

Household Analysis Review Group (HARG)

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The Census and Household Estimates and Projections

1. Purpose

In this paper, we will discuss the household and communal establishment data that has been published from Scotland's Census 2011, and compare it to previously published household estimates and projections. This paper will form the basis of the 'reconciliation report' that will be published alongside the 2012 household estimates.

2. Household Estimates

Household estimates for Scotland are produced from local authority council tax records. Households are considered to be those dwellings for which council tax is paid, or which are entitled to occupied exemptions. The number of occupied dwellings is adjusted from September (when the extract is taken) to 30 June to produce mid-year estimates in line with the population estimates. In order to improve comparability, the household estimate for each local authority is adjusted by the difference between the number of households recorded in the 2001 Census and the 2001 council tax figures and the same adjustment applied to each year's figures, including those for 2011 (which were published before the 2011 Census results were published).

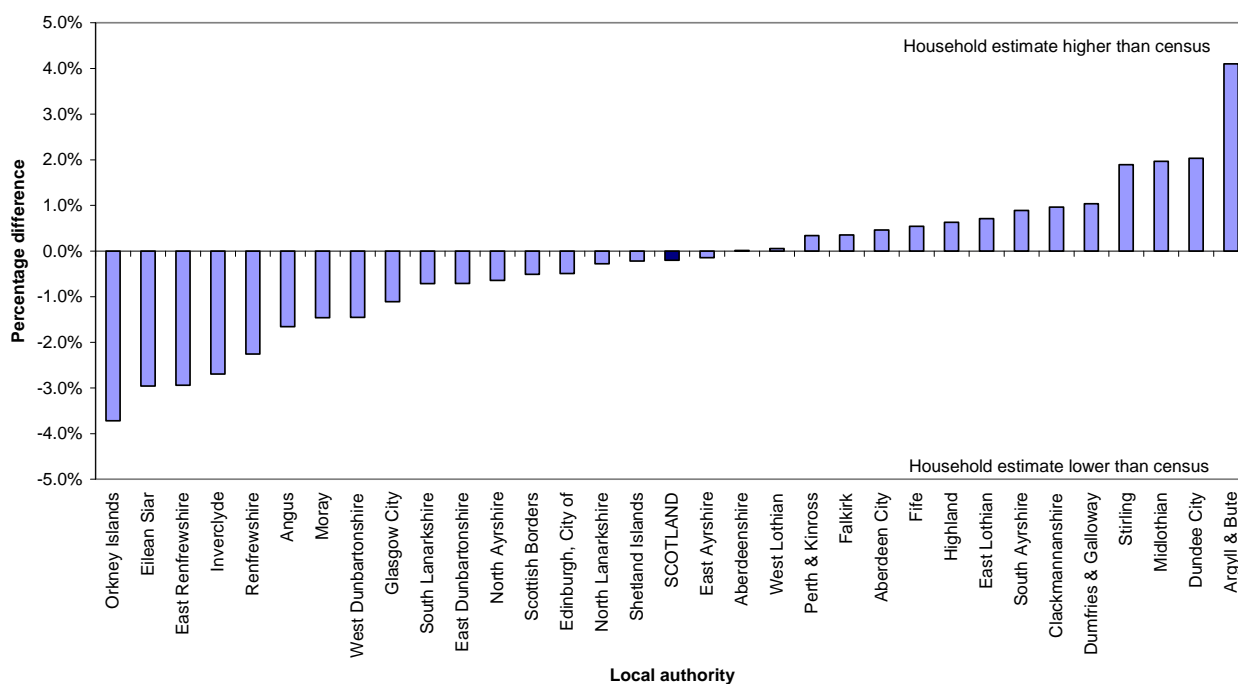
2.1 Scotland

The 2011 census-day estimate of the number of households in Scotland is 2,372,780. In comparison, the 2011 mid-year (June) household estimate is 2,368,034 households, 4,750 households (0.2 per cent) below the census estimate.

2.2 Local Authorities

[Table 1](#) (Annex A) compares the 2011 census-day estimate and the 2011 mid-year household estimate for each local authority. The mid-year estimates range from between 3.7 per cent below the census day estimate in the Orkney Islands to 4.1 per cent above in Argyll and Bute. The majority of local authority mid-year estimates (19 authorities) are within 1 per cent of the census day estimates.

