Cronfa - Swansea University Open Access Repository

_____

This is an author produced version of a paper published in:
Regional Studies

_____

Cronfa URL for this paper:

_____

Paper:

_____

Regional Pay? The Public/Private Sector Pay Differential

David Blackaby*
Swansea University, SERC and WISERD
School of Management, Swansea University
Swansea SA1 8EN
UK
TEL: +44 1792 602103
E-mail: d.h.blackaby@swansea.ac.uk

Philip Murphy
Swansea University, SERC and WISERD
School of Management, Swansea University
Swansea SA1 8EN
UK
E-mail: p.d.murphy@swansea.ac.uk

Nigel O'Leary
Swansea University, NILS Flinders University, SERC and WISERD
School of Management, Swansea University
Swansea SA1 8EN
UK
E-mail: n.c.oleary@swansea.ac.uk

Anita Staneva
The University of Sydney and WISERD
School of Economics, The University of Sydney
NSW 2006
Australia
E-mail: anita.staneva@sydney.edu.au

* corresponding author

Abstract

This paper extends the debate on making public sector wages more responsive to those in the private sector. The way in which the public/private sector wage differential is calculated dramatically alters conclusions and far from there being substantial regional disparity in wages offered to public sector workers, any differences are predominantly concentrated in London and the South East where public sector workers are significantly disadvantaged relative to private sector workers. This has implications for staff recruitment and retention. Such findings question the need for regional market-facing pay but highlight the necessity to revisit the London-weighting offered to public sector workers.

Introduction

The increasing size of government deficits following the 2007/08 financial crisis and policies put in place to address it led to the spotlight being placed on the size of the government sector workforce and the level of public sector pay. In many countries, this led to policies to reduce the size of the public-sector workforce and restraints on public sector pay (see Christofides and Michael, 2013). Public support for the latter policy was often encouraged by data that showed wages, uncorrected for characteristic differences, being much higher in the public sector (see, for example, Canadian Union for Public Employees, 2011; Congressional Budget Office, 2012).

Indeed, the size of the public sector deficit and public sector pay were central issues in the run-up to the 2010 UK General Election. In 2009, just over 6 million individuals in the UK were employed in the public sector, representing 21% of total employment (Matthews, 2010). The public sector pay bill amounted to £182 billion, 30% of all government expenditure and 13.1% of national income (IFS, 2011). In the June 2010 emergency budget the new government set out plans for reducing the deficit which included a two-year public sector pay freeze for public sector workers earning over £21,000. It was estimated that the pay freeze would save £3.3 billion a year by 2014/2015, and the deficit reduction plan would lead to a loss of 730,000 public sector jobs by 2016/2017. In 2011, the Government announced the pay freeze would come to an end and emphasis was placed on making public sector pay more responsive to local labour market conditions via Pay Review Bodies.[1] For this, the Government used evidence from the Institute of Fiscal Studies (IFS, 2012) which revealed a national public/private sector pay premium of 8.3%, but with substantial regional variations. For example, the largest public sector pay premium was found in Wales (at 18.0%), followed by Yorkshire and Humberside (13.4%) and Scotland (13.4%). The South East (0.5%) and London (4.6%) had the smallest differentials. On the basis of this evidence the Treasury (2012) made the case for regional/market-facing pay, suggesting that the public sector pay premium revealed the public sector pays more than is necessary to recruit, retain and motivate staff in some areas and this would have implications for the quality of service delivery. It was also suggested that more market-facing pay would help private business 'become more competitive and expand' by avoiding crowding out, particularly in areas where public sector pay is relatively high.

---

[1] This was not the first time that the UK Treasury has considered introducing regional/local pay. In the 2003 Budget the Chancellor of the Exchequer proposed to introduce measures to ensure the public service systems are more responsive to regional labour market conditions (HM Treasury, 2003). One area where this did take place was in the Ministry of Justice, when in 2007 it introduced five regional pay zones which led to some local pay variation outside of London.

In light of this debate, we examine the size of the public/private sector pay premium and its sensitivity to specification changes. Adding to this body of research in the context of pay localisation within a regional setting, we also discuss the policy implications of our findings. We begin by reviewing some of the evidence on the size of regional public/private wage differentials across and within countries before briefly highlighting the influence that such differentials will have for the crowding out of private sector jobs and potential recruitment and workforce quality issues. We then derive estimates for the size of the regional public/private sector pay differential for the UK and conduct sensitivity analysis to show how the wage differential changes with the inclusion/exclusion of certain independent variables. We draw reference to the work of the IFS (2012) as a convenient starting point for our own analysis and discussion and we benchmark our results against these given the prominence of this work in the recent policy debate. Finally, considering our findings, we draw out policy conclusions in the final section.

Background

Evidence on Pay Premiums

International comparisons on the size of the public/private sector wage differential across countries are problematic given that the composition of public sector workers varies dramatically. However, a common finding in the literature when making comparisons within countries is that the wage distribution is more compressed in the public sector then the private, with public sector workers enjoying a wage premium at the lower tail of the distribution but a wage penalty at the upper tail. There is also a smaller gender pay gap in the public sector and less regional variation in wages (see Krueger, 1988; Bender and Heywood, 2010).

Explanations for these phenomena include the greater success of trade unions in the public sector, where coverage rates tend to be relatively high, in raising the wages of relatively low paid workers; the greater enforcement of legislative measures to reduce exploitation of workers in the public sector; political consideration limiting wage increases for relatively high paid workers; and lack of performance measures in many public sector jobs. Bender and Heywood (2010) note that in many countries comparability is the most often used principle to set wages in the public sector. Gregory (1990) also notes the government should act as a 'model employer' in terms of employment policies, leading to lower earnings discrimination in the public sector. For a review of the evidence of the public sector pay gap in a number of Euro area countries see Giordano *et al*. (2011).

