

# Australia to 2050: future challenges

Circulated by  
The Hon. Wayne Swan MP  
Treasurer of the Commonwealth of Australia

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## Foreword

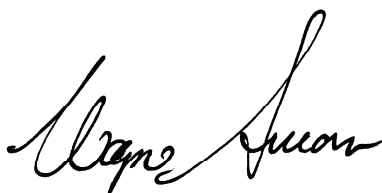
The *Intergenerational Report 2010* provides a comprehensive analysis of the challenges that Australia will face over the next forty years. It is a timely reminder that the decisions we take over the next four years will be crucial to our economic prospects and living standards over the next forty.

The key conclusion is that an ageing population and climate change present significant long-term risks for the economy and the sustainability of government finances. As the population ages, the rate of economic growth will slow. Pressures for government spending will increase, particularly in the health sector. At the same time, we will face the global challenge of climate change, which represents the largest threat to our environment and one of the most significant challenges to our economic sustainability.

The Government has begun to address these challenges through a broad agenda that includes supporting productivity growth through investment in infrastructure, skills and education, overhauling our health system to ensure it delivers maximum value for money, adhering to a disciplined fiscal strategy and introducing the Carbon Pollution Reduction Scheme.

This is the first Intergenerational Report of the Rudd Government and is being released in accordance with the *Charter of Budget Honesty Act*. In addition to assessing the fiscal and economic challenges of an ageing population, this report also includes a comprehensive discussion on environmental challenges and social sustainability.

The challenges outlined in the Intergenerational Report are substantial, but they are not beyond a nation like ours.

A handwritten signature in black ink, appearing to read 'Wayne Swan', written in a cursive style.

The Hon. Wayne Swan MP

## Notes

- (a) The following definitions are used in this report:
  - ‘real’ means adjusted for the effect of inflation; and
  - one billion is equal to one thousand million.
- (b) Figures in tables and generally in the text have been rounded. Discrepancies in tables between totals and sums of components are due to rounding.
- (c) References to the ‘States’ include the Territories.
- (d) Projections are based on the *Mid-Year Economic and Fiscal Outlook 2009–10* adjusted for the methodological changes to the System of National Accounts (SNA) from SNA93 to SNA08 by the Australian Bureau of Statistics in December 2009. For comparability purposes, the projections from IGR 2007 also have been adjusted for the SNA changes where they are reported as a proportion of GDP.

# Contents

<b>FOREWORD</b> .....	<b>III</b>
<b>EXECUTIVE SUMMARY</b> .....	<b>VII</b>
1. An ageing and growing population .....	viii
2. The economic and fiscal implications of an ageing population .....	ix
3. Responding to the implications of an ageing population .....	xii
4. Climate change and the environment.....	xvi
5. Social sustainability .....	xviii
6. The Government’s policy response .....	xviii
<b>CHAPTER 1: LONG-TERM DEMOGRAPHIC AND ECONOMIC PROJECTIONS</b> .....	<b>1</b>
1.1 Framework for real economic growth .....	1
1.2 Real GDP .....	4
1.3 Population .....	5
1.4 Participation .....	11
1.5 Productivity .....	13
1.6 Growth in real GDP per person .....	14
1.7 Prices, wages and nominal GDP .....	17
<b>CHAPTER 2: GROWING THE ECONOMY — PRODUCTIVITY, PARTICIPATION AND     POPULATION</b> .....	<b>21</b>
2.1 Promoting higher productivity growth .....	21
2.2 Participation .....	26
2.3 Population .....	30
<b>CHAPTER 3: LONG-TERM BUDGET PROJECTIONS</b> .....	<b>37</b>
3.1 Promoting fiscal sustainability: contribution of the medium-term fiscal strategy.....	37
3.2 Revenue.....	38
3.3 Ageing pressures will reduce fiscal sustainability.....	39
3.4 Net financial worth and net worth .....	42

<b>CHAPTER 4: AGEING PRESSURES AND SPENDING .....</b>	<b>45</b>
4.1 Projections of total spending.....	46
4.2 Health.....	49
4.3 Aged care.....	56
4.4 Pensions and income support payments.....	58
4.5 Education and training.....	63
4.6 Government employee superannuation .....	66
4.7 Defence.....	68
<b>CHAPTER 5: CLIMATE CHANGE AND THE ENVIRONMENT .....</b>	<b>71</b>
5.1 Climate change.....	71
5.2 Water .....	79
5.3 Land.....	82
<b>CHAPTER 6: A SUSTAINABLE SOCIETY .....</b>	<b>83</b>
6.1 Wellbeing and sustainability .....	83
6.2 The environment.....	88
6.3 Human and social capital: education, skills and health .....	93
<b>REFERENCES.....</b>	<b>105</b>
<b>APPENDICES</b>	
Appendix A: IGR 2010 projections summary.....	117
Appendix B: Sensitivity analysis of long-run economic and fiscal projections.....	121
Appendix C: Methodology.....	123
Appendix D: IGR 2007 projections.....	155

# Executive summary

## Overview

Australia faces a complex mix of long-term challenges — an ageing and growing population, escalating pressures on the health system, and an environment vulnerable to climate change. These challenges will place substantial pressure on Australia's economy, living standards and government finances over the next 40 years. These are challenges affecting developed countries around the world.

Population ageing reduces the proportion of working age people supporting people aged over 65 years. The rate of improvement in average living standards is projected to fall, placing pressure on Australia's capacity to fund the spending pressures associated with an ageing population, particularly in terms of health spending.

Australia's population will continue to grow over time, though at slightly lower rates than experienced over the past 40 years. This will put pressure on infrastructure, services and the environment, but the growth also assists in managing the pressures of an ageing population by providing the skills and innovation needed to underpin continued economic growth.

Decisions taken in the near term will impact on the wellbeing of future generations. Productivity-enhancing reforms, particularly through nation building infrastructure and improving the skills base, will grow the economy, improve living standards, and partly offset the fiscal pressures of ageing. With an ageing population, productivity growth is the key driver of future growth prospects. Reforms that reduce barriers to participation will also lift growth and reduce future pressures.

Steps to grow the economy and ensure permanent spending growth is sustainable, including through the implementation of the Government's fiscal strategy, will reduce future adjustment costs and the economic and fiscal consequences of ageing.

Climate change is the other big intergenerational challenge facing Australia. It is the largest threat to the environment and represents one of the most significant challenges to economic sustainability. There are currently 32 countries that are operating emissions trading schemes, and others are in the process of introducing them. The global consensus is that this use of market-based mechanisms is the least cost mechanism to reduce carbon emissions while protecting jobs and growth. Tackling climate change early will avoid larger costs for future generations, and a more severe adjustment to the economy in future years.

## 1. An ageing and growing population

Australia's population is ageing (Chart 1). The proportion of working age people is projected to fall, with only 2.7 people of working age to support each Australian aged 65 years and over by 2050 (compared to 5 working aged people per aged person today and 7.5 in 1970).

Population growth is projected to slow to an average annual rate of 1.2 per cent over the next 40 years, slightly lower than the 1.4 per cent average annual rate of growth in the previous 40 years. Population growth is a function of natural increase and net overseas migration. Fertility rates, along with mortality rates, are the determinants of the natural rate of increase in the population. Net overseas migration is mainly comprised of permanent migration (including skilled and family) and temporary migration (including temporary skilled and students). It is expected to continue at a similar rate as a proportion of the population to the past 40 years on average.

- Fertility rates are assumed to be broadly consistent with current levels, at about 1.9 births per woman. Over the past forty years, the fertility rate declined from 2.9 to 1.7 before recovering to nearly 2.0.
- Net overseas migration is expected to continue at a rate equivalent to 0.6 per cent of the total population per annum on average, as per the average of the past 40 years.

Even with slower population growth the total population is projected to be 35.9 million people by 2050.

All developed countries have experienced population ageing and will continue to do so. Those countries with low population growth face greater challenges from population ageing. For instance, Japan's already high old-age dependency ratio is projected to more than double in the next 40 years, resulting in only 1.4 people of working age for every person aged 65 years or older.



## Chart 1: An ageing and growing population

Chart 1.1: Population growth and combined dependency ratio

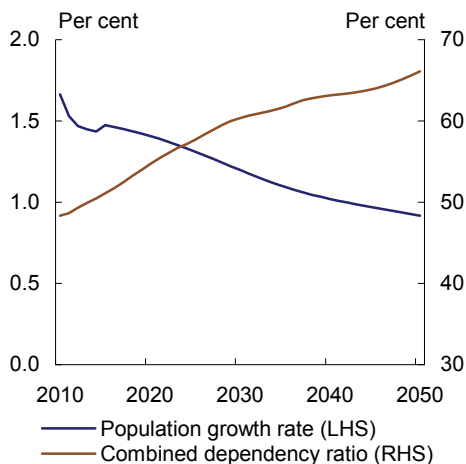
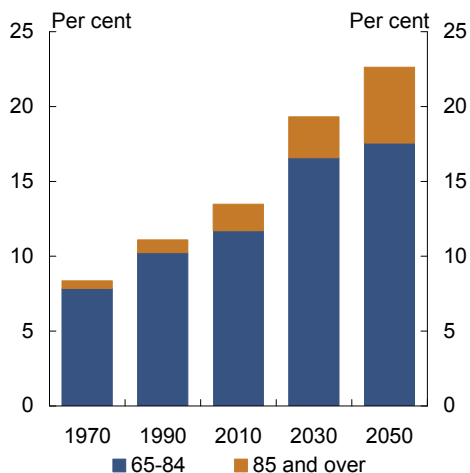


Chart 1.2: Proportion of the Australian population aged 65+



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

## 2. The economic and fiscal implications of an ageing population

An ageing population will have consequences for economic growth and government finances. The challenge is to develop responses that will mitigate these consequences in the most effective way and minimise the size of the adjustment costs in the future.

### 2.A Economic growth

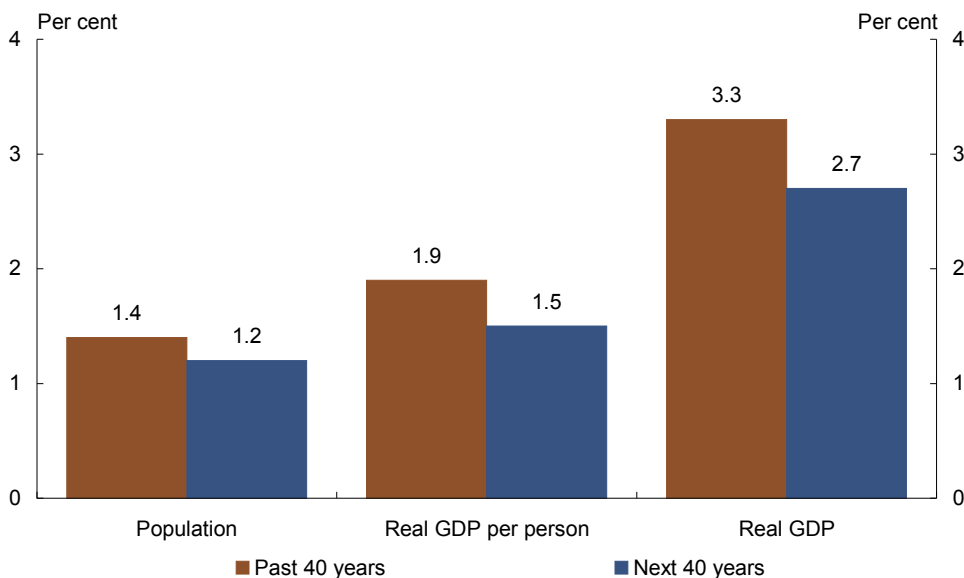
While the past 40 years have seen annual average growth in real GDP of 3.3 per cent, the next 40 years are projected to see growth slow to 2.7 per cent annually. Associated with this slower economic growth, real GDP per capita growth will slow to 1.5 per cent per annum from 1.9 per cent per annum over the previous 40 years (Chart 2).

The ageing of the population is the major factor driving the slowing in economic growth. As the proportion of the population of traditional working age falls, the rate of labour force participation across the whole population is also projected to fall.

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

**Chart 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.

## 2.B Ageing and fiscal pressures

Population ageing will create substantial fiscal pressures.

Slower economic growth associated with ageing, increased demand for age-related payments and services, expected technological advancements in health and demand for higher quality health services will add to these pressures.

These fiscal pressures are building off a large structural spending base, adding to the size of the adjustments required. Real growth in total government spending over the 2000s exceeded the spending growth experienced in previous expansions locking in permanent increases in spending. This will compound the pressures of ageing.

Contrary to these permanent increases in spending, the Government’s fiscal stimulus packages were temporary. Spending associated with these packages will be completely phased out of the spending base during 2012–13.

Ageing and health pressures are projected to result in an increase in total government spending from 22.4 per cent of GDP in 2015–16 to 27.1 per cent of GDP by 2049–50. As a consequence, spending is projected to exceed revenue by 2¾ per cent of GDP in 40 years time (Chart 3).

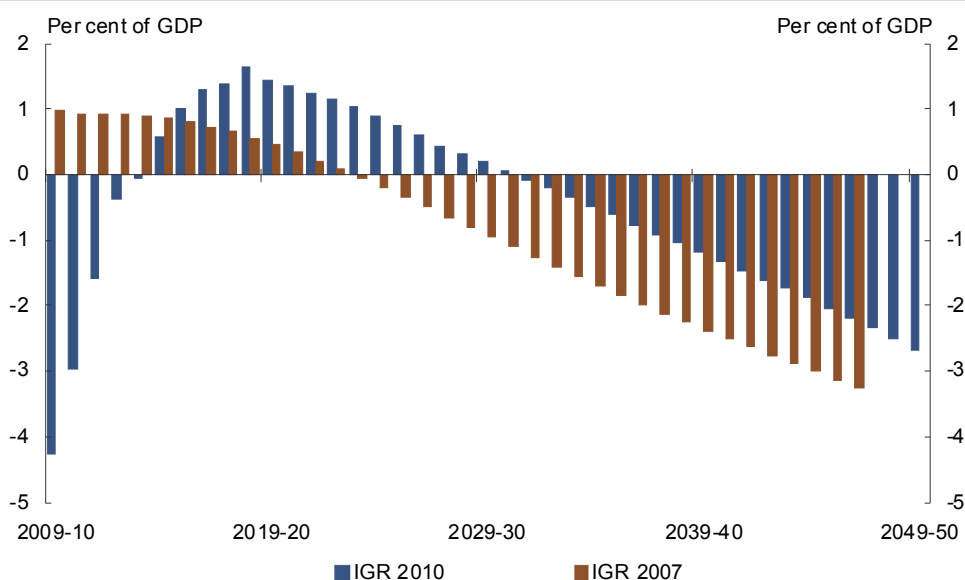
This is an improved result relative to the 3¼ per cent of GDP fiscal gap (spending greater than revenue) projected in the previous IGR, largely owing to the benefits of

the Government's fiscal strategy and a more gradual pace of ageing than previously expected.

By constraining real expenditure growth, the fiscal strategy will be a first step in delivering the structural adjustments in government finances necessary to address the spending pressures of an ageing population. Expenditure restraint through the Government's fiscal strategy will result in a permanent structural improvement in spending of around 1 per cent of GDP.

By acting early, the Government's fiscal strategy will reduce the size of the adjustment costs required in the long run.

**Chart 3: Projected fiscal gap**



Note: The fiscal gap is total Australian government receipts minus total Australian government payments (excluding interest).

Source: Treasury projections.

The fiscal projections are consistent with the Government's commitment to keep the tax-to-GDP ratio on average below the 2007–08 level of 23.6 per cent.

Notwithstanding the contribution full implementation of the fiscal strategy will have in reducing the fiscal pressures of an ageing population, ageing pressures will persist. If the projected fiscal gap associated with ageing pressures were to be realised, net debt would emerge in the 2040s and grow to around 20 per cent of GDP by 2049–50, and the budget would be in a deficit position of 3¾ per cent of GDP by 2049–50. Without the implementation of the Government's fiscal strategy, this challenge would be much bigger.

### **3. Responding to the implications of an ageing population**

#### **3.A Growing the economy**

The central plank of responding to the economic and fiscal consequences of an ageing population is to support stronger economic growth in sustainable ways. Economic growth is a function of productivity, participation and population — the '3Ps' (Chart 4).

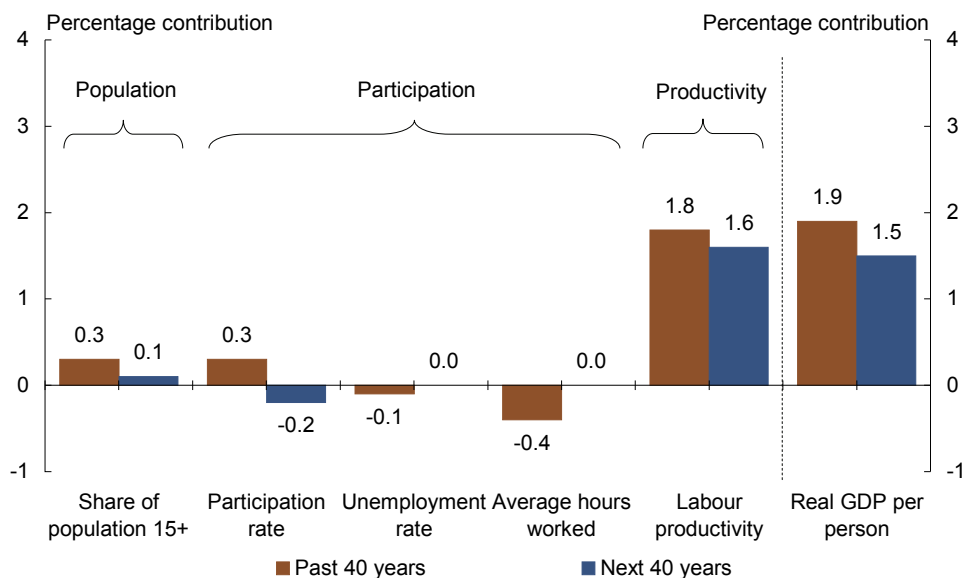
#### **Higher productivity is the key**

With an ageing population, it is critical that the Government continue to pursue productivity enhancing and nation building reforms through prudent investment in social and economic infrastructure, and policies to support skills and human capital development.

Enhanced productivity growth is the key to increasing economic growth. Australia's productivity performance has slowed in the recent past, averaging only 1.4 per cent in the past decade compared with 2.1 per cent in the 1990s. The IGR has assumed that the current 30-year historical average of 1.6 per cent will continue.

With the ageing of the population reducing participation, productivity growth will be the major contributor to real GDP per person growth in Australia over the next 40 years.

With the ageing of the population, and a continuation of the productivity trends of the past 30 years, growth in real GDP per person is projected to slow to 1.5 per cent per annum. If productivity growth were increased to 2 per cent per annum, the economy would be over 15 per cent larger in 2049–50, GDP per person would be around \$16,000 higher and fiscal pressures would be reduced as a result of an enhanced capacity to fund government services.

**Chart 4: The 3Ps of growth in real GDP per person**

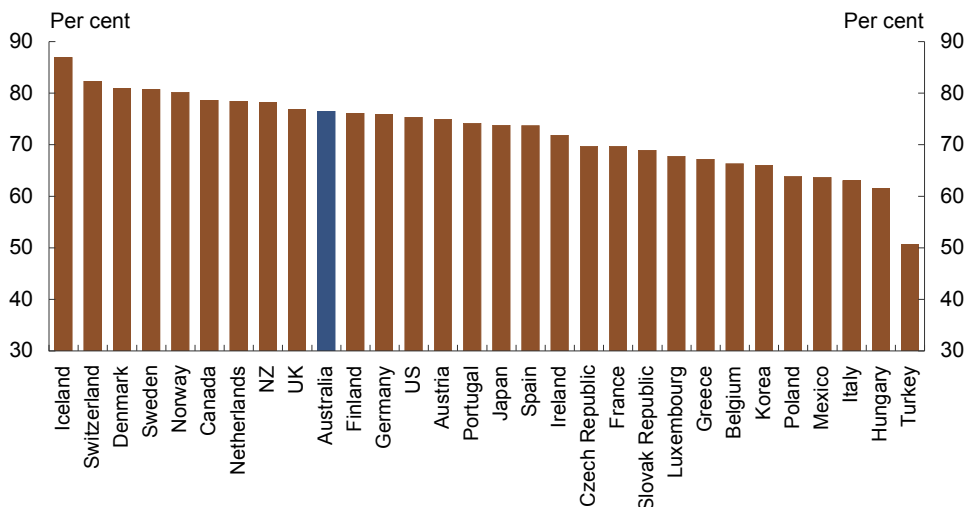
Source: ABS cat. no. 5206.0, cat. no. 3105.0.65.001 and cat. no. 6202.0, and Treasury projections.

### Supporting participation

While an ageing population will result in lower aggregate participation rates, steps to improve participation would minimise the impact.

In 2008, Australia's labour force participation rate was the tenth highest in the OECD; higher than the United States, but lower than the United Kingdom, New Zealand and Canada (Chart 5).

**Chart 5: OECD participation rates 2008, people aged 15–64**



Source: OECD.

Within this total, Australia’s participation rate for prime aged men has been relatively constant at around 91 per cent, below the OECD average of 92.2 per cent. In contrast, female participation of 75 per cent in Australia is higher than the OECD average of 71 per cent.

Despite recent increases, Australia's mature age participation rate is below that of comparable countries — including the United States, United Kingdom, Canada and New Zealand.

There is scope for Australia to improve its labour force participation rates, especially through policies that target improvements in education, health and attachment to the labour market. This includes removing the barriers to workforce participation for mature aged people who want to work. Policy responses need to reflect a sound understanding of the complex nature of mature age participation.

Retirees make a valuable contribution to the economy and living standards through activities such as volunteering or carer activities. For those wishing to continue working, key factors influencing workforce participation include: health outcomes; educational attainment; the tax-transfer system; cultural attitudes; workplace flexibility; and access to retraining and support services.

### Sustainable population growth

Continuation of current trends will result in inevitable population growth, albeit at a slightly slower rate on average than in the previous 40 years.

Population growth puts pressure on infrastructure and services, but will continue to contribute to economic growth. It can be socially and environmentally sustainable provided governments plan and invest, well ahead of time, for a larger population.

By way of comparison, if Australia was to face lower net overseas migration and fertility that led to a lower annual rate of population growth of 0.8 per cent (compared to the 1.2 per cent per annum growth rate that is projected), real GDP per person would be around 2 per cent lower in 2049–50.

Countries with low or declining population growth face more extreme ageing challenges, with greater demands for publicly funded social services and a reduced ability to meet these challenges. There are growing concerns about the fiscal sustainability of some of these countries.

Immigration plays a role in ameliorating the ageing of the population because migrants tend to be younger on average than the resident population. Currently around 89 per cent of migrants are aged less than 40 years when they migrate to Australia. This compares to around 55 per cent aged less than 40 years for the resident population.

Population growth has implications for the environment, including: greenhouse gas emissions, biodiversity and water availability; urban amenity; and infrastructure and government service delivery requirements. The risks in these areas are manageable provided governments take early action to plan for future needs and introduce efficient market mechanisms to transition to a less emissions-intensive economy.

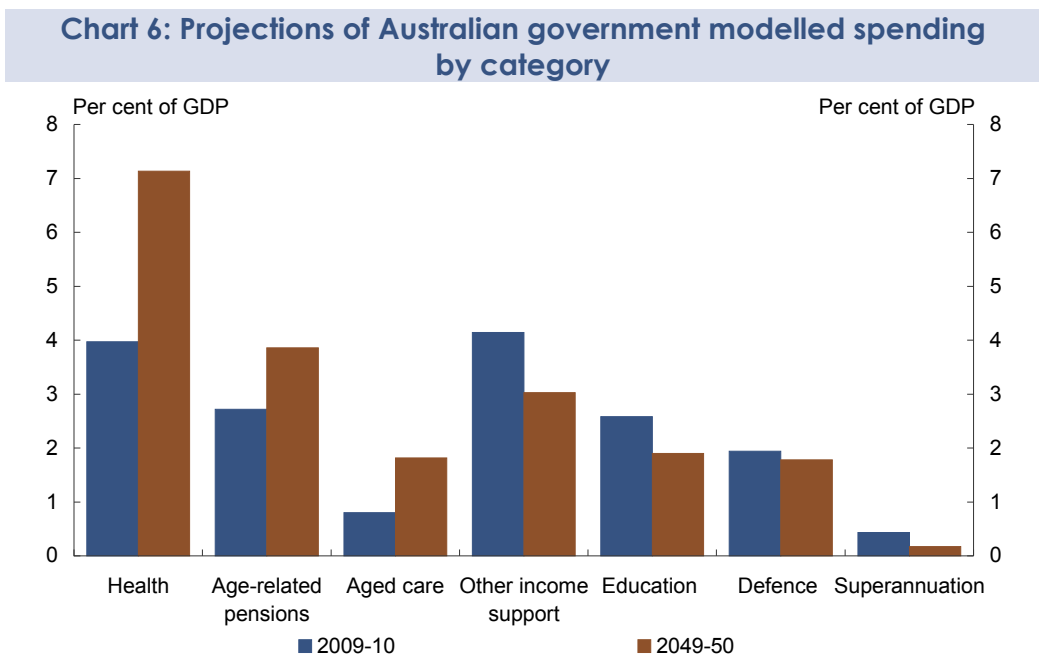
The development of Australia's cities will also be central to improving productivity performance. Much of a city's capacity to accommodate population increases while supporting productivity growth is reliant on the efficacy and adequacy of its infrastructure, including its housing stock. The sustainability of Australia's cities will also be dependent on better governance in the planning and organisation of city infrastructure and more efficient use of existing infrastructure.

### **3.B Responsibly managing the spending pressures of an ageing population**

An ageing population will significantly increase spending pressure in the areas of health, age-related pensions and aged care.

Currently, more than a quarter of Australian government spending is directed to health, age-related pensions and aged care. Australian government spending on these areas is projected to increase significantly, pushing their share of total spending to almost half by 2049–50. As a result, total Australian government spending is projected to rise to around 27 per cent of GDP by 2049–50, rising by around 4¾ per cent of GDP from the projected low-point in spending in 2015–16. Rising health costs are by far the

largest contributor to increased spending, accounting for around two-thirds of the overall increase (Chart 6).



Source: Treasury projections.

With some categories of spending declining as a proportion of GDP, the increase in health, age-related pensions and aged care more than explains the increase in total spending in dollar terms.

The very high future growth rates projected for health underscore the need for health reform. If health services and facilities are to be first-class and meet the needs of an ageing population, major cost drivers need to be addressed and efficiencies found. Simply cutting the health budget in order to achieve fiscal sustainability would not be appropriate. Rather, adjusting spending to obtain better value for money is necessary. This requires a more responsive and better coordinated health system. Health reform is required so that every health dollar will buy more and better quality health services.

#### 4. Climate change and the environment

Climate change is the largest and most significant challenge to Australia’s environment. If climate change is not addressed, the consequences for the economy, water availability and Australia’s unique environment will be severe.

As a hot and dry continent, Australia is more at risk from climate change than many other developed countries. Any response to the challenge of climate change requires



global coordination. There are 32 countries that are currently operating emissions trading schemes in response to this challenge and others are in the process of introducing them.

The Carbon Pollution Reduction Scheme (CPRS) is designed to deliver significant and certain reductions in carbon emissions in a cost-effective way, while protecting Australian businesses and jobs during the transition period.

The CPRS will drive large scale abatement at a much lower cost than narrower, prescriptive alternatives. For example, even if every car in Australia were taken off the road, emissions would still not be cut by enough to meet the commitment to reduce emissions by 5 per cent below 2000 levels by 2020.

Early action on climate change will allow strong long-term growth by steadily transforming the economy, rather than imposing on future Australians the need for a sharp, more costly shock to make the inevitable change to a sustainable low pollution economy. The CPRS will not only reduce emissions from currently emissions-intensive industries such as electricity generation, but will reduce the emissions intensity of industries across the economy.

The economy will continue to grow following the introduction of the CPRS, with some areas of the economy likely to experience a significant boost, including in the renewable energy sector. By 2050 output from the alternative energy sector is expected to be up to 30 times larger under a CPRS and expanded Renewable Energy Target.

Mitigation via the CPRS is projected to reduce the average annual growth rate of Australia's real Gross National Product per capita from 2010 to 2050 by only 0.1 of a percentage point.<sup>1</sup> The CPRS will allow businesses and consumers, rather than governments, to determine how and where emission reductions will occur.

It is in Australia's national interest to promote the achievement of an effective global response. The early adoption of emission reduction targets and carbon pricing in Australia would help shape a future global system in Australia's interests and improve business investment certainty.

The Government's approach will also allow for significant adjustment assistance to businesses, households and communities.

Reduced water availability is another key environmental risk. Improved water management — involving cooperation with the States to improve environmental water flows, water trading and the understanding of water systems — offers the potential of

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1 Australian Government, *Australia's Low Pollution Future: The Economics of Climate Change Mitigation*, 2008.

delivering long-term benefits for urban water security, the development of rural communities and valuable ecosystems.

At the same time efforts to bring about sustainable land use will be imperative to protecting Australia's unique biodiversity while supporting agricultural productivity.

## **5. Social sustainability**

With an ageing and growing population, a key challenge is to grow Australia's human and social capital by enhancing the skills and opportunities of all Australians today, particularly those facing, or at risk of, entrenched disadvantage. The Government can also help the next generation by building capabilities and expanding opportunities, especially for those in disadvantaged circumstances.

While an improvement in Australia's aggregate human capital over time is evident through improved education, employment and health outcomes for Australians overall, there is a small proportion of the population that is not sharing in this improvement.

Building human and social capital, including through the implementation of policies which support productivity and enable labour force participation, will be critical to meeting Australia's future challenges.

## **6. The Government's policy response**

The Government's broad policy agenda has been formulated with a view to responding to the long-term challenges highlighted in this Report, and laying the foundations for rising living standards for current and future generations.

By taking steps to address the long-term challenges of an ageing and growing population, and the global climate change challenge, Australia can avoid the need for more severe and costly reforms for future generations.

Responsible economic management built around the three pillars of productivity, participation and population is the key to sustainable economic growth.

Productivity growth — underpinned by investment in nation building infrastructure and improving the skills base of the workforce — is central to growing the economy and reducing the economic and fiscal pressures of an ageing population.

Details of the Government's long-term reform agenda are set out below.

## 6.A Lifting productivity to grow the economy

High productivity growth — producing more output with proportionately fewer workers — is the key to continued growth with an ageing population. Investments in Australia's skills and infrastructure base will lead to a lasting improvement in productivity.

### Education and skills

The Government is delivering education reform as part of the education revolution. This has delivered a 50 per cent real increase in funding across the next five years compared to the previous five years. The package is designed to: provide more opportunities for students with over 50,000 projected additional university places to 2013 and 711,000 extra vocational education and training places; improve transparency and quality of all forms of education; and increase the flexibility of education providers to meet the needs of students.

#### *Schools*

The basic skills acquired in early childhood and school years, particularly literacy and numeracy, are necessary foundations for developing higher order skills that contribute to a more productive workforce. The Australian Government, through the Council of Australian Governments (COAG), is implementing a reform agenda to help young Australians achieve during their school years, including through:

- investing \$43 billion in schools over four years through the National Education Agreement and the Schools Assistance Act, including more generous indexation arrangements;
- a suite of National Partnership agreements, backed by additional funding, focused on important reform areas including boosting the capacity of Low Socio-Economic Status School Communities, enhancing teacher quality and improving literacy and numeracy; and
- an agreement to work towards a national Year 12 or equivalent attainment rate of 90 per cent by 2015, backed by \$100 million in reward funding.

#### *Tertiary education and vocational training*

Recognising the importance of vocational education and training in delivering Australia's skills needs, in 2008 COAG also agreed to a new (\$6.7 billion over five years) National Skills and Workforce Development Agreement to increase the skill levels of all Australians, including targets to double the number of higher qualification completions by 2020. The Agreement is also complemented by the Productivity Places Program which provides 711,000 additional training places over five years.

The Government's \$2.7 billion reforms to the higher education system will improve quality and boost participation in higher education, consistent with the Government's ambition for 40 per cent of all 25–34 year olds to attain a bachelor level qualification or above by 2025. As part of these reforms, Commonwealth supported places will be uncapped from 2012 and more generous indexation arrangements will support teaching and research.

## **Nation building infrastructure**

The Government's nation building infrastructure policies are directed to ensuring efficient investment in, and use of, infrastructure to encourage future productivity growth in the economy.

In the 2009–10 Budget, the Government invested \$22 billion to improve Australia's core infrastructure. This included \$8.5 billion to expand Australia's land transport networks targeting roads, rail and ports — the building blocks for Australia's future productivity growth.

- The Government is investing \$4.6 billion to improve metropolitan rail networks in six major cities: Melbourne, Sydney, Brisbane, Perth, Adelaide and the Gold Coast. More efficient metro rail networks will deliver economic and social benefits through faster travel times, less road congestion and lower greenhouse emissions.
- The Government is investing \$3.4 billion to improve the quality and efficiency of Australia's road network. This includes a number of strategic investments in Network 1 — Australia's busiest freight route stretching along the eastern seaboard from Melbourne to Cairns. This investment will deliver economic benefits to Australian business through faster transit times and lower transportation costs.
- The Government has also set aside \$389 million towards developing, constructing and expanding critical port infrastructure in Western Australia and the Northern Territory. This investment in Australia's gateways will play an important role in driving economic growth into the future — improving access for Australia's mineral resources and commodities to global markets.

### *National Broadband Network*

The Government's investment in the National Broadband Network (NBN) will provide high speed broadband to meet the growing need for advanced telecommunications services over the long term, and aid in the delivery of services in areas such as education and health. The NBN, together with telecommunications regulatory reforms being undertaken by the Government, will enhance the competitive dynamics of the telecommunications sector.

### *Infrastructure planning and reform*

In 2008, the Government established Infrastructure Australia (IA) as an independent, statutory advisory council, to help drive the development of a strategic, national approach to infrastructure planning and investment.

IA provides advice to governments, investors and infrastructure owners on: nationally significant infrastructure priorities; possible impediments to the efficient use and provision of national infrastructure; and policy and regulatory reforms needed to more efficiently use national infrastructure.

As part of the Government's strategy of partnering with the private sector to address the nation's infrastructure challenges, IA assisted in the development of a set of national public-private partnership (PPP) policies and guidelines. Agreed by COAG in November 2008, this will help ensure there is a best-practice and a consistent national approach to delivering PPPs.

### *Energy, transport and water reforms*

The Government is working with the States and territories to improve the management of the nation's critical infrastructure — particularly in the areas of energy, transport and water.

- The Australian Government is working with the States and Territories through COAG on microeconomic reforms that will enhance and streamline the regulations applying to the nation's transport sector. COAG is pursuing reforms to heavy vehicle road user charging and has agreed to establish national regulators for rail safety, maritime safety and heavy vehicles.
- The Australian Government is working with other COAG members on a major energy market reform program. Reforms to date include new governance and legislative arrangements for the Australian energy market, including the establishment of the Australian Energy Market Operator in 2009, revised laws governing electricity networks and new laws governing gas networks.
- In December 2009, COAG agreed to redouble its efforts to accelerate the pace of reform under the National Water Initiative (NWI) and further committed to: completing NWI consistent water-sharing plans for all significant water resources; a National Framework for Non-urban Water Metering to improve the accuracy of water metering; a National Water Skills Strategy to address skills shortages in the water industry; and the in-principle endorsement of a National Framework for Water Compliance and Enforcement to combat water theft.

### *Seamless national economy*

A seamless national economy will be delivered by reducing inconsistent and unnecessary regulation across Commonwealth, State and Territory governments in 27 different areas and ensuring new regulation is introduced in a manner which minimises

costs to business and which ultimately improves Australia's international competitiveness.

COAG's Seamless National Economy National Partnership Agreement includes reforms to achieve: nationally uniform occupational health and safety laws; a more efficient system of environmental assessments and approvals; and consistent administration of payroll tax.

## **Innovation**

Innovation supports productivity by creating and diffusing more efficient processes and better products through the economy.

In 2009–10, the Government provided \$8.6 billion for science and innovation. This is 25 per cent more than in 2008–09. This direct investment in Australian innovation is supported by investments in infrastructure to sustain the innovation process — including the National Broadband Network — and in the Education Revolution, which is transforming every stage of the learning journey from pre-school to post-doctoral studies.

Key investments in the 2009–10 Budget included an additional \$2.4 billion to support research excellence, critical research infrastructure, business innovation and enabling technologies.

## **Sound macroeconomic management**

The Government's investments in future productivity are complemented by sound macroeconomic management, including minimising the impact of the global financial crisis on Australia's potential growth rates through judicious use of temporary fiscal stimulus. By minimising permanent damage to the economy from the global recession through the depletion of skills and physical capital, the fiscal stimulus places Australia on a sound footing to meet the challenges of an ageing population.

### **6.B Addressing the direct impacts of an ageing and growing population.**

Significant changes in Australia's demographic profile will place direct pressure on the country's health, aged care and retirement income systems. The Government has already taken significant steps to address these impacts.

#### **Investing in health for the future**

The Government has already embarked upon the path to build the health and hospital system that Australia needs for the 21st century. Key investments include:

- more than \$64 billion over five years in the hospital and health system, with \$7 billion in additional funding for the States and Territories over and above what would have been the case if the previous agreements had continued;
  - as part of this, \$1.1 billion will be provided for training more doctors, nurses and other health professionals (this unprecedented investment in the health workforce will see 812 ongoing GP training places from 2011 onwards — a 35 per cent increase on the cap of 600 places imposed since 2004);
- \$3.2 billion in health infrastructure projects across hospitals and medical research institutes — including \$1.2 billion in world-class cancer centres; and
- more than \$44 billion in direct financial support for aged and community care over the next four years. In the 2009–10 Budget, the Government committed \$9.9 billion for aged care, including \$7.1 billion for residential aged care.

The Government is continuing the overhaul of the health system to ensure that it can cope with the challenges of an ageing population and rising health care costs. The Government is committed to significant reforms in response to the National Health and Hospitals Reform Commission (NHHRC) which are designed to improve the productivity of service delivery, ensure value for money, and deliver a more responsive and better coordinated health and hospitals system.

### **Sustainable pension reform**

The Government has reformed the pension system to provide more support to those who need it most, and to enhance the sustainability of the pension system. In the 2009–10 Budget, the Government delivered an extra \$32.50 per week to full rate single pensioners and \$10.15 per week combined to couple pensioners.

The increase in the pension was delivered without placing additional long-term pressure on the budget. The Government has revised income test arrangements to better target the pension to those who are most in need. To respond to the long-term cost of demographic change, the Government will progressively increase the qualifying age for the pension. The Age Pension age will be increased to 67 years, at a rate of six months every two years, beginning in 2017.

### **Boosting labour force participation**

The Government has introduced a number of initiatives to boost labour force participation, including: increasing incentives to work through personal income tax cuts and increases in the Child Care Tax Rebate; reforms in the areas of education, employment services and health; and the Productive Ageing Package to support mature age participation through practical measures, including retraining and re-skilling

programs and enhanced assistance through the Keep Australia Working Career Advice Line.

## **6.C Managing the budget in the face of demographic change**

The Government is also addressing the pressures that an ageing population will place on the national budget.

### **Productivity**

The productivity agenda detailed above is also a key response to addressing the fiscal pressures of an ageing population. Investment in infrastructure and improving Australia's skill base to increase the growth potential of the economy will improve budget revenues without increasing the overall tax burden on the economy, and as a result the government's medium term-fiscal outlook will improve.

### **Fiscal strategy**

The Government's fiscal strategy will make an important contribution to addressing the fiscal pressures that will come with an ageing population. As the economy recovers, and grows above trend, the Government will allow the level of tax receipts to recover naturally and hold real growth in spending to two per cent a year until the budget returns to surplus.

Constraining annual real spending growth to two per cent in years where the economy is growing above trend until the budget is in surplus will deliver permanent structural savings of around one percentage point of GDP from 2015–16. This Government has already delivered \$56 billion in savings in the 2008–09 and 2009–10 Budgets.

## **6.D Underpinning investments in the future, with a sound response to climate change.**

Addressing the social and economic challenges of an ageing population needs to be supported by ambitious and effective policies to tackle the fundamental challenge of climate change.

### **Transformation to a low pollution economy**

The introduction of a price mechanism is a cost effective response to reduce the level of carbon emissions. The CPRS introduces a carbon price and will deliver certainty and efficiency in the level of emissions reductions over time. It is expected to deliver reductions in the emissions intensity of all industries, with many industries expected to more than halve their emissions intensity.



The Government has already implemented the expanded national Renewable Energy Target (RET) scheme, designed to ensure that 20 per cent of Australia's electricity supply is from renewable sources by 2020.

Owing to the long-lived nature of energy generation assets, it is important that an enhanced price signal is provided for renewable energy generation. As a transitional measure, the RET will accelerate the development and use of low emissions technologies in the shorter term, while the operation of the CPRS will help bring cleaner technologies into the market over time.

The new legislation provides certainty for investment in large-scale renewable energy generation, and the significantly expanded targets will boost growth in the renewable energy sector.

By 2050 output from the alternative energy sector is expected to be up to 30 times larger under a CPRS and expanded renewable energy target.

### **Investing in clean energy infrastructure**

The \$4.5 billion Clean Energy Initiative is helping support the development of low-emissions technology while also building the necessary infrastructure and skills and capacity needed for a low pollution future.

As part of this initiative, the Government will provide \$2.0 billion over nine years for the Carbon Capture and Storage Flagships program. The program will support the development of industrial-scale demonstration projects for carbon capture and storage. Shortlisted projects will soon commence pre-feasibility studies, with successful Flagship projects expected to be announced in the second half of 2010.

The Government will also invest \$1.5 billion over six years in a new Solar Flagships program. The program aims to establish up to 1,000 megawatts of solar electricity generation capacity in Australia. Together with the \$100 million Australian Solar Institute, the Solar Flagships program will develop Australia's potential to become a world leader in large-scale solar electricity generation.

### **Supporting action by households**

As part of the Economic Stimulus Plan, the Government has allocated some \$3 billion over four years to the Energy Efficient Homes program. The program provides assistance to households who wish to install ceiling insulation or replace an existing electric hot water system with a solar and heat pump hot water system. In addition to savings on electricity bills for households, this program is an investment in the future of Australia's environment by reducing emissions in 2020 by about 3.0 million tonnes and cumulative greenhouse gas emissions by around 35 million tonnes by 2020 (equivalent to taking about 800,000 cars off the road).

## **6.E Promoting social inclusion**

The Government's social inclusion agenda will support human capital development and hence productivity and participation, by seeking to ensure that all Australians have the capabilities and opportunities to participate fully in social and economic life. It is also seeking new ways to overcome disadvantage in the Australian population to ensure that all Australians will be able to: learn by participating in education and training; work by participating in employment, in voluntary work and in family and caring activities; engage by connecting with people and accessing their local community's resources; and have a voice so that they can influence decisions that affect them.

# 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 1¼ per cent. The IMF has estimated that for most advanced economies the average output loss could be over 10 per cent.<sup>1</sup>

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).

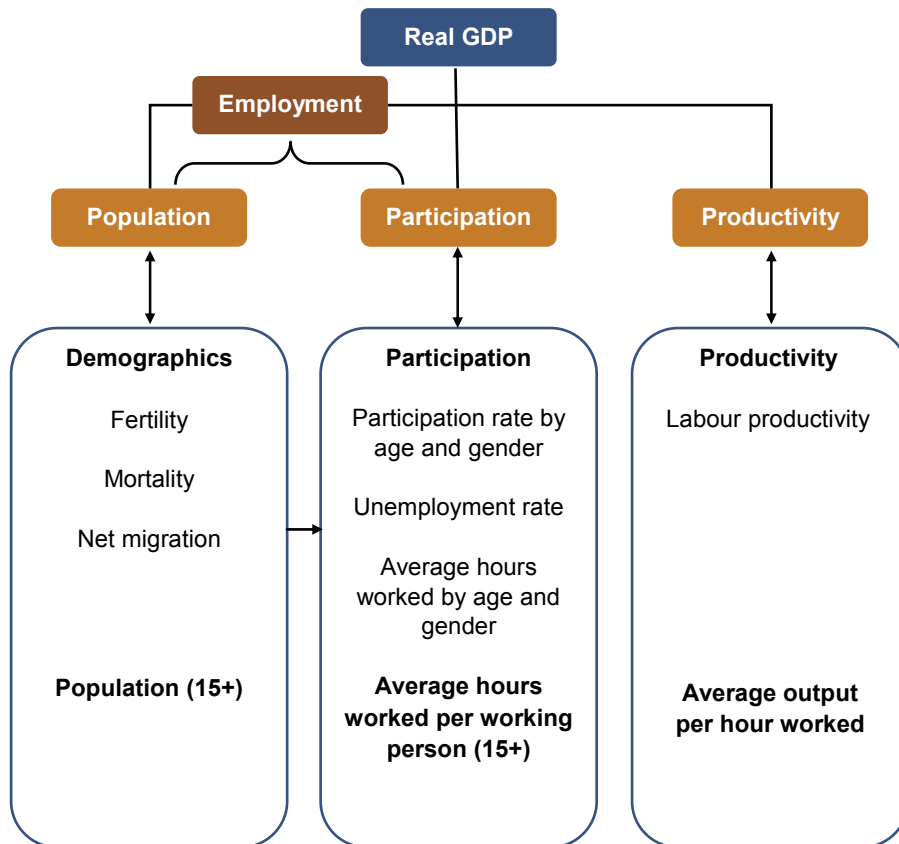
That is, real GDP growth is a function of:

- 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.

