

Dolton, Peter J.; Makepeace, Gerald; Marcenaro-Gutierrez, Oscar

**Working Paper**

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IZA Discussion Papers, No. 3373

**Provided in Cooperation with:**

IZA – Institute of Labor Economics

*Suggested Citation:* Dolton, Peter J.; Makepeace, Gerald; Marcenaro-Gutierrez, Oscar (2008) : The impact of the public sector pay review bodies in the UK, IZA Discussion Papers, No. 3373, Institute for the Study of Labor (IZA), Bonn

This Version is available at:

<https://hdl.handle.net/10419/35028>

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February 2008

# **The Impact of the Public Sector Pay Review Bodies in the UK**

**Peter Dolton**

*Royal Holloway, University of London,  
CEP, LSE and IZA*

**Gerald Makepeace**

*Cardiff University and IZA*

**Oscar Marcenaro-Gutierrez**

*University of Malaga*

Discussion Paper No. 3373  
February 2008

IZA

P.O. Box 7240  
53072 Bonn  
Germany

Phone: +49-228-3894-0

Fax: +49-228-3894-180

E-mail: [iza@iza.org](mailto:iza@iza.org)

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## **ABSTRACT**

### **The Impact of the Public Sector Pay Review Bodies in the UK<sup>\*</sup>**

This paper examines the impact of the Pay Review Bodies (PRBs) on the public sector pay of their remit groups. We compare the real weekly earnings of groups of workers in occupations covered by PRBs, in the remainder of the public sector and in the private sector using LFS data from 1993 to 2006 for 10 occupational sub-groups. We describe how the pattern of relative occupational pay varies over time and by gender and can be interpreted as compensating pay differentials. In several public sector occupations, men incur a much larger earnings penalty than women. Our difference-in-difference impact estimation method relies on comparison of the difference between any specific PRB group and other (non-PRB) public sector workers over time. For the most part we find that the PRBs have had little or no practical impact on earnings over and above that of comparable public sector workers not covered by the PRBs.

JEL Classification: J45, J48, J31, J38

Keywords: Public Sector Pay Review Bodies

Corresponding author:

Peter Dolton  
Department of Economics  
Royal Holloway College, University of London  
Egham  
Surrey, TW20 0EX  
United Kingdom  
E-mail: [Peter.Dolton@rhul.ac.uk](mailto:Peter.Dolton@rhul.ac.uk)

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<sup>\*</sup> We are grateful to Steve Palmer, Grant Whitfield and David Miner at the Office of Manpower Economics for their support and encouragement, Nigel O'Leary who helped to resolve several issues with the LFS data and to participants at the RES conference 2007 and OME/CMPO Conference 2007 conference for their helpful comments. The authors remain responsible for any errors or omissions.

# 1. Introduction

This paper examines the earnings received by different types of public sector worker in Britain in the last 14 years. In particular, we distinguish between workers who have their earnings determined by review bodies and workers in the remainder of the public sector. Using data from the Labour Force Survey (LFS) we compare the earnings of these workers in order to assess the impact of the Pay Review Bodies (PRBs) on the relative earnings of their remit groups. We consider how real weekly earnings evolved over time within specific occupations of interest and examine how the differences between comparable workers in PRB occupations, in the remainder of the public sector and in the private sector changed in each year from 1993 to 2006. We investigate whether any gains in real earnings for the PRB occupations have been translated into improvements in relative pay.

There are 6 Pay Review Bodies (for School Teachers, Nurses and other Health professions,<sup>1</sup> Doctors and Dentists, the Prison Service, the Armed Forces, and Senior Salaries). The Police Negotiating Board is supported by the same secretariat. The Boards cover 1.8 million workers. One of the main functions of these independent Review Bodies is to advise the government about appropriate pay awards. A broad question, and the motivation for this paper, is how should public sector pay be determined? Prior to 1971 there were a variety of mechanisms in place for different occupations. In recent years (and recurrently through time) a major constraint in public sector pay determination has been government expenditure allocated to separate government departments. This has variously been modelled by Zabalza (1979) as an 'expenditure constraint', Leslie (1985) as 'cash limits' and by Borjas (1980) as 'Federal budget limits'. These limits may at least partially constrain the decisions of the PRBs. We examine whether there is any difference between the earnings outcomes determined via the PRBs rather than other arrangements within the public sector. Our results suggest that there is no basic difference between pay determination via the PRBs and other public sector occupational arrangements. This finding casts doubt on whether the PRBs still have an effective role to play since their awards reflect what is happening elsewhere in the public sector.

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<sup>1</sup> This became the NHS Pay Review Body in July 2007.

Figure 1 presents an historical perspective on the role of PRBs in public sector pay settlements. It shows the trends in recommended pay awards by the different PRBs over the period 1971 to 2006. We can see from this that, in the first 22 years until 1993, public sector pay awards were rather large and sometimes apparently erratic due to changing inflationary pressures. Looking at Figure 1, we see that data period for our analysis - 1993-2006 - was one of unprecedented stability in terms of wage settlements. In each year over this period all the recommended pay awards (and all the settlements) were broadly in line with inflation and very stable. This means we could continue to argue that the PRBs have actually done their job and brought most pay settlements into line with government expenditure targets. The corollary of this argument is that they are no longer necessary. However, a converse argument is that our analysis does not allow us to observe the counterfactual - i.e. a world where PRBs do not exist. It could be argued that in such a world we may well return to erratic inflationary or unfairly low pay settlements. This paper is not able to judge this - we are merely able to quantify the impact of the PRBs relative to the pay awards in the non-PRB public sector.

### **Insert Figure 1**

The evidence we present suggests that the pattern of relative pay varied with some PRB occupations doing substantially better than comparable workers in the private sector and some worse. In several public sector occupations, men incur a much larger earnings penalty than women. Real earnings are often significantly different in occupations covered by PRBs compared with the remainder of the public sector although this depends on year and occupation. We interpret these findings on the pattern of relative occupational pay across time as evidence of the time path of compensating occupational wage differences.

Many papers have studied either specific occupations such as nurses or teachers<sup>2</sup> in isolation or the broad aggregate such as the public sector as a whole.<sup>3</sup> This paper examines a range of public sector occupations associated with the PRBs providing some insight into the effects of the PRBs. It deals with more occupations than most previous work although it does report results for more broad aggregates. It also provides an update of some previous analysis.

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<sup>2</sup> See, for example, Pudney and Shields (2000) and Dolton (1990).

<sup>3</sup> See, for example, Blackaby, Murphy and O'Leary (1999) and Disney and Gosling (1998)

The approach we adopt to identify the impact of the PRBs is to use a difference-in-difference estimation method. This method relies on comparison of the difference between any specific PRB group and other (non-PRB) public sector workers over time. Specifically we compare the change in the estimates for different occupational groups in two consecutive years using the non-PRB public sector as the control group. We then do this for every pair of years for each occupational group. We also suggest an estimation method which allows inference for each diff-in-diff point estimate. This means we can then examine the complete trend in occupational impacts of the PRBs over the whole period from 1993-2006. The crucial identification assumption here is that the unobservable factors in occupational choices will remain largely the same in two consecutive years. In large samples this is not an unreasonable assumption. Using this identification strategy we find (for the most part) that the PRBs have little or no impact over and above comparable public sector pay not covered by the PRBs.

The process of pay determination in the public sector varies in different occupations. In total around 1.8 million public sector employees (about 40% of the whole public sector<sup>4</sup>) have their pay set directly by government based on the recommendations of Pay Review Boards (see for example the School Teachers Pay Review Body (2002)) which receive evidence from different parties but do not engage in pay negotiations between them. Most commonly public sector employees in the UK are represented by national unions. In the non-PRB public sector in recent years there has been a tendency to move away from centralized wage setting towards individual government departments being responsible for wage setting. There have also been attempts to introduce individualised pay settlements based on changing contracts, performance-related elements or the movement towards more flexible working arrangements. For example, hospital consultants and GPs have both had new contracts in the last 5 years. Also a form of performance related pay was introduced for teachers in 2000 and there are now negotiations taking place about the use of more classroom assistants to cover elements of work done by teachers. (see Dolton et al 2003)

Much of the literature on public/private sectors differences has focussed on the difference in pay in the two sectors.<sup>5</sup> A good proportion of this literature has been devoted to trying

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<sup>4</sup> In our sample 47% of male and 44% of female public sector employees come under the remit of the PRBs.

<sup>5</sup> See Ehrenberg and Schwarz (1986), Gregory and Borland (1999) for summaries.

to account for the different composition of public and private sectors. This involves the use of various decomposition techniques to attempt to account for the difference in the mix of occupations, observable characteristics and other sources of differences in the two sectors. More recent papers have attempted to model the choice of entering one of these two sectors at the same time as modelling the determination of earnings in these two sectors (see Bargain 2007). It is suggested that there is some form of self selection in terms of the kind of person who chooses to enter one sector rather than another. Even after using these techniques there is a wide range on the public/private wage differential after conditioning for all the differences in the two sectors. Gregory and Borland (1999) present a summary of the estimates for the UK which vary from .09 to .38 for women and .05 to -.33 for men depending the year of the data and on whether we consider manual or non-manual workers.

In the UK over the last 30 years, there has been a slow decline in the earnings of individuals working in the public sector relative to private sector earnings. Correcting for basic characteristics like age, education region etc, in 1976 female earnings in the public sector were 42% higher than those in the private sector. In the same year male earnings were 13% higher in the public sector on average than in the private sector. (see Dolton and McIntosh 2003). By 2006 we find that female public sector earnings are only 6% higher than those in the private sector. In the same year male public sector earnings were lower than their private sector counterparts.

What explains these basic trends in public and private sector labour markets? The decline in relative public sector pay is partly due to the public expenditure constraints of successive governments over the 1979-2006 period and partly the increasing private demand for professional, technological and highly skilled labour which has forced up relative wages in that sector. This declining relative wage has caused real recruitment problems for occupations like teachers and nurses.

Recruitment has become increasingly difficult in public sector jobs in the South-East, and in London in particular. Real wages rose in the public sector by roughly the same amount in the South-East of England as they are in other regions over the period 1994-2001, while private sector wages were increasing at a much faster rate in this region compared to the rest of the country. The demand for professional private sector workers is strongest in these locations. If private sector wages are higher this also impacts directly on the local cost of living and hence the difficulty of recruiting and retaining public sector workers in



London and the South-East. This puts pressure on the public sector to improve career prospects and pay London allowances and other additional payments like housing subsidies.

## 2. Data: Sources and Preparation

This paper summarises data on large samples of individuals extracted from the Labour Force Survey (LFS). The LFS gives us information on large numbers of individuals in each year from 1993-2006 inclusive. LFS currently collects information in each quarter from a random sample of 60,000 households. It collects information on individuals using as its sampling frame households living at private addresses in Great Britain. Each individual remains in the sample for 5 quarters so each quarter's sample is made up of five waves of individuals, and each wave is interviewed in five consecutive quarters. Since 1997, individual's earnings are potentially recorded in only 2 of 5 quarters, the first and the last<sup>6</sup>. In all years, we obtain our annual data by aggregating the data for each quarter.