While an enormous amount of literature exists examining country-wide sector wage differentials, a much smaller literature has looked at regional public/private sector wage differentials within countries. A notable exception is Elliott *et al*. (2007) who examine the subject for five large European countries. They find the public/private sector wage differential in France and the UK is nowhere near as large as in Spain and Italy. However, they do find these former countries have a capital problem, such that Paris and London have a problem in providing common public services in these high wage areas.2 In addition, for France it is found that a recruitment and retention problem exists for highly skilled workers in some poorer regions. Italy, France and Spain are also found to have highly centralized public sector pay systems and in Italy and Spain there are large regional private sector wage variations. As such, the centralized public sector pay systems of Italy are seen as a regional policy mechanism to boost consumption in poorer areas as a result of a north/south earnings divide in the private sector.

Much of the literature in the US has looked at differences between Federal, State and Local Government (Lewin *et al*., 2012 *inter alia*) but, as noted by Lewis and Galloway (2011), regional investigations are sparse. However, early work by Belman and Heywood (1995) concludes that sectoral wage differentials vary significantly across states, a finding also confirmed by Llorens (2008) which identifies a large positive differential in California and a large negative differential in Mississippi.

Labour Market Implications of Public Sector Pay Premiums

In the context of the UK, research on the potential for public sector pay policy to crowd out private sector employment has been undertaken by Henley and Thomas (2001). Using micro panel data from the British Household Panel Survey 1991-1996, they find no evidence for this outcome but rather that the Keynesian multiplier effect dominates any displacement effect from public sector wages. They also find that higher unemployment in regions with relatively high public/private sector wage differentials was 'consistent with the suggestion that crowding-out is less likely in such regions'. Subsequent research by Faggio (2015) that evaluates the dispersal of civil service jobs up until 2010 from London to the regions following recommendations from the Lyons Review (2004) finds an overall positive impact on private sector employment. While the effect on manufacturing jobs is negative, the overall effect in the private sector is positive. For every 10 civil service jobs dispersed to an area, an additional 5.5 jobs are created in the private sector overall, with the majority of these within 2km of the dispersal.

---

2 Morikawa (2016) notes a similar problem exists in Tokyo.

As well as highlighting the potential for crowding out, the Treasury (2012) also cite research noting the potential impact on service quality 'in some areas there may not be sufficient incentives to recruit, retain and motivate quality public sector staff'. They quote research by Ma, Battu and Elliot (2009) who find public/private sector wage differentials are positively associated with teaching vacancies and a link between the pay differential and teaching quality. They also discuss research by Burgess, Gossage and Propper (2003) and Propper and Van Reenan (2010) that outlines implications of pay differential for the National Health Service (NHS). Indeed, when analysing heart attack data the latter study finds a '10 per cent increase in wages outside of nursing was associated with a 7.4 per cent increase in mortality'.[3] In contrast, Greaves and Sibieta (2014) find little evidence that higher teacher salaries increase pupil attainment at age 11 and that location choices of high-quality teachers 'are not sensitive to salary differentials' and suggest other strategies to improve student performance. However, Crawford and Disney (2015), when analysing the quality of recruits to the police force in the UK, finds a higher outside wage is associated with a lower quality applicant and that national pay scales cannot respond to variations in the disamenity of an area as measured by violent crimes. Such effects manifest themselves in poorer quality police applicants.

Data and Estimation Strategy

The data are taken from the quarterly versions of the *Labour Force Survey* (LFS), a large-scale survey conducted by the *Office for National Statistics*. Begun in 1992 as a follow on to the previous annual version of the survey, we pool the quarterly surveys over the period 2009q1-2015q4 to examine the UK public/private pay differential and to assess regional variation over time. The start date was chosen to provide consistency with the commonly cited IFS (2012) study and the end was determined by the most recently available quarter of data at the time. With this data, estimates of the public/private sector pay differential are obtained based on a linear regression of log-hourly earnings against a range of commonly used independent variables adopting the demarcation between public and private sectors as given within the LFS. The survey defines the public sector as that owned, funded or run by central or local government and respondents are classified as being

---

[3] While these two studies highlight rigidity in the NHS wage system, it should be noted that even though national pay scales (which includes London uplift) based on job evaluations are operated, the Market Forces Factor (MFF) funding formula is designed to take account of area differences in costs. By far the largest difference in costs relate to staff costs and the staff Market Forces Factor (a component of the MFF) has been designed to compensate for these potential cost differences. This formula uses ASHE data to account for local area differences in private sector wages. The NHS pay system for nurses, while a national system, allows health care providers to offset potential recruitment and retention issues through paying a recruitment and retention premia (RRP) to staff on top of national scales. However, there is evidence that health care providers in the NHS are reluctant to make extensive use of this tool (NHS Pay Review Body, 2012).

employed in the public or private sector based on information collected about an individual's employer.[4,5]

We do not, however, consider the issue of pension provision. While there is a generally held view that not only are wages higher in the public sector but so too are pensions, Danzer and Dolton (2012) find this may not be the case. Examining a group of highly educated individuals, they calculate measures of Accumulated Lifetime Total Reward (ALTR, which includes pensions, paid holidays, benefits in kind and health insurance) for public and private sector employees. They find the ALTR for public and private sector males are more or less equal at the age of 59, although a large and positive ALTR does exist for females in the public sector at the same age. This issue is further complicated by the findings of Cribb and Emmerson (2014) who show that the size of public/private sector pay differentials when including pensions (and other benefits) depends on what comparison groups are used and what benefits are included.[6]

Results and Discussion

Aggregate Results

Given the importance attached to the IFS estimates of the public/private sector pay differential, we have used these findings as a starting point for an examination of public sector wage structure across the UK. A sensitivity analysis is then undertaken to examine how these estimates change when a number of additional controls which have been found in the literature to be important in determining earnings are included. These results are shown in Table 1 and are presented over two separate time periods: 2009q2-2011q1 mimics that used by the IFS; 2011q2-2015q4 updates to the most recent period post financial crisis. Row 1 compares our results with those of the IFS using a

---

[4] Compared to the employer-based ASHE survey, which would be expected to provide a more accurate classification of sector, the LFS tends to overstate the size of the public sector (Heap, 2005). Part of this is due to outsourcing, where individuals believe they work in the public sector but are actually employed by the private sector.

