2021 Intergenerational Report

Australia over the next 40 years

Circulated by

The Honourable Josh Frydenberg MP
Treasurer of the Commonwealth of Australia

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Notes

(a) The following definitions are used in this report:

- – 'real' means adjusted for the effect of inflation

- – real growth in spending is calculated by the Consumer Price Index as the deflator

- – 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.

- – estimates midway between rounding points are rounded up

- – the percentage changes in statistical tables are calculated using unrounded data.

(c) References to the 'states' include the territories.

(d) GDP refers to Gross Domestic Product.

(e) CPI refers to Consumer Price Index.

(f) Real spending per person is expressed in 2020-21 dollars unless otherwise specified.

(g) Projections are based on the 2021-22 Budget.

(h) In this report, the term Commonwealth refers to the Commonwealth of Australia. The term is used when referring to the legal entity of the Commonwealth of Australia.

The term Australian Government is used when referring to the Government and the decisions and activities made by the Government on behalf of the Commonwealth of Australia.

(i) The forward estimates refers to 2020-21 to 2024-25, the medium term refers to 2025-26 to 2031-32 and the long term refers to 2032-33 to 2060-61.

Contents

Executive summary

The Intergenerational Report projects an outlook for the economy and the Australian Government's budget over the next 40 years. This outlook has been profoundly affected by the COVID-19 pandemic, which has caused the most severe global economic shock since the Great Depression.

While Australia's economic recovery is well advanced, some effects from this shock will persist for years to come. At the same time, pre-existing structural trends – such as population ageing – remain ongoing challenges for the economy and the budget.

The economic and fiscal projections highlight some of the long-term risks and opportunities Australia faces, assuming policies remain similar to current settings. However, government policies do not stand still and can be expected to change over time in response to the challenges presented in this report. Successive intergenerational reports have taken more optimistic views about the future as governments have responded to long-term challenges.

Australia remains very well placed to overcome these challenges and to take advantage of opportunities in the future. Australia has a strong economy that is growing. The Australian Government also has a responsible and sustainable fiscal position which means it can fund essential services and invest for the future.

COVID-19 will have lasting effects on the economy and the budget

Australia entered the COVID-19 pandemic from a position of economic and fiscal strength. The budget was in balance for the first time in 11 years with workforce participation at a record high and welfare dependency at its lowest in a generation.

A strong fiscal position allowed the Government to respond decisively to the once-in-a-century pandemic with $291 billion in direct economic support. The speed of Australia's economic recovery has exceeded the most optimistic of our expectations, with our economic growth outperforming every major advanced economy in 2020.

Having entered this crisis with a strong fiscal position, the Government continues to have substantial fiscal capacity to support the recovery and respond to future challenges. While we are not yet out of the pandemic, we are better placed than most other countries in the world to meet the economic challenges that lie ahead.

The economic recovery is well underway, but some effects from the pandemic will persist. The most enduring effect is likely to be a smaller population reflecting a period of sharply limited migration and a temporary fall in the fertility rate. Other impacts are less clear and potential upside and downside economic risks remain.

The COVID-19 pandemic has not displaced the pre-existing demographic, technological and other trends that will continue to shape the long-term economic and fiscal outlook. Indeed, the pandemic could accelerate some of those trends.

Economic growth is projected to slow, largely reflecting slower population growth

The Australian economy is projected to grow at a slower pace over the next 40 years than it has over the past 40 years, though growth per person is projected to be closer to historical averages.

Slower population growth is the main reason for the expected slowdown in economic growth. Australia's total population is projected to reach 38.8 million in 2060-61. This is lower than previous projections due to the lower level of migration resulting from the COVID-19 pandemic and a lower fertility rate.

Migrants are expected to continue to be the largest source of population growth. Migration contributes to economic growth and can help offset population ageing. However, migration needs to be managed well to ensure it supports higher living standards.

The population will continue to age, largely as a result of improved life expectancies and low fertility. In 2060-61, 23 per cent of the population is projected to be over 65, a rise of around 7 percentage points from 2020-21. The ratio of working-age people to those over 65 is projected to fall from 4.0 to 2.7 over the next 40 years. Australia is currently in the middle of a significant demographic transition, as people in the baby boomer generation reach 65. This has already driven a rapid fall in the ratio of working-age people to those over 65 through the past decade, which will continue for the next decade.

Ageing will reduce labour force participation. The participation rate is projected to decline from a record high of 66.3 per cent in March 2021 to 63.6 per cent by 2060-61. This reflects the increasing proportion of older people in the population, which is expected to be only partially offset by projected increases in women's and older people's participation.

Productivity has been the most important source of income growth in Australia, contributing over 80 per cent of growth in real gross national income (GNI) per person over the past 30 years. The economic projections assume that the labour productivity growth rate converges to 1.5 per cent per year – consistent with the 30-year historical average to 2018-19. Achieving this assumption will require an improvement over recent performance. Productivity growth averaged 1.2 per cent annually over the last complete productivity cycle in the 2010s. Government policies can assist in lifting productivity, including by helping individuals and businesses take advantage of new innovations and technologies.

These projected changes in population, participation and productivity mean that real gross domestic product (GDP) is projected to grow at 2.6 per cent per year over the next 40 years, compared with 3.0 per cent over the past 40 years. Real GDP per person

is projected to grow at an average annual rate of 1.5 per cent, compared with 1.6 per cent over the past 40 years. Nominal GDP growth is projected to slow to 5.0 per cent per year over the next 40 years, compared with 7.0 per cent over the past 40 years. Real GNI is projected to grow at an average annual rate of 2.3 per cent, compared with 3.3 per cent over the past 40 years. Real GNI per person is projected to grow at an average annual rate of 1.3 per cent, compared with 1.8 per cent over the past 40 years.

The larger slowdown in GNI growth than GDP growth reflects an assumption that the terms of trade will decline before stabilising at long-term levels. Over the past 40 years there have been periods where significant increases in commodity prices and the terms of trade have lifted growth in incomes.

Chart 1   Average growth rates
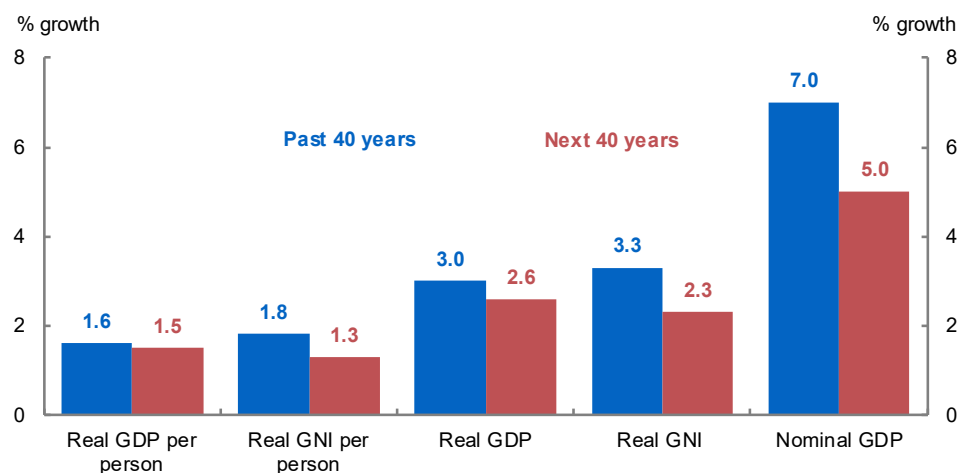
Source: ABS Australian National Accounts: National Income, Expenditure, and Treasury.

Chart 2   Nominal GDP growth
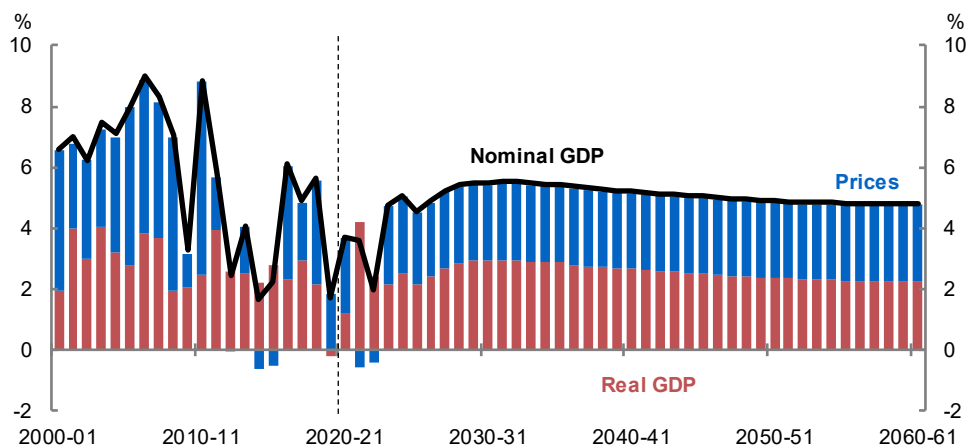
The likely physical and social effects of climate change, the impacts of mitigation efforts and the benefits of early adaptation measures will also affect the economy and the budget over the next 40 years. The transition to lower carbon emissions globally will mean that some sectors will need to adjust to falling demand for some exports, while new opportunities will be created in other sectors. The effects will depend on domestic and global actions, as well as the pace, extent and impacts of climate change.

The budget will improve as the economy recovers, but is projected to remain in deficit

As with previous intergenerational reports, the trajectory of the underlying cash balance begins with a period of improvement before deteriorating towards the end of the projection period.

Before the pandemic, the budget had returned to balance and was projected to be in surplus for an extended period. The fiscal response to the pandemic significantly increased the level of government spending in the short term and the economic slowdown substantially lowered tax revenue.

In 2020-21, the underlying cash balance is expected to be a deficit of 7.8 per cent of GDP, improving to 2.4 per cent of GDP by 2024-25. Supported by the economic recovery, the underlying cash balance is projected to improve to a deficit of 0.7 per cent of GDP in 2036-37. The deficit is then projected to widen to 2.3 per cent of GDP by 2060-61. This reflects growth in spending, mainly on health but also on aged care and interest payments, while tax receipts are constrained by the tax-to-GDP cap.

Chart 3   Underlying cash balance across intergenerational reports
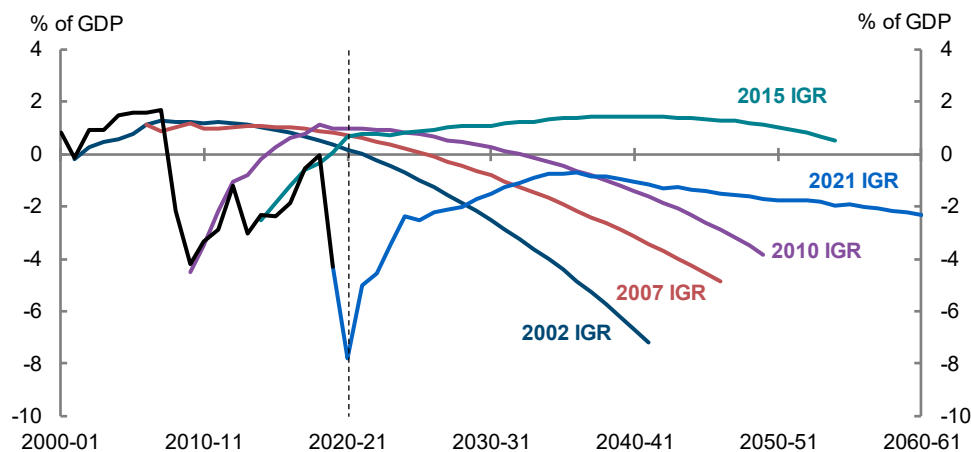
Source: Treasury.

Growth in interest payments partly reflects the assumption that government bond yields return to higher rates over the medium and long term. The primary balance, which excludes net interest, is projected to return to surplus, before falling to a deficit of 0.6 per cent of GDP by 2060-61.

Chart 4   Underlying cash balance and primary balance
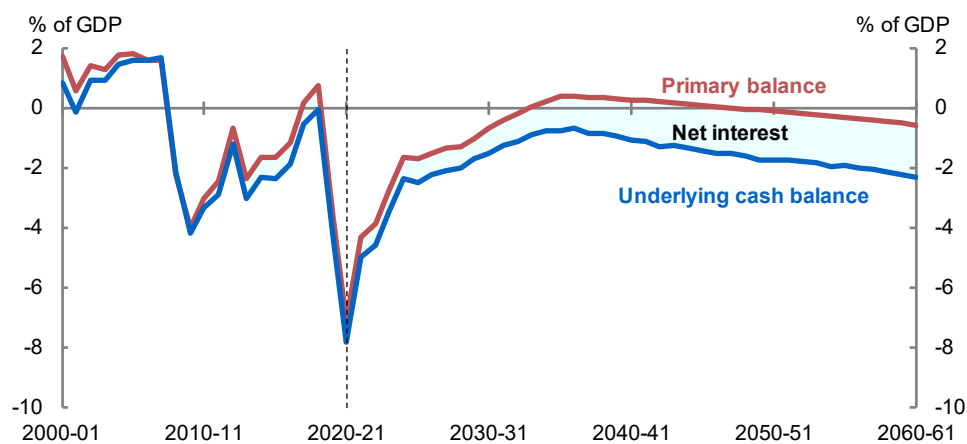
Source: Treasury.

Net debt is projected to peak at 40.9 per cent of GDP in 2024-25, before falling to 28.2 per cent of GDP in 2044-45 and then increasing to 34.4 per cent of GDP by 2060-61.

Chart 5   Net debt
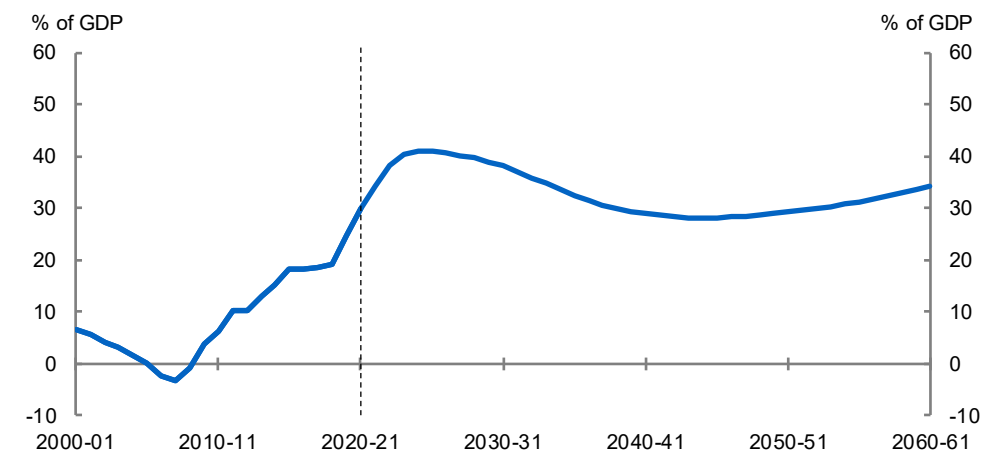
Source: Treasury.

After falling from a pandemic-induced high, government spending is projected to gradually increase over time. Health will comprise the single largest component of spending, accounting for 26 per cent of spending in 2060-61. Real per person health spending is projected to more than double over the next 40 years, substantially due to rising incomes, changes in preferences and the costs of using new health technology. Aged care spending is projected to nearly double as a share of the economy by 2060-61. This is largely driven by demographics over the next decade, after which non-demographic factors become the predominant drivers of growth.

In the future, more Australians will retire having made superannuation contributions while working. This will reduce the call for government support through the Age Pension. However, superannuation attracts favourable tax treatment which reduces government revenues. The projected combined total of Age and Service Pension expenditure and superannuation tax concessions is estimated to grow from around 4.5 per cent of GDP in 2020-21 to 5.0 per cent of GDP in 2060-61.

The Government is committed to maintaining a sustainable tax burden, with a tax-to-GDP ratio at or below 23.9 per cent of GDP. Tax receipts are expected to reach the Government's tax-to-GDP cap in 2035-36. Personal income tax is projected to grow faster than other sources of tax in reaching this cap. Company income taxes will likely continue to be volatile and consumption-based taxes will form a smaller proportion of total taxes than in the past.

Australia remains well placed to meet long-term challenges and future risks

Australia's performance during the COVID-19 pandemic has demonstrated the resilience of our economy. This has been backed by an economic and fiscal strategy that stabilised the economy when needed. The focus will move to debt reduction once the economic recovery is secure to ensure ongoing fiscal sustainability.

In the years ahead, it will continue to be important to address the structural challenges facing the economy and take opportunities to lift growth. It will also be prudent to strengthen the budget over time to ensure Australia is prepared for known pressures and unexpected risks.

These are long-term challenges that will require ongoing attention. Some immediate priorities include increasing the capacity of our economy and our workforce by improving the skills of workers, supporting participation in work, investing in infrastructure and taking full advantage of digital technologies to boost productivity.

Governments will also need to manage spending pressures by improving the efficiency of service delivery and ensuring support is targeted to those who need it most, particularly within the key areas of future spending such as health and aged care. It will also be critical that essential government services are funded by taxes that are as fair, efficient and low as possible.

What is the Intergenerational Report?

The Intergenerational Report examines the long-term sustainability of current policies and how demographic, technological and other structural trends may affect the economy and the budget over the next 40 years.

This is the fifth Intergenerational Report, following those released in 2002, 2007, 2010 and 2015.

Past intergenerational reports have raised awareness of the demographic and other long-term challenges Australia is likely to face and the implications for economic growth and fiscal sustainability. The 2002 and 2007 Reports highlighted the future budget pressures from a steadily ageing population. The 2010 Report emphasised the challenge posed by climate change. In the wake of the Global Financial Crisis, the 2015 Report illustrated the long-term sustainability of alternative fiscal policy scenarios.

The projections contained in this report present what could happen over the next 40 years based on detailed analysis of historical trends and current policy settings. They are designed to capture some of the fundamental trends that will influence economic and budget outcomes should policies remain similar to current settings. They help to highlight the significant risks and opportunities in Australia's future.

All projections are inherently uncertain, particularly over long timeframes, and are unlikely to unfold as outlined in this report. Events will take place that are not anticipated in the report's assumptions and government policies will change over time.

This report was prepared in especially uncertain times, with the global economic shock associated with the COVID-19 pandemic continuing to unfold. Against this backdrop, this report contains sensitivity analysis to highlight the variables that could significantly affect economic and fiscal outcomes over the next 40 years.

> ### Box 1. What is fiscal sustainability?
>
> The role of the Intergenerational Report is to examine the long-term sustainability of current policies and how demographic, technological and other structural trends may affect economic growth and public finances.
>
> Fiscal sustainability is important for maintaining macroeconomic stability, reducing economic vulnerabilities and improving economic performance.
>
> Fiscal sustainability is the government's ability to manage its finances so it can meet its spending commitments, now and in the future. It ensures future generations of taxpayers do not face an unmanageable bill for government services provided to the current generation.
>
> Public finances are considered sustainable when the government can meet its obligations without having to increase taxes or cut spending to an extent that is unrealistic or would harm the economy. A stable debt-to-GDP ratio is generally consistent with fiscal sustainability as it implies the government's obligations are growing no faster than its capacity to raise revenue. Lower debt levels are generally more sustainable than higher debt levels, as they involve lower debt servicing costs and risks. Part II of this report examines the drivers and risks of debt dynamics and the implications for fiscal sustainability.

How do we model current policy over the long term?

This report's 40-year projections extend the economic and fiscal baseline presented in the 2021-22 Budget. Projections are made for a range of demographic and economic parameters taking into account historical averages or long-term trends. These are then used to project revenue and spending over the next 40 years. Figure 1 shows how the economy affects the budget outlook.

The projections in this report are based on current policy settings. The report does not make assumptions about future policy decisions. Where the operation of policy over time is well defined, this report makes assumptions about the main variables relevant for that policy. For example, where an income support payment is indexed to maintain its real value, a combination of demographic and economic projections is used to project how many people will receive the payment, and inflation projections are used to project future increases in the rate of the payment.

The long-term operation of government policy is not always well defined. For example, due to technological progress it is unrealistic to expect government to fund exactly the same medicines and medical procedures over the next 40 years. For this reason, the report also uses assumptions based on analysis of historical drivers and information about possible future trends, including non-demographic drivers such as technological

and behavioural changes. The assumptions underpinning the projections are detailed in the Appendix.

Figure 1. How the economy affects the budget

The 3Ps framework: key drivers of economic growth

Population   Participation   Productivity

Economic growth

Government policy influences

Government spending   Revenue

Budget
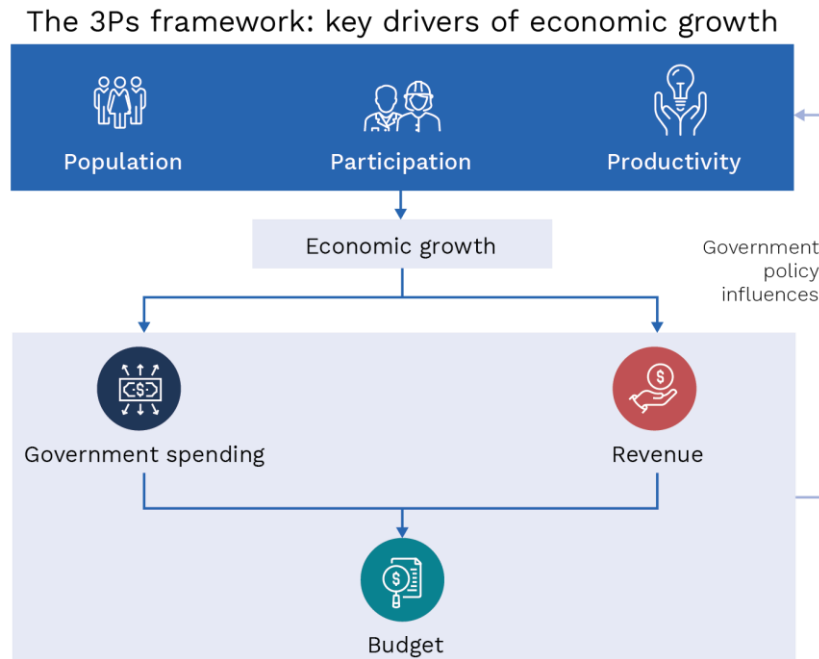
Source: Treasury.

