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Abstract: Earnings inequality in Great Britain has increased substantially over the last two decades at both the national and regional levels. This paper examines the determinants of regional hourly earnings over the period 1976 to 1995 by estimating regional fixed-effects earnings equations. Using panel dataset from the New Earnings Survey, individual-specific heterogeneity is controlled for, and superior estimates of the factors affecting regional earnings are obtained. Increasing returns to skill, increasing industrial differentials, and increasing premiums for older workers are found to have contributed to increasing regional earnings inequality, and consequently rising earnings inequality at the national level.

Keywords: Increasing regional earnings inequality; Fixed-effects earnings equations.

JEL classification: J31; R23

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I. INTRODUCTION

Earnings inequality in Great Britain has increased substantially over the last two decades at both the national and regional levels. Furthermore, the primary source of increasing inequality in the distribution of earnings has been increasing inequality within regions and not differences in average earnings between regions (Dickey, 2001).

In order to explain why the distributions of earnings within regions are becoming more unequal over time, this paper uses earnings data from the New Earnings Survey to investigate factors that influence the determination of earnings within the regions, and how these factors change over time. Despite the significant interest in research literature on the issue of earnings inequality, there has been little analysis carried out at the regional level in Great Britain, and the important issue of the determinants of regional earnings has been largely ignored.

However, one problem with the NES is that it is not rich in variables that are thought to determine wages, for example, human capital variables. The consequence of using a limited list of control variables when specifying earnings equations is the possibility of bias arising in cross-section coefficients. The use of panel data allows for the control of unobserved fixed effects that are especially important when using a dataset that is weak on personal characteristics.

This is achieved by the inclusion of individual fixed-effects which will reduce the omitted variable bias resulting from the limited list of control variables in the NES, and improve the precision of the estimates of regional earnings determinants.

In section 2 theoretical issues concerning panel data estimation are discussed, specifically the reasons why a fixed-effects specification is appropriate when estimating earnings equations. Section 3 outlines the two different fixed-effects specifications used in this paper. The first specification is the classical fixed-effects model in which the coefficients are fixed over time. The second specification is a fixed-effects model in which the coefficients are allowed to vary by period. Section 4 concludes.

II. THEORETICAL ISSUES

Fixed-effects and Random-effects models

The use of panel data provides the means of controlling for the effects of missing or unobserved variables. Omitted variables that are correlated with explanatory variables are a common econometric problem, and which cause least squares regression coefficients to be biased. Panel data has the advantage that if repeated observations for a group of individuals are available, the effect of omitted variables can be eliminated and, therefore, least squares regressions provide unbiased and consistent coefficients under the assumption that these effects do not change through time or vary in a random manner.

The effects of omitted individual-specific variables can be treated in one of two ways; namely as either fixed constants over time or as random variables, thus leading to the fixed-effects and random-effects models respectively.

The question of whether the individual-specifics should be treated as fixed or random depends on the situation to which the model applies and the inferences to be derived from it. Two issues have been raised in the literature regarding whether the effects of individual-specific and time-specific variables should be treated as random or fixed for a linear static model; the efficiency of the estimates and the unbiasedness and consistency of the estimates. The random-effects specification has been criticised by Mundlak (1978) because it ignores the possible correlation between the explanatory variables and the effects. When all the explanatory variables are exogenous the covariance estimator is BLUE under the fixed-effects assumption and a consistent and unbiased estimator under the random-effects assumption even though it is not efficient when the number of years (T) is fixed. When there are omitted individual attributes that are correlated with the included exogenous variables, the fixed-effects covariance estimates do not suffer from bias due to the omission of these individual attributes. However, a GLS estimator for the random-effects model under the assumption of independence between the attributes and the explanatory variables will be biased. If the effects are correlated with all the exogenous variables, a correctly formulated random-effects model will lead to the same covariance estimator as the fixed-effects model. As a result, the fixed-effects model has gained more importance in empirical studies.

For the estimation of earnings equations using panel data it is important to take account of the permanent unobserved differences across individuals, and in these equations there will be a high probability of correlation between the individual heterogeneity and the explanatory variables. Thus, a fixed-effects specification will be more appropriate as treating the individual heterogeneity as a random error component will result in biased and inconsistent estimates, whereas the fixed-effects estimator will be unbiased and consistent.

III. SPECIFICATION OF THE FIXED-EFFECTS REGIONAL EARNINGS EQUATIONS

In this paper panel data from the New Earnings Survey is used to investigate the determinants of regional earnings in Great Britain. The NES provides the main source of information on the structure of earnings in Great Britain. It is a sample survey of the earnings of employees in employment, and contains information on weekly earnings, hourly rates of pay and hours of work, as well as various employee characteristics such as age, occupation, industry, area and whether or not an individual is covered by a Wages Board or Council.