### Definition of variables

#### *Occupation*

The public sector is broadly defined as all individuals working for central and local government and related institutions. It includes civil servants, local government officers, teachers, doctors, nurses, university staff and police. We define membership of the public sector in terms of occupational groups. Certain occupations are defined as within the public sector and the remainder as not. The precision of the definition depends on the occupation. Local government officers and nurses, for example, are allocated to the public sector. All local government officers will be working in the public sector but some nurses will be working in the private sector. This occupational definition focuses on the earnings differences between occupations rather than between individuals potentially covered by the PRBs. This may not present a problem in the current context since the public sector

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<sup>6</sup> This data also facilitates a panel analysis of the effect of being in an occupation covered by a PRB. We use this panel data on the repeat wage data for each individual to examine the effect of changing between sectors: public sector Non-PRB, public sector PRB and the private sector. Identification in this model comes from those who change sector but our estimation of this model showed no significant effects of such changes. But in this case the fixed effects identification relied on too few observations. The identification using diff-in-diff which we focus on in this paper provides clearer conclusions based on the whole sample.

dominates these markets and effectively acts as a price setter for those markets. If this is the case, the PRB will be the main actor determining earnings in a particular occupation. Our definition is related to those used by others such as Nickell and Quintini (2002).

We identify the following occupational groups (1) Primary School Teachers (2) Secondary School Teachers (3) Nurses and Midwives (4) Practices Allied to Medicine (Radiographers, therapists etc) (5) Medical practitioners and Dentists (6) Prison Officers (7) Armed Forces and (8) Police covered by the Review Boards and the related Police Negotiating Board. We refer to these as the PRB groups. We cannot separately identify the occupations relevant for the Senior Salaries Review Body. Where a PRB contains relatively large and distinct groups, we have considered subsets of the workers covered by a PRB in order to investigate the potentially different impact of the pay awards on those groups. The Prison Service Review Board made its first recommendations in 2002. We have treated it as a distinct group in all our work although clearly its PRB would only play a role after 2001. All remaining Boards were established before the period covered by our data.<sup>7</sup> The remaining public sector workers comprise a group called non-PRB public sector.

The occupational classification changed in 2000 so we were forced to use SOC90 codes from 1993 to 2000 and SOC 2000 codes from 2001 to 2006 producing a discontinuity in 2000/2001. The main implications for our analysis are that Paramedics are PAMs after 2000 but non-PRB before and that Prison Officers (principal officers and above) are 'Prison Officers' before 2001 and non-PRB thereafter. Appendix A gives the list of occupations that comprise those two groups in the public sector using this typology.

### *Earnings and Other variables*

The dependent variable in our regressions is the log of the gross weekly pay in the individual's main job including any overtime pay.<sup>8</sup> All earnings variables have been adjusted using the Retail Price Index and are expressed in 2003 constant prices.

Our analysis includes controls for the separate effects on earnings of gender, qualifications, age, and region and working in a manual occupation. Since there is

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<sup>7</sup> The first recommendations of the School Teachers and Nurses and Other Health Professions Boards were made respectively in 1992 and 1984.

<sup>8</sup> Pay determination is mainly driven by for full time employees working 'standard' hours in PRB occupations so weekly earnings are a natural variable of interest.

considerable variability in the number of hours worked even amongst full time workers, we control for the number of working hours. The full regression results are available from the authors on request.

Our qualification dummies measure the highest academic or vocational qualification obtained. They identify the groups: "Degree or equivalent", "Higher Education", "GCE A Level or equivalent", "GCSE A\*-C or equiv", "Other quals" with the control group "No quals".. Hours of work is defined as the total usual hours worked each week in the individual's main job (including basic hours and unpaid and paid overtime). Age is represented by the age groups 20-29, 30-34, 35-39, 40-44, 45-49, 50-54 and 55-60. This set of groups is fine enough to allow age to have a non-linear effect on earnings but broad enough to have a large number of observations in each group. The analysis uses the standard regions. The data for 1997-2006 uses place of work to define region and 1993-1996 place of residence producing a potential small discontinuity in 1996-97.<sup>9</sup>

#### *Sample definition*

We include only full-time employees working in Great Britain because the individuals covered by the Pay Review Bodies are full time workers or on scales related to the pay of full time workers. Our analysis excludes self employed persons because the main groups we are interested are employees within the public sector and because the reported income is often not as reliable for self employed individuals as it is for employed. We restricted the sample to individuals working between 30 and 70 hours<sup>10</sup>. We also removed individuals in the bottom and top 1% of the distributions of real weekly earnings for the sub-periods 1993-1996, 1997-2000 and 2001-2006.

The size of the sample has varied over time and we only retain respondents satisfying the criteria above and with all the information needed for our analysis. Nonetheless, our estimating samples contain over 11,000 individuals in 1993, over 23,000 for 1994-96, over 46,000 for 1997-98, over 44,000 for 1999, over 41,000 for 2000-02 and nearly 39,000 in 2003 falling to over 34,000 in 2006.

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<sup>9</sup> We chose this date rather than 1995 because of the fundamental change in the collection of earnings data that took place in 1997.

<sup>10</sup> These were approximately the 1<sup>st</sup> and 99<sup>th</sup> percentiles for reported hours for public sector workers in 2001-2006.

## Overview of the data

### Public sector and private sector earnings differences (Unadjusted)

Panels a and b of Figure 2 display the observed mean values for real weekly earnings by gender for individuals working in the private and public sectors by gender in each year from 1993 to 2006 (in 2003 prices).<sup>11</sup> The growth in nominal earnings outpaced that of prices in both sectors so real earnings grew for both men and women over the period. Private sector earnings for men grew continuously after 1994 until 2005 moving from about £368 (2003 prices) in 1993-94 to about £422 in 2005-06, an increase of 15%. There was no sustained growth in public sector pay until after 1998 when it grew continuously until 2005 before falling back in 2006. Overall public sector earnings for men changed from £478 in 1993-94 and again in 1998 to about £524 in 2005-06, a growth of 10%. The pattern of pay for women was similar in both sectors. There was continuous growth after 1995 (although there were declines in the public sector in 1995 and 2005). Overall private sector pay for women grew by 23% from £260 in 1993 to £321 in 2006 while public sector pay for women grew by 20% from £370 in 1993 to £443 in 2006.

*See Figure 2.*

Public sector workers enjoyed a substantial earnings advantage over private sector workers for the whole of the period. The smallest premiums over the period were 23% for men in 2003 and 37% for women in 2001. Such broad comparisons do not necessarily compare like with like because the composition of the workforce may differ between sectors and over time. We therefore adjust the mean earnings using regression functions to control for the separate effects on earnings of different characteristics such as qualifications, age, and region. Panel c of Figure 2 presents estimates of the earnings differentials by gender corrected for different attributes.<sup>12</sup> The estimates predict the percentage increase in earnings if an individual moves from the private to the public sector.<sup>13</sup>

The pay of women remains higher in the public sector although the corrected differentials are much smaller than the raw ones, ranging from 3% in 2002 to 9% in 1994. The

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<sup>11</sup> The geometric means are used for consistency with the later analysis of the log of earnings.

<sup>12</sup> The estimates are obtained from a regression by gender of log weekly earnings on a dummy for 'working in the public sector' (in either a PRB or a non PRB occupation) and the controls described earlier. Let  $d$  be the estimated coefficient of the public sector dummy. The figure displays  $f=100(\exp(d)-1)$ .

<sup>13</sup> The largest p-value for the estimates for women is 0.003. The p-values for men are greater than 0.234 for 1997, 1999 and 2006.

corrected differential is higher for women than for men; the difference was, for example, about 7-8 percentage points during 2001-2006. The change in the differential over time is quite striking for men. It declined from 5% in 1993 to -4% in 2002 (albeit with a small rise from 1998 to 1999) before growing to -1% in 2006. Men working in the public sector enjoyed a noticeable pay advantage over comparable men in the private sector at the start of period but this had vanished by 1997-98 and thereafter there has been a pay penalty for working in the public sector.

### 3. The Econometric Model

The data are a sequence of 14 cross-sections, one for each year from 1993 to 2006. We index individuals by  $i$  and time by  $t$  ( $t=0, 1, \dots, 13$ ). There are thousands of individuals ( $i=1, \dots, N_t$ ) for each value of  $t$  but only one value of  $t$  for each individual. Let  $PRIV$ ,  $NON$ , and  $PRB_o$  ( $o=1, \dots, O$ ) be, respectively, mutually exclusive dummies for working in the private sector, the non-PRB public sector and the ' $o^{\text{th}}$ ' PRB occupation. The regression model for year  $t$  is:

$$Y_{it} = \mathbf{a}_t + \mathbf{b}_t PRV_{it} + \sum_o \mathbf{d}_{ot} PRB_{oit} + \sum_k \mathbf{g}_k X_{kit} + \mathbf{e}_{it} \quad i=1, \dots, N_t \quad 1.$$

where  $X_{kit}$  ( $k=1, \dots, K$ ) are the control variables (such as age, qualification, location).

$\mathbf{d}_{ot}$  shows the differences in pay between the  $o^{\text{th}}$  PRB occupation and the non-PRB public sector. If  $X$  were omitted and the error terms satisfied the standard OLS assumptions, then the OLS estimators of  $\mathbf{d}_{ot}$  would be the differences estimator used in experimental and quasi-experimental analyses. If conditional independence assumption holds for  $X$ , then the estimators would be differences estimators with additional regressors similar to matching estimators.

Conditional mean independence is debatable. It is known that educational standards are much higher in the public sector and that there are regional variations in earnings differentials between private and public sector workers. Regressors such as qualifications or location may be the outcome of sector choice. On the other hand, some of these choices at least are typically made early in one's career and are effectively predetermined for the people in our sample. It is also widely recognised that public sector workers enjoy various non-pecuniary benefits such as greater job security and more generous pension provision. The effects of these unobservables are unlikely to be conditioned away by our independent

variables. The regressors therefore have their standard interpretation as controls for the potentially diverse nature of individuals in each occupation and we explore ways of modelling the error terms.

If the underlying data generation mechanism for the error terms is stable over time, OLS estimation may yield information about the changes in differentials even when the errors are correlated with the key variables. Essentially we argue that the OLS estimates are inconsistent estimators of the parameters but that the asymptotic bias is constant from year to year. If we include fixed effects, our previous model becomes:

$$Y_{it} = \mathbf{a}_t + \mathbf{b}_t \text{PUB}_{it} + \sum_o \mathbf{d}_{ot} \text{PRB}_{oit} + \sum_k \mathbf{g}_{kt} X_{kit} + A_i + \mathbf{e}_{it} \quad i=1, \dots, N_t \quad 2.$$

$A_i$  is an unobserved, individual fixed effect (such as unobserved ability and attitudes to job attributes) that may have different relevance for different occupations.

