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PAY AND JOB RANK AMONGST ACADEMIC ECONOMISTS IN THE UK: IS GENDER RELEVANT?*

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Abstract

This article presents and explores a rich new data source to analyse the determinants of pay and job rank amongst academic Economists in the UK. Characteristics associated with individual productivity and workplace features are found to be important determinants of the relative wage and promotion structure in this sector. However, there is also a substantial unexplained gender pay gap. Men are considerably more likely to work in higher paid job ranks where there are also substantial within-rank gender pay gaps. We show that the nature of the gender pay gap has changed over the last two decades; but its size has not, suggesting a role for suitable policy intervention.

Key words: gender; pay-gap, academia, economist.

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1. Introduction

The participation of women in UK academic Economics has changed dramatically in the last twenty years. Comparison of balanced samples for 1996 (Mumford, 1997) and 2016 (Tenreyro, 2017) shows that the proportion of this workforce that is female increased from less than one-in-six in 1996, to more than one-in-four in 2016. Women have improved their relative representation in all job ranks over the two decades: from 17% to 35% of the Lecturers; 10% to 26% of the Readers/Senior Lecturers/Associate Professors; and from only 4% to 16% of the Professors. Canada, America, and Italy have also seen similar trends (see CWEN, 2015; CSWEP, 2017; and Corsi *et al*., 2016, respectively).

Despite these gains, women are still comparatively rare amongst academic Economists. As a discipline, Economics nestles amongst the Science, Technology, Engineering and Mathematics (STEM) disciplines on gender representation comparisons. Ceci *et al*. (2014) show that for the USA in 2011, the percentage of females amongst tenure track academics in Economics was higher than in Engineering and the Physical Sciences but below Maths and Computer Sciences, and only some half of that in Geoscience. With female Economists encountering substantial gender gaps in promotion to tenure (Ginther and Shilamit, 2004) and across the job ranks (McDowell *et al*., 2001; Bandiera *et al*., 2016).

The relative under representation of women in academia has been addressed in a series of reports investigating the status of women faculty in high prestige institutions, especially the early MIT study (MIT, 1999) and subsequent studies at the California Institute of Technology (Sargent, 2001); Duke University (Keohane, 2003); and MIT (MIT, 2011). These studies explicitly include discussion of voluntary reforms aimed at improving gender equality such as greater awareness of unconscious bias, more equal access to resources, increasing female promotion rates and ensuring female participation in governance. It is not clear, however, that voluntary programs have been responsible for increased female participation, for example, Gregory-Smith (2018) considers the vanguard Athena SWAN positive action program in UK medical schools and finds no direct participation effect.

A pertinent empirical outcome measure of relative equality in the academic labour market is the gender pay gap. Ward (2001), in her study of academic pay in Scotland, provides a useful survey of early national studies. She concludes that evidence of gender differences in salary is typically found although comparisons are difficult due to inconsistent approaches. In

probably the first empirical study for Britain, McNabb and Wass (1997) find a raw (unconditional) gender pay gap for academics of 15% for 1992. They have a limited range of explanatory variables (especially for productivity) but argue some two thirds of this gap can be explained. When matching job ranks with McNabb and Wass (1997), Ward (2001) finds an unconditional gap of 15% with a gap conditional on explanatory variables of some 3%. An early within-institution study of gender salary differences is provided for Princeton where an unconditional gender pay gap at the mean of 18% is found across all faculty in 2002, and a conditional gap of 8% once measures of experience and accomplishment are included (Tilghman, 2003). A recent (2015) institutional study at the LSE finds an unconditional gender pay difference amongst academics of 16.5 log percentage points (lpp) and a gap of 10.5 lpp after controlling for age, experience and research productivity (Bandiera *et al*., 2016).

It may be argued that women choose to work in low paying disciplines (Ceci *et al*., 2014), implying that aggregate (across discipline) studies will generate a spurious gender pay gap in favor of males. Discipline specific studies of academic salaries attempt to address this concern. Ginther and Hayes (2003) use data from the 1977 to 1995 waves of the US National Science Foundation (NSF) longitudinal Survey of Doctoral Recipients (SDR) for academics in Humanities disciplines. They find an unconditional gap of around 15 lpp across most of this time period with a conditional gap of some 5 lpp in 1977, declining to zero in 1985, and remaining small and insignificant thereafter.

Connolly and Holdcroft (2009) provide a rare study for the UK, they find a gap of 17% for UK academics in Medicine in 2006, with close to half of this gap explained (by age, experience, career breaks, and high profile job role). Bentley and Adamson (2003) provide a survey of studies amongst academic Scientists and Engineers. They find, subject to caveats on different approaches and data sets, that conditional (unexplained) gender gaps typically sat in the range of 12 to 21% in the 1960s; 5 to 14% in the 1970s and 1980s; with very few studies reporting significant gaps from the 1990s. This decline is argued to be partly due to improved explanatory variables but may also reflect greater equality in pay setting over time (Ginther and Hayes, 2003). Tao (2018) uses five waves of NSF SDR data (2003, 2006, 2008, 2010, and 2013) to extend the analysis of academic salaries in Science and Engineering. She finds unconditional gaps increase slightly from 14 to 17% but conditional gaps remain stable over the time period at 4 to 5%. Tao (2018) concludes that conditional (unexplained) gender pay gaps for STEM academics are now relatively low and are continuing to decline over time.

Studies focusing on the gender pay gap for academic Economists are rare. Blackaby *et al. (*2005) use a 1999 national survey of pay amongst academic Economists in the UK and find an unconditional gender salary difference of 17.7 lpp and a conditional gender pay gap of 9.4 lpp. Ceci *et al*. (2014) compare unconditional (raw) gender pay gaps for Associate and full Professors in the US in 1995 and 2010 for eight disciplines (Economics, Engineering, Geoscience, Life Science, Mathematics and Computer Science, Physical Sciences, Psychology, and Social Sciences). Strikingly, they find that there was only one significant decline in the relative pay of women over this time period; the gender pay gap for full Professors in Economics which rose from 5% in 1995 to 25% in 2010.

As with many developed countries (Blau and Kahn, 2017), the UK has introduced a range of equal pay legislation (Dickens, 2007) and seen a substantial decrease in gender pay differences across its national workforce in recent years. In UK academia, the voluntary Athena SWAN (AS) Charter was established in 2005 to advance the careers of women working in in STEM disciplines in Higher Education[1]. In May 2015, the Charter was broadened to recognize work undertaken in all disciplines. The mean UK full-time unconditional gender pay gap has fallen from 21% in 2004 to 18.7% in 2011; and further to 16% in 2015 (Butcher *et al.,* 2017; page 36). We might expect to see a fall in the gender pay gap amongst academic Economists in the UK as well.

Contemporary studies of the relative position of women in academia tend to provide detailed analysis of what may be considered components in the determination of salary. For example, gender differences in the production and recognition of quality (Sarsons, 2017) and/or quantity of research publications (Aiston, 2014; Joeks *et al.,* 2014; Eagan and Garvey, 2015; Krapf *et al.,* 2017); marriage and promotion (Mason *et al.,* 2013); applying for, and being awarded, research grants (Marsh *et al.,* 2011); and mentoring and career progression (Blau *et al.,* 2010). However, these studies do not include direct information on salaries.

A snapshot of recent research providing examples of differences in the way male and female economists are trained, supported and critiqued was presented at the 2018 American

[1] The STEM Equity Achievement (SEA Change) program is a similar incentivising awards-based program currently being developed in America (see https://www.aaas.org/news/sea-change-program-aims-transform-diversity-efforts-stem).

Economic Association (AEA) meetings. Stevenson and Zlotnick (2018) find that women are greatly underrepresented in leading introductory Economics textbooks, with women receiving less than a quarter of gendered mentions. We might expect economists trained from these texts to stereotype the genders differently in the discipline. Porter and Serra (2017) find that female Economics students are particularly sensitive (to even a single 15 minute exposure) to a positive female role model in their introductory lectures; those with such exposure to a role model are twice as likely to continue into intermediate classes (see also Avilova and Goldin, 2017). Wu (2017) explores anonymous contributions to the Economics Job Market Rumors (EJMR) forum and finds evidence of gendered stereotyped language for women; participants are more likely to deviate from an academic focus when women have been mentioned; and women are 45% less likely to occur in an Academic/Professional thread and more than twice as likely on an Personal/Physical thread than men. Hengel (2018) finds that peer reviewers are considerably more demanding of female contributions to leading Economics journals resulting in a six month longer review process for women. The behaviours demonstrated in these studies are consistent with an environment where it is very possible for academic Economists with the same characteristics to be rewarded with different pay according to their gender.

In this paper, we return to consider gender pay differentials for academic Economists, across institutions, at a national level. We introduce and employ a particularly rich source of new data generated by the authors from surveying academic Economists in 2016, collecting information on individual characteristics and on the workplaces they are employed in. These data are further combined with institutional information collected from the Royal Economic Society (RES) Women's Committee Surveys to explore the current determinants of pay and job rank for academic Economists in the UK.

The data are described in section 2 of the paper; section 3 discusses the estimation of the earnings function; decomposition analysis is presented in section 4; the probability of being in different job ranks is explored in section 5; changes in the gender pay gap over time are considered in section 6; and section 7 presents conclusions.

2. The 2016 survey data

Data Collection and the Structure of Pay

Information was gathered by the authors from an online survey emailed to individual academic staff members via their Heads of Department or similar department contact between February 26 and March 28, 2016. Contact details for the Heads of Departments were obtained from CHUDE (the Conference of Heads of University Departments of Economics). CHUDE was established by the Royal Economic Society (RES) in 1987 in collaboration with the Association of University Teachers of Economics. The individual staff member's responses were collated automatically via the survey software (Qualtrics) in an anonymised manner. Hard copies of the survey were also circulated at the 2016 Royal Economic Society Conference (March 21-23, 2016. In total, there were 668 responses, however, many had little or no information and may have been accessed to simply look at the questionnaire rather than to participate in the survey. There were 543 responses providing information on job rank. Given missing information on other variables of interest this allowed for the estimation of job rank with 526 observations. There was a substantial reduction in the number of respondents who provided salary information; 383 did, allowing for the estimation of wage regressions with 367 observations.

Supplementary institutional information is collected from the RES Women's Committee Survey (Mitka *et al.,* 2015; Tenreyro, 2017). The Women's Committee Survey harvests information from CHUDE listed university department webpages on the individual academic staff by grade of employment and gender. These survey entries are then emailed biennially to respective institutions for verification. The data used in this paper is clustered at the institutional level; all of the empirical analyses presented throughout are consequently adjusted for this potential intra-group correlation (Mouton, 1990; Cameron and Miller, 2015).

The Women's Committee Survey 2016 (Tenreyro, 2017) suggests there were 2077 workers across the entire UK academic Economics workforce in 2016. This would imply a total response rate for our survey of 32.7% (668/2077) with a useable response rate of 26.1% (543/2077), falling to 18.4% for those providing salary information. Online surveys have been found to typically have 11% lower response rates relative to traditional survey modes (Manfreda *et al*. 2008) although response rates tend to be higher for surveys directed at specific audiences, such as Professional Associations (Vehovar and Manfreda, 2017), and online surveys usually have lower measurement errors, particularly on sensitive topics such as income or earnings (Tourangeau *et al*. 2013). The only other survey that has been sent to individual UK academic economists was also sent to the CHUDE list of Heads of Departments to distribute to individual department members in 1999 (Blackaby and Frank, 2000). Of the 1600

hard copy surveys distributed, 516 individuals completed the survey, a response rate of 32%; their job-rank analysis is for 452 individuals (implying a response rate of 28.3%). The 1999 data are subsequently used in Booth *et al.,* 2005 to explore gender pay gaps; they include information on 351 individuals (or a response rate 21.9%) in their earnings estimations. These comparisons suggest the 1999 and the 2016 surveys have similar response rates, that are also consistent with response rates for other surveys of this type (Vehovar and Manfreda, 2017; see also Hamermesh, 2018).

