

# CAUGHT AT THE CROSSROADS?

AN INTERSECTIONAL APPROACH TO GENDER AND ETHNICITY PAY GAPS IN HE



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## 1 Summary

With the introduction of statutory gender pay gap reporting in 2017 and the prospect of ethnicity pay gap reporting in the near future, UCEA decided it would be timely to undertake an investigation into the differences between the pay of ethnic minority women and other comparator groups in the UK higher education (HE) workforce. The concept of two (or more) protected characteristics impacting on outcomes for individuals is referred to as 'intersectionality'. Its significance for labour market outcomes had been referenced for some years and it was formally incorporated as a principle of the HE sector's Athena SWAN Charter in 2015.

Our research focuses on differences in the basic pay of female and male staff in two broad 'Asian' and 'Black' ethnicity groups and that of White men and White women. We investigate whether intersectionality is an important concept when it comes to pay differentials while improving our understanding of ethnicity pay gaps in the sector. The situation for the whole staff population is considered as well as that for the academic staff and professional services staff groups. The first phase of the research involved a review of the unadjusted pay distributions for each group. In the second phase we carried out a regression analysis to understand systematic pay differences. We also looked at the impact of nationality and job levels on these pay differentials.

We use the term *pay penalty* in the report to describe the pay gaps that remain after taking into account observable characteristics that influence earnings. This term is distinct from a *pay gap*, denoting the difference in the average pay of two groups as a proportion of one of those groups, and *sex/racial discrimination*, the latter of which refers to differential treatment solely related to an individual's ethnicity, skin colour, nationality or citizenship. The Equality Act 2010 prohibits sex and racial discrimination in the workplace as well as in other situations such as access to public services.

The main results of our research are that:

- **Pay penalties for ethnic minorities are significant** in the sector with Black men and Black women earning the least on average.
- **There is no significant gender pay gap between Black men and Black women** either among all staff or in each of the main workforce segments (academic and professional services) indicating no compound intersectional effect for these groups.
- **Asian men earn significantly less on average than White men but marginally more than White females.** Asian women earn significantly less than White women.
- **The gender pay gap between Asian men and Asian women is significant** indicating the presence of an intersectional effect for these groups.
- **Black men and Black women are much more likely to work in lower level grades** and much less likely to work in senior and management positions than their White and Asian counterparts. As with the gender pay gap, we see that it is vertical job level

segregation rather than differences in pay for like workers that leads to large pay differentials for ethnic minority staff.

- **Nationality is a significant factor in the sector pay outcomes but this does not fully explain the pay penalties for Black staff and Asian women.** Non-UK ethnic minority staff show larger pay penalties relative to UK White male comparators than UK ethnic minorities. The earnings of UK Asian men are only slightly lower than those of UK White male comparators.
- **The pay penalty experienced by ethnic minority women in the sector is much more likely to be due to factors associated with their ethnicity than their gender.**
- **Our 'all staff' findings are not due to the influence of one part of the workforce over the other,** as we find general consistency across the two broad segments of the higher education workforce.

These results hold even when education levels and some demographic and institutional variables are accounted for, and prove robust to different specifications.

We conclude that ethnicity is an important factor in the HE labour market and deserves attention as do intersectional outcomes. We make the following general recommendations for higher education institutions (HEIs):

- Analyses of ethnicity pay gaps should at a minimum be disaggregated by broad ethnic groups and ideally by more granular ethnic groupings, when the data sample size allows.
- The impact of nationality on ethnicity pay gaps merits consideration and the reasons for any differences should be identified where possible.
- HEIs should consider intersectionality as part of their examination of gender and ethnicity on pay outcomes and how their existing gender pay gap interventions may affect women from different ethnic backgrounds.
- Given the findings on ethnic minority staff distribution by contract level, we believe attention should be given to interventions that improve the ethnic diversity of recruitment pools and actively address barriers to progression that are more likely to affect ethnic minorities.
- Care should be taken in communications to avoid ethnic pay gaps being attributed solely to 'discrimination' or 'racism'. In a similar vein, it is unhelpful to conflate gender pay gaps with equal pay problems.<sup>1</sup>

We also make the following recommendations for the sector-level work:

- Further qualitative and quantitative research would be beneficial to better understand the reasons for systematic pay differences between Black and Asian staff and

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<sup>1</sup>For more information on how gender pay gap is different from equal pay please visit <https://www.ucea.ac.uk/en/news/communications-materials/infographics.cfm>.

their White counterparts. Such research could consider the impact of household-level and individual-level characteristics that were not available in our dataset such as household composition and previous work experience. It would also be valuable to look at differences within the broad ethnicity categories used in this study.

- Further work could be undertaken to identify HR policy interventions that are effective in addressing recruitment and progression barriers that are particular to or more likely to affect ethnic minority staff.

## 2 A new agenda on race

On 11 October 2018, Prime Minister Theresa May launched a new Race at Work Charter to tackle barriers facing ethnic minorities in the workplace. Alongside the Charter, which commits organisations to principles and actions that target improvements in the recruitment and progression of ethnic minority staff, a consultation was launched on ethnicity pay reporting. The ethnicity pay reporting consultation closes in January 2019 and follows the first statutory publication of gender pay gap data by employers with more than 250 employees in March 2018.<sup>2</sup> The ethnicity pay gap is defined in the consultation, and typically elsewhere, as the difference between the earnings of men or women from various ethnic minority groups as a percentage of White British men's or women's earnings. While many HEIs look at gender or ethnicity pay gaps separately as part of equal pay reviews, 'intersectionality' considers the compounded impact of two or more characteristics – including but not limited to race, class, gender, sexuality and nationality – that interact in ways that are inextricable.

Although gender equality has received significantly more attention than ethnicity when it comes to the higher education (HE) workforce, a Race Equality Charter was launched in January 2016 by the Equality Challenge Unit (now AdvanceHE). Ethnicity pay gaps have also featured in the majority of equal pay audits in the sector for several years with 73 per cent of HEIs covering ethnicity in their pay audits as far back as in 2013 (New JNCHEs, 2013). Intersectionality has also attracted some HR policy attention in the sector with consideration of the 'intersection of gender and other factors' introduced as a principle in the Athena SWAN Charter as part of its expansion in 2015.

Against this backdrop of pay gap reporting and a new focus on race and ethnicity, this report presents an investigation of intersectionality of gender and ethnicity in the HE sector. We want to assess its impact and draw out considerations for HEIs in analysing their own staff profile and developing action plans to address inequalities and promote equal opportunities. Our analysis intends to improve our understanding of how the intersection of ethnicity and gender contribute to gender inequality in the UK HE sector. It is far from the final word on intersectionality or ethnicity pay gaps in HE but we hope our findings will encourage the sector and its institutions to continue and extend work to improve employment outcomes for ethnic minorities working, or with aspirations to work, in HE.

The report begins with an explanation of intersectionality (Section 3) which is followed by the research questions the report addresses (Section 4) and a note on data and terminology used in the report (Section 5). A descriptive analysis of intersectional pay distributions is set out in Section 6, examining all staff, academic staff and professional service staff in succession as well as differences by nationality. Section 7 sets out the empirical approach to the regression analysis and provides a detailed explanation of the results covering all staff, academic staff only and professional service staff only. Building on the regression

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<sup>2</sup>For more information visit <https://www.gov.uk/guidance/gender-pay-gap-reporting-overview>.

results, Section 8 investigates hypotheses related to job levels, nationality and part-time working. The report concludes with a set of recommendations based on the main findings of our analysis (Section 9).

### 3 Understanding intersectionality

“We cannot claim that men earn more than women when White women out-earn Black men” (Browne and Misra, 2003)

A substantial body of literature argues for consideration of ‘intersectionality’, which is understood as the recognition that group identities such as race and gender cannot be understood in isolation from one another. This concept, originally formulated by King (1988) and Crenshaw (1989), contrasts with the ‘additive’ or ‘double jeopardy’ approach, which treats gender and race/ethnicity as independent categories and assumes that the total discrimination faced by minority women is the sum of the disadvantage from being a woman belonging to an minority ethnicity. Such an approach ignores the ways in which minority women experiences are unique, comparable neither to those of White women nor to those on men of the same ethnicity (King, 1988). It also fails as a theory to explain earnings differences in the labour market which do not exhibit additivity (Greenman and Xie, 2008). By contrast, the intersectional approach offers a testable proposition that can aid in the development of appropriate equality objectives and equality outcomes.

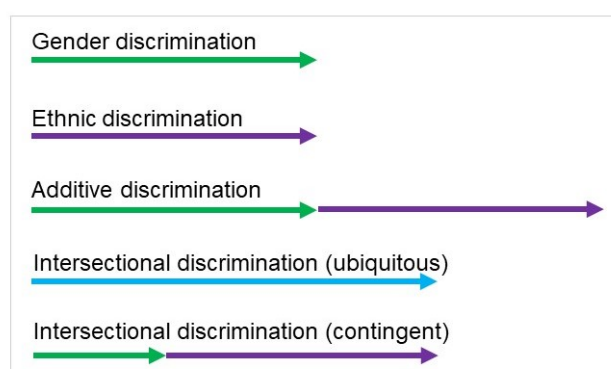
Despite the significance of this topic and the considerable attention given to gender inequality and ethnic inequality in social science literature, very few studies have focused on the interplay between the two (for a review of these studies see Browne and Misra, 2003) and intersectionality as a theoretical framework remains underdeveloped. However, we can draw on a large body of literature in both sociology and economics devoted to documenting the earnings differentials by gender or race/ethnicity in isolation. These analyses provide empirical evidence that there are significant differences in the earnings and career pathways of men and women and individuals from different ethnic groups (Cotter et al., 1999; England et al., 1999). In particular, it has been found (i) that women have lower earnings than men, (ii) that most ethnic minority groups have lower earnings than White people, and (iii) that such differentials cannot be fully attributed to human capital factors such as level of education and time spent in the labour market (Corcoran and Duncan, 1979).

There are different approaches to understanding and evaluating intersectionality in the labour market. The ‘contingent discrimination’ (Browne and Misra, 2003) approach considers that gender and race present different labour stratification systems and that the outcomes of these systems are differential based on individual combinations of race and gender. This approach assumes a certain independence between the different structures and that it should be possible to understand the relative weights of these structures in producing labour market outcomes. This approach contrasts with the ‘multiracial femi-



nist' or 'ubiquitous' approach in which "race, class, gender, and sexuality are not reducible to individual attributes to be measured and assessed for their separate contribution in explaining given social outcomes" (Zinn and Thornton Dill, 1996). Our approach is to follow the contingent discrimination model and therefore we explore and discuss within this research the extent to which gender or ethnicity may dominate in the explanation of labour market outcomes.

Figure 1: Intersectionality frameworks



## 4 Research questions

Given the context for ethnicity and gender pay gap reporting and the existing research and literature in this area, our research seeks to answer the following questions:

- (i) To what extent are there pay penalties for ethnic minority men and women in HE?
- (ii) Do ethnic minority women experience a compounded pay penalty?
- (iii) Do pay penalties differ significantly between different ethnic minority groups?
- (iv) Do ethnic minority pay penalties differ between academic and professional services staff?
- (v) Do ethnic minorities from non-UK nationalities experience a different pay penalty to their UK counterparts?

## 5 Data and terminology

This report uses 2016-17 HESA *Staff in Higher Education* data, which provide detailed information on academic and professional services staff employed at UK HE providers. The dataset is based on the contract population on 1 December 2016 covering 419,710 staff by headcount. The dataset includes personal and demographic characteristics of staff, as well as information on contract terms and employment type. Salary information is limited to basic pay only and does not include additional elements of pay such as responsibility

allowances and market supplements. To analyse the effect of gender and ethnicity on pay, we have focused on the White, Black and Asian populations only. All the other groups, including mixed, are classified as Other. Whilst we are aware that such a classification is not ideal, these were the broad categories available in the data extract.

The sample includes all staff employed in UK HEIs with a Full Person Equivalent (FPE) equal to 1 in order to ensure comparability of workers in the analysis. By restricting the sample to staff with FPE=1 only, we are left with 346,210 observations. All employees with missing demographic characteristics are also excluded from the analysis. The final sample contains 247,310 observations. A description of the variables can be found in Table A1 in the Appendix.

Throughout this report, we use the terms *gender penalty* and *ethnic penalty* to denote the systematic differences in pay and benefits encountered by women and ethnic minorities relative to their male or White counterparts. These terms, frequently used in economics and sociology, suggest that such difference in earnings can be thought of as a 'tax', an additional cost incurred for being a woman or member of a minority ethnic group. In practical terms it is the shortfall in earnings that remains after taking into account observable characteristics that would reasonably be expected to influence pay, such as age and education. It is misleading to label this penalty as 'discrimination' as there are other variables that may factor in determining wages. For example, our data includes no information on the household situation of the employees such as their marital status or number of dependants.

## 6 Pay distributions

This section contains a descriptive analysis of pay distributions by gender, ethnicity and nationality to help understanding the key features and shape of the data. First, we analyse the pay distribution by gender and ethnicity for all staff, for academic staff only and for professional services staff only. Since nationality has been found to be an important determinant of pay (Velling, 1995) we then repeat the above analysis differentiating between UK and non-UK staff. This analysis is restricted to all staff and academic staff only, as the proportion of international staff in professional services is considerably lower than in the academic staff population.

### 6.1 Gender and ethnicity

Two charts are presented for each staff category. The first one compares the pay distributions of women and men belonging to different ethnic groups, while the second one compares the percentage of women and men belonging to different ethnic groups paid above each pay band. In Appendix B, we also present a chart that visually compares

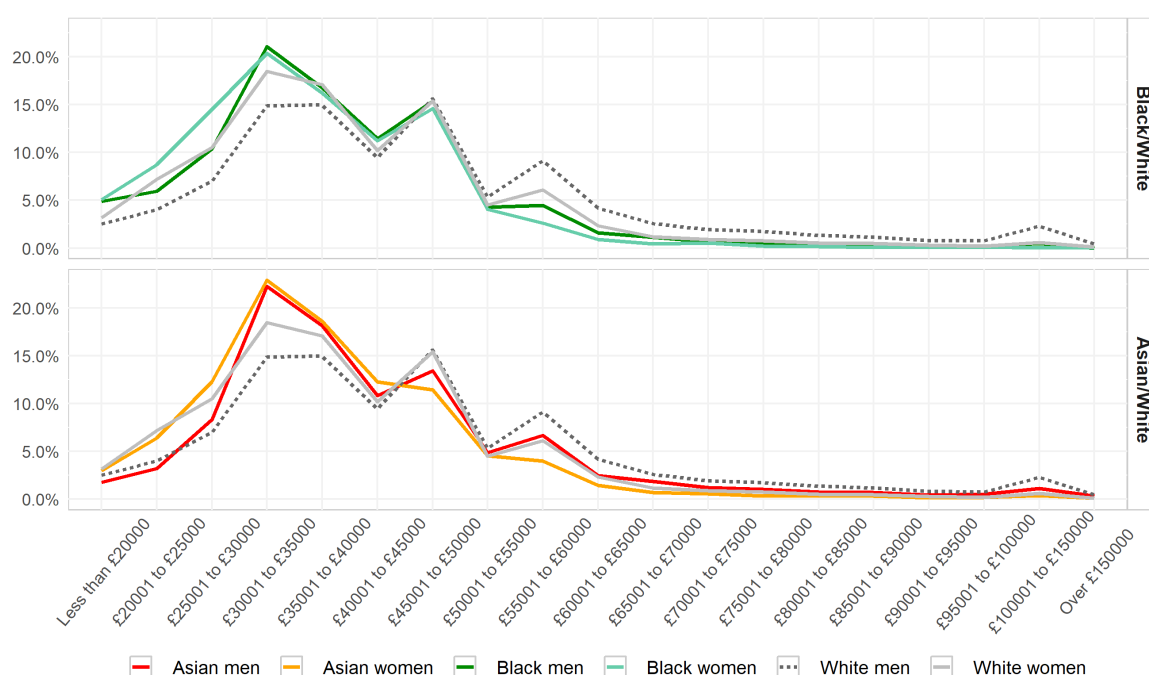
the pay distribution of women and broad ethnic minority groupings to that of White men.

