

DISCUSSION PAPER SERIES

IZA DP No. 14276

**The Changing Distribution of the Male  
Ethnic Wage Gap in Great Britain**

Ken Clark  
Steve Nolan

APRIL 2021

## DISCUSSION PAPER SERIES

IZA DP No. 14276

# The Changing Distribution of the Male Ethnic Wage Gap in Great Britain

**Ken Clark**

*University of Manchester and IZA*

**Steve Nolan**

*University of Manchester*

APRIL 2021

Any opinions expressed in this paper are those of the author(s) and not those of IZA. Research published in this series may include views on policy, but IZA takes no institutional policy positions. The IZA research network is committed to the IZA Guiding Principles of Research Integrity.

The IZA Institute of Labor Economics is an independent economic research institute that conducts research in labor economics and offers evidence-based policy advice on labor market issues. Supported by the Deutsche Post Foundation, IZA runs the world's largest network of economists, whose research aims to provide answers to the global labor market challenges of our time. Our key objective is to build bridges between academic research, policymakers and society.

IZA Discussion Papers often represent preliminary work and are circulated to encourage discussion. Citation of such a paper should account for its provisional character. A revised version may be available directly from the author.

ISSN: 2365-9793

**IZA – Institute of Labor Economics**

Schaumburg-Lippe-Straße 5–9  
53113 Bonn, Germany

Phone: +49-228-3894-0  
Email: [publications@iza.org](mailto:publications@iza.org)

[www.iza.org](http://www.iza.org)

## ABSTRACT

---

# The Changing Distribution of the Male Ethnic Wage Gap in Great Britain

We decompose the ethnic pay gap in Great Britain across the distribution of hourly wages, yielding a detailed insight into differences between groups and how these vary over pay percentiles and through time. While some groups experience reductions in the pay gap consistent with lower discrimination, including relatively well paid Indian workers and relatively poorly paid Bangladeshis, others - specifically Black groups - face an apparent glass ceiling barring access to well paid jobs. The increasing educational attainment of Britain's ethnic groups provides some optimism around narrowing pay differentials, particularly at the top of the distribution, while the introduction and uprating of the National Minimum/Living Wage has contributed to improvements at the lower end.

**JEL Classification:** D31, J15, J31, J38

**Keywords:** ethnic pay gap, race discrimination, minimum wages, decomposition

**Corresponding author:**

Ken Clark  
Centre on the Dynamics of Ethnicity & Department of Economics  
University of Manchester  
Oxford Rd  
Manchester M13 9PL  
United Kingdom  
E-mail: [ken.clark@manchester.ac.uk](mailto:ken.clark@manchester.ac.uk)

# 1 Introduction and Background

The existence of a gap in the average wages of White and ethnic minority men in the UK is well established. Such gaps seem to be persistent over time and across immigrant generations and are not generally explained by differences in the human capital endowments or other characteristics of the workers<sup>1</sup>. While there are differences in the extent of the gap between different individual groups (e.g. Indians may earn more than White workers while Pakistanis earn considerably less), decomposition of the pay gap at the mean tends to show that all ethnic groups earn less than they would were their human capital as well rewarded as that of the White majority group. Such differences persist despite decades of policy initiatives targeted at the situation of ethnic minority workers and the disadvantage they face. In this paper we focus explicitly on a broader approach to the discussion of pay gaps – looking at gaps across the distribution of wages rather than simply the mean – and show that this has important implications for understanding ethnic pay gaps and the policies which are intended to address them.

The existing literature on the ethnic pay gap in the UK focuses almost exclusively on differences in mean earnings between different groups. Early studies (e.g. Stewart 1983; Blackaby 1986) noted the economically and statistically significant gap in average earnings between White and ethnic minority workers, a difference which was not explicable by differences in observable characteristics such as human capital. An important development in this literature has been to recognise the considerable diversity within Britain’s ethnic minority population and recent work has noted how this diversity translates into a range of average earnings outcomes in comparison to Whites. Indian and Chinese men generally experience lower gaps compared to White workers and may even see a premium while Black groups and, particularly, the groups with a South Asian heritage – Pakistanis and Bangladeshis – earn considerably less than others. Henehan and Rose (2018) for example find that amongst graduate (non-graduate) men aged between 22 and 64, Black men earned 24% (15%) less than White men, compared to 27% (31%) for Pakistani and Bangladeshi men but only 4% (12%) for Indian men.

Econometric investigation of these raw wage gaps using a statistical model of earnings generally confirms that only a portion of the wage gaps can be “explained by” observable characteristics such as human capital, industry, occupation, region and health. Indeed, regression-adjusted measures of the pay gap suggest that the earnings of Indian and Chinese male workers might well exceed those of Whites were these workers to face the same wage structure as the majority. This reflects the “better” characteristics of these

---

<sup>1</sup>See for example: Blackaby et al. (1994); Blackaby et al. (1998); Blackaby et al. (2002) Metcalf (2009); Algan et al. (2010); Longhi et al. (2013); Henehan and Rose (2018); Li and Heath (2020); Office for National Statistics (2020b).

groups; for example Blackaby et al. (1998) show how the superior levels of education of Indians compared to Whites ought to translate into much higher average earnings for Indians. The conclusion is often drawn from such results that ethnic minority workers face discrimination in how they are treated in the wider labour market although it may also reflect unobserved differences in productivity, preferences or “oppositional identities” (Blackaby et al. 1999; Battu and Zenou 2010; Longhi and Brynin 2017). For the Black and South Asian groups, while the pay gap would be attenuated were they to face the same wage structure as Whites, a wage gap would remain indicating that some proportion of that gap can be explained by differences in observable characteristics, but that there is still a potential role for other factors including discrimination.

While differences in the average pay of different groups of workers is important and increasingly the focus of policymakers’ attention<sup>2</sup>, restricting the discussion of ethnic earnings disadvantage to a measure of central tendency may miss interesting and important details about the nature of the problem. For example more recent research has examined the importance of “sticky floors” and “glass ceilings” (Albrecht et al. 2003; Christofides et al. 2013) for pay gaps between men and women. A glass ceiling is where one group finds it hard to rise above a certain level in the pay distribution and would be reflected by a greater unexplained differential at higher percentiles while a sticky floor describes a situation where a group finds it hard to progress from the lower paid jobs at the bottom of the distribution. More generally the last 30 years have seen a focus on the large increase in earnings inequality in many countries explained, *inter alia*, by globalisation, technical change and institutional factors such as the decline of trade unionism (Machin 1996). To the extent that minorities are located towards the lower end of the pay distribution, global trends towards inequality may be a strong headwind against progress in closing the ethnic pay gap. The need to analyse the distribution of pay beyond just the mean is clear.

Tackling ethnic inequality in the workplace has been a recurring theme of UK government policy since the Race Relations Act 1976. The Act was amended by the Blair government in 2001 to include a specific duty on public authorities to promote racial equality. The establishment of the Ethnic Minority Employment Task Force in 2003 marked an explicit goal of eliminating race discrimination in the labour market (Cabinet Office 2003). While there has been little formal evaluation of the raft of policy measures flowing from the Task Force’s work, questions have been raised about its effectiveness and value for money (Clark and Shankley 2020). Considerable labour market disadvantage for some groups remained at the onset of the financial crisis in 2008 (Hogarth et al. 2009) and in its wake widened for men across all ethnic groups (Fisher and Nandi 2015). More

---

<sup>2</sup>See for example the UK and EU gender pay gap reporting requirements (Fawcett Society 2020).

recent policy initiatives have included the McGregor-Smith Review of 2017<sup>3</sup> which made 26 recommendations on government and employers to improve the situation of Black and Minority Ethnic (BME) workers. However, initial research into the effect of the economic slowdown induced by the Covid-19 pandemic indicates that ethnic penalties have been exacerbated by the nature of the industries affected by lockdown (Crossley et al. 2021).

Despite scant evidence that policies specifically targeted at ethnic labour market disadvantage have worked, it may be that other interventions in the labour market have boosted the pay of ethnic minority workers relative to their White counterparts. In particular, the National Minimum Wage (NMW) introduced in 1999 provides a floor for hourly wage rates: insofar as ethnic minority workers are more likely to be doing “minimum wage jobs” nearer the bottom of the pay distribution, this policy should disproportionately affect the earnings of minority groups. Other things equal, we would expect the NMW to reduce the ethnic pay gap. Lindley and Machin (2013) and Dickens and Manning (2004) emphasise the potential importance of the NMW in moderating the growth in lower tail wage inequality in the UK while successive reports from the Low Pay Commission have noted how the NMW affects some ethnic minority groups, particularly Pakistanis and Bangladeshis, more than Whites (e.g. Low Pay Commission 2014)<sup>4</sup>.

In this paper we document the changing ethnic pay gap in Britain across the distribution of wages and not just at the mean. This yields additional insights into the nature of the disadvantage faced by the different ethnic minority groups and suggests some explanations, in terms of the evolving human capital and other demographic characteristics of the groups, for where and why there may have been movement in the observed pay gaps. We further present evidence on how the introduction and subsequent upratings of the minimum wage have affected the pay gap. Our main findings are that while some groups experience reductions in the pay gap consistent with lower discrimination, including relatively well paid Indian workers and relatively poorly paid Bangladeshis, others – specifically Black groups - face an apparent glass ceiling barring access to well paid jobs. The increasing educational attainment of Britain’s ethnic groups provides some optimism around narrowing pay differentials, particularly at the top of the distribution, while the introduction and uprating of the National Minimum (Living) Wage has contributed to improvements at the lower end.

---

<sup>3</sup>[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/594336/race-in-workplace-mcgregor-smith-review.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/594336/race-in-workplace-mcgregor-smith-review.pdf)

<sup>4</sup>Lordan and Neumark (2018), however, find that the introduction of a NMW may result in some job displacement with ethnic minority workers in low paid jobs most at risk.

## 2 Data and Descriptive Statistics

### 2.1 The Labour Force Survey Data

In this paper we use data from the Labour Force Survey (LFS) collected between 1993 and 2019. The LFS is based on a rotating panel design where a sample of households is interviewed for five successive quarters of the year about a range of issues relating to employment and economic activity. Specifically, we have pooled individual data from 105 quarters of LFS data using only one wave’s information for each individual observation to avoid double counting. Prior to Spring 1997 income questions were only asked in the fifth wave; after that in both first and fifth. Where a choice is available we use wave 1 information to avoid panel attrition. The LFS has the advantage of being collected in a relatively consistent manner over an extended time period which allows us to investigate how the distribution of the ethnic wage differential has evolved. Datasets available prior to 1993 have lower sample sizes and contain less detailed or reliable information on ethnicity. We focus on the gross hourly wages of full and part-time male workers in their main job. Hourly wages are calculated as the ratio of gross weekly pay to a measure of usual weekly hours. Using a measure of hours controls for variations in weekly hours of work between groups and is a better measure of the price of a unit of labour; a weekly earnings measure might provide a better indication of overall income differences between groups. Given the variation in hours, we include part-time workers in the analysis. This is relatively unusual for this type of work but in this context is justified by the relatively large proportion of workers in ethnic minority groups who have this type of job (Kapadia et al. 2015).<sup>5</sup> All wage data have been rebased using the Retail Price Index, with a baseline of January 2010, to provide a measure of real hourly wages.

We focus on five ethnic groups: White, Indian, Pakistani, Bangladeshi, Black African and Black Caribbean. Respondents assign themselves to an ethnic group when responding to the LFS questionnaire. A number of changes to how the question on ethnicity is asked have been made over the period of time studied in this paper. In part this has been done by the Office for National Statistics to reflect how the definition of ethnicity has changed in the UK Census (Smith 2002; Milburn 2011). The broad thrust of the changes has been to construct a categorisation of ethnicity which more closely matches the increasing diversity of the UK population. Thus, for example, the newer classifications distinguish “White British” from “Other White” while these groups would previously have been classed together as simply “White”. Similarly, newer classifications allow for a finer-grained categorisation of those whose ethnicity is mixed, a group whose numbers are

---

<sup>5</sup>For example, between 1993 and 2019 the proportion of Bangladeshi males in part-time work grew from 23.6% to 37.15%.

growing through time. Since a major thrust of the paper is to examine changes in the distribution of earnings through time, we have opted to study the five groups identified above as these represent the key non-mixed, ethnic groups in the UK which can be identified on a consistent basis over the whole of the period we study. Due to the limited sample size we have decided to omit the analysis for the Chinese ethnic group. More recent versions of the LFS questionnaire have allowed respondents to indicate whether they are of mixed ethnicity, and while the economic outcomes of this group are of interest, for the sake of finding a consistent ethnicity classification over a long period of time we have also excluded these groups from the analysis.

Although our choice of which ethnic groups to study maximises consistency over time it is important to note some implications for the analysis. First, while the LFS allows us to identify the religion of the respondent in some years this is not available consistently across the period that we study. Some authors have noted the empirical importance of religion as an additional (to ethnicity) source of variation in labour market outcomes (e.g. see Longhi et al. (2013) on Indian Muslims vs Hindus) but we do not consider that here. As noted, we also exclude those who identify themselves as of mixed or other ethnicity and we do not distinguish between different White groups. This is of potential significance as a number of those who in later waves of the LFS would identify as “White Other” will include immigrants from the EU including the large influx of those from Eastern Europe in the mid 2000s (Clark and Drinkwater 2008).

## 2.2 Hourly wages

Table 1 provides some descriptive evidence on the pattern and evolution of real hourly wages for the six ethnic groups. The data have been divided into four sub-periods to balance the need both to increase the sample size for the ethnic minority groups and to illustrate how wages have changed through time. The periods – 1993-1999, 2000-2006, 2007-2013 and 2014-19 – are chosen to highlight any changes in wages that relate to important changes in the economy. These include the introduction of UK minimum wage in 1999 and the implications of the financial crisis beginning in 2007/8. For each group and sub-period we tabulate the mean level of wages, the interquartile range and the sample size.

From the table it is clear that there was strong real wage growth at the mean for all ethnic groups between the first sub-period up until the start of the third sub-period, which coincides with the onset of the financial crisis. Between 1993-97 and 2000-06 real hourly wages rose by 12.2% for Whites, 20.7% for Indians, 17.6% for Pakistanis, 21.3% for Bangladeshis, 11.2% for Black Caribbeans and 4.6% for Black Africans in our sample. The effect of the financial crisis on hourly wages also varied by ethnic group. Whites,

Black Caribbeans and Black Africans saw a fall in wages in the immediate aftermath of the crisis, a decline that worsened on average in the last sub-period in our sample. Indian and Pakistanis saw their wages slightly decline over the two sub-periods. The only group to see their average wages rise after the financial crisis were Bangladeshis.

Figure 1 looks at average real wage differences between the groups in a slightly different way plotting, for each period we examine, the average difference in log wages between Whites and each of the other ethnic groups. This ethnic pay gap at the mean is the usual focus of research on racial pay differences. The figure suggests that, in terms of the size of the wage gap the Pakistani and Bangladeshi groups experience that largest ethnic pay gap, with that for the Bangladeshis particularly large. Over time both Pakistanis and Bangladeshis have experienced pay growth relative to Whites although they still ended the period far behind. In the middle sub-periods Indians have pay that is comparable to Whites becoming a wage premium in the final sub-period. Across time both Black groups see the wage gap increase to their detriment. The effect is slightly larger for Black Africans although the gap narrows slightly in the latest sub-period.

The interquartile ranges reported in Table 1 indicate that the change in earnings distribution over time differs by ethnic group. Whites, Indians and Black Caribbeans all have wage distributions whose variance increased between 1993 and 2013. For Indians, this growth in the within-group inequality of real weekly earnings was particularly pronounced. In 2007-2013, the period of the financial crisis, there is an increase in within-group inequality for all except Bangladeshis and Black Africans. Following the crisis all groups see a reduction in the interquartile range, with the exception of Bangladeshis who see an increase and Indians where it remains unchanged.

### **2.3 The distribution of the ethnic pay gap**

The differential changes in the interquartile ranges by ethnicity noted in Table 1 suggest that examining the ethnic gap across the distribution of weekly earnings may yield additional insights into the group's respective labour market success. To investigate this we consider how the earnings distributions of each of the ethnic minority groups compare with that of Whites in each of the four sub-periods. In Figure 2, each histogram plots the proportion of workers within that group whose hourly wages lie within each decile of the White group's wage distribution. So, for example, the leftmost bar in the Indian chart for 1993-1999 indicates that in that sub-period 13% of Indian workers were earning an hourly wage below the tenth percentile of the White wage distribution. If the distributions of White and ethnic minority hourly wages were identical, the histograms would look like a flat rectangle at 0.1 indicating that 10% of each group fell into each of the deciles of the White distribution. Any deviation from this – above or below the horizontal line on each

graph - indicates a potentially interesting source of inequality in the wage distributions.

For the Indian group in the first period the relative distribution is slightly more concentrated in the bottom half of the distribution. While this suggests some disadvantage relative to Whites, it is worth noting that this is fairly muted compared to some of the other ethnic groups. Over time, however, the Indian distribution has become more bimodal with high proportions of relatively highly and poorly paid workers, particularly in the third sub-period. Thus the slight wage advantage at the mean for this group shown in Figure 1 actually disguises the fact that there is a relatively large group of Indians who earn wages which are near the bottom of the overall wage distribution.<sup>6</sup> It is the existence of precisely this kind of pattern which justifies looking at the whole distribution of the ethnic gap rather than simply the mean.

The Pakistani and Bangladeshi groups can be considered together although it is clear that the Bangladeshi relative distribution is an exaggerated version of that for the Pakistanis with an extremely high proportion of Bangladeshi workers crowded into the lowest decile, although the height of the leftmost bar does fall substantially over time from around 60% in the first sub-period to around 30% in the fourth sub-period. Any improvement in the Pakistani wage distribution is less obvious in comparison at least until the most recent sub-period. For both of these groups their low average wages in Figure 1 reflect the fact that relatively few workers are in the upper deciles of the White wage distribution. Equally their growing average wages relative to Whites, particularly for Bangladeshis, are due to the reduced likelihood of workers being found in the lower deciles.

Black Caribbean earnings display a certain continuity through time with concentrations particularly in the second to fifth deciles of the White distribution. The distribution becomes more weighted towards the lower end distribution in the post-financial crisis period, but the shape of the distribution moves back to one similar to the earlier sub-periods for 2014-19. The proportions in the top two deciles increase and then fall back to close to their initial levels of the period of our sample.

For the Black African group we observe an interesting dynamic pattern with the proportion in the lowest decile increasing as we reach the period of the financial crisis and then falling back in the latest period. Combined with a falling proportion at the very top of the earnings distribution after the financial crisis that does not recover in the 2014-19 sub-period, this helps us to understand the decline in average Black African weekly earnings relative to Whites over the period since the late 1990s.

One obvious potential explanation for changing patterns of the ethnic earnings gap is

---

<sup>6</sup>Although these proportions have fallen somewhat in the latest sub-period in line with an increase at the top decile.

changes in the relative endowments of human capital. Table A2 reports the distribution of formal education for each of the groups and each of the sub-periods. Educational attainment is based here on age of completing education and is categorised into three levels: High (21 and over), Medium (17 to 20) and Low (16 and under). Even in the earliest sub-period, Whites were most likely to have a low level of education and least likely to have a high level and, over time, the attainment of most groups has increased faster than that of Whites. The main exception to this is Black Caribbeans where the relative stability of their pay gap fits with the observation that only around 28% of workers had high levels of education in 2014-19 compared to 29% of Whites and 62% of Indians. The strong increase in the attainment of Bangladeshis is also notable: in 1993-99 50% (29%) of Bangladeshi full-time workers had low (high) attainment compared to a level of 28% (42%) in 2014-19. This may contribute to an explanation of why Bangladeshis saw an improvement in their pay relative to Whites over this period. There is no such immediate explanation of the declining relative pay of Black Africans. Their educational attainment also improved on average over this period, albeit not as substantially as that of the Bangladeshis, as they were already relatively well educated in the earliest sub-period. In relation to Whites the educational attainment of Black Africans at the highest level increased at a much lower rate (7% compared to 62%) suggesting one possible cause of the decline in relative pay.

### 3 Decomposition Analysis

#### 3.1 Pay Gap Decomposition

In this section we employ a quantile decomposition technique to document how the ethnic earnings gap at different points of the distribution can be attributed to either differences in observable characteristics between the groups or differences in the wage structure they face. Doing this for each of the sub-periods defined above also offers some clues as to how the ethnic earnings gap has evolved over time.

