

## **PART II: AUSTRALIA'S LONG-TERM DEMOGRAPHIC AND ECONOMIC PROSPECTS**

### Demographic prospects

Australia will experience further ageing of its population over the next four decades. Overall, the proportion of the population that is very old (over 85 years of age) is expected to triple, while the proportion in the prime working age range of 15 to 64 is expected to fall.

#### **FERTILITY AND MORTALITY**

The total fertility rate (TFR) of Australian women has declined since 1961 when it peaked at 3.5 births per woman during the post-World War II 'baby boom'. Since the mid-1970s the TFR has been well below the rate needed for population replacement (Chart 11). At the same time, high standards of public health have contributed to increased longevity. The ageing of Australia's 'baby boom' cohort, with lower mortality rates than previous generations and smaller cohorts following as fertility declined, accentuates the impact of an ageing population.<sup>1</sup> In the past century, the proportion of the population aged over 65 has risen from just over 4 per cent to nearly 12.5 per cent. By 2042, around 24.5 per cent of Australia's population is expected to be aged over 65.

The trend towards having fewer children, later in life, is a key influence on Australia's changing population structure. The number of children born to women aged 30 to 39 is increasing, but this does not fully compensate for the decline in the number of children born to women aged 20 to 29.

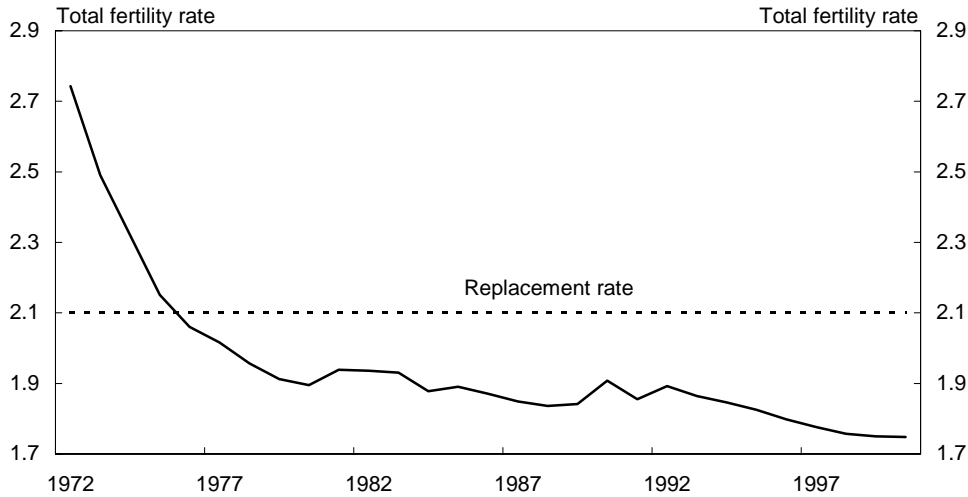
Based on recent trends, the TFR is projected to fall to 1.6 by 2042.<sup>2</sup> While this is lower than Australia's TFR of 1.75 in 2000, it is higher than the fertility rates in many OECD countries, including Italy, Japan and Sweden. Australia's current TFR is higher than the OECD average, but significantly lower than New Zealand (at 2.01 in 2000) and the United States (at 2.13 in 2000). Today's TFR will influence the size and growth rate of the population of labour force age in 15 to 20 years.

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1 The 'baby boom' cohort includes Australian residents born during Australia's 'baby boom', generally considered to have started in 1946 and ended some time between 1961 and 1965.

2 This projection is based on age-specific data and is not the same as the ABS methodology, which assumes a constant fertility rate.

**Chart 11: Australia's historical total fertility rate**



Note: The total fertility rate represents the number of children a woman would bear during her lifetime if she experienced the current age-specific fertility rates at each age of her reproductive life.  
 Source: ABS Cat. No. 3301.0 (various).

At the same time as fertility rates have fallen, mortality rates have also fallen. Declining mortality rates add to population growth rates and the proportion of aged people in the population. Australia's death rate fell from 8.5 per thousand in 1971 to 6.9 per thousand in 1991 and around 6.7 per thousand in 2001.

Mortality rates have fallen across all age groups, and this is expected to continue for the next four decades. The male proportion in older age groups is increasing slowly. Although women have a higher life expectancy than men, men's mortality rates have fallen faster than those of women.