Define the linear projections of  $A_i$  as:

$$A_i = \mathbf{I}_{NON} + \mathbf{I}_{PRIV} \text{PRIV}_{it} + \sum_o \mathbf{I}_o \text{PRB}_{oit} + \sum_k \mathbf{m}_k X_{kit} + \mathbf{h}_{it} \quad i=1, \dots, N_t$$

Then the *de facto* estimating equation for each year is found by substitution.

$$Y_{it} = (\mathbf{a}_t + \mathbf{I}_{NON}) + (\mathbf{b}_t + \mathbf{I}_{PRIV}) \text{PRIV}_{it} + \sum_o (\mathbf{d}_{ot} + \mathbf{I}_o) \text{PRB}_{oit} + \sum_k (\mathbf{g}_{kt} + \mathbf{m}_k) X_{kit} + \mathbf{u}_{it} \quad i=1, \dots, N_t \quad 3.$$

The OLS estimates of the PRB dummies ( $\mathbf{d}_{ot}$ ) are consistent estimates of  $(\mathbf{d}_{ot} + \mathbf{I}_o)$ . However we can retrieve consistent estimates of the impact of public sector pay bargaining by differencing. Consider the probability limit of the estimates for two time periods  $p$  and  $q$  as the sample size becomes arbitrarily large:

$$\text{Plim}(\mathbf{d}_{oq} - \mathbf{d}_{op}) = (\mathbf{d}_{oq} - \mathbf{d}_{op}) \quad 4.$$

The changes in the estimators from period  $p$  to period  $q$  consistently estimate the underlying changes in the impacts of occupations on earnings. If  $(\mathbf{d}_{op} - \mathbf{d}_{oq}) = 0$ , we would conclude that pay in the PRB occupation has not changed relative to nonPRB public sector pay. Since  $\mathbf{d}_{op}$  measures PRB pay relative to non-PRB pay at time  $p$  and  $\mathbf{d}_{oq}$  measures PRB pay relative to non-PRB pay at time  $q$ , we will interpret  $(\mathbf{d}_{oq} - \mathbf{d}_{op})$  as a difference-in-difference estimator. The success of this identification strategy depends on stability in the error structure. Although many panel studies assume stability over long periods of time, we examine only consecutive years (i.e.  $t$  and  $t+1$ ) and argue that the nature of public sector occupations means that it takes time for the stock of workers to change their characteristics. More specifically we assume that the occupational choices (or the non-

random selection device conditioning occupational entry), in large samples, for any given occupation remain the same in consecutive years. Hence, where our identification strategy is potentially limited is if we wished to make inferences about the relative position several years apart.

A similar argument could be made in the context of a treatment model. Assuming an unobservable,  $U_{it}$ , that is potentially correlated with the regressors of interest. The treatment model resolves the inconsistency of the OLS estimates by including a selection term representing the implied omitted variables. The treatment model is:

$$Y_{it} = \mathbf{a}_t + \mathbf{b}_t \text{PRIV}_{it} + \sum_o \mathbf{d}_{oit} \text{PRB}_{oit} + \sum_k \mathbf{g}_{kit} X_{kit} + \mathbf{I}_{it} + \mathbf{e}_{it} \quad i=1, \dots, N_t \quad 5.$$

where  $\mathbf{I}_{it} = E(U_{it} | \text{NON}_{it}=1) \text{NON}_{it} + E(U_{it} | \text{PRIV}_{it}=1) \text{PRIV}_{it} + \sum_o E(U_{it} | \text{PRB}_{oit}=1) \text{PRB}_{oit}$ .

Define the linear projection of  $\mathbf{I}_{it}$  as:

$$\mathbf{I}_{it} = \mathbf{I}_{\text{NON}} + \mathbf{I}_{\text{PRIV}} \text{PRIV}_{it} + \sum_o \mathbf{I}_o \text{PRB}_{oit} + \sum_k \mathbf{m}_k X_{kit} + \mathbf{h}_{it}$$

The previous argument then follows.

In order to test our difference-in-difference impact estimates we seek a way of making direct inferences on the significance of the impact parameters. We now outline a simple way of getting standard errors for these estimates. First, pool the data for two consecutive years,  $p$  and  $p+1$ , and create a time dummy for the second year:  $\mathbf{t}=1$  if  $t=p+1$  and  $\mathbf{t}=0$  if  $t=p$ . Then estimate:

$$Y_{it} = \mathbf{a} + \mathbf{t} + \mathbf{b} \text{PRIV}_{it} + \sum_o \mathbf{d}_o \text{PRB}_{oit} + \sum_k \mathbf{g}_k X_{kit} + \mathbf{b}^* (\mathbf{t} \times \text{PRIV}_{it}) + \sum_o \mathbf{d}_o^* (\mathbf{t} \times \text{PRB}_{oit}) + \sum_k \mathbf{g}_k^* (\mathbf{t} \times X_{kit}) + \mathbf{e}_{it} \quad t=p, p+1; p=1993-1995, 1997-1999, 2001-2005 \quad 6.$$

The differences in predicted log earnings for someone in the  $o$ 'th PRB occupation and the non-PRB public sector are  $d_o$  for period  $p$  and  $d_o + d_o^*$  for period  $p+1$ . Hence  $d_o^*$  measures the change in the pay of the PRB occupation relative to the non-PRB public sector [ $(d_{oq} - d_{op})$  above] and its standard error can be used to test whether this change is zero.

## 4. Results

Tables 1a and 2a show the estimated effects of working in different public sector occupations when the sample is split by gender.<sup>14</sup> The Tables report the estimated coefficients for the corresponding occupational dummy. The asterisks show the statistical significance of the estimates.<sup>15</sup> One asterisk means that the corresponding estimate is significant at the 10% level; two significant at 5%; and three significant at 1% on a 2-tailed test.<sup>16</sup> The null hypothesis is that working in the relevant occupation has the same effect on earnings as working in the non-PRB public sector. The final number shows the number of observations in that occupational group. There are discontinuities in the data in 1996-97 and, particularly, in 2000-01 when SOC 2000 was introduced. The Prison Service Review Board only began in 2001 although we have treated them as a separate group throughout to avoid another discontinuity. Tables 1b and 2b show the estimates of the changes in the coefficients ( $\mathbf{b}^*$  and  $\mathbf{d}_o^*$  above). The asterisks on the rows labelled non-PRB public sector show the statistical significance of the estimates. The null hypothesis is that there is no change in the coefficient from one year to the next. The final row for each occupation shows the t-statistics.

As an example consider the private sector in Table 1a. The figure of 0.074 for 2000 shows that the predicted log of earnings of a man assuming that he works in the private sector is 0.074 log units larger than the predicted log earnings of the same man assuming that he works in the non PRB Public sector. If the estimate is small, this translates approximately into the percentage gain in earnings (7.4%) from moving from the non-PRB public sector into the private sector.<sup>17</sup> The 3 asterisks indicate the null hypothesis that there is no significant difference in the coefficients for the two sectors is robustly rejected. The sample contains 22,801 private sector male workers. Table 1b gives an estimate of 0.010 for the private sector using 1999/2000. This figure equals the difference in the estimates

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<sup>14</sup> A longer discussion of these and similar results for 1993-2003 is available in an earlier research report. (See OME webpage: <http://www.ome.uk.com/research.cfm>)

<sup>15</sup> The hypothesis testing uses robust standard errors.

<sup>16</sup> We also estimated the results of a test of whether the estimates for the PRB occupations are significantly different from those in the Private Sector. We do not report those estimates here but changing the reference group makes no difference to the results or the inference involved.

<sup>17</sup> The exact change is  $100(\exp(0.074)-1)\%=7.7\%$



in Table 1a for 2000 (0.074) and 1999 (0.064). The differential with the non-PRB public sector therefore rose by 0.010. There are no asterisks so this difference is not statistically significant which is confirmed by the t-statistic of 0.77.

The number of observations varies across occupational groups. The sample size roughly doubled in 1997 so that the earlier data is less reliable. After 1997, there remain less than 100 observations for male PAMs, male prison officers, female Medical Practitioners and female Police Officers. The small numbers of women working in the Prison Service and the Armed Forces mean extreme caution should be exercised in interpreting these cases. The Table reports estimates of 9 coefficients for each of 14 years. Even in an ideal world there would be some odd results given the large number of implied tests.

The one feature of the results is their variability across occupations and gender. Only two generalisations are possible; Doctors and Dentists and Police, whether male or female, are consistently paid more than comparable individuals in the non-PRB public sector. Men working in the Armed Forces are also more highly paid. Taking into account the small number involved, this is almost certainly true for women as well. Male nurses are consistently paid less than similar workers the non-PRB public sector in contrast to women who have been more since 1998. This pattern is repeated for PAMs and teachers although the exact details vary. Male PAMs are paid less or about the same as the control group; once again in contrast to women who have been more since 1998. Male teachers are paid significantly less than the non-PRB public sector until 2000 (secondary) or 2001 (primary) and then are about the same for the remainder of the period. Female secondary school teachers have been paid consistently more than the control group and female primary school teachers typically more (although 2000-01 and 2005-06 are exceptions).

Figures 3a and 3b graph these estimates for men and for women respectively. The vertical distance from each line and the horizontal axis measures the occupational pay difference for each occupation relative to the Non PRB public sector. We have also emphasised the estimates for the Private sector in bold on each graph. The vertical distance between each point on a PRB line and the private sector line measures the corresponding occupational differential relative to the Private Sector. Since the estimates have been conditioned for all the control variables, we can interpret these vertical distances as the measures of the compensated wage differences between each occupation and either the Non PRB public sector or the private sector.

Figure 3a confirms that male Medical Practitioners, Police and Armed Forces earn more than their Private Sector and Non-PRB public sector counterparts over the whole period. Although the trends are not pronounced, private sector pay for men rose very slowly relative to non-PRB pay from 1993 to 2002 as did Medical Practitioner pay. Police pay fell relatively. Most of the other groups (Teachers etc) have remained roughly stable compared with the non-PRB public sector. Figure 3b shows relative pay for women has remained fairly constant in most occupations. A notable exception is Medical Practitioners. The erratic pattern in the years to 1996 may be due to the small number of observations, but even so relative pay appears much higher at the end of the period than the beginning.

Tables 1b and 2b and Figures 4a and 4b display our difference in difference estimates. Tables 1b and 2b report the change in the estimated differential in log earnings for each PRB. The first rows suggest that pay in the non-PRB public sector has been tracking that of the private sector for both men and for women. Examination of Table 1b and 2b reveals that there are very few years where there was a significant impact of the PRBs. Looking at the 5% level for men the exceptions are 1998/9 for Medical Practitioners, 1993/4 for the Armed Forces and 2001/2 for Teachers.<sup>18</sup> For women the exceptions are 2003/4 for the Police, 2002/3 and 2004/5 for Prison Officers and 1993/4 and 1998/9 for Medical Practitioners. Even if we disregard the fact that there are few female Prison Officers and few Doctors and Dentists in 1993, there are not many significant estimates. Tables 1b and 2b suggest strongly that the pay of occupations covered by PRBs are moving in line with the pay of occupations in the remainder of the public sector.

Figures 4a and 4b illustrate what is happening.<sup>19</sup> Most of the changes for men lie in the interval  $[-0.05, 0.05]$  and are insignificant. The significant changes appear as outliers such as Medical Practitioners and Nurses and Midwives in 1999/2000. The women's chart emphasises the erratic nature of the earnings for Doctors and Dentists but once again most changes are bunched in a relatively small interval and are insignificant.

