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THE PATTERN AND EVOLUTION OF GEOGRAPHICAL WAGE DIFFERENTIALS IN THE PUBLIC AND PRIVATE SECTORS IN GREAT BRITAIN*

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Government policy on the nature of wage bargaining in the public sector can have important implications for the provision of public services. Using the New Earnings Survey, the Labour Force Survey and the British Household Panel Survey, we examine the size and evolution of public–private sector wage differentials across geographical areas within the UK and over time. Public sector bargaining structures have led to historically high wage premia, although these premia are declining over time. In high-cost low-amenity areas, such as the south-east of England, the public sector underpays relative to the private sector, therefore creating problems in recruitment to and provision of public services. Public sector labour markets are around 40 per cent as responsive to area differences in amenities and costs as are private sector labour markets. Differences in the degree of spatial variation between sectors are likely to remain, leading to persistent problems for the delivery of public services in some parts of the UK. Reform of public sector pay structures is likely to be costly, and so other non-pay policies need to be considered to increase the attractiveness of public sector jobs.

1 Introduction

In April 2003 the Chancellor of the Exchequer proposed to introduce 'measures to ensure that public service pay systems are more responsive to

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regional labour market conditions'.[1] In response to this demand for public service pay systems that are responsive to local market conditions, in this paper we examine the current state of pay systems in the public and private sectors. The underlying mechanisms that enable the users of such pay systems to respond to local and regional labour market conditions are examined. Public sector pay structures as designed, in general, offer little scope for local flexibility. In contrast, there is considerable geographic variation in the rates paid in the private sector. As a result, there is substantial regional and geographic variation in the size of the pay gap between public and private sector employees. These pay gaps have important implications for the ability of the public sector to recruit and retain staff, and consequently for the quality of public services.

The aim of this paper is to examine spatial and temporal variations in the public sector premium using the Labour Force Survey (LFS), the New Earnings Survey Panel Dataset (NESPD) and the British Household Panel Survey (BHPS). Different empirical methods are used and compared. In addition to documenting the nature of pay variation, the results also highlight the differences between these three key data sets which have in the past been used to determine policies on public sector pay reform.

The background of research on geographically differentiated pay is discussed in the next section. Current pay setting arrangements in the private and public sectors are respectively discussed in Sections 3 and 4. This is followed by an empirical analysis of public sector pay premia across the UK.

2 Why Geographical Differences in Pay?

> The whole of the advantages and disadvantages of different employments of labour—must in the same neighbourhood, be either perfectly equal or continually tending to equality. If in the same neighbourhood there was any employment either evidently more or less advantageous than the rest so many people would crowd into it in the one case, and so many desert it in the other, that its advantages would soon return to the level of other employments. (Adam Smith, *The Wealth of Nations*, 1776)

This classic statement encapsulates the core of the theory of net advantages expounded by Smith. Competition in labour markets ensures that the net advantages of different jobs will tend to equality. We expect to find higher pay in some areas of the country to compensate for the higher cost of living and the less pleasant working environment. Once we have controlled for differences in the productive characteristics of the workforce in different areas of the country, pay will differ between different geographic areas due to differences in the cost of living and the amenity, the pleasantness, of working in different areas.[2] These same factors, cost of living and amenity, are likely

[1]HM Treasury, Budget Statement April 2003.
[2]For a review of this theory and a survey of empirical work see Rosen (1986).

to impact on wages at all points in the wage distribution, regardless of whether the employee is highly or lowly paid.

Empirical research has provided support for this theory of geographical pay differences. Differences between geographical areas in the human capital of the workforce, in working environment as approximated by the industrial mix, and in the attractiveness of the external environment in which they live and work, have all been found to be important in explaining the pattern of geographical pay differences in the UK (see Shah and Walker, 1983; Reilly, 1992; Blackaby and Murphy, 1995).

Estimates of standardized spatial wage differentials (SSWDs) have been produced for the UK by Blanchflower *et al.* (1996), as reported in Elliott *et al.* (1996), by Wilson *et al.* (1996, 2002) and by Davies and Owen (2004). Using standard regression models to control for all the measured differences in the characteristics of the workforce and jobs in different areas, they have estimated SSWDs for the public and private sectors. They reveal that a significant part of the differences in 'raw' or unadjusted differences in average pay levels between areas can be explained by the measured characteristics.[3]

Researchers have suggested that over the periods 1975–76 to 1987–88 (Molho, 1991) and 1973–93 (Blanchflower *et al.*, 1996) there was an increase in regional wage dispersion in Great Britain. Duranton and Monastiriotis (2002) suggest that the returns to all key labour market characteristics, which they argue are education, experience and gender, converged over the period 1982–97, although overall wage dispersion increased due to increased dispersion in educational attainment. A feature of the growing inequality of pay in the UK during the 1980s was an increase in the returns to unmeasured individual characteristics that relate to productivity. This development is evidenced by the substantial growth in within-group inequality during the 1980s and 1990s.

For the net advantages of jobs in different areas to be equalized, labour must be mobile; labour markets must be integrated; and pay structures must be flexible. Departures from equilibrium will occur where these are not present. Researchers have pointed to differences in geographical unemployment rates—strictly these must be differences in unemployment rates beyond the area-natural rates—as evidence of temporary disequilibrium. Such differences in the unemployment rates between areas feed back into and affect pay. Empirical evidence of a negative relationship between the levels of local pay and unemployment has been advanced to support the existence of a wage curve (Blanchflower and Oswald, 1994b). Although the existence of the wage curve has been contested (see Card, 1995; Blanchard and Katz, 1997; Black and Fitzroy, 2000), few researchers now dispute that in some way unemployment affects pay.

[3]Recent estimates for London only have been produced by the London Weighting Advisory Panel (2002).

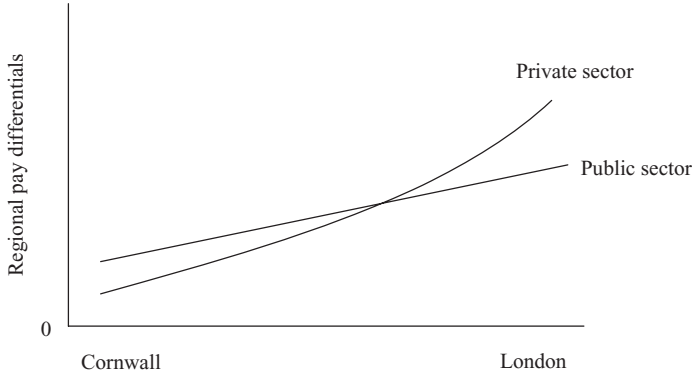

FIG. 1 Regional Pay Differentials in the Public and Private Sector

Disequilibria in labour markets may also result from inflexible wage structures. These structures reflect the preferences of labour market participants reflected in the institutions that set pay. Where trade unions have an important role in pay setting, pay is likely to deviate from the rates that would otherwise be paid in the market.[4] Trade unions are likely to be concerned about equity and fair pay, and often seek to negotiate a national rate for the job (see Metcalf *et al.*, 2001). Where this happens they will narrow the distribution of pay and the resulting wage structure will be flatter than would otherwise occur.

The incidence of trade unionism is much greater in the public sector than in the private sector. It therefore seems likely that the geographical pattern of pay in the public sector will reveal a much flatter pay structure than in the private sector. Thus, even though average pay may be the same in the two sectors, where the private sector exhibits a much steeper profile, as illustrated in Fig. 1, the public sector will overpay in the low-cost high-amenity area (e.g. Cornwall) and underpay in the high-cost low-amenity area (e.g. London). The commitment to provision of a common standard of service for most publicly provided services means that the difference between the profiles has important consequences for service delivery.

The levels of unemployment and perhaps the incidence of trade unionism may also be greater at different points in the wage distribution and both may have a greater impact on the pay of low-paid workers (Blau and Khan, 1999; O'Leary *et al.*, 2004). For this reason the pattern of spatial wage differentials may differ between occupations and at different points in the wage distribution. We explore these issues in our empirical analysis.

[4]If the power of trade unions differs between areas (see Blackaby and Manning, 1999) this will affect geographical patterns of pay.

3 Pay Setting Arrangements in the Private Sector

Private sector employers pay different salaries in different parts of the country (Incomes Data Services, 2002). Employers with factories or workplaces in only one part of the country pay local wages. For instance, a local garage in Doncaster in the north-east of England will not try to match rates of pay for mechanics or clerks in London. In 2003, the LFS shows that around 26 per cent of all employees in Great Britain worked in organizations that had only one workplace. Large employers with a network of factories or workplaces retain a national framework but use a variety of devices to adjust pay to the local market rates. Some have a national pay scale, or spine, but locate new employees further up the spine and advance existing employees more quickly up the pay spine in high-pay low unemployment areas. Others pay regional allowances in the high-cost and unattractive areas. Some pay London and south-east allowances while others have zonal or regional pay bands.

Evidence reveals that many private sector employers do not bargain locally (Incomes Data Services, 2002). They retain a national framework because of the high transaction costs resulting from the duplication of time and effort that is associated with multiple bargaining units. Another reason is because local managers are unlikely to be experienced pay negotiators. Local bargaining is vulnerable to union 'whipsawing' tactics, where unions collude to increase their power to raise wages by negotiating with each employer separately. As a result, private sector firms establish rules or guidelines at the national level, and the rules identify the conditions under which higher pay is offered in different areas of the UK. Typically these rules require evidence of the rates paid by local competitors, of the local cost of living, and perhaps of local unemployment rates or turnover rates as evidence of market tightness.

4 Pay Setting Arrangements in the Public Sector

Arrangements in the public sector are very different. In most parts of the public sector there are national agreements and national pay scales, and, with the exception of London and the south-east, pay is usually the same regardless of the area of the country in which the employee works. Employees in London and the south-east receive additional payments to cover acknowledged differences in the cost of living and some agreements now make provision for additional payments in areas with recruitment and retention difficulties. But as a general rule there is little scope for adjusting pay to local or regional labour market conditions. The pay setting arrangements for each of the largest groups of public sector employees, and the scope they offer for geographically differentiating pay, are reported below.

4.1 Local Government

Administrative Professional Technical and Clerical (APT&C) staff and manual workers in local government are covered by national pay structures. The arrangements in England and Wales are different from those in Scotland. Those in England once offered considerable scope for local flexibility; they allowed local authorities in different parts of the country to use the spine points to address local labour market conditions. However, a Single Status Agreement was negotiated in 1997 and the pay structures for APT&C staff and manual workers were integrated and harmonized following job evaluation. The new arrangements seem likely to result in less geographically differentiated rates of pay for APT&C and manual staff in the three areas.

