

FEATURE

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Regional analysis of public sector employment

SUMMARY

This article presents analysis of public sector employment by region, with time series since 1999, consistent with the official UK figures which are based on data supplied by public sector organisations. While figures are already available for Scotland and Northern Ireland on this basis, information from the Labour Force Survey is used to estimate the breakdown required for Wales and the English regions. This article includes commentary on the results as well as an explanation of the methodology and limitations of these estimates.

This article provides updated analysis of public sector employment (PSE) by region. The importance of regional PSE estimates for policy-related purposes was highlighted in the Allsopp Review of Statistics for Economic Policymaking, published in 2004. As part of the continuing programme for development of PSE statistics, the Office for National Statistics (ONS) produced regional PSE estimates by using information from the Labour Force Survey (LFS) which appeared for the first time in the article 'Public Sector Employment Trends 2005', published in October 2005.

The article is one of a series of articles providing analysis of PSE estimates. A previous article 'Public sector employment, 2006: seasonally adjusted series and recent trends' introduced the seasonally adjusted series and analysed trends in these series. It also reported on the progress of the development of PSE statistics. A further article planned for May 2007 will look at the characteristics of public sector employees.

The following are the main findings from the analysis:

- Between 1999 and 2006, all regions of the UK showed an increase in the level of public sector employment, although the trend has been flat in most regions over the past year or so
- Over the year to Q3 2006, the largest relative increase in the number of people working in the public sector was in the East Midlands region (5.5 per

cent), while the largest relative decrease was in the East region (3.7 per cent)

- Northern Ireland (29.1 per cent), the North East (23.8 per cent), Wales (23.7 per cent) and Scotland (23.6 per cent) had the highest proportion of their workforce working in the public sector, while the South East (17.2 per cent), East (17.9 per cent) and East Midlands (18.5 per cent) regions had the lowest over the 12 months to Q3 2006

Regional data based on information from public sector organisations

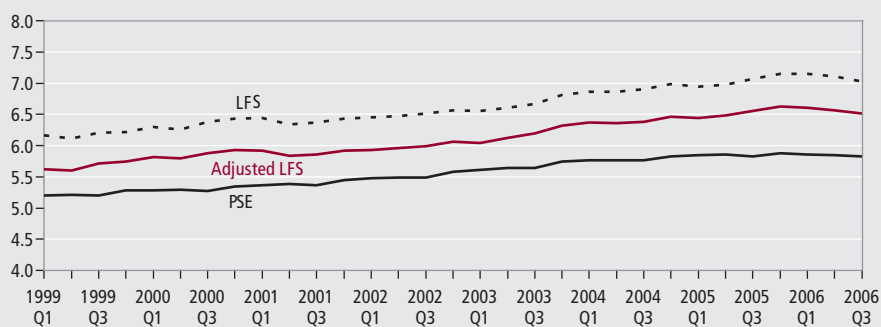
PSE estimates from administrative data supplied by public sector organisations are already available for Scotland and Northern Ireland (collected by the Scottish Executive (SE) and Department of Enterprise, Trade and Investment for Northern Ireland, respectively) as well as for the UK as a whole. SE began publishing quarterly PSE estimates in July 2005. The latest publication of the PSE series in Scotland now covers the period Q1 1999 to Q3 2006.

While PSE estimates for the English regions and Wales are not available from administrative sources, production of these estimates relies on information from the LFS for which the quality of public/private sector classification and region of workplace are deficient for reasons discussed below. A study to examine the feasibility of producing regional PSE estimates, using data from public sector organisations,

Figure 1

Comparison of PSE estimates from public sector organisations and LFS

United Kingdom, not seasonally adjusted
Millions



Sources : Labour Force Survey, returns from public sector organisations (ONS, Scottish Executive and Department of Enterprise, Trade and Investment for Northern Ireland)

was carried out last year. ONS has been researching the individual sources of PSE to establish what is currently available and how far it goes towards meeting the needs of users. As a result of this, the aim is to introduce a new series of regional estimates by the end of 2007.

Use of LFS data for analysis of public sector employment

A number of important quality issues arise with regard to using LFS data to produce regional PSE estimates.

LFS public/private sector and industry classifications are made on the basis of survey respondents' views about the organisations for which they work. As a consequence, they are likely to suffer from reporting error as well as the figures not corresponding to the National Accounts definition used to produce PSE estimates from administrative sources. For example, according to the National Accounts definition, university staff and GPs should be classified into the private sector while at present they remain in the public sector according to the definition applied within the LFS.