Quantile decomposition is a generalisation of the well-known Oaxaca-Blinder (Oaxaca 1973; Blinder 1973) methodology and is based on the following description of the quantile regression process characterising the relationship between earnings  $y$  and observable characteristics  $x$ :

$$F_{y|x}^{-1}(\tau|x_i) = x_i\beta(\tau), \quad 0 < \tau < 1 \tag{1}$$

Equation 1 describes the  $\tau$ th conditional quantile of  $y$  and this is assumed to be a linear function of the observable characteristics where the vectors of coefficients  $\beta(\tau)$  are to be estimated. Estimation of the entire quantile regression process  $\hat{\beta} = \left( \hat{\beta}(\tau_1), \hat{\beta}(\tau_2), \dots, \hat{\beta}(\tau_J) \right)$

is routine (Koenker and Bassett 1978) and is incorporated into many statistical packages.<sup>7</sup>

Melly (2005) shows how an estimate of the unconditional distribution of  $y$  can be obtained by integrating the conditional distribution over the distribution of  $x$ . The results of Chernozhukov et al. (2010) can be used to ensure monotonicity of the resulting distributions. In our case, letting  $g$  denote the ethnic group under consideration, an estimate  $\hat{q}$  of the  $\theta$ th unconditional quantile of  $y$  can be obtained from the expression<sup>8</sup>:

$$\hat{q}(\hat{\beta}^g, x^g) = \inf \left\{ q : \frac{1}{N} \sum_{i=1}^N \sum_{j=1}^J (\tau_j - \tau_{j-1}) \mathbb{1} \left( x_i^g \hat{\beta}^g(\tau_j) < q \right) \geq \theta \right\}.$$

The importance of this expression is that it is possible to combine the observable characteristics of one group with the estimated quantile regression process from another to obtain a counterfactual unconditional distribution. For example, combining the estimated returns to observable characteristics of an ethnic minority group (denoted  $n$ ) with the estimated quantile process for the White group yielding  $\hat{q}(\hat{\beta}^w, x^n)$  would provide an estimate of what the minority distribution of earnings would look like if the minority group faced the same labour market structure as Whites. It is this conceptual exercise which forms the basis of our decomposition procedure. Specifically the impact of differences in characteristics between Whites and any minority group is given by  $\hat{q}(\hat{\beta}^n, x^n) - \hat{q}(\hat{\beta}^n, x^w)$  while the impact of differential vectors of coefficients is given by  $\hat{q}(\hat{\beta}^n, x^w) - \hat{q}(\hat{\beta}^w, x^w)$ .

In practice, as discussed by Chernozhukov et al. (2013) and Fortin et al. (2011), it is possible to obtain an estimate of the counterfactual distribution through a more direct method which does not involve estimating a quantile regression at each quantile of interest but rather by estimating a “distribution regression”. This involves running a series of regressions each of which represents the probability that the dependent variable of interest lies below a certain value. By choosing these values to saturate the sample space of  $y$  and averaging across all observations, an estimate of the unconditional distribution of  $y$  can be obtained. Again, the combination of the regression process estimated on one ethnic group with the observable characteristics of another can provide a counterfactual distribution.

Figure 3 illustrates the procedure in a simplified form<sup>9</sup>.  $F_w$  is the CDF of wages for White workers while  $F_g$  is that for a particular minority group. At the median the wage gap is  $m_w - m_n$ . The aim of the exercise is to find the point on the horizontal line between points  $A$  and  $B$  which corresponds to the wages minority workers would earn if they faced the wage structure of Whites. A quantile regression approach would essentially

<sup>7</sup>We use Stata 14 for all estimation in this paper (StataCorp 2015).

<sup>8</sup>This is equation 1 in Melly (2005)

<sup>9</sup>This figure is based on Figures 1 and 2 in Fortin et al. (2011)

take the quantile regression coefficients estimated on the White sample, apply them to the minority sample and find the median of the resulting distribution of counterfactual fitted values (e.g. point  $D$ ). A distribution regression approach would estimate the probability of a minority worker falling below the White median if that minority worker faced the same wage structure as White workers (e.g. point  $C$ ). Repetition of this process for a large number of wage values would result in a set of points that could be joined together to obtain the dotted line in the graph and again a point like  $D$  could be found. Then the counterfactual median,  $m_c$  can be read off the horizontal axis. In practical terms, a variety of regression models such as linear probability, probit or logit can be used to estimate these probabilities in the distribution regression approach<sup>10</sup>.

The results of the aggregate decomposition obtained in this way are presented in figure 4. We decompose the difference between White log real hourly pay and the log real hourly pay of each group in each period across the wage distribution. Variables included in the underlying distribution regressions include: age, level of education, marital status, region, whether born in the UK and job tenure.<sup>11</sup> The shaded areas around the coefficient and characteristics components are 95% confidence intervals computed using a bootstrap method with 100 replications.

To understand these diagrams consider the first period for the Indian group. The “Total” line illustrates the difference in log earnings between White and Indian workers at different points of the distribution. A positive number indicates a wage disadvantage to the ethnic group. So at .5 on the horizontal axis, the median pay gap for Indians is around 0.09 log points corresponding to this group earning roughly 9% less than Whites. The blue “Characteristics” line can be interpreted as the predicted wage disadvantage of Indian workers relative to White workers if they faced the same labour market structure or, loosely, if the characteristics of each group were equally well rewarded in the market. The negative results for all but lowest decile suggests that Indians would in fact earn more than Whites if they faced the same labour market structure – up to around 15% more at the upper deciles. The red line (“Coefficients”) measures the extent of how differently the labour market rewards the characteristics of the two groups. By definition the Total wage gap is always the sum of the Coefficients and Characteristics lines. Finally, the grey shaded areas are a measure of how precisely we are measuring the Characteristics and Coefficient effects – this has been suppressed for the Total line to avoid cluttering the

---

<sup>10</sup>With large samples the distribution regression approach can be considerably less computationally intensive than a quantile regression approach and for this reason it is adopted here. Indeed we found that the distribution regression approach often provided a more accurate fit to the “raw” distribution than the quantile approach, particularly in the tails. However Koenker et al. (2013) suggest that from the perspective of asymptotic efficiency, the quantile regression approach may dominate for certain types of underlying data generation process.

<sup>11</sup>Descriptive statistics on the explanatory variables can be found in the Appendix.

graph.

We now consider each of the groups in turn and discuss the decomposition of the ethnic gap at different points of the distribution. For the Indian group, we see in the first sub-period a wage distribution which reveals a slight wage advantage in favour of the White group across the distribution. In the second and third sub-periods the wage gap falls such that a premium for Indians emerges at the higher percentiles and a deficit remains at the lower deciles. By the fourth sub-period there is no wage gap at the lower deciles and a premium for Indians at the higher. The decomposition suggests that the improvement in the Indian wage distribution relative to Whites has been due to a decrease in the extent to which coefficient differences with Whites reduce Indian wages, particularly at the top end of the distribution. This could reflect a reduction in labour market discrimination over time for well-paid Indians. It is also worth noting that, consistently over the four sub-periods, Indians have “better” characteristics than Whites- they have more education or other earnings-enhancing characteristics. In the first two sub-periods, this characteristics advantage increases at the top of the distribution.

As noted in the discussion of Figure 2, male Pakistani workers are heavily concentrated in the lower deciles of the White distribution. In Figure 4 this corresponds to a wage disadvantage relative to Whites across all quantiles in each of the periods although the gap narrows slightly over time. The decomposition suggests that across all periods for workers at the upper deciles the wage gap would be smaller if solely based on characteristics: higher earning Pakistani workers have human capital and other endowments that make their earning potential as good or better than Whites. There is also some evidence of an improvement in Pakistani characteristics over time, particularly at the lower deciles. That we continue to witness an overall pay gap is therefore overwhelmingly driven by a coefficients effect and the figure shows how the gap for the Total and Coefficients components track each other closely. In the most recent sub-period these lines are lower than in previous sub-periods suggesting an improvement in how Pakistanis are treated in the labour market.

The extent of the Bangladeshis’ concentration in the lowest decile is stark and justifies treating them as a separate group from Pakistanis in spite of the relatively small sample sizes – these groups are sometimes merged in empirical work. However, while the levels of the pay gap are much higher, the decomposition suggests that qualitatively how the pay gap is driven by characteristics and the wage structure has many similarities to the other South Asian group. At the lower end of the distribution Bangladeshi characteristics would drive a gap in favour of White workers but Bangladeshis should earn more than Whites at the very top end if their characteristics were as well rewarded. Improvements over time in the wages of Bangladeshis are particularly notable at the bottom of the distribution

and reflect an improvement both in the rewards to their characteristics as well as an improvement in those characteristics. To a greater extent than for the Pakistani group, Bangladeshis see an increasing Coefficients component as we move up through the deciles. Controlling for characteristics, a higher wage disadvantage at the top of the distribution is often referred to as a glass ceiling effect. In the UK Longhi et al. (2013) study the distribution of the wage gap between White Christian males and Indian Hindus, Indian Muslims and Pakistani Muslims. A substantial unexplained component in the upper deciles for second generation Indian Hindus is the only evidence found for a glass ceiling effect. Melly (2006) finds a glass ceiling effect for the Black/White wage gap in the US in the raw data however it largely disappears when observable characteristics are controlled for.

The overall picture for the Black Caribbeans confirms a story of broad continuity in the wage gap through time. The most striking feature is how, particularly in the latter sub-periods, the wage disadvantage increases as we move up the distribution. Indeed, at the lower end there is little or no wage gap which is unlike the other groups. Black Caribbean workers in the poorest paying jobs do seem to face a level playing field. However this only serves to highlight how, despite a characteristics advantage, the Total pay gap is sharply increasing across the percentiles and how this reflects the slope of the line representing the effect of Coefficients. Like the Bangladeshis, this is indicative of a glass ceiling effect which for the Black Caribbeans has worsened over time.

The Black African group has experienced an increasing wage gap relative to Whites over time. The disadvantage also increases at points further towards the top of the distribution. This disadvantage results from the combination of a substantial advantage in characteristics relative to Whites, particularly at the upper end of the distribution, with a substantial disadvantage in rewards which again increases towards the upper end of the distribution. Thus, like the Black Caribbean group there is some evidence here of a glass ceiling effect. Since the start of the period, and particularly in the latter two sub-periods, Black African characteristics have worsened relative to the comparison White group. This is most notable in the upper deciles where in the final period the explained wage gap in Black African's favour is half that found in sub-period 1993-1999. At the same time the Coefficients line has fallen somewhat reflecting an improving wage structure for Black Africans. The overall increase in the Black African pay gap is therefore due to this shift in the Characteristics effect, an issue we explore in further detail in the next section.

### 3.2 Detailed Decomposition

We now turn to a detailed decomposition of the characteristics effect. We have seen above how for many groups a characteristics advantage is outweighed by the effect of the wage structure and how there have been shifts over time in the relative contributions of characteristics and coefficients. It is useful to understand the detail of how the groups' human capital endowments and demographic factors contribute to the characteristics effects, and the overall pay gap at different quantiles and how it has changed through time.

The detailed decomposition is based on a recentered influence function (RIF) approach outlined by Fortin et al. (2011). Essentially this involves defining a new dependent variable which replaces the log wage,  $y$ , with the corresponding RIF for the distributional statistic of interest ( $v(F_Y)$ ) where  $F$  is the cumulative distribution function of the underlying random variable.

The RIF is defined as  $RIF(y; v) = v(F_y) + IF(y; v)$  where  $IF(y; v)$  is the influence function that corresponds to the observed log wage  $y$  for  $v(F_Y)$ . We apply the simplest approach and assume that conditional expectation of the  $RIF(Y; v)$  is modelled as a linear function of the explanatory variables ( $E[RIF(Y; v)|X] = X\gamma$ ) where  $\gamma$  can be estimated using OLS.

This approach can be extended across the distribution to obtain the detailed breakdown we are interested in. For each  $Q_\tau$  - the population  $\tau$ -quantile of the unconditional distribution of the log wage,  $Y$  - we calculate

$$RIF(y; Q_\tau) = Q_\tau + \frac{\tau - \mathbb{1}(y \leq Q_\tau)}{f_Y(Q_\tau)}, \quad (2)$$

where  $f_Y(\cdot)$  is the density of the marginal distribution of  $Y$ . The mean of the RIF at the  $\tau$ th quantile is equal to the unconditional quantile  $Q_\tau$ .

We estimate the RIF by computing the sample quantile  $\hat{Q}_\tau$  and then estimating the density using kernel methods. Plugging the estimates of  $\hat{Q}_\tau$  and  $\hat{f}(\hat{Q}_\tau)$  into the equation 2 gives an estimate of the RIF for each observation. With the coefficients of the unconditional quantile regression,  $\hat{\gamma}_{g,\tau}$ , the decomposition is

$$\widehat{RIF}(y; \hat{Q}_{\tau,w}) - \widehat{RIF}(y; \hat{Q}_{\tau,n}) = \bar{X}_n (\hat{\gamma}_{n,\tau} - \hat{\gamma}_{w,\tau}) + (\bar{X}_n - \bar{X}_w) \hat{\gamma}_{w,\tau}.$$

From here we can obtain the detailed decomposition that outlines the contribution of each grouping of covariates (denoted  $k$ ). We focus on the characteristics decomposition

(the first term on the right hand side) which can be re-expressed as

$$\bar{X}_n (\hat{\gamma}_{n,\tau} - \hat{\gamma}_{w,\tau}) = \sum_{k=1}^K \bar{X}_{nk} (\hat{\gamma}_{nk,\tau} - \hat{\gamma}_{wk,\tau}).$$

We can then obtain the detailed decomposition of characteristics for the variables of interest.

Figure 5 presents the results from this approach graphically as it allows the clearest view of trends across the distribution and enables the identification of which specific characteristics affect the ethnic wage gap. We show both the total distribution of the characteristics decomposition and graphs for each individual detailed component: age, marital status, level of education, region, tenure and whether the respondent was born in the UK<sup>12</sup>. Both the overall characteristics effect and each of the contributions are plotted with their 95% confidence interval.

Figure 5 suggests that three of the key characteristics in the analysis have broadly consistent effects across all of the groups considered here. First, the region of residence of minority workers consistently has a negative sign in the detailed decomposition of the characteristics effect telling us that the geographic location of the ethnic minority groups, relative to Whites, reduces the ethnic wage gap. This is because all the minority groups are more concentrated in the high-wage regions of Britain than the White group. Table A4 details the proportions of each group in the sample resident in London where wages (and prices) are generally much higher than in the rest of the country. It is clear that a large proportion of certain ethnic groups are found in the capital. For example, in the 1993-1999 sub-period over 70% of Black African employees were living in London. These location patterns are a legacy of migration choices by first-generation members of each group and, while there has been some dispersal over time, there is variation in the extent of this between groups (Zuccotti 2019). We see this in our sample where the proportion of London residents has fallen for all ethnic minority groups by the last sub-period. However it remained the case that all ethnic minority groups were twice as likely to live in the capital as Whites in the latest period. Our very broad measure of location (the region) will miss much of the subtlety of these more local processes of internal migration. Nevertheless, it is clear from the decomposition that, were minorities more spread out across Britain's regions, we would observe a larger ethnic wage gap across all percentiles of the distribution and for all four sub-periods. Of course, in Britain, high wage regions are also regions where the general price level is higher and so the characteristics "advantage" afforded to ethnic minority workers by their residence there need not translate into higher

---

<sup>12</sup>Detailed tables for all these results and for the distribution of the total wage gap and the characteristics component can be found in the Appendix.

living standards. Indeed, other work has pointed to the existence of pockets of ethnic minority poverty in otherwise wealthy areas of London (Peters et al. 2007).

The second characteristic with a consistently signed effect across time periods, percentiles and groups (with the exception of the Black Caribbeans) is job tenure. This has a positive effect on the ethnic wage gap because average job tenure is lower for minorities as Table A3 demonstrates. While the patterns of average tenure will partly reflect the younger age structure of the ethnic minority population relative to Whites, the regression-based detailed decomposition results, which control for age, suggest that there is an independent effect of tenure on the ethnic wage gap. The lower tenure of ethnic minority groups is driven by their higher risk of unemployment. Lower job tenure for minority workers has been identified as a feature of labour markets in a number of countries including Australia (Mumford and Smith 2004) the US (Antecol and Bedard 2004). Given how the labour market rewards tenure which can reflect the acquisition of general and specific human capital, the higher turnover experienced by minority groups contributes to the wage penalties we observe. These tenure effects seem to be highest at the median and lower quartile of the distribution across all of the periods in our study. It is also important to note that we should resist the temptation to label this characteristics effect as “non-discriminatory” or “justified” since the underlying processes which lead to higher turnover and lower tenure may reflect racial discrimination in hiring and firing decisions (Heath and Cheung 2006).

Education is the third characteristic with a consistently signed effect across the groups, again with the exception of the Black Caribbeans where it has a negligible impact. As noted earlier, most of Britain’s ethnic minority groups tend to have higher levels of formal educational attainment than the White majority population and this is reflected in the decompositions as a negative characteristics effect. The effect is also large, accounting for a significant proportion of the overall characteristics contribution to the wage gap. The absolute magnitude of the education contribution increases as we move up the wage distribution suggesting that it is amongst the higher paid workers where formal qualifications can make the most difference to ethnic pay gaps. Over time the contribution of education to the characteristics effect, and hence the overall pay gap, has remained relatively stable, with the exception of the Black African group where it has fallen somewhat in absolute value.

The age structure of the workforce has different effects for different groups. Indians, with a high proportion in the prime age category of 25-49, exhibit a negative effect particularly at the lower deciles and in the later sub-periods while for the Pakistanis and Bangladeshis the effect is positive but declining over time. The diminishing impact of age on the wage gap with Whites reflects that Pakistani and Bangladeshi workers were

considerably younger on average in the earlier periods but this difference has narrowed somewhat. Black Africans also aged, on average, over the period studied here which shows up as a more negative contribution to the characteristics effect in later sub-periods.

Differences in the proportion of the minority group who were born in the UK mostly serve to reduce pay relative to Whites. This immigration effect is because minority workers are significantly less likely, on average, to be UK born than Whites and on average we expect there to be an earnings penalty linked to immigrant status (Algan et al. 2010). In early periods this penalty is less prevalent in the top tail of the distribution but this changes in the post-financial crisis period where wage penalties increase in the middle and upper end of the distribution. This change is observable across all ethnic groups although is small in magnitude for Black Caribbeans, a difference that may be explained by the high proportion of UK born in this group.

Over time there is a significant increase in the contribution of immigrant status to the characteristics effect with it making a larger, positive contribution to pay gaps with the White group. This is somewhat counterintuitive as the proportion of each group born in the UK increases over time for all groups except the Black Africans. If immigrants are less well rewarded on average then the increasing proportion of second (or higher) generation members of minority groups should serve to reduce pay gaps, particularly since the proportion of White workers born in the UK is falling over this period largely as a result of the migration of Eastern European workers from 2004 onwards. In fact there is a complex set of factors at play. In the first two sub-periods the pay premium for being UK born is relatively small for White workers, however following the growth in Eastern European migration from 2004, this premium increased significantly due to the newly-arrived (White) workers being concentrated in relatively low-paid employment. In the decomposition the (shrinking but still positive) difference in the proportion UK born between White and minority groups is weighted by this premium, therefore this variable's contribution to the wage differential increases.

The immigration effect is particularly pronounced for the Black African group and this partly reflects the fact that the proportion of Black Africans born in the UK, alone amongst minority groups, declined over this period. Recall that the overall decomposition suggested that the Black Africans' characteristics worsened towards the end of our period of study. As well as the proportion UK born, educational attainment and region are the other characteristics which drive this. A much higher proportion of Black Africans lived outside London at the end of the period and their average educational attainment (which was already high in 1993) increased by less than other groups. These effects are inter-related: Mitton and Aspinall (2010) note how a new African migration, driven partly by the growth of asylum claims, from countries such as Somalia, Zimbabwe, the Democratic

Republic of Congo and other Central African countries has changed the composition of this section of the UK ethnic minority population since around 2000. The diversity within the Black African population has increased and, despite the relatively high levels of education, on average, sizeable numbers of African migrants with poor English and educational attainment also form part of this ethnic minority (Mitton and Aspinall 2010).