### 6.1.1 All staff

The charts confirm that there are sizeable earnings differentials by both gender and ethnicity in the HE sector, with women typically earning less than men and most broad ethnic minority groups earning less than both White men and White women.

Figure 2 shows that Black men and Black women are noticeably over-represented at low levels of pay (up to £35,000) and visibly underrepresented in the pay distribution above £55,000. Black men follow a similar pattern to White women beyond this point of the pay distribution, but very few Black women earn more than £65,000.

Figure 2: Pay distribution by gender and ethnicity for all HE staff

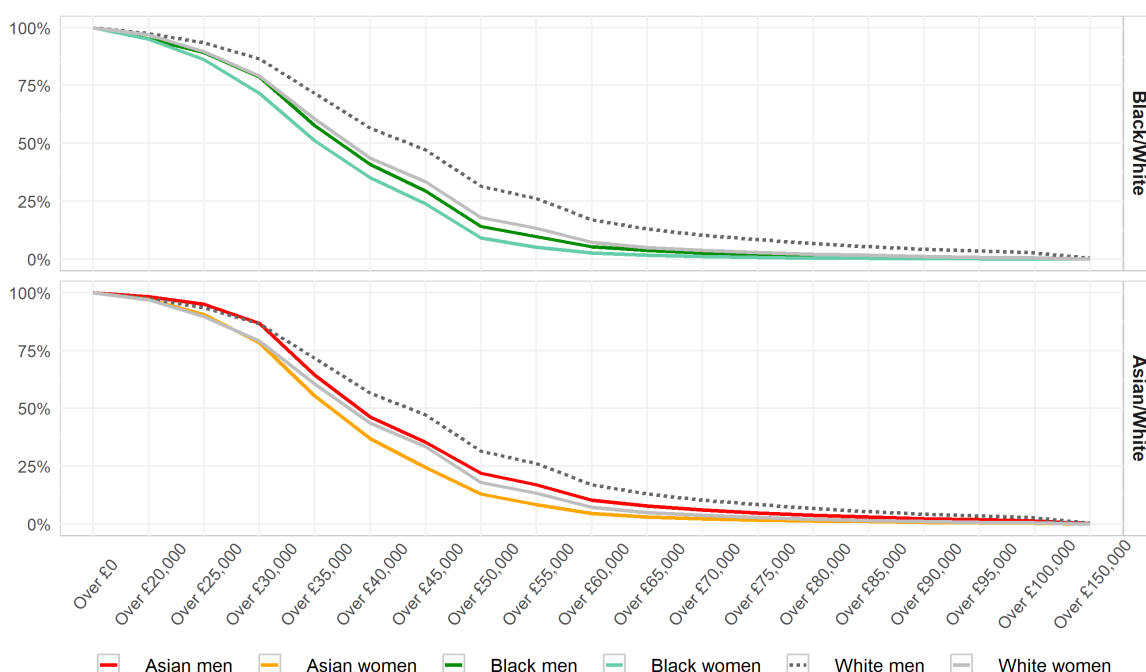


This chart compares the pay distributions of women and men belonging to different ethnic groupings. The larger the mass on the left of the distribution, the higher the proportion of employees concentrated in the lower end of the pay distribution.

The pay distribution for Asian men follows closely those of White women above the £35,000 mark but has stronger representation in the £30,001 to £35,000 bracket. Asian women appear to be over-represented at low levels of pay and distinctly underrepresented compared to White women above £55,000.

There is a smaller difference in earnings for Asian men relative to White men than for Black men. The cumulative earnings profile in Figure 3 shows that Asian men have a small edge over White women. while the opposite is true for Black men. Moreover, while women earn less than their male counterparts among all groups, the earnings gap appears to be

Figure 3: Cumulative pay distribution by gender and ethnicity for all HE staff



This chart compares the percentage of women and men belonging to different ethnic groupings paid above each pay band. For each pay band, if the pay distribution is below that of White men, the proportion of minority employees paid above that level is lower.

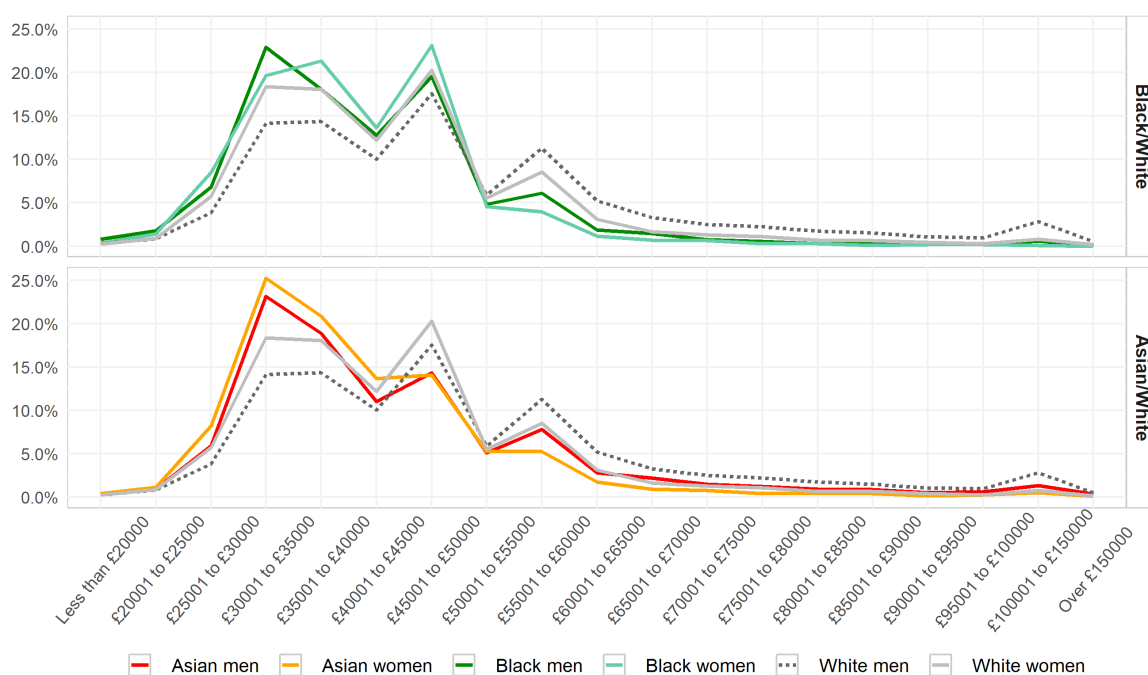
largest among White men and White women and smallest between Black men and Black women.

### 6.1.2 Academic staff

When we restrict the sample to academic staff only, the differences in pay distributions are even more striking (Figure 2). White academic men are the top earners with 38.7 per cent earning over £50,000 compared to 23.9 per cent of White women, 25.1 per cent of Asian men and much lower percentages for the other groups examined. The vast majority of staff have earnings between £25,000 and £55,000, with an over-representation of Black and Asian academics, irrespective of gender, at lower levels of pay. The pay distribution of Asian men mirrors closely that of Asian women up to £55,000 but mirrors White women above that level of pay. Black academic staff and Asian women are underrepresented in all pay brackets above £50,000.

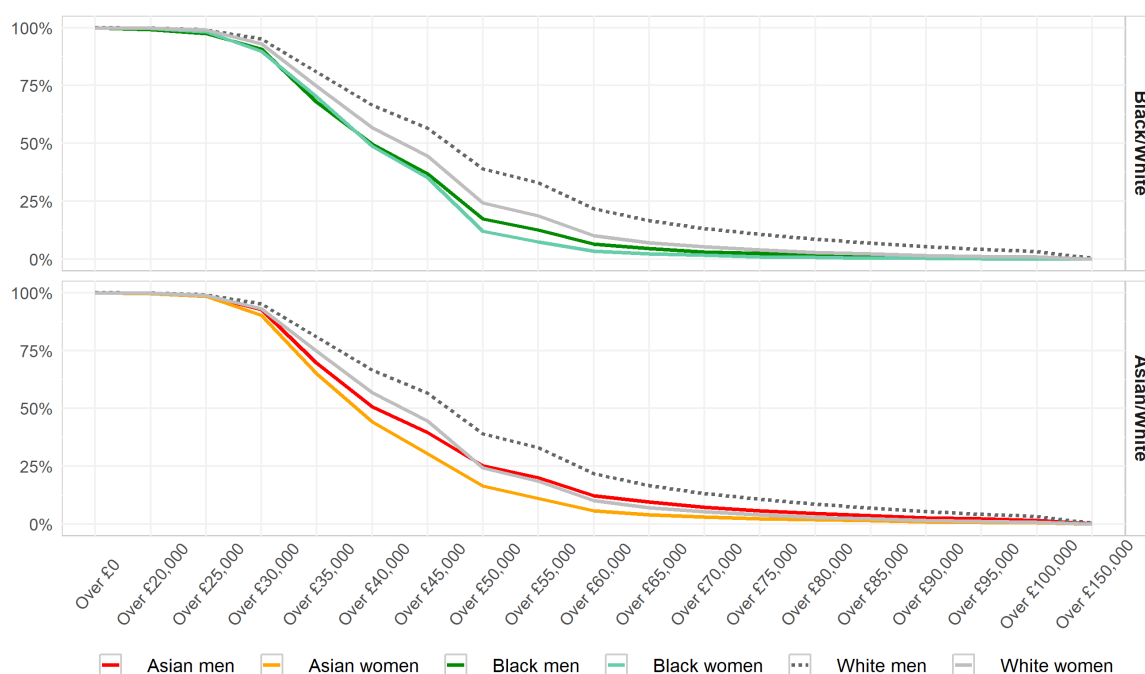
As before, all ethnic minority academics have lower earnings than White men. Again, the larger gender pay gap seems to be experienced by White women: their earnings relative to those of White men are lower than the earnings of minority women relative to those of their male counterparts. The cumulative distribution of pay for Black men and Black women in Figure 5 is nearly identical up to £50,000 while the curves for Asian men and Asian women begin to divert after £30,000.

Figure 4: Pay distribution by gender and ethnicity for academic staff



This chart compares the pay distributions of academic women and men belonging to different ethnic groupings. The larger the mass on the left of the distribution, the higher the proportion of employees concentrated in the lower end of the pay distribution.

Figure 5: Cumulative pay distribution by gender and ethnicity for academic staff



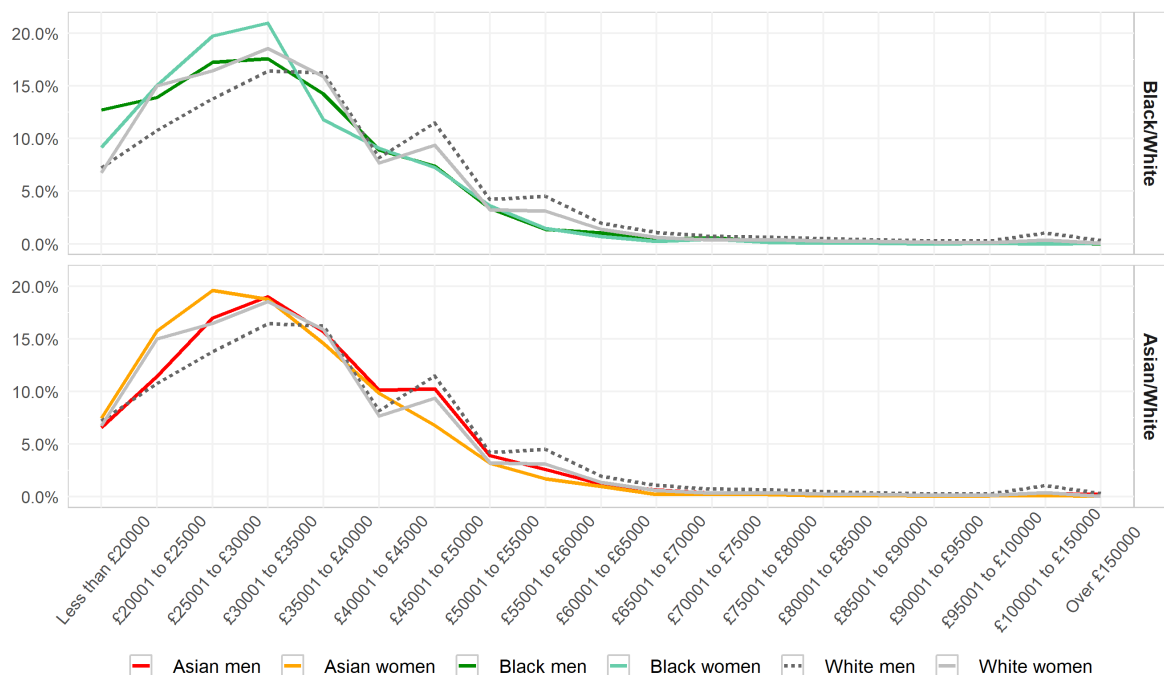
This chart compares the percentage of academic women and men belonging to different ethnic groupings paid above each pay band. For each pay band, if the pay distribution is below that of White men, the proportion of minority employees paid above that level is lower.

### 6.1.3 Professional services staff

The professional services group is different in profile and with less obvious differences compared to the academic staff group. Pay is more concentrated toward the lower end of the distribution for all groups, with most staff earning less than £45,000 (Figure 6). Black men and Black women follow a very similar distribution: both groups are over-represented at the lowest levels of pay (up to £30,000) and consistently below their White counterparts. While Asian men show a pay distribution that is broadly in line with that of White women, Asian women exhibit on a lower earning profile.

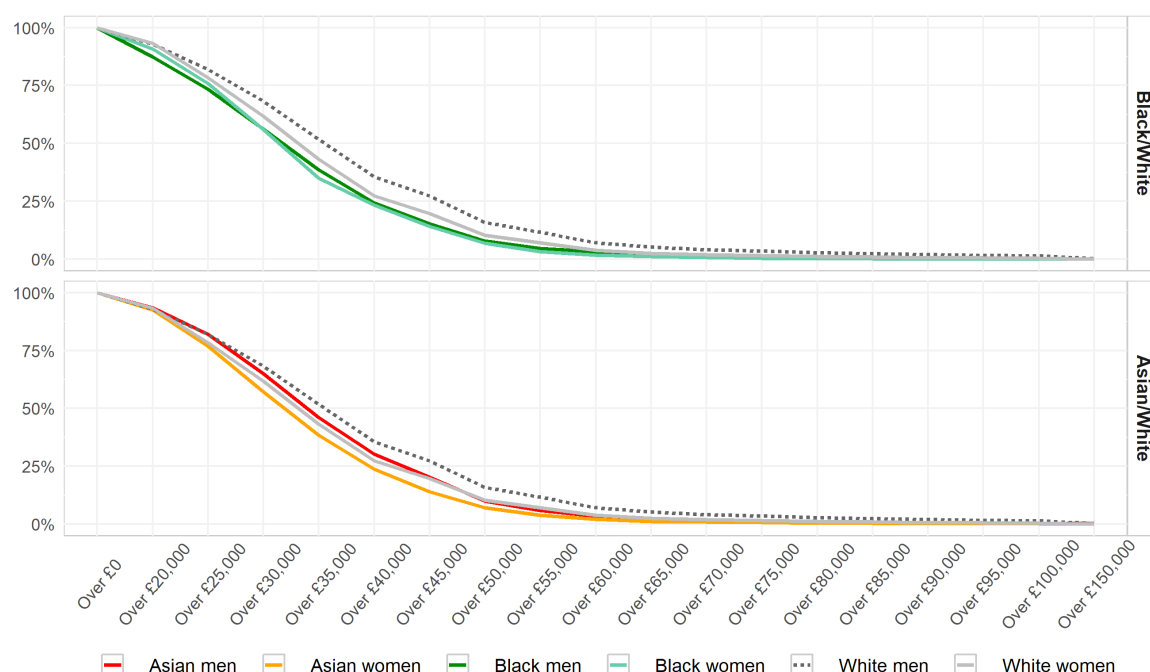
Finally, the pay differential of White women relative to their male counterparts appears to be relevant and negative, as does the difference between Asian men and Asian women. By contrast, the cumulative distribution curves of pay for Black men and Black women are very similar and broadly aligned (Figure 7).