Long-term projections necessarily involve the exercise of judgement and simplifying technical assumptions. This underscores the importance of viewing the projections as one possible picture of the future based on expected structural pressures and existing policy settings. In other words, the report presents a world that could be, rather than will be. In doing so, it helps governments to prepare for future challenges and take advantage of future opportunities.

Part I: The economy over the next 40 years

1.   Economic projections

Overview

The COVID-19 pandemic has caused the most severe global economic shock since the Great Depression. While Australia's economic recovery is well advanced, some effects will persist. At the same time, the pandemic has not displaced the pre-existing demographic, technological and other trends that will continue to shape the long-term economic outlook.

The Australian economy is projected to grow over the next 40 years at an average rate of 2.6 per cent per year. This compares with 3.0 per cent per year over the past 40 years. Real GDP per person is projected to grow at an average annual rate of 1.5 per cent, just below the average of 1.6 per cent per year over the past 40 years. Nominal GDP growth is projected to average 5.0 per cent per year, compared with 7.0 per cent per year over the past 40 years.

Slower population growth is the main reason for the projected slowdown in Australia's economic growth. In addition, ageing will reduce participation rates in the long term.

The projections assume that long-run labour productivity growth converges to 1.5 per cent per year – consistent with the average growth rate in labour productivity over the 30 years to 2018-19. Achieving this will require an improvement over recent performance. Government policies and institutional settings can play an important role in lifting productivity and ensuring individuals and businesses take full advantage of new innovations and technologies.

Population, participation and productivity shape long-term economic growth

The Australian economy will be shaped by 3 drivers over the next 40 years:

- the number of people in the working-age population (population)

- the proportion of those who work and their working hours (participation)

- the amount of output produced per hour worked (labour productivity).

These are the '3Ps'. Combined, they determine the quantity of goods and services the Australian economy can produce. This is commonly referred to as potential GDP. As spare capacity in the economy is absorbed over time, real GDP is projected to return to potential GDP. The future size and structure of the Australian economy are key determinants of the living standards of all Australians. Nominal GDP measures the total value of the output produced in Australia, by combining real GDP and prices. It is the main determinant of the tax base and, therefore, the government's capacity to fund services.

Potential GDP is a useful indicator of the trajectory of the economy over the long term. While changes in demand over the business cycle can be an important driver of economic activity in the short term, these temporary deviations in output are of less importance when averaged over a 40-year period. GDP is driven over the long term by increases in the productive capacity of the economy. Policy choices that promote growth in the 3Ps will increase potential GDP.

Figure 1.1 The 3Ps framework
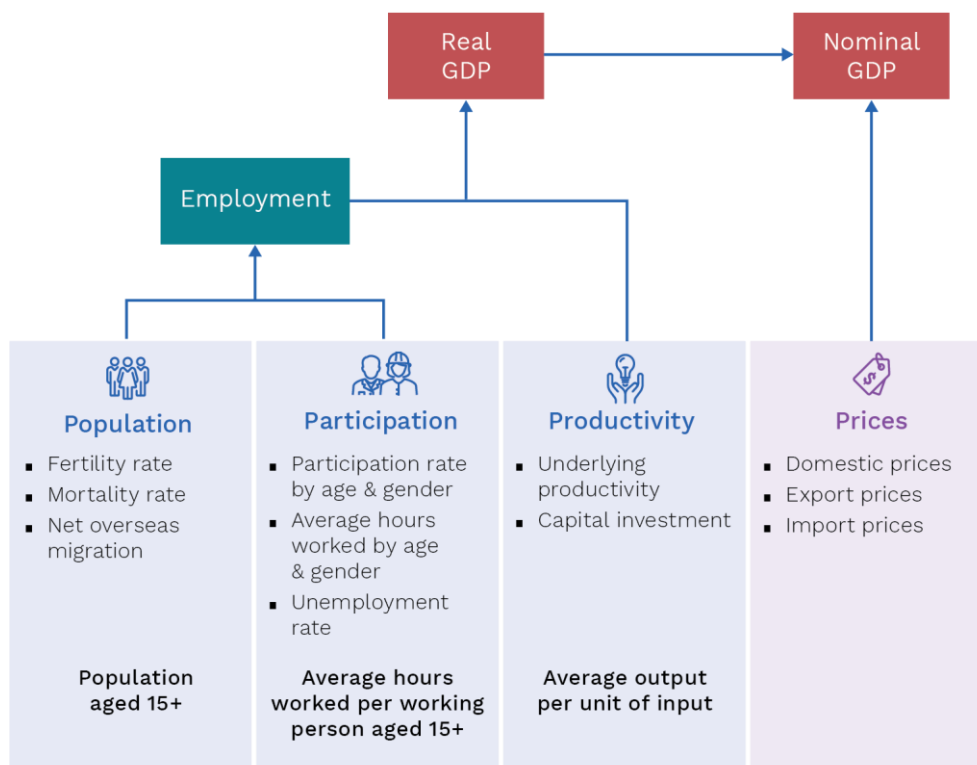
Source: Treasury.

The utility of this framework comes with caveats. The first is that potential GDP is only a measure of how much the economy can produce at its productive capacity. While GDP is often used as a measure of the economic wellbeing of a society as it reflects income and living standards, it is not a holistic measure of either. Alternative measures have been proposed to capture societal wellbeing, for example through incorporating outcome indicators such as environmental quality, health and non-market outcomes. Growth in potential GDP is not the only goal targeted by policy and not the only measure of Australia's progress. Population, participation and productivity can also interact with each other, with changes in one flowing through to one or more of the others.

This report builds on the economic and fiscal projections in the 2021-22 Budget. Employing the same projection methodology as used for the medium-term projections in the Budget, this report extends those projections to 2060-61. This extension is based on projections for population, participation, productivity and prices.

This report is underpinned by information and assumptions about the trajectories of the 3Ps. A macroeconometric model of the Australian economy is used to combine

these trend inputs to generate a projection for potential GDP.[1] On the nominal side, key non-rural commodity export prices are projected based on cost curve analysis. Domestic prices return over time to the mid-point of the RBA's inflation target band. The macroeconometric model is used to inform the path that real GDP takes to return to potential GDP and domestic price inflation takes to return to the mid-point of the RBA's inflation target band. The macroeconometric model combines these assumptions and trend inputs to generate a projection for real and nominal GDP. The output is then used to inform the assessment of the government's long-term fiscal position set out in Part II.

While the Australian economy will experience fluctuations in economic activity over the next 40 years, this part of the report focuses on the economic implications of long-term trends in population, participation and productivity. It projects the long-term path for each of the 3Ps, identifies associated risks and analyses the effects of the COVID-19 pandemic.

Australia's economy will continue to grow, but at a slower pace

Real GDP in Australia is projected to grow over the next 40 years, but at a slower pace than the past 40 years. Real GDP in Australia is projected to grow at an average annual rate of 2.6 per cent per year from 2020-21 to 2060-61, which is 0.4 percentage points lower per year than the past 40 years. Should this projected growth rate eventuate, the Australian economy will be more than two and a half times larger in 2060-61 than it is expected to be in 2020-21.

Chart 1.1   Size of the Australian economy
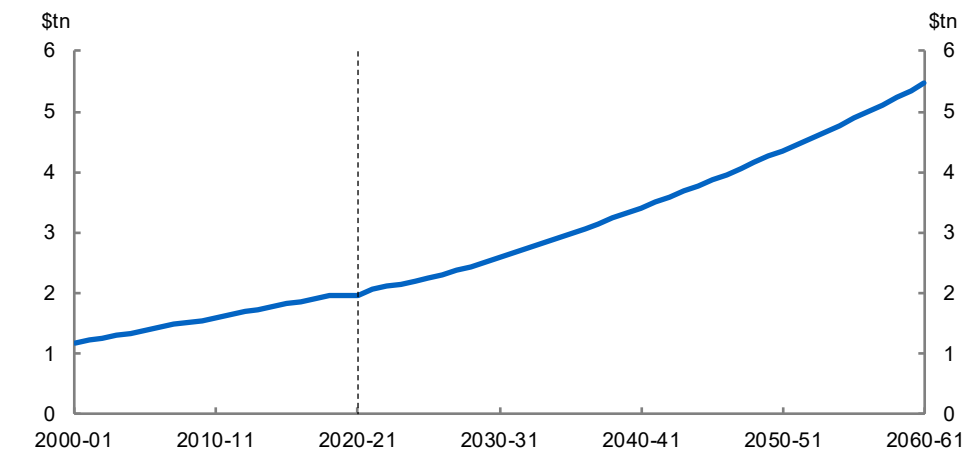
Source: ABS Australian National Accounts: National Income, Expenditure and Product, and Treasury.

The projected slowdown in Australia's real GDP growth rate over the long term largely reflects declining population growth. Annual population growth is expected to decline over the next 40 years to 0.8 per cent in 2060-61, lower than the average annual growth

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1   For further information on the economic projections methodology, see the Appendix.

rate of 1.4 per cent during the past 40 years. The changing composition of Australia's population will also have implications for participation. Australia's ageing population will reduce the number of working-age people as a share of the population, and the old-age dependency ratio will continue to fall.

This report, consistent with previous intergenerational reports, assumes that labour productivity growth converges to a historical average rate of growth. In this report underlying productivity growth converges to 1.5 per cent per year, the average growth rate in labour productivity over the 30 years to 2018-19.[2] Given the current underlying productivity growth rate is below 1.5 per cent, it is assumed that the transition to the long-term growth rate of 1.5 per cent per year will take place over the next 10 years. This is the same assumption as in the 2021-22 Budget. Real wages are projected to increase in line with growth in labour productivity.

Growth in incomes and living standards will slow if productivity growth remains at current rates. Government policies and institutional settings can play an important role in lifting productivity and ensuring individuals and businesses take full advantage of new innovations and technologies.

This report has been prepared as Australia's economic recovery from the COVID-19-induced economic recession is well underway. The Australian economy has recovered strongly from its first recession in almost 30 years, with output and employment returning to pre-pandemic levels faster than expected and ahead of any major advanced economy. The COVID-19 pandemic and associated containment measures, however, have profoundly affected Australian society and the economy, and are likely to shape the future in ways that are not yet apparent. The COVID-19 pandemic is currently expected to affect the short- and medium-term economic growth rates, and have minimal effects on real GDP growth beyond 2030. However, the level of real GDP remains permanently lower than projections made before the COVID-19 pandemic.

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2   Underlying productivity is also known as labour augmenting technical change. Long-term labour productivity growth depends on trends in underlying labour productivity and the productive capital stock. For further information, see the Appendix.

Box 1.1   The impact of COVID-19 on long-term economic growth

The COVID-19 pandemic has had substantial effects on Australia's economy throughout 2020 and 2021. Some effects are likely to persist.

The most enduring economic effect of the COVID-19 pandemic and associated containment measures is likely to be from a lower population level. International border restrictions have sharply limited migration and the COVID-19 pandemic is also expected to lower the fertility rate in the short term. The lower population level has also had flow-on effects to other elements of the 3Ps, such as the participation rate and, to a lesser extent, average hours worked.

The COVID-19 pandemic has had significant short-term effects on the labour market. The unemployment rate increased by 2.2 percentage points between March 2020 and July 2020 to peak at 7.4 per cent, while the participation rate fell by 1.2 percentage points over the same period. Recovering economic activity and the easing of restrictions saw Australia's economy grow at the fastest pace on record in the second half of 2020. There are now more people in work and the participation rate is higher than prior to the pandemic.

It is possible the COVID-19 pandemic has accelerated structural changes to the economy that were already underway. For example, aspects of business digitalisation that might otherwise have taken years have occurred in a matter of months. This acceleration of digitalisation may in turn boost productivity and contribute to future economic growth.

However, it is not yet clear if the COVID-19 pandemic, which is having a large economic impact today, will have a major impact on the main drivers of Australia's economic outcomes over the next 40 years.

The impact of COVID-19 can be illustrated by comparing the projections produced for this report with the medium-term projections made in the 2019-20 Mid-Year Economic and Fiscal Outlook (MYEFO), which was the last budget update published before the onset of the COVID-19 pandemic.

While the impact of the COVID-19 pandemic will subside, the level of real GDP is projected to be permanently lower than it was in the 2019-20 MYEFO by around 5 per cent in 2029-30. However, outside these immediate impacts, in the long term productivity and population growth remain the key drivers of improvements in potential GDP.

Chart 1.2   Real GDP growth compared with 2019-20 MYEFO
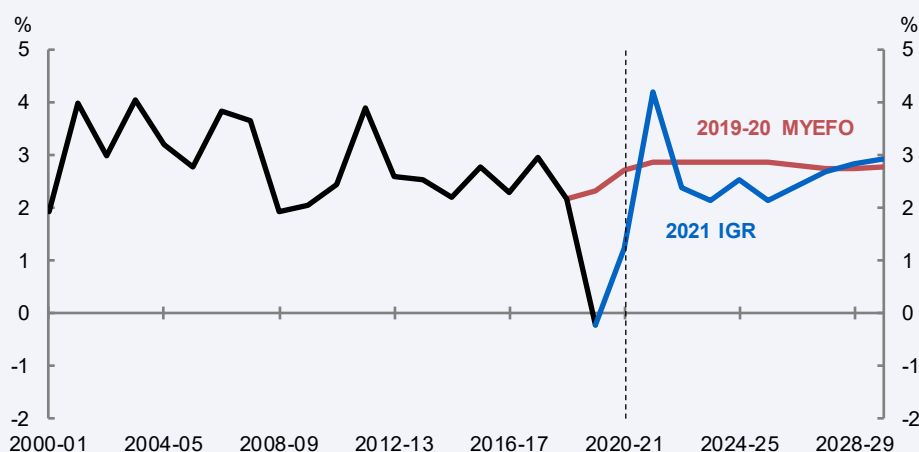
Source: ABS Australian National Accounts: National Income, Expenditure and Product, and Treasury.

Australia's population is estimated to be smaller than it would have been in the absence of the COVID-19 pandemic, as a result of reduced net overseas migration and fewer births (Chapter 2 – Population).

The COVID-19 pandemic has also had a negative effect on productivity over the past year, however it is uncertain if there will be any lasting effects from the short-term shocks to productivity. Government tax incentives to bring forward investment activity have played an important role in supporting capital expenditure through a period of heightened uncertainty which will help offset some of the impacts from the pandemic on the capital stock (Chapter 4 – Productivity).

Real GDP per person is expected to grow at 1.5 per cent per year on average

The level of real GDP per person is projected to almost double over the next 40 years. Real GDP per person is projected to grow over the next 40 years at an average annual rate of 1.5 per cent, from $76,700 in 2020-21 to $140,900 in 2060-61.

This means that, on average across the economy, a worker's output in 2060-61 is projected to be nearly double an equivalent worker's output this year.

As has been the case over the past 40 years, productivity improvements are projected to be the primary driver of growth in real GDP per person. As well as having individual effects, the 3Ps interact with each other. For example, migration directly boosts population growth and, because migrants tend to be younger and higher skilled, this population growth can also support labour force participation and productivity.

Chart 1.3   Drivers of real GDP per person growth
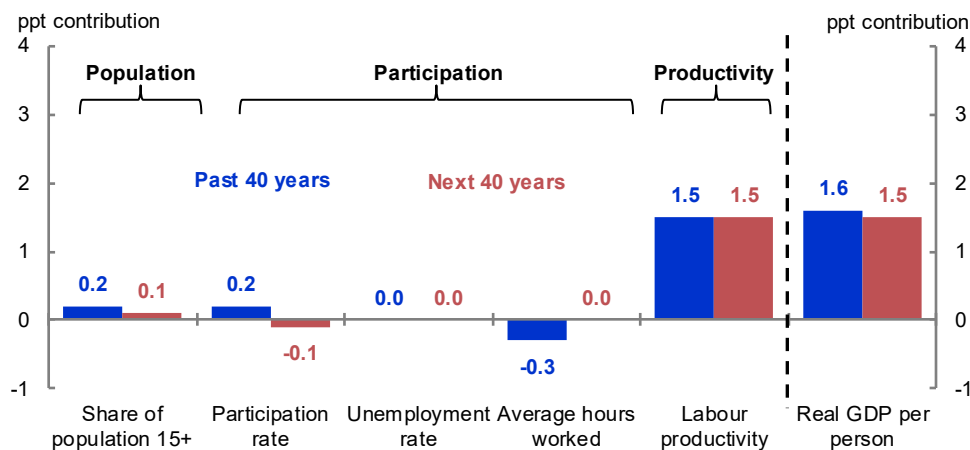
Source: ABS Australian National Accounts: National Income, Expenditure and Product; ABS Labour Force Survey; ABS National, state and territory population; and Treasury.

Real GNI per person is expected to grow at 1.3 per cent per year on average

Real gross national income (GNI) per person – the average amount earned by each Australian – is projected to grow at an average annual rate of 1.3 per cent over the next 40 years, from $77,900 in 2020-21 to $128,900 in 2060-61.

National income is affected by relative international prices, measured by the terms of trade, in addition to a range of other factors including the drivers of real GDP growth. Put simply, Australia's income is affected by the prices received for goods and services exports and the prices paid for goods and services imports. Real GNI per person grew more strongly than GDP per person over the past 40 years due to the periods of strong commodity prices. Over the period ahead, GNI per person is projected to grow slightly slower than real GDP per person, largely as a result of prices for Australia's commodity exports which are projected to fall until 2025-26, before stabilising at long-term levels thereafter. Real GNI growth will be negatively affected by falls in the terms of trade and slowing real GDP growth.

Chart 1.4   Average growth rates
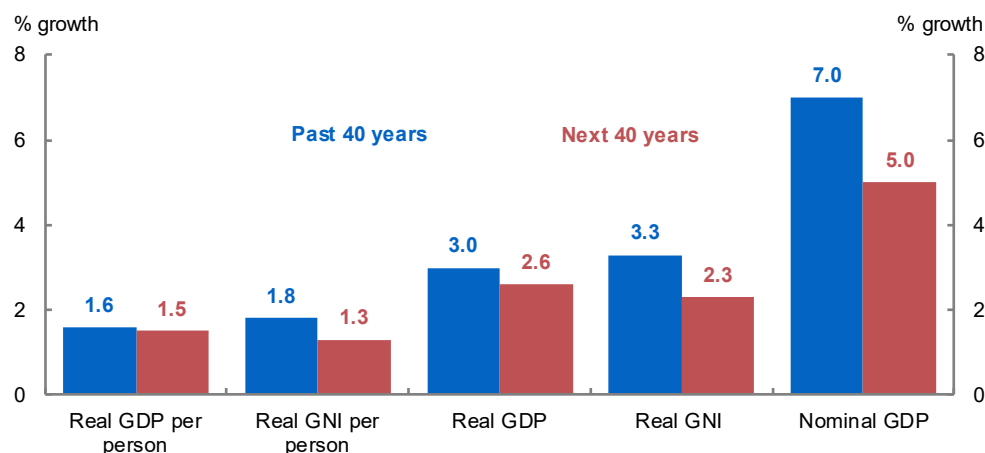
Source: ABS Australian National Accounts: National Income, Expenditure and Product, and Treasury.

Nominal GDP is expected to grow at 5.0 per cent per year on average

Nominal GDP measures the total value of the output produced in Australia, by combining real GDP and prices.

Taxes are levied on nominal incomes and expenditure. Changes in incomes, output or prices all affect the amount of tax collected. In addition, several government payments are indexed to various price measures. As such, changes in prices also affect the amount of total government payments.

Over the past 40 years, nominal GDP grew at an average of 7.0 per cent per year. Nominal GDP growth is projected to grow at 5.0 per cent per year over the next 40 years.

Chart 1.5   Nominal GDP growth
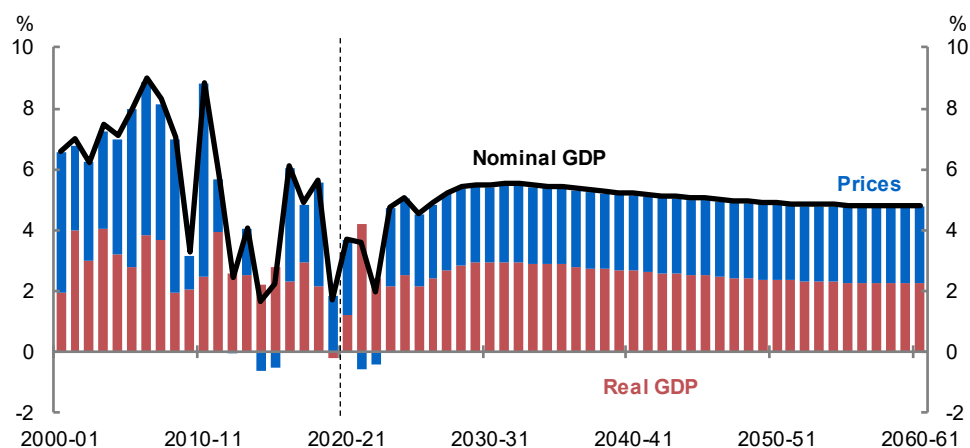
Source: ABS Australian National Accounts: National Income, Expenditure and Product, and Treasury.

The terms of trade, inflation and wages are assumed to be stable in the medium and long term

The terms of trade measure export prices relative to import prices. They have a significant influence on Australia's GNI and nominal GDP. The terms of trade have been increasing over the past few years, but are below the previous peak in 2011, at the height of the mining investment boom (Chart 1.6).

Favourable terms of trade – periods when export prices are high relative to import prices – have a positive impact on domestic incomes. In these periods, Australia is able to buy more imports for a given amount of exports.

The terms of trade flow through the economy via several channels.

- An increase in export prices contributes to higher domestic incomes, including company profits.

- Higher domestic incomes support consumption and investment, which in turn support employment and wages growth.

- Stronger tax receipts from higher domestic incomes (in particular, company profits) support greater general government revenue.