Figure 1: Difference Between the Mid-Year Household Estimate and the Census Day Estimate For 2011



2.3 Explaining the differences between the 2011 household estimates and census figures

From work done as part of census quality assurance, differences between the published household estimates and the 2011 Census were largely thought to be due to:

- some occupied dwellings being shared by more than one household. Each household is counted separately by the census, but together in council tax data;
- certain types of communal establishments, such as groups of separate student flats contained within the same building, being included in the count of occupied dwellings from council tax systems but being counted as communal establishments (i.e. not as households) in the census;
- not all data on the council tax system being up-to-date. For example, due to the council not being notified immediately of changes in circumstances or demolitions/new builds;
- differences in the definition of vacant dwellings, holiday lets and caravans between the census and council tax;
- adjustments that are sometimes made to council tax data to account for exemptions not yet in place at the time of the return. (For example, adjusting for occupied exemptions for students if their applications for exemptions were not yet registered). The adjustments attempt to make the data more robust, however they may not correspond exactly to census counts.

In the 2011 Census quality assurance process, we also looked at differences between the household estimates and census household numbers at data zone level, however, data zone level figures from the census will not be published until a later release. An extended reconciliation report will be published following the release of this data.

3. Household Projections

The household projections for 2011 are controlled to the 2011 household estimates, therefore the comparison of overall household numbers is the same as already described for the household estimates. Additional information is available from the household projections on household size and the communal establishment population. This section compares this information to the information published in the 2011 Census.

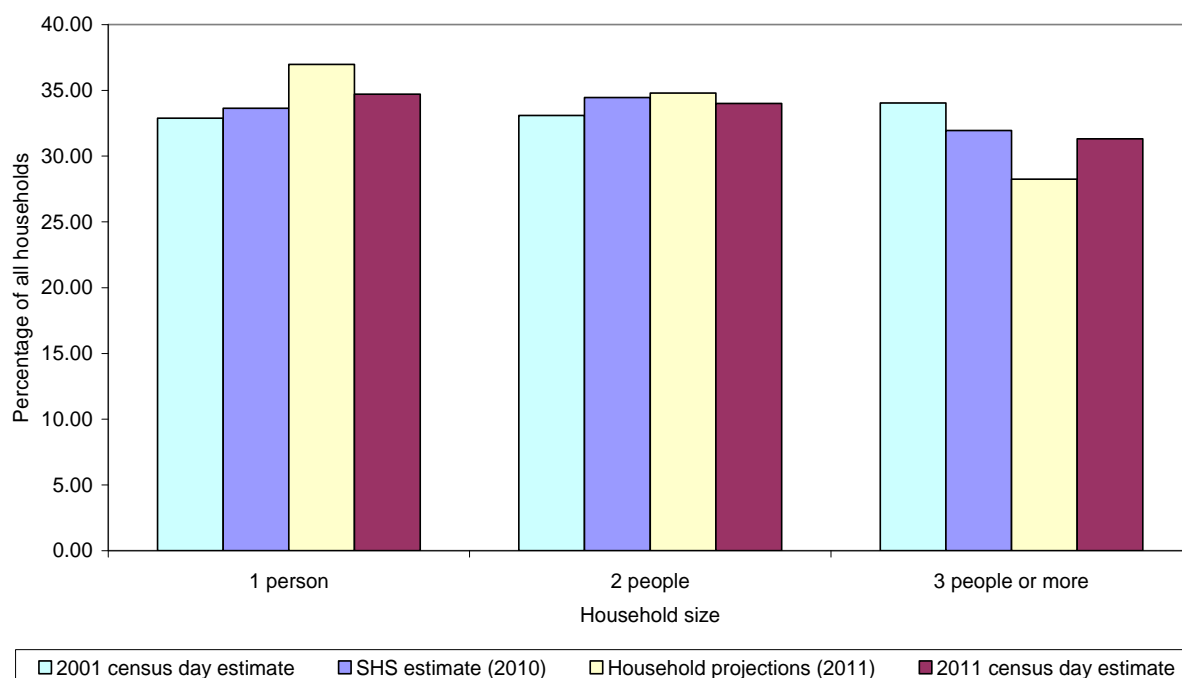
3.1 Household Size

Scotland's Census 2011 Release 1B contained information about the number of people in each household, from one-person households to households containing five or more people. These household sizes do not completely correspond to the household types used in the household projections, but three common household sizes can be distinguished; one-, two- and three-or-more-person households. These can also be compared to the estimates of households by household type published with the household estimates and which are based on Scottish Household Survey data (the latest data is for 2010).

