FEATURE

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The impact of Labour Force Survey and Annual Population Survey reweighting

SUMMARY

Rewighted Labour Force Survey (LFS) and Annual Population Survey (APS) microdata were published by the Office for National Statistics (ONS) in May 2008. The underlying weighting methodology and the statistical tool used for weighting the LFS were also changed for the reweighting programme and for subsequent LFS weighting (although not for the APS, as this already used the new methodology and tool).

This article outlines the background to the LFS and APS reweighting programme, briefly describes the changes to the weighting tool and methodology in the LFS, and presents some results of the impact of reweighting on population estimates at unitary authority/local authority district level, using APS microdata.

On 14 May 2008, reweighted Labour Force Survey (LFS) and Annual Population Survey (APS) microdata were published by the Office for National Statistics (ONS). The reweighted LFS and APS microdata are weighted to population estimates which are based on mid-year estimates up to 2006, in line with the revised 2001 Census data released in late 2003, and the projections from the mid-year estimates. The datasets they replaced had been weighted to population estimates which were based on mid-year estimates up to 2003, in line with 2001 Census data released in early 2003, and the projections from the mid-year estimates. Analysis of the reweighted microdata produces aggregates at the UK level which, by 2007, are approximately 800,000 above the estimates produced from the unweighted microdata for the 16+ population (900,000 for the total population). However, due to the interim reweighting which ONS carries out to adjust aggregate LFS data to the latest population estimates prior to publication, the reweighting has not resulted in any change to the published aggregates. It is only when LFS and APS microdata are used to generate aggregates (which have not been interim reweighted), that the changes in population estimates due to reweighting become apparent.

When analysis is conducted at lower levels of geography, for example, unitary authority (UA)/local authority district (LAD) level, the largest changes, as may be expected, can be seen for estimates for UA/LADs that experienced the largest

revisions to their population totals with reweighting. The differences are greatest for estimates of levels, that is, the actual number of people in a particular subpopulation. There has been less of an impact on rates and proportions (as revisions to population estimates produced changes in the numerator and denominator for these calculations). Differences may also be larger where the underlying base numbers in a particular subgroup are small, reflecting the larger sampling error for such estimates. Another factor to be aware of is that the underlying weighting methodology and the statistical tool used for weighting the LFS were changed for the reweighting programme and subsequent LFS weighting (but not the APS, as the APS already used the new methodology and tool). The changes to the LFS weighting methodology and tool are outlined in **Box 1**.

Use of APS microdata

The APS is a continuous survey of households in the United Kingdom, which is produced quarterly and contains annual data. Each dataset (known as a quarterly rolling annual dataset) consists of wave one and wave five of the quarterly LFS, and additional boost cases in England, Wales and Scotland, which are added to ensure that a minimum of 875 interviews are conducted with economically active people in each local education authority. Each APS dataset contains approximately 170,000 households and 360,000 individuals. The primary purpose of the APS is to provide estimates for labour market and socio-

Box 1

Methodological improvements to LFS weighting

The methodology for weighting LFS data was changed for the reweighting exercise from raking ratio estimation to calibration weighting within a generalised regression (GREG) framework, using the Statistics Canada Generalised Estimation System. The raking ratio method of weighting entailed using multistage iterative weighting in which the design-weighted sample was raked to known population totals. Each stage of the procedure corrected for a different cause of LFS non-response. Stage one corrected for non-response at local authority level. Stage two corrected for non-response by age-group and sex. Stage three corrected for non-response by region, age group and sex. The weights were deemed to have converged according to any of three separate criteria. The first was that the weighted sample met the set constraints within a specified tolerance. The second was that consecutive iterations did not differ by more than a given tolerance. The third was that a preset number of iterations had been completed. The advantage of the old methodology was that weights were always positive when given positive constraints, but the disadvantages were that the methodology was not supported by mature theory, although convergence appeared to be practically assured. Also, definitive variance estimates could not be produced (although assumptions were

made in order to produce variance estimates), and there was no control over the variance within the assumed model. Full details of the three-stage iterative weighting procedure can be found in the LFS User Guide Volume 1, Section 10.¹

