

Box E

Employment and Population Estimates

Over the past few years, changes in population growth associated with unanticipated swings in net migration flows have made the task of estimating employment growth more difficult than usual. As a result, employment growth was overstated in 2010 and understated over the past year. During this period, the employment-to-population ratio and unemployment rate have provided a more reliable picture of evolving labour market conditions.¹ This box outlines the methodology used to produce estimates of employment, and discusses how employment estimates have been affected by population estimates over recent years. The box also addresses the rebasing of population data to the results of the 2011 census. The treatment of the latest census data will have further implications for employment data when, in 2013, labour market data are re-benchmarked to the census.

Population and Employment Growth Estimates

Estimates of employment published by the Australian Bureau of Statistics (ABS) in its Labour Force release are constructed using two sources of information: the monthly survey of individuals' employment characteristics (the labour force survey (LFS)) and population benchmarks (which are projections of the working-age population).

1. The LFS, which surveys around 30 000 households, provides information on the employment patterns of around 56 000 individuals by subgroup (defined by age, gender and region). To estimate total employment, the survey information needs

to be 'scaled up' using information on the number of people in each of these subgroups within the total Australian population (the shares of each subgroup in the survey of households may differ from the shares in the total population). This process is known as benchmarking the LFS to the population.

2. The projections of the working-age population (by subgroup) that form the population benchmarks for the LFS are derived from the ABS' official population estimates published in the Australian Demographic Statistics release. These official population estimates are obtained from data on births, deaths and net overseas migration, since a complete count of the population is only available every five years with the census. The estimate of net migration is especially important as it is the main determinant of the cyclical variation in Australia's population growth, but it is also hard to estimate because of the difficulty in distinguishing between permanent and temporary migration flows. The official estimates of population growth are published with a lag of two quarters, only after there has been sufficient time to obtain and process administrative data on births, deaths and migration. Nevertheless, these population estimates are preliminary and subject to revisions. They do not become final until census data spanning the given period are available.

In order to be able to publish employment data the month after the reference month (e.g. August employment data are published in September), the ABS projects the working-age population three quarters ahead of the official population estimates to provide the population benchmarks for the LFS.

¹ The Australian Bureau of Statistics discussed the process of creating population benchmarks for the labour force survey and the recent difficulties in detail in the April 2012 Labour Force release (ABS Cat No 6202.0).

These population benchmarks are typically only revised after new census data are available, and so employment data are normally based on the profile of population projections prepared at the time the employment data are first published, rather than the profile of official population estimates that are published subsequently when additional administrative data become available. However, if it becomes apparent that a large discrepancy has emerged the ABS may revise the benchmarks on an ad hoc basis.²

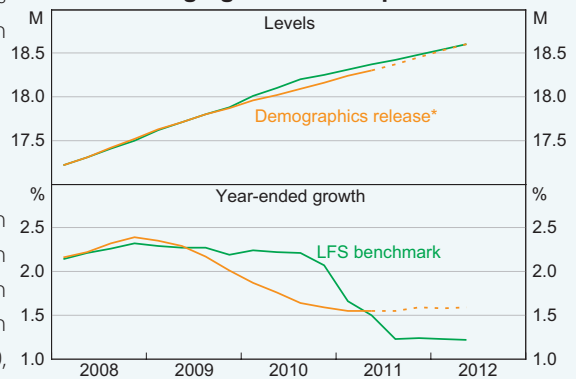
Recent Population and Employment Growth

Discrepancies arise between the official population estimates and the population benchmarks used in the LFS when there is a change in population growth that was not anticipated when the population benchmark projections were prepared. In 2009/10, a discrepancy arose when net migration slowed unexpectedly. Because it was unexpected, the slowdown was not incorporated in the projected LFS population benchmarks for this period. As a result, the population benchmarks overstated population growth in 2010, and subsequently the level of the population was also overstated (Graph E1).

When a discrepancy between the official population estimate and the LFS population benchmark arises, the normal approach for constructing the population benchmarks removes the difference over time by forcing the projected population benchmark to gradually converge toward the expected official estimate of the population. As a result, over 2011, population growth according to the population benchmark has been biased downwards relative to the official population estimates in the

demographics release (and so the two lines gradually converge in the top panel of Graph E1). In the July Labour Force release, the ABS has advised that for the November 2012 issue it will revise the LFS population benchmarks so that they are consistent with growth in the official population data.

Graph E1
Working-age Civilian Population



* Quarterly data imputed by RBA; dashed lines are RBA estimates based on DIAC data on migration and other assumptions as explained in footnote 3
Sources: ABS; DIAC; RBA