3.1.1 Scotland

A comparison of the proportions of households in each household type from the three data sources can be seen in [Figure 2](#), along with the equivalent data from the 2001 Census. Previous comparison of the household projections and SHS-based estimates has suggested that the projections may have been over-estimating the increases in smaller households (one- and two-person households) and the decreases in large households. We believe that this is because since 2001, and particularly since the start of the economic downturn in 2007, fewer people have been choosing to live alone or in small households, particularly amongst young adults, than would have been predicted from the changes between 1991 and 2001. This has resulted in there being fewer smaller households and more large adult households reported in the SHS, for example because young people are choosing to stay at home or live in shared households of three or more people.

Figure 2: Comparison of different estimates of the distribution of household sizes in Scotland



Comparison with the 2011 Census data confirms this:

- In the 2011 Census, there are a larger proportion of households that contain only one person than in the SHS-based estimates, but the census proportion is closer to the SHS-based estimate than the household projection proportion (which is much higher).
- The proportion of two-person households is similar across all three data sources. Both the SHS-based estimate and household projections proportion are higher than that in the census, but the proportions are all within one percentage point of each other.
- The proportion of households containing three or more people is much lower in the household projections than either the SHS-based estimates or the census day estimate. The census day estimate is slightly lower than the SHS-based estimate.

3.1.2 Local Authorities

Table 2 (Annex A) compares the proportion of households in each household type for the census day estimates and household projections for each local authority in 2011. At local authority level, SHS-based estimates have previously been shown to have a lot of year on year variation so are not considered reliable (Paper 5 HARG 2012 (5)). In almost all local authorities, the household projections overestimated the number of one- and two-person households. The number of three-or-more-person households was underestimated in all local authorities. The reasons for this are likely to be the same as those described for Scotland in 3.1.1.

3.2 Communal Establishments

Communal establishment estimates are produced as part of the household projections. The proportion of the total population that are resident in communal establishments, by age and gender, is used to estimate the private household population for the projections. The latest communal establishment estimates from the household projections are currently for 2010. The total number of communal

establishment residents in each local authority can be compared to the 2011 Census estimates for each area. [Table 3](#) (Annex A) presents this data.