There are concerns that the sample does not fully reflect the population. This concern is obvious in two main places. First, females make up some 43% of our total sample; however, Tenreyro (2017) found the proportion of the UK academic Economics workforce that is female is only 28%. Second, a little over a third of our sample are Professors, 42.3% of the men and 28.7% of the women. Tenreyro (2017; Table 1) found 25.5% of the workforce were Professors, 29.9% of the men and only 14.2% of the women. There is clearly an overrepresentation of Professors, especially female, in our sample. The sample accordingly has some underrepresentation of Lecturers amongst the women (Tenreyro found 31.8% of women were Lecturers, we have 24.2%) and an underrepresentation of Researchers amongst the men (12.2% in Tenreyro, 8.6% in our sample). Respondents were informed that they were being surveyed to "find out more about the working lives of academic Economists in the UK". It may be that the respondents have a greater awareness of, and greater commitment to, gender equity issues, and that this is especially so for senior females. Their greater concentration in the sample may have implications when extrapolating our findings to the UK academic Economist population. For example, having disproportionately more higher paid women in the sample may suggest the gender pay gap is lower than it is for the population of academic Economists.

One compensation for the over representation of female Professors in the sample is the inclusion of a reasonable number of observations in the analysis as there are 45 female Professors in the sample (54% of the potential population, Tenreyro 2017). In contrast, Blackaby *et al. (*2005) could include only 7 female Professors in their analysis, although this was also 54% of their potential population.

The measure of annual salary is the current gross full-time equivalent wage for the main job, including all salary components such as bonus payments, additional increment payments, and weightings (e.g., the London weighting). The majority of this workforce is on a seniority

based incremental pay structure. The University and College Union (UCU) publishes a recommended 50 point pay spine, however, the pay ladders for job ranks are not uniform across institutions. Professorial salaries are not on this pay spine and are instead negotiated between the individual and institution. Bonus payments, whilst not rare, are also not uniform across UK universities. Of the Russell group universities with the two highest published gender pay gaps across their entire workforces (Durham with a 29.3% gap at the median and Warwick with 23.4%); Durham has only 1.6% of males and 2.15% of female employees receiving bonuses whilst Warwick has 22% of males and 27% of females (https://gender-pay-gap.service.gov.uk/). On average, the UK academic Economists in our sample earn a full-time equivalent gross salary of £55,389 at the median in their main job: males average £60,000 and females average £52,000. This implies a raw gender pay difference of 15.4% at the median (or 21% at the mean).[2]

Most authors adopt the human capital model as the theoretical basis for the earnings function (Becker, 1974; Mincer, 1975). This approach will also be used here. It is assumed that wages increase with measures related to individual productivity: own education; research output and funding; and teaching excellence. The earnings function is augmented with the addition of further categories of explanatory variables including: demographic variables which may constrain an individual's choice of jobs (having children, marital status, ethnic identification, and age); workplace characteristics that are common to all workers in that workplace (working in a stronger research department, regional location, the percentage of women in the department, working in an Economics department within a Business School) and workplace characteristics that are provided by the workplace but can vary across employees within that work location (workplace network available, mentoring, if the workplace is perceived to be cooperative, or if the workplace is perceived to be competitive); and a range of variables loosely reflecting the individuals response to the labour market (being an external appointment, having a career break, working part-time, and attracting outside job offers).

Individual Characteristics

[2] Summary statistics and variable definitions are provided in Appendix Table A1 (column 1 for the pooled sample, column 2 for men, and column 3 for women). Summary statistics for the sample used to analyse job rank are provided in Online Annex Table OA1, the average characteristics are very similar to those reported for the earnings sample in Table A1.

Beginning with the demographic variables, the great majority of this workforce classify themselves as white (86%), and they are relatively young with an average age of 45. There is a difference in the age distribution for men and women, women are more likely to be aged below 50 (75% of the women compared to 63% of the men). As discussed above, there are incremental salary steps within many of the job ranks in different institutions and, whilst there is clearly not a one-to-one relationship between age and academic job-rank, it is important to control for age accordingly. Age may also be reflecting productivity-related skills accumulated on-the-job when a measure of actual work experience is not included in the earnings function. Although, Oster and Hamermesh (1998) argue Economists are more productive when they are younger and closer to completing their PhD. We do not have a reliable measure of actual, or post-PhD, work experience further complicating the interpretation of the relationship between age and salary.

Three quarters of these academics are married (by which we mean married or living together) and more than half have children. The women are less likely to be married and less likely to have children. If women believe they will be primarily responsible for childcare after marriage they may be less willing to incur the necessary investment expenditures for entering this occupation (Becker 1985; Summers 2005). There is considerable evidence that women in the STEM disciplines are more likely to leave academia, especially during the main childbearing years (Connolly and Fuchs, 2009). Gunther and Kahn (2004) argue that the 'leaky pipeline' effect for Economists is only slightly more common amongst women than men, and would result in a tendency to underestimate gender differences in promotion. For those who have chosen to enter and stay in academia, the empirical relationship between academic salary and being married and/or having children is not clear. For example, Mason *et al. (*2013) find having children has a negative association with female academic career progression but is positive for males. Ginther and Hayes (2003) establish a positive and significant promotion effect from having children for men; they find married women and mothers are less likely to be promoted. In contrast, Wolfinger *et al. (*2008) argues being a parent increases the likelihood of achieving tenure, regardless of the gender of the parent.

Considering the measures expected to be positively associated with individual productivity and earnings, 62% of the total sample has a first class undergraduate degree[3] (more so for females than males). Males are more likely to have a PhD (92% compared to 82% of the women), and to consider themselves to be better teachers. Respondents were asked to evaluate their teaching according to how their students typically rate the quality of their teaching. There is now a substantial literature suggesting that students display bias against female academics when evaluating teaching (see Mengel *et al*., 2018). This may be reflected in the lower average reported by females in our sample statistics (19% of men report they are excellent teachers, whilst 16% of the women do). Females are considerably more likely to have been awarded more than £100,000 in externally funded research grants in the previous 5 years (35% relative to 24% for the men). Individuals were asked to provide a REF (Research Excellence Framework) style publication score for each of their career best three publications (ranging from zero to four), these were averaged into a single mean value. Women report a lower average REF style score (self-reported over their three publications) than men.

It is important to explicitly include productivity measures in the empirical analysis not least because there is a mixed literature on the relationship between gender and research productivity of academics. Many recent studies find no gender differences (European Commission, 2011; Marsh *et al.,* 2011; Aiston, 2014; Eagan and Garvey, 2015). In contrast, Krapf *et al. (*2017) find no relationship between research productivity and fatherhood, but a loss of between 2 to 4 years of research output for mothers (of two or three children). We do not have a measure of citizenship. Babcock *et al.* (2017) argue that women are more likely to take on citizenship type roles that help the collective but are associated with a lower probability of promotion. We might expect including a citizenship measure would lower the estimated conditional gender pay gap, although we note that differential acceptance of these roles may itself reflect gender stereotyping.

Workplace Characteristics

The workplace variables can be divided into those that are constant across all workers in that workplace; and those that are associated with the workplace but can vary for different individuals working in that location. Starting with the workplace characteristics which are

[3] Holds a first class UK undergraduate degree or has a grade point average in the top decile if holding an overseas undergraduate degree.

constant for all those working in that location, women are considerably less common in the lower ranked REF departments (those in the lowest quartile of the REF 2014 score distribution) and they are slightly more common in the highest ranked REF departments. Women are also more likely to work in the "old" universities (those that were awarded their charter prior to the substantial movement of former Polytechnic and Central Institutions into the university sector in 1992). It is not obvious that old universities are offering benefits, such as family friendly work place practices, that might be more attractive to women. Epifanio and Troeger (2013) do not find a pattern in the availability of maternity leave or child care provision by the size, research intensity or financial resources of Higher Education Institutions in the UK. Nevertheless, we might expect the higher ranked research departments and the old institutions to provide more facilities which are in general conducive to academic performance and for earnings to be higher on this basis.

Women are also more likely to work with other women (or, alternatively, in a more feminised workplace) than are men. The percentage of females in the workplace is taken from the RES Women's Committee survey data for 2014 (Mitka *et al.,* 2015), this avoids potential difficulties extrapolating from our sample when calculating this measure. Using this institutional measure, the men in our sample are typically working in a workforce that is 23% female whilst for women this value is 28%. Working in a more feminised workplace is commonly associated with lower salaries (Groshen, 1991) and is often argued to be linked to over-crowding and a decrease in bargaining power (Babcock and Laschever, 2003; Leibbrandt and List, 2015). Some 17% of the Economists are based within Business Schools; 20% of the males and only 14% of the females and most (79%) of the UK academic Economists work in England (60% excluding London). Women are more likely to work in London and in Scotland than are men. A positive relationship between working in London and earnings is expected not least because universities provide a London weighting (an additional salary component to partially compensate for the higher costs associated with living in London).

Considering the within workplace variables, men are more likely to report that there are networks in their workplace they can use for advice concerning professional advancement (62% of the men compared to 55% of the women). However, some one in five of either gender respond that they have "never had an effective mentor for work related advice". As Sandberg (2016, page 70) argues, an effective mentor does not need to be a formally assigned mentor, and low earners may be less likely to recognize unofficial but effective mentoring. The

relationship between mentoring and salary is not clear in the literature (Quinn, 2012) although we might expect a positive relationship in the long run for early career researchers and students (Blau *et al.,* 2010; Avilova and Goldin, 2018). It would seem that there are unofficial support processes in these workplaces that, whilst relatively commonly available, are operating more inclusively for men than women. Women may be less willing to seek out mentoring or networks if they lack confidence in their relative abilities and/or fear being judged harshly. Women in our sample are considerably more likely to report that they feel their workplace is competitive or very competitive (49% relative to 39% for the men). Neiderle and Versterlund (2007) argue that, even with equal ability and productivity, women are more likely to shy away from competition than men are. They argue that this gender difference is due to men being overconfident in their own abilities and women preferring non-competitive work environments. Interestingly, both genders in our sample report a similar average for believing their workplace is cooperative or very cooperative (40% of the men and 38% of the women). Cooperation, or active recognition of mutual advantage, has long been associated positively with productivity in the labour economics literature (Mas and Moretti, 2009) and increasingly so amongst behavioural economists (Bruni and Sugden, 2013).

Turning to the remaining variables loosely grouped together as labour market related, 46% of men and 44% of women have received an outside job offer in the previous five years and men are more likely to have been appointed from an external position (50% versus 41%). These outcomes may be due to many factors (Leibrandt and List, 2015), including the males being on average older and in more senior ranks (Artz *et al.,* 2016). We will return to consider these issues more fully in the analysis below. One in ten of the workforce currently works part-time, and this is much the same for men and women. Whilst we do not have strong priors on the relationship between part-time employment and full-time equivalent earnings in this sector, previous studies suggest a bimodal relationship across the British economy with high and low skill employees choosing to work part-time (Mumford and Smith, 2009).

