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An educated guess: gender pay gaps in academia

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1. Introduction

Over the last few years there has been a surge in the literature investigating both the gender pay gap (female-male earnings ratios) and occupational segregation (predominantly female occupations paying less) in a variety of settings ranging from international comparisons to sector-specific studies, and addressing a range of possible explanatory characteristics (Blau and Kahn, 2000 and 1996; Blau et al, 1998). The policy implications from considering all the factors leading to unequal pay can be very significant, as witnessed by the case in 2004 of the £300million equal pay case won by Unison on behalf of women health workers in two Cumbrian NHS hospitals, which has been quickly buried in the news for fears of the repercussions it could have across the whole of the public sector. The issue is of current relevance since as part of the new Equality Bill **(**2007**)** the public sector in the UK is asked to take proactive steps to positively promote equality rather than solely taking steps to prevent discrimination.

Part of this entails monitoring and addressing the causes of the pay gap which raises the issue of what data (and what collection techniques) will be necessary, as well as what methods of analysis will be appropriate. This paper contributes to both issues in that it addresses the pay gap in a public sector institution making use of the data collected by the payroll office, and discusses information shortcomings as well as the merits of different techniques for analyzing the gap, which as we will show can produce significantly different results.

Several estimates of the unexplained part of the gender pay gap have been produced for the UK economy as a whole but there are no specific sectoral results. Olsen and Walby (2004) using the British Household Panel Survey find that in the UK the full-time gender pay gap has changed little since the 1990s and the pay gap

between females part-time and males full-time pay has not changed since the mid 1970s. The study finds that 36% of the gap is accounted for by differences in life-time working patterns, labour market rigidities (occupational segregation, work in smaller non-unionised firms, etc.) account for 18%, past educational attainment for 8% and 38% is linked to differences in labour market motivations and preferences and direct discrimination. The report also emphasises the effect of indirect discrimination and systematic disadvantage, which affect labour market motivations and preferences as well as labour market rigidities and the systematic low pay associated with certain occupations.

Data from the Labour Force Survey and New Earnings Survey referred to in the Kingsmill Review (2001) suggests that, as higher education institutions are autonomous employers, negotiations do play a significant role in determining pay. The Bett Report (1999), which focussed specifically on higher education noted not only that pay structures were largely unchanged from the 1960's but "there are real concerns about whether universities and HE colleges are fully meeting their statutory obligations to ensure equal pay for work of equal value." "The hard evidence available on patterns of employment by gender… suggest that most HE institutions have yet to become model employers as regards equal opportunities." "Rigidities in pay structures and inflexible people management practices… can hinder necessary adaptation to technological developments changes in employment patterns outside the sector, and variations in the pattern of demand and funding for higher education." (Brett report, quoted in the Kingsmill Review). Currently, data from the Higher Education Statistics Agency (HESA) suggests that women constitute 36% of the full-time academic staff, and 52% of part-time, reflecting the aforementioned importance of part time work by women in the public sector. There is also a literature on the pay gap in academic institutions (see for example Blau, Ferber and Winkler, 1998; McDowell, Singell and Ziliak, 1999; Blackaby et al, 2005), and most empirical studies aim to explain, making use of various factors, the reasons for this apparent discrimination between women and men's wages, as it is difficult to understand the nature of the gap from the figures on the difference between average men and women's pay in academia such as those routinely published by the Times Higher Education Supplement).

The higher education sector has been traditionally dominated by male academics, but recent years have seen a substantial increase of female academics and

the debate on the possible discrimination of women in a traditional male-dominated sector has heated up. In 2002 the Joint National Committee for Higher Education Staff (JNCHES) published a report entitled "Equal Pay Reviews: Guidance for Higher Education Institutions" whose purpose was to identify pay inequalities in order to eliminate them. In 2005, data compiled by the Higher Education Statistical Agency (HESA) showed that the gap between male and female pay in equivalent jobs was around 20%. In the same year, the Times Higher Education, in an article entitled "Deplorable pay inequality persists", published a ranking of Higher Education Institutions based on the gaps between female and male professorial and lecturers' salaries. It revealed that the gaps ranged from around 1% to almost 14% for professorial salaries and from 0.5% to almost 18% for lecturers. In 2006, a report published by the Higher Education Funding Council for England (HEFCE) pointed out that the number of female academics was rising at all levels, but women continue to be paid less with a mean salary (in 2006) of about £ 38,000 vs. nearly £ 43,000 for male academics. All these figures, however, are based on gross figures and fail to control for characteristics such as age, experience and subject studied. Focussing on a sample of five Scottish universities, Ward (2001) found an aggregate gender salary differential for academic staff of 15%, most of which was explained by limited opportunity for female academics to combine career and family, given the importance of mobility to academic careers. Her analysis also highlights that rank is key to both salaries and the pay gap, indicating that opportunities for promotion are very different between women and men. Within the economics subject, Blackaby et al (2005) use data from a comprehensive questionnaire conducted among women economists in the UK which includes information on rank, pay and productivity, as well as career breaks and outside offers and job applications, and also perception of discrimination, and find that both a gender promotion and within rank gap exist, and outside offers play an important role in determining the gap (much more significant than the effect of career breaks, which are found to have no significant direct effect on the gap in earnings). 'Women are less likely (for given observable characteristics) to be promoted, they receive lower wages in a given rank, they receive fewer job offers, gain lower financial reward to outside offers, and they perceive gender discrimination' (Blackaby et al, 2005: 104).