[5] We investigated this issue of sectoral classification extensively. As an alternative, we reclassified those who work in higher education or as temporary agency workers into the private sector as suggested by Heap (2005) and performed the entire analysis on this basis. The underlying story presented later is unaffected by this adjustment and indeed the magnitude of estimates is little changed. Alternatively, as a matched employer-employee survey the Workplace Employer Relations Survey (WERS) may give a more accurate representation of the public/private sectors. While previous authors such as Bryson *et al*. (2017) have used WERS data at an aggregate level, there is no analysis of regional public sector differentials using this data source. When we used WERS data along such regional lines an unclear and puzzling pattern emerged that is not consistent with the existing evidence base. For that reason, we use the LFS as our data source, although unravelling the puzzling regional results within WERS would be a fruitful avenue for future research. All results are available upon request.

[6] It should also be noted that such calculations do not take account of the fact that the decline in pension provision and defined benefit schemes will mean that many poorly paid private sector workers (and indeed some public sector workers) are likely to be increasingly supported by the state in old age.

similar specification and we will initially concentrate upon results estimated over the period 2009q2-2011q1. For men, there is a statistically significant wage premium of 8.1% (IFS 8.9%) and for women the premium is 16.1% (IFS 15.5%).[7] The first check undertaken is to redefine the dependent variable (hourly earnings) by dividing weekly earnings by usual paid hours as suggested by the ONS (see Laux and Marshall, 1994) rather than actual hours as undertaken by the IFS. They propose that this might be a more appropriate route to follow as the reference period form actual earnings and actual hours do not always coincide and can be further complicated by holiday pay. As shown in row 2, this reduces the premium to 6.1% for men and 15.1% for women. Controlling for a richer set of educational qualifications (in conjunction with years of education) and regions reduces the differentials further to 2.4% and 9.5% respectively. From this base of row 3 we then sequentially add additional controls for job tenure, establishment size, occupations, part-time employment and managerial responsibility.[8] The most noticeable effect from adding these controls is found through the inclusion of establishment size controls (see row 5), reducing the differential to -2.9% for men and 6.0% for women. When the complete set of additional controls that are often included in earnings equations in empirical investigations such as this are introduced (see row 9), the differential reduces further to -3.9% and 5.6% respectively. However, it is evident that adding the set of controls for plant size in isolation has arguably the most pronounced effect upon the wage premium and it is this aspect that we will investigate further in sections 4.2 and 4.3.

[insert Table 1 here]

The public/private sector wage differential is known to vary over the business cycle, being higher in recessions and falling in periods of recovery. Indeed, Disney and Gosling (1998, 2008) reveal that the raw public/private sector wage differential increased sharply in the two recessions in the 1980s and 1990s and over the period 1975 to 2006 the long run characteristics adjusted differentials 'do not seem to depart strongly from zero'. It is therefore of interest to examine how the public/private sector wage differential has evolved more recently. This is shown in the final column of Table 1 and for completeness comparable estimates over all specifications are presented for the updated period 2011q2-2015q4. Concentrating upon the estimates in row 9 (although the pattern exhibited is the same across all rows), there is a distinct squeezing of the differential as the economy has recovered from recession in the wake of the financial crisis. This latter period would also pick up the effects of

---

[7] More correctly, the figures in the tables are log point estimates and the actual percentage effect is [exp(β) - 1]x100, where β is the log point estimate. However, we will adopt the convention of referring to these as percentage effects in all the discussion that follows.

[8] These additional controls are added independently and not cumulatively.

the two-year public sector pay freeze introduced in 2011 following the Budget and later public sector pay policies limiting wage increases to 1% for many public sector employees. Consistent with this, the negative differential for men in favour of the private sector (-3.9%) increases in magnitude over the latter period (-4.8%), while the public sector premium for women declines from 5.6% to 2.4%.

Moving on from the estimates presented in row 9, there are two particular aspects of the empirical framework which might impact upon pay premiums. The first relates to the collection of proxy data in the LFS, whereby information is not provided by individuals themselves but by someone else in their household and around one third of responses are collected by proxy. Relative to the estimates in row 9, controlling for this feature in the data has a statistically insignificant effect upon the sectoral pay differentials (see row 10).[9] Second, it has also been suggested that when undertaking public/private sector comparisons, only those occupations that exist in both sectors should be used to avoid bias (Moulton, 1990). Row 11 provides estimates of the wage differential where occupations at the 4-digit level are matched such that only occupations that exist in both the public and private sectors are included in the sample. This adjustment has a negligible upon the estimated effects which are consistently insignificantly different from those of row 9. Row 12 presents estimates which include both occupational matching and proxy control, and as before there is no significant difference between these estimates and those in row 9. Although there are no statistically significant differences in these last two adjustments, it is with this specification shown in row 12 that all further analysis will be undertaken.

The Effect on Plant Size on Earnings – Existing Evidence

The seminal paper examining the firm/plant size wage premium is that by Brown and Medoff (1989).[10] They state that "the size-wage differential is one of the key differentials observed in labour markets. It is particularly interesting because, unlike the union wage differential it exists in the absence of an obvious agent, one whose goal is its existence". They find both company size and establishment size have independent effects on pay, such that a doubling of plant size leads to a

---

[9] We investigated the issue of proxy responses extensively, but regardless of whether we excluded proxy responses entirely or controlled for them the nature and magnitude of the results presented are unaffected. More specifically, for the results presented in Table 1 a dummy variable to denote a proxy response (which captures any bias in reported earnings) was included and also interacted with the public sector variable (to capture under/over-reporting of earnings specifically within the public sector). In all instances, neither control was significant for women. For men, only the direct control for a proxy response was significant and it indicated that proxy respondents under-report earnings to the order of 1.8-2.0%. There is no evidence of a systematic difference between sectors.

[10] Earlier, Dickens and Katz (1987) noted a significant increase in wages as plant size increased when reviewing the empirical literature in the area.

wage premium of between 1.5 and 3.8%. However, as in many other papers (see Oi and Idson, 1999 and Troske, 1999 *inter alia*), while they find a significant relationship between plant size and earnings, why bigger is better is not fully explained.

