REGIONAL EARNINGS DIFFERENCES IN
GREAT BRITAIN: EVIDENCE FROM THE
NEW EARNINGS SURVEY

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Abstract

Previous analysis comparing earnings between regions of Great Britain has concentrated upon the earnings of male employees. Using a large micro data base this paper takes a broader approach by examining earnings differences for female and part-time employees as well as male employees. Using 'human capital' models to decompose earnings differences into characteristic and reward effects, regional earnings differences in terms of characteristic and reward effects are found to be more marked for males compared to females. The paper concludes that such differences are the result of a lower diversity in range of occupations in which females are employed compared to male employees.

Key words: regional, earnings.

Introduction

In Great Britain government policy and economic strategy has in the last ten years placed greater faith and reliance upon the operation of the labour market. Regional spatial differences in unemployment are no longer the subject of government intervention, but there exists an expectation that the smooth operation of the labour market will ensure that over time unemployment will fall as workers and firms relocate. Armstrong and Taylor, 1986 find that in Britain although regional mobility flows are in the right direction, they are not strong enough to influence wage and unemployment differentials. Pissarides and McMaster, 1984 reach a similar conclusion in that there is evidence of an adjustment mechanism, but it is very slow and their results imply that it takes more than 20 years to eliminate a disequilibrium unemployment differential from a depressed region. Clearly if such region imbalance between labour markets exists one would expect to find evidence of earnings differences, *ceteris paribus*, between regions. In other words are regional earnings differences generated merely by differences in the distribution of employee characteristics (human capital etc.), or there are additional earnings differences which imply that equivalent employees receive different returns to characteristics between regions?

Previous analysis of this issue in the UK has been limited to the examination of male employees only. Through the use of the

New Earnings Survey data the following analysis compares regional earnings for female as well as male employees. The evidence for males supports previous results which suggest that there are statistically significant differences in returns to characteristics between regions. For female employees the evidence is not as strong and it seems quite possible that undetected characteristic differences could account for the observed differences in earnings.

Previous analysis of regional earnings differences

Studies of regional earnings differences from the US have concentrated upon the earnings differential between the north and the south. Of prime concern is whether the earnings differential arises through differences in the distribution of human capital or through returns to human capital. In practice the evidence from studies conducted in the U.S. have not produced agreement over this issue. Hanushek, 1981; Shaling and Smith, 1983 and Krum, 1984 find that the characteristic differences are important; whilst Belante, 1979 and Gerking and Weirick, 1983 advocate the returns to characteristics in their explanation of regional earnings differentials. Recent work by Farber and Neuman, 1987 using U.S. data analyse two cross sectional sets of data for 1973 and 1979. For a given point in time they find that it is the distribution of worker and job characteristics that is most significant in the explanation of

earnings differences. Whilst over time, (comparing 1973 with 1979) it is changes in the returns to characteristics that are important.

Maier and Weiss, 1986, in a study using Austrian data find that differences in the returns to characteristics are important in explaining regional earnings differences. This leads to the conclusion that labour market frictions render the competitive neoclassical approach inappropriate, and a more segmented view of regional labour markets may be more accurate. However, close examination of the data used by Maier and Weiss indicates that only four occupational categories were used in the analysis. Not surprisingly therefore the breadth of these skill-groups generates significantly different returns between regions for the occupational variable. This point brings out the need to emphasise that the discussion of returns to characteristics is very much data driven.

To date, only two studies have used U.K. micro data to analyse regional wage differentials, namely Shah and Walker, 1983 and Blackaby and Manning, 1987; 1988. The models in both cases use the General Household Survey database, from which the subset of white male employees are selected. Shah and Walker, 1983 specify the estimating equation:

$$\ln Y_i = a + a_1 \cdot Ed_i + a_2 \cdot Exp_i + a_3 \cdot Exp_i^2 + a_4 \cdot M_i + a_5 \cdot TA_i \\ + a_6 \cdot \ln WW_i + e_i$$

where Y_i is the observed earnings of the i th individual, Ed_i is education measured in years, M_i is a dummy variable, which equals 1 if the individual is married and 0 otherwise, TA_i is a dummy variable which equals 1 if the individual is a trade apprentice and 0 otherwise, and WW_i is weeks worked. Initially Shah and Walker assume the returns to characteristics to be the same across regions, i.e. only intercept dummies are included in their estimating equation. These results show reasonable R^2 values and the human capital coefficients are significant. The earnings differential implied by the differences in intercept between the regions highlight the greater earnings in the South East compared to the other regions. The addition of further industry dummies made little difference to the values of the other coefficients, but overall made a statistically significant contribution to the explanation of earnings. Shah and Walker express some concern over their assumption of equal returns to characteristics across regions, and qualitative comparison of results of regressions run for each region separately led them to conclude that some of the coefficients between regions are indeed different.

Finally, Shah and Walker take account of the cost-of-living differences by adjusting the nominal earnings data with a regional cost-of-living index which includes housing¹⁰. The effect on the intercept coefficients is quite marked, notably Greater London and the South East no longer experience the highest earnings, other regions having greater earnings through relatively low cost of living indices.