Consistent with the approach to commodity prices in the 2021-22 Budget, the real prices of Australia's commodity exports are expected to fall until 2025-26, before stabilising at long-term levels. The terms of trade are also projected to return to, and remain around, their 2006-07 level from 2025-26 to 2060-61.

However, there is considerable uncertainty around this projection as unexpected changes in commodity demand and supply can generate significant short- and medium-term commodity price movements. International developments, such as geopolitical instability and climate change mitigation efforts, may also influence the long-term growth path of the global economy and change demand for Australia's exports.

Chart 1.6   Terms of trade
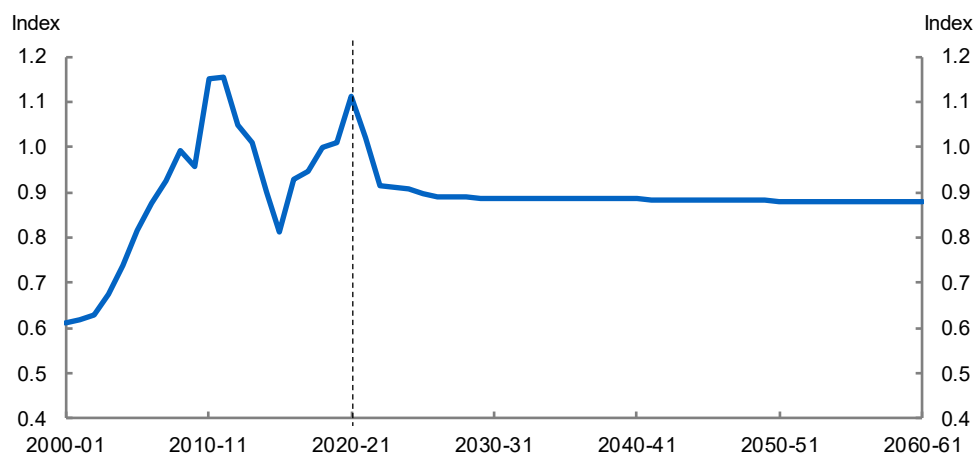
Note: Indexed to 2018-19.
Source: ABS Australian National Accounts: National Income, Expenditure and Product, and Treasury.

Domestically, consumer price growth fluctuated widely throughout 2020, largely resulting from the impacts of the pandemic and associated policy responses. Domestic price inflation is projected to return over time to the mid-point of the RBA's target band of 2-3 per cent. Inflation is then assumed to stay at the mid-point of the RBA's inflation target band to the end of the projection period.

Growth in nominal wages reflects the outlook for labour productivity growth and inflation. Nominal wage growth is expected to increase in the near term, rising to around 4 per cent per year in 2028-29 and remain stable at this rate of growth until 2060-61. This is consistent with the projection for domestic inflation and long-run labour productivity growth, converging to 1.5 per cent per year.

Shifts in the international environment will also influence the economy and budget directly through the terms of trade and indirectly through factors such as the extent of global integration.

In recent decades, Australia has benefited greatly from Asia's rapid economic growth, increasing global economic integration, more open trade and geopolitical stability. Over the next 40 years, changes in the international environment present both upside and downside risks for the projections contained in this report.

The shift in economic weight to the Indo-Pacific observed in recent decades is expected to continue over the next 40 years. In part, this will reflect population ageing in Europe and the United States – although several large Asian economies will face their own demographic challenges. Shifts in economic weight within the Indo-Pacific are also expected, which could see the geopolitical environment in the region become less stable and more contested than in recent decades.

Against this backdrop, there is the potential for international developments that reduce economic integration, productivity, and growth. A less stable international environment would require additional resources domestically to ensure national security and build national resilience.

2.   Population

Overview

Australia's population is projected to grow faster than most other developed countries and reach 38.8 million in 2060-61. However, for the first time in an intergenerational report, the population projection is being revised down.

The COVID-19 pandemic is causing a demographic shock that will be evident in Australia's population for years to come, with temporarily lower inward migration as well as expected delays in women having children. Alongside the shock from the COVID-19 pandemic, the long-run fertility rate is expected to be lower than previously estimated. Migration is expected to continue to be the largest source of population growth in the long term.

Australia's greatest demographic challenge is the ageing population caused by increasing life expectancies and falling fertility rates. As the population ages, there will be fewer people of working age relative to the number of older Australians. This presents long-term economic and fiscal challenges, similar to those faced in most comparable countries.

Migration plays a role in offsetting this demographic challenge by delaying the effects of the ageing population. However, migration is not a complete solution to the challenges associated with ageing, given migrants also age. Migration needs to be managed well to ensure it continues to support higher living standards.

Australia's population will continue to grow, but at a slower rate

Australia's population has grown at an annual average rate of 1.4 per cent over the past 40 years. Restrictions on migration in response to the COVID-19 pandemic are expected to reduce population growth to a low of 0.1 per cent in 2020-21 – the slowest growth in over a century.

Population growth is expected to recover to 1.3 per cent per year by 2023-24, but will then gradually slow, falling to 0.8 per cent per year by 2060-61 (Chart 2.1). The projected slowdown is due to a falling contribution from natural increase and net overseas migration falling as a share of the population, which is driven by an

assumption that the level of net overseas migration remains fixed over the long term consistent with current Government policy for the permanent Migration and Humanitarian Programs.

Chart 2.1   Australia's population growth
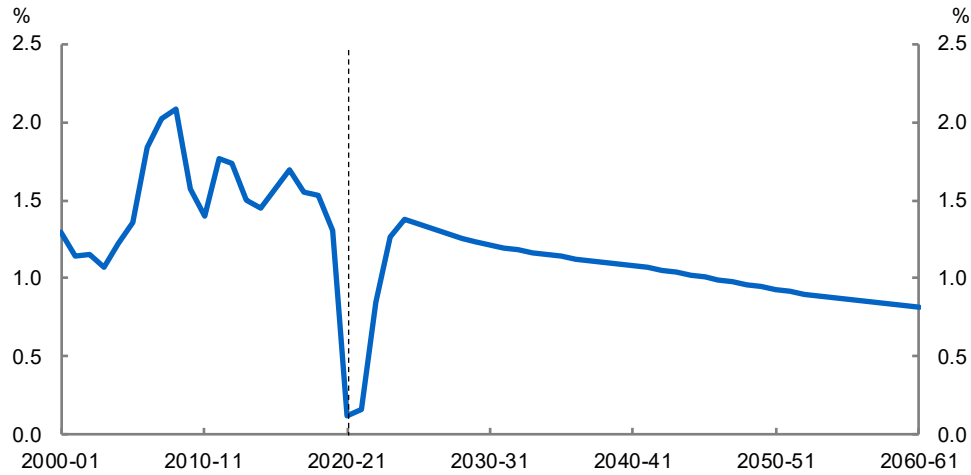
Source: ABS National, state and territory population, September 2020, and Treasury.

Continued growth, albeit at a slower rate, means Australia's total population is projected to reach 38.8 million in 2060-61. While this is a significant increase, it is lower than previous projections. This downward revision, the first in an intergenerational report, is due to the effects of the COVID-19 pandemic on migration, as well as updates to long-term trends. The most significant of these trends is the fertility rate being further below the rate required to sustain the size of the population than previously projected.

Chart 2.2   Australia's population levels

Source: ABS National, state and territory population, September 2020, and Treasury.

Policy changes to the Migration Program over the past 2 decades have led to higher migration levels and faster population growth. Australia's population has grown significantly faster than was projected in 2002. The Australian population reached 25.7 million at the end of 2019-20, 20 years earlier than projected in the 2002 Intergenerational Report.

Chart 2.3   Population projections across intergenerational reports
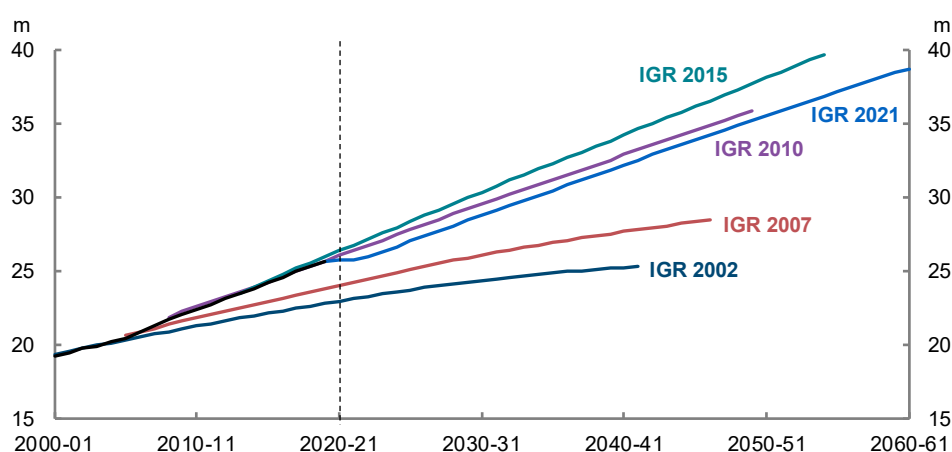
Source: ABS National, state and territory population, September 2020, and Treasury.

Migration will continue to drive population growth

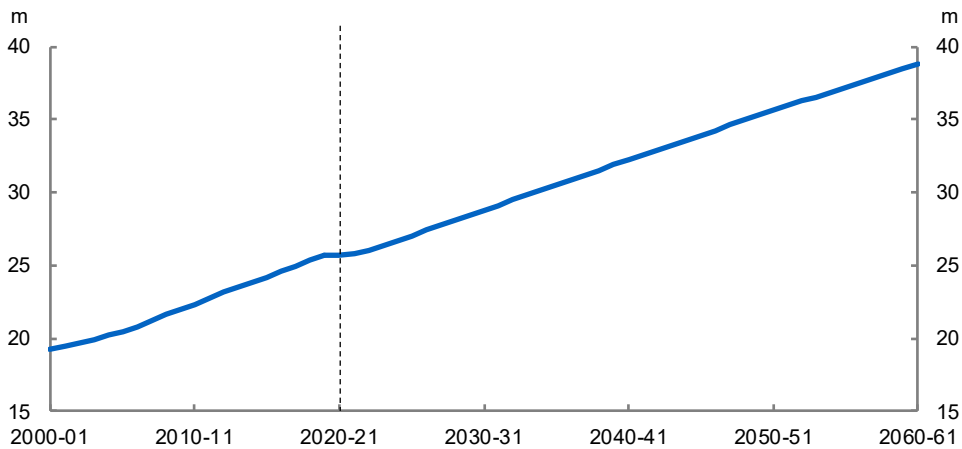Australia's population growth has been driven by net overseas migration, which accounted for around 60 per cent of growth in the last decade.[3] This is expected to increase to around 74 per cent by 2060-61.

Net overseas migration is the net gain or loss of population through immigration to, and emigration from, Australia. It is measured by counting people who stay in Australia for 12 months or more over a 16-month period. This includes individuals on permanent and temporary visas, as well as returning and departing Australian citizens. Net overseas migration varies with changes in policy, economic conditions and global movements of people.

Government migration policy influences the size of the population, with the size and composition of the permanent Migration Program confirmed each year through the budget process. The level of net overseas migration in Australia has risen with the planning levels of the Government's permanent Migration Program, in addition to an increase in temporary migration over the last decade. These planning levels increased from 80,800 places in 1995-96 to 190,000 places in 2012-13, before decreasing to

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3   ABS, *National, state and territory population, September 2020* (2021).

160,000 in 2019-20.[4] After 4 years at 160,000, the permanent planning level then returns to 190,000 in 2023-24. The eventual intake of migrants can be lower than the planning level.

The COVID-19 pandemic is causing a short-run shock to net overseas migration, which is forecast to be negative as more people leave the country than enter it. In net terms, 97,000 people are forecast to leave Australia in 2020-21 and 77,000 are forecast to leave in 2021-22. Following this, net overseas migration is forecast to recover to reach 235,000 people per year by 2024-25 and is assumed to stay at this level until the end of the projection period.

The long-run assumption of 235,000 people per year is based on current Government policy, with annual planning levels of the permanent Program assumed to continue at the 2023-24 level of 190,000 people, the Humanitarian Program assumed to continue at 13,750 people, and flows of temporary migrants, Australian citizens and departing permanent residents assumed to continue in line with historical averages.[5] The long-run assumption of fixed net overseas migration means that, as the population grows, the contribution of migration to overall population growth over the projection period declines each year.

Chart 2.4   Net overseas migration
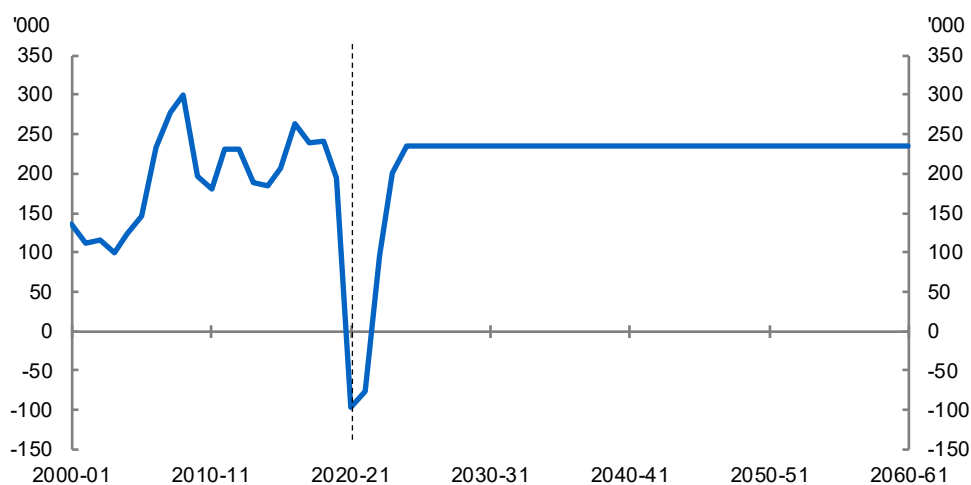
Source: ABS National, state and territory population, September 2020, and Treasury.

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4   H. Spinks, *Australia's Migration Program*, *Parliamentary Library Background Note* (Canberra: Parliament of Australia, 2010); Department of Home Affairs, *Planning Australia's 2021-22 Migration Program* (Canberra: Department of Home Affairs, 2021).

5   For further detail on the long-run net overseas migration assumption, see the Appendix.

Chart 2.5   Net overseas migration as a percentage of the population
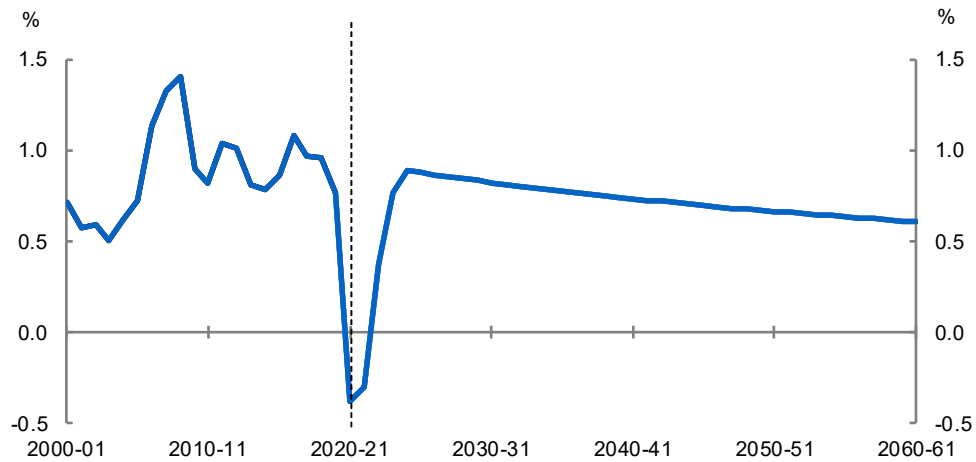
Source: ABS National, state and territory population, September 2020, and Treasury.

Understanding migration and its effects

To plan for future migration-driven population growth, it is important to consider its effects on Australia's economy, fiscal sustainability, environment and planning, and social cohesion.

Figure 2.1 Framework for understanding the impact of migration
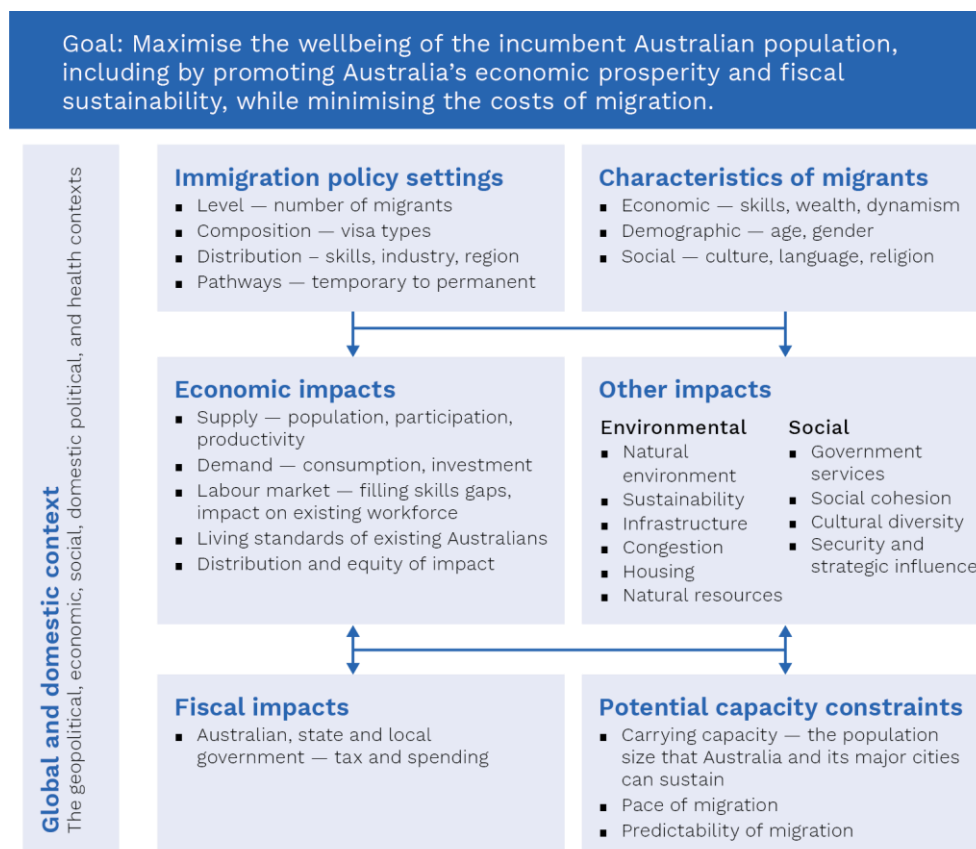
Source: Adapted from Productivity Commission, 2016 *Migrant Intake into Australia*, *Inquiry Report No.77.*

Immigration policy settings

The Government decides the policy settings of the Migration Program based on the supply of potential migrants from other countries and the domestic context. These decisions include:

• the number of migrants

• the types of migrants

• the locations where migrants initially settle

• the pathways from temporary to permanent migrant and from permanent migrant to citizen.

These policy decisions, as well as the characteristics of those who apply to migrate to Australia, play a large role in how migrants participate in the economy and contribute to the overall prosperity of Australia.

Interaction between permanent and temporary migration

The total level of net overseas migration over time is composed of 2 main factors – the size of the permanent Migration Program, and the change in the stock of temporary visa holders.

Temporary migration is demand driven and largely uncapped, limited only by meeting visa eligibility criteria. At the end of a temporary visa, migrants can apply for a new temporary visa, apply for a permanent visa, or depart Australia. This leads to an ongoing flow of temporary migrants in and out of the country.

Changes in the flows of temporary migrants can change the size of the stock of temporary migrants in Australia. Temporary visa holders typically make up the majority of overseas arrivals in any particular year. However, while some temporary migrants leave Australia, a significant portion transition into permanency. Permanent migrants make up the majority of migrants in Australia, when accounting for those who arrive as temporary migrants and later transition into permanent residency.

Temporary migration provides a pipeline of migrants to the skilled stream of the permanent Migration Program. Over half of those on temporary skilled visas transition to permanency.[6] Temporary migrants who arrive closer to their peak earning ages, and are more highly skilled, make a significant contribution to the Australian economy. Permanent migrants who enter the country on temporary skilled visas have much higher incomes than those who enter on other temporary visas or directly through the permanent stream.[7]

Economic and fiscal impacts of migration

The level and composition of the Migration Program are both important for the way they influence population change, and Australia's economy and budget.

As migrants are, on average, younger than the existing Australian population, migration reduces the average age of the population and slows the rate of population ageing.[8] This is not a complete solution to the long-term challenges associated with an ageing population as migrants also age. However, a well-targeted, skills-focused Migration Program can better support our ageing population by supplementing the stock of working-age people, slowing the transition to an older population, and improving Australia's fiscal outcomes. In 2018-19, the latest data available prior to the COVID-19 pandemic, 83 per cent of net overseas migrants were people of working age,

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6   Treasury and the Department of Home Affairs, *Shaping a Nation* (Canberra: Australian Government, 2018).
7   Treasury analysis of the average taxable income (2015-16) of permanent migrants by temporary visa history using the ABS Multi-Agency Data Integration Project.
8   Centre for Population, *Population Statement 2020* (Canberra: Centre for Population, 2020).

compared with 65 per cent of the existing population.[9] At June 2019, 46 per cent of the Australian population was younger than 35 years old, compared with 82 per cent of new migrants.

Box 2.1   Economic and fiscal impacts of proportional migration levels

This sensitivity analysis illustrates the effects of migration on Australia's economic and fiscal outlook. Net overseas migration is held at a constant 0.82 per cent of the population after the end of the medium term. As a result, net overseas migration reaches 327,000 people per year in 2060-61, compared with 235,000 per year in the baseline population projections.