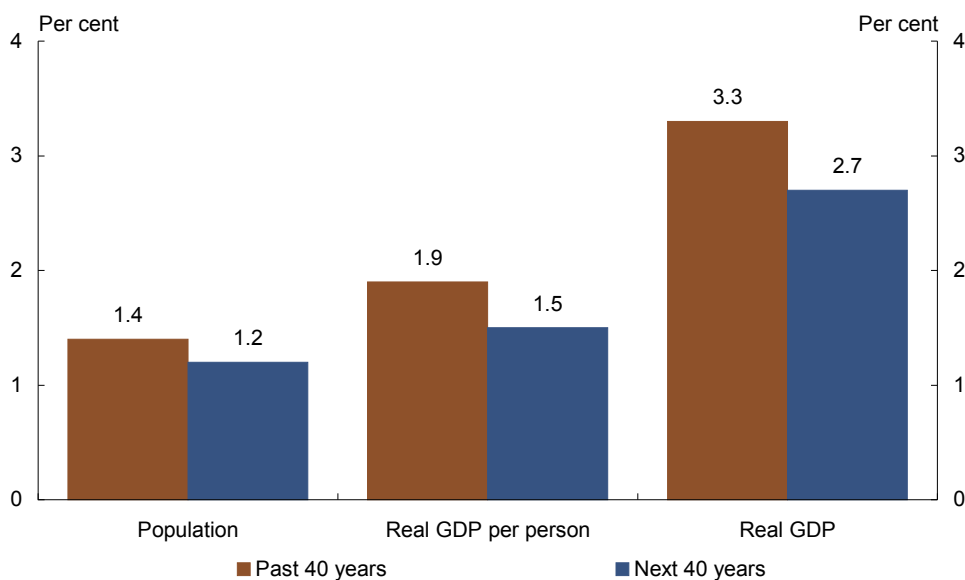
## 1.2 Real GDP

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**

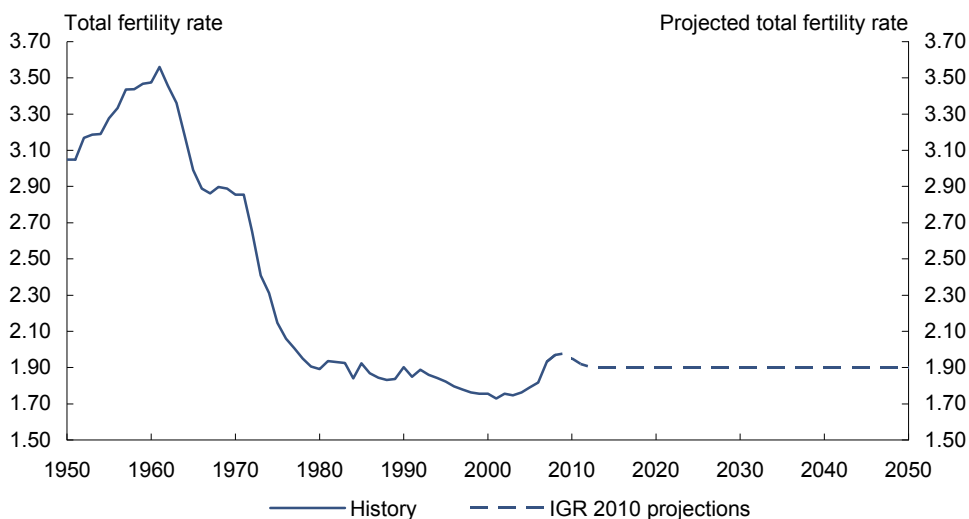
Over the past century, average Australian mortality rates have fallen significantly, with life expectancies rising for both men and women. These falls have added to population growth and the proportion of older people in the Australian population.

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.

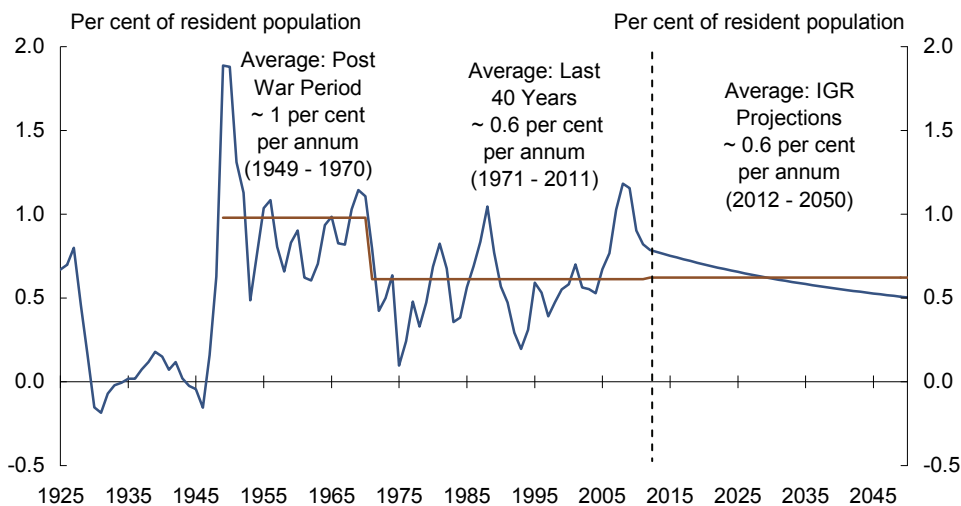
## Migration

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.

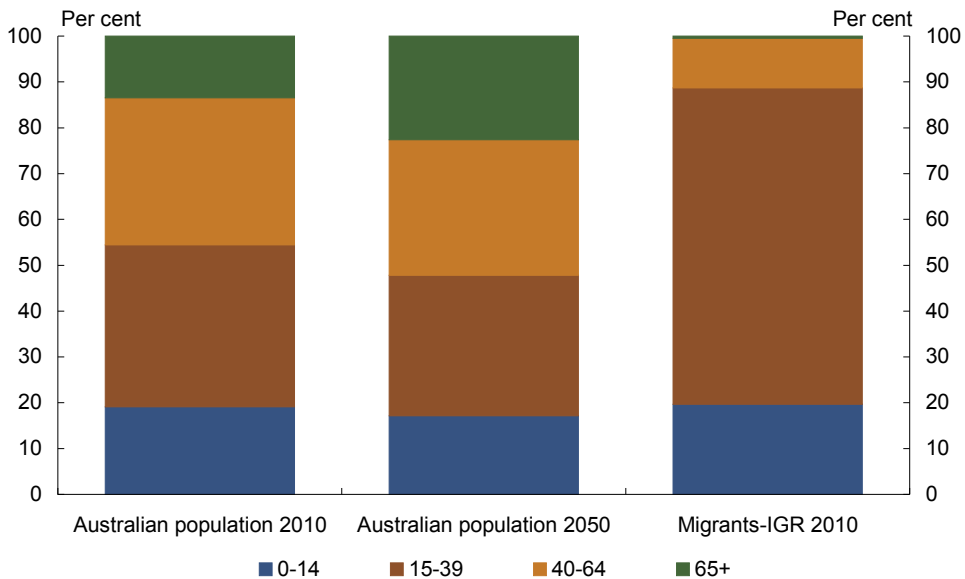
**Chart 1.4: Rate of absorption of net overseas migration**



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**

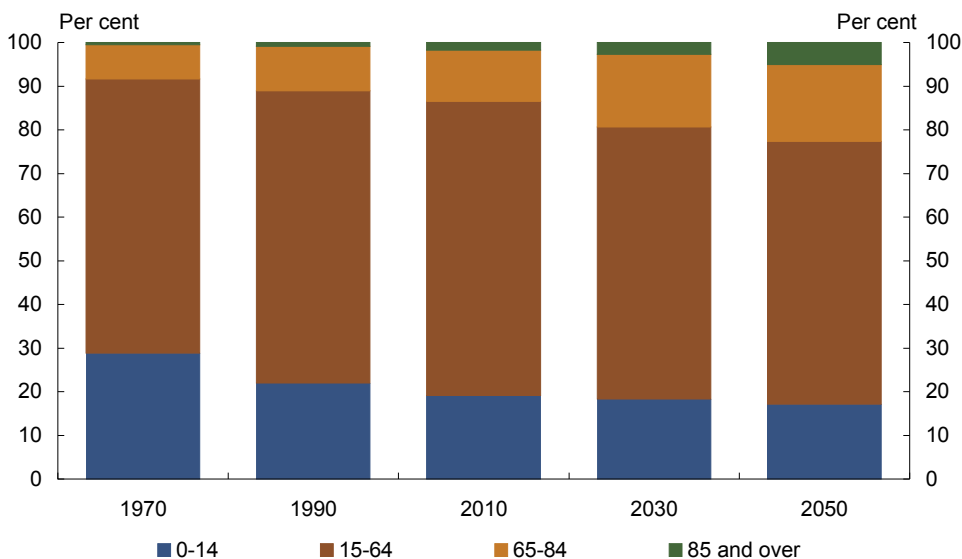
Age range	1970	2010	2020	2030	2040	2050
Population as at 30 June (millions of people)						
0-14	3.6	4.2	4.9	5.4	5.7	6.2
15-64	7.9	15.0	16.6	18.2	20.0	21.6
65-84	1.0	2.6	3.7	4.8	5.6	6.3
85 and over	0.1	0.4	0.5	0.8	1.3	1.8
<b>Total</b>	<b>12.5</b>	<b>22.2</b>	<b>25.7</b>	<b>29.2</b>	<b>32.6</b>	<b>35.9</b>
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.

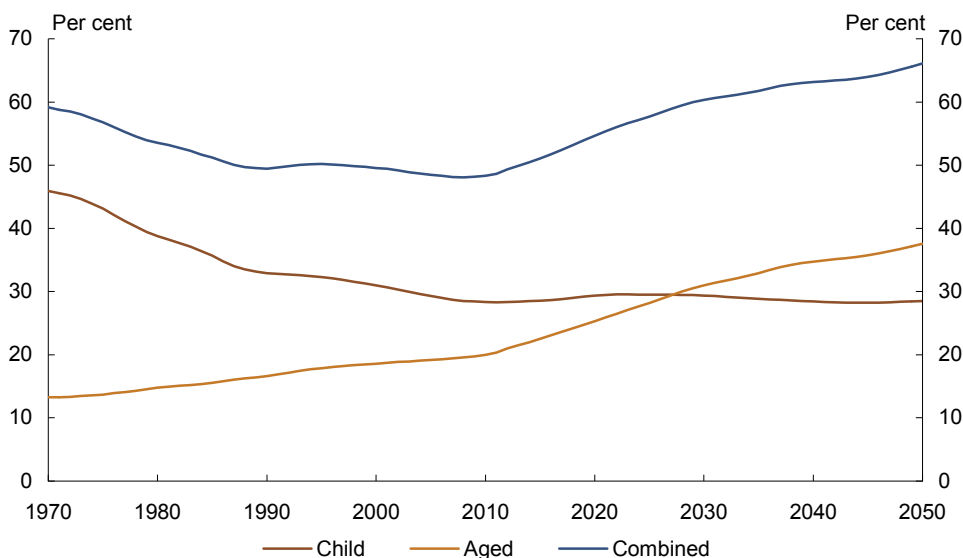
Between 2010 and 2050 the population of traditional working age (15 to 64 years) is projected to grow by 44 per cent and the population aged 0 to 14 years by 45 per cent. Despite this growth, as a proportion of the total population both age cohorts are projected to fall (by around 7 and 2 percentage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

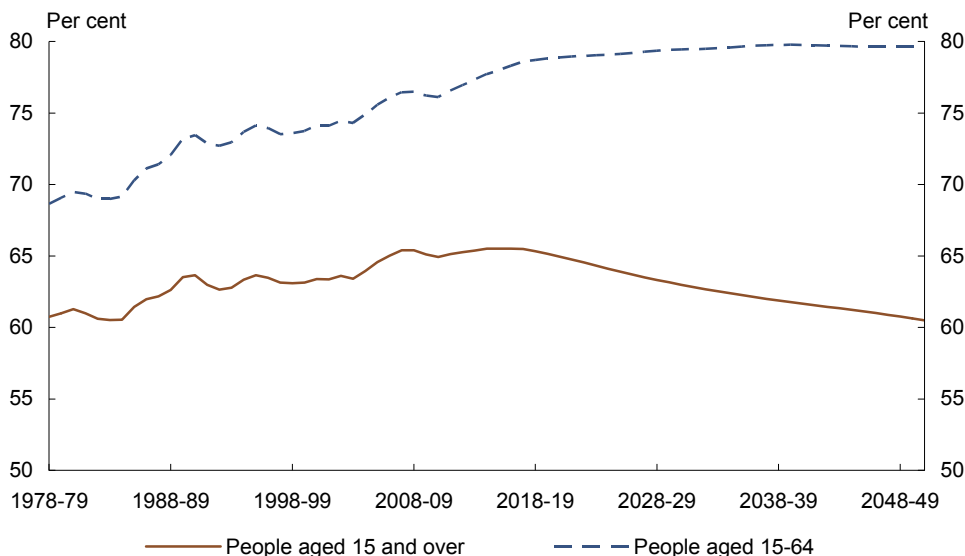
The total labour force participation rate for people aged 15 and over is projected to fall to less than 61 per cent by 2049–50, compared with 65 per cent today.

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

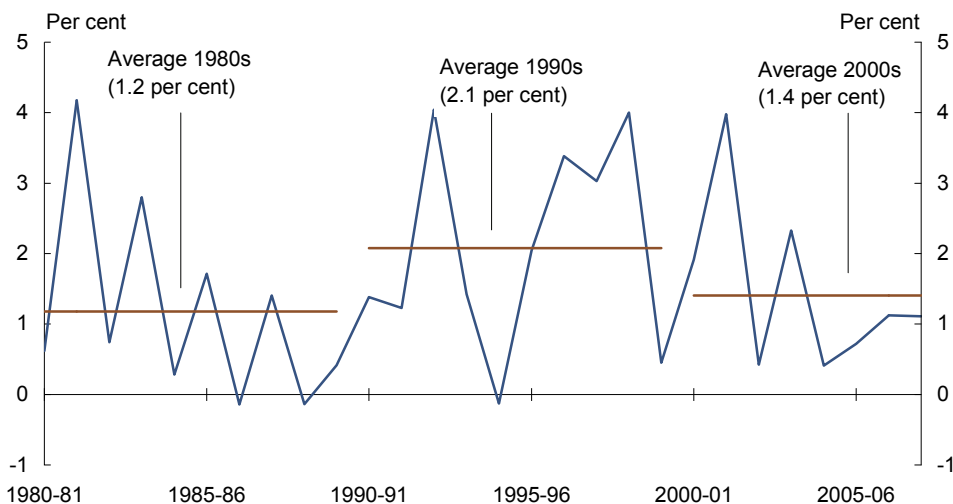
Chart 1.9 shows how labour productivity has varied considerably from year to year and decade to decade.

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.

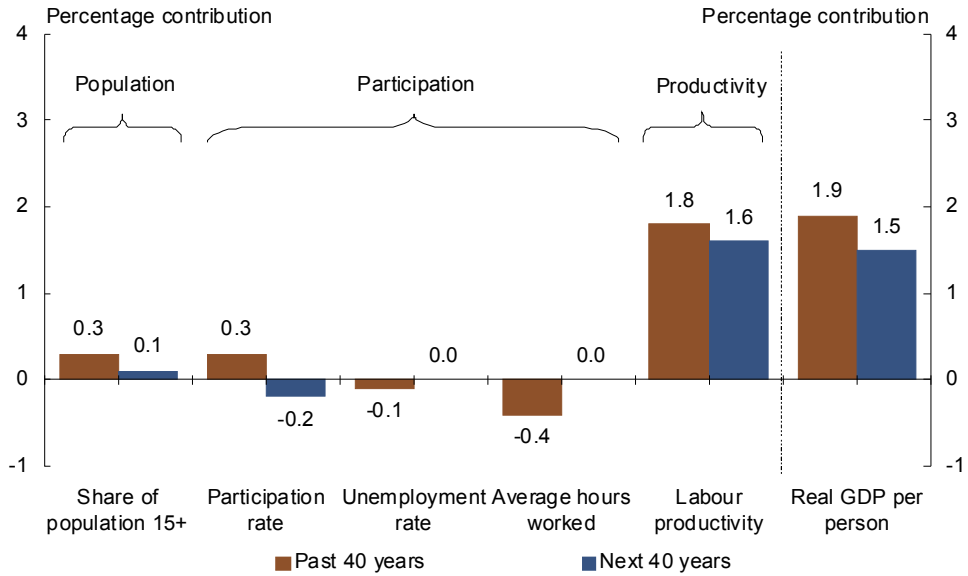
Compared with the previous 40 years, when real GDP per person grew by an average annual rate of 1.9 per cent, over the next 40 years growth in real GDP per person is projected to slow to 1.5 per cent.

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

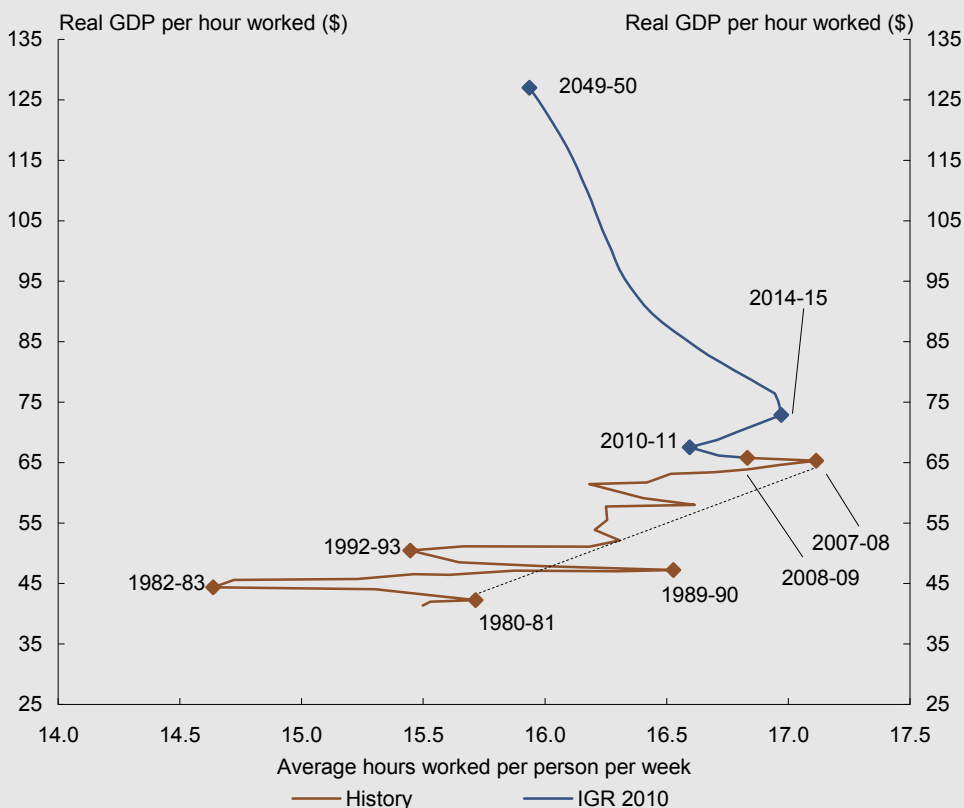
Growth in GDP per person can be expressed as growth in hours worked per person (labour utilisation) and growth in GDP per hour worked (productivity).

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.

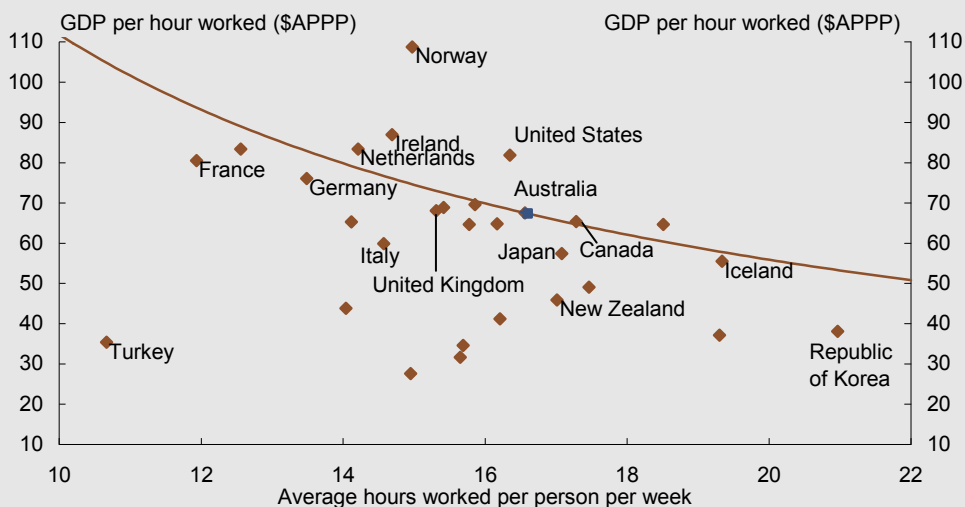
### Box 1.1: Productivity, labour utilisation and GDP per person (continued)

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.

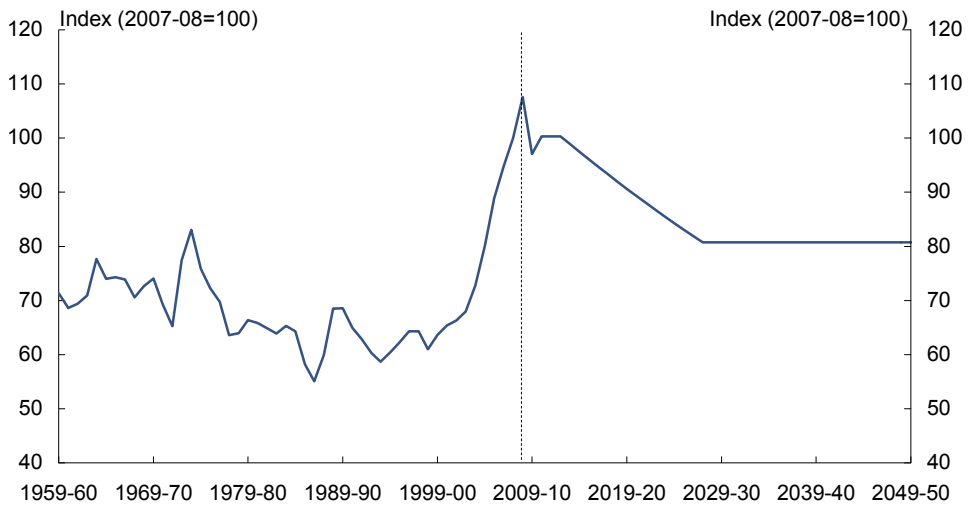
Lower growth in the GDP deflator results in lower growth in the value of the economy's output than would otherwise have been the case. Nominal GDP is assumed to grow at around 5 per cent per annum from the end of the medium-term transitional period (see section 1.1.1) until 2027–28, before increasing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



# Chapter 2: Growing the economy — productivity, participation and population

## Overview

The best way to respond to the economic and fiscal pressures of an ageing population is to support strong, sustainable economic growth. Economic growth will be supported by sound policies that support productivity, participation and population — the ‘3Ps’.

Productivity is the key to higher economic growth in the face of an ageing population. Policies that support higher productivity, including investments in nation building infrastructure and skills and education, will raise economic growth, improve living standards and enhance Australia’s capacity to fund the fiscal pressures of an ageing population.

While aggregate participation rates will fall as a result of an ageing population, steps to improve participation would minimise the impacts.

Australia’s population will continue to grow, though at slightly slower rates than experienced over the past 40 years. A growing population assists in managing the pressures of an ageing population and provides the skills needed for continued economic growth. However, population growth will also put additional pressure on infrastructure, services and the environment. Projected population growth is manageable, if governments plan for future needs.

## 2.1 Promoting higher productivity growth

Productivity growth will be the main driver of economic growth and living standards in the future.

Over the past four decades labour productivity growth accounted for most of the increase in real GDP per capita. With population ageing expected to reduce the participation rate, future growth in living standards will depend on the productivity gains that can be achieved.

The IGR 2010 projections are based on a technical assumption that the 30-year historical average for labour productivity growth of 1.6 per cent per annum will continue over the next 40 years.

Australia's recent productivity performance has slowed, averaging only 1.4 per cent over the past decade, compared with 2.1 per cent in the 1990s. This recent productivity performance has pulled down the 30-year average from the previous IGR.

If Australia's productivity growth could be increased above the long-run average, the economy would be bigger, living standards would be higher and fiscal pressure from the ageing of the population would be reduced. If, for example, annual productivity growth was to average 2 per cent over the next 40 years, then:

- annual real GDP growth would average over 3 per cent over the next 40 years and the economy would be \$570 billion bigger in 2049–50; and
- real GDP per capita in 2049–50 would be 15 per cent (or around \$16,000) higher.

There are a range of factors that influence productivity outcomes, including the flexibility and efficiency of the allocation of labour and capital, the level of capital intensity and technological change.

Governments can play an important role in promoting productivity growth, through investing in infrastructure and skills, promoting macroeconomic stability, and providing appropriate microeconomic frameworks.

Infrastructure investment increases the country's capital stock and the efficiency with which private sector resources can be used. Sound investment in education and training results in a workforce with a better mix of skills leading to potentially higher productivity, higher participation, lower unemployment and increased incomes and living standards. Reforms that improve the quality and efficiency of infrastructure markets and educational outcomes will also drive higher productivity over the medium term.

A stable macroeconomic environment increases the level of certainty that people and businesses have in making decisions. By ensuring macroeconomic stability, public policy frameworks can promote economic growth and improve efficiency in the allocation of resources across the economy. This is positive for productivity.

Microeconomic frameworks can also improve productivity. Microeconomic reforms can promote open and competitive markets, enhance incentives to develop and adopt new products and processes, and provide businesses with greater flexibility to adjust to changing circumstances.

The microeconomic reforms of the 1980s and 1990s contributed to the surge in Australia's productivity growth in the 1990s. While these reforms provide ongoing benefits to the Australian economy, further improvement is needed to achieve a sustained increase in Australia's productivity growth rate over the next 40 years.



## 2.1.1 Infrastructure

Investment in Australia's economic infrastructure and reform of infrastructure markets is critical to improving national productivity. Well-performing infrastructure will help drive a more diverse, competitive and sustainable economy that generates substantial and lasting economic, social and environmental benefits.

Infrastructure investment will be the cornerstone of the recovery of the Australian economy going forward. As the global economy recovers from the global financial crisis and China and other emerging economies in Asia continue to expand and grow, it is vital that Australia is positioned to take advantage of the many opportunities and benefits that will emerge.

Infrastructure investment directly increases the volume and quality of Australia's physical capital stock and facilitates enhanced private sector activity. By increasing the amount and quality of capital workers have available, infrastructure investment plays a key role in supporting labour productivity.

Infrastructure can facilitate trade and the division of labour, improve market competition, promote a more efficient allocation of activity across regions and countries, encourage the diffusion of technology and the adoption of new organisational practices, and provide access to new resources. Public infrastructure investment can contribute to more productive public sector service delivery.

The IMF estimates that, on average across 22 OECD countries, increasing the public infrastructure stock by 1 per cent leads to an increase in output of around 0.2 per cent.<sup>1</sup> The results for Australia are around the OECD average.

The Government established Infrastructure Australia to help drive a strategic, national approach to infrastructure planning and development. Infrastructure Australia's national infrastructure audit and work to identify strategic infrastructure priorities informed the Government's selection of nation building infrastructure projects in the 2009–10 Budget. The Government's investments in economic infrastructure will raise the productive capacity of the Australian economy over the long-run.

Recent OECD research suggests that investment in physical infrastructure can boost long-term economic output by more than other types of investment.<sup>2</sup> The OECD research highlights that infrastructure investment needs to be effectively targeted to maximise overall economic benefits. In addition to making sound decisions on projects, this also depends on having appropriate regulations and price signals in infrastructure markets.

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1 C Kamps 2006, 'New estimates of government net capital stocks for 22 OECD countries 1960 2001', in *IMF Staff Papers*, 53(1), Washington DC.

2 OECD 2009a, *Economic Policy Reforms: Going for Growth*, Organisation for Economic Co-operation and Development, Paris.

Australia has made substantial progress in reforming its infrastructure markets, most notably through the adoption of National Competition Policy in 1995. These reforms have improved efficiency across a range of areas of public infrastructure and the resulting increases in the productivity of Australia's stock of infrastructure have helped to raise Australia's potential output.

Continuing Government action to drive competitive and efficient infrastructure markets and lower regulatory costs for infrastructure development complements the Government's direct infrastructure investment. This action will ensure that the potential benefits created by such infrastructure investments are fully realised. It includes the Government's National Broadband Network and reforms to telecommunications regulation, COAG reforms to energy, transport and water markets and reforms to streamline and harmonise business regulation to promote a seamless national economy.

The Productivity Commission<sup>3</sup> has estimated that improving productivity and efficiency to achieve best practice in energy, transport, infrastructure and other activities could, after a period of adjustment, increase GDP by nearly 2 per cent.

## 2.1.2 Skills and human capital

Education and training can contribute to improvements in both productivity and participation in the workforce. The basic skills acquired in early childhood and school years, particularly literacy and numeracy, are the necessary foundation for developing higher order skills that contribute to a more productive workforce.

Microeconomic evidence suggests that, on average, higher levels of education increase productivity and earnings for individuals. For example, in Australia the latest available ABS data indicate that average weekly full time earnings for people with Certificate III level qualifications and above are at least 10 per cent above, and up to double, those without these qualifications.<sup>4</sup> However, evidence based on macroeconomic data is more difficult to interpret.

Flexible and responsive education and training systems allow educational institutions to alter the quantity and mix of services provided as individual preferences and needs change through time. Sound regulatory and policy structures can improve the matching of existing skilled labour to demand, provide some safeguards against skill shortages arising and assist in ameliorating any that do arise.

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3 Productivity Commission 2006, *Potential Benefits of the National Reform Agenda*, Report to the Council of Australian Governments, Canberra.

4 Australian Bureau of Statistics 2005, *Education and Training Experience, Australia*, cat. no. 6278.0, ABS, Canberra.

The Government's measures to enhance teacher quality, its early childhood quality education agenda and investments to achieve ambitious targets for higher educational attainment rates will contribute to ongoing productivity and participation growth.

The Productivity Commission has estimated that improvements to achieve best practice in workforce productivity could raise aggregate labour productivity up to 1.2 per cent by 2030.<sup>5</sup> Improvements could include reforms in education and training including areas such as early learning; higher educational attainment through better youth transitions and increases in adult learning; and improvements in literacy and numeracy.

### 2.1.3 Innovation

Innovation is a key element to productivity growth. A major input into innovation is research and development (R&D), which increases the stock of knowledge in the economy.

Where there is high-risk, experimental research, the high upfront cost generally outweighs the often uncertain returns. The benefits of research also tend to spillover to parties other than the original investor in that research. As a result, it may be beneficial for governments to correct underinvestment by the market through policy intervention.

A competitive and stable economy is important for encouraging innovation. Competition improves the incentives to innovate and encourages the flow of information between firms and across economies. The Productivity Commission<sup>6</sup> has noted that market competition is the main driver of innovation and its diffusion throughout the economy.

Macroeconomic stability is also important for innovation because it provides a more certain operating environment for firms. Several OECD studies have demonstrated that stable macroeconomic policies have a critical role to play in enabling innovations that lead to higher economic growth and productivity.<sup>7</sup>

The Government is supporting innovation in critical areas, including innovations by business, collaboration between private and public sector researchers and investing in the research capacities of our universities and public research agencies.

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5 Productivity Commission 2006, *Potential benefits of the National Reform Agenda*, Report to the Council of Australian Governments, Canberra.

6 Productivity Commission 2008, *Annual Report 2007–08*, Annual Report Series, Productivity Commission, Canberra.

7 OECD 2001, *The New Economy: Beyond the Hype*. Final Report of the OECD Growth Project, OECD, Paris;  
S Box, 2009, *OECD Work on Innovation — A Stocktaking of Existing Work*, OECD Science, Technology and Industry Working Papers, 2009(2), OECD, Paris.

## 2.1.4 Climate change

Unmitigated climate change would have a negative impact on productivity growth. As an indication of the size of this impact, the Garnaut Climate Change Review conservatively estimated that unmitigated climate change would leave Australian GDP in 2100 approximately 8 per cent lower than the level it would be in the absence of climate change, with even greater impacts on consumption and real wages. This is equivalent to losing around \$17,000 per capita (in current prices) from the Australian economy in 2100. Moreover, unmitigated climate change involves significant risks and non-market costs not captured by such estimates.<sup>8</sup>

Much of the productivity impact of climate change would be through reduced agricultural productivity. An analysis by ABARE found that, in the absence of mitigation, planned adaptation and carbon fertilisation, climate change could erode agricultural productivity by as much as 17 per cent by 2050.<sup>9</sup>

To best manage these risks to Australia's future productivity growth, Australia needs to contribute to an effective global response to climate change.

## 2.2 Participation

Over the next 40 years, the labour force participation rate for people aged 15 and over is projected to fall, reflecting the projected fall in the proportion of people aged 15 and over in the labour force and falling hours worked by those in employment.

Steps to improve Australia's participation rate will minimise the impact of an ageing population.

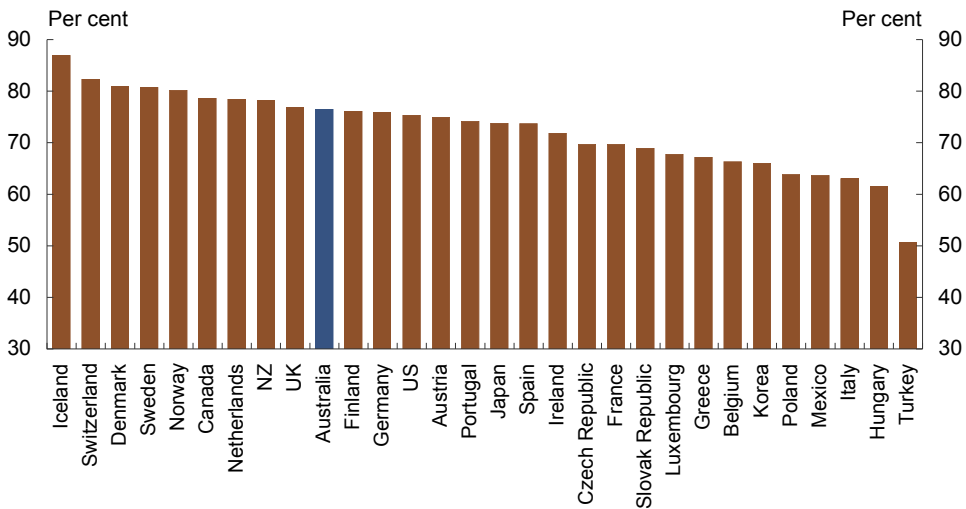
Australia's participation rate of 76.5 per cent for people of traditional working age (aged from 15 to 64 years) in 2008 is the tenth highest in the OECD. This is higher than the United States, but lower than the United Kingdom, New Zealand and Canada (Chart 2.1).

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8 R Garnaut, 2008, *The Garnaut Climate Change Review*, Cambridge University Press, Port Melbourne.

9 D Gunasekera, C Tulloh, M Ford and E Heyhoe, 2008 *Climate Change: Opportunities and Challenges in Australian Agriculture*, Proceedings of Faculty of Agriculture, Food and Natural Resources Annual Symposium.

**Chart 2.1: OECD participation rates 2008, people aged 15–64**



Source: OECD.

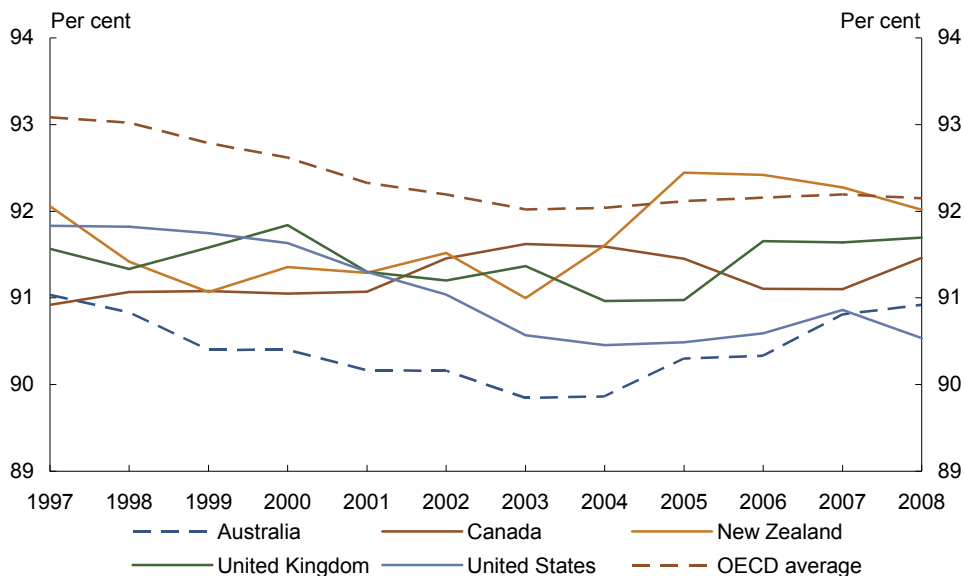
Across the OECD, prime age participation rates for men have either held constant or declined slightly between 1997 and 2008 (Chart 2.2). Australia’s prime age participation rates for men have remained relatively constant at around 90 per cent, although this remains lower than the OECD average of 92.2 per cent in 2008.

The prime age participation rates for women have risen strongly in most OECD countries. The Australian rate for women is 75 per cent, around 4 percentage points higher than the OECD average of 71 per cent in 2008 (Chart 2.3).

The Government has introduced a number of initiatives to support the development of human capital and boost labour force participation. These have included increasing incentives to work through personal income tax cuts, increases in the Child Care Rebate and the introduction of Paid Parental Leave.

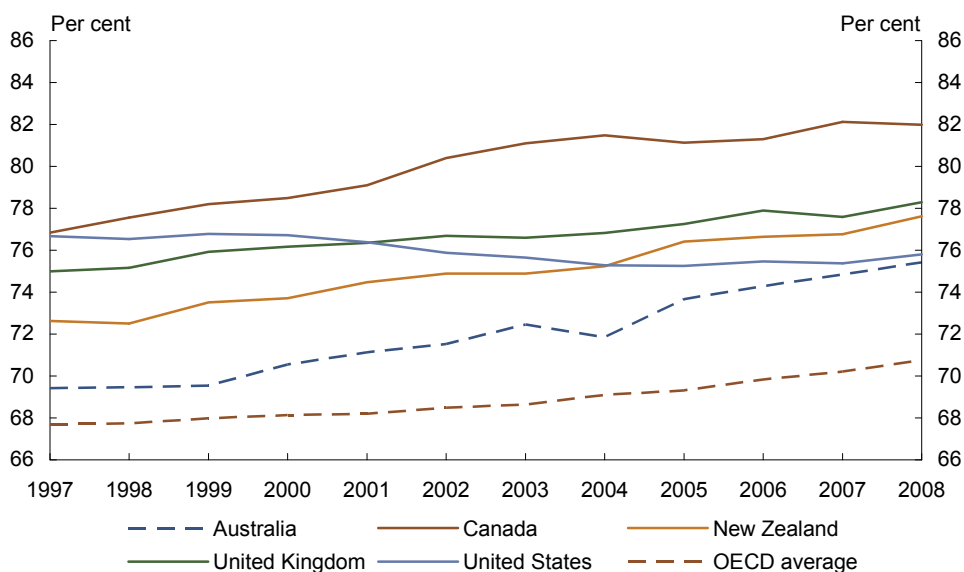
In addition, Government reforms in the areas of education, employment services and health are designed to lift participation in the workforce.

**Chart 2.2: Participation rates for men aged 25–54**



Source: OECD.

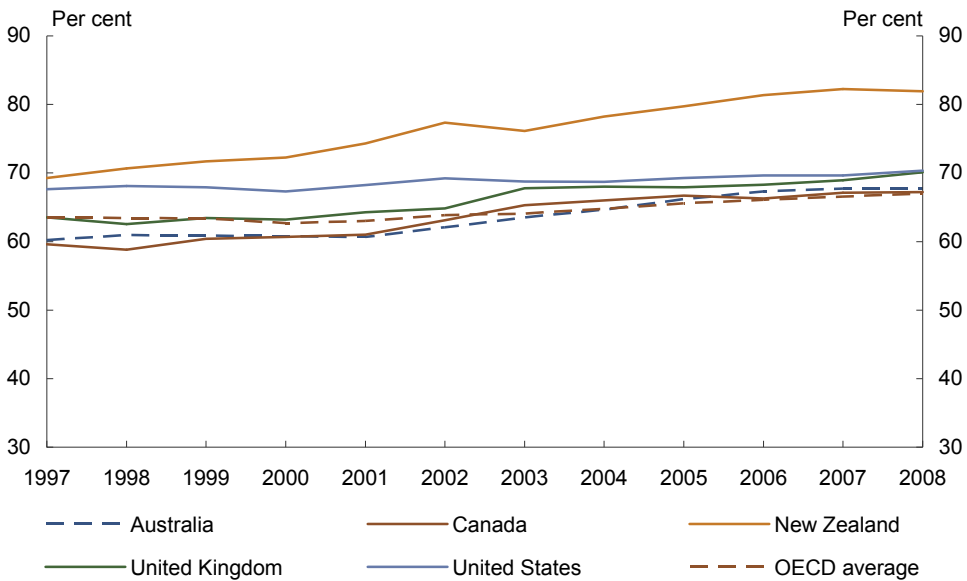
**Chart 2.3: Participation rates for women aged 25–54**



Source: OECD.

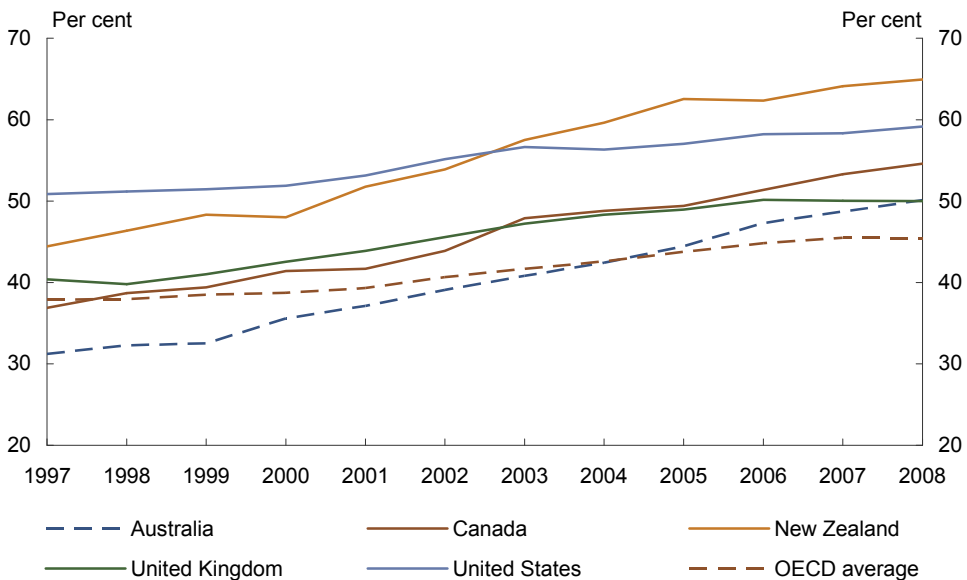
Mature age participation rates have been rising on average across the OECD (Chart 2.4 and 2.5). Participation rates for women across the OECD in the 55–64 age group have risen more strongly than those for men. Australia’s rise has been particularly strong — 19 percentage points since 1997. This brings the Australian rate for women in this age group to just higher than the OECD average.

**Chart 2.4: Participation rates for men aged 55–64**



Source: OECD.

**Chart 2.5: Participation rates for women aged 55–64**



Source: OECD.

Australia's mature age participation rate of 58.9 per cent in 2008 is the thirteenth highest in the OECD. This is higher than the OECD average (56.3 per cent), but lower than the United States, the United Kingdom, New Zealand and Canada. International comparisons show there is scope for Australia to increase participation rates for the mature age group. If mature age participation rates were to increase to around

67 per cent by 2049–50 (compared to the base case of 62 per cent by 2049–50), real GDP per capita would be 2.4 per cent higher in 2049–50. But to do so would not be straightforward.

Continued improvement in mature age participation rates will require ongoing policy effort to identify and remove the barriers for those who wish to remain in the workplace. These barriers can include cultural (including employer) attitudes, workplace flexibility, educational attainment, features of the tax and transfer system, and the availability of retraining and support services (such as health and rehabilitation services, career advice and employment services). One example of recent policy reform in this area is the introduction of a new Work Bonus, which treats earned income more generously under the Age and Service Pension income tests.

Future policy will be improved through the systematic development and trialling of new policies in the areas that are known to influence participation decisions. The establishment of a Consultative Forum on Mature Age Participation, as part of the Productive Ageing Package, will assist in identifying opportunities for the Government to further support employment for mature aged workers. The package contains retraining, re-skilling and career advice initiatives that will pilot new approaches to supporting mature age participation.

Of course, mature age Australians can choose to make a number of important contributions to the community outside of paid employment — including through activities such as volunteering or as carers. Retirement decisions reflect a complex mix of factors and the aim of policy in this area should be to enhance opportunities for mature age people.

## 2.3 Population

Over the next 40 years, the rate of population growth is projected to slow slightly to 1.2 per cent annually, compared to the 1.4 per cent experienced over the previous 40 years. At the same time, the population will continue to age.

Population growth can support economic growth, provided it is sustainable growth.

Lower population growth of 0.8 per cent annually,<sup>10</sup> relative to the 1.2 per cent annual population growth that is projected, would (Table 2.1):

- reduce the annual average rate of growth in real GDP to 2.3 per cent (compared to 2.7 per cent) — as a result, the level of real GDP would be 17 per cent lower in 2049–50;

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<sup>10</sup> Scenario based on net overseas migration of 100,000 per year (which is lower than the 30-year historical average to 2008 of 109,000) and total fertility of 1.7 births per woman (reflecting the historical minimum reached in 2001).



- reduce the number of working age people to support each person aged 65 years and over to 2.3 people (compared with 5 people today and 2.7 people under the central case population projections);
- reduce total workforce participation from 60.6 per cent to 58.2 per cent; and
- increase the median age in 2050 from 42 years to 45 years.

The key factor influencing these results is the lower net overseas migration assumption. Because migrants tend to be younger than the resident population, lower net overseas migration implies lower growth in the size of the labour force.

**Table 2.1: Australian population projections — low and base case**

Projected population as at June	2010	2050	
		Low	Base
Age range			
0-14	4.2	4.6	6.2
15-64	15.0	17.8	21.6
65-84	2.6	6.1	6.3
85 and over	0.4	1.8	1.8
<b>Total persons</b>	<b>22.2</b>	<b>30.2</b>	<b>35.9</b>
Percentage of total population			
0-14	19.1	15.1	17.2
15-64	67.4	58.9	60.2
65-84	11.7	20.0	17.6
85 and over	1.8	6.0	5.1

Source: Treasury projections.

