Chapter 1: Long-term demographic and economic projections

Overview

Population ageing, and the associated decline in workforce participation, is projected to reduce the potential economic growth rate of the Australian economy. Over the past 40 years, real GDP growth has averaged 3.3 per cent a year. For the next 40 years, real GDP growth is expected to slow to 2.7 per cent a year.

Average growth in real GDP per person is also projected to slow from 1.9 per cent a year over the past 40 years, to 1.5 per cent over the next 40 years.

The ageing of the population will see the number of people aged 65 to 84 years more than double and the number of people 85 years and over more than quadruple.

As a consequence, the proportion of the population of traditional working age and therefore the rate of labour force participation across the whole population is projected to decline. The number of people of working age to support every person aged 65 years and over is projected to decline to 2.7 people by 2050 (compared with 5 people now).

Ageing of the population reflects the effects of a decline in fertility rates which commenced in the 1960s and increasing life expectancy, which are expected to be only partially offset by future net overseas migration.

In the face of an ageing population, productivity growth is critical to supporting higher economic growth. This report makes the technical assumption that productivity growth will average 1.6 per cent a year consistent with the average over the last 30 years. Achieving and sustaining a higher rate of productivity growth would help to limit the economic and fiscal consequences of an ageing population.

1.1 Framework for real economic growth

Long-term projections of economic growth take current economic conditions and economic forecasts as a base. Trend growth rates over the longer term are a function of population, productivity and participation (the 3Ps framework). This IGR is based on the forecasts and projections set out in the *Mid-Year Economic and Fiscal Outlook 2009–10* (MYEFO).

The projections are also consistent with the methodology in the 2009–10 Budget and the MYEFO, with the economy projected to recover from the current economic downturn, returning to its potential level of output and trend growth path by 2014–15.

1.1.1 Forward estimates and medium-term projections

This IGR has been prepared at a time when the Australian economy is operating below potential as a result of the effects of the global financial crisis and global recession, with below-trend economic growth forecast for 2009–10 and 2010–11.

Economic downturns have the potential to reduce the growth potential of the economy through skill atrophy and capital erosion. The shallower downturn now expected in the Australian economy means the medium-term output loss is expected to be smaller than in other countries. In moderating the downturn, the monetary and fiscal stimulus is expected to place the economy in a better position, compared with the alternative of no policy action, to deal with the long-run challenges.

It is estimated that the loss of permanent output in Australia could be as little as 1¾ per cent. The IMF has estimated that for most advanced economies the average output loss could be over 10 per cent.[1]

Consistent with the MYEFO, as the shock abates the Australian economy is assumed to grow above trend, with a steady decline in the unemployment rate, until the economy returns to capacity. At this point growth returns to the long-run trend suggested by the 3Ps framework. Key macroeconomic aggregates over this period are presented in Table 1.1 and are the same as those presented in MYEFO.

Table 1.1: Medium-term economic parameters in projections

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Real GDP growth	1 1/2	2 3/4	4	4	4	4
Nominal GDP growth	1 1/4	5 1/2	6 1/4	6 1/4	6 1/4	6 1/4
Unemployment rate	6 1/4	6 1/2	6	5 3/4	5 1/2	5
Participation rate	65	65	65 1/4	65 1/4	65 1/2	65 1/2

Note: All parameters are expressed in year average terms and are consistent with MYEFO.
Source: ABS cat. no. 5206.0 and cat. no. 6202.0, and Treasury projections.

The medium-term assumptions for productivity and the unemployment rate compare favourably with those used in international medium-term projections (Table 1.2).

1 IMF Staff Report for the Australian 2009 Article IV Consultation, July 2009.

Table 1.2: International projections

Country	Years	Real GDP growth	Labour productivity growth	Unemployment rate
Australia	2015-16 to 2019-20	2.9	1.6	5.0
United States	2015 to 2019	2.4	1.9	4.8
United Kingdom	2012-13 to 2016-17	2.0	1.8	*
New Zealand	2014 to 2023	2.6	1.5	4.5
Japan	2016 to 2020	1.6	*	3.4

Note: Numbers are annual averages (per cent). * Indicates that these data are not available.
Source: Treasury projections; Congressional Budget Office (US Congress), 2009; Her Majesty's Treasury, 2009; The Treasury (New Zealand), 2009; and Japan Centre for Economic Research, 2009.

1.1.2 Long-term economic projections: the 3Ps framework

From 2015–16, real economic growth is determined by the 3Ps framework (Chart 1.1).

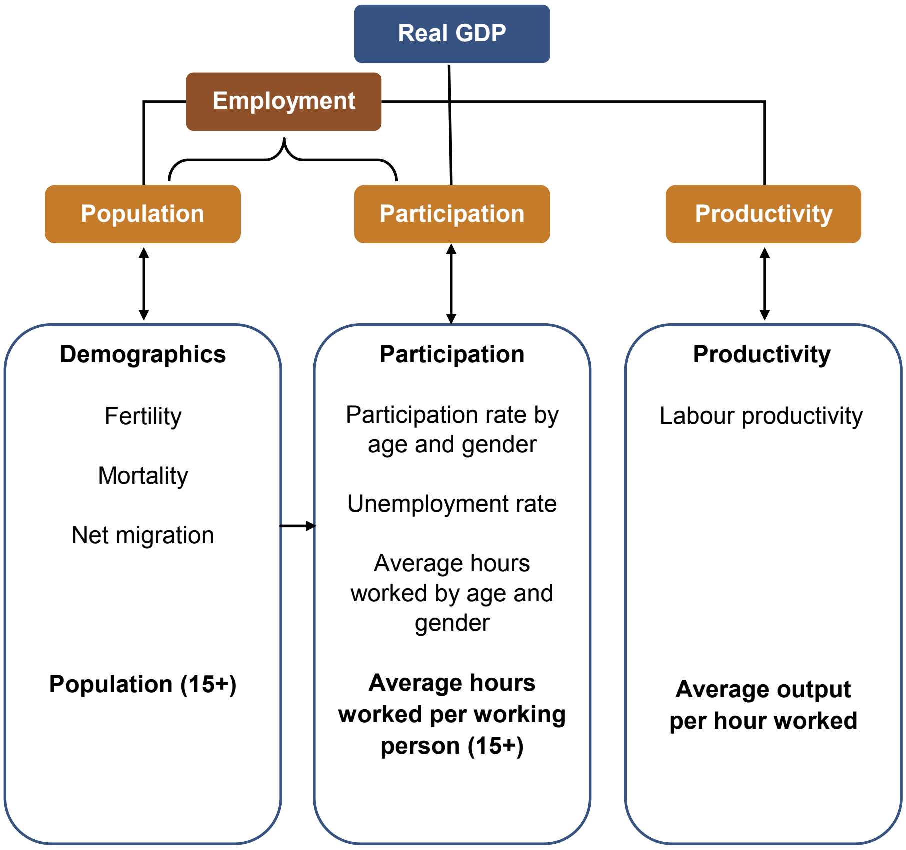
That is, real GDP growth is a function of:

- population — the number of people of working age (15 and over);
- productivity — the average output per hour worked; and
- participation — the average hours worked by each working person.

Projections of the 3Ps are determined by demographic and economic assumptions.

- The demographic assumptions about fertility, mortality and migration affect the number of people of working age (population) and the age and gender composition of the population.
- The composition of the population in turn affects participation and hours worked because different age-gender cohorts have different patterns of participation and hours worked. Changes in these patterns of work of individual cohorts over time will also affect aggregate labour market participation.
- Future average productivity is assumed to reflect historical experience.

Chart 1.1: The 3Ps framework for real GDP



Source: Treasury.

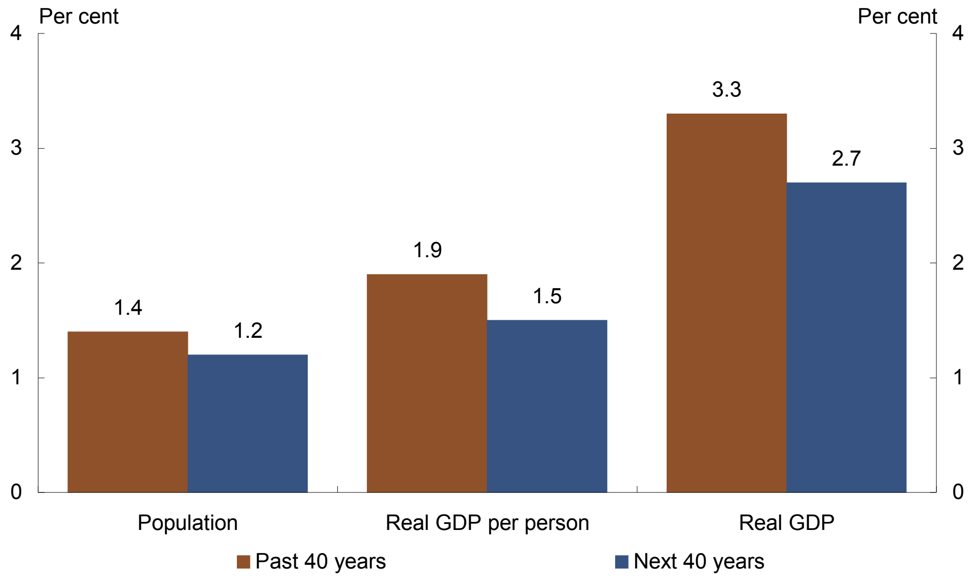
1.2 Real GDP

Real GDP growth over the next 40 years is projected to average 2.7 per cent per annum. This is composed of average annual real GDP per person growth of 1.5 per cent and average annual growth in the total population of 1.2 per cent (Chart 1.2).

This compares with the average of the past 40 years of 3.3 per cent per annum, during which there was stronger average growth in real GDP per person of 1.9 per cent and faster average growth in the total population of 1.4 per cent each year.

Chart 1.2: Real GDP and real GDP per person

Average annual growth



Source: ABS cat. no. 5206.0 and cat. no. 3105.0.65.001, and Treasury projections.

1.3 Population

While population will continue to grow, annual rates of population growth are projected to slow gradually, from 2.1 per cent in 2008–09 to 0.9 per cent in 2049–50. The projected average annual rate of population growth of 1.2 per cent over the next 40 years is slightly lower than the average annual rate of 1.4 per cent over the previous 40 years.

Australia's population is projected to grow from around 22 million people currently to 35.9 million people in 2050.

Population ageing is projected to continue. The number of children is projected to increase by 45 per cent and the number of prime working-age people is projected to increase by 44 per cent between 2010 and 2050. This is expected to occur at the same time as the number of older people (65 to 84 years) more than doubles, and the number of very old (85 and over) more than quadruples.

While there is positive growth in the size of all age groups and growth in the size of the labour force, the working-age ratios are projected to fall at the same time as the aged dependency and child dependency ratios rise.

In 1970, there were 7.5 people of working age to support every person aged 65 and over. By 2010 this has fallen to an estimated 5 people of working age for every person aged 65 and over. By 2050 the number is projected to decline to 2.7 people of working age to support every person aged 65 and over.

1.3.1 Parameters influencing population growth and composition

Fertility

Fertility peaked at 3.5 births per woman in 1961 (the end of the post World War II baby boom). Subsequently, the total fertility rate (TFR) of Australian women declined rapidly during the 1960s and 1970s, stabilised during the 1980s then declined further until 2001. Since that time fertility has been generally increasing to reach almost 2 births per woman in 2008, the highest since 1977 (Chart 1.3).

Australia's current TFR is higher than the fertility rates in many OECD countries, including Italy, Germany, Japan and Canada, and is well above the OECD average of 1.68 (2007 data). It remains below those for New Zealand (2.18 in 2008) and the United States (OECD estimate of 2.12 in 2007).

