

IZA DP No. 3158

**The Public-Private Sector Gender Wage Differential:
Evidence from Matched Employee-Workplace Data**

Monojit Chatterji
Karen Mumford
Peter N. Smith

November 2007

The Public-Private Sector Gender Wage Differential: Evidence from Matched Employee-Workplace Data

Monojit Chatterji
University of Dundee

Karen Mumford
*University of York
and IZA*

Peter N. Smith
University of York

Discussion Paper No. 3158
November 2007

IZA

P.O. Box 7240
53072 Bonn
Germany

Phone: +49-228-3894-0
Fax: +49-228-3894-180
E-mail: iza@iza.org

Any opinions expressed here are those of the author(s) and not those of the institute. Research disseminated by IZA may include views on policy, but the institute itself takes no institutional policy positions.

The Institute for the Study of Labor (IZA) in Bonn is a local and virtual international research center and a place of communication between science, politics and business. IZA is an independent nonprofit company supported by Deutsche Post World Net. The center is associated with the University of Bonn and offers a stimulating research environment through its research networks, research support, and visitors and doctoral programs. IZA engages in (i) original and internationally competitive research in all fields of labor economics, (ii) development of policy concepts, and (iii) dissemination of research results and concepts to the interested public.

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.

ABSTRACT

The Public-Private Sector Gender Wage Differential: Evidence from Matched Employee-Workplace Data*

Using new linked employee-workplace data for Britain in 2004, we find that the nature of the public private pay gap differs between genders and that of the gender pay gap differs between sectors. The analysis shows that little none of the gender earnings gap in both the public and private sector can be explained by differences in observable characteristics. Decomposition analysis further reveals that the contribution of differences in workplace characteristics to the public private earnings gap is sizeable and significant. Whilst the presence of performance related pay and company pension schemes is associated with higher relative earnings for those in the private sector, an important workplace characteristic for the public private pay gap is the presence of family-friendly employment practices. Increased provision is especially associated with higher relative earnings in the public sector for women.

JEL Classification: J3, J7

Keywords: public sector earnings, gender, gap, family friendly, decomposition

Corresponding author:

Karen Mumford
Department of Economics and Related Studies
University of York
Heslington York YO10 5DD
United Kingdom
E-mail: kam9@york.ac.uk

* The authors acknowledge the Department of Trade and Industry, the Advisory, Arbitration and Conciliation Service, the Economic and Social Research Council and the Policy Studies Institute as the originators of the 2004 Workplace Employment Relations Survey (WERS 2004) data, and the ESRC-funded WERS 2004 Information and Advice Service as the producers of the tabulations used in this work. None of these organisations bears any responsibility for the authors' analyses and interpretations of the data. We are also very grateful for help and advice from participants at the RES conference (2007), the CMPO/OME meetings (2007) and especially from John Beath, Richard Disney and from Peter Dolton.

The public sector wage bill is a matter of great concern to policy makers, contributing as it does to nearly 50% of government spending and employing a fifth of the total U.K. workforce. There has been considerable research into analysing both the size of the public-private pay differential and its movements over time, and possible explanations for these phenomena¹. Most studies have based their analysis upon cross-sectional or longitudinal data which is rich in the description of worker attributes but meagre in respect of workplace characteristics. If employers set wages in an environment where both employers and workers have a degree of bargaining power, then workplace characteristics that affect the value of the marginal product of labour may have an impact on the wage (Bhaskar and To, 1999; Bhaskar et al., 2002). These could include characteristics such as workplace size, foreign ownership, industrial relations policies, and human resource management practices.

This distinction between worker and workplace characteristics is important from an empirical perspective too, because, as Burgess and Metcalfe (1999) using the 1990 Workplace Industrial Relations Survey (WIRS90) show, incentive schemes which have a direct bearing on pay determination do vary across public and private sector workplaces. Similarly, Burgess and Ratto (2003) survey international evidence to further explore the impact of explicit incentives (and especially Performance Review Pay) in the public sector. They conclude that these practices are typically under utilised in the public sector. A strength of these studies is the recognition that workplace characteristics are not uniform across the sectors. The association between payment schemes such as these and the resultant public sector pay gap for individual employees can only be examined adequately with linked employee and workplace data. Similarly, we know that human resource management choices at the workplace (such as management structure, firm structure, employee involvement in decision making) in the workplace can have an impact on firm performance (Lazear, 2000) in both the private and public sectors (Dixit 1997; Simpson, 2006).

The literature on gender wage inequality is also well established (see surveys by Altonji and Blank, 1999; Weichselbaumer and Winter-Ebman, 2005)². There is dispersion in the findings of these studies, nevertheless, it is generally concluded that

¹ For example Trinder, 1997; Disney and Gosling, 1998 and 2003; Blackaby et al, 1999; Bender and Elliot, 1999; Yu et al, 2005; Luciflora and Meurs, 2006; Makepeace and Marcenaro-Gutierrez, 2006; Postel-Vinay and Turon, 2005.

² Recent results for Britain include Joshi and Paci (1998), Mumford and Smith (2007), Manning and Robinson (2004) and Manning and Petrongolo (2006).

whilst the gender gap has declined in the last two decades, a substantial and persistent earnings gap still exists between male and female employees in Britain. There is also a young, but growing, body of work on the gender pay gap that exploits linked evidence on both individual worker characteristics and those of their workplaces as an additional feature to help explain the earnings gap³. Typically, these studies show that the earnings gap differs across workplaces and that it differs with identifiable workplace characteristics. This suggests that including workplace information in the modelling of individual earnings allows for a more precise calculation of the explained part of the earnings gap

Given the theoretical literature and empirical evidence summarised above, there is good reason to suppose that allowing for the impact of various characteristics of the workplace in addition to the standard characteristics of the individual employee is likely to produce richer insight into the public private and gender pay differentials. In this paper, we use matched employee-workplace data from the British Workplace Employee Relations Survey 2004 (WERS04) to carry out such an analysis. The linked nature (and extensive questionnaires) of the WERS04 data allows us to control far more extensively for both individual employee characteristics and workplace characteristics than has been possible in previous earnings studies. A further attractive feature of the WERS04 data, of particular relevance to our study, is the extensive information it provides on both public and private sector workplaces (Kersley et al, 2006, page 5).

1. Data

The data used in this study are drawn from the British Workplace Employee Relations Survey 2004 (WERS04)⁴. WERS04 is a nationally representative survey of workplaces and their employees, where a workplace comprises the activities of a single employer at a single set of premises. Face-to-face interviews for WERS04 were conducted with a senior manager (with day-to-day responsibility for employee relations). At those workplaces responding to the manager survey, a questionnaire was presented to 25 randomly selected employees (in workplaces with more than 5

³ Groshen, 1991; Holzer and Neumark, 2000; Abowd et al, 2001; Drolet, 2002; Bayard et al, 2004; Anderson et al, 2001; Manning and Petrongolo, 2004; Mumford and Smith, 2007; Reilly et al, 2006; Hellerstein et al, 2007.

⁴ Department of Trade and Industry (2006). Workplace Employee Relations Survey: Cross-Section, 2004 (computer file). 5th ed. Colchester: The Data Archive (distributor). SN: 5294.

employees) or to all the employees (in workplaces with fewer than 26 employees).⁵ The entire surveying process resulted in 10,943 completed employee questionnaires for full-time employees and 1,562 completed workplace surveys for their linked places of employment.

WERS04 is a stratified random sample, and larger workplaces and some industries are over-represented. In this paper the data have been weighted throughout the analyses to allow for the complex survey design and are thus representative of the sampling population⁶. All of the empirical results that follow use workplace and employee sampling weights simultaneously.

WERS04 and its predecessors have been used to analyze diverse research questions (Millward et al. 2004), but we are not aware of any research using these data to explicitly examine the earnings gap between public sector and private sector male and female full-time employees in Britain. Retaining only those individuals who have complete information for the variables used in the analyses below leaves us 10,600 full-time employees; 2,903 in the public sector and 7,697 in the private sector.

2. Measuring the earnings gaps

Full definitions of the variables to be used in the study are presented in Table A1 in the Appendix. Summary statistics for these variables are in Table A2 for the full data sample, male and female employees, and public and private sector employees in aggregate, respectively. Summary statistics for the sub-samples of primary interest to this study (public sector male, private sector male, public sector female, and private sector female full-time employees) are presented in Table A3.