Figure 6: Pay distribution by gender and ethnicity for professional services staff



This chart compares the pay distributions of professional services women and men belonging to different ethnic groupings. The larger the mass on the left of the distribution, the higher the proportion of employees concentrated in the lower end of the pay distribution.

Figure 7: Cumulative pay distribution by gender and ethnicity for professional services staff



This chart compares the percentage of professional services women and men belonging to different ethnic groupings paid above each pay band. For each pay band, if the pay distribution is below that of White men, the proportion of minority employees paid above that level is lower.

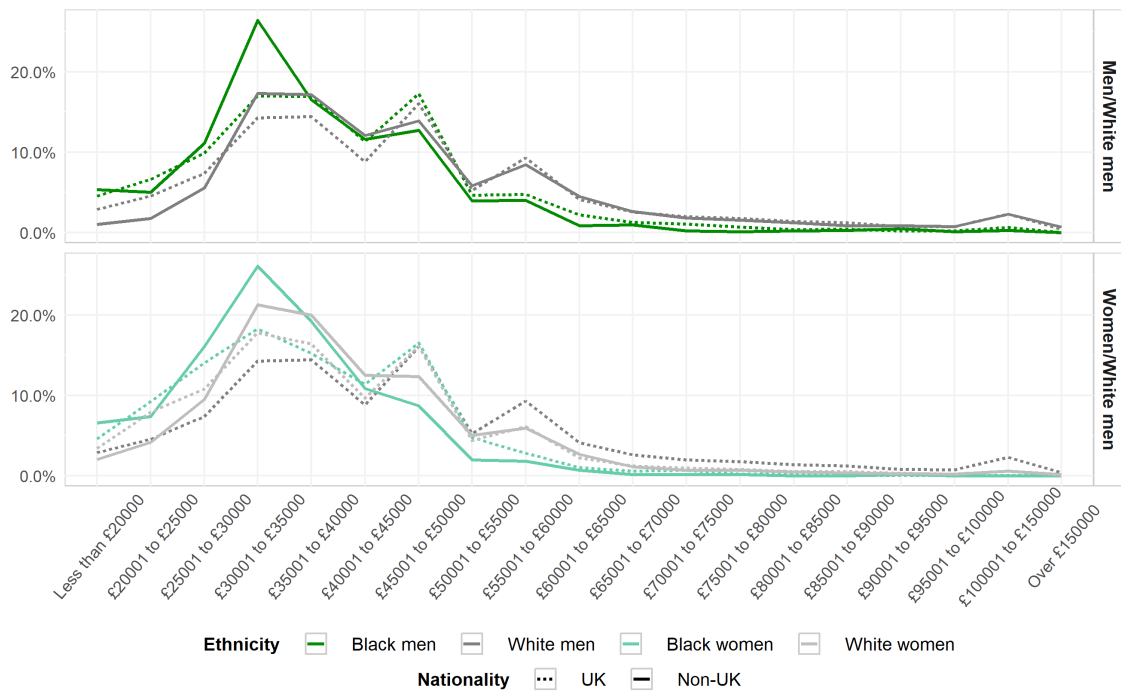
## 6.2 Gender, ethnicity and nationality

Since nationality has been shown to be an important determinant of earnings, and because we were interested in potential differences between British ethnic minorities and ethnic minority migrants, we replicate the above analysis differentiating between UK and non-UK staff. We present below results for all staff. With a high proportion of international staff in the academic sub population which could mask the outcomes of ethnic minorities of British nationality, we replicate the analysis focusing on academic staff only. Results on academic staff are included in Appendix B (Figures B6-B11).

We present two sets of charts. The first one compares the pay distributions of Black and Asian staff belonging to different nationality groupings (Figures 8 and 9). The second one compares the percentage of Black and Asian women and men belonging to different nationality groupings paid above each pay band (Figures 10 and 11). A final set of charts comparing the pay distribution of UK and non-UK Black and Asian staff to that of White UK men is included in Appendix B (Figures B4 and B5).

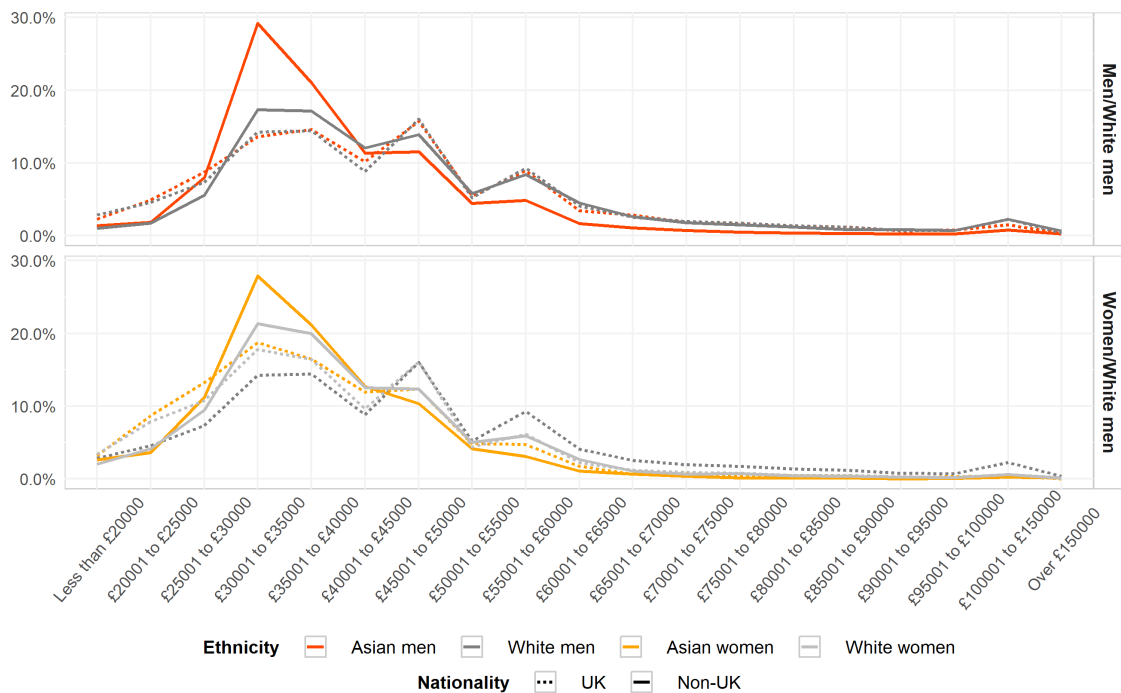
The charts show clear differences in the earnings profiles of UK and non-UK staff and justifies consideration of this variable. Non-UK staff show lower earnings than their UK counterparts irrespective of gender and ethnicity. Non-UK ethnic minorities and White non-UK women appear to be largely over-represented at low levels of pay and under-represented at high levels of pay.

Figure 8: Pay distribution by gender, ethnicity and nationality - Black staff



This chart compares the pay distributions of Black women and men belonging to different nationality groupings. The larger the mass on the left of the distribution, the higher the proportion of employees concentrated in the lower end of the pay distribution.

Figure 9: Pay distribution by gender, ethnicity and nationality - Asian staff



This chart compares the pay distributions of Asian women and men belonging to different nationality groupings. The larger the mass on the left of the distribution, the higher the proportion of employees concentrated in the lower end of the pay distribution.



Asian UK men and Asian UK women have a pay distribution that closely mirrors that of their White counterparts, while Asian non-UK men and Asian non-UK women are on lower earnings profile than White non-UK women. Black UK men follow a pay distribution similar to that of White non-UK men up to £45,000, but are under-represented thereafter. Similarly, the pay distribution of Black UK women is aligned to that of White UK women only up to £45,000.

The larger gender pay gap seems to be experienced by White women and Asian UK women: their earnings relative to those of their male counterparts are lower than the earnings of other minority women relative to those of their male counterparts.

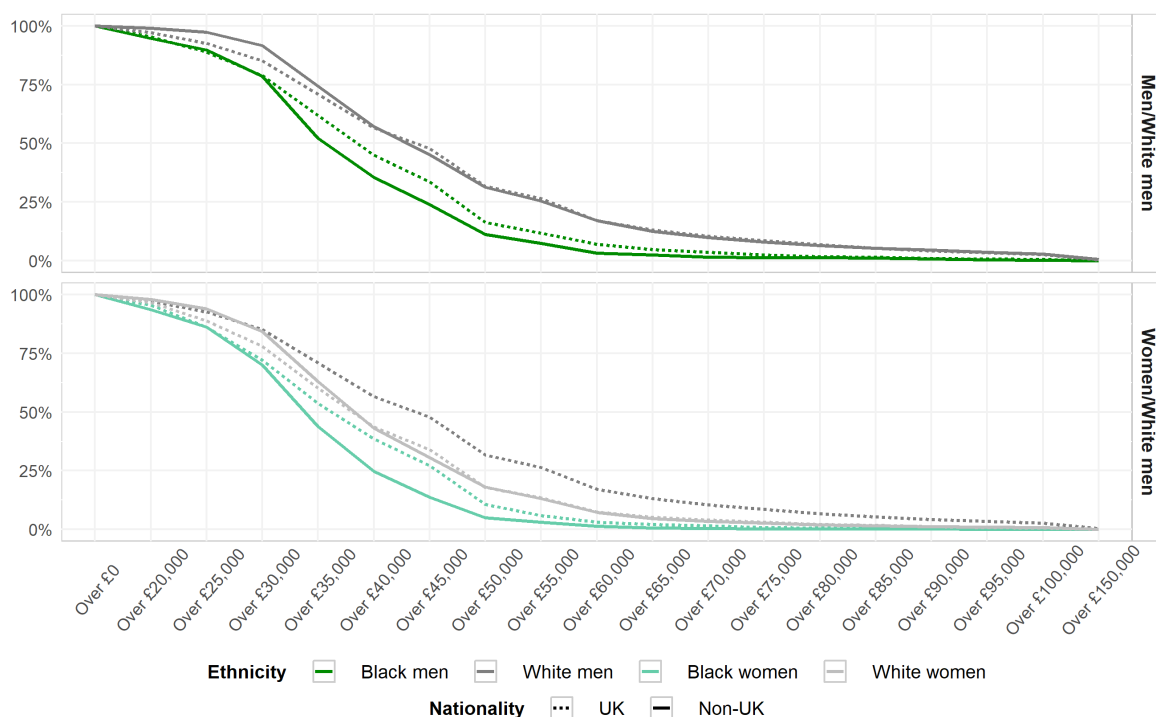
To summarise the findings of the pay distribution analysis, Table 1 ranks the minority groupings by distance from the earnings of White UK men for academic staff. The index is built by computing the area underneath the curves in Figure 10 and Figure 11, and taking the difference with respect to that of White UK men. While each number in isolation is arbitrary, it provides a single comparable indicator of relative difference in earnings distribution among the different minority grouping to enable a relative ranking of the distributions. The analysis shows that White non-UK men have an earnings profile similar to - and slightly higher than - White UK men, while Black non-UK women have the lowest earnings profile. The bottom six groups are Black staff and Asian women, both UK and non-UK.

Table 1: Index of distance of minority groupings' earning distribution from White UK men, all staff

	Distance relative to White UK men
White Non-UK men	0.12
Asian UK men	-0.17
White Non-UK women	-1.12
Asian Non-UK men	-1.19
White UK women	-1.21
Black UK men	-1.25
Asian UK women	-1.51
Asian Non-UK women	-1.71
Black Non-UK men	-1.75
Black UK women	-1.82
Black Non-UK women	-2.37

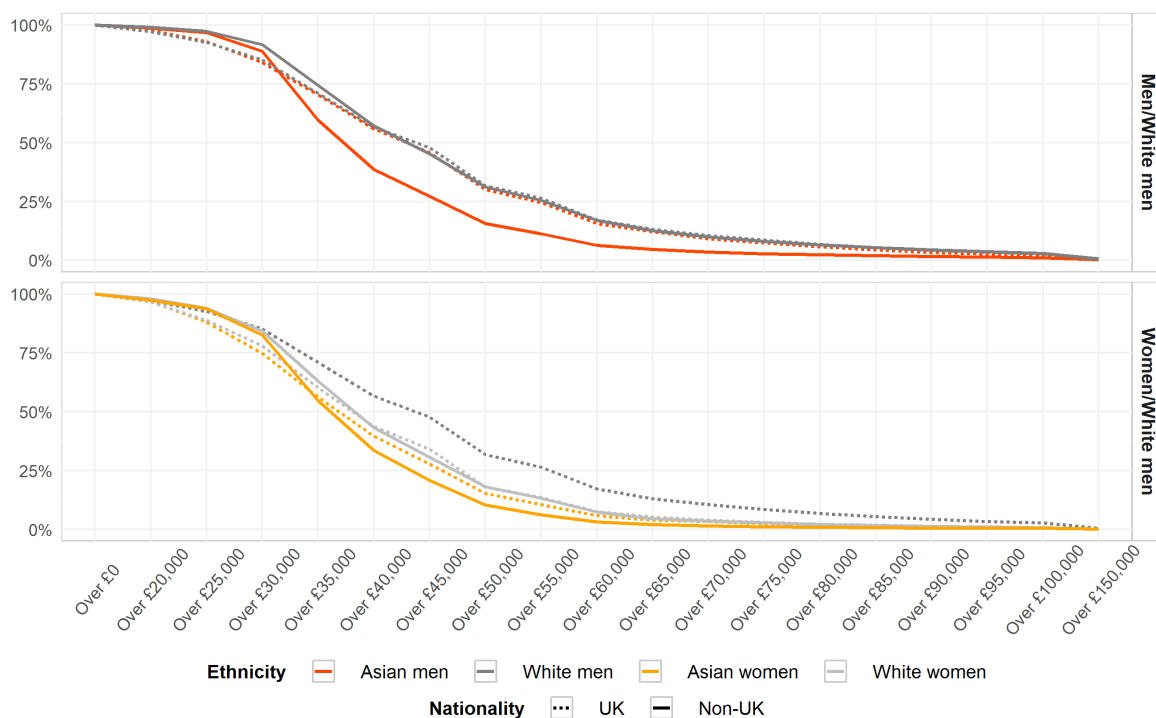
*Notes:* This table presents a measure of distance of minority grouping curves in Fig. 10 and Fig. 11 from that of White UK men. It is computed by calculating the area underneath each curve and then taking the difference with respect to the area underneath the White UK men curve. Whilst such a measure itself is arbitrary, it provides a single comparable indicator of relative difference in earnings distribution among the different minority groupings.

Figure 10: Cumulative pay distribution by gender, ethnicity and nationality - Black staff



This chart compares the percentage of Black women and men belonging to different nationality groupings paid above each pay band. For each pay band, if the pay distribution is below that of White UK men, the proportion of minority employees paid above that level is lower.

Figure 11: Cumulative pay distribution by gender, ethnicity and nationality - Asian staff



This chart compares the percentage of Asian women and men belonging to different nationality groupings paid above each pay band. For each pay band, if the pay distribution is below that of White UK men, the proportion of minority employees paid above that level is lower.

### 6.3 Summary of the pay distribution analysis

The graphical analysis presented in the previous section offers an interesting and rarely explored perspective on pay differences, which are typically focused on gender. Indeed, ethnicity appears to be an important determinant of pay, especially for the academic staff group, which contains a high proportion of international staff. Black men and Black women have pay distributions inferior to that of White women under all scenarios as do Asian women. Asian men fare better in most scenarios with UK Asian male academics sharing a similar profile to that of White UK males. The gender pay gap seems to be highest between White men and White women, and significantly lower among minorities.