Blackaby and Manning, 1988 specify the following augmented Mincer, 1974 earnings function;

$$\begin{aligned} \ln Y_i = & a + a_1.Ed_i + a_2.Exp_i + a_3.Exp_i^2 + a_4.M_i \\ & + a_5.\ln WW_i + b'.Z_i + c'.X_i + a_6.\ln U_r \\ & + e_t \end{aligned}$$

where Z_i is a vector of 0-1 dummies where 1 represents the industry in which the individual is employed, X_i is a vector of 0-1 dummies where 1 represents the occupation in which the individual is employed and U_r is the regional unemployment rate. The initial results produce similar coefficients to those produced by Shah and Walker. Blackaby and Manning then test for

regional differences by calculating F-tests, comparing the initial regressions with specifications which include intercept dummies, slope dummies and intercept and slope dummies. All of these are shown to be significant, thus confirming the qualitative assessment by Shah and Walker that there are both intercept and coefficient differences between regions. Adjustment of nominal earnings by a regional cost of living deflator again makes some significant difference to the results.

The basic estimating equation using the NES

The data used in this paper is taken from a computer based version of the New Earnings Survey (NES) conducted in 1979¹. The data is grouped into aggregated cells of three to five individuals. In the analysis it is assumed that inefficiencies arising as a result of grouped estimation are insignificant².

With respect to specifying a human capital model, the NES has some distinguishing features. One drawback of the data is that the survey contains no information about formal educational experience, hence this dimension of the human capital model cannot be measured. However some further control factors may be included in the analysis. Specifically variables measuring company and plant size and a measure of bargaining may be

included in the estimating equation. Some discussion of these variables is required since their inclusion is not typical in human capital type equations. Bargaining strength is measured by the proportion of individuals in a given cell who are subject to Wages Board or Wages Council agreements. This proxy is subject to two important qualifications: Firstly the proxy is dependent upon the extent to which individuals within each cell are comparable in terms of general bargaining behaviour. Each cell contains individuals with the same characteristics such as sex, occupation and industry³ hence it is possible that this assumption holds. Secondly, given that comparison is being made between similar employees there is ambiguity over the expected sign of the coefficient. Arguably evidence of bargaining is evidence of there being returns to bargaining in terms of achievement of above average wage rates. Alternatively the evidence of bargaining may point to areas of particularly low wages especially if Wages Board or Wages Councils are evidence of a lack of alternative bargaining procedures, such as strong Trades Unions.

Plant and company size have strong empirical support as explanatory variables of earnings differences, there being a positive relationship between earnings and plant or company size. Neoclassical explanations of this relationship focus upon differentials in the quality of labour or the conditions of work.

Within this context efficiency wage considerations emerge in the sense that a positive relation between earnings and productivity may arise as plant and/or company size grows. Basically it is hypothesised that larger firms, or establishments employ higher quality workers. The reasons for this may be due to reduced monitoring costs, or greater capital intensity of larger establishments and capital-skill complementarity. Institutional explanations of the positive plant and/or company size also exist. Large employers have been hypothesised as offering higher wages and better conditions as a preventative measure against unionisation. Alternatively, it has been hypothesised that larger plant and company size represents higher degrees of monopoly power, both in terms of the product market and labour supply (Brown and Medoff, 1987).

The data is disaggregated into the standard C.S.O. regions. For most individuals there is little difference between region of work place and region of residence. An exception to this is Greater London where many individuals commute from the South East (see DoE, 1979) and thus Greater London and the South East are treated as a single region.

The initial specification is the following modified Mincer, 1974 earnings function:

$$\begin{aligned} \ln E_i = & a + a_1 \cdot \text{Exp}_i + a_2 \cdot \text{Exp}_i^2 + a_3 \cdot \text{AGE}_i + \\ & b' \cdot \text{IND}_i + c' \cdot \text{OCC}_i + a_4 \cdot \text{PUB}_i + a_5 \cdot \ln \text{COMP}_i \\ & + a_6 \cdot \ln \text{PLANT}_i + a_7 \cdot \ln \text{UNSR}_r + a_8 \cdot \text{PNTAGT}_i + e_i \end{aligned}$$

where E is the average gross weekly earnings in cell i .

EXP is the average number of years spent with the same firm in cell i

AGE is the average age of individuals in cell i .

IND is a vector of 0-1 dummies where 1 represents the industry in which all the individuals in a cell are employed. Six industry dummies were formulated from an amalgamation of the SIC industry groups⁴.

PUB is a dummy variable where 1 indicates public sector employment and 0 private sector employment in cell i .

COMP is the average company size which the individuals of a cell are employed.

PLANT is the average plant size in which the individuals of cell i are employed.

UNSR is the short run regional unemployment rate, the short run unemployment rate being based only upon those who have been

unemployed for less than one year.

PNTAGT is the proportion of individuals in a cell who are covered by a Wages Board or Wages Council agreement.

Some further points should be noted about this specification which departs considerably from the specifications used by Shah and Walker, 1983 and Blackaby and Manning, 1987; 1988). Firstly, note that two approximations to experience have been used; namely age and the number of years spent with the same firm. To avoid repetition (and multicollinearity) , only the variable measuring the number of years spent with the same firm is specified as a quadratic function, so as to pick up the notion of a peak in the experience-earnings profile⁵. Secondly, the specification includes three sets of dummy variables to control for occupation and industry differences between cells. Occupation is approximated by using eight socio-economic groups⁶. The 'base group' used for manual employees was unskilled manual employees, and the base group used for non-manual employees was junior non-manual employees. Industry is approximated by 6 industry dummies where the service sector is used as the base group, and a dummy variable indicating whether the industry is in the public sector. The possibility of interaction (see Johnston, 1984) between the dummy variables is not tested.

