



PERFORMANCE PAY AND ETHNIC WAGE DIFFERENCES IN BRITAIN

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Abstract

In the first study using British data, we show that the average wage advantage of holding a performance pay job is greater for minorities than that for Whites. This generates a smaller ethnic wage gap among performance pay jobs than among time rate jobs. Yet, this pattern is driven by those receiving bonuses not those receiving performance related pay and it is evident only for Asians and for those in managerial jobs. Moreover, it is partially driven by sorting in which the more able take bonus jobs. Nonetheless, the basic results persist with diminished magnitude in fixed effect estimates. These findings differ dramatically from those for United States in which bonuses appear to increase racial differentials especially at the top of the earnings distribution.

KEYWORDS: Performance Pay; Ethnic Earnings Differentials

JEL CODES: J33, J71

1. INTRODUCTION

Performance pay mitigates inherent agency problems in labour contracts by linking worker compensation to worker performance. While this link generates greater wage dispersion within the firm (Lazear 2000), it may also influence the broader earnings distribution. Lemieux *et al.*, (2009) show that the growth in performance pay accounts for a large portion of the recent growth in U.S. wage inequality. They argue that performance pay provides an important mechanism by which underlying increases in the returns to skill are translated into greater earnings inequality. Yet, Heywood and Parent (2012) demonstrate that this translation is unique to white workers. Performance pay does not stretch out the top of the black wage distribution as it does for the white wage distribution. As a consequence, the racial earnings gap is larger in the performance pay sector and especially so at the top of the earnings distribution.

The recognition that performance pay may influence racial and ethnic earnings differences has been developed in a series of North American based studies but we provide the first examination of this influence in Britain. Our examination is timely in light of OECD research that earnings inequality is growing more quickly in the UK than in any other developed country (OECD 2011), and the evidence that this growth is uniquely tied to the financial services industry with its use of performance bonuses (Stewart 2011). We estimate the relative ethnic earnings gap in performance pay jobs and in time rate jobs. We draw data from the British Household Panel Survey (BHPS) which identifies performance pay receipt and provides detailed information on employees' personal and parental characteristics as well as on job characteristics and work conditions. We observe two measures of output pay: performance related pay and bonus/profit sharing schemes.

Further, the panel element allows us to remove unobserved individual heterogeneity that remains constant over time. In addition we can identify different ethnic minority groups.

The British results present what appear to be broad patterns but which on closer examination reflect heterogeneity by ethnic group, type of performance pay and occupational group. We initially confirm that the negative ethnic earnings differential is *smaller* within performance pay jobs than within time rate jobs. Yet, on further inspection the relatively smaller differential only applies within bonus jobs not those with other performance related pay. Moreover the smaller differential within bonus jobs applies for some ethnic groups but not for others. It appears more prominently for Asians than for Blacks.

We show that the relative advantage associated with bonus jobs for minorities derives largely from managerial occupations. Quantile regressions reveal that this appears to reflect the occupations rather than the higher position of those occupations in the earnings distribution. We also find evidence of sorting as individual fixed effect estimates of the influence of bonuses on earnings shrink. Nonetheless, the bonus jobs still provide a relatively larger advantage to minorities and shrink the ethnic earnings differential even in the fixed effect estimates. We examine the observables associated with the sorting confirming that it is the more educated and those minority groups typically associated with labour market success that move into bonus jobs. Thus, we identify a differentiated pattern of results unique to Britain and do not find evidence of the broad and persistent racial differences associated with performance pay as suggested in the North American studies.

The structure of the paper is as follows. Section 2 provides background on the underlying theoretical conjectures, the North American evidence and the British context.

Section 3 presents the data and reports descriptive analysis. Section 4 presents the central results. Section 5 describes the fixed effects results. Section 6 summarizes the findings and suggests future research.

2. BACKGROUND

There exist conflicting theories about the influence of performance pay on racial and ethnic wage differentials. Heywood and O'Halloran (2005) present a model in which objective based performance pay such as piece rates or commissions provide information to all workers and potential enforcement officials about the pay and productivity of each worker. This information makes it more likely that a discriminating employer would be detected, and face financial penalties. In turn, this reduces the incentive to discriminate suggesting that performance pay should be associated with reduced measured earnings differentials. Alternatively, performance pay is often set based on a managerial appraisal in which there may be large elements of subjectivity (MacLeod 2003). This subjectivity increases the latitude for managers who set, for example, the bonuses of their subordinates. As a consequence, the presence of performance pay may facilitate earnings set in accordance with the objective functions of managers rather than in accordance with profit maximization (Becker 1973). In their theoretical modeling, Meon and Szafarz (2011) show that in the face of agency problems between owners and managers, performance pay will not eliminate discrimination calling the modern corporation "a safe haven for taste-based discrimination".

In seeming accord with this distinction between formulaic and subjective bonuses, Heywood and O'Halloran (2005; 2006) use the US National Longitudinal Survey to show that

while measured racial wage differentials are significantly smaller among those paid objective piece rates than among those paid time rates, they are actually largest among those paid subjective bonuses. Elvira and Town (2001) confirm that supervisors' performance appraisals are influenced by the race of their subordinates. A White supervisor typically gives non-White subordinates worse ratings even when holding constant all other demographic variables and available (to the researcher) objective measures of productivity. This raises the possibility that equally productive Black and White workers are paid differently but have supervisory evaluations that support the differences. Castilla (2008; 2012) also uses U.S. data going further to show not only that race influences appraisal ratings but that Blacks receive smaller raises than Whites for equal ratings. Canadian evidence shows a substantial ethnic earnings gap among those on time rates but no evidence of an ethnic earnings gap among those receiving formulaic performance pay: tips, commissions or piece rates (Fang and Heywood 2006).