LFS estimates of public sector employment are around 1 million higher than those from the PSE. Even when LFS estimates are adjusted to match more closely National Accounts definitions, LFS estimates are still higher, and the difference between estimates from the two sources has grown over the period 1995 to 2005. A comparison between PSE estimates based on returns from public sector organisations, those from the LFS, and LFS estimates adjusted to the National Accounts definition, are shown in **Figure 1**.

A large part of the divergence between the two series is within local government, especially within the areas of education and public administration. One possible reason for the increasing overestimation of public sector workers within the LFS may be because of increased contracting out of ancillary services within the public sector to private sector businesses, for example, cleaning, catering and transportation. Workers in contracted-out jobs may classify their activity according to the activity of the organisation on whose premises they work, rather than the organisation with whom they are employed, when responding to the survey. Another factor which may contribute to the divergence between the two sources is the under-coverage of schools devolved from local government, for example, foundation schools, within the

PSE. Further work is being carried out to provide robust enough methods to estimate for the missing schools on a quarterly basis.

Until January 2006, the LFS used seasonal quarters as the main reporting period (spring, March–May; summer, June–August; autumn, September–November; winter, December–February). As of 2006, the LFS reporting period moved to calendar quarters as a consequence of EU regulation and the need to bring the survey in line with other ONS surveys. While key labour market variables were already available for calendar quarters from the quarterly figures published in the LMS First Release, the change from seasonal to calendar quarters introduced a break in the sequence of the LFS microdata used to estimate PSE. The issue arises as to whether PSE estimates based on calendar quarters can be used to extend existing series. Analysis suggests that extending existing series using calendar quarterly data does not introduce any important discontinuity when using four-quarterly rolling averages. Overall, the range of proportional differences between seasonal and calendar quarterly data is relatively small (generally within 1 per cent).

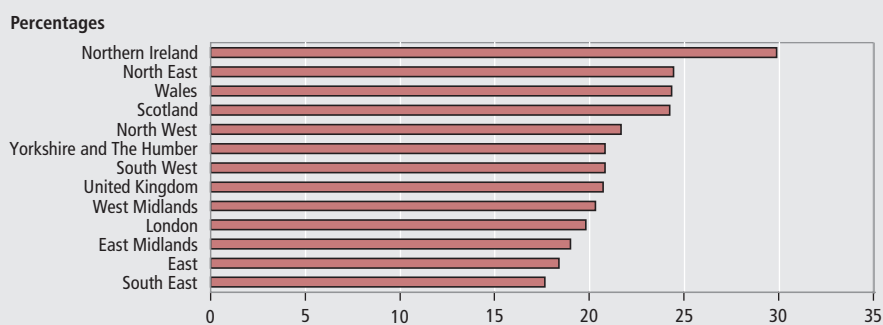
The method by which the LFS is used to produce regional PSE estimates is described in the Technical Note.

Public sector employment by region

Figure 2 shows that over the four quarters to Q3 2006, Northern Ireland (29.1 per cent), the North East (23.8 per cent), Wales (23.7 per cent) and Scotland (23.6 per cent) had the highest proportion of their

Figure 2

Public sector employment as a proportion of all in employment: by region and country of workplace, year to Q3 2006¹



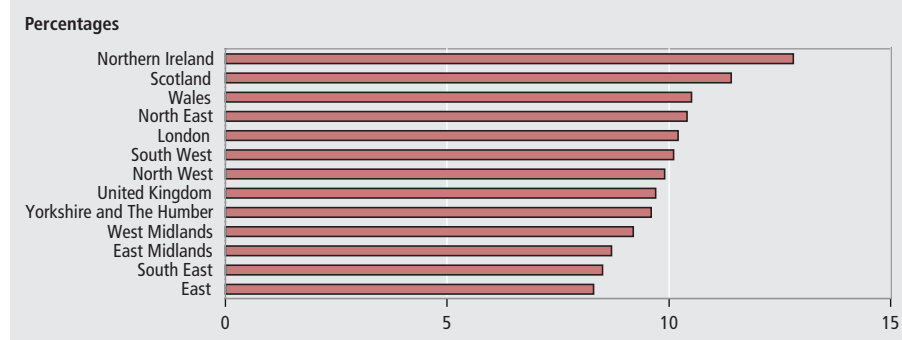
Note:

Public sector statistics for Northern Ireland relate to the number of public sector jobs rather than the number of people working in the public sector. The percentages for Northern Ireland as a proportion of all employment will tend to be around 2 percentage points higher than DETINI estimates expressed as a proportion of all jobs. HM Forces figures are not included in Northern Ireland estimates.