The results of this initial specification are shown in tables 1 and 2. R^2 ranges from 0.20 in the case of manual females to 0.53 in the case of full-time non-manual females. The results on the experience variable show increasing, but diminishing returns to experience (as expected) for all employees except manual males and part-time females. The implied maximum of the experience functions for the significant results is shown in column 11 of table 1, the figures indicate that part-time, non-manual females experience a maximum return to experience after 15 years employment in the same firm, whilst for non-manual males this maximum is reached with nearly 23 years of experience.

The coefficient on age indicates a positive and significant result for full-time, non-manual employees, whilst for the remaining employees the result is negative or insignificant (as in the case of full-time manual females). Negative coefficients on age are probably a further indication of relatively early 'peaks' in the earnings profiles. For example part-time, non-manual females have a negative return to experience, and a fairly low implied maximum earnings.

The coefficient on the unemployment variable (table 1) is negative and significant for all earnings groups. The coefficients imply an elasticity of earnings with respect to regional unemployment ranging from -0.22 (non-manual females) to -0.06 (manual males). Since the analysis is cross-sectional the

results can be interpreted as long-run elasticities. However these results should be treated with some caution since the unemployment data is only available at the regional level⁷.

The bargaining strength proxy, PNTAGT, is significant for five out of the six regressions, and is negative for four of the results. From previous discussion these negative results may be attributable either to heterogeneity in the characteristics of individuals within each cell, or due to Wages Board or Wages Council Agreements indicating weak, rather than strong bargaining positions.

Average plant size is significant for manual employees only, and has expected positive sign. Average company size is significant for all but one of the estimates, and has the expected positive sign. The results of the industry and occupation dummy variables and controls for hours worked are shown in table 2. The results show that both occupation and industry have generally significant results. The coefficients for occupation, as expected, increase as the level of skill increases (remembering that the base group is the lowest skill group). In the results of the industry dummy variables, the most significant differences between the base group, (i.e. the service industry), and other industries occur in the manual male equation. The public sector dummy is positive for all earnings groups.

Introduction of the regional dimension

The preceding analysis has been based upon estimating a restricted version of a more general model which allows for regional variation:

$$\begin{aligned} \ln E_i = & A + A'_1 \cdot \text{Exp}_i + A'_2 \cdot \text{Exp}_i^2 + A'_3 \cdot \text{AGE}_i + B' \cdot \text{IND}_i + \\ & C' \cdot \text{OCC}_i + A'_4 \cdot \text{PUB}_i + A'_5 \cdot \ln \text{COMP}_i + A'_6 \cdot \ln \text{PLANT}_i + \\ & A'_7 \cdot \ln \text{UNSR}_i + A'_8 \cdot \text{PNTAGT}_i + e \end{aligned}$$

where $A, A_1 \dots A_8$ are vectors of coefficients representing r regions; B and C are vectors representing s industries and t occupations for each region, hence they are vectors with dimension $s.r \times 1$ and $t.r \times 1$. In the preceding section it was implicitly assumed that the regional coefficients within each vector are the same. The validity of this assumption is tested by regressing the more general models and comparing them with the original specification. Note the regional unemployment variable is omitted from these tests to avoid singularity in the matrix of independent variables⁸. The results of F-tests (reported in appendix 1) show that for all earnings groups nominal earnings equations are significantly different in cases where intercepts, or intercepts and slopes are allowed to vary

across regions, thus confirming the results of Blackaby and Manning, 1987; 1988.

The results of the most general equation (i.e. the specification where both intercept and slope coefficients are allowed to vary across regions) are shown in tables 3a to 3f. The 'base' region in the vector of dummy variables representing the regions is Scotland, the coefficients shown are therefore deviations from the Scottish coefficients. Only results with significance of <10% are reported. Based upon this critical value, not all of the coefficients differ significantly from the base region. If the number of significant variables is assumed to be a measure of regional dis-similarity, the fact that only 134 out of the 783 coefficients of the equations for the six groups of employees differ significantly from the base region indicates a greater degree of similarity rather than dis-similarity between regions.

The results of tables 3a to 3f are further summarised in tables 4a and 4b, which cross-tabulate the number of significantly different coefficients. The results show that of the six earnings groups, it is manual males who display the greatest degree of regional variation in the earnings equation, whilst both full-time and part-time manual female employees indicate very little variation. In terms of the regions, the South East

of England has the greatest dis-similarity compared to Scotland, whilst the North, East Anglia, Wales and Yorks/Humberside indicate the greatest number of common coefficients in the earnings equation. The variables of the earnings equation which vary the most across the regions are the bargaining variable and the vectors of dummy variables relating to occupation and industry. Given that the occupation and industry dummy variables only disaggregate into eight and ten groups respectively, then coefficient differences are likely to indicate further differences in earnings due to the distribution of occupation and industry, as well as 'genuine' reward differences⁹.