While there may be a difference between subjective and formulaic performance pay, this difference may not always determine the extent of discrimination. Bureaucratic rules or reputation concerns may limit discrimination in subjective schemes (Prendergast and Topel 1996) and objective schemes may be manipulated to reflect managerial preferences. Thus, Madden (2008) uses data from two large US financial service firms to show that the size of stockbrokers' formulaic bonuses depends critically on "complementary inputs" provided by managers (such as the quality of the accounts managers distribute to brokers). She shows that differences in these complementary inputs, rather than differences in success with otherwise equal inputs, explain the lower earnings of female stock brokers who have male managers.

Heywood and Parent (2012) return to the issue of the influence of performance pay on racial wage differences with special attention paid to the distributional aspects. They use the US Panel Study of Income Dynamics and show that in the time rate sector the black earnings differential shrinks when moving up the earnings distribution. On the other hand, in the performance pay sector the black earnings differential grows when moving up the earnings distribution and explodes at the very top of the distribution. The authors highlight two potential explanations. Unmeasured ability at the top of the performance pay distribution may be greater for whites than for blacks and if measured might explain the large differential. Alternatively, the top of the performance pay distribution may be dominated by subjective evaluation schemes increasing the latitude for discrimination. While unable to distinguish between these explanations, the evidence of sorting was clear with high ability blacks tending to sort out of performance pay schemes as high ability whites tended to sort into performance pay schemes.

Despite the policy importance of earnings differentials in many countries and the growth of performance pay in the labour markets of many countries, the vast majority of the empirical literature stems from North America.¹ In particular, we know of no corresponding study for Britain. Yet, such a study seems called for.

Both UK academics and policy makers remain concerned about the relative labor market position of ethnic minorities and the causes of that relative position (see report of the National Equality Panel, 2010). One measure of this relative position is the ethnic earnings differential which we investigate. It is widely accepted that ethnic earnings differentials have declined far less than gender differentials over the period since the equal opportunities legislation were introduced in Britain starting with the Race Relations Act of

1965. Indeed, ethnic minorities have become increasingly concentrated in the lower percentiles of the pay distribution (Bell 1997; Blackaby *et al.*, 1994; 2002). Numerous studies have also found evidence of more limited employment prospects and wages (Clark and Drinkwater, 2009; Dustmann and Theodoropoulos, 2010), fewer training and promotion opportunities (Pudney and Shields, 2000) and lower occupational attainment (Stewart, 1983) for ethnic minority groups compared to similar white natives. Specifically, (Blackaby *et al.*, 1998; 2002) estimate that non-white ethnic males earned 11 percent less in the mid 1990s and that differences in characteristics explain very little of this gap. They also show great heterogeneity with the gap largest for Pakistanis and lowest for Indians. This wage disadvantage exists even for British born ethnic minorities (Blackaby *et al.*, 2005). Dustmann and Theodoropoulos (2010) use more recent data suggesting that ethnic minority men have better observed characteristics than white men, and that once those differences are taken into account the wage differential becomes larger. Yet, their corrected differential is of roughly the same size as the earlier estimates, approximately 9 percent. At issue is whether these ethnic wage differentials vary by whether or not workers receive performance pay.

Focusing on the influence of performance pay on ethnic wage differentials is timely as such pay has taken center stage both among academics in the economics of personnel and in the minds of firm managers. Bloom and Van Reenen (2010 p. 4) show a substantial increase in the incidence of performance pay in the UK. The incidence increased from 41 percent of firms using performance pay in 1984 to 55 percent of firms by 2004. While this increase was largely among the private sector, UK government policy has increasingly called for greater pay for performance within the public sector (for a review see Graham *et al.*

2007). The increased attention paid to performance pay by both academics and policymakers is driven by the view that it has the potential to have earnings more closely correspond with productivity. Yet, the consequences of greater use of performance pay on ethnic labor market outcomes have not been given sufficient consideration. We now turn to our attempt to provide this consideration.

3. DATA AND PRELIMINARY EVIDENCE

The data used in this paper are drawn from the BHPS. The BHPS is a household panel study, surveying households once a year. The data are representative of the British population. From 1991 to 1998, 5,500 households were interviewed providing information on 10,000 adult (age 16+) individuals. From 1999 onwards there are on average 15,000 individuals participating in the survey. The panel is unbalanced as there is entry and exit.

The key advantage of the BHPS for our purposes is that it identifies performance payment receipt and tracks individuals over time. Our analysis is based on data from the period 1998 to 2008 (wave 8 - wave 18). Earlier waves of the BHPS (1991-1997) (wave 1 - wave 7) fail to identify performance related pay. From 1998 onwards, two questions are asked regarding payment type, *“does your pay include performance related pay?”* and *“in the last 12 months have you received bonuses or profit sharing bonuses?”* We use these two variables to generate two indicators, receiving performance related pay and receiving a bonus or profit share. A difficulty with the data is that one cannot distinguish between these latter two types of payment bonuses or profit sharing payments. Yet, evidence from the UK labour force survey suggests that bonus payments are far more common than profit share

receipt. For instance, Green and Heywood (2011) report that bonus receipt is over five times more common than profit share receipt.

We limit our sample to all male workers aged 16 to 65 who were private sector employees at the time of interview.² We exclude female workers to make comparisons of wages more clear cut, and exclude public sector workers due to both the lack of prevalence of PRP in this sector and the difficulty of defining a profit share. We also exclude the self-employed as our measures of performance pay are essentially defined only for the employed. This yields a total of 25,841 annual observations across the eight waves. While the self-employed might be seen as receiving the ultimate form of performance pay, including them moves away from our focus on the employment relationship and concerns with labour market discrimination.³ Moreover, the earnings of the self-employed are difficult to reconcile with those of the employed as much of their earnings appear not as labour income but as retained profits.

