PUBLIC SECTOR WAGE DIFFERENTIALS IN GREAT BRITAIN

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This paper is circulated for discussion purposes only and its contents should be considered preliminary.

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Abstract :

The paper considers the estimation of wage differentials both between and within public and private sector labour markets, employing data from the 1991 BHPS. When controlling for a range of individual and job characteristics, including industry affiliation, the mean differential is estimated at 30 % for public sector women but is insignificantly different from zero for men.

Employees in the N. H. S. or Higher Education sectors experience a 10 - 12 % pay penalty relative to those employed in local government.

Differences in wage premia on the basis of education, workplace size, gender, race and union presence between public and private sectors are also found.

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1 Introduction

A fundamental distinction that exists within the British labour market is that which can be made on the basis of the public versus private sectors with approximately one in four full-time employees being employed in the public sector. Despite this importance which one might assign to the public sector, it is clear that the overwhelming majority of empirical studies of wage determination in Great Britain restrict their attention to the private sector. The possibility presents itself that there is something inherently different in the public sector which calls for a separate study of wage determination. As a source of variation in the way in which wages are determined, this possibility has not, however, been the focus of prior research.

There are several characteristics of the public sector which make it an interesting sector of the labour market to consider. For many public services, the employer is the sole provider of that particular service; it is therefore subject to little international competition with public sector employment also being heavily weighted towards service occupations (Brown and Walsh, 1991). In addition, although the private sector may be motivated by profit maximisation, such concerns are likely to be of less relevance in the public sector (Ehrenberg and Schwartz, 1986).

A concern for motivating research on the basis of consequences for public policy further suggests the importance of an analysis of such issues since the public sector is by definition a sector on which much public policy is concentrated. Moreover, successive rounds of pay determination within the public sector raise a debate regarding pay-setting in this sector and comparability with the private sector. Such pay comparability will represent an important determinant of the ability of the public sector to recruit, retain and motivate its employees. This debate does not however appear to be an informed debate on the basis of evidence regarding existing ceteris paribus wage differentials[1]. The motivation for the present research should therefore be clear. It reflects a combination of the importance of examining the relation between public versus private sector wage determination in Great Britain and the lack of detailed research in this area.

The starting point to our analysis will therefore be to estimate the wage differential associated with affiliation to the public sector as well as that additional differential associated with different types of public sector labour markets. Estimation of some average wage differential immediately focuses one's attention upon variation around the average. We consider such variation both according to different employee characteristics, such as levels of education, gender and union membership, as well as that associated with the estimation of different quantiles of the wage distribution. In so doing we also provide the first estimates for Great Britain of these additional wage differentials at different points in the wage distribution.

Furthermore, a consideration of the public sector provides scope for a detailed analysis of several additional issues which have long concerned those modelling wage determination in the private sector. Hence it will be possible to consider how estimated differentials according to characteristics such as education, union presence, gender and workplace size also vary between those estimated within the public and private sectors. Reflecting these innovations, we are able to provide several new results regarding wage determination in the British labour market.

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1 A number of studies do however, trace the behaviour of the raw public-private sector earnings ratio over time for particular occupations (e.g. Gregory, 1990; Elliott and Duffus, 1996). For U.S. evidence concerning government differentials see, inter alia, Smith (1976), Venti (1987), Gyourko and Tracy (1988) and Poterba and Reuben (1994).

The rest of the paper is organised as follows. Section 2 describes the relevant econometric considerations in the context of estimating inter-sectoral wage differentials. We discuss both standard wage decomposition techniques, following Oaxaca (1973) and quantile regression methods (Koenker and Bassett, 1978). Estimation results, employing individual-level cross-section data from the 1991 British Household Panel Survey are presented in Section 3. Concluding remarks are offered in Section 4.

2 Estimation Methodology

In the present section we provide an account of the relevant econometric specifications for our empirical analysis of wage differentials both between and within public and private sectors of the British labour market. This proceeds in two main stages. First, we describe the relatively familiar Oaxaca (1973) decomposition of wage differentials on the basis of some particular characteristic. The procedure decomposes a raw average wage difference into that which one may ascribe to differences in characteristics and the wage differential in the form of the way in which given characteristics are rewarded differently across the two sectors in question. Second, in order to explore in further detail the nature of wage differentials in public and private sector labour markets, we consider estimation of different quantiles of the conditional wage distribution. We therefore also discuss the application of quantile regression methods to our analysis. This provides scope for a more detailed analysis of wage-setting factors in the British labour market.

2.1 Wage Differentials

Let us consider the partitioning of the labour market into two sectors, A and B. We allow wage determination to differ between the two sectors by allowing the coefficients on each of our covariates to vary between the two sectors. We therefore specify the following two estimating equations :

$$\ln w_A = X_A' \beta_A + \varepsilon_A \quad (1)$$

$$\ln w_B = X_B' \beta_B + \varepsilon_B \quad (2)$$

where 'w' refers to the hourly wage rate for an individual with vector of characteristics X, associated parameter vector β, and random error term, ε. An alternative approach might be to impose common coefficients across the two sectors, evaluating the differential as the coefficient on an additive dummy variable in a single equation model.

One may define the average raw wage differential between sectors A and B on the basis of Equations 1 and 2 as : $\ln G = \ln\overline{w_A} - \ln\overline{w_B}$, where the upper bar denotes the average pertaining to that sector. In turn, one may substitute, $\ln\overline{w_A} = \overline{X_A}'\hat{\beta}_A$; $\ln\overline{w_B} = \overline{X_B}'\hat{\beta}_B$ to obtain , $\ln G = \overline{X_A}'\hat{\beta}_A - \overline{X_B}'\hat{\beta}_B$; The differences in mean observed characteristics may then be derived as, $\Delta\overline{X} = \overline{X_A} - \overline{X_B}$ and differences in returns across the two sectors, $\Delta\hat{\beta} = \hat{\beta}_B - \hat{\beta}_A$. If we choose to substitute $\hat{\beta}_A = \hat{\beta}_B - \Delta\hat{\beta}$ into the expression for ln G, we can arrive at the following convenient decomposition of the raw wage difference between sectors A and B :

$$\ln G = \overline{\Delta X}'\hat{\beta}_B - \overline{X_A}'\Delta\hat{\beta} \quad (3)$$

Thus, following Oaxaca (1973) the term, $\overline{\Delta X}'\hat{\beta}_B$, may be interpreted as the estimated effect of differences in individual characteristics whilst, $-\overline{X_A}'\Delta\hat{\beta}$, reflects variation in the way in which given characteristics are rewarded in the two sectors, evaluated at the means of the sector A group. It is to this latter that we refer when we estimate the wage differential (in log points) between the two sectors. The proportional wage differential is then given by

$$\delta = \exp(\gamma) - 1 \text{ , where } \gamma = -\overline{X_A}'\Delta\hat{\beta} .$$

In the context of estimating the union wage differential, Stewart (1983) notes that such an estimate considers the ceteris paribus premium enjoyed by a sector A individual over that which he / she would earn in sector B.

In the subsequent regression analysis, we present results for a number of differentials estimated in the manner of the procedure described above, standard errors being calculated following the method detailed in Stewart (1987). Our starting point is the evaluation of the overall average government status (i.e. public versus private sector) wage differential. We then stratify our sample by gender and by union membership and evaluate the government status differential separately for these groups of individuals. Moreover, our analysis provides scope for consideration of how these gender and union wage differentials as well as the returns to education and workplace size, vary between the public and private sectors of the British labour market.

2.2 Quantile Regression Methods

In order to gain further insight into forms of variation around an estimated wage differential, we may consider the estimation of different quantiles of the conditional (log) wage distribution. Thus whilst standard least squares methods provide an estimate of the mean log wage (conditional on our regressor set), quantile regression methods facilitate the estimation of several alternative quantiles of the wage distribution. This should therefore provide a more detailed account of the conditional wage distribution. Moreover, there may exist further reasons as to why the use of quantile methods may be preferred over, or alongside, least squares estimation. Thus much of the case made by Koenker and Bassett (1978) for a quantile regression approach is based upon the desire for robustness in regression analysis and reduced sensitivity to outlying observations.