Several possible avenues through which such an effect might operate exist. Neoclassical explanations include compensating differentials, which could include inferior working conditions and increased alienation of work among other factors (Beynon, 1973). Efficiency wage theories suggest large employers may substitute higher monitoring costs with a wage mark-up (Shapiro and Stiglitz, 1984). Institutional explanations include large establishments attempting to provide good working environments to avoid unionisation which have other costs (Freeman and Medoff, 1984). It has also been noted that the relationship may arise from the inability in empirical studies to fully control for quality differences between large and small plants (Evans and Leighton, 1989). Drawing upon this literature, Brown and Medoff evaluated six possible explanations for this positive empirical relationship between employer size and wages: the hiring of higher-quality workers; offering inferior working conditions; making more use of high wages to forestall unionisation; having a greater ability to pay high wages; facing smaller pools of applicants relative to vacancies; and being less able to monitor workers. They found supporting evidence for only the first of these explanations.

Alternatively, one explanation not consistent with the cost minimisation approaches already discussed is that large establishments may be able to exploit monopoly rents which employees may subsequently capture. Brown and Medoff noted that even if this is the case an explanation is required to "explain why they pay more than the market wage and why competition for these choice jobs does not lead to a work force that is over qualified but not overpaid". Even if the monopoly power argument is accepted, failure to match private sector wages offered by large private sector establishments is likely to lead to recruitment and retention problems. However, when comparing wages across public and private sector workers it is crucial that a like-for-like comparison is made. A natural fit for this would be to compare pay practices in the public sector with those in large, multi-site private sector organisations that operate in almost all parts of the country. While the availability of such data is limited, the empirical literature that has developed using nationally representative data across the entirety of the private sector suggests that estimates of the size of the public/private sector wage differential should control for establishment size or exclude employees in small establishments. In our empirical investigation, we effectively do both.

Public/Private Wage Differential and Plant Size

To examine the role of establishment size on the public/private sector wage differential in more detail, Table 2 provides estimates of the differential for different size establishments. These classifications are less than 25 employees; between 25 and 249 employees; between 250 and 499 employees; and establishments with more than 500 employees. For comparability with the estimates already discussed from Table 1 wage premiums are presented separately for men and women and for two time periods. A common pattern revealed in the data is that the public sector wage premium decreases with established size. For example, over the period 2011q2 to 2015q4 the wage premium for men working in public sector establishments with less than 25 employees is 5.4% and for women 8.5%. Significantly lower premiums are evident in establishments with 25 or more employees and for men these premiums consistently favour private sector workers. Indeed, in the largest establishments (with 500 or more employees) the wage premium favours both men (-13.3%) and women (-9.7%) in the private sector.

[insert Table 2 here]

There are, however, marked market differences in the distribution of public and private sector employees across establishment sizes for both men and women (see Table 3). In the private sector in the UK at the aggregate level (see panel (a)), there is a clustering in establishments with 249 or fewer employees and as such just less than three quarters of men and over three quarters of women are found in such establishments. In contrast, 49.8% of men and 39.0% of women in the public sector are in establishments employing 250 or more employees. Moreover, it is in the very largest establishments employing over 500 workers that the difference in concentration between public and private sectors is most marked. Such sized establishments employ 37.6% of the male public sector workforce but only 15.6% of the male private sector workforce. For women, the comparable figures are 31.7% and 11.5% respectively.

[insert Table 3 here]

Analysis of differences in establishment size across regions reveals little variations outside of London and the remaining panels of Table 3 give three illustrative regions of London (b), the South East (c) and Wales (d).[11] For men, London has a substantially larger proportion of 500+ establishments in

---

[11] In addition to having been identified by the IFS as a region with a particularly high pay premium, Wales also has the highest level of public sector employment for both men and women in the sample. London and the South East have the lowest.

both the public and private sector than in the country as a whole, being 10 percentage points higher in the public sector and 7 percentage points higher in the private sector, and smaller proportions working in establishments with less than 25 employees. Across other regions these differences are much smaller, with Wales and the South East looking similar in terms of the proportions working in different establishment sizes when comparing across sectors. Clearly London, with a large number of private sector head offices and the seat of Government and a large civil service workforce, looks very different to the rest of the country in terms of the distribution of establishment sizes.

Therefore, not only does the sectoral wage premium vary markedly by establishment size but so too does the sectoral distribution of workers. The only concerted evidence of substantial wage premiums for public sector workers is when making comparisons with small private sector establishment employing less than 25 employees, but only a small proportion of public workers (11.8% for men, 16.7% for women) are found in such establishments. For larger establishments where public sector workers are more heavily represented, the wage premium is much reduced for women and significantly negative for men. From an empirical standpoint, therefore, ignoring the influence of plant size can have profound effects upon the size of the public sector wage premium.

Regional Variation in the Public Sector Wage Differential

As outlined earlier, the Treasury and IFS note significant variations in the public sector pay differential across regions even after controlling for a number of characteristics. For example, in Wales the IFS found a public sector pay differential in favour of males of 18.0% and for females 18.5%. Given the moderation in estimates apparent from Table 1 that arise from adopting our preferred specification, it is not surprising that the estimates presented in Table 4 do not approach such levels. For the same time period used by the IFS (2009q2-2011q1), there are no significantly positive differentials for men, and the only estimates which are statistically significant are for London (-14.2%) and the South East (-8.4%), both of which are negative. While Wales does report the largest positive premium at 6.6%, this estimate is not significant at any conventional level of acceptance. In the case of women over the same period the picture is dramatically different, with 10 of the twelve regions showing a significantly positive differential, the largest being in Scotland at 12.0%. Only London has a negative differential (at – 5.1%), while the differential for the South East is insignificant. Over the more recent period 2011q2-2015q4, the estimated premiums tend to move against the public sector (as previously identified in the aggregate UK context). For men, the East Midlands (-5.0%), South West (-4.7%) and the North West (-3.4%) join London (-11.3%) and the South East (-9.8%) in having negative wage differentials. For women, the South East (-4.0%) now has

a negative wage differential, while the pay premiums in East Anglia and the South West are no longer significantly positive.[12]

[insert Table 4 here]

A corollary of these regional results is that while differentials favour women in the private sector across most regions, insignificant sectoral premiums are the norm for male workers. Even though differentials have moved away from the public sector after the financial crisis and recovery in the private sector that has followed, London and the South East consistently emerge as regions where public sector workers are disadvantaged relative to their private sector counterparts. This is particularly evident for men, and suggests a policy area that needs addressing. We shall return to this in the concluding section.