The new LFS weighting tool, and the methodology it uses, carry out calibration weighting in a single process to the same population groups as the old weighting, and are both more efficient and statistically robust. The tool also facilitates the identification and correction of data quality issues. The new weighting methodology has a number of advantages over the old one in terms of a well-developed theoretical base and the capacity to produce good variance estimates, and parameters within GREG allow for modelling of the variance within the assumed model. The new methodology was not expected to result in much change to LFS estimates at higher levels of geography, due to the large sample size, although it was expected that there were likely to be some changes within small domains, for example, when examining gender or ethnicity at UA/LAD level. However, while the LFS provides robust estimates at UK level, the APS, which also uses the GREG framework, is the preferred source for analysis at subnational level.

economic analyses at subnational level, and the APS is the recommended source of statistical information for analysis at UA/LAD level. Some analysis has been conducted of the change in population estimates at UA/LAD level as a result of reweighting the APS, using January to December 2006 APS microdata. The changes observed are reported below.

Change in APS population estimates following reweighting

The data reported have been generated from a comparison of estimates by UA/LAD using un-reweighted APS data and reweighted APS data, using January to December 2006 APS microdata. Data are provided on the percentage change in the estimates for people aged 16+ in the population and in employment for the total 16+ population and the UK born and non-UK born population subgroups (note that non-UK born include those from the Republic of Ireland, and that Northern Ireland is included as a single UA/LAD in the analysis). Most of the data included in the analysis meet the ONS criteria for statistical robustness, as outlined in **Box 2**. The exceptions to this rule are for estimates of non-UK born population and employment in some UA/LADs, due to the small sample sizes of this subgroup at this level of analysis.

Figure 1 shows the percentage change in the population aged 16+ at UA/LAD

level as a result of reweighting, for the total population and for UK born and non-UK born population subgroups. While the changes due to reweighting range between +22 and –6 per cent, most of the UA/LADs experienced a change within the range +5 to –5 per cent for the total population and for the UK born and non-UK born subgroups.

Figure 2 shows the banded percentage change in the 16+ population at UA/LAD level for the total population. As a result of reweighting, the majority (68.2 per cent) of UA/LADs experienced an increase in the 16+ population of between 0 and 5 per cent, a further 5.5 per cent experienced an increase of between 5 and 10 per cent, and 24.4 per cent experienced a decrease of between 0 and 5 per cent.

Figure 3 shows the banded percentage change in the 16+ population at UA/LAD level for the UK born population. The results are similar to those produced for the total population, with 67.2 per cent of UA/LADs experiencing an increase of between 0 and 5 per cent, a further 5.5 per cent experiencing an increase of between 5 and 10 per cent, and 25.9 per cent of UA/LADs experiencing a decrease of between 0 and 5 per cent.

Figure 4 shows the banded percentage change in the 16+ population at UA/LAD level for the non-UK born population. The percentage of UA/LADs experiencing an increase of between 0 and 5 per cent for the non-UK born 16+ population (61.7 per cent) was lower than for the UK born population, but was still the most common

Box 2

Sampling variability

As is the case with all sample surveys, estimates from the APS are subject to sampling variability. The larger the population whose size is being estimated, the more precise the estimate is (that is, the higher the quality), and vice versa. One estimate of the variability of the estimates from all possible samples is the coefficient of variation (CV). The CV provides a measure of dispersion, and a higher CV indicates greater dispersion (or margin of error). As the CV increases, the estimate itself becomes less reliable, and vice-versa. ONS publishes and categorises all APS estimates according to their statistical robustness, which are shown below.

0≤CV<5	Estimates are considered precise
5≤CV<10	Estimates are considered reasonably precise
10≤CV<20	Estimates are considered acceptable
CV≥20	Estimates are considered too unreliable for practical purposes

Figure 1
Percentage change in 16+ population due to reweighting: by unitary authority/local authority district

Figure 2
Percentage change in total 16+ population due to reweighting

Figure 3
Percentage change in UK born 16+ population due to reweighting

Figure 4
Percentage change in non-UK born 16+ population due to reweighting

change. Consequently, the percentage of UA/LADs with an increase of between 5 and 10 per cent was higher (10.4 per cent), while 21.9 per cent experienced a decrease of between 0 and 5 per cent, as a result of reweighting.

