

# 2011 Census-based reweighting of Annual Population Survey estimates

March 2015

Office for National Statistics

## 1. Introduction

In October 2014, ONS completed the reweighting of Labour Force Survey (LFS) aggregates and microdata, using revised UK and sub-national population estimates consistent with the 2011 Census and population projections. A revised set of LFS aggregates were published in the October monthly Labour Market Statistical Bulletin, covering the period mid-2001 onwards.

A description of the reweighting and information about the impact on the LFS aggregates was published in an article [2011 Census-based reweighting of Labour Force Survey estimates: indicative historical revisions, mid-2001 to end 2013](#). This article included descriptions of the populations used and the general impact of reweighting on those populations.

Following on from this, the next stage in the process is to similarly reweight the Annual Population Survey (APS) aggregates and microdata. Since the new population estimates used are sub-national, the impact of this reweighting will vary across the country.

This article looks at the impact of this reweighting on key labour market estimates across the UK.

## 2. Key Points

- There have been revisions to population totals, to the start of the survey in 2004, consistent with the revisions to the LFS populations published in October 2014.
- The impacts vary by area, with London having the largest upward revision in the population estimates and Yorkshire and The Humber the largest downward revision.
- The regions with the largest overall revision have the authorities with the largest revisions; Newham and Brent in London, and Leeds in Yorkshire and The Humber.
- These large revisions in populations are reflected in large revisions to the level estimates for the labour market statuses.
- Despite large revisions to populations and level estimates, the revisions to rates are relatively small.

## 3. Background to the Annual Population Survey (APS)

The APS is a continuous household survey, covering the UK, with the aim of providing estimates between censuses of key social and labour market variables at a local area level. The APS is not a stand-alone survey, but uses data combined from two waves from the main LFS with data collected on a local sample boost. Apart from employment and unemployment, the topics covered in the survey include housing, ethnicity, religion, health and education.

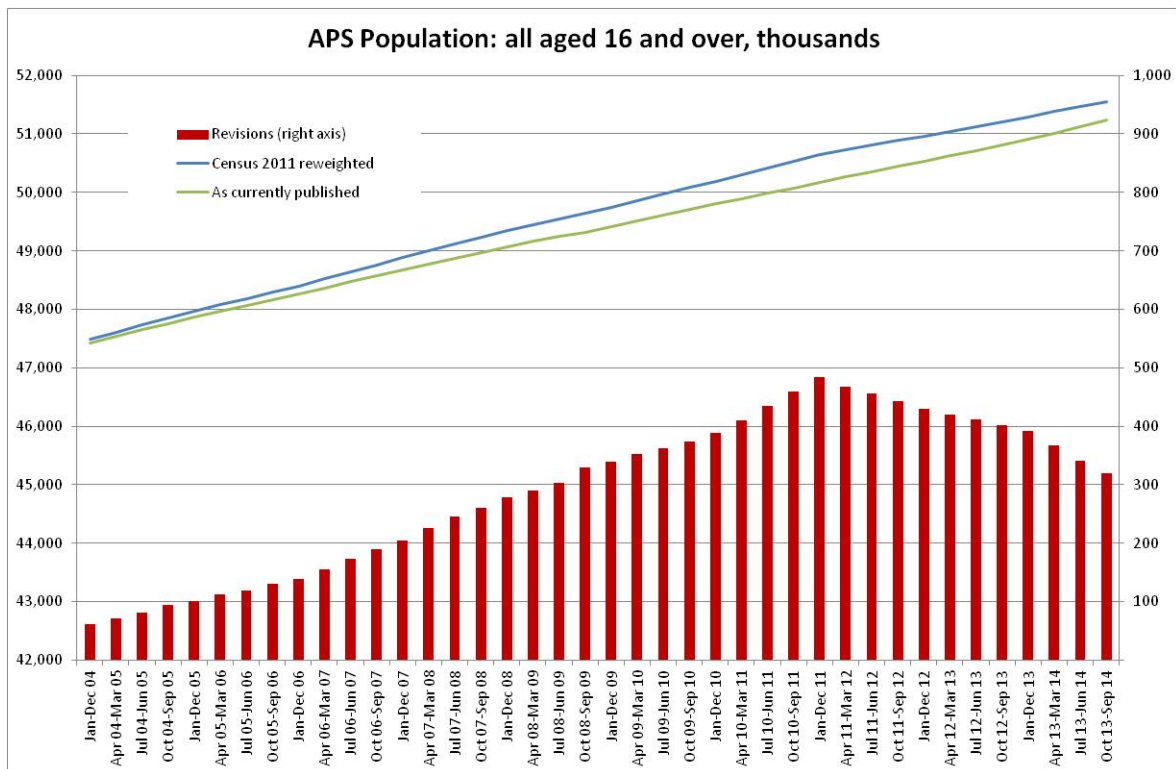
The data sets comprise 12 months of survey data and are disseminated quarterly. The achieved sample size is approximately 320,000 respondents.