Using individual earnings data from 1976, 1980, 1991 and 1995 earnings equations are estimated for the six broad regions of Great Britain; Greater London, the Rest of the South, the Midlands, the North, Wales and Scotland. The analysis focuses on full-time workers (defined as those that usually work 30 hours or more per week), as part-

time workers are omitted due to the sampling frame used by the NES[1]. The fixed-effects earnings equations are a standard formulation of the Mincer-type model that controls for both unobserved heterogeneity and for time-specific effects:

$$\ln y_{it} = \beta_t X_{it} + \lambda_t + \alpha_i + u_{it} \qquad [1]$$

where y_{it} is hourly earnings; X_{it} is a vector of conditioning variables; u_{it} is the disturbance associated with individual i at time t; β_t is the vector of parameters to be estimated for period t; α_i and λ_t are the coefficients on the individual-specific and time-specific dummy variables which allow for heterogeneous intercepts across

[1] The sampling frame used by the NES makes the earnings information on part-time workers less than fully representative. The NES is based largely on a 1% random sample of employees who are members of Pay As You Earn tax schemes, and comprises all those National Insurance numbers which end with a specified pair of digits. The use of Inland Revenue records to locate the employees with the appropriate NI numbers means that the sample base is effectively restricted to those employees who are recorded in the tax office records. The earnings threshold for the PAYE schemes will therefore have important implications for sample selection. Many of those excluded from the sample because their earnings fall below the income tax threshold include women with part-time jobs and a small proportion of young people. Further, due to the increasing number of part-time females included in the NES who earn below the NI lower limit, the statistics on part-time females must be treated with caution (Bell, 1995). As a result, only full-time employees are included in this analysis.

individuals and time. The individual-specific effect can take account of unmeasured individual differences in earnings capabilities (e.g. education or application) providing these stay constant through time, and which cannot be identified in cross-sectional studies but will appear instead in a composite error term (Bell and Ritchie, 1996).

Two different specifications of the above fixed-effects model are used to estimate the regional earnings equations. The first specification is the classical fixed-effects model in which the coefficients of the explanatory variables are fixed over time. Thus, only one vector of β parameters is estimated:

$$\ln y_{it} = \beta' X_{it} + \lambda_t + \alpha_i + u_{it} \qquad [2]$$

In contrast, the second specification is a fixed-effects model in which the coefficients are allowed to vary by period. In this specification, β_t is a vector of parameters to be estimated for each period t:

$$\ln y_{it} = \beta_t X_{it} + \lambda_t + \alpha_i + u_{it} \qquad [3]$$

For estimation purposes the difference in the two specifications is the way in which the data is arranged. In the classical time-invariant fixed-effects model the explanatory variables are set up as a matrix, one for each time period, and then the variable matrices are stacked vertically:

$$y_i \equiv \begin{bmatrix} y_{i1} \\ y_{i2} \\ \vdots \\ y_{iT} \end{bmatrix} \qquad X_i \equiv \begin{bmatrix} x_{i1} \\ x_{i2} \\ \vdots \\ x_{iT} \end{bmatrix} \qquad \beta \equiv \begin{bmatrix} \beta_1 \\ \beta_2 \\ \vdots \\ \beta_T \end{bmatrix} \qquad u_i \equiv \begin{bmatrix} u_{i1} \\ u_{i2} \\ \vdots \\ u_{iT} \end{bmatrix} \qquad [4]$$

In the time-varying fixed-effects model the coefficients for the explanatory variables are allowed to vary freely over the period. The vector of β coefficients is therefore estimated for each time period. This is achieved by stacking the X variable matrix block-diagonally. The model is rewritten as:

$$y_i = J_T \alpha_i + W_i \beta_i + u_i \qquad [5]$$

where

$$y_i \equiv \begin{bmatrix} y_{i1} \\ y_{i2} \\ \vdots \\ y_{iT} \end{bmatrix} \qquad W_i \equiv \begin{bmatrix} x_{i1} & 0 & \dots & 0 \\ 0 & x_{i2} & \dots & 0 \\ \vdots & \ddots & & \\ 0 & 0 & \dots & x_{iT} \end{bmatrix} \qquad \beta \equiv \begin{bmatrix} \beta_1 \\ \beta_2 \\ \vdots \\ \beta_T \end{bmatrix} \qquad u_i \equiv \begin{bmatrix} u_{i1} \\ u_{i2} \\ \vdots \\ u_{iT} \end{bmatrix} \qquad [6]$$

and J_T is a T-vector of ones. In this way the vector of β coefficients is estimated for each of the four sample years. In both specifications α_i is treated as a nuisance parameter that is eliminated by taking deviations from individual means.