This IGR projects the TFR to fall slightly to exactly 1.9 by 2013 and stay at that level for the remainder of the projection period. Natural increase remains positive throughout the projection period.

Mortality

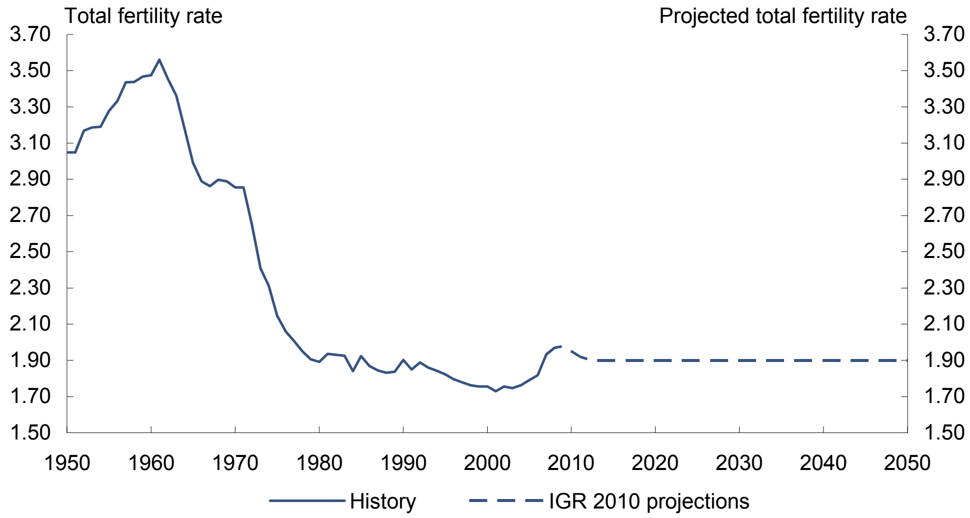
Over the past century, average Australian mortality rates have fallen significantly, with life expectancies rising for both men and women. These falls have added to population growth and the proportion of older people in the Australian population.

Australia's crude mortality rate has fallen from 9.1 deaths per 1,000 people in 1968 to 6.7 deaths per 1,000 people in 2008.

Given population ageing, this indicates considerable declines in age-specific mortality rates. Mortality rates have fallen for both sexes.

While women have lower mortality rates than men and are projected to live longer than men on average, life expectancies for men and women are slowly converging. Australians' life expectancies remain among the highest in the world. The 2006–08 life tables indicated that life expectancy at birth for men had risen to 79.2 years and for women to 83.7 years (an increase of 24.0 and 24.9 years respectively since 1901–10).

Chart 1.3: Australia's historical and projected total fertility rate



Source: ABS cat. no. 3105.0.65.001 and cat. no. 3301.0 (various), and Treasury projections.

These mortality and life expectancy trends are projected to continue (Table 1.3).

- Men born in 2050 are now projected to live an average of 7.6 years longer than those born in 2010, and women an average of 6.1 years longer.

- Men aged 60 in 2050 are projected to live an average of 5.8 years longer than those aged 60 in 2010, and women an average of 4.8 years longer.

Table 1.3: Australians' projected life expectancy (years)

	2010	2020	2030	2040	2050
Life expectancy at birth					
Men	80.1	82.5	84.5	86.1	87.7
Women	84.4	86.2	87.8	89.2	90.5
Life expectancy at age 60					
Men	23.4	25.2	26.7	28.0	29.2
Women	26.6	27.9	29.2	30.4	31.4
Life expectancy at age 67					
Men	17.6	19.1	20.4	21.6	22.6
Women	20.4	21.6	22.8	23.8	24.8

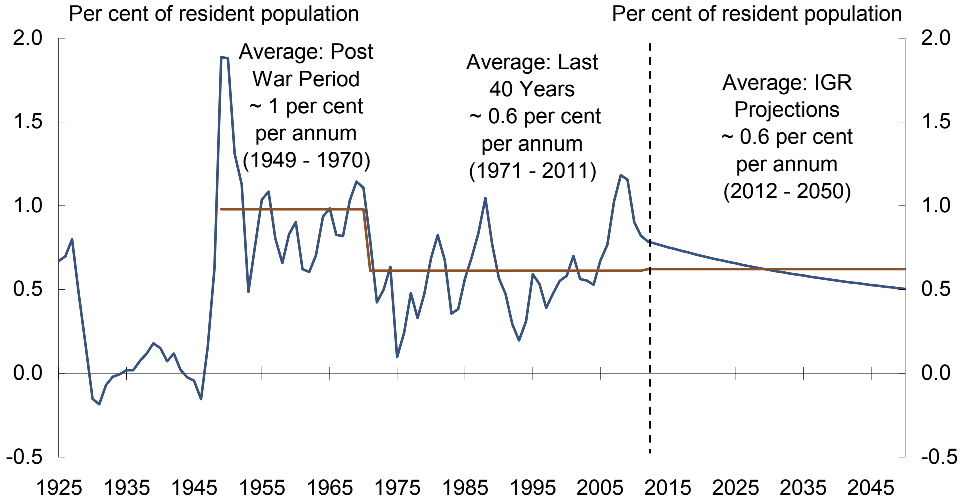
Source: Treasury.

Migration

For IGR 2010, net overseas migration is assumed to fall relatively sharply from an average of around 244,000 a year over the three years to June 2009 to 180,000 people a year from 2012, with the same age-gender profile as at present.

The rate of net overseas migration as a proportion of the resident population, as opposed to the absolute level of net overseas migration, is useful for assessing migration trends over long periods of time. The rate of net overseas migration was low during the Depression years, rose to around 1 per cent per annum in the period immediately following World War II, and has averaged 0.6 per cent per annum over the subsequent 40 year period (Chart 1.4). The average rate of net overseas migration over the IGR projection period is around the average observed over the last 40 years.