Our paper makes two novel contributions to this literature: it provides an overview of the evolution in the pay gap over the whole population of employees of

an academic institution over a period of nine years (1997-2005) controlling for age, experience and subject studied, and it tests the sensitivity of results to model specification using different decomposition methods.

2. Theoretical background

There exist many different theories explaining discrimination in the labour market (for a survey see Peterson and Lewis, 1999). Neoclassical labour market theory expects differences in pay to correspond to differences in productivity, as rational employers should hire cheaper labour until wages equalise. It therefore explains any remaining differential wages with women's labour supply choices. The human capital model (Becker, 1985, Mincer and Polachek, 1974) is used to explain gender differences in qualifications and in work experience as a result of the gendered division of labour in the family, with women primarily responsible for reproductive work (rearing children, domestic work, caring for other members of the family) creating a dis-incentive to investment in their human capital. This model is on its own empirically is able to statistically explain only 50% of the wage gap once education, training and experience are accounted for. Supply side theories of discrimination include Gary Becker's theory of the 'taste for discrimination' in co-workers or customers that employers have to cater for and imperfectly competitive markets allow discrimination to persist. The discrimination faced in the family would then combine with that occurring in the labour market because of employers' anticipating an expected lower productivity, or employers or customers' tastes (Becker, 1957), or again with occupational segregation in lower wage professions. According to this theory, when competitive pressure increases a fall in wage discrimination should be observed and Blau and Kahn (2000) point to evidence confirming Becker's prediction that discrimination is higher the more a sector is shielded from competitive pressures (Becker, 1957), and to experimental studies assessing the probability of being hired for women and men and the increases in this probability when sex is not known by the employer. However, Bergman (1974) suggests that discrimination may actually be profitable if it is generalised practice, as employers who compete only with other employers that hire white men at a premium might be able to pass higher prices on consumers, and occupational segregation as suggested by institutional labour market theory can maintain this state of affairs indefinitely. Moving further from strictly

neoclassical assumptions, Phelps' and Arrow's theory of statistical discrimination suggests that discrimination might be rational and arising through imperfect information about the productivity of future employees, so that assumptions about gender or race might be used as screening devices. Feminist economists argue that pre-labour force discrimination (as that which happens within the household when for example decision regarding the amount of education to be given to children or the division of child care responsibilities) and socialization play a role. This means that explaining discrimination as residual once controlling for human capital and omitted variables as is done in the wage gap literature fails to incorporate the discrimination that has taken place when investing in human capital and in accumulating on-the job experience, which are assumed implicitly to be a free choice, and the fact that part of that is internalised by women themselves, who may be less effective at self-promotion.

Since the seminal work of Oaxaca and Blinder in 1973, the word 'wage decomposition' has become incredibly popular in the labour market literature and has been widely used to try to estimate the extent of wage discrimination between different groups of workers (e.g. females vs. males, ethnic minorities vs. the rest of the population). The basic idea behind the Oaxaca-Blinder decomposition is quite straightforward. The observed differences in salary between two sub-groups of the working population can be divided into two parts: the first one (also called 'endowment' part) is simply due to differences in the observable characteristics of workers which might affect their productivity, the second one is due either to unobservable characteristics of workers for which the researchers does not have information or to 'discrimination' intended as giving inferior treatment to people of equal abilities.

In the case of female-male differences in wages, and assuming that the relationship between wages and individual abilities is linear, the Oaxaca-Blinder decomposition implies estimating the following two separate wage equations (with wages normally expressed in logarithmic form) for males and females by means of standard multiple regressions (and assuming therefore $E(\varepsilon)=0$):

$$W_m = \alpha_m + \sum_{j=1}^{N} X_m^{(j)'} \beta_m^{(j)} + \varepsilon_m \qquad (1a)$$

$$W_f = \alpha_f + \sum_{j=1}^{N} X_f^{(j)'} \beta_f^{(j)} + \varepsilon_f \tag{1b}$$

and defining the gender pay gap as:

$$E(W_m) - E(W_f) = (a_m - a_f) + \sum_{j=1}^{N} \overline{X}_f^{(j)'} \Delta b^{(j)} + \sum_{j=1}^{N} \Delta \overline{X}^{(j)'} b_m^{(j)} \tag{2}$$

where a and b are the OLS estimators of α and β.