Plant Size Differential by Regions

Just as there are important differences across plant size at the national level, as discussed in section 4.3, then so too do these plant size differences cut across regions. This can be seen in Table 5, which provides the same plant size analysis as discussed in Table 2 separately by region for the period 2011q2-2015q4.[13] Consistent with the aggregate results, point estimates decline as plant size increases. Particularly striking is the scale of the premium afforded to men working in small plants (<25 employees) in Wales. At 21.3%, this is by far the largest regional premium for either gender in any size of establishment. While the comparable figure for women is still substantial at 12.8%, it is significantly lower than the male premium. However, unlike the majority of other regions, it is not a case that females in Wales are not doing well, but rather that the position of male public sector workers in Wales is far better than men elsewhere. Meanwhile, significantly positive wage premiums are also observed for men in small establishments in only two other regions – Northern (12.4%) and Yorkshire & Humberside (11.3%). For women, all but three of the regional premiums in small establishments (in London, South East and South West) are statistically significant and positive.

[insert Table 5 here]

---

[12] See Blackaby *et al*. (2012) for a longer-term analysis of the public/private sector wage differential for each region going back to 1994. This paper also uses quantile regression techniques to examine the issue of regional wage dispersion between the public and private sectors.

[13] The latter period was chosen to provide more robust estimates from the larger sample. Notwithstanding the issue of some imprecise estimates, the pattern of differentials identified in Table 5 does not differ substantially from that estimated for the earlier period.

Moving to the very largest establishments (500+ employees), negative premiums are the norm for men. More specifically, within these establishments the wage differential is negative and significant in ten out of the twelve regions but not positive in any. Highlighting a recurring finding, London (−21.4 %) and the South East (−20.9%) have sizeable effects and it is these two regions that also have the largest premiums in comparable establishments for women (at −16.8% and −14.0% respectively). For plant sizes between the two extremes, the regional distribution of mark-ups is particularly muted for men, although London and the South East do again emerge as regions with significantly negative pay premiums across all establishment sizes. For women in these intermediate plant sizes, the general picture is one of a positive pay premium when significant but only outside of the south east corner of England. The Northern region and Scotland in particular consistently offer a significant premium to public sector workers. In contrast, London consistently affords an advantage to women in the private sector, with the South East and East Anglia also exhibiting significantly negative differentials in parts.

Comparing like with like is clearly important and while there may be monopoly elements present within large plants in the private sector that it would be undesirable to replicate within the wage-setting framework of the public sector, the majority of public sector workers are employed in establishments within which they do not receive any sort of wage premium at the regional level. This is more pronounced for men than it is for women. The one proviso to this is that the situation in London and the South East is clearly out of line with the experience elsewhere within the UK. Within these regions, for both men and women, there is clear evidence that public sector workers are disadvantaged relative to their private sector counterparts.

Conclusions

Given the importance attached to recent IFS estimates of the public/private sector pay differential by the Government, we have used these findings as a starting point for an examination of public sector wage structures across the UK. We find that the public/private pay differential is larger for women than for men, and is sensitive to how the dependent variable (hourly earnings) is measured. The aggregate wage differential falls and becomes significantly negative for men when additional controls such as job tenure, plant size, occupational controls and managerial responsibilities are included. For females over the period 2009q2 to 2011q1, the aggregate differential remains positive but is substantially reduced relative to a much simpler earnings specification. In the case of regions, when additional controls are included the differential is generally insignificant, but significantly

negative for London and the South East for men. Controlling for plant size appears to be particularly important.

While results suggest the need to revisit regional public sector wage setting, it should be noted that introducing and managing market-facing pay could be very expensive with regards additional administrative resources. Defining area boundaries can be difficult and these can change over time, and local pay differentials could lead to 'leapfrogging' and increased turnover costs with little efficiency gains. Indeed, many large private sector organisations operating a multi-plant operation across the country generally operate very few pay zones, tending to favour central control over pay determination as it enables employers to control costs, avoids duplication and provides simplicity. We would conclude, though, that a wholesale movement towards fully regionalised pay is unwarranted. Much of the previous discussion underpinning such a policy change was based upon a limited knowledge base which estimated the public/private sector wage differential using a parsimonious earnings equation in the deepest recession in the post war period. Indeed, prior evidence has noted the sensitivity of the differential to the trade cycle and in the UK found a small or insignificant public/private sector wage differential for males in earlier years. While Treasury evidence stated employees in some areas earn considerably more than their private sector counterparts, we find evidence that over the period 2009-2015 male public sector employees generally do not earn more than private sector employees (controlling for a number of individual and workplace characteristics). While this would bring into question the appropriateness of a blanket policy of market-facing pay at the regional level, there is incontrovertible evidence that public sector workers in London and the South East are disadvantaged. This has fundamental implications for recruitment and retention of public sector staff in these areas, and as such there would appear to be a very real need to revisit the London-weighting allowance in many areas of the public sector. This proposal would be consistent with the work of Propper and Van Reenen (2010).