In the classical fixed-effects specification the model concentrates on differences within individuals. It is explaining to what extent y_{it} differs from $\bar{y}_i$, and does not explain why $\bar{y}_i$ differs from $\bar{y}_j$. The parametric assumptions about β impose that a change in x has the same (ceteris paribus) effect, whether it as a change from one period to another or a change from one individual to the other. In the classical fixed-

effects model the effect of x is identified through individuals who change status over the period. For example, the effect of being in a union is identified only through people that change union status over the sample period.

In contrast, the time-varying fixed-effects model exploits all the observations in the sample, including those individuals who do not change status, and the estimation of coefficients for each time period means that the assumptions concerning β which impose that a change in x has the same ceteris paribus effect from one period to another no longer applies. The more flexible specification therefore allows us to model not just the different premiums associated with the different determinants of earnings, but also how these premiums have changed over time. Despite the existence of models that allow coefficients to vary over individuals, few authors have considered coefficients that vary over time. Consequently, theoretical and applied research with time-varying coefficients is almost non-existent (Bell and Ritchie, 1994).

The explanatory variables included in the model are dummies for occupation, industry, sector, coverage by major collective agreement, regional migration, and age. For the time-varying fixed-effects model, following the specification of Bell and Ritchie (1996) the coefficients on age are restricted to be the same for all periods. Direct modelling of human capital in these equations is precluded as a result of the NES not including observations on education and experience. In the absence of such variables previous research using the NES has used occupation and age variables as proxies for human capital (Bell, Rimmer and Rimmer, 1994). The nine major groups of the Standard Occupation Classification are used for the occupation variable.

Similarly, for the industry variable, the industrial divisions are from the Standard Industrial Classification.

The dependent variable is hourly earnings adjusted for overtime and the sample consists of full-time employees aged between 16 and 65 years with at least two observations in the dataset. This is necessary as those with only one observation are lost when the transformation for individual heterogeneity is made. In addition, the earnings data are deflated to the base year 1976 using the RPI.

Fixed-effects regression results

The estimates for the regional earnings equations using the classical fixed-effects model are shown in Table 1. The results for the time-varying fixed-effects specification for 1976 and 1995 are shown in Tables 2 and 3. The regional earnings equations were also estimated cross-sectionally for comparative reasons, and the cross-section results for 1976 and 1995 are shown in Tables 4 and 5.

The time-invariant estimates for the occupation variable show that skilled workers do better in terms of earnings relative to other workers irrespective of region. There is an earnings premium for workers in non-manual occupations compared to workers in manual occupations. The time-varying estimates for the occupation variable further reveal that inter-occupational differentials have risen over time, with the earnings gap between high- and low-skilled workers increasing in all regions.

The time-varying estimates also show that occupational structure has become more important over time in explaining hourly earnings. This changing impact of occupational structure on individual hourly earnings over the sample period will not be picked up by the classical fixed-effects model as it assumes that changes in occupation have the same ceteris paribus impact from one period to another.

A comparison of the panel estimates and cross-section estimates produce qualitatively similar results, but the fixed-effects estimates are generally smaller than the cross-section results. The time-varying coefficients for occupation are lowest in 1976 and highest in 1995, with the time-invariant coefficients generally falling around midway between this range. One reason for the difference in the size of the returns to occupation may be that non-manual occupations rely much more on "unmeasurable" characteristics, such as ability, personality and motivation. If these characteristics remain constant over time this could explain the disparity between the cross-section and fixed-effects results. Another reason may be education. Education is likely to produce an individual-specific element with occupation which will be transformed out by the fixed-effects model. By not transforming out this effect the cross-section estimation may more accurately reflect the occupational returns due to the average individual. On the other hand, the time-varying fixed-effects model produces a "pure" coefficient and therefore gives the return to an occupation allowing for any individual characteristics. Thus, the cross-section estimation predicts overall returns to an occupation, whereas the time-varying fixed-effects specification is more appropriate for comparing occupational differences (Ritchie, 1995).