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<sup>18</sup> Bear in mind that if the null of no effect is correct and each observation is independent, we would expect 5% of the observations to be significant. Ignoring the private sector and the Prison Service, we would anticipate 4 of the 77 estimates to be significant. If the significance level were 10%, we would not be surprised to see 8 estimates that are significant at the 10% level.

<sup>19</sup> The dates refer to the change from year before to the year indicated e.g. 1994 means the change from 1993 to 1994. The discontinuities in the data mean that there are 'missing' observations for 1996/97 and 2000/01.

## 5. Conclusions.

This paper has examined the determinants of the real weekly earnings of full-time workers aged 20-60 over a recent period of 14 years and across different occupational groups covered or not by the PRBs. Composition effects occur when individuals working in different occupations are compared. To avoid these problems, we have employed regression analyses to control for the different factors that affect earnings.

The policy implications of these estimates are not straightforward. The estimates show the difference in real weekly earnings of an individual if that individual were to work in the two occupations. This difference may merely be a compensating differential. Individuals accept lower earnings to work in the public sector because they value other attributes of public sector work such as better job security or pensions or even something more nebulous such as working for the public good. The positive differentials observed for some groups such as Medical Practitioners and the Police may compensate for greater stress and responsibility. In several of these occupations, either the employers or the employees may have significant market power.

If we assume stability in these factors over the period covered by our data, then we would expect the estimated differences to be similar over time. If the differences consistently fall in value, then we would expect there to be pressure on the recruitment and retention of good quality staff. Thus the tendency for the relative pay of non-PRB public sector workers to fall over time suggests that *ceteris paribus* it will be more difficult to maintain the labour force without lowering standards.

We observe considerable stability in the relationship between the earnings of different pay groups from one year to the next suggesting that PRBs are not exerting an independent influence on pay. However our results are evidence of correlation rather than causation. It may be that PRB pay is tracking that of the remainder of the public sector, or indeed that PRBs are acting as a leader in the setting of pay for the remainder of the public sector. In practice, it is more likely both sets of institutions are governed by a common factor, in this case the Treasury and its spending limits. In which case one policy implication of our results is that public sector pay for all occupations could all be set by the government with uniform across the board pay rises after due consideration of the trends in inflation. (This is *de facto* what happens in most European countries such as France). Our results suggest that such a policy would not have yielded significantly different pay settlements to those

were observed over the whole 1993-2006 period we have studied. The natural limitation to this conclusion is that it would require that the present pay relativities between occupations are, in some sense, the correct. If this were not the case then some mechanism would need to be put in place to rectify anomalies and other relative pay injustices. In addition such a conclusion would also ignore the other part of the PRBs remit which is to examine conditions of service - we have not considered their role in this regard. Nor have we considered the possibility that PRBs could take a more proactive role in changing the pay structure within an occupation by, for example, recommending an across the board flat lump sum pay rise (rather than a conventional percentage pay award)<sup>20</sup> – as this would act as a redistributive device for the allocation of pay – giving by definition more pay to those in junior position.

The issues raised by this paper are far from resolved. It is the case that government has done special deals with groups of workers outside of the normal pay setting mechanism. These may explain some of the results observed here. Further the paper focuses on pay setting from one year to the next rather than trends over a long period of time. The remit of Pay Review Bodies covers pay and conditions as well as other factors while this paper focuses solely on pay.

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<sup>20</sup> Such a recommendation was indeed made by the DDRB for the first time in 2007.

## References

- Bargain, O. and Melly, B. (2007) 'Are Civil Servants Paid too Much in France? QR Wage Decomposition with Endogenous Selection' University College Dublin, mimeo.
- Blackaby, D., Murphy, P. and O'Leary, N. (1999) 'The payment of public sector workers in the UK: reconciliation with North American findings', *Economics Letters*, vo..65, pp.239-23.
- Borjas, G. (1980)'Wage Policy in the Federal Bureaucracy', American Enterprise Institute for Public Policy Research, Washington DC.
- Chevalier, A., Dolton, P., Makepeace, G. and McIntosh, S. (2001) 'Relative Pay in the Public and Private Sectors,' Report to HM Treasury.
- Dean, A. (1981) Public and private sector pay and the economy', in Fallick, J. and Elliott, R. (Ed) 'Incomes Policies, Inflation and Relative Pay', Allen and Unwin.
- Disney, R. and Gosling, A. (1998) 'Does it Pay to Work in the Public Sector,' *Fiscal Studies*, 19, 347-374.
- Dolton, P. (1990) 'The economics of UK teacher supply: the graduate's decision', *Economic Journal*, 100, pp.91-104.
- Dolton, P. Chevalier, A and McIntosh, S. (2003) *Performance Related Pay for Teachers*, Bedford Way, Institute of Education, London.
- Dolton, P and McIntosh, S (2003) 'Public and Private Sector Labour Markets;, Chapter 14 in 'The Labour Market under New Labour: The State of Working Britain', Palgrave Macmillan.
- Elliott, R.F. and Murphy, P.D., (1987) 'The Relative Pay of Public and Private Sector Employees, 1970-1984,' *Cambridge Journal of Economics*, 11(2), pp. 107-32.
- Gregory, M (1990) 'Public sector pay', in Gregory, M and Thompson, A. eds 'A Portrait of Pay, 1970-1982, Clarendon Press, Oxford, pp.172-206.
- Haskel, J. and Szymanski, S. (1993) 'Privatisation, liberalisation, wages and employment: Theory and evidence for the UK', *Economica*, vol.60, pp.161-182.
- Ehrenberg, R.G. and J.L. Schwartz (1986) 'Public Sector labor markets' in Chap 22. *Handbook of Labor Economics*, Vol.2, Edited by Ashenfelter, O. and Layard, R., North Holland, Amsterdam.
- Elliott RF and Murphy,-P.-D., 1987, "The Relative Pay of Public and Private Sector Employees, 1970-1984", *Cambridge-Journal-of-Economics*; 11(2), pp. 107-32.
- Elliott RF and Duffus,-K, 1996, "What Has Been Happening to Pay in the Public-Service Sector of the British Economy? Developments over the Period 1970-1992", *British Journal of Industrial Relations*; 34(1), pp. 51-85.
- Elliott RF, Lucifora,-Claudio; Meurs,-Dominique, eds., 1999, Public sector pay determination in the European Union, New York: St. Martin's Press; London: Macmillan Press, pages xxi, 350
- Gregory, B. and Borland (1999) 'Recent Developments in Public Sector Labor Markets', in Chap 53. *Handbook of Labor Economics*, Vol.3, Edited by Ashenfelter, O. and Card.D, North Holland, Amsterdam.
- G Hundley,-1991, "Public- and Private-Sector Occupational Pay Structures", *Industrial Relations*; 30(3), pp. 417-34. (US)
- Lakdwalla D., (2001), "The declining quality of teachers", NBER 8263
- Layard, R., Marin, A., Zabalza, A. (1982) 'Trends in Civil Service Pay relative to the Private Sector', Inquiry into Civil Service Pay, vol.2, Research Studies, Cmnd 8590-1.
- Leslie, D. (1985) 'The Economics of Cash Limits as a Method of Pay Determination', *Economic Journal*, vol.95, pp.662-678.
- Makepeace G and Marcenaro-Gutierrez, O (2006) 'The Earnings of Workers Covered by Pay Review Bodies: Evidence from the Labour Force Survey' Report for the Office of Manpower Economics, available online at <http://www.ome.uk.com/research.cfm>
- D Marsden,-1995, "Public Sector Pay in Great Britain" in Silvestre JJ and Eyraud F., eds. Pay determination in the public sector: An international comparison between France, Great Britain and Italy. Labour

Law and Labour Relations Programme Occasional Paper, no 6. Geneva and Washington, D.C.: International Labour Office, 1995, pp. 73-112.

Murphy, P and Elliott, R, JJ Silvestre and Eyraud,-F., eds., 1995, Pay determination in the public sector: An international comparison between France, Great Britain and Italy. Labour Law and Labour Relations Programme Occasional Paper, no 6. Geneva and Washington, D.C.: International Labour Office ,

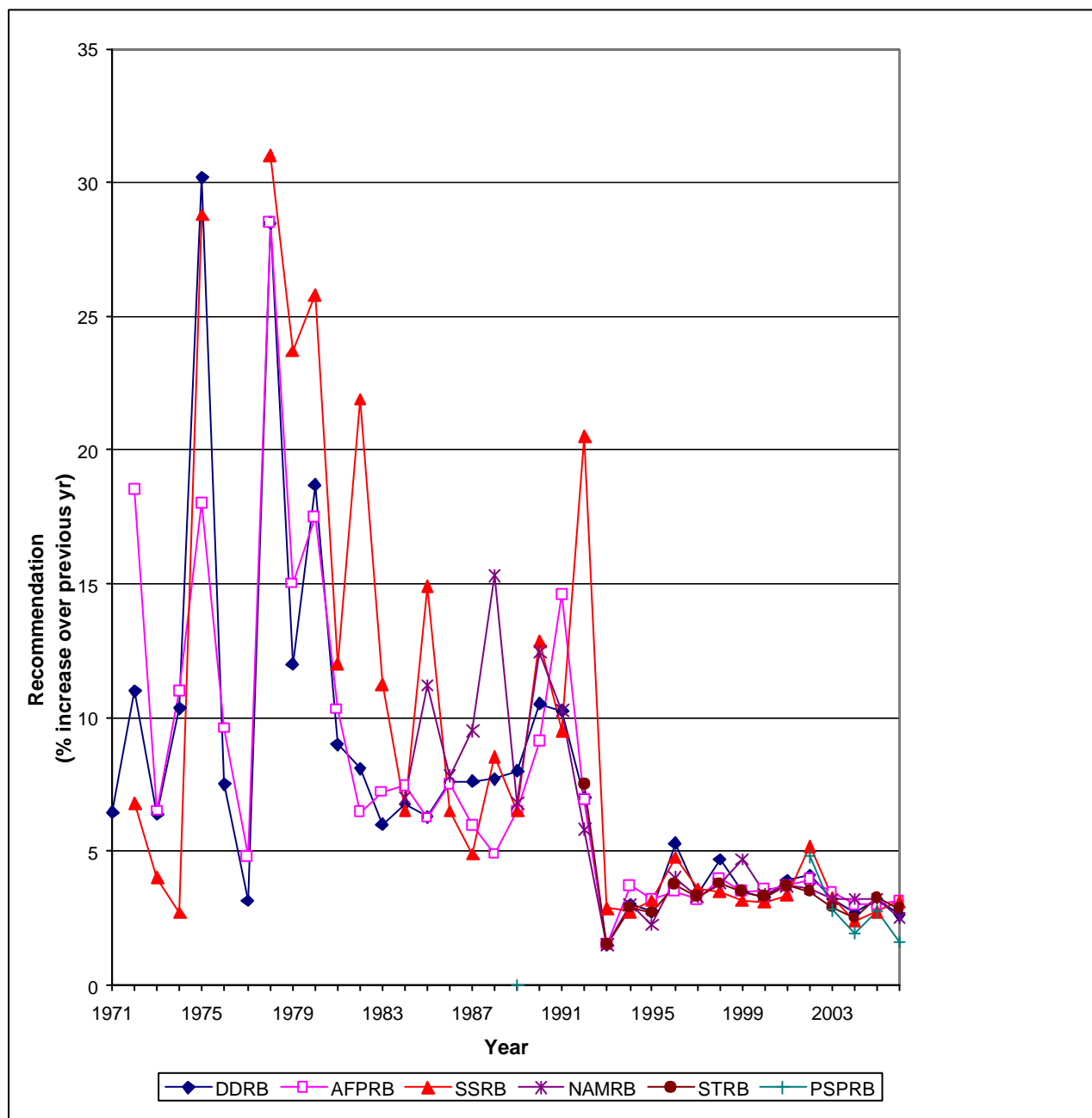
Nickell, S. and Quintini, G. (2002) 'The Consequences of the Decline in Public Sector Pay in Britain: A Little Bit of Evidence,' *Economic Journal*, pp.F107-F118.