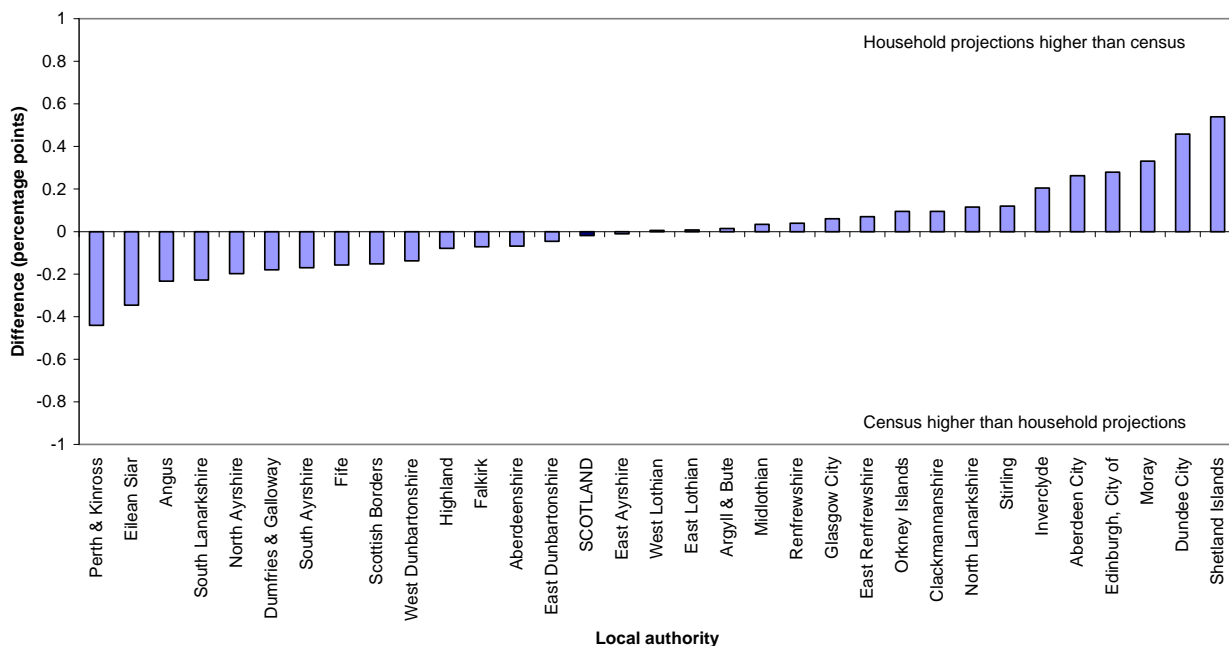
Scotland

In 2010, we estimated that there were 98,230 communal establishment residents in Scotland, while in 2011, the Census estimated that there were 99,000 (a difference of less than 1%). We have seen continuous growth in the number of communal establishment residents in Scotland between each year for which we have produced these estimates. Therefore, it would be expected that the 2011 Census figure is higher than a 2010 estimate. Another way of comparing the figures is to compare the proportion of the total population that is resident in a communal establishment. This takes into account the fact that the total population is also increasing year-on-year and is the same type of rate that is used in calculating of the household projections. In both the 2010 household projection and the 2011 Census, the proportion of the Scottish population that is resident in a communal establishment is 1.9%.

Local Authorities

Table 3 (Annex A) shows the total population, number of communal establishment residents and the proportion of the population that is resident in a communal establishment for each local authority. Figure 3 shows the percentage point difference in the proportion of the population in communal establishments between the 2010-based household projection estimate and the 2011 Census. For just over half of local authorities (17) the proportion of the population that is resident in communal establishments is higher in the 2010-based household projections than in the 2011 Census. In the remaining local authorities, the proportion in the 2010-based household projections is lower. The percentage point differences range between -0.4 in Perth & Kinross and 0.5 in Dundee City and Shetland Islands. Seventeen local authorities had proportions from the Census and the household projections within 0.1 percentage point of each other.

Figure 3: Comparison of the proportion of the population in communal establishments between the 2010-based household projections and the 2011 Census



Explaining the differences between the communal establishment estimates and census figures

Overall, the proportion of the total population that is resident in communal establishments is close to the 2010 estimates produced for the household projections, both for Scotland and its local authorities. Some of the difference will be attributable to the data referring to different years. It is communal establishment rates, rather than the absolute number of communal establishment residents, which is used in the household projections.

In the census quality assurance process, we also looked at differences between the type of communal establishment the residents were living in; however this data will not be published until late summer 2013 (Scotland's Census 2011, Release 2). An extended reconciliation report will be published following the release of this data.

4. Conclusion

Overall, the Census results and the household estimates and projections are comparable. The greatest difference from the Census data is the projections of household type. The 2011 Census results suggest that between 2001 and 2011, the change in the types of households that people live in were not as great as between the 1991 and 2001 Censuses. This is likely to be because the current economic downturn has affected the choices that individuals are making about the type of household that they are living in.

5. Next Steps

- Produce a reconciliation report based on this HARG paper, to be released with the 2012 household estimates.
- Extend this reconciliation report following later census releases. This report should contain additional comparisons of data zone household estimates, communal establishment data on type of establishment and possibly further comparisons of the household projections with census data, for example, the age of head of households. Ultimately, we would also like to produce direct comparisons of the headship rates themselves, but we do not yet know when this data will become available.

5.1 Household Estimates

- Develop and implement a methodology for adjusting the household estimates (2001 to 2012) to take account of the 2011 Census results. This is discussed further in the paper Paper 2 HARG 2013(2).

5.2 Household Projections

- Compare the 2011 communal establishment estimates from the household projections to the Census data, once the 2011 data collection is complete and census data on the type of establishment is published.
- Revise the household projections methodology to take account of 2011 Census data. This is discussed further in paper Paper 2 HARG 2013(2).

- The comparison of household types suggest that the SHS-based proportions were closer to reality than the household projections based on 1991 and 2001 Census headship rates. This suggests that it is worth continuing to monitor the difference between the survey data and the household projections as new household projections are produced. When incorporating survey data was investigated in 2012, it was found that incorporating this data did not improve the quality of the projections. This was thought to be because the adjustment couldn't be made at local authority level. At the end of 2013, the first set of data from the Scottish Pooled Survey Data will be published. This collects data for 20 core harmonised questions from the Scottish Household Survey, the Scottish Crime and Justice Survey and the Scottish Health Survey in a common format that allows the data to be considered together. A household relationship question forms part of this dataset and the increased the sample size may mean that the quality of the local authority data improves. At least two years' data from the Scottish Pooled Survey Data would need to be available to assess the year-on-year consistency. How this data could be incorporated is discussed further in the paper Paper2 HARG 2013(2).