Chart 1.4: Rate of absorption of net overseas migration

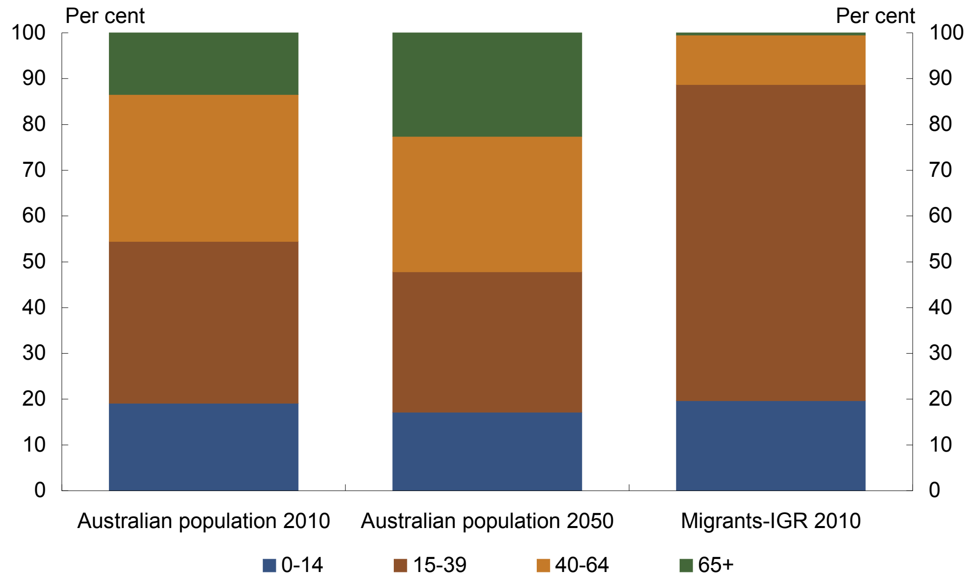


Source: Demography (1947, 1966, 1967 & 1968, 1971) (for years 1925–1971), ABS cat. no. 3401.0 (various issues) (for years 1972–1996), cat. no. 3101.0 (various issues) (for years 1997-2008), cat. no. 3105.0.65.001, and Treasury projections.

Recent increases in net overseas migration primarily reflect a significant increase in the rate of temporary, demand-driven migration, including international students and 457 visa holders (the latter contributing to fill skill shortages when the economy was growing rapidly) and a change in ABS methodology.

Net overseas migration contributes to population growth and tends to reduce the rate of population ageing since migrants are younger on average than the resident population. Currently, around 89 per cent of migrants are aged less than 40 when they migrate to Australia. This compares with around 55 per cent for the resident Australian population (Chart 1.5).

Chart 1.5: Age distribution of Australian population and migrants



Source: Unpublished ABS data and Treasury projections.

Net overseas migration has varied over the past four decades. Historically, this was the result, in part, of governments adjusting the permanent migration program to respond to the need for skilled workers during periods of high economic growth. It also reflects the self-adjustment that tends to occur in temporary migration as it moves in line with economic conditions. Permanent and long-term departures also have a propensity to increase when economic growth is strong.

1.3.2 Age dependency projections

Despite differing rates of growth among age groups, the population in all age groups is projected to increase (Table 1.4). Higher growth in older age groups, however, leads to a significantly higher proportion of older people in the 2050 population than in 2010 (Table 1.4 and Chart 1.6).

The projected population for selected age ranges highlights the growth in the proportion of older people.

- In June 2010, the proportion of those aged 65 and over in the Australian population is projected to reach 13.5 per cent, up from 8.3 per cent in 1970.

- By June 2050, around 22.6 per cent of the Australian population is projected to be aged 65 and over.

The proportion of the population aged 85 and over is projected to increase most rapidly, rising from 1.8 per cent in 2010 to 5.1 per cent in 2050.

Table 1.4: Australian population history and projections

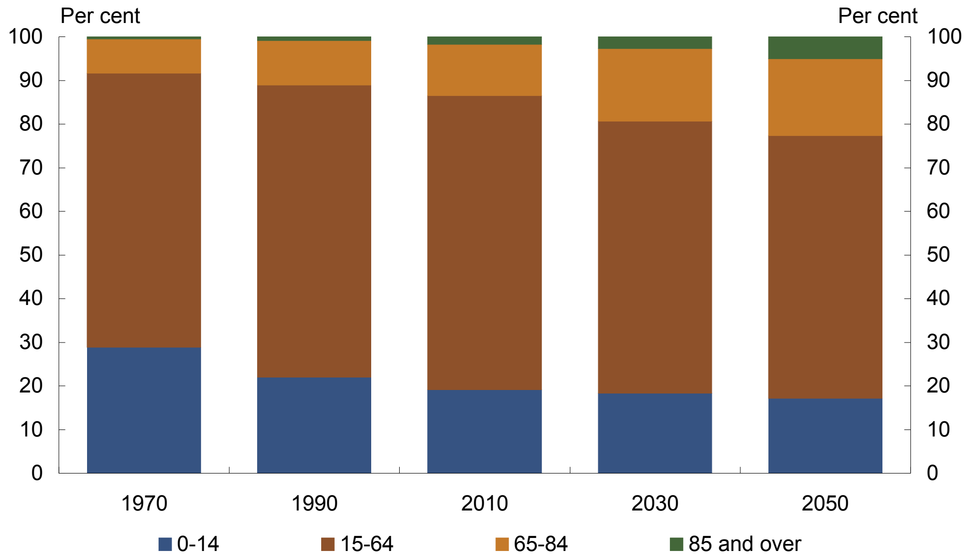
Age range	1970	2010	2020	2030	2040	2050
Population as at 30 June (millions of people)						
0-14	3.6	4.2	4.9	5.4	5.7	6.2
15-64	7.9	15.0	16.6	18.2	20.0	21.6
65-84	1.0	2.6	3.7	4.8	5.6	6.3
85 and over	0.1	0.4	0.5	0.8	1.3	1.8
Total	**12.5**	**22.2**	**25.7**	**29.2**	**32.6**	**35.9**
Percentage of total population						
0-14	28.8	19.1	19.0	18.3	17.4	17.2
15-64	62.8	67.4	64.7	62.4	61.3	60.2
65-84	7.8	11.7	14.3	16.6	17.2	17.6
85 and over	0.5	1.8	2.1	2.7	4.0	5.1

Source: ABS cat. no. 3105.0.65.001 (2008) and Treasury projections.