Large regional public/private sector wage differentials have the potential to damage regional development in both prosperous and less prosperous regions, although the evidence is inconclusive on crowding out and with no strong support in the UK. We have found that regional public/private sector wage differentials are relatively small outside of London and the South-East. Clearly the issue of a high cost area premium for London and the South-East needs to be addressed. Such a policy could be implemented with a policy of further civil service relocations from London as outlined by Lyons (2004). Any increase in a London allowance has the potential to lead to a wage spiral and increasing house prices, nullifying any benefit from an increase in nominal wages. The long-standing

issue of planning restrictions in London may also need to be addressed if house price inflation is not to offset any nominal wage increase. The challenge, as outlined by Martin *et al*. (2016), is to support the gains from agglomeration without creating further spatial imbalances. They also note that the political structure of the UK, which is heavily biased towards London, has been compounded by governments which have located over half of its research and development establishments in the South East. New infrastructure spending is also heavily concentrated in London (22% of the total), equivalent to £5305 per head as compared to £414 in the North East. The UK also has one of the highest levels of spatial disparities of any country in West Europe and Beatty and Fothergill (2013) have shown that recent welfare reforms are likely to add to this.

A debate in Parliament (Hansard Online, 2012) on regional pay noted that regional pay could 'institutionalise lower pay in poorer areas' and would lead to a brain drain from already disadvantaged areas and go against the Government policy of attempting to rebalance the economy following the financial crisis. As noted by Morgan (1997), the less prosperous regions are already disadvantaged by relatively low levels of social capital and institutional capacity which are critical for encouraging innovation and economic renewal. However, the position of London needs to be addressed. One way in which this might be achieved is for public sector organizations to make greater use of the flexibility currently available to them like Recruitment and Retention Premiums (RRPs) in the NHS.

Finally, it may not always be appropriate for the public sector to mimic the private sector. Evidence in this paper finds a larger public/private sector wage differential for women. Does this suggest these women are overpaid and should have their wages reduced? Alternatively, it could be that more discriminatory practices exist in the private sector, whereby such organizations have not implemented the sort of policies they should that are commonly found in the public sector. Full comparability with the private sector would increase the gender pay gap, reduce pensions (and their coverage) and increase inequality, generally and across regions. Social norms and political considerations play a more equalising role in the public sector which also places constraints on the top earnings in the public sector which do not match those that exist in the private sector.

References

Beatty C. and Fothergill S. (2013) "Hitting the Poorest Places Hardest: The Local and Regional Impact of Welfare Reform", Centre for Regional Economic and Social Research, Sheffield Hallam University.

Belman D. and Heywood J. (1995) "State and Local Government Wage Differentials: An Intrastate Analysis", Journal *of Labour Research*, 16, 187-201.

Bender K. and Heywood J. (2010) "Out of Balance? Comparing Public and Private Sector Compensation over 20 Years", Centre for State and Local Government Excellence.

Beynon H. (1973) *Working for Ford*, Penguin: London.

Blackaby D., Murphy P., O'Leary N. and Staneva A. (2012) "An Investigation of the IFS Public-Private Sector pay Differential: A Robustness Check", Economics Discussion Paper 2012-09, Swansea University.

Bryson A., Forth J. and Stokes L. (2017) "The Performance Pay Premium and Wage Dispersion in Britain", *The Manchester School*, (forthcoming)

Burgess S., Gossage D. and Propper C. (2003) "Explaining Differences in Hospital Performance: Does the Answer Lie in the Labour Market?" CEPR Discussion Paper, no. 4118.

Canadian Union of Public Employees (2011) "Battle of the Wages: Who Gets Paid More, Public or Private Sector Workers?" Ottawa.

Christofides L. and Michael M. (2013) "Exploring the Public-Private Sector Wage Gap in European Countries", *IZA Journal of European Labor Studies*, 2, 1-53.

Congressional Budget Office (2012) "Comparing the Compensation of Federal and Private Sector Employees", The Congress of the United States.

Crawford R. and Disney R. (2015) "Wage Regulation and the Quality of Police Officer Recruits", IFS Working Paper, W15/19.

Cribb J. and Emmerson C. (2014) "Workplace Pensions and Remuneration in the Public and Private Sectors in the UK", IFS Briefing Note, BN151.

Danzer A. and Dolton P. (2012) "Total Reward and Pensions in the UK in the Public and Private Sector", *Labour Economics*, 19, 584-94.

Dickens W. and Katz L. (1987) "Interindustry Wage Differences and Industry Characteristics", National Bureau of Economic Research, Cambridge, MA.

Disney R. and Gosling A. (1998) "Does it Pay to Work in the Public Sector?", *Fiscal Studies*, 19 , 347-74.

Disney R. and Gosling A. (2008) "Changing Public Sector Wage Differentials in the UK", IFS Working Papers, Institute for Fiscal Studies.

Elliott R., Mavromaras K. and Meurs D. (2007) "Special Issue on Public Sector Pay Structures and Regional Competitiveness: Editors' Introduction", *The Manchester School*, 75, 373-85.

Evans D. and Leighton L. (1989) "Why do Smaller Firms Pay Less?", *Journal of Human Resources*, 25, 299-318.

Faggio G. (2015) "Relocation of Public Sector Workers: Evaluating a Place-based Policy", SERC Discussion Paper, no. 155.

Freeman R. and Medoff J. (1984) "What Do Unions Do?", Basic Books: New York.

Giordano R., Depalo D., Pereira M., Eugène B., Papapetrou E., Perez J., Reiss L. and Roter M. (2011) "The Public Sector Pay Gap in a Selection of Euro Area Countries", European Central Bank, Working Paper Series No. 1406.

Greaves E. and Sibieta L. (2014) "Estimating the Effect of Teacher Pay on Pupil Attainment using Boundary Discontinuities", IFS Working Paper, no. 14/03.

Gregory M. (1990) "Public Sector Pay" in Gregory M. and Johnson A. (eds.) "A Portrait of Pay, 1970-1982: An Analysis of the New earnings Survey", 172-205, Oxford University Press: Oxford.

Hansard Online (2012) "Regional Pay (Public Sector)", vol. 538, January.

Heap D. (2005) "Characteristics of People Employed in the Public Sector", *Labour Market Trends*, 113, pp. 489-500.

Henley A. and Thomas D (2001) "Public Service Employment and the Public-Private Wage Differential in British Regions", *Regional Studies*, 35, 229-40.

HM Treasury (2003) "Budget Statement", April.