In the first instance, we consider the qth quantile of the conditional log wage distribution to be a linear function of the regressor variables, X :

$$Quantile_q(\ln w|X) \quad = \quad X'\beta_q + \sum_{j=1}^{k} \gamma_{qj} D_j \tag{4}$$

In applying our quantile regression methods we will therefore estimate a single equation model across both public and private sectors with government status being represented by 'k' additive dummy variables denoting a particular form of public sector affiliation. We are able to distinguish between central government, local government (which includes local services such as local education, fire and police), the National Health Service or state Higher Education and nationalised industry[2].

The minimising criterion for the above programming problem is to choose the vector (β_q , γ_q) which minimises the following expression :

$$\min_{\beta\gamma}\left[\sum_{r<0} q\left|\ln w - X'\beta_q - \sum_{j=1}^{k}\gamma_{qj}D_j\right| + \sum_{r>0}(1-q)\left|\ln w - X'\beta_q - \sum \gamma_{qj}D_j\right|\right]$$

where 'r' represents the residual , $r_i \quad = \quad \ln w - X'\beta_q - \sum \gamma_{qj} D_j$.

2 The data do not allow further disaggregation within these specified categories.

Thus in the special case of the median regression model, where q = 0.5, the minimising criterion is the least absolute error and the case for the robustness properties of the approach becomes clear (see Koenker and Bassett, 1978). Standard errors are calculated from the analytic variance-covariance matrix, $\text{cov}(\beta) = (X'X)^{-1} R_1 (X'X)^{-1}$ where the matrices are now defined appropriately to include the terms in the public sector variables; $R_1 = X'WW'X$ and $W = diag\left[(q|_{r>0} + (1-q)|_{r<0})\right] / f_r(0)$; $f_r(0)$ denotes the estimator of the density of the residuals at zero ; see Rogers (1993) regarding the estimation of this density.

Recent applications of quantile regression methods include Chamberlain (1994), Buchinsky (1994) and Poterba and Reuben (1994). Similar techniques are also applied by Gosling, Machin and Meghir (1996) in order to examine the changing distribution of male wages in the U.K. over the period 1966 to 1992. Chamberlain (1994) proposes and implements a minimum distance estimator but applies the linear programming algorithm adopted here, in the case where the number of covariates exceeds beyond a very small number.

3 Estimation Results

The estimation of inter-sectoral wage differentials has been of prime concern in understanding wage determination and hence the functioning of separate labour markets in general. We have made a case for arguing that the differential on the basis of government status is of special importance for a number a reasons. We now go on to estimate this mean differential across our sample of individuals in the British Household Panel Survey of 1991, as well as the additional differential associated with particular types of public sector affiliation. Further variations around this overall mean differential are then also considered.

The sole prior study for Great Britain which estimates a government status differential is that by Rees and Shah (1995). Rees and Shah (1995) employ General Household Survey data for 1983, 1985 and 1987. The estimates obtained suggest a small negative differential for men of 0.02 in the case of the 1983 and 1987 cross-sections, although the estimated differential for 1985 is -0.33, with an estimated large pay premium for women of approximately 0.30. (Standard errors for these differentials are not calculated). In addition to evaluating the nature of these differentials in finer detail, an advantage of our dataset is the ability to distinguish between different sectors within the public sector as a whole. In addition to examining the government differentials we also consider in greater detail estimated differentials within the public and private sectors of the labour market.

3.1 The Data

The data employed in our analysis is derived from the British Household Panel Survey of 1991. The BHPS represents a household- and individual-level, nationally representative survey. The dataset consists of more than 5 000 households and 10 000 individuals conducted between September and December 1991. Our sample is restricted to those individuals aged between 16 and 65, employed in either the public or private sectors, working at least 30 hours per week and providing relevant data on each of the variables employed in the analysis.

Our specifications include a set of standard human capital and demographic explanatory variables for the determination of individual-level (log) hourly earnings. Dummy variables indicating the highest academic qualification are therefore included alongside binary variables for employer size, union presence - membership and coverage at place of work -

race and gender. Additional controls for (potential) experience, job tenure (i.e. tenure in the current position at the firm), health status and managerial status are also included alongside occupational, industry and regional dummies. The dependent variables consists of the log of hourly earnings. This is derived from a point-in-time measure of earnings, generally preferred over annual measures, and hours worked per week (see Benito, 1997, for further details).

Table 1 presents our estimation results for the estimation of separate earnings equations according to government status and gender for our selected sample of the BHPS. There is evidence of a positive mean government status differential for women, estimated at 32 %. The mean differential for men is insignificantly different from zero. For comparison purposes we note that the estimation of a single equation model otherwise equivalent to that of Table 1, with a single additive dummy variable for public sector status reveals a coefficient (standard error) on the public sector term of 0.007 (0.034) for males and 0.249 (0.044) for females. The results also suggest a public sector pay penalty of 10 % for public sector male employees who are employed in the National Health Service (N.H.S.) or State Higher Education sector relative to those employed in Local Government or local services, although the coefficient is not especially well-determined with a standard error of 0.057. For women, there is also evidence of variation between categories within the public sector. Employees in the National Health Service or State Higher Education category again are estimated to experience a pay penalty relative to local government employees, in this case of the order of 13 %.

It is of further interest to consider the returns to individual characteristics in the public sector in some more detail. The returns to levels of educational attainment appear to be higher, for women, in the public relative to the private sector with the possible exception being in terms of the returns to a degree or higher qualification. The major positive differences occur in terms of the rewards to O-levels and A-levels with higher returns to Nursing and Teaching qualifications for women also being estimated in the public sector. For males, we estimate no marked distinction between the returns to educational levels in the public and private sectors, again with the possible exception of lower returns to a first or higher degree in the public sector.

The differential associated with workplace size, which Green *et al* (1996) ascribe, at least in part, to monopsony, is more pronounced in the private sector. As pointed out by Green *et al* (1996, p. 435), given that wage-setting in the public sector occurs at a more centralised level, one would not expect any monopsony argument to be appropriately proxied by workplace size in this sector. This nevertheless makes the possibility of a size differential in the public sector, albeit one which is rather less pronounced than in the private sector, an interesting one. There is also evidence of a race wage differential (i.e. on the basis of a white / non-white distinction) for both men and women in the public sector but not the private sector. We are however, somewhat reluctant to attach too great a significance to such an inference given the small cell sizes on which these estimates rely, with only 11 (23) males (females) being classed as 'non-white' in our public sector samples[3]. We also note that the total union wage differential in the private sector, which is similar in magnitude for both males and females at approximately 10 %, follows a different pattern in the public sector, being more particularly associated with coverage rather than individual membership. We note that 97 % of individuals in the public sector in our dataset report that they are employed at a place of work which recognises a trade union for bargaining purposes, with 78 % of employees being union members. The coverage differential is only significant for males but again on

[3] The numbers of 'non-whites' in the private sector sample are equal to 54 males and 20 females.

estimating separate equations by gender these estimates rely on small cell sizes (see Andrews *et al*, 1996, regarding the estimation of cross-sectional union wage differentials in Great Britain).

The wage premium associated with being married (or living as a couple), which for males is typically attributed to representing some proxy for individual reliability is only significant for males, not females. There is evidence that earnings vary to a less significant degree by region in the public sector relative to the private sector[4]. This may also have implications for public policy[5].

Turning to variation in the government status differential according to union membership, the estimated differentials do not appear to vary on the basis of this characteristic. The variation between public and private sector returns to education is also considered by the addition of interaction terms to a single equation model for earnings between education and public sector participation. The same point as that from Table 1 emerges in Table 3 which reports the associated estimation results for the interaction terms. Returns to educational qualifications relative to the omitted category of no qualifications, are generally higher in the public sector for women. For men there is generally no differential, with the exception of lower returns to a first or higher degree in the public sector. When focusing upon the returns to education, controlling for occupation may be ill-advised. As we

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4 The point estimates on the region dummies imply, inter alia, a 32 % (38 %) wage gap for males (females) working in London relative to the West Midlands in the private sector compared to one of 22 % (25 %) in the public sector.

5 It may well be the case that public sector wages also vary less over the economic cycle (e.g. Elliott and Duffus, 1996). Given the existence of a downturn in economic activity during 1991, this may imply that any estimated differential is an overestimate of that pertaining over the cycle as a whole.

observe in Table 3 however, omitting the occupation dummies gives rise to precisely the same pattern of results.