Overall it is a complex picture. Further investigation is needed to calculate the extent to which the distributional differences emerged from the graphical analysis can be explained by observable characteristics and how much is instead due to the gender and ethnic penalties - that is, the differences in distributional profiles that remain after controlling for observable characteristics. The next section will investigate this and try to provide a quantitative estimate of the gender and ethnic penalties.

## 7 Estimating the effect of gender and ethnicity on earnings

In this section, we turn to estimating the effect of gender and ethnicity on earnings by means of regression analysis. A regression analysis estimates the relationship between a dependent variable (in this case basic salary) and one or more independent variables (e.g. ethnicity, gender). It means we can understand how changes in the independent variables impact on the dependent variable even when we hold other factors, such as the employee's level of education, constant. The regression analysis also tells us whether these correlations are statistically significant. If unfamiliar with these models, Appendix C contains guidance on how to interpret regression tables and results included in this report.

We present the results of a regression analysis on earnings using ethnicity and gender as the independent variables and controlling for observable characteristics at the individual and HEI level. Section 7.1 contains a detailed description of the regression models used. Section 7.2 summarises the main results.

### 7.1 Empirical strategy

This section presents the regression models. Please note that it is not essential to follow this section to understand the results of the regressions. Readers unfamiliar with regression models may want to make use of Appendix C and skip to Section 7.2.

In this section, we first analyse the effect of gender and ethnicity on earnings for all staff, and academic staff and professional services staff separately. Consider the following base-line model:

$$Y_{ij} = \alpha + \beta Female_i + \sum_{k=1}^3 \gamma_k Ethnicity_i^k + \sum_{k=1}^3 \delta_k Ethnicity_i^k \times Female_i + \epsilon_{ij} \quad (1)$$

where  $Y_{ij}$  is the natural logarithm of earnings of employee  $i$  in HEI  $j$ ;  $Female_i$  is equal to one if employee  $i$  is female;  $Ethnicity_i^k$  denotes  $k = 3$  dummy variables (Black, Asian and Other (including mixed)), with White as the omitted category;  $Ethnicity_i^k \times Female_i$  are the corresponding interaction terms. In this simple model, White men are the excluded category to which all other groups are compared. The coefficient on the sex dummy ( $\beta$ ) represents the difference in the expected (log of) earnings of a White woman relative to a White man, while the coefficients on the three ethnicity dummies give the difference of the expected earnings between a man belonging to ethnicity  $k$  and a White man. The coefficients on the ethnicity-gender interaction terms together with  $\beta$  represent the extent to which being a member of ethnicity group  $k$  has a different effect for women than for men. The main effects of interest are the difference in expected earnings between a White woman and a White man - that is,

$$E(Y_{ij}|Female_i = 1, Ethnicity_i^k = 0) - E(Y_{ij}|Female_i = 0, Ethnicity_i^k = 0) = \beta,$$

and the difference in expected earnings between a woman and a man belonging to the ethnicity  $k$  - that is,

$$E(Y_{ij}|Female_i = 1, Ethnicity_i^k = 1) - E(Y_{ij}|Female_i = 0, Ethnicity_i^k = 1) = \beta + \delta_k,$$

To quantify the impact of ethnicity and gender on earnings and to control for potentially confounding variables, the main empirical model is specified as follows:

$$Y_{ij} = \alpha + \beta Female_i + \sum_{k=1}^3 \gamma_k Ethnicity_i^k + \sum_{k=1}^3 \delta_k Ethnicity_i^k \times Female_i + X'_{ij} \theta + \epsilon_{ij} \quad (2)$$

where:  $X_{ij}$  is a vector of individual (age and education) and HEI controls (income and region); and the other variables are defined as in (1).<sup>3</sup> The model is estimated using an Ordinary Least Squares (OLS) model and standard errors clustered at the institution level.

The specification in (2) allows us to answer the following question: "What is the impact of being a minority woman on earnings?". If the difference in earnings between a White man and a White woman is higher than the difference in earnings between a minority man and a minority woman (i.e., if  $\hat{\delta}_k > 0$ ), there is a positive interaction between being female and being a minority: that is, there is either a smaller gender penalty among minorities than among White people, or a smaller ethnic penalty among women. If instead the difference in earnings between a White man and a White woman is lower than the difference in earnings between a minority man and a minority woman (i.e., if  $\hat{\delta}_k < 0$ ),

<sup>3</sup>For a description of the variables used see Table A1 in the Appendix.

there is a negative interaction between being female and being a minority: that is, either being minority carries a greater penalty for women than men, or there is a greater gender penalty among minorities than among White people.

## 7.2 Regression results

In our regression setting, evaluating the impact of intersectionality on earnings implies considering all different combinations of ethnicity and gender while keeping all other factors fixed. In order to do that, we estimate several specifications. First, we estimate our model looking only at ethnicity and gender. Then we subsequently add demographic controls, such as age and education, and HEI controls, such as institution income and region.

The coefficients of interest remain stable and statistically significant throughout all the specifications considered, with the exception of the gender penalty for White women which drops significantly as more controls are added. Table 2 presents the main estimates of the effect of gender and ethnicity on earnings based on the most complete specification. Full regression results are reported in Table A3 in Appendix A.

Results show that, compared to similar White men:

- (i) White women earn 7.4 percentage points<sup>4</sup> less on average;
- (ii) Black men earn 14.3 percentage points less on average;
- (iii) Black women earn 14.3 percentage points less on average;
- (iv) Asian men earn 6.8 percentage points less on average;
- (v) Asian women earn 11.6 percentage points less on average.

Table 2: Difference in earnings relative to White men, all staff

Ethnicity	Women	Men	Difference
Black	-0.143***	-0.143***	-0.000
Asian	-0.116***	-0.068***	-0.048***
White	-0.077***		-0.077***

Notes: Estimation is conducted on model (3) in Table A3. \* denotes significance at 10%, \*\* denotes significance at 5%, \*\*\* denotes significance at 1%.

The gender pay gaps within the broad ethnic minority groups are smaller than the gap between White men and White women. In particular, there is no difference in average earnings between Black men and Black women, while Asian women earn 3 percentage

<sup>4</sup>The results are described as percentage point differences as the regression looks at differences between mean log earnings - these are similar to the actual percentage difference we would observe between mean earnings, although this similarity reduces as the coefficients get larger.

points less on average than their male counterparts. Our findings are in line with Greenman and Xie (2008) and Webber and Canché (2015), who also find that the gender penalty is larger among Whites than among minorities.

We then replicate the above analysis focusing on academic staff and professional services staff only. The main results of the estimation are reported in Table 3 and 4, respectively. Full regression results are summarised in Tables A4 and A5 in Appendix A.

Table 3: Difference in earnings relative to White men, academic staff

Ethnicity	Women	Men	Difference
Black	-0.127***	-0.143***	0.016
Asian	-0.101***	-0.065***	-0.036***
White	-0.067***		-0.067***

Notes: Estimation is conducted on model (3) in Table A4. \* denotes significance at 10%, \*\* denotes significance at 5%, \*\*\* denotes significance at 1%.

The magnitude and sign of the coefficients of interest are largely unchanged. Among academic staff (Table 3), Black men and Black women experience the largest pay penalties, with earnings that are 14.3 and 12.7 percentage points lower than those of similar White men. White academic women earn 6.7 percentage points less on average than their male counterparts. Asian academic women are paid 10.1 percentage points less than similar White men, while the pay penalty is 6.5 percentage points for Asian academic men. The gender pay gaps among academic staff within the broad ethnic minority groups remain smaller than the gap between White men and White women. Again, we do not find a significant difference in earnings between Black men and Black women.

Table 4: Difference in earnings relative to White men, professional services staff

Ethnicity	Women	Men	Difference
Black	-0.157***	-0.152***	-0.005
Asian	-0.132***	-0.078***	-0.053***
White	-0.075***		-0.075***

Notes: Estimation is conducted on model (3) in Table A5. \* denotes significance at 10%, \*\* denotes significance at 5%, \*\*\* denotes significance at 1%.

The picture is similar when looking at professional services staff only (Table 4). Black men and Black women experience once again the largest pay penalties, with earnings that are 15.7 and 15.2 percentage points lower than those of similar White men. White professional services women earn 7.5 percentage points less than their male counterparts. Asian professional services women and men are paid 13.2 and 7.8 percentage points less than similar White men, respectively. Also among professional services staff the gender pay

gap is wider among White men and White women than within the broad ethnic minority groups. The difference in earnings between Black men and Black women is small and not statistically significant.

In all the specifications considered, the coefficients of interest are stable and statistically significant from zero. The gender penalty for White women is an exception to this stability as the coefficients drop significantly as more controls are added - especially when considering all staff and academic staff only. This means that the controls we are applying explain some of the difference we observe when no controls are considered. The fact that we observe the gender penalty dropping significantly for White women relative to White men as more controls are included in the analysis is consistent with standard labour economics theory. Yet the same is not true for the ethnic minority coefficient nor for the coefficient of a combination of gender and Black and Asian ethnicity, with the controls making little difference to these pay penalties. The pay penalties for minority women do fall in the full specification but only insofar as the White female-male penalty falls. It might be the case that the model omits certain factors that are salient for ethnic minority staff but not for White staff, such as access to education and labour market opportunities. We also acknowledge that household-level variables are not included within the model and these can be significant determinants of wages (e.g. marital status and the number and age of children). If any of these omitted variables were to have different effects on minority men and women relative to White workers, we would be overestimating the combined pay penalty effect of gender and ethnicity. This means care must be taken in assigning causes to the pay penalty results.

This pay penalty puzzle is not unique to our analysis and is consistent with sociological research which finds that individuals experience disadvantage and privilege based on their social location - defined as the combined statuses of ethnicity, gender, class and other social categories (Weber, 2001; Browne and Misra, 2003). While this view is in contrast with neoclassical economic theories of labour markets, where differences in earnings are explained with variations in human capital, it appears to be corroborated by sociological research showing that accounting for education, experience and skills does not fully explain differences in labour market outcomes (Browne and Misra, 2003).

## **8 The effect of nationality and labour market segmentation**

In this section, we perform some sensitivity analysis to check the robustness of our results. These analyses test the following hypotheses:

1. The share of the differences in earnings among gender-ethnicity groups can be attributed to differences in the earnings of the labour market positions into which they have been sorted (see, among others, Beck et al., 1980; Tomaskovic-Devey, 1993; Alt-tonji and Blank, 1999; Hiebert, 1999; Hudson, 2007). The underlying mechanism is that minorities and women occupy jobs that typically have lower levels of earnings

than jobs occupied by white men, and are often unable to achieve inter-sectoral mobility (Kaufman, 2010; Howell, 2011).

2. Citizenship and nationality rival gender and ethnicity as important mechanisms for allocating workers to lower paid jobs, net of workers' human capital characteristics (Hudson, 2007; Constant and Massey, 2005).
3. Differentials in earnings between men and women are partially explained by the higher likelihood of part-time working for women (Olsen and Walby, 2004).

In order to investigate these hypotheses, we first extend our analysis to differentiate between UK and non-UK staff to reflect the fact that nationality appears to be an important determinant of pay (Section 8.1). We then investigate the effect of gender and ethnicity on contract levels, to capture whether the underlying mechanism is related to labour market segmentation (Section 8.2). Finally, to understand how much of the estimated gaps is due to part-time working, we estimate the probability of working part-time for women and minority workers (Section 8.3).

## 8.1 Gender, ethnicity and nationality

In order to determine the extent to which nationality affects pay, we repeat the specification in (2) differentiating between UK and non-UK staff. The empirical model we estimate is specified as follows:

$$\begin{aligned}
 Y_{ij} = & \alpha + \beta Female_i + \sum_{k=1}^3 \gamma_k Ethnicity_i^k + \delta NonUK_i + \sum_{k=1}^3 \zeta_k Ethnicity_i^k \times Female_i + \\
 & + \sum_{k=1}^3 \eta_k Ethnicity_i^k \times NonUK_i + \phi Female_i \times NonUK_i + \\
 & + \sum_{k=1}^3 \psi_k Ethnicity_i^k \times NonUK_i \times Female_i + X'_{ij} \theta + \epsilon_{ij}
 \end{aligned} \tag{3}$$

where:  $NonUK_i$  is equal to one if employee  $i$  is non-UK, and the other variables are defined as in (2). The model is again estimated using an OLS model and standard errors clustered at the institution level.

Table A6 in Appendix A reports the full regression results of the impact of gender, ethnicity and nationality on earnings, while Table 5 summarises the difference in earnings of women and minority group relative to White UK men for our preferred specification (column (3) in Table A6).

Results confirm the observations made in Section 6 and confirm the hypothesis that nationality is an important factor in explaining labour market outcomes. Non-UK staff show lower earnings than their UK counterparts irrespective of gender and ethnicity, with the largest difference experienced by Asian and Black non-UK men (earning 7.2 and 6.2 percentage points less than their UK counterparts). Black staff and Asian non-UK staff show the lowest earnings compared to White UK men. Black non-UK women and men earn 18.5 and 18.4 percentage points less than similar White UK men, respectively, while the gap is 14.5 and 10.9 percentage points for Asian non-UK women and men.



Table 5: Difference in earnings relative to White UK men, all staff

Ethnicity	Nationality	Women	Men	Difference
Black	Non-UK	-0.185***	-0.184***	-0.001
Black	UK	-0.134***	-0.122***	-0.012
	Difference	-0.051***	-0.062***	
Asian	Non-UK	-0.145***	-0.109***	-0.036***
Asian	UK	-0.105***	-0.037***	-0.069***
	Difference	-0.040***	-0.072***	
White	Non-UK	-0.109***	-0.026***	-0.082***
White	UK	-0.075***		-0.075***
	Difference	-0.034***	-0.026***	

Notes: Estimation is conducted on model (3) in Table A6. \* denotes significance at 10%, \*\* denotes significance at 5%, \*\*\* denotes significance at 1%.

The gender pay gap appears to be larger among White staff, with White non-UK women and White UK women earning 8.2 and 7.5 percentage points less than their male counterparts, respectively. Asian UK women follow closely, with earnings that are 6.9 percentage points lower than similar Asian UK men. Interestingly, there does not seem to be a significant gender pay gap among Black staff, and a small one (3.6 percentage points) for Asian non-UK staff.

We then replicate the above analysis focusing on academic staff only because of the high proportion of international staff in this population. A summary of results is reported in Table 6. Full regression results are summarised in Table A7 in Appendix A.

Table 6: Difference in earnings relative to White UK men, academic staff

Ethnicity	Nationality	Women	Men	Difference
Black	Non-UK	-0.156***	-0.163***	0.007
Black	UK	-0.117***	-0.134***	0.017
	Difference	-0.039**	-0.029**	
Asian	Non-UK	-0.130***	-0.102***	-0.027***
Asian	UK	-0.081***	-0.021***	-0.060***
	Difference	-0.048***	-0.081***	
White	Non-UK	-0.091***	-0.020***	-0.070***
White	UK	-0.065***		-0.065***
	Difference	-0.026***	-0.020***	

Notes: Estimation is conducted on model (3) in Table A7. \* denotes significance at 10%, \*\* denotes significance at 5%, \*\*\* denotes significance at 1%.

Results are mainly unchanged. Non-UK academic staff earn systematically less than their UK counterparts, with the largest penalty experienced by Asian men. Black non-UK men and Black non-UK women show the lowest earnings compared to White UK men, earning 15.6 and 16.3 percentage points less than similar White UK men, respectively. The gap is 13 and 10.2 percentage points for Asian non-UK women and Asian non-UK men. The gender pay gap appears to be larger among White staff, with White non-UK women and White UK women earning 7 and 6.5 percentage points less than their male counterparts, respectively. Asian UK women follow closely, with earnings that are 6 percentage points lower than similar Asian UK men. Again, we do not observe a significant gender pay gap among Black staff.