While the size of the labour force is projected to grow, the proportion of the population that is working age is expected to fall.

Between 2010 and 2050 the population of traditional working age (15 to 64 years) is projected to grow by 44 per cent and the population aged 0 to 14 years by 45 per cent. Despite this growth, as a proportion of the total population both age cohorts are projected to fall (by around 7 and 2 percentage points respectively).

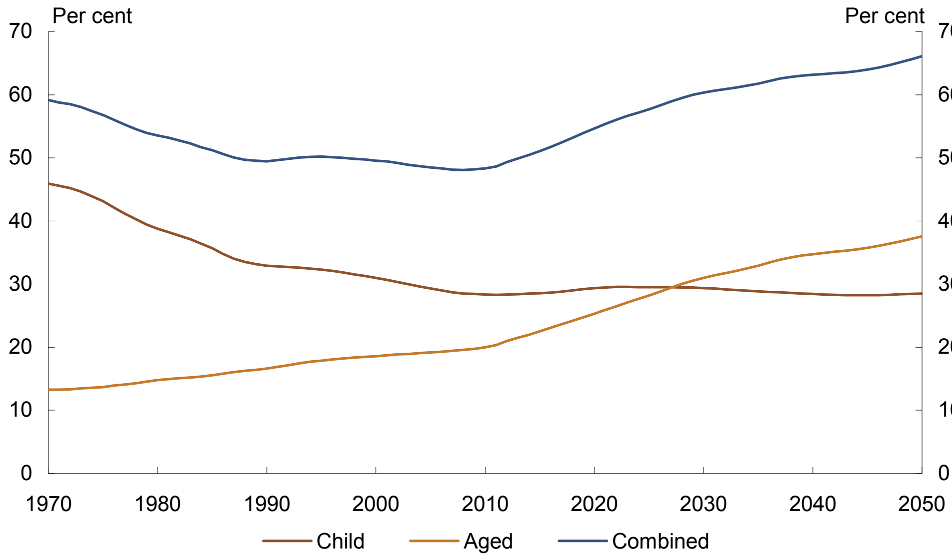
Chart 1.6: Proportion of the Australian population in different age groups



Source: ABS cat. no. 3105.0.65.001 (2008) and Treasury projections.

In 2010, the aged-to-working-age ratio (the proportion of people aged over 65 to people of traditional working age 15 to 64 years) is projected to be 20 per cent. This is projected to rise to 37.6 per cent by 2050 (Chart 1.7). Over the same period, the child-to-working-age ratio (the proportion of children aged 0 to 14 years relative to people of traditional working age) is projected to fluctuate around the current level.

Chart 1.7: Australia's aged- and child-to-working-age ratios



Source: ABS cat. no. 3201.0 (2008) and Treasury projections.

1.4 Participation

Total labour force participation is expected to fall, reflecting a combination of the projected fall in the proportion of people aged 15 and over in the labour force and falling hours worked by those in employment.

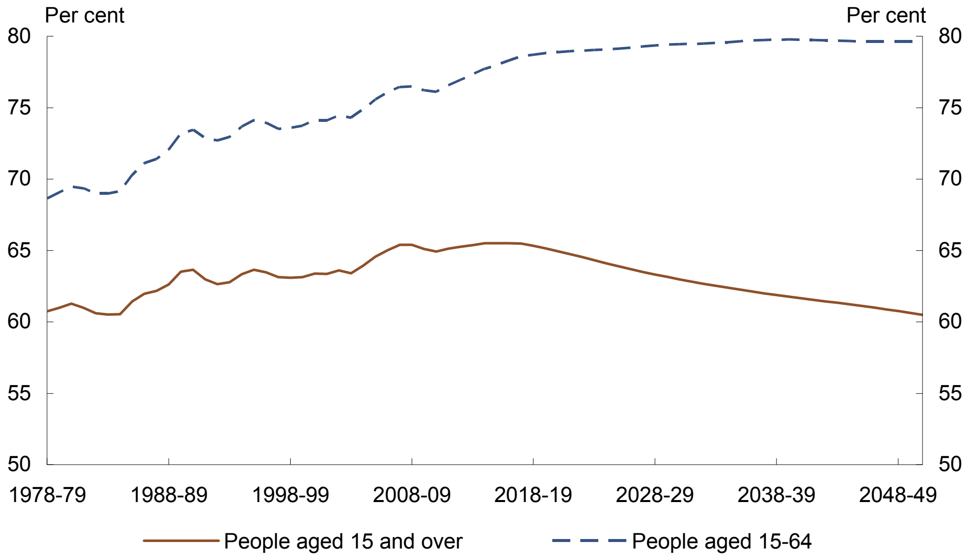
The total labour force participation rate for people aged 15 and over is projected to fall to less than 61 per cent by 2049–50, compared with 65 per cent today.

Average hours worked are determined by the changing age and gender distribution of the population. For example, a gradually increasing proportion of older people participate in the labour force over the IGR projection period. People in older age cohorts generally have lower participation rates and average hours worked than younger cohorts.

1.4.1 Trends in the participation rate

The composition of the labour force has changed considerably over the past two decades. Total labour force participation for people aged 15 and over has risen gradually from 60.7 per cent in 1978–79 to 65.4 per cent in 2008–09 (Chart 1.8). This stems from the strong rise in women's labour force participation, particularly for older women, from 43.5 per cent to 58.7 per cent, partly offset by a fall in men's participation, from 78.5 per cent to 72.3 per cent.

Chart 1.8: Historical and projected participation rates



Source: ABS cat. no. 6291.0.55.001 and Treasury projections.

The increase in female participation rates has been influenced by a range of factors including: increased levels of educational attainment; greater acceptance of working mothers; declining fertility rates; better access to childcare services and part-time work; and more flexible working arrangements.