### 3.3 National Minimum Wage

The results we have presented so far can help to understand how different characteristics inform the pay gap across both the distribution and ethnic groups. We now consider how this approach can throw light on the differential impact employment policy can have on ethnic pay differences. We augment our decomposition approach to present a detailed analysis of the distributional impact of the introduction of the national minimum wage in the UK.

The national minimum wage (NMW) was introduced in the UK in the spring of April 1999. The legislated floor on the hourly wage differed by age cohort. Initially those aged 18 to 21 were entitled to a lower minimum than over 21s. In 2010, minimums in four age categories were legislated for: 16-17, 18-20, 21 plus and a minimum rate for apprentices. With the introduction of the National Living Wage in April 2016 there are now five separate minimum wages that workers or trainees will face depending on age and whether they are in the first year of an apprenticeship (Low Pay Commission 2020). Figure A1 shows how the minimum wage has changed over time. In real terms the NMW rises until the period of the financial crisis where it declines over a number of years. Recently the minimum has begun to rise again and for the oldest group now exceeds the previous peak.

To assess the immediate and long term distributional impact of the minimum wage on the ethnic wage gap we follow a method suggested by Amadxarif et al. (2020) and rerun the detailed decompositions including an explanatory variable which takes the value of the minimum wage – rebased using the Retail Price Index – that each respondent was entitled to at the time they were interviewed for the LFS. For workers ineligible for the minimum wage we set this variable to zero<sup>13</sup>.

The presence of a minimum wage would be expected to have its greatest impact at the lower end of the distribution. In the initial stages the minimum level was set low: the “bite”, the ratio of the minimum wage and the median hourly wage, was 45.6% in 1999. This has increased over time to 59.8% in 2019 (Low Pay Commission 2020). Given the

---

<sup>13</sup>In order to establish whether this choice biases our results we repeated the analysis setting the level of NMW for those not eligible to be equal to the lowest observed wage for the respondent’s age group in each wave of the LFS. The results obtained were near identical to those reported.

prevalence of ethnic minority workers at the lower end of the distribution the expectation is that the introduction of the NMW would serve to decrease the ethnic pay gap at the bottom end of the distribution. Deroncourt and Montialoux (2020) find just this effect following the extension of the United States minimum wage in 1967. This policy is found to explain more than 20% of the reduction in the Black-White pay gap during the civil rights era, largely driven by a sharp increase in wages in low paid industries where Black workers were over-represented.

The results in figure 6 provide evidence of a similar effect following the introduction of the NMW in the UK<sup>14</sup>. The figure displays the contribution of the NMW variable to the characteristic effect. In essence we treat the level of the minimum wage the worker is entitled to as an additional characteristic to establish how variation in this affects the ethnic pay gap. As would be expected there is no significant effect during 1993-1999, given the introduction of the NMW late in this sub-period. Moving forward we see that there is a general trend across ethnic groups for the NMW to reduce the pay gap in the lower quantiles with diminishing impact as we move up the distribution. This effect is significant at the 95% confidence level for all groups except Bangladeshis. The initial reduction in the gap is strongest for Indians and Black Africans. Over time this pattern persists for most groups but the magnitude of the effect decreases.

The results for Pakistani and Bangladeshis – neither sizeable relative to overall wage gap nor significant in the case of the latter - is surprising given the high concentration of workers from these groups in the lowest decile. Part of the explanation may be the relative lack of enforcement of the policy. In the 2000-2006 sub-period, directly after its introduction, 14% of Pakistanis and just under 35% of Bangladeshi in our sample reported earning an hourly wage below the NMW they were entitled to by law. For other ethnic groups the results were generally much lower: Whites (3.4%); Indians (5.8%); Black Caribbeans (4.3%); Black Africans (5.9%). Non-compliance with the NMW policy remains an issue and the proportion of the workforce that is underpaid has recently seen a slight increase (Judge and Stansbury 2020). The overall impact varies by sector: in 2019 retail, cleaning & maintenance and hospitality were the sectors with the highest number of employees paid below the NMW (Low Pay Commission 2020). The most recent figures from the Office for National Statistics (2020a) show that Pakistani and Bangladeshi workers are the ethnic group most likely to be employed in distribution, hotels and restaurants sectors.

---

<sup>14</sup>Upon adding the NMW variable to the decomposition the effects of all other variables are stable relative to the original except for the UK born variable which in general tends to increase the gap, at least for the lower deciles. Frequently, this cancels out the reduction in the overall ethnic gap due to the minimum wage. Consequently, the characteristics effect can be smaller than it was in the original analysis. This UK born effect tends to increase across time even in the higher deciles.

These results present compelling evidence that the presence of a national minimum wage had an effect in reducing the ethnic wage gap for low paid workers from certain ethnic groups both at the time of its introduction and throughout its existence. We do not find any evidence that as the NMW has increased these effects have diminished. Indeed during the last sub-period we analyse the UK government introduced the National Living Wage. As can be seen in figure A1 this increased the hourly minimum for over 25s markedly in both real and nominal terms. During this period we see that the effect of the NMW at the bottom of the distribution serves to further reduce the ethnic wage gap for those groups the policy most effects – Indians and Black Africans. In the wake of the Covid 19 recession the fear will be that the ethnic wage gap will increase (see Johnston and Lordan 2016). Raising the minimum both overall and for those under 25 could help to combat this risk of increasing inequality.

## 4 Conclusion

This paper has considered the ethnic wage gap across the full wage distribution for British male workers and through time. This has allowed us to draw out aspects of ethnic wage advantage and disadvantage that the standard focus on the average misses. We find that while Indian workers have a better endowment of pay-enhancing characteristics than Whites, there has been increasing inequality within the Indian pay distribution which partly reflects a reduction in the extent to which Indian characteristics are less well rewarded at the top end of the distribution. This contrasts sharply with the Pakistani group whose pay gap is largely explained by the differential rewards to their characteristics particularly at higher levels of pay. Bangladeshi workers have seen a big improvement in their earnings relative to Whites, particularly at the bottom of the distribution and this reflects an improvement in both characteristics and how these are rewarded. Both of the Black groups, and the Bangladeshis, experience a glass ceiling with the potential impact of discrimination more prevalent towards the right tail of the pay distribution and the Black Africans, due to changes in the composition of that group, have seen their endowments of human capital fall through time.

A more detailed decomposition of pay gaps reveals that increasing education is associated with reducing the wage gap for all groups except Black Caribbeans. Our distributional analysis reveals how the marginal impact of education increases in magnitude the higher up the pay distribution one moves - most notably for Black Africans. Assuming a causal impact of education on pay, the increasing attainment of ethnic minority groups in the UK points to an important way in which pay gaps can be reduced, particularly in the types of reasonably well paid jobs where educational qualifications are an important

barrier to entry and a prerequisite for advancement.

Moving beyond the characteristics of these workers our approach allows for an initial assessment of the distributional effectiveness of employment policy - specifically the introduction of the national minimum wage in the UK on the wage gap across ethnic groups. Our findings show that the introduction of the minimum wage is associated with a reduction in the wage gap between ethnic minorities and White workers at the lower end of the pay scale. We find a significant reduction for all the groups we study bar Bangladeshis. The absence of any effect on this last group is in itself revealing and may suggest some potential issues related to non-compliance with the policy.

This research points towards an effective way to analyse and assess the effects of economic policy. What is done here for the minimum wage is both possible and necessary for other employment proposals. The heterogeneity of our results across both the wage distribution and ethnic groups highlight the need to consider the multi-distributional impact of a policy at the design stage rather than attempt to mitigate inequalities after the fact.

## References

- Albrecht, James, Anders Björklund, and Susan Vroman (2003). “Is There a Glass Ceiling in Sweden?” *Journal of Labor Economics* 21.1, pp. 145–177. DOI: 10.1086/344126.
- Algan, Yann, Christian Dustmann, Albrecht Glitz, and Alan Manning (2010). “The Economic Situation of First and Second-Generation Immigrants in France, Germany and the United Kingdom”. *The Economic Journal* 120.542, F4–F30. DOI: 10.1111/j.1468-0297.2009.02338.x.
- Amadxarif, Zahid, Marilena Angeli, Andrew G Haldane, and Gabija Zemaityte (2020). *Understanding Pay Gaps*. London: Bank of England. URL: <https://www.bankofengland.co.uk/-/media/boe/files/working-paper/2020/understanding-pay-gaps.pdf?la=en&hash=26073019C1193774B89891942C08376863840825>.
- Antecol, Heather and Kelly Bedard (2004). “The Racial Wage Gap: The Importance of Labor Force Attachment Differences across Black, Mexican, and White Men”. *The Journal of Human Resources* 39.2, p. 564. DOI: 10.2307/3559027.
- Battu, Harminder and Yves Zenou (2010). “Oppositional Identities and Employment for Ethnic Minorities: Evidence from England”. *The Economic Journal* 120.542, F52–F71. DOI: 10.1111/j.1468-0297.2009.02337.x.
- Blackaby, D. H., D. G. Leslie, P. D. Murphy, and N. C. O’Leary (2002). “White/Ethnic Minority Earnings and Employment Differentials in Britain: Evidence from the LFS”. *Oxford Economic Papers* 54.2. Publisher: Oxford University Press, pp. 270–297. URL: <https://www.jstor.org/stable/3488780>.
- Blackaby, D.H., K. Clark, D.G. Leslie, and P.D. Murphy (1994). “Black-white male earnings and employment prospects in the 1970s and 1980s evidence for Britain”. *Economics Letters* 46.3, pp. 273–279. DOI: 10.1016/0165-1765(94)00490-0.
- Blackaby, D.H., D.G. Leslie, P.D. Murphy, and N.C. O’Leary (1998). “The ethnic wage gap and employment differentials in the 1990s: Evidence for Britain”. *Economics Letters* 58.1, pp. 97–103. DOI: 10.1016/S0165-1765(97)00274-7.
- Blackaby, David, Derek Leslie, Philip Murphy, and Nigel O’Leary (1999). “Unemployment Among Britain’s Ethnic Minorities”. *The Manchester School* 67.1, pp. 1–20. DOI: 10.1111/1467-9957.00130.
- Blackaby, David H. (1986). “An analysis of the male racial earnings differential in the UK, using the General Household Survey”. *Applied Economics* 18.11, pp. 1233–1242. DOI: 10.1080/00036848600000076.

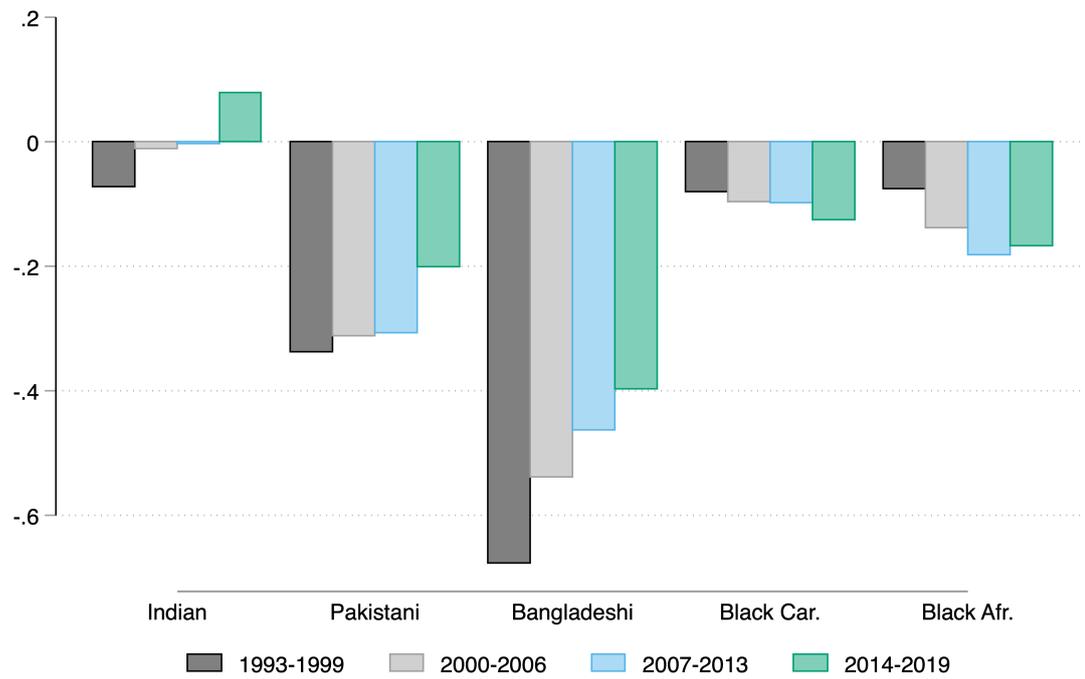
- Blinder, Alan S. (1973). “Wage Discrimination: Reduced Form and Structural Estimates”. *The Journal of Human Resources* 8.4, p. 436. DOI: 10.2307/144855.
- Cabinet Office (2003). *Ethnic Minorities and the Labour Market, Final Report*. London: Prime Minister’s Strategy Unit.
- Chernozhukov, Victor, Iván Fernández-Val, and Alfred Galichon (2010). “Quantile and Probability Curves Without Crossing”. *Econometrica* 78.3, pp. 1093–1125. DOI: 10.3982/ECTA7880.
- Chernozhukov, Victor, Iván Fernández-Val, and Blaise Melly (2013). “Inference on Counterfactual Distributions”. *Econometrica* 81.6, pp. 2205–2268. DOI: 10.3982/ECTA10582.
- Christofides, Louis N., Alexandros Polycarpou, and Konstantinos Vrachimis (2013). “Gender wage gaps, ‘sticky floors’ and ‘glass ceilings’ in Europe”. *Labour Economics* 21, pp. 86–102. DOI: 10.1016/j.labeco.2013.01.003.
- Clark, Ken and Stephen Drinkwater (2008). “The labour-market performance of recent migrants”. *Oxford Review of Economic Policy* 24.3, pp. 495–516. DOI: 10.1093/oxrep/grn023.
- Clark, Kenneth and William Shankley (2020). “Ethnic minorities in the labour market in Britain”. In: *Ethnicity, Race and Inequality in the UK*. Ed. by Bridget Byrne, Claire Alexander, Omar Khan, James Nazroo, and William Shankley. United Kingdom: Bristol University Press.
- Crossley, Thomas F., Paul Fisher, and Hamish Low (2021). “The heterogeneous and regressive consequences of COVID-19: Evidence from high quality panel data”. *Journal of Public Economics* 193, p. 104334. DOI: 10.1016/j.jpubeco.2020.104334.
- Derenoncourt, Ellora and Claire Montialoux (2020). “Minimum Wages and Racial Inequality”. *The Quarterly Journal of Economics* 136.1, pp. 169–228. DOI: 10.1093/qje/qjaa031.
- Dickens, Richard and Alan Manning (2004). “Has the national minimum wage reduced UK wage inequality?” *Journal of the Royal Statistical Society: Series A (Statistics in Society)* 167.4, pp. 613–626. DOI: 10.1111/j.1467-985X.2004.aeI2.x.
- Fawcett Society (2020). *Gender Pay Gap Reporting: A Comparative Analysis*. London: Fawcett Society. URL: <https://www.fawcettsociety.org.uk/Handlers/Download.ashx?IDMF=e67112b9-b01a-4852-9340-139e42585ae1>.
- Fisher, Paul and Alita Nandi (2015). *Poverty across ethnic groups through recession and austerity*. York: Joseph Rowntree Foundation. URL:

- <https://www.jrf.org.uk/report/poverty-across-ethnic-groups-through-recession-and-austerity>.
- Fortin, Nicole, Thomas Lemieux, and Sergio Firpo (2011). “Decomposition Methods in Economics”. In: *Handbook of Labor Economics*. Vol. 4. Elsevier, pp. 1–102. DOI: 10.1016/S0169-7218(11)00407-2.
- Heath, A and S.Y. Cheung (2006). *Ethnic Penalties in the Labour Market: Employers and Discrimination*. London: Department for Work and Pensions. URL: <https://webarchive.nationalarchives.gov.uk/20130125104217/http://statistics.dwp.gov.uk/asd/asd5/rports2005-2006/rrep341.pdf>.
- Henehan, K and H Rose (2018). *Opportunities Knocked? Exploring pay penalties among the UK’s ethnic minorities*. London: Resolution Foundation. URL: <https://www.resolutionfoundation.org/app/uploads/2018/07/Opportunities-Knocked.pdf>.
- Hogarth, Terence, David Owen, Lynn Gambin, Chris Hasluck, Clare Lyonette, and Bernard Casey (2009). *The equality impacts of the current recession*. Manchester: Equality and Human Rights Commission. URL: [https://www.equalityhumanrights.com/sites/default/files/research-report-47\\_the-equality-impacts-of-the-current-recession\\_0.pdf](https://www.equalityhumanrights.com/sites/default/files/research-report-47_the-equality-impacts-of-the-current-recession_0.pdf).
- Johnston, David W. and Grace Lordan (2016). “Racial prejudice and labour market penalties during economic downturns”. *European Economic Review* 84, pp. 57–75. DOI: 10.1016/j.euroecorev.2015.07.011.
- Judge, L. and A. Stansbury (2020). *Under the wage floor: Exploring firms’ incentives to comply with the minimum wage*. London: Resolution Foundation. URL: <https://www.resolutionfoundation.org/app/uploads/2020/01/Under-the-wage-floor.pdf>.
- Kapadia, D., James Nazroo, and Ken Clark (2015). “Have ethnic inequalities in the labour market persisted?” In: *Ethnic identity and inequalities in Britain: The dynamics of diversity*. United Kingdom: Policy Press.
- Koenker, Roger and Gilbert Bassett (1978). “Regression Quantiles”. *Econometrica* 46.1, p. 33. DOI: 10.2307/1913643.
- Koenker, Roger, Samantha Leorato, and Franco Peracchi (2013). *Distributional vs. Quantile Regression*. Roma: Einaudi Institute for Economics and Finance (EIEF). URL: <https://ideas.repec.org/p/eie/wpaper/1329.html>.
- Li, Yaojun and Anthony Heath (2020). “Persisting disadvantages: a study of labour market dynamics of ethnic unemployment and earnings in the UK (2009–2015)”. *Journal of Ethnic and Migration Studies* 46.5, pp. 857–878. DOI: 10.1080/1369183X.2018.1539241.