3. Estimating the earnings function.

There is an enormous literature examining the gender wage differential in the context of the human capital model developed by Becker (1975) and Mincer (1974). Following in this literature, using semi-logarithmic wage equations, we estimate the earnings equation as:

$$W_{il} = X'_{il}\beta_l + \varepsilon_l,\ E(\varepsilon_l) = 0,\ l \in (m, f, p) \qquad (1)$$

where W_i is the natural log of the wage, W, for individual i in group l; X_i is a vector of predictors

and a constant; ε_i is a residual term; and m represents male; f female or p pooled group membership. We begin our analysis with pooled wage equations for men and women (Neumark, 1988). An indicator variable identifying male group membership is included in the pooled model. Estimating the earnings function using ordinary least squares, and allowing for clustering at the institutional level throughout, the results are presented in Table 1.

[TABLE 1 AROUND HERE]

Pooled Models of Pay

Column 1 of Table 1 shows the unconditional gender wage gap to be 15.05 lpp, there are 367 observations in the regression, and the goodness of fit (in this case, the adjusted R-squared) measure is low at 2.4%. Additional categories of explanatory variables are added to the model from column 1 to column 3 of Table 1. Model 2, adds the individual productivity measures, the conditional gender pay gap becomes 12.3 lpp and the model fit improves to 29.7%.

Model 3, in column 3, presents our benchmark model including demographic, individual productivity, workplace, and labour market related characteristics; the conditional gender pay gap is 12.7 lpp and the measure of fit increases considerably to 53%. Considering the results in more detail, no significant relationship is found between earnings and ethnicity or having children. We find a small, but statistically insignificant, marriage premium of 3.6 lpp. Age is found to be positively linked with earnings, an extra year of age is associated with a 3 lpp pay rise on average. As discussed above, it may be that males and females have different relationships between their demographic characteristics and earnings, especially being married or having children. We will consider possibilities of this type more fully with gender specific analysis below.

Having a first class degree, a higher REF style publication score, or being awarded more than £100,000 of research income in the previous 5 years are all positively associated with higher earnings. The relationship between having a PhD and earnings is also positive but not statistically significant. The size of these relationships are also notable, for example, recent large research grants are associated with a 21 lpp higher salary. A negligible, and insignificant, association with earnings is found for being an excellent teacher.

Amongst the workplace constant variables, working in a top quartile REF ranked department and working in an old university are both positively associated with higher earnings as expected, although the relationship with old universities is not significantly different from zero. The strong regional effect associated with working in London relative to the omitted "other England", is not surprising as these universities provide a London weighting. However, the relative size of this effect is more than twice what we would expect from just the UCU recommended London weighting. The percentage of the departmental workforce that is female is negatively and insignificantly associated with salary and working in a Business School environment has a small (2 lpp) but insignificant pay premium.

Of the within workplace characteristics, a substantial negative and significant relationship is found between having a professional network available in the workplace and earnings. We might expect networks to improve output and wages. It may instead be that academic economists are encouraged to join workplace networks in response to their having a low wage or that those with lower wages are self-selecting into a network at their workplace. None of the other within workplace variables are found to be important in either size or significance; this is true for having never had a mentor or believing the workplace environment is cooperative (or competitive).

Finally, considering the labour market related variables, being an external appointment is associated with 6.4 lpp less pay, this variable may be capturing short job tenure, and it may also reflect a lack of willingness of previous employees to keep the staff member. In contrast, having received a recent outside job offer is strongly significantly related to a 12.9 lpp increase in earnings. We do not find a part-time pay penalty, however, this may be partly due to the dichotomous nature of the job ranks using part-time employment amongst academic economists; part-time employment is more common amongst Researchers (21%) but also amongst the Professors (13.4%).

Gender Specific Models

Results from gender specific estimation of Model 3 (benchmark model) are provided in columns 1 (for females) and 2 (for males) of Table 2. There are not many statistically significant differences across the genders, which might be expected given the comparatively small sample sizes (157 women and 210 men). For example, the return to age is considerably larger for men than women, however, the difference is not statistically significant.

Nevertheless, there are some interesting findings. Amongst the demographic characteristics, we find no marriage premium for women, however, marriage is associated with a 13 lpp pay premium for men. This is consistent with the finding of Greenhalgh (1980) who found a 10% marriage premium for males in Britain. Korneman and Neumark (1991) provide a survey of early findings and argue that married men are more likely to receive higher performance ratings than single men, and that this is in turn associated with more rapid promotion and higher earnings (see also Mason *et al*., 2013).

Considering the characteristics associated with individual productivity, the patterns across the genders are not uniform. Women receive lower returns from having a first class degree or a PhD and a larger return from higher quality publications, although these coefficients are not significantly different. Recent large research grants are strongly positively associated with higher earnings for both genders but the extent of this effect is more than twice as large for women as men. This is not influenced by the award of these grants being scarcer for women, indeed, these grants are more commonly awarded to women than men in this sample (see Appendix Table A1). The returns to excellent student teaching evaluations are also significantly different across the genders, with women receiving a penalty of some 10 lpp and men a premium of 8.7 lpp. As discussed above, there is now a considerable body of literature arguing that women are judged more harshly than men on student teaching evaluations (see Mengel *et* al., 2018). Our results suggest that men and women are also rewarded very differently for having excellent teaching evaluations.

Working part-time is associated with significantly higher wages for men than for women, as discussed above, this may be strongly related to job rank and we will return to discuss it further in section 5 below. It is particularly interesting that there is no significant gender difference in the relationship between receiving an outside job offer and salary. The results do not suggest women face lower earnings because employers do not respond to them having an outside job offer as fully as they do with men. Instead, the strong positive relationship between salary and having received an outside job offer is found to be virtually identical for men (13.3 lpp) and women (13.8 lpp). Outside job offers are also relatively evenly distributed between the genders (with 46% of men and 44% of women having received such an offer).

A small (insignificant) gain of 2.5 lpp is found for women from working in an old university and a substantial pay gain for men of 13 lpp (see columns 2 and 3 of Table 2,

respectively). We can consider this further by splitting the sample between new universities and old universities, (these results are presented in columns 1 and 2 of Table OA2 in the Online Annex). A small and insignificant gender pay gap is found in the new universities of 4 lpp, in contrast to the conditional 13.8 lpp gap in old universities. With only 42 observations in the new universities, however, these findings should perhaps be treated with some caution. We also considered dividing the sample between Economists working in Business Schools or not (columns 3 and 4 of Table OA2). The male wage premium is higher in a Business School environment but not statistically significantly so (see also Sutanto *et al.,* 2014).

4. Decomposing the gender earnings gap

Further insight into the gender pay gap across academic Economists in the UK may be provided using decomposition analysis (Oaxaca, 1973, Fortin *et al*., 2011). Following Jann (2008), the approach we adopt to apportion the gap in the mean earnings of men and women here is based on Neumark (1988) and discussed further in Oaxaca and Ransom (1994) where the reference set of parameters is given by the pooled estimates, $\hat{\beta}$, presented in Table 1, column 3.[4] The decomposition of the mean earnings gap is calculated as:

$$\overline{W}_m - \overline{W}_f = \{(\overline{X}_m - \overline{X}_f)\}'\hat{\beta} + \{(\overline{X}_m{}'(\hat{\beta}_m - \hat{\beta}) + \overline{X}_f{}'(\hat{\beta} - \hat{\beta}_f)\} \quad (2)$$

where overbar denotes the mean value; the first component $\{(\overline{X}_m - \overline{X}_f)\}'\hat{\beta}$ is often referred to as the explained component reflecting differences in the observed characteristics across the genders; the second component $\{(\overline{X}_m{}'(\hat{\beta}_m - \hat{\beta}) + \overline{X}_f{}'(\hat{\beta} - \hat{\beta}_f)\}$ is the remaining portion of the gender gap which is usually referred to as unexplained, $\hat{\beta}_f$ and $\hat{\beta}_m$ are reported in Table 2, columns 1 and 2 respectively, and $\overline{X}_m$ and $\overline{X}_f$ are reported in Table A1, columns 2 and 3 respectively.

[4] As discussed in Fortin *et al*. (2011, pages 32 to 47), it is well-known that the Oaxaca-Blinder approach suffers from the index number problem (i.e. the decomposition results are sensitive to the choice of reference group). The members of the reference group are assumed to be individuals who are not discriminated against. More commonly, there is no reason to assume that only one gender faces discrimination (Jann 2008, pages 456-457). Several solutions to this problem have been suggested. Reimers (1983) proposed using the average of the two group coefficients $\left(\hat{\beta} = \frac{\hat{\beta}_f + \hat{\beta}_m}{2}\right)$; Cotton (1988) proposed a weighted average by group sizes $\left(\hat{\beta} = \frac{n_f}{n_f + n_m}\hat{\beta}_f + \frac{n_m}{n_f + n_m}\hat{\beta}_m\right)$; and Newmark (1988) proposed using the coefficient from a pooled model. The Newmark approach can lead to a portion of the unexplained wage gap being transferred to the explained gap. We use the approach suggested by Jann (2008), which corrects for this by using the coefficient in the pooled model with a gender dummy, that is $\hat{\beta} = \hat{\beta}_p$ (see also Fortin (2006) for an application).

[TABLE 3 AROUND HERE]

Aggregate decompositions for the earnings function are presented in the first panel of Table 3. The total gender earnings gap is 15.05 lpp in favor of the males, 2.38 lpp (or some 15.8%) of this gap can be 'explained' by females having on average more of those observable characteristics associated with lower earnings than do males.

The explained component can be further decomposed, see panel 2. Observable differences in demographic characteristics across the genders contribute some -4.51 lpp; clearly the largest component of the explained pay gap. The demographic component can be itself be decomposed into the portion associated with age (-4.25 lpp or 94%), being married (-0.29 lpp or 6%) and other (ethnicity and having children) which is negligible at 0.03 lpp; where only age is found to be statistically significant.

There is very little aggregate difference (0.28 lpp) across the genders in the component reflecting individual productivity but there are offsetting effects within this grouping. Women are more likely, on average, to have a first class degree and higher research income which lower the gender gap; whilst they are less likely to have a PhD, higher ranked publications or, to a much lesser extent, excellent teaching evaluations which increase the gender pay gap. Similarly, the gender differences in average workplace and labour market characteristics tend to lower the pay gap, with the exception of women being more likely to work with other women, although none of these later relationships are significant at standard confidence levels. In aggregate, despite the considerably younger female workforce, the explained component of the gender pay gap is small and not significantly different from zero.

The remaining 12.67 lpp (or 84.2% of the total gender pay gap) is unexplained and is due to the characteristics (as estimated in the benchmark model) being rewarded, in aggregate, at a lower rate for women than for men (differences in the estimated coefficients). The results for the more detailed decompositions of this unexplained component are perhaps not surprising given our earlier analysis of the separate gender earnings functions in section 3. In terms of relative size, the demographic variables dominate with the higher male return to age and the male marriage wage premium making up most of this portion. The individual productivity measures again tend to offset each other, although not necessarily consistently with the explained component. For example, women are more likely to have a first class degree but

receive a lower reward for having one. A further notable result is the influence from differences in the reward for teaching excellence across the genders. Differential returns from workplace characteristics are a further important component of the pay gap; with women earning less in more feminized workplaces, and in the old universities. Finally, differences in returns to the labour market characteristics do not make a large difference in the gender pay gap (2.8 lpp in total) and is mostly related to the part-time pay penalty for women. To emphasize, the model does not explain why males and females may be being rewarded differently for the same characteristic (hence the term 'unexplained') but in aggregate this component of the gender pay gap is substantial and strongly statistically significant.