This sensitivity analysis projects a higher population growth rate and total population of 40.5 million in 2060-61, effectively replacing net overseas migration losses during the COVID-19 pandemic over the long term. This is 1.7 million people, or 4.3 per cent, higher than the baseline population projections. The increase in population is made up of an additional net 1.3 million migrants and 0.3 million extra births attributed to the additional migrants.

Chart 2.6   Population growth with proportional migration
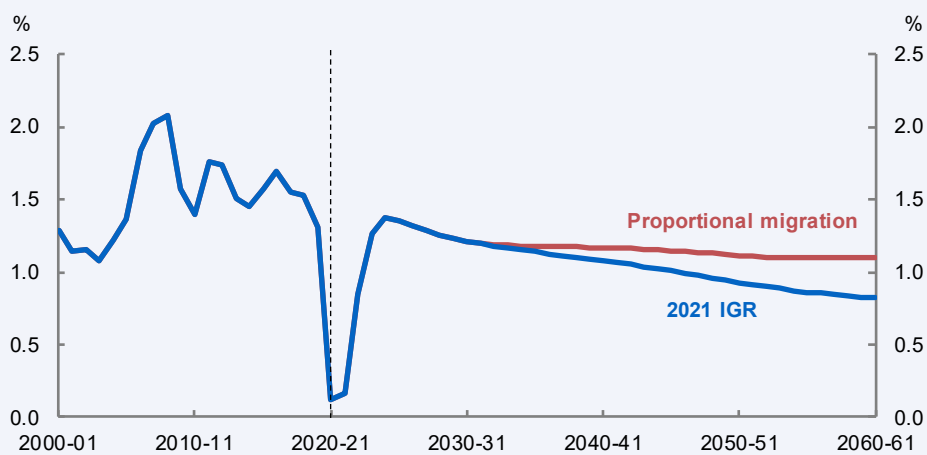
Source: ABS National, state and territory population, September 2020, and Treasury.

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9   ABS, *Migration, Australia*, 2018-19 financial year (2021). The unusual distribution of net overseas migration due to the COVID-19 pandemic in 2019-20, particularly the large number of returning Australians, meant that the share of net overseas migration of working age was much lower than usual.

The higher overall population due to proportional migration results in an increase in the level of real GDP of 4.7 per cent by 2060-61.

Chart 2.7 Impact of proportional migration on real GDP growth
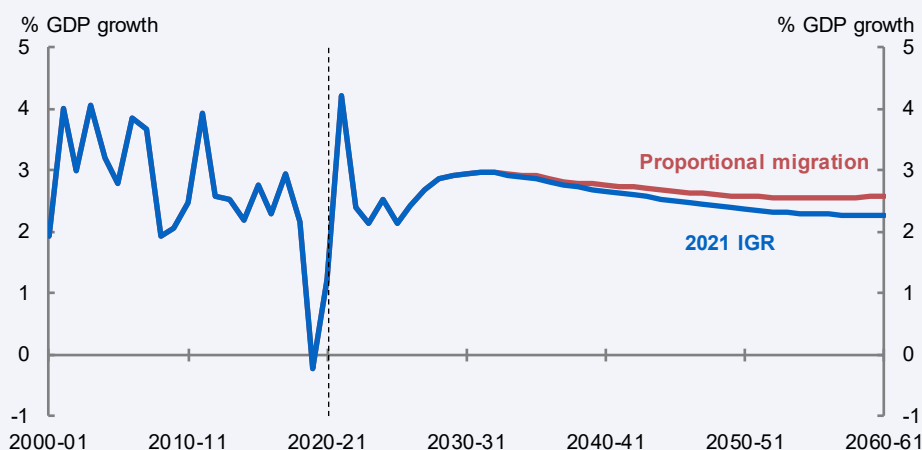
Source: ABS National Accounts: National Income, Expenditure and Product, and Treasury.

As migrants on average are younger than the overall Australian population, increasing the level of migration increases the working-age population and delays the effects of population ageing. This lifts the participation rate in the sensitivity analysis by around 0.6 percentage points by 2060-61. The increased participation rate flows through to a small positive lift in the level of real GDP per person of 0.4 per cent by 2060-61. This sensitivity analysis does not take into account any productivity effect of Australia's Migration Program. It also does not take into account other factors that may influence labour force participation beyond age and gender, such as a worker's skill or experience. Doing so may change the contribution of migration to GDP per person.

The increased long-run level of migration and increase in the working-age population benefits the budget. Under this sensitivity analysis there is projected to be additional government spending across a variety of categories including infrastructure and payments to individuals. However, while government spending increases in nominal terms, it is projected to decrease as a share of the economy. This is because the larger population is projected to increase GDP more than government payments. In addition, taxation receipts are projected to be larger due to the larger economy. As a result of these 2 factors, the underlying cash balance is 0.5 percentage points of GDP higher by 2060-61, compared with the baseline projections.

Chart 2.8   Impact of proportional migration on the underlying cash balance
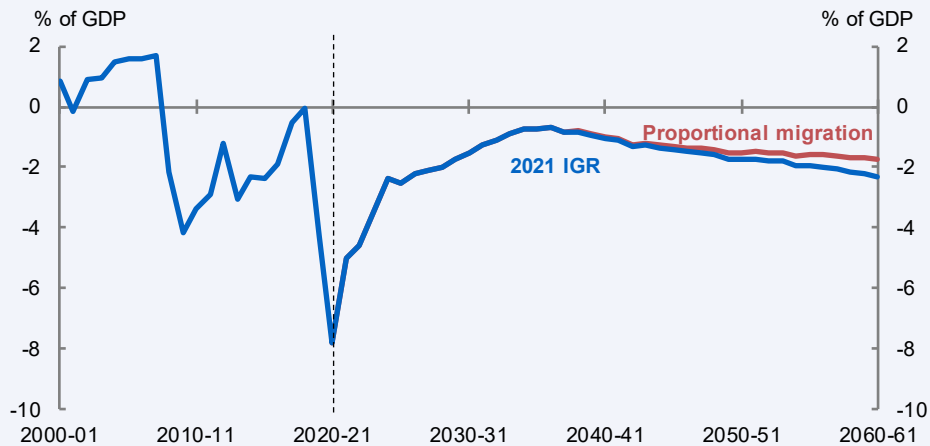
Source: Treasury.

The cumulative effect of improved budget positions and a larger economy is a reduction in projected net debt as a share of GDP by 4.8 percentage points by the end of the projection period.

The composition of the Migration Program matters

Treasury modelling shows that permanent migrants who arrive younger and are highly skilled make a higher economic and fiscal contribution during their time in Australia, compared with those migrants who arrive later in life or are lower skilled. This is largely because permanent migrants tend to arrive early in their working life and therefore spend longer in the workforce, and those who are highly skilled are likely to have high rates of workforce participation and labour productivity. This finding is reflected in Charts 2.9 and 2.10, which show that migrants selected via the Skill stream deliver a higher economic and fiscal dividend than those arriving via the Family stream and Humanitarian Program. Chart 2.10 includes both the fiscal benefits of migrants from additional tax revenue and the fiscal costs from additional Australian Government expenditure, including on aged care, education, health, infrastructure, transfer payments and settlement services. These results do not include the fiscal impacts at the state and local government level.[10]

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10   For further information, see the Appendix.

Aside from age and skill, other migrant characteristics such as English-speaking ability, complementarity with the existing labour force, and entrepreneurship have also been associated with higher economic and fiscal contributions.

Charts 2.9 and 2.10 show the Family stream and the Humanitarian Program deliver lower economic and fiscal dividends, reflecting that these programs are driven by social objectives. The Family stream supports family reunions, while the Humanitarian Program provides permanent resettlement to people who are subject to persecution, substantial discrimination, or significant harm in their home country. While the Skill stream tends to have higher economic and fiscal benefits, the Family stream and Humanitarian Program have other non-economic benefits, including supporting family reunion, increasing cultural diversity and fulfilling our international obligations.

Chart 2.9   Lifetime contributions to real GDP (direct and indirect effects) per permanent migrant, by income

$m (NPV)

4.5

4.2

4.0   ▲ **Real GDP**
       Indirect taxes
3.5   **Gross operating surplus**
       Compensation of employees
3.0

2.5

2.0

1.5   1.5
                                      1.0
1.0
                                                      0.4
0.5

0.0
   Skilled Primary   Skilled Secondary   Family   Humanitarian
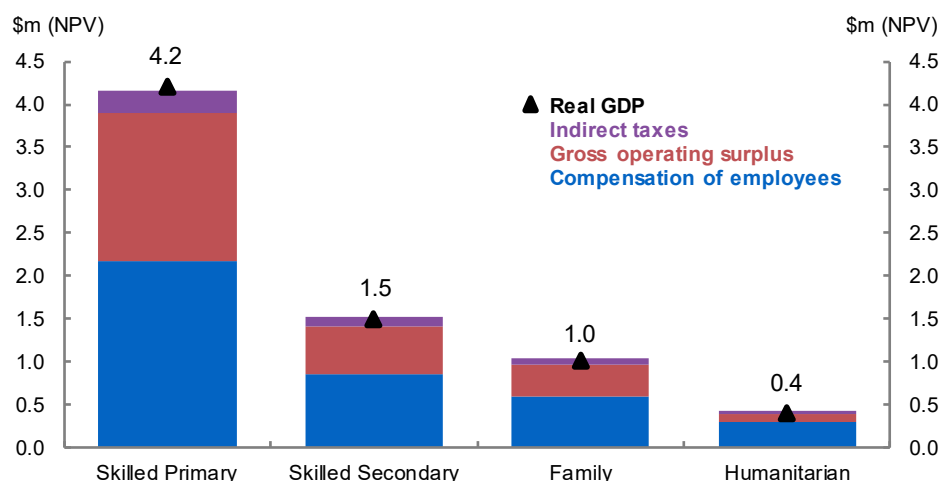
Note: The modelling only directly captures migrants who arrive aged 21 to 95. The Skill stream is comprised of primary and secondary migrants. Primary migrants are the main visa holders who satisfy the primary criteria for the grant of a visa. Secondary migrants are accompanying family of primary migrants, such as spouses and dependents. NPV stands for net present value. For further information, see the Appendix.
Source: Treasury.

Chart 2.10 Lifetime fiscal impact on the Australian Government budget per permanent migrant, by tax and expenditure type
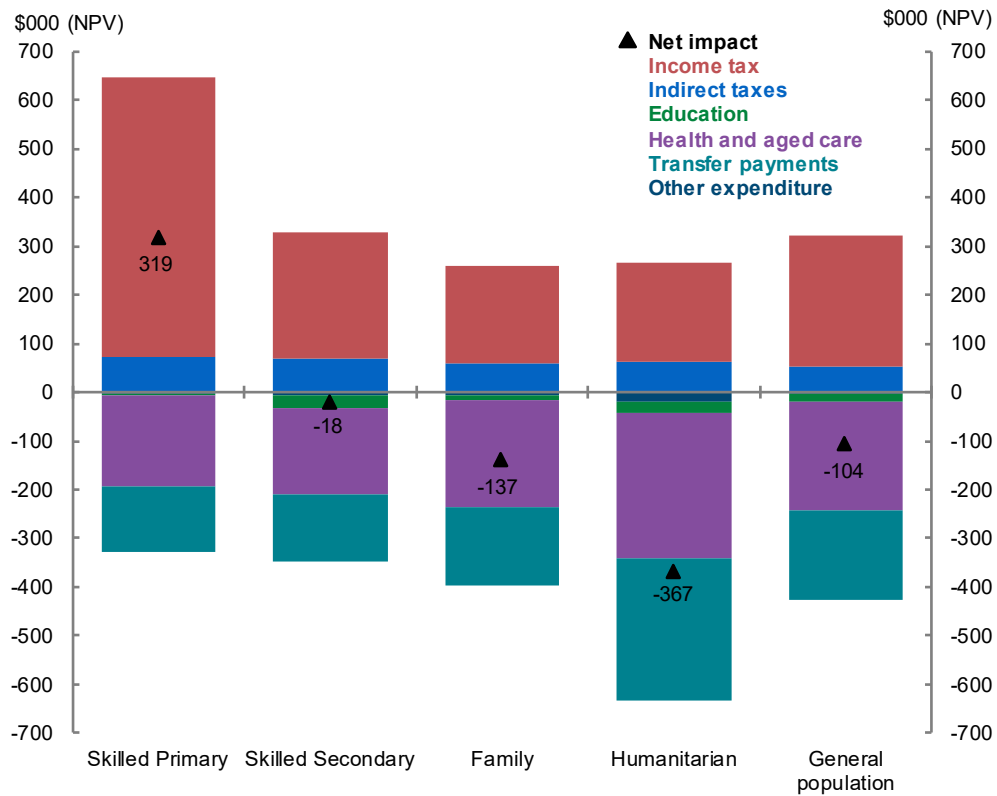
Note: This chart shows the net lifetime fiscal impact of different cohorts for a selection of key tax and expenditure types that can be attributed to individuals. Other expenditure includes Australian Government spending on infrastructure and settlement services. The results do not include all Australian Government revenue sources (such as corporate tax) or expenses (such as defence) or fiscal impacts at state and local government level. As estimates are sensitive to assumptions such as the discount rate, they are best interpreted as relativities rather than in absolute terms. The Skill stream is comprised of primary and secondary migrants. Primary migrants are the main visa holders who satisfy the primary criteria for the grant of a visa. Secondary migrants are accompanying family of primary migrants, such as spouses and dependents. NPV stands for net present value. For further information, see the Appendix.
Source: Treasury.

Managing the costs and benefits of migration

In the post-war era, Australia has been able to manage migration with relatively few social, political, or economic challenges. While the impact of migration can be estimated in economic measures such as GDP per person, broader quality-of-life impacts are more difficult to measure. For example, the contributions of migrants to cultural diversity, community connections or innovation are important but difficult to quantify.

The economic and social pressures and capacity constraints that result from an inward flow of migrants also need to be managed carefully. Migration should be kept at or below the capacity of the destination city or region to absorb new migrants, taking into account impacts on incumbent populations.

Sustainable migration provides greater certainty for governments, businesses and individuals to plan for the future. Higher migration rates bring forward higher demand for services, natural resources, urban land and infrastructure, which may be in limited supply and vary significantly based on region. Governments at all levels need to ensure that planning and infrastructure provision keep pace with current and future migration rates and ensure that migrants have access to essential services – such as public transport, support services and housing – and can meaningfully integrate into society.

This requires transparency, consistent decision making and careful planning by all levels of government. The National Population and Planning Framework, agreed by the Australian Government, state and local governments in 2020, provides a mechanism to pursue these population planning goals.

The total fertility rate is continuing to decline

As a result of the COVID-19 pandemic, the total fertility rate is assumed to fall in the short term. The total fertility rate is forecast to fall from 1.65 babies per woman in 2019-20 to 1.58 babies per woman in 2021-22 due to economic uncertainty causing some people to delay having children. In 2023-24 the total fertility rate is assumed to temporarily rise to 1.69 babies per woman as 80 per cent of the delayed births occur, before gradually declining to 1.62 babies per woman by 2030-31.[11]

The fertility rate is then assumed to remain at 1.62 babies per woman until 2060-61. This is a revision down from the 2015 Intergenerational Report, which assumed the total fertility rate was 1.90 babies per woman. This previous assumption was based on a 35-year average that included a temporary period of relatively high fertility between 2004 and 2007. The current assumption is based on a 60-year analysis of the long-term trend of declining fertility driven by women having children later in life, and having fewer children than women before them at the same ages.

Over the next 40 years, the fertility rate is projected to remain well below the replacement rate of 2.1 babies per woman, which is the level required to keep the population size steady assuming no net overseas migration and unchanged mortality. Australia's fertility rate has been below the replacement rate since 1976-77. Despite this, natural increase has continued to contribute positively to population growth as the number of women of childbearing age has continued to increase.

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11 P. McDonald, *A Projection of Australia's Future Fertility Rates,* (Canberra: Centre for Population, 2020).

Chart 2.11 Total fertility rate
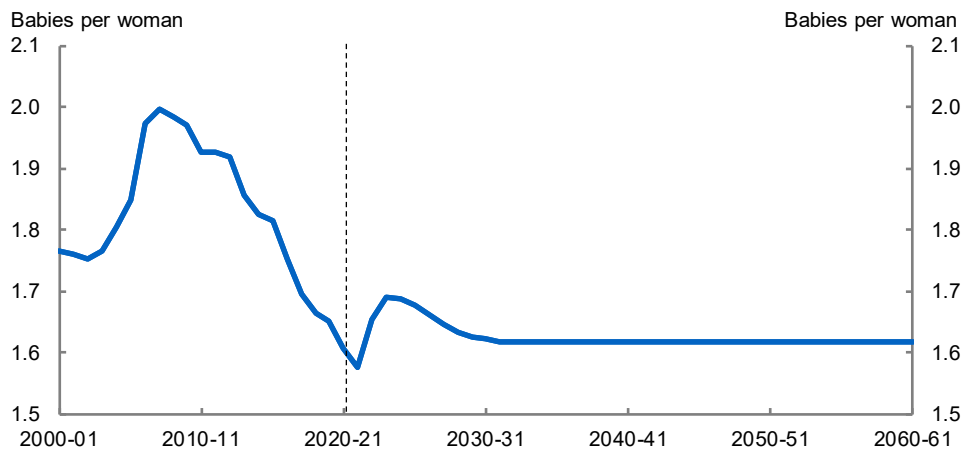
Source: Centre for Population, Population Statement (2020) and McDonald (2020).

Fertility rates among women in their 20s have been, on average, declining since the early 1980s. By contrast, the fertility rate for women in their 30s has remained broadly stable since the mid-2000s. These trends are a result of the shift towards women having their first child later in life and having fewer children overall.[12]

Chart 2.12 Total fertility rate by age cohort
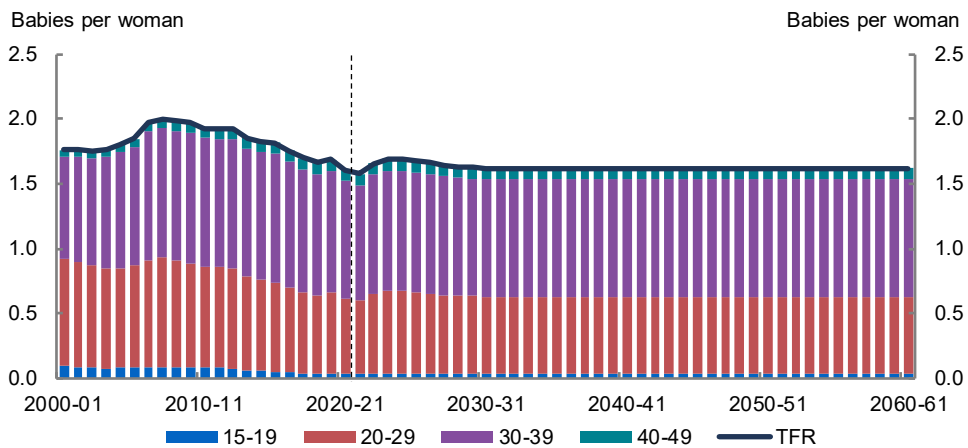
Source: ABS customised data request (2020) and McDonald (2020).

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12   P. McDonald, op. cit.

Life expectancies will continue to increase

Life expectancies in Australia have been improving over time (Chart 2.13).[13] This is due to advances in the way medical conditions are diagnosed and treated, as well as improvements in personal safety which have contributed to declining mortality rates.

Life expectancy at birth is expected to continue to increase from 80.9 years for men and 85.0 years for women in 2018, to 86.8 years for men and 89.3 years for women by 2061. However, projections have been revised down compared with the 2015 Intergenerational Report to reflect the recently observed slowdown in mortality improvements.

In 2013, dementia became Australia's second leading cause of death.[14] Dementia prevalence is expected to continue to rise as a result of Australia's ageing population over the next 40 years. It is expected to overtake ischaemic heart disease to become the leading cause of death in coming years.[15] Increasing rates of dementia will have a significant impact on Australia's health and aged care systems and present one of Australia's most pressing health challenges.

The life expectancy projections are based on the assumption that the trend of mortality improvement over the past 25 years continues over the next 25 years.[16] Thereafter, the rate of mortality improvement is expected to slow.

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13 This report uses the 'period' rather than 'cohort' life expectancy method. The 'period' method measures life expectancy as the average age to which a person is likely to live given the mortality rates in a given year. It does not take into account the potential advances in life expectancy that could happen during a person's lifetime.

14 ABS, *Causes of Death Australia*, 2013 (Canberra, 2015).

15 ABS, *Causes of Death Australia*, 2015 (Canberra, 2017).

16 The projections over the next 25 years are based on mortality improvement rates observed between the 1991 to 2016 Australian Life Tables.

Chart 2.13 Life expectancy at birth
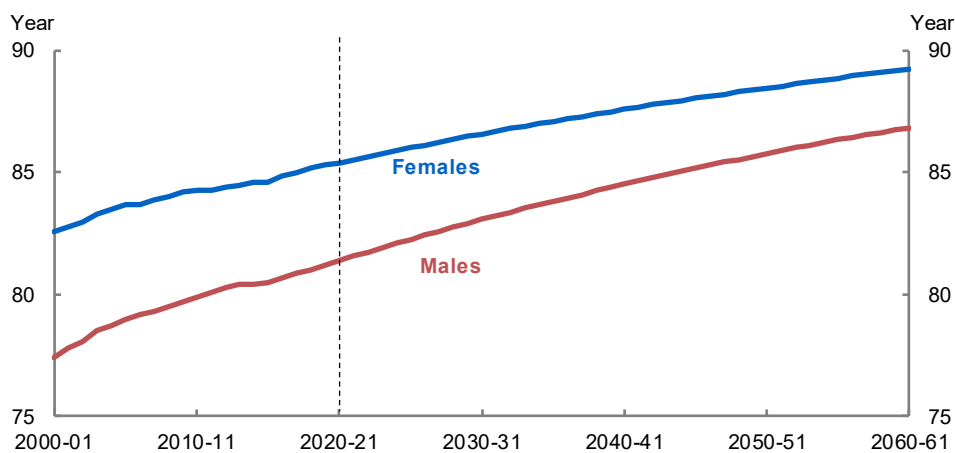
Source: ABS Australian Historical Population Statistics; ABS Life Tables: States, Territories and Australia, 2016-18; ABS Life Tables, 2017-2019; and Treasury.