- Lindley, J. and S. Machin (2013). “Wage inequality in the Labour years”. *Oxford Review of Economic Policy* 29.1, pp. 165–177. DOI: 10.1093/oxrep/grt009.
- Longhi, S. and M. Brynin (2017). *The ethnicity pay gap*. Manchester: Equality and Human Rights Commission. URL: <https://www.equalityhumanrights.com/sites/default/files/research-report-108-the-ethnicity-pay-gap.pdf>.
- Longhi, S., C. Nicoletti, and L. Platt (2013). “Explained and unexplained wage gaps across the main ethno-religious groups in Great Britain”. *Oxford Economic Papers* 65.2, pp. 471–493. DOI: 10.1093/oep/gps025.
- Lordan, Grace and David Neumark (2018). “People versus machines: The impact of minimum wages on automatable jobs”. *Labour Economics* 52, pp. 40–53. DOI: 10.1016/j.labeco.2018.03.006.
- Low Pay Commission (2014). *The National Minimum Wage Low Pay Commission Report*. London: Low Pay Commission. URL: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/288847/The\\_National\\_Minimum\\_Wage\\_LPC\\_Report\\_2014.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/288847/The_National_Minimum_Wage_LPC_Report_2014.pdf).
- (2020). *20 Years of the National Minimum Wage: A history of the UK minimum wage and its effects*. London: Low Pay Commission. URL: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/790910/20\\_years\\_of\\_the\\_National\\_Minimum\\_Wage\\_-\\_a\\_history\\_of\\_the\\_UK\\_minimum\\_wage\\_and\\_its\\_effects.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/790910/20_years_of_the_National_Minimum_Wage_-_a_history_of_the_UK_minimum_wage_and_its_effects.pdf).
- Machin, S (1996). “Wage inequality in the UK”. *Oxford Review of Economic Policy* 12.1, pp. 47–64. DOI: 10.1093/oxrep/12.1.47.
- Melly, Blaise (2005). “Decomposition of differences in distribution using quantile regression”. *Labour Economics* 12.4, pp. 577–590. DOI: 10.1016/j.labeco.2005.05.006.
- (2006). *Estimation of counterfactual distributions using quantile regression*. St. Gallen: University of St. Gallen. URL: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.580.8178&rep=rep1&type=pdf>.
- Metcalf, Hilary (2009). *Pay Gaps across the Equality Strands: A Review*. Manchester: Equality and Human Rights Commission. URL: [https://www.equalityhumanrights.com/sites/default/files/14\\_pay\\_gaps\\_across\\_equalities\\_review.pdf](https://www.equalityhumanrights.com/sites/default/files/14_pay_gaps_across_equalities_review.pdf).
- Milburn, Sean (2011). *2011 changes to how Ethnicity is asked on Labour Force Survey Sean Milburn*. Tech. rep. London: Office For National Statistics. URL: <http://www.ons.gov.uk/ons/guide-method/method-quality/specific/labour->

- market/subnational-labour/changes-made-to-ethnicity-questions-on-the-  
lfs-during-2011-and-effect-on-aps.pdf.
- Mitton, Lavinia and Peter Aspinall (2010). “Black Africans in England: A Diversity of Integration Experiences”. In: *Ethnicity and Integration*. Ed. by John Stillwell and Maarten van Ham. Dordrecht: Springer Netherlands, pp. 179–202. DOI: 10.1007/978-90-481-9103-1\_9.
- Mumford, Karen and Peter N. Smith (2004). “Job reallocation, employment change and average job tenure: theory and workplace evidence from Australia”. *Scottish Journal of Political Economy* 51.3, pp. 402–421. DOI: 10.1111/j.0036-9292.2004.00312.x.
- Oaxaca, Ronald (1973). “Male-Female Wage Differentials in Urban Labor Markets”. *International Economic Review* 14.3, p. 693. DOI: 10.2307/2525981.
- Office for National Statistics (2020a). *Employment by sector: 2018*. URL: <https://www.ethnicity-facts-figures.service.gov.uk/work-pay-and-benefits/employment/employment-by-sector/latest>.
- (2020b). *Ethnicity pay gaps: 2019*. URL: <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/articles/ethnicitypaygapsingreatbritain/2019>.
- Peters, Simon, Ken Clark, Pascal Ekin, Anja Le Blanc, and Stephen Pickles (2007). “Grid Enabling Empirical Economics: A Microdata Application”. *Computational Economics* 30.4, pp. 349–370. DOI: 10.1007/s10614-007-9093-3.
- Smith, Allan (2002). *The new ethnicity classification in the Labour Force Survey*. London: Office For National Statistics. URL: <http://www.ons.gov.uk/ons/rel/lms/labour-market-trends--discontinued/volume-110--no--12/the-new-ethnicity-classification-in-the-labour-force-survey.pdf>.
- StataCorp (2015). *Stata Statistical Software*. College Station, TX.
- Stewart, Mark B. (1983). “Racial Discrimination and Occupational Attainment in Britain”. *The Economic Journal* 93.371, p. 521. DOI: 10.2307/2232393.
- Zuccotti, Carolina V. (2019). “Ethnicity and neighbourhood attainment in England and Wales: A study of second generations’ spatial integration”. *Population, Space and Place* 25.7. DOI: 10.1002/psp.2252.

Figure 1: Average log real hourly wage for minority men relative to Whites.



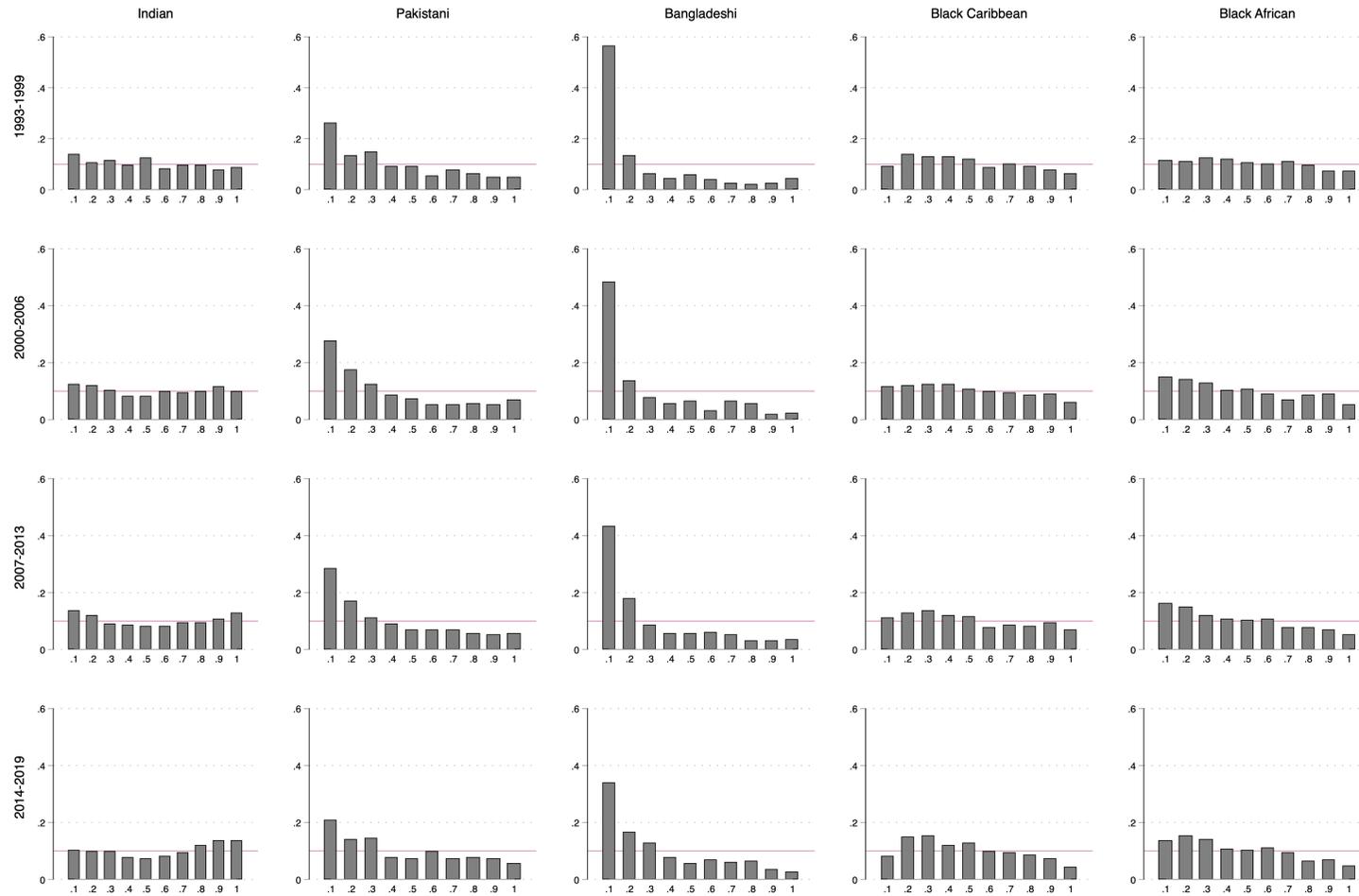
*Notes:* Figure displays the average difference in log wages between Whites and each indicated ethnic minority group. Data is from the quarterly Labour Force Survey 1993-2019. Sample is working age males in employment.

Table 1: Real Wages (Jan 2010 prices), £ per hour, male workers, full and part time, selected ethnic groups.

	1993 – 1999	2000 – 2006	2007 – 2013	2014 – 2019
<i>White</i>				
Mean	13.84	15.56	15.35	14.33
IQR	9.13	10.02	10.19	9.53
N	90243	83101	70322	57436
<i>Indian</i>				
Mean	12.88	15.57	15.58	15.58
IQR	8.46	11.03	12.13	12.19
N	1228	1493	1915	1886
<i>Pakistani</i>				
Mean	10.02	11.78	11.39	11.66
IQR	7.38	7.26	7.57	7.66
N	483	662	846	869
<i>Bangladeshi</i>				
Mean	7.36	8.93	9.59	9.27
IQR	4.83	5.98	5.25	5.72
N	162	236	354	393
<i>Black Caribbean</i>				
Mean	12.33	13.78	13.57	11.88
IQR	7.17	8.48	8.75	6.85
N	572	604	495	467
<i>Black African</i>				
Mean	12.69	13.31	12.44	11.46
IQR	7.67	8.44	7.62	6.81
N	339	601	906	986

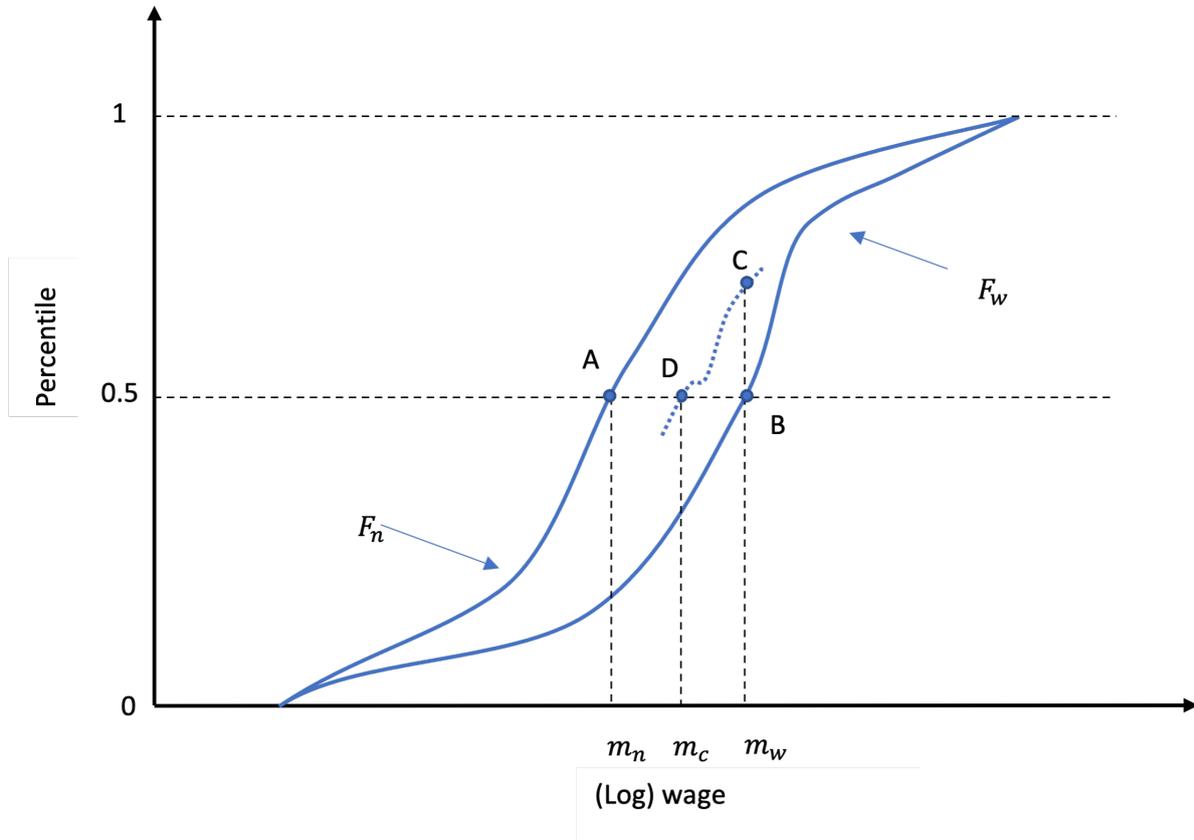
*Notes:* Data is from the quarterly Labour Force Survey 1993-2019. Sample is working age males in employment.

Figure 2: Quantile distribution of average log real hourly wage for minority men relative to Whites.



*Notes:* Figure outlines how the earnings distribution of each of the ethnic minority groups compare with that of Whites in each of the four sub-periods. Each histogram plots the proportion of workers within that ethnic group in that sub-period whose hourly wages lie within each decile of the White group's wage distribution. If the distributions of White and ethnic minority hourly wages were identical, the histograms would look like a flat rectangle at the horizontal line at 0.1. Any deviation from this – above or below the horizontal line on each graph indicates inequality in the wage distributions.

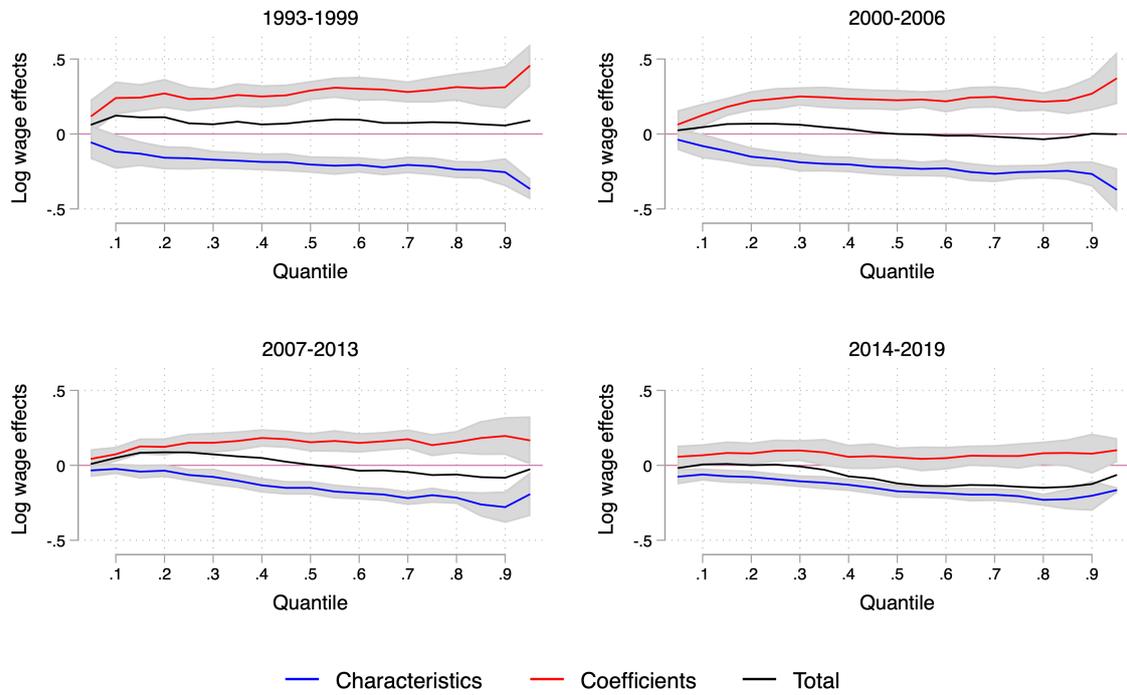
Figure 3: Quantile decomposition method



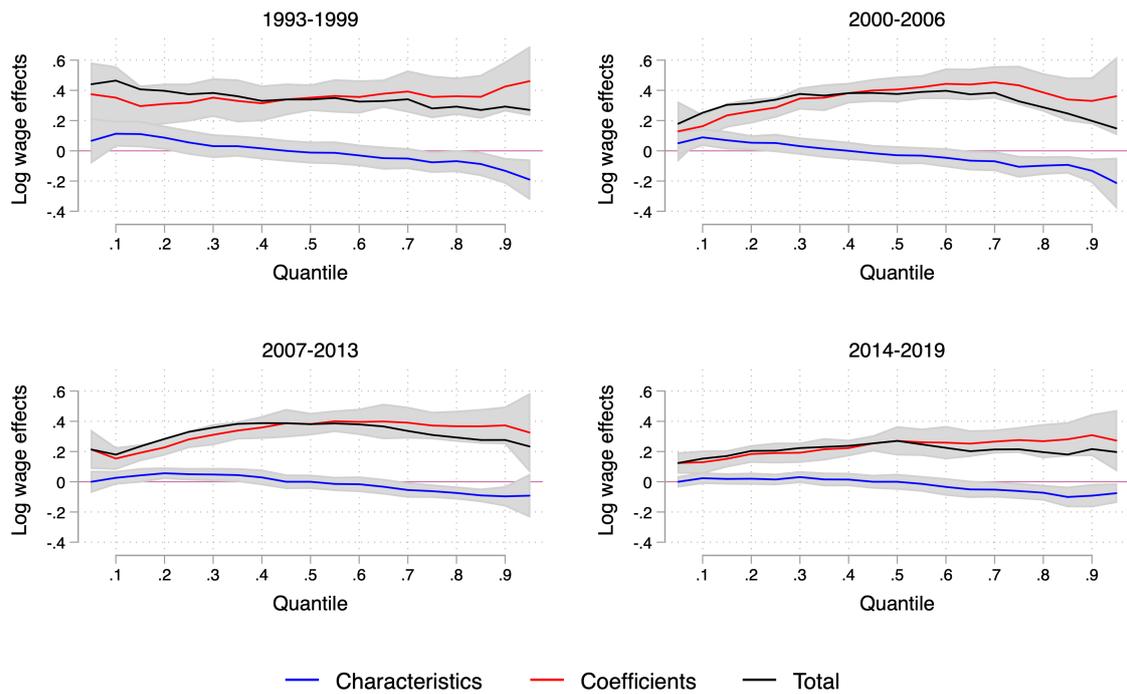
Notes: Figure outlines a simplified form of the “distribution regression” proposed by Chernozhukov et al. (2013) and Fortin et al. (2011).  $F_w$  is the CDF of wages for White workers;  $F_n$  is that for a particular minority group. At the median the wage gap is  $m_w - m_n$ . The aim of the exercise is to find the point on the horizontal line between points  $A$  and  $B$  which corresponds to the wages minority workers would earn if they faced the wage structure of Whites. The method estimates the probability of a minority worker falling below the White median if that minority worker faced the same wage structure as White workers (point  $C$ ). Repetition of this process for a large number of wage values results in a set of points that could be joined together to obtain the dotted line allowing point  $D$  to be identified. The counterfactual median,  $m_c$  can be read off the horizontal axis.

Figure 4: Quantile decomposition of average log real hourly wage for minority men relative to Whites.