Figure 5 shows the percentage change in employment levels at UA/LAD level as a result of reweighting, for the total population and for UK born and non-UK born subgroups. While the range of the percentage change in employment levels varies between +23 and -6 per cent, the majority of UA/LADs experienced a change of between +5 and -5 per cent.

Figure 6 shows the banded percentage change in employment levels at UA/LAD level for the total population. While 62.7 per cent of UA/LADs experienced an increase of between 0 and 5 per cent, a further 10.4 per cent experienced an increase of between 5 and 10 per cent, and 21.9 per cent experienced a decrease of between 0 and 5 per cent, as a result of reweighting.

Figure 7 shows the banded percentage change in employment levels at UA/LAD level for the UK born population. The data are very similar to that for the total population, with 62.7 per cent of UA/LADs experiencing an increase of between 0 and 5 per cent, a further 8.5 per cent experiencing an increase of between 5 and 10 per cent, and 22.4 per cent experiencing a decrease of between 0 and -5 per cent.

Figure 8 shows the banded percentage change in employment levels at UA/LAD level for the non-UK born population. Reweighting resulted in an increase in employment levels of between 0 and 5 per cent for 52.2 per cent of UA/LADs, an increase of between 5 and 10 per cent for a further 14.4 per cent, and a reduction of between 0 and 5 per cent for 24.9 per cent of UA/LADs.

Conclusion

The LFS and APS reweighting programme that was conducted between 2007 and early 2008 culminated in the release by ONS of reweighted LFS and APS microdata on 14 May 2008, bringing LFS microdata in line with published LFS aggregates. This article has outlined the background to the reweighting programme, the changes to the weighting methodology and tool used for LFS weighting, and the impact of reweighting on population estimates at UA/LAD level using APS microdata. Analysis of APS microdata, which is the recommended source for estimates at UA/LAD level, revealed that the majority of UA/LADs experienced a change of

Figure 5
Percentage change in employment levels due to reweighting: by unitary authority/local authority district

Figure 6
Percentage change in total population employment levels due to reweighting

Figure 7
Percentage change in UK born population employment levels due to reweighting

Figure 8
Percentage change in non-UK born population employment levels due to reweighting

between +5 and -5 per cent in the 16+ population and employment levels, for the total population and for the UK born and non-UK born population subgroups. ONS is currently planning the next LFS and APS reweighting programme, and full details will be announced when the plans have been finalised.

Notes

- 1 See www.statistics.gov.uk/statbase/product.asp?vlnk=1537

CONTACT

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APPENDIX

Table A1

Annual Population Survey, UK 16+ population and employment levels: by unitary authority/local authority district, January to December 2006