### 2.3.1 International experience

Over the next 40 years, a number of developed countries are expected to experience long-run population decline associated with low fertility levels. Europe's total population is projected to fall by over 40 million by 2050, driven by substantial falls in the populations of Russia and Germany.<sup>11</sup>

Higher spending on public health care, pensions and other social services caused by population ageing is resulting in rising fiscal pressures for governments across the OECD.

Two of the fastest-ageing countries with the oldest populations in the world are Japan and Italy (Box 2.1). Concerns about fiscal sustainability are particularly acute for these two countries.<sup>12</sup>

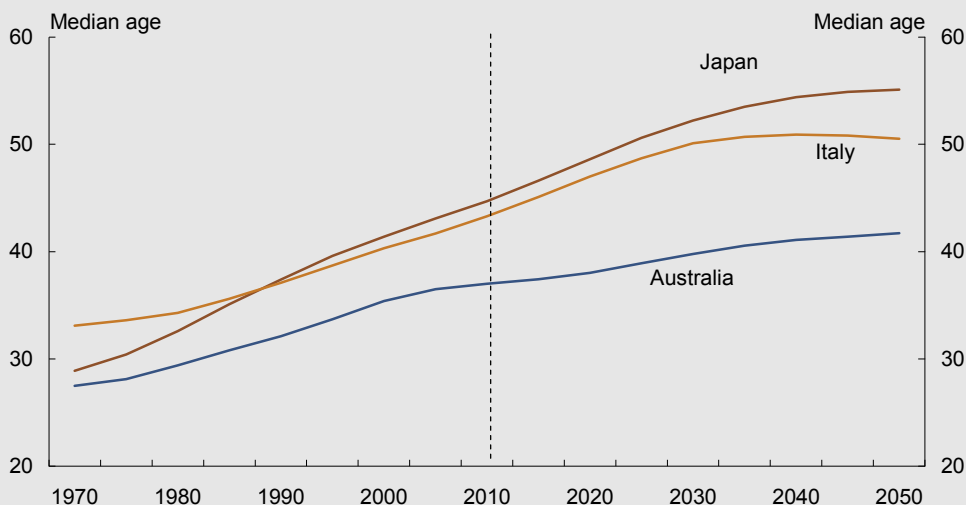
11 United Nations, World Population Prospects: *The 2008 Revision Population Database*, January 2010 update, <http://esa.un.org/unpp>.

12 OECD 2009b, *Pensions at a Glance 2009: Retirement-Income Systems in OECD Countries*, Organisation for Economic Co-operation and Development, Paris.

### Box 2.1: International case studies: Japan and Italy

The median age in Japan is expected to increase over the next 40 years to reach 55 years, more than 10 years older than the median age today and around double the median age 40 years ago (Chart 2.6). Italy is projected to age at a similar rate over the next two decades before stabilising at a median age of around 50 from 2030. This compares with Australia’s projected median age of around 42 years in 2050.

**Chart 2.6: Population ageing in Japan, Italy and Australia**



Source: Treasury projections and United Nations World Population Prospects: *The 2008 Revision Population Database*, January 2010 update, medium variant projections.

In the absence of any major changes in birth rates or immigration, Japan’s population is projected to fall by one-fifth or 25 million over the next 40 years. This follows steady falls in its population growth rate in recent decades culminating in a transition to negative growth rates from 2007. This projection reflects low fertility rates that are insufficiently offset by net overseas migration. Japan’s already high old-age dependency ratio is projected to double, resulting in only 1.4 people of working age for every person aged 65 years or older in 2050.

Falls in Italy’s population growth in recent decades mean that its population is projected to begin to decline from 60.6 million in 2016 to 57.1 million in 2050. While Italy’s fertility rate is marginally higher than Japan’s, the difference in their population trajectories also reflects Italy’s considerably stronger net overseas migration. It is projected that by 2050 there will be 1.6 people of working age for every person aged 65 or older for Italy (compared to 2.7 for Australia and 1.4 for Japan).

A key lesson from the international experience is that countries with low population growth or declining populations such as Japan and Italy face lower potential rates of economic growth than countries with relatively healthier population growth.

### 2.3.2 Infrastructure and the growth of cities

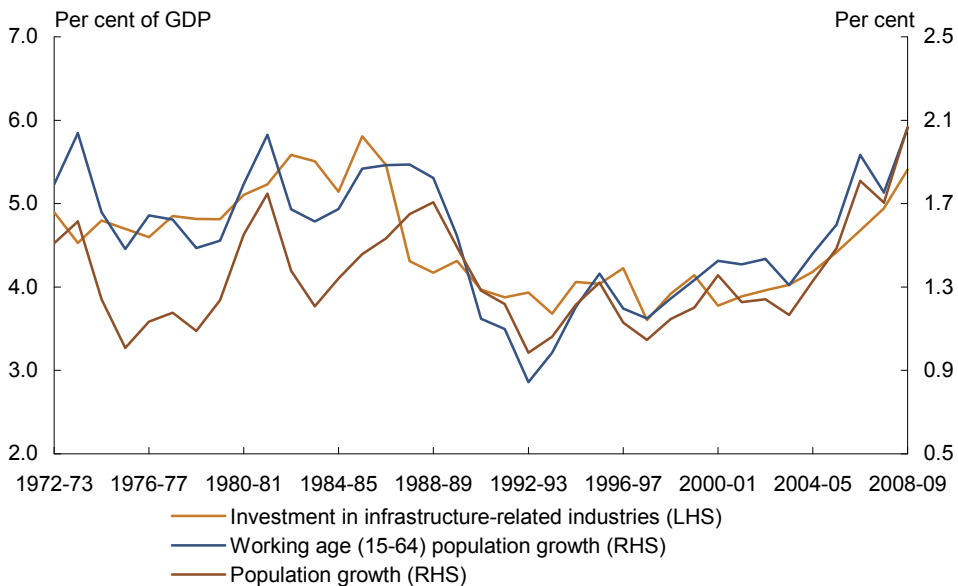
In 2008, for the first time in history, the majority of the world’s population lived in cities. This trend is expected to continue, with the United Nations predicting that over 70 per cent of the world’s population will live in cities by 2050.<sup>13</sup>

#### Australia’s future infrastructure needs

Demand for infrastructure is highly contingent upon the technology available, the demographics of population growth, the location of population growth and the manner in which households choose to live and commute.

Over recent decades investment in infrastructure-related industries has been closely correlated with population growth (Chart 2.7).

**Chart 2.7: Infrastructure and population growth**



Note: Excludes inventory investment. Infrastructure-related industries are electricity, gas, water and waste services, transport, postal and warehousing and information media and telecommunications.  
 Source: ABS cat. no. 3201.0 and ABS cat. no. 5204.0.

Cities require less fixed infrastructure per capita relative to rural areas because of the economies of scale that accompany infrastructure networks in cities. Still, increasing population density can lead to significant congestion costs that offset the benefits of these economies of scale. These effects are often most acutely felt in road transport infrastructure, but can also occur in electricity and communications infrastructure.

13 UN Population Division, 2007.

## Preparing for the future

There is a need to increase the future stock of infrastructure through investment. At the same time, reforms which ensure that existing infrastructure is efficiently and effectively utilised will further increase productivity and better enable us to meet future demands.

Improvements in governance that result in better planning, coordination and development of infrastructure are necessary to ensure that different types of infrastructure integrate effectively.

- Institutional reform in the planning and integration of networks would ensure that the infrastructure capital stock is well supplied, sufficient and functioning. Strategic planning to improve the selection of infrastructure projects and appropriate procurement methodology, such as public-private partnerships, are also needed to attract infrastructure investment.
- To encourage private investment in infrastructure, a certain and efficient regulatory environment is required, including minimising unnecessary delays in planning and construction.

### 2.3.3 Service delivery

Population ageing and growth will place pressure on government service delivery. These pressures will be ameliorated to some degree as urban density increases.

Population ageing will drive up demand for services related to seniors, carers and the disabled, which tend to be more complex and require more face-to-face interactions. In addition, the baby boomer generation will enter retirement with different expectations and aspirations, and is likely to demand higher quality and a greater range of services than previous generations.

These emerging trends will present challenges to the current service delivery system, which remains reliant on manual processes and face-to-face transactions. Client satisfaction surveys indicate that Australians want integrated, streamlined and flexible service delivery.

Significant improvements to client experiences will require transformational reform, necessitating a movement away from discrete programs built around government agencies to citizen-focused service delivery. A modern service delivery model will need to use resources more efficiently.

Reforms to achieve this have begun. In December 2009, the Government announced reforms to simplify people's dealings with government and to give them more control, while also taking advantage of synergies available across service delivery agencies.

This will, amongst other things, involve streamlining and automating processes for the majority of Australians with less complex needs, thereby freeing up resources to help those with unusual or complex needs.

Online technologies that can be accessed at home will support servicing an ageing population. The Government's National Broadband Network will be critical in opening up opportunities for service delivery to meet the challenges ahead.

Other Government reforms that simplify the service delivery process include: Medicare's electronic claiming initiative which enables Medicare rebates to be paid directly into the customer's bank account; the Australian Tax Office's pre-filing options which reduce the time spent on filling in a tax return; and Centrelink's mobile offices which enable services to be delivered to farmers and small business owners and their families in rural communities.



## Chapter 3: Long-term budget projections

### Overview

Population ageing will create pressure for increased spending, particularly in the demographically sensitive areas of age related programs and health. Health costs will also escalate as a result of technological enhancements and rising demand for better quality health services. Population ageing, by reducing the proportion of working age people in the population and hence potential economic growth rates, will also reduce Australia's capacity to fund these spending pressures.

Unless action is taken to increase the growth potential of the economy and ensure spending is sustainable, spending will exceed revenue and result in a fiscal gap of 2¾ per cent of GDP by 2049–50.

If steps were not taken to close the fiscal gap over time, it is projected that net debt will emerge in the 2040s and grow to around 20 per cent of GDP by 2049–50. Acting now to address fiscal pressures posed by ageing will minimise the fiscal adjustments required in the future.

The Government's fiscal strategy will make an important contribution to addressing these fiscal pressures. Full implementation of the fiscal strategy, by constraining spending growth to real growth of 2 per cent in years when the economy is growing above trend until the budget is in surplus, would deliver a permanent structural improvement in spending of around 1 percentage point of GDP from 2015–16.

### 3.1 Promoting fiscal sustainability: contribution of the medium-term fiscal strategy

Small adjustments now to minimise the spending pressures of an ageing population will reduce the size of the fiscal adjustments required in the longer term. The medium-term fiscal strategy when fully implemented will make a significant contribution to addressing these long-term ageing pressures. The key elements of the Government's medium-term fiscal framework are:

- achieving budget surpluses, on average, over the economic cycle;
- keeping taxation as a share of GDP on average below the 2007–08 level; and
- improving the Government's net financial worth over the medium term.

Consistent with this framework, the Government has committed to:

- supporting the economy while the economy is below trend;
- as the economy recovers and grows above-trend, taking action to:
  - allow tax receipts to recover naturally as the economy improves; and
  - limit real annual growth in Government spending to 2 per cent until the budget returns to surplus.

Implementation of the fiscal strategy is projected to reduce spending permanently by about 1 percentage point of GDP from 2015–16 onwards.

## 3.2 Revenue

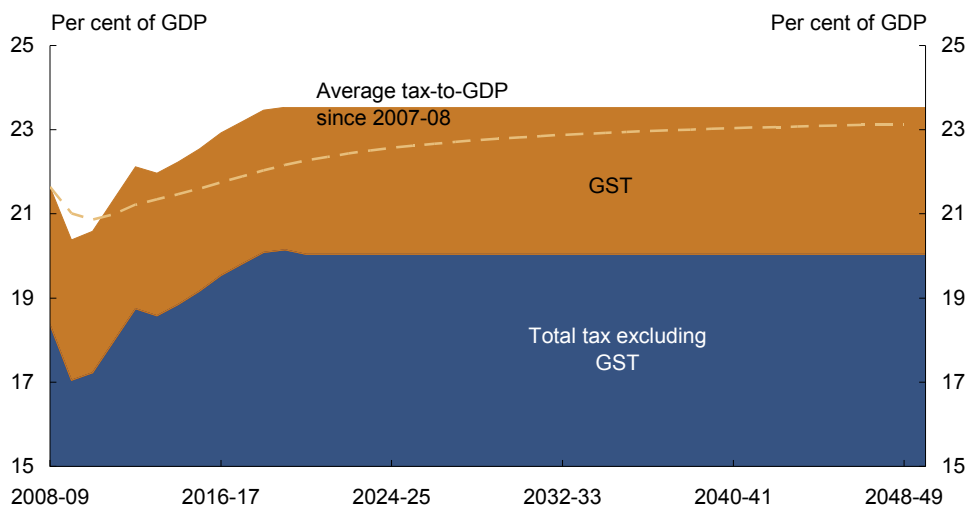
IGR 2010 assumes, in the long run, a constant tax-to-GDP ratio of 23.5 per cent. This rate is based on the historical average since the introduction of the GST. This methodology is similar to that used in previous IGRs. Appendix C sets out the methodology and the rationale for a constant tax-to-GDP assumption.

The global financial crisis has resulted in a significant fall in current revenues as a proportion of GDP. With recovery of the economy, revenues are expected to recover. From 2010–11, tax revenues are projected to increase in line with the economic recovery out to 2019–20, when they reach the long run tax-to-GDP ratio assumption. This is consistent with the Government's fiscal strategy.

The projected revenue path is shown in Chart 3.1. The tax-to-GDP ratio is projected to recover from 20.4 per cent of GDP in 2009-10 to 23.5 per cent of GDP in 2019–20.



Chart 3.1: IGR tax receipt assumptions



Source: *Mid-Year Economic and Fiscal Outlook 2009–10* and Treasury projections.

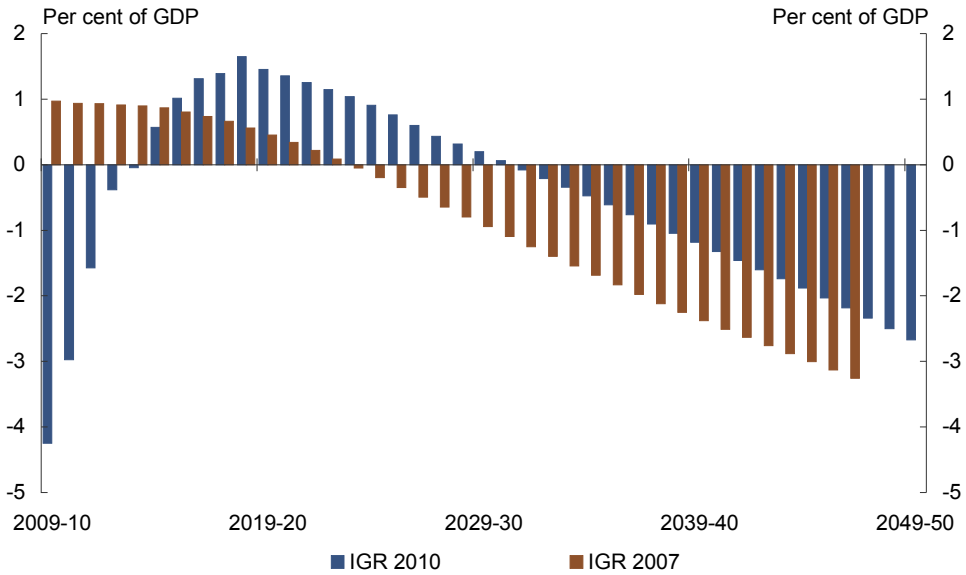
### 3.3 Ageing pressures will reduce fiscal sustainability

The fiscal gap is the gap between spending and revenue that needs to be closed to address the fiscal pressures of an ageing population (Chart 3.2).

From 2018–19 onwards, when revenue exceeds spending by around 1.6 per cent of GDP, ageing and health pressures are projected to lead to a gradual deterioration in government finances. A fiscal gap is projected to emerge in 2031–32 and grow to around 2¾ per cent of GDP by 2049–50.

This is an improvement on the fiscal gap of 3¼ per cent of GDP projected in IGR 2007. The Government's fiscal strategy of restraining real spending growth to 2 per cent in years when the economy is growing above trend until the budget returns to surplus (in 2015–16) makes a significant contribution to this improved outcome, along with the more gradual pace of ageing than previously projected.

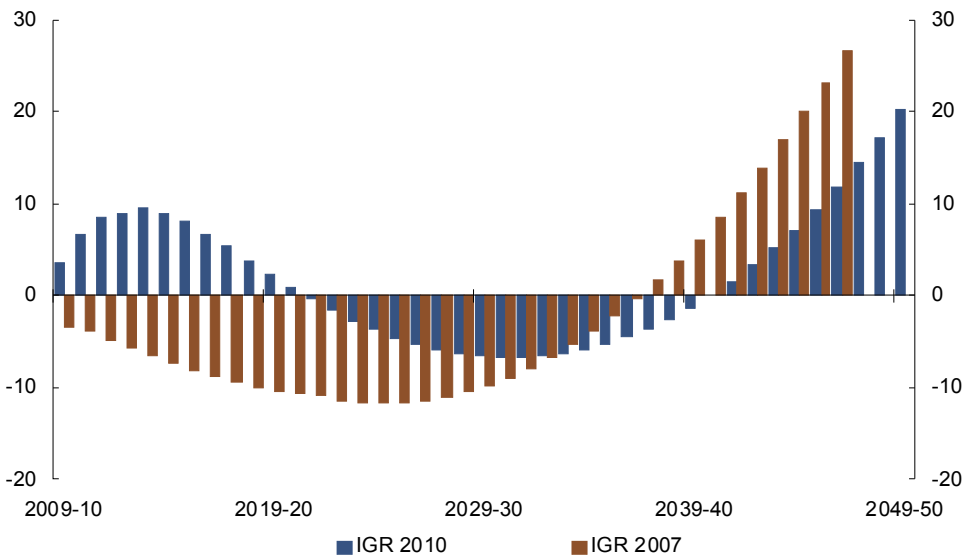
**Chart 3.2: Projected fiscal gap**



Note: Fiscal gap is the gap between government receipts and payments, excluding interest receipts and payments. It is equivalent to the primary balance.  
 Source: Treasury projections.

If a fiscal gap of 2% per cent of GDP were to develop, it is projected that net debt would re-emerge in the 2040s and rise to around 20 per cent of GDP by 2049–50 and continue to increase beyond this time (Chart 3.3).

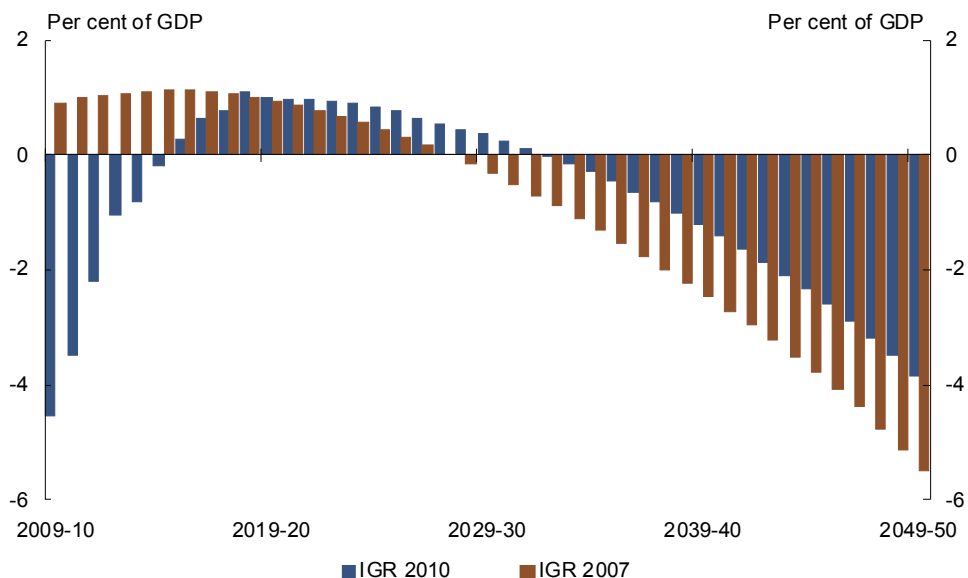
**Chart 3.3: Projected path of net debt**



Source: Treasury projections.

Similarly, if steps were not taken to close the fiscal gap over time, it is projected that the underlying cash deficit would be 3¾ per cent of GDP by 2049–50 (Chart 3.4). The difference between the fiscal gap and the underlying cash deficit is an indication of the costs of delaying policies to reduce spending growth now in response to ageing fiscal pressures.

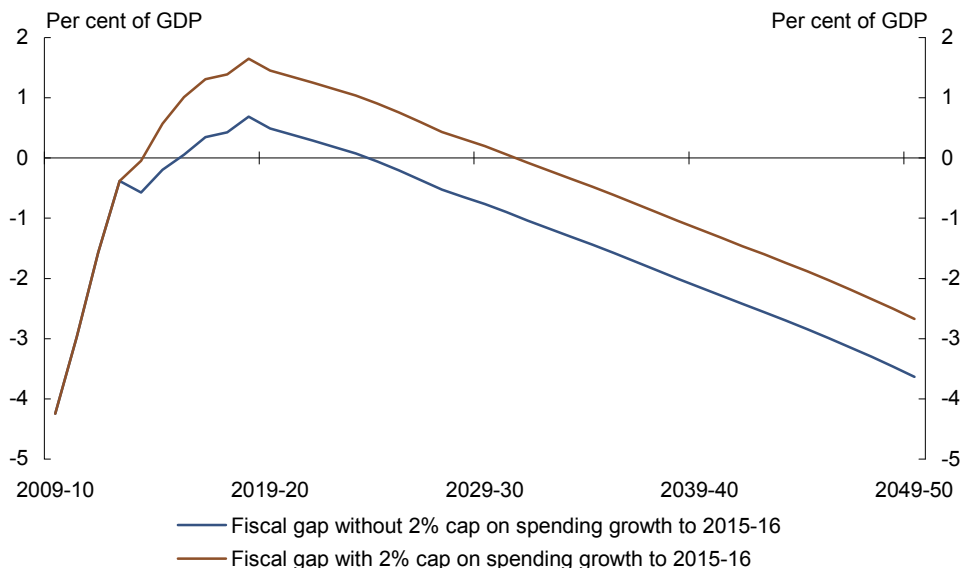
**Chart 3.4: Projected underlying cash balance**



Source: Treasury projections.

The fiscal strategy delivers a substantial contribution to long-term fiscal sustainability. Without the fiscal strategy, ageing of the population would result in a wider fiscal gap (3¾ per cent of GDP rather than 2¾ per cent of GDP) (Chart 3.5). As a result, the projected underlying cash deficit would be 3½ percentage points of GDP larger by 2049–50 than would be the case with the fiscal strategy.

**Chart 3.5: Projected fiscal gap with and without the fiscal strategy**



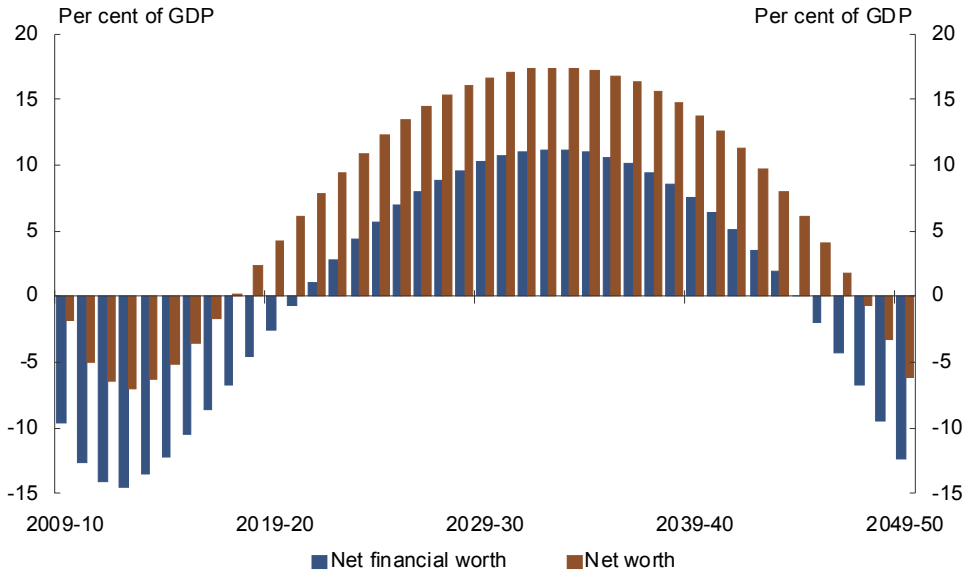
Source: Treasury projections.

### 3.4 Net financial worth and net worth

Net financial worth is a broader indicator of fiscal sustainability than net debt because it includes government borrowing, superannuation and all financial assets. Net worth is broader again as it includes non-financial assets.

As a result of an ageing population, net financial worth is projected to peak at around 11 per cent of GDP in 2032–33 before gradually deteriorating to around negative 12 per cent of GDP by 2049–50 (Chart 3.6). Net worth is projected to follow a similar path, falling to around negative 6 per cent of GDP in 2049–50.

**Chart 3.6: Projected path of Australian government net financial worth and net worth**



Source: Treasury projections.



## Chapter 4: Ageing pressures and spending

### Overview

Ageing of the Australian population will contribute to substantial pressure on government spending over the next 40 years.

Total spending is projected to increase to 27.1 per cent of GDP in 2049–50, around 4¾ percentage points of GDP higher than its projected low point in 2015–16. In today's terms, that's the equivalent of adding around \$60 billion to spending.

Around two-thirds of the projected increase in spending to 2049–50 is expected to be on health, reflecting pressures from ageing, along with increasing demand for health services and funding of new technologies.

Growth in spending on age-related pensions and aged care also is significant both as a proportion of GDP and in real spending per person, reflecting population ageing.

In the absence of the Government's fiscal strategy, total spending would grow even further. By 2015–16, the full implementation of the fiscal strategy would deliver a projected structural improvement in the level of spending equivalent to around 1 percentage point of GDP.

The Government is working to improve long-term fiscal sustainability by addressing these pressures at the source. For example, the 2008–09 and 2009–10 Budgets included greater means-testing of the private health insurance rebate, an increase in the Age Pension age and reforms to certain family payments.

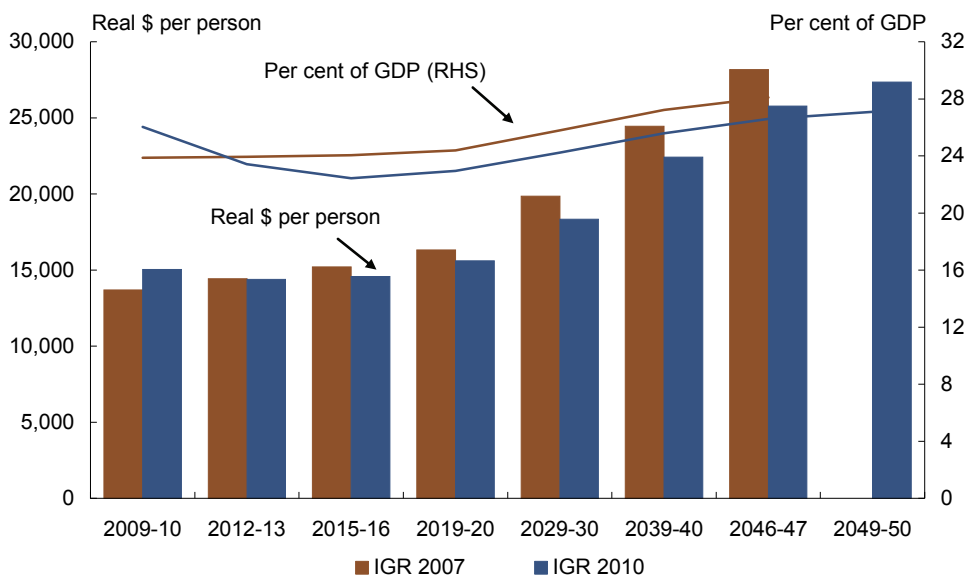
Policies to lift productivity and reduce barriers to participation also will help address the fiscal pressures of an ageing population by supporting higher economic growth over the longer term.

## 4.1 Projections of total spending

### 4.1.1 Spending pressure in demographically sensitive areas

IGR 2010 projects total spending<sup>1</sup> to increase gradually to 27.1 per cent of GDP by 2049–50, reflecting increased spending pressures in health, aged care and age-related pensions (Chart 4.1). This compares to its current level of 26.0 per cent of GDP in 2009–10, and a low-point of 22.4 per cent of GDP in 2015–16.

**Chart 4.1: Projections of total Australian government spending**



Source: Treasury projections.

The initial decline in spending is projected to occur for two reasons: first, the withdrawal of the Government’s fiscal stimulus; and secondly, the fiscal strategy of capping real spending growth to 2 per cent in years of above-trend economic growth until the budget returns to surplus.

This spending restraint is not only projected to return the budget to surplus in 2015–16, it also is expected to enhance long-term sustainability of the budget in the form of a structural improvement in the budget position and a downwards level-shift in total spending of around 1 percentage point of GDP.

1 Consistent with the methodology used in earlier IGRs (and international practice), total spending for the purposes of this chapter excludes interest payments. This methodology provides a clear picture of underlying spending pressures.



From 2015–16, spending as a proportion of GDP is projected to increase once more, reflecting underlying spending pressures in health, aged care and age-related pensions associated with an ageing population.

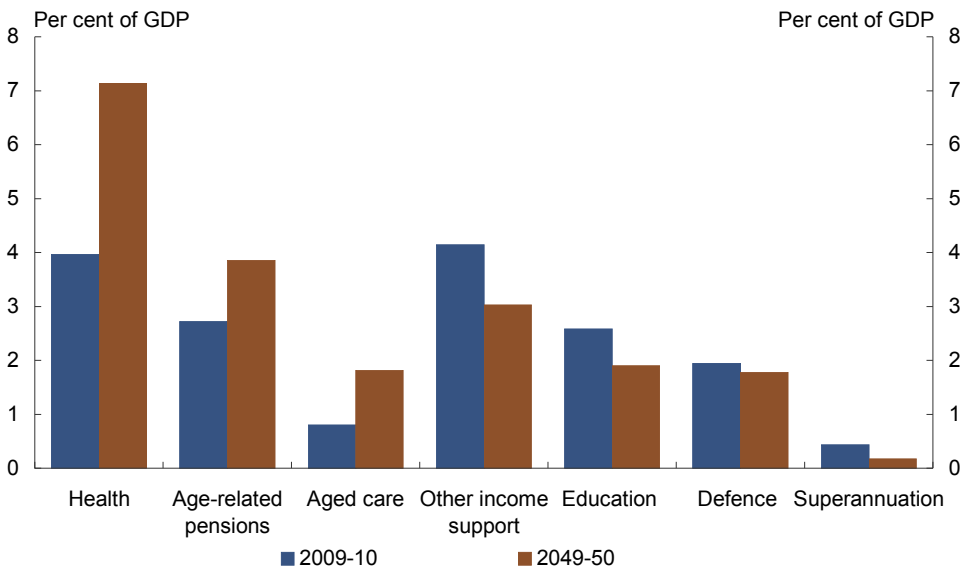
Total projected spending in IGR 2010 is lower than the projections in IGR 2007. The two key factors driving this outcome are the fiscal strategy and, to a lesser extent, the more gradual pace of ageing in IGR 2010 compared to IGR 2007. The latter leads to a slightly slower average rate of increase in real government spending per person of around 1.9 per cent a year from 2015–16 onwards, compared with an average of 2.0 per cent per annum in IGR 2007.

### 4.1.2 Compositional shifts in spending

Currently, more than a quarter of Australian government spending is directed to health, age-related pensions and aged care. Without action to curtail spending growth, Australian government spending on these functions is projected to increase significantly over the next 40 years, pushing the share of spending to almost half.

As a proportion of GDP, spending on health is projected to rise from 4.0 per cent to 7.1 per cent. Age-related pensions and aged care is projected to rise from 2.7 per cent and 0.8 per cent of GDP to 3.9 per cent and 1.8 per cent respectively in 2049–50 (Chart 4.2).

**Chart 4.2: Projections of Australian government spending by category (per cent of GDP)**



Source: Treasury projections.

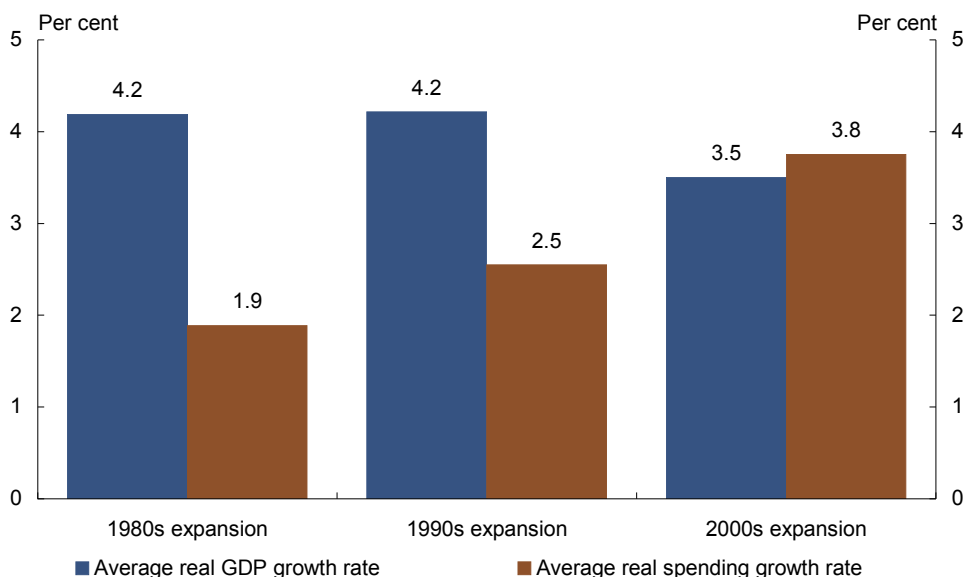
Currently, around a third of Government spending goes to income support payments (excluding aged-related pensions), education, defence and public sector defined benefit superannuation. The share of spending on these functions is projected to fall as a group to around one quarter.

Education spending is projected to grow gradually over the next 40 years, after the initial phase-down of the Government’s stimulus through the Building the Education Revolution. Once the stimulus spending is complete, spending on education as a proportion of GDP is projected to rise from 1.7 per cent in 2012–13 to 1.9 per cent by 2049–50.

### 4.1.3 Structural spending trends

Projected high spending growth rates caused by the ageing of the population are building on a high structural spending base. Average real growth in government spending over the 2000s economic expansion was significantly faster than it was during the 1980s and 1990s expansions (Chart 4.3).

**Chart 4.3: Real GDP and spending growth during recent economic expansions**



Note: Expansions defined as uninterrupted periods of annual real economic growth exceeding 2 per cent. Based on this definition, the 1980s expansion was from 1983–84 to 1989–90, the 1990s expansion from 1992–93 to 1999–2000 and the 2000s expansion from 2001–02 to 2007–08. Real spending growth is calculated by deflating nominal spending with the Consumer Price Index.

Source: ABS cat. no. 5206.0 and 2009–10 MYEFO.

The fiscal stimulus packages announced by the Government during 2008–09 will be completely phased out of the spending base during 2012–13. These packages did not lock-in a higher structural spending base. With the phasing out of the fiscal stimulus,

total spending is estimated to fall from 26.0 per cent of GDP in 2009–10 to 23.4 per cent of GDP in 2012–13.

Historical spending growth, and hence the size of the structural spending base, will make responding to the spending pressures of an ageing population more difficult. Early adjustments to the structural spending base now will limit the need for much larger adjustments to the ageing-sensitive spending categories of health, pensions and aged care in the long run.

The 2009–10 pension reforms, for example, incorporated a number of measures to increase long-term sustainability of the pension system. These included increased targeting of pension payments through changes to the income test, increasing the qualifying age of the Age Pension, and replacing the Pension Bonus Scheme with a new Work Bonus to increase workforce participation of older Australians.

The largest pressure on the budget is projected to come from health, reflecting ageing pressures, increasing demand for health services and the funding of new technologies. Pressure also is expected to come from increased spending on age-related pensions and non-age-related income support payments. Within other income support, spending on the Disability Support Pension and family payments are projected to bring the largest annual pressure on future budgets.

## 4.2 Health

### Key messages

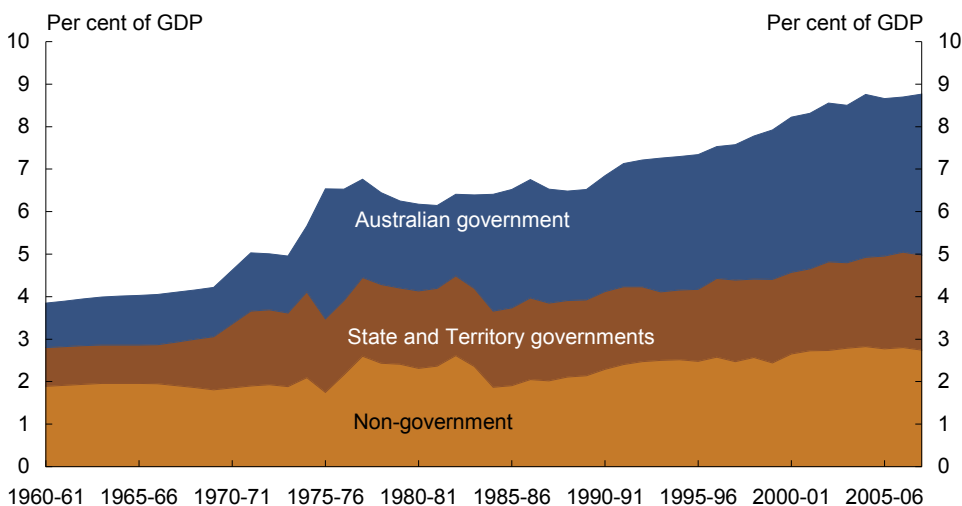
Health spending is projected to grow from 4.0 per cent of GDP in 2009–10 to 7.1 per cent of GDP in 2049–50. Population ageing will contribute to spending growth. In addition, based on past spending patterns, growth is projected to stem from increasing demand for health services and the funding of new technologies. Over the medium term, the combined effect is manifested in growth in all major categories of health spending: hospitals, medical benefits, pharmaceuticals and private health insurance.

Australia's health outcomes are achieved at a moderate cost, with total health spending as a share of GDP currently around the average for OECD countries.

Health care services are funded and provided by the public and private sectors. The Australian government provides over 40 per cent of the total health funding, and is the major source of public funds. State and territory and local governments fund around one quarter of the cost of health services, while non-government sources contribute around one third.

Since 1960, the fastest growing source of health care funding has been the Australian government. As a proportion of GDP, Australian government health funding increased from 1.0 per cent in 1960–61 to 3.8 per cent in 2007–08. State and Territory government funding increased from 0.9 per cent to 2.2 per cent of GDP over the same period and funding from non-government sources increased from 1.9 per cent to 2.7 per cent (Chart 4.4).

**Chart 4.4: Historical health spending**



Source: Australian Institute of Health and Welfare health spending database.

Major health programs funded by the Australian government include:

- the Medical Benefits Schedule, which forms the core of Medicare — \$14.1 billion in 2008–09; and
- the Pharmaceutical Benefits Scheme, under which the Government subsidises pharmaceuticals to provide patients with affordable access to medicines — \$7.7 billion in 2008–09.

In addition, the Australian government:

- makes a major contribution to the funding of health and hospital services provided by State governments — \$10.3 billion in 2008–09;
- provides a rebate to subsidise the cost of private health insurance — \$4.2 billion in 2008–09;
- provides health care services to veterans via White and Gold card arrangements — \$3.7 billion in 2008–09; and
- provides financial support in other areas, including medical research, public health, Indigenous health, health information management and access, health safety and quality, and medical workforce development and infrastructure — \$7.5 billion in 2008–09.

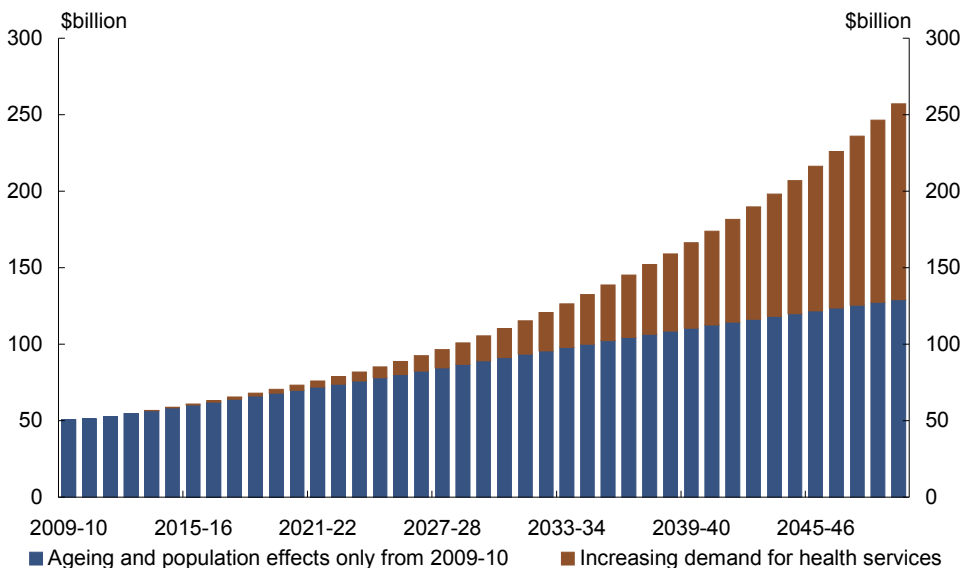
## 4.2.1 Key trends and drivers

As the population ages, more people will fall into the older age groups that are the most frequent users of the public health system. Combined with population growth, this will play an important role in increasing future health costs.

From 2009–10 to 2049–50, real health spending on those aged over 65 years is expected to increase around seven-fold. Over the same period, real health spending on those over 85 years is expected to increase around twelve-fold.

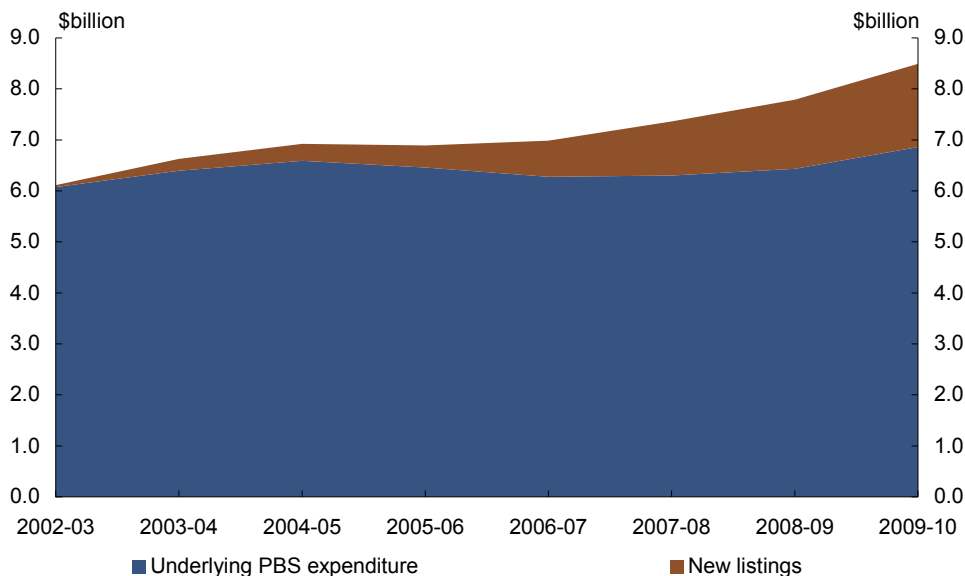
In addition to demographic pressures, demand for higher standards of care will place pressure on the Government to increase expenditure, as will rapid technological innovation (Charts 4.5 and 4.6).

**Chart 4.5: Total Australian government health expenditure with and without non-demographic growth (in 2009–10 dollars)**



Source: Treasury projections.

**Chart 4.6: New listings on the Pharmaceutical Benefits Scheme since the 2002–03 Budget (in 2009–10 dollars)**



Note: The figures for new listings do not take into account minor listings over the period. These are estimates of the net impact of the new listings.

Source: Department of Health and Ageing.

After fluctuating throughout the 1970s and 1980s, Australian government spending on health care has been on a steadily rising path since the early 1990s (Chart 4.4). A large part of the growth over this period was driven by non-demographic factors (Table 4.1). This includes increasing use of doctors, tests and pharmaceuticals, and decisions to subsidise the introduction of new technologies or list new drugs on the Pharmaceutical Benefits Scheme.

While not modelled explicitly, there may be interactions between demographic and non-demographic forces. For example, an older population may change community expectations concerning appropriate levels of care and encourage increased investment in health research and development.

The projections assume that these trends continue, with ageing and population growth contributing around 40 per cent of the projected increase in health spending over the next 40 years.

**Table 4.1: Real historical growth rates for Australian government health spending (per cent)**

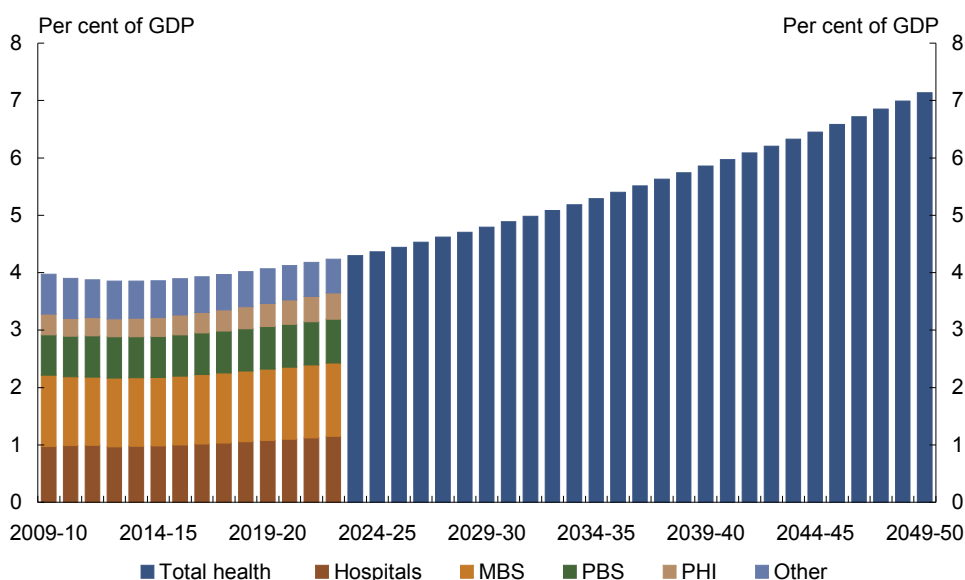
	1984-85 to 2007-08	1997-98 to 2007-08
Non-demographic (population and age structure removed)	3.31	4.01
Population	1.30	1.33
Age structure	0.45	0.45
<b>Total</b>	<b>5.13</b>	<b>5.87</b>

Note: Represents average annual growth using data from the start and end of the period. This is different from the calculation of growth rates for the projections, where growth rates are calculated from a fitted trend in the historical data to take account of the information in all data points.