Over the longer term, the ageing of the population is projected to lead to falling total participation rates over the next 40 years.

Older people are projected to continue to have lower labour market attachment than people of prime working age (25 to 54 years). This is particularly the case for people aged more than 65 years. As the number of aged people increases, their lower rates of participation are projected to pull down the total labour force participation rate from 65.1 per cent in 2009–10 to 60.6 per cent by 2049–50. That is, the impact of ageing on participation is expected to outweigh an improvement in the working-age participation rate for people aged 15 to 64 years from 76.2 per cent in 2009–10 to 79.7 per cent by 2049–50.

Age-specific labour force participation rates for men and women are projected to stabilise or increase in all age groups to 2049–50. With the exception of the very young, the total age specific participation rates (full-and part-time employment combined) are higher for men than for women. This is projected to continue. The majority of men of prime working age are in the labour force.

The trend of increasing female participation is projected to continue along with gradual increases in the Age Pension age for women.

1.4.2 Employment and unemployment

Projections of the unemployment rate are based on the rate that can be sustained without generating upward pressure on inflation, that is the non-accelerating-inflation rate of unemployment (NAIRU).

The NAIRU depends on a complex range of economic, demographic and institutional factors, including the way inflation expectations are formed, the wage-setting environment, the tax-transfer system, and the education and skills of people in the labour force.

The NAIRU varies over time and cannot be measured directly. It is typically estimated using economic models, which provide a range of estimates with considerable margin of imprecision around these estimates. IGR 2010 assumes a NAIRU of 5 per cent, the same rate assumed in IGR 2007. The NAIRU is held constant in the projections.

As a result, employment growth from 2014–15 (where the economy is projected to return to full employment) onwards reflects growth in the labour force. Employment growth is projected to slow in line with a gradual decline in labour force growth, associated with a falling total participation rate and slower growth in the working-age population.

1.4.3 Hours worked

The average number of hours worked per week per worker has fallen from 35.7 in 1997–98 to 34.1 in 2009–10. Beyond the forward estimates, a continued gradual decline is projected in average hours worked to 33.6 by 2049–50. This is largely attributable to higher labour force participation of older workers and women, with both of these groups more likely to work fewer hours.

1.5 Productivity

Chart 1.9 shows how labour productivity has varied considerably from year to year and decade to decade.

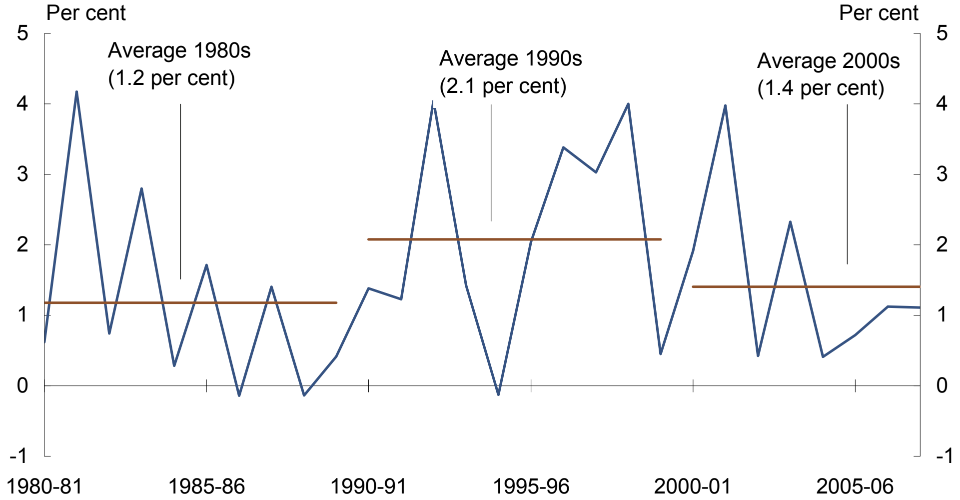
Average annual labour productivity growth was below average in the 1980s (1.2 per cent), but picked up in the 1990s (2.1 per cent) before slowing to around 1.4 per cent in the 2000s.

IGR 2010 assumes productivity growth equal to the average annual rate of growth of the previous 30 years, as was done in the first two IGRs. This average is 1.6 per cent per annum.

While implementation of recent policies to lift productivity growth will have implications for productivity over the medium term, it is inherently difficult to project productivity growth over long horizons with any precision. This is because of the historical variation in productivity growth, and difficulties in measuring and explaining the range of factors which drive productivity.

Chart 1.9: Labour productivity growth

Real GDP per hour worked



Note: Data are annual averages.
Source: ABS cat. no. 5206.0.

1.6 Growth in real GDP per person

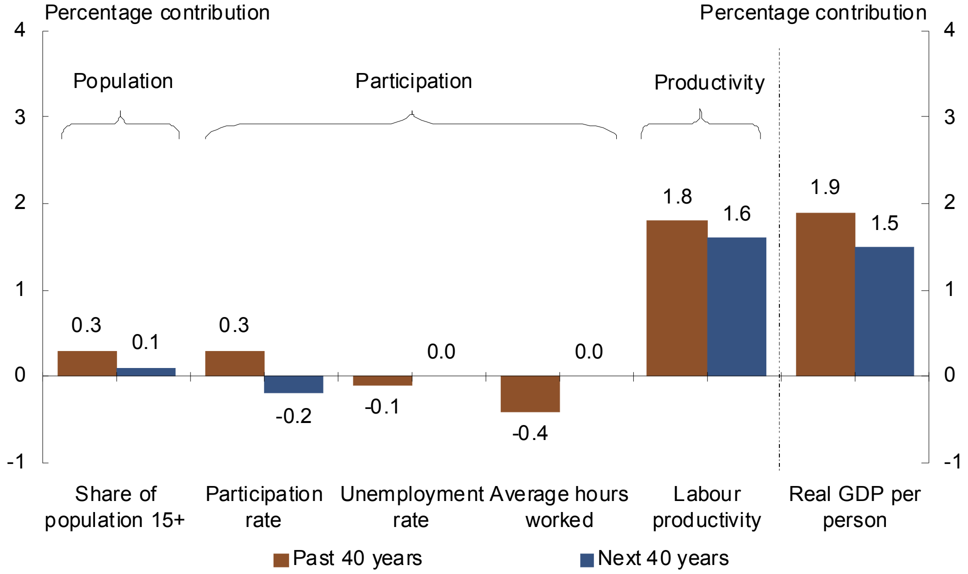
The contribution of population, participation and productivity to growth in real GDP per person is set out in Chart 1.10. Growth in productivity is the primary determinant of growth in real GDP per person.