5. Gender Differences in Job Ranks

As discussed in the Introduction, job-rank and promotion differences are important to the discussion of gender pay inequality in academia. McDowell *et al.* (2001) use panel data for American Economic Association (AEA) members to consider gender differences in promotion in 1964, 1974, 1985, and 1989; using ordered probit analysis and controlling for self-selection into academia. They find women face substantially higher promotion hurdles than men at all job ranks between 1964 and the early 1980s, however, this disadvantage falls away by the late 1980s. Ginther and Hayes (2003) find gender earnings gaps for academics in the Humanities decline over time (1977 to 1995), and that this is especially true when considering within job-rank salary differentials. They conclude that most of the remaining gender salary gap in Humanities is related to an unexplained 7 percentage point (pp) lower probability of women to be promoted.

Arguably, job rank should not be included in the earnings function due to obvious endogeneity concerns, nevertheless, it may allow for further insight into the gender pay gap. Comparing results for our benchmark earnings function with the addition of job rank (column 3 of Table 2) and without (column 3 of Table 1) shows that including job rank lowers the conditional gender pay gap from 12.7 lpp to 6.6 lpp (or by 48%). As a crude indicator, this suggests that roughly half the gender pay gap is related to between rank (women having lower probabilities of being promoted), and half is related to within-rank, differences. The size of the relationships between the individual productivity measures and earnings also typically halve as does having had a recent outside job offer. We next consider possible between and within-rank differences in more detail.

Following McDowell *et al.* (2001), we adopt an ordered probit estimation method to consider promotion across job ranks. It is assumed that job rank reflects a latent variable (s^*) dependent on observed characteristics (X) and an unobserved component (ε) for academic i.

$$i^* = \beta X_i + \varepsilon_i \qquad (3)$$

where $_i = (\ ^*_i)$ is a step function taking category values according to $^*_i$ crossing a set of threshold levels (Wooldridge, 2002; page 504). The category values are set to the job ranks we consider, from Teaching Fellow through to Professor.[5]

Results from the ordered probit estimation of job rank for the pooled job rank sample of 526 individuals are presented in Table 4. Panel 1 of Table 4 presents the male unconditional marginal effect at the means and shows that gender is related to job rank for academic Economists in the UK. Comparing Lecturers (column 3) with Professors (column 5): males are 6.7 pp less likely to be employed as Lecturers and they are 19.3 pp more likely to be Professors.

[TABLE 4 AROUND HERE]

Panel 2 of Table 4 presents selected ordered probit estimates for Model 3 from section 3 (full results are provided in the Online Annex Table OA3). The overall goodness of fit measure is not high (pseudo R2 of 22.1%), nevertheless, this is consistent with estimations of this type. The conditional gender difference in promotion to Professor is almost half the unconditional difference (10.97 pp compared to 19.27 pp, comparing the first rows of panel 2 and panel 1). Being married, older, having a first class degree, having a PhD, higher publication score, receiving more than £100,000 in research income, excellent teaching score, and having an outside offer in the last 5 years are generally negatively associated with lower job ranks, and positively associated with higher job ranks. Whilst being an external appointee or working part-time tends to be positively associated with lower ranks and negatively with higher ranks. These relationships are not, however, always statistically significant. These results are all consistent with the findings from the estimation of the earnings function when

[5] It has been standard practice to use ordered probit estimation in this area of the literature. It may be argued, however, that in a national study (such as ours) there is a potential tradeoff between job rank and institutional prestige. In which case, as suggested by an anonymous referee, the multinomial logit response model may be more suitable. The penultimate rows of Table OA4 in the Online Annex (panel 3) present conditional gender promotion gap results from multinomial logit estimation of Model 3 (full results are available upon request). Comparing results from ordered probit estimation of this model (panel 2 of Table OA4) with multinomial estimation (panel 3) suggests the probability of men being promoted to Lecturer is lower, however, we do not otherwise find qualitative differences between the results and choose to focus on the more readily comparable ordered probit estimation.

job rank was included (see Table 1). There are also some interesting standalone findings. For example, not being white is associated with a 6.6 pp lower probability of being a Professor,

Selected results from separate ordered probit analysis for women and men are provided in Table 5[6] and reveal that the ethnicity relationship is only relevant amongst women; non-white women are 10.8 pp less likely to be Professors and 11.4 pp more likely to be Researchers than white women. Analogously, the association between marriage and promotion is negligible for women, while for men being married is associated with a 15 pp lower probability of being a Lecturer and 21 pp higher chance of being a Professor. Amongst the Professors, the positive association between individual productive characteristics and promotion are shown by both genders, however, the returns to each of these characteristics are typically twice as high for men as women. Having had a recent outside job offer is also positively associated with being a Professor for both genders, although males who have received an outside offer in the previous five years are some 50% more likely to be a Professor than are women who have. There is also a very clear promotion difference for women and men in the old universities: women working in old universities are 14.7 pp less likely to be Professors. The promotion pattern across ranks is reversed, but not well determined, for men.

[TABLE 5 AROUND HERE]

We have established clear gender differences in the probability of being promoted to a higher rank, however, there may not be within-rank gender pay gaps. Re-estimating Model 3 (the benchmark model) earnings equation in section 3 for each job rank reveals the conditional gender pay gap amongst Lecturers is 4.9 lpp but insignificantly different from zero and it is 11.5 lpp for Professors (see Table 6, full results are provided in Table OA5 of the Online Annex). This conclusion is broadly consistent with Bandiera *et al*. (2016) who find the pay gap increases with seniority for academics at the LSE: at the Assistant Professor (Lecturer) level the within rank gender gap is small at around 2% and insignificantly different from zero, whilst the gap is 11% amongst Professors.[7]

[TABLE 6 AROUND HERE]

[6] Additional results and job ranks are included in the Online Annex Tables OA6 (for women) and OA7 (for men).
[7] Bandiera *et al*. (2016) also find that women have a slower promotion path at the LSE; tracking a cohort of starters in 1998, 24% of the male cohort are Professors after 15 years but only 11% of the women.

6. Changes in the conditional gender pay gap for UK academic Economists over time

Our study focuses on new data for a single cross section of UK academic economists in 2016 and, as such, does not allow for an intertemporal analysis. The results may be compared with Blackaby *et al*. (2005), however, their data (discussed in section 2 above) are no longer available and so a direct comparison cannot be performed with the new 2016 data. Results for a closer approximation of our model to the simpler specification used in Blackaby *et al*. (2005) are provided in Table 7, the conditional gender pay gap in 2016 is found to be larger than that found by Blackaby *et al*. in 1999 (10.5 lpp relative to 9.4 lpp). It is worth stressing how striking this finding is; in contrast to the other academic disciplines discussed above, between 1999 and 2016 there is no notable fall in the unexplained (conditional) gender pay gap for UK academic Economists.

[TABLE 7 AROUND HERE]

Blackaby *et al.* (2005) find the within-rank gender pay gap in 1999 is half as big for Professors at it is for Lecturers, we find a clearly insignificant gender gap of 3 lpp amongst Lecturers in 2016 but a significant gender pay gap of 12.6 lpp amongst Professors. The gender gap amongst Professors in 2016 is four times larger than it is for Lecturers. The within-rank gender pay gap has changed dramatically over time: diminishing for Lecturers whilst increasing substantially amongst Professors. Furthermore, considering promotion, Blackaby *et al. (*2005) found males were 13.8 pp less likely to be Lecturers and 7.4 pp more likely to be Professors in 1999; we find males are 7 pp less likely to be Lecturers and 11 pp more likely to be Professors in 2016 (with 99% confidence, see Table 4). Men are less rare amongst the Lecturers and they are considerably more likely to be Professors in 2016 than they were in 1999.

There are also some interesting changes over time related to particular characteristics.[8] Of particular note, Blackaby *et* al. (2005; Table 6) find women incurred a 9 to 10 lpp penalty from having had an outside job offer whilst men receive a 3 to 6 lpp pay gain. They do not

[8] For example, Blackaby and Frank (2000) found an 8 lpp pay penalty for Black and/or Asian academic Economists in the UK in 1999; using a comparable ethnicity measure we find a statistically insignificant 3.7 lpp penalty. Blackaby et al., (2005) find no ethnic difference in promotion, whilst we find non-white women are 11 pp less likely to be Professors than are other women, with no equivalent relationship for males.

include outside job offers as an explanatory variable in their analysis of job rank. In contrast, our gender specific analysis reveals the wage return for outside job offers is the same for men and women in 2016, but men with these offers are considerably more likely to be promoted than are the women.

To summarise, in 1999 the gender pay gap was driven by women disproportionately working in lower paid ranks (especially Lecturers) where women also faced within-rank gender pay gaps. In contrast, the gender pay gap for UK academic economists in 2016 is strongly influenced by the relative concentration of men amongst Professors where the unexplained gender pay differential is now considerable.

7. Concluding comments

The relative position of women in academic Economics has changed dramatically over the last two decades, nevertheless, in 2016 women held only 16% of the Chairs in the UK. Unlike the STEM (Science, Technology, Engineering and Mathematics) disciplines with similarly low female participation rates, Economics has attracted very little attention from university governing bodies or publicly funded institutions seeking to address potential gender inequities and facilitate female engagement.

The gender pay gap is a pertinent empirical outcome measure of relative equality in the academic labour market. We present and employ a particularly rich source of new data obtained by surveying UK academic Economists in 2016, collecting information on individual characteristics and the workplaces they are employed in to explore the current determinants of pay and job rank. We find a substantial unconditional gender pay gap of 15.05 log percentage points (lpp) and a conditional gap of 12.67 lpp. Decomposition analysis reveals that the great majority of the gap is related to men receiving higher returns from being older or married; and from workplace characteristics. We find little explanation of the gap from measures of individual productivity, although men (positively) and women (negatively) are rewarded very differently for having excellent teaching evaluations.

Job rank is found to be an important determinant of the gender pay gap. Roughly half of the conditional gap is related to within-rank pay differences and the other half due to differences in the probability for women of promotion into higher ranks. We find men are 11

percentage points (pp) more likely than women to be a Professor and 7.2 pp less likely to be a Lecturer, and that male Professors earn 11.5 lpp more than do female. Amongst Professors, the positive association between individual productivity characteristics and promotion are typically twice as high for men as women. Men who have received an outside offer in the previous five years are some 50% more likely to be a Professor than are women who have. And women, unlike men, working in old universities are more (less) likely to be in lower (higher) ranked jobs.

In contrast to national gender pay gaps, and evidence from other disciplines, the conditional pay gap amongst academic Economists in the UK has not fallen since the turn of the century. The gap is substantial, and it is strongly influenced by the relative concentration of men amongst Professors where the unexplained gender pay differential is considerable.

From 2017, organizations in the UK with 250 or more employers are legally required to publish their gender pay gap annually (https://gender-pay-gap.service.gov.uk/actions-to-close-the-gap) and the Equality Challenge Unit provides advice on how to go about reducing these gaps at the institutional level (Government Equalities Office, 2016). The extension of the Athena SWAN (AS) Charter across disciplines in 2015 should help to provide greater consciousness and linkage between gender equity at the department and the institutional (University) level for academic Economists. Furthermore, the specific commitment in the AS Charter to "tackling the gender pay gap" will increase institutional awareness of within-department gender pay gaps.