Source: Treasury estimates based on data from the Australian Institute of Health and Welfare health spending database.

## 4.2.2 Projections

Australian government spending on health is projected to increase as a proportion of GDP from 4.0 per cent in 2009–10 to 7.1 per cent in 2049–50 (Charts 4.7 and 4.8). Health system components are projected individually over the medium term, out to 2022–23. From 2023–24 onwards, total health spending is projected using an aggregate model based on the more stable long-term trends in public health expenditure growth. Further details on the projection methodology are given in Appendix C.

**Chart 4.7: Projected Australian government health spending**

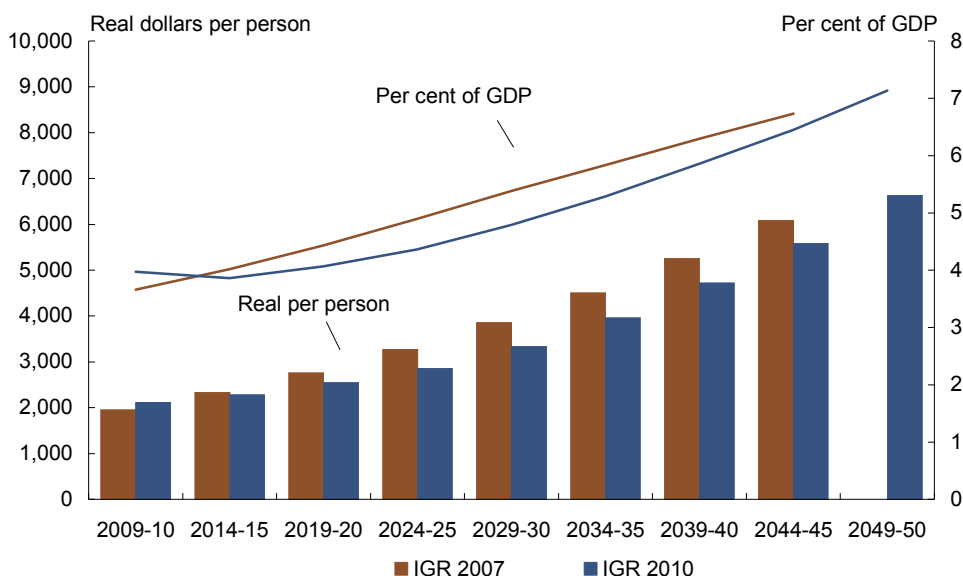
Source: Treasury projections.

- The private health insurance rebate is the fastest growing component of Australian government health expenditure, projected to grow from \$192 real per capita in 2012–13 to \$319 real per capita in 2022–23, an increase of

over 50 per cent in real spending per person. This is notwithstanding recent changes to the private health insurance rebate that, if enacted, are expected to deliver net savings of \$2.0 billion over five years.

- Hospital expenditure also is growing quickly, increasing from \$594 real per capita in 2012–13 to \$803 real per capita in 2022–23.
- Pharmaceutical spending remains a significant share of the health budget throughout the projection period, growing from \$443 real per capita in 2012–13 to \$534 real per capita in 2022–23.

**Chart 4.8: Projections of Australian government health spending**



Source: Treasury projections.

In light of these escalating health pressures, it will be important to ensure that the health system provides value for money. This requires a health system that responds well to innovation, funding cost-effective improvements to health care while being able to adjust spending levels in areas where better value for money could be obtained.

Reforms aimed at improving efficiency also could aid fiscal sustainability in the face of increasing demands on the health system. It will be important to encourage improvements in efficiency and quality, while being flexible enough to enable care to be provided by the most appropriate professionals in the most appropriate places.

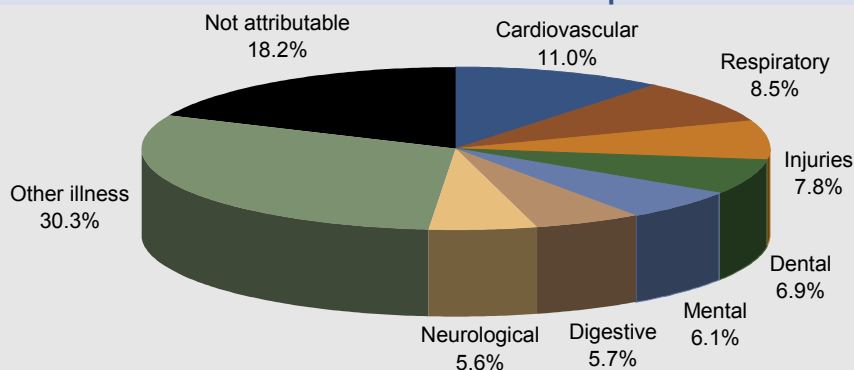


### Box 4.1: Chronic disease and health expenditure

Estimates of non-demographic growth in the IGR implicitly include the impact of changes in population health. While the IGR does not separately identify this effect, the Australian Institute of Health and Welfare (AIHW) has looked at both the distribution of health expenditure by disease, and how changing disease rates will affect future expenditure (AIHW 2008).

Expenditure on diabetes and neurological conditions is expected to grow most rapidly in the 30 years from 2002–03 to 2032–33 (AIHW 2009), although diabetes is coming off a low base (1.9 per cent of total expenditure in 2002–03). Costs from diabetes alone are projected to increase 436 per cent, from \$1.6 billion to \$8.6 billion. These trends are largely caused by the increasing numbers of overweight and obese people (for diabetes) and the ageing population (for both disease groups).

**Chart 4.9: Disease shares of total health expenditure in 2002–03**



Source: AIHW 2008.

These projections highlight an additional challenge for the health system. Not only must it respond to the fiscal pressures identified in the IGR, but it must also adapt to the changing health needs of the population.

In recent work for the National Health and Hospital Reform Commission, the AIHW estimated that real total health expenditure (private spending and spending by all governments) would increase by 189 per cent between 2002–03 and 2032–33. Constraining the growth in obesity would result in an increase of 186 per cent instead. In both cases, total health expenditure would be over 12 per cent of GDP in 2032–33.

## 4.3 Aged care

### Key messages

Spending on aged care is projected to grow from 0.8 per cent of GDP in 2009–10 to 1.8 per cent of GDP in 2049–50. Growth in spending on residential aged care is the main contributor to the increase, although spending on community care also is projected to rise significantly. Population ageing is the primary driver of aged care spending over the next 40 years, accounting for around two-thirds of the projected increase in real spending on aged care per person.

The Australian government provides funding for residential aged care and a range of community care services. Australian government aged care spending is estimated to be 0.8 per cent of GDP in 2009–10. State and Territory governments and individuals receiving care also contribute to total aged care spending, which is currently around 1.1 per cent of GDP.

The major aged care services funded by the Australian government are:

- residential services, classified as high care (formerly nursing home care) or low care services (formerly hostel care); and
- community care services, which include Home and Community Care program services, the Community Aged Care Package program, the Extended Aged Care at Home program and Veterans' Home Care.

### 4.3.1 Key trends and drivers

The dominant influence on future levels of Australian government aged care spending is the number of people over the age of 85, as this age group is the major user of formal aged care services. As mentioned in Chapter 1, the number of people aged 85 and over is expected to more than quadruple over the next 40 years, to 1.8 million people by 2050. This substantial increase will exert considerable pressure on aged care spending.

Other factors that can impact on future government aged care spending include:

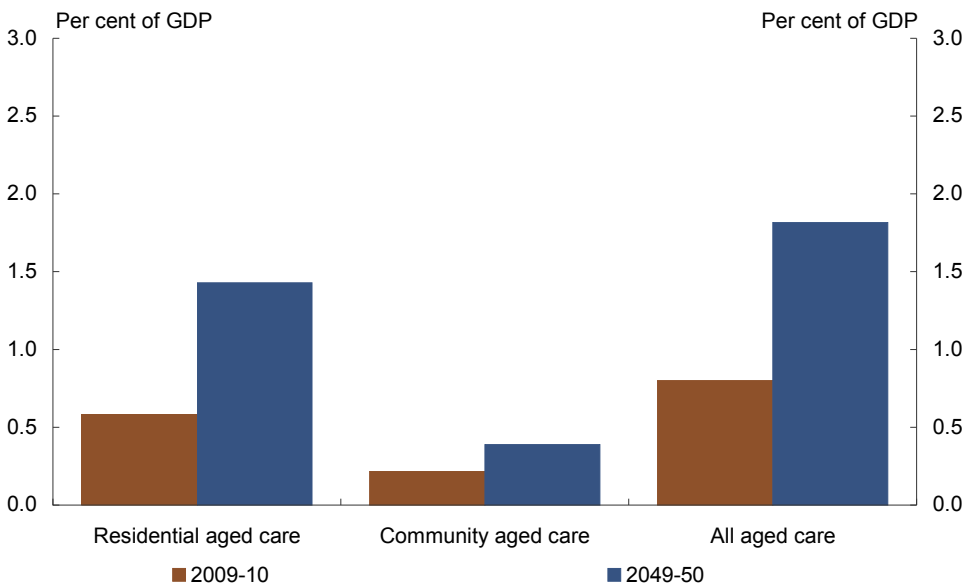
- changes in the average cost per person for a given type of care;
- future disability levels within the aged population;
- the mix between residential care and care in the community; and
- changes in Government policy, including changes to the number of aged care places and the proportions funded by government.

The projections of aged care spending are a function of the average real cost per person for a given type of care. This is assumed to rise at 1.6 per cent per annum, the rate of productivity growth. This is in line with historical non-demographic growth reflecting quality improvements, increasing frailty and wage pressures, counterbalanced by productivity improvements in the sector.

### 4.3.2 Projections

Australian government spending on aged care is projected to increase as a proportion of GDP from 0.8 per cent in 2009–10 to around 1.8 per cent in 2049–50 (Chart 4.10). This is caused mainly by projected increases in spending on residential aged care, reflecting very high rates of growth in the number of people aged 85 and over.

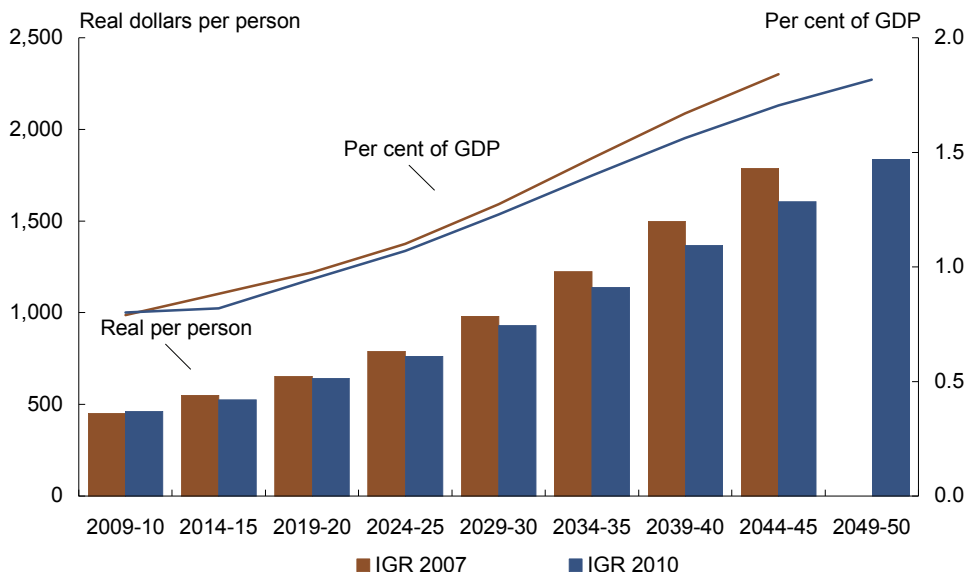
**Chart 4.10: Composition of Projected Australian government aged care spending**



Source: Treasury projections.

These projections are similar to those obtained by other recent studies of aged care in Australia and those of IGR 2007. Projections of real per person aged care spending in IGR 2010 are consistently lower than projected in IGR 2007 mainly because of the younger projected population in this IGR (Chart 4.11).

**Chart 4.11: Projections of Australian government aged care spending**



Source: Treasury projections.

## 4.4 Pensions and income support payments

### Key messages

Total spending on pensions and income support payments is projected to increase from 6.5 per cent of GDP in 2014–15 to 6.9 per cent of GDP in 2049–50, following an initial decline as the economy recovers. The growth is driven largely by projected increased spending on age-related pensions, reflecting the ageing population and indexation arrangements. Other income support payments, such as Disability Support Pension and family payments, are large scale programs and continue to make significant contributions to total aggregate spending.

The Australian government has a range of programs that provide payments to individuals who require support or supplementary assistance. These payments fall across three broad groups: assistance to the aged; assistance to those of workforce age; and assistance to families with children. A 2010 OECD Working Paper found that Australia performs well compared to other OECD countries in targeting low income support benefits to reduce the risk of poverty while maintaining incentives to return to the workforce.

### 4.4.1 Key trends and drivers

Australian government payments to individuals are sensitive to changes in population levels, age structure and the number of persons unemployed. They are also sensitive to changes in consumer prices or wages, depending on indexation arrangements.

The IGR 2010 projections include an increase in payments to individuals in the form of Carbon Pollution Reduction Scheme (CPRS) household assistance. This assistance will help households to adjust when the CPRS is introduced, increasing payments to individuals by 0.1 per cent of GDP in 2011–12, the first full year that CPRS household assistance is expected to be in operation. Appendix C sets out the methodology for projecting income support payments.

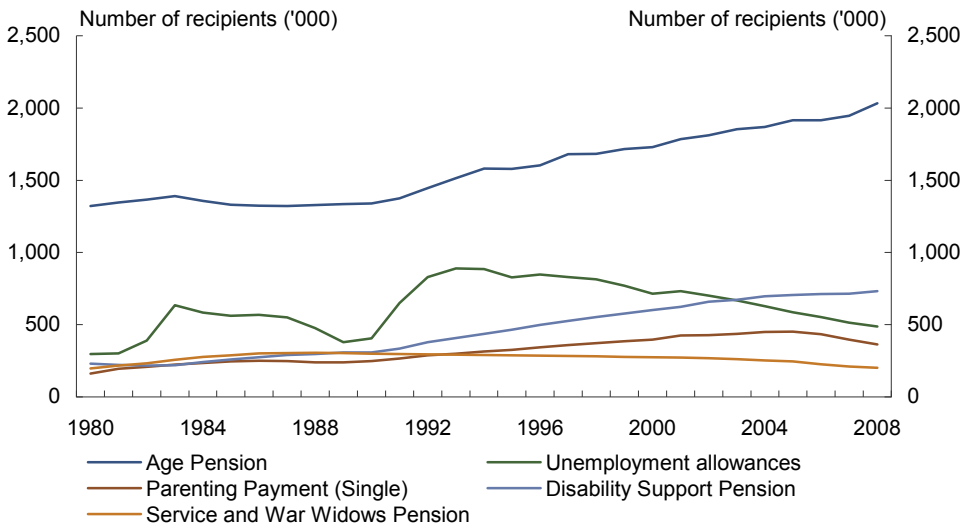
### 4.4.2 Assistance to the aged

Assistance to people older than usual workforce age includes the Age Pension and similar payments to veterans and war widows. These payments are estimated to be around 2.4 per cent of GDP in 2008–09. Following significant increases to these payment rates in September 2009, the payments are estimated to rise to about 2.7 per cent of GDP in 2009–10.

Between 1980 and 2008, the total number of age pensioners increased from 1.3 million to over 2.0 million (Chart 4.12). This mainly reflects growth in the eligible population, partly offset by an increase in the proportion of the population ineligible to receive a pension because of the means tests and the rising pension age for women. Recent reductions in asset prices for some growth assets and reduced interest rates and dividends have increased pensioner numbers. The number of service pensioners and war widow pensioners has been relatively stable.

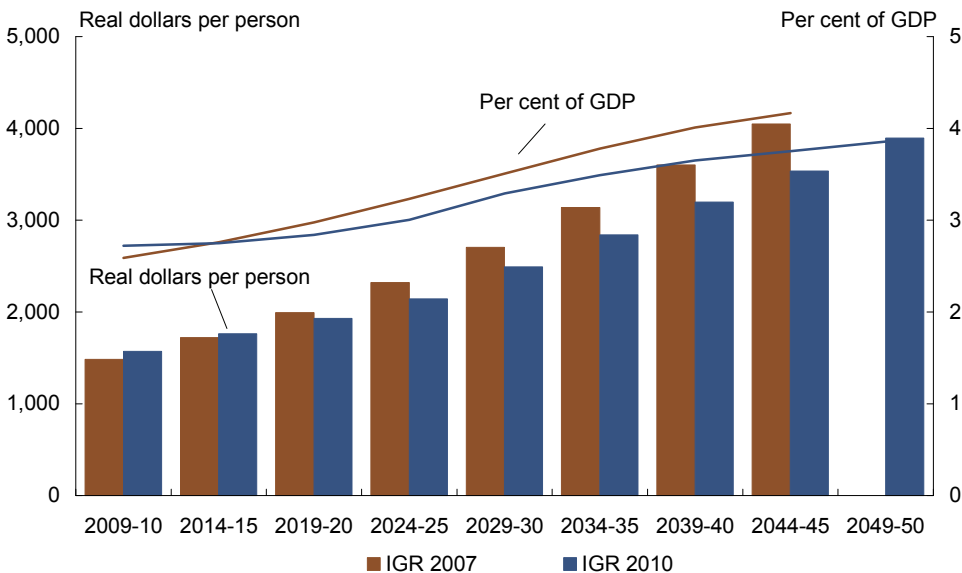
Age-related pension payments are projected to increase to 3.9 per cent of GDP in 2049–50 (Chart 4.13). The IGR 2010 projections are below the IGR 2007 projections of Age Pension spending from around 2016–17 onwards owing to a lower proportion of persons of Age Pension eligibility age in the population. This reflects a younger projected population and the increase in the eligibility age for the Age Pension that was announced in the 2009–10 Budget.

**Chart 4.12: Numbers of recipients of major payments to individuals, 1980 to 2008**



Source: Department of Families, Community Services and Indigenous Affairs, various years and Department of Family and Community Services Income Support Customers — a Statistical Overview, various years.

**Chart 4.13: Projections of Australian government spending on age-related pensions**



Source: Treasury projections.

Other factors affecting the projections of age-related pension spending include:

- The number of people of eligible age is projected to increase by around 150 per cent by 2049–50.
- A decline in the proportion of pensioners receiving a full Age Pension, because of the increased value of individuals' superannuation and other private assets and income.
- The proportion of people with a part Age Pension is projected to increase significantly while the proportion of the eligible age group not receiving any Age Pension is projected to rise slightly.

While the projected increase in spending on age-related pensions as a proportion of GDP is substantial, it is relatively low compared with most other OECD countries. Australia is comparatively well-placed in relation to Age Pension spending because the Pension is means-tested and targets poverty alleviation. By comparison, many OECD countries pay age pensions based on pre-retirement individual earnings, resulting in greater fiscal pressure as their populations age.

### **4.4.3 Assistance to those of workforce age**

The main payments to people of workforce age are Disability Support Pension (DSP), Newstart Allowance, Parenting Payment Single, Parenting Payment Partnered, Carer Payment, Youth Allowance for unemployed youths, Youth Allowance (student) and Austudy. Projections of these payments were included in IGR 2007. Carer Allowance has also been projected for IGR 2010.

Payments for people of workforce age are estimated to be around 2.4 per cent of GDP in 2009–10 declining to 2.1 per cent of GDP in 2049–50. Except for Carer Allowance, these payments are means-tested and, in some cases, people on these payments are required to seek work or undertake training.

Major factors influencing the number of recipients of payments to people of workforce age include the economic cycle, population growth and the raising of the eligibility age for the Age Pension (which is expected to result in some people taking up or staying on a workforce-age payment instead).

### **4.4.4 Assistance to families**

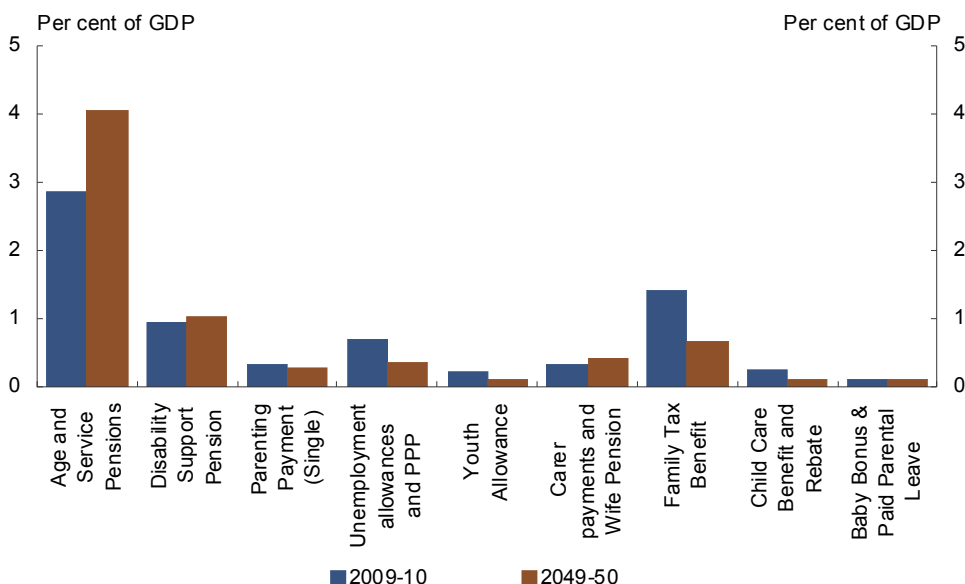
Family payments provide assistance to most families with children, with higher assistance provided to families with lower incomes. The payments modelled in this report include Family Tax Benefit Part A (FTBA), Family Tax Benefit Part B (FTBB), Child Care Benefit and the Baby Bonus, which were also modelled in IGR 2007. Paid Parental Leave and the Child Care Rebate are modelled for the first time in this IGR.

The key driver for projections of family assistance payments are the assumed number of children, female labour force participation and the number of births.

### 4.4.5 Projections of payments to individuals

Australian government payments to individuals are projected to fall initially as a share of GDP as the unemployment rate falls in line with the strengthening economy, but then gradually increase to 6.9 per cent of GDP in 2049–50. This reflects a projected increase in spending on age and service pensions to 3.9 per cent of GDP by 2049–50, partially offset by a decrease in other payments to individuals as a proportion of GDP (Chart 4.14).

**Chart 4.14: Composition of projected Australian government payments to individuals**



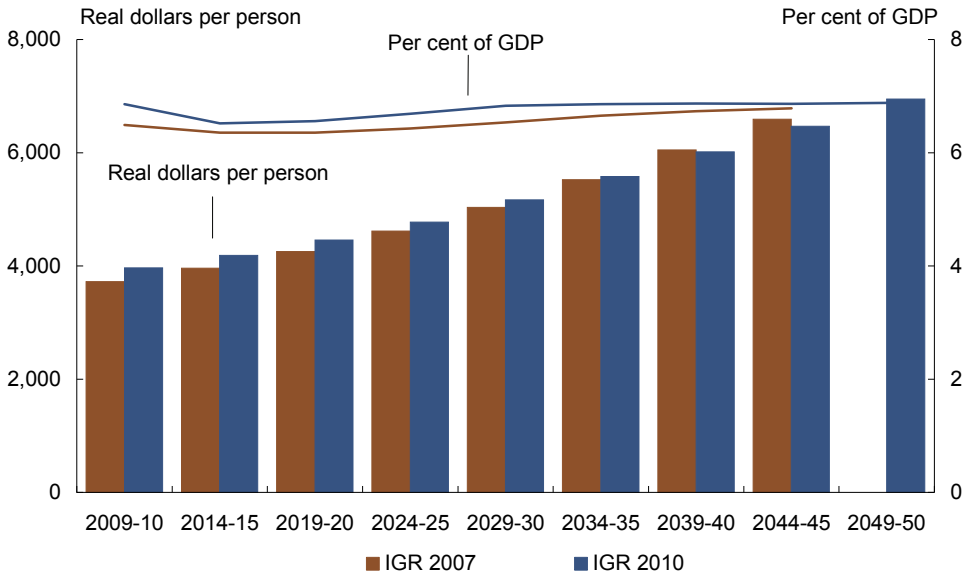
Note: PPP — Parenting Payment Partnered. Carer payments = Carer Allowance + Carer Payment  
 Source: Treasury projections.

The projected decrease in other payments to individuals reflects the relatively lower proportions of the population in the relevant age groups and the policy of indexing allowances and some components of family payments to consumer prices.

Spending on modelled income support payments is higher in IGR 2010 than in IGR 2007 as a proportion of GDP in all years reflecting the inclusion of payments not modelled in the previous IGR (Paid Parental Leave, the Child Care Rebate and Carer Allowance) (Chart 4.15). In real per capita terms, given the larger population projected in IGR 2010, spending is lower from the 2040s even including the additional payments.



**Chart 4.15: Projections of total Australian government income support payments**



Source: Treasury projections.

## 4.5 Education and training

### Key messages

Education spending is projected to increase from 1.7 per cent of GDP in 2012–13 to 1.9 per cent of GDP in 2049–50, reflecting the continuation of historical trends in schooling.

In 2009–10, Australian government spending on education is estimated at 2.6 per cent of GDP. Nearly two-thirds of this spending is on schools. This figure includes the capital expenditure in the Australian government's economic stimulus plan. By the end of the forward estimates, the proportion is anticipated to be more in line with recent history with around 55 per cent of total education spending being on government and non-government schools.

The Australian government is the main provider of public funds for higher education, with around 28 per cent of education spending allocated to this sector in 2008–09. By the end of the forward estimates period this will have increased to around 31 per cent.

Both the Australian government and State and Territory governments provide funding for vocational education and training providers. For both schools and tertiary education the trend towards privately provided education is also continuing.

### 4.5.1 Key trends

Key factors influencing education projections are the number of young people and the proportion of these young people that participate in education.

- The proportion of the population aged 5 to 24 years has decreased from 37 per cent in 1970 to an estimated 26 per cent in 2010, although the actual numbers have risen from 4.6 million to an estimated 5.9 million. By 2050, the proportion of the population in the 5 to 24 year age group is projected to fall to 23 per cent, with the actual number of people in this age group projected to reach 8.2 million.
- School participation rates have been relatively stable since the mid-1990s after increasing from the mid-1980s.
- Participation rates for most age groups in higher education have been generally stable or falling slightly since around 2001.
- For vocational education and training, participation in apprenticeships rose for all males and younger females (15 to 17 years old), while for other forms of vocational education and training, participation rates for 15 to 17 year old males and females rose but rates for older people generally fell between 2003 and 2007.

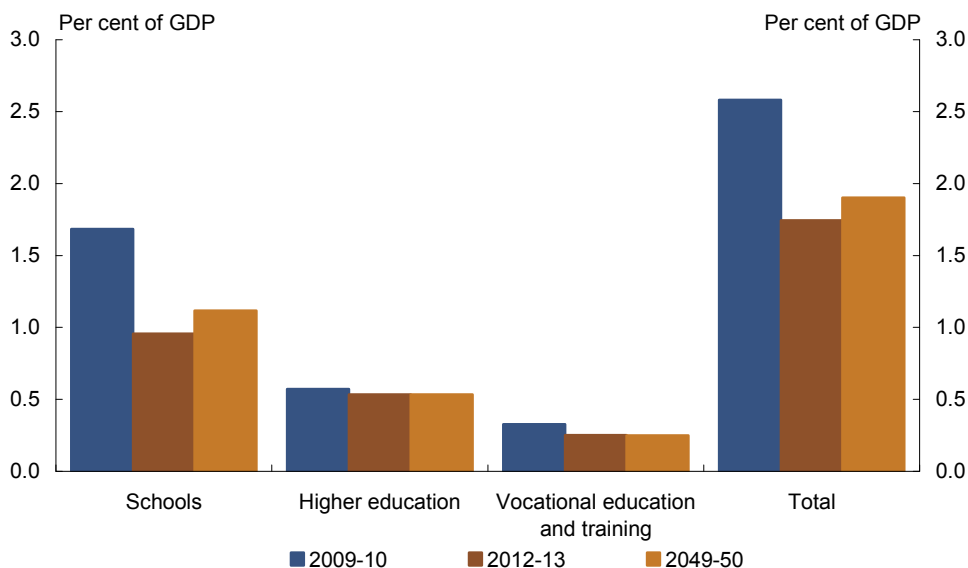
The Australian government is the principal government funder of non-government schools. This proportion has been increasing steadily at least since 1980 when it was 22 per cent, rising to 34 per cent by 2008. The higher proportion of students in non-government schools has the effect of increasing total costs to the Australian government. This trend is projected to continue.

Access to university is currently assisted through the income contingent loans scheme — the Higher Education Loans Program (HELP). In the 2009–10 Budget, the Government announced that the number of Commonwealth-supported places would be uncapped from 2012. This will allow universities to offer a place to any eligible student. As a result, the number of Australian students at university is expected to increase over time.

### 4.5.2 Projections

In real per person terms, total Australian government spending on education is projected to fall initially as the economic stimulus spending phases out but then gradually increase to 1.9 per cent of GDP in 2049–50 (Chart 4.16). The methodology is detailed in Appendix C.

**Chart 4.16: Composition of projected Australian government education spending**

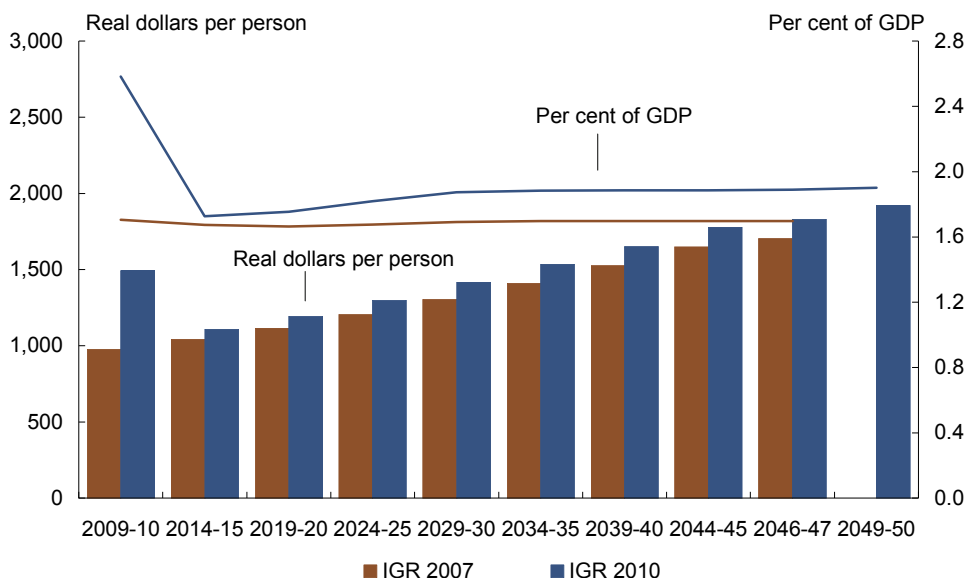


Source: Treasury projections.

Overall, education spending as a proportion of GDP is higher than in IGR 2007 (Chart 4.17). This trend reflects:

- the overall population being younger than previously projected;
- changes to participation rate projections in post-secondary school education reflecting the rise in educational attainment of Australians over time;
- the trend to a more highly skilled workforce;
- the introduction of uncapped university places from 2012 along with increases in per place funding;
- an increase in real per person education spending because of increased per place funding in schools since the last IGR, based on the National Education Agreement with the States and Territories; and
- the expansion of vocational education and training places through the Productivity Places Program.

**Chart 4.17: Projections of Australian government education spending**



Source: Treasury projections.

## 4.6 Government employee superannuation

### Key messages

Superannuation costs associated with the Government’s public sector defined benefit schemes constitute a relatively small proportion of future government obligations. Spending on these schemes is projected to decline from 0.4 per cent of GDP in 2009–10 to 0.2 per cent of GDP in 2049–50.

The most significant of the Australian government’s superannuation obligations, in terms of future spending, are the defined benefit schemes for civilian and military employees. These include the Commonwealth Superannuation Scheme (CSS), the Public Sector Superannuation Scheme (PSS), the Defence Force Retirement and Death Benefits Scheme (DFRDB) and the Military Superannuation and Benefits Scheme (MSBS). Defined benefit superannuation arrangements are also in place for federal politicians, judges and governors-general.

These arrangements affect future government spending because, historically, only a small proportion of the costs of superannuation benefits have been funded at the time employees accrue benefit entitlements — the unfunded superannuation liability as at 30 June 2009 was estimated at \$116 billion (or 9.6 per cent of GDP). The CSS, PSS, DFRDB and MSBS account for almost all of the Australian government’s unfunded superannuation liability and the following projections relate to only these schemes.

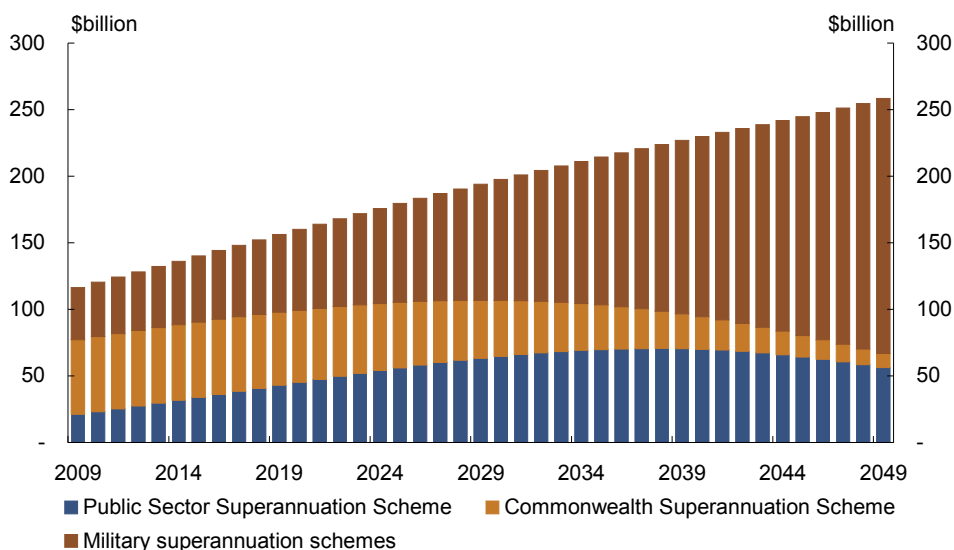
The Future Fund, which was established in 2006 to meet the Australian government's accumulated unfunded superannuation liability, had assets valued at \$61 billion at 30 June 2009.

### 4.6.1 Key trends and projections

The CSS, the DFRDB and the PSS were closed to new members in 1990, 1991 and 2005 respectively. From 2005, the Australian government began funding the superannuation entitlements for new civilian employees as they accrued.

Despite the closure of these schemes, the unfunded superannuation liability is projected to grow in nominal terms largely because of growth in the military superannuation liability and further entitlements accruing to existing members of the closed civilian schemes (Chart 4.18). However, the liability is projected to grow more slowly than the economy over the next 40 years and consequently decline from around 9.6 per cent of GDP in 2009 to around 2.8 per cent of GDP by 2049.

**Chart 4.18: Projected defined benefit superannuation liabilities**



Note: Military superannuation schemes include the Military Superannuation and Benefits Scheme and the Defence Force Retirement and Death Benefits Scheme.

Source: Department of Finance and Deregulation, *PSS and CSS Long Term Cost Report 2008*, and Australian Government Actuary, *Military Superannuation and Benefits Scheme and Defence Force Retirement and Death Benefits Scheme (MSBS and DFRDB)*, 2008.

## 4.7 Defence

### Key messages

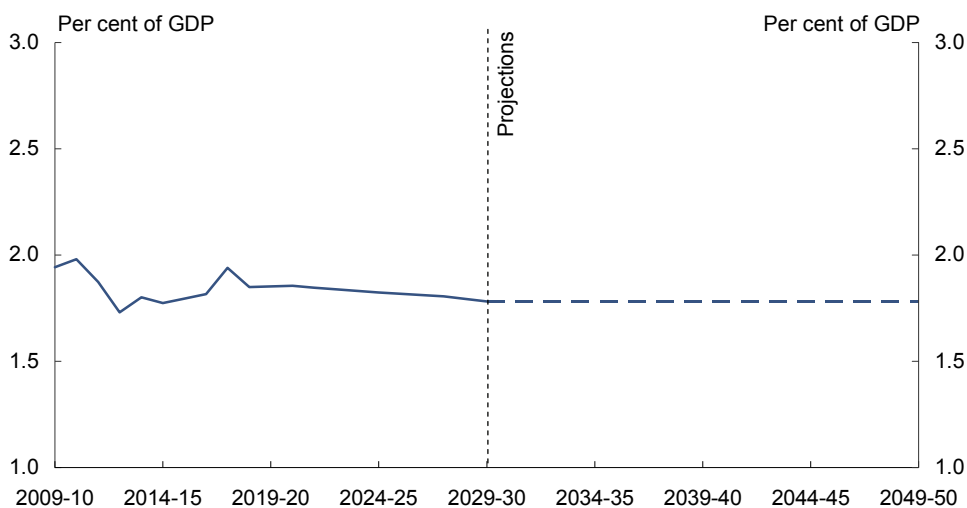
Defence funding is based on the 2009 Defence White Paper funding commitment to 2029–30 and held constant at the 2029–30 share of GDP of 1.8 per cent from 2030–31 to 2049–50.

The Government provides funding for the delivery of navy, army, air and intelligence capabilities, support for Australian military operations overseas and strategic policy advice for the defence of Australia and its national interests. Funding for defence (excluding operations) in 2009–10 is expected to be worth 1.9 per cent of GDP and around 7 per cent of total Government spending.

### 4.7.1 White Paper funding commitment and key trends

In May 2009, the Australian Government released *Defending Australia in the Asia Pacific Century: Force 2030* (the White Paper). The White Paper provides a long-term, real growth funding commitment from 2009–10 to 2029–30 which will provide defence with a certain, clearly-defined, long-term funding envelope within which resourcing decisions can be managed. As a consequence of the White Paper, defence funding (excluding military superannuation) is expected to be around 1.8 per cent of GDP in 2029–30 (Chart 4.19).

**Chart 4.19: Defence funding as a share of GDP**



Source: Treasury projections (excludes Defence operations).

The White Paper funding commitment and Chart 4.19 do not include funding for international operations (including funds provided in the 2009–10 Budget). Funding for future operations is not included as it is inherently difficult to anticipate future operational requirements through to 2049–50. This approach also is consistent with long-standing budget treatment.

Defence funding beyond 2029–30 will depend on a range of factors including the strategic environment. Beyond this time, defence funding is, therefore, assumed to be constant at the 2029–30 share of GDP of 1.8 per cent. This enables defence funding to reflect changes in national income without representing a significant change in policy. The methodology is detailed in Appendix C.





# Chapter 5: Climate change and the environment

## Overview

Climate change is the largest threat to Australia's environment and represents one of the most significant challenges to our economic sustainability. Failure to address this threat would have severe consequences for weather patterns, water availability in cities, towns and rural communities, agricultural production, tourism, infrastructure, health and Australia's unique biodiversity. The social and economic consequences of failing to act would be severe.

As Australia will be one of the countries that are hardest and fastest hit, we must be part of an effective global response. Thirty-two countries are currently operating emissions trading schemes and others are in the process of introducing them. There is a clear global consensus that this is the best way to tackle climate change, and we need to be part of the global solution.

Early action via the Carbon Pollution Reduction Scheme (CPRS) will allow strong long-term economic growth and employment by steadily transforming the economy. Delaying action would impose on future generations the need for a sharp, more costly adjustment task.

Market-based mechanisms like the CPRS achieve large-scale reductions in greenhouse gases at least cost. The CPRS will provide businesses and consumers with the incentives to adjust their behaviours, and will include financial assistance to help them adjust. The CPRS will also be enhanced by a range of complementary measures that support the transition to a low pollution future.

## 5.1 Climate change

If climate change is not addressed, the consequences for the economy, water availability and Australia's unique environment will be severe. A transformation to a low-pollution economy is required, with prompt action through the CPRS achieving this transformation at least cost.

Success in addressing the economic and fiscal challenges of an ageing population would be hollow if we cannot also move to an environmentally-sustainable economy.

### 5.1.1 Climate science

The consensus view is that global warming is unequivocal and human activities are very likely responsible for most of the observed warming over the last 50 years.<sup>1</sup>

Unmitigated climate change would be likely to result in significant species extinctions, threats to food production and severe health impacts. It would also be likely that by the end of this century the point of irreversible melting of the Greenland ice sheet would be reached and the ability of the oceans and the terrestrial biosphere to absorb carbon dioxide would be reduced.

Science suggests that an international agreement that sets the world on a path to limit the increase in global average temperatures to no more than 2 degrees Celsius will provide the best chance of avoiding catastrophic climate change.

Australia is more at risk than many other developed countries. As one of the hottest and driest continents on earth, we will be one of the hardest and fastest hit. The Great Barrier Reef and Kakadu National Park will be threatened, nearly all irrigated agriculture in the Murray-Darling Basin could cease, and the cost of urban water supply could increase dramatically.

The Garnaut Climate Change Review conservatively estimated that unmitigated climate change would leave Australian GDP in 2100 approximately 8 per cent lower than the level it would be in the absence of climate change, with even greater impacts on consumption and real wages. This is equivalent to losing around \$17,000 per person (in current prices) from the Australian economy in 2100. Moreover, unmitigated climate change involves significant risks and non-market costs not captured by such estimates.<sup>2</sup>

The Stern Review estimated that the global costs of climate change over the next two centuries would be equivalent to a reduction in global per capita consumption of between 5 and 20 per cent each year, now and forever. In contrast, the Stern Review concludes that strong, early action, which avoids the cost of more drastic action later, would have a cost of only around 1 per cent of global GDP each year by 2050.<sup>3</sup>

### 5.1.2 Global action

Climate change is a global phenomenon, with effects occurring independent of where the emissions occur. Coordinated global action is vital if mitigation efforts are to be effective and the adjustment costs limited.

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1 Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2007 — The Physical Science Basis; Contribution of Working Group I to the Fourth Assessment Report of the IPCC*, 2007. For example, see *Summary for Policymakers*.

2 R Garnaut, *The Garnaut Climate Change Review*, 2008, p 259.

3 N Stern, *The Economics of Climate Change: The Stern Review*, 2007, pp xv, p 162, 218.

The world took the first step with the Kyoto Protocol in 1997. A further step was achieved through the Copenhagen Accord of 2009. The Copenhagen Accord provides that:

- action be taken to hold the increase in global temperature to below 2 degrees Celsius;
- developed and developing countries would implement mitigation actions; and
- these actions would be subject to measurement, reporting and verification.

The foundation of this international agreement is being built upon with further negotiations and progress to reduce global emissions.

### **5.1.3 The benefits of prompt domestic action to address climate change**

Australia is playing its part in contributing to a global solution to tackle climate change. The Government is committed to reducing national emissions to 60 per cent below 2000 levels by 2050, and to reducing national emissions:

- to 5 per cent below 2000 levels by 2020 irrespective of the actions by other nations;
- to 15 per cent below 2000 levels by 2020 if there is an agreement where major developing economies commit to substantially restrain emissions and advanced economies take on commitments comparable to Australia's; and
- to 25 per cent below 2000 levels by 2020 in the context of a comprehensive global agreement capable of stabilising atmospheric concentrations of carbon dioxide equivalent at 450 parts per million or lower.

Modelling in the Government's *Australia's Low Pollution Future: The Economics of Climate Change Mitigation* Report estimates that, where emissions pricing expands gradually across the world, economies that act early face lower long-term costs: around 15 per cent lower compared to a world of coordinated global action. This is the case as:

- economies that defer action lock-in more emissions-intensive infrastructure;
- global investment is redirected to early movers; and
- early action allows individuals and firms to plan their adjustment pathways and better manage changes in skills acquisition and capital stocks.

These modelling results support the view presented consistently by the Government, the Garnaut Review and the Report to the previous Government from the Task Group on Emissions Trading. The latter Report argued that Australia should announce a domestic post-2012 emissions constraint as soon as possible.<sup>4</sup>

### 5.1.4 The Carbon Pollution Reduction Scheme

The CPRS is an emissions trading scheme that will be the primary mechanism to reduce Australia's emissions. Thirty-two countries are currently operating emissions trading schemes and other major economies are moving towards emissions trading schemes.

The CPRS will deliver emissions reductions at a lower cost to the economy than prescriptive measures such as regulations or subsidies (Box 5.1 describes the CPRS).

#### Box 5.1: The Carbon Pollution Reduction Scheme

The CPRS will require businesses and households to take better account of the current and future costs of their production and consumption decisions, by capping greenhouse gas emissions covered by the scheme. The Government will issue tradeable emissions units (or permits) up to the 'cap', and businesses will be required to surrender a permit for every tonne of emissions they produce.

The 'cap' will make permits scarce so that businesses will need to undertake actions that reduce emissions. The Government will reduce the cap over time, allowing Australia to achieve deeper reductions in emissions.

Higher prices for emissions-intensive products will encourage businesses and consumers to choose cleaner, lower-emissions alternatives. Where there are low-cost abatement opportunities, businesses will shift to cleaner production processes and reduce their exposure to the carbon price.

Every cent received from the sale of pollution permits will be used to help households and businesses adjust and move Australia to the low pollution economy of the future.

Under the CPRS, businesses and the community, rather than governments, will determine where and how the required abatement will occur by taking into account current and expected future carbon prices when making production and investment decisions. By placing a cap on emissions, and through the resulting price signal, the

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4 Australian Government, *Report of the Prime Minister's Task Group on Emissions Trading*, May 2007.