Note:

We would welcome HARG members' views on the analysis given in this paper and the proposed reconciliation report

NRS: Household estimates and projections branch
April 2013

Table 1: Comparison between the 2011 census day and mid year estimates of household numbers

Local authority	2011 census day estimate	2011 mid-year household	Difference	
			Number	%
SCOTLAND	2,372,780	2,368,034	-4,746	-0.20%
Aberdeen City	103,370	103,843	473	0.46%
Aberdeenshire	104,710	104,724	14	0.01%
Angus	51,620	50,766	-854	-1.65%
Argyll & Bute	40,130	41,775	1,645	4.10%
Clackmannanshire	22,730	22,949	219	0.96%
Dumfries & Galloway	67,980	68,685	705	1.04%
Dundee City	69,190	70,596	1,406	2.03%
East Ayrshire	53,920	53,841	-79	-0.15%
East Dunbartonshire	43,480	43,171	-309	-0.71%
East Lothian	42,910	43,215	305	0.71%
East Renfrewshire	37,210	36,116	-1,094	-2.94%
Edinburgh, City of	223,050	221,954	-1,096	-0.49%
Eilean Siar	12,580	12,208	-372	-2.96%
Falkirk	68,730	68,974	244	0.36%
Fife	160,950	161,820	870	0.54%
Glasgow City	285,690	282,522	-3,168	-1.11%
Highland	102,090	102,736	646	0.63%
Inverclyde	37,440	36,431	-1,009	-2.69%
Midlothian	34,980	35,668	688	1.97%
Moray	40,060	39,474	-586	-1.46%
North Ayrshire	62,500	62,097	-403	-0.64%
North Lanarkshire	146,000	145,589	-411	-0.28%
Orkney Islands	9,730	9,368	-362	-3.72%
Perth & Kinross	64,780	65,001	221	0.34%
Renfrewshire	80,910	79,083	-1,827	-2.26%
Scottish Borders	52,500	52,233	-267	-0.51%
Shetland Islands	9,950	9,928	-22	-0.22%
South Ayrshire	51,290	51,745	455	0.89%
South Lanarkshire	139,190	138,196	-994	-0.71%
Stirling	37,570	38,280	710	1.89%
West Dunbartonshire	42,170	41,558	-612	-1.45%
West Lothian	73,400	73,439	39	0.05%

Table 2: Household type distribution, 2011

Council area	Census-day estimate (%)			Household projections (%)		
	1 person	2 people	3+ people	1 person	2 people	3+ people
SCOTLAND	34.7	34.0	31.3	37.0	34.8	28.2
Aberdeen City	37.9	34.8	27.3	42.1	33.1	24.8
Aberdeenshire	26.5	36.4	37.1	28.8	38.8	32.4
Angus	32.1	36.6	31.3	34.6	38.7	26.7
Argyll & Bute	35.6	36.4	28.0	36.4	39.2	24.4
Clackmannanshire	32.2	35.8	32.0	36.1	35.6	28.3
Dumfries & Galloway	32.5	37.5	30.1	33.9	39.7	26.4
Dundee City	40.4	32.4	27.1	42.5	31.5	25.9
East Ayrshire	31.8	34.7	33.5	32.6	36.3	31.1
East Dunbartonshire	28.4	32.8	38.8	29.8	35.6	34.6
East Lothian	30.6	35.4	34.0	32.9	36.5	30.6
East Renfrewshire	30.2	30.8	38.9	29.5	34.3	36.2
Edinburgh, City of	39.1	33.5	27.5	40.2	32.7	27.1
Eilean Siar	37.2	32.2	30.6	38.8	33.3	27.9
Falkirk	31.7	35.1	33.3	35.8	34.7	29.5
Fife	31.8	36.6	31.6	35.2	36.8	28.0
Glasgow City	43.1	30.3	26.5	46.3	29.1	24.6
Highland	31.7	36.7	31.6	35.6	37.5	26.9
Inverclyde	38.5	30.2	31.4	40.0	32.0	28.0
Midlothian	27.4	36.3	36.3	30.4	37.4	32.1
Moray	30.1	37.2	32.8	32.4	38.7	28.9
North Ayrshire	34.6	34.4	31.0	36.4	36.3	27.3
North Lanarkshire	32.1	32.0	36.0	34.9	33.3	31.8
Orkney Islands	34.4	36.2	29.3	35.8	37.9	26.3
Perth & Kinross	32.2	37.7	30.0	35.5	38.3	26.2
Renfrewshire	38.6	30.5	30.9	38.3	33.2	28.5
Scottish Borders	34.4	37.2	28.4	34.7	40.3	25.0
Shetland Islands	32.0	34.5	33.4	35.6	36.3	28.2
South Ayrshire	33.9	36.1	30.1	35.3	37.6	27.1
South Lanarkshire	33.5	33.1	33.5	34.9	34.3	30.8
Stirling	30.6	35.4	34.0	32.1	37.5	30.4
West Dunbartonshire	38.3	30.7	31.0	39.6	32.5	27.9
West Lothian	28.5	34.0	37.4	32.1	35.0	32.8