4.2 Police

There is some differentiation of reward within the present agreement covering the Constables, Sergeants and Inspectors, the Federated ranks, in the Police Service. Pay rates are UK wide but the payment of rent allowance, housing allowance and London payments results in geographical differentiation of total reward.

4.3 Education

The pay of teachers in England and Wales is set by different institutional arrangements from those for teachers in Scotland. Both countries have in common that major changes in pay structure have recently been negotiated between the Professional Associations, the unions representing the teachers, and representatives of central government and local government on the employers' side. A review body monitors developments and up-rates pay in England and Wales but in Scotland all matters of pay are dealt with by negotiation between employers and teachers unions.

Main grade teachers in England and Wales and classroom teachers in Scotland are paid on national pay scales. Progression through the main scales is by years of completed service while access to an upper scale is conditional on evidence of performance, in England and Wales, and competence in Scotland. In neither of the countries does progression offer opportunities for geographically differentiating pay. This is possible in England and Wales through payment of allowances, while Scotland has only the Islands Allowance. In England and Wales teachers in shortage subjects or in hard-to-fill posts can receive additional payments and a further discretionary payment is available on top of the London Allowance to address recruitment and retention problems. Payment of these allowances is at the discretion of schools but payments are neither substantial nor widespread.

4.4 National Health Service

In the National Health Service negotiations between the employers, government and National Health Service employers, and the professional bodies representing the main staff groups determine major changes in pay structure. Two review bodies monitor the arrangements for qualified staff and determine the sizes of the annual up-rating of pay. Since 2004 all non-medical staff are now covered by a new pay structure called 'Agenda for Change' which was introduced progressively from the middle of that year. This provides for additional payments in 'high-cost areas' and allows the payment of recruitment and retention premia; however, the latter has yet to be implemented. Prior to Agenda for Change there was scope for additional payments to nursing and medical staff working in London and contiguous areas while unqualified staff pay reflected local conditions.

4.5 Central Government

Pay and grading decisions in central government have been devolved to Ministries and agencies. Since April 1996 each department and agency has been able to establish its own pay and grading structure. Many are located in London and therefore have no need to devise a pay structure for geographically differentiating pay. However, the four largest have employees throughout the UK and thus need to address this issue: they are the Department of Work and Pensions, Ministry of Defence, Inland Revenue and Customs and Excise. Together they employed over 300,000 of a total of 508,000 civil servants in 2001.

These decentralized arrangements have given rise to a diversity of pay and grading practices in the UK civil service. Three of the four largest have separate London pay scales and two pay London allowances. Some have identified 'location pay zones' for additional payments, although these are largely confined to the south-east and east of England.

4.6 Overview of Recent Developments

A general feature of public sector pay arrangements in the last few years has been the drive to shorten the length of pay scales. Shorter pay scales offer fewer opportunities to use accelerated incremental progression to respond to tight labour markets. These changes have been accompanied by the increased use of job evaluation. Both developments have reduced the scope for geographical differentiation of pay outside London. Although this scope was limited prior to the most recent round of reforms, it is likely to have reduced still further.

5 Data and Methodology

Against this institutional wage-setting background, we now investigate wage outcomes for private and public sector employees across UK labour markets. We use a number of data sets and econometric techniques to build up a picture of spatial wage variation in the UK and its evolution through time. This section describes both the data and the methods that we use.

5.1 Data

Two data sets allow detailed mapping of geographical wage patterns in the UK: the NESPD and the LFS. Both contain individual observations on pay, hours, age, industry and occupation, while in addition the LFS includes a wide range of information on job, individual and household characteristics. Both surveys collect detailed information on the geographical areas in which people work, while the LFS also has information on where people live. The Office for National Statistics has made available local area identifiers of where people work for both the NESPD and LFS to enable this research.

One weakness of the NESPD is that it contains no details of employees' education or experience. Another is that, prior to the introduction of the Annual Survey of Hours and Earnings in 2005, there was doubt about its ability to sample accurately the lower end of the earnings distribution. This is because its sample frame is based on Inland Revenue records and thus those that do not pay tax may well be omitted. Nevertheless, it does offer some advantages over the LFS.[5] First, it has a very large sample. In theory, the sample consists of 1 per cent of all employees, although there is some attrition. Second, the questionnaire is completed by employers providing accurate earnings data—perhaps more accurate than is the case with the LFS, where it is the employee (or their proxy) who responds. In the questionnaire used to generate NESPD data, employers are asked to provide details of weekly earnings for a pay period in April and to provide details of hours of paid work together with information about the industries and occupations in which they work and the age and gender of employees. Finally, NESPD is a panel data set, so the same employees should be sampled each year while they continue to be employed. The LFS, on the other hand, contains detailed reporting of individual, household and job characteristics and the actual, as distinct from the 'paid for', hours of work of employees. However, it has a smaller sample size and therefore often requires pooling data from a number of years if detailed analysis is to be conducted.

The BHPS was also used to generate some of our results. It is the only general purpose longitudinal survey carried out in the UK. Its sample size is much smaller than that of the other surveys, but in addition to having

[5]For a detailed analysis of the differences between the NESPD and LFS see Ma *et al.* (2006). The definitions of public sector in each of the data sets differ only slightly and are shown in the Appendix.

relatively low attrition rates for a panel data set, it contains a much more detailed picture of individuals' life circumstances than either of the other surveys.

5.2 Methods

We use two methods to investigate patterns of geographical wage dispersion in the public and private sectors and to distinguish spatial differences in the public sector wage premium. These are (i) SSWDs, and (ii) quantile regressions.[6]

The first of these methods can be used where we have a large number of observations and detailed area identifiers, as we do with the NESPD and LFS data sets, and where the analysis concentrates on the complete sample of employees in each area. The second focuses on how the public sector premium varies across particular parts of the wage distribution in different areas. We now briefly describe these methodologies.

5.2.1 SSWDs and the Public Sector Premium. SSWDs are simple area dummy variable coefficients estimated from equation (1) which is the standard Mincer earnings equation.

$$\ln w_{it} = \gamma + \beta X_{it} + \delta A_{it} + u_{it} \tag{1}$$

where $\ln w_{it}$ is the natural log of real hourly earnings for individual i at time t, X represents the set of controls which include gender, tenure in the current job in excess of one year, age, age squared and year dummies which can be used to 'adjust' the results for the effects of inflation and other omitted time-dependent events. Finally, A is our set of area dummy variables whose coefficients provide estimates of the SSWDs. This specification imposes a common set of responses across areas on regressors such as age, education and tenure. Thus, it assumes that the effects of area compensating differentials are reflected only in the estimates of the area dummy variable coefficients. This equation is usually estimated by least squares using private sector employees only.

The use of private sector workers is based on the assumption that the private sector labour market is competitive and that private sector area differentials adjust to compensate employees for differences between areas in the cost of living and amenities. They are argued to be more flexible because the impact of unions on pay setting is negligible and employers therefore pay what is necessary to attract and retain employees to each area. The pattern in the private sector therefore serves as the benchmark against which to judge

[6]We also used geographically weighted regressions (see Fotheringham *et al.*, 2002) to investigate the spatial pattern of wage premia. These results are available in an Appendix to this paper that is available on request from the authors.

the pattern in the public sector. In the public sector there is less spatial differentiation because, as detailed above, pay setting is less flexible.

The argument for using least squares is that selection issues are unlikely to affect the relative size of the area dummies. Sectoral selection will affect mean wages in the public and private sectors because the sorting of employees into the two sectors is likely to be a non-random process. Studies have shown that unmeasured characteristics affect sectoral choice and therefore ordinary least squares will yield biased estimates (Bender, 1998; Gregory and Borland, 1999; Postel-Vinay and Turon, 2005). Postel-Vinay and Turon (2005) show that income mobility and job security in each sector have a major role to play. This depends on whether these job characteristics are captured by the observed market wage, which is more likely for wages in the private rather than public sector. As long as the returns to these characteristics are constant across regions, and there seems no reason why they should not be, then spatial wage differences across regions should not be influenced by these factors. When analysing the difference in mean wages between sectors, previous researchers have used a range of methods to correct for this effect, but most usually selectivity correction or instrumental variables (Disney and Gosling, 2003; Heitmueller, 2006).

While selection might be expected to affect mean wages across sectors, it is unlikely to affect the pattern of spatial wage differentials in the two sectors. It seems unlikely that the selection process is different across areas. The arguments that have been proffered to support the claim that unmeasured characteristics affect mean wages in the two sectors are not of this type. It has been argued that risk-averse individuals, and individuals who might view public service as a vocation, are attracted to public sector employment.[7] It is unclear why individuals' preferences for sector of employment should differ systematically between regions.

A second potential source of selection bias is selection into geographical areas due to unmeasured characteristics. For example, unmeasured ability may be the same across geographical regions, but may differ across regions in terms of the returns to ability. The private sector returns to ability may be higher in region one compared with region two, and therefore high-ability individuals in region two may choose to work in the private sector in region one. This is essentially a supply-side issue and is concerned first with the ability of the private sector to have flexible pay structures that reward unmeasured productive characteristics, and second, that the flexibility of these pay structures vary in some systematic way across regions. In part it depends on the size of the private sector employer relative to the region. Employers with employees located across many regions are likely to have the same type of pay structure across the whole company, and so there are unlikely to be systematic differences across

[7]See Gregory and Borland (1999).

regions, especially if the regions, as in our data, are relatively small (Incomes Data Services, 2002). For smaller private sector employers located only in one region, there does not seem to be a reason why the average level of pay flexibility should differ across regions, although we cannot rule this out nor can we account for it in the empirical analysis that follows. The results should therefore be interpreted with this in mind.

Equation (1) can also be estimated for public sector employees. The area dummy coefficients then represent differentials in pay between public sector employees between areas. These differentials will partly reflect the public sector wage bargaining structure that we discussed in the previous section. Hence we would expect smaller area differentials than those found in the private sector. We can test this hypothesis, which would imply that the pattern of area differentials in the private and public sector is as implied by Fig. 1, by testing the null hypothesis that $\tau = 1$ against the alternative that $\tau < 1$ in the equation

$$\delta^{\mathrm{PUB}} = \theta + \tau\delta^{\mathrm{PRIV}} \tag{2}$$

where δ^{PUB} and δ^{PRIV} are, respectively, the estimated area coefficients for the public and private sector from equation (1).