Bearing this in mind there are nevertheless some interesting features of the compositional coefficients with respect to the earnings equation for Scotland. Firstly, male employees in Scotland have a noticeably higher return compared to other regions in the energy industry and in agriculture and construction. This is probably due to employment in the oil industry and related large-scale construction. Secondly there is a noticeably lower return in Scotland to intermediate non-manual females (both full-time and part-time).

The returns to plant and company size are, in general, not significantly different between regions. One exception occurs in the case of manual males where the positive returns to employment in larger companies are much greater in Scotland,

this could again be a reflection of employment in the oil and oil-related industries.

Finally, returns to experience and age generally show little variation across the regions, again highlighting the fact that there is more similarity rather than dis-similarity between regional labour markets. The exception again is with manual males where returns to experience are negative compared to positive returns in most other regions.

Real wage compared to nominal wage differentials

In the analysis conducted so far models have been used to explain nominal wage variation. Arguably the appropriate independent variable is not nominal but real earnings. Variation in nominal regional earnings may be attributable to variation in the cost-of-living. The only data of regional cost-of-living indices is available from Regional Reward Surveys Ltd. For various reasons this index may be inadequate and it is felt that these results should be treated with some caution¹⁰. Most of the regional price variation is generated by the housing and accommodation component. Hence the following results use an index which includes this component.

In terms of the general model defined above, the deflation of

the independent variable by regional price indices will generate results which differ only by the set of regional dummy variables, all other coefficients remain the same. Table 5 shows the percentage earnings difference for nominal and real earnings. Nominal earnings are on average lower in Scotland compared to the most other regions, especially the South East of England. Deflation of earnings by the regional cost-of-living further accentuates this with real earnings in Yorkshire and Humberside being 14.4% greater than in Scotland. One important impact of introducing the price index is that the ranking of earnings changes completely. The South East falls from having the highest earnings to having amongst the lowest earnings. These results support the notion that cost-of-living differences have an important role in explaining current labour market behaviour (see for example Minford, Ashton and Peel, 1987), especially with respect to the apparent immobility of labour. Cost-of-living differences are deflating the value of opportunities in prosperous regions (i.e. the South East), hence generating what appear to be large inflexibilities in the market for labour in terms of persistent differences in regional unemployment.

Summary and Conclusion

The preceding analysis has both confirmed and qualified the previous results based upon using data for male employees in the

General Household Survey (i.e. the papers by Shah and Walker, 1983 and Blackaby and Manning, 1987; 1988). The analysis has confirmed that the regional dimension to cross-sectional variation in earnings is statistically significant, both terms of the intercepts and coefficients of regional human capital equations. However what is apparent is that coefficient differences in compositional variables are difficult to interpret in terms of characteristic and return to characteristic differences due to the inevitable aggregation of occupation and industry characteristics in micro-databases. How much regional variation would be left if more thorough disaggregation were possible is unknown. As in previous analysis adjustment of the independent variable for cost-of-living differences provides some clues to the apparent inflexibility of regional labour markets.

The main qualification that this broader analysis has contributed, is the contrast between regional variation for male employees compared to other employees ie full-time and part-time females. The results for females show considerably less variation in the earnings equations, especially in the case of manual females. This could suggest that female employees are subject to lower regional mobility costs and therefore the regional aspect of the labour markets is weak and earnings and returns to characteristics are more homogeneous. This is unlikely, one would expect women to be less mobile in labour

market terms than men due to the fact that they often act as secondary earners in a family unit and consequently have little choice over the geographical location decision. The results are more likely to be pointing to the fact that women are employed in relatively few occupations and industries within which there is little regional variation.

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1.The New Earnings Survey (NES) is a random sample of approximately 1% of all registered employees in Great Britain. The survey contains data representing about 150,000 individuals. The construction of this data base formed part of an inter-university ESRC funded project. Other years of the data are available, however 1979 is the only year which contains comprehensive human capital type data.

2.The use of grouped data implies that the disturbance terms is heteroscedastic (see Kmenta 1971, pp 323). Such grouping of the observations and estimating the regression coefficients from group means rather than individual observations, results in some loss of information from the sample. This implies that there is a loss of efficiency in going from individual estimation to estimation based upon group means. This can be measured by the ratio of the variance of the estimate of the coefficient based upon the grouped data, to the variance of the estimate based upon individual data. In the regression analysis conducted it is assumed that this loss of efficiency is minimal. This may be a reasonable assumption for the following reasons: firstly, the cells of data are very small in relation to the overall number of cells. Hence it is unlikely that intra-cell variation will be anything but small in relation to inter-cell variation. Secondly, and in support of the previous point, each cell is identified by eight record identities, each of which identify employees with similar labour market characteristics. Hence the variation of the variables within a given cell is likely to be low.

3.The identifying characteristics of each cell are: sex, full-time/part-time, public/private sector, occupation (eight socio-economic groups), industry division (1980 SIC industry divisions) and region (standard CSO regions).

4. Initially it was hoped that a more disaggregated approach using the SIC, 27 industry classification could be used. Unfortunately insufficient numbers were sampled in each industry for each and every region. Hence the 27 SICs were amalgamated into the following groups : agriculture and construction (1,20), energy (2,21), manufacturing (3 to 12 inclusive, 16), light manufacturing (13,14,15,17,18,19), distribution (22,23) and services (24,25). The figures in parentheses are the SIC (1968) codes. The only curious combination is that between agriculture and construction, the main justification for this is that the agricultural sector is very small and has to be combined with some other sector, and it was felt that if anything the construction industry was similar to the agriculture industry through the skills and types of workers employed. Based on the evidence from Shah and Walker (1983) the industry dummies only made a small contribution to the overall explanatory power of the equation and it is assumed that these aggregations will not have affected the results significantly compared to the results of a more highly disaggregated approach.