Australians' life expectancies are among the highest of OECD countries, and this is expected to continue. In the past 40 years, Australians' life expectancies have increased by more than 8.3 years for men and 7.6 years for women. Based on recent trends, men born in 2042 are projected to live to 82.5 years, an average of 5.3 years longer than those born in 2002. Women born in 2042 are projected to live to 87.5, 4.9 years longer on average (Table 2).

**Table 2: Australians' projected life expectancy at birth (in years)**

	2002	2012	2022	2032	2042
Males	77.2	79.3	80.7	81.7	82.5
Females	82.6	84.4	85.7	86.7	87.5

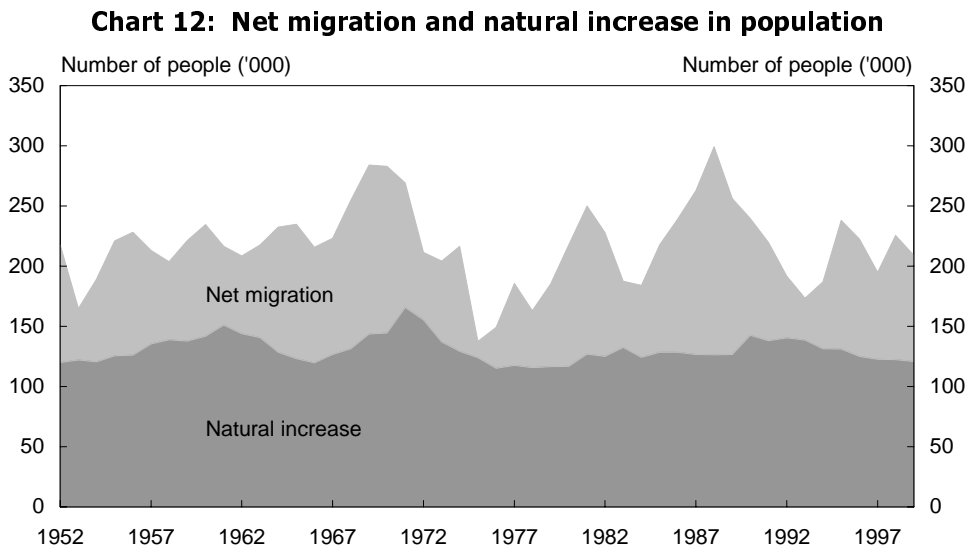
Source: Treasury projections.

## MIGRATION

An influence with some offsetting effect on the rate of population ageing is Australia's net overseas migration. This is the number of permanent and long-term temporary arrivals minus permanent and long-term temporary departures. Over many years, Australia's net migration inflow has been younger on average than the resident population; this has slowed population ageing.

The contribution of net overseas migration to population growth has varied significantly over the last five decades (Chart 12). Net migration tends to fall during economic downturns, partly because permanent and long-term temporary departures increase, and partly because governments have adjusted migrant intakes.

While most arrivals of new permanent settlers are subject to government policy, many arrivals and departures are not subject to official control, including the permanent departures and arrivals of Australian residents and New Zealand citizens. A large component of net migration is on a long-term but temporary basis. In the future, levels of net migration are likely to be affected by greater competition for skilled migrants, particularly as populations age in OECD countries. Unlike most countries, Australia has a planned migration programme supporting skilled migration, which should provide an advantage in future competition for skilled migrants. Future net migration is assumed to be constant at 90,000 people per year, with the same age-gender profile as at present.



Note: Natural increase is equal to the number of births minus the number of deaths in a given period of time.  
Source: ABS AusStats Time Series Spreadsheets 3105.0.65.001.

## POPULATION PROJECTIONS

While the population of labour force age is projected to decline as a proportion of the total population, the continued rise in numbers of people in the 15 to 64 age group is expected to increase the labour force (Table 3). Australia is one of only a few OECD countries projecting continued labour force growth over the next 40 years. Of these countries, only the United States is projected to have stronger growth in its working-age population.<sup>3</sup> This is partly due to its relatively high fertility rate compared to Australia.