¹ Headcount, four-quarterly averages, based on estimates over the quarters December (Q4) 2005, March (Q1), June (Q2) and September (Q3) 2006.

Sources : Labour Force Survey, returns from public sector organisations (ONS, Scottish Executive and Department of Enterprise, Trade and Investment for Northern Ireland)

Figure 3

Public sector employment as a proportion of total resident population: by region and country, year to Q3 2006^{1,2}**Note:**

Public sector statistics for Northern Ireland relate to the number of public sector jobs rather than the number of people working in the public sector. HM Forces figures are not included in Northern Ireland estimates.

1 Public sector employment estimates are workplace-based estimates, that is, where people work rather than where they live. Mid-year population estimates measure resident population.

2 Headcount, four-quarterly averages, based on estimates over the quarters December (Q4) 2005, March (Q1), June (Q2) and September (Q3) 2006.

Sources: Labour Force Survey, returns from public sector organisations (ONS, Scottish Executive and Department of Enterprise, Trade and Investment for Northern Ireland) and ONS mid-year 2005 population estimates.

workforce working in the public sector.

In contrast, the regions with the lowest proportion of the workforce in the public sector were the South East (17.2 per cent), East (17.9 per cent) and East Midlands (18.5 per cent).

Public sector employment estimates by region are expressed as the proportion of resident population in **Figure 3**. This approach takes into account the relationship between the size of the public sector and the customer base that it serves, although it cannot take account of the relative needs for public services in different areas. Variation between regions is smaller when based on resident population, for Q3 2006 ranging from 8.3 per cent in the East to 12.8 per cent in Northern Ireland.

All regions and countries showed an increase in the level of public sector employment between 1999 and 2006 (see **Table 1**). Over the period 1999 to 2006, the largest relative increase in the number of people working in the public sector was in the South West, which showed a 20.1 per cent increase. The East Midlands (17.0 per cent), North West (14.0 per cent) and West Midlands (14.0 per cent) regions showed the next largest proportional increases over the same period. The regions with the smallest relative increases over the same period were London (8.2 per cent) and Wales (8.2 per cent). Over the past two years, the trend has been close to flat in most regions.

Assessing the accuracy of ONS regional estimates of PSE

The method by which regional PSE estimates have been produced from the LFS can be evaluated by comparing them with PSE estimates for Scotland published by SE, based on administrative sources. Comparison of these estimates with LFS-based PSE estimates for Scotland produced in the same way as those for the English regions and Wales gives some measure of how accurate this method of producing estimates is. A comparison of these two sources of PSE estimates for Scotland is shown in **Table 2**.

This indicates that differences between the two sources of estimates are modest, no larger than may inevitably be expected due to LFS sampling variability and usual respondent errors. Over the period Q4 1999 (December) to Q3 2006 (July), LFS estimates were at most 3.5 per cent (Q4 2003) more and 1.5 per cent less (Q3 2006) than those published by SE.

Were figures available for the other regions of Great Britain based on returns from public sector organisations, it might be expected that similar differences would be found.

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Livesey D, Machin A, Millard B and Walling A 'Public sector employment 2006: Seasonally adjusted series and recent trends', *Labour Market Trends* 114(12), pp419–38 and at www.statistics.gov.uk/cpi/article.asp?id=1686

TECHNICAL NOTE**Method of producing PSE regional estimates from LFS**

The regional estimates are presented on a seasonally adjusted basis for the sake of consistency with the main headline PSE figures. In practice though, this will make very little difference, as the figures are provided only in the form of four-quarter rolling averages, in order not to be significantly affected by the sampling variability of the LFS results.