Alongside estimation of the differential associated with a particular characteristic, it is also informative to provide a (joint) test of whether particular characteristics are rewarded equally across the sectors in question. This will also indicate whether modelling wage determination in these sectors is more appropriate by employing a separate equation approach. In Table 4 report the results of tests of the equality of the coefficient vectors across a number of different labour market sectors. Wald tests indicated that in each case, at the 5 % level, we reject the null hypothesis. At the 1 % level we are unable to reject the null of equality of coefficients for union members and non members in the public sector. It is known however, that these Wald tests, whilst allowing for unequal disturbance variances, tend to too frequently reject the null hypothesis, particularly in small samples. As a consideration of this potential issue, we present the results of Kobayashi's (1986) bounds test for the equality of coefficient vectors. The same pattern of results is observed as that noted previously for the Wald tests. The null hypothesis is rejected in each case with the exception of the union member - non member case within the public sector which, at the 5 % level lies in the inconclusive region of the bounds test.

We next go on to consider variation in the government differential according to the individual occupation, region and industrial sector. The differentials for these different categories are considered individually, being evaluated in turn for the particular category with the further set of characteristics being set at their mean public sector values. Considering variation by occupation first, in Table 5 we observe evidence of a significantly negative public sector pay penalty for male professional employees. By region, the government differential for males is significantly negative for employees located in the North East with evidence of smaller government differentials for women residing in the South of England. In terms of evaluating the government differential by industry sector, it is clear that our previous set of results for the government differential for males and females are being driven by the differential in the 'Other Services' sector which accounts for a very large proportion of public sector employment by industry group. Hence, estimated differentials for other industry groups tend to be rather poorly-determined. It may also be necessary to acknowledge the possibility of some misclassification of industry affiliation (see e.g. Krueger and Summers, 1988). There exists one possible source of concern in evaluating the government differential for the 'Other Services' industry sector. There is the possibility of significant heterogeneity within this residual category which may be related to government status. Indeed, on examining the sample distributions across industries at the two-digit level, we observe that whilst 53 % of public sector male employees in Other Services are employed in Public Administration, there are no male private sector employees in this two-digit industry. Similarly, for the female samples, as one would expect, there are no women in the private sector employed in Public Administration, whereas 26 % of public sector women in Other Services are employed in this industry category.

An analysis of wage determination in the public sector also provides a context for considering how the differential associated with gender varies between the public and private sectors. On conducting an Oaxaca (1973) decomposition of the wage differential, the results indicate a significantly larger gender wage differential in the private relative to the public sector. The gender-based differential is estimated at approximately 25 % in the private sector and at 8 % in the public sector. Moreover, this latter estimate is insignificantly different from zero at conventional levels. When estimating the gender differential at female rather than male mean characteristics, the estimated differential (standard error) becomes 0.099 (0.032) in the public sector and is therefore statistically significant. This compares to an estimate in the private sector of 0.192 (0.026), estimated at female sector means. This finding of a smaller gender differential in the public sector has also been obtained in U.S. studies (see Ehrenberg and Schwartz, 1986, pp. 1252-1255) and studies for Sweden (e.g. Zetterberg, 1992) and Denmark (Rosholm and Smith, 1996) and has been interpreted in the manner of evidence for less gender-based discrimination in the public sector.

A similar consideration of variation in the union membership differential suggests that this is larger in the private sector, estimated at 10 % to 12 % in this sector of the economy. The evidence from Table 1 indicated that the union wage differential in the public sector appears to be associated with coverage rather than membership to a greater extent than in the private sector. However, given that such a small proportion of workplaces in the public sector do not recognise a trade union, we are not in a position to estimate separate equations by coverage within the public sector.

We now turn to a quantile regression analysis of wage determination in the public and private sectors of the British economy using BHPS 1991, estimating our earnings equations separately by gender.

For males, there is some evidence of variation by quantile in the government status differentials with these becoming negative at high quantiles, particularly in the case of the National Health Service / State Higher Education and local government sectors. For women, these government status differentials show further variation. Whilst remaining significantly positive for each estimated point in the conditional wage distribution, they appear greater in magnitude at lower quantiles. However, at this point we must note that a similar pattern in variation i.e. larger government differentials at lower quantiles, would be anticipated on the basis of the smaller residual variance the public sector. One may assess the extent to which differences in residual variances are likely to account for these results by reference to a result presented in Chamberlain (1994). Thus if we let the conditional distribution of the log wage in the public sector be $N(X'\beta_A, \sigma_A^2)$ and in the private sector $N(X'\beta_B, \sigma_B^2)$ then the wage differential at the qth quantile is given by $X'(\beta_A - \beta_B) + (\sigma_A - \sigma_B)q$. Thus for $\sigma_A < \sigma_B$, this predicts that that the estimated differential is larger at lower q. We have observed from our previous regression results that the equation standard error is indeed smaller in the public sector for both males and females. Following Chamberlain (1994) (see also Poterba and Reuben, 1994), we substitute the least squares estimates into the above expression which leads us to anticipate the differential to vary by 0.037 for males and 0.022 for females in moving from the 0.1 to 0.9 quantile - compared to our derived estimates of approximately 0.2 for males and 0.1 for females. In practice therefore, this suggestion would not appear to account for our pattern of results.

Consideration of the additional estimated wage differentials in these quantile wage equations is also worthy of note. We focus upon the differentials associated with education, workplace size and union presence. Regarding the returns to education qualifications, there is little suggestion that these display any great variation for either males or females across the quantiles considered with the main exception being the declining returns to A-levels for women at higher quantiles. The workplace size differential, particularly in terms of the differential between the smallest and largest categories appears to be greater at the lowest quantiles. The union wage differential, for both males and females appears to follow a similar pattern, also being larger at lower quantiles of the wage distribution. This is a result also found by Chamberlain (1994) on U.S. C.P.S. data, although Chamberlain's results appeared to indicate that this pattern could be accounted for by differences in the residual variance in the union and non-union sectors. For the case of Great Britain, this issue is worthy of further attention beyond that presented in the present paper.

We have noted that the conditional wage distribution is less dispersed for both males and females in the public sector. In terms of the unconditional log wage distributions for these sectors we can again note that as one would tend to expect, there exists greater wage dispersion within the private sector relative to that in the public sector. Thus for males, the coefficient of variation in the public sector of 0.251 compares to a value of 0.321 in the private sector. An even greater dispersion for females is evident with the coefficient of variation being equal to 0.256 in the public sector and 0.351 in the private sector.

A further point we wish to make refers to the results of sensitivity checks of our estimation results in terms of the inclusion or exclusion of particular controls. The results prove to be insensitive to the precise specification and as such display strong signs of being robust - with one notable exception. In the estimating equation for women, the estimated premium for employment in the public sector hinges upon the inclusion of controls for industry. Thus the large positive wage premia for women in the public sector is very much a within industry differential. There would however appear to be at least two important reasons for retaining these industry controls. First, earnings have been found to vary significantly according to industry even after controlling for a range of human capital and demographic characteristics (Hildreth, 1995; Benito, 1997). Thus if we wish to consider a wage differential associated with public sector affiliation per se, we should ensure that we are not merely picking up what is essentially an industry effect. Second, and relatedly, it is clear that public and private sector activities are not evenly distributed across industries. Thus activities for the public sector are to a significant degree based in the relatively low-paying service sector : 84% of employees in the public sector in our sample are to be found in the 'Other Services' sector compared to 6 % of private sector employees. This would therefore appear to account for the fact that failure to control for industry is associated with a much reduced estimated public sector wage effect, at least for women. Both Hildreth (1995) and Benito (1997) estimate a 10% pay penalty in the private sector of working in this industry relative to the 'average' industry. Nevertheless, one might wish to argue that it is in the nature of public services to be specialised in particular activities (e.g. public goods and merit goods) such that, as a consequence, public sector employment is concentrated in particular sectors. On such an argument, the desirability of controlling for industry affiliation may seem less clear. For comparison purposes we report the results of the government wage differential by gender when estimated without industry controls in Table 7. It is clear that this has a marked impact upon the nature of our results for women. The overall government differential for women is now insignificantly different from zero with a point estimate (standard error) of 0.035 (0.038). There is also variation around the average in terms of employment in different public sector activities. Relative to employment in local government, there is an estimated public sector pay penalty of working in the N.H.S. or State Higher Education sectors of 12 %. One should be clear that the inclusion or not of the industry dummies implies a different conceptual experiment in the differential being estimated. This distinction in the conceptual experiment we are attempting to consider, according to the inclusion or otherwise of the industry dummies, comes to the fore in the two contexts in which our results have special relevance. First, privatisation naturally gives rise to a case of switching from public to private sector status whilst holding constant other factors, including industrial activity. Our results imply the prediction that the wages of women will fall markedly following privatisation. Second, the debate concerning public sector pay comparability is made with reference to the level of pay in the private sector as a whole, controlling for the standard individual and job characteristics. The major British study of pay comparability between the public and private sectors is that of the Clegg Commission Report (1980). The pay comparability exercises carried out by the Commission essentially attempted to define comparator groups in terms of occupation, education and experience levels. In this context, a case can be made therefore, for omitting the industry controls. On the basis of our associated set of results, the suggestion emerges that male employees experience a 13 % pay penalty of employment in the National Health Service / Higher Education sectors relative to the private sector, with some indication of a pay penalty also being experienced by women employees in this sector. Female civil service or central government employees appear to enjoy a pay premium of over 14 % compared to the private sector. In general, the results also serve to highlight the importance of clarity in the debate concerning public sector pay comparability and the definition of the comparator group which one has in mind.