**Table 3: Australian population projections for selected age ranges (millions of people)**

Age range	2002	2012	2022	2032	2042
0 to 14	3.9	3.8	3.8	3.8	3.7
15 to 64	13.2	14.6	15.1	15.3	15.4
65 to 84	2.2	2.7	3.8	4.7	5.1
85+	0.3	0.4	0.5	0.8	1.1
<b>Persons</b>	<b>19.6</b>	<b>21.5</b>	<b>23.2</b>	<b>24.5</b>	<b>25.3</b>

Source: Treasury projections.

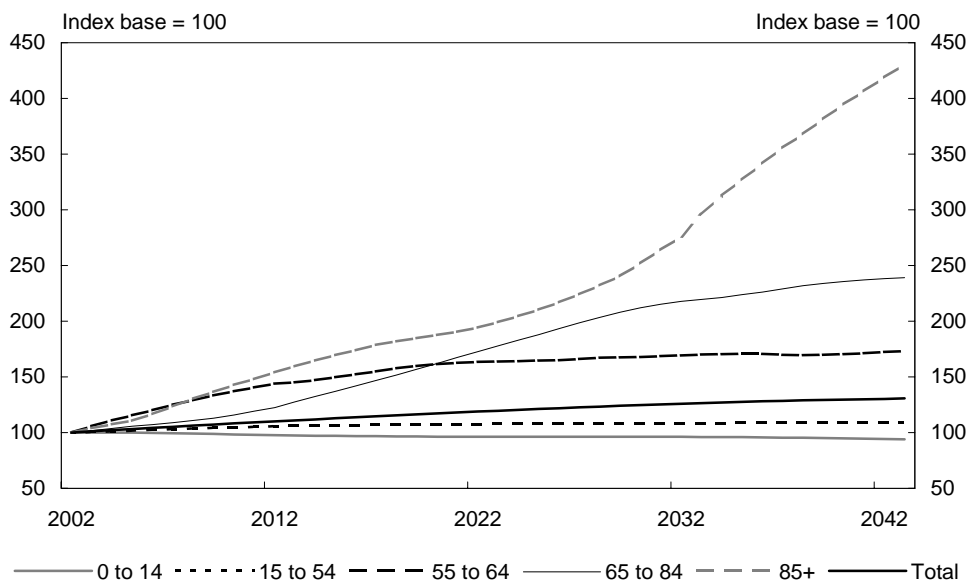
Population growth is expected to continue slowing, from 1.2 per cent in 2000 to around 0.2 per cent by 2042. However, the growth rate of the population aged 85 or over is projected to accelerate sharply, while the youth population is anticipated to decline slightly. While the population of labour force age is projected to grow by just 14 per cent, the number of people aged 55 to 64 is projected to increase by more than 50 per cent over the next two decades. This is expected to be the fastest growing group of labour force age (Chart 13).

The projected population of Australia for selected age ranges highlights the expected growth in the proportion of the population who are 'very old', that is over 85. Currently, around 1.5 per cent of the population is in this age range, but by 2042 it is expected to rise to over 4 per cent.

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3 Dang, Antolin and Oxley 2001.

**Chart 13: Growth indices by age group  
(on a 2001 population base)**



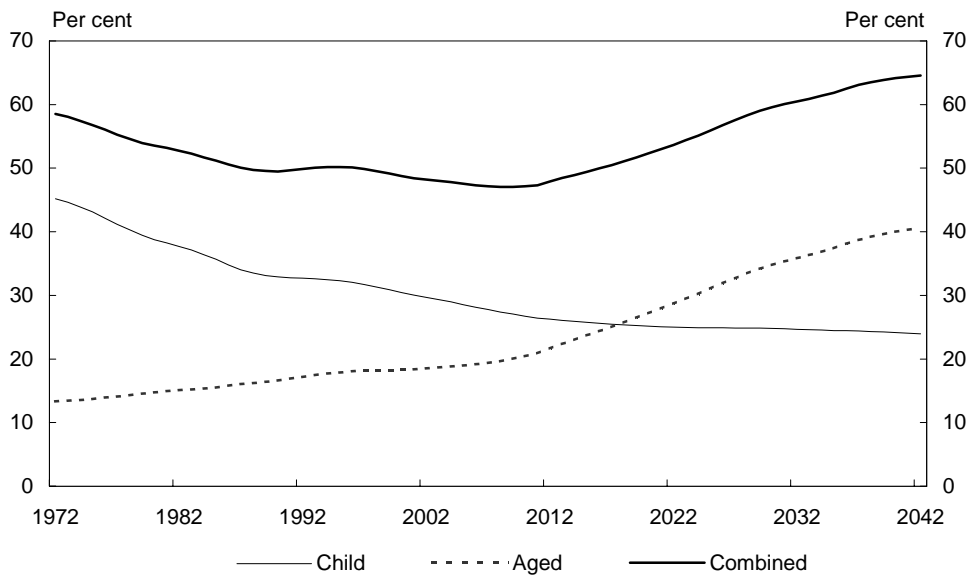
Source: ABS Cat. No. 3201.0 (June 2001) and Treasury projections.