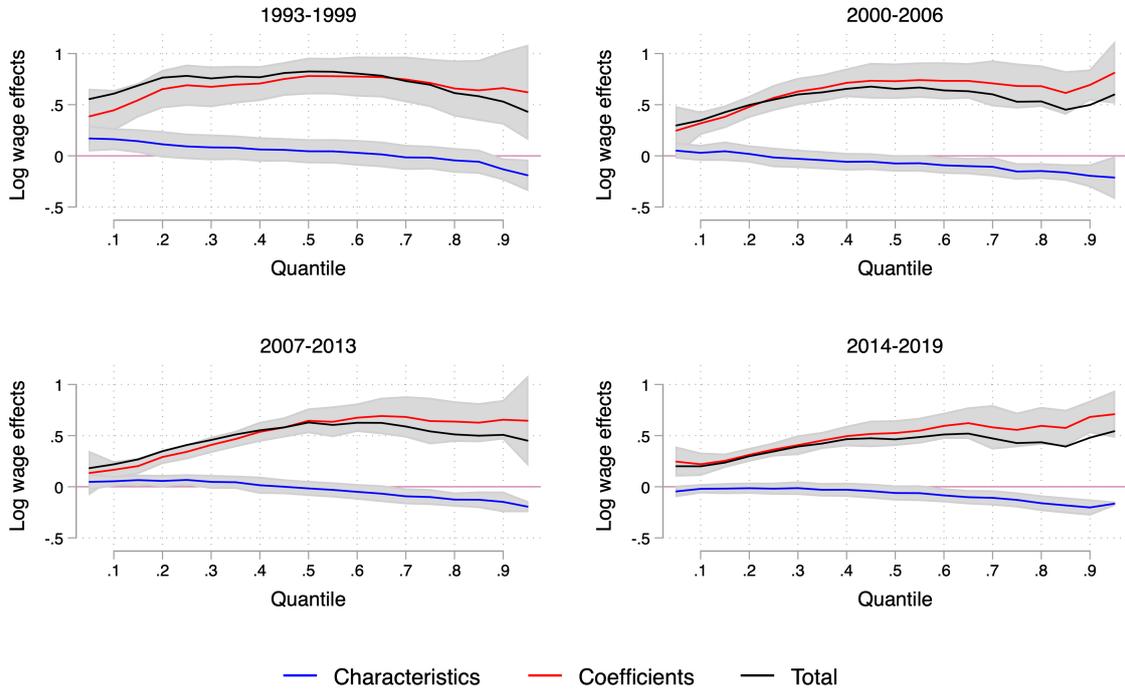
(a) Indian



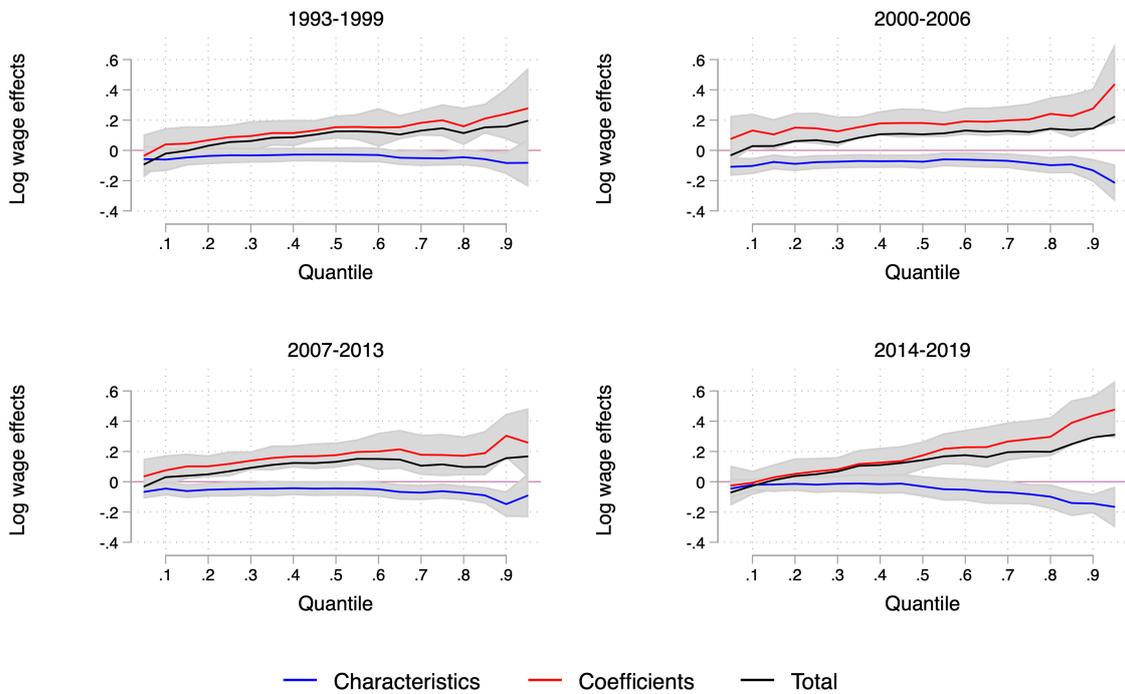
(b) Pakistani



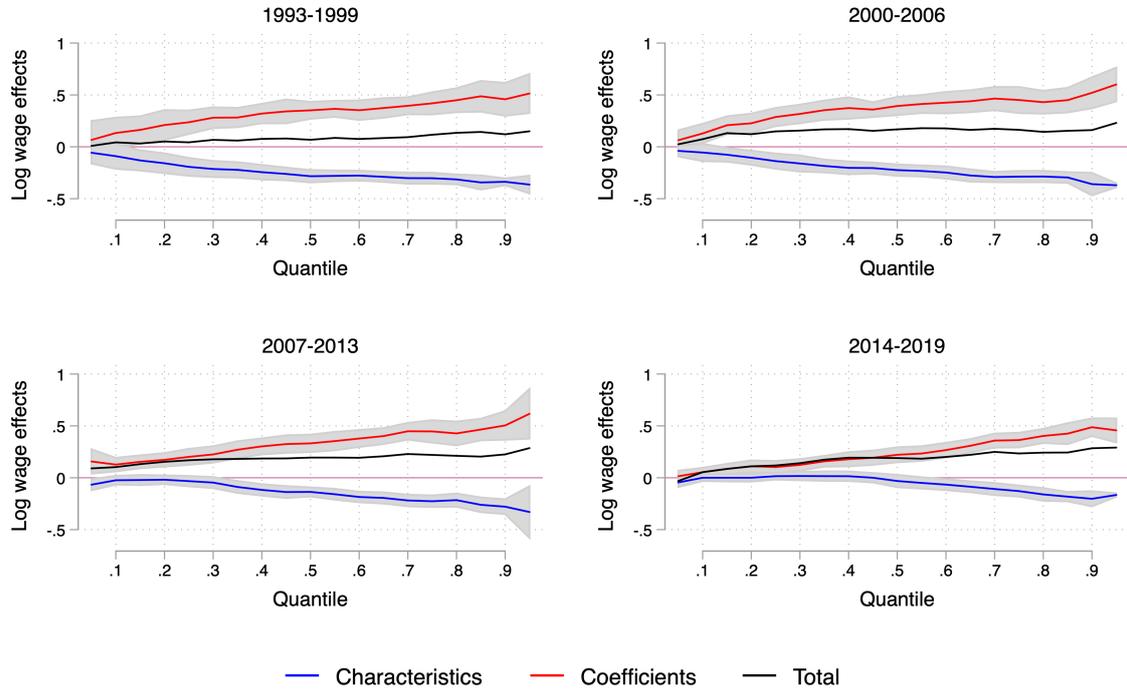
(c) Bangladeshi



(d) Black Caribbean



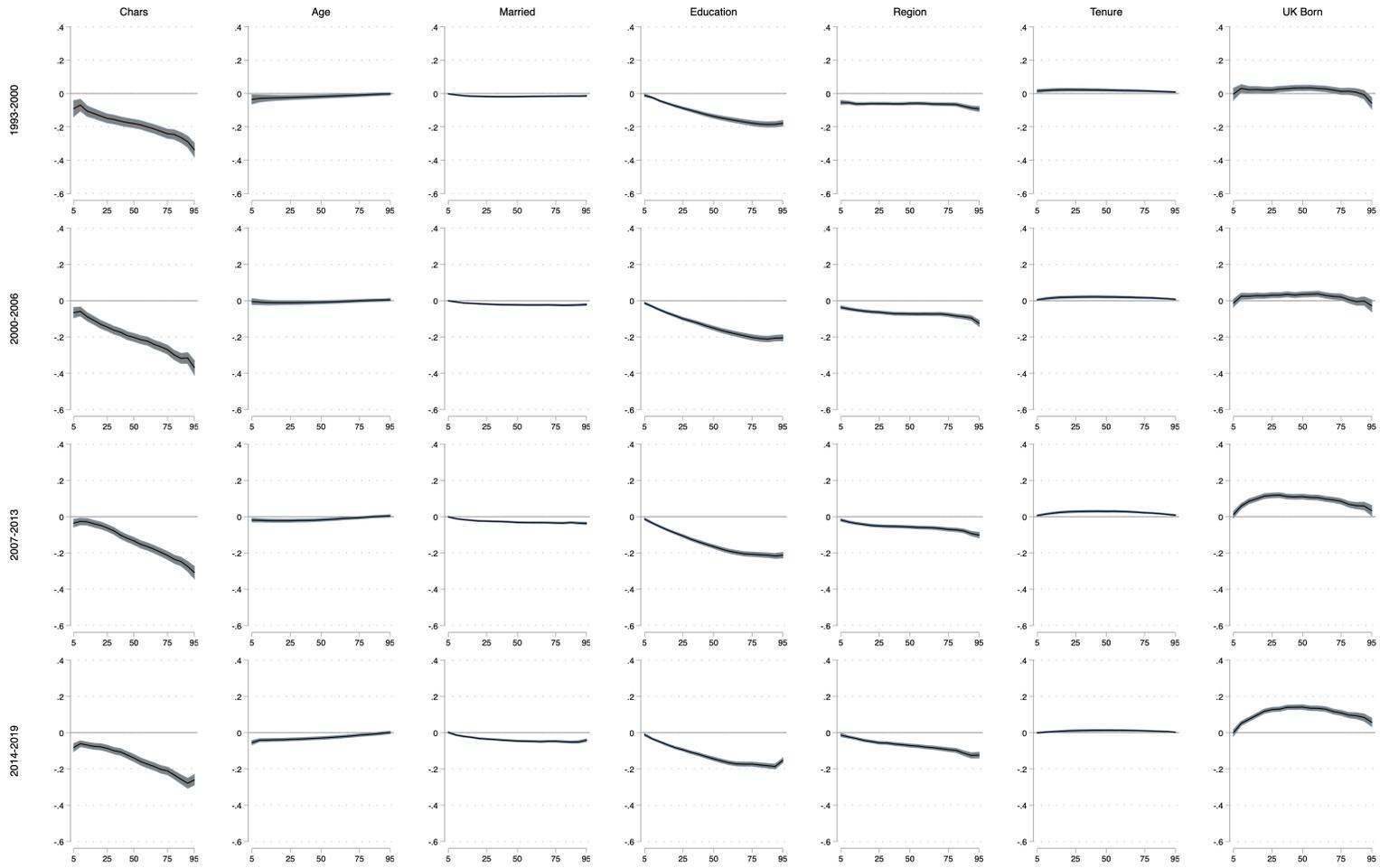
(e) Black African



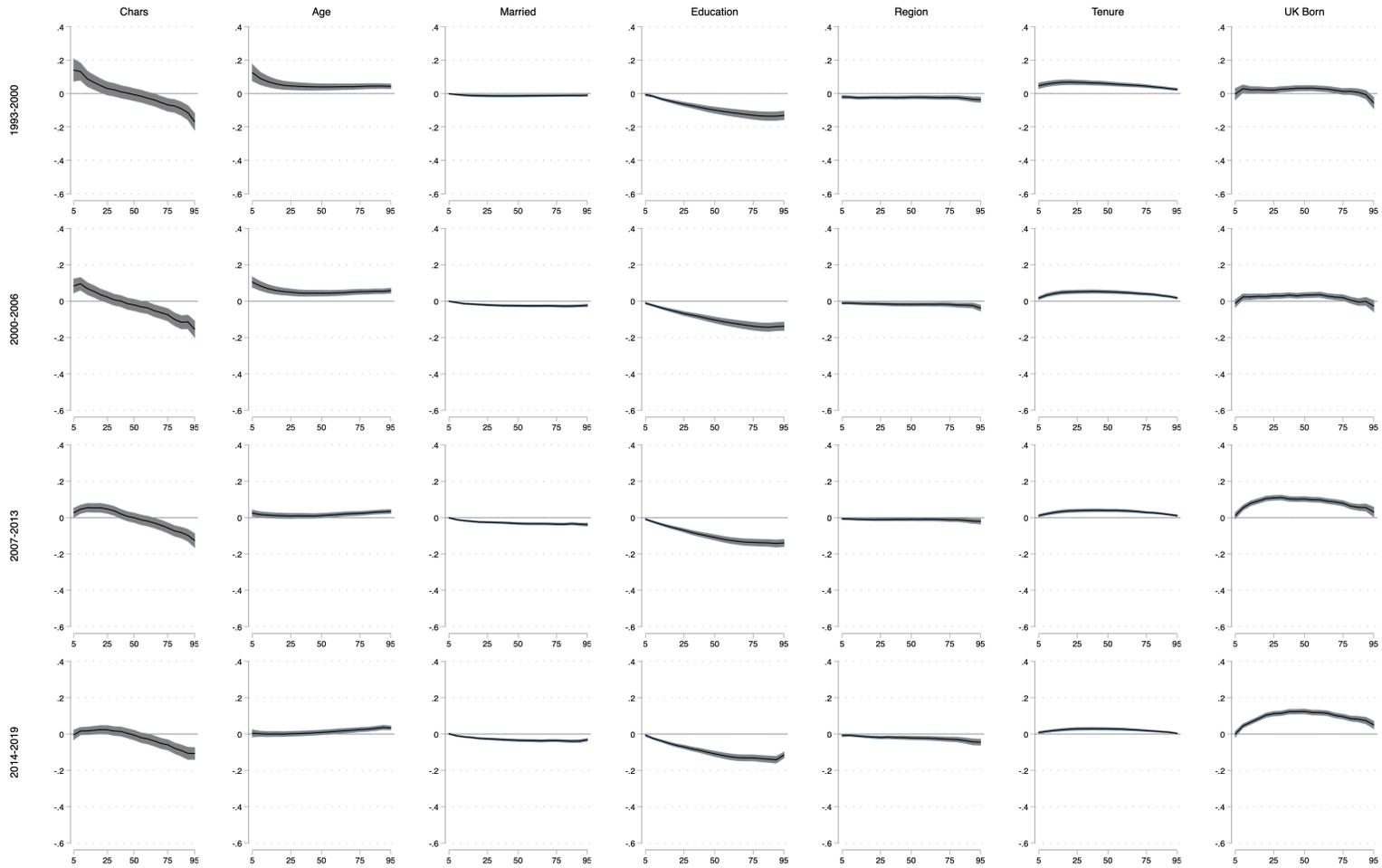
*Notes:* These figures display the aggregate decomposition of the ethnic gap of the log hourly wage between Whites and each ethnic group across the distribution. This uses the method outlined in section 3.1 to decompose the ethnic wage by the impact of differences in characteristics and coefficients. 95% confidence intervals, calculated using a bootstrap method with 100 repetitions are displayed in the grey shaded area. Estimates above zero indicate an increase in the pay gap in favour of Whites.