CPRS will motivate innovative changes in production and consumption decisions, spur investment in low-emissions technology, and provide business investment certainty.

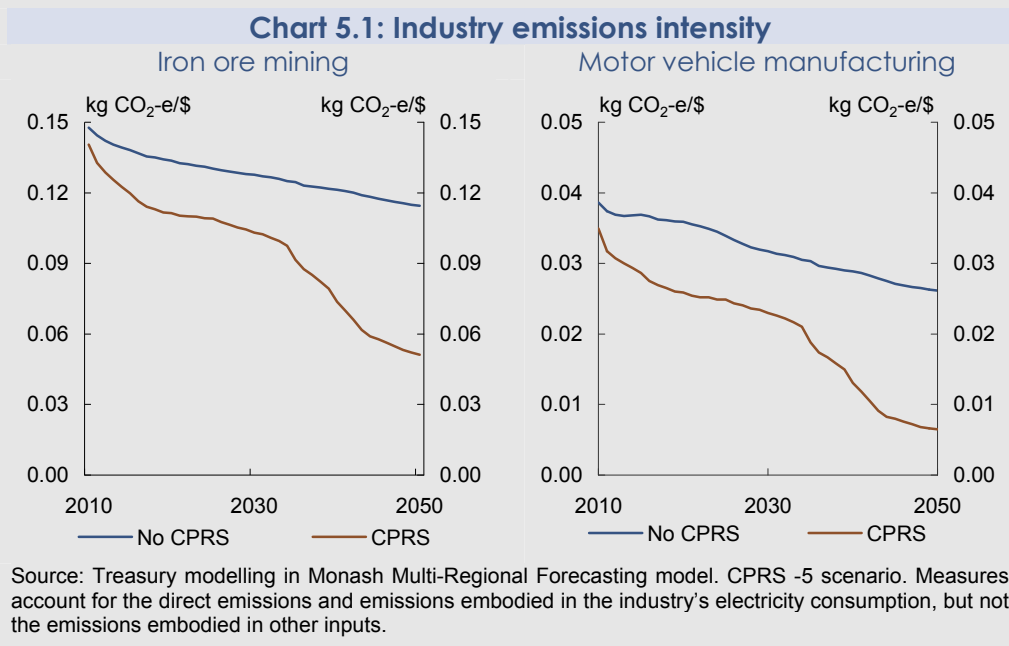
The devolved decision-making together with the broad coverage of the CPRS will transform the entire economy, putting Australia on a sustainable growth path. Under the CPRS, every business and every job will be encouraged to become greener. The CPRS will not only reduce emissions from currently high-emitting industries like electricity generation, but will reduce the emissions intensity of every single industry in Australia (see Box 5.2).

### Box 5.2: Transforming the entire Australian economy

The CPRS will transform the entire economy, moving Australia onto a sustainable, low-pollution growth path. As a broad-based instrument that facilitates devolved decision-making, the CPRS is estimated to reduce the emissions intensity of each industry in Australia.

#### *Industry emissions intensity*

The CPRS is expected to deliver reductions in the emissions intensity of all industries, with many industries projected to halve their emissions intensity. Some industries could reduce their emissions intensity by three-quarters or more. Chart 5.1 illustrates two examples. By 2050 the emissions intensity of iron ore mining is projected to be reduced by around 50 per cent, and the emissions intensity of motor vehicle manufacturing is projected to be reduced by over 75 per cent.



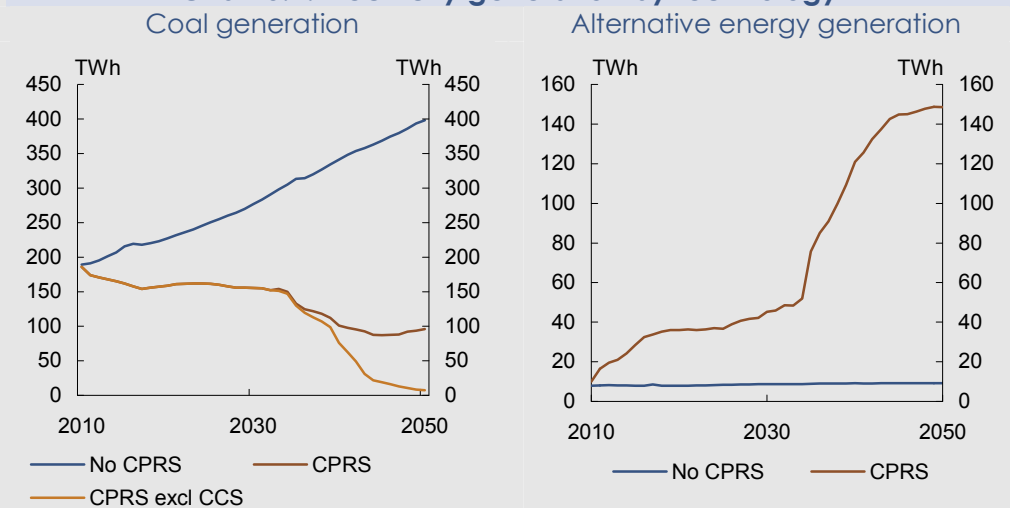
## Box 5.2: Transforming the entire Australian economy (continued)

### Electricity sector

The electricity generation sector is the single largest source of emissions in Australia, making up around one-third of Australia’s total emissions in 2007. It also has very long-lived assets. Transformation of the sector will take time. Early action will move the electricity sector onto a low-emissions path with less dislocation.

In the absence of the CPRS, coal-fired electricity generation is projected to grow strongly to 2050 and beyond. With the CPRS it is projected that there will be significantly less coal-fired generation. By 2050 coal-fired generation is effectively eliminated except for plants using carbon capture and storage (CCS) and alternative energy generation is projected to have grown markedly (Chart 5.2).

**Chart 5.2: Electricity generation by technology**



Note: Alternative energy generation consists of wind, biomass, geothermal and solar photovoltaic.  
Source: Treasury modelling and McLennan Magasanik Associates. CPRS -5 scenario (including RET).

## 5.1.5 Regulatory and subsidy arrangements

Attempting to achieve large-scale emissions reductions primarily through regulatory and subsidy arrangements would be costly for the economy, businesses and households.

An approach focussed on regulations would provide no incentive for a business to reduce emissions by more than the required amount or to develop low-emissions technologies superior to the required standard, and would not accommodate specific circumstances where meeting the requirements involves excessive costs. It would also tend to impose a significant burden on a limited number of sectors to shoulder the emissions-reduction task.

The costs of regulatory approaches can be more than double the costs of market-based approaches like the CPRS.<sup>5</sup> Regulatory approaches are also less capable of achieving large-scale emissions reductions.

As an indication, the task of achieving Australia's unconditional emissions-reduction target of 5 per cent below 2000 levels by 2020 would be roughly equivalent to:

- removing emissions associated with all cars on the road, and nearly half of Australia's electricity generation, in the year 2020; or
- planting new forests equivalent to four times the area of Tasmania by 2020.

Using subsidies as a primary means to achieve significant emissions reductions would involve a significant and ongoing fiscal cost that would add to the fiscal pressures arising from an ageing population.<sup>6</sup> Moreover, an approach focussed on subsidies would rely heavily on estimates of hypothetical 'business-as-usual' behaviour, in an attempt to target genuine additional emissions-reduction activity. Such estimation involves significant administrative and compliance costs, and is inherently difficult.

The CPRS, as a market-based approach, will deliver emissions reductions at least cost, with the necessary scope to provide assistance to businesses and households to help the adjustment to a low-pollution future.

### 5.1.6 The CPRS and a growing economy

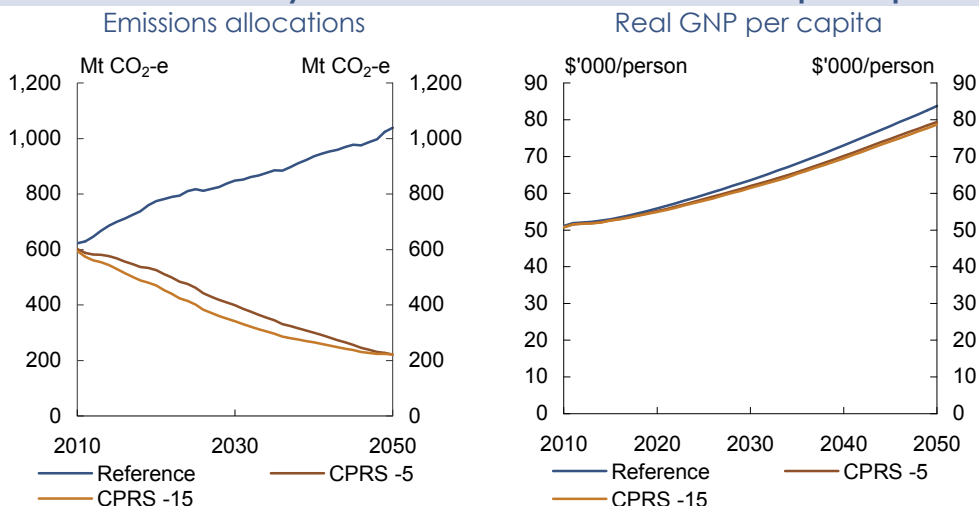
It is estimated that the average annual growth rate of Australia's real Gross National Product (GNP) per capita from 2010 to 2050 would be only 0.1 of a percentage point slower under emissions pricing in the context of global action compared to a scenario without climate change mitigation. That is, Australia's real GNP per capita would still be 55–57 per cent above current levels by 2050 (Chart 5.3). National employment and average real income are projected to grow strongly.

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5 T Tietenberg, 'Economic Instruments for Environmental Regulation', *Oxford Review of Economic Policy*, 6(1), 1990, pp 17–34.

6 Australian Government, *Report of the Prime Minister's Task Group on Emissions Trading*, May 2007, pp 84–5; Australian Government, *Intergenerational Report 2007*, p 71.

**Chart 5.3: Pathways for Australian emissions and GNP per capita**



Note: Units are in Australian dollars, 2005 prices. The reference scenario shows modelled emissions in the absence of climate change mitigation. The policy scenarios show allocations to 5 and 15 per cent below 2000 levels by 2020 and to 60 per cent below 2000 levels by 2050. Actual emissions differ from allocations due to banking of permits and international permit trade.

Source: Australian Government 2008. Treasury estimates from Monash Multi Regional Forecasting model.

### 5.1.7 Complementary policies

The Government is committed to policies that promote the research, development and use of renewable technologies.

The expanded national Renewable Energy Target (RET) is designed to ensure that, by 2020, 20 per cent of Australia’s electricity supply comes from renewable sources. By helping accelerate the deployment of renewable energy, the RET will assist the energy sector transition to the introduction of the CPRS. By 2050 output from the alternative energy sector is expected to be up to 30 times larger under a CPRS and expanded RET.

The Clean Energy Initiative, costing \$4.5 billion over nine years, complements the RET by supporting investment in low-emissions technologies, which enhances Australia’s infrastructure and skills capacity.

- A \$2 billion investment is supporting commercial-scale integrated projects under the Carbon Capture and Storage Flagships Program.
- The \$1.5 billion Solar Flagships Program is assisting Australia to lead large-scale solar electricity generation.
- The establishment of the Australian Centre for Renewable Energy is promoting the development, commercialisation and deployment of new and existing renewable technologies.



Through initiatives such as the Energy Efficient Homes Package, costing \$3 billion over four years, the Government is encouraging households to improve the energy efficiency of their homes. The package provides up to \$1,200 for ceiling insulation for Australian homes and increased rebates for solar and heat pump hot water systems. In addition to supporting jobs, these initiatives are helping households take practical action to reduce their energy use and save on energy bills.

Policies to support climate change adaptation will also complement mitigation. The Government will have a role in facilitating flexible markets and providing information, so as to allow resources to shift to more productive uses as the climate changes. This is in addition to protecting public infrastructure and addressing community-wide health, safety and environment issues.

## 5.2 Water

Climate change mitigation will contribute to countering the risk of reduced long-term water availability, which is driven in part by poor water management as well as climate change. Improved water management will benefit urban water security, the development of rural communities and valuable ecosystems.

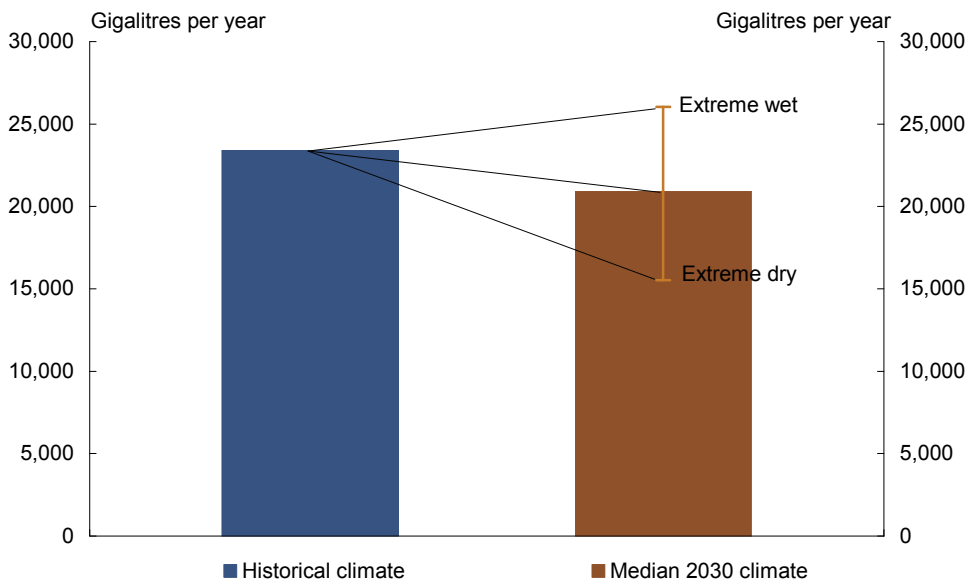
Low rainfall over long periods of time, low historical investment in water storage facilities, poor price signals to guide water allocation and increasing demand for water has created water shortages for cities, rural communities and agriculture.

Many urban water authorities have decided to impose water restrictions, rather than consider whether water charges are appropriate and properly signal investment decisions. Some are now committing to substantial investment to augment water supplies and to increases in water prices. Water pricing is needed to provide appropriate incentives for water conservation and investment in water infrastructure.

Numerous rural communities and ecosystems, particularly in the Murray-Darling Basin, are threatened by reduced water availability (Chart 5.4) and poor water management.

The Basin presently represents 40 per cent of Australia's agricultural production, and 70 per cent of irrigation water use. Various ecosystems — including a number of wetlands recognised as internationally important — rely on water flowing through the Basin's rivers and tributaries. A failure to provide sufficient environmental water flows has put many of these ecosystems under severe stress. Recovery may not be possible in some of these ecosystems.

**Chart 5.4: Projected Murray-Darling Basin water availability**



Source: CSIRO Sustainable Yields Project, 2008.

Water management in the Basin has been poor in three key areas. It is in these areas that improvements are most needed and where the Australian Government is investing considerable effort.

- Improved information is required on inflows, extraction levels, the water needs of environmental assets, the interaction between groundwater and surface water systems, and water losses through evapo-transpiration.
- Restoring suitable water flows to rivers, wetlands and floodplains could assist stressed ecosystems, with additional environmental water flows acquired through purchasing water entitlements from willing sellers.
- Removing restrictions on water trading would allow water to be traded to its most productive use, providing economic benefits to irrigators and the wider community (Box 5.3). Caps on the trade of permanent water entitlements remain a key barrier to trade, while inconsistent trading rules and processing timeframes are also problematic.

The history of inconsistent and complex water management in the Murray-Darling Basin arising from the involvement of multiple jurisdictions has contributed to poor water management.

New governance arrangements negotiated through the Council of Australian Governments, including the establishment of an independent Murray-Darling Basin Authority, represent a step in the right direction. Particularly important will be the

Authority's development of a comprehensive Basin plan to provide for sustainable extraction and to improve water security and quality for all users.

A particular challenge is the impact on small rural communities that primarily rely on irrigated agriculture if farmers exit the community as a result of significant trade out of water entitlements. The wellbeing of these communities will need to be taken into account. The Murray-Darling Basin Authority is required to advise on possible socio-economic impacts of water reforms.

### Box 5.3: The benefits of water trading

Permanent water entitlements acquired through water trading give irrigators more certainty about pursuing long-term investments in permanent plantings such as grape vines or fruit trees. Water trading also allows irrigators to more effectively manage income streams during periods of prolonged drought.

It is estimated that the gains in output from the freeing of water trade will offset much of the losses that will result from reduced water availability — whether as a result of drought or government purchases of water.

It has also been estimated that a Government buy-back of 1,500 gigalitres in the southern Murray-Darling Basin would only result in a fall in regional output of 0.058 per cent because of the flexibility that trade allows.<sup>7</sup> Similarly, a Productivity Commission paper found that trading halved the impact of 10 per cent and 30 per cent reductions in water availability on gross regional incomes.<sup>8</sup>

A further study found that the estimated revenue gains for the irrigation sector as a whole resulting from freeing water trade would exceed estimated revenue losses resulting from reallocating 500 gigalitres from irrigation to environmental flows.<sup>9</sup>

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7 PB Dixon, MT Rimmer and G Wittwer, *Modelling the Australian Government's Buyback Scheme with a Dynamic Multi-Regional CGE Model*, Centre of Policy Studies, Monash University, 2009, p 19.

8 D Peterson, G Dwyer, D Appels and JM Fry, *Modelling water trade in the southern Murray-Darling Basin*, Productivity Commission staff working paper, Melbourne, 2004, p 31.

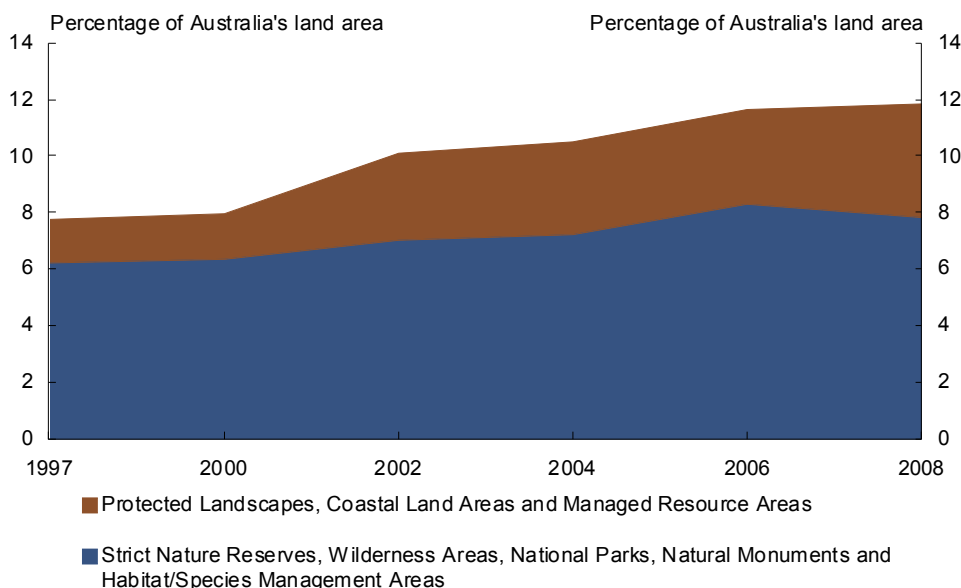
9 ME Qureshi, J Connor, M Kirby and M Mainuddin, 'Economic assessment of acquiring water for environmental flows in the Murray Basin', *The Australian Journal of Agricultural and Resource Economics* 51(3), 2007, p 297.

### 5.3 Land

The clearance of vegetation and degradation of natural habitats is threatening Australia’s rich biodiversity.

The Australian Government and the State and local governments manage a large network of national and state parks, nature reserves and other protected areas (Chart 5.5). However, around three-quarters of Australia’s land area is managed by private land occupiers. Efforts to protect biodiversity must, therefore, extend beyond the management of protected areas to conserving biodiversity on private land.

**Chart 5.5: Terrestrial protected areas**



Note: Australia’s land area includes island external territories but excludes the Australian Antarctic Territory. Source: Department of the Environment, Water, Heritage and the Arts, 2010. Collaborative Australia Protected Area Database.

While most private land managers would value biodiversity, the competing activities that they undertake to derive benefit from their land — such as agriculture, forestry, hunting or housing development — may threaten biodiversity and native habitats. The challenge is to provide the incentives for private land managers to take into account broader environmental interests in making land use decisions.

One option is for governments to pay land managers to undertake agreed actions on their land, beyond their regulated responsibilities. The Australian Government’s recently commenced Environmental Stewardship Program is consistent with this approach.

Under this program, the Government is entering into contracts for up to 15 years with landowners to manage matters of national environmental significance on their properties. The first rounds of contracts have related to the protection of box gum grassy woodlands, which provide habitat for at least 19 threatened species.

# Chapter 6: A sustainable society

## Overview

Sustainability requires that at least the current level of wellbeing be maintained for future generations. The Government's policies seek to do more than this. The Government's goal is to improve the wellbeing of current and future generations.

Wellbeing and sustainability are multi-dimensional concepts that go beyond material living standards. In this report wellbeing and sustainability are assessed through the prism of the stock of economic, environmental, human and social resources.

The natural environment is a key component of the wellbeing of current Australians and of the endowments passed to future generations. It is difficult to measure the contribution of the environment to wellbeing, creating a risk that it will be undervalued and suffer damage.

Similarly, wellbeing is enhanced if Australians share the benefits of economic growth and members of society have the opportunity to participate in economic and social activities. Education, quality health services and access to employment, for instance, contribute to higher productivity growth and higher labour force participation. They also contribute to the ability of Australians to be active members of society.

For some Australians poor economic and social outcomes can persist. Disadvantage affects the lives of those involved, their families and communities, as well as negatively affecting workforce participation, productivity and governments' fiscal sustainability. The Government's Social Inclusion agenda is seeking new ways to overcome disadvantage.

## 6.1 Wellbeing and sustainability

### 6.1.1 A framework for wellbeing and sustainability

Wellbeing relates to the aspects of life that people and societies value. It is a multi-dimensional concept that incorporates notions of individual freedoms, opportunities and capabilities. The Commission on the Measurement of Economic

Performance and Social Progress<sup>1</sup> identified the following dimensions of wellbeing: material living standards; health; education; personal activities; political voice and governance; social connections and relationships; environment; and insecurity (economic and physical).

An alternative classification of wellbeing is to look at five dimensions: consumption possibilities; distribution; complexity; risk; and opportunity and freedom.<sup>2</sup> These dimensions cut across each of the dimensions identified by the Commission.

The wellbeing of a generation is determined by the 'stock' of resources that is inherited from previous generations and the choices that generation makes. The stock refers to the quantity and quality of all of the tangible and intangible economic, social, human and environmental resources that are available to a generation (Box 6.1).

### **Box 6.1: Stocks, wellbeing and sustainability**

The many different forms of resources that comprise the stock of resources available to a generation include: renewable and non-renewable resources; physical capital including machines and buildings; human capital (for example through education and research); and the quality of institutions for maintaining a properly functioning human society. The stock of resources is a dynamic concept that comprises a multitude of tangible and intangible elements that are interrelated and difficult to define and measure.

The stock of resources inherited by a generation influences the set of capabilities available to them, where capabilities are the skills and abilities needed to take up opportunities. These capabilities influence the extent of a person's opportunity set and their freedom to choose among this set to live a life that they and society value; that is, the level of wellbeing experienced.

The choices made by a generation will dictate the quantity and quality of the stock of resources available, or 'bequeathed', to future generations. A stylised depiction of wellbeing and sustainability is at Chart 6.1.

In some instances, choices made by a generation that increase their wellbeing will necessarily expend a particular component of the stock of resources. For example, the consumption of non-renewable resources by one generation will reduce the quantity of non-renewable resources bequeathed to subsequent generations.

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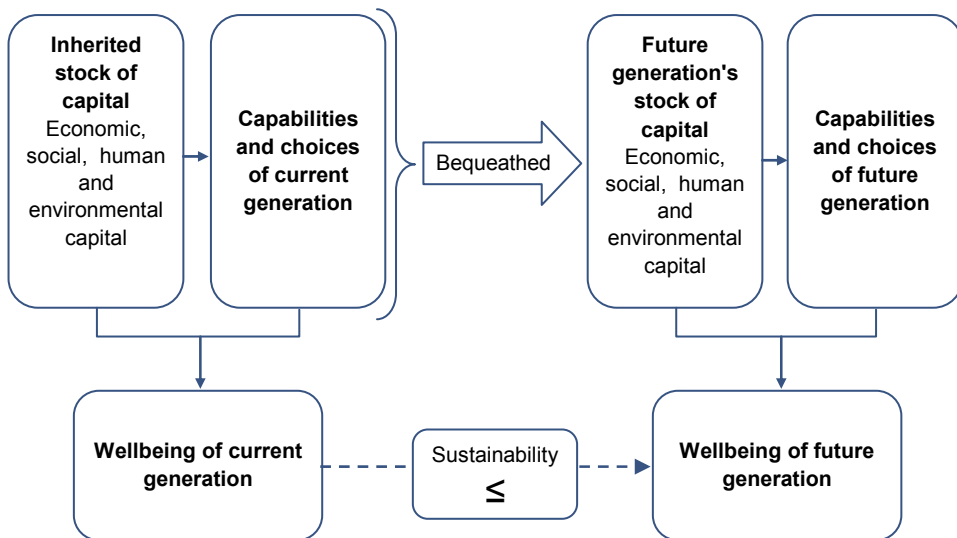
1 Joseph Stiglitz, Amartya Sen and Jean-Paul Fitoussi, *Report by the Commission on the Measurement of Economic Performance and Social Progress*, 2009.

2 Treasury, 'Policy advice and Treasury's wellbeing framework', *Economic Roundup*, Winter 2004.

In other instances, the choices made by a generation that result in an increase in their level of wellbeing may also result in an increase in the endowment of resources bequeathed to future generations. Human capital, such as education, is one example.

A reduction in the endowment of a particular component of the stock does not necessarily lead to a reduction in the wellbeing of future generations if, for example, there are technological advancements that increase efficiency or utilise alternative resources. The challenge for each generation is making choices now about the use of the stock of resources without knowing what knowledge and technological advancements will be available to future generations.

**Chart 6.1: Wellbeing and sustainability**



### 6.1.2 GDP as a measure of wellbeing

Gross Domestic Product (GDP) is the measure of the total market value of goods and services produced in Australia. The economic projections in the IGR are based on the 3Ps framework for growth in real GDP.

GDP per capita has traditionally been used for measuring progress over time and as a proxy for living standards. Australia has experienced improvements in living standards over time, averaging 1.9 per cent of real GDP annually over the past 40 years. With population ageing, this improvement in living standards is projected to slow to 1.5 per cent per annum.

GDP per capita is not a comprehensive measure of wellbeing, because wellbeing encompasses more than material living standards.

An assessment of wellbeing is a point-in-time assessment of the level of wellbeing experienced by people and society. It entails significant tradeoffs that are not easily captured by a comprehensive summary indicator. Indicators of wellbeing need to be comprehensive, consider distribution, and provide both an objective and subjective assessment.

To measure sustainability, indicators are needed that tell us about the qualitative and quantitative changes in the various 'stocks' that matter for future wellbeing. The different perspectives people and societies have on wellbeing will result in different assessments as to whether wellbeing has improved over time.

### **6.1.3 International IGR and sustainability reports**

Nearly all of the economies in the OECD produce long-term fiscal projections (Table 6.1). Few countries have incorporated the potential impact of policies related to environmental issues into their long-term projections.



**Table 6.1: International comparison of intergenerational reporting**

	First/ most recent	Frequency	Time horizon	Cost drivers		
				Health, aged care, old age pension	Other welfare	Environment
Australia	2002/2010	Every 3-5 years	40 years	Yes	Yes	No
Austria	2001/2009	12-18 months(a)	50 years	Yes	No	No
Belgium	2001/2009	12-18 months(a)	40 years	Yes	No	No
Canada	2000/2002	<i>Ad hoc</i>	40 years	Yes	Yes	No
Czech Republic	2004/2008	12-18 months(a)	50 years	Yes	No	No
Denmark	1997/2008	Annually(a)	Until 2070	Yes	Yes	Yes
Finland	2001/2008	12-18 months(a)	40 years	Yes	No	No
France	2008/2008	12-18 months(a)	40 years	Yes	np	No
Germany	2005/2008	Every 4 years	Until 2050	Yes	Yes	No
Greece	2001/2009	12-18 months(a)	50 years	Yes	Yes	No
Hungary	2004/2008	12-18 months(a)	40 years	Yes	No	No
Ireland	2002/2008	12-18 months(a)	40 years	Yes	No	No
Italy	2001/2009	12-18 months(a)	50 years	Yes	No	No
Japan	2007/2009	<i>Ad hoc</i>	10-40 years	Yes	Yes	No
Korea	2006/2006	<i>Ad hoc</i>	25 years	Yes	Yes	No
Luxembourg	2006/2008	12-18 months(a)	30 years	Yes	No	No
Netherlands	2000/2006	<i>Ad hoc</i>	Until 2100	Yes	Yes	No
New Zealand	1993/2006	Every 4 years	40 years	Yes	Yes	No
Norway	1993/2009	Every 3-5 years	50 years	Yes	Yes	No
Poland	2004/2008	12-18 months(a)	40 years	Yes	No	No
Portugal	2001/2009	12-18 months(a)	40 years	Yes	Yes	No
Slovak Republic	2004/2009	12-18 months(a)	40 years	Yes	Yes	No
Spain	2002/2009	12-18 months(a)	40 years	Yes	No	No
Sweden	1999/2009	Annually	Until 2060	Yes	Yes	No
Switzerland	2008/2008	Every 4 years	50 years	Yes	Yes	No
United Kingdom	1999/2008	Annually	50 years	Yes	Yes	No
United States						
OMB	1997/2009	Annually	75 years	Yes	Yes	No
CBO	1991/2009	Every 2 years	75 years	Yes	Yes	No
GAO	1992/2009	3 times per year	75 years	Yes	Yes	No

(a) Conducted for EC Stability and Convergence Program.

Notes: Current as at end December 2009.

np Data not published.

Source: Federal Treasuries and Finance Ministries (excl. Netherlands), OECD, CBO, Netherlands Bureau for Economic Policy Analysis.

While there is a growing appreciation internationally of the importance of sustainable development, many countries are yet to develop quantitative indicators to assess sustainability in terms of economic, social, and environmental resources (Table 6.2).

**Table 6.2: Economic, social and environmental sustainability reporting**

	Organisation	First/most recent	Frequency	Dimension of sustainability		
				Economic	Social	Environmental
<b>Australia</b>	ABS(a)	2002/2009	Biennial	Yes	Yes	Yes
<b>Ireland</b>	CSO(a)	2003/2009	Annual	Yes	Yes	Yes
<b>UK</b>	DEFRA	2004/2009	Annual	Yes	Yes	Yes
<b>Canada</b>	Institute of Wellbeing(b)	2009/2009	<i>Ad hoc</i>	Yes	Yes	No
<b>38 countries</b>	UN	1990/2009	Annual	Yes	Yes	No
<b>EU27</b>	EC	2007/2007	Biennial	Yes	Yes	Yes

(a) Is a member of the OECD working group on Statistics for Sustainable Development.

(b) Private sector institution.

There is no consensus internationally on defining and measuring sustainability.

- The United Nations publishes an annual *Human Development Report* to explore sustainable development challenges including poverty, gender, democracy, human rights, cultural liberty, globalization, water scarcity and climate change.
- The Australian Bureau of Statistics produces a biennial report titled *Measuring Australia's Progress*, which assesses a variety of economic, social (life expectancy, education and training, democracy, governance and citizenship) and environmental indicators (biodiversity, air quality, and land use).
- The European Commission has developed a framework, consisting of 155 indicators that assess the sustainability of Europe's development.
- The Commission on the Measurement of Economic Performance and Social Progress released a report in 2009 which aims to consider what additional information might be required to produce more relevant indicators of social progress.

## 6.2 The environment

The environment offers direct and indirect benefits to wellbeing. The environment's direct contribution to wellbeing comes from the fact that it sustains life, provides health benefits and generates considerable enjoyment. We also are enriched simply by its existence. It is difficult to estimate the value of the environment's direct contribution to wellbeing, creating the risk that it will be undervalued and suffer damage (Box 6.2).

### Box 6.2: Estimating the non-commercial value of the environment

The environment's direct contribution to wellbeing is generally non-commercial. Non-commercial values can be estimated through surveys, where respondents are asked to rank or put a value on different environmental outcomes. Australian applications of stated preference techniques include the valuation of remnant vegetation in central Queensland and the valuation of water for environmental flows in New South Wales.

'Revealed preference' techniques infer non-commercial values by considering outcomes in a related commercial market. Such techniques have been employed to assess aircraft noise pollution in Sydney and recreational values in the Great Barrier Reef and Kakadu National Park.

The usefulness of revealed preference techniques can be limited because of loose associations between the environment and the 'related' commercial markets and because they only measure a subset of non-commercial values. Similarly, survey responses can be inconsistent with actual behaviour, and the values expressed can be unrealistically high or low. Importantly, no valuation technique captures unanticipated shifts in the values and preferences of future generations. Nonetheless, efforts to measure the non-commercial value of the environment are important as they demonstrate that wellbeing depends on much more than just material consumption.

The environment's indirect contribution to wellbeing is as an input to production. The value of this indirect contribution is difficult to estimate. Australia's natural resources are a substantial component of Australia's total commercial assets. With technology improvements, the environment will potentially play a more sophisticated role in production in the future.

The importance of the environment and the impact of government policy on it are covered in more detail in Chapter 5.

## 6.2.1 Well-designed environmental policy

Individuals making decisions affecting the environment would rarely be fully aware of, or personally accrue, the range of benefits offered by the environment and all the costs from environmental degradation. Consequently, there is a role for government environmental policy to influence decision-making.

Environmental policy can involve education and research, public ownership and management (such as national parks), or influencing private behaviour, including through regulations, property rights, market-based mechanisms or subsidising certain activities.

Market-based mechanisms such as permit trading are generally superior to regulations and standards. Market-based mechanisms encourage (and reward) ongoing behavioural change from those most able to change, rather than requiring pre-determined behaviours or outcomes irrespective of the costs involved.

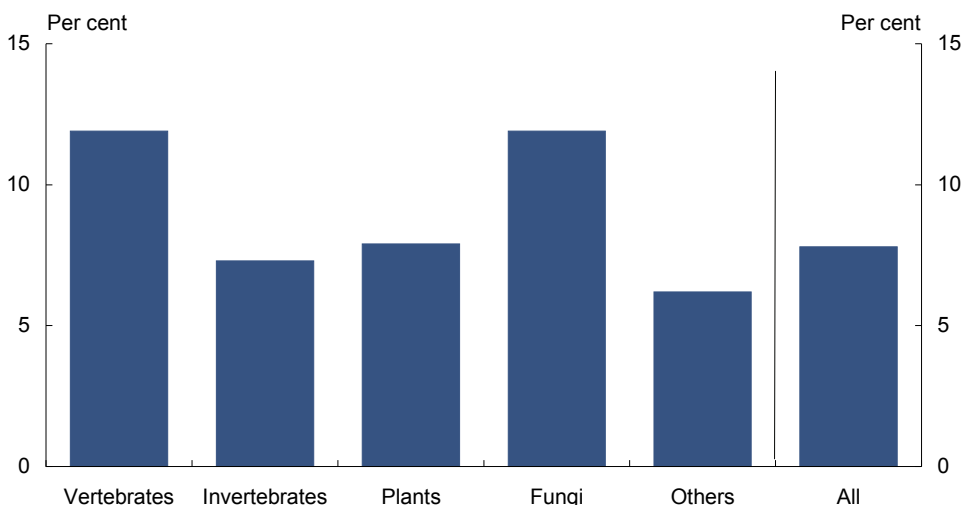
The CPRS is an important use of a market-based mechanism and property rights. The permits issued under the CPRS will be secure and tradeable, facilitating sound long-term decision-making. This will achieve substantial emissions reductions in a way that exploits the cheapest abatement opportunities.

### 6.2.2 State of the environment

The Government’s environmental policies, including those relating to climate change and water and land management, recognise the environment’s particular importance to the living standards of current and future generations of Australians. This reflects the fact that Australia is a unique continent, exceptionally rich in biodiversity and resources. Australia:

- supports around 8 per cent of the world’s species (Chart 6.2); and
- could sustain its extraction of many non-renewable resources for many generations to come (Chart 6.3).

**Chart 6.2: Australia’s share of the world’s described species**



Source: A Chapman, *Number of Living Species in Australia and the World: A Report for the Australian Biological Resources Study*, 2009.

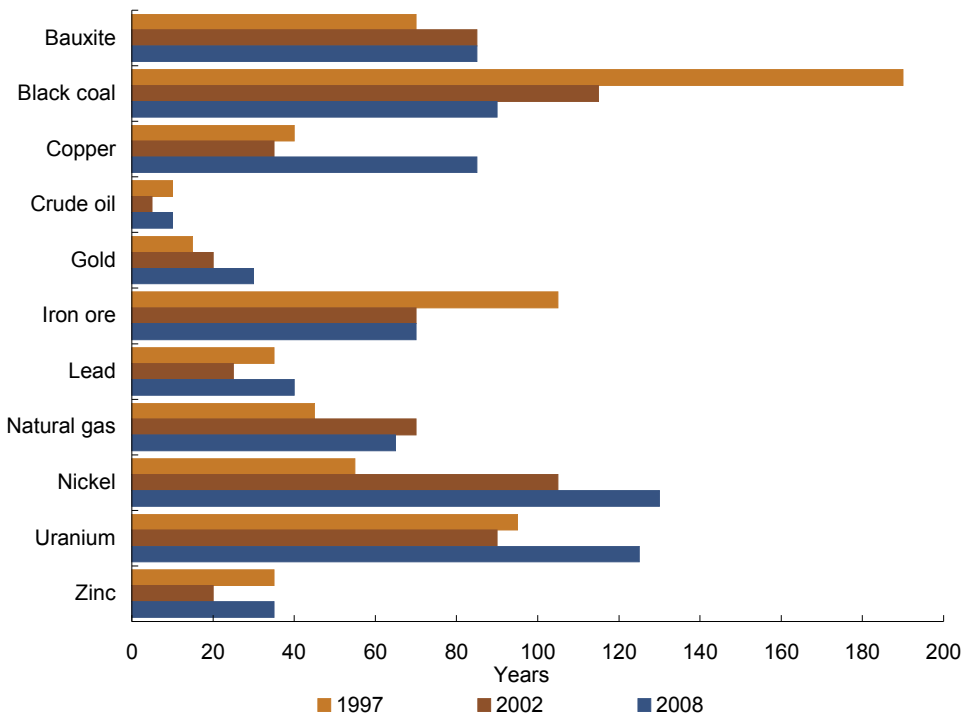
Of great concern are indicators that suggest that Australia’s unique biodiversity is threatened. Chart 6.4 outlines the significant number of flora and fauna species that

are threatened or already extinct, and Chart 6.5 shows the decline in native vegetation since European settlement.

The threat to Australia's biodiversity is in large part a result of a long history of poor management of particular native species and of the land, water and climate. Improved management, appropriately balancing environmental with commercial and social values, is urgently required if wellbeing is to be sustained.

The Government is making progress in this regard through the specific policies discussed in Chapter 5, as well as through the wide range of initiatives under the Caring for Our Country program and implementation of the *Environment Protection and Biodiversity Conservation Act 1999*. Still, as reflected in the Government's active participation in the development of a new National Biodiversity Strategy, continual progress in this area of policy is required to match our growing awareness of the importance of the environment to current and future generations.

**Chart 6.3: Indicative life of Australia's non-renewable resource stocks<sup>(a)</sup>**

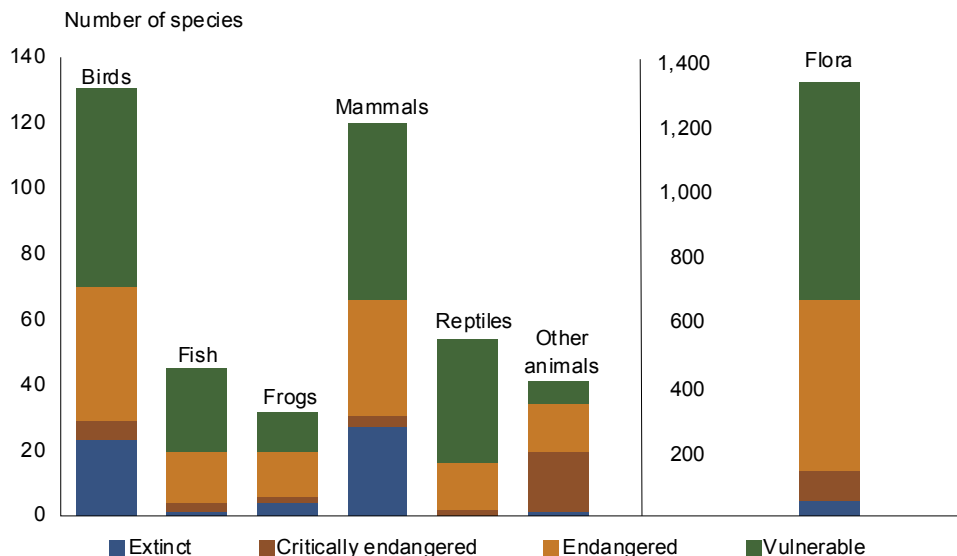


(a) The indicative life of a non-renewable resource is calculated as the stock of the accessible economic demonstrated resource relative to annual production. Brown coal's indicative resource life in 2008 was 490 years.

Note: The data for crude oil and natural gas is based on economic demonstrated resources, which for these two commodities is equivalent to accessible economic demonstrated resources.

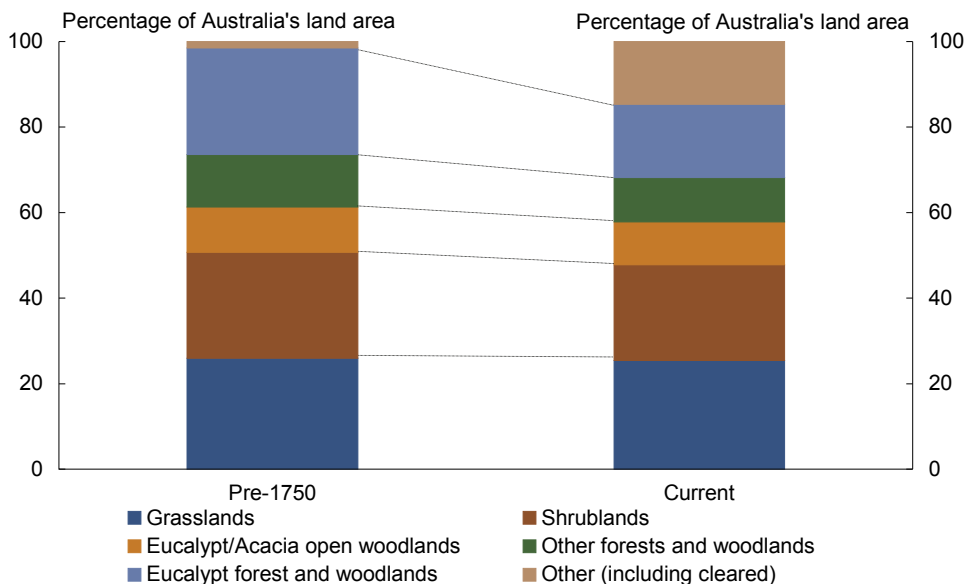
Source: Geoscience Australia.

### Chart 6.4: Threatened and extinct species



Source: *Environment Protection and Biodiversity Conservation Act 1999 — Species Profile and Threats Database*, October 2009.

### Chart 6.5: Estimated vegetation cover



Source: Department of the Environment and Water Resources, *Australia's Native Vegetation: A summary of Australia's Major Vegetation Groups*, 2007.

## 6.3 Human and social capital: education, skills and health

Human and social capital are key components of the 'stock' of resources passed to future generations.

Human capital (the stock of skills, knowledge and health that individuals possess) is a function of the level of education, employment, and health services in a society, and the freedom and opportunity of individuals to access those services. Both the level and the distribution of human capital are important to the wellbeing of current and future generations.

Higher levels of human capital support workforce participation and increased productivity. This is an increasingly important consideration as the working age population declines as a proportion of total population.

Human capital also is important for individual wellbeing in its own right. For example, better health or higher education levels can improve quality of life.

Human capital within and between generations is increased through investments in education and health. The role of parents and carers also is crucial to the development of each generation's human capital.

Social capital refers to the social relationships, networks and norms within society and the institutions that underpin these, such as the justice system, governance and representative democracy.

### 6.3.1 Australia's stocks of human capital have been improving but disadvantage persists

On the whole, Australia's stocks of human capital are improving over time. Still, societal wellbeing is compromised by persistent and intergenerational disadvantage for some individuals. This poses significant challenges for social policy.

Disadvantage exists where an individual lacks access to resources. Low educational outcomes, for example, are generally associated with poorer health and wage outcomes. Disadvantage can be persistent and passed across generations.

Indigenous Australians, in particular, tend to experience multiple forms of disadvantage that can be passed to future generations (Box 6.3).

### Box 6.3: Indigenous disadvantage

The Productivity Commission's *Overcoming Indigenous Disadvantage Key Indicators 2009 Report* notes that Indigenous Australians are, on the whole, markedly disadvantaged when compared to non-Indigenous Australians.

- Unemployment rates for Indigenous Australians are, as a percentage of the labour force, greater than for non-Indigenous Australians. In 2006, the Indigenous unemployment rate was more than three times the non-Indigenous unemployment rate (16 per cent compared to 5 per cent).
- Indigenous Australians have significantly lower rates of post-secondary attainment compared to non-Indigenous Australians. For those aged 25-64 years, non-Indigenous Australians were more than twice as likely as Indigenous Australians to have a non-school qualification in 2006 (53 per cent compared to 26 per cent).
- Indigenous Australians suffer from poorer health outcomes than non-Indigenous Australians. The overall age standardised rate of diabetes/high sugar levels is three times as great for Indigenous Australians as non-Indigenous Australians.
- Based on combined data for Australia for 2005–2007, estimated life expectancy at birth was 67 years for Indigenous males, and 73 years for Indigenous females. This represents a gap between Indigenous and non-Indigenous life expectancy at birth of 12 years for males and 10 years for females.
- Indigenous Australian households' mean (average) equivalised gross household incomes in 2006 were about 62 per cent of non-Indigenous Australian households' incomes (\$460 per week compared to \$740 per week).
- 41 out of every 1,000 Indigenous children were on care and protection orders, compared to 5 in every 1,000 non-Indigenous children as at 30 June 2008.
- Indigenous Australians were hospitalised as a result of spouse or partner violence at 34 times the rate of non-Indigenous Australians in 2006–07.