The effect of industry on individual hourly earnings shown by both the time-invariant and time-varying estimates broadly supports the cross-section estimates. One striking difference, however, between the cross-section and time-varying fixed-effects estimates, however, is the coefficients for the industrial division banking, finance and insurance. The cross-section results reveal an earnings premium for those individuals employed in this industry, particularly in Greater London. In contrast, the fixed-effects coefficients are mostly negative and significant. Taking into account unobserved individual heterogeneity (i.e. the unmeasured differences between individuals, such as ability) therefore suggests that the earnings premium for workers in this industry reported by cross-section estimation may be a result of these workers being of higher than average ability rather than because there is a larger rent paid to these workers in this particular industry. The use of panel estimates, however, avoids the problem of unobserved individual heterogeneity being wrongly ascribed to the control variables.

The time-invariant fixed-effects estimates suggest that industrial structure has a greater impact on earnings in the northern regions of Great Britain that are traditionally considered manufacturing regions compared to the southern regions that are relatively more concentrated in service industries. The time-varying results further reveal that industrial structure has become more important in explaining hourly earnings over the period.

The time-invariant fixed-effects estimates for the sector variable indicate that being employed in either a public corporation or local government has a largely positive impact on individual hourly earnings, whereas employment in central government has

a negative effect on earnings. The time-varying results further highlight a downward trend in the sector coefficients, implying that the public sector premium has declined over the period. This is particularly true for workers in public corporations.

A comparison of the time-invariant and the time-varying fixed-effects coefficients show that the time-invariant estimates are generally smaller than the time-varying estimates, and both fixed-effects estimates are smaller than the cross-section estimates for the sector variable.

Rees and Shah (1992) and Bell and Ritchie (1994) also found a public sector premium in the hourly wage rate. Rees and Shah argue that public sector employees work significantly fewer hours, which could produce a private sector premium if the difference in hours is not recognised.

The age variable is specified as a set of dummy variables that allows for a very flexible specification of the age-earnings profile. For the time-varying fixed-effects model, only one set of coefficients for age is estimated. Consequently, the coefficients for age are time-invariant in both fixed-effects specifications.

Both fixed-effects estimates show that there is an earnings premium for workers in the prime age band of 36-50 years. This is consistent with the cross-section results and the fixed-effects estimates of Bell and Ritchie (1996). In addition, all age groups do well relative to the very young. In all six regions workers under the age of 20 years are particularly disadvantaged.

The age-earnings profiles of the different regions display a similar pattern. Earnings increase with age until they peak in the 36-45 age range and then begin to decline as workers get older. One regional difference in the age-earnings profiles revealed by the time-varying estimates is that earnings peak in the 41-45 age group in Greater London but for the other regions earnings peak in the 36-40 age band. Another regional difference is that individuals aged between 19 and 30 years in Greater London earn lower wages (relative to prime age workers) compared to workers aged between 19 and 30 years in the rest of the country.

A comparison of the two fixed-effects estimates for the age variable show that the coefficients are very similar in value and statistical significance, and also the patterns highlighted by the fixed-effects estimates are similar to the cross-section results. Cross-section estimates further show that the age premiums for prime-age workers increased over the period, so that by 1995 younger workers were even more disadvantaged relative to prime-age workers (aged between 36 and 50 years).

In the classical fixed-effects model the effect of unionism is identified only through those individuals who change union status over time. The time-invariant estimates indicate that the effect of union coverage on individual hourly earnings is positive for all six regions. Union coverage has the greatest impact on earnings in the North and the least impact in the Rest of the South.

The fixed-effects specification of the earnings equations that allows the coefficients to vary over time further shows that the size of the union effect varies considerably over the period. Bell and Ritchie (1996) suggest that estimates of the union effect may be

sensitive to the measurement period, and given the legislative changes concerning trade unions over the last 25 years significant variation in the union effect is to be expected.

As expected the fixed-effects estimates of the union differential are lower than cross-section estimates. This is a result of allowing for individual heterogeneity. In addition, the classical fixed-effects model gives lower estimates of the union differential than the time-varying fixed-effects model. The difference between the fixed-effects and cross-section estimates are consistent with the results of Andrews, Bell and Upward (1998) who find fixed-effects of a 2% union coverage differential in both 1978 and 1985 and cross-section estimates of 4% for the same years. Booth (1995) states that panel estimates give much lower estimates of the union effect than cross-sections, with the latter generally seeming to be twice as large (Bell and Ritchie, 1996).

IV. CONCLUSIONS

This paper has examined the determinants of regional hourly earnings over the period 1976 to 1995 by estimating regional fixed-effects earnings equations. The presence of unmeasured differences between individuals raises the possibility of bias arising in cross-section estimates. However, using the NES panel dataset this individual-specific heterogeneity can be controlled for, and superior estimates of the factors affecting regional earnings can be obtained.