The first two terms in the right-hand side of equation (2) are generally used as measure of discrimination as they are not linked with observable initial ability differences between the two groups. Traditionally they are called 'differences in coefficients' (including the intercept) or C, while the last term represents 'differences in endowments' and is normally labelled E.

The standard Oaxaca-Blinder (1973) decomposition has been variously modified over the years. Some authors (see for instance Daymont and Andrisani, 1984, Oaxaca and Ransom, 1994) suggested introducing an 'interaction term' between C and E in equation 2 so that the final model has the form:

$$E(W_m) - E(W_f) = (a_m - a_f) + \sum_{j=1}^{N} \overline{X}_f^{(j)'} \Delta b^{(j)} + \sum_{j=1}^{N} \Delta \overline{X}^{(j)'} b_m^{(j)} + \sum_{j=1}^{N} \Delta \overline{X}^{(j)'} \Delta b^{(j)} \tag{3}$$

The problem with this approach resides in defining whether the interaction term is part of the explained part or the discrimination part. This partly depends on which group is supposed to be the 'base group' or, in other words, the 'non discriminated' one. This is often referred to as 'index number' problem in the literature. Oaxaca (1973) and Blinder (1973) both propose to consider either the group with the lowest salary (in our case females) or the group with the highest salary (males) as comparison group. Reimers (1983) and Cotton (1988) both suggest using an average between the mean salaries of females and males. Reimers suggests a simple arithmetic mean, while Cotton recommends a 'weighted' average, with the weights being the proportions of each group in the population. Neumark (1988) points out that "the no-

discrimination wage structure is simply the set of coefficients from the pooled regression" (pag. 289) where both groups are included.

Table 1 provides a summary of the above contributions and their definition of 'reference salary'.

Author	Reference salary
Oaxaca (1973) and Blinder (1973)	Either $\overline{X}_m$ or $\overline{X}_f$
Reimers (1983)	$(\overline{X}_m + \overline{X}_f)/2$
Cotton (1988)	$n_m \overline{X}_m + n_f \overline{X}_f$ where: n_m and n_f are the relative frequencies ($n_m = N_m / N$ and $n_f = N_f / N$) being: N_m = number of males, N_f =number of females and $N = N_f + N_m$
Neumark (1988)	Coefficients from pooled regression

Results on the extent of discrimination are not only influenced by the choice of the reference salary and how to deal with the interaction term, but also on the definition of the characteristics to be included as explanatory variables in equation (3) and on how representative the sample is of the whole population. Sample bias did not represent a problem in our case as we are focusing on salaries in one specific British higher education institution (the University of Reading) and have data on the whole population of employees for the period 1997-2005.

Our final wage equations are:

$$\ln W_m = \alpha_m + \beta^1 \text{age}_\text{m} + \beta^2 \text{age}_\text{m}^2 + \beta^3 \text{ethn}_\text{m} + \beta^4 \text{UK}_\text{m} + \beta^5 \text{mode}_\text{m} + \beta^6 \text{exp}_\text{m} + \\ + \sum_{j=7}^{12} \beta^j \text{D}_\text{m}^{(j-6)} + \varepsilon_m \qquad (4a)$$

$$\ln W_f = \alpha_f + \beta^1 \text{age}_f + \beta^2 \text{age}_f^2 + \beta^3 \text{ethn}_f + \beta^4 \text{UK}_f + \beta^5 \text{mode}_f + \beta^6 \text{exp}_f + \\ + \sum_{j=7}^{12} \beta^j \text{D}_f^{(j-6)} + \varepsilon_f \qquad (4b)$$

Where the explanatory variables are:

Age = age of employee

Ethn = dummy variable equal one if employee is Caucasian

UK = dummy variable equal one if employee is British

Mode = dummy variable equal one if contract is permanent

Exp = length of service at University

D^j (with j=1,2…6) = dummies for subjects (Mathematics & Physics, Psychology, Linguistic, Engineering, English, Business)

Ideally, to measure discrimination accurately, productivity variables should be included in the analysis, but these are incredibly difficult to find (or create). We were unable to add any specific productivity index, as our micro-individual data had to be provided in an anonymous format to preserve privacy. In the absence of these measures, the unexplained part of the gender gap should be interpreted as an 'upper-boundary' for 'potential' discrimination rather than a measure of discrimination itself.