## 8.2 Labour market segmentation

In order to test the assumption that ethnic minorities and women are less likely to be in higher paid job levels, we repeat the specification in (2) using contract levels as the dependent variable. The empirical model we estimate is specified as follows:

$$ContractLevel_{ij} = \alpha + \beta Female_i + \sum_{k=1}^3 \gamma_k Ethnicity_i^k + \sum_{k=1}^3 \delta_k Ethnicity_i^k \times Female_i + X'_{ij} \theta + \epsilon_{ij} \quad (4)$$

where:  $ContractLevel_{ij}$  is the contract level<sup>5</sup> of individual  $i$  employed in HEI  $j$ , and the other variables are defined as in (2). The model is estimated using an ordered log-odds (logit) model.

Table 7 presents the main estimates of the effect of gender and ethnicity on contract levels for all staff. Full regression results are summarised in Table A9 in Appendix A. The ordered logit coefficients are not straightforward to interpret. The standard interpretation is that for a one unit increase in the predictor, the response variable level is expected to change by its respective regression coefficient in the ordered log-odds scale, while all the other variables in the model are held constant.

Table 7: Difference in contract levels likelihood relative to White men, all staff

Ethnicity	Women	Men	Difference
Black	-0.970***	-0.855***	-0.115**
Asian	-0.762***	-0.455***	-0.307***
White	-0.435***		-0.435***

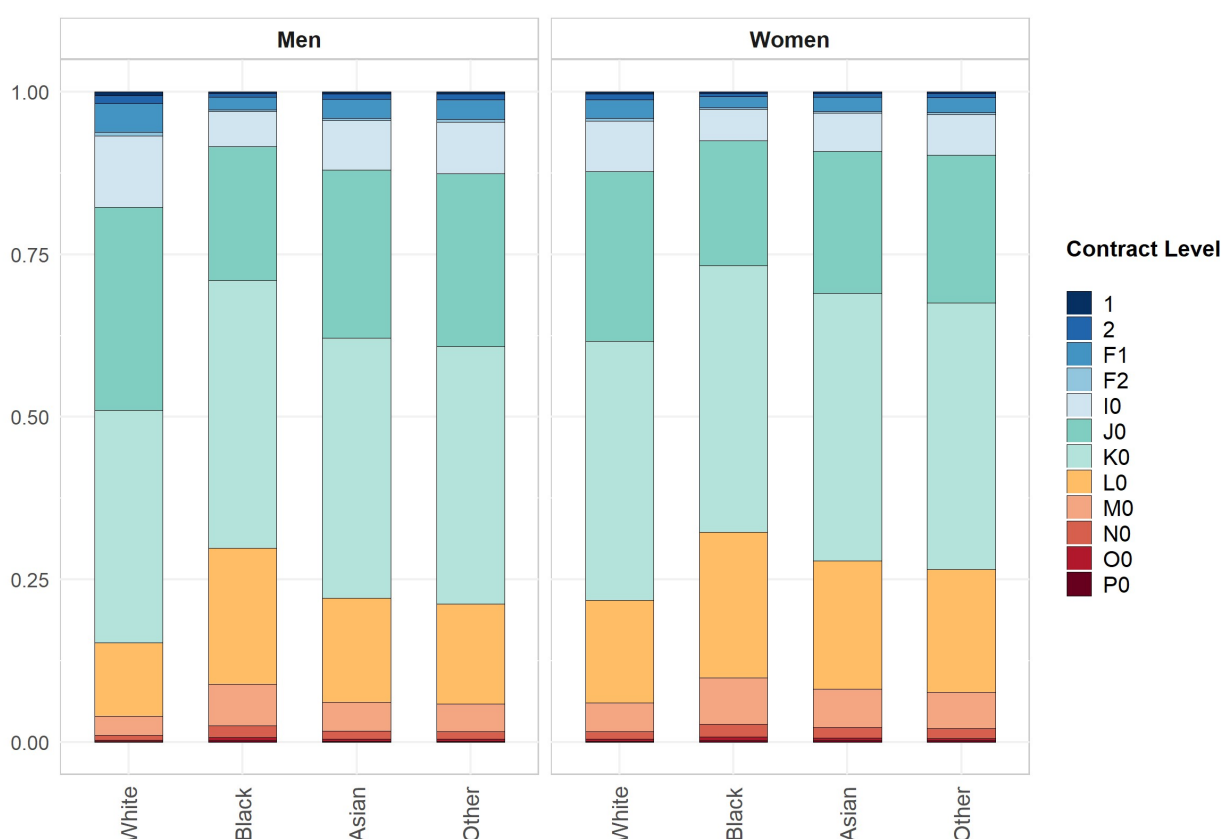
Notes: Estimation is conducted on model (3) in Table A9. \* denotes significance at 10%, \*\* denotes significance at 5%, \*\*\* denotes significance at 1%.

<sup>5</sup>For a description of all contract levels see Table A8 in the Appendix, or visit [https://www.hesa.ac.uk/collection/c16025/combined\\_levels](https://www.hesa.ac.uk/collection/c16025/combined_levels)

For example, the ordered log-odds for White women being in a higher contract level is 0.435 lower than for White men. For ethnic minorities, the log-odds of being in a higher contract level are even lower, especially for Black women and men (0.97 and 0.855 lower than White men, respectively) - Table 7.

To provide an easier interpretation of these coefficients, we have computed the predicted probability for each gender-ethnicity combination to be in a given contract level. Such probabilities are estimated from the model in Table A9 - column (4), and are plotted in Figure 12.

Figure 12: Predicted probabilities of being in each contract level by gender and ethnicity



This chart compares the predicted probabilities of being in each contract level by gender and ethnicity. These have been estimated using an ordered logit on model (3) in Table A9.

While most of the staff from all gender-ethnicity groups are concentrated on contract levels J0-K0, White men are most likely to be in Senior Management and least likely to be in routine/simple task provider contracts. Ethnic minority groups, and Black staff in particular, are instead much more concentrated towards the lowest contract levels and display very low probabilities of being in senior positions.

### 8.3 Part-time working

In order to better understand the working patterns of women and ethnic minorities which may factor in earnings, we repeat the specification in (2) using part-time working as the dependent variable. The empirical model we estimate is specified as follows:

$$Part-time_{ij} = \alpha + \beta Female_i + \sum_{k=1}^3 \gamma_k Ethnicity_i^k + \sum_{k=1}^3 \delta_k Ethnicity_i^k \times Female_i + X'_{ij} \theta + \epsilon_{ij} \quad (5)$$

where:  $Part-time_{ij}$  is equal to one if employee  $i$  in HEI  $j$  is working part-time, and the other variables are defined as in (2). The model is estimated using an Linear Probability Model and standard errors clustered at the institution level.<sup>6</sup>

Table A10 in Appendix A reports the full regression results of the impact of gender, ethnicity and nationality on earnings, while Table 8 summarises the difference in probability of working part-time of women and minority group relative to White men for our preferred specification (column (3) in Table A10).

Table 8: Difference in probability of working part-time relative to White men, all staff

Ethnicity	Women	Men	Difference
Black	0.059***	0.018	0.041***
Asian	0.077***	-0.021***	0.098***
White	0.143***		0.143***

Notes: Estimation is conducted on model (3) in Table A10. \* denotes significance at 10%, \*\* denotes significance at 5%, \*\*\* denotes significance at 1%.

As expected, all women are more likely to work part-time than their male counterparts, irrespective of ethnicity. Interestingly, White women are 14.3 percent more likely to be in a part-time contract than White men, against 7.7 percent for Asian women and 5.9 percent for Black women. Our data do not allow us to control for important household-level determinants of part-time working (such as household type, number and age of children and income of partner/spouse), but this finding is consistent with other research on the UK workforce which shows that Black women in work are more likely to work full-time than their White counterparts (Buckner et al., 2007).

<sup>6</sup>The results are unchanged if a Probit model is used. We rely on the Linear Probability Model for ease of interpretation.

## 9 Conclusions and recommendations

**The gender pay gap is receiving unprecedented public focus in the UK with the introduction of statutory gender pay gap reporting but the ethnicity pay gap presents a whole new set of challenges.** While no substantive evaluations have been published, the attention on gender appears to have been successful in putting women's pay and progression on to the agendas of boards and executives and in spurring action to address the gender pay gap. While there is wider public and organisational awareness of the issues relating to the gender pay gap, underpinned by a significant amount of UK research on the topic, the ethnicity pay gap and its causes are not well understood. There is also greater complexity as ethnicity is complex to partition and ethnic groups do not feature throughout the UK in consistent proportions. Ethnic minority staff in HE are also far more likely to be of a non-UK nationality compared to White staff, which adds additional factors to consider. Our starting point as researchers is also more limited as the extant research on ethnicity pay gaps is dominated by the US experience and particularly differences between Black and White Americans.

**The concept of intersectionality has emerged as an acknowledgement of the complexity of individual identities and empirical evidence of differential outcomes in the labour market.** Intersectional approaches emphasise the importance of understanding the intersection of gender and ethnicity rather than treating each in isolation. Gender and ethnicity are found to be highly relevant to earnings outcomes in other research and our findings are consistent with this. Civil society organisations have also adopted the intersectional approach to raise awareness of the 'double discrimination' faced by minority women.

**Ethnic minorities earn systematically less than their White counterparts and there are significant differences between broad ethnic minority categories with Black staff systematically earning less than all other groups.** Our results suggest that these earnings differences are partly the result of labour market segmentation, with White men over-represented at the most senior levels and minorities - especially Black men and Black women - over-represented at the lowest-skilled jobs. In terms of gender-based earnings inequality, our findings show that the widest intra-ethnic gender pay gap is experienced by White women, in line with previous research (Greenman and Xie, 2008; Webber and Canché, 2015). However, of all the intersected groups studied, White women have the smallest pay penalty relative to White men with ethnic minority male and female groups all earning significantly less on average than similar White women. This highlights the value of the intersectional approach in understanding pay outcomes in the workforce, but interestingly our results do not universally conform to the common assertions of intersectional advocates. Contrary to the hypothesis that ethnic minority women experience a compounded pay penalty due to their gender and ethnicity, Black women earn the same on average as Black men when we control for demographics and institutional factors and when we split the population by nationality. We do, however, see a significant gender

pay gap between Asian men and Asian women, and so there is evidence here of a compounded pay penalty of the type foreseen by intersectional theory.

**Our sector level findings are not driven by the influence of one part of the workforce over the other, we find general consistency across the two broad segments of the HE workforce.** We observe the same outcomes for Black men and Black women - no intra-ethnic gender pay gap and higher pay penalties relative to Asian and White counterparts. The results for Asian men and Asian women in the two segments are also broadly similar with a significant gender pay gap found in both segments and pay penalties exceeding White females. Again the pay penalties for Asian men and Asian women are more significant for professional services staff. These findings indicate that the pay penalties detailed in the all staff results are evident across the the entire workforce and there is no masking effect whereby one segment reduces the pay penalties of another. This is an important finding when we turn to policy recommendations.

**Nationality is an important factor in the determination of earnings in HE with significant differences across all staff and in the academic population.** Irrespective of gender and ethnicity, non-UK staff earn systematically less than their counterparts of UK nationality. The results are a clear sign of the complexity of the ethnicity pay gap. These differences could be due to a host of reasons such as years of UK work experience and language proficiency, which we cannot adequately address here. What we can say is that when considering ethnicity pay gaps, we should seek to understand the extent to which those differences may be due to factors related to migrant staff and those factors which might be common to all individuals of a given ethnic group. This is particularly important for academic staff where more than 60 per cent of Black and Asian staff are not UK nationals.

**Ethnic minorities and White women are less likely to be in senior management positions and more likely to be in administrative and routine occupations.** Our analysis shows that, much like the gender pay gap, ethnicity pay gaps are not attributable to ethnic minorities being paid less for the same or similar work. Black men and Black women are significantly more concentrated towards the lowest job levels and have a very low likelihood of reaching senior management positions. Vertical segregation and the 'glass ceiling' are known to factor in the gender pay gap and we can identify similar patterns for ethnic minorities. It is commonly stated that for women these effects are linked to time out of the labour market and the pressure of domestic responsibilities - yet these factors do not explain why we see similar profiles for ethnic minority men.

**Policies that seek to improve part-time opportunities for women may be more likely to favour White women.** While it is common for gender pay gap interventions to improve opportunities for part-time working, our analysis shows that this is more than twice as likely to benefit White women than Black women in the sector. This finding highlights the benefits of intersectional analysis and shows that interventions that are based on an analysis of women as a homogeneous group may actually differentially benefit the dominant part of that group and exacerbate within gender differences.

**In the intersection of ethnicity and gender, ethnicity is the dominant factor in determining pay penalties.** Our results show that the pay penalty for White women falls away as we apply controls to account for differences in the characteristics of the population, but we do not see this same effect on the larger pay penalties for ethnic minority men or any change in the intersectional component in our analysis. We suggest that the stubborn residual pay penalties for the ethnic minority groups could be due to the omission of factors such as household-level variables. If variable omission is responsible or at least partly responsible, then it must be the case that these factors are of greater importance for ethnic minority staff than for White staff. It therefore follows that the differential factors associated with being an ethnic minority have a greater negative impact on pay than those factors associated with being female. This interpretation of the results is consistent with our analytical framework, which assumed that the effects of gender and ethnicity on labour market outcomes are independent but intersect for each individual. While this conclusion is tentative in the absence of comprehensive data, it is an important consideration in designing responses to ethnic pay gaps. It suggests that the pay penalty experienced by minority women in the sector is much more likely to be due to factors associated with their ethnicity than their gender. It also means that while 'intersectionality' is important as a concept and consideration, it should be not at the expenses of tackling ethnic pay inequalities on a gender-neutral basis.

**Pay penalties are not equivalent to discrimination.** Our analysis is not comprehensive and we acknowledge the limitations of our model, particularly the omission of household-level variables. We therefore caution interpretation the pay penalties as solely the result of 'discrimination' by HEIs. What our results do suggest is that ethnicity really matters and deserves greater attention. Our results show that ethnic minorities working in the sector earn less on average and are more likely to be working in lower grades than their White counterparts. By focusing efforts on this topic we may better understand why we see such differences in levels of pay and differences in progression and this will in turn improve our policy responses.

Taking these findings and conclusions into consideration, we make the following general recommendations for HEIs:

- Analyses of ethnicity pay gaps should at a minimum be disaggregated by broad ethnic groups and ideally by more granular ethnic groupings, when the data sample size allows.
- The impact of nationality on ethnicity pay gaps merits consideration and the reasons for any differences should be identified where possible.
- HEIs should consider the intersectionality of gender and ethnicity on pay outcomes and how existing gender pay gap interventions may affect women from different ethnic backgrounds (e.g. improving part-time work opportunities).
- Given the findings on ethnic minority staff distribution by contract levels, we believe

attention should be given to interventions that improve the ethnic diversity of recruitment pools and actively address barriers to progression that are more likely to affect ethnic minorities.

- Care should be taken in communications to avoid ethnic pay gaps being attributed solely to racial discrimination. In a similar vein that, it is unhelpful to conflate gender pay gaps with equal pay problems.

We also make the following recommendations for the sector-level work:

- Further qualitative and quantitative research would be beneficial to better understand the reasons for systematic pay differences between Black and Asian staff and their White counterparts. Such research could consider the impact of household-level and individual-level characteristics that were not available in our dataset such as household composition and previous work experience. It would also be valuable to look at differences within the broad ethnicity categories used in this study.
- Further work could be undertaken to identify HR policy interventions that are effective in addressing recruitment and progression barriers that are particular to or more likely to affect ethnic minority staff.