Pudney S and MA Shields, 2000, "Gender, Race, Pay and Promotion in the British Nursing Profession: Estimation of a Generalized Ordered Probit Model", *Journal of Applied Econometrics*; 15(4), pp. 367-99

School Teachers Pay Review Body (2002) *Eleventh Report 2002*, HMSO, London.

Zabalza, A., Turnbull, P and Williams, G. (1979) 'The Economics of Teacher Supply', Cambridge University Press. Cambridge.

**Figure 1. Evolution of PRB Pay Recommendations over 1971 – 2006**



DDRDB Doctors and dentists

AFPRB Armed Forces

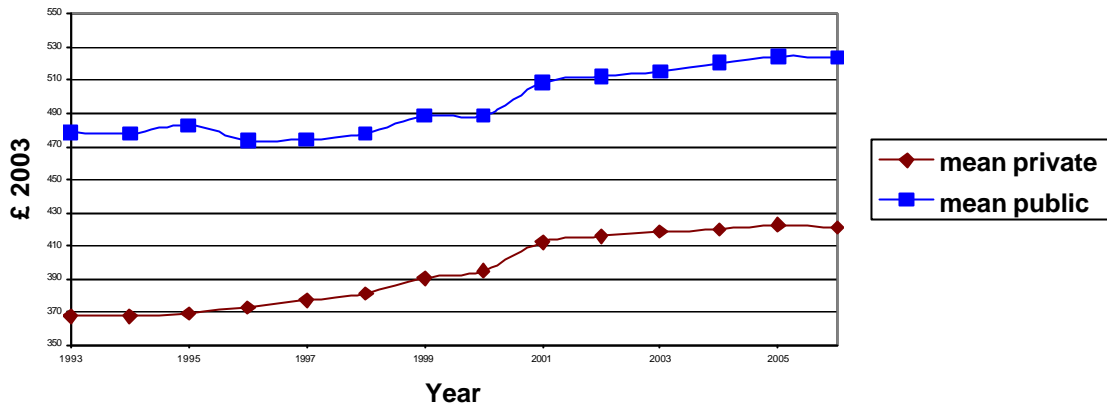
SSRB Senior Salaries

STRB Schoolteachers (first awards after 1992)

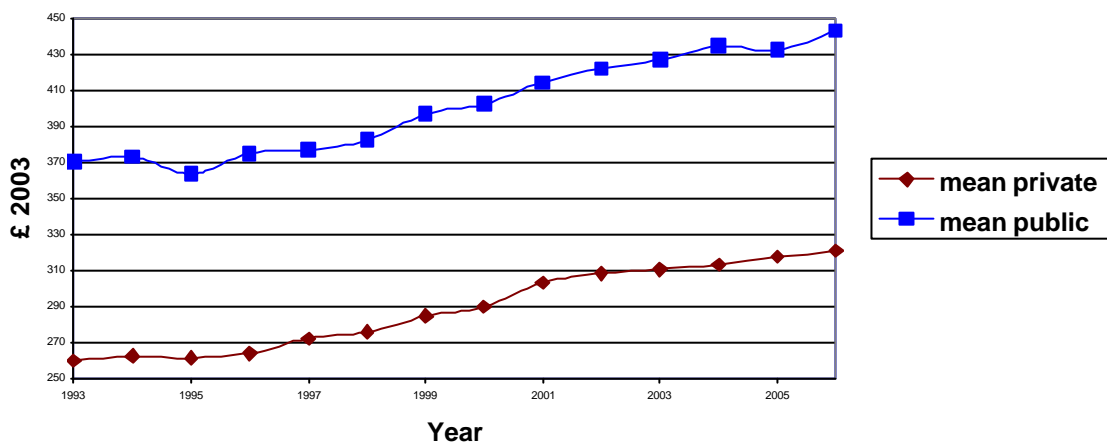
NAMRB Nurses and Midwives (first award 1984)

PSPRB Prison Service Pay Review Board (first award 2002)

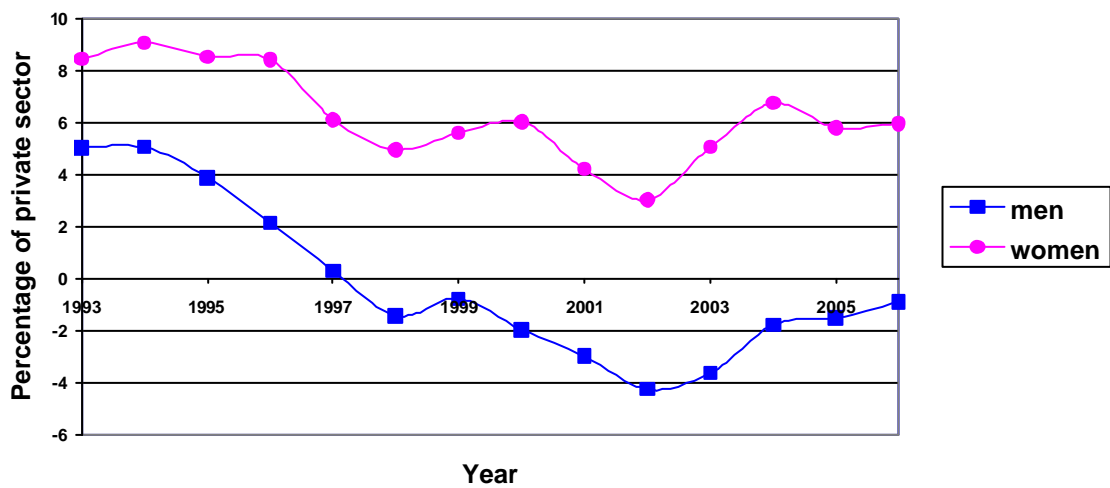
**Figure 2: Differentials by gender**  
**Panel a: Uncorrected means for men by sector**