In 2002, the aged to working-age ratio (the proportion of people aged over 65 to people of traditional labour force age, 15 to 64) is 19 per cent. This is projected to rise to almost 41 per cent by 2042 (Chart 14). Over the same period, the child to working-age ratio (the proportion of people aged under 15 to those aged 15 to 64) is projected to decline. However, this does not completely compensate for the increase in the aged to working-age ratio. Thus, the overall proportion of the population potentially to be supported by the working-aged population is expected to rise.

Indeed, the combined aged and child to working-age ratio is projected to be slightly higher in 2042 than it was in 1972. However, the rising aged to working-age ratio may have greater implications for government spending than the falling child to working-age ratio. Historically, a significant component of the cost of children has been financed privately, while a larger proportion of the cost of supporting older people has been funded through government transfers (for example, pensions).

Today, the combined aged and child to working-age ratio is lower than it has been at any point in the last 30 years. It is projected to continue falling until 2009, before rising again and reaching a level similar to today's level by 2012.

**Chart 14: Australia's child and aged to working-age ratios**



Source: ABS Cat. No. 3201.0 (various) and Treasury projections.

## Economic prospects

Consistent with the projected lower labour force growth, economic growth in Australia, as measured by growth in real GDP, is expected to slow over the next four decades. Real GDP per person, a more appropriate indicator of living standards, is also expected to grow more slowly, but is not expected to decline to the same extent as the growth rate of real GDP.

Growth in real GDP in the longer term reflects the net impact of productivity growth, employment growth and changes in hours worked. These drivers in growth are difficult to project over the longer term and often are interdependent. For instance, labour force participation rates may increase with employment growth. To simplify the analysis, the projections used in this report make no allowance for any feedback between the individual drivers of growth.

### **PRODUCTIVITY**

Productivity is calculated as the amount of goods and services produced divided by the inputs used to produce them. Productivity growth indicates a higher level of output for a given level of inputs and will be the key driver of GDP growth in the decades ahead. Faster productivity growth would enable higher rates of growth of both GDP and real wages over the projection period, other factors unchanged.

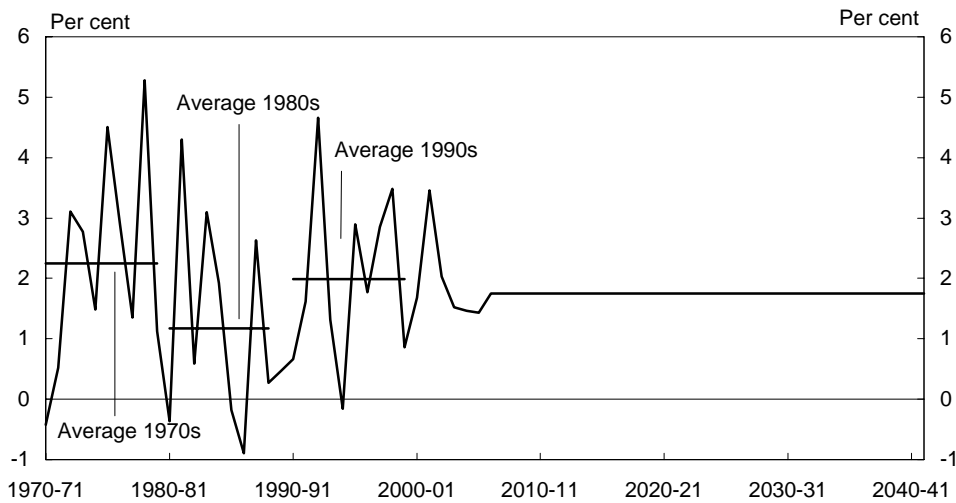
Chart 15 shows that despite short-term volatility, labour productivity growth in the 1990s averaged around 2 per cent per year, which was significantly above the 30-year average of about 1.75 per cent. Conversely, at an average of around 1.2 per cent per year, labour productivity growth in the 1980s was below the long-term average.