A final point we must acknowledge is that we have not allowed for the possibility that assignment between public and private sectors is non-random, a point which applies equally to the estimation of any inter-sectoral wage differential associated with a characteristic that is not purely exogenous. Estimation of such selection models allowing for non-random selection rests upon one's ability to identify factors which influence the probability of being employed in a particular sector but may be validly excluded from a wage equation. As in Poterba and Reuben (1994), we have not adopted this approach owing to our inability to find such variables which may be convincingly excluded from the wage equations. This may however represent a natural direction for further research. The paper by Rees and Shah (1995), whilst claiming to allow for non-random selection does not employ any identifying variables in the selector equation. Thus the analysis attempts to achieve identification by virtue of the non-linearities of the probit model for sector attachment. Achieving identification via such functional form assumptions is highly questionable. Gyourko and Tracy (1988) also attempt to allow for endogenous selection. In this case, Education, as a disjointed spline function, and dummies for junior and senior worker status are employed as instruments for sector attachment. Imposing zero restrictions on educational attainment is clearly questionable according to human capital theory, whilst occupational effects are standard in analysis of wage determination.

4 Concluding Remarks

The paper has considered the determination of earnings in both the public and private sectors of the British economy, employing cross-sectional data from the British Household Panel Survey of 1991. Estimation of the differential associated with employment in the public sector alongside variation in estimated wage premia between the public and private sectors allowed us to document several new results regarding wage determination in the British labour market. Our results may be summarised as follows :

- For women, and controlling for a range of individual and job characteristics - including industry - there is evidence of a substantial wage premium associated with employment in the public sector. The mean differential for women is estimated at 32 % when evaluated at the mean characteristics of female public sector employees. This differential does appear to vary significantly between employment in different categories within the public sector in that women in the N.H.S. or State Higher Education sectors experience an estimated pay penalty of 13 % relative to local government or local service employees.
- For men, there was no significant mean government wage differential. There was however some evidence of a negative wage differential for those public sector male employees employed in the National Health Service or State Higher Education sector.
- The gender wage differential is significantly smaller in the public sector relative to the private sector. The gender differential is estimated at between 8 % and 10 % in the public sector, compared to an estimate of 20 % to 25 % in the private sector.

- The union membership wage differential is insignificantly different from zero in the public sector and is estimated at approximately 10 % in the private sector. The union differential for males in the public sector appears to be more particularly associated with union coverage, with 97 % of employees being employed at places of work which recognise a trade union.
- The returns to education qualifications are significantly higher for women in the public sector.
- There is evidence of a smaller differential associated with workplace size. In the public sector, wages vary less significantly by region than in the private sector.
- The Government differentials for males appeared to be increasingly negative for males at relatively high quantiles of the conditional wage distribution, particularly in terms of the National Health Service / State Higher Education differential. For women, the positive government wage differentials are estimated as being larger at lower quantiles of the distribution.
- Evidence was found for greater union and workplace size wage effects at low quantiles of the wage distribution.
- Estimated government differentials for women were sensitive to the inclusion of controls for industry affiliation. This is likely to reflect the fact that public sector employment tends to be concentrated in low-paying service sector jobs.

The observation of differentials which vary so markedly on the basis of gender naturally gives rise to a discussion regarding the presence of discrimination. In this context, our results would appear to indicate that there may exist significantly less gender-based discrimination in the public sector relative to the private sector. Nevertheless, we must remain sensitive to the suggestion that the estimated wage equations may not control sufficiently well for relevant wage-determining factors, in which case such a conclusion must be made with some caution. Nevertheless, such suggestions, perhaps based on an argument regarding the greater practice of attaching wages to jobs rather than individual workers in the public sector, appear to be consistent with evidence for other countries of a smaller gender differential in the public sector.

In order to derive further implications of the present analysis for the determination of pay for groups of public sector employees it would be desirable to consider separately, wage determination for distinct groups of occupations. This may be possible if we choose to pool successive waves of the British Household Panel Survey. Additional scope for future research is provided by the ongoing panel nature of the current dataset in the sense that it will be possible to attempt to control for omitted unobservable characteristics which may be related to both the wage and propensity to be employed in the public sector. The present results have nevertheless, served to suggest that there are significant differences to patterns of wage determination between the public and private sectors of the British labour market.

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Table 1 : Public and Private Sector Wage Equations
Dependent Variable : log usual hourly wage
standard errors in parentheses

	Public sector		Private sector	
	male	female	male	female
Civil Service/Central Govnment	0.054 (0.048)	0.056 (0.055)		
Nationalised Industry	0.083 (0.091)	0.093 (0.201)		
Nat Health Serv/Higher Eductn	-0.098 (0.057)	-0.122 (0.045)		
highest qualification obtained :				
Apprenticeship	-0.047 (0.124)	-	0.090 (0.057)	0.083 (0.260)
CSE Grades 2-5	0.226 (0.103)	-0.007 (0.172)	0.030 (0.045)	-0.004 (0.066)
Commercial Qualifications	0.376 (0.235)	0.310 (0.105)	0.193 (0.223)	0.013 (0.058)
GCE O-level	0.107 (0.065)	0.210 (0.076)	0.113 (0.030)	0.092 (0.041)
GCE A-level	0.164 (0.068)	0.323 (0.085)	0.176 (0.035)	0.120 (0.052)
Nursing	0.238 (0.160)	0.509 (0.093)	0.114 (0.282)	0.221 (0.109)
Other Higher Qualification	0.269 (0.069)	0.396 (0.078)	0.249 (0.034)	0.206 (0.057)
Teaching	0.303 (0.104)	0.447 (0.093)	0.136 (0.280)	0.149 (0.148)
First Degree / Higher Degree	0.366 (0.083)	0.500 (0.084)	0.449 (0.047)	0.397 (0.070)
experience	0.043 (0.006)	0.020 (0.006)	0.035 (0.003)	0.031 (0.004)
*experience^2	-0.085 (0.013)	-0.046 (0.013)	-0.061 (0.007)	-0.071 (0.010)
*tenure	0.030 (0.053)	0.017 (0.075)	0.082 (0.003)	0.097 (0.057)
**tenure^2	0.007 (0.014)	0.016 (0.030)	-0.022 (0.008)	-0.022 (0.019)
size : 25 to 99 employees	0.047 (0.057)	0.015 (0.044)	0.126 (0.027)	0.122 (0.149)
size : 100 to 499 employees	0.114 (0.055)	-0.016 (0.046)	0.129 (0.028)	0.149 (0.036)
size : 500 or more	0.104 (0.059)	0.111 (0.051)	0.217 (0.032)	0.217 (0.046)
union member X coverage	0.227 (0.098)	0.019 (0.094)	0.103 (0.025)	0.102 (0.035)
(1-union member) X coverage	0.211 (0.103)	-0.007 (0.098)	0.005 (0.030)	0.066 (0.040)
white	0.393 (0.102)	0.183 (0.073)	0.026 (0.049)	0.081 (0.082)
married	0.172 (0.043)	0.047 (0.037)	0.106 (0.026)	0.014 (0.029)
managerial duties	0.067 (0.039)	0.147 (0.037)	0.119 (0.024)	0.138 (0.031)
poor health	-0.037 (0.107)	0.092 (0.072)	0.010 (0.054)	-0.092 (0.054)
Additional controls :				
occupation dummies	yes (8)	yes (7)	yes (8)	yes (8)
industry dummies	yes (7)	yes (5)	yes (8)	yes (8)
region dummies	yes (10)	yes (10)	yes (10)	yes (10)
constant	0.417 (0.220)	1.070 (0.355)	0.475 (0.088)	0.433 (0.173)
F-test occupation dummies	F(8,367)=3.77	F(7,405)=5.69	F(8,1479)=15.16	F(8,770)=6.01
F-test industry dummies	F(7,367)=1.54	F(5,405)=1.47	F(8,1479)=7.89	F(8,770)=8.80
F-test region dummies	F(10,367)=4.50	F(10,405)=3.98	F(10,1479)=10.07	F(10,770)=9.45
Root M.S.E.	0.323	0.323	0.369	0.351
Mean of dependent variable	1.854	1.712	1.672	1.379
R-squared	0.579	0.514	0.544	0.505
R-bar squared	0.522	0.459	0.529	0.474
sample size	418	452	1528	819