Our results imply that universities need to reconsider the implementation of their equal pay policies in Economics Departments, especially in the old universities. We show that men and women receive substantially different rewards for the same characteristics; detailed pay and promotion reviews at the institution level for the senior rank holders should help to reveal this differential treatment and indicate appropriate adjustments. Adjusting the salary of female Professors in a one off uplift (as the well intentioned Vice Chancellor at the University of Essex did in 2016) to close the Professorial pay gap will be of limited effect, not least because our results suggest women are 11pp less likely to be promoted to Professor. Implementing pay and promotion reviews, however, without recognizing the unconscious bias and institutional cultures that have led to the current outcomes will also be of limited use.

Professional bodies can play an important role introducing and promoting cultural change across a discipline. The Professional Societies in the STEM disciplines have had a long-term relationship with the AS Charter in the UK. This collaboration has allowed for more effective guidance of how to introduce and measure cultural change from the Equality Challenge Unit into academia, and has also allowed for a greater extension of good practice across activities organized by professional bodies off-campus (such as at conference). The Royal Economic Society (RES) has a long history of supporting diversity and seeking to improve the position of women in the discipline. It has also recently moved to encourage a culture shift away from any form of harassment at, or in connection with, any RES activity (RES 2019, page 24). Nevertheless, we find that the gender pay gap for academic Economists has not fallen in the last two decades in the UK. The RES could consider doing more to address the gender pay gap. For example, the RES could associate more closely with the AS Charter to help induce cultural shift and good practice within departments. The RES could also adopt more direct engagement, such as encouraging Vice-Chancellors to provide information on the gender pay gap amongst Economists in their institution and their plans to induce more equitable treatment.

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Table 1. ***The Determinants of Log Earnings*** **(OLS estimates).**

Dependent variable is ln(salary)	(1)	(2)	(3)
male	0.1505**	0.1226**	0.1267***
	(0.0608)	(0.0465)	(0.0430)
non-white			-0.0028
			(0.0383)
married			0.0357
			(0.0388)
children			-0.0050
			(0.0364)
age			0.0300*
			(0.0171)
age squared			-0.0001
			(0.0002)
first class degree		0.0343	0.0954***
		(0.0359)	(0.0250)
PhD		0.1665***	0.1013
		(0.0582)	(0.0624)
publication score		0.0964***	0.0429***
		(0.0188)	(0.0143)
research income > 100		0.2761***	0.2167***
		(0.0415)	(0.0423)
excellent teaching score		-0.0195	0.0055
		(0.0627)	(0.0600)
REF GPA (ommitted group: not a REF dept and lowest quartile)			
2nd quartile			0.0677
			(0.0697)
3rd quartile			0.0009
			(0.0542)
4th quartile			0.2017***
			(0.0589)
old university			0.1053
			(0.0654)

Table 1. ***The Determinants of Log Earnings*** **(OLS estimates), contined.**

Dependent variable is ln(salary)	(1)	(2)	(3)
Region (omitted: England excluding London)			
London			0.1165**
			(0.0504)
Scotland			0.0689
			(0.0690)
Wales/N. Ireland			-0.1441
			(0.0922)
% staff female			-0.0044
			(0.0028)
wp network			-0.1086***
			(0.0350)
no mentor			-0.0171
			(0.0465)
competitive			-0.0260
			(0.0319)
cooperative			0.0068
			(0.0262)
business school			0.0214
			(0.0736)
external appointment			-0.0639*
			(0.0347)
career break			-0.0014
			(0.0349)
part-time			0.0506
			(0.0592)
outside offers in last 5 years			0.1289***
			(0.0370)
constant	10.9259***	10.4769***	9.5070***
	(0.0381)	(0.0628)	(0.3877)
Obs	367	367	367
R-squared	0.027	0.308	0.563
Adj. R-squared	0.024	0.297	0.527

Standard errors in parentheses (clustered at the institution level). * p<0.10 ** p<0.05 *** p<0.01.

Table 2. ***The Determinants of Log Earnings*** **(OLS estimates).**

Dependent variable is ln(salary)	(1) women	(2) men	(3) pooled
male			0.0659*
			(0.0380)
non-white	-0.0774	0.0335	0.0186
	(0.0585)	(0.0603)	(0.0292)
married	**-0.0386**	**0.1282****	-0.0163
	(0.0600)	(0.0610)	(0.0332)
children	-0.0330	-0.0085	0.0161
	(0.0487)	(0.0512)	(0.0267)
age	0.0216	0.0370*	0.0247**
	(0.0256)	(0.0188)	(0.0123)
age squared	-0.0001	-0.0002	-0.0002
	(0.0003)	(0.0002)	(0.0001)
first class degree	0.0607	0.0857**	0.0437
	(0.0443)	(0.0346)	(0.0293)
PhD	0.0824	0.1143	0.0133
	(0.0921)	(0.0899)	(0.0440)
publication score	0.0607***	0.0303	0.0229**
	(0.0220)	(0.0197)	(0.0105)
research income > 100	**0.2922*****	**0.1427****	0.1049***
	(0.0505)	(0.0630)	(0.0393)
excellent teaching score	***-0.0978***	***0.0873***	-0.0305
	(0.0817)	(0.0618)	(0.0401)
Rank (Researcher omitted)			0.6540***
Professor			(0.0823)
			0.2381***
SL/Reader			(0.0853)
			0.0791
Lecturer			(0.0905)
			-0.1206
Teaching Fellow			(0.1133)
			0.6540***
REF GPA (omitted group: not a REF dept and lowest quartile)			
2nd quartile	***0.1838****	***-0.0378***	0.0857*
	(0.0697)	(0.0779)	(0.0506)
3rd quartile	0.0427	-0.0155	0.0344
	(0.0514)	(0.0830)	(0.0456)
4th quartile	0.1320*	0.2235**	0.1905***
	(0.0675)	(0.0907)	(0.0544)
old university	***0.0251***	***0.1306****	0.0584
	(0.0705)	(0.0711)	(0.0516)

Table 2. ***The Determinants of Log Earnings*** **(OLS estimates), continued.**

Dependent variable is ln(salary)	(1) women	(2) men	(3) pooled
Region (omitted: England excluding London)			
London	0.0743	0.2339**	0.1284***
	(0.0592)	(0.0906)	(0.0452)
Scotland	0.0624	0.0738	0.0631
	(0.0744)	(0.0857)	(0.0448)
Wales/N. Ireland	-0.1747	-0.1224	-0.1357*
	(0.1493)	(0.0917)	(0.0742)
% staff female	-0.0070**	-0.0014	-0.0025
	(0.0031)	(0.0039)	(0.0022)
wp network	-0.0927	-0.1348**	-0.0591***
	(0.0610)	(0.0600)	(0.0220)
no mentor	0.0332	-0.0661	-0.0167
	(0.0610)	(0.0698)	(0.0344)
competitive	-0.0278	-0.0022	-0.0169
	(0.0458)	(0.0471)	(0.0281)
cooperative	0.0228	-0.0046	-0.0191
	(0.0410)	(0.0455)	(0.0234)
business school	-0.0159	0.0603	0.0070
	(0.0921)	(0.0747)	(0.0589)
external appointment	-0.0345	-0.0566	-0.0014
	(0.0446)	(0.0399)	(0.0244)
career break	-0.0162	-0.0095	0.0092
	(0.0491)	(0.0402)	(0.0275)
part-time	***-0.0912***	***0.1737****	0.1161**
	(0.0685)	(0.1020)	(0.0460)
outside offers in last 5 years	0.1377**	0.1331***	0.0554**
	(0.0548)	(0.0497)	(0.0277)
constant	9.9346***	9.3326***	9.8113***
	(0.5261)	(0.4463)	(0.2870)
Obs	157	210	367
R-squared	0.607	0.594	0.755
Adj. R-squared	0.525	0.534	0.731

Standard errors in parentheses (clustered at the institution level). * p<0.10 ** p<0.05 *** p<0.01. Coefficient pairs in italics are significantly different at the 90% confidence level; in italics and bold are significantly different at the 95% confidence level.

Table 3. Decomposing the gender pay gap.

ln(salary)	Comp.	Std. Err.	
Difference	-0.1505	0.0537	***
Explained	-0.0238	0.0411	
Unexplained	-0.1267	0.0427	***
Explained components			
demographic	**-0.0451**	**0.0235**	*
age	-0.0425	0.0232	*
married	-0.0029	0.0034	
other	0.0003	0.0019	
individual productivity	**0.0028**	**0.0200**	
first class degree	0.0100	0.0047	**
PhD	-0.0110	0.0076	
publication score	-0.0194	0.0094	**
research income	0.0233	0.0116	**
excellent teaching score	-0.0001	0.0015	
workplace	**0.0147**	**0.0248**	
fem share	-0.0196	0.0129	
old university	0.0082	0.0058	
other	0.0261	0.0192	
labour market	**0.0038**	**0.0066**	
part time	0.0010	0.0020	
other	0.0028	0.0059	
Unexplained components			
demographic	**-0.5462**	**0.6037**	
age	-0.3947	0.5987	
married	-0.1243	0.0642	*
other	-0.0273	0.0380	
individual productivity	**0.0349**	**0.1378**	
first class degree	-0.0181	0.0357	
PhD	-0.0275	0.1056	
publication score	0.0676	0.0659	
research income	0.0444	0.0244	*
excellent teaching score	-0.0316	0.0115	***
workplace	**-0.1951**	**0.1749**	
fem share	-0.1421	0.1120	
old university	-0.0961	0.0768	
other	0.0431	0.0996	
labour market	**-0.0222**	**0.0464**	
part time	-0.0280	0.0120	**
other	0.0058	0.0443	
constant	0.6020	0.5748	

Standard errors in parentheses (clustered at the institution level). * p<0.10 ** p<0.05 *** p<0.01. Models include all the explanatory variables included in Model 3 as presented in column 3 of Table 1.

Table 4. ***Academic Ranking*** **(Marginal Effects at Means), Selected Results.**

Ordered Probit	Teaching Fellow (1)	Researcher (2)	Lecturer (3)	SL/Reader (4)	Professor (5)
Panel 1. (unconditional)					
male	-0.0460***	-0.0928***	-0.0674***	0.0135*	0.1927***
	(0.0133)	(0.0258)	(0.0152)	(0.0077)	(0.0325)
Obs	526	526	526	526	526
Pseudo R-squared	0.0204				
Panel 2. (conditional)					
male	-0.0056**	-0.0471**	-0.0717***	0.0147*	0.1097***
	(0.0028)	(0.0212)	(0.0216)	(0.0082)	(0.0347)
non-white	0.0039	0.0309	0.0433*	-0.0124	-0.0657**
	(0.0029)	(0.0188)	(0.0228)	(0.0095)	(0.0333)
married	-0.0044	-0.0352*	-0.0508**	0.0131	0.0772**
	(0.0030)	(0.0209)	(0.0253)	(0.0091)	(0.0383)
age	-0.0001	-0.0008	-0.0013	0.0002	0.0020
	(0.0009)	(0.0074)	(0.0119)	(0.0021)	(0.0181)
first class degree	-0.0025	-0.0216	-0.0334	0.0067	0.0508
	(0.0022)	(0.0204)	(0.0263)	(0.0074)	(0.0409)
PhD	-0.0200**	-0.1174***	-0.1157***	0.0687**	0.1843***
	(0.0092)	(0.0404)	(0.0280)	(0.0267)	(0.0348)
publication score	-0.0021*	-0.0187***	-0.0299***	0.0052*	0.0455***
	(0.0011)	(0.0065)	(0.0092)	(0.0027)	(0.0132)
research income > 100	-0.0053*	-0.0509***	-0.0932**	0.0027	0.1467**
	(0.0031)	(0.0154)	(0.0452)	(0.0097)	(0.0651)
excellent teaching score	-0.0024	-0.0226	-0.0393	0.0036	0.0608
	(0.0020)	(0.0208)	(0.0358)	(0.0033)	(0.0565)
old university	0.0017	0.0162	0.0277	-0.0030	-0.0426
	(0.0021)	(0.0183)	(0.0351)	(0.0026)	(0.0536)
external appointment	0.0039	0.0332**	0.0519**	-0.0096	-0.0793**
	(0.0024)	(0.0156)	(0.0262)	(0.0060)	(0.0370)
part-time	0.0225**	0.1270***	0.1184***	-0.0767**	-0.1912***
	(0.0114)	(0.0453)	(0.0336)	(0.0352)	(0.0407)
outside offers in last 5 years	-0.0059**	-0.0522**	-0.0859***	0.0111	0.1329***
	(0.0027)	(0.0206)	(0.0275)	(0.0070)	(0.0430)
Obs	526	526	526	526	526
Pseudo R-squared	0.2221				

Standard errors in parentheses (clustered at the institution level). * p<0.10 ** p<0.05 *** p<0.01. Models in panel 2 include all the explanatory variables included in Model 3 as presented in column 3 of Table 1.