3. Data

The data used come from the University of Reading Payroll Office and include the salaries of all the employees from 1997 to 2005. The total number of observations over the 9-year period is 30,956 with a minimum of 3,446 observations in 1997 and a maximum of 3,606 in 1999 (see Table 3).

Table 2: Population characteristics by year

Year	Total no. obs.	Female (% over tot pop)	Female Full-Time (% fem pop)	Male Full-Time (% mal pop)	Female Full-time Academic (% fem FT)	Male Full-time Academic (% mal FT)
1997	3,446	1,806 (52.41)	798 (44.19)	1,460 (89.02)	242 (30.33)	741 (50.75)
1998	3,549	1,874 (52.80)	815 (43.49)	1,469 (87.70)	243 (29.82)	756 (51.46)
1999	3,606	1,914 (53.08)	875 (45.72)	1,463 (86.47)	251 (28.69)	738 (50.44)
2000	3,549	1,855 (52.27)	875 (47.17)	1,437 (84.83)	247 (28.23)	689 (47.95)
2001	3,458	1,804 (52.17)	830 (46.01)	1,385 (83.74)	271 (32.65)	686 (49.53)
2002	3,437	1,804 (52.49)	861 (47.73)	1,360 (83.28)	310 (36.00)	695 (51.10)
2003	3,355	1,822 (54.31)	897 (49.23)	1,282 (83.63)	326 (36.34)	657 (51.25)
2004	3,320	1,816 (54.70)	879 (48.40)	1,265 (84.11)	315 (35.84)	639 (50.51)
2005	3,236	1,783 (55.10)	876 (49.13)	1,229 (84.58)	285 (32.53)	600 (48.82)

As expected, the vast majority of male employees are full-time, while less than half of the female employees work full-time. Within the population of full-time workers, the percentage of female academics is lower than the male counterpart, though it has increased over the 9-year period and it is now around one-third of the female full-time population. On the opposite, the percentage of male academics over the male full-time population has fluctuated around the value of 50% and no clear pattern is identifiable.

As far as average salaries are concerned, these are summarised in Table 4 for full-time employees and full-time academic employees.

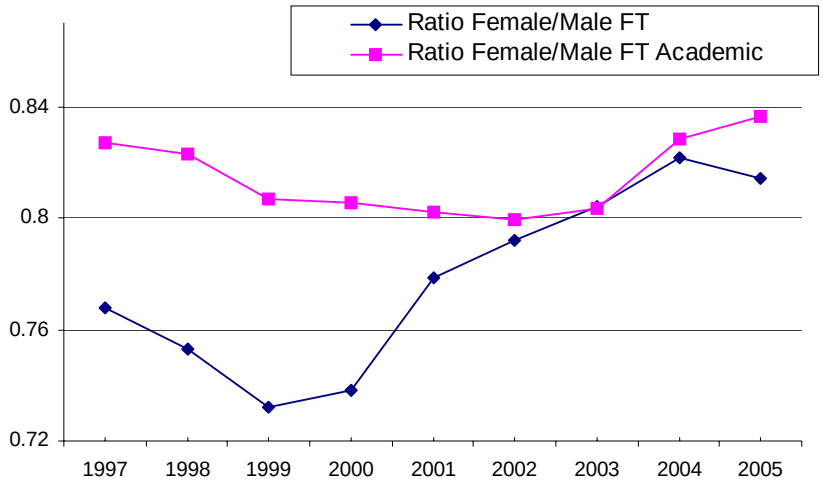
Table 3: Average nominal salaries by group and year (in £)

Year	Female Full-Time	Male Full-Time	Female Full-time Academic	Male Full-time Academic
1997	16,996.21	22,132.67	23,486.75	28,391.88
1998	17,080.27	22,678.36	23,691.65	28,778.73
1999	17,358.01	23,699.01	24,686.83	30,609.03
2000	18,068.24	24,484.53	25,970.21	32,245.95
2001	20,248.22	26,006.10	26,621.92	33,205.31
2002	22,201.83	28,040.97	27,992.91	35,004.93
2003	23,539.46	29,276.95	29,412.47	36,605.61
2004	24,942.44	30,369.67	31,328.07	37,835.73
2005	25,117.91	30,859.58	32,349.11	38,690.07

The figures in Table 4 are non-deflated, but, as our purpose is to compare the two groups and both are affected by inflation, deflation is not crucial. Partly because of inflation, salaries show an upper trend over the 9-year period. In particular, if we compare the final value of 2005 with the initial value of 1997, we can see that nominal salaries for full-time female employees have increased by around 48% vs. around 39% for full-time males. The nominal salaries for academics have increased by around 38% for female academics and around 36% for male academics.

It is also interesting to have a look at the ratios between average[1] female and male earnings over time. Figure 1 shows the trend for full-time employees and for full-time academics.

