmes which lead to an advanced research qualification (PhD)).

(2) The range of the gender pay gap and the rankings of countries are markedly different in the different subcategories of associate professionals. Among physical and engineering science associate professionals, the gender pay gap is substantially larger (by 7 percentage points) than in the broad category of all associate professionals (ISCO88 major group 3) in Cyprus, Luxembourg, Latvia, and Estonia. In other countries, the gap is substantially smaller in the subcategory than in the broad occupational group (by more than 10 percentage points): Finland, Sweden, and Portugal. The occupational subgroups of life science and health associate professionals and teaching associate professionals stand out because of the negative gaps that are observed in some countries and that point towards a comparative female wage advantage as compared with men. The gender wage gap in the subcategories of life science and health associate professionals and teaching associate professionals is in most countries much smaller than in the broad group of all associate professionals. A comparison across the subcategories of associate professionals shows that there is no consistency in the country rankings

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