Two specifications of the fixed-effects model were used to estimate the regional earnings equations. The classical time-invariant fixed-effects model and a time-varying specification that allowed the vector of coefficients to be estimated for each time period. The allowance for individual-specific heterogeneity goes some way to making up for the lack of personal and educational variables in the NES, and specifying fixed-effects earnings equations allows us to take into account characteristics which are constant over time but which are essentially unmeasurable.

The importance of allowing for individual-specific heterogeneity is shown in the fixed-effects results. The cross-section and fixed-effects estimates are qualitatively similar but the scale of the estimates is different. Both fixed-effects specifications generally produce smaller coefficients than those obtained from cross-section estimation. In general, the regional fixed-effects results support the findings of the cross-section estimates. Increasing returns to skill (as proxied by occupation and age), increasing industrial differentials over time, and increasing premiums for older workers have all contributed to increasing regional earnings inequality, and consequently rising earnings inequality at the national level.

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TABLE 1
Classical Fixed-Effects Results

	Greater London	Rest of the South	The Midlands	The North	Wales	Scot-land
Occupation						
Managers & administrators	0.089**	0.146**	0.146**	0.145**	0.051**	0.162**
Professional occupations	0.066**	0.097**	0.080**	0.090**	0.023	0.090**
Associate professional & technical	0.069**	0.058**	0.054**	0.071**	0.022	0083**
Clerical & secretarial	-0.057**	-0.033**	-0.038**	-0.009**	-0.084**	-0.022*
Personal & protective services	-0.91**	-0.038**	-0.049**	-0.041**	-0.101**	-0.043**
Sales occupations	-0.033*	-0.012	-0.030*	-0.001	-0.077**	-0.039*
Plant & machinery operatives	-0.031*	-0.021**	-0.033**	-0.005	-0.047**	-0.013
Other occupations	-0.099**	-0.070**	-0.073**	-0.032**	-0.097**	-0.051**
Industry						
Agriculture, forestry & fishing	0.079	-0.021	-0.074*	-0.008	-0.021	-0.075*
Energy & water supply	0.038	0.094**	0.242**	0.183**	0.231**	-0.129**
Other mineral & ore extraction	0.035	0.006	0.017	0.066**	0.135**	0.036*
Metal, vehicles & engineering	0.004	0.023*	0.025*	0.042**	0.064**	0.044**
Construction	-0.052*	-0.020	-0.055**	-0.022*	-0.058*	-0.020
Distribution, catering & repairs	-0.073**	-0.076**	-0.074**	-0.089**	-0.073**	-0.069**
Transport & communication	-0.010	-0.030*	-0.075**	-0.052**	-0.053	-0.063**
Banking, finance & insurance	0.007	-0.014	-0.050**	-0.028*	-0.051	0.076**
Other services	-0.049**	-0.035**	-0.021	-0.038**	-0.069*	-0.068**
Sector						
Public corporations	0.056**	0.017*	0.020*	0.011	0.019	0.041**
Central government	-0.039*	-0.055**	-0.039*	-0.037**	-0.054*	0.008
Local government	0.031	0.001	0.030*	-0.007	-0.047*	0.032*
Age group						
17 – 18	-0.570**	-0.538**	-0.527**	-0.503**	-0.503**	-0.522**
19 – 20	-0.411**	-0.322**	-0.346**	-0.289**	-0.297**	-0.300**
21 – 22	-0.289**	-0.217**	-0.205**	-0.162**	-0.184**	-0.188**
23 – 24	-0.226**	-0.152**	-0.143**	-0.122**	-0.103**	-0.112**
25 – 26	-0.167**	-0.108**	-0.098**	-0.082**	-0.109**	-0.096**
27 – 30	-0.084**	-0.051**	-0.041**	-0.040**	-0.023	-0.038**
36 – 40	0.046**	0.031**	0.021*	0.033**	0.015	0.026*
41 – 45	0.065**	0.025*	0.023	0.035**	0.010	0.024
46 – 50	0.054*	0.017	0.008	0.019	-0.019	0.009
51 – 55	0.034	-0.025	-0.021	-0.018	-0.054	-0.026

56 – 60	-0.017	-0.078**	-0.065*	-0.068*	-0.093	-0.069
>60	-0.089	-0.145**	-0.125**	-0.137**	-0.122	-0.128*
Collective agreement	0.030**	0.023**	0.035**	0.039**	0.032**	0.025**
Move	-0.019	-0.041**	-0.012	-0.003	-0.009	-0.055*
Time dummy: 1980	0.541**	0.548**	0.537**	0.544**	0.533**	0.528**
Time dummy: 1991	1.572**	1.529**	1.464**	1.477**	1.473**	1.484**
Time dummy: 1995	1.743**	1.696**	1.634**	1.669**	1.677**	1.687**
R^2	0.917	0.923	0.924	0.926	0.931	0.928

Notes:

* Significant at the 10% level.
** Significant at the 5% level.
*** Significant at the 1% level.