IFS (2012) "The IFS Green Budget", Chapter 5 in "Public Sector Pensions and Pay", Emmerson C. and Wenchao J., IFS: London.

Krueger A. (1988) "Are Public Sector Workers Paid More than their Alternative Wage? Evidence from Longitudinal Data and Job Queues", Chapter 8 in Freeman R. and Ichniowski C. (eds.) "When Public Sector Workers Unionize", NBER: New York.

Laux R. and Marshall N. (1996) "Income and Earnings Data from the LFS", *Employment Gazette*, December, 461-71.

Lewin D., Keefe J. and Kochan T. (2012) "The New Great Debate and Unionism and Collective Bargaining in the US State and Local Governments", *Industrial and Labour Relations Review*, 65, 749-78.

Lewis G. and Galloway C. (2011) "A National Analysis of Public/Private Wage Differentials at the State and Local Levels by Race and Gender", Andrew Young School of Policy Studies, Working Paper, no. 10-11.

Llorens J. (2008) "Uncovering the Determinants of Competitive State Government Wages", *Review of Public Personnel Administration*, 28, 308-26.

Lyons M. (2004) "Well Placed to Deliver? Shaping the Pattern of Government Service", Independent Review of Public Sector Relocation.

Ma A., Battu H. and Elliott B. (2009) "Local Pay Differences and Vacancy Rates for School Teachers in England and Wales: Regional Differences in Teachers' Rates of Pay and Teacher Vacancy Rates", Report to the Office of Manpower Economics and the School Teachers' Pay Review Body, March 2009.

Martin R., Pike A., Tyler P. and Gardiner B. (2016) "Spatially Rebalancing the UK Economy: Towards a New Policy Model?", *Regional Studies*, 50, 342-57.

Matthews P. (2010) "The Changing Face of Public Sector Employment: 1999-2009"*, Economics of Labour Market Review*, 14, 28-35.

Morgan K. (1997) "The Learning Region: Institutions, Innovation and Regional Renewal", *Regional Studies*, 31, 491-503.

Morikawa M. (2016) "A Comparison of the Wage Structure between the Public and Private Sectors in Japan", *Journal of the Japanese and International Economies*, 39, 73-90.

Moulton B. (1990) "A Reexamination of the Federal-Private Wage Differential in the United States", *Journal of Labor Economics*, 8, 270-93.

NHS Pay Review Body (2012) "Market-Facing Pay: How Agenda for Change Pay Can be Made More Appropriate to Local Labour Markets, Cm 8501.

Oi W. and Idson T. (1999) "Firm Size and Wages", Chapter 33 in Ashenfelter O. and Card D, (eds.) Handbook of Labour Economics, Elsevier.

Propper C. and Van Reenen J. (2010) "Can Pay Regulation Kill? Panel Data Evidence on the Effect of Labor Markets on Hospital Performance", *Journal of Political Economy,* 118, 222-73.

Shapiro C. and Stiglitz J. (1984) "Equilibrium Unemployment as a Worker Discipline Device", *American Economic Review*, 73, 433-44.

Treasury (2012) "Government Evidence to Pay Review Bodies: Economics of Local Pay", HM Government.

Troske K. (1999) "Evidence on the Employer Size-Wage Premium from Worker-Establishment Matched Data", *Review of Economics and Statistics*, 8, 15-26.

Table 1
Public/Private Wage Differentials across Specifications by Gender

Specification	2009q2-2011q1		2011q2-2015q4	
	Men	Women	Men	Women
1. Controlling for age, age squared, age left full time education and interactions (**actual**)	0.081 (7.58)	0.161 (18.75)	0.057 (8.02)	0.134 (23.63)
2. Controlling for age, age squared, age left full time education and interactions (**usual**)	0.061 (6.42)	0.151 (20.75)	0.049 (7.71)	0.143 (29.52)
3. Controlling for education, age, qualification and region (**usual**)	0.024 (2.62)	0.095 (13.63)	0.018 (3.01)	0.106 (22.40)
4. Adding job tenure	0.019 (2.05)	0.088 (12.76)	0.011 (1.78)	0.096 (20.39)
5. Adding establishment size dummy controls	-0.029 (3.19)	0.060 (8.43)	-0.035 (5.72)	0.060 (12.35)
6. Adding occupational controls	0.010 (1.23)	0.084 (13.69)	0.003 (0.59)	0.059 (14.00)
7. Adding part time	0.026 (2.94)	0.097 (14.24)	0.023 (3.82)	0.106 (22.82)
8. Adding managerial responsibilities	0.032 (3.68)	0.106 (15.76)	0.026 (4.51)	0.115 (25.35)
9. All variables (**full**)	-0.039 (4.72)	0.056 (8.88)	-0.048 (8.90)	0.024 (5.57)
10. Specification 9 + proxy	-0.034 (3.65)	0.054 (7.99)	-0.047 (7.54)	0.023 (5.02)
11. Specification 9 + occupational matching	-0.051 (5.97)	0.053 (8.34)	-0.051 (9.37)	0.022 (5.08)
12. Specification 9 + proxy + occupational matching	-0.045 (4.68)	0.051 (7.48)	-0.050 (7.92)	0.021 (4.54)
Sample size – row 9	16,469	17,016	38,716	39,949

Notes: absolute t-statistics in parentheses; all figures are estimated using nationally representative person income weights.

Table 2
Public/Private Wage Differentials by Gender and Plant Size

	2009q2-2011q1		2011q2-2015q4	
	Men	Women	Men	Women
Less than 25 employees				
	0.044	0.102	0.054	0.088
	(1.54)	(6.81)	(2.79)	(8.55)
Sample size	4,439	5,087	10,738	12,511
Between 25 and 249 employees				
	-0.013	0.077	-0.027	0.019
	(0.89)	(7.68)	(2.83)	(2.82)
Sample size	5,881	6,388	14,302	15,532
Between 250 and 499 employees				
	-0.072	0.038	-0.071	0.005
	(2.71)	(1.80)	(4.22)	(0.22)
Sample size	1,684	1,420	4,209	3,398
500+ employees				
	-0.154	-0.084	-0.157	-0.078
	(9.15)	(5.66)	(14.92)	(8.05)
Sample size	3,009	3,219	7,788	7,914

Notes: absolute t-statistics in parentheses; all figures are estimated using nationally representative person income weights.