**Panel b: Uncorrected means for women by sector**

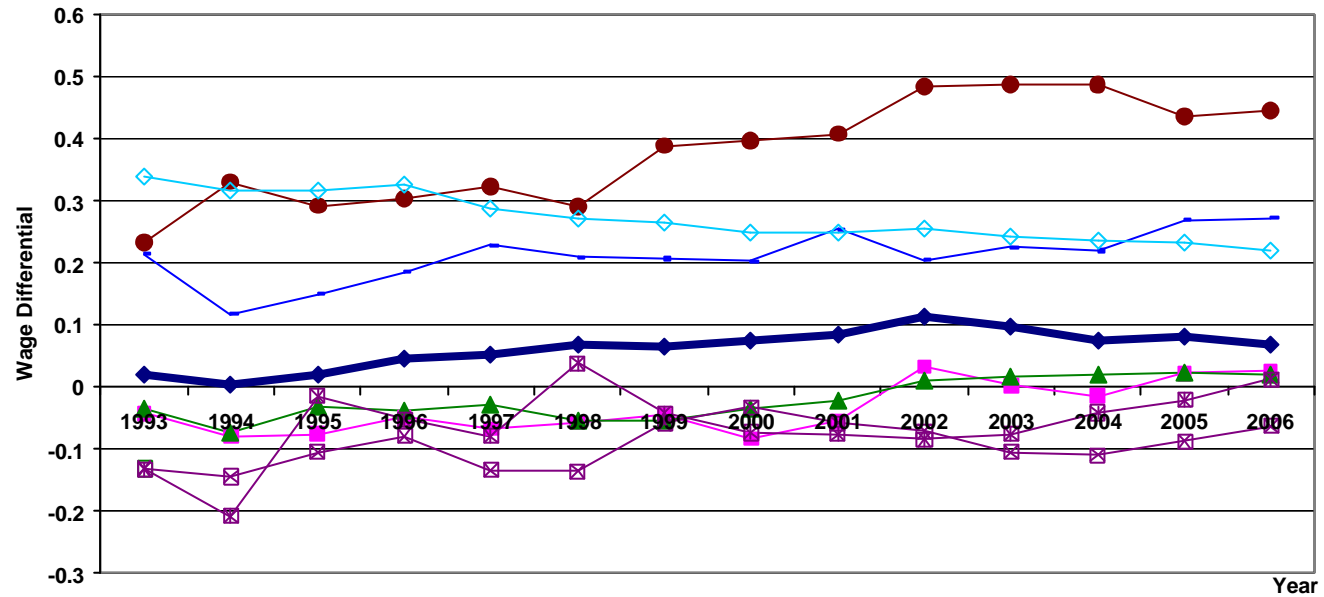


**Panel c: Corrected differentials by gender**

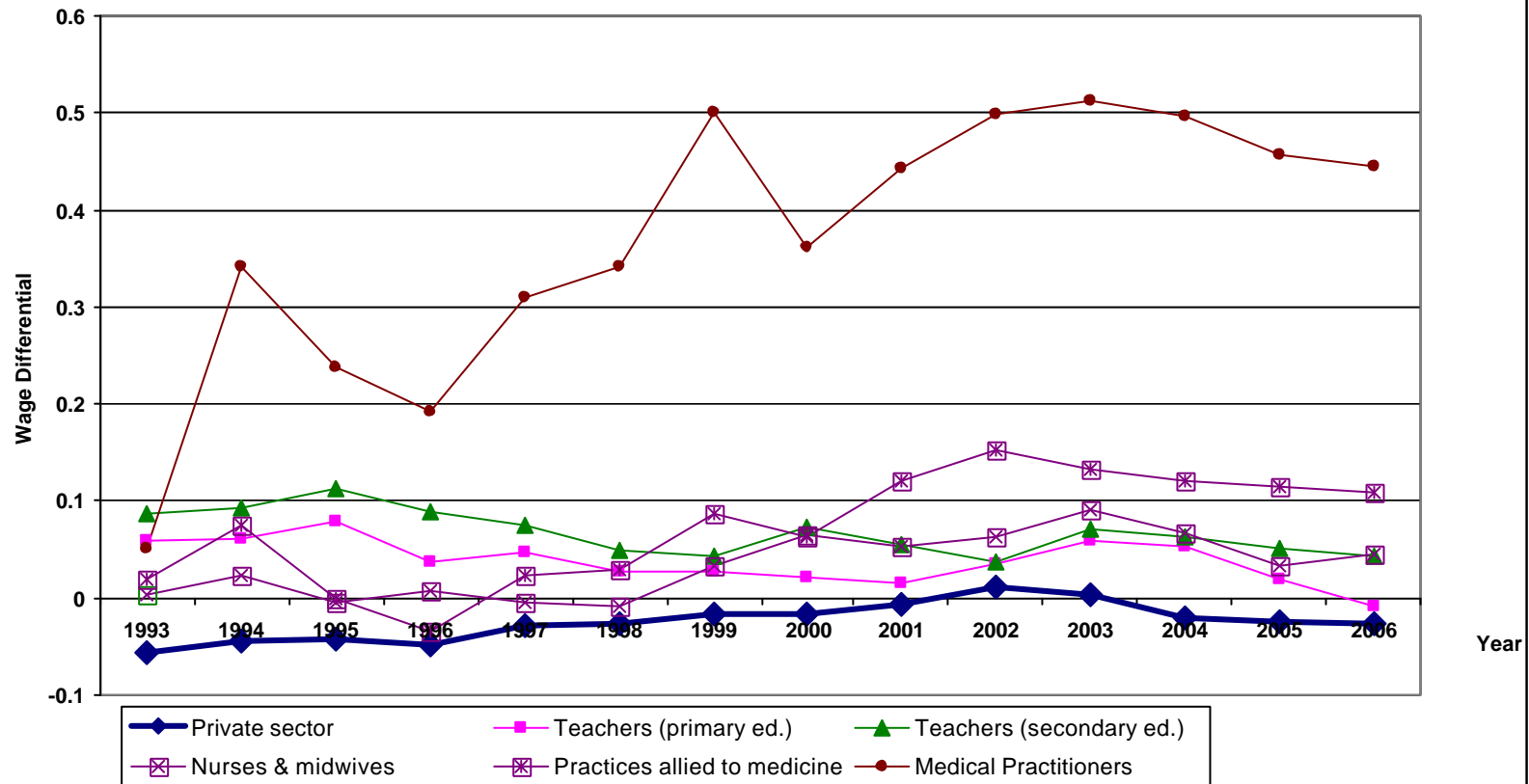




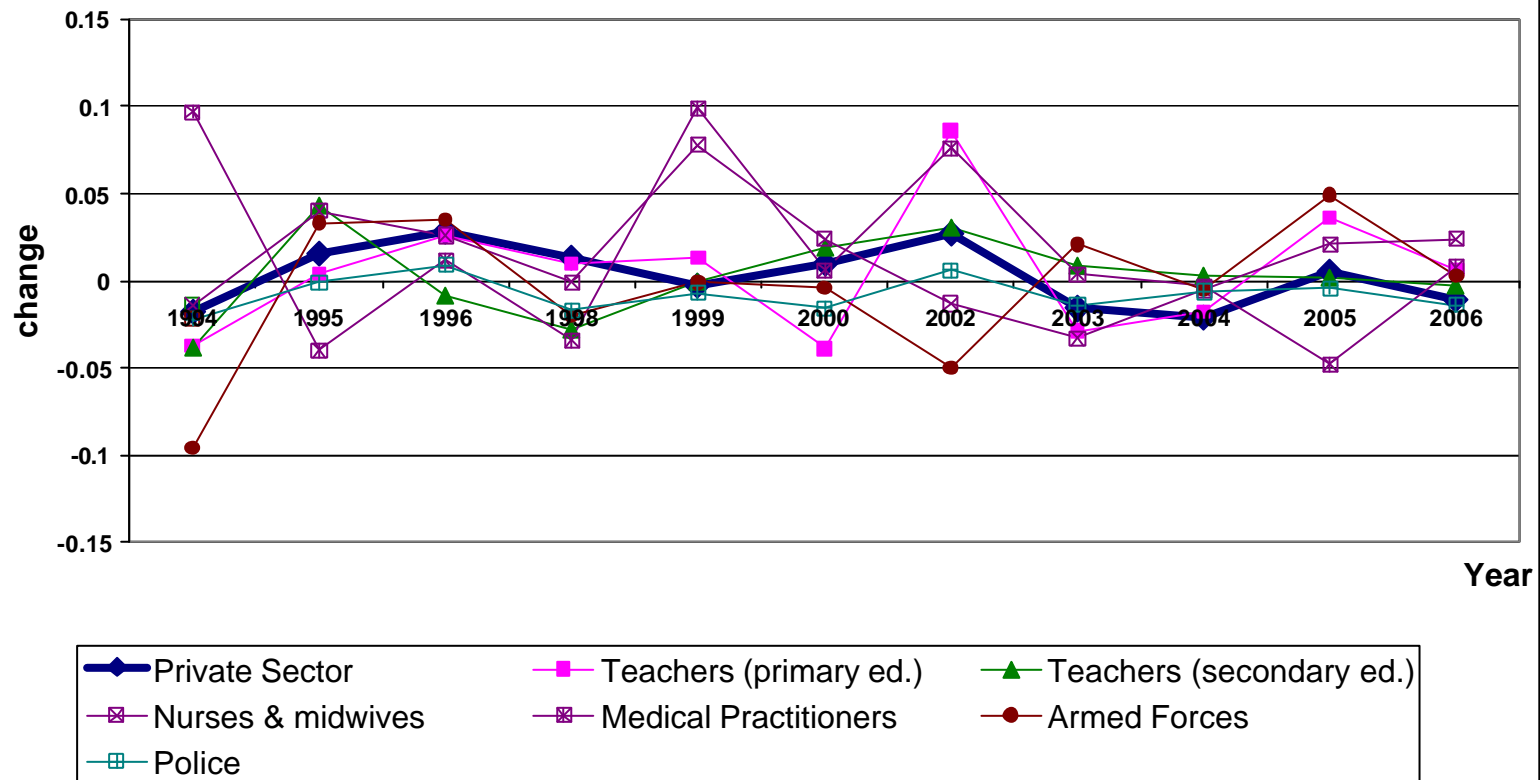
**Figure 3a. Male % Occupational Wage Differentials PRB Occupations Relative to Non-PRB Public Sector  
1993-2006**



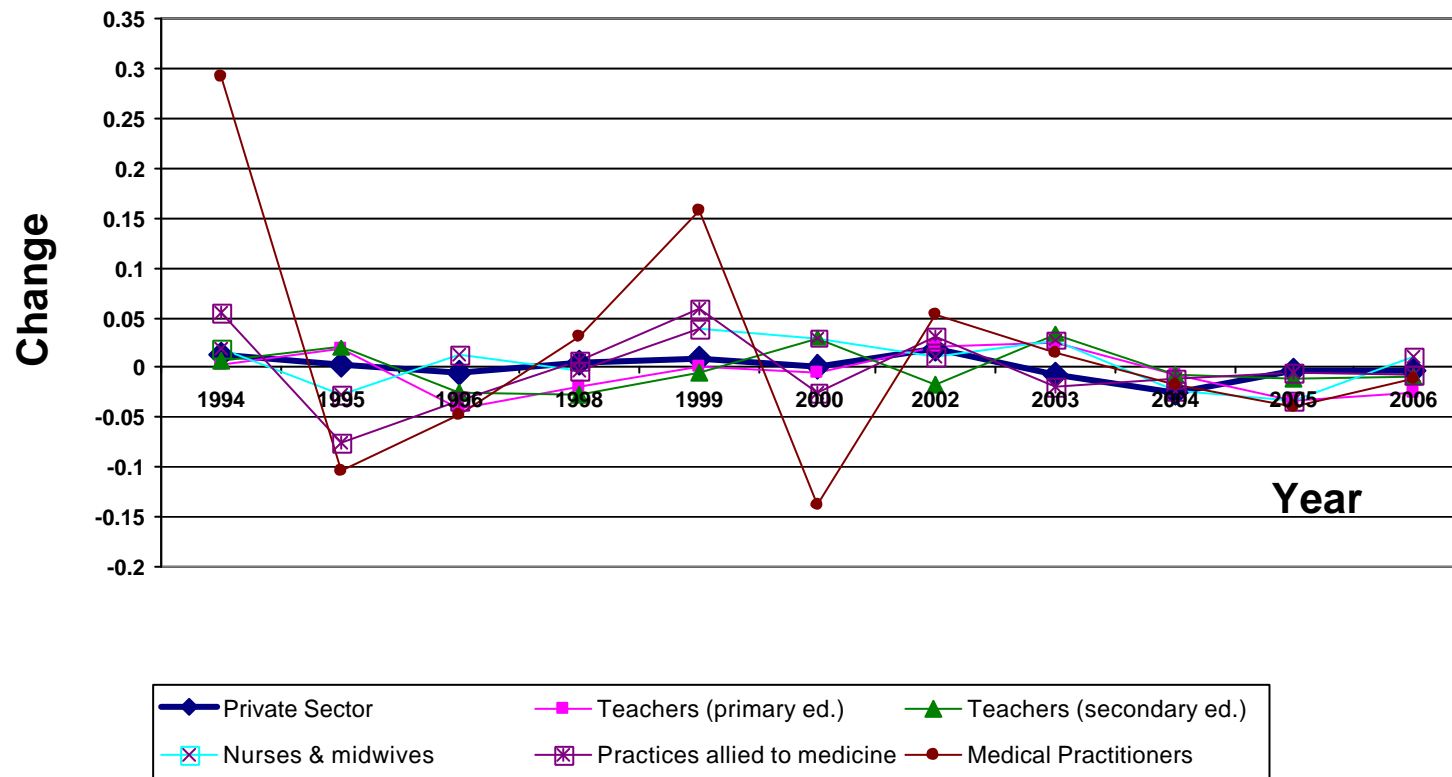
**Figure 3b Female % Occupational Wage Differentials PRB Occupations Relative to Non-PRB Public Sector 1993-2006**



**Figure 4a. Male Year on Year Diff-in-Diff Impact of PRBs  
Relative to Non-PRB Public Sector 1993/4- 2005/6**



**Figure 4b Female Year on Year Diff-in-Diff Impact of PRBs Relative to Non-PRB Sector 1993-2006**



**Table 1a: Effects of Working in PRB and Other Occupations (Men)**  
(log weekly real earnings, SOC90, control group non-PRB sector)