The APS data sets are weighted to reflect the size and composition of the general population, by using official population data. Weighting factors take account of the design of the survey (which does not include communal establishments) and the composition of the local population by age and gender.

#### 4. The revisions to the national APS estimates

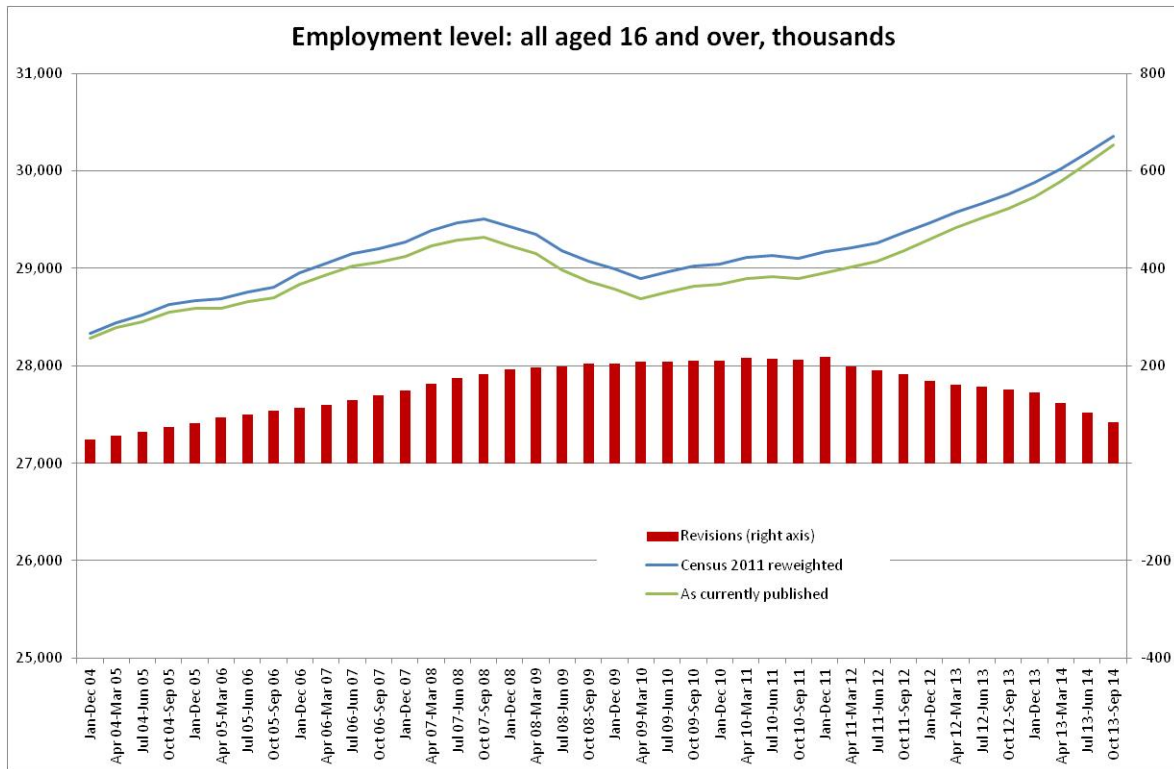
Since the APS is using the same underlying population estimates, the impact on the APS population at a national level reflects the same impacts seen for the LFS. The revisions to the APS populations, for those aged 16 and over, starting in 2004, are all positive, reaching a peak of just under half a million people in 2011.