Productivity growth is extremely difficult to forecast over a long time horizon. Therefore, productivity is projected to grow at its long-term average rate (30 years) of about 1.75 per cent from the middle of this decade to the end of the projection horizon.<sup>4</sup> Given the differences in past decade averages, and the importance of productivity growth in determining longer term economic growth, the impact of high and low productivity growth scenarios is discussed later in this part. In addition, Part IV explores the impact of both high and low productivity growth scenarios on real GDP growth and spending.

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4 Growth in labour productivity, as defined in this report, can be decomposed into a contribution from 'capital deepening' — or growth in the capital-labour ratio — and from growth in 'multi-factor' productivity — measured as a residual and attributable to influences other than increases in the quantity and quality of labour and capital. For ease of analysis, the projections focus solely on labour productivity.

**Chart 15: Labour productivity growth<sup>(a)</sup>**



(a) Real GDP per hour worked.  
Note: Data prior to 1978-79 are estimates. Data are annual averages.  
Source: ABS Cat. No. 5206.0 and 6203.0 and Treasury.

## EMPLOYMENT

In addition to the productivity influences, employment growth in the decades ahead will be another driver of real GDP growth. Changes in employment reflect the combined impact of changes in: the working age population; the labour force participation rate; the unemployment rate; and average hours worked.

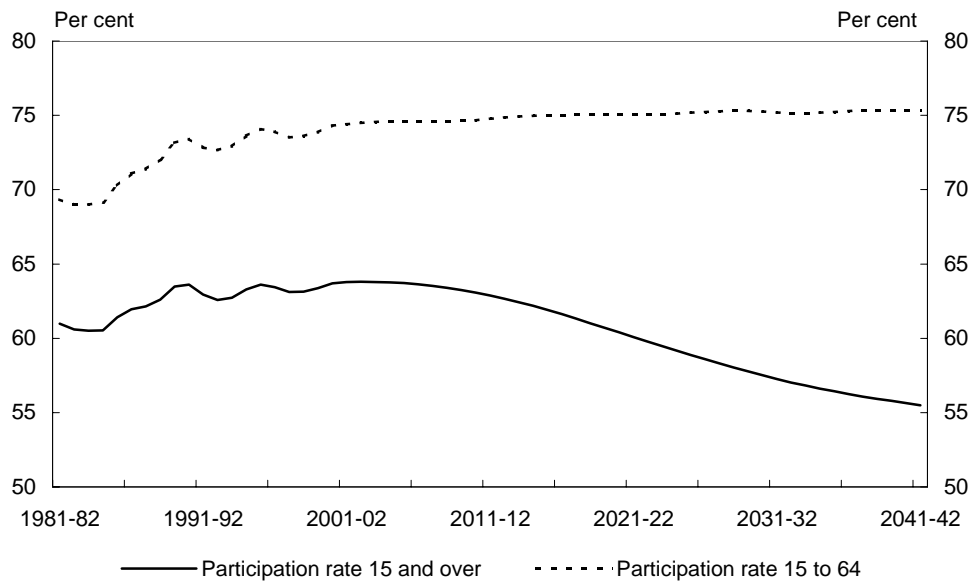
Given the demographic projections outlined previously, it is likely that the rate of growth in the labour force will decline, perhaps significantly, although the outcome will be influenced by future trends in labour force participation.

### Participation rate

Over the past three decades, the total labour force participation rate, that is the participation rate of those aged 15 years and over, rose from an estimated 58 per cent in 1960-61 to 64 per cent in 2000-01 (Chart 16). The upward trend reflected a fall in male labour force participation that was more than offset by a strong rise in female participation. The male participation rate fell from an estimated 83 per cent in 1960-61 to 72 per cent in 2000-01, while that of females rose from an estimated 36 per cent to 55 per cent over the same period.