	1993	1994	1995	1996	1997	1998	1999	2000
<b>Private Sector</b>	0.021	0.003	0.019	0.047	0.054	0.067	0.064	0.074
<b>Non-PRB public sector</b>	*			***	***	***	***	***
<b>Number</b>	13003	12675	13159	13099	25855	25674	24342	22801
<i>PRB Groups</i>								
<b>Teachers (primary ed.)</b>	-0.042	-0.079	-0.075	-0.049	-0.067	-0.057	-0.044	-0.083
<b>Non-PRB public sector</b>		***	**	*	***	**	**	***
<b>Number</b>	101	92	86	101	165	150	146	143
<b>Teachers (secondary ed.)</b>	-0.036	-0.074	-0.031	-0.039	-0.027	-0.055	-0.055	-0.036
<b>Non-PRB public sector</b>	**	***	*	**	**	***	***	**
<b>Number</b>	265	268	294	242	488	469	488	450
<b>Nurses &amp; midwives</b>	-0.131	-0.144	-0.104	-0.078	-0.134	-0.136	-0.058	-0.033
<b>Non-PRB public sector</b>	***	***	***	***	***	***	**	
<b>Number</b>	64	79	64	73	154	151	130	128
<b>Practices allied to medicine</b>	-0.132	-0.207	-0.014	-0.052	-0.078	0.039	-0.042	-0.073
<b>Non-PRB public sector</b>	*	***			**			*
<b>Number</b>	23	18	20	30	53	43	45	50
<b>Medical Practitioners</b>	0.234	0.331	0.292	0.304	0.324	0.290	0.389	0.396
<b>Non-PRB public sector</b>	***	***	***	***	***	***	***	***
<b>Number</b>	42	41	55	45	101	122	107	105
<b>Prison officers</b>	0.161	0.119	0.156	0.114	0.088	0.064	0.086	0.091
<b>Non-PRB public sector</b>	***	***	***	**	***	**	***	***
<b>Number</b>	42	43	36	42	86	101	107	98
<b>Armed Forces</b>	0.214	0.117	0.150	0.185	0.228	0.209	0.207	0.203
<b>Non-PRB public sector</b>	***	***	***	***	***	***	***	***
<b>Number</b>	151	137	162	142	266	247	249	199
<b>Police</b>	0.338	0.317	0.316	0.325	0.288	0.271	0.265	0.249
<b>Non-PRB public sector</b>	***	***	***	***	***	***	***	***
<b>Number</b>	243	238	267	220	436	461	405	399

**Table 1a: Effects of Working in PRB and Other Occupations (Men)**  
(log weekly real earnings, SOC 2000, control group non-PRB sector)

	2001	2002	2003	2004	2005	2006
<b>Private Sector</b>	0.086	0.113	0.097	0.076	0.081	0.070
<b>Non-PRB public sector</b>	***	***	***	***	***	***
<b>Number</b>	22572	22013	20649	19304	18525	17711
<i><b>PRB Groups</b></i>						
<b>Teachers (primary ed.)</b>	-0.055	0.032	0.003	-0.015	0.022	0.027
<b>Non-PRB public sector</b>	**					
<b>Number</b>	135	137	147	141	142	117
<b>Teachers (secondary ed.)</b>	-0.022	0.009	0.018	0.021	0.023	0.020
<b>Non-PRB public sector</b>						
<b>Number</b>	388	403	416	408	387	389
<b>Nurses &amp; midwives</b>	-0.058	-0.071	-0.104	-0.109	-0.087	-0.063
<b>Non-PRB public sector</b>	**	***	***	***	***	***
<b>Number</b>	119	115	129	122	127	114
<b>Practices allied to medicine</b>	-0.075	-0.084	-0.075	-0.041	-0.021	0.013
<b>Non-PRB public sector</b>	**		**			
<b>Number</b>	82	90	91	98	90	85
<b>Medical Practitioners</b>	0.408	0.484	0.488	0.486	0.437	0.445
<b>Non-PRB public sector</b>	***	***	***	***	***	***
<b>Number</b>	110	142	114	114	130	112
<b>Prison officers</b>	-0.014	0.038	0.046	-0.002	0.029	0.008
<b>Non-PRB public sector</b>						
<b>Number</b>	83	75	65	74	72	65
<b>Armed Forces</b>	0.254	0.204	0.225	0.220	0.269	0.273
<b>Non-PRB public sector</b>	***	***	***	***	***	***
<b>Number</b>	200	171	152	144	145	119
<b>Police</b>	0.250	0.256	0.242	0.236	0.233	0.219
<b>Non-PRB public sector</b>	***	***	***	***	***	***
<b>Number</b>	359	350	349	338	304	267

**Table 1b: Estimates of changes in coefficients for Men**  
(log weekly real earnings, control group non-PRB sector)

	1993/ 1994	1994/ 1995	1995/ 1996	1997/ 1998	1998/ 1999	1999/ 2000	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006
<b>Private Sector</b>	-0.018	0.016	0.028	0.013	-0.003	0.010	0.027	-0.016	-0.021	0.005	-0.011
<b>Non-PRB public sector</b>							*				
<b>t-statistic</b>	-1.08	0.92	1.61	0.99	-0.23	0.77	1.93	-1.14	-1.48	0.34	-0.76
<i><b>PRB Groups</b></i>											
<b>Teachers (primary ed.)</b>	-0.037	0.004	0.026	0.010	0.013	-0.039	0.086	-0.029	-0.018	0.036	0.006
<b>Non-PRB public sector</b>							**				
<b>T-statistic</b>	-0.93	0.09	0.64	0.33	0.43	-1.18	2.36	-0.81	-0.52	1.07	0.15
<b>Teachers (secondary ed.)</b>	-0.038	0.043	-0.008	-0.028	-0.000	0.019	0.031	0.009	0.003	0.002	-0.003
<b>Non-PRB public sector</b>		*									
<b>T-statistic</b>	-1.59	1.78	-0.30	-1.39	-0.02	0.90	1.33	0.41	0.13	0.08	-0.13
<b>Nurses &amp; midwives</b>	-0.014	0.040	0.026	-0.001	0.078	0.024	-0.013	-0.033	-0.005	0.021	0.024
<b>Non-PRB public sector</b>					**						
<b>T-statistic</b>	-0.26	0.78	0.54	-0.04	2.36	0.73	-0.037	-0.99	-0.14	0.53	0.70
<b>Practices allied to medicine</b>	-0.075	0.193	-0.037	0.039	-0.003	-0.031	0.071	-0.072	0.034	0.020	0.034
<b>Non-PRB public sector</b>		*									
<b>T-statistic</b>	-0.72	1.84	-0.39	0.69	-0.04	-0.49	1.50	-1.55	0.73	0.43	0.74
<b>Medical Practitioners</b>	0.097	-0.040	0.012	-0.034	0.099	0.006	0.076	0.004	-0.003	-0.048	0.008
<b>Non-PRB public sector</b>					**		*				
<b>T-statistic</b>	1.44	-0.58	0.17	-0.64	2.01	0.14	1.69	0.11	-0.06	-1.14	0.16
<b>Prison officers</b>	-0.042	0.037	-0.041	-0.025	0.023	0.005	0.052	0.008	-0.048	0.031	-0.021
<b>Non-PRB public sector</b>											
<b>T-statistic</b>	-0.82	0.78	-0.66	-0.61	0.57	0.12	1.27	0.20	-1.08	0.76	-0.51
<b>Armed Forces</b>	-0.096	0.033	0.035	-0.020	-0.001	-0.004	-0.050	0.021	-0.005	0.049	0.003
<b>Non-PRB public sector</b>	**										
<b>T-statistic</b>	-2.46	0.89	0.94	-0.69	-0.05	-0.14	-1.42	0.60	-0.14	1.30	0.07
<b>Police</b>	-0.022	-0.001	0.009	-0.017	-0.007	-0.016	0.006	-0.014	-0.006	-0.004	-0.014
<b>Non-PRB public sector</b>											
<b>T-statistic</b>	-0.78	-0.03	0.34	-0.86	-0.32	-0.75	0.28	-0.65	-0.25	-0.15	-0.55

The figures show the coefficient for year  $t+1$  minus that for year  $t$ . ( $b^*$  and  $d_o^*$ )

The row labelled 'non-PRB public sector' shows significance of estimate.

**Table 2a: Effects of Working in PRB and Other Occupations (Women)**  
(log weekly real earnings, SOC90, control group non-PRB sector)

	1993	1994	1995	1996	1997	1998	1999	2000
<b>Private Sector</b>	-0.057	-0.044	-0.042	-0.049	-0.029	-0.026	-0.017	-0.017
<b>Non-PRB public sector</b>	***	***	***	***	***	***	**	*
<b>Number</b>	6693	6674	6955	6841	13883	13947	13285	12448
<i><b>PRB Groups</b></i>								
<b>Teachers (primary ed.)</b>	0.058	0.061	0.079	0.037	0.047	0.027	0.027	0.021
<b>Non-PRB public sector</b>	***	***	***	**	***	**	**	
<b>Number</b>	423	410	406	431	827	841	817	783
<b>Teachers (secondary ed.)</b>	0.086	0.092	0.113	0.088	0.075	0.048	0.042	0.072
<b>Non-PRB public sector</b>	***	***	***	***	***	***	***	***
<b>Number</b>	262	268	255	240	518	506	523	479
<b>Nurses &amp; midwives</b>	0.004	0.022	-0.005	0.008	-0.004	-0.008	0.033	0.064
<b>Non-PRB public sector</b>							**	***
<b>Number</b>	509	474	464	495	884	888	869	806
<b>Practices allied to medicine</b>	0.019	0.075	-0.001	-0.035	0.022	0.028	0.087	0.062
<b>Non-PRB public sector</b>		**					***	**
<b>Number</b>	100	84	100	93	182	202	188	183
<b>Medical Practitioners</b>	0.051	0.342	0.238	0.191	0.311	0.343	0.500	0.363
<b>Non-PRB public sector</b>		***	***	**	***	***	***	***
<b>Number</b>	22	19	33	24	57	68	70	53
<b>Prison officers</b>	0.298	0.459	0.264	0.329	0.238	0.187	0.045	0.071
<b>Non-PRB public sector</b>	***	***	***	***	***	***		
<b>Number</b>	6	4	7	4	17	18	20	18
<b>Armed Forces</b>	0.257	0.010	0.241	0.115	0.161	0.425	0.299	0.368
<b>Non-PRB public sector</b>	***		*		*	***	***	***
<b>Number</b>	4	8	3	8	13	9	18	11
<b>Police</b>	0.374	0.422	0.358	0.424	0.359	0.310	0.333	0.365
<b>Non-PRB public sector</b>	***	***	***	***	***	***	***	***
<b>Number</b>	28	33	34	31	73	66	79	85



**Table 2a: Effects of Working in PRB and Other Occupations (Women)**  
(log weekly real earnings, , SOC 2000, control group non-PRB public sector)