TABLE 2

Time-varying Fixed-Effects Results for 1976

	Greater London	Rest of the South	The Midlands	The North	Wales	Scot-land
Occupation						
Managers & administrators	-0.016	-0.004	-0.011	-0.008	-0.039	0.030
Professional occupations	0.002	0.017	-0.004	-0.007	-0.049	-0.015
Associate professional & technical	-0.009	-0.002	-0.001	-0.019	0.007	-0.007
Clerical & secretarial	-0.022	-0.033**	-0.035**	-0.016	-0.075**	-0.026
Personal & protective services	-0.103**	-0.074**	-0.092**	-0.067**	-0.102**	-0.069**
Sales occupations	-0.041	-0.051**	-0.046*	-0.040*	-0.069	-0.068**
Plant & machinery operatives	0.010	0.011	-0.016	0.029**	-0.020	0.005
Other occupations	-0.015	-0.014	-0.012	0.007	-0.074*	0.007
Industry						
Agriculture, forestry & fishing	0.196	0.003	-0.052	0.009	-0.007	-0.043
Energy & water supply	-0.040	0.016	0.112**	0.065**	0.091*	-0.013
Other mineral & ore extraction	0.037	-0.002	0.017	0.046**	0.114**	0.032
Metal, vehicles & engineering	0.026	0.013	0.028*	0.032**	0.055*	0.064**
Construction	-0.051*	-0.028	-0.086**	-0.016	-0.058	-0.012
Distribution, catering & repairs	-0.015	-0.040**	-0.090**	-0.084**	-0.050	-0.034
Transport & communication	0.002	-0.007	-0.061*	-0.031	-0.062	-0.078**
Banking, finance & insurance	-0.088**	-0.143**	-0.150**	-0.130**	-0.199**	-0.169**
Other services	-0.034	-0.035*	-0.027	-0.034*	-0.047	-0.094**
Sector						
Public corporations	0.118**	0.038*	0.066**	0.052**	0.082**	0.101**
Central government	0.034	-0.026	-0.041	-0.029	-0.071*	0.083**
Local government	0.105**	0.041*	0.071**	0.020	0.042	0.073**
Age group						
17 – 18	-0.575**	-0.550**	-0.546**	-0.525**	-0.508**	-0.521**
19 – 20	-0.401**	-0.327**	-0.350**	-0.302**	-0.294**	-0.288**
21 – 22	-0.289**	-0.218**	-0.212**	-0.174**	-0.176**	-0.177**
23 – 24	-0.214**	-0.152**	-0.139**	-0.125**	-0.101**	-0.096**
25 – 26	-0.155**	-0.105**	-0.094**	-0.086**	-0.098**	-0.081**
27 – 30	-0.074**	-0.048**	-0.036**	-0.039**	-0.016	-0.027*
36 – 40	0.037**	0.023**	0.018*	0.026**	0.006	0.007
41 – 45	0.049**	0.013	0.018	0.023*	-0.007	-0.008

46 – 50	0.035	0.003	0.005	0.006	-0.037	-0.031
51 – 55	0.024	-0.036	-0.017	-0.026	-0.077	-0.074*
56 – 60	-0.017	-0.082**	-0.056	-0.068*	-0.125*	-0.122**
>60	-0.074	-0.136**	-0.103*	-0.128**	-0.150*	-0.183**
Collective agreement	0.049**	0.041**	0.035**	0.043**	0.039*	0.033**
Move	-0.023	-0.040**	-0.042	-0.025	-0.083*	-0.183**
R^2	0.777	0.784	0.789	0.788	0.783	0.787
N	31088	57671	33871	53216	9039	22403