5.2.2 Quantile Regression. In long-run equilibrium the pattern of spatial wage differentials may be the same for all occupations at all levels of pay because the underlying determinants, cost of living and amenity, might have the same impact at all levels of pay. However, amenity is partly determined by the location of the place of work and therefore individuals at different parts of the earnings distribution may experience different amenities. Further, if the labour market is out of equilibrium and if the departure from equilibrium is greater at some levels of pay—suppose, for example, that unemployment is more heavily concentrated among the low paid in some areas of the country—then the pattern of spatial wage differentials will be different between occupations and perhaps between the low and high paid. For these reasons we might expect spatial wage differentials to vary at different points in the wage distribution. Quantile regression provides empirical estimates of such outcomes by varying the weights associated with different observations, depending on their location within the wage distribution.

The potential impact of trade unions on the wage structure provides another reason for examining spatial differentials at different points in the earnings distribution. If they are particularly strong among lower-paid workers in the public sector, then they may narrow the spatial wage distribution in the public sector relative to that in the private sector, more at the lower quartile of the wage distribution than further up. Again this can be picked up by the spatial distribution of the coefficients from quantile regressions.

The quantile regression analysis requires us to aggregate the local authority districts (LADs) into the constituent countries of Great Britain

because sample numbers are too small to conduct this analysis at the same level of spatial detail as used to estimate SSWDs. Further, for brevity, we do not report the underlying pattern of spatial wage differentials in the public and private sectors as we do for the SSWDs, but instead move directly to report the size of the public sector premium at various points in the wage distribution in the different territories of the UK.

6 Results

In this section, we examine estimates of the size and evolution of spatial wage differentials using the methods described previously. The results are based on data from the NESPD, the LFS or the BHPS. The NESPD begins in 1975 and hence we are able to examine the evolution of wages over a period during which the British labour market experienced radical change and transformation. We start by examining spatial wage differentials at the level of LADs and then shift our focus to the territorial level where, as we have indicated, administrative responsibility for the underlying wage bargaining processes rests.

6.1 Changes in Patterns of LAD Wage Differentials since 1975

First we look at how the pattern of SSWDs in the private sector has changed through time. The SSWDs presented in Table 1 have been derived by taking the exponent of the coefficients on the area dummies from a version of equation (1). They are reported as the proportional mark-up on the reference area, which is the area with the smallest SSWD. For example, Powys had the lowest SSWDs for males in 1975–79, and therefore it is set as the reference area for males for that period and its SSWD is equal to 0.000. The estimates use the NESPD and we are therefore only able to control for age, gender and industry. The model is estimated for three periods: 1975–79, 1985–89 and 1993–2001. These periods were chosen because they all seem to cover a similar, upward stage of the business cycle.

Most SSWDs are statistically significantly different from the reference area. The results suggest a steady increase in the dispersion of the SSWDs over time. In 1993–2001 the standard deviation of the coefficients is 0.119 compared with 0.059 in 1975–79. It is perhaps not surprising that the dispersion is greater in the latter period because during much of the period 1975–79 incomes policies were restraining wage growth and wage inequality. However, spatial wage inequality continued to grow after these restraints were removed. Thus, spatial earnings dispersion was also greater in 1993–2001 than in 1985–89.

We find that there is considerable stability in the rankings of the SSWDs both through time and between genders. These are reported in Table 2. This shows that the rank correlation for men and women between 1975–79 and

TABLE 1
SSWDs IN THE PRIVATE SECTOR 1975–79, 1985–89 AND 1993–2001—NESPD

	(1) Combined male and female			(2) Males			(3) Females		
Local authority districts	*1975–79*	*1985–89*	*1993–2001*	*1975–79*	*1985–89*	*1993–2001*	*1975–79*	*1985–89*	*1993–2001*
Inner London	0.371	0.527	0.664	0.327	0.435	0.571	0.362	0.477	0.549
Outer London	0.234	0.317	0.384	0.247	0.291	0.354	0.266	0.312	0.346
Bedfordshire	0.174	0.205	0.290	0.167	0.178	0.265	0.173	0.163	0.250
Berkshire	0.198	0.344	0.477	0.184	0.303	0.432	0.229	0.298	0.380
Buckinghamshire	0.190	0.283	0.375	0.164	0.241	0.342	0.152	0.276	0.300
East Sussex	0.045	0.135	0.178	0.034	0.082	0.135	0.083	0.166	0.190
Essex	0.169	0.194	0.249	0.170	0.179	0.213	0.182	0.168	0.189
Hampshire	0.157	0.218	0.288	0.125	0.178	0.260	0.097	0.176	0.200
Hertfordshire	0.228	0.310	0.394	0.217	0.269	0.346	0.226	0.264	0.338
Isle of Wight	0.030	0.083	0.122	0.038	0.047	0.095	0.017	0.109	0.120
Kent	0.127	0.150	0.229	0.138	0.143	0.212	0.145	0.150	0.183
Oxfordshire	0.155	0.215	0.333	0.149	0.176	0.289	0.164	0.165	0.253
Surrey	0.189	0.303	0.462	0.168	0.247	0.402	0.163	0.260	0.353
West Sussex	0.127	0.225	0.321	0.126	0.192	0.285	0.159	0.189	0.241
Cambridgeshire	0.149	0.203	0.265	0.139	0.161	0.230	0.117	0.154	0.223
Norfolk	0.089	0.098	0.126	0.082	0.079	0.118	0.117	0.105	0.107
Suffolk	0.086	0.118	0.153	0.078	0.103	0.141	0.133	0.083	0.097
Avon	0.173	0.205	0.269	0.164	0.170	0.236	0.185	0.153	0.191
Cornwall	***0.000***	0.014	***0.000***	0.013	***0.000***	***0.000***	0.020	0.077	***0.000***
Devon	0.028	0.059	0.074	0.037	0.049	0.073	0.110	0.123	0.100
Dorset	0.081	0.114	0.198	0.084	0.094	0.178	0.080	0.121	0.143
Gloucestershire	0.110	0.135	0.222	0.121	0.122	0.212	0.162	0.105	0.146
Somerset	0.102	0.093	0.139	0.103	0.096	0.119	0.169	0.152	0.142
Wiltshire	0.120	0.177	0.275	0.119	0.156	0.255	0.124	0.189	0.172
West Midlands MC	0.141	0.119	0.195	0.150	0.113	0.184	0.150	0.130	0.149
Hereford	0.100	0.062	0.125	0.100	0.063	0.123	0.163	0.116	0.127
Shropshire	0.068	***0.000***	0.079	0.061	0.001	0.079	0.103	0.075	0.062
Staffordshire	0.090	0.050	0.090	0.098	0.054	0.087	0.117	0.101	0.087
Warwickshire	0.142	0.111	0.236	0.165	0.114	0.224	0.122	0.104	0.162
Derbyshire	0.099	0.079	0.135	0.103	0.077	0.127	0.122	0.081	0.081
Leicestershire	0.116	0.088	0.157	0.106	0.083	0.156	0.139	0.108	0.105
Lincolnshire	0.075	0.033	0.079	0.078	0.024	0.095	0.089	0.052	0.068

Northamptonshire	0.112	0.118	0.214	0.116	0.094	0.201	0.129	0.095	0.149
Nottinghamshire	0.101	0.099	0.131	0.111	0.079	0.117	0.127	0.130	0.099
South Yorkshire MC	0.116	0.083	0.107	0.139	0.094	0.114	0.106	0.099	0.090
West Yorkshire MC	0.088	0.073	0.169	0.098	0.070	0.146	0.127	0.117	0.162
Humberside	0.102	0.084	0.120	0.109	0.079	0.117	0.111	0.085	0.081
North Yorkshire	0.099	0.077	0.135	0.080	0.046	0.126	0.101	0.070	0.068
G. Manchester MC	0.123	0.131	0.194	0.132	0.113	0.172	0.133	0.143	0.156
Merseyside MC	0.157	0.139	0.179	0.159	0.121	0.158	0.164	0.147	0.143
Cheshire	0.164	0.168	0.251	0.170	0.157	0.235	0.151	0.155	0.164
Lancashire	0.098	0.082	0.145	0.085	0.071	0.125	0.087	0.116	0.114
Tyne & Wear MC	0.125	0.100	0.146	0.113	0.073	0.110	0.114	0.081	0.090
Cleveland	0.187	0.142	0.148	0.190	0.136	0.143	0.140	0.134	0.053
Cumbria	0.102	0.110	0.118	0.116	0.113	0.133	0.108	0.107	0.079
Durham	0.115	0.077	0.089	0.110	0.054	0.093	0.118	0.074	0.074
Northumberland	0.072	0.057	0.075	0.093	0.055	0.069	0.048	0.082	0.040
Clwyd—West	0.028	0.055	0.029	0.050	0.063	0.064	0.031	***0.000***	0.014
Clwyd—East	0.080	0.078	0.147	0.144	0.120	0.152	0.063	0.073	0.102
Dyfed	0.061	0.004	0.048	0.044	0.027	0.058	0.124	0.061	0.019
Gwent	0.103	0.072	0.110	0.109	0.057	0.099	0.085	0.088	0.091
Gwynedd	0.028	0.025	0.052	0.029	0.018	0.049	***0.000***	0.049	0.090
Mid Glamorgan	0.088	0.050	0.075	0.098	0.057	0.078	0.150	0.134	0.105
Powys	0.021	0.037	0.011	***0.000***	0.020	0.011	0.108	0.184	0.058
South Glamorgan	0.149	0.146	0.194	0.157	0.124	0.161	0.114	0.131	0.155
West Glamorgan	0.120	0.077	0.111	0.119	0.072	0.102	0.120	0.100	0.107
Borders	0.053	0.057	0.099	0.060	0.063	0.098	0.125	0.047	0.062
Central	0.114	0.092	0.182	0.141	0.141	0.184	0.084	0.062	0.105
Dumfries & Galloway	0.050	0.021	0.056	0.076	0.020	0.064	0.028	0.088	0.001
Fife	0.090	0.069	0.115	0.084	0.066	0.113	0.074	0.036	0.034
Grampian	0.135	0.168	0.221	0.136	0.165	0.224	0.133	0.126	0.122
Highland	0.153	0.047	0.093	0.142	0.085	0.082	0.091	0.071	0.048
Lothian	0.121	0.168	0.252	0.124	0.143	0.200	0.119	0.154	0.208
Strathclyde MC	0.138	0.124	0.177	0.132	0.115	0.153	0.110	0.136	0.136
Tayside	0.080	0.060	0.135	0.072	0.055	0.139	0.112	0.096	0.100

Note: The values are the estimated coefficients of LAD dummies from a wage regression.
Dependent variable = real hourly wage; independent variables other than LAD dummies = gender, dummy, age groups.