The Government has allocated significant resources to Closing the Gap in Indigenous Disadvantage and improving the wellbeing of Indigenous Australians.



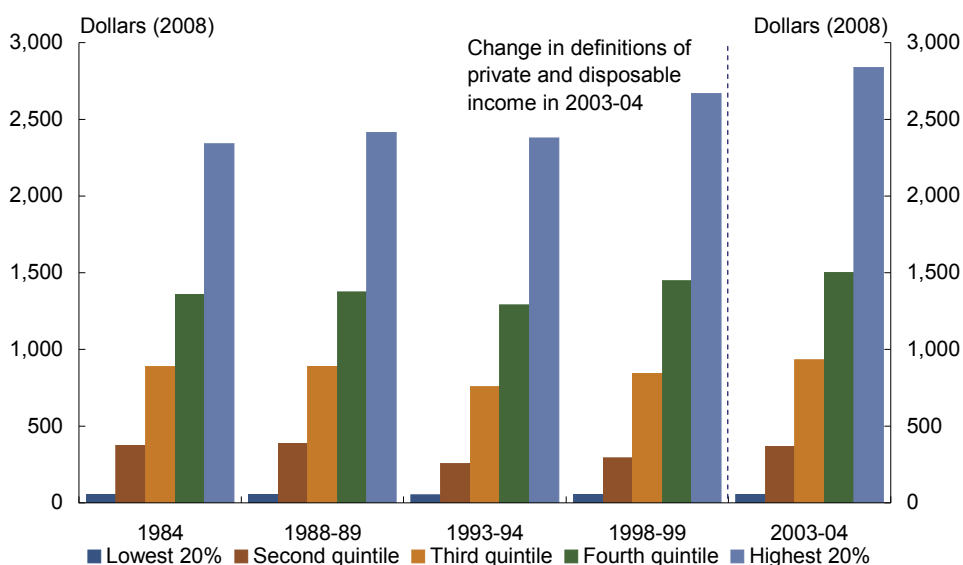
## Income disadvantage

Australia experienced growth in its real net national disposable income per capita of 3 per cent per annum on average during the period 1994–95 to 2008–09.<sup>3</sup> This improvement in material living standards is expected to continue, although at a slower rate with the ageing of the population.

Increased real incomes have not been shared equally. Income inequality in terms of private income has increased over the 20 years to 2004 (Chart 6.6). While the private incomes of low income households have been growing, this growth has been slower than for high income households.

**Chart 6.6: Trends in private income, all households**

Private weekly income for gross income quintiles, all households, 1984–2004



Notes: There is a structural break in the series that results in some loss of comparability between 1998–99 for private income and gross income. All figures have been converted to 2008 dollars using a CPI deflator. Gross income consists of private income plus social assistance benefits in cash.

Sources: ABS cat. no. 6537.0, 2001; ABS cat. no. 6537.0, 2007.

The increase in private income inequality has been reduced by the tax and transfer system. Once taxes and transfers are taken into account, there has been a larger increase in weekly disposable income for the first and second gross income quintiles since the 1980s (Chart 6.7). The tax and transfer system has led to a redistribution of income that has resulted in the disposable incomes of those at the lower end of the income spectrum growing at a faster rate than their level of private income.

3 Thomson Reuters, <http://thomsonreuters.com>; OECD, *OECD Economic Outlook No. 86*, November 2009. OECD Income Distribution data; extracted by Social Policy Research Centre, University of New South Wales.

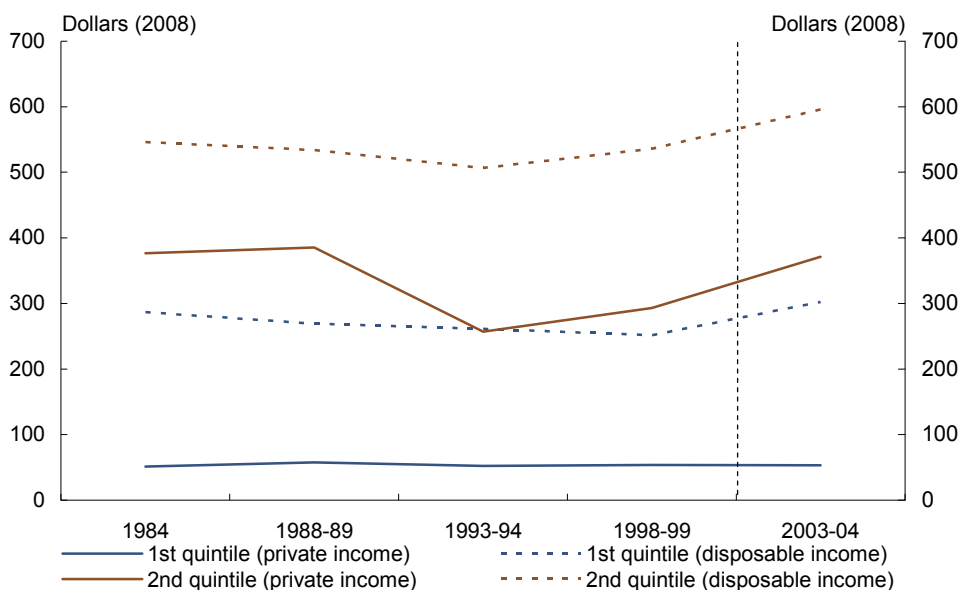
Australia’s tax and transfer system is progressive and highly redistributive, and as such is relatively effective at improving household disposable incomes for those on the lowest private income levels. The share of transfers paid to the lowest income quintile is higher in Australia than in any other country in the OECD. Australia also has the lowest share of taxes paid by the bottom income quintile (among those OECD countries which collect tax data in their income surveys).<sup>4</sup>

A recent OECD Working Paper found that Australia performs well compared to other OECD countries in terms of targeting of low income support benefits when considered both in terms of incentives to return to the workforce and reducing the risk of poverty.<sup>5</sup>

With a growing and ageing population, it will be important that the tax and transfer system works together with active labour market policies to support those on lowest private incomes, while encouraging labour market participation.

**Chart 6.7: Trends in private and disposable income, 1st and 2nd quintiles**

Average weekly private and disposable income at the 1st and 2nd gross income quintile, 1984–2004



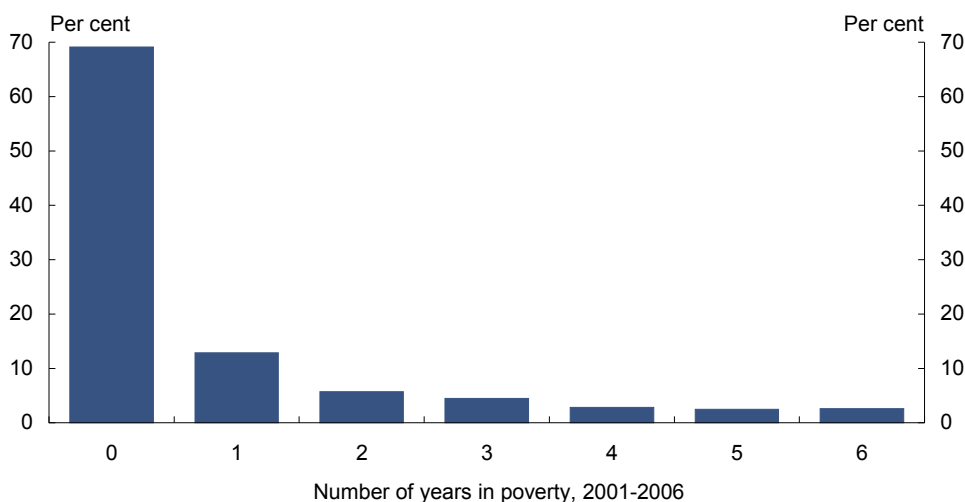
All figures have been converted to 2008 dollars using a CPI deflator.  
Sources: ABS cat. no. 6537.0, 2001; ABS cat. no. 6537.0, 2007.

4 OECD Income Distribution data; extracted by Social Policy Research Centre, University of New South Wales (unpublished).  
5 H Immervol, ‘Minimum-income benefits in OECD countries: Policy design, effectiveness and challenges’, OECD Social, Employment and Migration Working Paper No. 100, released 7 January 2010.

The provision of public services, rather than direct cash transfers, also can alleviate poverty and help people to grow their skills and capabilities. Mainstream services need to be easily accessible by those facing or at risk of multiple disadvantage; and there may need to be supplementary targeted services available to the most disadvantaged individuals and households.

For most Australians, experiences of income poverty are largely temporary. Almost one in three Australians earned less than half of median income at some point between 2001 and 2006 (Chart 6.8). About 18 per cent of all Australians experienced relative income poverty for a period of one or two years, and only 2.6 per cent of Australians experienced relative income poverty in all years between 2001 and 2006.

**Chart 6.8: Percentage of Australians who experienced relative income poverty for between 0 and 6 years, 2001–2006**



Notes: Population weighted results. Percentages may not add up to 100 owing to rounding.

Source: Wilkins, R, Warren, D and Hahn, M, 2009, *Families, Incomes and Jobs*, Volume 4. Melbourne Institute of Applied Economic and Social Research, The University of Melbourne.

## Access to education

Educational attainment is a critical element of human capital, in its own right and through its contribution to workforce participation. Improved education and skills will contribute to enhancing productivity and optimising workforce participation.

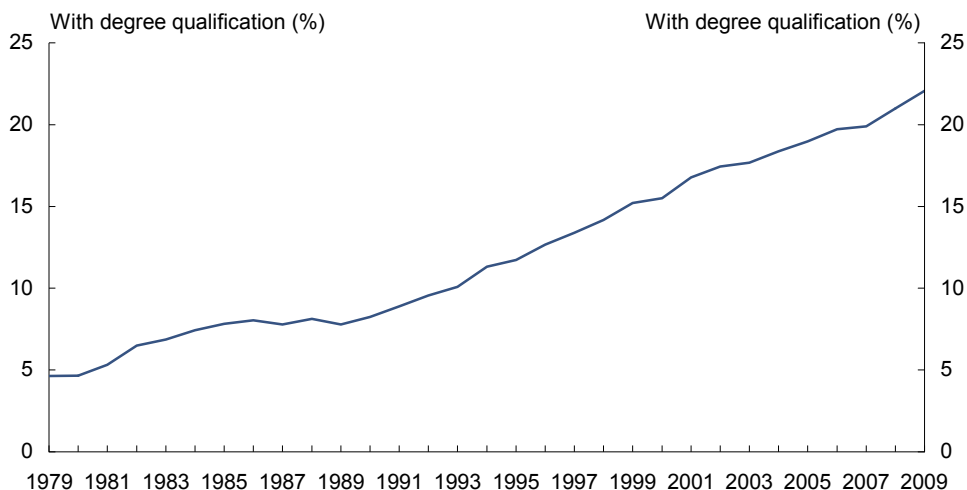
Australians are showing strong and improving results in terms of educational attainment. For example, the percentage of the working age population with a bachelor degree or higher qualification rose from 5 per cent in 1979 to 22 per cent in 2009 (Chart 6.9).

Still, Australians from low socio-economic groups are more likely to experience poorer education outcomes, and these poor outcomes tend to persist across generations,

suggesting improving educational attainment is likely to play a role in addressing disadvantage over time.

Young Australians from lower socio-economic status backgrounds appear to lag at least one school year behind the Australian average, and by more than two years when compared to students in the highest socio-economic quartile.<sup>6</sup>

**Chart 6.9: Proportion of working age population that has attained a tertiary degree, 1979–2009**

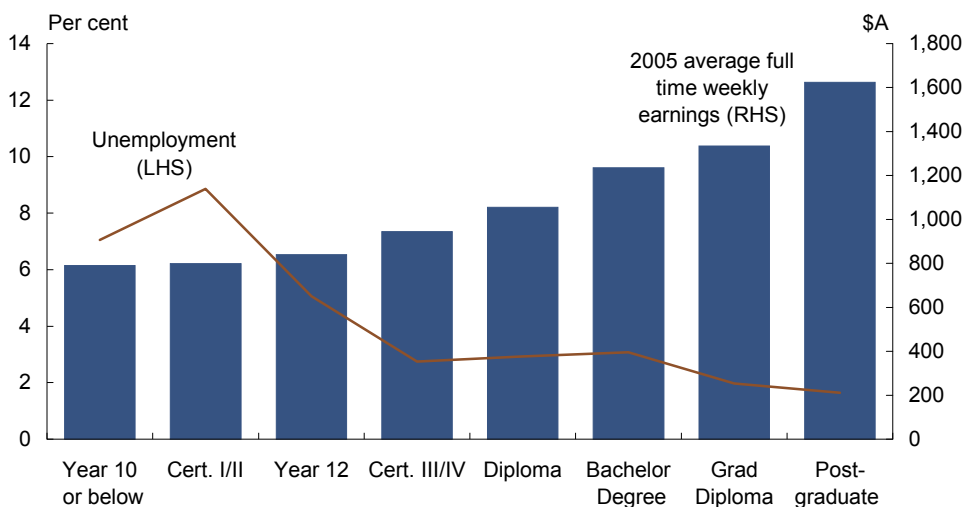


Source: ABS cat. no. 6227.0, 2009.

Higher educational attainment is associated with lower levels of unemployment and higher wage levels (Chart 6.10).

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6 OECD Programme for International Student Assessment (PISA), 2006.

**Chart 6.10: The correlation of education with employment and wage outcomes**

Note: 2005 average full-time weekly earnings, all persons.  
Source: ABS cat. no. 6278.0, 2006.

Educational attainment and qualifications seem to be correlated across generations. For example, Australian students whose parents achieved low educational attainment were achieving significantly lower mathematical scores at age 15.<sup>7</sup>

The Government is making significant investments to improve educational attainment for children at risk of disadvantage — including improving literacy and numeracy and the quality of teaching, and focusing more effort on schools in low socio-economic communities. These investments aim to break the cycle of educational disadvantage, so that future generations are provided with capabilities and opportunities that their parents may never have had.

### Access to employment

Supporting workforce participation is critical to meeting the economic and fiscal challenges of an ageing population. Workforce participation also is associated with a range of positive life outcomes such as sense of identity, financial independence and opportunities to socialise with others.

As the working age population declines as a proportion of total population, it will be important that all Australians have the opportunity to contribute productively to the nation's economic prosperity.

<sup>7</sup> OECD, *Growing Unequal?: Income Distribution and Poverty in OECD Countries*, 2008, p 211.

Australia has performed well in terms of employment outcomes, with the unemployment rate declining over the past 25 years. The unemployment rate is substantially below the OECD average, with Australia's rate standing at 5.6 per cent in November 2009, compared to 8.8 per cent for the OECD average.<sup>8</sup> Still, pockets of high unemployment remain.

While Australia's workforce participation rate for youth (15–24 years) is among the highest in the OECD, participation for people with no post-school qualifications remains significantly below those with post-school qualifications (around 10 percentage points lower).<sup>9</sup>

In order to lift youth participation and productivity, the Government is investing an additional \$6.7 billion in vocational education training through the National Skills and Workforce Development Agreement with the States and Territories. Support for higher education is being increased, including by uncapping the number of supported places. It is the Government's goal for 40 per cent of all 25–34 year olds to attain a bachelor level qualification or above by 2025.

Australia's employment rate for people with a disability is lower than the OECD average. As part of the 2009–10 Budget the Government committed \$1.2 billion over four years to implement reforms to the disability employment services.

The longer people are unemployed, the harder it becomes to return to work. There is also evidence of an association between long-term joblessness and persistent intergenerational disadvantage.<sup>10</sup> Positively, Australia's long-term unemployment rate has fallen in recent decades from a high of almost 4 per cent in the early 1990s to less than 1 per cent today.<sup>11</sup>

Maintaining these low levels of unemployment, and where possible further improving participation and employment levels, will become increasingly important as the working age population declines as a share of total population.

## Health outcomes

Good health makes it easier for people to participate in society and in economic activities. It is also an important component of wellbeing in its own right.

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8 ABS cat. no, 6202.0, 2010; *Labour Force*, Australia, December 2009; OECD Labour Force Statistics.

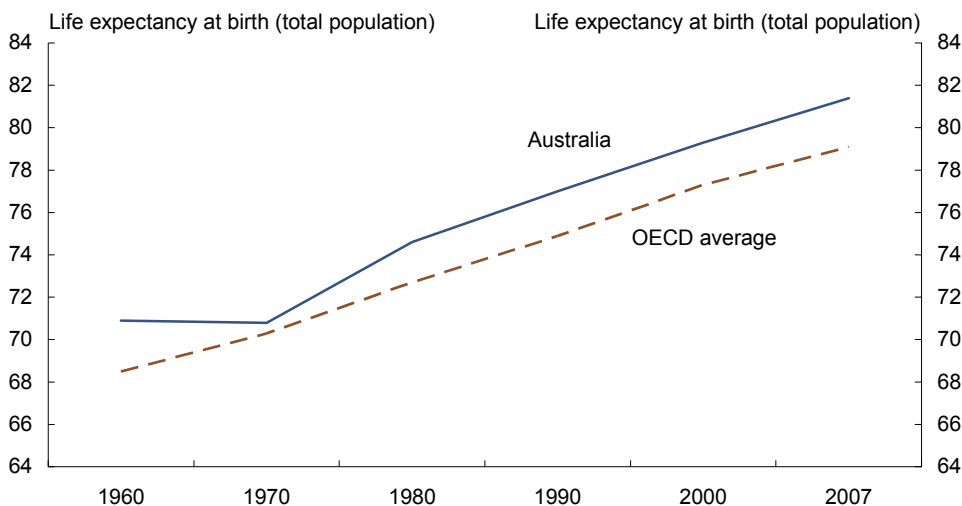
9 S Kennedy, N Stoney, L Vance, 'Labour force participation and the influence of educational attainment', *Economic Roundup*, Issue 3, 2009.

10 J Pech and F McCoull, 'Transgenerational welfare dependence: myths and realities', *Australian Social Policy*, 2000(1), 43–67.

11 Australian Bureau of Statistics, *Labour Force, Australia, Detailed*, cat. no. 6291.0.55.001, ABS, Canberra, 2009.

Life expectancy at birth is a proxy for measuring the overall health of a population. In 2007, Australians were among the longest lived OECD members<sup>12</sup> (Chart 6.11). Continued improvements in life expectancy are forecast for Australians. It is projected that men born in 2050 will live an average of 7.6 years longer than those born in 2010, and women an average of 6.1 years longer.

**Chart 6.11: Life expectancy at birth (1960–2007)**



Source: OECD *Health at a Glance 2007*, Table A.2.1a; OECD *Health at a Glance 2009*.

Indigenous life expectancy is significantly below that of the general population (12 years lower for males and 10 years lower for females). The Government has committed to close this life expectancy gap within a generation.

Where there are cases of persistent poor health, often it is found alongside other forms of disadvantage, including income poverty (Table 6.3). Poor health can contribute to, and perpetuate, disadvantage. There is evidence that low maternal socio-economic status can lead to poorer child health, and mental health in particular, that in turn may lead to poorer educational and labour force outcomes in the future.<sup>13</sup>

<sup>12</sup> OECD, *Health at a Glance, 2009: OECD Indicators*, Organisation for Economic Co-operation and Development, Paris, 2009.

<sup>13</sup> J Currie, 'Healthy, Wealthy, and Wise: Socioeconomic Status, Poor Health in Childhood, and Human Capital Development', *Journal of Economic Literature*, 47(1), 2009, pp 87-122.

**Table 6.3: Comparison of disease rates by percentage of the population and level of disadvantage**

	Most disadvantaged quintile (% of population)	Least disadvantaged quintile (% of population)
Arthritis	17.3	12.9
Asthma	11.9	7.6
Malignant neoplasms	1.9	1.4
Heart, stroke and vascular disease	7.2	3.7
Diabetes	5.3	2.6
Mental and behavioural problems	14.2	10.4

Source: ABS cat. no. 4364.0, 2009.

## 6.3.2 Other factors affecting human and social capital

### Early childhood

Cost-effective investments to build the capabilities of children and youth are critical for building the human and social capital of the next generation. For instance:

- Poor nutritional intake and poor health outcomes in early life can be associated with ongoing cognitive impairment.<sup>14</sup>
- Maltreated children are less likely to have the cognitive and socio-emotional skills required to perform well at school,<sup>15</sup> which can have implications for their educational outcomes and their employment opportunities later in life.
- There is evidence that children whose parents relied heavily on income support are more likely themselves to rely on income support when they reach adulthood than are other children. For example, young people are more likely to support the provision of income support payments, and perceive inequality as the result of forces beyond their control, if their family received income support payments.<sup>16</sup>

### Individual resilience

Psychological studies have looked at educational and life outcomes for children with risk factors for long-term disadvantage (such as learning difficulties, behavioural

14 A Sorhaindo and L Feinstein, 'What is the relationship between child nutrition and school outcomes', *Research Report No. 18*, Centre for Research on the Wider Benefits of Learning, London, 2006.

15 S Twardosz and J Lutzker, 'Child maltreatment and the developing brain: A review of neuroscience perspectives', *Aggression and Violent Behaviour*, vol. 15/1, 2010, pp 59-68.

16 J Baron, D Cobb-Clark and N Erkal, 'Cultural Transmission of Work-Welfare Attitudes and the Intergenerational Correlation of Welfare Receipt', *Centre for Economic Policy Research Discussion Paper No. 594*, The Australian National University, 2009.



disorders, social and emotional problems, low family income and parental criminality).<sup>17</sup> These studies suggest that some children possess greater resilience which enables them to overcome the risk factors in their lives.

Appropriate parenting is particularly important in developing children's emotional and learning skills, but there is also a critical role for early childhood development programs, and for responsive schools.

### Locational impacts

Locations that contain high concentrations of one component of disadvantage tend also to rank higher on other components. Locational disadvantage can reflect a number of factors such as: wealthier people are able to afford the higher property values in more desirable locations, lack of transport (making it difficult to take up job opportunities) or lack of community infrastructure to support those facing disadvantage.

Policy can play an important role by targeting improved service provision to locations with high levels of disadvantage. In such areas, multi-faceted policy interventions are important to address the multiple types of prevailing disadvantage.

### 6.3.3 Social Inclusion Agenda

The Government's Social Inclusion Agenda is seeking new ways to overcome disadvantage in the Australian population, to ensure that all Australians will be able to:

- learn by participating in education and training;
- work by participating in employment, voluntary work and family and caring;
- engage by connecting with people and using their local community's resources; and
- have a voice so that they can influence decisions that affect them.

The Government is developing a framework to tackle multiple and entrenched disadvantage in Australia. Box 6.4 outlines the Government's social inclusion principles. State and Territory governments have endorsed the principles as part of their commitment to develop a National Action Plan on Social Inclusion.

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<sup>17</sup> A Masten, K Best and N Garmezy, 'Resilience and development: Contributions from the study of children who overcome adversity', *Development and Psychopathology*, Vol. 2, Issue 04, Oct 1990, pp 425-444.

#### **Box 6.4: Principles for Social Inclusion in Australia**

1. *Building on individual and community strengths* — Making the most of people's strengths, including the strengths of Aboriginal and Torres Strait Islander peoples and people from other cultures.
2. *Building partnerships with key stakeholders* — Governments, organisations and communities working together to get the best results for people in need.
3. *Developing tailored services* — Services working together in new and flexible ways to meet each person's different needs. For some members of the Australian population experiencing, or at immediate risk of, significant exclusion, mainstream services may not be sufficient or appropriate to mitigate exclusion.
4. *Giving a high priority to early intervention and prevention* — Heading off problems by understanding the root causes and intervening early.
5. *Building joined-up services and whole of government(s) solutions* — Getting different parts and different levels of government to work together in new and flexible ways to get better outcomes and services for people in need.
6. *Using evidence and integrated data to inform policy* — Finding out what programs and services work well and understanding why, to share good ideas, keep making improvements and put effort into things that work.
7. *Using locational approaches* — Working in places where there is a lot of disadvantage, to get to people most in need and to understand how different problems are connected.
8. *Planning for sustainability* — Doing things that will help people and communities deal better with problems in the future, as well as solving the problems they face now.

While there is a need to maintain policy settings which support improvements in human and social capital for the benefit of the majority of Australians, interventions targeted at addressing the specific needs of those experiencing multiple and/or persistent disadvantage are also warranted.

The evidence suggests that simply increasing government expenditure does not necessarily lead to improved life outcomes for the recipients. Mainstream services need to be accessible to those who need them most. Targeted assistance, designed around the needs of the individual, also may be required to assist those facing multiple, entrenched disadvantage.

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# Appendix A: IGR 2010 projections summary

**Table A1: Economic and fiscal projections**

	2009-10	2019-20	2029-30	2039-40	2049-50
<b>Economic projections</b>					
Real GDP growth (%)	1.6	2.7	2.6	2.5	2.3
Real GDP per person growth (%)	-0.1	1.3	1.4	1.5	1.4
Total participation rate 15+ (%)	65.1	65.1	63.1	61.8	60.6
Male					
15+	72.4	72.0	69.7	68.1	66.8
25-54	90.4	92.2	92.5	92.6	92.7
55-69	58.5	60.6	60.5	61.0	61.0
Female					
15+	58.0	58.4	56.7	55.4	54.4
25-54	74.7	77.6	78.8	79.5	79.7
55-69	40.9	44.7	44.8	45.1	45.1
<b>Fiscal projections (% of GDP)</b>					
Primary balance	-4.2	1.5	0.2	-1.2	-2.7
Underlying cash balance	-4.5	1.0	0.4	-1.2	-3.8
Net debt	3.5	2.4	-6.6	-1.4	20.2
Net financial worth	-9.6	-2.5	10.2	7.6	-12.3
Net worth	-1.8	4.2	16.6	13.8	-6.2

Source: Treasury projections.

**Table A2: Demographic projections**

	2010	2020	2030	2040	2050
<b>Population projections</b>					
Population (millions)	22.2	25.7	29.2	32.6	35.9
0-14	4.2	4.9	5.4	5.7	6.2
15-64	15.0	16.6	18.2	20.0	21.6
65-84	2.6	3.7	4.8	5.6	6.3
85 and over	0.4	0.5	0.8	1.3	1.8
Life expectancy at birth					
Male	80.1	82.5	84.5	86.1	87.7
Female	84.4	86.2	87.8	89.2	90.5
Total fertility rate	1.95	1.9	1.9	1.9	1.9
Dependency ratios					
Aged to working-age ratio	20.0	25.3	31.0	34.7	37.6
Child to working-age ratio	28.3	29.3	29.4	28.4	28.5
Net migration to population ratio	0.9	0.7	0.6	0.6	0.5

Source: Treasury projections.

**Table A3: Projections of major components of Australian government spending in IGR 2010 (per cent of GDP)**

	2009-10	2014-15	2019-20	2029-30	2039-40	2049-50
<b>Health(a)</b>						
Hospitals	1.0	1.0	1.1	na	na	na
Medical Benefits Schedule	1.2	1.2	1.2	na	na	na
Pharmaceutical Benefits Scheme	0.7	0.7	0.7	na	na	na
Private Health Insurance	0.4	0.3	0.4	na	na	na
Other	0.7	0.6	0.6	na	na	na
<b>Total health</b>	<b>4.0</b>	<b>3.9</b>	<b>4.1</b>	<b>4.8</b>	<b>5.9</b>	<b>7.1</b>
<b>Aged care</b>						
Residential care	0.6	0.6	0.7	0.9	1.2	1.4
Community care	0.2	0.2	0.3	0.3	0.4	0.4
<b>Total aged care</b>	<b>0.8</b>	<b>0.8</b>	<b>0.9</b>	<b>1.2</b>	<b>1.6</b>	<b>1.8</b>
<b>Payments to individuals</b>						
Aged and Service Pensions	2.7	2.7	2.8	3.3	3.7	3.9
Disability Support Pension	0.9	0.9	0.9	1.0	1.0	1.0
Family payments						
Family Tax Benefit	1.3	1.1	1.1	0.9	0.8	0.7
Child Care Benefit and Rebate	0.2	0.2	0.2	0.2	0.1	0.1
Baby Bonus & Paid Parental Leave	0.1	0.1	0.1	0.1	0.1	0.1
Parenting Payment Single	0.3	0.3	0.3	0.3	0.3	0.3
Unemployment Allowances and Parenting Payment Partnered	0.7	0.5	0.5	0.5	0.4	0.4
Youth Allowance and Austudy	0.2	0.2	0.2	0.1	0.1	0.1
Carer Payment/Allowance and Wife Pension	0.3	0.4	0.4	0.4	0.4	0.4
<b>Total payments to individuals</b>	<b>6.9</b>	<b>6.5</b>	<b>6.6</b>	<b>6.8</b>	<b>6.9</b>	<b>6.9</b>
<b>Education</b>						
Schools	1.7	1.0	1.0	1.1	1.1	1.1
Higher Education	0.6	0.5	0.5	0.5	0.5	0.5
Vocational education and training	0.3	0.2	0.2	0.3	0.3	0.3
<b>Total education</b>	<b>2.6</b>	<b>1.7</b>	<b>1.8</b>	<b>1.9</b>	<b>1.9</b>	<b>1.9</b>
<b>Public sector superannuation(b)</b>	<b>0.4</b>	<b>0.4</b>	<b>0.4</b>	<b>0.3</b>	<b>0.2</b>	<b>0.2</b>
<b>Total modelled payments (excluding defence)(c)</b>	<b>14.6</b>	<b>13.3</b>	<b>13.7</b>	<b>15.0</b>	<b>16.4</b>	<b>17.9</b>
<b>Total payments (excluding interest)</b>	<b>26.0</b>	<b>22.6</b>	<b>23.0</b>	<b>24.2</b>	<b>25.6</b>	<b>27.1</b>

(a) Health system components are projected individually over the medium term, out to 2022–23. From 2023–24 onwards, total health spending is projected using an aggregate model.

(b) Refers to the Government's superannuation spending associated with the public sector defined benefit schemes. The projections of public sector superannuation payments are from the 2009 Long Term Cost Report. The Report relies on economic assumptions which differ slightly from those underpinning the IGR 2010. The impact of this inconsistency on the above proportions is not considered to be material.

(c) Excludes Defence funding. Additional information on Defence funding and the Defence White Paper commitment can be found in the 2009–10 Portfolio Budget Statements for the Department of Defence.

Figures may not add due to rounding.

Source: Treasury projections.



**Table A4: Projections of major components of Australian government spending in IGR 2010 (real spending per person, 2009–10 dollars)**

	2009-10	2014-15	2019-20	2029-30	2039-40	2049-50
<b>Health(a)</b>						
Hospitals	560	630	730	na	na	na
Medical Benefits Schedule	720	770	850	na	na	na
Pharmaceutical Benefits Scheme	410	460	500	na	na	na
Private Health Insurance	210	210	270	na	na	na
Other	400	410	410	na	na	na
<b>Total health</b>	<b>2,290</b>	<b>2,480</b>	<b>2,760</b>	<b>3,630</b>	<b>5,130</b>	<b>7,210</b>
<b>Aged care</b>						
Residential care	340	380	470	690	1,050	1,440
Community care	120	140	180	240	320	390
<b>Total aged care</b>	<b>460</b>	<b>530</b>	<b>640</b>	<b>930</b>	<b>1,370</b>	<b>1,840</b>
<b>Payments to individuals</b>						
Aged and Service Pensions	1,570	1,760	1,930	2,490	3,200	3,890
Disability Support Pension	530	570	640	750	860	1,000
Family payments						
Family Tax Benefit	780	730	730	700	670	660
Child Care Benefit and Rebate	140	140	140	140	130	130
Baby Bonus & Paid Parental Leave	60	90	90	90	100	110
Parenting Payment Single	190	180	190	210	230	270
Unemployment Allowances and Parenting Payment Partnered	390	350	360	360	360	360
Youth Allowance and Austudy	120	120	110	110	110	110
Carer Payment/Allowance and Wife Pension	180	240	270	310	350	410
<b>Total payments to individuals</b>	<b>3,960</b>	<b>4,180</b>	<b>4,460</b>	<b>5,170</b>	<b>6,020</b>	<b>6,950</b>
<b>Education</b>						
Schools	970	610	680	820	950	1,130
Higher Education	330	340	350	410	470	540
Vocational education and training	190	160	170	190	220	250
<b>Total education</b>	<b>1,490</b>	<b>1,110</b>	<b>1,190</b>	<b>1,420</b>	<b>1,650</b>	<b>1,920</b>
<b>Public sector superannuation(b)</b>	<b>250</b>	<b>240</b>	<b>240</b>	<b>230</b>	<b>210</b>	<b>170</b>
<b>Total modelled payments (excluding defence)(c)</b>	<b>8,500</b>	<b>8,500</b>	<b>9,300</b>	<b>11,400</b>	<b>14,400</b>	<b>18,100</b>
<b>Total payments (excluding interest)</b>	<b>15,000</b>	<b>14,500</b>	<b>15,600</b>	<b>18,300</b>	<b>22,400</b>	<b>27,400</b>

(a) Health system components are projected individually over the medium term, out to 2022–23. From 2023–24 onwards, total health spending is projected using an aggregate model.

(b) Refers to the Government's superannuation spending associated with the public sector defined benefit schemes.

(c) Excludes Defence funding. Additional information on Defence funding and the Defence White Paper commitment can be found in the 2009–10 Portfolio Budget Statements for the Department of Defence.

Figures may not add due to rounding.

Source: Treasury projections.



## Appendix B: Sensitivity analysis of long-run economic and fiscal projections

**Table B1: Assumptions underlying sensitivity analysis**

	Base case	Lower	Higher
<b>Participation</b>			
Total labour force participation rates (population aged 15 and over)	60.6% by 2049-50	57.0% by 2049-50(a)	63.7% by 2049-50(b)
Older workers participation rates (aged 50-69)	61.9% by 2049-50		66.9% by 2049-50(c)
Unemployment rate (per cent)	5.0	4.0	6.0
<b>Productivity</b>			
Labour productivity growth (per cent)	1.6	1.2(d)	2.0
<b>Population</b>			
Net migration (no. of people per year)	180,000	150,000	210,000
Fertility (total fertility rate)	1.9	Constant at 1.7	Constant at 2.1
Life expectancy at birth (years)			
Males in 2050	87.7	86.4(e)	91.0(f)
Females in 2050	90.5	90.2(e)	92.8(f)

(a) Male and female age specific participation rates held constant at 2006–07 levels from 2013–14.

(b) All male and female age specific participation rates are adjusted to achieve an increase of 5 per cent in total participation rates for population aged 15 and over.

(c) Growth in age specific participation rates is increased by 10 per cent for workers in the age cohorts of 50–54, 55–59, 60–64 and 65–69, giving a total participation rate (15+) of 62.0 per cent in 2049-50.

(d) Represents the average productivity rate in the 1980s.

(e) Uses IGR 2007 life expectancy projections.

(f) All the improvement factors are scaled by 1.625 for men and 1.5 for women.

Source: Treasury projections.

**Table B2: Impact of alternative scenarios**

	Participation			Productivity	Population		
	Higher labour force participation		Lower unemployment rate	Higher labour productivity	Higher migration	Higher fertility rate	Higher life expectancy
	Older	All ages					
<b>Annual growth rate(a)</b>							
Labour force	0.06	0.12	0.00	0.00	0.13	0.08	0.01
Real GDP	0.06	0.12	0.03	0.36	0.13	0.08	0.01
Real GDP per person	0.06	0.12	0.03	0.36	0.02	-0.03	-0.04
<b>Levels(b)</b>							
Labour force	2.25	5.01	0.00	0.00	5.18	3.34	0.59
Real GDP	2.36	4.94	1.01	15.12	5.23	3.17	0.55
Real GDP per person	2.36	4.94	1.01	15.12	0.86	-1.14	-1.47
<b>Dependency ratios(c)</b>							
Aged to working-age ratio	0.00	0.00	0.00	0.00	-1.47	-1.27	2.84
Child to working-age ratio	0.00	0.00	0.00	0.00	0.06	2.61	-0.06
<b>Change in spending(c)</b> (per cent of GDP)							
Health	-0.15	-0.30	-0.06	(d)	-0.16	-0.10	0.30
Aged care	-0.04	-0.09	-0.02	-0.01	-0.08	-0.05	0.29
Age and service pensions	-0.16	-0.25	-0.03	-0.01	-0.16	-0.12	0.40
Other payments to individuals	-0.06	-0.13	-0.09	-0.18	-0.01	0.07	0.00
Education	-0.05	-0.09	-0.02	0.00	0.00	0.12	0.00
	Participation			Productivity	Population		
	Lower labour force participation		Higher unemployment rate	Lower labour productivity	Lower migration	Lower fertility rate	Lower life expectancy
	All ages						
<b>Annual growth rate(a)</b>							
Labour force		-0.16	0.00	0.00	-0.13	-0.09	0.00
Real GDP		-0.11	-0.03	-0.39	-0.14	-0.08	0.00
Real GDP per person		-0.11	-0.03	-0.38	-0.02	0.03	0.01
<b>Levels(b)</b>							
Labour force		-5.98	0.00	0.00	-5.18	-3.33	-0.14
Real GDP		-4.27	-1.01	-13.98	-5.23	-3.16	-0.12
Real GDP per person		-4.27	-1.01	-13.98	-0.93	1.14	0.47
<b>Dependency ratios(c)</b>							
Aged to working-age ratio		0.00	0.00	0.00	1.63	1.36	-0.91
Child to working-age ratio		0.00	0.00	0.00	-0.07	-2.64	0.02
<b>Change in spending(c)</b> (per cent of GDP)							
Health		0.29	0.07	(d)	0.18	0.11	-0.10
Aged care		0.08	0.02	0.01	0.09	0.06	-0.06
Age and service pensions		0.33	0.04	0.05	0.18	0.13	-0.12
Other payments to individuals		0.11	0.09	0.22	0.01	-0.07	0.00
Education		0.08	0.02	0.00	0.00	-0.12	0.00

(a) Represents the percentage point difference in the average annual growth rate for the period 2009–10 to 2049–50, compared to the base scenario.

(b) Represents the percentage change in the size of the labour force and the level of GDP and GDP per capita by 2049–50 compared to the base scenario.

(c) Percentage point change in 2049–50 compared to the base scenario.

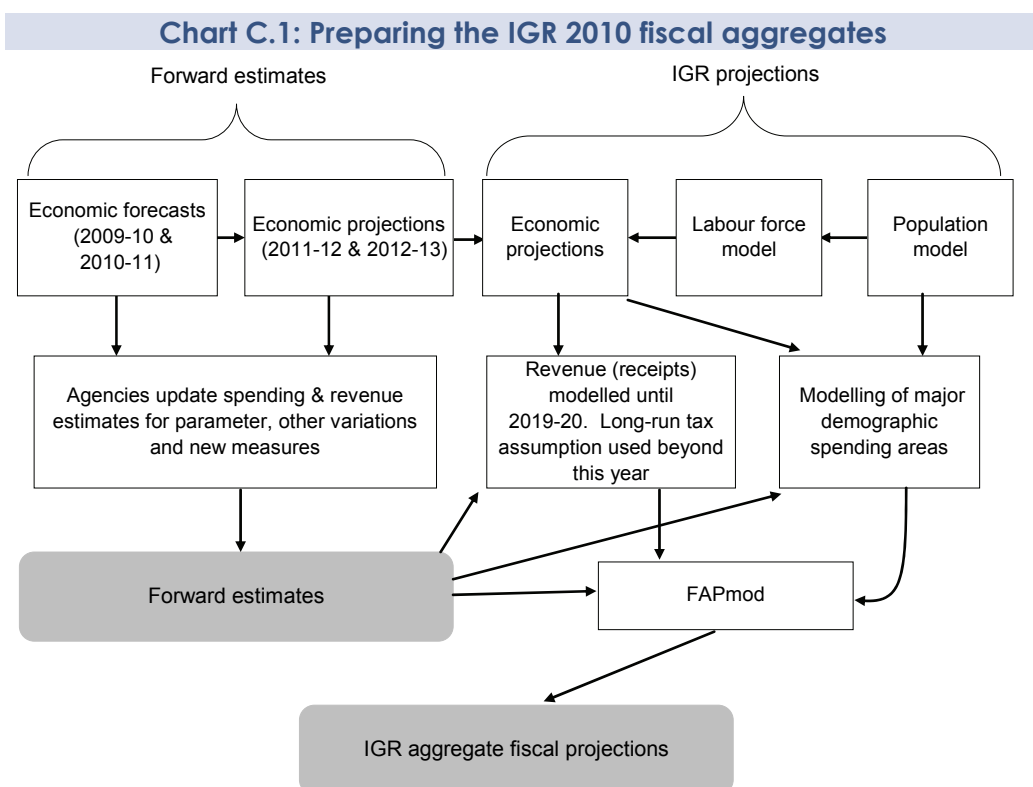
(d) The potential impact of higher or lower productivity growth on Australian government health spending is difficult to quantify and has not been included here.

Source: Treasury projections.

# Appendix C: Methodology

## C.1 Aggregate fiscal projections

The fiscal aggregate projection model (FAPmod) used to prepare the aggregate fiscal projections reported in IGR 2010 draws together the outputs of a wide range of separate but consistent models (Chart C.1).



For IGR 2010, FAPmod takes the fiscal and economic forward estimates published in the *Mid-Year Economic and Fiscal Outlook 2009–10* as its starting point. Beyond the forward estimates, the fiscal projections draw together the population and economic projections developed within the ‘3Ps’ framework that underlies the IGR 2010. These projections, in turn, underpin the separate but related models of revenue, health, income support payments, education and training, aged care, major defined superannuation benefit schemes for public sector employees and defence. Consistent

with previous IGRs, this involves up to eight models that produce projections under the guidance of a senior Treasury steering committee designed to ensure internal consistency and legitimacy of assumptions.

FAPmod is designed to replicate an internally consistent cash and accrual accounting system so that all fiscal aggregates can be produced. This means the operating statement, the cash flow statement and the balance sheet are interconnected with changes in one statement affecting the other statements.

By capturing the interactions between flow concepts such as the budget balance and stock concepts such as debt, FAPmod provides the capacity to model a broader range of fiscal aggregates than in previous IGRs. This allows for a more detailed assessment of the long-term fiscal outlook.

By providing for a more detailed treatment of interest payments and receipts, FAPmod has enabled long-run projections of the underlying cash balance to be reported for the first time in IGR 2010. Interest payments on Commonwealth Government Securities (CGS) are modelled as a function of the projected level of CGS in FAPmod over the projection period.

In FAPmod, the financing of the headline cash deficit and the refinancing of maturing debts are assumed to incur interest at the rate of 6 per cent per annum beyond the forward estimates period (2013–14 onwards). When the budget is in headline cash surplus, it is assumed that those funds will be used to retire any outstanding CGS and thereafter will accumulate in term deposits. The 6 per cent interest rate assumption is consistent with the Long-Term Cost Reports prepared by the Australian Government Actuary. The same interest rate also is applied to the Government's term deposits in FAPmod.

## C.2 Revenue projections

### C.2.1 Overview

IGR 2010 assumes a constant tax-to-GDP ratio of 23.5 per cent (the historical average) from 2019–20. This methodology is similar to that used in previous IGRs.

Prior to 2019–20, tax revenue is allowed to recover, in line with economic recovery, from the impacts of the global financial crisis. This is consistent with the Government's medium-term fiscal strategy.

The constant tax-to-GDP ratio recognises that tax revenues are broadly correlated with the size of the economy. Analysis suggests that the impact on aggregate growth of the economy is expected to be the most significant way in which demographic change impacts on tax revenues.

## C.2.2 Historical trends and drivers

Australian government revenue is derived from taxation and non-taxation sources.

Taxation receipts averaged 23.5 per cent of GDP over the nine years from 2000–01 (the year the GST was introduced) to 2008–09 and accounted for 94 per cent of total Australian government receipts. Over this period:

- income taxes accounted for 71 per cent of taxation receipts;
- indirect taxes amounted to 29 per cent of total taxation receipts; and
- within indirect taxation, GST accounted for 15 per cent of total taxation receipts.

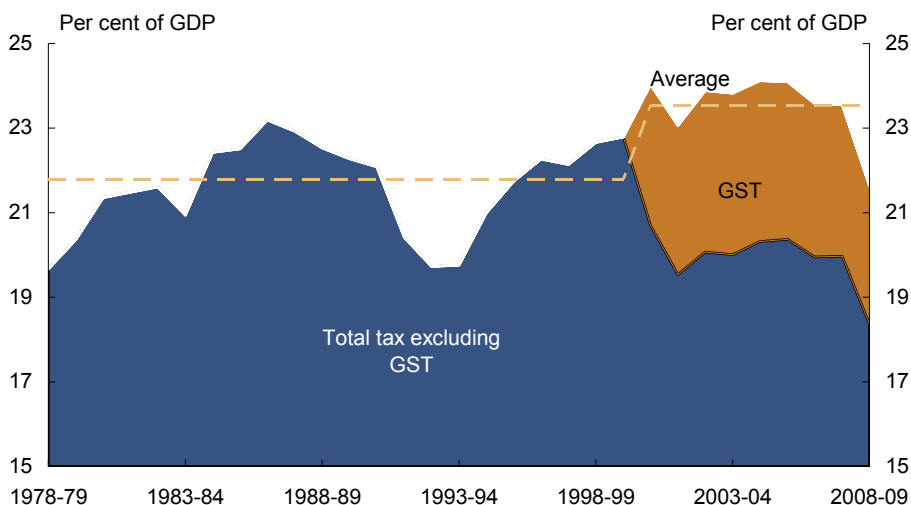
Non-taxation receipts include sales of goods and services, interest, dividends, petroleum royalties and seigniorage from circulating coin production. Non-taxation receipts averaged 1.5 per cent of GDP over the period 2000–01 to 2008–09 and accounted for 6 per cent of Australian government receipts.

Over time, taxation receipts are broadly correlated with nominal economic activity. Most tax bases correspond broadly to major elements of nominal GDP (such as compensation of employees, gross operating surplus and nominal consumption).

In the 20 years prior to the introduction of the GST, the ratio of Australian government taxation receipts to GDP fluctuated between 19.7 and 23.2 per cent and averaged 21.8 per cent.