The BHPS also contains relatively detailed information on ethnicity. Individuals provide a range of responses on their ethnic group membership, including a range of “black” ethnicities (i.e. black-Caribbean, black-African) and “Asian” ethnicities (Indian, Pakistani, Bangladeshi and Chinese) and other non-white ethnicities. In our primary analysis we focus primarily on comparing workers who self-identify as white and those who identify as of a non-white ethnicity.⁴ We appreciate that this latter categorisation is broad and contains much heterogeneity (for instance covering Asian, African and Caribbean ethnicities). However, this decision is driven by sample size and the desire to gain precise estimates. Nonetheless an attempt is made to investigate the robustness of our results to this categorisation in the empirical section. We drop observations from Northern Ireland for two

reasons: a) a Northern Ireland boost sample was included in the BHPS only from 2001 onwards and b) there are very few individuals from an ethnic minority background residing in Northern Ireland.⁵

The BHPS contains a variety of wage and income variables. In order to best match with the bonus question we use the measure of annual labour income. The alternative of using the earnings in the last pay period may exclude low frequency performance pay receipt. We use the log of annual earnings as the dependent variable and control for total hours worked which is the product of usual weekly hours (including overtime) and the weeks worked in the year. Annual earnings are deflated to a 2005 base year using the CPI.

Table 1 presents descriptive information on some variables for our sample. It shows that a higher percentage of ethnic minorities are in jobs offering performance related pay compared to whites. But essentially the same percentage of whites and ethnic minority employees are in bonus/profit share jobs. Ethnic minorities in our sample have substantially higher levels of education than whites. This higher educational achievement of ethnic minorities is in line with results reported by Dustmann and Theodoropoulos (2010) and Dustmann *et al.* (2011).

Table 2 presents the mean earnings separated by payment method and by ethnic group. These simple comparisons suggest the patterns that interest us. Among those on time rates, ethnic minorities earn significantly less. This large difference of around 18 percent does not persist among those on performance pay. When we combine the two categories of performance pay into a single indicator, the sign reverses to an earnings advantage for minorities that is small and insignificantly different from zero. This, in turn, varies by the two forms of performance pay. Among those receiving performance related

pay, the earnings differential is negative but remains insignificant. Among those receiving bonus/profit sharing, ethnic minorities earn substantially more. Thus, the receipt of performance pay can eliminate or even reverse the raw wage disadvantage of minorities. Another way of seeing the point is to recognize that the difference in earnings associated with output pay is far greater for ethnic minorities than for whites. While whites receiving bonuses have earnings that are .356 log points larger than whites receiving time rates, minorities receiving bonuses have earnings that are .663 log points larger than minorities receiving time rates. These differences do not hold constant earnings determinants but the larger return to performance pay for racial minorities seems in the spirit of the US evidence (Heywood and O'Halloran 2005). We now turn to the heart of our regression estimates.

4. Results

Table 3 summarizes our initial regression estimates. The indicator of performance pay is a single dichotomous variable that takes the value of one if the worker receives either performance related pay and/or a bonus/profit share. The estimates follow the simple assumption that a single equation summarizes the earnings determinants for both White and minority workers, an assumption we relax in subsequent estimates. The table focuses on an interaction between the indicator for performance pay and the indicator for the worker being an ethnic minority. The columns show an increasingly complete set of control variables that ultimately include human capital and demographic variables, controls for the workplace and for years, region, industry and occupation. The estimates pool across years and estimate robust standard errors.

The key pattern across the estimates remains the same. Focusing on the final column, ethnic minorities not in performance pay jobs face a large earnings penalty of 21.6

percent while those in performance pay jobs face a significantly smaller earnings penalty of 11.0 percent.⁶ Alternatively, for white workers performance pay is associated with 12.1 percent higher wages while for ethnic minority workers performance pay is associated with 27.1 percent higher. Thus, the initial estimates continue to suggest that performance pay may help close the ethnic earnings gap by increasing the earnings of minorities more than the earnings of whites. While the increasingly complete set of controls in Table 3 causes the interaction to shrink in size, it remains substantial and statistically significant throughout the series of estimates.

While we have included hours as an independent variable, this pattern is not a function of that choice. We created a measure of hourly wages that takes the actual earnings and divides by the hours worked. Using this imputed wage measure, the results appear largely unchanged with a positive and statistically significant coefficient for the interaction of performance pay and ethnic minority status. We retain our specification as it is inherently more flexible.

Table 4 summarizes an estimate of the final column of Table 3 that simply disaggregates performance pay into the two indicators of performance related pay and bonus/profit sharing. The disaggregation is dramatic. The pattern just shown in Table 3 is driven entirely by bonus pay. There is a large and highly significant interaction indicating that the measured ethnic earnings gap is smaller among those receiving bonuses. On the other hand, the interaction of ethnic status with performance related pay is both insignificant and small. In what follows, we will continue to consider performance related pay but much of our attention will be on the indicator of bonus pay. Before proceeding, we confirm the difference in the two types of performance pay using more flexible estimates.

Table 5 estimates earnings equations within each of a several subsamples. The first two columns estimate the ethnic earnings differential within the time rate sector and within the broad performance pay sector. The results largely mimic those from Table 3 with a negative differential of 20.6 percent in the time rate sector and 13.4 in the performance pay sector. This again shows the smaller ethnic wage differential for those receiving performance pay. Columns 3 and 4 confirm the heterogeneity within the performance pay sector. Column 3 reveals a negative differential of 18.0 percent among those only receiving performance related pay slightly smaller than the differential as among those receiving time rates. Column 4 shows a negative differential of only 6.7 percent among those receiving a bonus/profit sharing payment. This is less than a third of the differential among those on time rates and is insignificantly different from zero.

We next examine a broad occupational difference. We conjecture that bonuses may be fundamentally different among supervisors and managers than among other workers. They may be more likely to reflect not only personal performance but the performance of those in the work group or division for which the supervisor or manager is responsible. They may also be based on broad divisional or establishment criteria that make discrimination on ethnicity more difficult. Table 6 divides the sample into all workers who claim to be either managers or have supervisory responsibilities and those that claim neither.