**Chart 1 - APS Population, effect of reweighting**

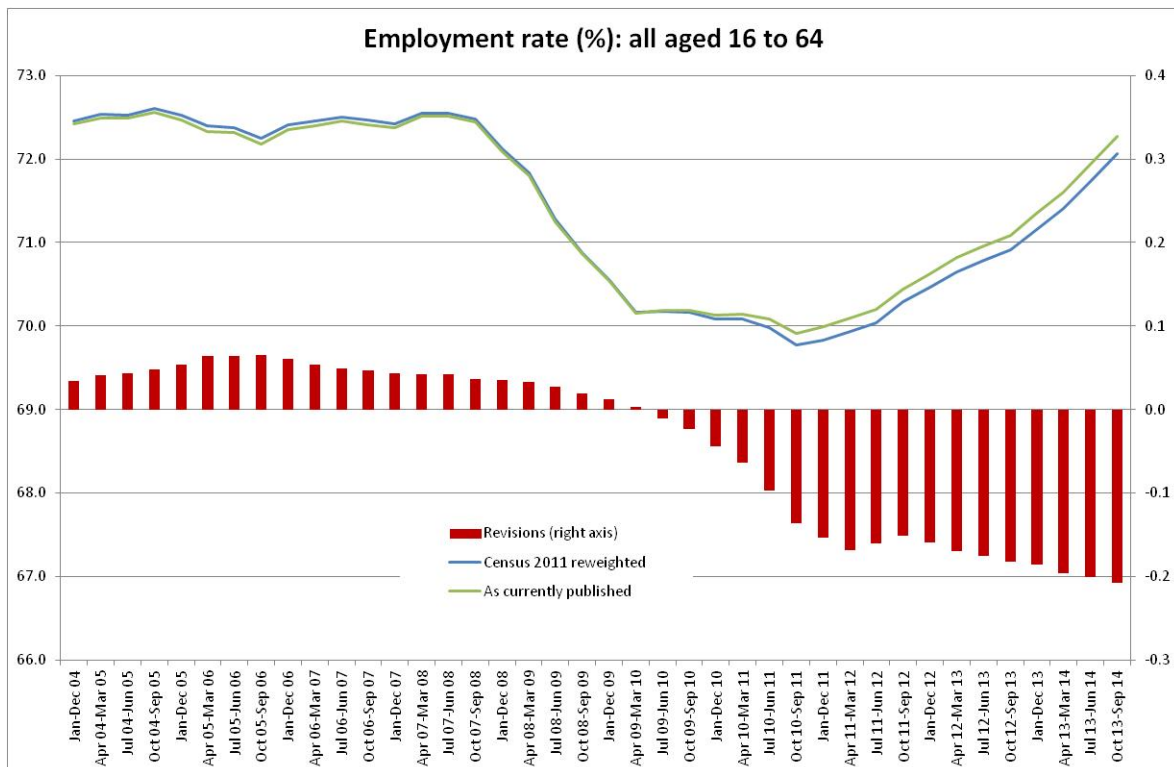


As with the populations, the revisions to the UK level employment, unemployment and economic activity levels and rates also follow a similar path to those previously reported for the reweighting of the LFS estimates. Although the paths are similar and reflect the same picture over time, the revisions at a UK level from the APS tend to be less volatile than those reported for LFS.

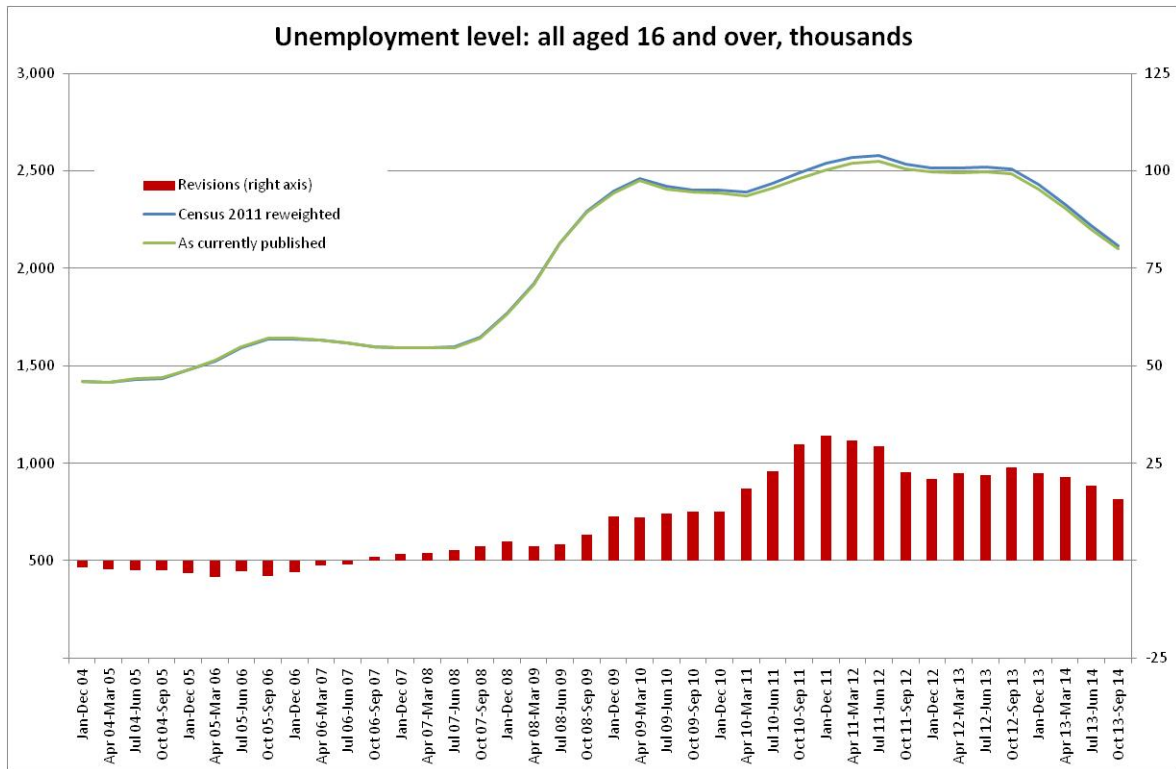
**Chart 2 – APS Employment level, effect of reweighting**