Compared with the previous 40 years, when real GDP per person grew by an average annual rate of 1.9 per cent, over the next 40 years growth in real GDP per person is projected to slow to 1.5 per cent.

The growth in real GDP per person is driven by assumed labour productivity growth of 1.6 per cent, with the combined effect of changes in the share of the population aged 15 and over (working-age population) and participation detracting 0.1 percentage points. This compares with the previous 40 years, when employment growth contributed (rather than detracted) 0.1 percentage points to growth in real GDP per person.

IGR 2007 projected slightly higher average annual growth in GDP per person. Its higher productivity growth assumption outweighed the larger detraction it had projected from changes in the participation rate.

Chart 1.10: Growth in real GDP per person based on the 3Ps



Source: ABS cat. no. 5206.0, cat. no. 3105.0.65.001 and cat. no. 6202.0, and Treasury projections.

Box 1.1: Productivity, labour utilisation and GDP per person

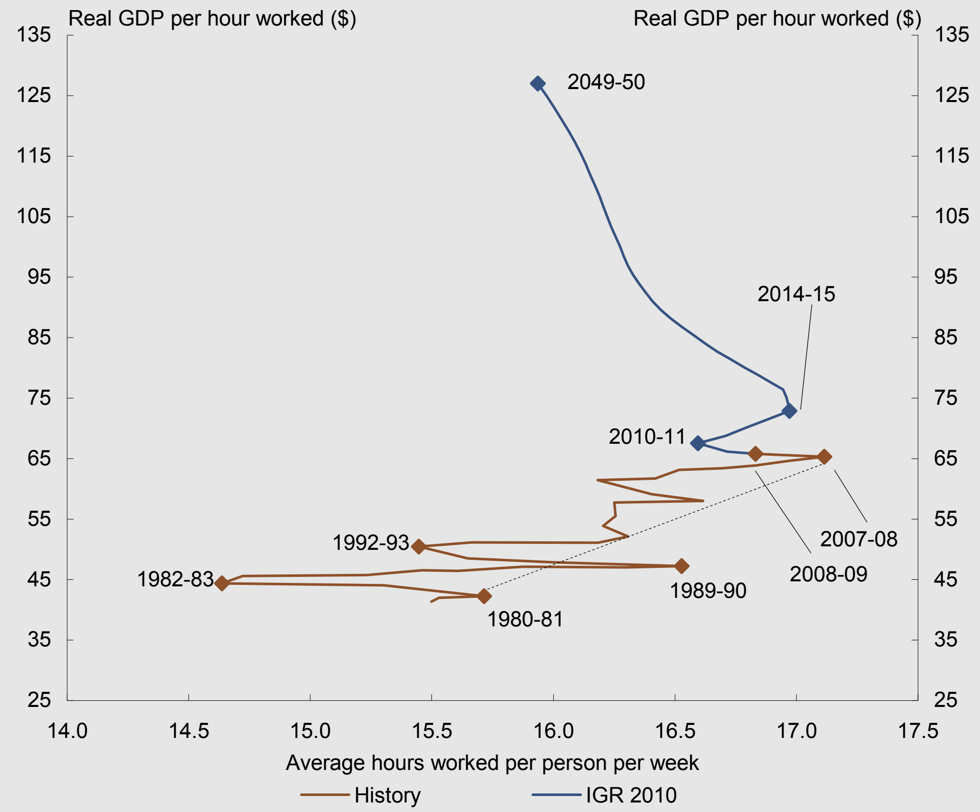
Growth in GDP per person can be expressed as growth in hours worked per person (labour utilisation) and growth in GDP per hour worked (productivity).

The history and projected path of productivity and labour utilisation is depicted in Chart 1.11.

Increases in productivity (which move the line up) and labour utilisation (which move the line to the right) both increase GDP per person.

The increase in GDP per person from 1980–81 to 2007–08 reflected both increased productivity and increased labour utilisation over this period. The fall in GDP per person in the recessions of 1982–83 and 1992–93 reflected lower labour utilisation rather than a fall in the level of productivity.

Chart 1.11: Productivity and labour utilisation



Note: Average hours worked per person are calculated across the whole population, not just those in the labour force. Real GDP per hour worked is in 2008–09 dollars.
Source: ABS cat. no. 5206.0 and Treasury projections.

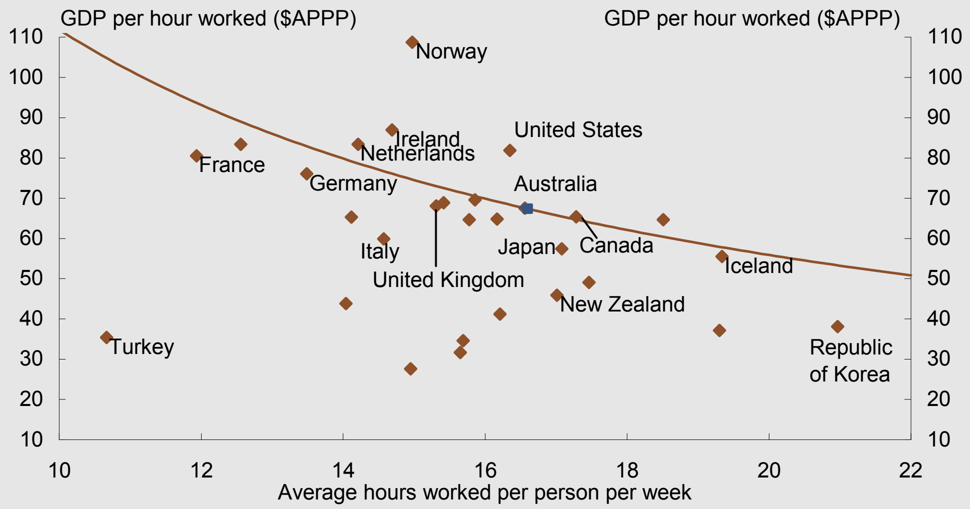
Box 1.1: Productivity, labour utilisation and GDP per person (continued)