Natural increase is projected to decline

Natural increase – the population change resulting from the number of births minus the number of deaths – is expected to continue to contribute positively to population growth (Chart 2.14). This is driven by growth in the number of women of childbearing age.

Deaths are projected to continue to increase faster than births, growing by an annual average rate of 1.6 per cent over the 40 years to 2060-61, with births projected to increase at an average rate of 0.7 per cent over the same period. This means the contribution of natural increase to population growth will fall to around one quarter of annual population growth by 2060-61, compared with around 44 per cent of population growth over the past 20 years.

Chart 2.14 Natural increase
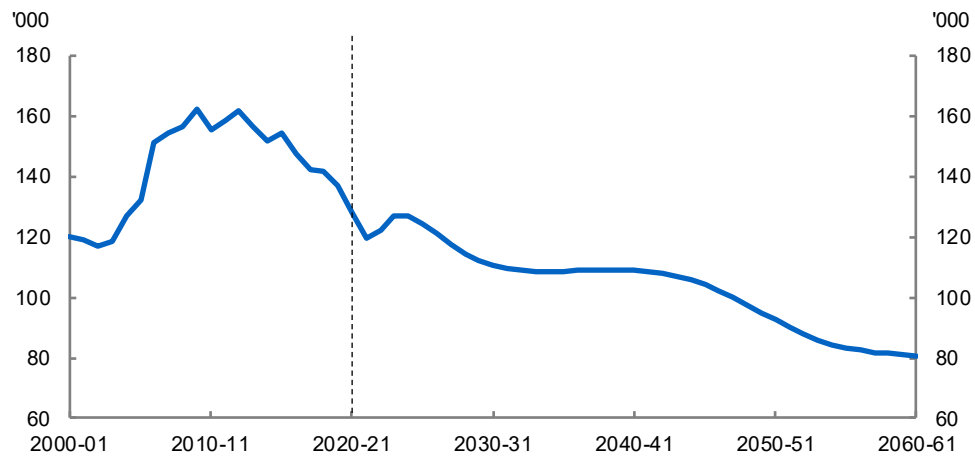
Source: ABS National, state and territory population, September 2020, and Treasury.

Population ageing will present economic and fiscal challenges

Australia's greatest demographic challenge is the ageing population, caused by increasing life expectancies and falling fertility rates. From 2019-20 to 2060-61, the number of people aged 65 and older will double to 8.9 million. In 2060-61, 23 per cent of the population is projected to be 65 and older, an increase from 16 per cent in 2019-20. The number of people aged 85 and older will more than triple to 1.9 million. In 2060-61, 5 per cent of the population is projected to be 85 and older, up from 2 per cent in 2019-20. In 2019-20, there were 6,400 centenarians. In 2060-61, there are projected to be 40,900 centenarians.

Chart 2.15 Older Australians by level and share of population
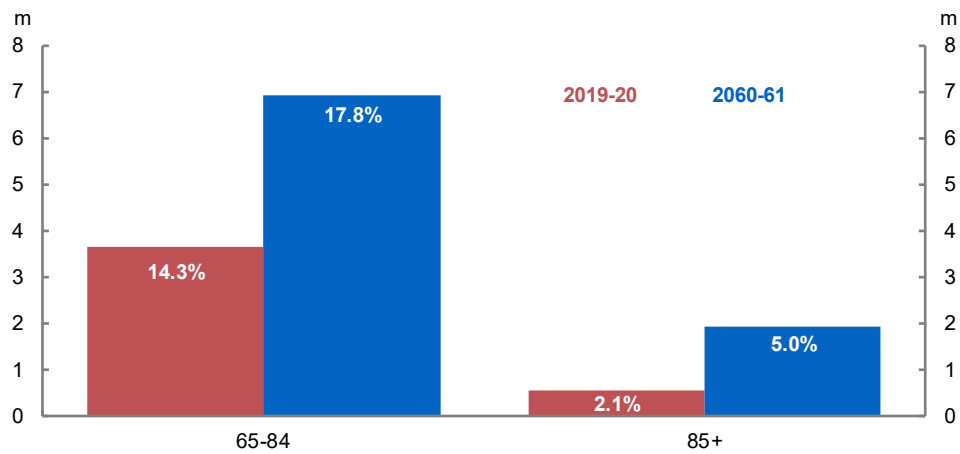
Source: ABS National, state and territory population, September 2020, and Treasury.

Chart 2.16 Population age pyramid

Australia
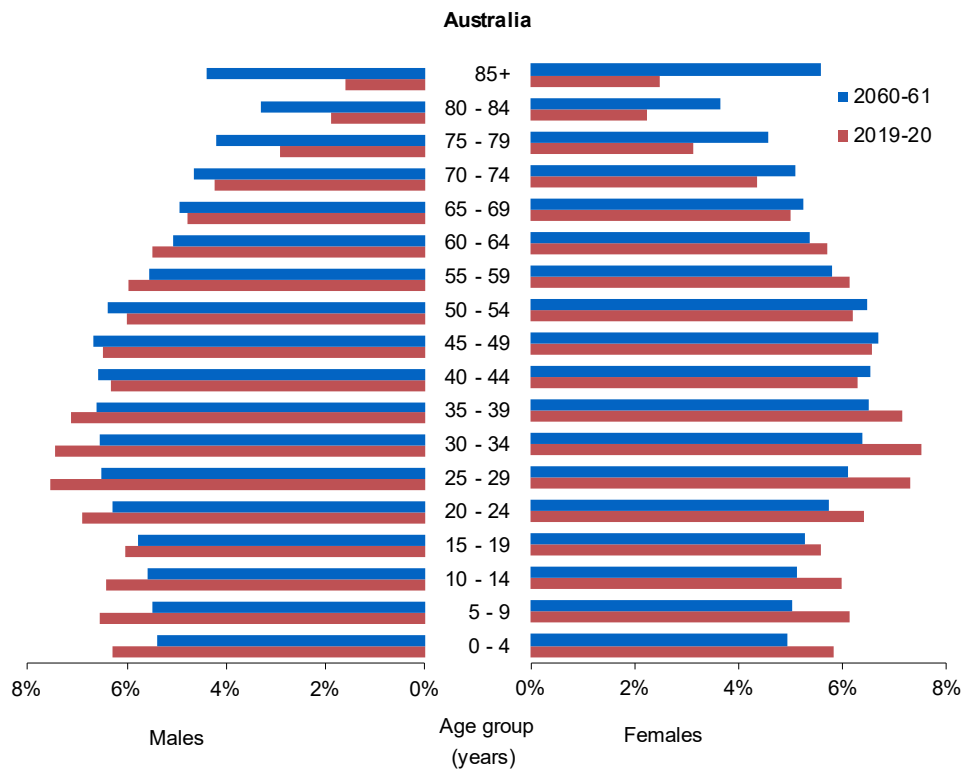
Source: ABS National, state and territory population, September 2020, and Treasury.

The number of working-age people (aged 15 to 64) as a share of the population is projected to fall over the next 40 years, in line with an increasing share of people aged

over 65. The ratio of working-age people to those over 65 is known as the old-age dependency ratio. In 1981-82, for every person aged over 65, there were 6.6 working-age people. In 2019-20, for every person aged over 65, there were 4.0 working-age people. This ratio is projected to fall further – by 2060-61, for every person aged over 65, there will only be 2.7 working-age people. The rapid decline in the old-age dependency ratio between 2010-11 and 2029-30 is largely due to the baby boomer generation reaching age 65. The ratio continues to decline from the mid-2030s after this transition is complete, but does so less rapidly than before.

The falling old-age dependency ratio presents challenges for Australia's long-term economic growth and fiscal outlook. A working-age person's taxes will be required to support a greater number of people aged over 65. A larger older population will require greater government spending in healthcare, the Age Pension and end-of-life support, and has implications for participation and productivity growth. As the population continues to age and adds pressure to the budget, government policy will need to adapt and foster economic growth to overcome these fiscal challenges.

Chart 2.17 Old-age dependency ratio

People aged 15-64 to people aged 65+

People aged 15-64 to people aged 65+

Baby boomers turning 65
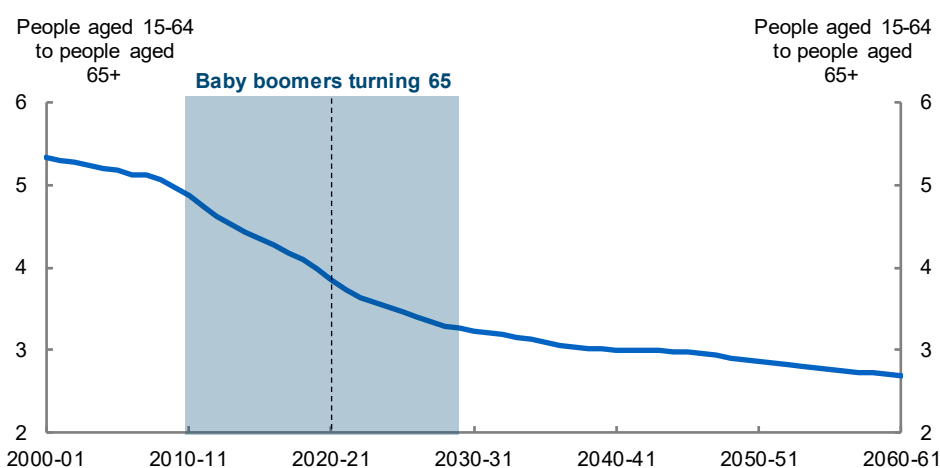
Note: Number of people of traditional working-age (15-64) for every person aged 65 and over.
Source: ABS National, state and territory population, September 2020, and Treasury.

3. Participation

Overview

The participation rate has increased over the past 40 years to reach record high levels of 66.3 per cent in March 2021. This has been driven by a significant increase in participation by women aged 24 to 54, and older Australians.

The participation rate is expected to decline to 63.6 per cent by 2060-61 as the proportion of older Australians in the population increases. However, the effect of ageing is expected to be partly offset by continued increases in participation of women. This largely reflects that younger generations of women participate more than older generations and are expected to continue to do so as they get older. While female participation rates have increased considerably in Australia in recent decades, there is scope for further increases.

The average number of hours worked per week has declined from around 35 in 1978-79 to around 32 in 2018-19. This reflects an increase in the share of part-time workers, largely driven by the increased participation of women and older Australians, as well as increased use of part-time work by men. These trends are expected to continue (after partly recovering from a significant fall in 2019-20 due to COVID-19), resulting in a projected decline to an average of 31 hours worked per week by 2060-61.

Technological developments, the continued shift towards a service-based economy, and broader changes in the occupational structure of the Australian workforce have the potential to support participation into the future.

Participation is at record levels

Participating in the labour force brings many benefits to individuals and the broader economy. Work provides financial security, social connection, and more opportunities to contribute to society. Maintaining a high rate of labour force participation is central to supporting future economic growth, easing spending pressures created by an ageing population, and sustaining revenues for government services.

Australians in most age groups are participating in the labour force more than ever before. In March 2021 the total participation rate reached its highest level on record at 66.3 per cent, up from 64.8 per cent at the end of 2014-15.

The record rate of participation seen in March 2021 is the result of longer-term trends in the Australian labour market, some of which have spanned several decades. Increased participation by older Australians has been supported by greater life expectancy and better health, as well as greater availability of part-time and less physically demanding jobs.

Chart 3.1   Male participation   **Chart 3.2   Female participation**
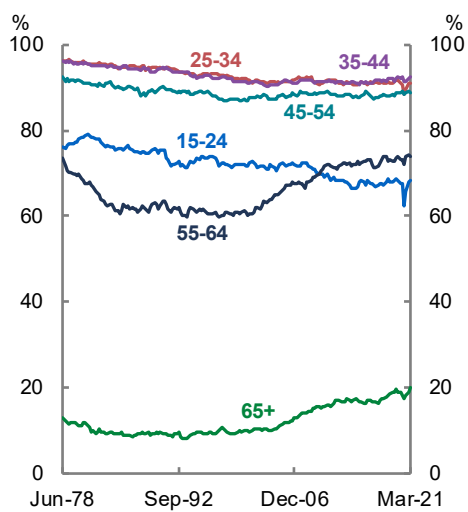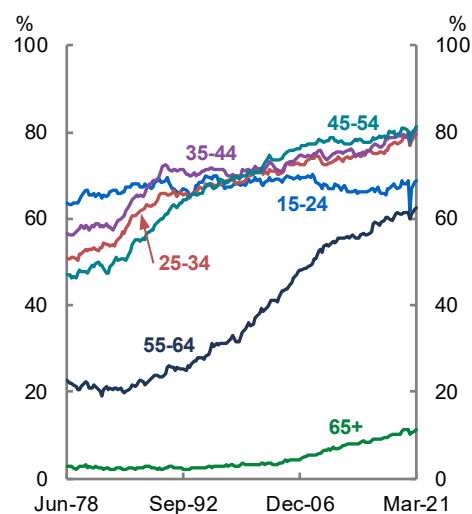
Note: Data are seasonally adjusted.
Source: ABS Labour Force.

Australia's migration policy settings have supported participation. These policies have targeted young skilled migrants and resulted in migrants generally arriving in Australia at ages with relatively high participation rates (Chapter 2 - Population).

While participation has increased across most age groups, the largest contribution has been from increased participation by women. Female participation has been boosted by several factors, notably changing social attitudes, declining fertility rates, changes in government policies (particularly child care), and increasing availability of part-time and flexible working arrangements. However, there are differences in women's increased participation at different life stages, reflecting that factors affecting participation are not the same across all ages.

Projections of future participation rates

This report uses a new methodology to project participation rates: participation rates at later stages of life for a given generation are based on the observed participation for that generation at younger ages. In this model, changes in aggregate participation rates

mainly reflect 2 trends: the changing demographic structure of the workforce (in Australia's case, an ageing population), and the changing propensity to participate in the workforce between different birth cohorts.

In the first trend the participation rate typically follows a familiar profile through life; starting low during school age, peaking around middle age, and tapering towards retirement. As the population ages there will be more people in the later stage of this profile, thus lowering the overall participation rate.

The second trend reflects how life cycle participation profiles have shifted up or down from one generation to another. Participation rates are higher for more recent generations of women and lower for recent generations of men. Upward shifts in participation for women have more than offset the downward shifts for men, resulting in a positive impact on overall participation. These generational cohort effects have contributed to moderating the effect of the ageing population.

The total participation rate is projected to decline from 66.3 per cent in March 2021 to 63.6 per cent in 2060-61. The decline is due to the negative effect of ageing on the participation rate being only partially offset by higher participation for younger, and future, generations.

Chart 3.3   Historical and projected labour force participation rates
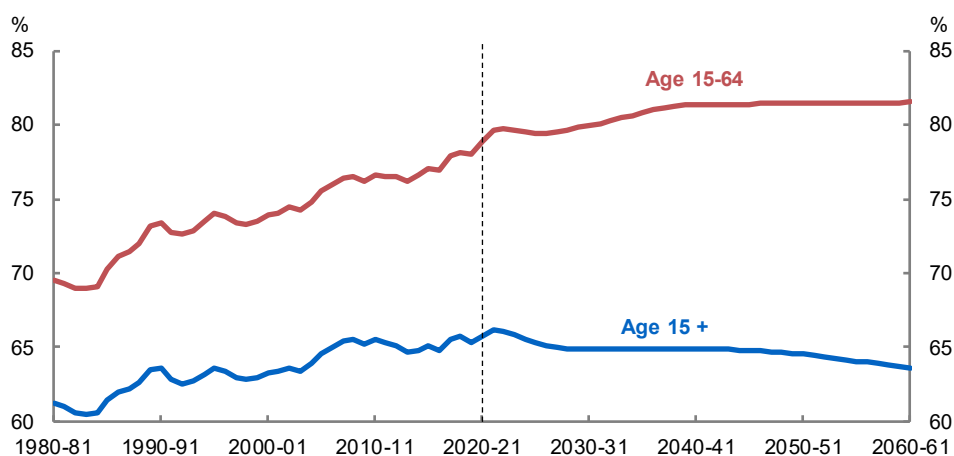
Note: For further information, see the Appendix.
Source: ABS Labour Force and Treasury.

The participation rate for those aged 15 to 64 is projected to increase over the next 2 decades and then remain broadly stable. This projected increase is mainly due to the increased participation rates of women aged 40 years and over. This reflects the higher likelihood of younger generations of women participating in the labour force, who are expected to continue participating later in life. This means that as these generations age and replace older generations, the participation rate will increase.

Over the past 40 years, participation rates have increased in most age groups. However, over the next 40 years, participation rates are projected to significantly increase only at ages 40 and over, with little change at younger ages. Both historical changes and projected changes are mainly due to changing workforce participation patterns for women. Higher participation at certain ages will be more than offset by population ageing, resulting in a projected decline in the total participation rate.

Chart 3.4   Participation rates over the life cycle
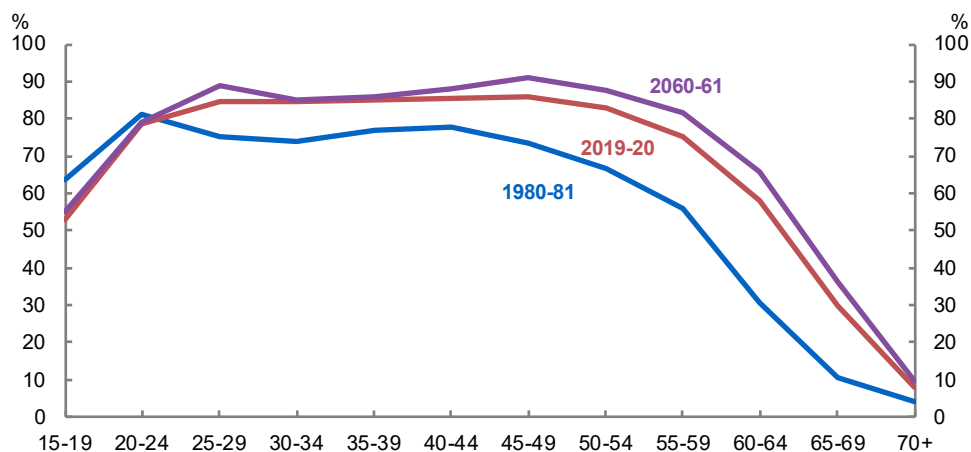
Source: ABS Labour Force and Treasury.

The total participation rate has consistently outperformed the projections in past intergenerational reports, with projected participation rates revised up in each report since 2007 (Chart 3.5). The 2002 Intergenerational Report projected that the labour force participation rate would fall to 61 per cent by 2020. However, the participation rate reached a high of 66.3 per cent in March 2021. The stronger than expected outcomes and the adoption of a new methodology results in projected participation remaining higher for longer before the effects of ageing dominate.

Chart 3.5 Participation rates across intergenerational reports
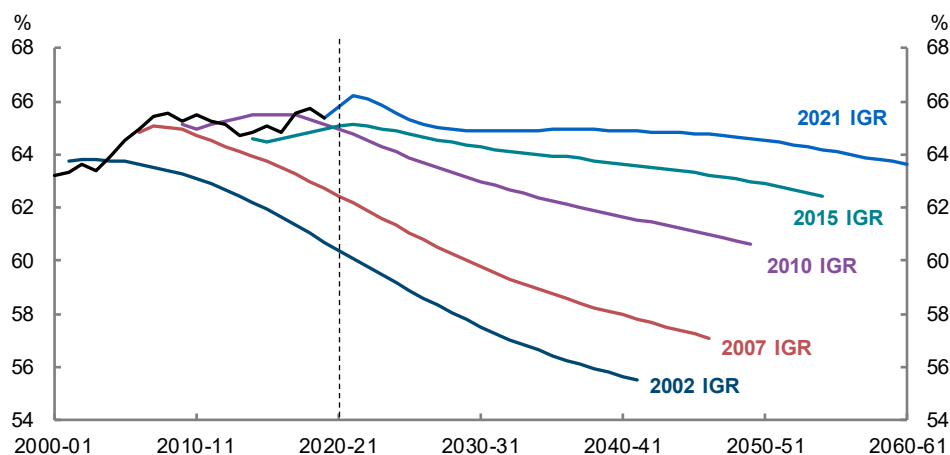
Source: ABS Labour Force and Treasury.

While the participation rate measures the share of the population that is either working or actively looking for work, the size of the economy depends on what proportion of those wanting to work cannot find employment – the unemployment rate. In this report it is projected that the unemployment rate falls to 4¾ per cent and remains there.

The non-accelerating inflation rate of unemployment (NAIRU) is assumed to be 4¾ per cent, based on analysis suggesting that the NAIRU was between 4½ and 5 per cent prior to the COVID-19 pandemic. This is lower than in the 2015 Intergenerational Report, which assumed a NAIRU of 5 per cent. A lower NAIRU increases the supply of available labour in the economy and in turn increases potential output.[17]

The workforce is ageing but working longer

Population ageing is projected to significantly lower the total participation rate. Prior to COVID-19, the participation rates for men and women aged 65 years and over were around 20 and 10 per cent, respectively, compared with a total participation rate of around 66 per cent. Due to low fertility rates and increased life expectancy, the share of the population aged 65 years and over is expected to increase from 16 per cent in 2019-20 to 23 per cent by 2060-61 (Chapter 2 – Population).

There has been an increase in the proportion of older people who remain engaged in the workforce. This likely reflects changing social attitudes towards older workers, improved health at older ages and an increase in less physically demanding employment opportunities. The increase in the share of part-time jobs has likely also

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17   H. Ruberl et al., 'Estimating the NAIRU in Australia', *Treasury Working Paper* 2021-01 (2021).

contributed to older people transitioning from full-time work to part-time work before retirement. The current generation of older women has had significantly higher levels of workforce engagement throughout their lives, and this has likely increased their workforce participation at older ages.

The gradual increase to the female Age Pension eligibility age beginning in the 1990s is also likely to have had an effect. There were significant increases in female participation at ages 60 years and over between 1995 and 2013.