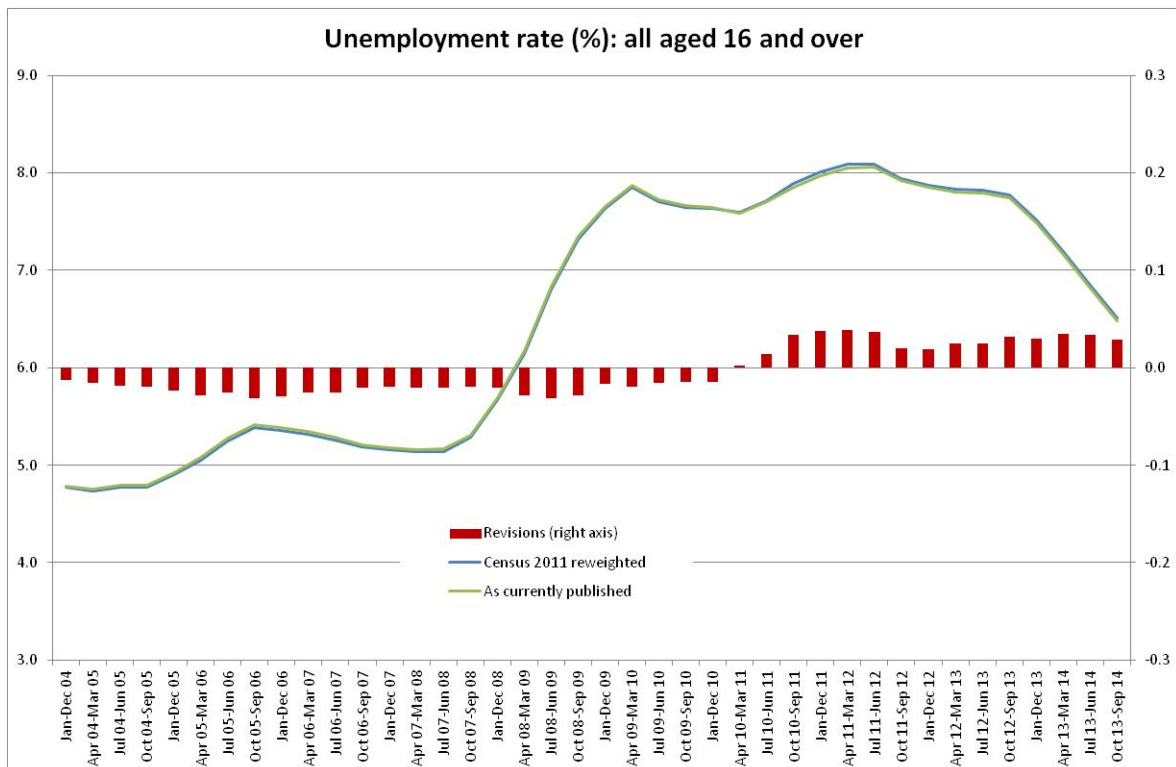
**Chart 3 – APS Employment rate, effect of reweighting**



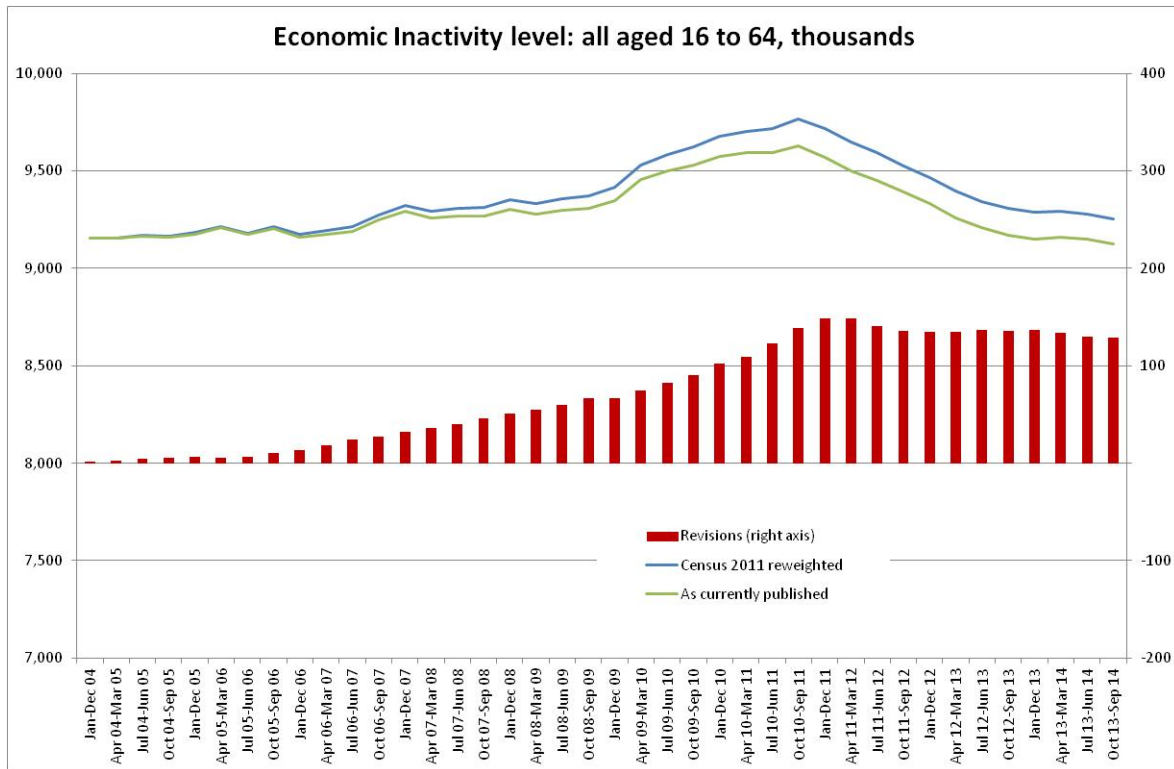
**Chart 4 – APS Unemployment level, effect of reweighting**