5. Several commentators have questioned the use of both age and experience in specification of the human capital function. The reason for this specification is that the 'experience' variable in the NES database, only measures the number of years spent with one firm. This is an inadequate measure of general experience, since it only indicates firm-specific experience. The inclusion of age in the specification is aimed at capturing more general experience gained by individuals. Examination of the collinearity between these variables indicates that there is collinearity between age and experience, however it is far less than that between experience and (experience)², which are used in the standard human capital formulations. Overall it is not considered that the inclusion of both age and experience has contributed to serious multicollinearity in the estimated equations.

6. The eight socio-economic groups are : managerial, professional and technical, intermediate non-manual, junior non-manual, foremen and supervisors, skilled manual, semi-skilled manual and unskilled manual employees.

7. The results of the unemployment variable, since it is regional unemployment should be treated with some caution. Inclusion of grouped data in the micro-specification means that the standard errors are incorrect and exaggerate the significance of the included aggregate variables (Dickens and Katz 1987).

8. 'Singularity' in the matrix of the independent variables means that the determinant of the matrix is zero (and therefore the inverse of the matrix cannot be calculated), due to the linear dependence between some of its rows and columns. Hence in the estimation of the human capital model, the regional unemployment variable should be omitted from the regression when regional dummy variables are included in the analysis.

9. The cross section models of this type generate coefficients which are ambiguous in this respect due to the fact that data sources are insufficiently disaggregated. This makes analysis which decomposes earnings differences into overall characteristic and reward effects difficult to interpret. Given the obvious breadth of the compositional variables in the NES such decomposition would not provide meaningful results. See Blinder (1973), Oaxaca (1973) and Winsbrough and Dickinson (1971) for details of this technique.

10. The cost-of-living index available from Regional Reward Surveys Ltd is based upon a tri-annual survey and has been conducted since 1973. The weights used to calculate the indices are based upon patterns of consumption from the Family Expenditure Survey. The price information used to calculate the index is based upon surveys conducted of the prices of goods selected from a sample of approximately 100 towns and cities in the UK. The regions are the same as those used by the Department of Employment (with some minor qualifications). The sample of towns and cities does not give an indication of rural price indices and it must be noted that the Regional Reward Survey Ltd data is geared towards providing cost of living information for managerial and other high income groups. It is not always clear in the documentation provided how the regional cost of living indices are constructed. However it seems likely that they are biased towards assessing high income employees. Source Regional Reward Surveys, "Cost of living report; regional comparisons", September 1985.

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APPENDIX

- Appendix 1: Results of the Test of Regional Compared to Restricted Model.

TABLE 2: Results of regression of overall pooled regression: structural variables

	OCCUPATION (base groups; unskilled manual or junior non-manual)				INDUSTRY (base group; service industry)				
	Semi-skilled manual/intermediate non-manual	Skilled manual/professional & technical	Foreman and supervisors managers	Agriculture and construction	Energy	Manufac-turing	Light Manufac-turing	Distri-bution	Public sector
Non-manual males	0.2627 (37.14)	0.4127 (56.81)	0.4636 (60.28)	-0.1189 (9.86)	-0.0420 (3.05)	-0.0467 (3.56)	-0.0551 (3.61)	-0.1707 (23.97)	0.0716 (8.21)
Manual males	0.0574 (11.65)	0.1610 (34.77)	0.2513 (38.33)	0.1230 (20.44)	0.2619 (33.58)	0.0850 (10.44)	0.0888 (10.53)	0.0368 (6.91)	0.0054 (1.159)
Non-manual females	0.2922 (46.17)	0.3327 (29.24)	0.3396 (21.02)	-0.0723 (3.67)	0.0248 (1.34)	-0.0043 (0.26)	-0.0105 (0.571)	-0.1628 (22.87)	0.1159 (13.78)
Manual females	0.0629 (8.71)	0.0747 (7.92)	0.01472 (10.25)	-	-	0.0691 (4.07)	0.0289 (1.87)	0.0727 (6.13)	0.1380 (12.37)
Part-time:									
Non-manual females	0.3078 (24.64)	0.4727 (21.43)	-	-	-	0.0181 (0.965)	-	-0.1417 (10.73)	0.0988 (6.47)
Manual females	0.0491 (6.67)	0.0591 (4.65)	-	-	-	0.0804 (5.00)	0.0357 (2.10)	0.0284 (2.63)	0.1100 (10.84)

- indicates that these variables were not included in the regression due to insufficient data.