TABLE 3

Time-varying Fixed-effects Results for 1995

	Greater London	Rest of the South	The Midlands	The North	Wales	Scot-land
Occupation						
Managers & administrators	0.203**	0.264**	0.275**	0.270**	0.188**	0.278**
Professional occupations	0.207**	0.208**	0.223**	0.216**	0.174**	0.246**
Associate professional & technical	0.196**	0.163**	0.163**	0.174**	0.166**	0.203**
Clerical & secretarial	-0.054*	0.021*	0.016	0.022*	-0.017	0.023
Personal & protective services	-0.075**	0.011	-0.016	0.013	-0.021	-0.004
Sales occupations	0.012	0.065**	0.048*	0.048**	-0.002	0.029
Plant & machinery operatives	-0.087**	-0.054*	-0.056**	-0.048**	-0.008	-0.042*
Other occupations	-0.139**	-0.113**	-0.101**	-0.082**	-0.103**	-0.124**
Industry						
Agriculture, forestry & fishing	-0.073	-0.107**	-0.140**	-0.082*	-0.100	-0.125*
Energy & water supply	0.117**	0.142**	0.281**	0.254**	0.345**	0.176**
Other mineral & ore extraction	0.073*	0.043*	0.006	0.105**	0.139**	0.073*
Metal, vehicles & engineering	-0.033	0.017	0.024	0.025*	0.039	0.025
Construction	-0.085*	-0.061**	-0.051*	-0.058**	-0.098*	-0.027
Distribution, catering & repairs	-0.115**	-0.138**	-0.095**	-0.138**	-0.084*	-0.130**
Transport & communication	-0.046*	-0.035*	-0.091**	-0.054**	-0.023	-0.071**
Banking, finance & insurance	0.094**	0.009	-0.025	0.007	0.032	-0.024
Other services	-0.049*	-0.062**	-0.001	-0.052**	-0.110**	-0.047*
Sector						
Public corporations	0.070**	-0.006	0.052*	-0.050*	-0.038	0.060*
Central government	-0.079**	-0.035*	-0.055*	-0.027	0.013	-0.022
Local government	0.005	0.026	0.005	0.015	0.117**	0.026
Collective agreement	0.059**	0.026**	0.048**	0.035**	0.036*	0.030*
Move	-0.012	0.023	dropped	0.055	0.071	0.017
Time dummy	1.708**	1.645**	1.561**	1.604**	1.598**	0.653**
R^2	0.777	0.784	0.789	0.788	0.783	0.787
N	31088	57671	33871	53216	9039	22403

TABLE 4

Cross-section Results for 1976

	Greater London	Rest of the South	The Midlands	The North	Wales	Scot-land
Occupation						
Managers & administrators	0.320**	0.254**	0.228**	0.224**	0.229**	0.256**
Professional occupations	0.379**	0.381**	0.338**	0.334**	0.315**	0.314**
Associate professional & technical	0.351**	0.347**	0.270**	0.289**	0.319**	0.311**
Clerical & secretarial	0.054**	0.034**	0.011	0.011	0.035*	0.024*
Personal & protective services	-0.040*	-0.003	-0.040*	-0.048**	0.047	-0.048*
Sales occupations	0.153**	0.057**	0.068**	0.053**	0.053	0.008
Plant & machinery operatives	-0.044**	-0.034**	-0.038**	-0.041**	-0.029*	-0.055**
Other occupations	-0.115**	-0.094**	-0.095**	-0.101**	-0.107**	-0.100**
Industry						
Agriculture, forestry & fishing	-0.092	-0.056*	-0.066*	-0.026	-0.069	-0.049
Energy & water supply	0.071*	0.135**	0.108**	0.168**	0.094**	0.145**
Other mineral & ore extraction	0.012	0.063**	0.043**	0.145**	0.133**	0.089**
Metal, vehicles & engineering	-0.035*	0.049**	0.047**	0.072**	0.055*	0.091**
Construction	-0.058**	-0.086**	-0.074**	-0.010	-0.103**	-0.014
Distribution, catering & repairs	-0.050**	-0.101**	-0.168**	-0.127**	-0.193**	-0.131**
Transport & communication	-0.005	0.032*	-0.006	0.031*	-0.071*	-0.014
Banking, finance & insurance	0.144**	0.061**	0.045**	0.082**	-0.037	0.043*
Other services	0.105**	0.081**	0.094**	0.144**	0.047	0.069**
Sector						
Public corporations	0.123**	0.050**	0.078**	0.058**	0.119**	0.073**
Central government	0.086**	0.025*	0.004	-0.006	0.057*	0.038*
Local government	0.141**	0.163**	0.186**	0.133**	0.141**	0.138**
Age group						
16 – 20	-0.469**	-0.430**	-0.409**	-0.439**	-0.412**	-0.421**
21 – 25	-0.220**	-0.195**	-0.149**	-0.168**	-0.163**	-0.153**
26 – 30	-0.078**	-0.061**	-0.042**	-0.069**	-0.079**	-0.046**
31 – 35	-0.028*	-0.021*	0.004	-0.027*	-0.021	-0.006
41 – 45	-0.006	-0.011	0.004	-0.021*	-0.033	-0.008
46 – 50	-0.016	-0.011	-0.027*	-0.035**	-0.027	-0.038*
51 – 55	-0.025*	-0.047**	-0.044**	-0.076**	-0.029	-0.045**
56 – 60	-0.086**	-0.083**	-0.064**	-0.104**	-0.078**	-0.096**