							Numbers and percentages	
Local authority	Unreweighted (PWT03)			Reweighted (PWT07)			Difference in 16+ population (per cent)	Difference in employment levels (per cent)
	16+ population	Employment levels	Coefficient of variation	16+ population	Employment levels	Coefficient of variation		
Westminster	171,166	95,495	7.80	209,257	117,543	7.77	22.25	23.09
Manchester	309,115	169,415	5.46	362,108	202,708	5.40	17.14	19.65
Southwark	190,991	109,901	8.23	216,925	128,503	8.11	13.58	16.93
Camden	167,985	99,403	7.68	185,837	112,700	7.59	10.63	13.38
Bristol, City of UA	313,008	194,371	5.69	338,956	213,741	5.65	8.29	9.97
Nottingham UA	219,232	116,158	5.56	236,199	128,652	5.48	7.74	10.76
Kingston Upon Hull, City of UA	193,103	101,882	5.87	206,292	111,643	5.80	6.83	9.58
Middlesbrough UA	101,978	55,083	5.52	108,644	59,104	5.50	6.54	7.30
Lambeth	205,478	115,776	8.41	218,025	128,280	8.23	6.11	10.80
North Somerset UA	152,993	96,353	5.28	161,954	101,601	5.29	5.86	5.45
Stockton-on-Tees UA	139,882	82,964	5.73	147,649	87,641	5.72	5.55	5.64
Southampton UA	178,477	104,104	5.74	188,202	112,660	5.67	5.45	8.22
Wandsworth	222,116	137,777	8.42	234,126	150,088	8.28	5.41	8.94
Islington	143,101	84,440	7.90	150,631	92,026	7.76	5.26	8.98
Newcastle Upon Tyne	205,877	110,654	5.49	216,645	116,659	5.48	5.23	5.43
York UA	151,599	95,170	5.49	159,169	101,893	5.43	4.99	7.06
Derby UA	179,653	101,585	5.43	188,589	106,841	5.42	4.97	5.17
North East Lincolnshire UA	119,358	67,924	5.71	124,922	72,485	5.65	4.66	6.71
Halton UA	89,618	50,285	5.74	93,759	52,762	5.73	4.62	4.93
Edinburgh, City of	370,529	231,725	5.41	387,317	242,747	5.41	4.53	4.76
Eilean Siar, Orkney & Shetland	52,334	33,607	6.34	54,704	35,354	6.32	4.53	5.20
Highland	164,882	103,311	6.10	172,315	109,054	6.07	4.51	5.56
North Lincolnshire UA	121,018	71,345	5.81	126,456	75,433	5.78	4.49	5.73
Leeds	578,830	368,652	4.52	604,732	387,638	4.51	4.47	5.15
Newport	105,371	61,013	5.36	109,775	63,856	5.35	4.18	4.66
Aberdeen City	164,822	108,760	5.52	171,281	115,060	5.48	3.92	5.79
Knowsley	114,203	61,661	5.29	118,622	64,085	5.29	3.87	3.93
Hounslow	165,768	106,174	7.38	172,136	110,546	7.37	3.84	4.12
Salford	167,862	96,405	5.08	174,241	101,146	5.05	3.80	4.92
Bradford	367,946	208,060	5.74	381,433	215,996	5.74	3.67	3.81
Tower Hamlets	162,241	74,707	8.58	168,182	81,477	8.36	3.66	9.06
Perth and Kinross	108,147	65,319	4.94	112,107	68,545	4.91	3.66	4.94
Cardiff	245,789	138,148	5.51	254,699	145,117	5.47	3.63	5.04
Gwynedd	91,725	51,618	5.36	94,954	53,307	5.37	3.52	3.27
Merthyr Tydfil	42,751	21,042	7.71	44,229	21,830	7.69	3.46	3.74
Kensington and Chelsea	144,747	82,194	8.24	149,709	84,003	8.29	3.43	2.20
Plymouth UA	191,484	111,021	5.76	198,017	116,228	5.73	3.41	4.69
Anglesey, Isle of	53,682	28,418	6.15	55,484	29,048	6.18	3.36	2.22
Brent	205,057	116,327	8.98	211,891	121,297	8.94	3.33	4.27
North Tyneside	155,110	89,998	5.50	160,210	93,747	5.48	3.29	4.17
Bridgend	102,184	55,764	5.48	105,542	57,768	5.47	3.29	3.59
Neath Port Talbot	106,880	53,773	5.39	110,392	55,914	5.37	3.29	3.98
Carmarthenshire	138,372	73,220	5.38	142,871	75,447	5.38	3.25	3.04
Rhondda, Cynon, Taff	179,950	96,786	5.55	185,742	100,817	5.52	3.22	4.16
Dundee City	112,994	62,356	5.28	116,627	65,752	5.22	3.22	5.45
Sandwell	215,011	115,186	5.71	221,902	119,540	5.69	3.20	3.78
Durham	389,259	220,538	5.42	401,475	228,701	5.40	3.14	3.70
Glasgow City	461,816	247,528	5.47	476,123	253,440	5.49	3.10	2.39
Northamptonshire	507,586	335,831	4.74	523,134	349,217	4.72	3.06	3.99
Birmingham	749,977	391,955	4.61	772,947	405,252	4.60	3.06	3.39