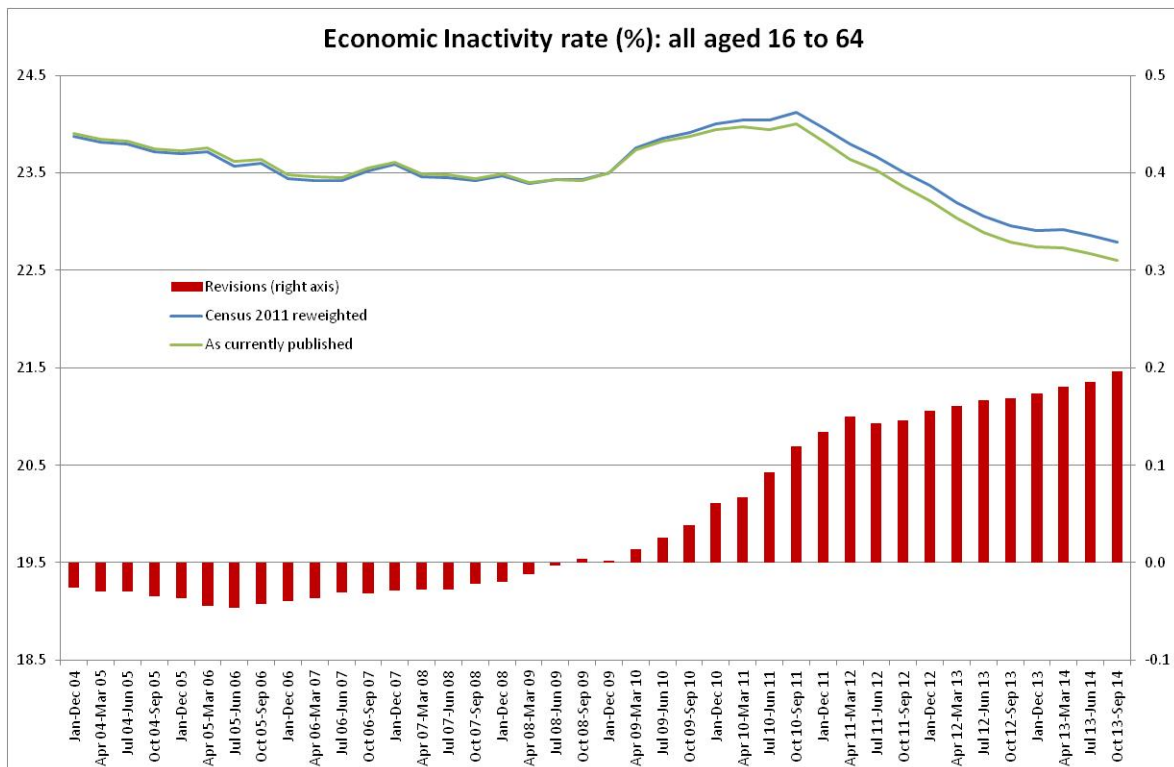
**Chart 5 – APS Employment rate, effect of reweighting**