Notes to Table 1

1. sample is restricted to those individuals employed in either the public or private sectors, aged between 16 and 65 and working at least 30 hours per week.
2. * denotes coefficient and standard error multiplied by 100
   ** denotes coefficient and standard error multiplied by $1x\ 10^4$.
3. Number of controls may vary between columns if zero cell size requires dropping of control variable.

Table 2 : Variation in Government Differential		
Wage Differential		
Overall	0.111 (0.034)	
Estimated Coefficient on# :		
Civil Service / Central Government	0.054 (0.034)	
Nationalised Industry	0.042 (0.078)	
N. H.S. / State H. E.	-0.129 (0.035)	
	Male	Female
Mean	-0.010 (0.047)	0.278 (0.053)
Estimated Coefficient on :		
Civil Service / Central Government	0.054 (0.048)	0.056 (0.055)
Nationalised Industry	0.083 (0.091)	0.093 (0.201)
N. H.S. / State H. E.	-0.098 (0.057)	-0.122 (0.045)
	Union Member	Non-union member
Mean	0.161 (0.058)	0.117 (0.048)
Estimated Coefficient on :		
Civil Service / Central Government	0.036 (0.038)	0.094 (0.086)
Nationalised Industry	0.053 (0.085)	-0.177 (0.334)
N. H.S. / State H. E.	-0.144 (0.040)	-0.135 (0.078)

Notes to Table 2 :

1. Standard errors in parentheses (see Stewart, 1987).
2. Differentials evaluated at Public Sector Means
3. # Omitted category : employment in Local Government / Local Services.

Table 3 : Variation in Return to Educational Attainment Between Public and Private Sectors

	Males		Females	
	[occupation controls]	[no occupation controls]	[occupation controls]	[no occupation controls]
Apprenticeship	-0.134 0.136)	-0.072 (0.147)	-	-
CSE Grades 2-5	0.229 (0.105)	0.225 (0.117)	0.034 (0.179)	-0.150 (0.180)
Commercial Qualifications	0.247 (0.333)	0.170 (0.346)	0.329 (0.098)	0.249 (0.112)
GCE O-level	0.013 (0.052)	-0.022 (0.070)	0.218 (0.053)	0.166 (0.074)
GCE A-level	0.012 (0.059)	-0.017 (0.075)	0.315 (0.074)	0.247 (0.091)
Nursing	0.006 (0.306)	0.035 (0.320)	0.288 (0.116)	0.235 (0.130)
Other Higher Qualification	0.008 (0.052)	-0.011 (0.070)	0.299 (0.067)	0.208 (0.086)
Teaching	0.101 (0.286)	0.070 (0.299)	0.418 (0.161)	0.561 (0.166)
First / Higher Degree	-0.183 (0.061)	-0.164 (0.076)	0.189 (0.074)	0.166 (0.089)
Root M.S.E.	0.363	0.374	0.348	0.355
Mean of dependent variable	1.711	1.711	1.497	1.497
R-squared	0.543	0.511	0.527	0.503
R-bar squared	0.529	0.498	0.505	0.483
sample size	1946	1946	1271	1271

Notes to Table 3 :

1. Table 3 reports the results for interaction terms between public sector affiliation and educational qualifications; for additional explanatory variables, see Table 1.
2. There are no females with an apprenticeship in the public sector.

Table 4 : Bounds Tests of Equality of Coefficients Across Sectors	
Public Sector	Private Sector
Males and Females : F(47, 371) = 2.106; [p=0.000] F(47, 776) = 2.106 ; [p=0.000]	Males and Females : F(49, 770) = 5.042 ; [p=0.000] F(49, 2249) = 5.042 ; [p=0.000]
Union members & non-members : F(50,138) = 1.433 ; [p=0.053] F(50, 770) = 1.433 ; [p=0.029]	Union members & non-members : F(49, 679) = 1.659 ; [p=0.004] F(49, 2249) = 1.659 ; [p=0.003]
Males	Females
Public & Private : F(48, 370) = 1.920 ; [p=0.000] F(48, 1850) = 1.920 ; [p=0.000]	Public & Private : F(44, 408) = 2.789 ; [p=0.004] F(44, 1183) = 2.789 ; [p=0.003]
Union Members	Non-Union members
Public & Private : F(47, 635) = 1.622 ; [p=0.007] F(47, 1316) = 1.622 ; [p=0.005]	Public & Private : F(48, 140) = 1.604 ; [p=0.018] F(48, 1711) = 1.604 ; [p=0.006]

Notes to Table 4 :

1. Table 4 reports the results of Kobayashi's (1986) Bounds Test of the Equality of Sets of Coefficients. The former test statistic value is considered against the Upper Critical Value of the bound with the latter figure being with respect to the Lower Critical Value.

Table 5 : Variation in Government Differential by Occupation, Region and Industry

	Males		Females	
Occupation	Wage Differential	No. In Public Sector	Wage Differential	No. In Public Sector
Managers & Admin.	-0.031 (0.074)	49	0.478 (0.092)	37
Professional	-0.187 (0.074)	82	0.317 (0.097)	117
Assoc. Professional & Technical	0.009 (0.076)	49	0.164 (0.074)	112
Clerical & Secretarial	-0.012 (0.074)	49	0.257 (0.070)	106
Craft & related	-0.075 (0.075)	44	0.492 (0.176)	4
Personal & Protective Service	omitted group	74	omitted group	56
Sales	0.032 (0.380)	1	0.186 (0.387)	1
Plant & Machine Operatives	-0.060 (0.088)	27	-	0
Other	0.037 (0.089)	43	0.105 (0.116)	19
Region				
London	-0.014 (0.067)	59	0.204 (0.075)	56
South West	-0.005 (0.062)	68	0.146 (0.072)	56
Rest of South	0.005 (0.080)	35	0.170 (0.101)	20
East Anglia	-0.194 (0.138)	8	0.165 (0.126)	12
East Midlands	0.028 (0.087)	30	0.378 (0.094)	28
West Midlands	omitted group	39	omitted group	47
North West	0.026 (0.075)	35	0.330 (0.075)	53
Yorkshire	0.036 (0.073)	45	0.314 (0.081)	48
North East	-0.202 (0.086)	30	0.286 (0.092)	45
Wales	-0.021 (0.095)	25	0.203 (0.099)	34
Scotland	-0.059 (0.080)	44	0.443 (0.086)	53
Industry				
Energy & Water Supply	0.026 (0.110)	20	-	0
Extractn & Manuf. of Minerals	0.288 (0.213)	3	0.118 (0.408)	1
Metal Gds., Engnrng, Vehicles	0.029 (0.146)	6	0.122 (0.232)	2
Other Manufacturing	-0.124 (0.275)	2	-	0
Construction	omitted group	24	omitted group	2
Distribution, Catering, Repairs	-	0	-0.136 (0.242)	2
Transport & Communications	-0.044 (0.093)	52	0.155 (0.149)	7
Banking, Finance and Business	-0.027 (0.101)	14	-	0
Other Services	-0.011 (0.064)	297	0.284 (0.055)	438