**Chart 16: Participation rates**



Source: ABS Cat. No. 6202.0, ABS AusStats Time Series Spreadsheets 6291.0.40.001 and Treasury.

The future trends in participation rates are uncertain. With other factors unchanged, the overall upward trend in the labour force participation rate over recent decades seems unlikely to continue over the projection horizon, mainly reflecting Australia's ageing population.

The projections are based on current participation rate trends adjusted for demographic changes and reflect different age groups' traditionally different labour force participation rates. Prime-aged workers, that is, those between 25 and 54 years, historically have been more likely to be in the labour market than those aged 55 years and over. As the 'baby boomers' age, older groups with traditionally lower labour market attachment will increase in size relative to the overall population. This is likely to put downward pressure on the overall participation rate.

Nevertheless, rises in participation rates are projected for a number of other sub-groups. For example, labour force participation of women aged 45 to 54 years has been trending up over time, and this trend is assumed to continue over the projection horizon.

Overall, until 2007-08, the participation rate for people aged 15 and over is projected to remain around current levels (about 64 per cent) but then to decline steadily to around 56 per cent by the second half of the 2030s. The decline reflects the increase in the proportion of the population over 64, and the very low participation rates of this group. In contrast, the participation rate of 15 to 64 year olds is projected to be steady. (See Appendix B for projected age and gender-specific labour force participation rates.)

Changes in the overall participation rate are mainly driven by changes in the labour force attachment of prime-aged workers, as this group constitutes about 70 per cent of the total labour force, with the remainder comprising of older and younger workers. As a result, increasing the participation rates of groups with lower participation rates, such as older workers, would have only a limited impact on the overall participation rate. For example, a large 10 percentage point increase in the participation rate of male workers aged 55 years and over would be required to lead to an increase in the overall participation rate of at most 2 percentage points.<sup>5</sup> Although a substantial increase in participation of older workers would not have a large impact on the overall participation rate and hence economic growth, other benefits such as higher income for this group would result.

## Unemployment

In the longer term, it may be possible to achieve a significantly lower unemployment rate than the current 6.3 per cent level, without triggering ever higher inflation. This potential longer term unemployment rate is often referred to as the non-accelerating inflation rate of unemployment (NAIRU).<sup>6</sup> To the extent that the NAIRU is below the current unemployment rate, there is scope for employment to grow faster than the labour force for a period, allowing the unemployment rate to fall until it reaches the NAIRU. Determining the exact level of the NAIRU is difficult, especially as this level is likely to shift over time, such as with changes in education, the location of work and structure of the economy. Further, the NAIRU may decline over time in response to future labour market reforms, or as earlier labour market reforms continue to work through the economy.

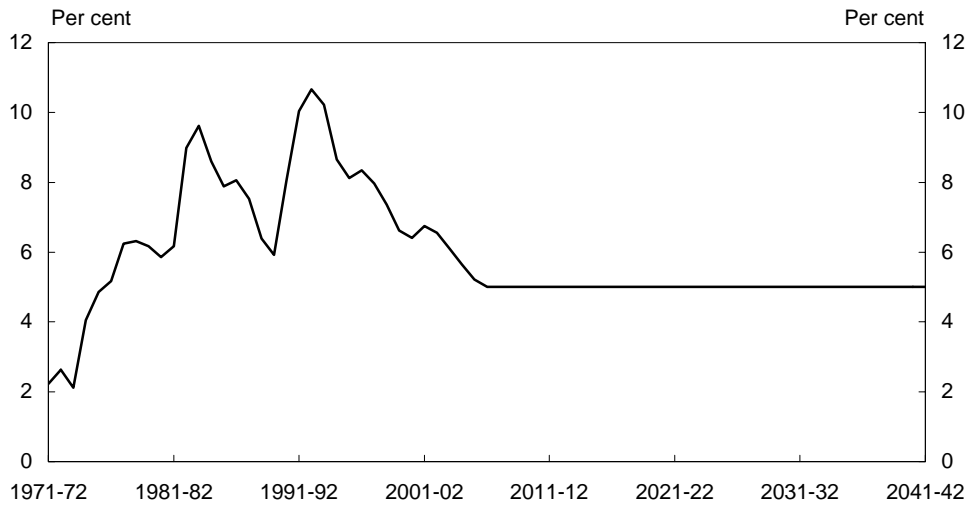
These projections assume that the unemployment rate will gradually decline to 5 per cent in 2006-07 and remain at this level thereafter, although significant uncertainty remains around these assumptions (Chart 17).