TABLE 3A : COEFFICIENTS' OF DATA: NON-MANUAL MALES OF GENERAL REGIONAL EQUATION

VARIABLE	1 SOUTH EAST	2 EAST ANGLIA	3 SOUTH WEST	4 WEST MIDLANDS	5 EAST MIDLANDS	6 YORKS/ HUMBE- RSHIRE	7 NORTH WEST	8 NORTH WALES	9	10 SCOT- LAND
CONSTANT	0.2375*									0.2384
EXPERIENCE										0.0128*
(EXPERIENCE)*										0.0003*
AGE										0.0022
PROPORTION IN AN AGREEMENT			0.1282*	0.0979	*0.1165*			0.1345*		-0.1571*
JUNIOR NON- MANUAL (BASE)	----	----	----	----	----	----	----	----		
INTERMED- IATE NON- MANUAL		-0.0461								0.2763*
PROFES- SIONAL AND TECHNICAL				-0.0623	-0.0967*					0.4287*
MANAGERS			-0.0731	-0.0902*	-0.1160*		-0.0690			0.5752*
AGRICUL- TURE AND CONSTR- UCTION	-0.1146*	-0.2203*	-0.1632*		-0.1407*	-0.1029				
ENERGY	-0.1025			-0.1807*	-0.1647	-0.1116	-0.2125*	-0.1290		0.0771
MANUF- ACTURING										
LIGHT MANUFAC- TURE										
DISTRIBUTION										0.1660*
SERVICE (BASE)	----	----	----	----	----	----	----	----		
PUBLIC SECTOR	-0.0615						0.0758			0.0757*
AVERAGE PLANT SIZE										
AVERAGE COMPANY SIZE				-0.0263						0.0468*

1: Only coefficients with significance of < 10% are reported. Results with a significance of < 5% are indicated by a *.

TABLE 3B : COEFFICIENTS' OF DATA: MANUAL MALES OF GENERAL REGIONAL EQUATION

VARIABLE	1 SOUTH EAST	2 EAST ANGLIA	3 SOUTH WEST	4 WEST MIDLANDS	5 EAST MIDLANDS	6 YORKS/ HUMBE- RSHIRE	7 NORTH WEST	8 NORTH WALES	9	10 SCOT- LAND
CONSTANT										0.2066
EXPERIENCE	0.0097*		0.0106	*0.0070*		0.0083*	0.0108*		0.0070	-0.0054*
(EXPERIENCE)*	-0.0003*		-0.0003	-0.0002*		-0.0002	-0.0003*			0.0004
AGE										-0.0016*
PROPORTION IN AN AGREEMENT					0.0531*		0.0483			-0.0409*
UNSKILLED (BASE)	----	----	----	----	----	----	----	----		
SEMI- SKILLED				0.0477						0.0494*
SKILLED										0.1685*
FOREMEN & SUPER- VISORS						-0.0596*				0.2701*
AGRICUL- TURE AND CONSTR- UCTION	-0.0542*	-0.1573*	-0.0808*	-0.0599*	-0.0939*	-0.0475	-0.0524*			0.1700*
ENERGY	-0.1894*	-0.2923*	-0.1613*	-0.0774*						0.3150*
MANUF- ACTURING		-0.2061*						0.1061*		0.0930*
LIGHT MANUFAC- TURE		-0.0960				-0.0712	-0.0806*			0.0872*
DISTRIBUTION										0.0341*
SERVICE (BASE)	----	----	----	----	----	----	----	----		
PUBLIC SECTOR										
AVERAGE PLANT SIZE			0.0396							0.0156*
AVERAGE COMPANY SIZE		-0.0126		-0.0128	-0.0145*	-0.0135*	-0.0109	-0.0148*		0.0380*

1: Only coefficients with significance < 10% are reported. Results with a significance of < 5% are indicated by a *.

TABLE 3C : COEFFICIENTS' OF DATA: FULL-TIME NON-MANUAL FEMALES OF GENERAL REGIONAL EQUATION

VARIABLE	1 SOUTH EAST	2 EAST ANGLIA	3 SOUTH WEST	4 WEST MIDLANDS	5 EAST MIDLANDS	6 YORKS/ HUMBE- RSIDE	7 NORTH WEST	8 NORTH	9 WALES	10 SCOT- LAND
CONSTANT	0.374B*									
EXPERIENCE										0.0365*
(EXPERIENCE)*						-0.0010*		-0.0015*		-0.0010
AGE		0.0065								0.0221*
PROPORTION IN AN AGRE- EMENT	-0.0719*		0.0901	0.0788						-0.0618*
JUNIOR NON- MANUAL (BASE)		----	----	----	----	----	----	----	----	----
INTERMED- IATE NON- MANUAL			0.0484	0.1438	0.1304	0.0917*	0.0780*	0.1480	0.1008*	0.2382*
PROFES- SIONAL AND TECHNICAL		-0.1166					-0.1143	-0.1490		0.3627*
MANAGERS	0.1170	-0.1551								0.2569
AGRICUL- TURE AND CONSTR- UCTION	-0.1023									
ENERGY										0.0993
MANUF- ACTURING										
LIGHT MANUFAC- TURE										
DISTRIBUTION										-0.1550*
SERVICE (BASE)	----	----	----	----	----	----	----	----	----	----
PUBLIC SECTOR						0.0679				0.1284
AVERAGE PLANT SIZE	-0.0331*								0.1398*	
AVERAGE COMPANY SIZE										0.0225*

1: Only coefficients with significance < 10% are reported. Results with a significance of < 5% are indicated by a *.