**Chart 6 – APS Economic Inactivity level, effect of reweighting**



**Chart 7 – APS Economic Inactivity rate, effect of reweighting**

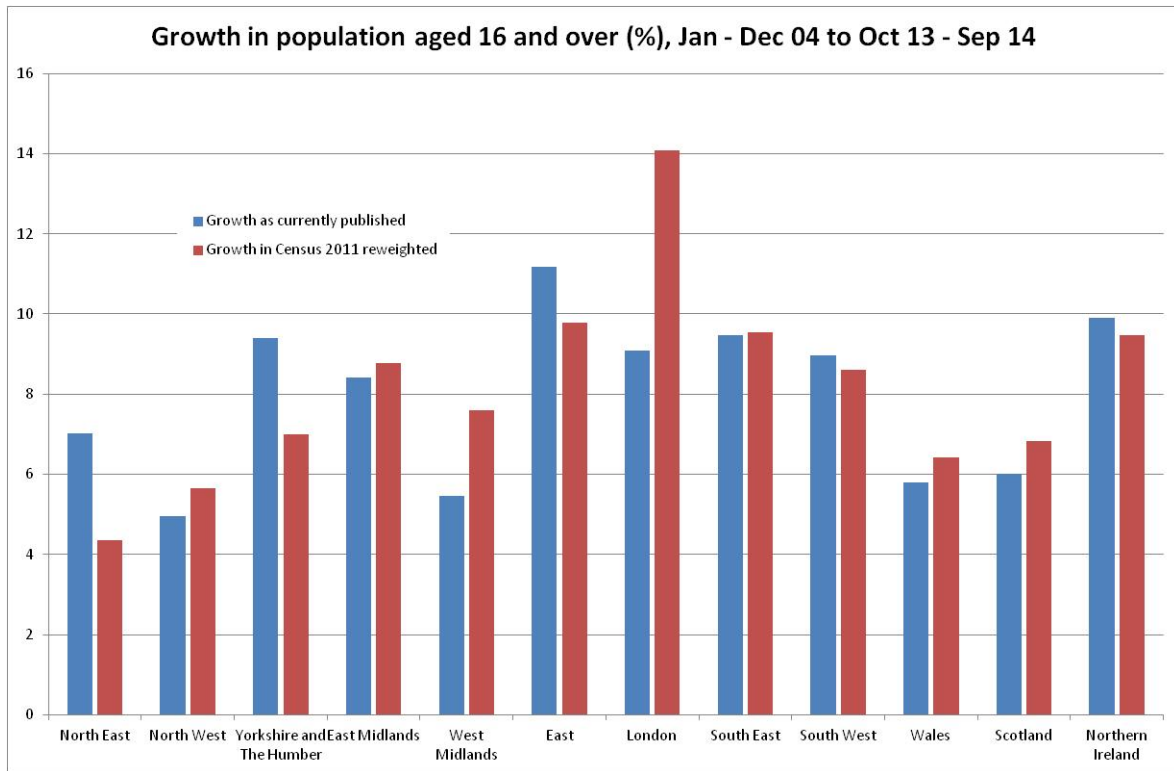


5. The revisions to the regional APS estimates

Although the overall revisions to the UK population shown in Charts 1 and 2 have been positive, there have been large differences in the population revisions at a regional level. It is important to

remember that what we are talking about is a revision to an existing estimate of population change as a result of information from the 2011 Census. For all regions and countries of the UK these existing population estimates showed that the population for those aged 16 and over was increasing. The revised estimates are still showing increases in the population for those aged 16 and over, but the rate of increase has changed as a result of the Census information.

**Chart 8 – APS Growth in population, effect of reweighing**

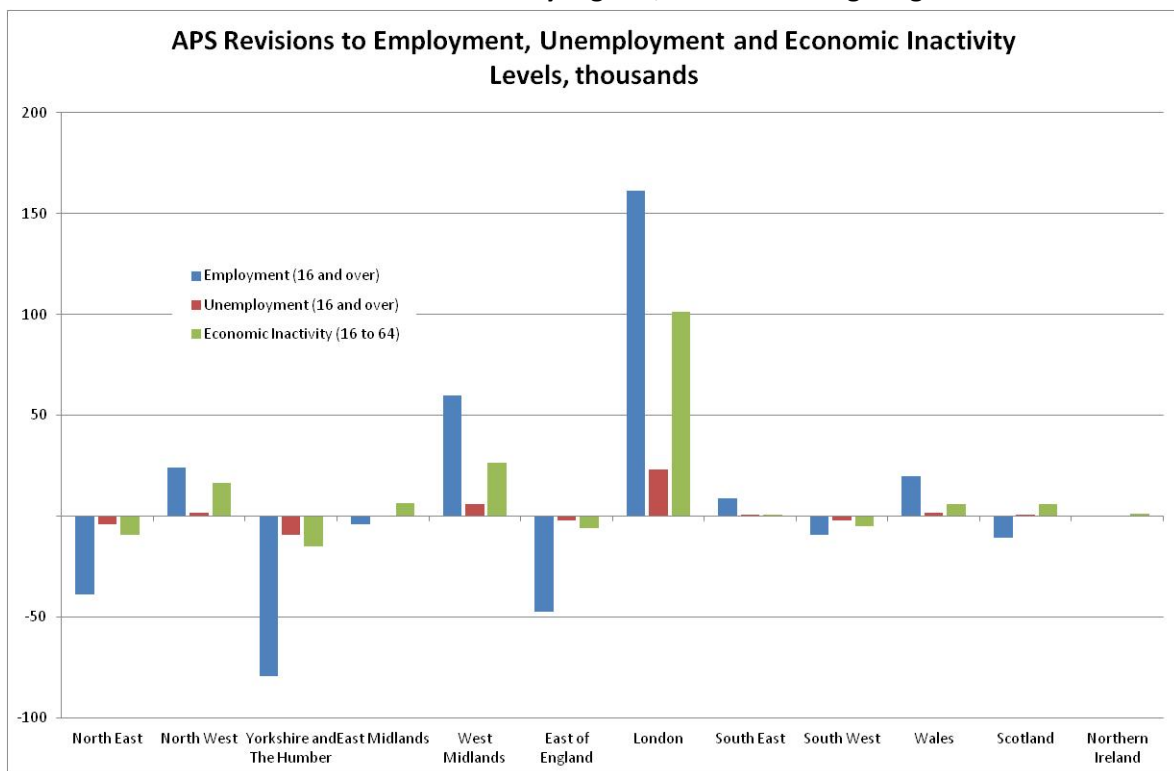


As can be seen, for some regions, in particular London and the West Midlands, the new estimate of population growth is much higher than those that the estimates currently published are based on. For others, such as the North East and Yorkshire and The Humber, the new estimate is lower. Consequently, across the regions, there is a mix of regions with upward and downward revisions in the estimate for the latest period.