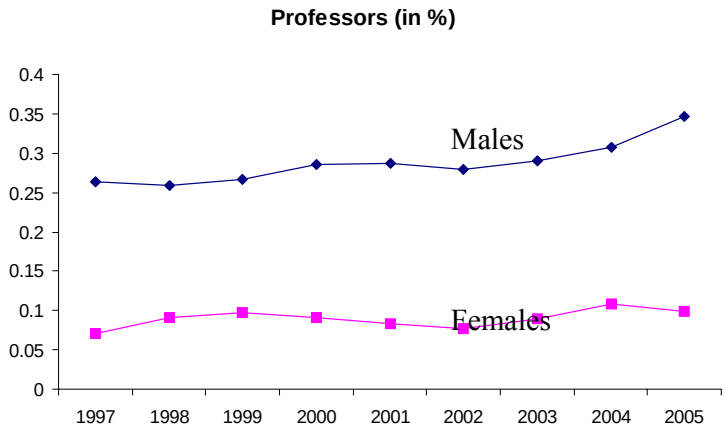
Figure 1: Female/male average salary ratios – 1997 to 2005

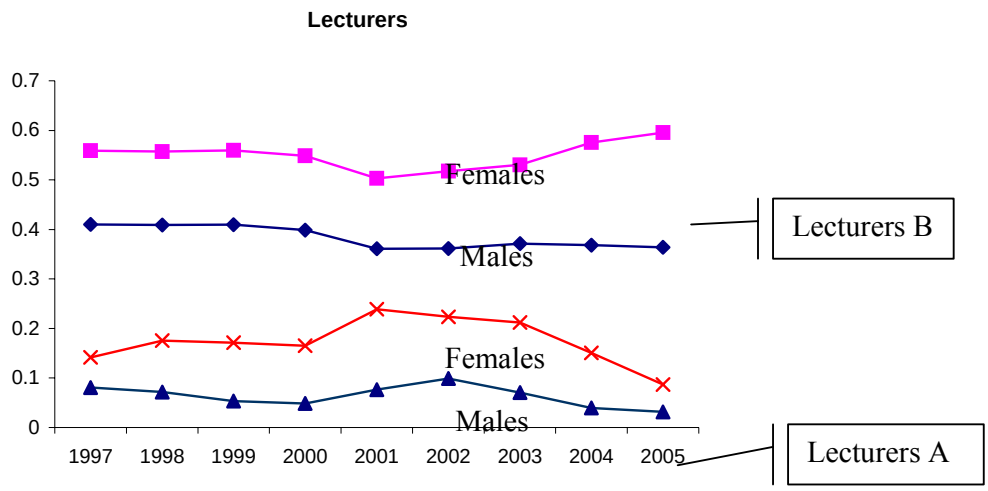


[1] Mean and median salaries show similar patterns.

Figure 1 shows a clear upward trend for female/male ratios for full-time employees, but, surprisingly a downward trend for the female/male ratios for full-time academics, with a partial recovery after 2003. This phenomenon could partially be explained by the age structure of the academic population, with an increase of young female academics joining the university in recent years and taking over more junior positions. In reality, this is only partially proven by the data. If it is true, on one side, that a larger proportion of female academics are in more junior positions (see Figure 2), it is also true, on the other side, that the percentage of females in junior position has not increased much over our period of analysis (in fact, in the case of lecturers A, the percentage of females dropped even more than males).

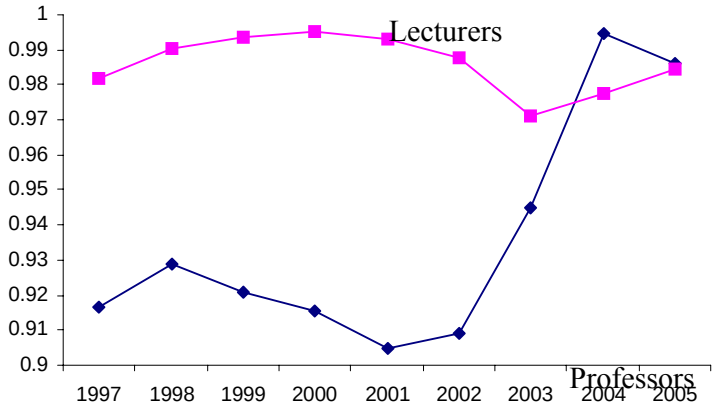
Figure 2: Percentages of grades by gender – 1997 to 2005





It is also interesting to have a look at the female/male average salary ratios by 'academic grade'. Figure 3 shows the ratios for professors and lecturers (A and B pooled together) for our period of analysis.