TABLE 3D : COEFFICIENTS' OF DATA: FULL-TIME MANUAL FEMALES OF GENERAL REGIONAL EQUATION

VARIABLE	1 SOUTH EAST	2 EAST ANGLIA	3 SOUTH WEST	4 WEST MIDLANDS	5 EAST MIDLANDS	6 YORKS/ HUMBE- RSIDE	7 NORTH WEST	8 NORTH	9 WALES	10 SCOT- LAND
CONSTANT										-0.4448 0.0002
EXPERIENCE										0.0347
(EXPE- RIENCE)*										-0.0028*
AGE						0.0027				
PROPORTION IN AN AGRE- EMENT										0.0445
UNSKILLED (BASE)		----	----	----	----	----	----	----	----	----
SEMI- SKILLED										0.0622*
SKILLED										0.1029*
FOREMEN & SUPER- VISORS									-0.3258*	0.1909*
AGRICUL- TURE AND CONSTR- UCTION										
ENERGY										
MANUF- ACTURING	-0.1302*									0.1329*
LIGHT MANUFAC- TURE	-0.1033*									0.0884*
DISTRIBUTION										
SERVICE (BASE)	----	----	----	----	----	----	----	----	----	----
PUBLIC SECTOR						0.0967				0.1188
AVERAGE PLANT SIZE										0.0313*
AVERAGE COMPANY SIZE										0.0273

1: Only coefficients with significance < 10% are reported. Results with a significance of < 5% are indicated by a *.

TABLE 3E : COEFFICIENTS' OF DATA: PART-TIME NON-MANUAL FEMALES OF GENERAL REGIONAL EQUATION

VARIABLE	1 SOUTH EAST	2 EAST ANGLIA	3 SOUTH WEST	4 WEST MIDLANDS	5 EAST MIDLANDS	6 YORKS/ HUMBE- RSIDE	7 NORTH WEST	8 NORTH WALES	9	10 SCOT- LAND
CONSTANT						-0.2727				0.0075
EXPE- RIENCE		-0.0661*	-0.0280							0.0257*
(EXPERIENCE)*										
AGE				0.0059*	0.0065*		0.0046			-0.0040*
PROPORTION IN AN AGRE- EMENT	0.1110		0.1597*	0.1752	0.2868*		0.1260	0.2099	0.2850*	-0.1623*
JUNIOR NON- MANUAL (BASE)		----	----	----	----	----	----	----	----	----
INTERMED- IATE NON- MANUAL				0.1487*	0.1084	0.1372*	0.1991*			0.2404*
PROFES- SIONAL AND TECHNICAL		-0.5557*			-0.4150*		-0.2486*	-0.7223*	0.1593*	
MANAGERS										
AGRICUL- TURE AND CONSTR- UCTION										
ENERGY										
MANUFACTURING		0.2105*					0.3504*			
LIGHT MANUFACTURE										
DISTR- IBUTION	-0.1260*				-0.1511*					
SERVICE (BASE)		----	----	----	----	----	----	----	----	----
PUBLIC SECTOR	-0.1403		-0.1541	-0.2018				-0.2346	0.2218*	
AVERAGE PLANT SIZE										
AVERAGE COMPANY SIZE					-0.0244					

1: Only coefficients with significance < 10% are reported. Results with a significance of < 5% are indicated by a *.

TABLE 3F : COEFFICIENTS' OF DATA: PART-TIME MANUAL FEMALES OF GENERAL REGIONAL EQUATION

VARIABLE	1 SOUTH EAST	2 EAST ANGLIA	3 SOUTH WEST	4 WEST MIDLANDS	5 EAST MIDLANDS	6 YORKS/ HUMBE- RSIDE	7 NORTH WEST	8 NORTH WALES	9	10 SCOT- LAND
CONSTANT										
EXPERIENCE										
(EXPE- RIENCE)*									-0.0017	
AGE										-0.0025
PROPORTION IN AN AGRE- EMENT			0.0992	0.1429*						
UNSKILLED (BASE)			----	----	----	----	----	----	----	----
SEMI- SKILLED										
SKILLED										
FOREMEN & SUPER- VISORS		0.0627								
AGRICUL- TURE AND CONSTR- UCTION										
ENERGY										
MANUF- ACTURING	-0.1507*								-0.1275	0.1828*
LIGHT MANUFAC- TURE	-0.1347									0.1149*
DISTRIBUTION	0.2044*				0.0984					
SERVICE (BASE)		----	----	----	----	----	----	----	----	----
PUBLIC SECTOR				-0.1002*						0.1306*
AVERAGE PLANT SIZE										
AVERAGE COMPANY SIZE										0.0271*

1: Only coefficients with significance < 10% are reported. Results with a significance of < 5% are indicated by a *.

TABLE 4A : SUMMARY OF THE RESULTS OF TABLES 3A TO 3F : NUMBER OF SIGNIFYCANT VARIABLES

	EARNINGS GROUP				PART-TIME		ROW TOTAL
	NON-MANUAL MALES	MANUAL MALES	NON-MANUAL FEMALES	MANUAL FEMALES	NON-MANUAL FEMALES	MANUAL FEMALES	
SOUTH EAST	4	4	5	2	3	2	20
EAST ANGLIA	2	5	1	0	1	2	11
SOUTH WEST	3	5	4	0	4	1	17
WEST MIDLANDS	4	6	2	0	4	2	18
EAST MIDLANDS	5	3	1	0	6	1	16
YORKS/ HUMBERSIDE	2	6	1	2	2	0	13
NORTH WEST	3	6	3	0	4	1	17
NORTH	1	2	2	0	3	1	9
WALES	1	1	4	4	3	0	13
COLUMN TOTAL	25	38	23	8	30	10	

1: Significant is indicated by variables with significance < 10%.