The chart above shows the revision to the previously published estimates for a selection of regions over time. The pattern for the North West is quite typical of a number of regions and reflects the general pattern of UK revisions in Chart 1. The South West shows a region where there has been very little revision in the 16 and over population estimates as a result of the 2011 Census. Yorkshire and The Humber is the region with the largest downward revision in the 16 and over population estimates, with around 100,000 less than previously estimated for the twelve month period October 2013 to September 2014. The new population estimates for the latest periods for the East of England are lower than the previously published estimates, however until 2008 the estimates have been revised slightly upwards. Even in London, where the latest estimates are showing the largest revision, being revised upwards by over 250,000, the earliest periods have small downward revisions to the population estimates.

**Chart 11 – APS Labour market status levels by regions, effect of reweighting**



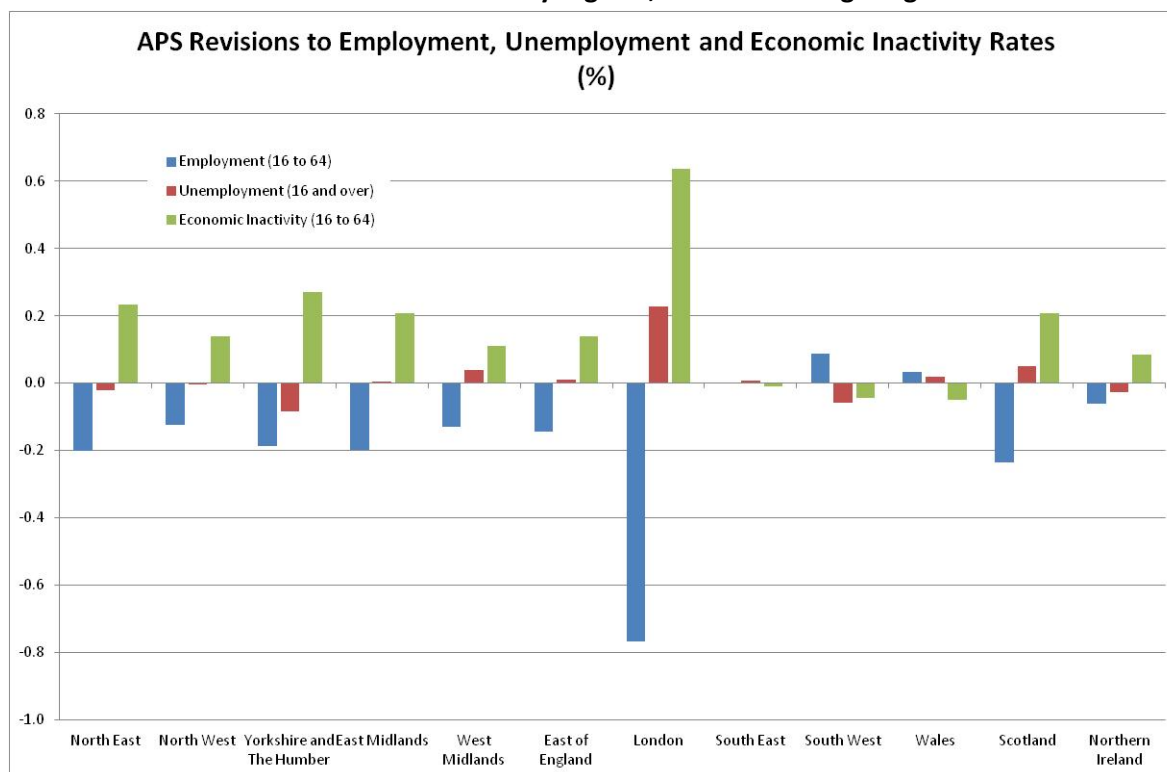
In general, regions that have seen a larger upward revision to the population estimates will see an upward revision to the estimates of the individual Labour Market status levels. Similarly, downward revisions in population estimates are generally reflected in each of the Labour Market statuses. However, because the weight for each individual case is calculated separately, the impact can be in different directions and is not necessarily directly proportionate to the overall revision. For example, in London, whereas the large upward revision to the population results in increases to the level of all the statuses, proportionately the increase of 100,000 in the estimate for economic inactivity, is far larger than the increase in employment, given that the economically inactive only account for around one in four of the population. Meanwhile, for Yorkshire and The Humber, the fall in the employment estimate is proportionately far larger than the fall in economic inactivity.