A full-time employee is defined to be working 37 or more hours per week, which is a standard full-time working week in the public sector and a reasonable assumption for the more variable definition of full-time in the private sector (Manning and Petrongolo, 2004). The public sector (as defined by the suppliers of the data set⁷)

⁵ The industries excluded from the survey were agriculture, hunting and forestry; fishing; mining and quarrying; private households with employed persons; and extra-territorial organisations and bodies.

⁶ The advantages from using weighted complex survey design data is discussed at length in Deaton (1998) and by the suppliers of the WERS data series (see footnote above). When weighted accordingly, the data are representative of all workplaces with 5 or more employees, located in Great Britain, and engaged in activities within sectors D (Manufacturing) to O (Other Community, Social and Personal Services) of the Standard Industrial Classification (SIC) 2003. The data, suitably weighted, are therefore also representative of all employees within these workplaces.

⁷ A public sector workplace is one where the best description of the formal status of the establishment (or the organisation of which it is a part) is that it is a: government owned limited company;

employs 27.4 per cent of full-time employees in Britain (Table A1): 22.2 per cent of the males and 35.8 per cent of the females.

The measure of earnings used is average hourly earnings for each employee. This is calculated by dividing the employee's gross (before tax and other deductions) weekly wages by the hours they usually work each week (including any overtime and extra hours). Whilst usual hours worked is a continuous measure, the survey responses for gross weekly wages are banded in the data set. There are 14 bands and the midpoints of these bands are used. On this measure, public sector employees earn, on average, 14 log per cent (or log wage points) more than private sector employees (see Table A2). Full-time male earnings are, on average, also 14 log per cent (or log wage points) above full-time female average earnings (see Table A2). These similarly sized aggregate earnings gap may, however, camouflage quite different earnings gaps between sectors and genders.

This paper is specifically concerned with comparing male and female public sector and private sector full-time employees, implying that there are a range of earnings gaps to consider (see Figure 1 and Table A3). For example, within genders but across sectors, the public sector to private sector gap for men is 11.7 log per cent in terms of mean log hourly wages; this is only half as big as the public sector to private sector gap for women (which is 24.3 log per cent). Within sectors but across genders the differences are even larger: the male public sector to female public sector gap is 7 log per cent, whilst the male private sector to female private sector gap is almost three times bigger (at 19.6 log per cent).

3. The determinants of earnings

3.1 Individual characteristics

Most authors have adopted the human capital model as the theoretical basis for the earnings function (Becker, 1975; an extensive recent survey was provided Chiswick, 2003). This approach will also be used here. At the individual employee level, it is

nationalised industry; public service agency; other non-trading public corporation; quasi autonomous national government organisation (QUANGO); or local/central government (including the National Health Service and Local Education Authorities).

A private sector workplace is one where the best description of the formal status of the establishment (or the organisation of which it is a part) is that it is a: public limited company (PLC); private limited company; company limited by guarantee; partnership (including limited liability partnership/ self-proprietorship.); trust/charity; body established by Royal Charter; or co-operative/mutual/friendly society.

assumed that wages increase with measures of accumulated skills such as education, work experience, and training.

WERS04 provides information as to the highest level of education the individual has received across a range of educational categories. Just over a quarter of full-time employees have a degree or postgraduate qualification whilst nearly 60 per cent have no post-age 16 qualifications (Table A2). The public sector employs more highly educated workers than does the private sector, and women are substantially less likely than men to have the lowest education levels.

Measures of work experience are usually assumed to be positively related to wages via the ability to acquire skills over the time period the employee has spent working. Typically, cross-sectional studies do not have data on the history of actual lifetime work experience across firms for individuals. Instead proxies are provided, the most common of which is potential experience: the age of the individual minus years spent in education. This may lead to an underestimate of the relationship between work experience and earnings if the individual was not actually employed during substantial parts of their life (such as the long-term unemployed or mothers who have taken time out of the labour force to care for their children). WERS04 also does not have information on actual experience over working life; potential experience (age minus education and infant years) is used instead and the results need to be interpreted with this caveat in mind.

The length of the time the employee spent in employer-provided training in the previous year is also included in the dataset; this measure of training is expected to be positively related to wages (Hashimoto, 1981; Almeida-Santos and Mumford, 2005). Training periods are some 50 per cent higher in the public sector, they are also a little (around 10 per cent) higher for women.

The earnings function is augmented with the inclusion of further categories of explanatory variables capturing individual employee characteristics such as demographic variables (which may constrain an individual's choice of jobs including the presence of dependent children, marital status, ethnic identification, and physical disability); individual job characteristics (being on a fixed term contract, and union membership); and occupation.

Considering the demographic variables in more detail, just over a third of British full-time employees have at least one dependent child (Table A2), more so for males (42 per cent) than females (25 per cent). Close to two thirds of employees are

partnered or married (again more so for males, 71 per cent, than females, 61 per cent). There are more private sector employees who consider themselves to be of a non-white ethnic background (6 per cent) than public sector employees (4 per cent); with little difference across the genders. Finally, a substantial proportion of the workforce has an ongoing physical disability (12 per cent of the men and 11 per cent of the females).

Amongst the individual job characteristics, some 3 per cent of employees are hired on fixed term contracts, reflecting a more insecure employment future. These employment contracts are more common in the public sector (4 per cent) than in the private sector (2 per cent) but not significantly different across the genders. Current job tenure (uncompleted spells) is on average 5.2 years (5.5 for men and 4.6 for women). Tenure is also higher in the public sector (5.9 per cent) than in the private sector (5 per cent). Current job tenure is expected to be positively related to wages primarily because it reflects a successful match between employee and employer (Mumford and Smith, 2004). Returns to current job length have often been found to be very small and the major action with this variable in the literature appears to be capturing the wage gains associated with changing jobs (Manning and Robinson, 2004).

Union membership has declined dramatically in Britain since the 1970s. Nevertheless, in 2004 it was still substantial at 32 per cent of full-time employees representing a potentially major source of bargaining power (in 1998 it was 39 per cent). Union membership rates are very similar across the genders but are very much higher in the public sector (69 per cent) than in the private sector (21 per cent). The union may provide a voice mechanism for the individual thereby leading to less quits, longer tenure and higher wages (Freeman and Medoff, 1984, Chatterji 2007). Unions may also, however, provide a range of other services to their members, which could increase relative job satisfaction and reduce the wage. On balance, a positive relationship between union membership and the wage is expected.

Considering the distribution of occupations amongst the full-time employees in our data, in general, those occupations typically associated with higher skills (professional, technical, clerical) are more likely to occur in the public sector. (With the exception of the highly skilled managers, who are also more likely to be employed in the private sector.) Analogously, the lower skilled occupations (crafts, personal services, sales, operative and assembly workers and the unskilled) are more likely to

be employed in the private sector. In aggregate, women are less likely to be managers, professionals, craftsmen, operative and assembly workers, or unskilled. They are much more likely to be employed in the technical, clerical, personal services, or sales occupations. In gender related studies occupational choice, at an individual level, is often treated in much the same way as educational outcome since they both reflect a range of variables, including individual ability, incentive and opportunity (Becker, 1993; Filer, 1986). Occupational choice may, of course, be constrained and these constraints may vary over the life cycle especially for part-time female employees (Manning and Petrongolo, 2007; Connolly and Gregory, 2007). Analysing only full-time employees excludes this potential source of unobserved heterogeneity. Even with longitudinal matched employee-workplace data, one can't expect to deal with all of the potential simultaneity problems when analysing a sample that includes both men and women (as highlighted by Becker⁸ in his original treatise). There are further potential problems in the interpretation of the impact of human capital variables in gender wage gap studies related to neglected heterogeneity. These would not be solved by using longitudinal matched employee-workplace data if ability, choice and incentive are not constant over time (Kunze, 2007).

3.2 Workplace characteristics

A range of workplace characteristics are included in the analyses, which may be considered in groups: structural conditions; employment conditions; and industrial relations measures.

Structural conditions are captured by: workplace size, if the workplace is foreign controlled, regions and, of course, being in the public or private sector⁹. British workplaces are dominated by small workforces, however, large workplaces employ a disproportionately large number of total employees (Kersley et al, 2006;

⁸ Incentives may be also time varying and complex; further complicating the relationship between education and occupation. For example, Becker (1993: page 193) discusses the possibility of female rates of return from college education being lower as they may enter college to seek a 'more desirable' husband rather than aiming for long term employment.