In 2000–01, the introduction of the GST and associated changes in Commonwealth-State financial arrangements resulted in proportionately more tax revenue being levied by the Australian government and less by the States and Territories. The impact of this change can be seen in the upward step in the Australian government's tax-to-GDP ratio in 2000–01 (Chart C.2).

**Chart C.2: Total Australian government taxation receipts  
1978–79 to 2008–09**



Source: *Mid-Year Economic and Fiscal Outlook 2009–10*.

### C.2.3 Medium- and long-term revenue projections

IGR 2002 and IGR 2007 both adopted an assumption that total Australian government receipts as a proportion of GDP would remain constant for the projection period following the end of the four year ‘forward estimates’ period. This assumption was largely based on:

- an observation that the tax-to-GDP ratio had remained relatively stable over the past 30 years, and that such stability was observed widely in developed economies;
- that a strict no-policy-change scenario was unrealistic as it would imply constantly increasing average tax rates on personal income; and
- the emphasis of the reports rested on pressures that demographic change was likely to impose on future government spending rather than the way these spending pressures may be financed (such as through increasing revenues or raising debt).

Similarly, IGR 2010 also assumes an unchanged tax-to-GDP ratio in the long term.<sup>1</sup>

IGR 2010 builds off the projections and methodology in the *Mid-Year Economic and Fiscal Outlook 2009–10*. With the economic downturn associated with the global financial crisis, the tax-to-GDP ratio is expected to decline from 24.1 per cent of GDP

<sup>1</sup> The comparable long-run tax-to-GDP ratio (that is, as if GST receipts had been included and had the GDP revisions been known) used in IGR 2002 was 23.9 per cent and in IGR 2007 was 23.8 per cent.



in 2005–06 to 20.4 per cent of GDP in 2009–10. Such effects are largely cyclical and, with recovery of the economy, revenues are expected to recover.

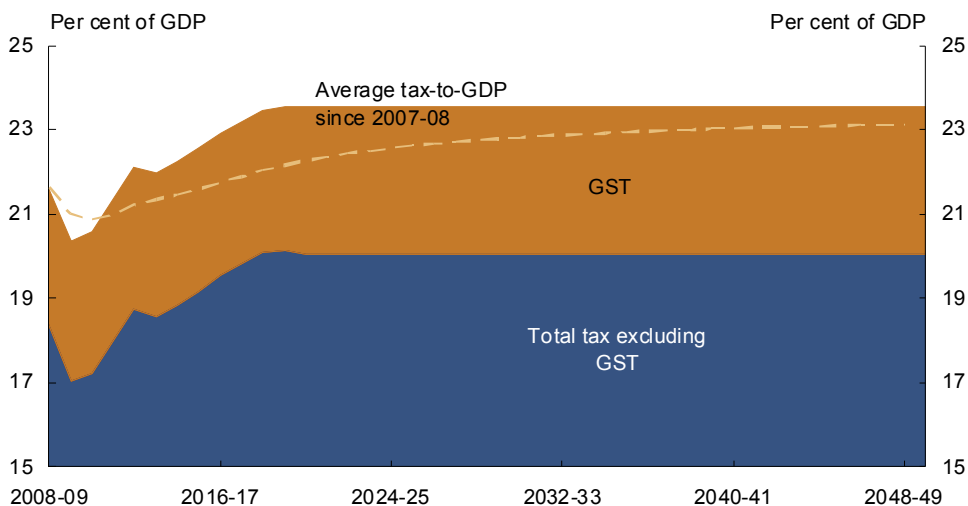
The Government's fiscal strategy provides that as the economy recovers and grows above trend, the return to budget surpluses will be assisted by allowing the level of tax receipts to recover naturally while maintaining the Government's commitment to keep taxation receipts as a share of GDP below the 2007–08 level (of 23.6 per cent of GDP) on average.

Consistent with the medium-term projections published in the 2009–10 Budget and MYEFO, tax receipts are assumed to recover with economic recovery. The tax-to-GDP ratio is projected to rise from 20.4 per cent of GDP in 2009–10 to 23.5 per cent of GDP in 2019–20 (Chart C.3).

The average tax-to-GDP ratio over the period 2008–09 to 2049–50 is 23.1 per cent of GDP, well inside the Government's commitment to maintain tax receipts as a share of GDP below the 2007–08 level of 23.6 per cent on average.

Non-tax revenues are relatively small and have not varied significantly over time. With the exception of interest receipts, IGR 2010 retains the assumption that non-tax receipts remain constant as a share of GDP. Non-tax receipts (excluding interest) are assumed to be 1¼ per cent of GDP.

**Chart C.3: IGR tax receipt assumptions**



Source: *Mid-Year Economic and Fiscal Outlook 2009–10* and Treasury projections.

## C.2.4 Policy assumptions

The relative overall stability of the historical tax-to-GDP ratio is largely the result of policy adjustments, particularly periodic adjustments to the personal income tax scale. Under strict no-policy-change assumptions (including no change to personal income tax scales), tax collections would rise faster than GDP (and be reflected in higher tax to GDP ratios). This mainly reflects the progressivity of the personal income tax system.

The projections from the end of the forward estimates period out to 2019–20 are based on a strict ‘no policy change’ scenario, allowing for the natural recovery of revenues after the downturn to be dedicated to improving the budget position and eliminating net debt. Beyond 2019–20, the estimates are prepared using a ‘top-down’ approach, as described earlier, assuming a constant tax-to-GDP ratio of 23.5 per cent. Within the overall long-run assumption, GST is assumed to comprise 3.5 per cent of GDP.

The aggregate constant tax to GDP ratio is not intended to imply that different types of revenue will remain constant as a share of GDP. In the absence of policy adjustments, the current structure of the tax system will lead to some types of revenue not remaining constant as a share of GDP. The following explores some of these in more detail.

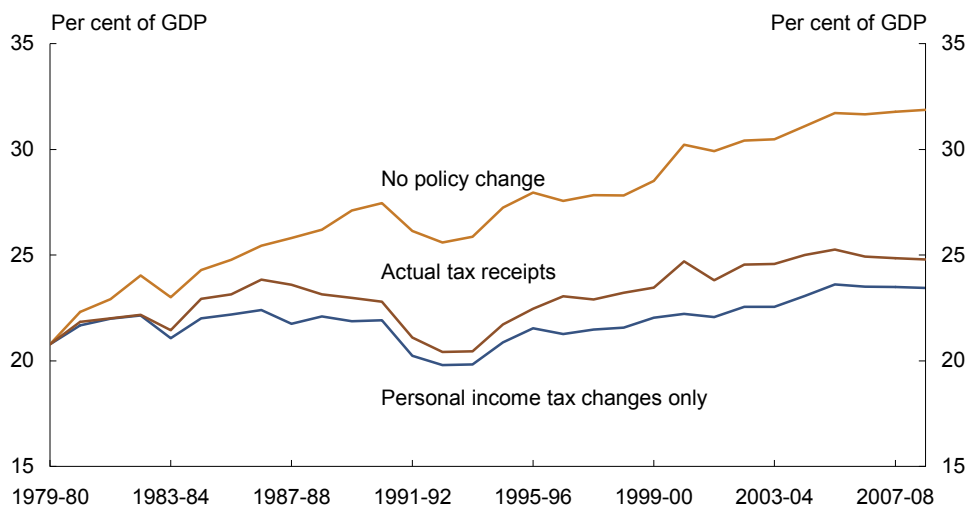
### Progressivity of the nominal personal tax system

Under a strict no-policy-change assumption tax collections would have risen much faster than GDP over the period from 1979–80 to 2008–09, resulting in a tax-to-GDP ratio considerably higher than actually occurred — more than 6 percentage points higher in 2008–09 (Chart C.4). This reflects increasing tax rates on personal income over time owing to the progressivity of the personal income tax scale and the fact that the personal income tax thresholds are set in nominal terms.

If individual taxpayers in 2006–07 had been taxed under the personal income tax scales of 1979–80, more than 60 per cent would have faced the top marginal tax rate of 61 per cent and 90 per cent would have faced a marginal rate of over 47 per cent, higher than today’s highest rate.

History shows that in practice governments make substantial periodic adjustments to the personal income tax scale. The impact of these adjustments is reflected in the difference between the strict no-policy-change scenario and the bottom line of Chart C.4, which illustrates what the tax-to-GDP ratio would have looked like if the only policy changes since 1979–80 had been those made to the personal tax scales.

**Chart C.4: Impact of policy change on Australian government tax receipts, 1979–80 to 2008–09<sup>(a)(b)</sup>**



- (a) Wholesale Sales Tax (WST) has been included in all three series on the basis of actual collections, as a no-policy-change series for this tax is not available.
- (b) The impact of policy changes in this analysis was calculated between pairs of sequential years and then aggregated. As the analysis period increases, there is an increased level of uncertainty with the total policy impact since 1979–80.

Source: Australian Bureau of Statistics cat. no. 5206.0; Australian Government Budget Paper No. 1, various years.

## Capital gains tax

The capital gains tax (CGT) is not yet 'mature' because all assets acquired before 1985 and not subsequently disposed of remain exempt. The CGT asset base will grow relatively more quickly as pre-1985 assets enter the CGT base through a change of ownership. This effect matures when all pre-1985 CGT assets are in the CGT base. A constant tax-to-GDP ratio assumption implies that other taxes fall in relative terms until the CGT system matures.

## Volumetric taxes

Some tax bases are defined in volume terms rather than value terms, such as fuel excises that have been fixed at a nominal amount per litre since price indexation was abolished in 2001. On a no policy change basis, and an IGR assumption of 2.5 per cent inflation per annum, after 40 years fuel excise is expected to contribute around one third of its current share of total tax (that is, a fall from more than 5 per cent of total tax in 2008–09 to less than 2 per cent in 2049–50). A constant tax-to-GDP ratio implies that other taxes would increase as a share of total tax.

## Superannuation

There are two offsetting effects on tax revenues stemming from the superannuation and taxation system.

First the superannuation system is still maturing. Superannuation contributions and earnings, and associated taxes, will grow significantly faster than GDP, particularly earlier in the IGR period, until the system approaches maturity. According to current projections, the superannuation system will mature at about the same time as the old-age dependency ratio stabilises.

Superannuation income is, in general, taxed at a lower rate than other income. As the population ages and a greater share of income is earned through superannuation funds, the overall average tax rate will decrease and tax revenues will grow slower than nominal GDP.

The longer term net impact of these is difficult to determine. Initially the first effect will continue to outweigh the second, though as the superannuation system matures the second effect will grow in influence.

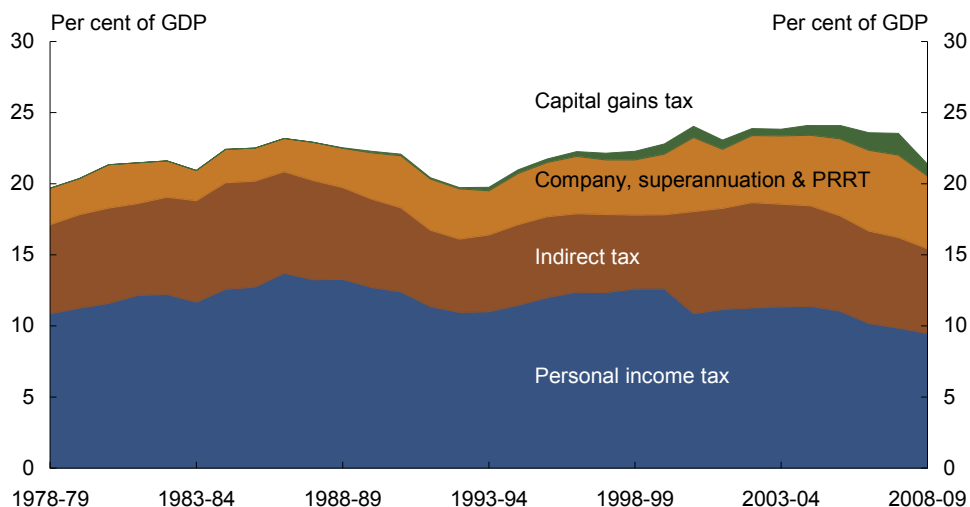
### C.2.5 Demographic change and revenue composition

While demographic influences clearly have an impact on aggregate GDP, they may also impact on the composition of GDP — such that the various tax bases do not grow in line with GDP — and, hence, generate either more or less revenue than assumed by the constant tax-to-GDP ratio.

The composition of taxation revenue has been relatively stable over the past 30 years (Chart C.5) despite demography-related changes such as increasing female workforce participation and an increasing fraction of persons aged over 65. Most of the compositional changes are explained by policy changes rather than demographic change (for example, the introduction of the GST) and, more recently, by rising terms of trade. These changes, which have tended to increase taxes, have been largely offset by reductions to personal income tax.

The following section considers three scenarios where compositional changes might be expected to have a significant effect on the tax-to-GDP ratio. While accounting for the compositional impacts of demographic change on tax revenues is inherently difficult, preliminary indications from the analysis are that the impact of these changes is either ambiguous or likely to be small.

**Chart C.5: Changing composition of the tax base from 1978–79 to 2008–09**



Source: Treasury projections.

### Lower saving rates among older persons

As a greater proportion of the population becomes older, there may be an increase in consumption relative to gross disposable income. This could occur as older persons run down previously saved assets to fund retirement.

Within the IGR assumptions, with the level of aggregate nominal GDP unchanged, an increase in household consumption would need to displace other domestic economic activity (investment and government spending) or be sourced through greater imports. In either case, the tax-to-GDP ratio will most likely increase because a component of GDP which is more heavily taxed — consumption — would increase compared to components of GDP which are more lightly taxed — investment and government spending.

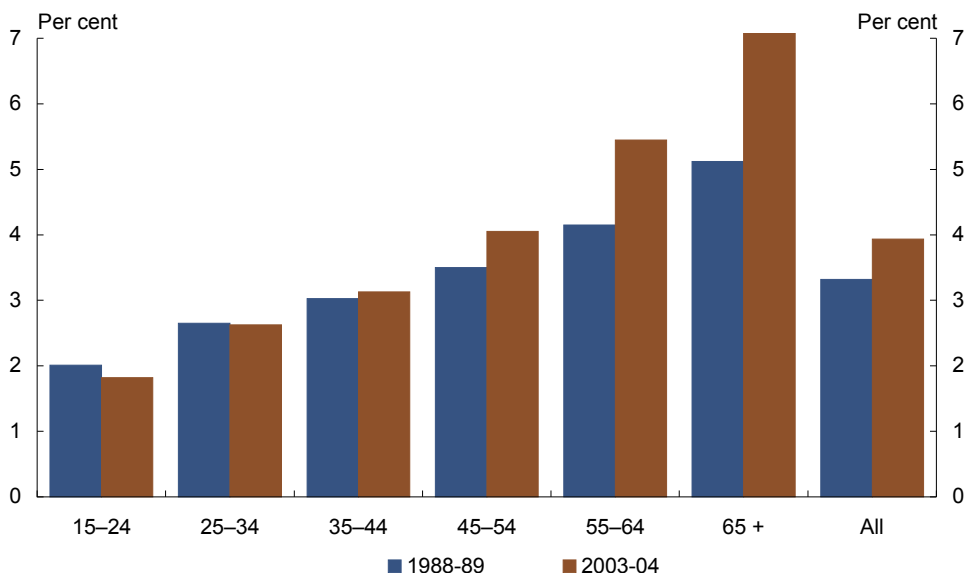
This scenario is complicated, however, by the fact that a future decrease in saving would be preceded by a build up in savings suggesting that over the longer term there may be little average impact on tax revenues.

### *Changed consumption patterns*

As the population ages, the composition of consumption across the economy is likely to change. For example, older people spend a greater proportion of their income on health services than the average, and this proportion has been rising over time (Chart C.6). An ageing population will increase the overall average proportion of income spent on health, hence decreasing GST (as health services are GST-free). At the same time, however, an ageing population will also decrease the overall average proportion of income spent on education, which is also GST-free.

Assuming that the consumption behaviour of each age cohort remains at 2003–04 percentages, changes in the composition of consumption from population ageing are estimated to subtract less than 0.1 percentage point from the tax-to-GDP ratio at the end of the IGR period.

**Chart C.6: Expenditure on medical care and health expenses as a percentage of total household expenditure, by age of reference person**



Source: *Household Expenditure Survey*, ABS cat. no. 6530.0.

### *Changed labour-capital ratios*

The labour-capital ratio may trend in a particular direction affecting the relative taxes on wages and capital. For example, a change to saving rates or the composition of expenditure will affect the composition of income between wages and profits as the economy shifts its production.

The impact on taxes will depend on the difference between tax rates on wages and profits. Historically, both rates range between 24 and 28 per cent, depending on the year and definitions used.<sup>2</sup> The small range of these rates suggests that a very large compositional change between wages and profits would be required before there was a significant effect on tax revenues.

For example, between 1959–60 and 2008–09 corporate profits increased from 36.5 per cent of total wages to 51.3 per cent of total wages. Even with the effective tax rate for profits assumed to be 5 percentage points higher than for wages, the

<sup>2</sup> For effective corporate tax rates see Box 5.2 of 2007-08 Budget Paper No. 1. Effective tax rates on wages depend on how items such as the Medicare Levy and various offsets are treated.

tax-to-GDP ratio would have increased by only 0.2 percentage points as a result of the compositional change.

While there is considerable uncertainty in quantifying such scenarios over 40 years or more, the considerations above provide some support for believing that the impact on tax revenues from an ageing population will be largely captured through the effect on the aggregate size of the economy rather than compositional changes in the economy.

## C.3 Spending projections

### C.3.1 Health

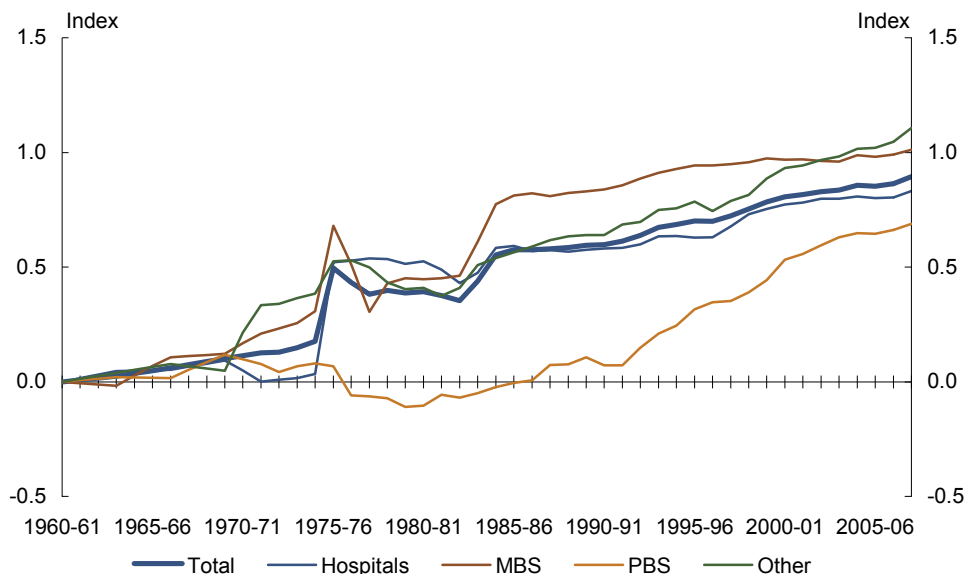
#### Primary model

Projections of health spending over the next 40 years are based on trends in the cost of health services per head of population by age and gender, combined with projected population changes.

For the past 50 years, aggregate Australian government health expenditure has grown steadily outside periods of major reform. The historical variability in growth for components of health spending poses challenges for projecting health expenditure over a 40-year period (Chart C.7). It means that while modelling components separately (using so-called component models) provides useful policy insight in the short to medium term, this may be less robust to technology-induced changes in the composition of health care than using a model of total health care expenditure (a so-called aggregate model).

In previous IGRs, health expenditure has been projected on the basis of component models. This was useful to illustrate the different trends in the components of health expenditure and the long-term impacts of these trends, such as highlighting the rapid increase in spending on pharmaceuticals through the 1990s and early 2000s. In more recent years, growth in spending on pharmaceuticals has moderated but remains a significant component of health expenditure. On the other hand, expenditure on private health insurance is becoming a bigger driver of Australian government health expenditure. Given that shares and trends can change significantly over the longer term, moving to an aggregate model is likely to provide a more robust long-term projection of Australian government health expenditure.

**Chart C.7: Historical growth in health component spending**



Note: The index is the logarithm (base 10) of real per capita spending, set to zero in 1960–61. An increase of one unit in the index thus implies a ten-fold increase in real per capita spending. The slope of a line gives an indication of the (exponential) non-demographic growth rate at that point in time, with a linear trend reflecting a relatively steady (exponential) non-demographic growth rate.

Source: Australian Institute of Health and Welfare health spending database.

The challenge with long-term projections is predicting for how long these trends in expenditure on components are likely to continue. To balance the desire for policy insight with the need for long-term stability in projections, this report projects the main components of health spending separately for ten years beyond the end of the forward estimates. This allows different growth rates for medical benefits, pharmaceutical benefits, private health insurance, hospitals and other health spending over this period.

From 2023–24 onwards, this IGR uses a model of total Australian government health spending that assumes that non-demographic growth trends towards the historical growth rate for health spending by all levels of government over the longer term. Projections of spending on individual components are not produced beyond 2023–24.

Since IGR 2007, component projection methodologies have also been refined to reflect new data and policy developments. Major changes include:

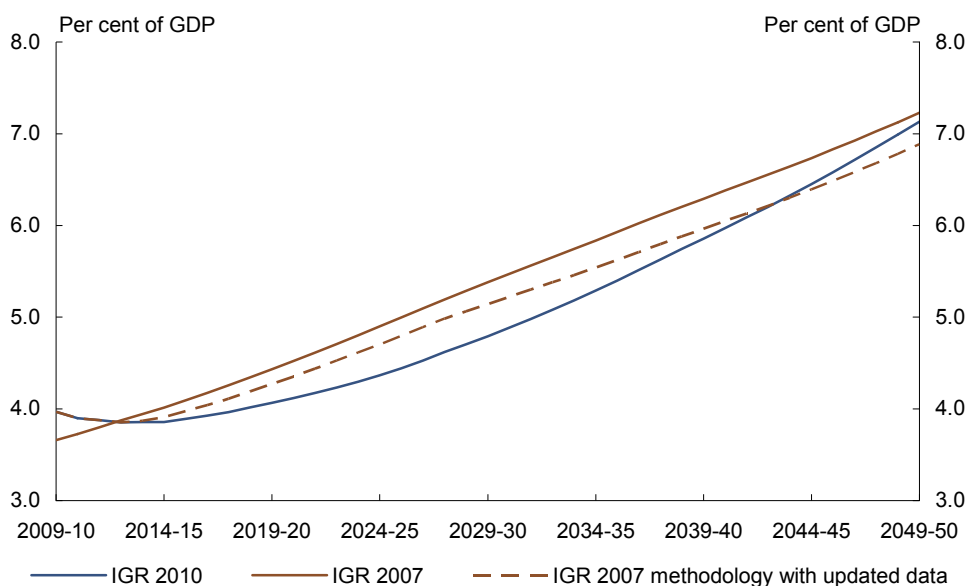
- using a linear model for non-demographic growth in pharmaceutical benefits, based on the change in growth in this area of expenditure;
- using the indexation formula for the National Healthcare Specific Purpose Payment for growth in hospital expenditure, which was agreed in 2008 as part of the reforms to federal financial relations; and



- assuming other expenditure (not including expenditure on veterans) remains a constant proportion of GDP over the projection period, bringing its treatment into line with all other non-modelled expenditure in the IGR.

These changes result in higher projections for hospital expenditure and lower projections for other expenditure than would occur if the projection methodology for IGR 2007 was used. The new methodology gives slightly higher health expenditure in 2049–50 than would have been predicted using the IGR 2007 methodology with updated data (Chart C.8).

**Chart C.8: Impact of methodological changes since IGR 2007**



Source: Treasury projections.

### Further detail

In general, projections are derived by first applying non-demographic growth to current, age-specific spending rates per person. These estimates are then increased by the projected population and CPI to derive nominal projections of spending.

The non-demographic growth rates for each component, and total government health expenditure (used to calculate the growth rate for total Australian government expenditure on health) are derived from trends in the historical data. This is done by first adjusting historical spending data for CPI growth and changes in the size and age structure of the population to derive a series of real age-adjusted spending per person.

The non-demographic growth rates are then determined by fitting trends to these series (Table C.1) and, where possible, calculating non-demographic growth by age group. For medical and pharmaceutical benefits, a linear trend fits the historical data

more closely, so non-demographic growth is projected forward as a constant real dollar increase in spending. For expenditure on private health insurance and total government health expenditure, an exponential trend fits the data more closely, so non-demographic growth is projected as a percentage increase in spending each year.

**Table C.1: Components and modelling approaches for health projections**

<b>Component</b>	<b>Modelling approach (to 2022–23)</b>	<b>Non-demographic growth form and rates(a)</b>
Pharmaceutical benefits	Spending per person by age and gender. Separate growth rates for each age and gender.	Linear growth form. Age gender specific growth varies from \$0.00 per annum to \$53.16 per annum. Where in some age groups non-demographic growth is negative, real per capita expenditure is assumed to remain constant.
Medical benefits	Spending per person by age and gender. Separate growth rates for each age and gender.	Linear growth form. Age gender specific growth varies from -\$0.10 per annum to \$54.18 per annum.
Hospitals	Projected using the National Healthcare Specific Purpose Payment indexation rate (includes a technology growth factor, health price index and an age-weighted population index).	Includes a technology growth factor of 1.2 per cent.
Private health insurance	Spending per person by age and gender. Same growth rate for all ages.	Exponential growth form; 4.5 per cent per annum.
Other health spending(b)	Veterans spending not elsewhere included is on a per person basis. Remainder assumed to remain a constant proportion of GDP.	
<b>Modelling approach in aggregate model (2023–24 to 2049–50)</b>		<b>Non-demographic growth form and rates(a)</b>
Spending per person by age and gender. Same growth rate for all age groups.		Exponential growth form; 1.8 per cent per annum trending up to 3.2 per cent per annum.

(a) Per person real age adjusted.

(b) Other health spending includes population health and safety, workforce initiatives and non-Medical Benefits Scheme payments to GPs (including for infrastructure, training and the Practice Incentive Program), medical research, and veterans' health spending not elsewhere modelled.

Different age groups have different relative per person spending rates (Table C.2 and Chart C.9). For all components of spending, per person spending rates are higher for older age groups than for younger age groups. This is most notable for pharmaceutical benefits and hospital spending. Spending rates tend to peak at age 75 to 84 years for most spending components, except for hospitals where the peak is for those over 85 years.

As the population grows and ages more people will fall into the age groups that are the most frequent users of the health system. From 2009–10 to 2049–50, real spending on

those aged over 65 years is expected to increase around seven-fold. Real spending on those aged over 85 years is expected to increase around twelve-fold.

Nevertheless, nearly half the increase in expenditure over the projection period is on those under 65 years of age, indicative of the important role non-demographic growth plays in increasing health expenditure.

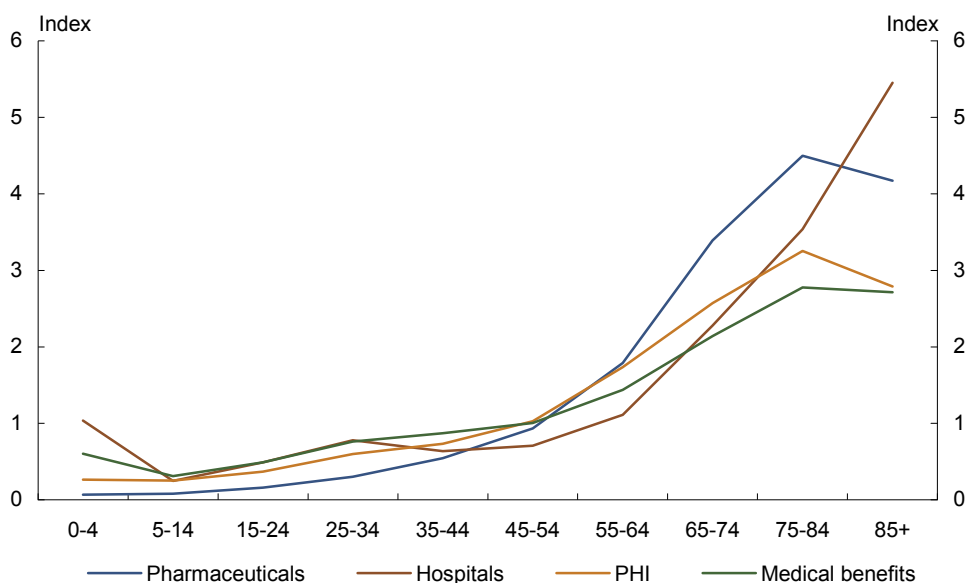
**Table C.2: Index of the 2008 age profile of health spending per person**

Age group	Pharmaceutical benefits	Medical benefits	Hospitals	Private health insurance
0-4	0.07	0.60	1.04	0.26
5-14	0.08	0.31	0.25	0.25
15-24	0.16	0.49	0.49	0.37
25-34	0.30	0.76	0.78	0.60
35-44	0.54	0.87	0.64	0.73
45-54	0.93	1.01	0.71	1.03
55-64	1.79	1.44	1.11	1.74
65-74	3.39	2.14	2.28	2.57
75-84	4.50	2.78	3.54	3.25
85+	4.17	2.71	5.45	2.79
<b>All people</b>	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>

Source: Treasury estimates based on data from the Department of Health and Ageing, Department of Veterans' Affairs, Medicare Australia, Australian Institute of Health and Welfare, and Private Health Insurance Administration Council.

**Chart C.9: Index of the age profile of health spending per person**

(Weighted average of all people = 1)



Source: Treasury estimates based on data from the Department of Health and Ageing, Department of Veterans' Affairs, Medicare Australia, Australian Institute of Health and Welfare, and Private Health Insurance Administration Council.

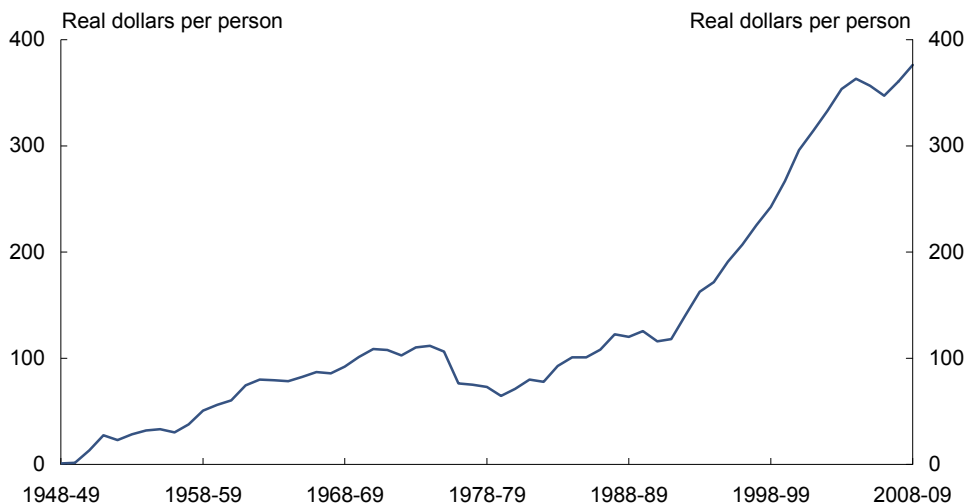
### Pharmaceutical benefits

The pharmaceutical benefits model covers spending under the Pharmaceutical Benefits Scheme (including the Highly Specialised Drug Program) and the Repatriation Pharmaceutical Benefits Scheme.

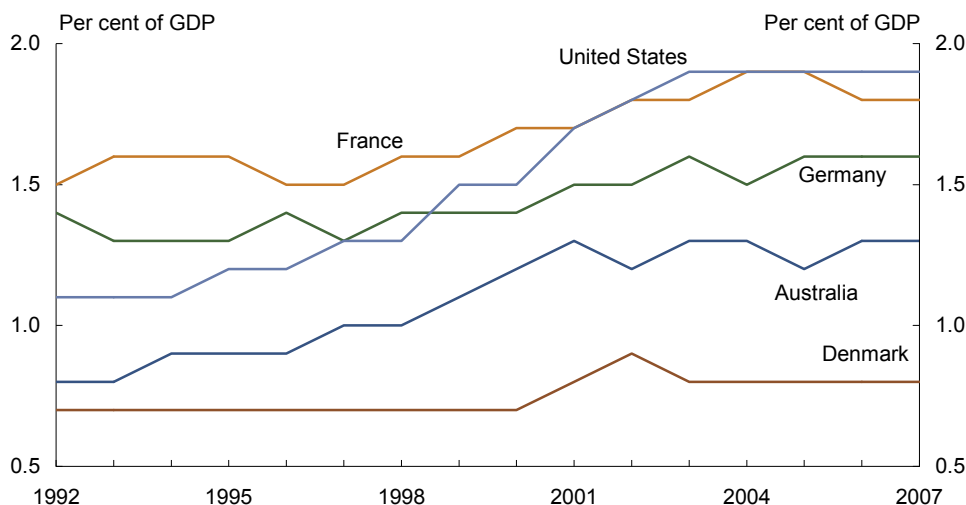
There was rapid growth in real per capita PBS expenditure between 1991–92 and 2004–05 (Chart C.10). This was mainly driven by the listings of high-volume drugs such as lipid-modifying agents (cholesterol-reducing drugs).

The rapid growth in drug spending as a share of GDP appeared in many countries, with differing systems, but has flattened out in recent years (Chart C.11). Notwithstanding this, the PBS remains a significant component of overall health costs, and will need to be monitored closely in case high growth trends re-emerge.

**Chart C.10: Age-adjusted pharmaceutical spending per person (2009–10 dollars)**



Source: Department of Health and Ageing and Medicare Australia, and Department of Veterans' Affairs annual reports.

**Chart C.11: Pharmaceutical spending in selected OECD countries**

Source: OECD Health Data 2009, June 2009.

Since IGR 2007, new data has become available from Medicare Australia to determine a more accurate age/gender profile of spending per person. Trends in this data, particularly in real per capita expenditure by age and gender, support a change to a linear functional form as a better fit for the longest sample of consistent historical data, 1983–84 to 2008–09.

### *Medical benefits*

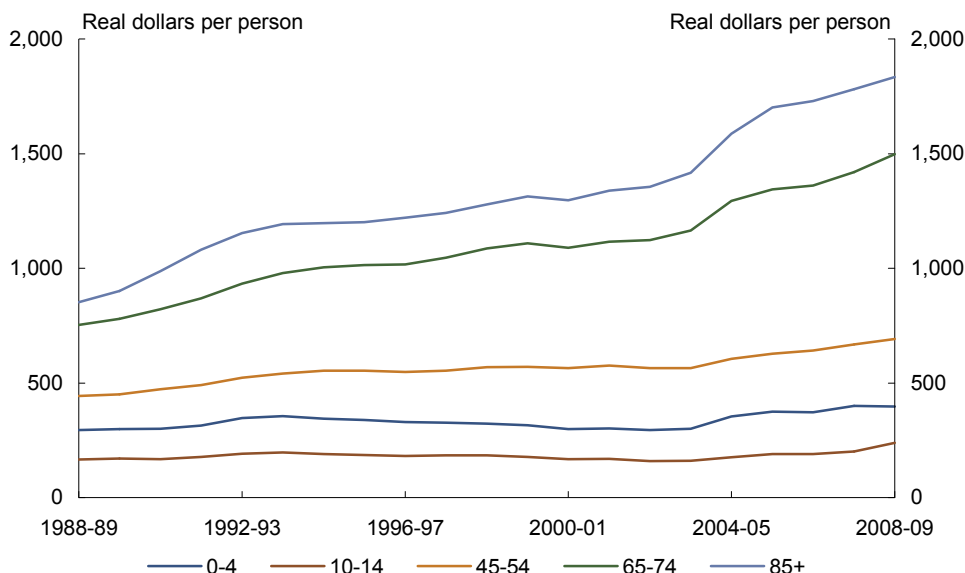
The medical benefits model includes spending under the Medicare Benefits Schedule and equivalent age-specific and gender-specific spending rates for veterans.

The data on medical benefits allows for the calculation of different non-demographic growth for men and women in a given age range. To calculate accurate real per person spending rates, the historical population series used removes veterans, who receive medical services under separate arrangements to the Medicare Benefits Schedule. Because of limitations in the availability of veteran population data, the historical series used covers 1988–89 to 2008–09 (Chart C.12).

Fitting trends to these spending series indicates that non-demographic growth in medical benefits historically has followed a largely linear trend. Projections for medical benefits are based on these observed trends in non-demographic growth. Calculated growth is very low for age groups below 65 and highest for men aged 75 and over.

**Chart C.12: Real medical benefits spending per person  
(in 2009–10 dollars)**

Selected age groups



Source: Department of Health and Ageing.

### Hospitals

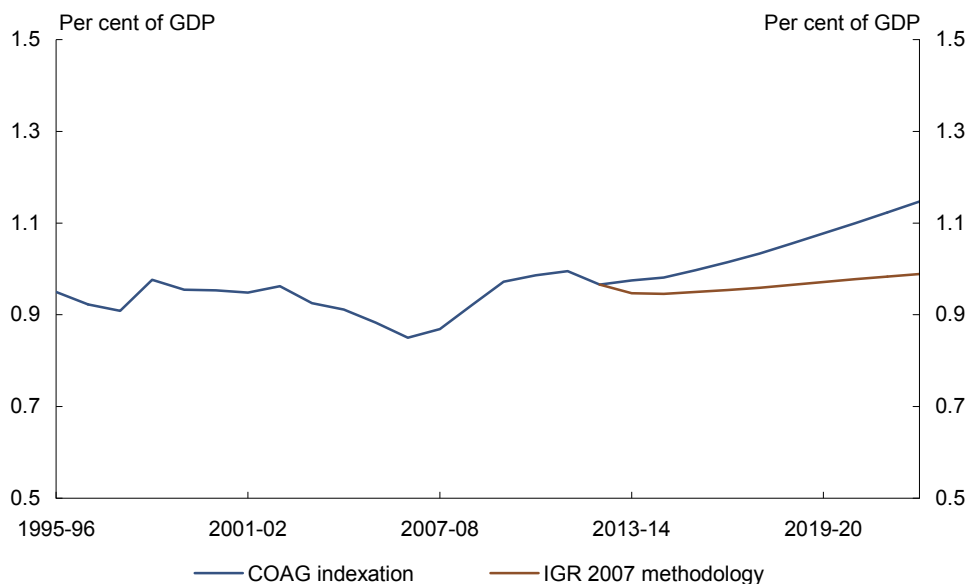
The hospitals model projects spending under the National Healthcare Specific Purpose Payment (SPP) and equivalent age-specific and gender-specific expenditure for veterans. In November 2008, the Council of Australian Governments agreed to a new indexation rate for the National Healthcare SPP under the new federal financial framework.

This new indexation rate, which is around 7 per cent, is used as the basis for projecting Commonwealth hospital expenditure. The indexation rate is a composite index that reflects age-weighted population growth, growth in health prices as measured by the Australian Institute of Health and Welfare and a health technology growth factor of 1.2 per cent.

Funding for veterans is included by adjusting the forward estimates expenditure for the National Healthcare SPP to include equivalent age-specific and gender-specific expenditure for veterans. The indexation rate is then applied to this higher base, and thus equivalent expenditure on veterans is included in the projection.

As shown in Chart C.13 the new methodology projects higher expenditure on hospitals than the methodology used in IGR 2007, consistent with the Government’s increased funding commitment for hospitals.

**Chart C.13: Projected hospital spending: comparison of IGR 2010 and IGR 2007 methodology**



Source: Treasury projections and Department of Health and Ageing.

### *Private health insurance*

The private health insurance model incorporates spending on the private health insurance rebate introduced on 1 January 1999. The rebate increased from 30 per cent to 35 per cent for people aged 65 to 69 years and to 40 per cent for people aged 70 years or more from 1 April 2005. From 1 July 2010, the rebate will remain unchanged for people with income for surcharge purposes below \$75,000 per annum for singles and \$150,000 per annum for families, but will be progressively reduced for people with income above these amounts — phasing out above \$120,000 for singles and \$240,000 for families. The private health insurance surcharge rate also will increase progressively for people with income above \$90,000 for singles and \$180,000 for families.

Age-specific and gender-specific spending rates were calculated by using the age and gender profile of benefits paid out by private health insurers per person. This age profile is used to indicate the impact of ageing on private health insurers' costs which affects premiums and thus the rebate.

Historical information is compiled on the nominal total cost of the rebate each year, with 2000–01 chosen as the start year for the analysis. This start date excludes the rapid growth in spending in 1999–2000 related to the initial uptake of the rebate and effect of the introduction of Lifetime Health Cover on 1 July 2000.

An exponential trend for non-demographic growth was found to provide the greatest explanatory power, and was fitted to the real per person age-adjusted spending series,

resulting in a growth rate of 4.5 per cent a year. As the historical spending data do not fully reflect the recent increase in the rebate for older Australians, this growth rate is likely to be conservative.

### *Other health spending*

Other health spending includes all other Australian government health spending but does not include administration expenses. Major components of other health include:

- health workforce programmes, including payments to GPs for infrastructure, training and support, and the Practice Incentive Program;
- population health and safety programmes, including funding of essential vaccines;
- health and medical research; and
- spending on veterans' health care.

Spending on veterans' health care included in the other health model represents additional Australian government spending on this group compared to other Australians. Spending is projected in a linear form based on trends in real spending per person from 1993–94 to 2004–05. These were then combined with population projections from the Department of Veterans' Affairs and CPI assumptions.

Remaining spending in the other health model is assumed to remain as a constant proportion of GDP. This approach is consistent with how other payments are modelled in the rest of the report.

IGR 2007 modelled other spending using a linear trend as a proportion of GDP. Under the new approach, other spending is projected to be lower by 2022–23 than in IGR 2007.

### *Aggregate model*

Historical trends suggest that the components of health spending will grow at different rates in the short to medium term. History also suggests that these differences are unlikely to be maintained over the long term. For this reason, the IGR transitions to an aggregate model of health expenditure from 2022–23. It does this by growing the projected real per capita spend in each age and gender group by an aggregate non-demographic growth rate.

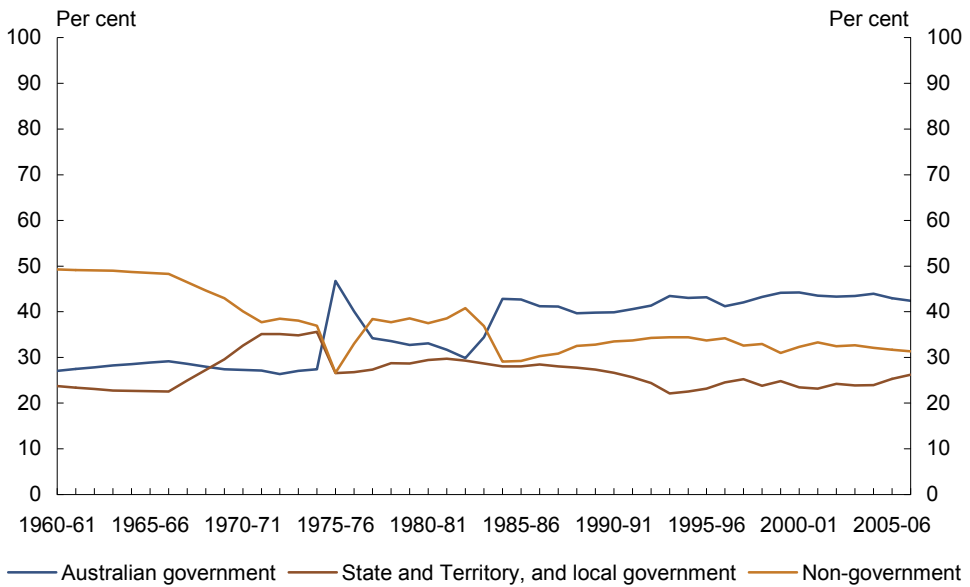
The non-demographic growth rate is calculated from the growth in real, age-adjusted per capita spending from all government sources — Australian, State and Territory, and local governments. This is equivalent to assuming long-term stability in funding shares between levels of government. The data shown in Chart C.14 suggests that this is a reasonable assumption; with the exception of major reform periods, funding shares



have been relatively stable. The growth rate is calculated from after the introduction of Medicare — the last major reform to have a pronounced impact on funding shares.

To aid a smooth transition between models, non-demographic growth in the aggregate model starts out at the rate implied by the component models at the end of their projections — around 1.8 per cent. This is transitioned up to the all-government growth rate of 3.2 per cent using a logistic curve.

**Chart C.14: Shares of total health expenditure**



Source: Australian Institute of Health and Welfare health spending database.

### Table C.3: Health spending data sources

#### Pharmaceutical benefits

##### Age-cost profiles

Average of age-cost profiles from 2002–03 to 2008–09. Data includes all Pharmaceutical Benefits Scheme and Repatriation Pharmaceutical Benefits Scheme spending administered by Medicare Australia sourced from Medicare Australia. An age-cost profile was imputed for some special arrangements pharmaceutical spending which is not administered by Medicare Australia and for which an age-cost profile is unavailable.

##### Historical programme spending

Pharmaceutical Benefits Scheme data from Department of Health and Ageing website and Medicare Australia website. Repatriation Pharmaceutical Benefits Scheme data from Department of Veterans' Affairs annual reports and Medicare Australia website.

#### Medical benefits

##### Historical programme spending by age and gender

Data sourced from Table D.2 — Benefits Paid, Medicare Statistics, Department of Health and Ageing website. Veterans' population data supplied by the Department of Veterans' Affairs.

#### Hospitals

##### Age-cost profiles

Public hospital spending ratios supplied by Australian Institute of Health and Welfare. Veterans' population data supplied by the Department of Veterans' Affairs.

##### Historical programme spending

Public Hospital spending data from Department of Health and Ageing and the Australian Institute of Health and Welfare health spending database.

#### Private health insurance

##### Age-cost profiles

Average of Private Health Insurance Administration Council hospital and ancillary benefits paid data from 2002–03 to 2008–09.

##### Historical programme spending

Private Health Insurance Rebate spending data from the Department of Health and Ageing.

#### Other health

##### Historical programme spending

Computed from annual report data compiled by the Department of Health and Ageing, covering spending by that department, the Department of Veterans' Affairs and the Australian Taxation Office. Veterans' population data supplied by the Department of Veterans' Affairs.