Table 2
Rank Correlation Coefficients of SSWDs Reported in Table 1

		Males and females			*Males*			*Females*		
		1975–79	*1985–89*	*1993–2001*	*1975–79*	*1985–89*	*1993–2001*	*1975–79*	*1985–89*	*1993–2001*
Males and females	1975–79	1.00	0.83	0.81	0.94	0.87	0.81	0.70	0.64	0.70
	1985–89		1.00	0.95	0.79	0.95	0.93	0.66	0.80	0.87
	1993–2001			1.00	0.78	0.92	0.99	0.66	0.74	0.91
Males	1975–79				1.00	0.88	0.80	0.65	0.58	0.66
	1985–89					1.00	0.93	0.67	0.72	0.82
	1993–2001						1.00	0.67	0.72	0.88
Females	1975–79							1.00	0.65	0.65
	1985–89								1.00	0.83
	1993–2001									1.00

1985–89 is 0.83 and between 1985–89 and 1993–2001 is 0.95. The correlation between the earliest and the latest periods is 0.81. This confirms the findings reported in Table 1—that LADs at the bottom of the ranking in 1975–70 were likely to remain at the bottom of the more dispersed distribution that existed in 1993–2001.

Table 1 also reports SSWDs for men and women separately. Again it can be seen that the spatial distribution of pay has increased over the period, although the increase is less marked for women than for men. The standard deviation increased from 0.055 in 1975–79 to 0.078 in 1985–89 and to 0.103 in 1993–2001 for males, while over the same periods it grew from 0.057 in 1975–79 to 0.075 and then 0.098 for females. Again, Table 2 reveals that there is considerable stability in the rankings. The rank correlation coefficient is 0.88 between 1975–79 and 1985–89 and is 0.93 between 1985–89 and 1993–2001 for men. The respective figures for women are 0.65 and 0.83.

The literature on trends in inequality in Great Britain during the last three decades has focused on the increase in inequality within industries and occupations (e.g. Duranton and Monastiriotis, 2002). The exceptions are Molho (1991) and Blanchflower *et al.* (1994a) who show that there was an increase in regional wage dispersion in the 1970s and 1980s. Our results suggest that the spatial component of this change continued through the 1990s. The effect is stronger for men than women. Many of the areas with low SSWDs appear to be rural, whereas the areas where SSWDs have increased tend to be urban and particularly located in the south-east of England. At present, we have not tried to distinguish between such urban–rural and south-east drift explanations of increasing SSWDs.

6.2 Differences between the Public and Private Sectors at LAD Level

Now consider both the public and private sectors together and the differences between their respective area coefficients, where these are estimated using separate private and public sector estimates of equation (1). The results of this estimation are presented in Table 3. The results are for the year 2000 and are generated using both the NESPD and the LFS. First in columns (1) and (2) we report results using the same specification on the two data sets. Then in column (3) the results of using the full range of controls available in the LFS are reported. The SSWDs reported in Table 3 for the private and public sectors are plotted in Figs 2–4.

Figures 2 and 3, which contain only those controls available in the NESPD, show the SSWDs as a mark-up on the lowest paying area in the private sector and are ordered by size of private sector SSWD. It is evident from these that the pattern of the public sector SSWDs does not follow that of the private sector SSWDs. The relationship between pay premia in the two sectors is relatively weak. The correlation coefficient between the private and

TABLE 3
SSWDs IN THE PRIVATE AND PUBLIC SECTORS

	(1) NESPD 2000				(2) LFS 2000 (Q1–4)				(3) LFS 2000 (Q1–4)			
	Controlling for gender, industry and age group				Controlling for gender, industry and age group				Controlling for tenure, tenure^2, experience, experience^2, gender, industry, age group and education			
Local authority districts	*Private*	*t stat*	*Public*	*t stat*	*Private*	*t stat*	*Public*	*t stat*	*Private*	*t stat*	*Public*	*t stat*
Inner London	0.395	–34.64	0.318	–4.64	0.568	–12.01	0.359	–6.02	0.537	–11.34	0.302	–4.81
Outer London	0.269	–24.43	0.240	–4.86	0.413	–11.27	0.319	–3.68	0.419	–10.18	0.206	–4.41
Bedfordshire	0.524	–13.74	0.206	–6.63	0.646	–5.87	0.252	–5.78	0.612	–5.2	0.189	–5.57
Berkshire	0.393	–20.25	0.248	–4.69	0.539	–8.63	0.352	–3.36	0.504	–8.48	0.289	–2.9
Buckinghamshire	0.203	–26.33	0.128	–9.66	0.280	–14.83	0.233	–5.85	0.306	–13.54	0.161	–5.93
East Sussex	0.271	–34.6	0.120	–12.73	0.404	–14.86	0.219	–8.36	0.442	–12.17	0.175	–7.63
Essex	0.315	–34.36	0.151	–12.94	0.453	–15.84	0.249	–8.57	0.444	–14.72	0.192	–8.05
Hampshire	0.418	–21.85	0.246	–5.88	0.522	–10.41	0.353	–3.82	0.494	–9.99	0.265	–3.94
Hertfordshire	0.188	–11.45	0.076	–5.56	0.197	–8.26	***0.000***	–3.99	0.211	–7.97	0.006	–3.6
Isle of Wight	0.237	–38.07	0.125	–13.5	0.301	–21.3	0.270	–6.72	0.334	–18.91	0.219	–6.01
Kent	0.390	–18.21	0.203	–7.23	0.502	–9.42	0.288	–4.92	0.459	–9.71	0.201	–5.23
Oxfordshire	0.495	–15.69	0.216	–7.61	0.567	–8.34	0.275	–5.74	0.527	–8.24	0.188	–6.11
Surrey	0.318	–25.51	0.119	–8.51	0.470	–10.97	0.257	–5.25	0.453	–10.39	0.172	–5.57
West Sussex	0.268	–30.07	0.171	–9.51	0.432	–12.37	0.265	–5.88	0.408	–12.19	0.175	–6.36
Cambridgeshire	0.152	–35.2	0.128	–10.44	0.224	–16.55	0.152	–8.65	0.241	–15.72	0.100	–8.49
Norfolk	0.162	–33.18	0.024	–12.16	0.272	–14.79	0.155	–7.52	0.291	–13.76	0.117	–7.02
Suffolk	0.266	–33.96	0.123	–13.64	0.454	–11.77	0.326	–4.83	0.411	–12.24	0.219	–5.64
Avon	***0.000***	–30.19	***0.000***	–11.95	0.226	–13.54	0.185	–5.48	0.226	–13.32	0.143	–5.07
Cornwall	0.074	–42.19	0.088	–14.14	0.223	–20.23	0.162	–8.8	0.236	–19.39	0.086	–9.27
Devon	0.201	–28.49	0.111	–10.27	0.297	–15.36	0.240	–5.87	0.308	–14.44	0.206	–5.02
Dorset	0.232	–27.13	0.181	–6.98	0.389	–12.57	0.204	–6.06	0.371	–12.37	0.126	–6.35
Gloucestershire	0.159	–28.45	0.121	–8.25	0.304	–15.93	0.248	–5.47	0.298	–15.56	0.199	–4.97
Somerset	0.274	–26.14	0.075	–11.56	0.419	–12.9	0.283	–4.92	0.407	–12.3	0.194	–5.28
Wiltshire	0.215	–50.9	0.156	–15.49	0.326	–24.09	0.262	–8.86	0.333	–22.61	0.153	–10.36
West Midlands MC	0.149	–33.16	0.127	–9.36	0.253	–17.99	0.246	–5.04	0.250	–17.72	0.160	–5.38
Hereford	0.119	–28.45	0.081	–9.59	0.257	–14.1	0.211	–5.72	0.282	–13.04	0.132	–6.01
Shropshire	0.108	–41.93	0.152	–10.15	0.176	–21.11	0.193	–7.57	0.197	–20.15	0.090	–8.61
Staffordshire	0.267	–25.14	0.208	–5.22	0.363	–12.19	0.154	–6.14	0.359	–11.64	0.070	–6.63