⁹ A further issue concerns unobservable heterogeneity in true worker quality in the two sectors, this is particularly relevant to studies exploring changes in returns in the two sectors over time. Disney and Gosling (1993 and 2003) use changes in those occupations shifted from the public to the private sector to analyse this effect. Nickel and Quintini (2002), using evidence from age 10 and 11 test scores from the National Child Development Survey (NCDS) and the New Earnings Survey (NES), argue that a decline in public sector relative to private sector pay adversely affects the quality of males in the public sector, but not females. Their paper emphasises the need to control fully for the individual characteristics of public sector employees, but also raises the question of why the different genders may respond differently to the characteristics of public sector workplaces.

page 13). This is reflected in the large average sizes reported in Table A2. On average, private sector workplaces have 355 full-time employees, whilst public sector establishments are some three times larger. Females, on aggregate, tend to work in larger workplaces.

The measures of employment conditions include: if employees receive performance based pay; if the workplace has pension provision; the extent of team working, if any of the workforce operate in quality circles; if employees have a lot of discretion over their work; if employee briefing systems are in place; and the availability of family-friendly work practices.

Performance related pay is not surprisingly much more common in the private sector than the public sector (Burgess and Ratto, 2003) and is slightly more common amongst males than females. A positive relationship between earnings and performance related pay is expected as employees typically respond positively to the incentive effects associated with such a pay system (Lemieux et al, 2007). The relationship between productivity and pension provision is complex (see Disney et al, 2004), nevertheless, there is a strong positive correlation between high paying jobs and access to occupational pension plans in Britain (see Disney et al, 2004; page 244).

Team working may be particularly important for efficient outcomes in the public sector where monitoring worker effort may be more difficult than it is in the private sector (Burgess and Ratto, 2003; page 289). It may also be that the interaction between team members allows for greater skill transmission and increased productivity in both sectors (Hamilton et al, 2003).

Operating in quality circles, having a lot of discretion over how work tasks are carried out and an effective employee briefing system are all characteristics of a management structure that facilitates employee-employer interactions and employee responsibility for outcomes. A positive relationship is predicted between such policies and average earnings (Simpson, 2006; Burgess and Ratto, 2003).

A less well documented human resource management policy associated with firm performance is the presence of family friendly work practices. Budd and Mumford (2003), using WERS98, find positive payoffs in terms of workplace performance indicators and lower levels of employee absenteeism for workplaces with higher values of this index (see also Dex and Smith 2002; Equal Opportunity Commission, 2006; and Gray, 2002). The use of an index to capture family friendly work practices is commonly used to capture the multi-faceted aspects of these policies.

The index of family friendly work practices used in this study ranges from zero to six depending on how many of the following practices are available: paternity leave with full normal weekly pay; maternity leave with full normal weekly pay; home working; job sharing; child care; and/or paid family leave. A positive relationship is also expected between family friendly work practices and earnings.

The summary statistics in Table A2 reveal quite different levels of the measures of employment conditions. With the exception of performance related pay, females are more likely to say they are available to them (although often this difference is not substantial and is indeed equally as likely for quality circles). The public sector is also more likely to offer these employment conditions than the private sector, again with the exception of performance related pay.

Finally, amongst the workplace characteristics are measures of the industrial relations practices at the workplace: if there is collective bargaining; if there are equal opportunities provisions; and if there are formal grievance procedures. Whilst males and females report similar averages for the presence of these measures, they are much more likely to occur in the public sector than in the private.

3.3 Within sector differences in characteristics across the groups of employees

Considering sector differences within gender in more detail (Table A3), the findings discussed above are still typically true. For example, public sector employees have more potential experience *ceteris paribus*, as do males. They are more likely to have a dependent child and so on.

Amongst those mean characteristics that reveal differences within gender and sector is the ethnic mix, 4 per cent of all public sector employees regardless of gender consider themselves to be from an ethnic background. In the private sector these figures are higher at 6 per cent for men and 8 per cent for women. Union membership can now also be seen to be consistently lower for private sector and female employees, with only 16 per cent of women employed in the private sector having current membership. Similarly amongst occupations, females in the public sector are clearly the least likely to be managers of the four categories of employees; in the private sector there is little difference between the proportion of males and females who are managers. In contrast, female public sector employees are much more likely to be professionals (with females in the private sector being least likely).

There is very little difference across genders in the measures of employment conditions discussed above; Table A3 reveals that these differences are essentially related to the sector the workplace occurs in. This is also typically the case for the industrial relations measures, with the exception of collective bargaining where, within sectors, females are less likely to be employed in workplaces with these characteristics.

4. Estimation of the earnings functions

Using semi-logarithmic wage equations, the earnings equation is estimated as:

$$W_i = \alpha + X_i\beta + Z_k\gamma + \varepsilon_i \quad (1)$$

where W_i is the natural log of the wage for individual i ; α is the intercept term; X_i is a vector of regressors measuring a range of individual characteristics; workplace k characteristics are measured in the vector of regressors Z_k ; and ε_i is a residual term.

We estimate models separately for each of the groups of employees, public sector males and females and private sector males and females. Pooling of models for males and females is a common approach (see Bayard et al, 2003, for example). We take the view, however, that models for male and female public sector and private sector employees may be more likely to produce different parameters than those for all employees. This is borne out in the results shown below.

Robustness of the estimation results is of clear concern. The nature of the earnings data in WERS04 presents an issue for the construction of the earnings series employed in this paper. As noted above, the earnings data in WERS04 is banded. As Stewart (1983) discusses, it is possible, in principle, that this banding may affect the properties of the ordinary least squares estimates of the earnings function that we estimate. In unreported results (available from the authors) we provide a full set of estimates employing the appropriate (and suitably weighted) interval regression method. Comparison of the estimates confirms that interval estimates are very similar to the ordinary least squares estimates. We therefore concentrate our analysis on the ordinary least squares estimates.

5. Estimation Results

The estimates of the earnings function for each of the four groups of employees are presented in Table 1. These are the estimates for public sector male, public sector

female, private sector male and private sector female full-time employees, respectively. In each case we estimate the models with ordinary least squares, fully allowing for the complex survey design of the data set and the need to weight accordingly. Overall, the parameter estimates are generally well defined and have the expected sign.

Reading across the columns in Table 1, the return to potential experience is higher in the private sector and they are higher for women within the sectors. We expect the returns from experience for women to be biased downwards as the measure of experience used is likely to overestimate the time they actually spent in employment. Current job tenure is rewarded similarly for men and women across sectors. The returns from education are higher for men than women across sectors, and higher in the public sector than in the private sector within gender. Postgraduate females in the private sector have a rate of return which is some 50 per cent lower than postgraduate males in the public sector. There is no significant evidence of men receiving higher earnings associated with recent training, unlike women in both sectors where a relative small impact is found. Vocational qualifications are similarly only significantly related to earnings for women.

Of the remaining individual characteristics, being married and having a dependent child are only associated with higher earnings for men. In contrast, having a dependent child is linked to lower wages for females in the private sector. Being on a fixed-term contract or a union member is not related to earnings for any of the four types of employees.

The relative returns to occupation (relative to the omitted craft category) are substantially higher for females than males, and there is not a clear pattern in these returns across the sectors. In the public sector, highly skilled occupations are relatively poorly rewarded for men but well rewarded for women (with female managers receiving almost twice the relative return than the male managers in this sector, and almost three times as much for professionals). Amongst the lower skilled occupations there is little difference across the sectors in relative returns, but males are seen to be more heavily penalised than females.

Considering the workplace characteristics, there are few characteristics shown to be significantly related to wages in the public sector. This may be due to a lack of variability in these characteristics across these workplaces. An exception is the availability of family friendly work practices which has a similar sized significant

positive relationship for all the groups except for men in the public sector. Performance related pay and pensions provision are strongly related to higher earnings in the private sector, as is team working to a lesser extent. Collective bargaining is only associated with higher pay for male private sector employees.

Regional measures are included in the models essentially as additional structural controls, unsurprisingly, employees in the London area receive substantially higher wages and this impact is similar across sectors and genders. For men there is also some gain from living in the south-east (and also the east of England in the private sector).