Table 6 : Wage Premia in the Public and Private Sectors				
Wage Differential	Public Sector		Private Sector	
Estimated by Separate Equations :				
Union Membership Wage Differential	-0.019 (0.051)		0.092 (0.027)	
Gender Differential	0.077 (0.052)		0.230 (0.027)	
Estimated as Additive Dummy :				
Covered Member	0.141 (0.066)		0.103 (0.021)	
Covered Non-Member	0.110 (0.070)		0.026 (0.024)	
Gender	0.111 (0.027)		0.201 (0.019)	
	Male	Female	Male	Female
Workplace Size :				
25 to 99 employees	0.047 (0.057)	0.015 (0.044)	0.126 (0.027)	0.122 (0.034)
100 to 499 employees	0.114 (0.055)	-0.016 (0.046)	0.129 (0.028)	0.149 (0.036)
500 or more	0.104 (0.059)	0.111 (0.051)	0.217 (0.032)	0.217 (0.046)
Covered Member	0.227 (0.098)	0.019 (0.094)	0.103 (0.025)	0.102 (0.035)
Covered Non-member	0.211 (0.103)	-0.007 (0.098)	0.005 (0.030)	0.066 (0.040)

Notes to Table 6 :

1. Differentials when estimated as separate equations are evaluated at Sector A means where :
Union Wage Differential : Sector A=union member;
Gender Differential : Sector A=male .

Table 7 : Government Differentials With and Without Controls for Industry		
	Males	Females
Including Industry Controls		
Mean Differential	-0.010 (0.047)	0.278 (0.053)
Differential for :		
Civil Service / Central Gov.	0.033 (0.057)	0.365 (0.069)
Nationalised Industry	0.061 (0.089)	0.402 (0.202)
N.H.S./Higher Education	-0.119 (0.066)	0.187 (0.060)
Local Government	0.021 (0.052)	0.309 (0.057)
Excluding Industry Controls		
Mean Differential	-0.019 (0.027)	0.035 (0.038)
Differential for :		
Civil Service / Central Gov.	0.029 (0.041)	0.141 (0.057)
Nationalised Industry	0.030 (0.053)	0.292 (0.147)
N.H.S./Higher Education	-0.129 (0.052)	-0.060 (0.047)
Local Government	-0.025 (0.034)	0.061 (0.043)
Estimated Coefficient On# :		
Civil Service / Central Gov.	0.054 (0.045)	0.081 (0.053)
Nationalised Industry	0.055 (0.056)	0.232 (0.146)
N.H.S./Higher Education	-0.103 (0.056)	-0.121 (0.045)

Notes to Table 7 :

1. Regressions as in Table 1 with exclusion of industry control variables.
2. Differentials evaluated at Public Sector mean characteristics for males and females respectively
3. # denotes omitted group : Local Government / Local Services

Table 8 : Quantile Regressions of Wage Equations

Including Industry Controls
MALES

Percentile (from bottom of distribution) :

	10^{th}	25^{th}	50^{th}	75^{th}	90^{th}
Central Government	0.103 (0.092)	0.079 (0.043)	0.041 (0.046)	-0.032 (0.059)	-0.088 (0.085)
local government	0.109 (0.083)	-0.005 (0.039)	0.021 (0.040)	-0.032 (0.052)	-0.121 (0.068)
N. H. S. / H.E.	-0.003 (0.111)	-0.188 (0.055)	-0.136 (0.057)	-0.180 (0.071)	-0.222 (0.097)
Nationalised Industry	0.089 (0.093)	0.047 (0.047)	0.069 (0.047)	0.069 (0.059)	-0.009 (0.079)
.					
highest qualification obtained :					
Apprenticeship	0.149 (0.099)	0.130 (0.046)	0.017 (0.047)	0.057 (0.058)	0.083 (0.078)
CSE Grades 2-5	-0.051 (0.070)	0.035 (0.035)	0.093 (0.037)	0.101 (0.047)	0.103 (0.059)
Commercial	-0.161 (0.112)	0.297 (0.124)	0.313 (0.135)	0.461 (0.166)	0.415 (0.094)
GCE O-level	0.070 (0.052)	0.067 (0.025)	0.116 (0.025)	0.112 (0.033)	0.090 (0.043)
GCE A-level	0.158 (0.059)	0.173 (0.028)	0.176 (0.029)	0.169 (0.037)	0.173 (0.050)
Nursing	0.461 (0.225)	0.227 (0.097)	0.115 (0.128)	0.290 (0.148)	0.152 (0.121)
Other Higher	0.274 (0.064)	0.248 (0.029)	0.261 (0.028)	0.290 (0.035)	0.279 (0.046)
Teaching	0.334 (0.091)	0.291 (0.081)	0.177 (0.078)	0.268 (0.090)	0.452 (0.111)
First / Hghr Degree	0.422 (0.084)	0.389 (0.038)	0.431 (0.037)	0.454 (0.047)	0.478 (0.061)
experience	0.038 (0.005)	0.032 (0.003)	0.031 (0.003)	0.036 (0.003)	0.038 (0.004)
*experience^2	-0.073 (0.011)	-0.059 (0.006)	-0.053 (0.006)	-0.062 (0.007)	-0.071 (0.009)
*tenure	0.100 (0.045)	0.066 (0.024)	0.070 (0.025)	0.069 (0.030)	0.100 (0.043)
**tenure^2	-0.022 (0.010)	-0.011 (0.006)	-0.016 (0.007)	-0.020 (0.008)	-0.014 (0.012)
size : 25 to 99 employees	0.151 (0.044)	0.111 (0.021)	0.074 (0.022)	0.063 (0.028)	0.066 (0.039)
size : 100 to 499 employees	0.096 (0.046)	0.118 (0.022)	0.111 (0.023)	0.122 (0.029)	0.102 (0.038)
size : 500 or more	0.236 (0.053)	0.199 (0.025)	0.155 (0.026)	0.167 (0.033)	0.165 (0.044)
union member X coverage	0.162 (0.045)	0.108 (0.021)	0.075 (0.021)	0.105 (0.027)	0.023 (0.037)
(1-union member) X coverage	0.135 (0.051)	0.042 (0.024)	0.035 (0.025)	0.020 (0.030)	-0.093 (0.041)
white	0.284 (0.089)	0.091 (0.043)	0.098 (0.044)	0.067 (0.054)	0.074 (0.066)
married	0.211 (0.036)	0.134 (0.020)	0.092 (0.021)	0.073 (0.026)	0.053 (0.033)
managerial duties	0.109 (0.038)	0.125 (0.018)	0.115 (0.019)	0.103 (0.024)	0.137 (0.030)
poor health	-0.124 (0.070)	0.032 (0.042)	0.013 (0.042)	-0.012 (0.057)	-0.024 (0.075)
Additional controls					
occupation dumms	yes (8)	yes (8)	yes (8)	yes (8)	yes (8)
industry dummies	yes (8)	yes (8)	yes (8)	yes (8)	yes (8)
region dummies	yes (10)	yes (10)	yes (10)	yes (10)	yes (10)
constant	-0.155 (0.131)	0.441 (0.070)	0.674 (0.071)	0.875 (0.090)	1.256 (0.114)
F-test : occupation	F(8,1893)=2.78	F(8,1893)=15.29	F(8,1893)=17.10	F(8,1893)=12.96	F(8,1893)=12.96
F-test : industry	F(8,1893)=3.53	F(8,1893)=10.74	F(8,1893)=12.81	F(8,1893)=5.82	F(8,1893)=12.96
F-test : region	F(10,1893)=7.95	F(10,1893)=14.98	F(10,1893)=12.49	F(10,1893)=10.77	F(8,1893)=12.96
pseudo R-squared	0.326	0.323	0.348	0.359	0.367
sample size	1946	1946	1946	1946	1946