Warwickshire	0.157	−38.72	0.089	−12.05	0.237	−19.75	0.185	−6.89	0.237	−19.37	0.113	−7.13
Derbyshire	0.161	−39.34	0.131	−11.28	0.261	−19.51	0.254	−5.41	0.288	−17.94	0.190	−5.24
Leicestershire	0.076	−41.07	0.135	−9.65	0.125	−20.68	0.244	−5.34	0.183	−18.77	0.174	−5.35
Lincolnshire	0.234	−29.77	0.162	−7.44	0.359	−14.06	0.205	−5.28	0.388	−12.26	0.153	−5.03
Northamptonshire	0.160	−38.92	0.112	−13.36	0.311	−17.02	0.260	−5.75	0.303	−16.68	0.138	−7.06
Nottinghamshire	0.105	−45.99	0.137	−12.02	0.183	−23.11	0.157	−9.45	0.215	−21.54	0.076	−10.14
South Yorkshire MC	0.192	−50.86	0.146	−15.45	0.291	−24.95	0.224	−10.19	0.292	−24.06	0.143	−10.7
West Yorkshire MC	0.114	−35.1	0.081	−11.85	0.159	−22.39	0.212	−6.89	0.167	−22	0.131	−7.29
Humberside	0.172	−33.45	0.060	−12.37	0.283	−16.14	0.196	−7.3	0.278	−15.81	0.135	−7.25
North Yorkshire	0.207	−50.33	0.124	−17.63	0.308	−25.25	0.192	−11.29	0.299	−24.77	0.104	−12.29
Greater Manchester	0.181	−34.99	0.108	−15.24	0.321	−15.98	0.249	−8.14	0.293	−16.36	0.148	−9.19
Merseyside MC	0.241	−33.77	0.130	−10.03	0.348	−16.74	0.242	−7	0.323	−16.91	0.144	−7.85
Cheshire	0.165	−44.73	0.102	−14.81	0.214	−23.08	0.217	−8.42	0.216	−22.64	0.130	−9.08
Lancashire	0.156	−41.11	0.047	−19.32	0.241	−21.3	0.105	−11.71	0.235	−21.13	0.054	−11.64
Tyne & Wear MC	0.140	−28.77	0.079	−10.76	0.310	−13.49	0.216	−5.58	0.292	−13.56	0.181	−4.91
Cleveland	0.103	−29.67	0.184	−6.57	0.245	−15.1	0.211	−5.95	0.233	−15.16	0.155	−5.73
Cumbria	0.058	−33.66	0.085	−11.93	0.151	−18.23	0.061	−9.53	0.184	−17.12	0.023	−9.27
Durham	0.094	−21.91	0.020	−10.81	0.095	−13.87	0.081	−5.68	0.118	−13.49	0.021	−5.86
Northumberland	0.142	−26.07	0.101	−9.06	0.126	−19.25	0.147	−6.56	0.147	−18.62	0.084	−6.69
Clwyd	0.065	−22.41	0.016	−11.26	***0.000***	−12.45	0.070	−7.13	0.054	−11.78	0.059	−6.46
Dyfed	0.114	−30.48	0.127	−9.53	0.281	−13.05	0.244	−4.82	0.286	−12.55	0.173	−4.84
Gwent	0.053	−16.42	0.063	−7.52	0.113	−10.61	0.130	−4.73	0.117	−10.61	0.080	−4.65
Gwynedd	0.085	−25.26	0.101	−9.08	0.215	−15.38	0.248	−5.45	0.249	−14.18	0.183	−5.32
Mid Glamorgan	0.021	−14.54	0.020	−6.91	0.190	−7.4	0.128	−3.09	0.176	−7.53	0.036	−3.43
Powys	0.208	−26.06	0.108	−11.03	0.285	−12.31	0.230	−6.49	0.280	−12.05	0.124	−7.49
South Glamorgan	0.139	−22.78	0.090	−9.73	0.332	−7.88	0.216	−4.3	0.302	−8.11	0.099	−5.13
West Glamorgan	0.072	−14.52	0.049	−4.79	0.174	−9.97	0.054	−3.9	0.168	−10.03	0.022	−3.77
Borders	0.173	−18.68	0.135	−5.76	0.265	−12.28	0.227	−4.59	0.258	−12.17	0.149	−4.79
Central	0.022	−16.93	0.081	−4.48	0.200	−8.98	0.081	−4.66	0.191	−9.05	***0.000***	−5.04
Dumfries & Galloway	0.100	−24.9	0.005	−11.73	0.256	−12.8	0.269	−4.06	0.262	−12.33	0.154	−4.87
Fife	0.237	−25.25	0.110	−9.6	0.347	−13.18	0.232	−5.52	0.311	−13.67	0.114	−6.63
Grampian	0.099	−18.79	0.024	−8.48	0.161	−10.78	0.338	−2.69	0.150	−10.97	0.190	−3.84
Highland	0.294	−27.89	0.087	−14.99	0.405	−15.27	0.251	−7.41	0.367	−15.81	0.164	−7.94
Lothian	0.186	−47.64	0.090	−19.5	0.269	−23.67	0.222	−10.71	0.247	−24.09	0.141	−11.27
Strathclyde MC	0.126	−25.5	0.095	−10.05	0.215	−14.6	0.211	−5.65	0.175	−15.48	0.120	−6.18
Tayside	0.197	−3.53	0.092	−2.28	0.030	−6.16	0.249	−1.72	0.000	−6.54	0.138	−2.02
Number of observations	72,993		26,908		25,912		11,513		25,888		11,503	
R^2	0.2854		0.1490		0.2686		0.1124		0.4089		0.3245	