Table 5. ***Academic Ranking*** **(Marginal Effects at Means), Selected Results by Gender.**

Ordered Probit	Researcher (1)	Lecturer (2)	Professor (3)	Researcher (4)	Lecturer (5)	Professor (6)
	Women			**Men**		
non-white	0.1137**	0.0334	-0.1083***	-0.0027	-0.0110	0.0175
	(0.0460)	(0.0242)	(0.0376)	(0.0099)	(0.0420)	(0.0680)
married	0.0039	0.0022	-0.0047	-0.0506*	-0.1497***	0.2091***
	(0.0385)	(0.0223)	(0.0468)	(0.0262)	(0.0532)	(0.0659)
children	-0.0100	-0.0056	0.0120	-0.0005	-0.0018	0.0029
	(0.0360)	(0.0207)	(0.0433)	(0.0088)	(0.0357)	(0.0561)
age	0.0073	0.0040	-0.0087	-0.0014	-0.0058	0.0090
	(0.0192)	(0.0109)	(0.0230)	(0.0038)	(0.0152)	(0.0239)
first class degree	-0.0224	-0.0118	0.0262	-0.0097	-0.0383	0.0598
	(0.0463)	(0.0224)	(0.0514)	(0.0098)	(0.0339)	(0.0512)
PhD	-0.1665*	-0.0313	0.1461***	-0.0775	-0.1826**	0.2369***
	(0.0850)	(0.0358)	(0.0507)	(0.0504)	(0.0780)	(0.0797)
publication score	-0.0305***	-0.0170*	0.0365***	-0.0095**	-0.0381***	0.0599***
	(0.0110)	(0.0091)	(0.0126)	(0.0045)	(0.0119)	(0.0194)
research income > 100	-0.1143***	-0.0864	0.1663**	-0.0147	-0.0647	0.1083
	(0.0358)	(0.0589)	(0.0727)	(0.0101)	(0.0530)	(0.0936)
excellent teaching score	-0.0031	-0.0017	0.0037	-0.0113	-0.0497	0.0827
	(0.0377)	(0.0214)	(0.0457)	(0.0113)	(0.0433)	(0.0769)
old university	0.0918**	0.0804	-0.1465*	-0.0055	-0.0210	0.0323
	(0.0363)	(0.0565)	(0.0775)	(0.0130)	(0.0466)	(0.0697)
external appointment	0.0064	0.0035	-0.0076	0.0274***	0.1057**	-0.1656***
	(0.0373)	(0.0209)	(0.0449)	(0.0106)	(0.0428)	(0.0594)
part-time	0.1891***	0.0193	-0.1547***	0.0412	0.1202	-0.1644*
	(0.0638)	(0.0400)	(0.0334)	(0.0355)	(0.0815)	(0.0909)
outside offers in last 5 years	-0.0808*	-0.0486	0.1017*	-0.0237**	-0.0973**	0.1573**
	(0.0091)	(0.0301)	(0.0560)	(0.0105)	(0.0406)	(0.0624)
Obs	230	230	230	296	296	296
Pseudo R-squared	0.373			0.2678		

Standard errors in parentheses (clustered at the institution level). * p<0.10 ** p<0.05 *** p<0.01. Models include all the explanatory variables included in Model 3 as presented in column 3 of Table 1.

Table 6. ***Gender Pay Gap for Academic Ranks*** **(OLS Estimates).**

Dependent variable is ln(salary)	Researcher	Lecturer	SL/Reader	Professor
male	-0.1367**	0.0487	0.0415	0.1147*
(conditional)	(0.0573)	(0.0545)	(0.0398)	(0.0619)
Obs	57	82	82	134
R-squared	0.874	0.679	0.700	0.504
Adj. R-squared	0.749	0.509	0.542	0.372

Standard errors in parentheses (clustered at institution level). * p<0.10 ** p<0.05 *** p<0.01. Models include all the explanatory variables included in Model 3 as presented in column 3 of Table 1.

Table 7. ***Gender Pay Gap 1999 and 2016*** **(Limited Specification)**

	(1) Full sample	(2) Lecturer	(3) Professor
1999 Blackaby *et al*. (2005)			
male	0.094***	0.063***	0.034
	(3.58)	(2.63)*	(0.44)
Obs	351	133	88
Adj R-squared	0.64	0.56	0.41
2016 Blackaby *et al. (2005) approximation*			
male	0.105***	0.030	0.126**
	(2.83)	(0.577)	(2.12)
Obs	367	82	134
Adj R-squared	0.49	0.44	0.24

t-statistics in parentheses. * p<0.10 ** p<0.05 *** p<0.01.
2016 regressions include controls for ethnicity, marriage, age, age squared, UK first class degree, PhD, publication quality, research income, excellent teaching, department REF grade 2014, location, old university, external appointment, and career break. Blackaby *et al*. (2005) also include controls for non-academic work experience, job tenure and job tenure squared. Column (i) from Blackaby *et al*. (2005) Table 1, column (iv); column (ii) and (iii) from Blackaby *et al*. (2005) Table 3 columns (iv) and (ii), respectively.

Appendix Table A1. ***Definitions and Means (Standard Deviations) of Variables***

	Means (standard deviations)			Definitions
	Pooled	**Males**	**Females**	
salary	67,680 (35781)	***73,109*** (40775)	***60,418*** (26145)	Total current annual gross salary in GBP (full time equivalent.
natural log salary	11.01 (0.45)	***11.08*** (0.48)	***10.93*** (0.40)	
Job rank				
Professor	0.37	***0.43***	***0.29***	Current academic job rank (if holding more than one position, rank of primary employment)
SL/Reader	0.22	0.25	0.18	
Lecturer	0.22	0.21	0.24	
Researcher	0.16	0.09	0.25	
Teaching Fellow	0.03	0.02	0.04	
Demographics				
male	0.57			Respondent is male
non-white	0.14	0.13	0.14	Ethnic group not white (Mixed/ Multiple; Asian/Asian British; Black/ African/ Caribbean/ Black British; or Other)
married	*0.75*	*0.78*	*0.7*	Married or living together
children	0.53	0.55	0.5	Has children
age 20-34	0.22	***0.21***	***0.23***	
age 35-49	0.46	***0.42***	***0.52***	
age 50-64	0.28	***0.30***	***0.25***	
age 65 and above	0.04	***0.07***	***0.00***	
age	45	***46***	***44***	Set at 30 if age group 20-34; 42.5 if age group 35-49; 57.5 if age group 50-64; 68 if 65 and above.
Productivity measures				
first class degree	0.62	***0.58***	***0.68***	Has a first class UK undergraduate degree or is in top decile for overseas UG degrees
PhD	0.88	***0.92***	***0.82***	Has a PhD
publication score	2.29 (1.62)	***2.49*** (1.59)	***2.04*** (1.63)	Average REF type ranking (range: 1-4) of three best career outputs (including journal publications, working/discussion papers, or books)
research income > 100	0.29	***0.24***	***0.35***	Received more than £100 k of external research funding over the last five years
excellent teaching score	0.17	0.19	0.16	Teaching ranked as outstanding (self-ranked from: 1 - weak; 2; 3; 4; 5 - outstanding)
Workplace characteristics				
REF GPA: not a REF dept or 1st quartile	*0.24*	*0.29*	*0.19*	=1 if not a REF dept or GPA < 2.62

	Pooled	Males	Females	Definitions
REF GPA: 2nd quartile	*0.24*	*0.20*	*0.29*	=1 if 2.62 < GPA < 2.93
REF GPA: 3rd quartile	*0.25*	*0.25*	*0.24*	=1 if 2.93 < GPA < 3.24
REF GPA: 4th quartile	*0.27*	*0.26*	*0.28*	=1 if GPA > 3.24
old university	0.89	***0.85***	***0.93***	Institutions that were awarded their charter prior to the substantial movement of former Polytechnic and Central Institutions into the university sector in 1992
Region of institution				
England (excl. Lond)	0.60	0.62	0.58	
London	0.19	0.17	0.21	
Scotland	0.16	0.14	0.18	
Wales/N. Ireland	0.05	0.07	0.03	
% staff female	25.14 (9.47)	***23.23*** (8.79)	***27.69*** (9.75)	Percentage of females in the department workforce
professional networks available	0.59	0.62	0.55	Workplace provides networks that can be used for advice concerning professional advancement (e.g. conferences, promotion advice, research possibilities, etc.)
no mentor	0.20	0.20	0.19	Have never had an effective mentor for work related advice
competitive	0.43	***0.39***	***0.49***	Workplace is competitive (self-identified as 4 or 5 from: 1 - not at all competitive; 2; 3; 4; 5 - extremely competitive)
cooperative	0.39	0.4	0.38	Workplace is cooperative (self-identified as 4 or 5 from: 1 - not at all cooperative; 2; 3; 4; 5 - extremely cooperative)
business school	0.17	0.20	0.14	=1 if workplace is a Business School
Characteristics related to the labour market				
external appointment	0.47	***0.5***	***0.41***	Current post appointed from outside the current place of employment
career break	0.59	0.57	0.62	Years in labour market exceeds years in academic labour market
part-time	0.10	0.10	0.11	Current post is on a part-time basis
outside offer in last 5 years	0.45	0.46	0.44	Has received external job offer(s) in the last 5 years
Observations	367	210	157	

Mean pairs difference: bold p<0.10, bold and italic p<0.05.

ONLINE ANNEX FOR –

PAY AND JOB RANK AMONGST ACADEMIC ECONOMISTS IN THE UK: IS GENDER RELEVANT?