The differences across this division are substantial. Among those on time rates, the ethnic wage disadvantage appears smaller in non-supervisory jobs. The return to bonuses for whites appears to be modestly larger for those in non-supervisory jobs. The critical difference comes in focusing on the return to bonuses for minorities. The return to bonuses for minorities is insignificantly different from that for whites in non-supervisory jobs. The

return to bonuses for minorities is significant and enormous .28 percent larger than that for whites among supervisors and managers. Moreover, as a robustness check we reproduced for the supervisory subsample the specification from Table 4 that included the interaction of race with performance related pay. It remains insignificant. Thus, the result we showed in Tables 4 and 5 that the performance pay influence is driven by bonuses should be further amended as it appears to be driven almost exclusively by bonuses received by managers and supervisors.⁷

It is possible that managers and supervisors are simply more highly paid and that what we have seen as a difference by broad occupation is actually a distributional phenomenon. In the US it has been claimed that racial wage differentials shrink for those at the top of distribution who have more education and training (Lang 2007). The strong interaction coefficient for managers and supervisors may reflect underlying differences across the earnings distribution. To test this we estimate quantile regressions of the basic specification from Table 4. These are presented in Table 7. We show the quantiles for the 10th, 25th, 50th, 75th and 90th percentiles. There appears to be support for the US pattern, that racial earnings differentials shrinks when moving up the earnings distribution. The non-white coefficient takes a coefficient in the 90th percentile that is less than 40 percent of what it was in the 10th percentile. Critically, the evidence that bonuses reduce that differential attenuates only modestly across the distribution. The interaction of bonuses with minority status retains approximately the same size and significance in all but the lowest quantile. As a consequence, there is little support for the conjecture that distribution influences account for the strong role for bonuses in shrinking the differential among

managerial and supervisory workers. Ethnic minorities receive essentially the same differential return on bonuses over whites throughout the distribution.

The quantile regressions do indicate two patterns of interest. First, at the lower half of the earnings distribution minorities receive a significantly lower return on performance related pay. Alternatively, ethnic wage differentials are larger for those in the lower half of the distribution that receive performance related pay than for those receiving time rates. Second, the return on bonuses seems to attenuate as one moves of the distribution even as the interaction with minority status does not.

We next isolate the heterogeneity by ethnic group. We focus on the difference between the three categories of non-white ethnicities: Asian, Black and other. We reproduce the estimates by sector from Table 4 now replacing the single non-White indicator with these three group indicators. Among those receiving time rates, Asians receive significantly lower earnings than Whites while Blacks and others receive essentially the same earnings as Whites. Examining performance related pay in Column 3 further emphasizes the heterogeneity. The coefficients for Blacks and others are larger in absolute sign than in the time rate sector and are negative and highly significant. The Asian coefficient remains half of its size in the time rate sector and only weakly significant. While the coefficients for Blacks and others look roughly similar between the time rate and bonus sector, this is not true for Asians who have a coefficient much closer to zero in the bonus sector and which is no longer significantly different than zero. It appears that performance pay in general and especially bonus pay is associated with lower measured racial differentials for Asians. There is no such pattern for either Blacks or other non-white minorities.

We emphasize that the patterns we have uncovered in this section are not dependent upon our particular choice of independent variables or our particular choice of how to trim the sample. In robustness exercises we have added educational levels of the respondent's parents, whether or not the respondent is foreign born, self-perception of being overweight (as proxy for non-cognitive skills) and being paid by the hour.⁸ None of these alter the basic results. Similarly, we have excluded the top and bottom one percent of respondents in the hours of work distribution and also eliminated all workers less than 25 years of age. Neither modification materially changes the pattern of results.

In sum, in this initial section of results, we find that performance pay appears to be associated with a greater earnings increase for ethnic minorities than for whites and so shrinks the ethnic earnings differential. We found that this pattern is driven largely by those receiving bonuses and within that by supervisors and managers and by Asians rather than Blacks. One of the features of the US results is the persistence of racial differences in the return to performance pay even in estimates that account for worker fixed effects. We now turn to those estimates.

5. Fixed Effects Estimates

We return to the patterns isolated in the initial results to focus explicitly on the possibility of worker sorting. What appears to be a differential attributable to performance pay may instead reflect the tendency of workers with greater unobserved ability to sort into jobs offering performance pay (Lazear 2000). Thus, rather than measuring a true return to performance pay, the differential may reflect the unmeasured characteristics of the workers who sort into jobs offering performance pay. The first order treatment for such unmeasured characteristics is to estimate a fixed effects model that in essence differences out time

invariant worker specific earnings determinants. We use such estimates to examine the pooled estimates in which we found evidence that the earnings associated with performance pay differ by ethnic minority status. At issue is the role of unmeasured ability in driving the return to performance pay and critically, how that role may differ between Whites and ethnic minorities. We examine whether or not the greater return to performance pay for ethnic minorities reflects greater unmeasured ability among those minorities that sort into performance pay jobs.

Our empirical strategy is to reproduce the bulk of the estimates in the previous section using fixed effect estimates. In these estimates only those respondents who change payment method identify the estimates. As there is no change in minority status, this and other unchanging characteristics play no role in the estimate. Nonetheless, we can identify the influence of performance pay on earnings separately for Whites and ethnic minorities even though we will be unable to identify an ethnic minority wage gap.

The first column of Table 9 returns to the broad estimate of performance pay and shows the fixed effect estimate that includes the indicator and its interaction with minority status. The coefficient on performance pay remains statistically significant but it has shrunk. When accounting for the time invariant fixed effects, the coefficient implies a 5.2 percent increase in earnings associated with performance pay which is roughly half of that implied by the pooled estimate. The coefficient on the interaction remains statistically significant suggesting a difference by ethnicity in the premium associated with performance pay. The sum of the coefficients suggests that for minorities the return to performance pay is 13.9 percent. The second column divides the performance pay category into the two components revealing largely the same pattern as shown in the pooled estimates. The

difference in returns to performance pay is driven by a significant interaction for bonuses but not for performance related pay which takes an insignificant coefficient.⁹ It is well recognized that panel estimates of this sort increase the role of measurement error and that increased standard errors can be the cause of a lack of statistical significance (Solon 1995). There is some evidence of this and the standard error is much larger in the fixed effect estimates. Nonetheless, the pattern and basic significance remains.