6. Decomposing the earnings gaps

The estimates we have for the four groups of employees allow us to examine a number of earnings gaps. The approach we adopt to apportion the gap in the mean earnings of any two groups is that discussed in Oaxaca and Ransom (1994). In general, the decomposition of the mean earnings gap between groups of employees a and b is calculated as:

$$\bar{W}_a - \bar{W}_b = \left\{ \left(\bar{X}_a - \bar{X}_b \right) \hat{\beta}_a + \left(\bar{Z}_a - \bar{Z}_b \right) \hat{\gamma}_a \right\} + \left\{ \bar{X}_b \left(\hat{\beta}_a - \hat{\beta}_b \right) + \bar{Z}_b \left(\hat{\gamma}_a - \hat{\gamma}_b \right) \right\} \quad (4)$$

for the model described in equation (3) above. In this calculation $\left(\bar{X}_a - \bar{X}_b \right) \hat{\beta}_a$ captures the impact of the difference in the individual characteristics weighted by the parameters from the model for group a ; $\left(\bar{Z}_a - \bar{Z}_b \right) \hat{\gamma}_a$ captures the impact of the difference in the characteristics of the workplaces where groups a, b work, again weighted by the parameters from the model for group a ; and $\left\{ \bar{X}_b \left(\hat{\beta}_a - \hat{\beta}_b \right) + \bar{Z}_b \left(\hat{\gamma}_a - \hat{\gamma}_b \right) \right\}$ is the remaining unexplained gap. The decompositions are presented in Figure 1.

Figure 1 lays out the four sub-samples of concern (public sector male, private sector male, public sector female and private sector female). Each total bilateral earnings gap is presented next to an arrow indicating the direction of the comparison. Thus, the earnings gap between male public sector and male private sector full-time employees in Britain is 11.8 log per cent (or log wage points). This earnings gap can be decomposed into the component explained by differences in the mean values of

their individual characteristics which make up the major component of 8.64 log percentage points (or 73% of the raw gap); differences in the mean values of their occupational characteristics which make up 2.58 log percentage points (22%); differences in the mean values of their workplace characteristics which make up a further 2.49 log percentage points (21%); and an unexplained component of -1.96 log percentage points (17%). The four components summing to the earnings gap of 11.8 log per cent. The contribution of the differences in the characteristics (individual, occupational and workplace) is evaluated using the parameters from the model for the higher earnings group (a in equation 2). The unexplained component results from differences in the parameters for the two groups evaluated at the mean values of the individual characteristics for the lower wage group (b in equation 2).

The earnings gap between public sector and private sector male employees is therefore due to the former having more productive characteristics (or at least characteristics that are more likely to be associated with higher pay) especially individual characteristics. Indeed, the size and sign of the negative unexplained component suggests that not only do males working in the private sector have less productive characteristics on average than do males in the public sector; they are also being relatively over-rewarded for their characteristics.

Similar analyses can be carried out for the three other bilateral earnings gaps¹⁰ presented in Figure 1. In aggregate, across-sector but within-gender comparisons reveal that public sector employees are more likely to have individual characteristics associated with high pay¹¹. They are also more likely to work in high paid occupations and in workplaces with high paying characteristics. Finally, the unexplained components in the earnings gaps are different in size but similar in relative scale (16.6 per cent of the raw gap for males and 19.3 per cent for females), however, male private sector employees are over rewarded for their characteristics whilst female private sector employees are under rewarded¹².

¹⁰ The fifth bilateral gap, not included in Figure 1, is that between male public sector and female private sector employees. Unsurprisingly, given the information in Figure 1, the earnings gap between these employees is 31.3 log percent, differences in the mean values of their: individual characteristics make up 13.31 log percentage points (or 43%); occupational characteristics make up 1.01 log percentage points (3%); workplace characteristics a further 2.0 log percentage points (6%); and the unexplained component is 15.01 log percentage points (48%).

¹¹ 8.86 log percentage points of the 11.8 log per cent gap for males, or 73%, and 8.78 log percentage points of the 24.3 log percent gap for females, or 36%.

¹² By 4.68 log percentage points or 19% of the 24.3 log per cent gap.

Across-gender but within-sector analysis shows that males are more likely to have individual characteristics associated with higher pay (although the extent of this distribution is not as strong as across public and private sectors); females are more likely to work in occupations and workplaces with higher paying characteristics; and there are substantial unexplained components in the gender pay gaps (more than 100% in the public sector and 81% in the private sector).

An important policy response in these cases could be more effective application of equal pay legislation. Strictly speaking, equal pay policies might only be applied to jobs that obviously have the same characteristics; however, the Equal Pay Act that was passed in Britain in 1970 included a broad concept of equity allowing for some comparisons between jobs typically performed by women and jobs typically performed by men. We find substantial within-sector, within-occupation earnings gap which should have been amenable to such an equal pay policy response. The new Gender Equality Duty (GED) is a statutory duty which came into force in April 2007¹³ may be shown to be more effective in the future. According to the GED, all public authorities in Britain must demonstrate that they are promoting equality for women and men and that they are eliminating sexual discrimination and harassment¹⁴.

The decomposition results (Figure 1) show that the nature of the public private pay gap differs between genders and that of the gender pay gap differs between sectors. Whilst the public private pay gap for men is substantial, we show that it can be explained by weighted differences in the means of the variables that determine earnings. This is in contrast with the public private earnings gap for women where more than one fifth of the gap remains unexplained.

When examining within sector gender gaps, the situation is very different. The raw gender earnings gap in the private sector is almost 20 log per cent, nearly three times that in the public sector. In both cases most of this raw gender gap is

¹³ “The gender equality duty comes into force in April 2007 and is the biggest change in sex equality legislation in thirty years, since the introduction of the Sex Discrimination Act itself. It has been introduced in recognition of the need for a radical new approach to equality – one which places more responsibility with service providers to think strategically about gender equality, rather than leaving it to individuals to challenge poor practice.” Jenny Watson. (Chair, Equal Opportunities Commission. November 2006 cited in Equal Opportunities Commission 2006b, page 2).

¹⁴ The Equality Act 2006 amends the Sex Discrimination Act to place a statutory duty on all public authorities, when carrying out their functions, to have due regard to the need: to eliminate unlawful discrimination and harassment; and to promote equality of opportunity between men and women. This is known as the 'general duty' and came into effect on 6 April 2007. The duty applies to all public authorities in respect of all of their functions. (Equal Opportunities Commission 2006b, pages 4 to 7).

unexplained in the results presented here. A part which is due to males having individual characteristics that are better rewarded than females in both sectors is essentially offset by the impact of the occupation. Whilst these gender gaps remain unexplained, we can say that a large proportion of the difference between the gender pay gaps within the public and private sectors is due to women in the public sector being paid substantially more than those in the private sector. As discussed above, most of this within sector gap can be explained but a substantial part remains unexplained.

The contribution of differences in workplace characteristics to the public private earnings gap is substantial and significant. Of these, structural factors appear unimportant, contributing less than 0.5 log percentage points of the gap for males or females. Industrial relations measures contribute 2.2 log percentage points for men and 1.3 log percentage points for women; the presence of collective bargaining being the most important. Finally, employment conditions contribute a substantial 3.8 log percentage points for women and 0.9 log percentage points for men.

The presence of performance pay and a pension scheme are associated with higher earnings in the private sector for men and women. In both cases this is because there is higher incidence in the private sector, confirming Burgess and Metcalfe (1999), which reduces the earnings gap by 0.4 and 0.3 log percentage points for men and women, respectively. In addition, we find that the returns to these characteristics are higher in the private sector, further attenuating the public private earnings gap.

An important workplace characteristic for the earnings gap, however, is the presence of family-friendly work practices. The higher incidence of these practices in the public sector contributes 4.8 log percentage points to the female and 1.3 log percentage points to the male public private earnings gaps. In the case of men, this effect is more than offset by a difference in the returns to the presence of family friendly work policies. The earnings of men in the private sector are more positively associated with their presence providing a further attenuation of the public private earnings gap.

7. Conclusions

The raw public private earnings gap for full-time employees in Great Britain is, on average, some 14 log per cent. This figure hides important compositional detail. The gap for male employees is less than half that for females. Another way of presenting

this fact is that the gender earnings gap is three times larger in the private sector than it is in the public sector. The results in this paper show that whilst much of the public private earnings gap for males can be explained by individual characteristics, occupation and workplace features, a substantial proportion of the gap for females remains unexplained. This is consistent with the finding that essentially the entire raw average gender earnings gap in either the public or private sectors remains unexplained after the analysis.