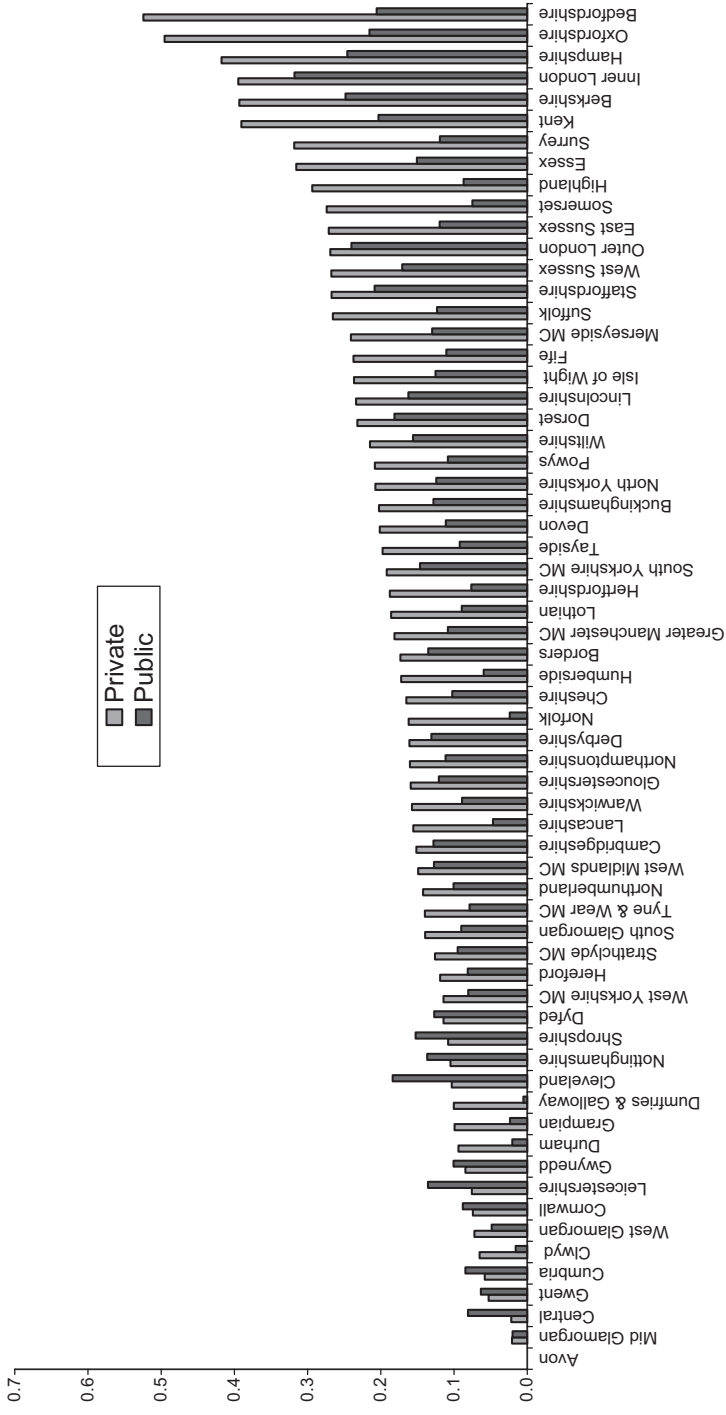

FIG. 2 SSWDs Estimated using NESPD 2000

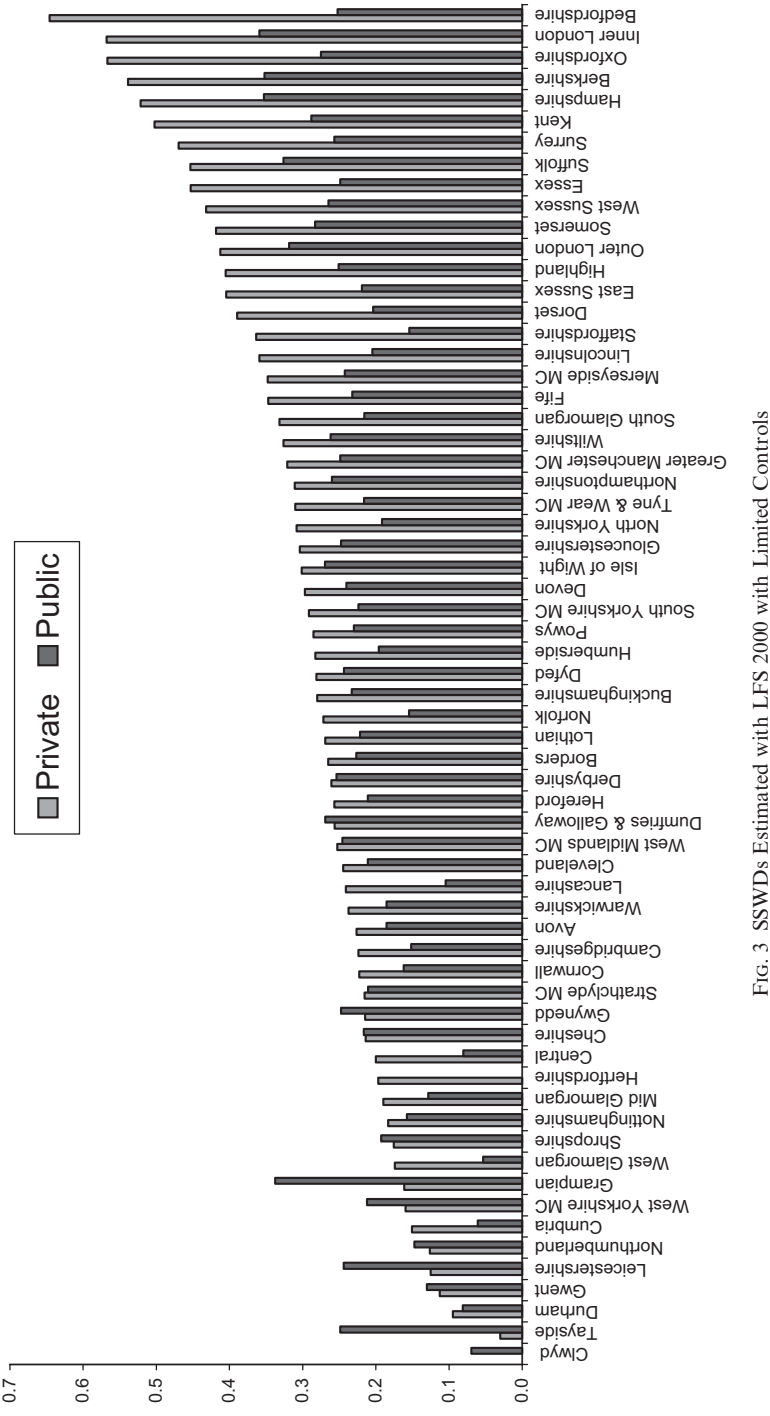

FIG. 3 SSWDs Estimated with LFS 2000 with Limited Controls

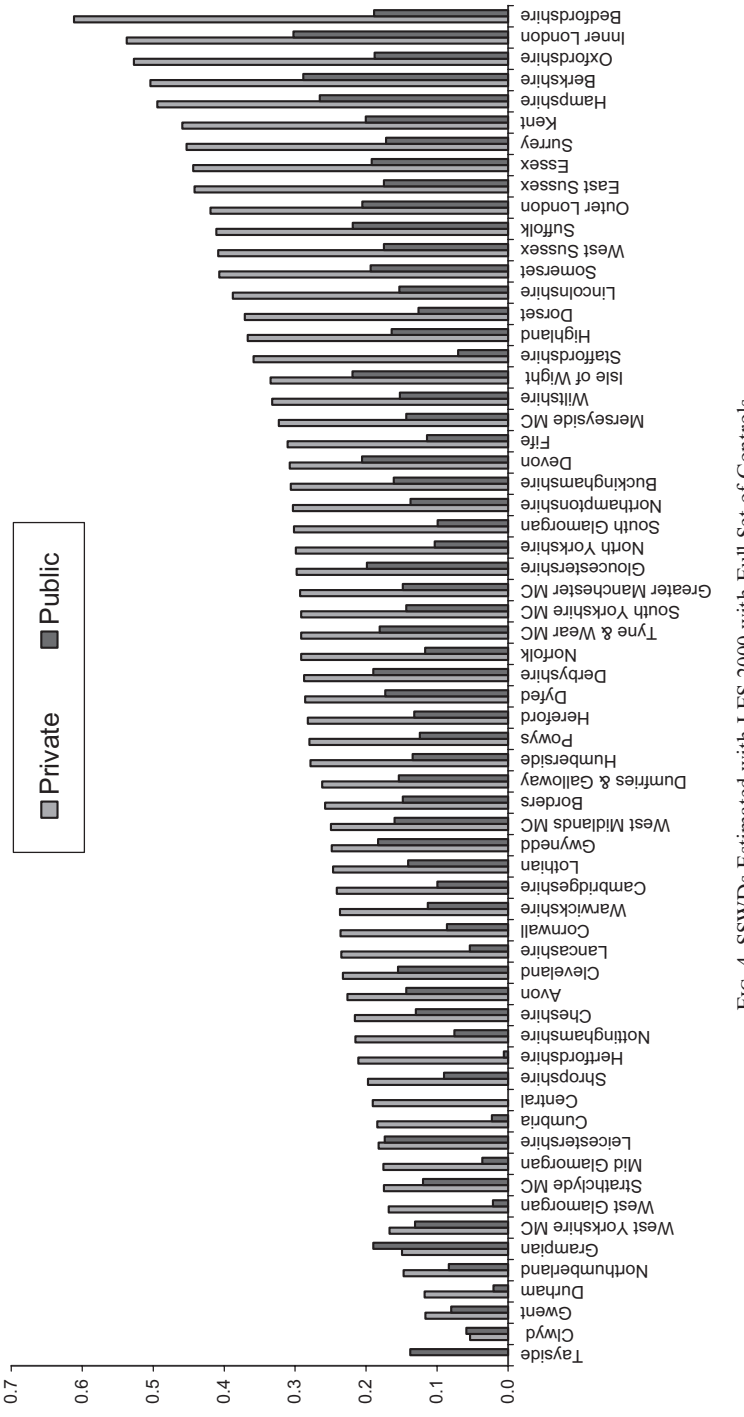

FIG. 4 SSWDs Estimated with LFS 2000 with Full Set of Controls

TABLE 4
RELATIONSHIP BETWEEN PUBLIC AND PRIVATE SECTOR SSWDS

Data set	*Time period*	*Regressors*	*Slope*	*t*	*n*	*F statistic*
NESPD	1997	Limited	0.30	2.38	64	5.7
NESPD	2000	Limited	0.42	7.28	64	53.0
LFS	2000	Limited	0.36	5.35	64	28.6
LFS	2000	Full	0.36	5.66	64	32.0

Note: Standard errors and *t* statistics have been estimated by robust regression since the data used in these regressions are themselves estimated coefficients from public sector wage regressions and therefore subject to sampling error.

public sector SSWDs shown in Fig. 2 is 0.73, while that in Fig. 3 is 0.63. The largest gaps between public and private SSWDs tend to be found in areas where the private sector SSWDs are biggest. This suggests that the labour markets where there is most likely to be excess demand for public sector workers are those where the private sector SSWDs are largest;[8] many of these are in the south-east.

One possible explanation for the absence of any systematic relationship between private and public sector SSWDs may be due to omitted variable biases in the estimated SSWDs. Thus, Fig. 4 shows the effects on the SSWDs of including tenure, tenure squared, experience, experience squared and education in the LFS estimates in addition to the industry, age group and gender variables. This results in a small increase in the correlation between private and public sector SSWDs to 0.67. This suggests our initial finding of low correlation between private and public SSWDs is not due to the absence of a full set of Mincer-equation control variables.

Taking our argument one stage further, we now estimate equation (2). That is, we set the public sector SSWD as the dependent variable in a regression where the private sector SSWD is the independent variable. There is one observation for each LAD. If the public sector response to local labour market conditions were of the same magnitude as that in the private sector, we would expect the coefficient in this regression to be insignificantly different from unity.

The results are shown in Table 4. There is a great deal of consistency in the slope estimates across time periods, regressors and data sets. The average response to a unit increase in a private sector area spatial differential is an increase of 0.36 in the public sector area wage differential. All of the estimates using both the NESPD and the LFS, in both 1997 and 2000, with a full set of regressors and the more restricted set that is available in the NESPD, reject the null hypothesis that the coefficient on the private sector SSWD is unity. The results thus imply that public sector differentials are significantly less

[8]We also plotted the difference between the SSWDs of the private and public sectors for both data sets. They show a remarkably similar pattern, with the exception of a few outliers.

responsive to spatial cost and amenity differences than are those in the private sector.

6.3 Territorial Differences

We now report a set of comparisons of estimates of spatial variation in the public sector premium using the BHPS, the LFS and the NESPD.[9] We focus on England, Scotland and Wales for this exercise. Our argument for doing so is administrative: the Westminster and Scottish parliaments and the Welsh Assembly have powers to influence the structure of public sector pay within their respective areas of responsibility. While we have seen that the structure of public sector pay bargaining arrangements is spatially complex, the current constitutional settlement within the UK suggests that no progress on reforming the structures of public sector pay would be possible without the active participation of these bodies. The estimates of public sector premia for England, Scotland and Wales are presented in Tables 5–8.

Like the NESPD, the BHPS is a panel data set, but provides a richer set of controls than either the LFS or NESPD. We begin with a simple pooled model that uses the same specification as the extended LFS model in Table 3, column (3). The BHPS is available for a shorter period than the NESPD and therefore we concentrate here on the last period reported in Table 1, the period 1993–2001. Our estimates are constructed for the years 1994–95 and 2000–1 because the BHPS operates a continual sampling process which starts on 1 September in each year.

Earlier research using the BHPS to analyse the pattern of public–private differentials (Disney and Gosling, 1998, 2003) has shown that women earn significantly more in the public sector than the private sector. The authors also found that men earned slightly more in the public sector than in the private sector, but that this advantage fell up to 1995, and was not statistically significant. The earlier paper looked at just the first half of the 1990s while the latter analysed the 1990s as a whole using the first nine waves of the BHPS. The latter paper sought to distinguish the impact of selection, endogenous job switching and measurement error on the premia. It found that, although cross-section estimates of the premia could be driven by selection, models in first differences still revealed a statistically significant pay premium in the public sector.

Table 5 compares the mid-1990s with 2000–1 and shows a declining pattern of public sector premia in England. This fall is larger for females, with premia for females always higher than those for males at different points in the distribution. In Wales, the picture is different. The male premium

[9]Henley and Thomas (2001) mapped the public–private wage differential across 11 regions of Great Britain using the BHPS for the period 1991–96. They found that the public sector differential was the highest in West Midlands, Wales and Scotland.

TABLE 5
BHPS (POOLED ESTIMATES)

	1994–95				*2000–1*			
	Coeff.	*t stat*	*n*	*Pseudo-R^2*	*Coeff.*	*t stat*	*n*	*Pseudo-R^2*
England								
Females								
Median	0.264	8.15	1834	0.376	0.155	4.96	1602	0.369
0.25 quantile	0.330	7.27	1834	0.227	0.173	3.98	1602	0.214
0.75 quantile	0.214	7.01	1834	0.254	0.117	3.81	1602	0.239
Males								
Median	0.046	1.47	2921	0.393	0.036	1.25	2927	0.397
0.25 quantile	0.113	3.45	2921	0.238	0.096	2.46	2927	0.217
0.75 quantile	0.008	0.19	2921	0.251	0.079	2.31	2927	0.261
Wales								
Females								
Median	0.060	0.31	89	0.504	0.125	2.62	578	0.434
0.25 quantile	0.361	0.88	89	0.424	0.105	2.52	578	0.286
0.75 quantile	–0.076	–0.15	89	0.407	0.124	2.39	578	0.301
Males								
Median	0.134	1.07	157	0.440	0.067	1.64	956	0.399
0.25 quantile	0.191	1.84	157	0.315	0.131	2.72	956	0.264
0.75 quantile	0.016	0.08	157	0.277	0.011	0.16	956	0.247
Scotland								
Females								
Median	0.169	2	227	0.600	0.195	4.78	836	0.529
0.25 quantile	0.255	2.71	227	0.345	0.219	3.66	836	0.327
0.75 quantile	0.015	0.14	227	0.416	0.169	3.93	836	0.379
Males								
Median	0.026	0.33	293	0.483	0.073	1.85	1261	–0.458
0.25 quantile	0.095	0.87	293	0.32	0.126	2.02	1261	0.231
0.75 quantile	–0.061	–1.21	293	0.389	0.006	0.14	1261	0.312

Notes: Regress log hourly wage on tenure, tenure^2, experience, experiance^2, industry, qualifications, sector and year.
Coefficients on sector variable (public sector = 1).
Using 1994–95 not 1993–95 because no sector variable available in 1993.

decreased from 12 per cent to 7 per cent between 1994–95 and 2000–1 while that for females doubled—from 6 per cent to 12 per cent. In Scotland, premia increased for males (7 per cent) and females (19 per cent) to levels that are higher than either England or Wales by 2000–1.