Table A1 continued

Local authority	Numbers and percentages							
	Unweighted (PWT03)			Reweighted (PWT07)			Difference in 16+ population (per cent)	Difference in employment levels (per cent)
	16+ population	Employment levels	Coefficient of variation	16+ population	Employment levels	Coefficient of variation		
Peterborough UA	121,918	76,306	5.48	125,584	79,270	5.46	3.01	3.88
Hartlepool UA	70,399	36,279	5.69	72,511	37,452	5.68	3.00	3.23
Calderdale	150,520	91,731	5.70	154,974	94,647	5.70	2.96	3.18
Portsmouth UA	150,729	96,314	5.67	155,167	99,762	5.65	2.94	3.58
Sheffield	409,092	223,909	5.61	421,042	230,837	5.60	2.92	3.09
Bath and North East Somerset UA	139,181	82,710	5.67	143,147	85,152	5.66	2.85	2.95
Powys	102,739	61,313	5.43	105,663	62,279	5.46	2.85	1.58
Barnsley	174,026	94,473	5.59	178,971	97,277	5.58	2.84	2.97
Suffolk	542,946	326,442	4.77	558,056	336,919	4.76	2.78	3.21
Aberdeenshire	181,805	120,831	5.22	186,798	124,564	5.21	2.75	3.09
Nottinghamshire	598,209	357,875	4.51	614,624	370,447	4.49	2.74	3.51
St. Helens	139,402	77,081	5.26	143,191	78,985	5.27	2.72	2.47
Sunderland	220,626	119,646	5.73	226,531	123,819	5.70	2.68	3.49
Clackmannanshire	37,637	21,016	9.17	38,610	22,034	9.07	2.59	4.84
Blaenau Gwent	53,848	27,115	6.91	55,215	27,871	6.90	2.54	2.79
Angus	85,273	53,197	4.91	87,417	54,192	4.93	2.51	1.87
Isle of Wight UA	104,827	58,187	5.45	107,441	60,296	5.42	2.49	3.62
Liverpool	337,432	175,921	5.48	345,826	180,733	5.47	2.49	2.74
Rotherham	198,144	112,297	5.48	202,930	115,054	5.48	2.42	2.46
Darlington UA	77,670	46,074	5.51	79,456	47,153	5.51	2.30	2.34
East Riding of Yorkshire UA	259,338	155,053	5.22	265,206	158,836	5.21	2.26	2.44
Leicester UA	220,145	127,046	5.18	225,051	131,605	5.14	2.23	3.59
Wakefield	252,054	151,718	5.76	257,608	155,325	5.75	2.20	2.38
Waltham Forest	171,007	97,219	8.35	174,775	101,899	8.24	2.20	4.81
Walsall	197,878	102,316	5.96	202,159	104,483	5.96	2.16	2.12
Newham	188,272	93,685	8.07	192,243	98,750	7.95	2.11	5.41
Rutland UA	30,014	18,729	9.08	30,627	18,453	9.24	2.04	-1.47
Swansea	180,595	97,429	5.49	184,211	100,195	5.47	2.00	2.84
Greenwich	169,997	99,829	7.95	173,374	103,071	7.90	1.99	3.25
Coventry	240,767	141,455	5.47	245,500	145,148	5.45	1.97	2.61
Havering	181,390	108,171	7.92	184,925	110,089	7.93	1.95	1.77
Milton Keynes UA	166,305	115,669	5.91	169,541	118,248	5.90	1.95	2.23
Cornwall and The Isles of Scilly	421,281	235,966	5.57	429,450	242,349	5.55	1.94	2.71
Lancashire	910,438	532,665	3.81	928,013	544,142	3.81	1.93	2.15
Lewisham	201,424	124,122	7.77	205,281	128,231	7.71	1.91	3.31
Kent	1,072,446	637,456	3.48	1,092,946	653,552	3.47	1.91	2.53
Merton	156,406	100,443	7.25	159,394	102,611	7.24	1.91	2.16
Devon	585,663	343,177	4.95	596,779	351,811	4.94	1.90	2.52
West Dunbartonshire	72,441	42,729	5.14	73,792	43,162	5.16	1.86	1.01
Blackburn with Darwen UA	102,521	57,117	5.24	104,429	58,559	5.22	1.86	2.52
South Ayrshire	89,648	50,173	5.32	91,291	51,023	5.33	1.83	1.69
Norfolk	664,031	387,677	4.47	676,108	395,308	4.46	1.82	1.97
Wirral	244,005	132,739	6.02	248,202	133,296	6.06	1.72	0.42
Leicestershire	505,369	327,154	4.78	514,043	334,754	4.76	1.72	2.32
Redbridge	193,555	110,572	8.48	196,867	112,569	8.48	1.71	1.81
Doncaster	228,434	124,435	5.71	232,313	126,959	5.70	1.70	2.03
Wigan	240,070	140,064	6.19	244,078	141,938	6.20	1.67	1.34
South Lanarkshire	242,356	150,203	5.39	246,397	151,814	5.40	1.67	1.07
Haringey	178,830	106,660	7.66	181,787	110,517	7.59	1.65	3.62
Essex	1,070,822	650,999	3.58	1,088,049	665,667	3.57	1.61	2.25
Falkirk	117,631	72,372	5.30	119,522	74,456	5.27	1.61	2.88
Torfaen	71,051	38,860	5.40	72,186	39,275	5.41	1.60	1.07
Moray	68,214	41,883	4.73	69,230	43,169	4.69	1.49	3.07
Bedfordshire	314,234	198,910	6.23	318,902	202,349	6.23	1.49	1.73
Redcar and Cleveland UA	109,732	59,851	5.50	111,358	61,009	5.49	1.48	1.93