Columns 3 and 4 of Table 9 show the fixed effect estimates by whether or not the respondent has managerial or supervisory responsibilities. So as to retain estimates that account for those workers who move into and out of such responsibilities, we avoid making two separate estimates. Instead, we estimate a single equation that includes the performance pay variables and the ethnicity interactions entered separately for supervisors and non-supervisors. Thus, the proper way to read the coefficients in both columns 3 and 4 are as comparisons with a white non-supervisory worker who is paid time rates. We show the coefficient on the supervisory indicator which is large and positive. The fixed effect estimate again presents much smaller coefficients than the OLS but the same pattern is evident. The estimate among managers and supervisors shows an interaction of ethnicity and bonus that is large and statistically significant. As with the OLS, it implies a return to being paid a bonus that is several times larger for minorities than that for Whites. There is no such pattern in the return to bonuses for non-supervisory workers. Thus, despite the smaller coefficients, we largely reproduce the pattern shown in the pooled estimates.

In the last section we presented quantile regressions. One analogue to the fixed effects approach in linear regression is to include a worker specific shift for each individual for every τ th quantile. This might be termed a conditional (on the quantile) fixed effects

quantile regression model. However, as discussed by Koenker (2004) including this type of quantile dependent distributional worker effect is difficult in practice in a setting such as ours where there is a large number of cross-sectional units but the number of time observations per unit is not large. Instead he suggests the inclusion of a single individual specific effect across the quantiles. To do this requires the joint estimation of all τ quantile regressions simultaneously. This is termed an unconditional fixed effects quantile regression and we implement it using the public domain package "R" and the program by Koenker (2004).

Table 10 shows the fixed effect quantile estimates and they present similarities with and differences from the patterns without the fixed effects. First, it continues to be the case that the influence of bonus receipt remains a significant positive determinant of earnings throughout the distribution and that the magnitude of the coefficient clearly declines higher in the distribution. As with all of the fixed effect estimates, the overall magnitudes of the coefficients are smaller than those without fixed effects. Second, the fixed effect estimate of the coefficient on the interaction of bonus with minority status remains positive but grows over the distribution and is significant only at the 75th and 90th percentile. This pattern of the interaction concentrated at the top of the distribution was not evident in the OLS estimates. This result differs dramatically from the evidence on black-white earnings differences using US data. Heywood and Parent (2012) show that the positive earnings differential associated with performance pay is larger for whites than for blacks. Moreover, this difference grows dramatically at the top of the US earnings distribution. As a consequence, more able blacks are shown to sort out of performance pay. Our results suggest that the positive differential for performance pay is larger for ethnic minorities and

that it is this advantage that grows at the top of the distribution. Thus, our implication for Britain would seemingly be the opposite: more able ethnic minorities should sort into performance pay. We will explore this before concluding.

Table 11 examines the evidence for the three broad ethnic groups Asians and Blacks.¹⁰ The original pooled data showed that Asians face a significantly negative wage differential in the time rate that vanished in the bonus pay sector. Said differently, the return to bonus pay for Asians was larger than for whites even as this did not appear to be the case for Blacks or others. The fixed effect estimates in Table 11 generate very few significant differences by ethnicity. In particular, the interaction on bonus pay and Asian remains positive but insignificantly different from zero. We note that the standard errors have increased substantially in these estimates and that looking for fixed effect estimates for ethnic subgroups may be expecting too much of the data. The only observed difference is a weakly significant difference for other non-Whites suggesting their return to bonuses may be larger than that of whites.

Despite these last findings, there is generally little evidence that accounting for time invariant individual earnings components reverses the conclusion from the earlier pooled estimates. Ethnic minorities benefit more from performance pay than do whites. This is true for those receiving bonuses, those who are managers or supervisors and for those at the top of the earnings distribution. Nonetheless, we note that the estimated magnitudes associated with performance pay are smaller in the fixed effect estimates. This suggests that the apparent ethnic difference in the return to bonuses seen in the pooled estimates may be driven, in part, by sorting. Relatively more able minorities would appear to be sorting into jobs with this type of performance pay.

While we obviously cannot identify all the ability components that would drive this sorting, we can compare the composition of the sectors. Table A1 presents two simple probit estimates of the probability of being observed in the performance pay sector. The first is for Whites and the second is for ethnic minorities. Each coefficient is the marginal effect of the left hand side variable on the probability of receiving performance pay. These are not meant to imply causation but rather simply document the patterns of sorting across the observable variables.

A comparison of the two estimates is highly suggestive of ability sorting on the observables. The influence of possessing a university degree or more is nearly five times larger for ethnic minorities. Thus, more highly educated minorities are more likely to sort into performance pay jobs. Managers and Supervisors who are minorities are also more likely to sort (or be sorted) into performance pay jobs. Expanding the estimates to include other indicators of ability find that parental education also tends to play a larger role for minorities sorting into performance pay than for whites. Thus, if we anticipate that unobservable measures of ability are correlated with observed measures, the pattern of sorting is consistent with high ability minorities sorting into performance pay jobs and consistent with the fixed effect estimates being smaller than the pooled estimates. While minorities earn more from being in performance pay jobs than whites, this partially reflects that high ability minorities disproportionately appear in performance pay jobs. This is not consistent with the finding from the US that high ability blacks sort out of performance pay jobs.

6. Conclusions

The intent of performance pay is to more closely link worker productivity and earnings. We have explored how performance pay with this closer link influences the size of the measured ethnic earnings differential. We are, to our knowledge, the first to do this using data from Britain. We show that in pooled estimates performance pay is associated with a smaller ethnic wage differential. This is driven by a smaller ethnic differential for those receiving bonuses/profit shares. This, in turn, is concentrated among managers and supervisors and for Asians rather than Blacks. Another view of the fundamental result is that ethnic minorities receive a larger return to working in the performance pay sector thus shrinking the ethnic earnings differential.