In this article, the estimates for Scotland and Northern Ireland are taken directly from the quarterly PSE estimates published by the Scottish Executive and the Department of Enterprise, Trade and Investment for Northern Ireland. These are not seasonally adjusted, but the four-quarter rolling averages are comparable enough to the corresponding figures derived from the total UK PSE seasonally adjusted series. Corresponding totals for each four-quarter period back to 1999, for England and Wales combined, are thus derived by subtraction of the figures for Scotland and Northern Ireland from the corresponding UK totals. These estimates are then split, by English region and for Wales, on a pro rata basis according to the corresponding average LFS estimates of public sector employment, by region of workplace, using LFS microdata, after making the required adjustments to bring these estimates as close as possible to the National Accounts definition. These adjustments are to exclude employees of universities and grant-funded educational establishments, and temporary agency workers, who clearly belong to the private sector. Note that GPs and their practice staff who are allocated to the public sector in the LFS cannot be reclassified to the private sector as they cannot be distinguished from others, such as doctors and dentists working in hospitals that are part of the public sector.

Regional PSE employment rates are an expression of the levels of PSE as a proportion of total employment within each region. The regional total employment estimates by workplace are obtained by constraining the microdata estimates to the headline LFS figures for total employment (seasonally adjusted) on a pro rata basis for each region.

Table 1
Public sector employment:¹ by region and country of workplace

Thousands, seasonally adjusted

Average of four quarters to: ²	North East	North West	Yorkshire and The Humber	East Midlands	West Midlands	East	London	South East	South West	England	Wales	Scotland ³	Great Britain	Northern Ireland ⁴	United Kingdom
PSE level															
1999 Q4	238	594	441	321	435	414	711	630	427	4,210	287	529	5,026	197	5,223
2000 Q1	236	601	444	322	440	417	708	628	433	4,229	285	530	5,044	198	5,242
2000 Q2	231	615	454	320	438	418	696	630	440	4,243	289	531	5,063	199	5,262
2000 Q3	231	631	457	318	431	425	685	636	447	4,259	293	532	5,084	199	5,282
2000 Q4	230	642	461	316	429	428	675	639	451	4,271	297	532	5,100	199	5,299
2001 Q1	233	649	462	317	431	429	672	641	452	4,286	302	532	5,120	200	5,320
2001 Q2	238	654	454	317	435	431	687	643	452	4,310	299	533	5,143	201	5,344
2001 Q3	240	660	448	319	444	431	698	639	453	4,331	298	534	5,163	202	5,365
2001 Q4	244	664	440	320	449	431	707	644	457	4,355	296	536	5,187	202	5,389
2002 Q1	248	664	437	321	453	431	717	647	464	4,381	294	538	5,214	203	5,417
2002 Q2	252	662	441	327	457	430	720	647	467	4,403	297	540	5,240	204	5,443
2002 Q3	253	659	451	331	461	434	721	648	468	4,426	300	543	5,269	205	5,474
2002 Q4	252	661	460	330	467	440	725	644	473	4,453	304	545	5,302	206	5,508
2003 Q1	252	666	468	330	471	448	719	644	478	4,478	310	548	5,335	208	5,543
2003 Q2	253	674	478	331	472	453	715	649	482	4,507	314	551	5,373	209	5,582
2003 Q3	253	677	485	331	470	462	714	660	487	4,539	317	554	5,410	211	5,621
2003 Q4	252	681	497	340	468	469	712	671	486	4,576	316	558	5,449	212	5,661
2004 Q1	254	681	506	353	465	476	717	681	481	4,613	311	561	5,485	213	5,699
2004 Q2	255	677	508	362	466	484	723	688	478	4,642	307	565	5,514	214	5,728
2004 Q3	258	678	504	369	472	485	732	693	479	4,669	304	568	5,542	215	5,757
2004 Q4	263	676	496	368	477	487	740	697	483	4,688	303	571	5,563	216	5,779
2005 Q1	262	679	489	359	484	484	748	700	498	4,704	305	574	5,582	217	5,799
2005 Q2	261	688	484	354	493	481	748	705	510	4,723	305	576	5,604	219	5,823
2005 Q3	261	687	487	356	495	478	748	708	518	4,738	303	579	5,620	220	5,840
2005 Q4	261	684	493	361	496	470	752	707	522	4,746	305	580	5,632	220	5,852
2006 Q1 ⁵	263	682	495	370	496	465	755	702	519	4,746	306	583	5,635	221	5,855
2006 Q2 ⁵	265	675	495	375	495	462	765	699	514	4,744	306	583	5,633	221	5,853
2006 Q3 ⁵	266	677	486	376	496	460	769	696	513	4,738	310	583	5,631	221	5,852
Change on latest year	5	-10	-1	20	1	-18	21	-12	-5	0	6	4	11	1	12
Percentage change	1.9	-1.5	-0.1	5.5	0.3	-3.7	2.8	-1.8	-1.0	0.0	2.1	0.7	0.2	0.5	0.2