Table 9 : Quantile Regressions of Wage Equations

Including Industry Controls
FEMALES

Percentile (from bottom) :

	10^{th}	25^{th}	50^{th}	75^{th}	90^{th}
Central Government	0.300 (0.107)	0.409 (0.047)	0.320 (0.087)	0.262 (0.056)	0.180 (0.067)
local government	0.343 (0.096)	0.376 (0.036)	0.312 (0.071)	0.218 (0.051)	0.199 (0.054)
N. H. S. / H.E.	0.343 (0.096)	0.197 (0.039)	0.225 (0.074)	0.160 (0.048)	0.187 (0.054)
Nationalised Industry	0.222 (0.105)	0.193 (0.085)	0.130 (0.173)	0.052 (0.119)	0.120 (0.072)
.					
highest qualification obtained :					
Apprenticeship	0.299 (0.142)	-0.038 (0.077)	-0.345 (0.233)	0.164 (0.116)	0.120 (0.097)
CSE Grades 2-5	0.092 (0.107)	0.018 (0.041)	-0.035 (0.083)	0.005 (0.057)	0.001 (0.072)
Commercial	0.124 (0.092)	0.112 (0.037)	0.060 (0.068)	0.037 (0.047)	0.021 (0.055)
GCE O-level	0.127 (0.066)	0.158 (0.026)	0.118 (0.048)	0.119 (0.033)	0.053 (0.043)
GCE A-level	0.207 (0.086)	0.236 (0.033)	0.165 (0.060)	0.148 (0.040)	0.042 (0.053)
Nursing	0.370 (0.134)	0.318 (0.051)	0.333 (0.086)	0.418 (0.059)	0.284 (0.063)
Other Higher	0.302 (0.089)	0.303 (0.034)	0.268 (0.061)	0.275 (0.041)	0.218 (0.048)
Teaching	0.464 (0.140)	0.310 (0.055)	0.297 (0.092)	0.408 (0.062)	0.360 (0.076)
First / Hghr Degree	0.425 (0.101)	0.373 (0.038)	0.383 (0.071)	0.457 (0.049)	0.387 (0.061)
experience	0.020 (0.007)	0.022 (0.002)	0.026 (0.005)	0.030 (0.003)	0.037 (0.004)
*experience^2	-0.046 (0.015)	-0.047 (0.006)	-0.057 (0.011)	-0.063 (0.008)	-0.078 (0.010)
*tenure	0.186 (0.070)	0.082 (0.030)	0.084 (0.058)	0.038 (0.045)	0.010 (0.067)
**tenure^2	-0.060 (0.021)	-0.011 (0.010)	-0.009 (0.020)	-0.005 (0.017)	0.008 (0.027)
size : 25 to 99 employees	0.128 (0.046)	0.096 (0.019)	0.053 (0.037)	0.048 (0.026)	0.098 (0.033)
size : 100 to 499 employees	0.136 (0.050)	0.100 (0.020)	0.035 (0.039)	0.049 (0.027)	0.075 (0.035)
size : 500 or more	0.253 (0.057)	0.189 (0.024)	0.135 (0.047)	0.116 (0.033)	0.142 (0.043)
union member X coverage	0.104 (0.050)	0.133 (0.021)	0.070 (0.041)	0.037 (0.029)	0.026 (0.035)
(1-union member) X coverage	0.113 (0.055)	0.043 (0.022)	0.060 (0.045)	0.043 (0.032)	0.050 (0.041)
white	0.110 (0.102)	0.121 (0.038)	0.156 (0.075)	0.149 (0.051)	0.217 (0.071)
married	0.062 (0.041)	0.042 (0.016)	0.037 (0.031)	0.029 (0.022)	-0.007 (0.029)
managerial duties	0.135 (0.045)	0.114 (0.018)	0.124 (0.033)	0.118 (0.023)	0.088 (0.028)
poor health	-0.217 (0.086)	-0.025 (0.032)	-0.055 (0.060)	-0.034 (0.040)	-0.001 (0.058)
Additional controls					
occupation dumms	yes (8)	yes (8)	yes (8)	yes (8)	yes (8)
industry dummies	yes (8)	yes (8)	yes (8)	yes (8)	yes (8)
region dummies	yes (10)	yes (10)	yes (10)	yes (10)	yes (10)
constant	-0.465 (0.174)	0.352 (0.097)	0.519 (0.195)	0.828 (0.112)	0.904 (0.182)
F-test : occupation	F(8,1218)=3.78	F(8,1218)=15.51	F(8,1218)=5.21	F(8,1218)=10.06	F(8,1218)=9.88
F-test : industry	F(8,1218)=13.21	F(8,1218)=19.93	F(8,1218)=6.32	F(8,1218)=13.96	F(8,1218)=9.93
F-test : region	F(10.1218)=3.43	F(10.1218)=16.09	F(10.1218)=5.94	F(10.1218)=11.39	F(10.1218)=8.77
pseudo R-squared	0.295	0.327	0.367	0.399	0.398
sample size	1271	1271	1271	1271	1271

Data Appendix

Table A.1 Descriptive Statistics

Table A.1: Summary Statistics

standard errors in parentheses where applicable

	Public sector		Private sector	
	n=418 Male	n=452 Female	n=1528 Male	n=819 Female
log hourly wage	1.854 (0.466)	1.712 (0.438)	1.672 (0.537)	1.379 (0.484)
civil service / Central Gov.	0.248	0.146		
local gov / local services	0.453	0.506		
N. H. S. / Higher Educ	0.147	0.334		
Nationalised industry	0.150	0.015		
highest qualification obtained :				
Apprenticeship	0.021	0.000	0.033	0.002
CSE Grades 2-5	0.034	0.010	0.066	0.054
Commercial Qualifications	0.005	0.043	0.002	0.075
GCE O-level	0.178	0.213	0.228	0.349
GCE A-level	0.142	0.087	0.151	0.124
Nursing	0.014	0.101	0.001	0.015
Other Higher Qualification	0.211	0.148	0.198	0.102
Teaching	0.042	0.096	0.001	0.008
First Degree / Higher Degree	0.195	0.203	0.086	0.068
potential experience (years)	20.242 (11.677)	18.439 (11.156)	18.347 (12.273)	15.626 (12.014)
tenure (months)	82.449 (91.389)	53.828 (63.200)	61.076 (77.379)	45.691 (60.907)
size : 25 to 99 employees	0.266	0.268	0.253	0.250
size : 100 to 499 employees	0.324	0.234	0.267	0.263
size : 500 or more	0.276	0.233	0.182	0.136
union member X coverage	0.784	0.747	0.317	0.212
(1-union member) X coverage	0.183	0.222	0.135	0.137
white	0.971	0.943	0.957	0.975
married or living as a couple	0.731	0.697	0.700	0.616
managerial duties	0.492	0.444	0.396	0.341
poor health	0.026	0.050	0.033	0.059

Table A.2 : Quantile Regressions of Wage Equations

MALES

Percentile :