Table A1 continued

Local authority	Numbers and percentages							
	Unweighted (PWT03)			Reweighted (PWT07)			Difference in 16+ population (per cent)	Difference in employment levels (per cent)
	16+ population	Employment levels	Coefficient of variation	16+ population	Employment levels	Coefficient of variation		
Lincolnshire	544,524	315,647	4.96	552,540	324,785	4.92	1.47	2.90
Wolverhampton	185,404	99,015	5.87	188,084	102,082	5.82	1.45	3.10
Renfrewshire	134,609	82,213	5.29	136,542	83,855	5.28	1.44	2.00
Solihull	160,601	98,698	5.55	162,900	100,116	5.55	1.43	1.44
North Yorkshire	462,901	278,519	5.33	469,292	283,806	5.31	1.38	1.90
Oxfordshire	488,599	329,086	4.86	495,179	332,657	4.87	1.35	1.09
Staffordshire	650,012	397,985	4.68	658,334	404,288	4.68	1.28	1.58
Stoke-on-Trent UA	189,617	104,876	5.61	192,032	106,845	5.59	1.27	1.88
Kingston upon Thames	123,382	80,955	7.46	124,924	81,944	7.46	1.25	1.22
Sutton	143,011	94,935	8.30	144,795	95,635	8.32	1.25	0.74
Cumbria	395,791	232,300	5.73	400,631	235,249	5.73	1.22	1.27
Dumfries and Galloway	118,916	69,940	5.34	120,275	71,991	5.30	1.14	2.93
South Tyneside	119,735	61,181	5.73	121,092	62,281	5.71	1.13	1.80
Gateshead	152,762	85,798	5.34	154,424	86,463	5.35	1.09	0.78
Kirklees	305,765	185,938	5.56	309,089	188,128	5.56	1.09	1.18
Cambridgeshire	466,506	296,730	5.21	471,260	299,542	5.21	1.02	0.95
Windsor and Maidenhead UA	107,142	70,842	5.18	108,208	70,973	5.20	0.99	0.18
Derbyshire	596,463	368,087	4.51	602,337	370,636	4.51	0.98	0.69
Northern Ireland	1,324,363	749,954	2.78	1,337,318	759,237	2.77	0.98	1.24
Inverclyde	65,052	36,959	5.75	65,678	37,208	5.76	0.96	0.67
Tameside	169,234	101,348	5.34	170,856	102,055	5.35	0.96	0.70
North Ayrshire	107,869	59,329	5.31	108,877	59,824	5.32	0.93	0.83
Shropshire	229,395	134,568	5.80	231,486	135,950	5.80	0.91	1.03
Oldham	165,975	95,833	5.72	167,461	96,615	5.72	0.90	0.82
Luton UA	142,548	82,295	5.99	143,775	84,171	5.95	0.86	2.28