Notes:

1 Headcount, rolling four-quarter averages.

2 Rolling four-quarterly averages are based on estimates over the quarters March (Q1), June (Q2), September (Q3) and December (Q4). For example, the Q4 1999 estimate is an average taken for the quarters Q1 to Q4 1999.

3 Public sector employment estimates for Scotland are published by the Scottish Executive on a quarterly basis back to Q1 1999 from administrative records and surveys of public sector organisations in Scotland.

4 Public sector statistics for Northern Ireland relate to the number of public sector jobs rather than the number of people working in the public sector. The percentages for Northern Ireland as a proportion of all employment will tend to be around 2 percentage points higher than DETINI estimates expressed as a proportion of all jobs. HM Forces figures are not included in Northern Ireland estimates.

5 Estimates for these quarters have been produced using calendar quarterly LFS microdata to obtain regional splits (see section 'Use of LFS data for analysis of public sector employment').

Sources : Labour Force Survey, returns from public sector organisations (ONS, Scottish Executive & Department of Enterprise, Trade and Investment for Northern Ireland)

Table 1 - *continued***Public sector employment:¹ by region and country of workplace**

Thousands, seasonally adjusted

Average of four quarters to: ²	North East	North West	Yorkshire and The Humber	East Midlands	West Midlands	East of London	London	South East	South West	England	Wales	Scotland ³	Great Britain	Northern Ireland ⁴	United Kingdom
PSE as a percentage of all in employment															
1999 Q4	23.4	19.6	19.9	17.0	17.9	17.1	18.6	16.5	18.2	18.3	23.9	23.1	19.0	28.7	19.2
2000 Q1	22.9	19.7	19.9	17.0	18.2	17.2	18.5	16.4	18.4	18.3	23.6	23.0	19.0	28.9	19.2
2000 Q2	22.2	20.1	20.2	16.8	18.2	17.1	18.3	16.3	18.5	18.3	23.8	22.8	19.0	29.0	19.2
2000 Q3	22.1	20.6	20.3	16.7	18.0	17.2	18.0	16.4	18.7	18.4	24.0	22.6	19.0	28.9	19.3
2000 Q4	22.0	20.9	20.4	16.6	17.9	17.1	17.8	16.5	18.8	18.4	24.4	22.5	19.0	28.9	19.3
2001 Q1	22.3	21.1	20.4	16.7	17.9	17.1	17.6	16.5	18.8	18.4	24.9	22.4	19.0	28.7	19.3
2001 Q2	22.8	21.3	20.1	16.8	17.9	17.2	17.8	16.5	18.8	18.5	24.8	22.4	19.1	28.6	19.3
2001 Q3	23.1	21.5	19.8	16.8	18.1	17.3	18.0	16.4	18.8	18.5	24.7	22.5	19.1	28.6	19.4
2001 Q4	23.5	21.6	19.4	16.8	18.3	17.2	18.2	16.5	18.8	18.6	24.6	22.6	19.2	29.0	19.4
2002 Q1	23.8	21.7	19.2	16.8	18.4	17.2	18.4	16.6	19.1	18.7	24.5	22.7	19.3	29.0	19.5
2002 Q2	24.1	21.6	19.3	17.0	18.5	17.1	18.5	16.7	19.2	18.7	24.7	22.8	19.3	29.1	19.6
2002 Q3	24.2	21.4	19.6	17.2	18.6	17.2	18.5	16.6	19.2	18.8	24.7	22.9	19.4	29.1	19.6
2002 Q4	24.1	21.4	19.9	17.1	18.8	17.4	18.7	16.5	19.4	18.9	24.7	22.9	19.5	28.6	19.7
2003 Q1	24.0	21.4	20.3	17.0	19.0	17.7	18.6	16.5	19.5	18.9	24.7	22.9	19.6	28.6	19.8
2003 Q2	24.0	21.5	20.6	17.0	19.1	17.9	18.5	16.6	19.6	19.0	24.7	22.9	19.6	28.7	19.9
2003 Q3	23.8	21.5	20.9	17.0	19.1	18.2	18.5	16.8	19.7	19.1	24.6	22.9	19.7	29.0	20.0
2003 Q4	23.5	21.6	21.3	17.5	19.0	18.3	18.4	17.1	19.7	19.2	24.4	23.0	19.8	29.3	20.1
2004 Q1	23.5	21.6	21.6	18.1	18.8	18.5	18.4	17.4	19.4	19.3	23.9	23.0	19.9	29.8	20.1
2004 Q2	23.5	21.4	21.6	18.6	18.8	18.7	18.5	17.6	19.3	19.4	23.7	23.1	20.0	30.0	20.2
2004 Q3	23.7	21.4	21.4	18.9	18.9	18.8	18.7	17.7	19.4	19.5	23.4	23.2	20.0	30.0	20.3
2004 Q4	24.0	21.3	21.0	18.9	19.0	18.9	18.9	17.7	19.5	19.5	23.3	23.2	20.0	30.0	20.3
2005 Q1	24.0	21.4	20.6	18.4	19.2	18.8	19.1	17.7	20.0	19.5	23.5	23.4	20.1	29.9	20.3
2005 Q2	23.8	21.6	20.4	18.0	19.5	18.7	19.0	17.7	20.5	19.6	23.4	23.4	20.1	29.8	20.3
2005 Q3	23.7	21.5	20.5	17.9	19.6	18.6	19.0	17.7	20.7	19.6	23.2	23.5	20.1	29.7	20.3
2005 Q4	23.7	21.5	20.7	17.9	19.8	18.3	19.1	17.6	20.8	19.6	23.3	23.5	20.1	29.5	20.4
2006 Q1 ⁵	23.7	21.3	20.7	18.3	19.8	18.2	19.1	17.4	20.7	19.6	23.3	23.6	20.1	29.4	20.3
2006 Q2 ⁵	23.8	21.1	20.7	18.5	19.8	18.1	19.3	17.3	20.4	19.5	23.3	23.6	20.0	29.2	20.3
2006 Q3 ⁵	23.8	21.1	20.3	18.5	19.8	17.9	19.3	17.2	20.3	19.4	23.7	23.6	20.0	29.1	20.2
Percentage point change on latest year															
	0.1	-0.4	-0.2	0.6	0.1	-0.7	0.3	-0.4	-0.4	-0.1	0.5	0.1	-0.1	-0.6	-0.1