This pattern of results remains to a large extent in fixed effect estimates. We find continuing evidence that minorities receive a larger return to working in the performance pay sector and particularly when receiving bonuses. Yet, the size of the influence is smaller than in the OLS suggesting sorting. The fixed effects estimates confirm an influence among managers and supervisors that is absent otherwise. They also show that the tendency of performance pay to shrink ethnic wage differentials is concentrated at the top of the earnings distribution. It is here that the return to performance pay is significantly larger for ethnic minorities. The pattern by Asian and Black ethnicities does not carry-over to the fixed effect estimates. Despite this, the general finding is seemingly robust and pooled evidence carries over to holding constant the time-invariant individual characteristics. The descriptive estimates suggest that high ability minorities (using the observables) are disproportionately sorting into the performance pay sector. If the unobservables are correlated with the observables, the fixed effect estimates are consistent with sorting on unobserved ability.

Thus, ethnic minorities may anticipate that they will more likely be able to reveal this unobserved (to the researcher) ability and be rewarded for in the performance pay sector.

It is valuable to contrast the tenor of our results for Britain with those for the United States. First, the results from the US are also typically robust to fixed effects estimates leading researchers to speculate that performance pay influences the ability of firms to engage in discrimination. Yet, they differ in kind from those we have presented. They typically show that only very formulaic performance pay is associated with reduced racial earnings gaps. Broader forms of performance pay and especially bonuses have been associated with increased differentials. Moreover, the results from the US are highly dependent on distributional aspects with blacks on performance pay doing far worse than whites at the top of the earnings distribution (Parent and Heywood 2012). We found strong distributional influences only in the fixed effect quantile estimates. They suggested the opposite: ethnic minorities on performance pay tend to earn more nearly the same as whites only at the top of the distribution. Third, while US studies typically focus on Blacks, we found differences across ethnic minorities.

Future work should examine alternative data sources for Britain. Linked employer-employee data may allow new insights. Moreover, many countries other than the US and UK have ethnic minorities and they may serve to generalize the findings. In each case, the issue would be the influence of performance pay on the ethnic earnings differential. While these alternative sources may provide new or different results, the estimates in this paper suggest that ethnic minorities of higher ability tend to sort into performance pay and that when accounted for, the interaction of performance pay and minority status is reduced but not eliminated.

Table 1 - Summary Statistics, 1998-2008, Male Private Sector Employees

	All	White	Non White
Log Annual Pay	9.743	9.745	9.663
PRP	0.178	0.177	0.231
Bonus/Profit Share	0.416	0.417	0.404
Non White	0.031		
Age	37.755	37.798	36.391
Tenure in years	19.623	19.610	15.032
A Level	0.246	0.27	0.200
Diploma/Vocational qualification	0.084	0.082	0.129
Degree or Higher	0.146	0.139	0.354
Married	0.540	0.538	0.603
Children < 18	0.356	0.353	0.447
Large Firm	0.415	0.412	0.503
Total Hours	1,774.89	1,778.996	1,644.284
Union member	0.199	0.202	0.116
Temporary job	0.036	0.036	0.048
Obs	25,841	25054	787

Table 2 - Log Annual Pay by Payment Method and Ethnicity, 1998-2008, Male Private Sector Employees

Log Annual Pay				
	Time Rates	Output Pay	PRP	Bonuses
White	9.588	9.922	9.944	9.944
Non White	9.385	9.974	9.888	10.048
= Non White- White	-0.203*	0.052	-0.056	.104*
	[0.042]	[0.034]	[0.053]	[0.036]

Standard errors in square brackets. * Indicates statistical significance at the 1% level

Table 3 – Log Annual Pay Preliminary Estimates 1998-2008, Male Private Sector Employees

	(1)	(2)	(3)	(4)
Non-White	-0.288*** (0.0659)	-0.231*** (0.0578)	-0.200*** (0.0532)	-0.243*** (0.0522)
Output Pay	0.248*** (0.0113)	0.143*** (0.00962)	0.121*** (0.00883)	0.114*** (0.00869)
Output Pay * Non-White	0.208** (0.0823)	0.161** (0.0737)	0.142** (0.0673)	0.126** (0.0637)
Age	0.148*** (0.00440)	0.110*** (0.00373)	0.0999*** (0.00351)	0.101*** (0.00348)
Age ² /100	-0.165*** (0.00552)	-0.125*** (0.00464)	-0.113*** (0.00431)	-0.115*** (0.00428)
A Level	0.105*** (0.0176)	0.102*** (0.0150)	0.0681*** (0.0134)	0.0735*** (0.0131)
Diploma	0.299*** (0.0265)	0.264*** (0.0232)	0.174*** (0.0214)	0.174*** (0.0210)
Degree or Higher	0.408*** (0.0222)	0.399*** (0.0205)	0.258*** (0.0205)	0.248*** (0.0199)
Married	0.156*** (0.0165)	0.0968*** (0.0143)	0.0808*** (0.0129)	0.0856*** (0.0126)
Child	0.00506 (0.0151)	0.0104 (0.0131)	0.0220* (0.0120)	0.0281** (0.0117)
Health Limits Work	-0.158*** (0.0253)	-0.118*** (0.0218)	-0.0833*** (0.0204)	-0.0849*** (0.0200)
Hours Worked		0.00022*** (6.78e-06)	0.00022*** (6.48e-06)	0.00023*** (6.42e-06)
Union Member		0.0540*** (0.0126)	0.0526*** (0.0117)	0.0677*** (0.0115)
Temporary Job		-0.235*** (0.0379)	-0.234*** (0.0366)	-0.235*** (0.0365)
Large Firm		0.145*** (0.0112)	0.127*** (0.0107)	0.126*** (0.0104)
Tenure		0.00909*** (0.000852)	0.00829*** (0.000807)	0.00769*** (0.000794)
Tenure ² /100		-0.0115*** (0.00138)	-0.0105*** (0.00131)	-0.0103*** (0.00128)
Manager/Supervisor		0.300*** (0.0110)	0.200*** (0.0107)	0.199*** (0.0105)
Year	X	X	X	X
Industry/Occupation			X	X
Regions				X
Constant	6.357*** (0.0794)	6.531*** (0.0697)	6.897*** (0.0764)	7.012*** (0.0840)
Observations	25,841	25,841	25,841	25,841
R-squared	0.343	0.465	0.506	0.516