The level of GDP per person is projected to be over 80 per cent higher in 2049–50 than in 2009–10, reflecting continued productivity growth (shown by the significant upward movement in the line), being only partly offset by lower labour utilisation from population ageing (shown by the shift of the line to the left).

International comparisons

OECD country data on labour productivity and utilisation in 2008 are presented in Chart 1.12. Different combinations of productivity and labour utilisation can result in the same level of GDP per person. The line in the chart shows combinations of productivity and labour utilisation that generate the same GDP per person as in Australia in 2008. For example, Canada has lower productivity and higher labour utilisation than Australia but the same GDP per person. Countries above (below) the line have higher (lower) GDP per person than Australia.

Chart 1.12: Productivity and labour utilisation in OECD countries in 2008



Note: Average hours worked per person are calculated across the whole population, not just those in the labour force. Thus, the horizontal axis combines the population and participation components of the 3Ps.
Source: OECD Productivity Database.

1.7 Prices, wages and nominal GDP

Nominal GDP is the value of the economy's output. Growth in nominal GDP reflects growth in the volume of output and growth in the price of output. Projections of nominal GDP growth therefore depend on assumptions regarding real GDP growth and growth in prices.

On average over the projection period, nominal GDP is projected to grow at around 5¼ per cent per annum.

The Consumer Price Index (CPI) is assumed to grow by 2½ per cent per annum beyond the forward estimates, consistent with Australia's medium-term inflation target. Nominal wages are assumed to grow at around 4 per cent, reflecting growth in the CPI and productivity growth of 1.6 per cent.

In IGR 2007 the GDP deflator and the CPI were assumed to grow together beyond the forward estimates, with both measures assumed to grow at 2½ per cent per annum.

IGR 2010 assumes that the terms of trade will decline gradually from their level at the end of the forward estimates period through until 2027–28, consistent with the medium-term projection assumptions adopted in the 2009–10 MYEFO and the terms of trade assumption underpinning modelling of the Carbon Pollution Reduction Scheme (CPRS) (see Chart 1.13). This has the effect of lowering annual growth in the GDP deflator to 2¼ per cent over this period.

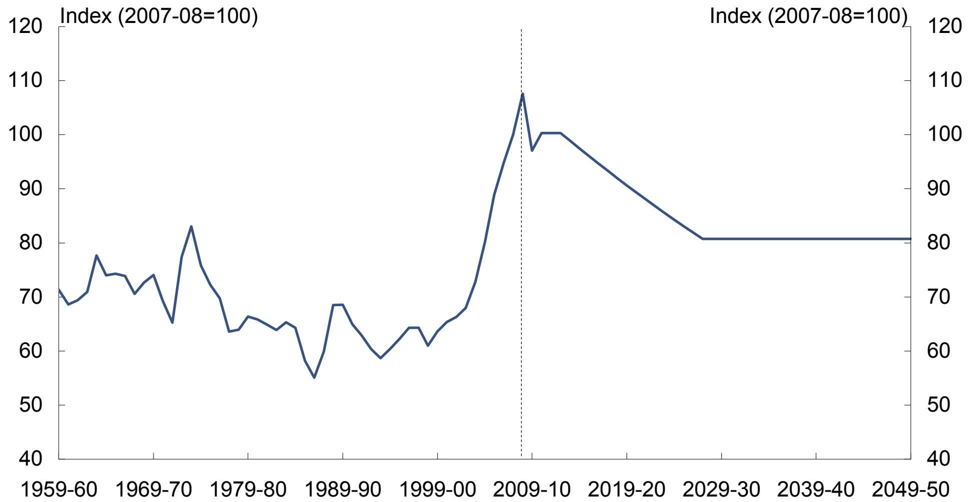
Lower growth in the GDP deflator results in lower growth in the value of the economy's output than would otherwise have been the case. Nominal GDP is assumed to grow at around 5 per cent per annum from the end of the medium-term transitional period (see section 1.1.1) until 2027–28, before increasing to 5¼ per cent once the terms of trade settle at their long-run level.

With the GDP deflator projected to grow at 2¼ per cent per annum until 2027–28, and the CPI assumed to grow at the higher rate of 2½ per cent beyond the forward estimates, a wedge appears between growth in producer prices (the GDP deflator) and consumer prices (the CPI) up until 2027–28, which has implications for assumed corporate profitability and the labour share of income. Nominal wages are assumed to grow at around 4 per cent per annum, which, along with assumptions for employment growth, results in the economy's total wage bill growing by 5¼ per cent over this period, faster than nominal GDP growth. This technical assumption leads to a rising wages share of factor income and an associated decline in the profits share of income through until 2027–28.

These assumptions lead to a reversal of the trends in factor income shares that have occurred in recent years. The past five years or so have seen a significant rise in the economy's profit share and a declining wages share. These trends have reflected the substantial rise in Australia's terms of trade, driven largely by higher world prices for commodity exports.

From 2028–29 onwards, the GDP deflator is assumed to grow by 2½ per cent, in line with annual growth in the CPI, with the wages and profits share of income assumed to remain flat for the remainder of the IGR 2010 projection period. From 2028–29, growth in nominal GDP is the sum of growth in prices (2½ per cent) and growth in real GDP.

Chart 1.13: Terms of trade projections



Source: ABS cat. no. 6206.0 and Treasury projections.