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## Appendix A Additional Tables

Table A1: Variables description

Variables	Description	Min	Max
<i>Outcome variables</i>			
Log of earnings	Natural logarithm of basic pay	8.161	12.073
Contract level	HESA contract levels	1	12
Part-time	Has a part-time contract	0	1
<i>Demographics</i>			
Female	Is female	0	1
Black	Is Black (includes Black African, Black Caribbean, other Black)	0	1
Asian	Is Asian (includes Indian, Pakistani, Bangladeshi, Chinese, other Asian)	0	1
Other	Is of other ethnicity (includes Arab, any other ethnicity, any mixed ethnicity)	0	1
Nationality	Is non-UK	0	1
Age (Under 21)	Is under 21	0	1
Age (21-25)	Is aged 21-25	0	1
Age (26-30)	Is aged 26-30	0	1
Age (31-35)	Is aged 31-35	0	1
Age (36-40)	Is aged 36-40	0	1
Age (41-45)	Is aged 41-45	0	1
Age (46-50)	Is aged 46-50	0	1
Age (51-55)	Is aged 51-55	0	1
Age (56-60)	Is aged 56-60	0	1
Age (61-65)	Is aged 61-65	0	1
Age (Over 65)	Is over 65	0	1
Education	Highest qualification held	1	12
<i>HEI characteristics</i>			
Region	Institution's jurisdiction (NI, S, W, LS, E)	1	5
HEI income	Institution's income	15.51	21.35

Table A2: Index of distance of minority groupings' earning distribution from White UK men, academic staff

	Distance relative to White UK men
Asian UK men	-0.04
White Non-UK men	-0.62
White UK women	-1.17
Black UK men	-1.30
Asian UK women	-1.44
Black UK women	-1.65
White Non-UK women	-1.68
Asian Non-UK men	-2.01
Black Non-UK men	-2.31
Asian Non-UK women	-2.41
Black Non-UK women	-2.77

*Notes:* This table presents a measure of distance of minority grouping curves in Fig. B8 and Fig. B9 from that of White UK men. It is computed by calculating the area underneath each curve and then taking the difference with respect to the area underneath the White UK men curve. Whilst such a measure itself is arbitrary, it provides a single comparable indicator of relative difference in earnings distribution among the different minority groupings.

Table A3: Impact of ethnicity and gender on earnings, all staff

	Log of earnings		
	(1)	(2)	(3)
Female	-0.131*** (0.006)	-0.077*** (0.003)	-0.077*** (0.003)
Black	-0.162*** (0.011)	-0.136*** (0.006)	-0.143*** (0.006)
Asian	-0.071*** (0.009)	-0.062*** (0.006)	-0.068*** (0.005)
Other	-0.069*** (0.010)	-0.063*** (0.007)	-0.071*** (0.006)
Female x Black	0.072*** (0.011)	0.086*** (0.009)	0.077*** (0.008)
Female x Asian	0.031*** (0.008)	0.034*** (0.005)	0.029*** (0.005)
Female x Other	0.041*** (0.011)	0.037*** (0.008)	0.034*** (0.008)
Other demographic controls	N	Y	Y
HEI controls	N	N	Y
Observations	247,310	247,310	247,310
R-squared	0.033	0.426	0.437
Adjusted R-squared	0.033	0.426	0.437

Notes: Estimation is conducted on all staff with FTE=1. \* denotes significance at 10%, \*\* denotes significance at 5%, \*\*\* denotes significance at 1%. Standard errors clustered at the HEI level in parentheses.

Table A4: Impact of ethnicity and gender on earnings, academic staff

	Log of earnings		
	(1)	(2)	(3)
Female	-0.110*** (0.005)	-0.067*** (0.004)	-0.067*** (0.004)
Black	-0.167*** (0.010)	-0.146*** (0.008)	-0.143*** (0.008)
Asian	-0.117*** (0.010)	-0.063*** (0.006)	-0.065*** (0.005)
Other	-0.107*** (0.010)	-0.066*** (0.007)	-0.069*** (0.007)
Female x Black	0.091*** (0.012)	0.087*** (0.010)	0.083*** (0.009)
Female x Asian	0.040*** (0.008)	0.034*** (0.006)	0.031*** (0.006)
Female x Other	0.043*** (0.011)	0.034*** (0.008)	0.032*** (0.008)
Other demographic controls	N	Y	Y
HEI controls	N	N	Y
Observations	154,840	154,840	154,840
R-squared	0.036	0.383	0.390
Adjusted R-squared	0.036	0.383	0.390

Notes: Estimation is conducted on academic staff with FTE=1. \* denotes significance at 10%, \*\* denotes significance at 5%, \*\*\* denotes significance at 1%. Standard errors clustered at the HEI level in parentheses.

Table A5: Impact of ethnicity and gender on earnings, professional services staff

	Log of earnings		
	(1)	(2)	(3)
Female	-0.072*** (0.006)	-0.076*** (0.004)	-0.075*** (0.004)
Black	-0.130*** (0.021)	-0.112*** (0.015)	-0.152*** (0.012)
Asian	-0.051*** (0.015)	-0.054*** (0.012)	-0.078*** (0.010)
Other	-0.090*** (0.017)	-0.060*** (0.014)	-0.090*** (0.011)
Female x Black	0.073*** (0.015)	0.076*** (0.013)	0.070*** (0.012)
Female x Asian	0.011 (0.011)	0.024*** (0.009)	0.022*** (0.008)
Female x Other	0.050*** (0.015)	0.040*** (0.012)	0.039*** (0.012)
Other demographic controls	N	Y	Y
HEI controls	N	N	Y
Observations	92,470	92,470	92,470
R-squared	0.011	0.315	0.350
Adjusted R-squared	0.011	0.315	0.350

Notes: Estimation is conducted on professional services staff with FTE=1.  
 \* denotes significance at 10%, \*\* denotes significance at 5%, \*\*\* denotes significance at 1%. Standard errors clustered at the HEI level in parentheses.

Table A6: Impact of ethnicity, nationality and gender on earnings, all staff

	Log of earnings		
	(1)	(2)	(3)
Female	-0.131*** (0.006)	-0.076*** (0.003)	-0.075*** (0.003)
Black	-0.133*** (0.015)	-0.108*** (0.008)	-0.122*** (0.008)
Asian	-0.015 (0.011)	-0.026*** (0.008)	-0.037*** (0.007)
Other	-0.032*** (0.010)	-0.030*** (0.007)	-0.041*** (0.007)
Non-UK	0.028*** (0.009)	-0.011 (0.007)	-0.026*** (0.005)
Female x Black	0.064*** (0.014)	0.072*** (0.011)	0.063*** (0.009)
Female x Asian	-0.018* (0.011)	0.012* (0.007)	0.006 (0.007)
Female x Other	0.007 (0.012)	0.018** (0.008)	0.014* (0.008)
female x Non-UK	-0.004 (0.006)	-0.005 (0.005)	-0.007 (0.005)
Black x Non-UK	-0.084*** (0.018)	-0.061*** (0.014)	-0.035*** (0.012)
Asian x Non-UK	-0.121*** (0.013)	-0.062*** (0.010)	-0.046*** (0.008)
Other x Non-UK	-0.095*** (0.014)	-0.065*** (0.010)	-0.051*** (0.010)
Female x Black x Non-UK	-0.011 (0.022)	0.012 (0.014)	0.018 (0.014)
Female x Asian x Non-UK	0.088*** (0.013)	0.036*** (0.009)	0.039*** (0.009)
Female x Other x Non-UK	0.074*** (0.015)	0.038*** (0.011)	0.039*** (0.011)
Other demographic controls	N	Y	Y
HEI controls	N	N	Y
Observations	246,820	246,820	246,820
R-squared	0.034	0.427	0.439
Adjusted R-squared	0.034	0.427	0.439

Notes: Estimation is conducted on all staff with FTE=1. \* denotes significance at 10%, \*\* denotes significance at 5%, \*\*\* denotes significance at 1%. Standard errors clustered at the HEI level in parentheses.



Table A7: Impact of ethnicity, nationality and gender on earnings, academic staff

	Log of earnings		
	(1)	(2)	(3)
Female	-0.111*** (0.006)	-0.066*** (0.004)	-0.065*** (0.004)
Black	-0.120*** (0.012)	-0.134*** (0.010)	-0.134*** (0.010)
Asian	-0.003 (0.011)	-0.017* (0.009)	-0.021*** (0.008)
Other	-0.044*** (0.011)	-0.030*** (0.008)	-0.033*** (0.008)
Non-UK	-0.061*** (0.010)	-0.009 (0.008)	-0.020*** (0.007)
Female x Black	0.078*** (0.013)	0.088*** (0.012)	0.082*** (0.011)
Female x Asian	-0.027** (0.011)	0.010 (0.008)	0.005 (0.008)
Female x Other	0.003 (0.013)	0.014 (0.010)	0.011 (0.009)
Female x Non-UK	0.005 (0.006)	-0.004 (0.006)	-0.005 (0.006)
Black x Non-UK	-0.061*** (0.017)	-0.021 (0.013)	-0.009 (0.013)
Asian x Non-UK	-0.141*** (0.012)	-0.069*** (0.010)	-0.061*** (0.009)
Other x Non-UK	-0.086*** (0.015)	-0.064*** (0.011)	-0.058*** (0.011)
Female x Black x Non-UK	-0.021 (0.023)	-0.010 (0.016)	-0.004 (0.015)
Female x Asian x Non-UK	0.089*** (0.013)	0.035*** (0.010)	0.038*** (0.010)
Female x Other x Non-UK	0.060*** (0.017)	0.035*** (0.013)	0.036*** (0.013)
Other demographic controls	N	Y	Y
HEI controls	N	N	Y
Observations	154,505	154,505	154,505
R-squared	0.049	0.384	0.392
Adjusted R-squared	0.049	0.384	0.392

Notes: Estimation is conducted on academic staff with FTE=1. \* denotes significance at 10%, \*\* denotes significance at 5%, \*\*\* denotes significance at 1%. Standard errors clustered at the HEI level in parentheses.

Table A8: HESA Contract levels

Contract level	Description
A0	Head of Institution, Vice-Chancellor, Principal or equivalent
B0	Deputy Vice-Chancellor, Pro Vice-Chancellor, Chief Operating Officer, Registrar/Secretary
C1	Head/Director of major academic area
C2	Director of major function/group of functions (e.g. finance, corporate services, HR)
D1/D2/D3	Head of a distinct area of academic responsibility centre size 1/2/3 (e.g. head of school/ division/ department)
E1	Head of a subset of an academic area/director of a small centre
E2	Senior function head
F1	Professor
F2	Function head
I0	Non-Academic Staff, Section Manager, Senior Lecturer (Pre-92), Principal Lecturer (Post-92), Reader, Principal Research fellow
J0	Section/Team Leader (Professional, Technical, Administrative), Lecturer B (Pre-92), Senior Lecturer (Post-92), Senior Research Fellow
K0	Senior Professional/ Technical/Staff, Lecturer A (Pre-92), Lecturer (Post-92), Research fellow, Researcher/ Senior research assistant, Teaching fellow
L0	Professional/ Technical/ Senior Administrative Staff, Research Assistant, Teaching Assistant
M0	Assistant Professional Staff, Administrative Staff
N0	Junior Administrative Staff, Clerical Staff, Technician/Craftsmen, Operative
O0	Routine Task Provider
P0	Simple Task provider

Notes: For a more detailed description of all contract levels please visit [https://www.hesa.ac.uk/collection/c16025/combined\\_levels](https://www.hesa.ac.uk/collection/c16025/combined_levels)

Table A9: Impact of ethnicity and gender on contract levels, all staff

	Contract levels		
	(1)	(2)	(3)
Female	-0.594*** (0.008)	-0.435*** (0.008)	-0.435*** (0.008)
Black	-0.695*** (0.035)	-0.831*** (0.036)	-0.855*** (0.036)
Asian	-0.376*** (0.018)	-0.449*** (0.018)	-0.455*** (0.018)
Other	-0.319*** (0.027)	-0.401*** (0.028)	-0.401*** (0.028)
Female x Black	0.179*** (0.051)	0.320*** (0.052)	0.321*** (0.052)
Female x Asian	0.104*** (0.026)	0.128*** (0.026)	0.128*** (0.026)
Female x Other	0.145*** (0.039)	0.146*** (0.039)	0.144*** (0.039)
Other demographic controls	N	Y	Y
HEI controls	N	N	Y
Observations	247,310	247,310	247,310

Notes: Estimation is conducted on all staff with FTE=1. \* denotes significance at 10%, \*\* denotes significance at 5%, \*\*\* denotes significance at 1%.

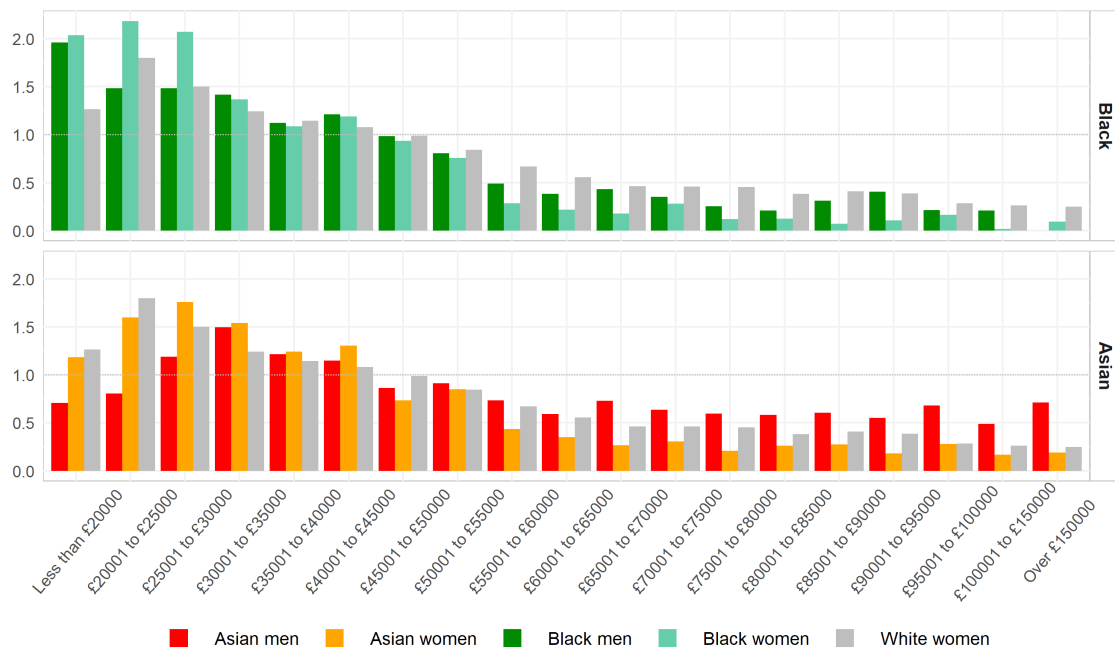
Table A10: Impact of ethnicity and gender on the probability of working part-time, all staff

	Working part-time		
	(1)	(2)	(3)
Female	0.149*** (0.006)	0.144*** (0.006)	0.143*** (0.006)
Black	0.024* (0.013)	0.032** (0.013)	0.018 (0.014)
Asian	-0.068*** (0.008)	-0.021*** (0.007)	-0.021*** (0.007)
Other	0.009 (0.011)	0.042*** (0.010)	0.036*** (0.009)
Female x Black	-0.083*** (0.012)	-0.102*** (0.012)	-0.102*** (0.012)
Female x Asian	-0.027*** (0.008)	-0.044*** (0.007)	-0.045*** (0.007)
Female x Other	-0.036*** (0.011)	-0.048*** (0.010)	-0.048*** (0.010)
Other demographic controls	N	Y	Y
HEI controls	N	N	Y
Observations	247,310	247,310	247,310
R-squared	0.030	0.105	0.115
Adjusted R-squared	0.030	0.105	0.115

Notes: Estimation is conducted on all staff with FTE=1. \* denotes significance at 10%, \*\* denotes significance at 5%, \*\*\* denotes significance at 1%. Standard errors clustered at the HEI level in parentheses.