Table 3: Comparison of communal establishment estimates

Council area	2011 Census			2010 Household projections			Difference between 2010 household projections and 2011 census	
	All usual residents	Usual residents in communal establishments ³		Mid-year population (2010)	Usual residents in communal establishments		Number	% of council area population (% points)
		Number	% of council area population		Number	% of council area population		
SCOTLAND	5,295,400	99,000	1.9	5,222,100	98,230	1.9	-770	0.0
Aberdeen City	222,800	8,600	3.8	217,120	8,820	4.1	220	0.3
Aberdeenshire	253,000	2,500	1.0	245,780	2,290	0.9	-210	-0.1
Angus	116,000	1,500	1.3	110,570	1,180	1.1	-320	-0.2
Argyll & Bute	88,200	2,500	2.8	89,200	2,510	2.8	10	0.0
Clackmannanshire	51,400	1,000	1.9	50,630	1,010	2.0	10	0.1
Dumfries & Galloway	151,300	2,000	1.3	148,190	1,660	1.1	-340	-0.2
Dundee City	147,300	5,200	3.5	144,290	5,710	4.0	510	0.5
East Ayrshire	122,700	1,500	1.2	120,240	1,430	1.2	-70	0.0
East Dunbartonshire	105,000	600	0.6	104,580	580	0.6	-20	0.0
East Lothian	99,700	1,900	1.9	97,500	1,860	1.9	-40	0.0
East Renfrewshire	90,600	600	0.6	89,540	600	0.7	0	0.1
Edinburgh, City of	476,600	14,300	3.0	486,120	15,940	3.3	1640	0.3
Eilean Siar	27,700	400	1.3	26,190	250	1.0	-150	-0.3
Falkirk	156,000	1,800	1.2	153,280	1,730	1.1	-70	-0.1
Fife	365,200	7,800	2.1	365,020	7,090	1.9	-710	-0.2
Glasgow City	593,200	15,000	2.5	592,820	15,180	2.6	180	0.1
Highland	232,100	3,800	1.6	221,630	3,370	1.5	-430	-0.1
Inverclyde	81,500	1,200	1.5	79,770	1,360	1.7	160	0.2
Midlothian	83,200	900	1.1	81,140	920	1.1	20	0.0
Moray	93,300	2,100	2.2	87,720	2,220	2.5	120	0.3
North Ayrshire	138,200	1,500	1.1	135,180	1,220	0.9	-280	-0.2
North Lanarkshire	337,800	2,400	0.7	326,360	2,660	0.8	260	0.1
Orkney Islands	21,400	200	0.9	20,110	200	1.0	0	0.1
Perth & Kinross	146,700	4,500	3.1	147,780	3,930	2.7	-570	-0.4
Renfrewshire	174,900	2,200	1.3	170,250	2,280	1.3	80	0.0
Scottish Borders	113,900	1,300	1.1	112,870	1,070	0.9	-230	-0.2
Shetland Islands	23,200	200	0.8	22,400	300	1.3	100	0.5
South Ayrshire	112,800	1,500	1.4	111,440	1,370	1.2	-130	-0.2
South Lanarkshire	313,800	3,300	1.1	311,880	2,720	0.9	-580	-0.2
Stirling	90,200	4,400	4.8	89,850	4,420	4.9	20	0.1
West Dunbartonshire	90,700	700	0.8	90,570	600	0.7	-100	-0.1
West Lothian	175,100	1,800	1.0	172,080	1,730	1.0	-70	0.0