#### Aggregate model

##### Historical government spending

Computed using data on health expenditure by all government sources from the Australian Institute of Health and Welfare health spending database.

## C.3.2 Aged care

These projections are based on current spending per person receiving aged care services (indexed for growth in costs) and the projected number of older people. The projection combines base participation rates by age and gender for the main aged care programs with the projected population by age and gender. Together with assumed growth in the average (government) cost per participant, this provides a base projection. The projection method is very similar to the one used in IGR 2007 and adapts and extends the aged care model used by the Productivity Commission (2005).

The dominant factor in aged care spending is the number of people aged 85 and over, as the proportional use of formal aged care services increases rapidly for both men and women beyond this age. As noted elsewhere, the number of people aged 85 and over is expected to more than quadruple over the projection period. Thus, ageing will exert substantial pressure on aged care spending.

The projections directly allow for factors influencing the participation rate by program (such as the trend to increased community care and the availability of carers). The model also reduces cost to government by increasing private contributions in line with the growing real income and wealth of the users of aged care services.

## **Changes in the unit cost of care**

### *Labour costs*

Labour costs, representing around three-quarters of total residential costs and a slightly higher proportion of the cost of community care services, dominate the cost of aged care (Hogan 2004). Real unit costs have grown and will continue to grow in aged care, reflecting quality improvements, increasing frailty of users and workforce pressures, counterbalanced by improvements in productivity in the sector. In these projections, real unit costs are assumed to grow at 1.6 per cent per annum. This parallels the approaches taken in previous IGRs.

### *Disability rates*

The proportion of the population likely to seek long-term aged care is correlated with the numbers classified as having severe or profound levels of disability. Thus reductions in rates of severe disability among older age groups, and the greater use of technology to allow people to live independently, could partially offset the greater demand for aged care coming from increased numbers of older people.

The Australian Bureau of Statistics surveys and Australian Institute of Health and Welfare analyses continue to suggest a relatively stable prevalence rate of severe disability among older Australians. Accordingly, the base projections presented here do not assume any change in severe disability rates. This assumption is an important one; if disability were to fall at the rate used in the Hogan Report the base projections would fall by around 0.2 per cent of GDP.

## **Change in the care mix and role of informal care**

Most older people wish to remain and be cared for in the community for as long as possible. Reflecting both current trends and policy, these projections incorporate some change in care mix away from low-level residential care to community care over the medium term.

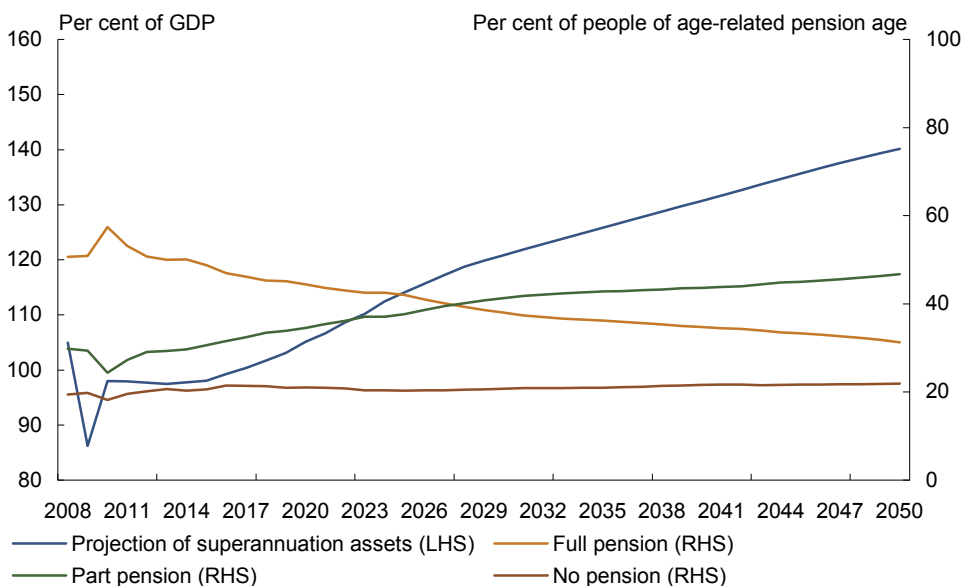
## Impact of a wealthier aged population

Treasury’s RIMGROUP model underlies the projections of age-related pensions and projects the increasing income and wealth of successive cohorts of retirees. This modelling incorporates the maturing of the Superannuation Guarantee arrangements and other Government policies, such as the Better Superannuation package and other recent changes such as the legislated change to Age Pension age.

The established trend of higher private incomes and wealth interacts with means tests to constrain future spending on age-related pensions. Similarly, extensive means tests apply in aged care, and the aged care projections include the reduction in Australian government costs as the increasing income and wealth of participants generates higher private contributions.

Chart C.15 shows that superannuation assets are projected to rise from 100 per cent of GDP to around 140 per cent by 2049–50. Importantly, superannuation assets are not projected to decline as the baby boomers retire and withdraw their assets but asset growth relative to GDP is projected to be slow. The impact of higher wealth is shown in the projected decline of full-rate pensioners and in the projected rise in part-rate pensioners and non-pensioners in the chart.

**Chart C.15: Projections of superannuation assets and age-related pension coverage and type**



Source: Treasury projections.

## C.3.3 Income support payments

### Comprehensive policy models

RIMGROUP is a comprehensive cohort projection model of the Australian population, which starts with population and labour force models, tracks the accumulation of superannuation, estimates non-superannuation savings and calculates pension payments and the generation of other retirement incomes (after all taxes). Thresholds and withdrawal levels associated with income and assets tests are modelled in detail.

The model is consistent with current policy and also includes known future policy changes such as increases to the superannuation preservation age and, importantly, the raising of the eligibility age to receive the Age Pension from 65 to 67 progressively from 2017.

RIMGROUP's ability to estimate improvements in retirement income and assets make it superior to trend projections of age-related pensions or those using a coverage rate approach. It projects in detail the higher retirement incomes of Australian retirees as the superannuation system matures and reflects this as a restraining influence on Australian government spending on age-related pensions over time.

The usual approach to testing such models is to see how they track history and to check their predictive ability. Testing on RIMGROUP has shown good results in respect of both tracking history and predicting likely outcomes from policy changes. The projections have been benchmarked to the forward estimates.

In addition to including the pension reforms announced in the 2009–10 Budget, IGR 2010 includes an increase in age-related pension payments in the form of Carbon Pollution Reduction Scheme (CPRS) compensation.

### Coverage trend models

Coverage trend models were used when spending was strongly related to participation rates for a payment and the unit cost growth was linked to a price index. These models were used to project spending on Disability Support Pension, Parenting Payment Single, Parenting Payment Partnered, Newstart Allowance, Youth Allowance (Student and other), Austudy, Wife Pension, Carer Payment, Family Tax Benefit, Child Care Benefit and Baby Bonus.

The approach takes historical data on coverage or participation (in a payment or service) and extracts the trend to give a coverage or participation projection for the future, usually by age and gender. This projection is used with the population (or unemployment) projections and a standard unit cost to project the future level of expenses. The standard unit cost is usually independent of age or gender and assumed to grow in the future in line with either wages or CPI growth (or a mixture).

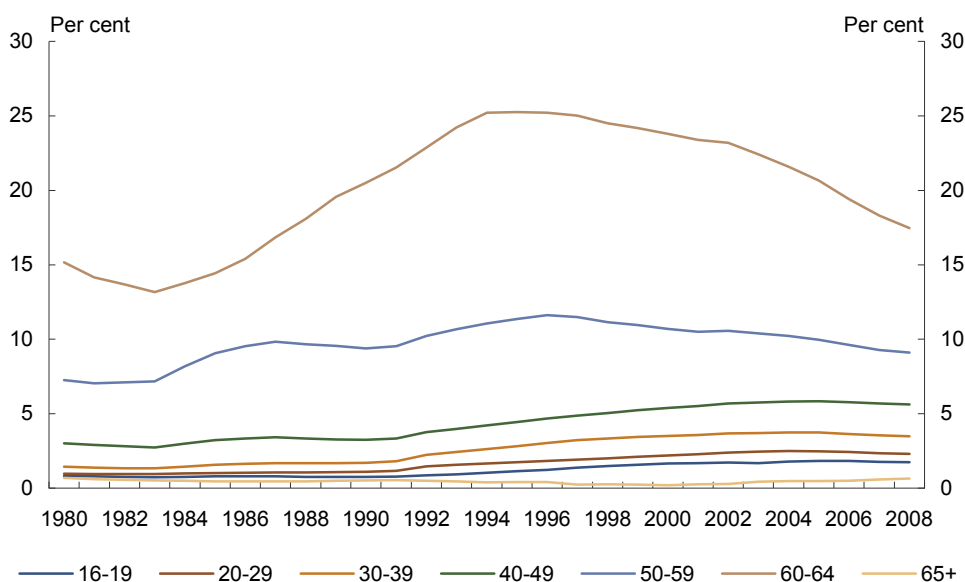
The projection of coverage often involves non-linear techniques such as logistic functions.

The modelling for the Disability Support Pension (DSP) illustrates the process. DSP uptake has grown strongly from 220,000 recipients in 1983 to 732,400 recipients in 2008 (Chart 4.12). The upward trend in DSP recipients has started to flatten since IGR 2007, except for women aged 60 to 64 (Charts C.16 and C.17).

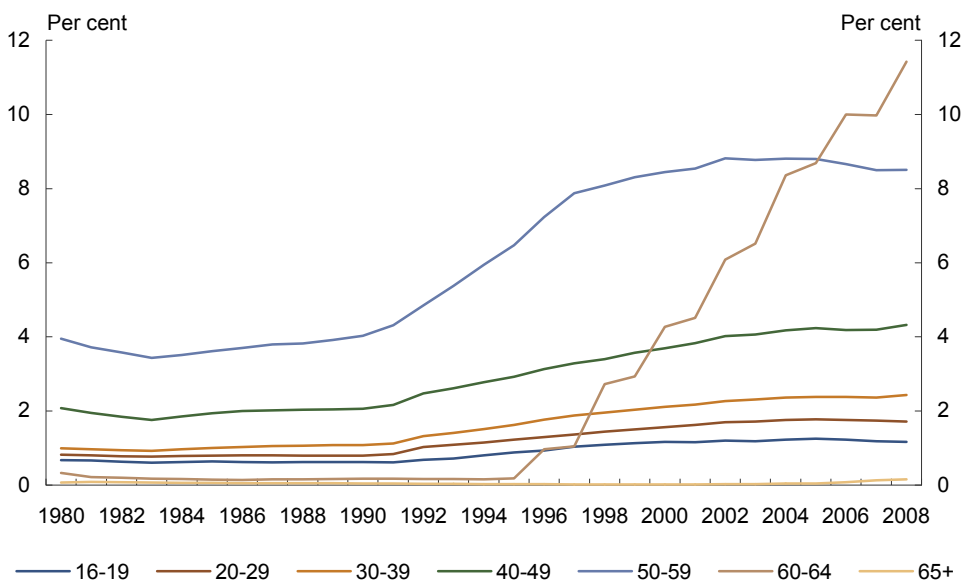
DSP coverage rates are projected based on historical trends for seven age groups, with growth being gradually slowed. The number of DSP recipients in the future is expected to decrease with potential new recipients being required to go onto Newstart Allowance if they are assessed as able to work 15 hours or more per week at award wages. To project the number of recipients for a given year, these rates were multiplied by the population in each age group. An average rate of payment was calculated for DSP and indexed by wages (MTAWE) for future years. Projected nominal spending was derived by multiplying the projected recipient numbers and the indexed rate per recipient, and benchmarked to the forward estimates. Lastly, the GDP projection was used to calculate the projections as a proportion of GDP.

While the increase in the Age Pension age announced in the 2009–10 Budget will reduce the number of people eligible to receive the Age Pension, it is assumed that a proportion of those who would otherwise have been eligible to receive a pension when they turn 65 will remain on other benefits. Coverage rates for DSP and Newstart Allowance have been upwardly adjusted to account for the increase in the Age Pension age.

**Chart C.16: Disability Support Pension coverage rates, males by age**



Source: Treasury modelling.

**Chart C.17: Disability Support Pension coverage rates, females by age**

Source: Treasury modelling.

IGR 2010 projects spending on Paid Parental Leave, a measure announced in the 2009-10 Budget, using the methodology adopted by the Productivity Commission in recommending the introduction of such a scheme (Productivity Commission, 2009). As parents taking Paid Parental Leave are ineligible to receive the Baby Bonus, the number of recipients receiving the Baby Bonus have been adjusted to take into account the number of recipients of Paid Parental Leave.

The Child Care Rebate, previously known as the Child Care Tax Rebate, was not modelled in IGR 2007 as it was previously a tax rebate and not an income support payment. Because of an absence of historical data, it could not be modelled using a coverage trend model. After 2012-13, expenditure on the Child Care Rebate is assumed to increase at the same rate as expenditure on the Child Care Benefit.

Table C.4 summarises both the coverage ratio and standard unit cost methods used in modelling payments to individuals using coverage trend models.

**Table C.4: Summary of income support payment projection methodology**

	<b>Coverage rates</b>	<b>Future trends</b>	<b>Unit cost growth</b>
Disability Support Pension	Derived for seven age groups for men and women	Logistic curves used to taper growth	MTAWE
Parenting Payment Single	Derived for seven age groups for men and women	Logistic curves used to taper growth	MTAWE
Newstart Allowance	Derived for six age groups	Coverage based on recent recipient to unemployed persons ratios	CPI
Parenting Payment Partnered	Derived for six age groups	Coverage based on recent recipient to unemployed persons ratios	CPI
Carer Payment	Derived for eight age groups for men and women	Logistic curves used	MTAWE
Wife Pension	Total	Linear regression	MTAWE
Youth Allowance Student	Derived for three age groups for men and women	Coverage based on recent average	CPI
Austudy	Derived for three age groups for men and women	Coverage based on recent average	CPI
Family Tax Benefit	Average per child for FTBA and per family for FTBB	Coverage based on recent average	CPI
Child Care Benefit	Average per child	Coverage based on female labour force participation	CPI
Baby Bonus	Average per child	Projected number of births	CPI

IGR 2010 includes an increase in payments to individuals in the form of CPRS compensation. This applies to the following payments: DSP, Parenting Payment Single, Parenting Payment Partnered, Newstart Allowance, Youth Allowance (Student and other), Austudy and Family Tax Benefit. In modelling CPRS compensation, the average payment per recipient is indexed with CPI and then multiplied by the number of recipients to calculate the amount of compensation paid.

### C.3.4 Education

Projections of education spending over the next 40 years are based on current Australian government spending combined with projections of total student numbers incorporating demographic change and economy-wide cost growth. Average costs per student in the different sectors have been indexed by wages. For IGR 2010, expenditure projections are done separately for each of government and non-government schools and specific funding for schools, vocational education and training (separately for apprentices and other) and higher education.

Reflecting the stability in school-age participation rates, they are projected to remain at an average of the annual rates since 1994. An important contributor to increasing



school expenditure is the ratio of non-government to government school attendance. This ratio has increased linearly for many years so that by 2008, about 35 per cent of girls and 33 per cent of boys were attending non-government schools. This increasing trend is projected to continue and there is a separate calculation of student numbers attending government and non-government schools out to 2049–50.

University participation rates for males aged 17 to 21 years and females aged 17 to 25 years are projected to increase allowing for previously unmet demand to be accommodated. For the same reason, for males aged 22 years and over and females aged 26 years and over, participation rates are held at around current levels, rather than being allowed to fall further in line with recent trends. Only students in Australian government supported places are included in the projections.

Vocational education and training participation rates for apprentices are projected to increase for males aged 14 to 28 years and females aged 14 to 18 years in line with recent trends. Apprentice participation rates for older people are held at around current levels rather than being allowed to fall further. For other vocational education and training, participation rates for males and females aged 15 to 18 years are projected to increase, while for people aged over 18 years, rates are held at around current levels.

Total education spending to 2012–13 reflects the forward estimates. From 2013–14, average Australian government contributions per student were calculated for each component separately; this average cost is then indexed for projected increases in inflation and wages growth, and multiplied by the projected student populations to obtain nominal spending for each sector. These are aggregated and total nominal spending as a proportion of projected GDP is calculated.

This methodology projects future Australian government education funding based on the current Australian government spending combined with projections based on demographic change and economy-wide cost growth, rather than modelling spending as a continuation of current funding arrangements.

### **C.3.5 Government employee superannuation**

Projections of Australian government spending on defined benefit superannuation over the next 40 years are based on official actuarial valuations using data to 30 June 2008 and published in the 2008 Long Term Cost Reports. The reports rely on economic assumptions which differ slightly from those underpinning the IGR. The impact of this inconsistency is not considered to be material.

The valuations project the unfunded liabilities and Commonwealth outlays associated with the four major defined benefit superannuation schemes: the Commonwealth Superannuation Scheme, the Public Sector Superannuation Scheme, the Defence Force Retirement and Death Benefits Scheme and the Military Superannuation and

Benefits Scheme. These schemes account for almost all of the Australian government's unfunded superannuation liability.

Superannuation costs in relation to civilian employees who are members of fully funded accumulation plans, such as the Public Sector Superannuation Scheme Accumulation Plan (PSSap), are not separately modelled. For the purposes of this report, such superannuation spending is included in 'other' government spending. It is worthwhile noting that, during the process of transition from unfunded defined benefit schemes to funded accumulation arrangements, the superannuation costs associated with civilian employees who are members of the fully funded schemes will increase significantly faster than other departmental operating expenses such as salaries.

### C.3.6 Defence

Whereas IGR 2007 included defence spending as part of the 'other spending' criterion, IGR 2010 has modelled Defence funding based on the long-term 2009 Defence White Paper commitment. The White Paper funding commitment extends from 2009–10 to 2029–30 and provides for:

- 3 per cent average real growth in the Defence budget to 2017–18; and
- 2.2 per cent average real growth in the Defence budget from 2018–19 to 2029–30.

In addition, the White Paper included a provision for fixed indexation of 2.5 per cent for the period to 2030. Previously defence funding had been indexed by the non-farm GDP deflator. The fixed indexation arrangement will remove the need to adjust defence expenditure parameters to short-term fluctuations in the broader economy.

A number of adjustments have been made to the White Paper funding profile to account for two 2009–10 Budget decisions to move funding across years.

The first adjustment will deliver savings of \$2 billion over three years from 2010–11 which will be returned to the Defence budget beyond 2015–16. This aims to ensure defence funding is consistent with large capital acquisitions set out in the White Paper.

The second adjustment reflects the transition to the new Defence White Paper long-term funding path over 2013–14 and 2014–15. Defence funding will be \$1 billion below the new long-term funding path in 2013–14 and \$500 million lower in 2014–15 as higher funding levels are phased in. These amounts will be added back to the Defence budget from 2016–17 onwards.

The White Paper funding profile does not include funding for future international operations because of the inherent difficulty in anticipating future operational requirements. Consistent with this, funding for operations agreed in the 2009-10 Budget has not been included in Defence funding.

The model assumes defence funding is held constant at the 2029–30 share of GDP of 1.8 per cent from 2030–31 to 2049–50.

### C.3.7 Other spending

Other government spending includes GST payments to the States and Territories, purchases of non-financial assets and ‘other payments’. These areas of spending generally do not have a clear link with demographic factors. Consequently these spending categories are not modelled separately.

#### *GST payments*

As the GST is entirely passed on to the States and Territories, GST payments are assumed to equal GST receipts, which in turn are modelled as a revenue head to 2019–20 (see Section C.2). Beyond then, GST is assumed to remain constant as a share of GDP at 3.5 per cent of GDP.

#### *Purchases of non-financial assets*

Purchases of non-financial assets account for a relatively small proportion of other spending (around 2.7 per cent in 2009–10). They include purchases of fixed assets such as property, plant and equipment from outside the government sector, and prepayments. This category is held fixed at 0.1 per cent of GDP from 2012–13 onwards.

#### *Other payments*

Major components of other payments include spending on the environment, transport and communications infrastructure, core government services such as departmental operating expenses and housing and community amenities.

Reflecting the Government’s fiscal strategy, real annual growth in total Government spending is constrained to 2 per cent in years of above-trend growth until the budget is projected to return to surplus in 2015–16. For those years, the overall spending constraint is met by compressing growth in ‘other payments’. This is a technical assumption that allows the underlying spending pressures (particularly those which are demographically sensitive such as health, aged care, age-related pensions and education) to be evident.

As a result of this approach, ‘other payments’ are projected to fall by around one percentage point of GDP. To the extent that savings to implement the fiscal strategy come from faster growing areas, they may yield larger long-term benefits than allowed for in these projections.

Once the budget is projected to be in surplus, other payments are held constant as a proportion of GDP.

## C.4 Carbon Pollution Reduction Scheme

IGR 2010 is based on the *Mid-Year Economic and Fiscal Outlook 2009–10* released on 2 November 2009, and reflects all Government policies announced up to that time. Consequently IGR 2010 incorporates the CPRS as reintroduced to the Parliament in October 2009, before the amendments announced on 24 November 2009.

Consistent with the treatment of all other revenue heads, the IGR models CPRS receipts to 2019–20 then incorporates them into the long-term assumption of a fixed tax-to-GDP ratio based on the historical average. CPRS-related compensation payments are incorporated into modelled income support payments.

Consistent with the methodology adopted for previous IGRs, the growth rates for economic parameters in IGR 2010 are based on the 3Ps framework. As such, the economic impacts of individual policy measures such as the CPRS are not specifically modelled. The modelling reported in the Government's *Australia's Low Pollution Future: the Economics of Climate Change Mitigation* report suggests that the economic impacts from climate change mitigation policies would be modest.

# Appendix D: IGR 2007 projections

## D.1: Revised IGR 2007 projections summary

To facilitate comparisons with IGR 2010, the economic and aggregate fiscal projections in IGR 2007 have been revised to take into account the methodological changes to the System of National Accounts (SNA) from SNA93 to SNA08 by the ABS in December 2009.

**Table D.1: Economic and fiscal projections**

	2009-10	2019-20	2029-30	2039-40	2046-47
<b>Economic projections</b>					
Real GDP growth (%)	3.0	2.4	2.2	2.1	2.0
Real GDP per person growth (%)	1.8	1.4	1.5	1.6	1.6
Total participation rate 15+ (%)	64.9	62.7	60.0	58.1	57.1
Male					
15+	71.8	69.2	66.4	64.5	63.4
25-54	90.8	91.0	91.4	91.5	91.6
55-69	57.3	57.0	56.2	56.3	56.7
Female					
15+	58.2	56.3	53.6	51.7	50.7
25-54	76.5	77.7	78.5	78.9	78.9
55-69	38.7	39.8	39.6	39.7	40.2
<b>Fiscal projections (% of GDP)</b>					
Primary balance	1.0	0.5	-0.9	-2.4	-3.3
Net debt	-3.4	-10.4	-9.8	6.1	26.6

Source: *Intergenerational Report 2007* and ABS cat. no. 5206.0.

**Table D.2: Demographic projections**

	2010	2020	2030	2040	2047
<b>Population projections</b>					
Population (millions)	21.6	23.9	25.9	27.5	28.5
0-14	4.0	4.2	4.3	4.3	4.3
15-64	14.5	15.4	16.0	16.6	17.0
65-84	2.6	3.7	4.8	5.4	5.6
85 and over	0.4	0.5	0.8	1.3	1.6
Life expectancy at birth					
Male	79.9	82.0	83.6	85.1	86.0
Female	84.4	86.1	87.6	88.9	89.8
Total fertility rate	1.82	1.76	1.73	1.71	1.70
Dependency ratios					
Aged to working-age ratio	21.0	27.5	34.9	40.2	42.4
Child to working-age ratio	27.6	27.0	26.6	25.6	25.1
Net migration to population ratio	0.5	0.5	0.4	0.4	0.4

Source: *Intergenerational Report 2007*.

**Table D.3: Revised projections of major components of Australian government spending in IGR 2007 (per cent of GDP)<sup>(a)</sup>**

	2009-10	2019-20	2029-30	2039-40	2046-47
<b>Health</b>					
Hospitals	0.8	0.9	1.0	1.1	1.1
Medical Benefits Schedule	1.1	1.2	1.2	1.3	1.3
Pharmaceutical Benefits Scheme	0.7	1.1	1.5	2.0	2.4
Private Health Insurance	0.3	0.5	0.7	0.9	1.2
Other	0.7	0.8	0.9	1.0	1.1
<b>Total health</b>	<b>3.7</b>	<b>4.4</b>	<b>5.4</b>	<b>6.3</b>	<b>6.9</b>
<b>Aged care</b>					
Residential care	0.6	0.7	0.9	1.3	1.5
Community care	0.2	0.3	0.3	0.4	0.4
<b>Total aged care</b>	<b>0.8</b>	<b>1.0</b>	<b>1.3</b>	<b>1.7</b>	<b>1.9</b>
<b>Payments to Individuals</b>					
Aged and Service Pensions	2.6	3.0	3.5	4.0	4.2
Disability Support Pension	0.7	0.6	0.6	0.6	0.7
Family payments					
Family Tax Benefit	1.4	1.2	1.0	0.9	0.8
Child Care Benefit	0.1	0.1	0.1	0.1	0.1
Baby Bonus	0.1	0.1	0.1	0.1	0.1
Parenting Payment Single	0.4	0.3	0.3	0.3	0.3
Unemployment Allowances and Parenting Payment Partnered	0.7	0.7	0.6	0.5	0.5
Youth Allowance and Austudy	0.2	0.1	0.1	0.1	0.1
Carer Payment and Wife Pension	0.2	0.2	0.2	0.2	0.2
<b>Total payments to individuals</b>	<b>6.5</b>	<b>6.4</b>	<b>6.5</b>	<b>6.7</b>	<b>6.8</b>
<b>Education</b>					
Schools	0.8	0.8	0.9	0.9	0.9
Higher Education	0.6	0.6	0.6	0.6	0.6
Vocational education and training	0.2	0.2	0.2	0.2	0.2
Other	0.0	0.0	0.0	0.0	0.0
<b>Total education</b>	<b>1.8</b>	<b>1.7</b>	<b>1.7</b>	<b>1.7</b>	<b>1.7</b>
<b>Public sector superannuation(b)</b>	<b>0.4</b>	<b>0.4</b>	<b>0.3</b>	<b>0.2</b>	<b>0.2</b>
<b>Total modelled payments</b>	<b>13.1</b>	<b>13.8</b>	<b>15.2</b>	<b>16.7</b>	<b>17.5</b>
<b>Total payments(c)</b>	<b>23.9</b>	<b>24.4</b>	<b>25.8</b>	<b>27.2</b>	<b>28.1</b>

(a) The revised IGR 2007 projections are based on the new level of GDP resulting from the methodological changes to the System of National Accounts (SNA) from SNA93 to SNA08 by the ABS in December 2009.

(b) This refers to the Government's superannuation spending associated with the public sector defined benefit schemes.

(c) Total payments include GST payments but are exclusive of interest payments.

Figures may not add due to rounding.

Source: *Intergenerational Report 2007* and ABS cat. no. 5206.0.

**Table D.4: Projections of major components of Australian government spending in IGR 2007 (real spending per person 2009–10 dollars)**

	2009-10	2019-20	2029-30	2039-40	2046-47
<b>Health</b>					
Hospitals	470	610	770	950	1,070
Medical Benefits Schedule	640	800	970	1,140	1,260
Pharmaceutical Benefits Scheme	380	720	1,200	1,830	2,390
Private Health Insurance	190	320	520	840	1,160
Other	420	550	710	930	1,110
<b>Total health</b>	2,100	2,990	4,180	5,700	7,000
<b>Aged care</b>					
Residential care	330	470	720	1,150	1,480
Community care	120	180	260	350	420
<b>Total aged care</b>	450	650	980	1,500	1,900
<b>Payments to Individuals</b>					
Aged and Service Pensions	1,480	1,990	2,700	3,600	4,240
Disability Support Pension	410	420	480	570	660
Family payments					
Family Tax Benefit	830	800	780	770	780
Child Care Benefit	80	80	80	70	70
Baby Bonus	60	60	60	50	50
Parenting Payment Single	220	210	250	290	320
Unemployment Allowances and Parenting Payment Partnered	420	480	470	460	460
Youth Allowance and Austudy	110	100	90	90	90
Carer Payment and Wife Pension	100	110	130	140	160
<b>Total payments to individuals</b>	3,720	4,260	5,040	6,050	6,820
<b>Education</b>					
Schools	480	560	670	790	890
Higher Education	350	380	440	500	550
Vocational education and training	130	140	170	190	220
Other	30	30	30	40	40
<b>Total education</b>	980	1,110	1,300	1,530	1,700
<b>Public sector superannuation(a)</b>	250	250	240	220	200
<b>Total modelled payments</b>	7,500	9,300	11,700	15,000	17,600
<b>Total payments(b)</b>	13,700	16,300	19,900	24,500	28,200

(a) This refers to the Government's superannuation spending associated with the public sector defined benefit schemes.

(b) Total payments include GST payments but are exclusive of interest payments. Figures may not add due to rounding.

Source: *Intergenerational Report 2007* and ABS cat. no. 5206.0.

## **D.2: Comparisons with IGR 2007 economic and population projections**

### **Demographics**

Australia's estimated resident population in the IGR 2010 projections is 34.9 million in 2047, larger than that projected for IGR 2007 (28.5 million). This is mainly because of higher fertility, lower mortality (with correspondingly higher life expectancies) and higher net overseas migration with a slightly younger age distribution, over the next 40 years, than projected in IGR 2007. There have also been revisions in population estimates and faster population growth in 2007, 2008 and 2009 than was projected in IGR 2007.

Fertility rates have been higher since IGR 2007 than was anticipated and projected fertility rates have been raised to reflect this. In IGR 2007, the total fertility rate was projected to fall to 1.7 by 2047 while, after a small drop from the current level, the total fertility rate is held constant at exactly 1.9 from 2013 onwards in IGR 2010. Mortality rates have also been falling faster than was anticipated in IGR 2007 so life expectancy at birth is projected to be higher, especially for men.

The ABS has revised its methodology for estimating net overseas migration since IGR 2007. 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. This compares to 110,000 people a year projected in IGR 2007, which would have been around 140,000 if the new ABS methodology were available for earlier years.

The proportion of older people in the population is smaller in IGR 2010 than in IGR 2007, but the proportion of children is larger. Overall there is a slightly higher proportion of the population of working age to support the young and those aged 65 and over in the IGR 2010 projections.

In IGR 2010, the aged-to-working-age ratio (the proportion of people aged over 65 to people of traditional working age 15 to 64) is projected to rise to over 37 per cent by 2050. This is significantly below the 42 per cent by 2047 projected in IGR 2007. Over the same period, the child-to-working-age ratio (the proportion of people aged over 65 to people of traditional working age 15 to 64) is projected to fluctuate around the current level of 28.4 per cent in IGR 2010, whereas it fell gradually to 25 per cent by 2047 in IGR 2007.

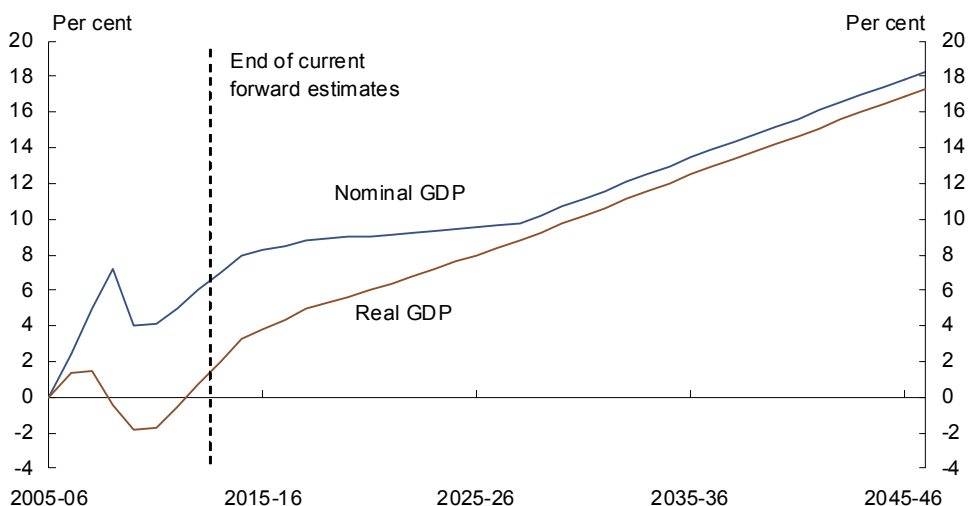
### **GDP and population**

In IGR 2010, real GDP is projected to be 17 per cent higher by 2046–47 than was projected in IGR 2007 and nominal GDP is projected to be 18 per cent higher



(Chart D.1). The higher GDP numbers are the result of differences in population, GDP per person and, in the case of nominal GDP, the GDP deflator. These are discussed in the following sections.<sup>1</sup>

**Chart D.1: Nominal and real GDP**  
Percentage change from IGR 2007 to IGR 2010



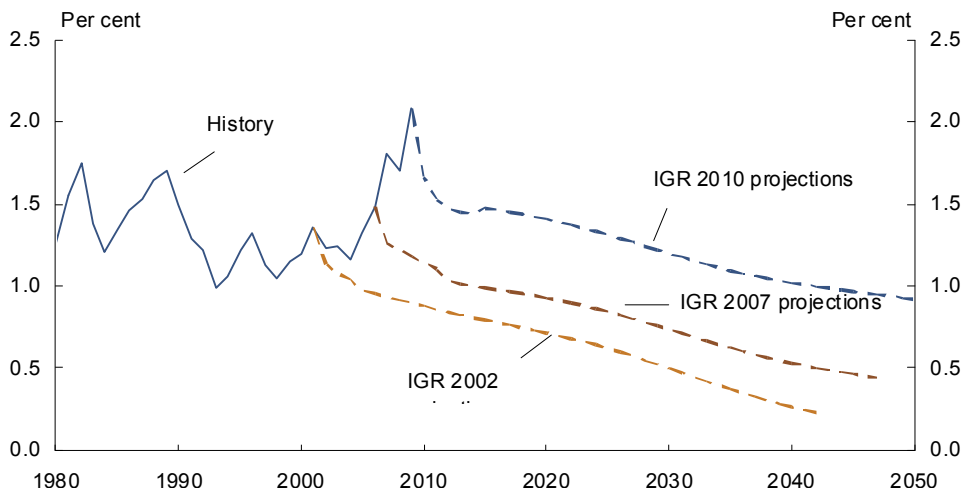
Source: ABS cat. no. 5206.0 and Treasury projections.

## Population

Differences in population growth rates are the largest single source of the differences in nominal and real GDP projections between IGR 2007 and IGR 2010. In IGR 2007, Australia's population was projected to grow to 28.5 million by June 2047, but in IGR 2010, this population projection is 34.9 million. In both the first IGR and IGR 2007, annual population growth was projected to fall steadily, to rates considerably below those in recent history. In IGR 2010, population growth still falls over time, but its annual rate is only a little below 1 per cent at the end of the projection period (Chart D.2).

<sup>1</sup> Differences between projections in IGR 2010 and those published in IGR 2007 partly reflect data revisions between the two reports. These include the move of the National Accounts to the new *System of National Accounts 2008* (SNA08) standard. The GDP comparisons in this Appendix use IGR 2007 projections adjusted for data revisions.

**Chart D.2: Annual population growth rates**



Source: ABS cat. no. 3201.0 and Treasury projections.

A small part of the difference in projected population levels — around 2½ percentage points — stems from revisions to population estimates and faster population growth between 2006 and 2009 than was projected in IGR 2007. Most of the difference, however, reflects differences over the projection period — increased fertility rates, increased migration, declines in mortality and a change in the age structure of migration.

### GDP per person

Projections of both nominal and real GDP per person over the next 40 years are lower in IGR 2010 than they were in IGR 2007 (Chart D.3).<sup>2</sup>

Real GDP per person falls below the levels projected in IGR 2007 over the forward estimates period and is still 1½ per cent lower by the end of the recovery period in the middle of the next decade. It is then projected to grow slightly more slowly than in IGR 2007 and be almost 4 per cent lower by 2046–47.

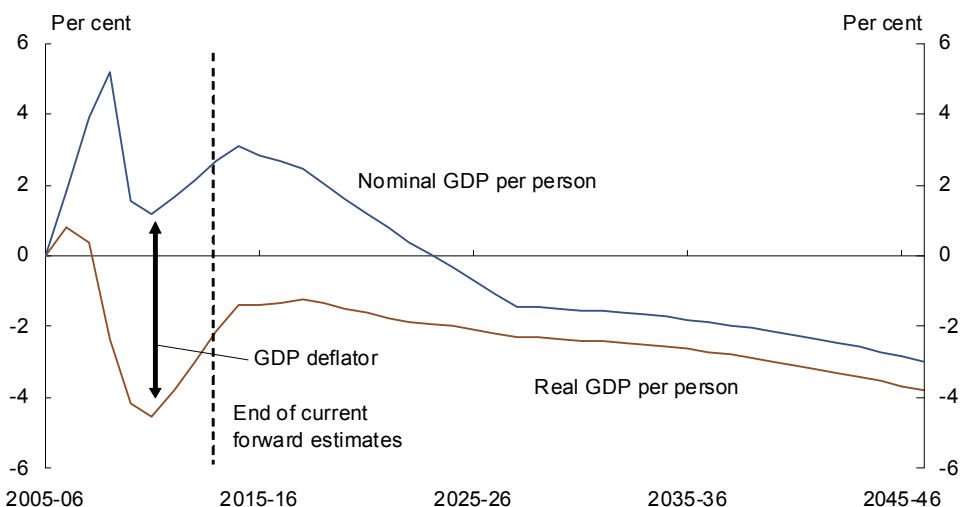
Differences between IGR 2007 and IGR 2010 projections of nominal GDP per person are affected by the same factors as for real GDP per person, but also reflect relative movements in the GDP deflator. These are significant over the period to the late 2020s, but are very small in later years. By 2046–47, nominal GDP per person is projected to be around 3 per cent lower than in IGR 2007.

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<sup>2</sup> GDP per person comparisons use IGR 2007 projections adjusted for data revisions — see Footnote 1 above.

### Chart D.3: Nominal and real GDP per person

Percentage change from IGR 2007 to IGR 2010



Source: ABS cat. no. 5206.0; ABS cat. no. 3201.0 and Treasury projections.

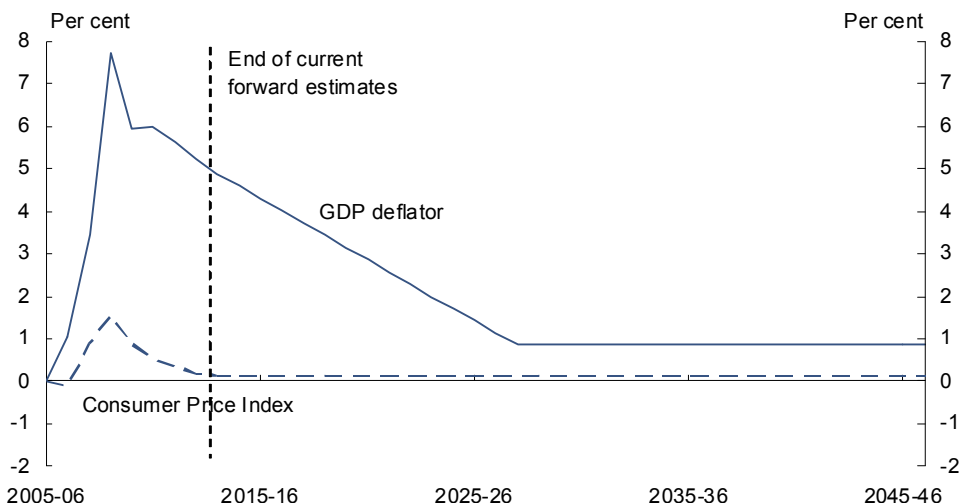
### GDP deflator

Price impacts on government expenditure depend mainly on consumer prices and nominal wages. Nominal GDP and nominal GDP per person depend on a broader set of prices, including prices of consumption goods, investment goods, dwelling construction and exports.

In 2008–09, the GDP deflator (which measures the average level of prices of the various components of GDP) was 7½ per cent higher than was projected in IGR 2007, but the difference then falls and from the mid-2020s the GDP deflator is projected to be around 1 per cent higher than in IGR 2007 (Chart D.4).

### Chart D.4: The GDP deflator and the CPI

Percentage change from IGR 2007 to IGR 2010



Source: ABS cat. no. 5206.0; ABS cat. no. 6401.0 and Treasury projections.

The relative movements in the GDP deflator predominantly are caused by the recent boom in the terms of trade. In IGR 2007, it was projected that the strong increases in the terms of trade would be reversed partially over the three years to 2010–11, staying constant thereafter. The boom in the terms of trade was stronger and lasted longer than was projected, so that the GDP deflator was 7½ per cent higher in 2008–09. It is now projected to be around 5 per cent higher at the end of the current forward estimates in 2012–13. IGR 2010 projections factor in a decline in the terms of trade out to 2027–28, so that the GDP deflator grows more slowly over this period than in IGR 2007.

CPI growth has been much more muted than growth in the GDP deflator. From the end of the forward estimates, the CPI is projected to grow at 2½ per cent a year, the same rate as in IGR 2007.

### Real GDP per person

The level of real GDP per person is projected to be almost 4 per cent lower by 2046–47 than in IGR 2007. In the short run, differences in projections are mostly driven by labour utilisation (hours worked per person), but in the longer run, slower productivity growth is the main driver. Labour productivity is projected to be 1½ per cent lower than in IGR 2007 by the end of the forward estimates, and then to grow more slowly: at an annual rate of 1.6 per cent a year compared with 1.75 per cent in IGR 2007. Long-term productivity growth rates in IGR 2007 and IGR 2010 are based on average annual rates of growth of the previous 30 years, and the lower rate in IGR 2010 reflects lower productivity growth in the late 2000s compared to the late 1970s. Higher fertility, and to a lesser extent lower mortality, also have tended to reduce real GDP per person.

Labour utilisation is projected to be slightly stronger than in IGR 2007 by 2046–47. As explained above, changes in hours worked per person are driven by changes in age- and gender-specific participation rates and average hours, and by the impact of demographic changes on the age and gender composition of the population. These factors interact, making it difficult to identify their separate contributions to changes in hours worked per person. In broad terms, changes in assumptions about participation rates and average hours worked between IGR 2007 and IGR 2010 contribute around 1¼ per cent to hours worked per person from 2009–10 to 2046–47 and demographic changes add around 1 per cent. As a result, hours worked per person are projected to rise by around 2¼ per cent relative to IGR 2007 over this period.

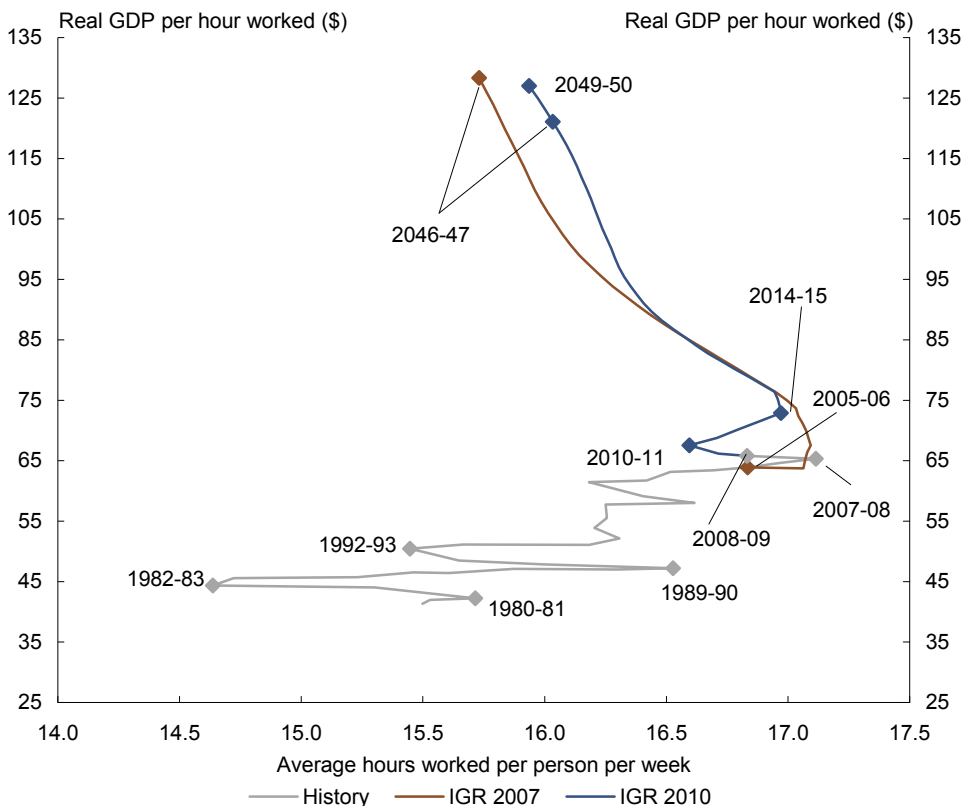
## Productivity and labour utilisation

Chart D.5 shows the paths of productivity (real GDP per hour worked) and labour utilisation (hours worked per person) in recent history and their projected paths in IGR 2007 and IGR 2010. Vertical movements in the chart show changes in labour productivity. Horizontal movements show changes in labour utilisation. The lines on the chart trace out combinations of productivity and labour utilisation in successive years.

In IGR 2007 (red line), hours worked per person were projected to rise to a gentle peak towards the end of the current decade and then, once the baby-boomer generation began to retire, to fall steadily. By 2046–47, the end of the projection period in IGR 2007, hours worked per person were projected to have fallen to a level around the same as in the middle of the 1990s.

The new projections of IGR 2010 (dark blue line) have labour utilisation rising to a peak in 2014–15 after declining in 2009–10 and 2010–11 because of the economic downturn. After 2014–15, labour utilisation is projected to fall while productivity rises. In each year out to 2046–47, labour utilisation is higher than projected in IGR 2007, but productivity is lower. The improvement in labour utilisation is principally the result of higher projected participation rates for older workers and higher levels of skilled migration in IGR 2010. The slower labour productivity growth is a technical assumption based on the historical 30-year average. This is 1.6 per cent annually, compared with 1¾ per cent in IGR 2007.

**Chart D.5: 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.