61 – 65	-0.178**	-0.149**	-0.149**	-0.181**	-0.139**	-0.143**
Institutions						
Collective agreement	0.235**	0.154**	0.120**	0.134**	0.080*	0.166**
Wages boards and councils	0.012	-0.053*	-0.060*	-0.054*	-0.192**	-0.033
No coverage	0.291**	0.159**	0.108**	0.133**	0.063	0.162**
Gender	0.223**	0.242**	0.251**	0.263**	0.256**	0.279**
Move	-0.046**	0.091**	0.017	0.049**	0.069	0.129**
Constant	0.027	-0.023	0.003	-0.013	0.039	-0.050
R^2	0.422	0.462	0.463	0.463	0.466	0.467
N	11092	17437	10795	18747	3192	7795

TABLE 5

Cross-section Results for 1995

	Greater London	Rest of the South	The Midlands	The North	Wales	Scot-land
Occupation						
Managers & administrators	0.523**	0.530**	0.520**	0.488**	0.491**	0.511**
Professional occupations	0.561**	0.561**	0.594**	0.596**	0.587**	0.648**
Associate professional & technical	0.456**	0.328**	0.304**	0.299**	0.315**	0.359**
Clerical & secretarial	0.051*	0.041**	0.027*	0.004	0.022	0.038*
Personal & protective services	-0.049*	-0.032*	-0.034*	-0.046**	-0.020	-0.017
Sales occupations	0.130**	0.128**	0.137**	0.106**	0.083*	0.094**
Plant & machinery operatives	-0.171**	-0.132**	-0.080**	-0.098**	-0.060*	-0.101**
Other occupations	-0.254**	-0.221**	-0.207**	-0.215**	-0.201**	-0.238**
Industry						
Agriculture, forestry & fishing	-0.441*	-0.214**	-0.156**	-0.176**	-0.226*	-0.222**
Energy & water supply	0.172**	0.194**	0.236**	0.269**	0.327**	0.252**
Other mineral & ore extraction	-0.008	0.088**	0.060**	0.152**	0.223**	0.103**
Metal, vehicles & engineering	-0.103**	0.014	0.062**	0.041**	0.091**	0.051**
Construction	-0.206**	-0.143**	-0.049*	-0.067**	-0.124**	-0.074**
Distribution, catering & repairs	-0.241**	-0.202**	-0.119**	-0.190**	-0.235**	-0.253**
Transport & communication	-0.069**	-0.009	-0.007	-0.007	-0.004	-0.018
Banking, finance & insurance	0.167**	0.074**	0.096**	0.074**	-0.076*	0.021
Other services	-0.076**	-0.117**	-0.012	-0.049**	-0.075*	-0.050*
Sector						
Public corporations	0.037	-0.066**	-0.019	-0.070**	-0.115*	-0.032
Central government	-0.079**	0.044**	0.090**	0.068**	0.110**	0.025
Local government	0.037*	0.122**	0.125**	0.138**	0.160**	0.104**
Age group						
16 – 20	-0.531**	-0.486**	-0.481**	-0.465**	-0.488**	-0.488**
21 – 25	-0.273**	-0.262**	-0.225**	-0.231**	-0.238**	-0.211**
26 – 30	-0.114**	-0.114**	-0.095**	-0.098**	-0.071**	-0.086**
31 – 35	-0.034*	-0.035**	-0.020	-0.030**	0.005	-0.017
41 – 45	0.019	-0.014	0.014	0.013	0.024	0.001
46 – 50	0.018	-0.011	0.013	0.013	0.007	0.012
51 – 55	-0.040*	-0.050**	-0.030*	-0.014	-0.020	-0.004
56 – 60	-0.086**	-0.113**	-0.054**	-0.061**	-0.016	-0.053*

61 – 65	-0.142**	-0.209**	-0.184**	-0.162**	-0.075	-0.105**
Collective agreement	-0.074**	-0.062**	-0.074**	-0.054**	-0.083**	-0.039**
Gender	0.154**	0.184**	0.203**	0.179**	0.186**	0.186**
Move	-0.037*	0.096**	0.061**	0.071**	0.033	0.145**
Constant	2.120**	1.893**	1.730**	1.793**	1.748**	1.791**
R^2	0.460	0.495	0.498	0.503	0.523	0.562
N	11513	22667	12943	19292	3354	7687

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