Online Annex Table OA1. ***Summary Statistics,*** **Academic Job Rank Sample**

	Pooled Sample Mean	Male Mean	Female Mean
male	0.56		
non-white	0.14	0.13	0.16
married	0.74	***0.78***	***0.67***
children	0.52	***0.57***	***0.46***
age	45	***47***	***43***
age 20-34	0.22	***0.19***	***0.26***
age 35-49	0.46	***0.42***	***0.50***
age 50-64	0.28	***0.31***	***0.23***
age 65 and above	0.04	***0.09***	***0.01***
first class degree	0.62	***0.57***	***0.69***
PhD	0.88	***0.91***	***0.84***
publication score	2.21	***2.38***	***1.98***
research income > 100	0.26	0.24	0.28
excellent teaching score	0.18	0.19	0.16
REF GPA: 2nd quartile	0.24	0.23	0.26
REF GPA: 3rd quartile	0.25	0.26	0.24
REF GPA: 4th quartile	0.25	0.23	0.28
old university	0.86	0.84	0.89
institution in England (excl. London)	0.62	0.63	0.59
institution in London	0.18	0.16	0.20
institution in Scotland	0.15	0.15	0.17
institution in Wales/N. Ireland	0.05	0.06	0.04
% staff female	24.96	***23.10***	***27.36***
professional networks available	0.57	0.59	0.54
no mentor	0.20	0.22	0.18
competitive	0.41	***0.36***	***0.48***
cooperative	0.39	0.41	0.38
business school	0.60	0.59	0.61
external appointment	0.11	0.09	0.12
career break	0.42	0.43	0.42
part-time	0.62	0.63	0.59
outside offer in last 5 years	0.18	0.16	0.20
Professor	0.36	***0.42***	***0.27***
SL/Reader	0.23	***0.27***	***0.19***
Lecturer	0.23	***0.20***	***0.27***
Researcher	0.14	***0.09***	***0.20***
Teaching Fellow	0.04	***0.02***	***0.07***
observations	526	296	230

Mean pairs difference: bold $p<0.10$, bold and italic $p<0.05$.

Table OA2. ***The Determinants of Log Earnings*** **(OLS estimates).**

Dependent variable is ln(salary)	(1) new	(2) old	(3) non-business	(4) business
male	0.0410	0.1378***	0.1286**	0.1622
	(0.0781)	(0.0501)	(0.0543)	(0.1043)
non-white	0.0345	-0.0360	0.0024	0.0054
	(0.1383)	(0.0378)	(0.0420)	(0.0867)
married	**-0.2446**	**0.0452**	0.0365	0.0644
	(0.2787)	(0.0410)	(0.0416)	(0.1771)
children	***0.1508***	***-0.0156***	-0.0131	-0.0524
	(0.1199)	(0.0398)	(0.0428)	(0.0835)
age	***-0.0658****	***0.0330****	0.0327*	0.0266
	(0.0369)	(0.0181)	(0.0178)	(0.0461)
age squared	***0.0009****	***-0.0002***	-0.0002	0.0001
	(0.0004)	(0.0002)	(0.0002)	(0.0005)
first class degree	-0.0010	0.0966***	0.0990***	0.1758*
	(0.1115)	(0.0273)	(0.0264)	(0.0976)
PhD	***0.3757****	***0.0843***	0.0977	0.1780
	(0.1505)	(0.0681)	(0.0670)	(0.1565)
publication score	***0.0639***	***0.0476*****	***0.0482*****	***-0.0093***
	(0.0415)	(0.0153)	(0.0167)	(0.0275)
research income > 100	***-0.2307***	***0.2172*****	***0.2326*****	***-0.0962***
	(0.1934)	(0.0431)	(0.0437)	(0.2098)
excellent teaching score	0.2988	-0.0122	0.0018	0.1665
	(0.3202)	(0.0665)	(0.0694)	(0.2147)
2nd quartile	-0.1751	0.1125	***0.0999***	***-0.1928***
	(0.2762)	(0.0802)	(0.0757)	(0.1294)
3rd quartile	0.0133	0.0222	***0.0099***	***-0.4114***
	(0.2880)	(0.0573)	(0.0550)	(0.2609)
4th quartile	0.3537	0.2180***	***0.2034*****	***-0.1017***
	(0.2937)	(0.0602)	(0.0598)	(0.1567)
old university			0.1116	0.2886**
			(0.0912)	(0.1127)
London	0.0561	0.1316**	***0.1035*****	***0.6355*****
	(0.3314)	(0.0504)	(0.0509)	(0.2381)
Scotland	***0.3748*****	***0.0688***	**0.0054**	**0.2941**
	(0.1358)	(0.0707)	(0.0673)	(0.1926)
Wales/N. Ireland	***0.0914***	***-0.2710*****	-0.1855	-0.1719
	(0.1545)	(0.1078)	(0.1903)	(0.1757)
% staff female	-0.0033	-0.0045	-0.0057*	-0.0002
	(0.0033)	(0.0033)	(0.0031)	(0.0052)

Table OA2. ***The Determinants of Log Earnings*** **(OLS estimates), continued.**

Dependent variable is ln(salary)	(1) new	(2) old	(3) non-business	(4) business
wp network	**0.0640**	**-0.1196*** **	-0.0912**	-0.1187
	(0.1585)	(0.0389)	(0.0403)	(0.1142)
no mentor	0.0219	-0.0092	0.0080	-0.1974
	(0.1468)	(0.0503)	(0.0471)	(0.1747)
competitive	***-0.0059***	***-0.0332***	-0.0332	-0.0602
	(0.1082)	(0.0325)	(0.0335)	(0.1226)
cooperative	-0.1056	0.0119	**0.0343**	**-0.1148**
	(0.1831)	(0.0261)	(0.0242)	(0.1028)
business school	0.1101	0.0230		
	(0.1081)	(0.0879)		
external appointment	-0.0514	-0.0670*	-0.0532	-0.0405
	(0.1704)	(0.0380)	(0.0387)	(0.1188)
career break	***0.2524****	***-0.0085***	0.0013	0.1363
	(0.0988)	(0.0393)	(0.0403)	(0.1667)
part-time	-0.0074	0.0340	0.0538	-0.0386
	(0.1947)	(0.0678)	(0.0645)	(0.1677)
outside offers in last 5 years	-0.0327	0.1423***	0.0988**	0.2256**
	(0.1901)	(0.0396)	(0.0403)	(0.1048)
constant	11.3490***	9.5383***	9.4730***	9.0725***
	(0.9141)	(0.4160)	(0.3904)	(1.0764)
Obs	42	325	303	64
R-squared	0.731	0.560	0.588	0.641
Adj. R-squared	0.266	0.520	0.548	0.371

Standard errors in parentheses (clustered at the institution level). * p<0.10 ** p<0.05 *** p<0.01. Coefficient pairs in italics are significantly different at the 90% confidence level; in italics and bold are significantly different at the 95% confidence level.

Table OA3. ***Academic Ranking*** **(Ordered Probit, Marginal Effects at Means).**

	Teaching Fellow	Researcher	Lecturer	SL/Reader	Professor
	(i)	(ii)	(iii)	(iv)	(v)
male	-0.0056**	-0.0471**	-0.0717***	0.0147*	0.1097***
	(0.0028)	(0.0212)	(0.0216)	(0.0082)	(0.0347)
non-white	0.0039	0.0309	0.0433*	-0.0124	-0.0657**
	(0.0029)	(0.0188)	(0.0228)	(0.0095)	(0.0333)
married	-0.0044	-0.0352*	-0.0508**	0.0131	0.0772**
	(0.0030)	(0.0209)	(0.0253)	(0.0091)	(0.0383)
children	-0.0001	-0.0010	-0.0015	0.0003	0.0024
	(0.0016)	(0.0136)	(0.0218)	(0.0038)	(0.0331)
age	-0.0001	-0.0008	-0.0013	0.0002	0.0020
	(0.0009)	(0.0074)	(0.0119)	(0.0021)	(0.0181)
age squared	-0.0000	-0.0001	-0.0001	0.0000	0.0002
	(0.0000)	(0.0001)	(0.0001)	(0.0000)	(0.0002)
first class degree	-0.0025	-0.0216	-0.0334	0.0067	0.0508
	(0.0022)	(0.0204)	(0.0263)	(0.0074)	(0.0409)
PhD	-0.0200**	-0.1174***	-0.1157***	0.0687**	0.1843***
	(0.0092)	(0.0404)	(0.0280)	(0.0267)	(0.0348)
publication score	-0.0021*	-0.0187***	-0.0299***	0.0052*	0.0455***
	(0.0011)	(0.0065)	(0.0092)	(0.0027)	(0.0132)
research income > 100	-0.0053*	-0.0509***	-0.0932**	0.0027	0.1467**
	(0.0031)	(0.0154)	(0.0452)	(0.0097)	(0.0651)
excellent teaching score	-0.0024	-0.0226	-0.0393	0.0036	0.0608
	(0.0020)	(0.0208)	(0.0358)	(0.0033)	(0.0565)
REF GPA (omitted group: not a REF dept and lowest quartile)					
2nd quartile	-0.0002	-0.0016	-0.0029	0.0002	0.0045
	(0.0016)	(0.0155)	(0.0282)	(0.0017)	(0.0436)
3rd quartile	0.0012	0.0112	0.0187	-0.0024	-0.0287
	(0.0024)	(0.0231)	(0.0366)	(0.0057)	(0.0565)
4th quartile	0.0038	0.0316	0.0472	-0.0108	-0.0718
	(0.0027)	(0.0240)	(0.0320)	(0.0086)	(0.0493)
old university	0.0017	0.0162	0.0277	-0.0030	-0.0426
	(0.0021)	(0.0183)	(0.0351)	(0.0026)	(0.0536)
Region (omitted: England excluding London)					
London	-0.0017	-0.0158	-0.0275	0.0025	0.0424
	(0.0019)	(0.0171)	(0.0304)	(0.0026)	(0.0477)
Scotland	0.0044	0.0331	0.0437	-0.0151	-0.0662
	(0.0037)	(0.0281)	(0.0316)	(0.0150)	(0.0471)
Wales/N. Ireland	-0.0032	-0.0329	-0.0644	-0.0015	0.1020
	(0.0022)	(0.0234)	(0.0505)	(0.0108)	(0.0828)

Table OA3. ***Academic Ranking*** **(Ordered Probit, Marginal Effects), continued.**

	Teaching Fellow	Researcher	Lecturer	SL/Reader	Professor
	(1)	(2)	(3)	(4)	(5)
% staff female	0.0001	0.0009	0.0015	-0.0003	-0.0022
	(0.0001)	(0.0008)	(0.0012)	(0.0002)	(0.0018)
wp network	0.0019	0.0167	0.0270	-0.0044	-0.0413
	(0.0018)	(0.0140)	(0.0235)	(0.0037)	(0.0355)
no mentor	0.0003	0.0028	0.0045	-0.0008	-0.0068
	(0.0024)	(0.0211)	(0.0327)	(0.0063)	(0.0498)
competitive	-0.0005	-0.0044	-0.0070	0.0012	0.0106
	(0.0015)	(0.0136)	(0.0214)	(0.0037)	(0.0328)
cooperative	-0.0002	-0.0015	-0.0024	0.0004	0.0036
	(0.0020)	(0.0172)	(0.0277)	(0.0047)	(0.0423)
business school	-0.0007	-0.0066	-0.0107	0.0016	0.0164
	(0.0018)	(0.0170)	(0.0274)	(0.0037)	(0.0425)
external appointment	0.0039	0.0332**	0.0519**	-0.0096	-0.0793**
	(0.0024)	(0.0156)	(0.0262)	(0.0060)	(0.0370)
career break	0.0017	0.0154	0.0250	-0.0039	-0.0383
	(0.0015)	(0.0150)	(0.0212)	(0.0031)	(0.0345)
part-time	0.0225**	0.1270***	0.1184***	-0.0767**	-0.1912***
	(0.0114)	(0.0453)	(0.0336)	(0.0352)	(0.0407)
outside offers in last 5 years	-0.0059**	-0.0522**	-0.0859***	0.0111	0.1329***
	(0.0027)	(0.0206)	(0.0275)	(0.0070)	(0.0430)
Obs	526	526	526	526	526
Pseudo R-squared	0.2221				

Standard errors in parentheses (clustered at the institution level). * p<0.10 ** p<0.05 *** p<0.01.