Figure 3: Female/male average salary ratios professors and lecturers (A and B)



The gaps between female and male professorial salaries have been traditionally higher than the gaps between female and male salaries for more junior positions (i.e. lectureships or research assistant positions), but there might be some evidence of 'catching up' though our period of analysis is to short to identify trends with certainty. According to the HESA data published by the THES at the end of 2005, on average nationally female professorial salaries are 6.3% lower than male professorial salaries while the same figure for researchers is only 3.0%. Our data seem to confirm that, in fact, gaps are generally higher for more senior positions.

4. Results and discussion

4.1 Decomposition methods and the gap

The aim of this section is to present and discuss the results of our decomposition analysis carried out on the lines explained in the theoretical framework part. We will present separate results for each year and for two different sub-populations, i.e. all full-time employees and all full-time academics only. The reason why we restricted to full-time employees only is self-evident: it is extremely difficult to include part-time employees because there are different degrees of 'part-time' and standardisation is not straightforward (and sometimes not even desirable as it might introduce substantial biases in the sample). We have then restricted to full-time academic only and decided to present these results as well because, theoretically, we would expect the same decomposition model to perform 'better' (i.e. explain more of the pay gap) the more homogenous the population. If this is the case, our model applied to two populations, one of which is more dis-homogenous than the other, should give us substantially different results.

Our results are summarised in Table 5. The table reports the part of the gap which remains unexplained (in %) after controlling for the individual and subject characteristics highlighted in equations 4a and 4b. Different columns report the results of the different models described in the theoretical framework section (see Table 2). The first two columns report the results of the standard Oaxaca and Blinder (1973) decomposition when the average female salary and the average male salary are used as 'reference' salary respectively. As it is to be expected, the unexplained part is higher when the higher salary (i.e. the male one) is used as 'reference'. The third and fourth columns report the results of the Reimers and Cotton 'weighted average' approaches. In the case of full-time employees the two methods give very similar results as the percentage of female employees (reported in brackets in the fourth column) is close to 50% (in which case Reimers and Cotton would give exactly the same results). The Neumark approach gives consistently lower figures than all the other models.

Table 5: Unexplained part of gender gap in % (percentages of unexplained gaps only)[2]

a) Full-time Employees

Year	Oaxaca and Blinder $\overline{X}_f$	Oaxaca and Blinder $\overline{X}_m$	Reimers	Cotton	Neumark
1997	74.4	85.2	76.6	76.5 (0.476)	71.0
1998	74.9	78.8	77.2	77.1(0.471)	71.7
1999	75.1	79.5	77.9	77.7 (0.469)	73.5
2000	78.1	80.7	79.6	79.5 (0.478)	75.8
2001	80.9	81.1	83.5	83.4 (0.479)	79.1
2002	84.3	86.0	86.7	86.6 (0.477)	82.0
2003	83.7	89.2	85.0	84.9 (0.459)	79.6
2004	78.5	83.4	80.9	80.7 (0.454)	76.4
2005	79.3	84.6	82.0	81.7 (0.449)	77.6

b) Full-time Employees – Only Academic

Year	Oaxaca and Blinder $\overline{X}_f$	Oaxaca and Blinder $\overline{X}_m$	Reimers	Cotton	Neumark
1997	39.6	52.8	46.2	49.1 (0.752)	41.7
1998	44.1	56.0	50.0	52.7 (0.721)	45.7
1999	47.7	48.7	48.2	48.4 (0.721)	42.2
2000	52.9	42.2	47.6	45.3 (0.725)	40.8
2001	53.2	45.1	49.2	47.6 (0.717)	42.7
2002	48.3	42.4	45.4	44.4 (0.712)	39.0
2003	42.8	43.5	43.2	43.3 (0.688)	36.9
2004	60.3	60.2	60.3	60.2 (0.661)	54.3
2005	59.9	63.0	61.5	61.9 (0.637)	54.4

What is clear from these results is that restricting the analysis to the 'academic only' population, the part of the pay gap explained by individual and subject characteristics increase noticeably: from around 20-25% to around 50% on average. This is in line with expectations as the population of academics is a lot more homogenous that the overall population of full-time employees. This also tells us that most of the gender pay gap is not due to pure discrimination between individuals doing similar jobs, but rather to the fact that women perform jobs which, on average, are less qualified and

[2] For brevity we decided to report only the percentages of unexplained gaps. Full calculations are available from the authors.

less remunerative. In other words, there is still a very clear 'crowding effect' of women into administrative/secretarial type of position and this is clear even when restricting to the higher education sector. It cannot be argued that non-academic positions offer more flexibility for part-time working to rear children, as our sample includes only full-time positions.