Figure 5: Detailed Decomposition of male log hourly wage by quantile

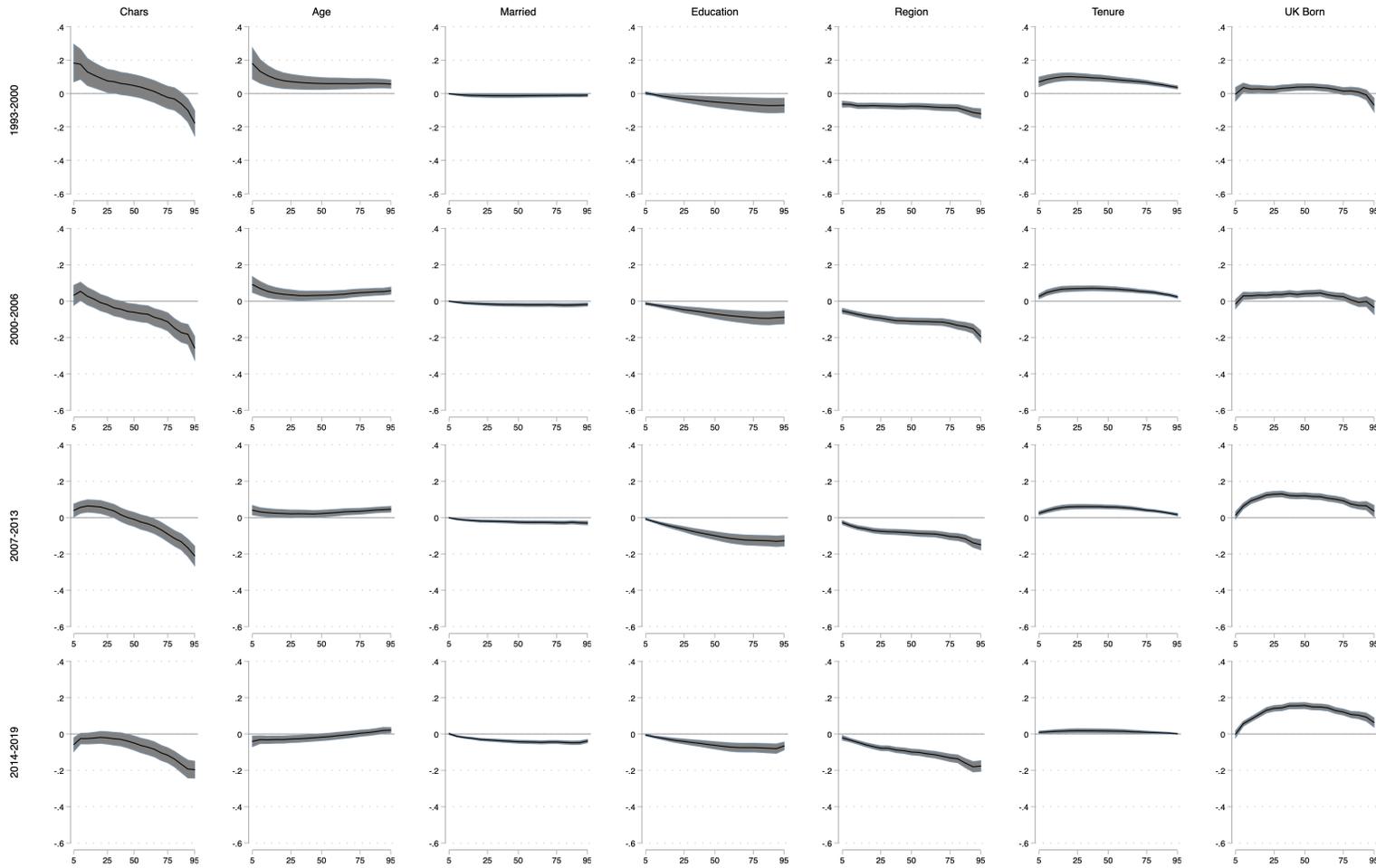
(a) Indian



(b) Pakistani

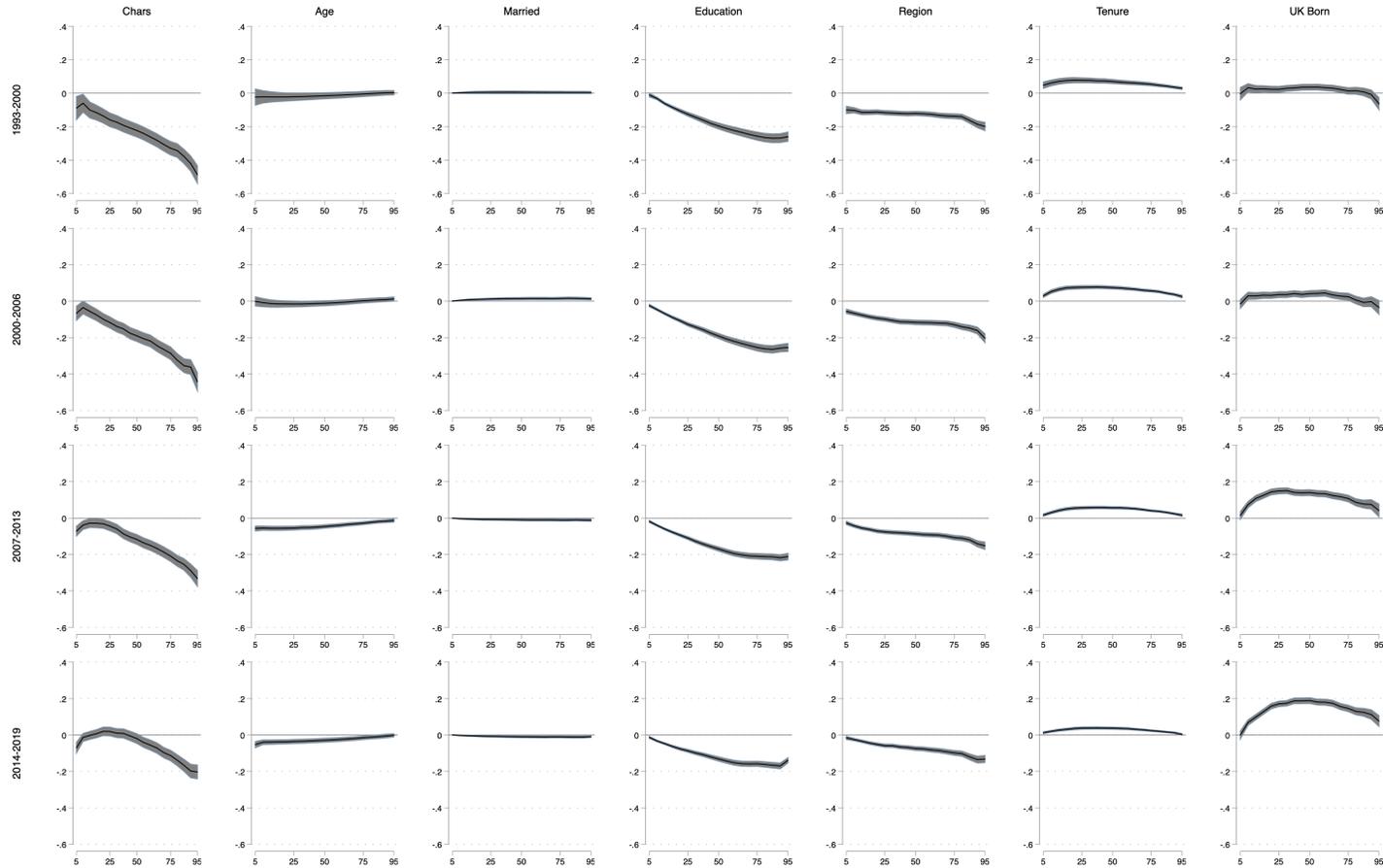


(c) Bangladeshi



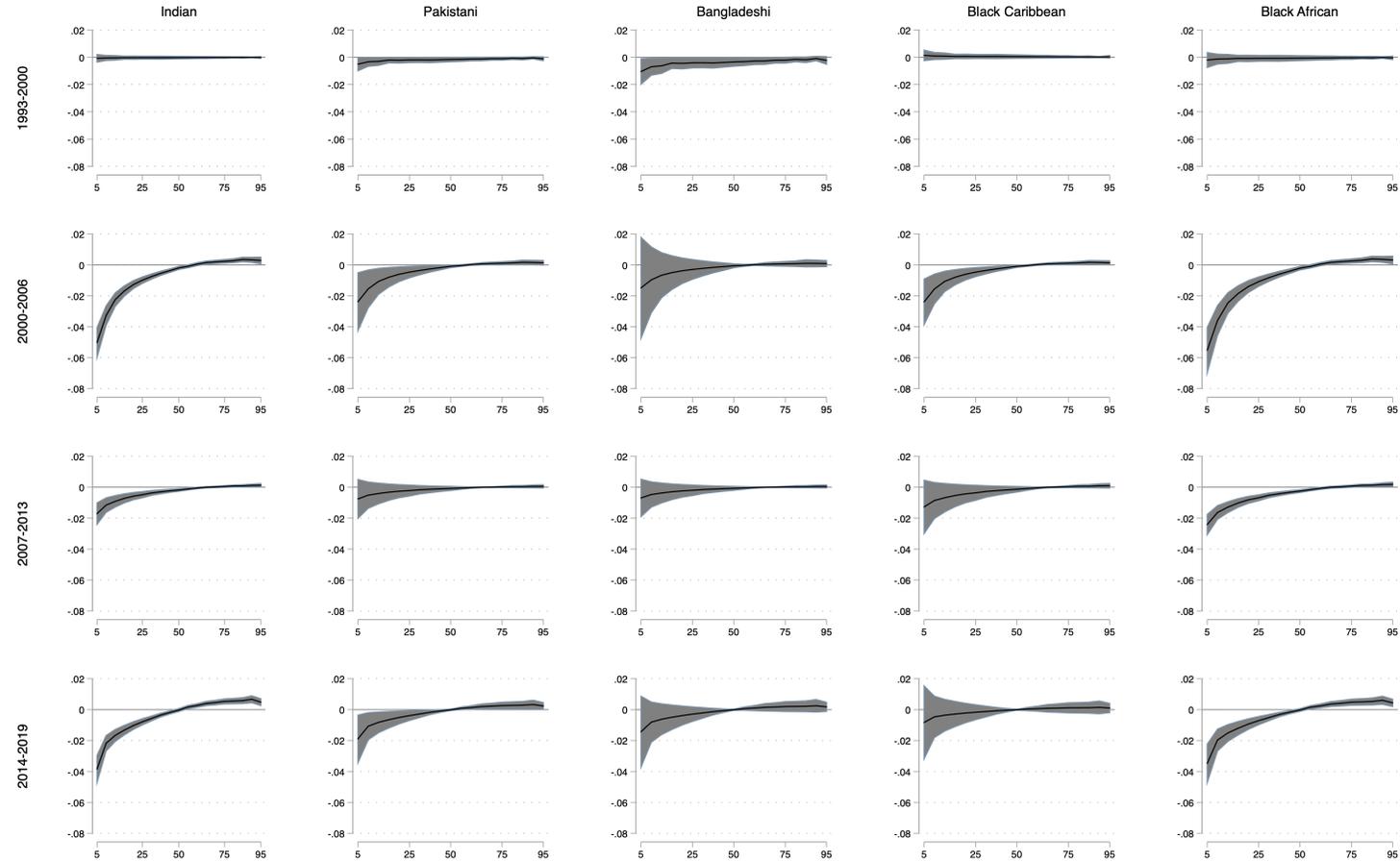


(e) Black African



*Notes:* These figures outline the detailed decomposition of the ethnic gap of the log hourly wage across the distribution for each individual ethnic group explained by the characteristics: age, marriage status, level of education, region, job tenure, UK native. Estimates for twenty quantiles from the 5th to the 95th are calculated using the method outlined in section 3.2. Estimates above zero indicate an increase in the pay gap in favour of Whites. Grey area indicates the 95% confidence intervals.

Figure 6: Contribution of minimum wage to characteristics in detailed quantile decomposition



*Notes:* Figure displays the results of adding a National Minimum Wage variable to the detailed decomposition of the ethnic gap of the log hourly wage for each group across the wage distribution. Minimum wage variable takes the value of the minimum wage – rebased using the Retail Price Index (Jan 2010 prices) – that each respondent was entitled to at the time they were interviewed for the LFS. For workers ineligible for the minimum wage we set this variable to zero. Grey area indicates the 95% confidence intervals.

# A Appendix

Table A1: Age categories by Ethnicity and sub-period

	White	Indian	Pakistani	Bangladeshi	Black Caribbean	Black African	Total
<i>1993-1999</i>							
16-24	14.93	13.60	21.95	30.25	11.19	12.09	14.95
25-34	27.63	31.60	39.54	28.40	35.49	38.05	27.83
35-49	37.38	43.16	30.02	33.95	34.44	38.64	37.40
50-64	20.05	11.64	8.49	7.41	18.88	11.21	19.82
<i>2000-2006</i>							
16-24	12.86	10.45	22.05	18.64	9.11	13.64	12.89
25-34	23.13	34.70	38.97	46.61	20.03	34.94	23.57
35-49	39.62	36.64	31.27	30.93	54.30	40.77	39.59
50-64	24.39	18.22	7.70	3.81	16.56	10.65	23.95
<i>2007-2013</i>							
16-24	11.77	7.42	11.82	15.25	9.29	5.74	11.58
25-34	21.25	34.26	39.95	44.07	18.99	29.91	21.99
35-49	38.95	40.99	37.71	33.90	49.70	51.43	39.19
50-64	28.03	17.34	10.52	6.78	22.02	12.91	27.24
<i>2014-2019</i>							
16-24	10.62	5.51	10.24	11.20	8.99	8.01	10.41
25-34	22.87	27.47	33.60	23.41	18.42	21.91	23.11
35-49	36.66	48.62	41.66	55.98	34.90	50.20	37.41
50-64	29.85	18.40	14.50	9.41	37.69	19.88	29.06

*Notes:* Data is from the quarterly Labour Force Survey 1993-2019. Sample is working age males in employment.

Table A2: Educational Attainment (Years of schooling) by Ethnicity and sub-period.

	White	Indian	Pakistani	Bangladeshi	Black Caribbean	Black African	Total
<i>1993-1999</i>							
Low	60.36	26.30	36.23	50.00	57.69	13.57	59.58
Medium	22.08	32.65	28.36	20.99	29.90	32.74	22.34
High	17.56	41.04	35.40	29.01	12.41	53.69	18.08
<i>2000-2006</i>							
Low	55.04	22.44	31.42	36.02	51.16	10.32	53.91
Medium	24.12	26.93	28.55	33.05	32.95	34.61	24.36
High	20.84	50.64	40.03	30.93	15.89	55.07	21.73
<i>2007-2013</i>							
Low	48.24	16.24	26.36	28.53	43.03	9.82	46.58
Medium	27.15	23.55	26.12	25.71	34.95	34.00	27.18
High	24.61	60.21	47.52	45.76	22.02	56.18	26.24
<i>2014-2019</i>							
Low	39.96	14.05	22.09	28.24	36.83	13.79	38.41
Medium	31.52	23.59	22.44	29.01	35.33	28.90	31.12
High	28.52	62.35	55.47	42.75	27.84	57.30	30.47

*Notes:* Data is from the quarterly Labour Force Survey 1993-2019. Sample is working age males in employment. Sample split by age of completing education: Low (16 and under); Medium (17 to 20); High (21 and over).

Table A3: Job tenure by ethnicity and sub-period.

	White	Indian	Pakistani	Bangladeshi	Black Caribbean	Black African	Total
<i>1993-1999</i>							
<1yr	17.26	22.39	31.47	38.27	19.58	32.15	17.51
1 - 5 yrs	26.61	27.93	34.16	38.27	30.59	38.05	26.76
5 - 10 yrs	16.54	17.18	13.46	11.73	17.13	13.86	16.52
> 10 yrs	39.59	32.49	20.91	11.73	32.69	15.93	39.22
<i>2000-2006</i>							
<1yr	18.34	20.50	26.59	31.36	18.71	32.78	18.58
1 - 5 yrs	31.93	37.98	43.81	44.07	33.77	47.09	32.28
5 - 10 yrs	16.44	16.41	14.80	15.25	17.72	12.15	16.41
> 10 yrs	33.29	25.12	14.80	9.32	29.80	7.99	32.74
<i>2007-2013</i>							
<1yr	15.15	17.91	20.21	26.27	17.37	22.63	15.44
1 - 5 yrs	31.43	39.48	40.43	42.94	31.31	46.80	31.97
5 - 10 yrs	19.69	21.36	21.87	18.08	22.83	18.87	19.76
> 10 yrs	33.73	21.25	17.49	12.71	28.48	11.70	32.83
<i>2014-2019</i>							
<1yr	15.98	15.96	20.94	20.87	20.56	23.73	16.24
1 - 5 yrs	31.86	35.26	37.97	34.35	34.48	38.44	32.19
5 - 10 yrs	17.27	21.95	18.99	15.52	14.13	19.47	17.44
> 10 yrs	34.89	26.83	22.09	29.26	30.84	18.36	34.14

*Notes:* Data is from the quarterly Labour Force Survey 1993-2019. Sample is working age males in employment.

Table A4: Percentage of each ethnic group resident in London.

	1993-1999	2000-2006	2007-2013	2014-2019
White	8.82	7.46	7.26	8.06
Indian	41.29	37.78	31.64	34.68
Pakistani	24.84	20.54	17.26	21.86
Bangladeshi	49.38	54.24	44.92	48.09
Black Caribbean	51.57	45.03	42.42	45.61
Black African	73.16	54.24	41.61	37.93

*Notes:* Data is from the quarterly Labour Force Survey 1993-2019. Sample is working age males in employment.

Table A5: Percentage of each group born in UK.

	1993-1999	2000-2006	2007-2013	2014-2019
White	96.21	95.40	92.84	90.30
Indian	25.08	30.34	29.09	32.34
Pakistani	27.54	33.53	33.81	39.36
Bangladeshi	12.35	17.80	23.16	25.95
Black Caribbean	54.90	60.10	66.46	66.60
Black African	18.88	17.14	11.81	12.47

*Notes:* Data is from the quarterly Labour Force Survey 1993-2019. Sample is working age males in employment.

Table A6: Percentage of each group married.

	1993-1999	2000-2006	2007-2013	2014-2019
White	60.92	57.11	54.74	52.91
Indian	73.78	72.94	74.57	79.11
Pakistani	70.60	74.47	75.30	72.84
Bangladeshi	69.75	70.76	70.62	77.10
Black Caribbean	45.98	42.55	42.22	42.40
Black African	57.52	47.59	60.93	58.62

*Notes:* Data is from the quarterly Labour Force Survey 1993-2019. Sample is working age males in employment.

Table A7: Decomposition of the wage gap between Whites and Indians

	1993-1999	2000-2006	2007-2013	2014-2019
<i>Differences</i>				
q10	0.024 (0.020)	-0.060*** (0.015)	-0.007 (0.013)	-0.012 (0.008)
q25	0.001 (0.015)	-0.064*** (0.015)	-0.021 (0.014)	-0.036*** (0.011)
q50	0.026 (0.022)	-0.058*** (0.017)	-0.088*** (0.022)	-0.128*** (0.017)
q75	0.019 (0.028)	-0.027 (0.025)	-0.081*** (0.017)	-0.090*** (0.019)
q90	0.049 (0.033)	-0.066 (0.044)	-0.070*** (0.016)	-0.108*** (0.032)
<i>Characteristics</i>				
q10	-0.083*** (0.015)	-0.080*** (0.010)	-0.028*** (0.008)	-0.057*** (0.008)
q25	-0.190*** (0.017)	-0.149*** (0.014)	-0.080*** (0.008)	-0.095*** (0.011)
q50	-0.235*** (0.014)	-0.229*** (0.016)	-0.172*** (0.012)	-0.185*** (0.012)
q75	-0.266*** (0.016)	-0.227*** (0.015)	-0.175*** (0.013)	-0.172*** (0.010)
q90	-0.247*** (0.032)	-0.254*** (0.019)	-0.186*** (0.014)	-0.193*** (0.004)
<i>Coefficients</i>				
q10	0.107*** (0.022)	0.021 (0.016)	0.021 (0.014)	0.045*** (0.011)
q25	0.191*** (0.020)	0.085*** (0.019)	0.059*** (0.014)	0.060*** (0.014)
q50	0.261*** (0.022)	0.170*** (0.021)	0.084*** (0.022)	0.057*** (0.018)
q75	0.285*** (0.029)	0.200*** (0.025)	0.094*** (0.020)	0.082*** (0.020)
q90	0.296*** (0.046)	0.188*** (0.049)	0.116*** (0.022)	0.084*** (0.032)
N	91024	87056	75149	62187

*Notes:* Table outlines the aggregate decomposition of the ethnic wage gap between Whites and each ethnic group across the distribution. This uses the method outlined in section 3.1 to decompose the ethnic wage by the impact of differences in characteristics and coefficients. Estimates above zero indicate an increase in the pay gap in favour of Whites. \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

Table A8: Decomposition of the wage gap between Whites and Pakistanis

	1993-1999	2000-2006	2007-2013	2014-2019
<i>Differences</i>				
q10	0.078 (0.065)	0.094** (0.040)	0.069*** (0.015)	0.110*** (0.028)
q25	0.068** (0.032)	0.084*** (0.020)	0.079*** (0.020)	0.077*** (0.016)
q50	0.124*** (0.040)	0.101** (0.039)	0.121*** (0.027)	0.116*** (0.020)
q75	0.164*** (0.046)	0.128** (0.055)	0.138*** (0.036)	0.143*** (0.034)
q90	0.222 (0.137)	0.146** (0.059)	0.119* (0.066)	0.164*** (0.048)
<i>Characteristics</i>				
q10	0.110*** (0.022)	0.061*** (0.012)	0.020** (0.008)	0.017* (0.009)
q25	0.040* (0.021)	0.039*** (0.014)	0.027** (0.011)	0.013 (0.011)
q50	-0.011 (0.033)	0.013 (0.019)	0.000 (0.019)	-0.014 (0.019)
q75	-0.042 (0.040)	-0.019 (0.023)	-0.041** (0.018)	-0.041** (0.019)
q90	-0.084** (0.036)	-0.039 (0.028)	-0.038** (0.019)	-0.038** (0.019)
<i>Coefficients</i>				
q10	-0.032 (0.065)	0.033 (0.040)	0.049*** (0.018)	0.093*** (0.026)
q25	0.028 (0.031)	0.045* (0.024)	0.052** (0.020)	0.064*** (0.019)
q50	0.136*** (0.044)	0.088** (0.039)	0.121*** (0.027)	0.130*** (0.021)
q75	0.206*** (0.052)	0.148*** (0.054)	0.179*** (0.037)	0.184*** (0.034)
q90	0.306** (0.133)	0.185*** (0.062)	0.158** (0.068)	0.202*** (0.050)
N	90146	86030	73989	61090

*Notes:* Table outlines the aggregate decomposition of the ethnic wage gap between Whites and each ethnic group across the distribution. This uses the method outlined in section 3.1 to decompose the ethnic wage by the impact of differences in characteristics and coefficients. Estimates above zero indicate an increase in the pay gap in favour of Whites. \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

Table A9: Decomposition of the wage gap between Whites and Bangladeshis

	1993-1999	2000-2006	2007-2013	2014-2019
<i>Differences</i>				
q10	0.429*** (0.119)	-0.050 (0.049)	0.062 (0.065)	0.137** (0.069)
q25	0.302** (0.124)	0.050 (0.052)	0.123*** (0.038)	0.095*** (0.020)
q50	0.308** (0.139)	0.051 (0.056)	0.189*** (0.057)	0.152*** (0.036)
q75	0.007 (0.223)	0.095 (0.095)	0.175** (0.074)	0.108** (0.043)
q90	0.144 (0.184)	0.216** (0.086)	0.141** (0.059)	0.007 (0.095)
<i>Characteristics</i>				
q10	0.158*** (0.053)	0.039* (0.023)	0.061*** (0.015)	0.017 (0.012)
q25	0.054 (0.065)	-0.016 (0.034)	0.027 (0.020)	-0.023 (0.017)
q50	-0.027 (0.090)	-0.086* (0.048)	-0.061* (0.037)	-0.105*** (0.030)
q75	-0.064 (0.092)	-0.129*** (0.044)	-0.104*** (0.030)	-0.123*** (0.025)
q90	-0.084 (0.090)	-0.129*** (0.046)	-0.129*** (0.032)	-0.193*** (0.034)
<i>Coefficients</i>				
q10	0.271** (0.111)	-0.089* (0.047)	0.001 (0.068)	0.120* (0.068)
q25	0.248** (0.105)	0.065 (0.051)	0.096** (0.042)	0.118*** (0.021)
q50	0.335*** (0.095)	0.137** (0.057)	0.250*** (0.058)	0.257*** (0.037)
q75	0.071 (0.186)	0.224*** (0.080)	0.279*** (0.072)	0.231*** (0.044)
q90	0.227 (0.161)	0.345*** (0.080)	0.269*** (0.064)	0.199** (0.092)
N	89976	85791	73676	60692

*Notes:* Table outlines the aggregate decomposition of the ethnic wage gap between Whites and each ethnic group across the distribution. This uses the method outlined in section 3.1 to decompose the ethnic wage by the impact of differences in characteristics and coefficients. Estimates above zero indicate an increase in the pay gap in favour of Whites. \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

Table A10: Decomposition of the wage gap between Whites and Black Caribbeans

	1993-1999	2000-2006	2007-2013	2014-2019
<i>Differences</i>				
q10	-0.131*** (0.026)	-0.145*** (0.023)	-0.076*** (0.021)	-0.050*** (0.017)
q25	-0.216*** (0.025)	-0.166*** (0.023)	-0.147*** (0.020)	-0.097*** (0.020)
q50	-0.187*** (0.020)	-0.165*** (0.018)	-0.184*** (0.031)	-0.120*** (0.021)
q75	-0.089*** (0.031)	-0.081*** (0.022)	-0.087*** (0.027)	-0.039 (0.032)
q90	0.013 (0.039)	-0.012 (0.039)	-0.010 (0.020)	0.002 (0.055)
<i>Characteristics</i>				
q10	-0.114*** (0.014)	-0.110*** (0.013)	-0.067*** (0.010)	-0.042*** (0.008)
q25	-0.205*** (0.013)	-0.163*** (0.014)	-0.106*** (0.013)	-0.048*** (0.010)
q50	-0.219*** (0.012)	-0.194*** (0.015)	-0.156*** (0.016)	-0.105*** (0.017)
q75	-0.187*** (0.013)	-0.175*** (0.014)	-0.149*** (0.017)	-0.123*** (0.014)
q90	-0.181*** (0.023)	-0.191*** (0.016)	-0.186*** (0.023)	-0.129*** (0.032)
<i>Coefficients</i>				
q10	-0.017 (0.025)	-0.035 (0.023)	-0.009 (0.022)	-0.007 (0.017)
q25	-0.010 (0.024)	-0.004 (0.021)	-0.041* (0.021)	-0.049** (0.021)
q50	0.032* (0.019)	0.029 (0.020)	-0.028 (0.031)	-0.014 (0.024)
q75	0.098*** (0.030)	0.094*** (0.023)	0.062** (0.029)	0.085*** (0.031)
q90	0.194*** (0.042)	0.180*** (0.038)	0.176*** (0.030)	0.132** (0.063)
N	90707	86506	74305	61263