If the estimates for each Labour Market status increased in similar proportions, there would be little or no impact to the rates. However, it is the disproportionate increases described above that bring



about revisions to the rates. The disproportionately small increase in employment and large increase in economic inactivity for London results in a downward revision to the employment rate and increase in the inactivity rate. This has generally been the case, with the population revisions usually giving a decrease in the employment rate and increase in the economic inactivity rate. With the exception of London, these revisions are only around 0.2 percentage points.

**Chart 12 – APS Labour market status rates by regions, effect of reweighting**



#### 6. The revisions to the local and unitary authority APS estimates

Just as each region is impacted differently, individual local authorities are impacted individually by the changes to the population estimates.

**Table 1 – Largest revisions to local authority APS populations, effect of reweighting**

Ten largest 16 to 64 population revision increases, by LA				
	As currently published	Census 2011 reweighted	Revision	% Revision
Newham	157,181	228,114	70,933	45.1
Brent	169,409	217,834	48,425	28.6
Haringey	156,768	185,095	28,327	18.1
Hackney	159,155	187,086	27,931	17.5
Waltham Forest	155,437	181,144	25,707	16.5
Greenwich	154,322	178,505	24,183	15.7
Lambeth	216,544	237,871	21,327	9.8
Birmingham	677,826	696,953	19,127	2.8
Tower Hamlets	184,278	201,634	17,356	9.4
Liverpool	302,176	319,444	17,268	5.7

Ten largest 16 to 64 population revision decreases, by LA				
	As currently published	Census 2011 reweighted	Revision	% Revision
Leeds	565,179	502,362	-62,817	-11.1
Westminster	202,502	166,016	-36,486	-18.0
Bristol, City of	328,223	297,144	-31,079	-9.5
Newcastle upon Tyne	213,984	194,504	-19,480	-9.1
Edinburgh, City of	353,077	333,685	-19,392	-5.5
Sheffield	387,831	369,356	-18,475	-4.8
Manchester	382,568	364,515	-18,053	-4.7
Camden	182,132	164,273	-17,859	-9.8
Norwich	109,954	93,151	-16,803	-15.3
Merton	150,985	138,147	-12,838	-8.5

As can be seen from the above table, eight out of ten of the local authorities with the largest upward revision in the population estimates for those aged 16 to 64 are in London, which reflects this region having the largest overall upward revision. The largest two, Newham and Brent, between them account for nearly 120,000 of the revision and have significantly larger overall revision than any other authority.

The largest downward revision, for Leeds, again drives Yorkshire and The Humber having the largest overall downward revision of any region. In this case, Leeds accounts for the majority of the regional revision. Although the level of the revision for Leeds is by far the largest, because Leeds is a very large local authority, it is actually a smaller percentage revision than Westminster or Norwich.

As with regions, while these revisions are generally reflected in large revisions to levels, this does not necessarily translate into large revisions to rates, since the levels of different labour market statuses can be revised by similar proportions.

Despite some very large revisions to levels resulting from the reweighting to the 2011 Census populations, the resulting revisions to rates are small. The mean revision to the employment and economic inactivity rates resulting from the revision is only 0.2 percentage points, with only the three local authorities listed below having revisions of 1.0 percentage points or more.

**Table 2 – Largest revisions to local authority APS employment and economic inactivity rates, effect of reweighting**

Largest revisions to employment and economic inactivity rates						
	Employment Rate (%)			Economic Inactivity Rate (%)		
	As currently published	Census 2011 reweighted	Revision	As currently published	Census 2011 reweighted	Revision
Aberdeen City	77.0	75.4	-1.6	18.6	19.7	1.0
Glasgow City	65.6	64.5	-1.1	27.7	28.7	1.0
Ealing	66.3	65.3	-1.1	26.4	27.5	1.1

## 7. APS Data Publication

A full set of results based on the previous population estimates were published in the February edition of the Regional Labour Market Statistical Bulletin on 18 February 2015. For each region, tables 2, 3, 6, 9, 10 and 11 include a timeseries of APS data. In addition the Local Indicator tables LI01-LI05 contain indicators for the latest period, using APS data, based on the latest time period for October 2013 to September 2014.

<http://www.ons.gov.uk/ons/rel/subnational-labour/regional-labour-market-statistics/february-2015/stb-regional-labour-market-february-2015.html>

The March edition of the Bulletin, published on 18 March 2015, the APS data in all of these tables was updated to data based on the Census 2011 reweighted population estimates. These tables cover the same periods as the tables published in February.

<http://www.ons.gov.uk/ons/rel/subnational-labour/regional-labour-market-statistics/march-2015/stb-regional-labour-market-march-2015.html>

The April edition of the Bulletin will include data for the period January 2014 to December 2014, based on the Census 2011 reweighted population estimates.

APS datasets held on Nomis will be released based on the Census 2011 reweighted population estimates on 18 March 2015. However, due to the amount of work involved it has not been possible to update all of the datasets by that date. Although most periods will be updated to the new basis at that time, some of the earlier datasets may remain on the previous population basis until they can be updated in the following few weeks. It is expected that all periods will be on the new basis before the release of the January 2014 to December 2014 statistics in April.

<http://www.nomisweb.co.uk/>