TABLE 4B : SUMMARY OF THE RESULTS OF TABLES 3A TO 3F : NUMBER OF SIGNIFICANT COEFFICIENT

	NON-MANUAL MALES	MANUAL MALES	NON-MANUAL FEMALES	MANUAL FEMALES	PART-TIME		ROW TOTAL
					NON-MANUAL FEMALES	MANUAL FEMALES	
CONSTANT	1		1	1	1		4
EXPERIENCE		6		1	2		9
(EXPERIENCE) ^a		5	2	1		1	9
AGE			1	1	3		5
PROPORTION IN AN AGREEMENT	4	2	3		7	2	18
SEMI-SKILLED MANUAL INTERMEDIATE NON-MANUAL	1	1	7		4		13
SKILLED MANUAL/ PROFESSIONAL & TECHNICAL	2		3		4		9
FOREMEN & SUPERVISORS MANAGERIAL	4	1	2	1		1	9
AGRICULTURE & CONSTRUCTION	5	7	1				13
ENERGY	6	4					10
MANUFACTURING		2		1	2	2	7
LIGHT MANUFACTURING		3		1		1	5
DISTRIBUTION					2	2	4
PUBLIC SECTOR	2		1	1	4	1	9
AVERAGE PLANT SIZE		1	2				3
AVERAGE COMPANY SIZE	1	6			1		8

TABLE 5 : REGIONAL NOMINAL AND 'REAL' EARNINGS DIFFERENCES (RELATIVE TO SCOTLAND)

	NOMINAL (%)									
	SOUTH EAST	EAST ANGLIA	SOUTH WEST	WEST MIDLANDS	EAST MIDLANDS	YORKS/ HUMB- ERSIDE	NORTH WEST	NORTH	WALES	AVE- RAGE
NON-MANUAL MALES	10.7	-3.1	-2.8	-1.1	-2.6	-0.5	0.5	-1.8	-5.4	-0.6
MANUAL MALES	3.6	-4.4	-6.2	4.9	1.9	2.2	2.1	6.1	4.4	1.5
NON-MANUAL FEMALES	14.5	-2.6	1.9	5.1	2.8	1.4	4.1	1.3	3.1	3.2
MANUAL FEMALES	7.9	4.6	0.6	6.0	1.7	0.5	3.6	3.1	5.3	3.3
PT NON-MANUAL FEMALES	10.1	-0.2	-0.5	4.6	0.6	1.9	2.0	1.0	-3.4	1.9
PT MANUAL FEMALES	6.8	0.4	-3.1	2.0	0.3	3.0	1.8	1.2	-1.9	1.1
AVERAGE	8.9	-0.9	-1.7	3.6	0.8	1.4	2.4	1.8	0.4	
	REAL (%)									
	SOUTH EAST	EAST ANGLIA	SOUTH WEST	WEST MIDLANDS	EAST MIDLANDS	YORKS/ HUMB- ERSIDE	NORTH WEST	NORTH	WALES	AVE- RAGE
NON-MANUAL MALES	4.0	4.4	0.3	5.7	9.5	12.2	6.7	9.7	0.4	0
MANUAL MALES	-2.7	3.1	-3.3	12.1	14.6	15.3	8.4	18.5	10.8	0
NON-MANUAL FEMALES	7.5	5.1	5.1	12.3	15.6	14.4	10.5	13.2	9.5	0
MANUAL FEMALES	1.3	12.8	3.7	13.2	14.4	13.4	10.0	15.2	11.9	0
PT NON-MANUAL FEMALES	3.4	7.6	2.6	11.8	13.1	15.0	8.3	12.8	2.5	0
PT MANUAL FEMALES	0.3	8.3	-0.1	9.0	12.8	16.2	8.1	13.0	4.2	0
AVERAGE	2.3	6.9	1.4	10.7	13.3	14.4	8.7	13.7	6.6	

APPENDIX 1

RESULTS OF TEST OF REGIONAL COMPARED TO RESTRICTED MODEL

	HYPOTHESIS					
	COMMON INTERCEPT			COMMON INTERCEPT AND SLOPE COEFFICIENT		
	F-VALUE	DEGREES OF FREEDOM	CRITICAL F-05 VALUE	F-VALUE	DEGREES OF FREEDOM	CRITICAL F-05 VALUE
a) DEPENDENT VARIABLE NOMINAL EARNINGS						
NON-MANUAL MALES	55.0	(9,00)	1.88	16.3	(144,00)	1.17
MANUAL MALES	42.9	(9,00)	1.88	7.4	(144,00)	1.17
NON-MANUAL FEMALES	77.6	(9,00)	1.88	9.6	(144,00)	1.17
MANUAL FEMALES	15.1	(9,00)	1.88	2.3	(126,00)	1.17
PT NON-MANUAL FEMALES	15.7	(9,00)	1.88	3.4	(108,00)	1.17
PT MANUAL FEMALES	18.3	(9,00)	1.88	2.6	(117,00)	1.17