More recently, further increases in the Age Pension eligibility age for both men and women have been legislated. These most recent changes can be expected to affect future participation rates.

Participation by women is likely to continue increasing

The sustained increase in the female participation rate in Australia has been larger than projected in previous reports but is broadly mirrored by the experience of similar countries. However, the female participation rate remains well below that of males. In 2019-20, the participation rate for women aged over 15 was 60.5 per cent, compared with 70.4 per cent for men. As participation rates for women aged over 40 are expected to increase, the gap between female and male participation is expected to narrow by around 2 percentage points by 2060-61. Continued policy support could further encourage female participation.

Chart 3.6   Historical and projected participation rates, by gender
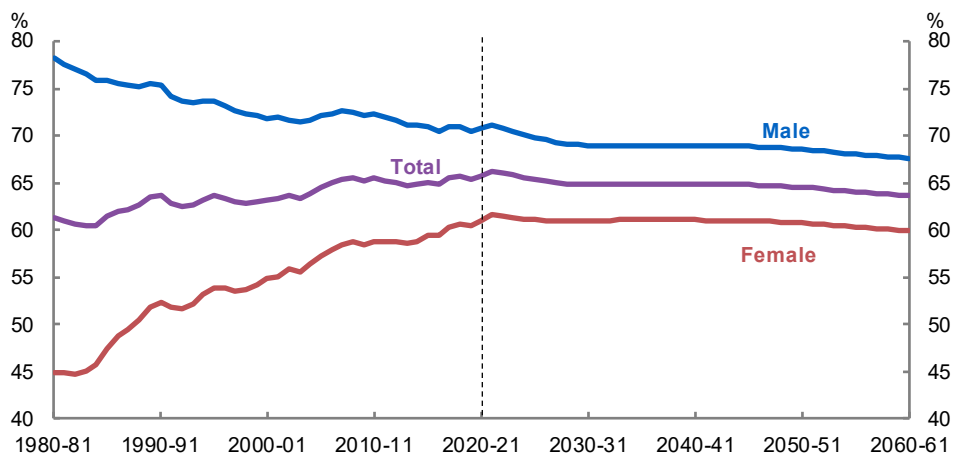
Note: For further information, see the Appendix.
Source: ABS Labour Force and Treasury.

Improvements to women's participation and economic security are not just meaningful at an individual and societal level but could significantly increase potential GDP and thereby add to Australia's economic growth. It is estimated that 20 to 40 per cent of per person growth in the United States between 1960 and 2010 may be due to the

reduction of barriers faced by women and minority groups that prevented making the best use of people's talents in the economy.[18]

Changes in social attitudes and legislation over past decades have allowed women to join the labour market and gain educational qualifications to enter skilled professions. Women are now more likely to have a non-school qualification than men (70 per cent of women compared with 68 per cent of men), and to have a Bachelor degree or above (39 per cent compared with 31 per cent).[19]

Chart 3.7   Share of total employment by industry
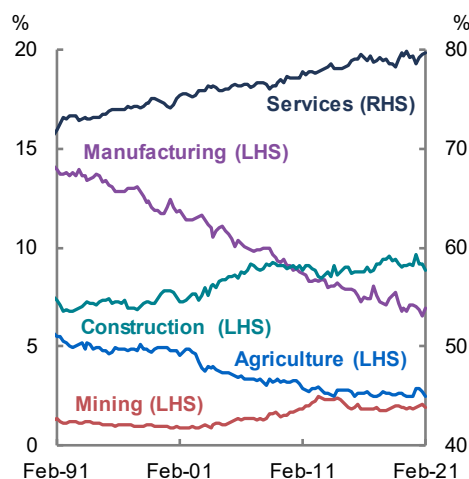
Chart 3.8   International comparison of female participation rates (ages 15-64)
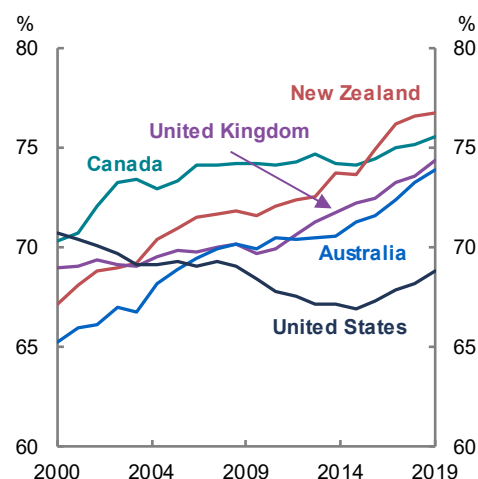
Note: Female participation rates comparisons are for ages 15-64 (rather than for ages 15 and over) as this allows for a more accurate comparison between countries with different demographic structures.
Source: ABS Labour Force and OECD Labour Force Statistics.

Improvements in female participation have also been supported by significant structural changes in the economy, in particular the types of jobs available. The share of employment in the services industries, in which women are strongly represented, has steadily increased from around 70 per cent in 1990 to around 80 per cent today. An increase in part-time work has improved flexibility for men and, in particular, for women, allowing them to participate in the paid workforce alongside unpaid domestic and care work.

A key demographic driver of increased female participation over recent decades has been changes in fertility decisions, with women having fewer children and having them later in life. With peak fertility rates moving from ages 25-30 to ages 30-34, there has

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18   C. Hsieh et al., 'The allocation of talent and U.S. economic growth' *Econometrica*, *87*/5 (2019), 1439-1474.

19   ABS, *Education and Work, Australia May 2020* (2020).

been a corresponding increase in the full-time participation of women in their late 20s.[20] There has also been an increase in full-time participation by women at peak fertility age, with more women working while pregnant and returning to work after pregnancy.[21] Attitudes towards women returning to work after having children have also shifted; there is increased societal support for women combining work and parenting responsibilities.[22]

Government policies, such as increasing female Aged Pension eligibility ages and improving access to child care services, have played a role in increasing female labour force participation. The participation rate for mothers in couples with children under 4 is 68 per cent, compared with 87 per cent for coupled women in the same age group of 25-44 without young children. However, the participation rate for mothers with young children has been increasing at a faster rate, with the gap decreasing from around 27 percentage points in 2005 to 18 percentage points in 2020.[23]

While female participation rates have increased considerably in Australia in recent decades, further improvement is possible (Chart 3.8). Primary caring responsibilities continue to fall disproportionately to women. Women are much more likely than men to adjust their paid work after having a child. Paid work patterns for most men remain essentially unchanged when they become fathers.[24] There is still a significant gap in the amount of unpaid care work undertaken by mothers and fathers, even beyond the early years of child rearing. This may present ongoing barriers to mothers increasing their workforce participation.

While the gender wage gap has narrowed in recent years, women's average weekly ordinary time full-time earnings remain $242 less than men's.[25] The wage gap persists even in industries where women are over represented.[26] The persistence of a gender wage gap has the potential to dampen incentives to participate in the labour force and entrench economic disadvantages for women, such as reducing women's ability to accumulate retirement savings.

A focus for recent policy reform has been child care availability and affordability, and reducing high workforce disincentives for second income earners. Policy settings, workplaces and society have come some way in supporting more flexible and family-friendly work arrangements. The COVID-19 pandemic has also significantly

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20   Centre for Population, *Historical single year of age fertility rates, for Australia and by state/territory, by financial year* (2019).

21   ABS, *Pregnancy and Employment Transitions, Australia, Nov 2017* (2018).

22   Australian Institute of Health and Welfare*, Australian Families Then & Now: How we worked* (2020). Melbourne Institute, *The Household, Income and Labour Dynamics in Australia Survey: Selected Findings from Waves 1 to 17* (2019).

23   Treasury analysis of ABS Labour Force Survey microdata.

24   Australian Institute of Family Studies, *Fathers and Work: A Statistical Overview, Research Summary May 2019* (Canberra: AIFS, 2019).

25   Workplace Gender Equality Agency, *Australia's Gender Pay Gap Statistics* 2021.

26   Workplace Gender Equality Agency, *Gender segregation in Australia's workforce, 2019*.

disrupted the balance between work and home life, while potentially accelerating trends towards more flexible work.

> ### Box 3.1   The impacts of the COVID-19 pandemic on participation
>
> Restrictions and precautionary behaviour by consumers and businesses due to the COVID-19 pandemic reduced activity across the economy. The participation rate fell by 3.4 percentage points and unemployment increased by 1.8 percentage points between January 2020 and May 2020. However, the participation rate has since rebounded above pre-COVID-19 levels as economic activity has recovered.
>
> The impacts of the COVID-19 pandemic on population – particularly, sharply reduced migration – may have ongoing implications for participation. These impacts will depend on the time taken for migration to return to pre-pandemic levels, the characteristics of new migrants, and how these migrants interact with the domestic labour market in years to come.
>
> The COVID-19 pandemic may have accelerated trends in the nature of work that could further reduce barriers to participation through increased flexibility. Remote work had been slowly gaining acceptance in some sectors but was rapidly and widely adopted in 2020 as businesses responded to the pandemic.
>
> The prevalence of remote working is likely to persist with early research finding more widespread acceptance for working from home (facilitated by improvements in supporting infrastructure) will remain even while many workers return to their workplaces.[27] Higher adoption and acceptance of remote working practices may improve participation as they allow greater flexibility and are more accommodating of individual life and family commitments. Remote work enables smoother matching between workers and employers across geographical boundaries. These changes have great potential to improve not just participation, but also Australia's productivity and economic growth.

Working hours are declining

Economic output is not only a function of how many people work, but how much each person works on average. The average number of hours worked per week per worker has declined from around 35 in 1978-79 to around 32 in 2018-19. This is largely due to an increase in the share of part-time employment – reflecting the increased participation of women and older workers – as well as an increased incidence of male

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27   J. Barrero, N. Bloom, and S. Davis, 'Why working from home will stick', *National Bureau of Economic Research Working Paper No. 28731* (2021).

part-time work. This also reflects the increased flexibility of the labour market and the shift towards service-oriented jobs.

Average hours worked per week fell significantly in 2019-20 due to the effects of COVID-19, but has since recovered to its pre-pandemic level. Over the long term, the average number of hours worked per week is projected to decline further to 31 by 2060-61. The decline reflects a projected ongoing increase in part-time employment and growth in the proportion of women in the labour force, as they work fewer hours on average than men. The projected increase in participation by older Australians also contributes to falling hours worked, as they generally work fewer hours when they do work.

Chart 3.9   Average hours worked
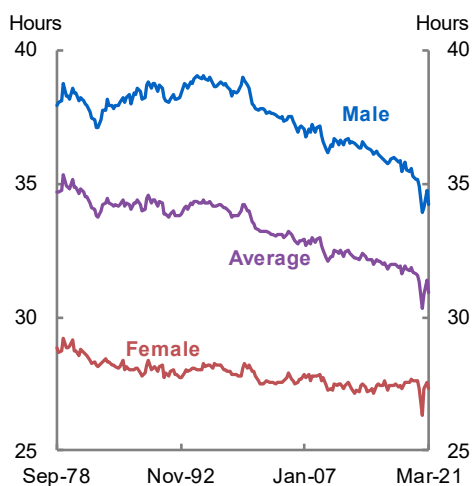
Chart 3.10 Share of employed working part-time
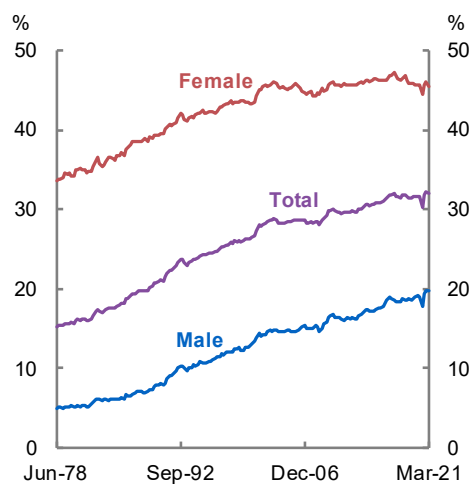
Source: ABS Labour Force and Treasury.

Reasons for working part-time differ by gender. For men, the main reason is studying. Over time, an increasing share of men have also reported working part-time due to preferences, or because their preferred job is part-time. By comparison, women are most likely to report working part-time due to caring responsibilities (28 per cent compared with 5 per cent of male part-time workers).

Chart 3.11 Main reason for working part-time, men
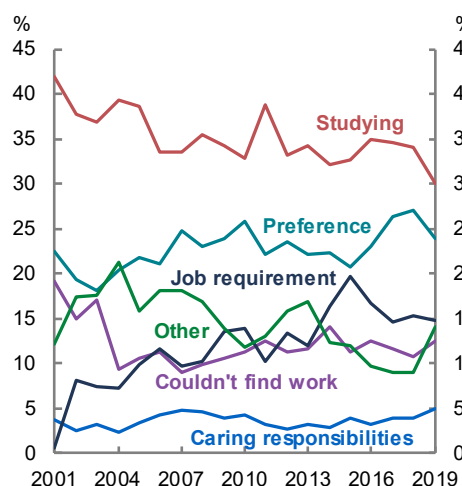
Chart 3.12 Main reason for working part-time, women
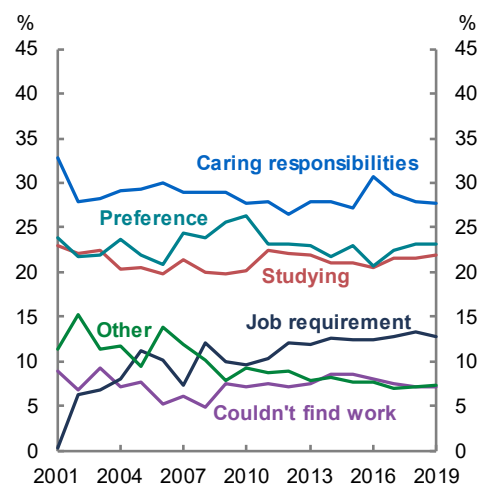
Source: Household, Income and Labour Dynamics in Australia Survey, Release 19.0.

The future of work

Alongside demographic changes and increases in female workforce participation, the occupational structure of the Australian labour force has also undergone radical changes. Compared with 50 years ago, the number of people working has more than doubled. However, today's workforce is comprised of a very different mix of jobs. In 1966, machinery operators and drivers comprised around 11 per cent of the labour force and technicians and tradespersons around 21 per cent. Today they have almost halved to around 6 and 14 per cent of the labour force respectively. Meanwhile, professionals have doubled as a share of the workforce while community and personal service workers have nearly tripled.[28]

The main drivers of these shifts include increasing global interconnectedness, technological change and automation. Increased international trade has altered what Australia manufactures onshore, alongside creating entirely new export industries and freeing up labour for the expanding domestic services sector.

These changes have implications for participation: the increase in non-manual labour-intensive work has boosted female labour force participation as well as allowing older people to remain in the workforce longer. Similarly, technology enabling flexible work means jobs can now be more accommodating of individual life and family

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28   Based on Treasury analysis of ABS Census data from 1966 to 2016, following M. Coelli & J. Borland, 'Job Polarisation and Earnings Inequality in Australia', *Economic Record, 92/296* (2016), 1-27. These occupations reflect ANZSCO major occupation groups.

commitments, enabling those with caring responsibilities or higher barriers to participation to participate more.

Increasing global interconnectedness and technological change require a highly skilled workforce. The compositional shift in employment brought about by these changes has increased the share of jobs requiring highly skilled workers over the past 50 years. In 1966, the share of the workforce employed in a job requiring a highly skilled employee was 31 per cent. This increased to 45 per cent in 2016.[29]

New technologies will mean jobs are redesigned to take maximum advantage of the capabilities new technologies enable. Governments will need to reduce unnecessary regulations or occupational licensing restrictions which hamper job redesign and hinder the adoption of productivity-enhancing processes and technologies. Businesses will also need to invest in improving managerial expertise to best manage how these enhancements are integrated into organisational work practices.

Australia's workforce already has a high level of educational attainment, which positions it well to deal with future shifts in technology. As technology continues to reshape tasks and occupations, 'lifelong learning' and continual reskilling will be needed to ensure people have the skills to take advantage of new processes, jobs and occupations driven by technological change.

Ensuring businesses contribute to a lifelong skills system that is responsive to the changing demands of the labour force will help build a resilient and adaptable workforce that can support future economic growth.

Governments can support a culture of lifelong learning by ensuring the education and training system is responsive to change and provides appropriate opportunities for reskilling. Policies such as the new National Skills Agreement currently being negotiated can improve the operation and efficiency of training, through ensuring individuals have opportunities to upskill and reskill. The Agreement will improve the relevance and quality of skills training, and help to reduce skills shortages, while facilitating employment growth and better labour market outcomes (Chapter 7, Section 6 – Education and Training).

Education and employment policies have great potential to maximise the productive use of skills, enable the labour market to operate in a way which minimises skill mismatch between employers and employees, and boost labour market dynamism and productivity growth.

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29   Based on Treasury analysis of ABS Census data from 1966 to 2016, following M. Coelli & J. Borland, op. cit.

4.   Productivity

Overview

Labour productivity has contributed more than 80 per cent of growth in real gross national income per person over the past 30 years.

This report assumes that the long-run labour productivity growth rate returns to 1.5 per cent per year – consistent with the 30-year historical average to 2018-19.

Labour productivity growth has slowed since around 2005, averaging 1.2 per cent annually over Australia's last complete productivity cycle. This is below the historical average and is around half the growth experienced during the 1990s productivity boom.

The slowdown in Australia's productivity growth is not unique and has been broadly consistent with that experienced in most other advanced economies. No single factor explains the ongoing slowdown.

An improvement over recent productivity performance is needed to raise productivity growth and ensure growth in income and living standards.

Given the widespread global trends in productivity it is unlikely that domestic policy factors explain all of the productivity slowdown. However, productivity can be supported at all levels of government through policy and regulatory reform. Policies can lift productivity by supporting a dynamic and competitive economy and allowing individuals and businesses to take advantage of new innovations and technologies.

Productivity growth is essential for improved living standards in the future

Productivity is a measure of how efficiently an economy turns inputs into outputs. Productivity grows when things are done more efficiently today than yesterday. When there is productivity growth, an economy produces more outputs from the same amount of inputs.

The most common measure of productivity is labour productivity. It measures the quantity of goods and services produced per hour of work. Labour productivity growth is essential to improving national income and real wages. People can use their growing wages to buy more goods and services, save and invest, and have greater freedom to

choose how they spend their time. In turn, higher wages increase tax revenues and the capacity of government to deliver services to the community.

Labour productivity has been the most important source of income growth in Australia over the past 30 years, contributing over 80 per cent of growth in real gross national income (GNI) per person. It is projected to remain the most important source of income growth in the future.

Chart 4.1   Contributions to real GNI per person growth
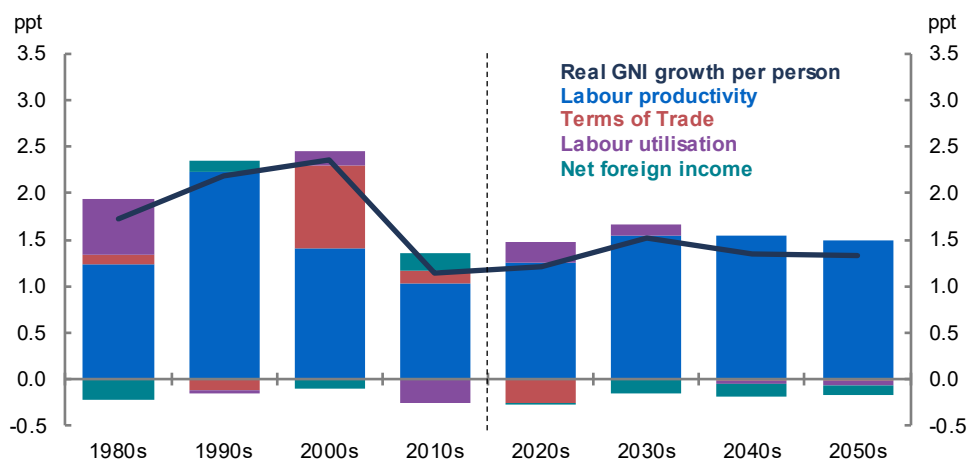
Note: Chart derived from calculations of real GNI, real Gross Domestic Income (GDI) and real GDP.
Source: ABS Australian System of National Accounts 2019-20; ABS Labour Force; ABS unpublished data; and Treasury.

Given its importance to living standards, the evolution of productivity over the next 40 years is a key component of the economic projections in this report.

This report, consistent with previous intergenerational reports, assumes that labour productivity growth converges to a historical average rate of growth. In this report underlying productivity growth converges to 1.5 per cent per year, the average growth rate in labour productivity over the 30 years to 2018-19. Given the current underlying productivity growth rate is below 1.5 per cent, it is assumed that the transition to the long-term growth rate of 1.5 per cent per year will take place over the next 10 years.

Labour productivity growth has slowed

Labour productivity growth has slowed over the past few decades, in line with global trends. Growth over the last complete productivity growth cycle averaged 1.2 per cent per year, which was below the 30-year historical average to 2018-19.[30]

Chart 4.2   Labour productivity growth and productivity cycles
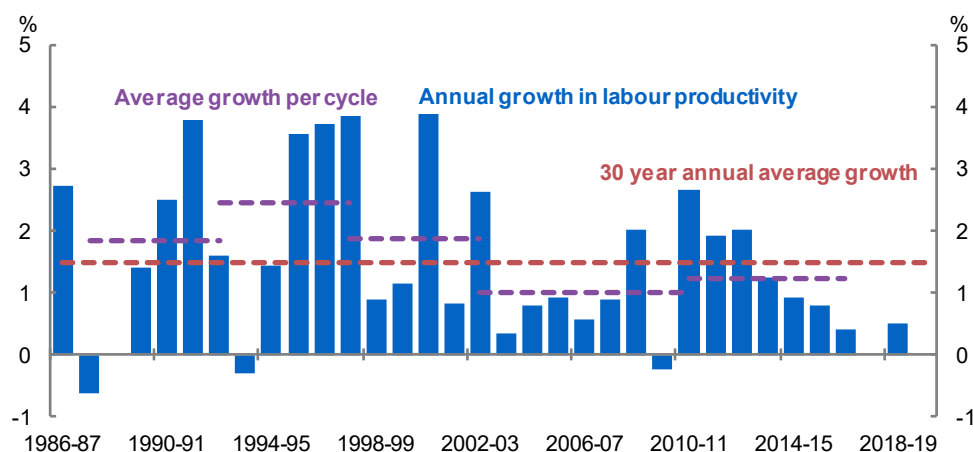
Source: ABS Australian System of National Accounts, 2019-20, and Treasury.