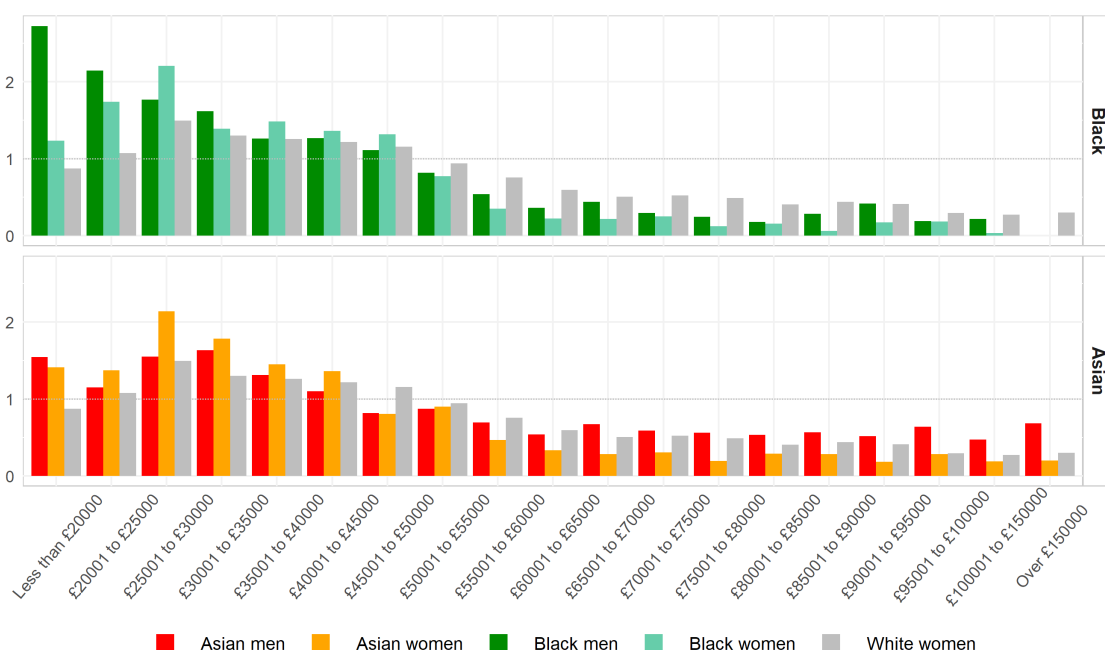
## Appendix B Additional Figures

Figure B1: Pay distribution of minority groupings relative to White men for all staff



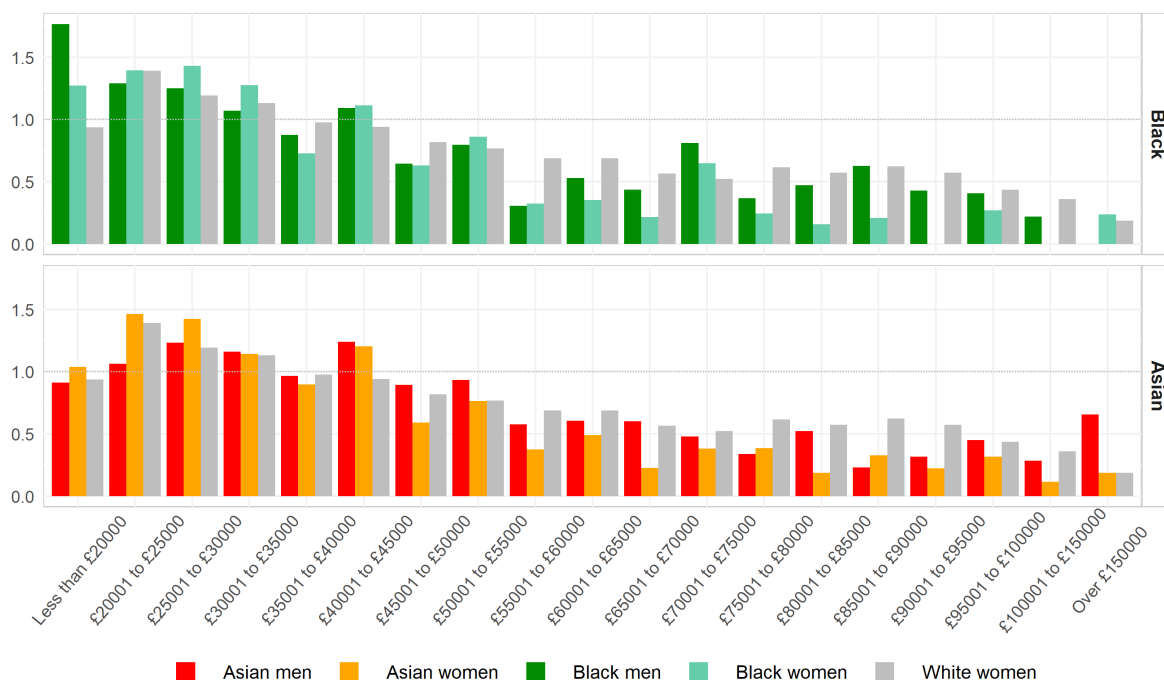
This chart compares the pay distribution of women and broad ethnic minority groupings to that of White men. If pay was equally distributed across each £5k pay band then all bars would be level at 1. Where the bar is above 1 it indicates a higher proportion of employees at this pay band and where it is below 1 it indicates a lower proportion.

Figure B2: Pay distribution of minority groupings relative to White men for academic staff



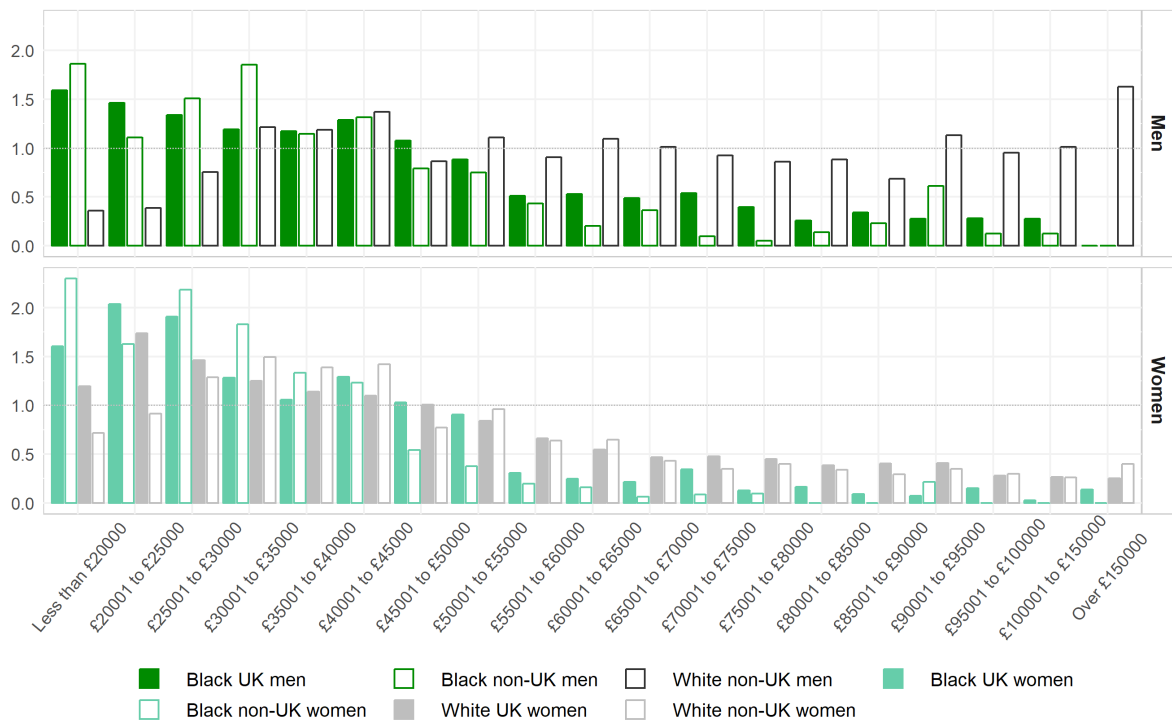
This chart compares the pay distribution of academic women and broad ethnic minority groupings to that of White academic men. If pay was equally distributed across each £5k pay band then all bars would be level at 1. Where the bar is above 1 it indicates a higher proportion of employees at this pay band and where it is below 1 it indicates a lower proportion.

Figure B3: Pay distribution of minority groupings relative to White men for professional services staff



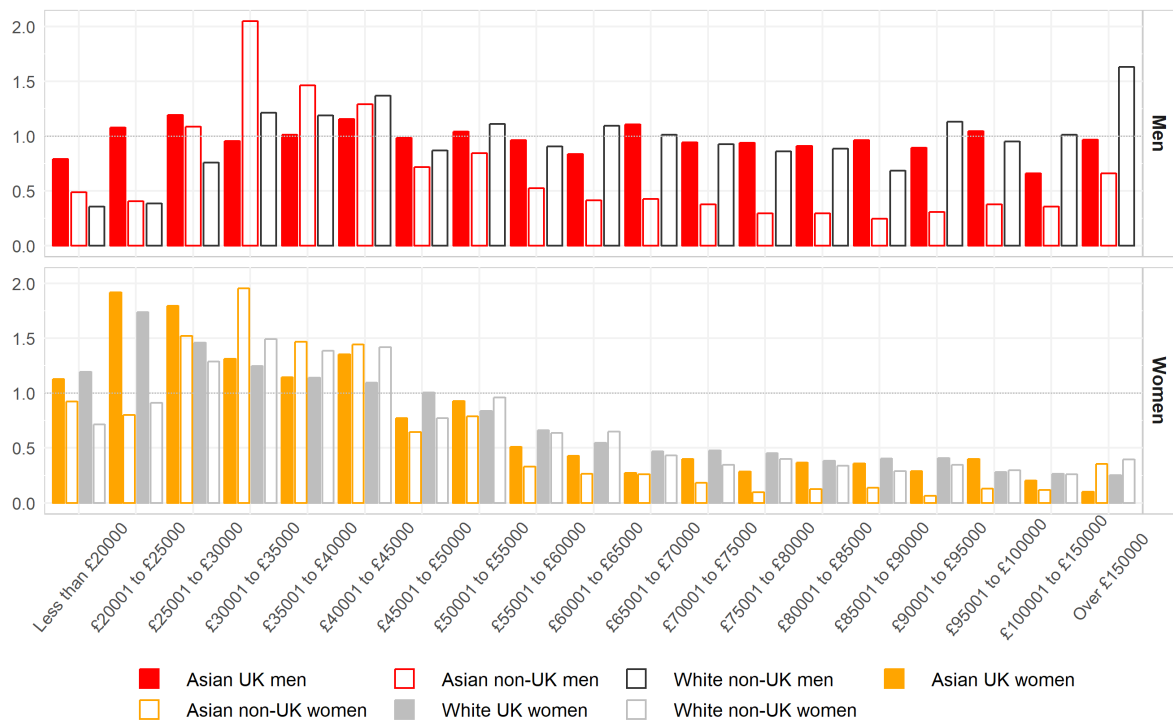
This chart compares the pay distribution of professional services women and broad ethnic minority groupings to that of White professional services men. If pay was equally distributed across each £5k pay band then all bars would be level at 1. Where the bar is above 1 it indicates a higher proportion of employees at this pay band and where it is below 1 it indicates a lower proportion.

Figure B4: Pay distribution of Black UK/non-UK staff relative to White UK men for all staff



This chart compares the pay distribution of Black UK and non-UK staff to that of White UK men. If pay was equally distributed across each £5k pay band then all bars would be level at 1. Where the bar is above 1 it indicates a higher proportion of employees at this pay band and where it is below 1 it indicates a lower proportion.

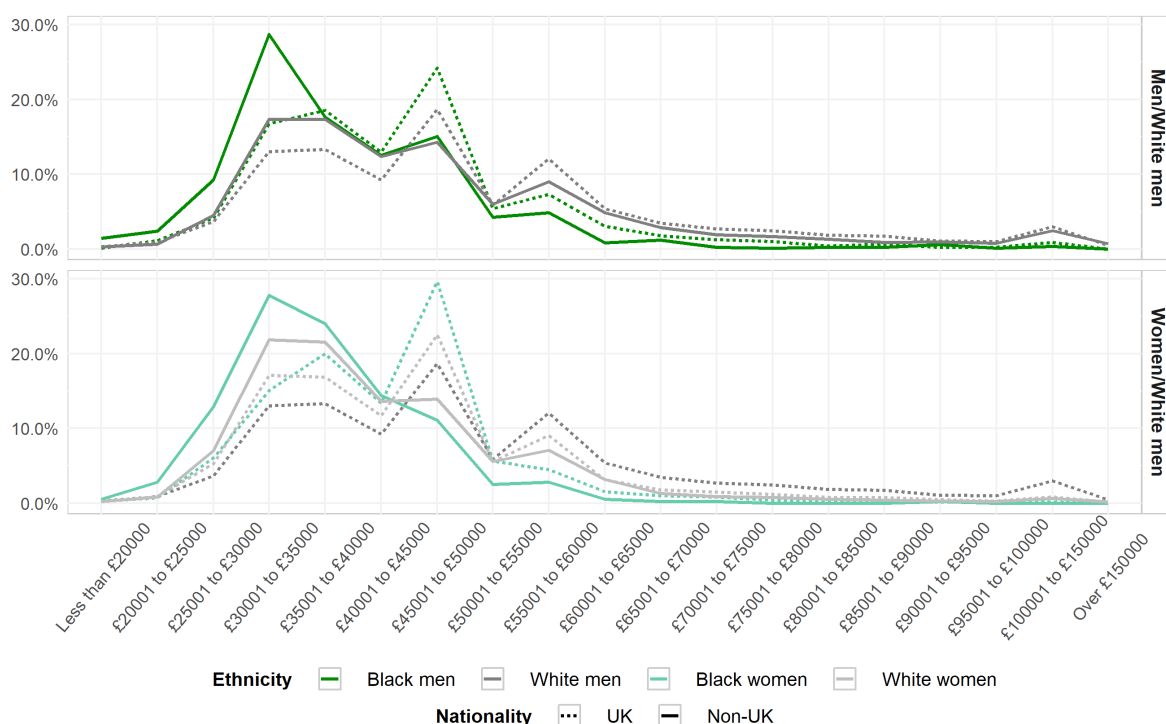
Figure B5: Pay distribution of Asian UK/non-UK staff relative to White UK men for all staff



This chart compares the pay distribution of Asian UK and non-UK staff to that of White UK men. If pay was equally distributed across each £5k pay band then all bars would be level at 1. Where the bar is above 1 it indicates a higher proportion of employees at this pay band and where it is below 1 it indicates a lower proportion.