Table 3
Plant Size Distribution by Sector of Employment and Gender: 2009Q2-2015Q4

	Men		Women	
	Public	Private	Public	Private
(a) UK				
<25 employees	11.8	34.2	16.7	42.8
25-249 employees	38.4	39.0	43.4	36.4
250-499 employees	12.2	11.2	8.3	9.3
500+ employees	37.6	15.6	31.7	11.5
(b) London				
<25 employees	6.8	28.1	9.4	33.4
25-249 employees	33.1	35.6	43.2	35.3
250-499 employees	12.4	12.0	9.0	10.5
500+ employees	47.7	24.4	38.5	20.8
(c) South East				
<25 employees	10.4	36.4	16.0	43.2
25-249 employees	41.8	38.4	48.3	36.8
250-499 employees	12.8	10.8	8.7	9.2
500+ employees	34.9	14.5	27.0	10.8
(d) Wales				
<25 employees	14.4	35.4	20.7	46.1
25-249 employees	39.2	39.2	39.2	34.4
250-499 employees	11.1	11.1	6.6	10.6
500+ employees	35.2	14.3	33.6	9.0

Note: figures based upon occupation matching between sectors.

Table 4
Public/Private Sector Wage Differential by Region and Gender

| | Males | | | | Females | | | |
| | 2009Q2-2011Q1 | | 2011Q2-2015Q4 | | 2009Q2-2011Q1 | | 2011Q2-2015Q4 | |
Region	Coef	Sample size	Coef	Sample size	Coef	Sample size	Coef	Sample size
Northern	-0.036 (0.89)	773	0.002 (0.07)	1,910	0.102 (3.58)	874	0.093 (5.43)	2,178
Yorkshire & Humberside	-0.009 (0.29)	1,363	0.004 (0.22)	3,327	0.079 (3.76)	1,521	0.077 (5.38)	3,777
East Midlands	-0.012 (0.35)	1,152	-0.050 (2.17)	2,786	0.099 (4.18)	1,251	0.046 (2.69)	2,920
East Anglia	-0.033 (0.70)	701	-0.019 (0.63)	1,722	0.086 (2.58)	740	0.036 (1.56)	1,828
London	-0.142 (4.67)	1,814	-0.113 (5.84)	4,707	-0.051 (2.01)	1,619	-0.090 (5.72)	4,286
South East	-0.084 (3.36)	2,793	-0.098 (6.29)	6,895	0.002 (0.14)	3,032	-0.040 (3.46)	7,309
South West	-0.043 (1.39)	1,371	-0.047 (2.22)	3,281	0.067 (2.86)	1,493	0.021 (1.38)	3,537
West Midlands	0.034 (1.10)	1,279	-0.023 (0.96)	2,959	0.070 (3.07)	1,360	0.065 (4.12)	3,054
North West	-0.046 (1.62)	1,579	-0.034 (1.72)	3,746	0.077 (4.07)	1,708	0.032 (2.29)	4,072
Wales	0.066 (1.55)	589	0.030 (1.18)	1,661	0.080 (2.78)	702	0.088 (4.52)	1,872
Scotland	-0.020 (0.66)	1,347	-0.031 (1.62)	3,204	0.120 (5.78)	1,493	0.096 (6.87)	3,544
Northern Ireland	0.033 (0.48)	252	-0.060 (1.55)	839	0.085 (2.21)	321	0.122 (4.44)	978

Notes: absolute t-statistics in parentheses; all figures are estimated using nationally representative person income weights.

Table 5
Public/Private Sector Wage Differential by Region and Plant Size: 2011Q2-2015

	Men				W	
	<25 employees	25-249 employees	250-499 employees	500+ employees	<25 employees	25-249 employee
Northern	0.124	0.011	-0.03	-0.057	0.151	0.08
	(1.86)	(0.28)	(0.40)	(1.30)	(4.11)	(3.4
Yorkshire & Humberside	0.113	0.027	0.032	-0.120	0.109	0.05
	(1.78)	(0.87)	(0.56)	(3.44)	(3.56)	(2.6
East Midlands	0.077	-0.028	-0.080	-0.138	0.073	0.06
	(1.00)	(0.83)	(1.08)	(3.69)	(1.99)	(2.6
East Anglia	-0.029	0.004	-0.056	-0.053	0.176	0.00
	(0.27)	(0.09)	(0.82)	(1.00)	(3.14)	(0.2
London	0.082	-0.076	-0.105	-0.214	0.040	-0.06
	(0.99)	(2.55)	(2.11)	(7.64)	(0.85)	(2.6
South East	0.003	-0.081	-0.123	-0.209	0.021	-0.05
	(0.06)	(3.67)	(2.96)	(8.32)	(0.78)	(3.1
South West	0.014	-0.034	-0.131	-0.118	0.048	0.03
	(0.23)	(1.07)	(2.13)	(3.39)	(1.41)	(1.3
West Midlands	0.036	0.029	0.036	-0.136	0.070	0.06
	(0.43)	(0.88)	(0.54)	(3.38)	(2.07)	(2.9
North West	-0.013	0.007	-0.098	-0.145	0.145	0.00
	(0.20)	(0.22)	(1.99)	(4.40)	(4.65)	(0.2
Wales	0.213	0.039	-0.050	-0.092	0.128	0.06
	(3.07)	(0.99)	(0.66)	(1.85)	(3.22)	(2.1
Scotland	0.018	0.016	-0.025	-0.176	0.134	0.11
	(0.38)	(0.57)	(0.43)	(4.75)	(4.88)	(5.5
Northern Ireland	-0.031	-0.027	-0.021	-0.398	0.189	0.04
	(0.36)	(0.49)	(0.18)	(2.67)	(4.35)	(0.9

Notes: absolute t-statistics in parentheses; all estimates are calculated using nationally representative person-incom