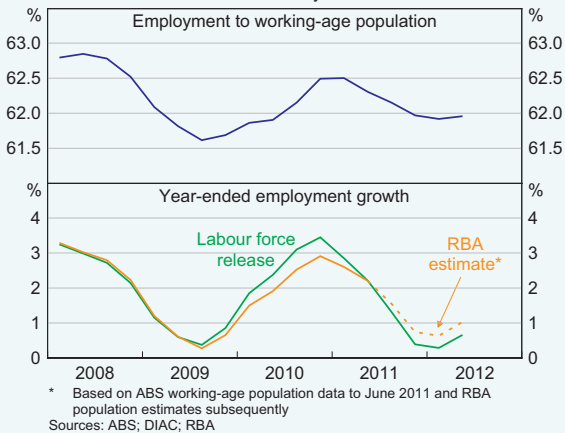
As a result of the discrepancy in the LFS population benchmarks over this period, employment growth as currently published is overestimated in 2010 and underestimated in 2011. It is possible to estimate what the revised profile for aggregate employment growth will look like by applying the employment-to-population ratio from the LFS to the population profile from the demographics release (Graph E2). The employment-to-population ratio from the LFS captures the employment propensities of persons in the survey, and so is not significantly affected by errors in aggregate population growth. However, this approach also requires a range of assumptions in order to estimate working-age population growth in the quarters since June 2011, as population

² This occurred after improvements were made to the methodology for estimating net migration in 2009. The official population estimates were revised following the change in methodology, which caused a discrepancy between the official population estimates and the population benchmarks. In August 2010, the ABS revised the population benchmarks to eliminate the discrepancy.

data by age are only published in June each year.³ Therefore, there is greater uncertainty about the adjustment to the employment growth profile after mid 2011 than there is about the profile prior to that. Nevertheless, this approach provides an indication of the magnitude of the bias in the published employment data from late 2009 to the present.

This adjusted estimate suggests that employment growth was around ½ percentage point lower in 2010 than the published estimate and around ½ percentage point higher over the past year. By coincidence, this bias has exaggerated the recent cycle in employment growth. It is apparent from the profile of the employment-to-population ratio that employment conditions were strong in 2010, deteriorated in 2011, and have subsequently improved somewhat in 2012, but the overall cycle is slightly less pronounced than indicated by the published employment data (and more in line with the RBA estimate shown in Graph E2).

Graph E2
Employment
Quarterly



3 The alternative quarterly estimate of the working-age population (underlying Graph E1) is imputed by taking the June quarter level in each year from the ABS demographics release, adjusting it for defence force employment and adding estimates of natural increase and net overseas migration. The quarters following the latest available data use simple estimates of natural increase and Department of Immigration and Citizenship (DIAC) estimates of net overseas migration.

These problems with employment growth estimates also affect measures in the national accounts such as total hours worked, productivity growth and average earnings growth. The overestimation, then underestimation, of employment growth has resulted in productivity growth being underestimated over 2010 and then overestimated more recently.

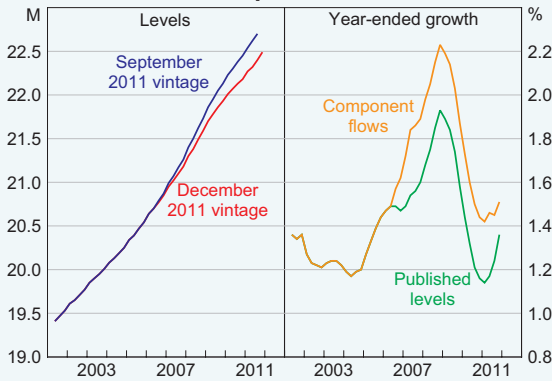
Rebasing Population Estimates to the 2011 Census

Following each census, the population data in the demographics release and the population benchmarks underpinning the employment data in the labour force release are updated to ensure they are consistent with the census data. The demographics release was rebased to the 2011 census in June 2012 and the population benchmarks in the LFS are scheduled to be re-benchmarked to the census in July 2013. The incorporation of the 2011 census data has resulted in a substantial downward revision to the level of the population in June 2011, of around 300 000 people or 1.3 per cent (Graph E3, left panel). This downward revision, called the ‘intercensal error’, is significantly larger than previous census revisions, in part reflecting improvements in the methodology used by the ABS for estimating the census net undercount.⁴

The intercensal error has implications for the estimated population levels all the way back to the previous census in mid 2006 because the ABS allocates the intercensal error evenly over the period between the censuses. This has the effect of not only changing the estimated levels throughout the period, but also growth rates calculated from these levels. One implication is that there is a larger-than-usual discrepancy between the change in the population between June 2006 and June 2011 implied by births, deaths and net migration data, and

4 Further detail on census net undercount, the changes implemented for the 2011 census and the intercensal error can be found in the December 2011 Australian Demographic Statistics release (ABS Cat No 3101.0).

**Graph E3
Population**



Sources: ABS; RBA

the change implied by published estimates of the level of the population. The ABS has advised users of the data that the latest series in the demographics release is the best estimate of the population level in 2011 but not population growth. Population growth over this period is better approximated by

the component flows data, that is, the estimates of the natural increase in population and net overseas migration. While the component flows data imply population growth of 1.5 per cent over the year to June 2011, estimates calculated from the published levels are around ¼ percentage point lower (Graph E3, right panel).

The ABS has not yet announced how it will treat the intercensal error in final population estimates and benchmarks, and therefore the effect of these revisions on the published employment levels and growth rates. The treatment of the error will have implications for the correct interpretation of a number of series including employment and productivity growth. Again, measures expressed as ratios, such as the employment-to-population ratio or the unemployment rate, are less affected by these issues and so will remain important guides to interpreting labour market developments. ✎