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5 A 10 percentage point rise in the participation rate of male workers aged 55 years and over would cause an increase of about 1.5 percentage points in the overall participation rate in 2009-10 and a rise of about 2 percentage points in 2041-42. The larger impact in 2041-42 reflects the projected larger share of older people in the overall population by that year.

6 For example, Gruen, Pagan, and Thompson 1999, estimated the NAIRU to be between 5½ and 7 per cent in 1997 while Dungey and Pitchford 1998, estimated that at steady inflation growth, the unemployment rate could fall to around 5 per cent after four years.

**Chart 17: Unemployment rate**

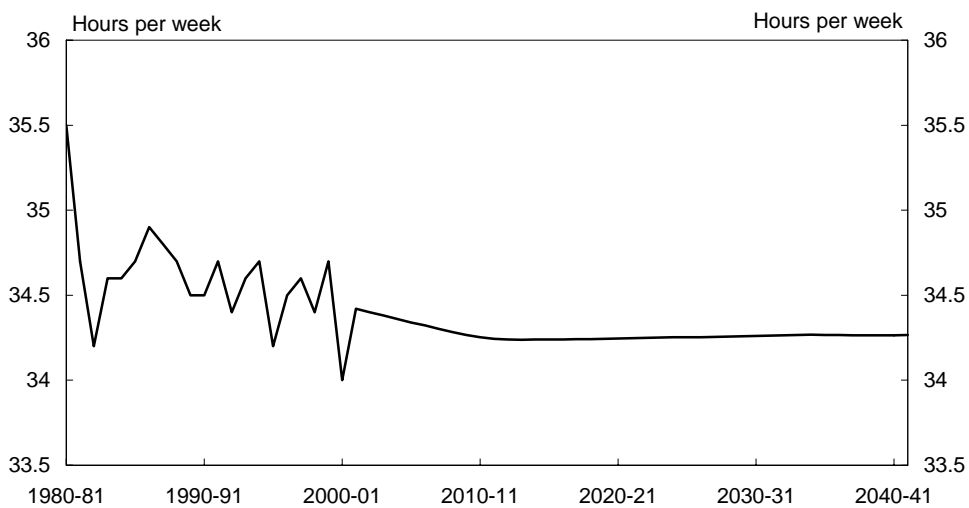


Note: Data prior to 1978-79 are estimates.  
 Source: ABS Cat. No. 6202.0 and Treasury.

**Hours worked**

Over the past decade, average hours worked per week declined slightly overall, although with large fluctuations from year to year. In the projection period, average hours worked per week are assumed to decline slightly, by 0.1 per cent per year over this decade, and to remain essentially unchanged thereafter (Chart 18).

**Chart 18: Average hours worked**



Source: ABS Cat. No. 6203.0 and Treasury.

## PRICES, THE GDP DEFLATOR AND WAGES

To compare the actual performance of the economy over time, this report uses real GDP, that is the level of economic activity in constant prices. So that the spending projections can be considered relative to the size of the economy they are calculated as a share of nominal GDP. To convert real GDP to nominal GDP, an estimate of the GDP deflator is required. Over the longer term, the GDP deflator and Consumer Price Index (CPI) are assumed to move together.

Following two decades of moderate to high inflation rates, inflation has been much lower and less volatile since the early 1990s. This low and steady inflation environment has been built into the monetary policy framework and hence is assumed to continue over the projection period. In line with the Reserve Bank of Australia's target band, both the CPI and the GDP deflator are assumed to increase 2.5 per cent per year from 2005-06 onwards.

Prior to 2006-07, with the unemployment rate declining to the NAIRU, real wages are assumed to rise at a lower rate than productivity growth, allowing employment to rise faster than otherwise. Once the unemployment rate has declined to the assumed NAIRU, real wage growth is assumed to be equal to productivity growth, consistent with a steady unemployment rate and a steady inflation rate over the remainder of the period. Nominal wages are therefore projected to grow at 4.25 per cent per year beyond 2006-07 (that is, at a rate reflecting inflation of 2.5 per cent per year and productivity growth of 1.75 per cent per year).