The BHPS fixed-effects estimates of the premium are reported in Table 6. They tend to be lower than the equivalent pooled estimates, particularly for women. Trends over time are also less consistent. The premia for both men and women fall in England while they rise in Wales. In Scotland the picture is mixed as they fall for men and rise for women. The results imply that much of the observed differences in pay between public and private sector workers are due to unobserved characteristics of the workers who select into each sector. The characteristics are seen to have a

TABLE 6
BHPS (INDIVIDUAL FIXED EFFECTS)

	1993–2001				*1994–95*				*2000–1*			
	Coeff.	*t stat*	R^2	*No. of obs.*	*Coeff.*	*t stat*	R^2	*No. of obs.*	*Coeff.*	*t stat*	R^2	*No. of obs.*
Males												
England	0.044	2.06	0.327	15,263	0.023	0.49	0.003	2,921	–0.041	–1.01	0.048	2,927
Wales	0.139	2.51	0.637	2,424	0.008	0.03	0.046	157	0.128	1.83	0.055	956
Scotland	0.114	2.44	0.432	3,389	0.055	0.56	0.011	293	–0.012	–0.19	0.000	1,261
Females												
England	0.051	2.3	0.230	9,081	0.071	1.78	0.000	1,079	–0.014	–0.33	0.000	1,602
Wales	0.069	1.52	0.780	1,491	–0.004	–0.06	0.005	89	0.008	0.09	0.009	578
Scotland	0.016	0.41	0.584	2,394	–0.071	–0.67	0.057	227	0.047	1.06	0.000	836

Notes: Dependent variable = real hourly wage.
Independent variables = tenure, tenure^2, experience, experience^2, gender, industry, qualification, sector.

TABLE 7
LFS

	Males		*Females*	
	1994–95	*2000–1*	*1994–95*	*2000–1*
England	0.070	–0.012	0.166	0.099
Wales	0.023	0.044	0.224	0.241
Scotland	0.015	0.052	0.180	0.131

Notes: Dependent variable = real hourly wage.
Independent variables = tenure, tenure^2, experience, experience^2, gender, industry, qualification, sector.

TABLE 8
NESPD

	Males			*Females*		
	1975–79	*1985–89*	*1993–2001*	*1975–79*	*1985–89*	*1993–2001*
GB	0.064	–0.028	0.084	0.230	0.130	0.275
England	0.060	–0.034	0.081	0.220	0.121	0.270
Wales	0.073	0.046	0.175	0.284	0.217	0.360
Scotland	0.050	–0.025	0.069	0.287	0.166	0.272

Notes: Dependent variable = real hourly wage.
Independent variables = gender, industry, sector, age group, UK area.

positive effect on public sector workers' wages. The characteristics might be unmeasured ability, but they might also be those characteristics of jobs mentioned earlier: the opportunity to pursue a career regarded as a vocation or performing a public service. A note of caution is however appropriate: the BHPS sample sizes are much smaller than those for the NESPD or LFS and hence standard errors are somewhat higher and the results less reliable using the BHPS.

The LFS results in Table 7 again suggest that the public sector premium in England fell between 1994–95 and 2000–1 for both genders. Again they suggest that over the same period the premia increased in Wales. However, in contrast to the BHPS results they now rise for men and fall for women in Scotland. The premia for women are universally higher than those for males.

The NESPD earnings data go back to 1975 and allow us to investigate public sector premia over a longer period. Table 8 shows premia calculated for the same three periods analysed earlier: 1975–79, 1985–89 and 1993–2001. Again, premia for females are consistently higher than those for males. They peaked during the period 1993–2001 after falling between 1975–79 and 1985–89. We suspect that there are two important processes underlying these shifts. First, the substantial weakening of public sector institutions during the 1980s weakened the bargaining power of public sector trade unions. This included

the contracting out of some public services to the private sector. Hence the 1980s dip in the public sector premium. The recovery during the 1990s reflects some rebuilding of these institutions.

Second, throughout the period, female levels of education and labour market participation were increasing relative to those of males. Much of the increased female employment was in the public sector. The NESPD does not include a measure of educational attainment and hence it is not surprising that results from this survey suggest high female public sector premia towards the end of the period. A much higher NESPD female premium was found in the NESPD during 1993–2001 than was found in either the BHPS or the LFS. In both the latter data sets the premia were estimated with a control for educational attainment. Further support for this hypothesis is provided by the contrast between the patterns for women and men. For men, even after controlling for education, there is no clear direction to the differences between the BHPS and NESPD.

The spatial data suggest that the public sector premium is lower in England than in other parts of Great Britain. This is consistent with the more detailed spatial analysis of the premium in the early part of this paper. There we found that the private sector premium in the south-east had been increasing relative to other parts of Great Britain. Most of the other results (with the exception of the BHPS, where the Welsh sample is quite small) suggest that the public sector premium is higher in Wales than in Scotland.

Is there a consistent message regarding public sector premia that can be extracted from Tables 5–8? The following seem to emerge. First, the historical record seems to suggest a recovery in the public sector premium during the period 1994–95 to 2000–1 after the low levels of the 1980s. Second, the female premium appears to be higher than that for males—although this should be qualified by the fixed-effects results, which suggest that omitted variables may cause greater upward bias in the estimates of the female premium. Finally, the public sector premium appears to be higher in Wales than in Scotland, which in turn is higher than in England.

6.4 Quantile Regressions

We now consider the spatial distribution of the public sector premium at different points in the earnings distribution. The coefficients for the public sector dummy, which have been estimated at the 25th, 50th and 75th percentiles, are plotted in Figs 5–7. Corresponding regression statistics are summarized in Tables 9–11. Estimates for full-time males, full-time females and part-time females using both the NESPD and LFS are reported. Similar estimates for the BHPS are constrained to full-time males and full-time females due to the relatively small sample. The NESPD estimates control for gender, age group and industry. In the LFS and the BHPS, we are able to

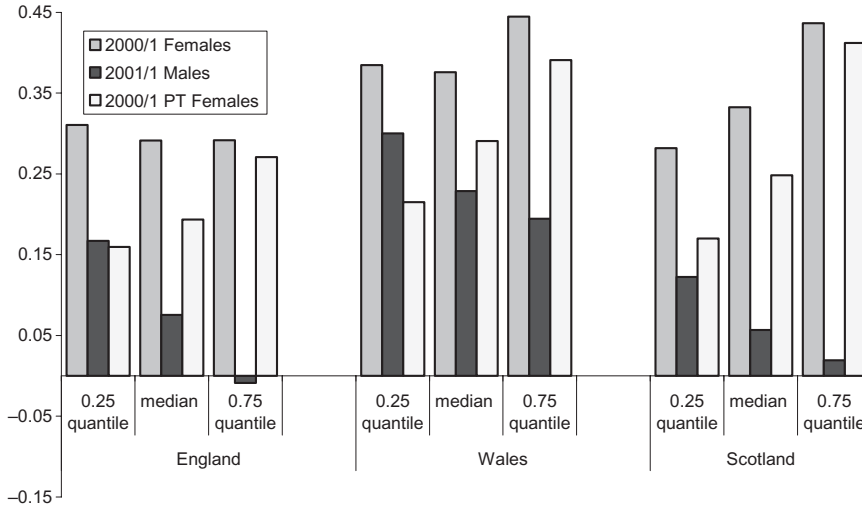

FIG. 5 Public Sector Premiums—NESPD

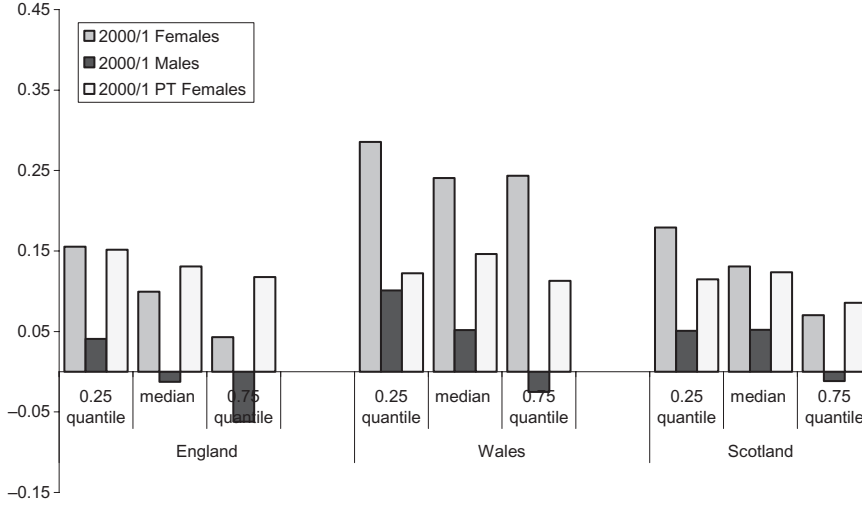

FIG. 6 Public Sector Premiums—LFS

control for gender, age group, industry, tenure, tenure squared, experience, experience squared and education.

Most of the coefficients estimated using the NESPD and the LFS are significant at the 1 per cent level. Some lack of significance tends to arise in the tails of the earnings distribution where there are relatively few public sector workers. However, the BHPS results are less robust; while all the

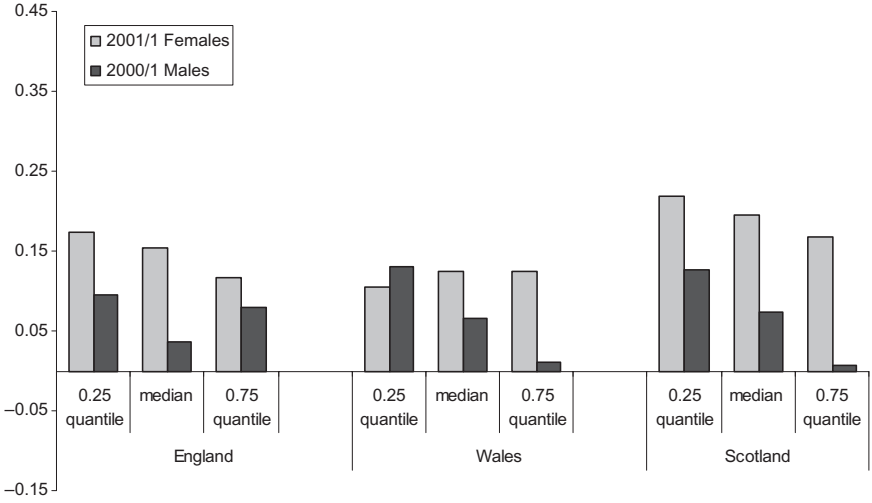

FIG. 7 Public Sector Premiums—BHPS

public sector premia are significant at the 1 per cent level for full-time females, the results for full-time males are more mixed. Although the premia for full-time males in England are significant at 1 per cent (25th and 75th) and 10 per cent (50th median), the 75th percentile estimates are significant for neither Scotland nor Wales, due to the limited sample size.