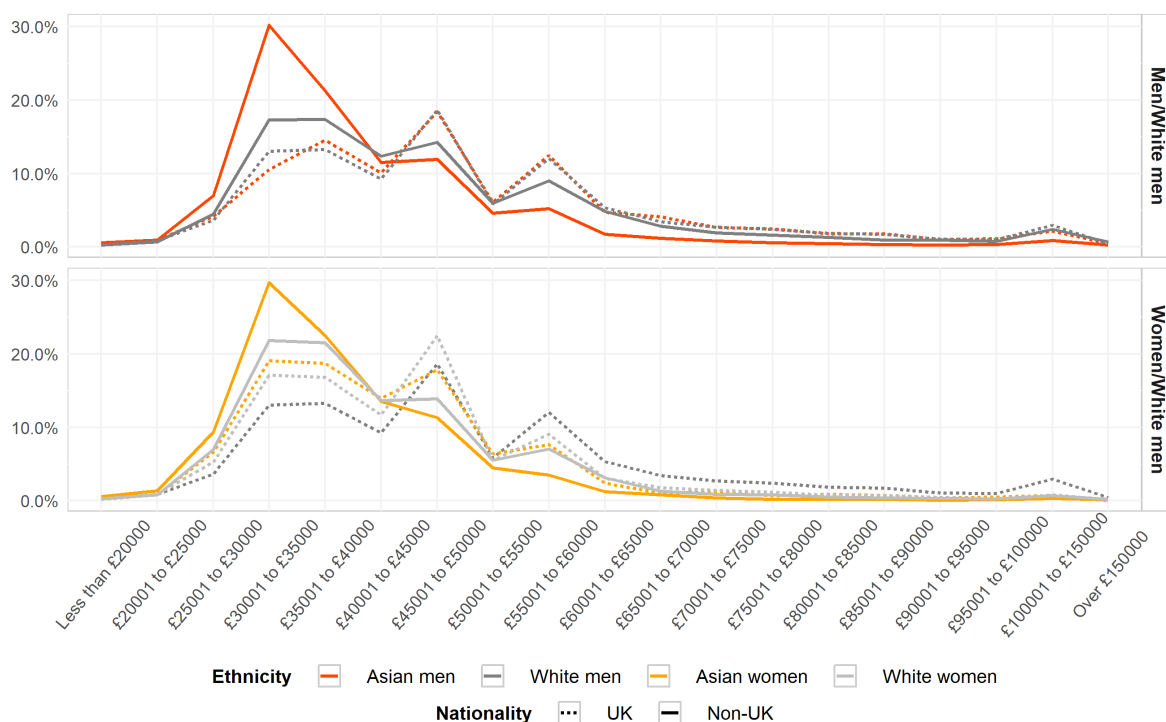


Figure B6: Pay distribution by gender, ethnicity and nationality - Black academic staff



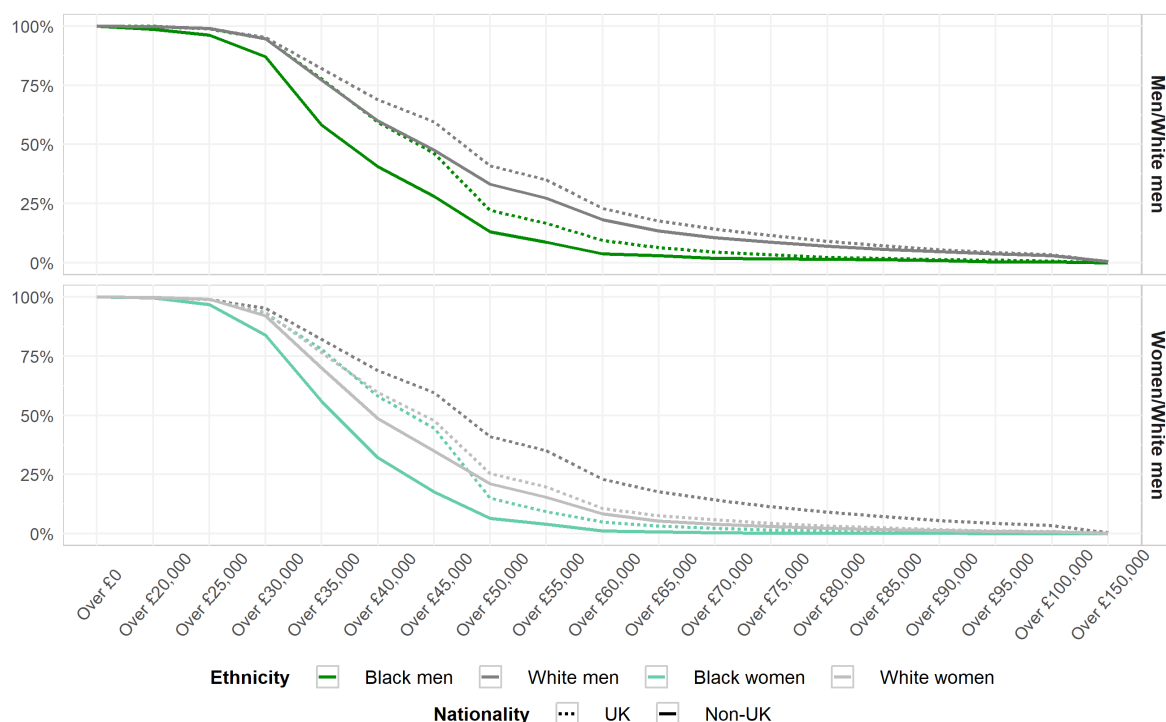
This chart compares the pay distributions of Black academic women and men belonging to different nationality groupings. The larger the mass on the left of the distribution, the higher the proportion of employees concentrated in the lower end of the pay distribution.

Figure B7: Pay distribution by gender, ethnicity and nationality - Asian academic staff



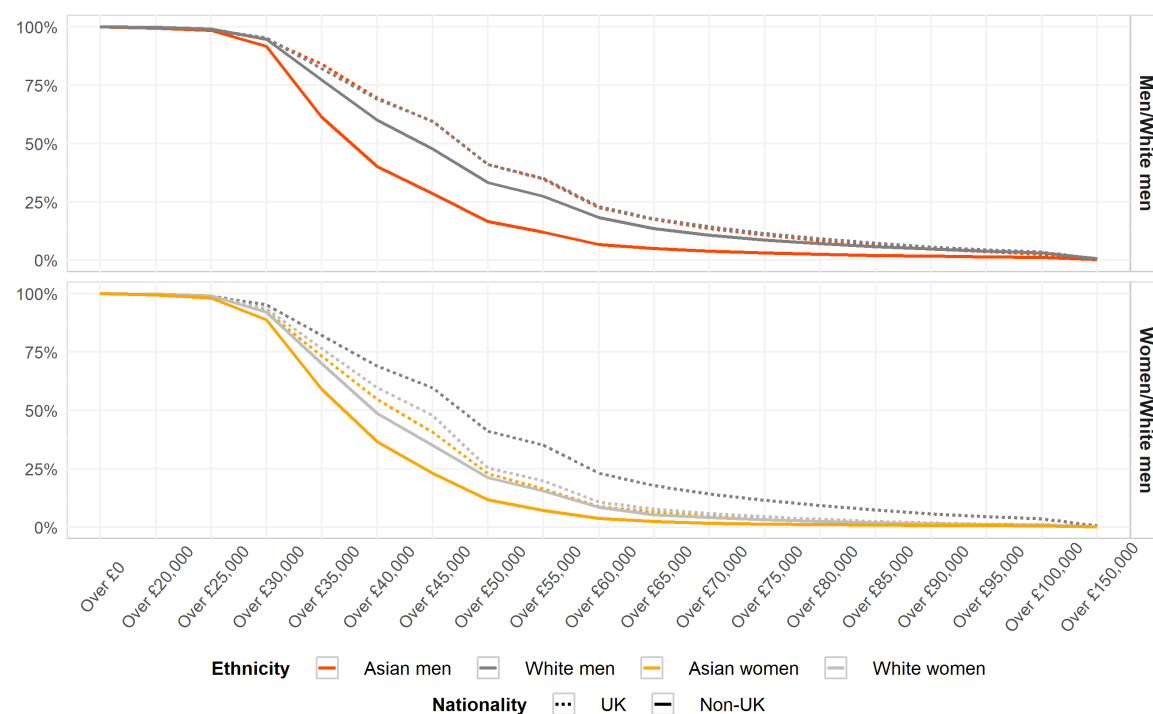
This chart compares the pay distributions of Asian academic women and men belonging to different nationality groupings. The larger the mass on the left of the distribution, the higher the proportion of employees concentrated in the lower end of the pay distribution.

Figure B8: Cumulative pay distribution by gender, ethnicity and nationality - Black academic staff



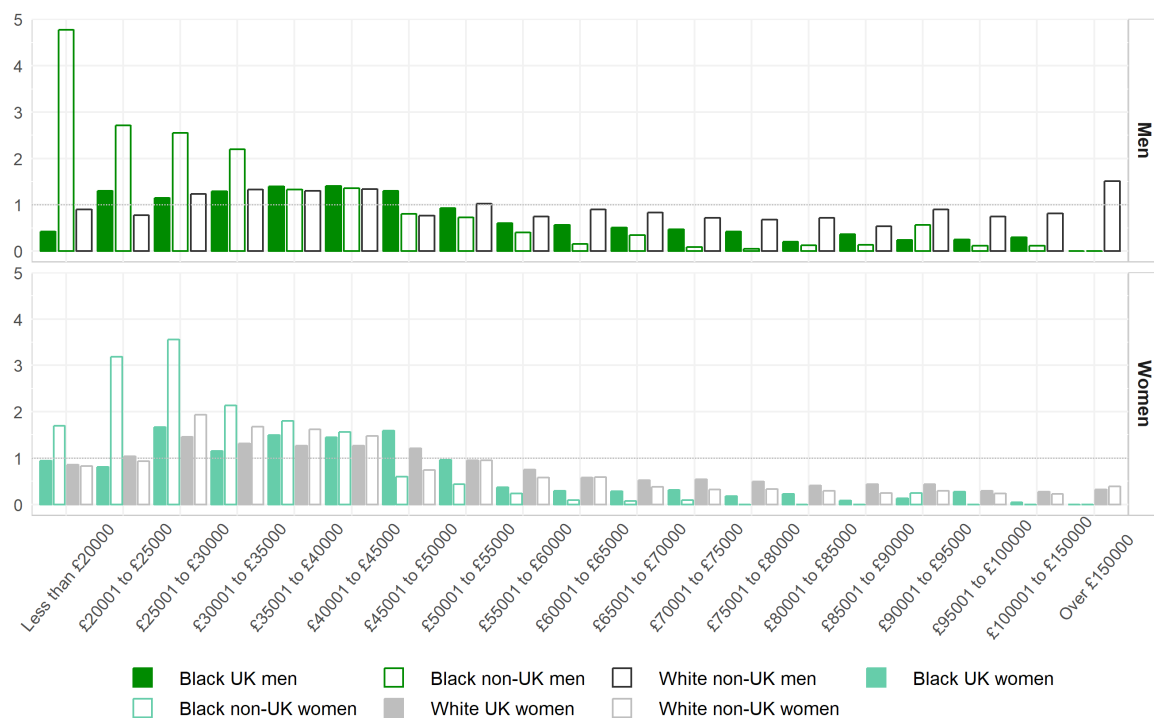
This chart compares the percentage of Black academic women and men belonging to different nationality groupings paid above each pay band. For each pay band, if the pay distribution is below that of White UK men, the proportion of minority employees paid above that level is lower.

Figure B9: Cumulative pay distribution by gender, ethnicity and nationality - Asian academic staff



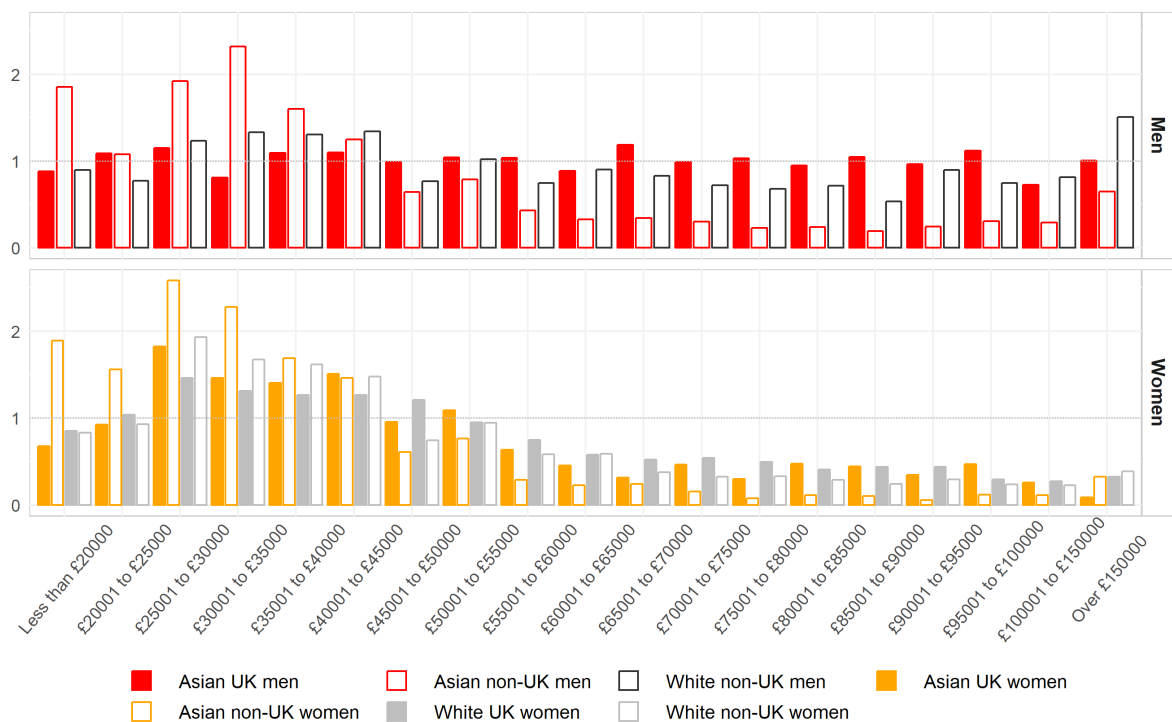
This chart compares the percentage of Asian academic women and men belonging to different nationality groupings paid above each pay band. For each pay band, if the pay distribution is below that of White UK men, the proportion of minority employees paid above that level is lower.

Figure B10: Pay distribution of Black UK/non-UK staff relative to White UK men for academic staff



This chart compares the pay distribution of Black UK and non-UK academic staff to that of White UK academic men. If pay was equally distributed across each £5k pay band then all bars would be level at 1. Where the bar is above 1 it indicates a higher proportion of employees at this pay band and where it is below 1 it indicates a lower proportion.

Figure B11: Pay distribution of Asian UK/non-UK staff relative to White UK men for academic staff



This chart compares the pay distribution of Asian UK and non-UK academic staff to that of White UK academic men. If pay was equally distributed across each £5k pay band then all bars would be level at 1. Where the bar is above 1 it indicates a higher proportion of employees at this pay band and where it is below 1 it indicates a lower proportion.

## Appendix C How to interpret the regression results

In this appendix, we explain how to interpret a regression tables for readers unfamiliar with it. We will refer to the regression results presented in Table A3 in Appendix A.

- (i) Each independent variable (e.g. female) is listed down the left hand side of the table.
- (ii) The four columns of numbers show the regression output for four different regression specifications which are indicated below the results with Y/N to indicate what controls have been applied. Column (1) reports the estimation of the baseline model with no controls. Column (2) includes demographic controls such as age and education. Column (3) adds job-specific characteristics such as mode of employment, academic marker and cost centres. Column (4) also controls for institutional income and region.
- (iii) The relationship ('coefficient') between the variable is listed for each of the four models on the same line as each independent variable. For example, for the first specification in Table A3, the White female coefficient is -0.131.
- (iv) The single variable coefficients represent the percentage difference between the independent variable group (e.g. White females) and White males. So a coefficient of -0.131 means that White females earn 13.1 percentage points less than white males. These coefficients are based on differences between mean log salaries but can be treated as approximate percentage differences as long as the coefficients remain small. So -0.131 can be read as a White female earning around 13 per cent less on average than a White male.
- (v) The conjoint variables (e.g. female x Black) need to be added together with the relevant coefficients to calculate the percentage comparison with a White male. For example in Table A3 Female x Black has a coefficient of 0.072 which needs to be added to the coefficients for Black men (-0.162) and White females (-0.131) which gives a coefficient of -0.221 (i.e. that Black women earn 22.1 per cent less on average than White men).
- (vi) The number in brackets below each coefficient is the standard error of the coefficient and this informs the calculation of the significance of the coefficient, which is indicated by one or more asterisks. Three asterisks denotes that there is only a 1 per cent chance that the difference is not true and one asterisk means a 10 per cent chance that the result is not true. For example, the -0.131 figure for White females has three asterisks and which means that there is only a 1 per cent chance that difference is not true and is just due to chance.

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