	10^{th}	25^{th}	50^{th}	75^{th}	90^{th}
Central Government	-0.044 (0.066)	0.042 (0.052)	0.017 (0.054)	-0.022 (0.055)	-0.102 (0.079)
local government	-0.070 (0.056)	-0.022 (0.044)	-0.001 (0.044)	-0.017 (0.045)	-0.031 (0.059)
N. H. S. / H.E.	-0.246 (0.075)	-0.190 (0.063)	-0.205 (0.069)	-0.145 (0.072)	-0.184 (0.107)
Nationalised Industry	0.074 (0.074)	0.021 (0.063)	-0.019 (0.065)	0.040 (0.069)	0.004 (0.098)
.					
<u>highest qualification obtained :</u>					
Apprenticeship	0.135 (0.083)	0.119 (0.066)	0.065 (0.069)	0.067 (0.072)	0.093 (0.099)
CSE Grades 2-5	0.020 (0.058)	-0.001 (0.052)	0.106 (0.055)	0.141 (0.057)	0.126 (0.077)
Commercial	-0.327 (0.090)	0.277 (0.175)	0.353 (0.197)	0.445 (0.205)	0.387 (0.112)
GCE O-level	0.031 (0.042)	0.074 (0.035)	0.125 (0.037)	0.117 (0.039)	0.127 (0.051)
GCE A-level	0.142 (0.050)	0.145 (0.040)	0.205 (0.042)	0.189 (0.044)	0.207 (0.060)
Nursing	0.442 (0.182)	0.185 (0.137)	0.103 (0.185)	0.237 (0.179)	0.218 (0.148)
Other Higher	0.242 (0.054)	0.241 (0.041)	0.307 (0.041)	0.296 (0.041)	0.353 (0.057)
Teaching	0.312 (0.138)	0.262 (0.111)	0.207 (0.111)	0.277 (0.111)	0.442 (0.137)
First / Hghr Degree	0.365 (0.071)	0.392 (0.053)	0.491 (0.054)	0.470 (0.056)	0.538 (0.078)
experience	0.041 (0.004)	0.031 (0.004)	0.031 (0.004)	0.033 (0.004)	0.039 (0.005)
*experience^2	-0.077 (0.009)	-0.055 (0.008)	-0.056 (0.008)	-0.056 (0.008)	-0.068 (0.011)
*tenure	0.076 (0.039)	0.100 (0.034)	0.071 (0.036)	0.043 (0.036)	0.127 (0.053)
**tenure^2	-0.017 (0.009)	-0.021 (0.009)	-0.009 (0.010)	-0.013 (0.009)	-0.026 (0.016)
size : 25 to 99 employees	0.188 (0.036)	0.104 (0.029)	0.109 (0.032)	0.054 (0.034)	0.105 (0.047)
size : 100 to 499 employees	0.149 (0.035)	0.107 (0.030)	0.147 (0.032)	0.139 (0.035)	0.089 (0.046)
size : 500 or more	0.307 (0.040)	0.200 (0.034)	0.196 (0.036)	0.182 (0.039)	0.156 (0.055)
union member X coverage	0.151 (0.037)	0.138 (0.029)	0.095 (0.030)	0.122 (0.033)	0.073 (0.043)
(1-union member) X coverage	0.080 (0.040)	0.066 (0.034)	0.048 (0.036)	0.021 (0.037)	-0.060 (0.048)
white	0.290 (0.071)	0.125 (0.060)	0.019 (0.064)	0.092 (0.066)	0.112 (0.091)
married	0.206 (0.029)	0.154 (0.028)	0.118 (0.030)	0.083 (0.031)	0.057 (0.042)
managerial duties	0.101 (0.031)	0.110 (0.026)	0.109 (0.027)	0.111 (0.029)	0.121 (0.038)
poor health	-0.051 (0.068)	-0.002 (0.059)	-0.021 (0.064)	-0.031 (0.068)	0.009 (0.092)
<u>Additional controls</u>					
occupation dumms	yes (8)	yes (8)	yes (8)	yes (8)	yes (8)
region dummies	yes (10)	yes (10)	yes (10)	yes (10)	yes (10)
constant	-0.214 (0.106)	0.409 (0.088)	0.672 (0.091)	0.897 (0.098)	1.045 (0.146)
F-test : occupation	F(8,1901)=5.94	F(8,1901)=10.04	F(8,1901)=9.12	F(8,1901)=10.22	F(8,1901)=6.15
F-test : region	F(10,1901)=11.44	F(10,1901)=8.35	F(10,1901)=5.92	F(10,1901)=7.22	F(10,1901)=4.60
pseudo R-squared	0.326	0.309	0.348	0.345	0.354
sample size	1946	1946	1946	1946	1946

Table A.3 : Quantile Regressions of Wage Equations

FEMALES

Percentile :

	10^{th}	25^{th}	50^{th}	75^{th}	90^{th}
Central Government	0.145 (0.108)	0.082 (0.048)	0.096 (0.041)	0.069 (0.047)	-0.023 (0.056)
local government	0.140 (0.077)	0.076 (0.034)	0.078 (0.030)	0.016 (0.034)	-0.012 (0.051)
N. H. S. / H.E.	-0.093 (0.088)	-0.081 (0.041)	0.020 (0.030)	0.003 (0.036)	-0.058 (0.052)
Nationalised Industry	0.283 (0.115)	0.171 (0.121)	0.126 (0.104)	0.097 (0.111)	0.224 (0.071)
<u>highest qualification obtained :</u>					
Apprenticeship	0.206 (0.148)	-0.108 (0.099)	-0.451 (0.136)	0.383 (0.102)	0.129 (0.098)
CSE Grades 2-5	0.067 (0.127)	0.083 (0.055)	-0.024 (0.048)	-0.062 (0.053)	0.038 (0.071)
Commercial	0.193 (0.109)	0.166 (0.049)	0.104 (0.040)	0.010 (0.044)	0.032 (0.058)
GCE O-level	0.183 (0.082)	0.193 (0.034)	0.144 (0.028)	0.099 (0.030)	0.049 (0.041)
GCE A-level	0.274 (0.104)	0.258 (0.043)	0.202 (0.036)	0.126 (0.038)	0.033 (0.049)
Nursing	0.424 (0.160)	0.279 (0.069)	0.308 (0.050)	0.336 (0.054)	0.298 (0.063)
Other Higher	0.325 (0.107)	0.317 (0.044)	0.315 (0.035)	0.283 (0.038)	0.223 (0.050)
Teaching	0.493 (0.164)	0.399 (0.070)	0.338 (0.054)	0.372 (0.058)	0.353 (0.077)
First / Hghr Degree	0.479 (0.118)	0.426 (0.051)	0.453 (0.042)	0.429 (0.046)	0.409 (0.061)
experience	0.021 (0.008)	0.018 (0.003)	0.027 (0.003)	0.032 (0.003)	0.039 (0.004)
*experience^2	-0.051 (0.019)	-0.037 (0.008)	-0.058 (0.007)	-0.071 (0.008)	-0.086 (0.011)
*tenure	0.24 (0.086)	0.147 (0.039)	0.092 (0.036)	0.052 (0.041)	0.040 (0.054)
**tenure^2	-0.076 (0.026)	-0.040 (0.013)	-0.015 (0.013)	-0.007 (0.016)	-0.003 (0.017)
size : 25 to 99 employees	0.160 (0.056)	0.073 (0.026)	0.038 (0.022)	0.063 (0.024)	0.107 (0.034)
size : 100 to 499 employees	0.169 (0.060)	0.110 (0.027)	0.060 (0.023)	0.071 (0.025)	0.102 (0.036)
size : 500 or more	0.314 (0.066)	0.184 (0.032)	0.138 (0.027)	0.131 (0.031)	0.167 (0.044)
union member X coverage	0.144 (0.057)	0.190 (0.027)	0.094 (0.024)	0.087 (0.027)	0.087 (0.039)
(1-union member) X coverage	0.065 (0.062)	0.103 (0.030)	0.068 (0.026)	0.083 (0.029)	0.094 (0.043)
white	0.098 (0.119)	0.085 (0.054)	0.166 (0.045)	0.207 (0.051)	0.178 (0.061)
married	0.038 (0.048)	0.070 (0.021)	0.047 (0.018)	0.018 (0.021)	0.003 (0.030)
managerial duties	0.162 (0.054)	0.102 (0.023)	0.104 (0.019)	0.101 (0.021)	0.073 (0.029)
poor health	-0.132 (0.099)	-0.043 (0.043)	-0.044 (0.035)	-0.069 (0.039)	-0.063 (0.054)
<u>Additional controls</u>					
occupation dumms	yes (8)	yes (8)	yes (8)	yes (8)	yes (8)
region dummies	yes (10)	yes (10)	yes (10)	yes (10)	yes (10)
constant	0.112 (0.187)	0.339 (0.082)	0.530 (0.065)	0.704 (0.072)	0.877 (0.093)
F-test : occupation	F(8,1226)=2.97	F(8,1226)=12.61	F(8,1226)=19.96	F(8,1226)=22.60	F(8,1226)=12.47
F-test : region	F(10,1226)=2.22	F(10,1226)=9.28	F(10,1226)=15.83	F(10,1226)=14.52	F(10,1226)=10.03
pseudo R-squared	0.272	0.305	0.337	0.362	0.361
sample size	1271	1271	1271	1271	1271