	2001	2002	2003	2004	2005	2006
<b>Private sector</b>	-0.006	0.012	0.004	-0.021	-0.024	-0.027
				**	***	***
<b>Number</b>	1795	1766	1713	1753	1873	1662
<i><b>PRB Groups</b></i>						
<b>Teachers (primary ed.)</b>	0.015	0.034	0.059	0.052	0.018	-0.008
<b>Non-PRB public sector</b>		**	***	***		
<b>Number</b>	707	682	706	678	625	630
<b>Teachers (secondary ed.)</b>	0.054	0.036	0.070	0.063	0.051	0.042
<b>Non-PRB public sector</b>	***	**	***	***	***	***
<b>Number</b>	476	494	477	489	466	487
<b>Nurses &amp; midwives</b>	0.053	0.063	0.091	0.067	0.033	0.044
<b>Non-PRB public sector</b>	***	***	***	***	***	***
<b>Number</b>	721	724	730	670	668	660
<b>Practices allied to medicine</b>	0.120	0.152	0.132	0.121	0.115	0.108
<b>Non-PRB public sector</b>	***	***	***	***	***	***
<b>Number</b>	186	169	146	167	165	166
<b>Medical Practitioners</b>	0.443	0.498	0.513	0.497	0.457	0.446
<b>Non-PRB public sector</b>	***	***	***	***	***	***
<b>Number</b>	77	84	73	83	83	98
<b>Prison officers</b>	0.080	0.112	-0.035	-0.090	0.105	0.005
<b>Non-PRB public sector</b>		**		*	**	
<b>Number</b>	12	15	18	21	25	27
<b>Armed Forces</b>	0.177	0.192	0.340	0.270	0.269	0.289
<b>Non-PRB public sector</b>	*	**	***	**	**	***
<b>Number</b>	13	5	7	8	10	9
<b>Police</b>	0.245	0.301	0.326	0.231	0.222	0.159
<b>Non-PRB public sector</b>	***	***	***	***	***	***
<b>Number</b>	70	73	88	75	76	89

**Table 2b: Estimates of changes in coefficients for women  
(log weekly real earnings, control group non-PRB sector)**

	1993/ 1994	1994/ 1995	1995/ 1996	1997/ 1998	1998/ 1999	1999/ 2000	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006
<b>Private Sector</b>	0.013	0.002	-0.006	0.004	0.009	0.000	0.018	-0.008	-0.025	-0.003	-0.003
<b>Non-PRB public sector</b>									**		
<b>t-statistic</b>	0.81	0.11	-0.40	0.34	0.71	-0.01	1.60	-0.69	-2.14	-0.22	-0.28
<b>PRB Groups</b>											
<b>Teachers (primary ed.)</b>	0.003	0.018	-0.041	-0.020	0.000	-0.006	0.020	0.024	-0.007	-0.034	-0.026
<b>Non-PRB public sector</b>											
<b>T-statistic</b>	0.13	0.66	-1.55	-1.08	0.02	-0.33	0.99	1.25	-0.34	-1.60	1.21
<b>Teachers (secondary ed.)</b>	0.006	0.021	-0.025	-0.027	-0.006	0.03	-0.018	0.034	-0.007	-0.012	-0.009
<b>Non-PRB public sector</b>											
<b>T-statistic</b>	0.21	0.72	-0.83	-1.34	-0.29	1.40	-0.82	1.51	0.31	-0.53	-0.37
<b>Nurses &amp; midwives</b>	0.018	-0.027	0.013	-0.004	0.041	0.031	0.010	0.028	-0.024	-0.033	0.010
<b>Non-PRB public sector</b>					**					*	
<b>T-statistic</b>	0.67	-0.97	0.49	-0.19	2.23	1.61	0.56	1.56	-1.31	-1.82	0.57
<b>Practices allied to medicine</b>	0.056	-0.076	-0.034	0.006	0.06	-0.026	0.032	-0.020	-0.011	-0.006	-0.007
<b>Non-PRB public sector</b>		*			*						
<b>T-statistic</b>	1.33	-1.71	-0.77	0.20	1.92	-0.78	1.04	-0.61	-0.32	-0.17	0.20
<b>Medical Practitioners</b>	0.292	-0.103	-0.047	0.032	0.158	-0.138	0.055	0.015	-0.017	-0.040	-0.011
<b>Non-PRB public sector</b>	***				**	*					
<b>T-statistic</b>	2.08	-0.91	-0.44	0.46	2.20	-1.91	1.03	0.28	-0.30	-0.71	-0.19
<b>Prison officers</b>	0.161	-0.195	0.066	-0.052	-0.141	0.026	0.032	-0.147	-0.055	0.196	-0.100
<b>Non-PRB public sector</b>		*			*			**		***	
<b>T-statistic</b>	1.27	-1.67	0.56	-0.56	-1.76	0.32	0.32	-2.05	-0.78	2.72	-1.33
<b>Armed Forces</b>	-0.247	0.231	-0.126	0.265	-0.126	0.069	0.015	0.148	-0.070	-0.001	0.016
<b>Non-PRB public sector</b>				**							
<b>T-statistic</b>	-1.29	1.08	-0.81	2.13	-1.12	0.79	0.12	1.30	-0.51	-0.01	0.11
<b>Police</b>	0.048	-0.064	0.066	-0.050	0.023	0.032	0.055	0.026	-0.095	-0.009	-0.063
<b>Non-PRB public sector</b>									**		
<b>T-statistic</b>	0.61	-0.88	1.08	-1.27	0.54	0.78	1.28	0.68	-2.42	-0.20	-1.33

The figures show the coefficient for year  $t+1$  minus that for year  $t$ . ( $b^*$  and  $d_o^*$ )

The row labelled 'non-PRB public sector' shows significance of estimate.

# Appendix A: Definition of Occupational Groups

## Definition of occupations using SOC 2000 (2001-2006)

### Non-PRB Public Sector

1111	Senior officials in national government	1113	Senior officials in local government
1173	Senior officers in fire, ambulance, prison and related services		
1181	Hospital and health service managers		
1184	Social services managers	2212	Psychologists
2311	Higher education teaching professionals		
2312	Further education teaching professionals		
2313	Education officers, school inspectors		
2317	Registrars and senior administrators of educational establishments		
2419	Legal professionals n.e.c.		
2441	Public service administrative professionals		
2442	Social workers		
2443	Probation officers		
3232	Housing and welfare officers		
3313	Fire service officers (leading fire officer and below)		
3319	Protective service associate professionals n.e.c. (e.g. customs officers, scenes of crime officers)		
3511	Air traffic controllers		
3551	Conservation and environmental protection officers		
3561	Public service associate professionals		
3565	Inspectors of factories, utilities and trading standards		
3566	Statutory examiners		
3568	Environmental health officers	4111	Civil Service executive officers
4112	Civil Service administrative officers and assistants		
4113	Local government clerical officers and assistants		
6111	Nursing auxiliaries and assistants		
6112	Ambulance staff (excluding paramedics)	9221	Hospital porters
9243	School crossing patrol attendants	9244	School mid-day assistants

### PRB Groups and Police

#### Medical Practitioners

2211	Medical practitioners	2215	Dental practitioners
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#### Armed Forces

1171	Officers in armed forces	3311	NCOs and other ranks
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#### Prison Officers

3314	Prison service officers (below principal officer)		
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#### Nurses and Midwives

3211	Nurses	3212	Midwives
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#### Practices Allied to Medicine (PAM)

3213	Paramedics	3214	Medical radiographers
3215	Chiropodists	3218	Medical and dental technicians
3221	Physiotherapists	3222	Occupational therapists
3223	Speech and language therapists	3229	Therapists not elsewhere coded

#### Teachers Secondary

2314	Secondary education teaching professionals	2319	Teaching professionals n.e.c.
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#### Teachers Primary

2315	Primary and nursery education teaching professionals	2316	Special needs education teaching professionals
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#### Police

1172	Police officers (inspectors and above)	3312	Police officers (sergeant and below)
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## Definition of occupations using SOC90

### Non-PRB Public Sector

100	General Administrators		
102	Local Government Officers		
103	General Administrators		
132	Civil Service Executive Officers		
153	Fire service officers		
155	Customs & excise, immigration service officers (customs: chief preventive officer & above; excise: surveyor & above)		
191	Registrars & administrators of educational establishments		
230	University & polytechnic teaching professionals		
231	Higher & further education teaching professionals		
232	Education officers, school inspectors	240	Judges & officers of the court
290	Psychologists	293	Social workers, probation officers
330	Air traffic planners & controllers	348	Environmental health officers
394	Inspectors of factories, utilities & trading standards		
395	Other statutory & similar inspectors		
400	Civil Service administrative officers & assistants		
401	Local government clerical officers & assistants		
611	Fire service officers (leading fire officer & below)		
613	Customs & excise officers, immigration officers (customs: below chief preventive officer; excise: below surveyor)		
619	Other security and protective service occupations n.e.c.		
640	Assistant nurses, nursing auxiliaries	641	Hospital ward assistants
642	Ambulance staff	950	Hospital porters

### Pay Review Body (PRB) Groups and Police

#### Medical Practitioners

220	Medical practitioners	223	Dental practitioners
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#### Armed Forces

150	Armed Forces (Officers)	600	Armed Forces (NCOs and other ranks)
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#### Prison Officers

154	Prison Officers (princ. officers & above)	612	Prison Officers (below princ. officer)
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#### Nurses and Midwives

340	Nurses	341	Midwives
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#### Practices Allied to Medicine (PAM)

342	Medical radiographers		
343	Physiotherapists	344	Chiropodists
346	Medical Technicians	347	Occupational & Other Therapists

#### Teachers Secondary

233	Secondary (& middle school deemed secondary) education teaching professionals		
239	Other teaching professionals not elsewhere coded		

#### Teachers Primary

234	Primary (& middle school deemed primary) & nursery education teaching professionals		
235	Special education teaching professionals		

#### Police

152	Police officers (inspector & above)	610	Police officers (sergeant & below)
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## Appendix B: Definition of other variables

### *Qualifications*

The qualifications variables are a set of 6 dummies for the highest qualification obtained using the LFS derived variable Quald. Broad details of this variable are given in the Labour Force Survey User Guide Volume 3 (Details of LFS variables) and specific details in Volume 4 (LFS Standard derived variables). Quald has the advantage that it provides a simple, comprehensible and relevant classification that it is readily available for our data period. Quald includes vocational qualifications and reflects NVQ level. The main difference lies in that quald distinguishes between degree level qualifications and other NVQ level 4 qualifications such as non-degree level teaching and nursing qualifications. Quald does not make some of the distinctions used by NVQs. For instance, the number of A-levels does not matter for quald. The similarly defined variable, Qualdp, is used for 1993-95. Our qualification dummies identify the groups: "Degree or equivalent", "Higher Education", "GCE A Level or equivalent", "GCSE A\*-C or equiv", "Other quals" with the control group "No quals".

### *Manual Occupations*

Manual occupations are defined for 2001-2006 using the LFS derived variable nsecm which reports the National Statistics Socio-economic Classification (NS-SEC) in the main job. The manual dummy is derived from the table below. Manual occupations are defined for 1993-2000 using the LFS derived variable socmanm which reports whether the individual's main job was manual or non-manual or armed forces. Armed forces were defined as manual.

**Table B.1. Link between Social Class and SEC**

Manual vs Non-manual		Social Class	NS-SEC Operational Categories
Non-manual	I	Professional, etc. occupations	3.1, 3.3
Non-manual	II	Managerial and Technical occupations	1, 2, 3.2, 3.4, 4.1, 4.3, 5, 7.3, 8.1, 8.2, 9.2
Non-manual	III N	Skilled occupations – non-manual	4.2, 4.4, 6, 7.1, 7.2, 12.1, 12.6
Manual	III M	Skilled occupations - manual	7.4, 9.1, 10, 11.1, 12.3, 13.3
Manual	IV	Partly skilled occupations	11.2, 12.2, 12.4, 12.5, 12.7, 13.1, 13.2, 13.5
Manual	V	Unskilled occupations	13.4