Labour productivity growth can be calculated as the sum of capital deepening and multifactor productivity (MFP).[31] Capital deepening is a measure of the change in the amount of capital per unit of labour, while MFP measures the efficiency with which labour and capital inputs are used together in producing output. While there has been a reduction in capital deepening, most of the slowdown in labour productivity growth is due to a decline in MFP growth. In the most recent complete productivity cycles, MFP growth was lower than in the 3 cycles that covered the 1990s.

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30   Australia's last complete productivity cycle ran from 2011-12 to 2017-18. Movements in productivity are best evaluated over productivity growth cycles, which more accurately highlight underlying structural trends by abstracting from temporary business cycle fluctuations. Productivity growth cycles are based on multifactor productivity (MFP) growth estimates. For more information, see the ABS National Accounts glossary.

31   While the use of MFP and capital deepening is a widely used way of thinking about labour productivity, the long-term projections in this report disaggregate labour productivity slightly differently. For further information, see the Appendix.

Chart 4.3   Decomposition of labour productivity by productivity cycles
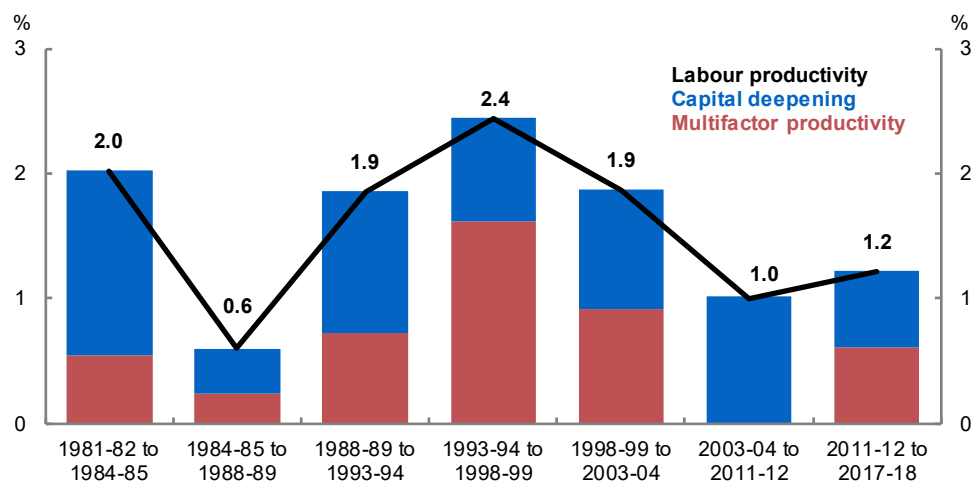
Note: Whole of economy MFP estimates are based on ABS estimates of the market sector.
Source: ABS Australian System of National Accounts, 2019-20, and Treasury.

Considering productivity in the international context

A slowdown in productivity growth is not unique to Australia. Other advanced economies are facing similar situations, with Australia's slowdown in productivity broadly consistent with that experienced in most other advanced economies.

While comparisons between countries can be difficult because of differences in economic, institutional and policy environments, considering productivity performance in other advanced economies provides useful insights into Australia's productivity prospects.

The United States is considered the productivity frontier for international comparisons. While there is a persistent gap between Australian and US aggregate productivity levels, this gap has tended to be relatively stable over time, and productivity growth rates have been broadly similar over the long run.

Chart 4.4   International comparisons of labour productivity levels
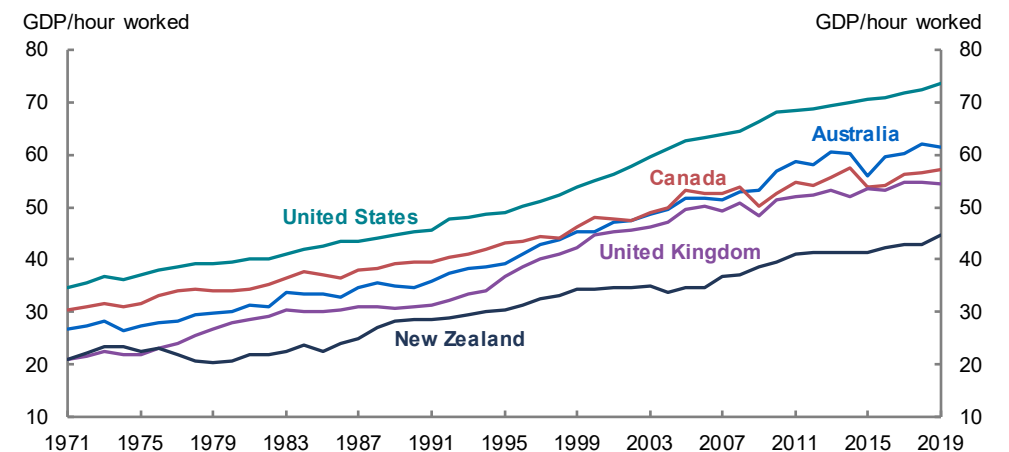
Note: Productivity levels are measured as GDP per hour worked using output-side real GDP at chained purchasing power parities (in 2017 USD).
Source: Treasury analysis of Penn World Table data, version 10.0.

Box 4.1   International productivity projection methodologies

Australia's approach to determining its assumption for productivity is similar to comparable countries.

- The Canadian Department of Finance reviewed its long-term labour productivity assumption in 2018 leaving it at 1.2 per cent per year, which is based on a historical average taken over the period 1970-2017.

- The New Zealand Treasury downgraded its long-run assumption of labour productivity growth in December 2019 to 1.2 per cent per year, based on an analysis of historical trends, placing more weight on the historical average and less weight on convergence prospects.

- The United Kingdom's Office of Budget Responsibility (OBR) downgraded its long-term labour productivity growth assumption to 1.5 per cent in March 2020. This was based on an analysis of historical data, comparisons of other forecasting institutions' projections, and international comparisons. The OBR places more weight on recent trend data.

- The United States Congressional Budget Office (CBO) projects long-run MFP, instead of labour productivity. Downgrades in MFP led to a downgrade in the labour productivity assumption in September 2020 to 1.3 per cent per year. This reflected the effect of long-term demographic trends, slower expected improvements in educational attainment and labour quality, a projected increase in federal borrowing which will reduce growth, and climate change. The CBO places greater weight on recent trend data.

Slowing productivity is driven by several factors

There is no single factor that has driven the recent global slowdown in productivity growth. Rather, it may reflect a mix of factors including:

- declining economic dynamism, which lowers productivity by
    - slowing the rate of innovation and technology adoption, or
    - slowing reallocation of resources – both capital and labour – from less productive to more productive firms
- structural shifts in the composition of the economy including the increasing size of the services sector and population demographics
- the nature of recent technologies and difficulties in their measurement
- lower business investment
- slower growth in educational attainment and labour quality, given a large portion of the labour force is already highly educated.[32]

A dynamic economy is one where resources are able to move between productive uses. In a dynamic economy, firms can enter, compete, innovate, and either thrive or exit. This creates competitive pressures, incentivises firms to innovate and improve their performance, and broadly helps funnel resources into their most productive uses. As such, economic dynamism helps to drive productivity growth.

Measures of dynamism have declined over recent decades in Australia and overseas. Rates of business entry have declined, job switching rates have slowed, and measures of competitive pressures have declined. While there is no consensus about why, potential explanations include increased use of digital technologies, increased barriers to entry for new firms, and insufficient access to finance.[33]

There is evidence that declining dynamism can account for some of the slowdown in productivity growth in Australia. First, the flow of resources – capital and labour – from less productive to more productive firms has slowed, dragging on aggregate productivity.[34]

Second, Australian firms appear to be slower to adopt world-leading technologies. As a result, non-mining businesses in Australia have fallen further behind global frontier firms and appear to be catching up more slowly.[35]

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32   Congressional Budget Office, *The 2021 Long-Term Budget Outlook* (Washington DC, March 2021).

33   F. Calvino, C. Criscuolo & R. Verlhac, 'Declining business dynamism: structural and policy Determinants', *OECD Science, Technology and Industry Policy Papers No. 24,* November 2020.

34   D. Andrews & D. Hansell, 'Productivity-enhancing Labour Reallocation in Australia', *Economic Record* 97/317 (2021), 157-169.

35   M. Quinn, 'Keeping pace with technological change: the role of capabilities and dynamism', Speech to the OECD Global Forum on Productivity, Sydney, 20 June 2019.

Finally, the slowdown in reallocation and adoption was larger in sectors where competitive pressures fell by more. This suggests that declining competitive pressures and dynamism explain part of the slowdown in productivity in Australia.[36]

Ongoing structural shifts in economic activity to the services sector are also potentially dragging on overall productivity growth. The services sector now comprises the majority of employment in Australia. While there is substantial variation across services industries, and measurement of productivity in services is inherently challenging as it depends on measuring the quality of services provided, some have experienced persistently low productivity growth.[37] As the population ages, there will be a further shift in the services sector towards services that cater to an older population, which tend to be less capital intensive and have slower productivity growth.

Recent technological advances such as artificial intelligence and digital platforms – and their associated inputs and outputs – are difficult to properly measure, which could lead to productivity mismeasurement. This could account for part of the slowdown, but is not likely to be enough to explain all the slowdown in productivity growth.[38] Additionally, there may be a lag between technological progress and productivity growth, particularly as 'general purpose technologies' such as artificial intelligence require significant complementary investments and it can take a long time before productivity gains are realised.[39]

In the context of technological advances, improvements in education to meet the demands of employers will be critical. However, the United States CBO has found that slower increases in educational attainment have weighed on productivity growth and are likely to restrain it in coming decades. While this is not the experience in Australia to date, Australia may experience similar slower increases in educational attainment over coming decades.

The long-term labour productivity growth assumption

Long-term labour productivity growth depends on trends in underlying productivity and the productive capital stock.[40]

Historical trends in growth can be a reasonable guide to future prospects for productivity. In Australia, while there are short-term deviations, productivity over the long run has been growing at a relatively steady and constant pace (Charts 4.1 and 4.2).

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36   J. Hambur, 'Product market power and its implications for the Australian Economy', Treasury Working Paper No. 2021-03 (2021).

37   Productivity Commission, 'Productivity Insights: Things you can't drop on your feet – An overview of Australia's services sector productivity', *PC Insights*, 15 April 2021.

38   C. Syverson (2017), 'Challenges to Mismeasurement Explanations for the US Productivity Slowdown', Journal of Economic Perspectives 31(2), 165-86.

39   E. Brynjolfsson, D. Rock, and C. Syverson (2018), 'The Productivity J-Curve: How Intangibles Complement General Purpose Technologies', *National Bureau of Economic Research Working Paper No. 25148*.

40   For further information, see the Appendix.

Where there are structural changes in productivity growth, an assumption based on the long-term historical growth rate will reflect adjustments to these changes over time as new information or data is incorporated.

This report assumes that underlying productivity growth converges to 1.5 per cent per year – consistent with the average growth rate in labour productivity over the 30 years to 2018-19. The convergence takes place over the next 10 years.

The gradual transition to the long-term growth rate recognises that while the pace of future productivity growth is uncertain, it tends to move within the bounds of historical performance. Averaging productivity growth over a sufficiently long period also smooths out cyclical volatility.

While every methodology for determining the long-term productivity assumption has strengths and weaknesses, the use of the 30-year average is still the most appropriate for the long-term projections used in this report. Gauging the long-term effects of policy choices on the fiscal baseline is best supported by a productivity assumption that slowly adjusts to underlying structural changes and minimises volatility or responsiveness to shorter-term or cyclical factors.

This approach is also in line with international best practice. While some details – such as time periods – may vary, similar methodologies that assume productivity will grow in line with a historical average have been adopted by other government and financial institutions to model future productivity growth.

Any lasting effects of the COVID-19 pandemic are highly uncertain. On the upside, accelerating technological changes – such as a greater shift towards working-from-home and online business models – could spur innovation and productivity growth in some sectors. However, the COVID-19 pandemic also has the potential to exacerbate pre-existing challenges for productivity growth, such as growing market concentration, reduced levels of firm entry and exit, and less job switching. Further, the pre-existing challenges that have dampened productivity growth in recent decades may continue to weigh down on productivity into the future.

In recognition of these uncertainties, this report considers an alternative to the baseline projections. A lower growth sensitivity analysis reflects a future where much of the current slow-down in productivity growth is due to persistent structural issues. In this sensitivity analysis, productivity continues to grow at a rate similar to the most recent productivity cycle of 1.2 per cent, rather than 1.5 per cent.

Box 4.2   Lower productivity growth sensitivity analysis

This sensitivity analysis examines the impact of lower long-term underlying productivity growth. Growth in underlying productivity is assumed to converge to the average of the most recent productivity cycle of 1.2 per cent by 2024-25 and remain at that rate of growth for the remaining period. This is below the historical 30-year average to 2018-19 of 1.5 per cent assumed in this report.

Chart 4.5   Impact of lower productivity growth on real GDP growth

Source: ABS Australian National Accounts: National Income, Expenditure and Product, and Treasury.

In this sensitivity analysis, the level of real and nominal GDP are both projected to be around 9½ per cent lower by the end of the projection period. Nominal GNI per person is also projected to be $32,000 lower by the end of the projection period compared with the baseline.

Lower GDP results in lower projected tax receipts, with the tax-to-GDP cap being reached 2 years later compared with the baseline projections. Lower productivity is also projected to reduce wages by 9¼ per cent by the end of the projection period. This results in lower indexation rates for some government payment programs.

While total government spending is projected to be slightly lower, spending does not fall to the same extent as tax receipts. The underlying cash balance is, therefore, projected to be 2.2 percentage points of GDP lower at the end of the projection period compared with the baseline.

Chart 4.6   Impact of lower productivity growth on the underlying cash balance
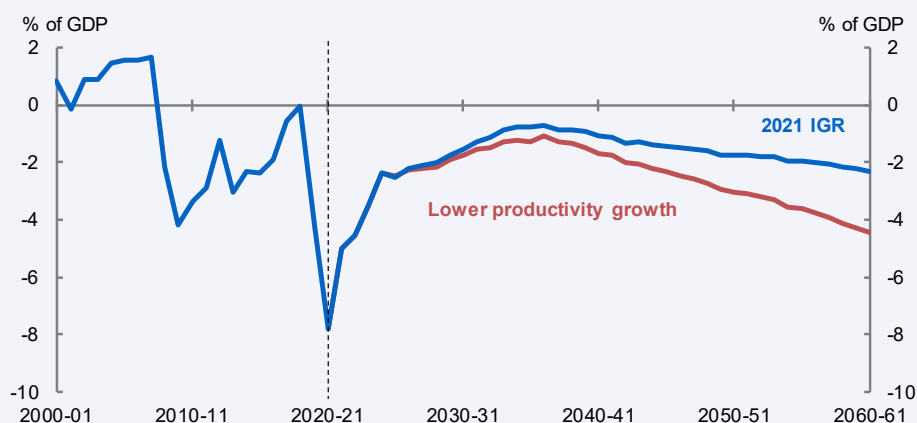
Source: Treasury.

Net debt is 22.7 percentage points higher at the end of the projection period as a share of GDP. This reflects higher government borrowing associated with weaker budget positions, and the smaller economy. This is slightly offset by reductions in the government's cost of borrowing, due to the assumption that the government's long-run cost of borrowing is consistent with nominal GDP growth.

Policy can raise productivity and income growth

All levels of government have a role to play in boosting productivity growth through policy and regulation that facilitates efficient investment in technology, improves market efficiency and competitiveness, and lifts the health and capability of our workforce. By providing strong institutions and a predictable policy environment, government can increase certainty, encouraging investment and efficient risk-taking.

The Government is accelerating reforms and investments to enable greater adoption of digital technologies to support the goal of Australia becoming a leading digital economy by 2030.

The Government is also continuing to implement reforms to make the economy more dynamic and productive. This includes recent reforms to bankruptcy, which encourage firms to innovate and experiment, a uniform scheme for automatic mutual recognition of state-based occupational licenses and registrations to increase labour market flexibility, and a 'patent box' to encourage companies to develop and retain innovation ideas in Australia, complementing the $2 billion investment in the Research and Development Tax Incentive announced in the 2020-21 Budget. The Government has

also committed to boosting skills by investing in apprenticeships, higher education short courses, vocational education and training. This will open new opportunities and jobs for Australians, allow more innovation and adoption, and foster growth in labour reallocation and productivity.

Continued investments through the Government's infrastructure investment pipeline will further support productivity growth by bringing consumers closer to more markets and bring workers in contact with more employment opportunities. The Government's pursuit of open and free trade will provide further access to global markets, encouraging businesses to be more competitive, to innovate, and to adopt new technologies and methods supporting productivity growth.

The Government is committed to increasing productivity in non-market sectors,[41] by ensuring diversity, choice, and responsiveness in the delivery of government services to spur innovation and quality.[42]

This commitment to pro-productivity policies and an environment that supports productivity growth aims to ensure sustained increases in output, wages and living standards into the future.

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41   Non-market sectors refer to Health Care and Social Assistance, Education and Training, and Public Administration and Safety.

42   Productivity Commission, 'Shifting the Dial: 5 Year Productivity Review', *Inquiry Report No. 84* (Canberra, Productivity Commission: 2017) and I. Harper et al, 2014 Competition Policy Review ('the Harper Review'), Final Report (Canberra, Australian Government: 2015).

5.   Environment

Overview

The natural environment is central to the quality of life enjoyed by Australians and to the state of the economy. It provides natural resources that are direct inputs into Australia's productive capacity and supports activity in a range of sectors. Over the next 40 years, Australia will continue to respond and adapt to environmental challenges that will affect the economy and the budget.

Climate change presents a significant challenge to the natural environment. Rising global temperatures and other changes to the climate will impact locations, sectors and communities in diverse ways driving both structural adjustments and corresponding innovation. Connecting innovation and investment in climate-resilient development can significantly increase the adaptive capacity of our regions, towns and cities. Such solutions will require effective action by governments, businesses and communities, to keep the economy strong now and into the future.

Mitigation efforts will require a step-change in innovation and global collaboration to make new energy technologies commercial and scalable. Australia is working with our trading and strategic partners to make low and zero emissions technologies globally scalable and commercially viable.

Australia has made, and continues to make, a significant contribution to global emissions reduction efforts, reducing emissions faster than many similar advanced economies, as well as the OECD and G20 averages. Australia is at the forefront of adopting low emissions technologies, with the highest level of solar photovoltaic capacity per person of any country in the world, and more solar and wind generation capacity per person than any country outside Europe.

Effectively managing the broader pressures on the environment — including on oceans, waste and water management — and biodiversity, will also improve economic prospects and our quality of life.

A healthy environment provides essential inputs into Australia's productive capacity and directly influences potential GDP. These inputs include provisioning services, such

as food, fibre and fuels. The environment also provides regulating and supporting services such as soil formation, pollination, and water filtration, as well as recreational and cultural benefits.

Historically, the benefits of natural capital have not been fully recognised or valued. Natural capital is difficult to observe and measure, and is often not fully accounted for in economic decision making, leading to environmental degradation.[43] Without more action to maintain and improve natural capital, future generations will not benefit from it to the same extent.

The *Independent Review of the Environment Protection and Biodiversity Conservation Act 1999* found that Australia's natural environment and iconic places are in decline and are under increasing threat, and that the current environmental trajectory is unsustainable.[44]

To protect the environment, the Australian Government funds actions including habitat protection and pollution controls, as well as regulating harmful activities. The Government is continuing to invest in adaptation, mitigation and environmental protection, including $20 billion in new and emerging low emissions technologies over the decade to 2030.

The Government is reforming Australia's environmental laws to better protect the environment, and has undertaken a number of initiatives to increase environmental resilience, such as the National Landcare Program, the $100 million Oceans Leadership Package to protect Australia's oceans, the National Soil Strategy, and the $66 million Agriculture Biodiversity Stewardship Package.

The Government is also improving the measurement and valuation of Australia's natural assets. This will better enable the environment to be considered in commercial decisions, reducing environmental degradation and supporting greater private investment.

Climate change

Australia's leading scientific and climate institutions have concluded that Australia's land temperature has warmed on average by about 1.4°C since national records began in 1910.[45] While climate change is often commonly understood as global warming, it also includes an increase in the severity and frequency of many kinds of extreme weather events, rising sea levels and changing rainfall patterns.[46] Responding to climate change requires both climate mitigation and climate adaptation.

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43 P. Dasgupta, *Final Report – The Economics of Biodiversity: The Dasgupta Review* (London: HM Treasury, 2021).

44 G. Samuel, *Independent Review of the EPBC Act – Final report* (Canberra, Department of Agriculture, Water and the Environment, 2020), 1.

45 Bureau of Meteorology & Commonwealth Scientific and Industrial Research Organisation, *State of the Climate 2020* (Canberra, Australian Government: 2020), 2.

46 ibid*, p. 2.*

Climate mitigation

Climate mitigation refers to efforts to prevent further increases in global temperatures. The extent to which additional future warming can be avoided will depend on the success and timeliness of global climate mitigation efforts.

Australia, in concert with the rest of the world, is taking action to reduce emissions in line with the Paris Agreement. Australia has reduced its own emissions faster than many similar countries, as well as the OECD and G20 averages, making a significant contribution to global emissions reduction efforts.[47] Exports of our low emissions technology support rising prosperity and mitigation efforts in our region. There will be opportunities for Australia to expand into new energy exports, such as clean hydrogen, with the Government already providing over $850 million in support of this growing industry.