Again we find that because of the greater number of explanatory variables available in the LFS and BHPS, the public sector premia estimated using these two data sets are much smaller than those estimated using the NESPD. This is again consistent with the results in the last section. There may also be some small effect resulting from the failure of the NESPD to adequately sample the lower end of the earnings distribution (Ma *et al.*, 2006).

Public sector premia for full-time male workers exhibit very similar patterns in all of the surveys, with the premia declining as earnings increase. This pattern tends to be repeated in all three countries. The exception is the BHPS in England where the premium is slightly higher at the 75th percentile than at the median. The NESPD and LFS suggest that public sector premia among full-time males in England are smaller at all points of the earnings distribution than in either Scotland or Wales. Indeed, both the LFS and the NESPD suggest that the premia for males in England are negative at the 75th percentile.

The LFS results for females reveal a similar pattern to those for males, though at a much higher level. The same is generally true of the BHPS results, except that there is no clear trend in Wales. In contrast, the NESPD results for full-time females suggest that the premia *increase* with earnings in

TABLE 9
BHPS

		Full-time males				*Full-time females*			
Percentile		*Coeff.*	*t stat*	*No. of obs.*	R^2	*Coeff.*	*t stat*	*No. of obs.*	R^2
England	25th	0.096	2.46	2927	0.217	0.173	3.98	1602	0.214
	50th (median)	0.036	1.25	2927	0.397	0.155	4.96	1602	0.369
	75th	0.079	2.31	2927	0.262	0.117	3.81	1602	0.239
Wales	25th	0.131	2.72	956	0.264	0.105	2.52	578	0.286
	50th (median)	0.067	1.64	956	0.399	0.125	2.62	578	0.434
	75th	0.011	0.16	956	0.247	0.124	2.39	578	0.301
Scotland	25th	0.126	2.02	1261	0.231	0.219	3.66	836	0.327
	50th (median)	0.073	1.85	1261	0.459	0.195	4.78	836	0.529
	75th	0.006	0.14	1261	0.312	0.169	3.93	836	0.379

TABLE 10
LFS

		Full-time males				*Full-time females*				*Part-time females*			
Percentile		*Coeff.*	*t stat*	*No. of obs.*	*Pseudo-R^2*	*Coeff.*	*t stat*	*No. of obs.*	R^2	*Coeff.*	*t-stat*	*No. of obs.*	R^2
England	25th	0.041	3.69	39,552	0.203	0.155	14.25	24,395	0.214	0.152	16.95	17,934	0.129
	50th (median)	–0.012	–1.27	39,552	0.326	0.099	10.80	24,395	0.329	0.131	13.15	17,934	0.282
	75th	–0.062	–5.20	39,552	0.209	0.043	3.66	24,395	0.202	0.118	10.18	17,934	0.225
Wales	25th	0.101	2.24	2,216	0.254	0.286	6.45	1,362	0.279	0.122	3.06	1,063	0.142
	50th (median)	0.052	1.51	2,216	0.383	0.241	6.40	1,362	0.386	0.146	4.26	1,063	0.346
	75th	–0.025	–0.79	2,216	0.237	0.244	5.79	1,362	0.273	0.113	3.82	1,063	0.305
Scotland	25th	0.051	2.07	4,401	0.229	0.179	6.64	2,902	0.266	0.115	4.72	1,952	0.128
	50th (median)	0.052	2.08	4,401	0.372	0.131	5.34	2,902	0.415	0.124	4.49	1,952	0.307
	75th	–0.011	–0.47	4,401	0.247	0.070	2.57	2,902	0.283	0.086	2.19	1,952	0.254

TABLE 11
NESPD

		Full-time males				*Full-time females*				*Part-time females*			
		Coeff.	*t stat*	*No. of obs.*	*Pseudo-R^2*	*Coeff.*	*t stat*	*No. of obs.*	*Pseudo-R^2*	*Coeff.*	*t stat*	*No. of obs.*	*R^2*
England	25th percentile	0.167	22.19	108,638	0.101	0.311	41.45	59,463	0.110	0.159	34.89	39,017	0.089
	50th median	0.076	11.80	108,638	0.187	0.291	44.75	59,463	0.178	0.194	30.17	39,017	0.168
	75th percentile	–0.009	–1.00	108,638	0.124	0.292	32.96	59,463	0.111	0.271	29.98	39,017	0.128
Wales	25th percentile	0.300	8.73	5,568	0.152	0.385	15.81	3,069	0.139	0.215	13.77	2,152	0.131
	50th median	0.229	8.61	5,568	0.226	0.376	13.70	3,069	0.240	0.291	11.75	2,152	
	75th percentile	0.195	5.62	5,568	0.131	0.445	11.88	3,069	0.178	0.391	10.87	2,152	0.145
Scotland	25th percentile	0.122	6.23	10,341	0.105	0.282	13.13	5,952	0.158	0.170	12.76	4,104	0.108
	50th median	0.057	3.07	10,341	0.198	0.333	18.16	5,952	0.254	0.248	12.06	4,104	0.177
	75th percentile	0.019	0.93	10,341	0.139	0.437	19.40	5,952	0.173	0.412	11.37	4,104	0.124

Scotland and Wales. The increase between the 25th percentile and the median may be partly explained by the NESPD sampling structure, but it is less easy to explain why the premium continues to rise from the median to the 75th percentile. The NESPD also reveals a clear tendency for the public sector premium to increase with earnings among part-time women. This may reflect the greater prevalence of part-time working among females in the public sector. However, this contrasts with the results for full-time females between the NESPD on the one hand and the LFS and BHPS on the other. Again, the lack of a full set of controls weakens the case for the NESPD estimates.

The spatial results from the quantile regressions are not conclusive. While premia at the 25th and 75th percentiles in Scotland and Wales are typically larger than in England, there is no consistency in their relative size across surveys. This may reflect difficulties with sample size. It may also reflect spatially correlated unobserved heterogeneity that is not being picked up in either the LFS or NESPD.

7 Conclusions

The analysis of the existing pay arrangements in the public sector revealed that in general there was little opportunity for geographical differentiation, beyond paying more to those who work in London. One result from our regressions that seems to hold across data sets and time periods is that public sector labour markets are only, at most, 40 per cent as responsive to area differences in amenities and costs as private sector labour markets. We have also found a trend increase in the variability of SSWDs, implying a growth in spatial inequality during the 1980s and 1990s.

We also examined the spatial variation of SSWDs at different points in the earnings distribution, but here our results were less conclusive. This was because at this fine level of analysis each of the surveys—the LFS, NESPD and BHPS—has significant weaknesses. Drawing detailed conclusions had to a degree to be based on judgement and an interpretation of the econometric findings.

Our analysis revealed that private sector SSWDs vary widely across Great Britain with the variation increasing over time. However, they are only loosely correlated with their public sector equivalents, whose variation is much less marked. This is likely to create excess demand for public sector workers in areas with high private sector SSWDs and excess supply where SSWDs are small. Given the complexity of bargaining structures described in the first section, there may be considerable problems associated with attempts to correct such imbalances.

We have focused on public sector bargaining structures as a possible cause of the divergence between private and public sector SSWDs. But we could equally inquire into why private sector SSWDs vary so widely.

Towards the end of our period, on 1 April 1999, the National Minimum Wage was introduced and this is likely to have reduced some of the private sector variation. However, differences in the degree of spatial variation between the sectors are likely to remain, and the absence of a sufficient degree of spatial wage variation in public sector wage structures means that public sector employees in some parts of the country are not being paid sufficient to defray differences in the cost of living and amenities. Where this happens the public sector has found it difficult to attract and retain the labour it needs[10] and this has consequences for service delivery.

However, the costs of reforming public sector pay bargaining are likely to be high. Much of the public sector operates under tight budget caps and if more flexibility is introduced this will involve a spatial redistribution of existing resources. Such redistribution is likely to be resisted and would therefore be costly to implement locally.

Other policies to support public services in areas where the private sector SSWDs are high have been used to a limited extent. These have focused on non-pay factors, including housing subsidies and improving the quality of public sector jobs through investment in infrastructure and training. The relative costs and effects of pay versus non-pay policies therefore become an important area of future research.

Appendix

Definition of Public Sector Workers

NES—it is by the IDBRSTA variable.
Status of the company on the IDBR
1 = private companies
2 = sole proprietor
3 = partnership
4 = public corporation and nationalized industries
5 = central government
6 = local authority
7 = non-profit institution serving households
Categories 1–3 are classified as private sector, 5–7 as public sector.

LFS—it is by the PUBLIC variable.
'. . . the public sector is defined as that owned, funded or run by central or local government, and the "private" sector as everything else. The private sector includes:
– Public limited companies (PLC), companies that are quoted on the stock market and have shareholders.

[10]For evidence from the labour market for qualified nurses see Elliott *et al.* (2007).

– Limited companies (ltd). Small businesses often owned by one or more individuals. These may also be referred to as private limited companies.
– Self-employed individuals; sole traders, or owners of small shops or businesses.
– Charities, private trusts, housing associations or other voluntary organizations.
– Trade Unions (employees of).'

From *Labour Force Survey User Guide*, Vol. 3: *Details of LFS variables 1992–2002*, p. 112.

BHPS—it is by the E9 variable.
Public sector is defined as Civil Service/Central Government, Local Government/ Town Hall, National Health Service or higher education and Nationalized Industry. The remaining categories are classified as private sector. Armed forces are excluded.

1. Private firm/company
2. Civil Service/Central Government
3. Local Government/Town Hall
4. National Health Service or higher education
5. Nationalized industry
6. Non-profit organizations
7. Armed forces
8. Other

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