The possibility of including workplace information in the modelling of individual earnings allows for a more precise calculation of the explained part of the earnings gap. This paper shows that workplace features play an additional important role in the determination of individual earnings. Features expected to raise productivity in the workplace are shown to also increase individual earnings. Earnings are also positively influenced by the presence of performance related pay schemes and, importantly, the presence of family friendly work policies. The increased use of performance related pay in the private sector raises earnings there relative to the public sector, although not to a large extent. The increased presence of family friendly work policies in the public sector is significantly associated with higher earnings in the public sector, the more so for females. This largely contributes to the explained part of the public private earnings gap.

The explained part of the gender earnings gap in the private sector is due mostly to differences in the values of individual characteristics. However, more than four fifths of the gap remains unexplained. In the public sector the impact of a higher number of females in higher paid occupations offsets the impact of differences in individual characteristics leaving all of the raw gender earnings gap unexplained. The fact that the raw gap is much smaller than in the private sector suggests that the employment policy environment in the public sector is more conducive to higher relative female earnings.

The major component of the earnings gap between full-time men and women in Britain is associated with the gender effect. This finding suggests that the Equal Pay legislation in Britain has not been fully effective in either the public or the private sector. The recently introduced Gender Equality Duty adopts a new approach by placing the responsibility for devising, monitoring and providing a discrimination free work environment on public authorities. If the Gender Equality Duty proves to be effective, we should see the unexplained components of the gender gap fall in the

public sector in the near future. As yet, there is no additional legislation covering the private sector.

References

- Abowd, J.M., F. Kramarz, D.N. Margolis, D.N., and Troske, K. 2001. 'The Relative Importance of Employer and Employee Effects on Compensation: A Comparison of France and the United States.' *Journal of the Japanese and International Economies* 15(4): 419-436.
- Altonji, J.G. and Blank, R. 1999. 'Race and Gender in the Labor Market' in Ashenfelter, O. and Card, D. (eds.) *Handbook of Labor Economics*. Elsevier Science B.V, Amsterdam.
- Almeida-Santos, F. and Mumford, K. 2005. "Employee Training and Wage Compression in Britain." *The Manchester School* 73: 321-342.
- Anderson, T. Forth, J. Metcalf, H. and Kirby, S. 2004. 'The Gender Pay Gap.' *Women and Equality Unit Report*.
- Bayard, K., Hellerstein, J., Neumark, D. and Troske, K. 2003. "New Evidence of Sex Segregation and Sex Differences in Wages from Matched Employee-Employer Data." *Journal of Labor Economics* 21(4), 887-922.
- Becker, G.1993. *Human Capital* 3rd Edition. University of Chicago Press, Chicago.
- Bender K. A and Elliot, R (1999) "Relative Earnings in the UK Public Sector: The Impact of pay Reform on Pay Structure" in *Public Sector Pay Determination in the European Union*, ed. by Elliot, R, Lucifora, C and Meurs, D, Macmillan 1999.
- Bhaskar, V. and To, T. 1999. "Minimum Wages for Ronald Macdonald Monopsonies: A Theory of Monopsonistic Competition," *Economic Journal* 109, 190-203.
- Bhaskar,V. Manning, A. and To, T. 2002. "Oligopsony and Monopsonistic Competition in Labor Markets." *Journal of Economic Perspectives* 16, 155-174
- Blackaby, D. Murphy, P. and O'Leary, N. 1999. "The Payment of Public Sector Workers in the UK: Reconciliation with North-American Findings." *Economics Letters* 65, 239-243
- Budd, J. W. and Mumford, K. 2003. "Family Friendly Work Practices in Britain: Availability, Awareness and Workplace Performance". *Mimeo*, University of York.
- Budd, J. W. and Mumford, K. 2004. "Trade Unions and Family Friendly Work Practices in Britain." *Industrial and Labor Relations Review* 57(2); 204-222.
- Burgess, S and Metcalfe, D (1999). "The Use of Incentive Schemes in the public and private sectors: evidence from British Establishments", CMPO Working Paper 99/015.
- Burgess, S and Ratto, M (2003), "The Role of Incentives in the Public Sector: Issues and Evidence", *Oxford Review of Economic Policy*, Vol.19, No. 2, pp 285-300.
- Chatterji, M (2007) "Training Hold Up and Social Labour Markets" (in press, *Labour Economics*, Vol.15)
- Chiswick, B.R. 2003. "Jacob Mincer, Experience and the Distribution of Earnings." *IZA Discussion Paper* No. 847, Bonn.

- Connolly, S. and Gregory, M. 2007. 'Moving Down? Women's Part-Time Work and Occupational Change in Britain 1991-2001.' *Department of Economics, University of Oxford Working Paper* 302.
- Deaton, A. 1998. *The Analysis of Household Surveys. A Microeconometric Approach to Development Policy*. World Bank. John Hopkins University Press, Baltimore.
- Department of Trade and Industry. 2006. *Workplace Employee Relations Survey: Cross-Section, 2004 (computer file)*. 5th ed. Colchester: The Data Archive (distributor), 2006. SN: 5294.
- Dex, S. and Smith, C. 2002. *The Nature and Patterns of Family-Friendly Employment Policies in Britain* Bristol: Policy Press and the Joseph Rowntree Foundation.
- Dixit, A. 1997. "Power of Incentives in Private vs Public Organisations." *American Economic Review Papers and Proceedings* 87, 378-382.
- Disney, R. Emmerson, E. and Smith, S. 2004. "Pensions Reform and Economic Performance in Britain in the 1980s and 1990s", in R. Blundell, D. Card and R. Freeman (eds) *Seeking a Premier Economy: The Economic Effects of British Economic Reforms, 1980-2000*, (Chicago, Chicago University Press).
- Disney, R. and Gosling, A. 1998. "Does it Pay to Work in the Public Sector?" *Fiscal Studies* 19(4); 347-374.
- Disney, R. and Gosling, A. 2003. "A New Method for Estimating Public Sector Pay Premia: Evidence from Britain in the 1990's," CEPR Discussion Papers 3787.
- Drolet, M. 2002. *The "Who, What, When and Where" of Gender Pay Differentials*. Canada Statistics, The Evolving Workplace Series, 71-584-MIE, no. 4.
- Equal Opportunity Commission. 2006. "Family Friendly Working". <http://www.eoc.org.uk/default.aspx?page=15407> as cited on July 4, 2007).
- Equal Opportunity Commission. 2006b. *Gender Equality Duty Code of Practice England and Wales*
- Filer, R. 1986. "The Role of Personality and Tastes in Determining Occupational Structure." *Industrial and Labor Relations Review* 39, 412-424.
- Freeman, R B., and Medoff., J.L. 1984. *What Do Unions Do?* New York: Basic Books.
- Gray, H. 2002. "Family-Friendly Working: What a Performance! An Analysis of the Relationship Between the Availability of Family-Friendly Policies and Establishment Performance." *CEP Discussion Paper* 529.
- Groshen, E. 1991. "The Structure of the Female/Male Wage Differential. Is It Who You Are, What You Do, or Where You Work?" *Journal of Human Resources* 26(3): 457-472.
- Hamilton, B. Nickerson, J. and Owan, H. 2003. "Team Incentives and Worker Heterogeneity: An Empirical Analysis of the Impact of Teams on Productivity." *Journal of Political Economy* 111(3), 465-497.
- Hashimoto M. 1981. "Firm-specific Human Capital as a Shared Investment" *American Economic Review*, 71, 475-82.
- Hellerstein, J. Neumark, D. and McInerney, M. 2007. "Changes in Workplace Segregation in the United States Between 1900 and 2000: Evidence from Matched Employer-Employee Data." *NBER Working Paper* 13080.
- Joshi, H., and P. Paci, 1998. *Unequal Pay for Men and Women*. MIT Press, Cambridge Massachusetts.