*Notes:* Table outlines the aggregate decomposition of the ethnic wage gap between Whites and each ethnic group across the distribution. This uses the method outlined in section 3.1 to decompose the ethnic wage by the impact of differences in characteristics and coefficients. Estimates above zero indicate an increase in the pay gap in favour of Whites. \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

Table A11: Decomposition of the wage gap between Whites and Black Africans

	1993-1999	2000-2006	2007-2013	2014-2019
<i>Differences</i>				
q10	-0.165*** (0.038)	-0.072** (0.031)	0.014 (0.010)	0.017 (0.011)
q25	-0.142*** (0.016)	-0.079*** (0.024)	-0.027* (0.016)	0.019 (0.013)
q50	-0.069** (0.031)	-0.078*** (0.019)	-0.043 (0.027)	0.031 (0.020)
q75	0.001 (0.030)	-0.000 (0.020)	0.042 (0.028)	0.076*** (0.020)
q90	0.084* (0.051)	0.069** (0.028)	0.061 (0.037)	0.133*** (0.025)
<i>Characteristics</i>				
q10	-0.251*** (0.029)	-0.132*** (0.017)	-0.054*** (0.011)	-0.027*** (0.008)
q25	-0.371*** (0.021)	-0.239*** (0.016)	-0.080*** (0.015)	-0.035*** (0.009)
q50	-0.406*** (0.017)	-0.317*** (0.016)	-0.187*** (0.020)	-0.089*** (0.015)
q75	-0.362*** (0.019)	-0.285*** (0.014)	-0.197*** (0.018)	-0.123*** (0.016)
q90	-0.333*** (0.004)	-0.338*** (0.041)	-0.256*** (0.027)	-0.193*** (0.028)
<i>Coefficients</i>				
q10	0.086* (0.048)	0.060* (0.036)	0.068*** (0.015)	0.044*** (0.013)
q25	0.229*** (0.027)	0.160*** (0.029)	0.054*** (0.020)	0.054*** (0.015)
q50	0.337*** (0.034)	0.239*** (0.024)	0.143*** (0.031)	0.120*** (0.022)
q75	0.363*** (0.033)	0.284*** (0.024)	0.239*** (0.028)	0.199*** (0.024)
q90	0.417*** (0.051)	0.407*** (0.048)	0.317*** (0.039)	0.325*** (0.037)
N	90265	86323	74420	61642

*Notes:* Table outlines the aggregate decomposition of the ethnic wage gap between Whites and each ethnic group across the distribution. This uses the method outlined in section 3.1 to decompose the ethnic wage by the impact of differences in characteristics and coefficients. Estimates above zero indicate an increase in the pay gap in favour of Whites. \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

Table A12: Detailed Decomposition of male log hourly wage by quantile - Indian

	1993-1999					2000-2006					2007-2013					2014-2019				
	q10	q25	q50	q75	q90	q10	q25	q50	q75	q90	q10	q25	q50	q75	q90	q10	q25	q50	q75	q90
Difference	0.112*** (0.027)	0.076*** (0.025)	0.086*** (0.020)	0.076*** (0.023)	0.078*** (0.030)	0.037** (0.019)	0.073*** (0.020)	0.000 (0.022)	-0.021 (0.022)	0.004 (0.026)	0.049*** (0.015)	0.083*** (0.019)	0.007 (0.022)	-0.064*** (0.021)	-0.081*** (0.025)	0.004 (0.016)	0.006 (0.018)	-0.122*** (0.022)	-0.141*** (0.021)	-0.123*** (0.025)
Characteristics	-0.070*** (0.018)	-0.135*** (0.014)	-0.181*** (0.013)	-0.241*** (0.014)	-0.289*** (0.017)	-0.060*** (0.012)	-0.130*** (0.011)	-0.203*** (0.011)	-0.271*** (0.012)	-0.316*** (0.015)	-0.027*** (0.009)	-0.048*** (0.009)	-0.134*** (0.010)	-0.214*** (0.011)	-0.274*** (0.014)	-0.061*** (0.008)	-0.078*** (0.009)	-0.140*** (0.010)	-0.211*** (0.011)	-0.279*** (0.014)
Coefficients	0.181*** (0.029)	0.211*** (0.024)	0.267*** (0.021)	0.318*** (0.024)	0.367*** (0.032)	0.097*** (0.021)	0.203*** (0.020)	0.204*** (0.021)	0.249*** (0.022)	0.321*** (0.028)	0.075*** (0.016)	0.132*** (0.019)	0.141*** (0.021)	0.150*** (0.021)	0.193*** (0.027)	0.066*** (0.017)	0.085*** (0.018)	0.018 (0.021)	0.071*** (0.021)	0.156*** (0.027)
Age	-0.030*** (0.011)	-0.026*** (0.007)	-0.018*** (0.005)	-0.010** (0.004)	-0.004 (0.004)	-0.009 (0.007)	-0.012** (0.005)	-0.009** (0.004)	-0.001 (0.004)	0.003 (0.003)	-0.021*** (0.005)	-0.023*** (0.004)	-0.018*** (0.004)	-0.006* (0.003)	0.001 (0.003)	-0.042*** (0.004)	-0.040*** (0.004)	-0.030*** (0.004)	-0.014*** (0.003)	-0.003 (0.004)
Married	-0.008*** (0.001)	-0.017*** (0.002)	-0.019*** (0.002)	-0.017*** (0.002)	-0.016*** (0.002)	-0.008*** (0.001)	-0.018*** (0.002)	-0.023*** (0.002)	-0.025*** (0.002)	-0.024*** (0.002)	-0.012*** (0.001)	-0.024*** (0.002)	-0.032*** (0.002)	-0.035*** (0.002)	-0.036*** (0.003)	-0.014*** (0.002)	-0.033*** (0.002)	-0.046*** (0.002)	-0.048*** (0.003)	-0.052*** (0.003)
Education	-0.024*** (0.003)	-0.075*** (0.003)	-0.137*** (0.006)	-0.178*** (0.007)	-0.185*** (0.008)	-0.032*** (0.002)	-0.084*** (0.003)	-0.152*** (0.005)	-0.203*** (0.007)	-0.207*** (0.008)	-0.036*** (0.003)	-0.091*** (0.003)	-0.165*** (0.005)	-0.208*** (0.006)	-0.217*** (0.007)	-0.034*** (0.002)	-0.084*** (0.003)	-0.145*** (0.005)	-0.174*** (0.006)	-0.187*** (0.007)
Region	-0.055*** (0.005)	-0.061*** (0.004)	-0.060*** (0.004)	-0.065*** (0.005)	-0.087*** (0.006)	-0.046*** (0.004)	-0.062*** (0.004)	-0.074*** (0.004)	-0.078*** (0.005)	-0.096*** (0.006)	-0.030*** (0.003)	-0.049*** (0.003)	-0.057*** (0.004)	-0.071*** (0.004)	-0.094*** (0.006)	-0.024*** (0.003)	-0.050*** (0.003)	-0.072*** (0.004)	-0.094*** (0.005)	-0.126*** (0.008)
Tenure	0.018*** (0.004)	0.022*** (0.004)	0.020*** (0.004)	0.015*** (0.003)	0.010*** (0.002)	0.011*** (0.003)	0.019*** (0.003)	0.020*** (0.003)	0.016*** (0.002)	0.010*** (0.002)	0.013*** (0.002)	0.026*** (0.003)	0.029*** (0.003)	0.021*** (0.002)	0.012*** (0.002)	0.002 (0.002)	0.009*** (0.002)	0.012*** (0.002)	0.010*** (0.002)	0.006*** (0.001)
UK Born	0.030*** (0.012)	0.021** (0.009)	0.033*** (0.008)	0.012 (0.009)	-0.007 (0.013)	0.024*** (0.008)	0.026*** (0.007)	0.034*** (0.007)	0.020** (0.008)	-0.002 (0.012)	0.058*** (0.007)	0.113*** (0.007)	0.110*** (0.007)	0.084*** (0.007)	0.059*** (0.011)	0.051*** (0.006)	0.117*** (0.006)	0.141*** (0.006)	0.108*** (0.007)	0.083*** (0.010)
N	91471	91471	91471	91471	91471	84592	84592	84592	84592	84592	72236	72236	72236	72236	72236	59322	59322	59322	59322	59322

Notes: Table outlines the detailed decomposition of the ethnic pay gap across the distribution for each individual ethnic group explained by the characteristics: age, marriage status, education, region, job tenure, uk native. Estimates for twenty quantiles from the 5th to the 20th calculated using the method outlined in section 3.2. Estimates above zero indicate an increase in the pay gap in favour of Whites. \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

Table A13: Detailed Decomposition of male log hourly wage by quantile - Pakistani

	1993-1999					2000-2006					2007-2013					2014-2019				
	q10	q25	q50	q75	q90	q10	q25	q50	q75	q90	q10	q25	q50	q75	q90	q10	q25	q50	q75	q90
Difference	0.453*** (0.056)	0.380*** (0.041)	0.343*** (0.034)	0.287*** (0.044)	0.308*** (0.048)	0.241*** (0.023)	0.331*** (0.023)	0.380*** (0.028)	0.325*** (0.045)	0.201*** (0.056)	0.175*** (0.017)	0.326*** (0.017)	0.375*** (0.027)	0.309*** (0.035)	0.269*** (0.042)	0.155*** (0.020)	0.211*** (0.020)	0.274*** (0.025)	0.214*** (0.030)	0.212*** (0.036)
Characteristics	0.131*** (0.026)	0.047** (0.020)	-0.007 (0.018)	-0.068*** (0.019)	-0.115*** (0.021)	0.095*** (0.017)	0.035** (0.016)	-0.022 (0.016)	-0.075*** (0.017)	-0.115*** (0.019)	0.045*** (0.011)	0.053*** (0.012)	-0.002 (0.013)	-0.057*** (0.014)	-0.098*** (0.016)	0.016 (0.010)	0.024** (0.011)	-0.006 (0.013)	-0.060*** (0.014)	-0.107*** (0.017)
Coefficients	0.322*** (0.058)	0.334*** (0.040)	0.350*** (0.031)	0.355*** (0.041)	0.423*** (0.047)	0.146*** (0.026)	0.296*** (0.023)	0.401*** (0.025)	0.400*** (0.041)	0.316*** (0.054)	0.129*** (0.019)	0.273*** (0.018)	0.377*** (0.025)	0.366*** (0.033)	0.367*** (0.041)	0.139*** (0.021)	0.187*** (0.021)	0.281*** (0.023)	0.274*** (0.028)	0.319*** (0.036)
Age	0.091*** (0.019)	0.050*** (0.013)	0.039*** (0.009)	0.042*** (0.008)	0.045*** (0.007)	0.084*** (0.013)	0.052*** (0.010)	0.043*** (0.008)	0.051*** (0.007)	0.053*** (0.006)	0.017** (0.008)	0.010 (0.007)	0.011* (0.006)	0.023*** (0.005)	0.031*** (0.005)	0.001 (0.007)	-0.001 (0.007)	0.009 (0.007)	0.024*** (0.006)	0.036*** (0.006)
Married	-0.006*** (0.002)	-0.013*** (0.003)	-0.014*** (0.003)	-0.012*** (0.003)	-0.012*** (0.003)	-0.008*** (0.001)	-0.019*** (0.002)	-0.026*** (0.003)	-0.027*** (0.003)	-0.026*** (0.003)	-0.012*** (0.002)	-0.025*** (0.002)	-0.033*** (0.003)	-0.036*** (0.003)	-0.037*** (0.003)	-0.010*** (0.002)	-0.025*** (0.002)	-0.035*** (0.003)	-0.036*** (0.003)	-0.039*** (0.004)
Education	-0.017*** (0.003)	-0.054*** (0.005)	-0.100*** (0.009)	-0.130*** (0.012)	-0.135*** (0.013)	-0.024*** (0.002)	-0.058*** (0.005)	-0.104*** (0.008)	-0.138*** (0.011)	-0.141*** (0.011)	-0.024*** (0.002)	-0.060*** (0.004)	-0.109*** (0.007)	-0.137*** (0.009)	-0.143*** (0.010)	-0.025*** (0.002)	-0.063*** (0.004)	-0.109*** (0.007)	-0.132*** (0.008)	-0.142*** (0.009)
Region	-0.022*** (0.004)	-0.024*** (0.004)	-0.023*** (0.005)	-0.024*** (0.005)	-0.035*** (0.007)	-0.012*** (0.003)	-0.015*** (0.004)	-0.019*** (0.005)	-0.019*** (0.005)	-0.024*** (0.007)	-0.008*** (0.002)	-0.012*** (0.003)	-0.010** (0.004)	-0.012*** (0.005)	-0.020*** (0.006)	-0.008*** (0.002)	-0.017*** (0.003)	-0.022*** (0.005)	-0.029*** (0.006)	-0.044*** (0.008)
Tenure	0.056*** (0.007)	0.068*** (0.007)	0.059*** (0.006)	0.044*** (0.004)	0.029*** (0.003)	0.032*** (0.004)	0.050*** (0.005)	0.051*** (0.004)	0.039*** (0.003)	0.025*** (0.003)	0.020*** (0.003)	0.036*** (0.004)	0.038*** (0.004)	0.028*** (0.003)	0.016*** (0.002)	0.014*** (0.003)	0.026*** (0.004)	0.028*** (0.003)	0.018*** (0.002)	0.009*** (0.002)
UK Born	0.029*** (0.011)	0.020** (0.008)	0.032*** (0.008)	0.012 (0.009)	-0.007 (0.012)	0.023*** (0.008)	0.025*** (0.007)	0.032*** (0.007)	0.019** (0.008)	-0.002 (0.011)	0.053*** (0.007)	0.104*** (0.007)	0.102*** (0.007)	0.078*** (0.007)	0.055*** (0.010)	0.044*** (0.005)	0.103*** (0.006)	0.124*** (0.006)	0.095*** (0.007)	0.073*** (0.009)
N	90726	90726	90726	90726	90726	83761	83761	83761	83761	83761	71167	71167	71167	71167	71167	58305	58305	58305	58305	58305

Notes: Table outlines the detailed decomposition of the ethnic pay gap across the distribution for each individual ethnic group explained by the characteristics: age, marriage status, education, region, job tenure, uk native. Estimates for twenty quantiles from the 5th to the 20th calculated using the method outlined in section 3.2. Estimates above zero indicate an increase in the pay gap in favour of Whites. \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

Table A14: Detailed Decomposition of male log hourly wage by quantile - Bangladeshi

	1993-1999					2000-2006					2007-2013					2014-2019				
	q10	q25	q50	q75	q90	q10	q25	q50	q75	q90	q10	q25	q50	q75	q90	q10	q25	q50	q75	q90
Difference	0.624*** (0.046)	0.771*** (0.052)	0.815*** (0.052)	0.690*** (0.105)	0.498*** (0.133)	0.344*** (0.025)	0.547*** (0.026)	0.649*** (0.046)	0.531*** (0.080)	0.487*** (0.058)	0.208*** (0.018)	0.399*** (0.018)	0.619*** (0.025)	0.532*** (0.064)	0.492*** (0.062)	0.190*** (0.020)	0.335*** (0.020)	0.478*** (0.031)	0.424*** (0.056)	0.460*** (0.046)
Characteristics	0.175*** (0.046)	0.092** (0.036)	0.047 (0.033)	-0.023 (0.034)	-0.102*** (0.035)	0.053** (0.026)	-0.009 (0.023)	-0.062*** (0.023)	-0.115*** (0.025)	-0.183*** (0.028)	0.056*** (0.017)	0.058*** (0.018)	-0.011 (0.020)	-0.091*** (0.021)	-0.167*** (0.024)	-0.025* (0.015)	-0.019 (0.017)	-0.050** (0.020)	-0.117*** (0.021)	-0.193*** (0.025)
Coefficients	0.449*** (0.061)	0.679*** (0.060)	0.768*** (0.056)	0.713*** (0.097)	0.600*** (0.128)	0.290*** (0.035)	0.556*** (0.034)	0.711*** (0.050)	0.646*** (0.078)	0.670*** (0.057)	0.153*** (0.023)	0.341*** (0.024)	0.629*** (0.027)	0.623*** (0.061)	0.659*** (0.061)	0.216*** (0.025)	0.354*** (0.024)	0.528*** (0.033)	0.541*** (0.054)	0.653*** (0.046)
Age	0.132*** (0.036)	0.077*** (0.024)	0.060*** (0.018)	0.060*** (0.015)	0.060*** (0.013)	0.069*** (0.019)	0.037** (0.015)	0.032*** (0.012)	0.046*** (0.010)	0.052*** (0.009)	0.031*** (0.012)	0.022** (0.011)	0.022** (0.009)	0.034*** (0.008)	0.043*** (0.008)	-0.031*** (0.011)	-0.031*** (0.010)	-0.018* (0.009)	0.004 (0.009)	0.019** (0.009)
Married	-0.006** (0.002)	-0.012** (0.005)	-0.013** (0.005)	-0.011** (0.005)	-0.011** (0.004)	-0.007*** (0.002)	-0.015*** (0.003)	-0.020*** (0.004)	-0.021*** (0.005)	-0.021*** (0.005)	-0.009*** (0.002)	-0.019*** (0.003)	-0.026*** (0.004)	-0.028*** (0.004)	-0.029*** (0.005)	-0.013*** (0.002)	-0.030*** (0.003)	-0.043*** (0.004)	-0.044*** (0.004)	-0.048*** (0.005)
Education	-0.005 (0.003)	-0.026*** (0.009)	-0.051*** (0.016)	-0.068*** (0.021)	-0.072*** (0.022)	-0.021*** (0.004)	-0.041*** (0.007)	-0.070*** (0.013)	-0.092*** (0.017)	-0.092*** (0.018)	-0.022*** (0.003)	-0.055*** (0.006)	-0.100*** (0.011)	-0.125*** (0.014)	-0.131*** (0.015)	-0.015*** (0.003)	-0.036*** (0.006)	-0.063*** (0.010)	-0.075*** (0.012)	-0.081*** (0.013)
Region	-0.065*** (0.008)	-0.073*** (0.008)	-0.076*** (0.008)	-0.085*** (0.010)	-0.114*** (0.013)	-0.064*** (0.007)	-0.089*** (0.008)	-0.111*** (0.009)	-0.123*** (0.010)	-0.152*** (0.013)	-0.044*** (0.005)	-0.072*** (0.007)	-0.084*** (0.008)	-0.104*** (0.009)	-0.139*** (0.012)	-0.034*** (0.005)	-0.069*** (0.006)	-0.099*** (0.008)	-0.131*** (0.010)	-0.181*** (0.014)
Tenure	0.084*** (0.013)	0.101*** (0.011)	0.088*** (0.009)	0.066*** (0.006)	0.044*** (0.005)	0.046*** (0.007)	0.067*** (0.008)	0.067*** (0.006)	0.051*** (0.005)	0.033*** (0.004)	0.037*** (0.005)	0.059*** (0.006)	0.058*** (0.005)	0.040*** (0.004)	0.024*** (0.003)	0.011*** (0.004)	0.017*** (0.005)	0.016*** (0.005)	0.009*** (0.003)	0.004** (0.002)
UK Born	0.035*** (0.014)	0.025** (0.010)	0.039*** (0.010)	0.014 (0.011)	-0.009 (0.015)	0.029*** (0.010)	0.031*** (0.008)	0.041*** (0.008)	0.024** (0.010)	-0.003 (0.014)	0.063*** (0.008)	0.123*** (0.008)	0.120*** (0.008)	0.092*** (0.008)	0.064*** (0.012)	0.056*** (0.007)	0.130*** (0.007)	0.156*** (0.008)	0.120*** (0.008)	0.093*** (0.011)
N	90405	90405	90405	90405	90405	83335	83335	83335	83335	83335	70675	70675	70675	70675	70675	57829	57829	57829	57829	57829

Notes: Table outlines the detailed decomposition of the ethnic pay gap across the distribution for each individual ethnic group explained by the characteristics: age, marriage status, education, region, job tenure, uk native. Estimates for twenty quantiles from the 5th to the 20th calculated using the method outlined in section 3.2. Estimates above zero indicate an increase in the pay gap in favour of Whites. \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