Once we move to the academic sample, the extent of the unexplained pay gap moves from around 40% to just above 60% according to the different methods and different years used. Although nine years are not enough to positively identify a 'trend', it is worth observing some short-term phenomena, which might be representative of a longer-term trend. Surprisingly, the unexplained part of the gender pay gap seems to increase over time rather than decrease and this is true especially for the academic population. As women move up the ladder and get promoted to more senior positions, the unexplained part of the gender gap seem to widen rather than getting narrower. One could argue that, because professorial salaries (at least in the period analysed) were not linked to a specific pay scale, but rather contracted on an individual basis, this contracting process might have penalised (for whatever reason including female contracting abilities) female academics. Certainly, more research is required on this point to draw a positive conclusion.

The widening of the unexplained part is partly true also for the population of full-time employees as a whole with values over 80% in the period 2001-2003, but this seems to have partially reversed in the last two years of the sample and it would be interesting to monitor the phenomenon to see whether this will continue in the future or it is just cyclical.

4.2 Decomposing the gap by individual characteristics

In the previous section we showed that the Neumark decomposition, which is the more sophisticated one, it is also the one which explains the largest part of the gap. This section, therefore, discusses in more details the results obtained using this approach. Tables 6 and 8 present a decomposition of the 'explained' part of the gap by 'component'. Results have been converted in pounds, so that each line represents the gross premium (in £) from significant components of the explained part of the gap for all years. Table 6 summarises the results when all full-time employees are included, while table 8 focuses specifically on the full-time academic population. The

variables presented are the significant ones, age (and age squared) are proxies for 'general' experience whereas TimeUni is 'specific' experience at the current institution. The first thing to note is that the decomposition for the whole full time staff leaves a much bigger proportion of the gap unexplained suggesting, as discussed above, that women 'cluster' themselves in jobs which, on average, are less qualified and less remunerative. Table 7 assesses the extent of this 'crowding effect' (see for instance Solberg and Laughlin T. 1995) of women into administrative/secretarial type of position.

Table 6: Decomposition of the explained part of gender gap: gross premium in £ to males (+) and females (-)

ALL FULL TIME	1997	1998	1999	2000	2001	2002	2003	2004	2005
Gender Gap (% of male av. salary)	**5,136.5 (23%)**	**5,598.1 (25%)**	**6,341.0 (27%)**	**6,416.3 (26%)**	**5,757.9 (22%)**	**5,839.1 (21%)**	**5,737.5 (20%)**	**5,427.2 (18%)**	**5,741.7 (19%)**
Explained Part: (% of gap)	**1,469.5 (29%)**	**1,584.2 (28%)**	**1,680.7 (26%)**	**1,552.7 (24%)**	**1,203.4 (21%)**	**1,021.8 (17%)**	**1,160.0 (20%)**	**1,271.8 (23%)**	**1,266.0 (22%)**
Age	-476.4	-404.6	-277.3	-582.3	-808.1	-467.1	-564.7	-313.3	-170.8
Age^2	670.9	569.2	456.8	813.3	904.7	379.5	482.5	230.4	50.24
TimeUni	932.7	960.2	1020	859.6	737.8	788.3	883	774	723.5
UK	-13.42	34.29	106.04	92.43	17.57	0	0	9.21	10.05
White	120.8	75.4	48.9	83.2	52.7	-19.5	112.9	239.6	261.2
Permanent	13.4	6.9	-65.3	-64.7	-35.1	-29.2	-92.4	9.21	0
Subjects:									
Math, Physics, Meteo	127.5	192.0	228.4	240.3	210.8	243.3	225.9	230.4	231.1
Psychology	-20.1	-27.4	-24.5	-27.7	-26.3	-38.9	-41.1	-27.6	-20.1
Linguistics, Languages	0	0	0	0	-17.57	-19.46	-10.27	-18.43	-10.05
Engineering	73.81	109.73	114.2	120.1	131.8	136.2	112.9	101.4	130.6
English	0	-6.9	8.2	0	0	0	0	0	10.1
Business	53.7	75.4	65.3	18.5	35.1	48.7	51.3	36.9	50.2

The explained part of the gap is quite small, and suggest that there is a premium to women from age (table 7 below shows in fact that they are on average older). Experience both per se and at the university gives instead a premium to men, whereas no discernible trends exist for being British, white and with a permanent contract. The effect of different subjects is as expected, with the sciences giving a premium to men

and the humanities to women, reflecting the composition of staff by gender in these areas.