- Kersley, B. Alpin, C. Forth, J. Bryson, A. Bewley, H. Dix, G. and Oxenbridge, S. 2006. *Inside the Workplace: First Findings from the 2004 Workplace Employment Relations Survey*.
- Kunze, A. 2007. "Gender Wage Gap Studies: Consistency and Decomposition." *Empirical Economics*, forthcoming.
- Lazear, E. 2000. "The Future of Personnel Economics" *Economic Journal*, 110 (467), F611-39
- Lemieux, T. MacLeod, W.B. and Parent, D. 2007. "Performance Pay and Wage Inequality" *IZA Discussion Paper* 2850.
- Luciflora, C. and Meurs, D. 2006. "The Public Sector Pay Gap in France, Great Britain and Italy." *Review of Income and Wealth* 52(1); 43- 59.
- Makepeace, G and Marcenaro, O. 2006. "The Earnings of Workers Covered by Pay Review Bodies: Evidence from the Labour Force Survey" *Report for the office of Manpower Economics*, <http://www.ome.uk.com/research.cfm>
- Manning, A. and Robinson, H. 2004. 'Something in the Way She Moves: A Fresh Look at an Old Gap.' *Oxford Economic Papers* 56: 169-188.
- Manning, A. and Petrongolo, B. 2006. 'The Part-Time Pay Penalty for Women in Britain.' *IZA Discussion Paper no. 2419*.
- Millward, N., Woodland, S., Bryson, A., Forth, J., Kirby, S., and Stokes, L. 2004. "A Bibliography of Research Based on the British Workplace Industrial Relations Survey Series." London: National Institute for Economic and Social Research.
- Mumford, K. and Smith, P.N. 2004. "Job Tenure in Britain: Individual versus Workplace Effects." *Economica* 71; 275-298.
- Mumford, K. and Smith, P.N. 2007. "The Gender Earnings Gap in Britain: Equal Pay versus Comparable Worth." *The Manchester School* 75(6); 653-672.
- Nickel, S and Quintini, G . 2002. "The Consequences of the Decline in Public Sector Pay in Britain: A Little Bit of Evidence", *Economic Journal*, Vol. 112, No.477, pp F85-F118
- Oaxaca, R.L., and Ransom, M.R. 1994. "On Discrimination and the Decomposition of Wage Differentials." *Journal of Econometrics* 61: 5-24.
- Postel-Vinay, F. and Turon, H. 2005. "The Public Pay Gap in Britain: Small Differences that (Don't?) Matter" *IZA Discussion Paper* 1637.
- Reilly, K. Garcia, J. Hernandez, P. Lopez-Nicolas, A. and Zanchi, L. 2006. 'The Why of More or Less: Evidence from Spain on Gender Segregation at the Establishment Level of the Firm.' *Mimeo* Department of Economics, University of Leeds (March).
- Simpson, H. 2006. "Productivity in Public Services". *Centre for Market and Public Organisation Working Paper* 07/164.
- Stewart, M. 1983. "On Least Square Estimation when the Dependent Variable is Grouped." *Review of Economic Studies* 50(4): 737-753.
- Trinder, C (1997), "Public Sector Pay" in Dan Corry ed. *Public Expenditure*, Dryden Press, 1997.
- Weichselbaumer, D., and Winter-Ebmer, R., 2005. 'A Meta-Analysis of the International Gender Wage Gap.' *Journal of Economic Surveys* 9(3): 479-511.

Table 1. Within sector earnings functions.

log hourly pay	male				female			
	public		private		public		private	
	coeff.	t-value	coeff.	t-value	coeff.	t-value	coeff.	t-value
potential experience	0.017	4.72*	0.026	12.44*	0.016	4.19*	0.030	9.72*
potential exp squared (x1000)	-0.220	-3.08*	-0.395	-9.71*	-0.250	-3.01*	-0.574	-8.56*
dependent child	0.054	2.72*	0.030	2.50*	0.028	1.42	-0.049	-2.36*
married	0.062	2.97*	0.081	5.98*	0.014	0.88	0.016	0.94
disabled	-0.025	-1.26	-0.022	-1.35	-0.016	-0.68	-0.015	-0.62
ethnic	0.037	0.82	-0.108	-3.81*	-0.041	-0.64	-0.119	-3.58*
education (omitted category is none or other):								
cse25	0.092	2.90*	0.060	3.23*	-0.007	-0.12	0.064	2.05*
cse1	0.138	5.72*	0.092	5.13*	0.111	2.52*	0.096	4.05*
ceae	0.079	1.02	0.099	3.31*	0.169	2.47*	0.122	2.43*
ce2ae	0.215	6.67*	0.218	8.89*	0.182	3.17*	0.179	5.15*
degree	0.266	10.18*	0.315	13.69*	0.255	5.05*	0.341	10.37*
postgraduate	0.455	9.09*	0.415	12.11*	0.296	5.29*	0.377	9.39*
vocational qualification	0.032	1.81	0.043	3.45*	0.011	0.49	0.056	3.46*
fixed contract	0.035	0.74	-0.099	-1.69	-0.080	-1.21	-0.050	-0.88
training	0.002	0.85	0.002	1.09	0.006	2.26*	0.006	2.28*
tenure	0.013	4.79*	0.010	5.18*	0.013	4.39*	0.010	3.61*
union member	0.004	0.18	0.003	0.17	-0.004	-0.23	0.015	0.64
occupations (omitted category is crafts):								
managerial	0.222	5.97*	0.259	12.23*	0.379	2.23*	0.299	4.98*
professional	0.136	2.78*	0.219	8.31*	0.334	1.93	0.367	5.35*
technical	0.145	3.75*	0.114	4.69*	0.207	1.22	0.235	4.17*
clerical	-0.062	-1.26	0.041	1.41	0.025	0.15	0.118	2.22*
personal	-0.148	-3.60*	-0.209	-4.99*	-0.053	-0.30	-0.166	-2.79*
sales	-0.012	-0.12	-0.217	-6.62*	-0.005	-0.03	-0.056	-0.97
operative	-0.183	-2.23*	-0.147	-6.80*	-0.045	-0.19	-0.052	-0.90

	male				Female			
	public		private		public		private	
	coeff.	t-value	coeff.	t-value	coeff.	t-value	coeff.	t-value
unskilled	-0.275	-6.40*	-0.290	-11.48*	-0.135	-0.77	-0.132	-2.21*
workplace size (/1000)	0.003	0.81	0.013	1.05	0.006	1.75	0.022	1.87
foreign owned			0.029	1.53			0.040	1.65
performance pay	0.025	0.99	0.056	3.11*	0.016	0.86	0.043	2.10*
pension provision	-0.069	-1.19	0.057	2.53*	0.026	0.56	0.073	3.04*
equal opportunity	0.011	0.13	-0.011	-0.47	-0.035	-0.97	-0.035	-1.25
family friendly index	0.007	0.58	0.025	3.77*	0.026	3.42*	0.023	3.14*
discretion over work	-0.003	-0.12	0.022	1.04	0.032	1.46	0.035	1.52
quality circles	0.044	0.72	-0.008	-0.25	0.018	0.53	-0.001	-0.02
team working	-0.013	-0.42	0.048	1.99*	-0.044	-1.32	0.087	3.14*
briefing system	0.092	1.83	0.016	0.68	-0.004	-0.14	0.011	0.40
collective bargaining	0.025	0.96	0.066	2.99*	0.024	1.21	0.038	1.37
grievance proc.	0.027	0.74	-0.036	-1.85	-0.001	-0.02	-0.040	-2.01*
regions (omitted category is east midlands):								
north east	-0.023	-0.47	-0.008	-0.15	-0.024	-0.48	-0.069	-1.13
north west	-0.058	-0.86	-0.013	-0.33	0.015	0.36	-0.052	-1.06
yorkshire & the humberside	-0.061	-1.60	0.046	1.20	0.023	0.53	-0.004	-0.07
west midlands	0.066	1.56	0.021	0.53	-0.007	-0.17	-0.036	-0.71
east of england	0.050	1.11	0.095	2.29*	0.083	1.90	-0.001	-0.01
london	0.207	3.99*	0.237	6.13*	0.239	5.05*	0.256	5.00*
south east	0.121	2.18*	0.144	3.87*	0.071	1.46	0.080	1.48
south west	-0.014	-0.29	0.030	0.79	-0.017	-0.36	0.017	0.33
scotland	0.029	0.63	0.012	0.26	0.057	1.33	-0.019	-0.34
wales	0.009	0.16	0.057	1.12	0.007	0.14	-0.096	-1.43
constant	1.523	15.18*	1.349	25.63*	1.467	7.92*	1.177	14.04*
No. observations		1489		5206		1414		2491
R squared		0.5539		0.5680		0.4820		0.5396

Source: WERS 2004. * Significant at a confidence level of 95% or above.

Fig. 1: Decomposition of the Earnings Gaps - Comparing Public and Private Sectors.