Table A15: Detailed Decomposition of male log hourly wage by quantile - Black Caribbean

	1993-1999					2000-2006					2007-2013					2014-2019				
	q10	q25	q50	q75	q90	q10	q25	q50	q75	q90	q10	q25	q50	q75	q90	q10	q25	q50	q75	q90
Difference	-0.034 (0.033)	0.049* (0.027)	0.123*** (0.028)	0.148*** (0.031)	0.186*** (0.036)	0.021 (0.030)	0.069*** (0.026)	0.107*** (0.027)	0.120*** (0.033)	0.147*** (0.040)	0.020 (0.030)	0.070*** (0.027)	0.136*** (0.031)	0.114*** (0.042)	0.139*** (0.044)	-0.028 (0.025)	0.045* (0.024)	0.138*** (0.029)	0.192*** (0.035)	0.271*** (0.045)
Characteristics	-0.047** (0.020)	-0.037** (0.015)	-0.027* (0.014)	-0.048*** (0.014)	-0.092*** (0.016)	-0.088*** (0.015)	-0.081*** (0.013)	-0.074*** (0.014)	-0.077*** (0.015)	-0.108*** (0.016)	-0.057*** (0.013)	-0.048*** (0.015)	-0.050*** (0.016)	-0.069*** (0.017)	-0.108*** (0.018)	-0.018 (0.012)	-0.010 (0.015)	-0.029* (0.017)	-0.082*** (0.018)	-0.141*** (0.021)
Coefficients	0.013 (0.033)	0.086*** (0.026)	0.150*** (0.027)	0.196*** (0.030)	0.277*** (0.037)	0.108*** (0.029)	0.150*** (0.025)	0.181*** (0.025)	0.197*** (0.030)	0.255*** (0.040)	0.077*** (0.029)	0.118*** (0.025)	0.186*** (0.028)	0.183*** (0.040)	0.247*** (0.045)	-0.010 (0.026)	0.055** (0.024)	0.167*** (0.028)	0.274*** (0.036)	0.412*** (0.046)
Age	-0.008 (0.015)	-0.007 (0.010)	-0.005 (0.007)	-0.002 (0.006)	-0.001 (0.005)	-0.049*** (0.012)	-0.040*** (0.009)	-0.032*** (0.007)	-0.024*** (0.006)	-0.019*** (0.005)	-0.048*** (0.010)	-0.046*** (0.009)	-0.039*** (0.008)	-0.029*** (0.007)	-0.022*** (0.006)	-0.020** (0.009)	-0.018** (0.009)	-0.020** (0.008)	-0.022*** (0.008)	-0.025*** (0.008)
Married	0.010*** (0.002)	0.020*** (0.003)	0.022*** (0.003)	0.019*** (0.003)	0.018*** (0.003)	0.007*** (0.001)	0.016*** (0.002)	0.021*** (0.003)	0.023*** (0.003)	0.022*** (0.003)	0.007*** (0.002)	0.015*** (0.003)	0.020*** (0.004)	0.022*** (0.004)	0.023*** (0.004)	0.005*** (0.001)	0.013*** (0.003)	0.019*** (0.004)	0.019*** (0.004)	0.021*** (0.005)
Education	-0.005** (0.002)	0.000 (0.004)	0.004 (0.007)	0.008 (0.009)	0.011 (0.009)	-0.006** (0.002)	-0.000 (0.004)	0.003 (0.007)	0.007 (0.010)	0.009 (0.010)	-0.004* (0.002)	-0.004 (0.005)	-0.005 (0.009)	-0.004 (0.011)	-0.003 (0.011)	-0.003 (0.002)	-0.003 (0.005)	-0.005 (0.009)	-0.005 (0.011)	-0.006 (0.011)
Region	-0.072*** (0.006)	-0.080*** (0.005)	-0.083*** (0.005)	-0.093*** (0.006)	-0.125*** (0.008)	-0.056*** (0.005)	-0.077*** (0.005)	-0.092*** (0.006)	-0.099*** (0.007)	-0.122*** (0.009)	-0.042*** (0.005)	-0.070*** (0.006)	-0.082*** (0.007)	-0.101*** (0.008)	-0.134*** (0.011)	-0.033*** (0.005)	-0.066*** (0.007)	-0.095*** (0.007)	-0.125*** (0.009)	-0.169*** (0.013)
Tenure	0.010* (0.006)	0.017*** (0.006)	0.016*** (0.005)	0.013*** (0.004)	0.009*** (0.003)	0.003 (0.004)	0.006 (0.005)	0.007 (0.005)	0.006 (0.005)	0.003 (0.004)	0.006 (0.002)	0.010* (0.005)	0.011** (0.005)	0.008** (0.005)	0.004* (0.002)	0.011*** (0.004)	0.015*** (0.005)	0.014*** (0.005)	0.007** (0.003)	0.003* (0.002)
UK Born	0.017** (0.007)	0.012** (0.005)	0.019*** (0.005)	0.007 (0.005)	-0.004 (0.007)	0.013*** (0.005)	0.014*** (0.004)	0.019*** (0.004)	0.011** (0.004)	-0.001 (0.006)	0.024*** (0.003)	0.047*** (0.005)	0.045*** (0.005)	0.035*** (0.004)	0.024*** (0.005)	0.021*** (0.003)	0.048*** (0.005)	0.057*** (0.006)	0.044*** (0.005)	0.034*** (0.005)
N	90815	90815	90815	90815	90815	83703	83703	83703	83703	83703	70816	70816	70816	70816	70816	57903	57903	57903	57903	57903

Notes: Table outlines the detailed decomposition of the ethnic pay gap across the distribution for each individual ethnic group explained by the characteristics: age, marriage status, education, region, job tenure, uk native. Estimates for twenty quantiles from the 5th to the 20th calculated using the method outlined in section 3.2. Estimates above zero indicate an increase in the pay gap in favour of Whites. \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

Table A16: Detailed Decomposition of male log hourly wage by quantile - Black African

	1993-1999					2000-2006					2007-2013					2014-2019				
	q10	q25	q50	q75	q90	q10	q25	q50	q75	q90	q10	q25	q50	q75	q90	q10	q25	q50	q75	q90
Difference	0.036 (0.052)	0.035 (0.039)	0.065* (0.039)	0.108*** (0.039)	0.104 (0.066)	0.080*** (0.026)	0.145*** (0.026)	0.169*** (0.029)	0.156*** (0.037)	0.157*** (0.040)	0.094*** (0.020)	0.167*** (0.022)	0.190*** (0.024)	0.232*** (0.027)	0.226*** (0.035)	0.041*** (0.016)	0.122*** (0.017)	0.184*** (0.023)	0.234*** (0.025)	0.270*** (0.032)
Characteristics	-0.060** (0.027)	-0.136*** (0.022)	-0.223*** (0.020)	-0.329*** (0.021)	-0.420*** (0.023)	-0.035* (0.018)	-0.099*** (0.016)	-0.190*** (0.016)	-0.286*** (0.018)	-0.362*** (0.021)	-0.039*** (0.012)	-0.032** (0.013)	-0.117*** (0.014)	-0.209*** (0.015)	-0.288*** (0.018)	-0.013 (0.011)	0.020* (0.012)	-0.020 (0.014)	-0.113*** (0.015)	-0.198*** (0.019)
Coefficients	0.096* (0.054)	0.171*** (0.039)	0.288*** (0.039)	0.437*** (0.039)	0.525*** (0.066)	0.115*** (0.027)	0.244*** (0.026)	0.359*** (0.029)	0.442*** (0.036)	0.518*** (0.042)	0.132*** (0.022)	0.199*** (0.022)	0.308*** (0.024)	0.440*** (0.027)	0.514*** (0.037)	0.055*** (0.018)	0.103*** (0.019)	0.204*** (0.024)	0.347*** (0.026)	0.468*** (0.036)
Age	-0.022 (0.019)	-0.023* (0.012)	-0.016* (0.009)	-0.005 (0.008)	0.002 (0.007)	-0.008 (0.011)	-0.015* (0.009)	-0.012* (0.007)	0.002 (0.006)	0.009 (0.006)	-0.055*** (0.006)	-0.056*** (0.006)	-0.046*** (0.005)	-0.028*** (0.004)	-0.017*** (0.004)	-0.040*** (0.006)	-0.038*** (0.006)	-0.029*** (0.006)	-0.015*** (0.005)	-0.006 (0.005)
Married	0.002 (0.002)	0.005 (0.004)	0.005 (0.004)	0.004 (0.003)	0.004 (0.003)	0.005*** (0.001)	0.011*** (0.002)	0.014*** (0.003)	0.015*** (0.003)	0.014*** (0.003)	-0.004*** (0.001)	-0.008*** (0.002)	-0.010*** (0.003)	-0.011*** (0.003)	-0.011*** (0.003)	-0.003*** (0.001)	-0.007*** (0.002)	-0.010*** (0.003)	-0.010*** (0.003)	-0.011*** (0.003)
Education	-0.032*** (0.004)	-0.106*** (0.005)	-0.196*** (0.009)	-0.257*** (0.012)	-0.268*** (0.014)	-0.046*** (0.003)	-0.108*** (0.004)	-0.191*** (0.007)	-0.254*** (0.010)	-0.258*** (0.010)	-0.040*** (0.003)	-0.094*** (0.004)	-0.170*** (0.006)	-0.210*** (0.008)	-0.218*** (0.009)	-0.033*** (0.002)	-0.077*** (0.004)	-0.132*** (0.006)	-0.158*** (0.007)	-0.170*** (0.008)
Region	-0.102*** (0.008)	-0.113*** (0.007)	-0.121*** (0.007)	-0.138*** (0.007)	-0.186*** (0.010)	-0.067*** (0.006)	-0.094*** (0.006)	-0.117*** (0.006)	-0.130*** (0.007)	-0.161*** (0.009)	-0.043*** (0.004)	-0.072*** (0.005)	-0.087*** (0.005)	-0.107*** (0.006)	-0.141*** (0.009)	-0.025*** (0.004)	-0.052*** (0.004)	-0.075*** (0.005)	-0.098*** (0.007)	-0.135*** (0.010)
Tenure	0.061*** (0.009)	0.078*** (0.008)	0.070*** (0.006)	0.053*** (0.005)	0.036*** (0.004)	0.052*** (0.005)	0.075*** (0.005)	0.074*** (0.004)	0.057*** (0.003)	0.037*** (0.003)	0.030*** (0.003)	0.054*** (0.004)	0.056*** (0.003)	0.040*** (0.003)	0.023*** (0.003)	0.020*** (0.003)	0.035*** (0.003)	0.037*** (0.003)	0.024*** (0.002)	0.012*** (0.002)
UK Born	0.033*** (0.013)	0.023** (0.009)	0.036*** (0.009)	0.013 (0.010)	-0.008 (0.014)	0.029*** (0.010)	0.032*** (0.008)	0.041*** (0.008)	0.024** (0.010)	-0.003 (0.014)	0.073*** (0.009)	0.143*** (0.008)	0.140*** (0.008)	0.107*** (0.009)	0.075*** (0.013)	0.068*** (0.008)	0.158*** (0.008)	0.189*** (0.008)	0.146*** (0.009)	0.112*** (0.013)
N	90582	90582	90582	90582	90582	83700	83700	83700	83700	83700	71227	71227	71227	71227	71227	58422	58422	58422	58422	58422

Notes: Table outlines the detailed decomposition of the ethnic pay gap across the distribution for each individual ethnic group explained by the characteristics: age, marriage status, education, region, job tenure, uk native. Estimates for twenty quantiles from the 5th to the 20th calculated using the method outlined in section 3.2. Estimates above zero indicate an increase in the pay gap in favour of Whites. \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

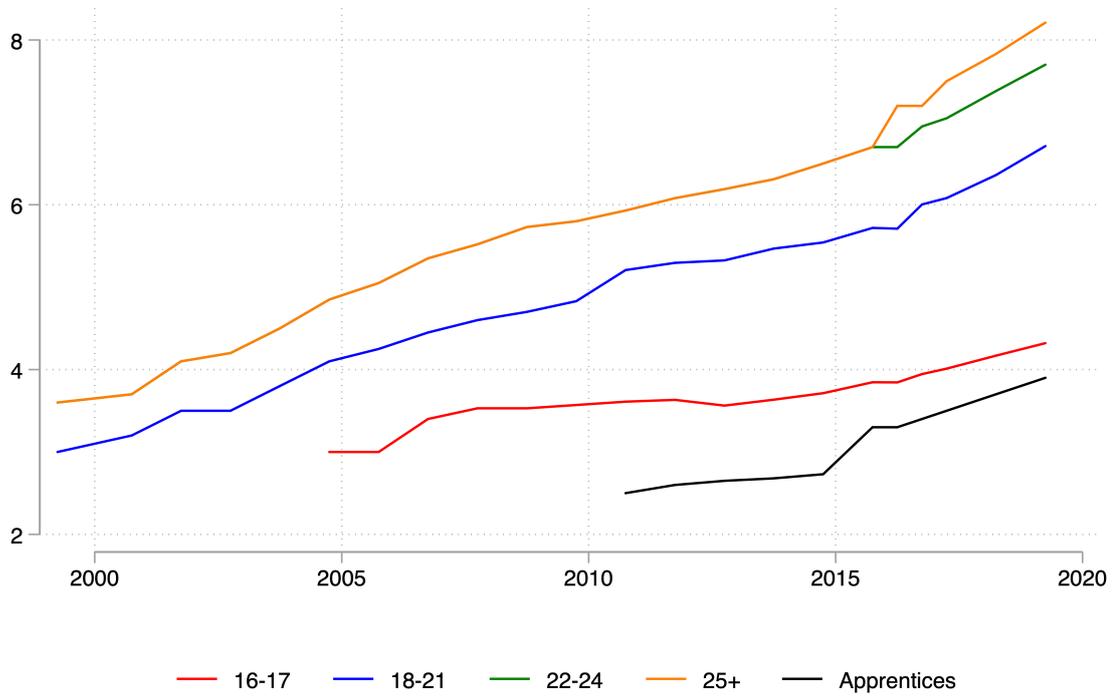
Table A17: Detailed Decomposition contribution of National minimum wage

	Indian		Pakistani		Bangladeshi		Black Caribbean		Black African	
<i>1993-1999</i>										
q10	-0.001	(0.001)	-0.003**	(0.002)	-0.007**	(0.003)	0.001	(0.001)	-0.001	(0.002)
q25	-0.000	(0.001)	-0.002**	(0.001)	-0.005**	(0.002)	0.001	(0.001)	-0.001	(0.001)
q50	-0.000	(0.000)	-0.002**	(0.001)	-0.003**	(0.002)	0.000	(0.001)	-0.001	(0.001)
q75	-0.000	(0.000)	-0.001*	(0.001)	-0.002**	(0.001)	0.000	(0.000)	-0.000	(0.001)
q90	-0.000	(0.000)	-0.000	(0.000)	-0.001	(0.001)	0.000	(0.000)	-0.000	(0.000)
<i>2000-2006</i>										
q10	-0.033***	(0.003)	-0.016**	(0.006)	-0.010	(0.011)	-0.016***	(0.005)	-0.036***	(0.005)
q25	-0.013***	(0.001)	-0.006**	(0.002)	-0.004	(0.004)	-0.006***	(0.002)	-0.014***	(0.002)
q50	-0.002***	(0.001)	-0.001**	(0.000)	-0.001	(0.001)	-0.001**	(0.000)	-0.002***	(0.001)
q75	0.002***	(0.001)	0.001**	(0.001)	0.001	(0.001)	0.001**	(0.000)	0.003***	(0.001)
q90	0.003***	(0.001)	0.002**	(0.001)	0.001	(0.001)	0.002**	(0.001)	0.004***	(0.001)
<i>2007-2013</i>										
q10	-0.012***	(0.002)	-0.005	(0.004)	-0.005	(0.004)	-0.009	(0.006)	-0.016***	(0.002)
q25	-0.006***	(0.001)	-0.003	(0.002)	-0.002	(0.002)	-0.004	(0.003)	-0.008***	(0.001)
q50	-0.002***	(0.000)	-0.001	(0.001)	-0.001	(0.001)	-0.001	(0.001)	-0.002***	(0.000)
q75	0.001*	(0.000)	0.000	(0.000)	0.000	(0.000)	0.000	(0.000)	0.001**	(0.000)
q90	0.001***	(0.000)	0.001	(0.000)	0.000	(0.000)	0.001	(0.001)	0.002***	(0.001)
<i>2014-2019</i>										
q10	-0.022***	(0.003)	-0.011**	(0.004)	-0.008	(0.007)	-0.005	(0.007)	-0.020***	(0.004)
q25	-0.010***	(0.001)	-0.005**	(0.002)	-0.004	(0.003)	-0.002	(0.003)	-0.009***	(0.002)
q50	-0.000	(0.000)	-0.000	(0.000)	-0.000	(0.000)	-0.000	(0.000)	-0.000	(0.000)
q75	0.005***	(0.001)	0.003**	(0.001)	0.002	(0.002)	0.001	(0.002)	0.005***	(0.001)
q90	0.007***	(0.001)	0.003**	(0.001)	0.002	(0.002)	0.001	(0.002)	0.006***	(0.001)

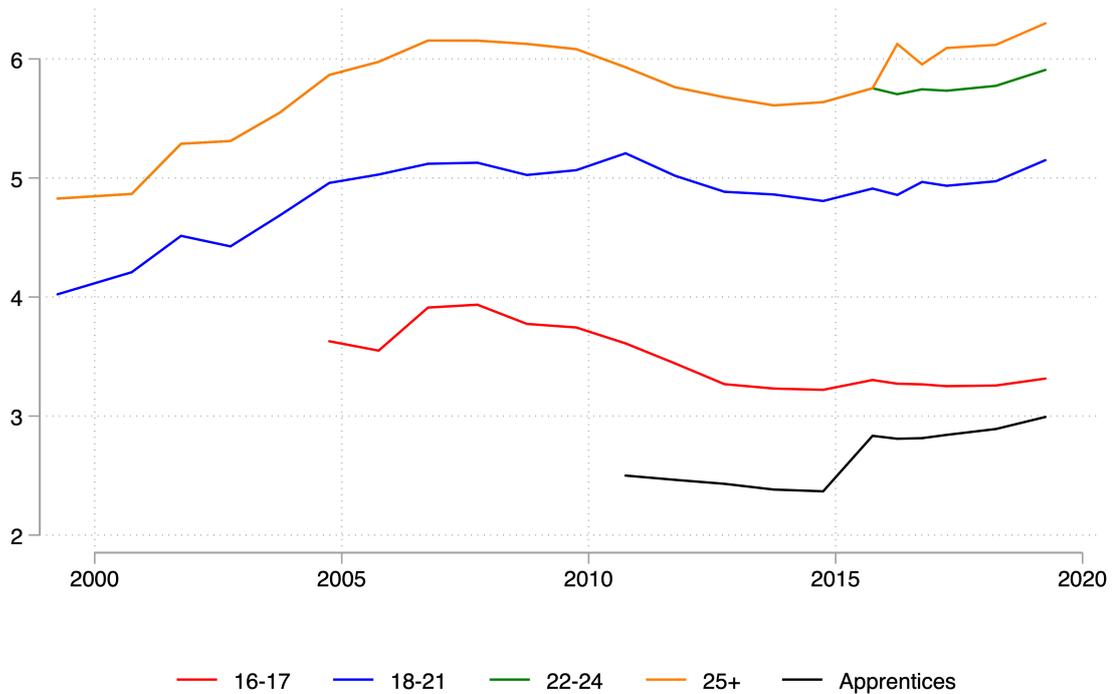
*Notes:* Table outlines the results of added a national minimum wage variable to the detailed decomposition of the ethnic gap of the log hourly wage for each group across the wage distribution. Minimum wage variable takes the value of the minimum wage – rebased using the Retail Price Index (Jan 2010 prices) – that each respondent was entitled to at the time they were interviewed for the LFS. For workers ineligible for the minimum wage we set this variable to zero. \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

Figure A1: National minimum wage by age group: 1999 - 2019

(a) Nominal



(b) Real wages (2010)



Notes: Data from the Low Pay Commission (2020) outlining the nominal level and the level in real terms (Jan 2010 prices) of the National Minimum Wage from its introduction in 1999 up to 2019. Note the level for 25+ from 2016 onwards represents the National Living Wage.