Table OA4. ***Academic Ranking*** **(Marginal Effects at Means), Selected Results.**

	Teaching Fellow	Researcher	Lecturer	SL/Reader	Professor
	(1)	(2)	(3)	(4)	(5)
1. Ordered Probit (unconditional)					
male	-0.0460***	-0.0928***	-0.0674***	0.0135*	0.1927***
	(0.0133)	(0.0258)	(0.0152)	(0.0077)	(0.0325)
Obs	526	526	526	526	526
Pseudo R-squared	0.0204				
2. Ordered Probit (conditional)					
male	-0.0056**	-0.0471**	-0.0717***	0.0147*	0.1097***
(conditional)	(0.0028)	(0.0212)	(0.0216)	(0.0082)	(0.0347)
Obs	526	526	526	526	526
Pseudo R-squared	0.2221				
3. Multinomial Logit (conditional)					
male	-0.0002*	-0.0485	-0.1301**	0.0647	0.1141*
	(0.0001)	(0.0319)	(0.0512)	(0.0570)	(0.0605)
Obs	526	526	526	526	526
Pseudo R-squared	0.496				

Standard errors in parentheses (clustered at the institution level). * p<0.10 ** p<0.05 *** p<0.01.
Regressions in panels (2) and (3) include all variables from Model 3 in Table 1.

Table OA5. *Gender Pay Gap for Academic Ranks* (OLS Estimates).

Dependent variable is ln(salary)	Researcher	Lecturer	SL/Reader	Professor
male	-0.1367**	0.0487	0.0415	0.1147*
	(0.0573)	(0.0545)	(0.0398)	(0.0619)
non-white	-0.1400***	0.0691	0.0333	0.0205
	(0.0404)	(0.0511)	(0.0469)	(0.0978)
married	-0.0067	0.0506	-0.0561	-0.0219
	(0.0768)	(0.0544)	(0.0414)	(0.0604)
children	-0.0783	-0.0116	0.0096	0.0020
	(0.0626)	(0.0505)	(0.0365)	(0.0611)
age	-0.0092	0.0127	0.0409*	0.0302
	(0.0302)	(0.0208)	(0.0207)	(0.0243)
age squared	0.0001	-0.0001	-0.0004*	-0.0003
	(0.0004)	(0.0003)	(0.0002)	(0.0002)
first class degree	-0.1117	-0.0328	-0.0739*	0.0817*
	(0.0645)	(0.0505)	(0.0386)	(0.0409)
PhD	0.0996	0.0522	-0.0630	0.0718
	(0.0726)	(0.1022)	(0.0627)	(0.1133)
publication score	0.0158	0.0106	0.0168	-0.0017
	(0.0189)	(0.0157)	(0.0141)	(0.0275)
research income > 100	0.1618***	0.0682	-0.1374	0.0232
	(0.0510)	(0.0850)	(0.0972)	(0.0579)
excellent teaching score	0.0101	0.0579	0.0189	-0.0573
	(0.1071)	(0.0653)	(0.0452)	(0.0601)
REF GPA (omitted group: not a REF dept and lowest quartile)				
2nd quartile	0.2409	0.0287	-0.0255	0.0550
	(0.1494)	(0.0486)	(0.0273)	(0.0767)
3rd quartile	-0.0049	0.0796	0.0396	0.0608
	(0.1305)	(0.0574)	(0.0621)	(0.0832)
4th quartile	-0.0111	0.3522***	0.2532***	0.2676***
	(0.1725)	(0.1074)	(0.0722)	(0.0991)
old university	-0.1489	0.0336	0.1561***	-0.1119
	(0.3518)	(0.0960)	(0.0396)	(0.1790)
Region (omitted: England excluding London)				
London	-0.0754**	0.1637	0.1623***	0.2083**
	(0.0357)	(0.1037)	(0.0534)	(0.0865)
Scotland	-0.0469	0.0794	0.0261	0.2154***
	(0.1494)	(0.0481)	(0.0496)	(0.0740)
Wales/N. Ireland	0.4717***	-0.2226**	-0.1443*	-0.2578*
	(0.1428)	(0.1052)	(0.0732)	(0.1503)
% staff female	-0.0002	-0.0045	-0.0017	-0.0039
	(0.0023)	(0.0037)	(0.0024)	(0.0047)
wp network	0.1096*	-0.0009	0.0271	-0.0860
	(0.0613)	(0.0643)	(0.0453)	(0.0562)

Table OA5. ***Gender Pay Gap for Academic Ranks*** **(OLS Estimates), continued.**

Dependent variable is ln(salary)	Researcher	Lecturer	SL/Reader	Professor
no mentor	-0.0057	0.0619	-0.0104	0.0039
	(0.0817)	(0.0483)	(0.0536)	(0.0528)
competitive	0.0247	0.0904*	0.0431	-0.0849*
	(0.0468)	(0.0496)	(0.0314)	(0.0488)
cooperative	0.0881*	-0.0549	-0.0793	0.0459
	(0.0492)	(0.0430)	(0.0569)	(0.0518)
business school	-0.0235	0.0178	0.0759*	0.0542
	(0.1129)	(0.0556)	(0.0408)	(0.0929)
external appointment	-0.1642***	0.0297	0.0242	0.0987*
	(0.0490)	(0.0649)	(0.0433)	(0.0510)
career break	0.0266	-0.0063	0.0881*	-0.0137
	(0.0248)	(0.0441)	(0.0445)	(0.0436)
part-time	-0.0195	-0.0401	-0.1988	0.1816**
	(0.0593)	(0.0565)	(0.1445)	(0.0749)
outside offers in last 5 years	-0.0425	0.0093	0.0316	0.1767***
	(0.0413)	(0.0565)	(0.0436)	(0.0451)
constant	10.8325***	10.1219***	9.7129***	10.3934***
	(0.3381)	(0.4197)	(0.5023)	(0.6418)
Obs	57	82	82	134
R-squared	0.874	0.679	0.700	0.504
Adj. R-squared	0.749	0.509	0.542	0.372

Standard errors in parentheses (clustered at institution level). * p<0.10 ** p<0.05 *** p<0.01.

Table OA6. ***Academic Ranking*** **(Marginal Effects at Means), Selected Results for Women.**

Ordered Probit	Teaching Fellow (1)	Researcher (2)	Lecturer (3)	SL/Reader (4)	Professor (5)
Women					
non-white	0.0299	0.1137**	0.0334	-0.0687**	-0.1083***
	(0.0195)	(0.0460)	(0.0242)	(0.0316)	(0.0376)
married	0.0008	0.0039	0.0022	-0.0022	-0.0047
	(0.0077)	(0.0385)	(0.0223)	(0.0216)	(0.0468)
children	-0.0020	-0.0100	-0.0056	0.0055	0.0120
	(0.0073)	(0.0360)	(0.0207)	(0.0206)	(0.0433)
age	0.0014	0.0073	0.0040	-0.0040	-0.0087
	(0.0038)	(0.0192)	(0.0109)	(0.0107)	(0.0230)
first class degree	-0.0046	-0.0224	-0.0118	0.0127	0.0262
	(0.0095)	(0.0463)	(0.0224)	(0.0261)	(0.0514)
PhD	-0.0506	-0.1665*	-0.0313	0.1022**	0.1461***
	(0.0320)	(0.0850)	(0.0358)	(0.0501)	(0.0507)
publication score	-0.0061*	-0.0305***	-0.0170*	0.0170***	0.0365***
	(0.0032)	(0.0110)	(0.0091)	(0.0064)	(0.0126)
research income > 100	-0.0203**	-0.1143***	-0.0864	0.0548**	0.1663**
	(0.0102)	(0.0358)	(0.0589)	(0.0224)	(0.0727)
excellent teaching score	-0.0006	-0.0031	-0.0017	0.0017	0.0037
	(0.0074)	(0.0377)	(0.0214)	(0.0208)	(0.0457)
old university	0.0148*	0.0918**	0.0804	-0.0404**	-0.1465*
	(0.0081)	(0.0363)	(0.0565)	(0.0160)	(0.0775)
external appointment	0.0013	0.0064	0.0035	-0.0036	-0.0076
	(0.0077)	(0.0373)	(0.0209)	(0.0210)	(0.0449)
part-time	0.0642*	0.1891***	0.0193	-0.1179***	-0.1547***
	(0.0333)	(0.0638)	(0.0400)	(0.0431)	(0.0334)
outside offers in last 5 years	-0.0159*	-0.0808*	-0.0486	0.0436*	0.1017*
	(0.0091)	(0.0482)	(0.0301)	(0.0232)	(0.0560)
Obs	230	230	230	230	230
Pseudo R-squared	0.373				

Standard errors in parentheses (clustered at the institution level). * p<0.10 ** p<0.05 *** p<0.01.
Regressions in panels (2) and (3) include all variables from Model 3 in Table 1.

Table OA7. ***Academic Ranking*** **(Marginal Effects at Means), Selected Results for Men.**

Ordered Probit	Teaching Fellow (1)	Researcher (2)	Lecturer (3)	SL/Reader (4)	Professor (5)
Men					
non-white	-0.0001	-0.0027	-0.0110	-0.0038	0.0175
	(0.0003)	(0.0099)	(0.0420)	(0.0160)	(0.0680)
married	-0.0020	-0.0506*	-0.1497***	-0.0068	0.2091***
	(0.0022)	(0.0262)	(0.0532)	(0.0184)	(0.0659)
children	-0.0000	-0.0005	-0.0018	-0.0006	0.0029
	(0.0003)	(0.0088)	(0.0357)	(0.0113)	(0.0561)
age	-0.0000	-0.0014	-0.0058	-0.0018	0.0090
	(0.0001)	(0.0038)	(0.0152)	(0.0049)	(0.0239)
first class degree	-0.0003	-0.0097	-0.0383	-0.0115	0.0598
	(0.0003)	(0.0098)	(0.0339)	(0.0092)	(0.0512)
PhD	-0.0039	-0.0775	-0.1826**	0.0271	0.2369***
	(0.0041)	(0.0504)	(0.0780)	(0.0496)	(0.0797)
publication score	-0.0003	-0.0095**	-0.0381***	-0.0121*	0.0599***
	(0.0002)	(0.0045)	(0.0119)	(0.0065)	(0.0194)
research income > 100	-0.0004	-0.0147	-0.0647	-0.0285	0.1083
	(0.0004)	(0.0101)	(0.0530)	(0.0326)	(0.0936)
excellent teaching score	-0.0003	-0.0113	-0.0497	-0.0213	0.0827
	(0.0003)	(0.0113)	(0.0433)	(0.0238)	(0.0769)
old university	-0.0002	-0.0055	-0.0210	-0.0057	0.0323
	(0.0004)	(0.0130)	(0.0466)	(0.0103)	(0.0697)
external appointment	0.0008	0.0274***	0.1057**	0.0317**	-0.1656***
	(0.0008)	(0.0106)	(0.0428)	(0.0161)	(0.0594)
part-time	0.0017	0.0412	0.1202	0.0014	-0.1644*
	(0.0022)	(0.0355)	(0.0815)	(0.0282)	(0.0909)
outside offers in last 5 years	-0.0007	-0.0237**	-0.0973**	-0.0356*	0.1573**
	(0.0006)	(0.0105)	(0.0406)	(0.0192)	(0.0624)
Obs	296	296	296	296	296
Pseudo R-squared	0.2678				

Standard errors in parentheses (clustered at the institution level). * p<0.10 ** p<0.05 *** p<0.01.
Regressions in panels (2) and (3) include all variables from Model 3 in Table 1.