Indiv Char	8.64 lpp						5.03 lpp	Indiv Char	
Occupation	2.58 lpp						- 0.71 lpp	Occupation	
Workplace	2.49 lpp						- 0.59 lpp	Workplace	
Unexplained	- 1.96 lpp						15.85 lpp	Unexplained	
		Male Private							
		11.7 lpp				19.6 lpp			
Male Public					Female Private				
		7.0 lpp				24.3 lpp			
Indiv Char	2.88 lpp						8.78 lpp	Indiv Char	
Occupation	- 3.06 lpp						5.70 lpp	Occupation	
Workplace	- 0.23 lpp						5.16 lpp	Workplace	
Unexplained	7.43 lpp						4.68 lpp	Unexplained	
Female Public									

Notes:

Source: WERS 2004. Each total bilateral earnings gap is presented next to an arrow indicating the direction of the comparison.

In each case the contribution of each group of variables is evaluated using the parameters from the model for the lower earnings group. All figures are expressed in log-percentage points.

Appendix Table A1. Variable definitions.

Variable name	Variable definition
hourly pay	Average hourly pay. This is calculated by dividing the employee's gross (before tax and other deductions) weekly wages by the hours they usually work each week (including any overtime and extra hours). Whilst usual hours worked is a continuous measure, the survey responses for gross weekly wages are banded in the data set. There are 14 bands and the midpoints of these bands are used.
log hourly pay	The natural log of average hourly pay
Individual characteristics:	
potential experience	Age minus (approximate years of schooling plus 5), measured in years.
training	Days of training in the previous twelve months [midpoints of 6 bars, top coded at 10 days]
education measures;	
none/ other	Has none of the academic qualifications listed and/or has other academic qualifications than those listed
cse25	Highest level of education is GCSE grades D-G; CSE grades 2-5 SCE; O grades D-; SCE Standard grades 4-7.
cse1	Highest level of education is GCSE grades A-C; GCE O-level passes; CSE grade 1 SCE; O grades A-C; or SCE Standard 1-3
gceae	Highest level of education is GCE A-level grades A-E; 1-2 SCE; Higher grades A-C, As levels
gce2ae	Highest level of education is 2 or more GCE; A-levels grades A-E; 3 or more SCE; or Higher grades A-C
degree	Highest level of education is a first degree, eg BSc, BA, HND, HNC Ma at first degree level
postgraduate	Highest level of education is a higher degree, eg MSc, MA, PGCE, PhD
child	Has a dependent child aged below 18
married	Married or living with a partner
disabled	Has a long term (>1 year) illness/disability
ethnic	Employee considers they are white and black Caribbean; white and black African; white and Asian; any other mixed background; Indian; Pakistani; Bangladeshi; any other Asian background; Caribbean; African; any other black background; Chinese; or any other ethnic group.
fixed contract	Employed on a fixed term contract
hours	Usual hours worked per week (includes over time)
full time	Working full time, if standard working hours is greater than 36
tenure	Years at this workplace [midpoints of 5 bars, top coded at 10 years]
union	Employee is a union member
occupation categories;	
managerial	Managerial
professional	Professional
technical	Technical
clerical	Clerical
craft	Craft service
personal	Personal service
sales	Sales and customer services
operative	Operative and assembly workers
unskilled	Unskilled

Workplace characteristics:

public sector	The formal status of this establishment (or the organisation) is described as: government-owned limited company / nationalised industry/T); public service agency; other non-trading public corporation; quasi autonomous national government organisation (QUANGO); local/central government (inc. NHS and Local Education Authorities).
private sector	The formal status of this establishment (or the organisation) is described as: public limited company (plc); private limited company; company limited by guarantee; partnership (inc. limited liability partnership/self-prop); trust / charity; body established by royal charter; co-operative / mutual / friendly society.
workplace size	Total number of employees in the workplace
foreign owned	Foreign controlled workplace
performance pay	Whether any employees in the workplace are paid by results or receive merit pay.
pension provision	If employer provided pension is available to the largest occupation group in the workplace.
equal opportunity	Workplace has a formal written equal opportunity policy
family friendly index	Index of Six Family Friendly Policies available at the workplace: paternity leave; maternity leave; home working; job sharing; childcare; paid leave.
paternity leave	If employees on paternity leave receives the normal, full rate of pay
maternity leave	If employees on maternity leave receives the normal, full rate of pay
home working	If employees can work at home
job sharing	If a job sharing scheme exists in the workplace
child care	If a workplace nursery or child care subsidy is available at the workplace
paid leave	If paid family leave is available
quality circles	Fraction of the workforce in quality circles
team working	Fraction of workforce operating in formal work teams
briefing system	Recognised system of briefing employees exists
discretion over work	Has a lot of discretion over how they work
collective bargaining	If pay is set via collective bargaining
grievance procedure	Collective grievance procedure present at the workplace
regions:	
north east	north east of England
north west	north west of England
yorkshire & the humber	Yorkshire & the Humberside
east midlands	east midlands of England
west midlands	west midlands of England
east of england	east of England
london	London
south east	south east of England
south west	south west of England
scotland	Scotland
wales	Wales

Source: WERS 2004.

Appendix Table A2. Sample means for the aggregate samples.

	full sample		public		private		males		females	
	mean	s.e.	mean	s.e.	mean	s.e.	mean	s.e.	mean	s.e.
hourly pay	9.72	0.108	10.53	0.154	9.48	0.131	10.23	0.132	8.78	0.114
log hourly pay	2.17	0.011	2.28	0.014	2.14	0.013	2.22	0.013	2.08	0.013
potential experience	23.06	0.208	24.66	0.292	22.60	0.251	24.32	0.235	20.74	0.301
potential exp squared	685.2	9.842	740.9	14.138	669.2	11.901	740.9	11.805	583.2	13.441
dependent child	0.36	0.006	0.37	0.011	0.35	0.007	0.42	0.007	0.25	0.009
married	0.67	0.006	0.70	0.012	0.66	0.007	0.71	0.007	0.61	0.010
disabled	0.12	0.004	0.13	0.008	0.11	0.004	0.12	0.005	0.11	0.006
ethnic	0.06	0.005	0.04	0.005	0.06	0.006	0.06	0.005	0.07	0.009
education measures:										
educ none	0.17	0.006	0.10	0.009	0.19	0.008	0.21	0.008	0.11	0.008
educ other	0.06	0.003	0.05	0.005	0.07	0.004	0.07	0.004	0.06	0.005
cse25	0.11	0.004	0.07	0.006	0.12	0.005	0.11	0.005	0.09	0.006
cse1	0.24	0.006	0.24	0.013	0.24	0.007	0.22	0.007	0.29	0.010
ceae	0.05	0.003	0.05	0.005	0.04	0.003	0.04	0.003	0.05	0.005
ce2ae	0.08	0.003	0.09	0.008	0.07	0.004	0.07	0.004	0.09	0.006
degree	0.21	0.007	0.26	0.015	0.19	0.008	0.20	0.008	0.22	0.009
postgraduate	0.07	0.004	0.11	0.009	0.06	0.005	0.07	0.005	0.07	0.005
vocational qualification	0.61	0.008	0.69	0.014	0.58	0.009	0.60	0.010	0.62	0.011
fixed contract	0.03	0.002	0.04	0.005	0.02	0.003	0.02	0.003	0.03	0.003
training	2.70	0.056	3.79	0.111	2.39	0.063	2.55	0.066	2.97	0.075
tenure	5.19	0.073	5.85	0.139	5.00	0.083	5.51	0.081	4.60	0.096
union member	0.32	0.011	0.69	0.015	0.21	0.011	0.32	0.013	0.31	0.012
occupations:										
managerial	0.15	0.005	0.09	0.009	0.16	0.006	0.16	0.007	0.13	0.008
professional	0.11	0.006	0.20	0.014	0.09	0.007	0.12	0.007	0.11	0.007
technical	0.15	0.006	0.25	0.014	0.13	0.007	0.13	0.007	0.19	0.009
clerical	0.15	0.006	0.22	0.016	0.13	0.006	0.07	0.005	0.28	0.011
craft	0.11	0.007	0.05	0.014	0.12	0.008	0.16	0.010	0.01	0.004
personal	0.04	0.003	0.07	0.007	0.03	0.004	0.02	0.003	0.07	0.007
sales	0.06	0.005	0.01	0.003	0.07	0.007	0.04	0.004	0.09	0.009
operative	0.12	0.007	0.03	0.007	0.15	0.009	0.17	0.009	0.05	0.008