Table 2
Comparison between Scottish Executive¹ and ONS PSE estimates

Scotland		
Average of four quarters to: ²	Difference: ONS minus SE estimates of PSE	
	PSE levels (thousands)	PSE levels (percentage difference)
1999 Q4	-2	-0.5
2000 Q1	2	0.3
2000 Q2	2	0.4
2000 Q3	3	0.6
2000 Q4	4	0.8
2001 Q1	4	0.7
2001 Q2	4	0.8
2001 Q3	7	1.3
2001 Q4	11	2.0
2002 Q1	14	2.6
2002 Q2	15	2.8
2002 Q3	14	2.7
2002 Q4	13	2.4
2003 Q1	15	2.7
2003 Q2	17	3.1
2003 Q3	19	3.4
2003 Q4	20	3.5
2004 Q1	16	2.8
2004 Q2	16	2.8
2004 Q3	15	2.6
2004 Q4	11	1.9
2005 Q1	10	1.8
2005 Q2	9	1.6
2005 Q3	7	1.1
2005 Q4	4	0.7
2006 Q1 ³	-1	-0.1
2006 Q2 ³	-6	-1.0
2006 Q3 ³	-9	-1.5

Notes:

1 Public sector employment estimates for Scotland are published by the Scottish Executive on a quarterly basis back to Q1 1999 from administrative records and surveys of individual public sector organisations in Scotland.

2 Rolling four-quarterly averages are based on estimates over the quarters March (Q1), June (Q2), September (Q3) and December (Q4). For example, the Q4 1999 estimate is an average taken for the quarters Q1 to Q4 1999.

3 Estimates for these quarters have been produced using calendar quarterly LFS microdata to obtain regional splits (see section 'Use of LFS data for analysis of public sector employment').

Sources: Labour Force Survey, returns from public sector organisations (ONS, Scottish Executive)