Table 7: Crowding, age and contract type

	Female Admin. Staff		Male Admin. Staff		Average Age (All FT)		% Perm contract (ALL FT)	
	No.	% over female staff	No.	% over male staff	Females	Males	Females	Males
1997	556	69.67	719	49.25	49.46	48.14	69.10	68.41
1998	572	70.18	713	48.54	48.79	47.52	67.50	67.16
1999	624	71.31	725	49.56	48.05	47.52	61.50	64.80
2000	628	71.77	748	52.05	48.21	47.17	60.22	64.47
2001	559	67.35	699	50.47	47.28	46.15	63.02	64.91
2002	551	64.00	665	48.90	46.56	46.12	65.87	67.12
2003	571	63.66	625	48.75	46.00	45.49	66.85	70.44
2004	564	64.16	626	49.49	45.29	44.96	71.37	70.74
2005	591	67.47	629	51.18	44.71	44.53	71.62	71.64

Table 8: Decomposition of the explained part of the gender pay gap (Academic Full Time staff only): gross premium in £ to males (+) and females (-)

ACADEMIC FULL TIME	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Gender Gap (% of male av. salary)	**4,905.1 (17%)**	**5,087.1 (18%)**	**5,922.2 (19%)**	**6,275.7 (19%)**	**6,583.4 (20%)**	**7,012.02 (20%)**	**7,193.14 (20%)**	**6,507.66 (17%)**	**6,340.96 (16%)**
Explained (% of gap)	**2,859.9 (58%)**	**2,744.9 (54%)**	**3,383.4 (57%)**	**3,715.4 (59%)**	**3,796.6 (58%)**	**4,292.8 (61%)**	**4,463.4 (62%)**	**2,996.2 (46%)**	**2,891.8 (46%)**
Age	2,025	1,619	3,085	5,356	4,489	5,703	4,387	1,476	2,959
Age^2	-1,900.5	-1,460.3	-2,706.6	-4,825	-4,011	-5,457.3	-4,361.4	-2,079.6	-3,115.6
TimeUni	834.8	457.4	477.6	579	310.4	735.5	1,116	1,319	694.9
UK	35.52	35.19	39.80	24.12	71.63	73.75	25.36	67.08	134.49
White	0	0	0	0	0	0	0	22.36	0
Perm	1,705.2	1,759.4	2,189.1	2,412.5	2,650.1	2,679.5	2814.61	2057.20	1681.09
Subjects:									
Math, Physics, Meteo	35.52	70.38	79.61	120.62	167.13	319.57	329.64	223.61	224.15
Psychology	106.57	158.35	179.11	24.12	-23.88	98.33	177.50	22.36	201.73
Linguistics, Languages	-17.76	-17.59	0	0	0	-7.01	0	-67.08	-44.83
Engineering	-17.76	35.19	19.90	-24.12	95.50	98.33	-76.07	-67.08	89.66
English	0	0	0	24.12	23.88	0	0	0	0
Business	53.29	87.97	19.90	24.12	23.88	49.16	50.71	22.36	67.24

Women/men ratio by subject academic staff only

ALL FULL TIME	1997	1998	1999	2000	2001	2002	2003	2004	2005
Math, Physics, Meteo	15/86	15/98	16/98	16/95	17/91	21/102	16/94	26/103	26/96
Psychology	18/18	18/18	19/18	24/20	24/16	25/14	29/16	27/17	22/15
Linguistics, Languages	22/35	21/34	21/34	18/34	21/28	26/24	22/19	23/19	21/16
Engineering	18/96	19/90	15/83	16/77	18/86	22/86	23/80	16/71	17/81
English	12/16	12/14	10/14	11/14	12/15	14/16	14/17	14/18	12/20
Business	9/48	6/54	9/49	11/47	13/48	14/51	21/50	21/49	19/51

The gap itself is not very different amongst academics, tough it constitutes a smaller proportion of the average male wage. The part of the gap explained by our variables is much higher amongst academics since they are obviously more homogeneous in terms of qualifications and type of work than the whole university staff. Age and time at the university give a premium to men, whereas experience gives a premium to women, reflecting the relatively more recent incorporation of women in the academic sector compared with the rest of the university.

Conclusions

We have decomposed the pay gap at an academic institution using the standard wage decomposition techniques and found gaps and explanations in line with the literature on the subject. To reiterate, specific caveats to our study include: the absence of a measure of efforts (workload models are only starting to be implemented, no access to self reported staff time use surveys), which would help to see whether slower women progress is associated with being assigned jobs which hinder their career progression; and lack of output measures (the RAE information is not by person), which does not allow to connect effort to rewards. The differentials found in the date could be explained by different effort, by task segregation, by discrimination in the promotions process. A general caveat also applies in that the literature has shown that money wages are a very incomplete indicator of total compensation (Blau and Kahn, 2000). Given the paucity of information available on our sample and the difficulty of not being able to follow careers through time, our main contribution has been to focus instead on the different results produced by using different wage decomposition methods. An important note of caution can be drawn from our estimates and it is that

decomposition methods do matter as they lead to considerably different results (in some cases the difference being over 10%). This means that reporting different results is a must to accurately inform public policies on the subject.

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