Somerset	407,951	237,271	5.90	411,391	240,761	5.88	0.84	1.47
Torbay	105,163	58,011	5.60	106,015	58,878	5.58	0.81	1.49
North Lanarkshire	255,054	149,881	5.30	257,067	152,609	5.27	0.79	1.82
Gloucestershire	459,179	288,198	5.14	462,674	292,069	5.13	0.76	1.34
Fife	287,621	172,994	5.42	289,623	175,403	5.40	0.70	1.39
Sefton	222,249	118,499	5.63	223,766	118,886	5.64	0.68	0.33
Surrey	854,088	552,222	3.82	859,583	556,110	3.82	0.64	0.70
Swindon	147,233	95,938	5.78	148,031	97,651	5.75	0.54	1.79
East Ayrshire	95,232	53,619	5.44	95,715	54,784	5.39	0.51	2.17
Barking and Dagenham	124,812	64,788	8.19	125,442	66,151	8.12	0.50	2.10
Northumberland	250,366	140,915	5.77	251,625	141,495	5.78	0.50	0.41
Cheshire	546,717	334,413	5.07	549,429	336,390	5.06	0.50	0.59
Warwickshire	413,933	261,940	4.90	415,608	263,474	4.90	0.40	0.59
Blackpool UA	110,681	59,278	5.66	111,075	59,324	5.67	0.36	0.08
Bexley	174,155	107,922	7.61	174,770	107,955	7.62	0.35	0.03
Hertfordshire	828,881	529,190	3.84	831,702	531,819	3.84	0.34	0.50
Dudley	240,781	142,078	5.69	241,493	142,332	5.69	0.30	0.18
Trafford	167,543	105,874	5.40	168,030	106,467	5.39	0.29	0.56
Rochdale	159,316	94,444	5.58	159,605	94,534	5.58	0.18	0.10
Scot Borders, The	88,793	52,877	5.38	88,908	54,036	5.33	0.13	2.19
Worcestershire	443,846	282,141	5.15	444,254	284,932	5.13	0.09	0.99
Enfield	217,648	133,619	7.96	217,698	134,564	7.93	0.02	0.71
Bolton	208,193	120,790	5.61	208,085	120,350	5.62	-0.05	-0.36
Pembrokeshire	93,288	51,767	5.47	93,223	51,277	5.50	-0.07	-0.95
Bury	144,273	86,003	5.54	144,138	85,512	5.55	-0.09	-0.57
Flintshire	120,464	76,560	5.21	120,200	75,835	5.23	-0.22	-0.95
Stirling	69,980	42,250	6.03	69,782	41,888	6.05	-0.28	-0.86
Wrexham	104,985	62,498	5.74	104,642	62,443	5.73	-0.33	-0.09
Argyll & Bute	72,290	43,471	5.41	72,049	43,917	5.37	-0.33	1.03
South Gloucestershire UA	199,160	136,514	5.18	198,303	136,643	5.17	-0.43	0.09