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 4 – Log Annual Pay and Disaggregated Payment Types, 1998-2008, Male Private Sector Employees

	(I)
Non-White	-0.239*** (0.0501)
Bonus/Profit Share	0.0976*** (0.00864)
Bonus/Profit Share*Non-White	0.168*** (0.0634)
Performance Pay	0.0741*** (0.0113)
Performance Pay*Non-White	-0.0570 (0.0658)
Constant	7.186*** (0.0845)
Observations	25,841
R-squared	0.517

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

All controls as per (4) in Table 3.

Table 5 - Pay Returns in Different Pay Sectors, Male Private Sector Employees, 1998-2008

	(1) Time Sector	(2) Output Pay	(3) PRP Only	(4) Bonus/Profit Share Only
Non-White	-0.231*** (0.0520)	-0.144*** (0.0479)	-0.198* (0.113)	-0.0698 (0.0555)
Age	0.107*** (0.00460)	0.0922*** (0.00458)	0.127*** (0.0140)	0.0815*** (0.00539)
Age ² /100	-0.122*** (0.00557)	-0.104*** (0.00565)	-0.143*** (0.0170)	-0.0916*** (0.00664)
A Level	0.0639*** (0.0178)	0.0854*** (0.0162)	-0.0156 (0.0473)	0.0996*** (0.0188)
Diploma	0.143*** (0.0260)	0.205*** (0.0260)	0.202*** (0.0763)	0.212*** (0.0288)
Degree or Higher	0.207*** (0.0284)	0.282*** (0.0229)	0.253*** (0.0610)	0.270*** (0.0260)
Married	0.0831*** (0.0166)	0.0900*** (0.0153)	0.0391 (0.0403)	0.100*** (0.0173)
Child	0.0125 (0.0162)	0.0457*** (0.0139)	0.0380 (0.0396)	0.0387** (0.0162)
Health Limits Work	-0.0869*** (0.0277)	-0.0726*** (0.0227)	0.00662 (0.0681)	-0.0861*** (0.0281)
Constant	6.853*** (0.111)	7.387*** (0.112)	6.761*** (0.360)	7.796*** (0.132)
Observations	13,656	12,195	1,423	7,579
R-squared	0.483	0.525	0.508	0.538

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 All other controls are include as in Column (4) in Table 3.

Table 6 – Log Annual Pay, Payment Methods and the Role of Managerial and Supervisory Positions

	(1) Exclude Managers & Supervisors	(2) Only Managers & Supervisors
Non-White	-0.194*** (0.0580)	-0.278*** (0.0780)
Bonus/Profit Share	0.165*** (0.0118)	0.102*** (0.0123)
Bonus/Profit Share*Non-White	0.114 (0.0752)	0.247** (0.102)
Performance Pay	0.0496*** (0.0160)	0.0683*** (0.0153)
Performance Pay*Non-White	-0.0534 (0.0823)	-0.0503 (0.0904)
Constant	6.223*** (0.115)	7.734*** (0.134)
Observations	15,499	10,342
R-squared	0.432	0.443

Robust standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 7 - Quantile Regressions, 1998-2008, Male Private Sector Employees

	0.10	0.25	median	0.75	0.90
Non-White	-0.349*** (0.0481)	-0.244*** (0.0263)	-0.193*** (0.0193)	-0.208*** (0.0253)	-0.147*** (0.0334)
Bonus/Profit Share	0.120*** (0.0133)	0.0768*** (0.00746)	0.0617*** (0.00551)	0.0644*** (0.00719)	0.0489*** (0.00952)
Bonus/Profit Share*Non-White	0.223*** (0.0753)	0.141*** (0.0431)	0.157*** (0.0312)	0.156*** (0.0409)	0.144*** (0.0516)
Performance Pay	0.0783*** (0.0172)	0.0829*** (0.00946)	0.0695*** (0.00697)	0.0626*** (0.00915)	0.0686*** (0.0123)
Performance Pay*Non-White	-0.163* (0.0877)	-0.109** (0.0502)	-0.137*** (0.0362)	-0.0629 (0.0476)	-0.00262 (0.0596)
Constant	6.020*** (0.106)	7.257*** (0.0546)	7.898*** (0.0389)	8.540*** (0.0496)	8.880*** (0.0650)
Observations	25,841	25,841	25,841	25,841	25,841

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 8 – Log Annual Pay by Sector and Disaggregated Ethnic Group,
1998-2008 Male Private Sector Employees

	Time Pay	Bonus Pay	Performance Pay
Asian	-0.313*** (0.0680)	-0.0828 (0.0659)	-0.151* (0.0907)
Black	-0.0136 (0.0995)	-0.119 (0.106)	-0.292** (0.120)
Non-White (Other)	-0.175 (0.108)	-0.158 (0.0966)	-0.288** (0.118)
Constant	6.822*** (0.111)	7.557*** (0.113)	7.076*** (0.191)
Observations	13,656	10,762	4,606
R-squared	0.483	0.537	0.525

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 9 - Fixed Effects Estimates of the Bonus/Profit Share Premium, 1998-2008, Male Private Sector Employees