	full sample		public		private		males		females	
	mean	s.e.	mean	s.e.	mean	s.e.	mean	s.e.	mean	s.e.
unskilled	0.11	0.007	0.09	0.013	0.11	0.008	0.13	0.009	0.05	0.006
workplace size	513.90	57.7	1068.95	232.4	354.99	25.0	46942	45.9	595.02	88.7
foreign owned	0.17	0.013			0.22	0.017	0.19	0.016	0.13	0.012
performance pay	0.51	0.017	0.37	0.032	0.54	0.020	0.52	0.020	0.49	0.020
pension provision	0.79	0.015	0.96	0.018	0.74	0.018	0.78	0.018	0.80	0.015
equal opportunity	0.85	0.012	0.99	0.008	0.81	0.015	0.83	0.014	0.88	0.012
family friendly index	2.96	0.050	4.39	0.063	2.55	0.055	2.83	0.059	3.19	0.052
discretion over work	0.22	0.014	0.22	0.027	0.22	0.017	0.21	0.016	0.24	0.017
quality circles	0.14	0.008	0.14	0.013	0.14	0.010	0.14	0.010	0.14	0.009
team working	0.69	0.013	0.81	0.024	0.65	0.015	0.66	0.015	0.74	0.013
briefing system	0.82	0.013	0.94	0.012	0.78	0.017	0.80	0.017	0.85	0.014
collective bargaining	0.35	0.015	0.72	0.028	0.24	0.016	0.35	0.017	0.34	0.018
grievance proc.	0.57	0.016	0.85	0.020	0.49	0.020	0.56	0.019	0.59	0.019
regions:										
north east	0.04	0.007	0.07	0.021	0.03	0.007	0.04	0.009	0.04	0.007
north west	0.15	0.013	0.15	0.025	0.15	0.015	0.15	0.014	0.15	0.016
yorkshire & the humberside	0.10	0.012	0.11	0.018	0.10	0.014	0.10	0.013	0.10	0.014
east midlands	0.08	0.009	0.07	0.015	0.08	0.011	0.08	0.010	0.07	0.011
west midlands	0.10	0.011	0.09	0.027	0.10	0.012	0.10	0.013	0.09	0.013
east of england	0.10	0.010	0.10	0.021	0.09	0.012	0.09	0.012	0.10	0.011
london	0.10	0.010	0.08	0.014	0.10	0.012	0.09	0.011	0.11	0.012
south east	0.13	0.012	0.12	0.021	0.13	0.014	0.12	0.014	0.13	0.013
south west	0.08	0.009	0.06	0.014	0.09	0.011	0.08	0.010	0.09	0.010
scotland	0.10	0.011	0.11	0.023	0.09	0.012	0.11	0.014	0.08	0.009
wales	0.04	0.006	0.06	0.013	0.03	0.006	0.04	0.006	0.04	0.007
female	0.35	0.009	0.48	0.018	0.32	0.010				
public sector	0.22	0.011								
No. observations		10600		2903		7697		6695		3905

Source: WERS 2004.

Appendix Table A3. Sample means by gender and sector.

	male				female			
	public		private		public		private	
	mean	s.e.	mean	s.e.	mean	s.e.	mean	s.e.
hourly pay	10.97	0.222	10.07	0.155	10.06	0.150	8.22	0.145
log hourly pay	2.315	0.021	2.198	0.015	2.245	0.014	2.002	0.016
potential experience	26.22	0.406	23.91	0.270	22.96	0.409	19.78	0.385
potential exp squared	810.9	20.890	725.7	13.573	665.2	19.368	547.7	17.058
dependent child	0.45	0.017	0.41	0.008	0.27	0.015	0.23	0.011
married	0.75	0.014	0.69	0.008	0.65	0.017	0.59	0.013
disabled	0.14	0.012	0.12	0.005	0.13	0.011	0.10	0.007
ethnic	0.04	0.007	0.06	0.006	0.04	0.008	0.08	0.012
education measures:								
educ none	0.14	0.015	0.22	0.009	0.06	0.008	0.14	0.011
educ other	0.06	0.007	0.07	0.005	0.05	0.007	0.06	0.006
cse25	0.09	0.010	0.12	0.006	0.05	0.006	0.11	0.008
cse1	0.21	0.014	0.22	0.007	0.27	0.018	0.29	0.012
ceae	0.05	0.006	0.04	0.003	0.07	0.008	0.05	0.005
ce2ae	0.08	0.009	0.07	0.004	0.11	0.011	0.09	0.007
degree	0.24	0.019	0.19	0.009	0.28	0.018	0.20	0.011
postgraduate	0.11	0.013	0.06	0.006	0.12	0.012	0.05	0.006
vocational qualification.	0.67	0.019	0.58	0.011	0.71	0.016	0.58	0.014
fixed contract	0.03	0.006	0.02	0.003	0.05	0.007	0.02	0.004
training	3.56	0.162	2.33	0.072	4.04	0.111	2.50	0.092
tenure	6.34	0.162	5.33	0.090	5.32	0.165	4.29	0.111
union member	0.74	0.018	0.23	0.013	0.65	0.018	0.16	0.014
occupations:								
managerial	0.12	0.012	0.17	0.008	0.07	0.010	0.15	0.010
professional	0.16	0.017	0.11	0.008	0.24	0.017	0.06	0.007
technical	0.24	0.022	0.11	0.007	0.25	0.016	0.17	0.012
clerical	0.12	0.016	0.06	0.005	0.32	0.021	0.27	0.013
craft	0.10	0.024	0.17	0.011	0.00	0.001	0.02	0.005
personal	0.06	0.011	0.01	0.002	0.07	0.009	0.07	0.009
sales	0.01	0.003	0.04	0.005	0.01	0.004	0.12	0.013

	male				female			
	public		private		public		private	
	mean	s.e.	mean	s.e.	mean	s.e.	mean	s.e.
operative	0.05	0.012	0.19	0.011	0.00	0.002	0.07	0.012
unskilled	0.14	0.021	0.13	0.010	0.03	0.006	0.07	0.008
workplace size	904.2	213.6	374.7	28.9	1247.6	270.4	312.17	23.4
foreign owned	0.00	0.000	0.24	0.019	0.00	0.000	0.19	0.017
performance pay	0.38	0.039	0.54	0.022	0.35	0.034	0.55	0.024
pension provision	0.96	0.027	0.74	0.021	0.96	0.011	0.74	0.021
equal opportunity	0.99	0.007	0.79	0.017	0.98	0.012	0.84	0.017
family friendly index	4.31	0.078	2.51	0.063	4.48	0.068	2.63	0.058
discretion over work	0.20	0.030	0.21	0.019	0.23	0.030	0.24	0.020
quality circles	0.12	0.014	0.14	0.012	0.15	0.015	0.14	0.012
team working	0.76	0.035	0.63	0.017	0.85	0.015	0.69	0.017
briefing system	0.94	0.016	0.77	0.020	0.94	0.015	0.81	0.019
collective bargaining	0.77	0.034	0.26	0.018	0.68	0.031	0.19	0.019
grievance proc.	0.86	0.024	0.50	0.022	0.84	0.022	0.48	0.024
regions:								
north east	0.07	0.030	0.04	0.009	0.06	0.016	0.03	0.007
north west	0.14	0.027	0.15	0.016	0.15	0.029	0.16	0.019
yorkshire & the humberside	0.10	0.021	0.09	0.015	0.11	0.021	0.10	0.019
east midlands	0.07	0.017	0.08	0.012	0.07	0.016	0.07	0.015
west midlands	0.09	0.027	0.11	0.014	0.10	0.029	0.09	0.013
east of england	0.07	0.021	0.10	0.014	0.12	0.025	0.09	0.012
london	0.06	0.013	0.10	0.013	0.10	0.020	0.11	0.014
south east	0.13	0.028	0.12	0.015	0.10	0.018	0.15	0.017
south west	0.05	0.014	0.08	0.012	0.07	0.017	0.09	0.013
scotland	0.15	0.037	0.10	0.015	0.08	0.016	0.08	0.011
wales	0.06	0.018	0.03	0.006	0.05	0.012	0.04	0.009
No. observations		1489		5206		1414		2491

Source: WERS 2004.