Table A1 continued

							Numbers and percentages	
Local authority	Unweighted (PWT03)			Reweighted (PWT07)			Difference in 16+ population (per cent)	Difference in employment levels (per cent)
	16+ population	Employment levels	Coefficient of variation	16+ population	Employment levels	Coefficient of variation		
Wiltshire	350,511	226,045	5.92	348,862	224,711	5.93	-0.47	-0.59
Monmouthshire	70,196	42,797	5.50	69,856	42,128	5.53	-0.48	-1.56
West Berkshire UA	119,317	81,299	5.71	118,662	80,068	5.74	-0.55	-1.51
East Sussex	406,254	232,619	5.67	403,681	230,221	5.68	-0.63	-1.03
Ealing	242,686	151,943	7.23	240,531	149,698	7.25	-0.89	-1.48
Medway UA	194,804	124,150	5.57	192,905	123,835	5.55	-0.97	-0.25
Warrington UA	155,038	97,223	5.35	153,507	96,610	5.34	-0.99	-0.63
Conwy	90,382	47,872	5.45	89,462	47,396	5.44	-1.02	-0.99
Bromley	241,939	147,726	7.57	239,111	146,168	7.57	-1.17	-1.05
West Sussex	621,457	374,099	4.45	613,848	368,824	4.46	-1.22	-1.41
Buckinghamshire	395,429	254,434	5.52	390,258	249,499	5.54	-1.31	-1.94
Dorset	334,867	191,979	5.96	330,487	185,651	6.02	-1.31	-3.30
Hillingdon	201,241	122,339	7.77	198,552	118,266	7.85	-1.34	-3.33
Hampshire	1,022,070	664,776	3.37	1,007,801	652,867	3.38	-1.40	-1.79
Caerphilly	137,135	76,155	5.43	135,218	75,181	5.42	-1.40	-1.28
Stockport	227,543	145,452	5.64	224,265	143,054	5.65	-1.44	-1.65
Brighton and Hove UA	210,967	130,570	5.28	207,705	129,207	5.27	-1.55	-1.04
Hackney	161,056	85,081	8.02	158,437	84,468	7.98	-1.63	-0.72
Herefordshire, County of UA	148,175	90,014	5.42	145,532	88,855	5.40	-1.78	-1.29
Harrow	176,808	108,423	8.17	173,595	105,153	8.22	-1.82	-3.02
Thurrock UA	117,581	73,431	5.65	115,434	72,855	5.62	-1.83	-0.78
Reading UA	116,990	80,229	5.54	114,676	79,573	5.51	-1.98	-0.82
Telford and Wrekin	128,165	79,346	5.94	125,604	78,251	5.92	-2.00	-1.38
East Lothian	74,877	46,862	5.32	73,351	45,444	5.35	-2.04	-3.03
Croydon	271,900	170,161	7.23	266,315	165,881	7.25	-2.05	-2.52
Wokingham UA	123,624	84,521	5.30	121,033	82,961	5.29	-2.10	-1.85
West Lothian	133,045	87,861	5.45	130,047	84,977	5.48	-2.25	-3.28
Slough UA	95,390	60,921	5.33	93,055	60,027	5.30	-2.45	-1.47
Barnet	276,289	164,287	7.89	268,414	154,786	8.01	-2.85	-5.78
East Dunbartonshire	87,067	55,751	4.91	84,541	54,145	4.91	-2.90	-2.88
Denbighshire	78,816	42,868	5.90	76,512	41,537	5.91	-2.92	-3.10
Bracknell Forest UA	90,620	63,514	5.04	87,916	61,418	5.05	-2.98	-3.30
Vale of Glamorgan, The	100,037	58,549	5.48	97,019	56,866	5.48	-3.02	-2.87
Southend-on-Sea UA	129,509	78,490	5.49	125,585	75,143	5.53	-3.03	-4.26
Midlothian	64,627	42,414	6.14	62,644	40,296	6.20	-3.07	-4.99
Bournemouth UA	133,099	78,763	5.44	128,175	76,622	5.41	-3.70	-2.72
Richmond upon Thames	149,716	98,784	7.05	143,862	94,228	7.08	-3.91	-4.61
Hammersmith and Fulham	146,477	91,987	7.42	140,313	88,700	7.39	-4.21	-3.57
Ceredigion	67,603	34,879	6.02	64,459	32,880	6.05	-4.65	-5.73
East Renfrewshire	73,785	46,135	5.52	70,292	43,393	5.55	-4.73	-5.94
Poole UA	113,947	68,889	5.48	108,315	64,628	5.52	-4.94	-6.19
Total	47,452,934	28,277,079		48,257,081	28,849,553		1.69	2.02

Note:

1 Key data for UK born and non-UK born population subgroups are available on request.