## ECONOMIC GROWTH PROJECTIONS

Over the longer term, productivity growth is the key driver of real GDP growth. With projected lower growth in the labour force and falling participation rates, annual employment growth could be significantly lower over coming decades. Assuming that productivity will grow at around its 30-year average of 1.75 per cent per year, real GDP growth is projected to decline to an average of 3.1 per cent per year in the current decade, and to around 2 per cent per year by the 2020s and beyond (Table 4).

**Table 4: Growth in real GDP and real GDP per person<sup>(a)</sup>**

Decade	Labour productivity growth	Employment growth	Real GDP growth(b)	Real GDP per person growth
1980s	1.2	2.4	3.4	1.8
1990s	2.0	1.3	3.4	2.2
2000s	1.7	1.5	3.1	2.1
2010s	1.75	0.6	2.3	1.5
2020s	1.75	0.2	2.0	1.4
2030s	1.75	0.1	1.9	1.5

(a) Average annual growth rates (per cent).

(b) 1999–2000 dollars.

Source: ABS Cat. No. 5206.0 and 6203.0 and Treasury.

GDP per person, a more appropriate indicator of the growth in living standards, also is projected to grow more slowly over the long term. However, the growth in real GDP per person is not anticipated to decline to the same extent as the growth rate of real GDP. This is because the projected slowdown in GDP growth is partly driven by demographic factors, including slower growth in the total population.

As these GDP projections depend critically on the productivity assumptions, this report also provides both high and low productivity growth scenarios starting in 2006-07 (Table 5). The high productivity scenario uses a productivity growth rate similar to the 1990s (that is, 2.0 per cent per year) while the low growth scenario uses a productivity growth rate similar to that experienced in the 1980s (that is, 1.2 per cent per year). The high productivity growth assumption leads to higher annual real GDP growth and results in the level of real GDP being about 9 per cent higher than under the base case in 2041-42. Similarly, the low productivity scenario leads to lower annual real GDP growth and results in the level of real GDP being about 18 per cent lower than under the base case in 2041-42.

**Table 5: Real GDP growth under different productivity growth scenarios<sup>(a)</sup>**

Decades	High productivity growth scenario	Base case	Low productivity growth scenario
2000s	3.2	3.1	2.9
2010s	2.6	2.3	1.8
2020s	2.2	2.0	1.4
2030s	2.1	1.9	1.3

(a) Average annual growth rates (per cent).  
Source: Treasury.

GDP can be measured in three different ways: through measures of income flows, measures of expenditure flows and from direct measures of production. The difference between the three measures of GDP can be important as different areas of government expenditure are affected by different measures of GDP. The income approach, GDP(I), measures the income derived from the inputs of production (labour and capital). The expenditure approach, GDP(E), measures the domestic final consumption of goods and services. The production approach, GDP(P), measures the value of the goods and services produced in the economy. Conceptually, each measure of GDP should deliver the same estimate. Therefore, the three different measures of GDP are assumed to be equal over the projection period.

## INTERNATIONAL COMPARISONS

Over the longer term, all OECD countries are expected to experience similar downward pressure on the growth rate of the labour force and hence real economic growth, as a result of declining fertility rates and an ageing population (Table 6).

Using the base case assumptions, by the end of the decade, Australia's average real GDP growth rate is projected to be stronger than some recent projections for the United Kingdom, New Zealand and Japan, reflecting Australia's projected stronger employment growth. However, Australia's projected average real growth rate is slightly lower than recent projections for the United States, reflecting higher fertility rates in the United States.

**Table 6: International projections<sup>(a)</sup>**

Country	Year	Real GDP growth	Labour productivity growth	Unemployment rate
Australia	2006-07 to 2010-11	2.7	1 3/4	5.0
USA	2007 to 2011	3.1	1.7(b)	5.2
UK	2007-08 to 2011-12	2 1/4	2	**
New Zealand	2006 to 2011	2.2	1.5	5.9
Japan	2005 to 2015	-0.1	**	**

(a) Numbers are presented as annual averages (per cent).

(b) Total factor productivity.

Source: Treasury projections, US Congressional Budget Office 2000, Her Majesty's Treasury 2002, The Treasury (New Zealand) 2001, Japan Center for Economic Research 1999.