	(1)	(2)	(3) Non Supervisor/Manager	(4) Managers & Supervisors Only
Output Pay	0.0506*** (0.00741)			
Output Pay * Non-White	0.0798* (0.0447)			
Bonus/Profit Share		0.0577*** (0.00749)	0.152*** (0.00998)	0.0501*** (0.0116)
Bonus/Profit Share*Non-White		0.0838* (0.0453)	0.0503 (0.0596)	0.126** (0.0629)
Performance Pay		0.0133 (0.00930)	0.00731 (0.0133)	0.0312** (0.0138)
Performance Pay*Non-White		0.0187 (0.0485)	-0.00158 (0.0681)	-0.0177 (0.0699)
Supervisor/Manager				0.171*** (0.0120)
Constant	9.489*** (0.0459)	9.489*** (0.0459)	9.083*** (0.0866)	9.519*** (0.0665)
Observations	25,841	25,841		25,841
R-squared	0.221	0.222		.223
Number of individuals	6,318	6,318		6,318

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 10 - Quantile Regressions with Fixed Effects, 1998-2008, Male Private Sector Employees

	0.10	0.25	med	0.75	0.90
Bonus/Profit Share	0.078*** (0.010)	0.033*** (0.005)	0.029*** (0.004)	0.026*** (0.004)	0.014** (0.006)
Bonus/Profit Share*Non-White	0.007 (0.051)	0.028 (0.028)	0.030 (0.023)	0.050** (0.026)	0.055* (0.033)
Performance Pay	0.007 (0.011)	0.015*** (0.005)	0.019*** (0.005)	0.019*** (0.005)	0.026*** (0.008)
Performance Pay*Non-White	-0.105 (0.074)	-0.065 (0.044)	-0.044* (0.026)	-0.037 (0.033)	-0.005 (0.042)
Constant	6.223*** (0.119)	7.215*** (0.062)	7.413*** (0.055)	7.549*** (0.055)	7.879*** (0.073)
Observations	25,841				

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 11 – Log Annual Pay and Disaggregated Ethnic Groups, Fixed Effects

	(1)	
VARIABLES		
Bonus/Profit Share	0.0582*** (0.00747)	0.0583*** (0.00748)
Bonus/Profit Share*Black	0.102 (0.0837)	0.102 (0.0839)
Bonus/Profit Share*Asian	0.00450 (0.0601)	0.00450 (0.0602)
Performance Pay	0.0133 (0.00929)	0.0135 (0.00930)
Performance Pay*Asian	0.0801 (0.0645)	0.0798 (0.0646)
Performance Pay*Black	-0.140 (0.0896)	-0.141 (0.0898)
Bonus/Profit Share*Other		0.180* (0.104)
Performance Pay*Other		0.0599 (0.122)
Constant	9.133*** (0.0453)	9.125*** (0.0451)
Observations	25,702	25,841
Number of individuals	6,289	6,318
R-squared	0.221	0.222

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Appendix: Table - A1 Probability of Bonus/Profit Share Receipt, Probit Estimates

	(1) whites	(2) non whites
Age	0.0129*** (0.00224)	0.00287 (0.0167)
Age ² /100	-0.0199*** (0.00280)	-0.00970 (0.0205)
A Level	0.0552*** (0.00886)	0.0206 (0.0773)
Diploma	0.00534 (0.0138)	-0.0108 (0.0862)
Degree or Higher	0.0450*** (0.0121)	0.207*** (0.0702)
Married	0.0256*** (0.00924)	0.0898 (0.0672)
Child	-0.00229 (0.00892)	-0.203*** (0.0617)
Health Limits Work	-0.0491*** (0.0153)	0.110 (0.0992)
Union Member	0.0737*** (0.00961)	-0.0550 (0.0728)
Temporary Job	-0.288*** (0.0155)	-0.299*** (0.0771)
Large Firm	0.0736*** (0.00772)	0.0531 (0.0498)
Tenure	0.00382*** (0.000713)	0.0105** (0.00460)
Tenure ² /100	-0.00478*** (0.00121)	-0.0105* (0.00782)
Manager/Supervisor	0.0780*** (0.00882)	0.159*** (0.0542)
Industry	X	X
Occupation	X	X
Region	X	X
Years	X	X
Observations	21,024	659

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Endnotes

¹ Additional North American based studies of racial earnings differentials and performance pay include Belman and Heywood (1989) and Fang and Heywood (2006, 2010). There also exist studies of the gender earnings differential and performance pay and while many are also based on North American data, one exception is that by Jirjahn and Stephan (2004) who use German data to demonstrate a smaller gender earnings differential among workers paid by the piece than among those on time rates.

² In robustness checks we will show that focusing on prime age males does not change the results.

³ For evidence on the relative performance of ethnic minority groups in Britain with respect to self-employment, see Clark and Drinkwater (2000).

⁴ We include workers with mixed ethnicity, those who identify one or more non-white ethnicities, as non-white.

⁵ Across all years there were only 42 non-white observations in Northern Ireland.

⁶ The second estimate comes from adding the relevant coefficients $(-.243+.126)$ and taking e to this power and subtracting one.

⁷ While managers and supervisors are more likely to receive bonuses, nearly 30 percent of non-supervisory workers receive some form of bonus in our data.

⁸ Johnson and Neal (1996) show that controlling for parental characteristics causes the measured racial earnings gap to decline.

⁹ It can be the case that those observed making transitions into and out of performance pay represent a selected sample. In this case the fixed effect estimate may not be representative and will suffer from selection bias (Solon 1988). As a simple check on this possibility, we limited our sample to only those observed moving between performance pay and time rates. We re-estimated the pooled OLS from Table 4 on this subsample. The smaller sample size (2,350 individuals) resulted in a lack of precision but the pattern of coefficients mimicked that for the entire sample with the interaction of bonus with ethnic minority estimate remaining positive and statistically significant.

¹⁰ Asians included all respondents who identify themselves as Indians, Pakistanis, Bangladeshi, Chinese or Other Asian. Blacks are all who identify themselves as Black-Caribbean, Black-African or Black Other.