Climate adaptation

Notwithstanding global efforts to reduce emissions, responding to the impacts of climate change will be required and is a shared responsibility across all levels of government, community, and businesses. It will require adapting to current and future impacts and an expected increase in the frequency and intensity of natural disasters and extreme temperatures.

Adaptation includes being more climate- and disaster-resilient and will require changes to the way Australians live and businesses operate. Planning for these impacts will help improve economic resilience.

The Government is implementing a broad range of reforms in response to the Royal Commission into National Natural Disaster Arrangements which will improve Australia's disaster preparedness and resilience. Key measures include establishing a National Recovery and Resilience Agency, enhancing Emergency Management Australia, and establishing the Australian Climate Service.

Economic and sectoral impacts of a changing climate

Climate change is expected to have physical effects and transition effects on Australia's economy. Physical effects are impacts caused directly by a changing climate. Transition effects relate to the impacts of global and domestic efforts to reduce greenhouse gas emissions. This includes the costs of Australia's own mitigation efforts, as well as changes to demands for our exports due to mitigation actions by our trading partners. There could also be impacts on global capital flows.

A reduction in real GDP associated with climate change would have a fiscal impact through reducing taxation revenue, as well as increasing pressure on expenditure. Other revenue sources such as fuel excise and mining royalties could also be affected

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47   World Resources Institute CAIT, *Historical GHG emissions,* 2018 update.

by changes in demand and consumption related to a global transition away from fossil fuel use.

Any reduction in GDP is likely to be unevenly distributed across sectors and regions. The agricultural sector is particularly vulnerable to the physical effects of climate change, the resources sector is particularly vulnerable to the transition effects, and the financial sector is vulnerable to both.

Impacts on the agricultural sector

The impacts of climate change are already being felt by the agricultural sector. Agriculture industries are developing methods to better understand and manage the physical impacts of climate change, for example through changes to crop selection, land management, and improving water efficiency. Adaptation efforts have reduced but not eliminated the impact of climate change over the past 20 years.[48]

The global effort to mitigate and adapt to climate change is also presenting market opportunities to the agriculture sector. As economies transition towards lower emissions, opportunities may emerge for agriculture industries that can demonstrate more emissions-efficient production systems.[49]

Impacts on the resources sector

The global effort to reduce emissions is likely to have both positive and negative impacts on Australia's resources sector. 129 countries have committed to net-zero emissions by 2050, including key trading partners such as Japan and South Korea, while China has committed to carbon neutrality by 2060. In 2019-20, these 3 countries accounted for 87 per cent of Australia's LNG export value, 74 per cent of Australia's thermal coal export value and 55 per cent of Australia's metallurgical coal export value.[50]

These commitments by other countries, if fully implemented, are likely to reduce demand for unabated fossil fuels over some decades. The global transition is also likely to lead to increased demand for clean energy and associated critical minerals exports, and the creation of new markets such as clean hydrogen and carbon capture and storage. These new or expanded markets will present new opportunities for Australia.

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48 N. Hughes, D. Galeano & S. Hatfield-Dodds, *The Effects of Drought and Climate Variability on Australian Farms* (Canberra: ABARES 2019), p. 7.

49 J. Greenville, H. McGilvray, and K. Burns, *Global Responses to Climate Change: Opportunities for Australian Agricultural Producers* (Canberra: ABARES 2020).

50 Office of the Chief Economist, Department of Industry, Science, Energy and Resources, *Resources and Energy Quarterly — Historical data.*

Impacts on the financial sector

The financial sector plays an important role in helping the economy adjust to climate change through appropriately pricing risks and encouraging the reallocation of capital to more sustainable areas.

More frequent and severe climate-related natural disasters will increase costs for the insurance sector, with flow on effects to insurability and insurance affordability, potentially making it more difficult for households to hold adequate insurance.[51] Changing weather systems may make parts of Australia more difficult to insure, unless there are effective investments to build resilience. Climate change is also complicating risk assessment for the insurance and financial services sector, as past experience is becoming less of a guide to future risks.

Some changes are already taking place in the insurance sector, with claims relating to natural disasters in the past decade having doubled those made in the decade prior in real terms.[52] In Northern Australia, where disaster risk is generally higher, home insurance premiums have risen much faster than the rest of the country, and there has been a rise in the number of uninsured homes.[53] To improve the accessibility and affordability of insurance in cyclone-prone areas, the Australian Government has committed to establishing a reinsurance pool to cover cyclone and related flood damage, backed by an annually reinstated $10 billion Government guarantee.[54]

The financial sector is also exposed to transition risks from the adjustment to a low-emissions economy globally which could lead to falling demand in some sectors, prompting write-downs in the value of assets.

Australia's financial regulators have recognised that climate change is exposing the financial system to risks that will rise over time. To respond to these risks, regulators are working on strengthening the identification and management of climate-related risk and improving disclosure.[55]

Government action on climate change

Australia is part of global efforts to reduce emissions to net zero. The Government has committed to reducing emissions by 26-28 per cent below 2005 levels by 2030 and to reaching net zero as soon as possible, preferably by 2050, consistent with the global goals of the Paris Agreement. Australia is on track to meet and beat its 2030 Paris target.

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51 Royal Commission into National Natural Disaster Arrangements (Commonwealth of Australia), Report (Canberra: Australian Government, 2020), Final Report, 417.
52 Reserve Bank of Australia, *Financial Stability Review — October 2019* (3 October 2019), 57.
53 Australian Competition and Consumer Commission, *Northern Australia Insurance Inquiry — Final Report* (Canberra: ACCC, 2020), 29 & 270.
54 Treasury, Reinsurance pool for cyclones and related flood damage consultation paper (Canberra: Treasury, 2021), 2.
55 C. Armour, 'Managing climate risk for directors' *ASIC News Centre* (February 2021).

To date, Australia has reduced greenhouse gas emissions by 20.1 per cent compared to 2005 levels. Emissions per person are 46.7 per cent lower than 1990 levels, while the emissions intensity of the economy is 66.1 per cent lower.[56]

Chart 5.1   Renewable energy capacity per person installed in 2020
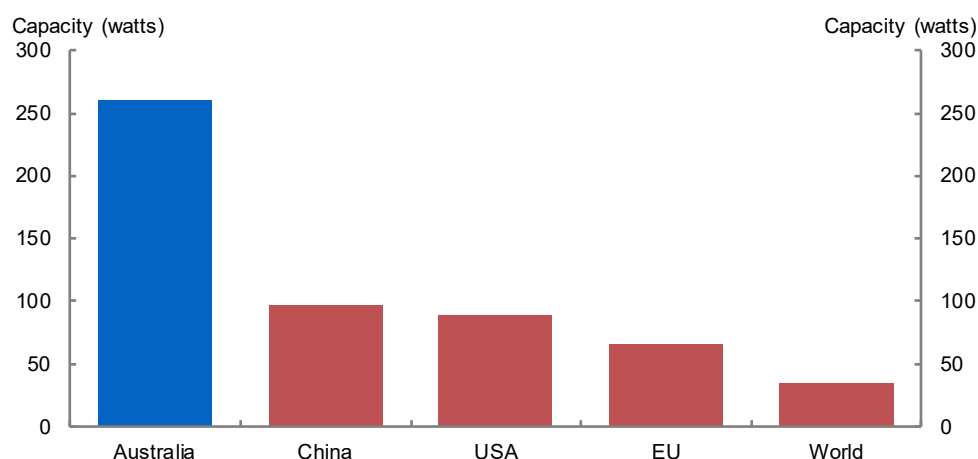
Source: International Renewable Energy Agency *Renewable Capacity Statistics 2021*; World Bank *Population Estimates and Projections dataset*; Department of Industry, Science, Energy and Resources.

Energy transition

Underpinned by the Government's renewable energy policies, Australia deployed new renewable energy almost 8 times faster than the global average per person in 2020 and has the highest uptake of rooftop solar in the world. In 2020, a record 7 gigawatts of new renewable generation was installed across Australia,[57] and a record 64.7 terawatt hours of electricity was generated from renewables (including rooftop solar). This is 14 per cent higher than the previous record set in 2019.[58] At the same time, renewable energy is getting cheaper, most notably utility scale solar, which has seen costs fall by over 75 per cent since 2014.[59]

The Government is supporting continued strong investment in, and connection of, new renewable projects by supporting investment in the reliable generation technologies needed to ensure the reliable integration of renewables into the grid. This includes a $1.4 billion equity investment in the development of the 2,000 megawatt Snowy 2.0 pumped hydro expansion to the Snowy Hydro Scheme, and up to $600 million to

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56   Department of Industry, Science, Energy and Resources, *Quarterly Update of Australia's National Greenhouse Gas Inventory: December 2020* (Canberra: Department of Industry, Science and Energy, 2021) 3.

57   Clean Energy Regulator. *Quarterly Carbon Market Report — December Quarter 2020* (10 March 2021).

58   Australian Energy Statistics. Table O Electricity generation by fuel type 2019-20 and 2020.

59   BloombergNEF, *New Energy Outlook (NEO),* 2020. Historic LCOE benchmark dataset.

deliver Snowy Hydro's Hunter Power Project gas generator in NSW. The Government is also supporting all major priority transmission projects identified in the Australian Energy Market Operator's Integrated System Plan, including Humelink, QNI, and a $250 million program to support Marinus Link, Project Energy Connect and VNI West.

Australia's policies to further reduce emissions

Beyond 2030, further reductions in greenhouse gas emissions across the world economy are required to reach the Paris Agreement's global temperature goal of holding the increase in global average temperature to well below 2°C, while pursuing efforts to limit the temperature increase to 1.5°C.

The Government is focusing on new and emerging technologies that will allow Australia to capitalise on opportunities to develop new industries and jobs. This includes by working with other nations to accelerate the development and deployment of emissions reduction technologies through the $565.8 million technology partnership fund.

The Technology Investment Roadmap will help accelerate the commercialisation of new and emerging low emissions technologies. Low Emissions Technology Statements will be released annually under the Roadmap to update and refine priority technologies with the potential to deliver strong economic and abatement outcomes for Australia.

In the first Statement released in September 2020, 5 initial priority technologies were identified — clean hydrogen, carbon capture and storage, long duration energy storage, low carbon materials including low emissions steel and aluminium, and soil carbon measurement.

The Roadmap complements other Australian initiatives to advance clean energy generation and reduce emissions. These include the ongoing work and investment of Clean Energy Finance Corporation and the Australian Renewable Energy Agency, which finance renewable energy projects; and the Emissions Reduction Fund which incentivises Australian businesses to cut the amount of greenhouse gases they create and undertake activities that store carbon. The Emissions Reduction Fund has delivered more than 66 million tonnes of abatement,[60] and a record 16 million tonnes were accredited in 2020.[61]

The Future Fuels Fund will increase electric vehicle charging and hydrogen refuelling stations to support consumer choice. More than $850 million of investment has been provided to grow Australia's clean hydrogen industry.

The Roadmap will guide around $20 billion of Government investment over the next 10 years and drive around $80 billion of total new investment in low emissions technologies in Australia by 2030.

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60   Clean Energy Regulator, *12th Auction April 2021- Scheme performance* (23 April 2021).
61   Clean Energy Regulator*, Quarterly Carbon Market Report – December Quarter 2020*, 9.

Climate adaptation action in Australia

Regardless of the future success of global mitigation efforts, some climate change impacts are unavoidable. Over the next 40 years, Australia will need to manage these climate risks through strategic environmental management and adaptation to protect communities and strengthen the resilience of the economy. Early investment in adaptation will mean Australia is better prepared and safer from current and future climate change, and will remain an attractive place to do business.

In 2012, the Council of Australian Governments agreed the roles and responsibilities for adaptation at each level of government.[62] The Australian Government is primarily responsible for providing national science and information, managing Commonwealth assets and programs, providing national leadership on adaptation reform and maintaining a strong, flexible economy and well-targeted social safety net.

The Australian Government's National Climate Resilience and Adaptation Strategy (NCRAS) outlines the risks of a changing climate and a set of principles to guide effective adaptation practice and resilience building. A new NCRAS to provide a roadmap towards climate resilience is being developed through 2021.

The new $210 million Australian Climate Service will support better planning and preparedness for climate and natural hazards, and better response and recovery to disasters. While the next phase of the $149 million National Environmental Science Program includes a Climate Systems Hub and a mission to undertake applied research on climate change science and adaptation.

Australia is working with the international community to support greater climate adaptation action. As a member of the global Adaptation Action Coalition (AAC), Australia supports the AAC's commitment to practical climate adaptation strategies that deliver on-ground support for vulnerable communities, knowledge sharing and a joint approach to the protection of ecosystems and World Heritage properties from the physical effects of a changing climate.

Australia has also joined the Coalition for Climate Resilient Investment (CCRI), working with the investment sector to better consider physical climate risks and create resilient investment solutions. The CCRI will develop tools to help investors make climate-smart investments in resilient infrastructure which supports stronger economic growth while safeguarding Australian communities.

Broader environmental issues

Beyond climate change, there are other pressures on the environment. The effective management of these pressures into the future will have implications for economic growth, government spending and quality of life.

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62   Council of Australian Governments, *Roles and responsibilities for Climate Change Adaptation in Australia* (2012).

Oceans

Australia's oceans support marine industries, including shipping, energy, mineral production, fisheries and tourism. The ocean economy also supports emerging industries, including carbon sequestration, offshore aquaculture, marine renewable energy and desalination. By 2025, marine industries are projected to contribute around $100 billion each year to the Australian economy.[63] In addition to climate change, pollution (including plastic waste) and illegal fishing are causing degradation to the ocean environment.

To prevent further degradation of oceans, and maintain and expand their economic potential, long-term planning, action and international cooperation are required. The $100 million Oceans Leadership Package includes investments in blue carbon ecosystems which play a critical role in carbon capture and storage, as well as expanding and better managing our marine parks and iconic species.

Other measures include the development and implementation of the International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing and the Reef 2050 Long-Term Sustainability Plan. The 25-year commitment to the International Coral Reef Initiative brings together managers of 75 per cent of the world's coral reefs. This initiative will develop ocean accounts to capture the value and benefits of the ocean, ensuring that these are recognised in ocean policy, law and development.

Waste management

Effective waste management protects the natural environment by making efficient use of waste materials, reducing the demand for new natural resources, and keeping harmful materials out of the environment. Around 60 per cent of Australia's waste is recycled.[64] While the amount of waste generated per person is declining, and recovery rates from recycling have improved slightly, overall waste continues to rise, with the increase largely driven by population growth.

The Australian Government has set a clear goal to move towards a more sophisticated approach to waste management and recycling. The Government has passed significant new laws to phase in the ban of the export of 645,000 tonnes of unprocessed waste (glass, plastic, tyres and paper) that is shipped overseas each year and has set an 80 per cent average recovery target for all waste streams. The National Waste Policy Action Plan sets out how we will make this transition and achieve our targets. It is supported by the National Plastics Plan and the National Food Waste Strategy.

Significant investments are supporting progress towards Australia's targets and driving the transformation of Australia's waste and recycling capacity, including $190 million

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63   K. Evans, N. Bax & D. Smith, 'Marine Environment' *State of the environment 2016* (Canberra: Department of the Environment and Energy, 2016).

64   J. Pickin et al, *National Waste Report 2020* (Canberra: Department of Agriculture, Water and the Environment, 2020).

for the Recycling Modernisation Fund and $67 million to upgrade organic waste processing.

Water management and security

Australia is the world's driest inhabited continent. It has high per person water use and high streamflow variability.[65] Climate change will exacerbate the existing challenge in managing and sharing water between competing uses like agriculture, industry, communities, and the environment.

Implementation of the National Water Initiative and the Murray-Darling Basin Plan will improve the efficiency and sustainability of how water is managed. These frameworks will need to remain fit-for-purpose and continue to account for the impacts of the changing climate.

A range of federal initiatives are supporting the agriculture sector to build resilience and adapt to the impacts of climate change on water management and security. This includes the $5 billion Future Drought Fund and $3.5 billion for the National Water Grid Authority.

Recent Government investments to support a healthier river system include the Sustaining Riverland Environments Program and $1.3 billion to recover water for the environment in the Murray-Darling Basin.

Biodiversity

The *Independent Review of the Environment Protection and Biodiversity Conservation Act 1999* found that the population of threatened species is continuing to decline, and the number of threatened species listed is growing. Since 1999, approximately 4 times more species listed as vulnerable have become more threatened than those that have shown an improvement.[66]

Biodiversity plays a critical role in increasing the resilience of natural capital. The environment is a complex set of ecosystems that need to operate in balance. A diverse ecosystem with many different species is better able to respond and adapt to changes, and to continue to support natural capital.[67] Australia's unique ecosystems also have immense cultural value and support our economy, including the tourism industry.

The Government's 2021-2031 Threatened Species Strategy is a 10-year blueprint for protecting Australia's biodiversity, establishing a national prioritisation framework for threatened species and focussing on key native habitats. This Strategy will focus on recovery of 100 species and 20 priority places through key action areas, such as

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65   I. Prosser, *Water: Science and Solutions for Australia* (Melbourne: CSIRO Publishing, 2011), 1-9.

66   G. Samuel, op.cit, 40.

67   P. Dasgupta, op. cit, 69-72.

mitigating new and established threats, conserving and restoring habitat, emergency preparedness and response and climate adaption and resilience.

Part II: The budget over the next 40 years

6.   Budget projections

Overview

The economic crisis associated with the COVID-19 pandemic has placed significant demands on public finances in Australia and around the world. While Australia's stronger-than-expected economic recovery has flowed through into the fiscal position, the effects of the pandemic on the budget are expected to remain into the long term.

The underlying cash balance is projected to be in deficit over the next 40 years, with the deficit initially improving before widening to 2.3 per cent of GDP by 2060-61. The primary balance, which excludes net interest, is projected to return to surplus before deteriorating to a deficit of 0.6 per cent of GDP by 2060-61.

The initial improvement in the fiscal outlook reflects a projected return to strong economic growth, lower payments and higher receipts following the COVID-19 pandemic. From the 2030s, spending as a share of GDP is projected to grow (particularly health, aged care and interest payments) while tax receipts are constrained by the tax-to-GDP cap, reflecting the Government's commitment to maintaining a sustainable tax burden.

Consistent with the trajectory of the underlying cash balance, both gross and net debt are projected to initially improve before deteriorating again. By 2060-61, gross debt is projected to be 40.8 per cent of GDP and net debt is projected to be 34.4 per cent of GDP. The Government's medium-term fiscal strategy focuses on growing the economy in order to stabilise and reduce debt as a share of GDP once the economic recovery is secure. While current levels of debt remain low by international standards, this will help to mitigate the pressures projected to arise over time, including from an ageing population.

Australia's fiscal trajectory depends on the performance of the economy and government policy settings.

As outlined in Part I, population, participation and productivity trends are expected to remain the key drivers of Australia's long-term economic outlook. These trends also affect the budget directly and indirectly. For example, government payments are commonly indexed by economic variables such as prices and wages and often increase with population growth. Government receipts fluctuate largely in line with the economy as businesses and individuals tend to earn less and pay less tax during downturns and earn more and pay more tax when economic conditions are stronger.

The COVID-19 pandemic has affected the economic and fiscal outlook. As a result of the pandemic, Australia's economy is projected to be smaller than it otherwise would have been over the next 40 years. While the fiscal position is projected to improve as the economy recovers, receipts strengthen and the fiscal support provided in response to COVID-19 tapers off, this improvement is not projected to persist. This is due to payments increasing as a share of the economy over time while receipts are constrained by the Government's tax-to-GDP cap of 23.9 per cent.

Underlying cash balance

The underlying cash balance is the government's total earnings received from taxes and assets, less the cost of programs and interest payments on debt. The underlying cash balance is projected to be in deficit over the next 40 years. While the underlying cash balance improves initially, it then deteriorates in the long term.

Chart 6.1   Underlying cash balance
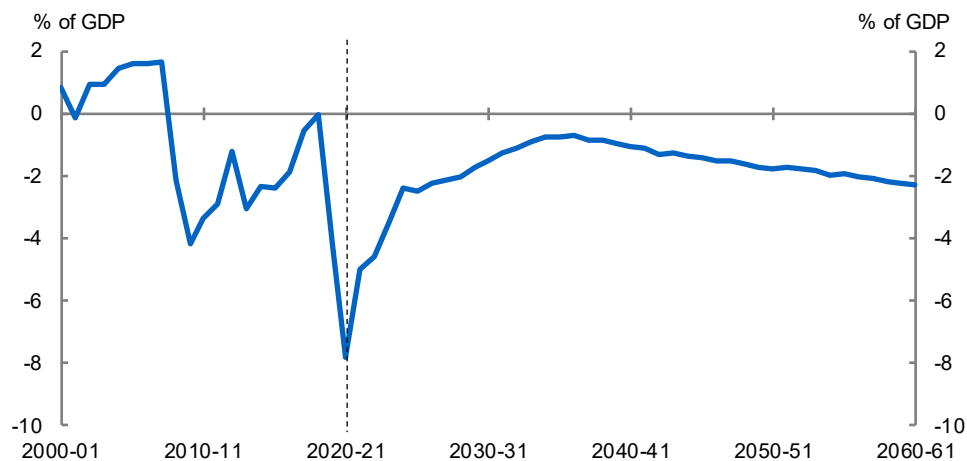
Source: Treasury.

In 2020-21, the underlying cash balance is expected to be a deficit of 7.8 per cent of GDP. This reflects the effects of the COVID-19 pandemic on government finances. The underlying cash balance is projected to improve to a deficit of 0.7 per cent of GDP in 2036-37, reflecting the impact of the expected economic recovery on tax receipts, withdrawal of temporary support measures and the continued low cost of borrowing.

In 2035-36, tax receipts are expected to reach the tax-to-GDP cap. However, payments are projected to continue to increase as a share of GDP, largely due to continuing increases in health, aged care and interest payments. Overall, these factors contribute to the projected deficit widening to 2.3 per cent of GDP by 2060-61.

Chart 6.2   Payments, receipts and the underlying cash balance
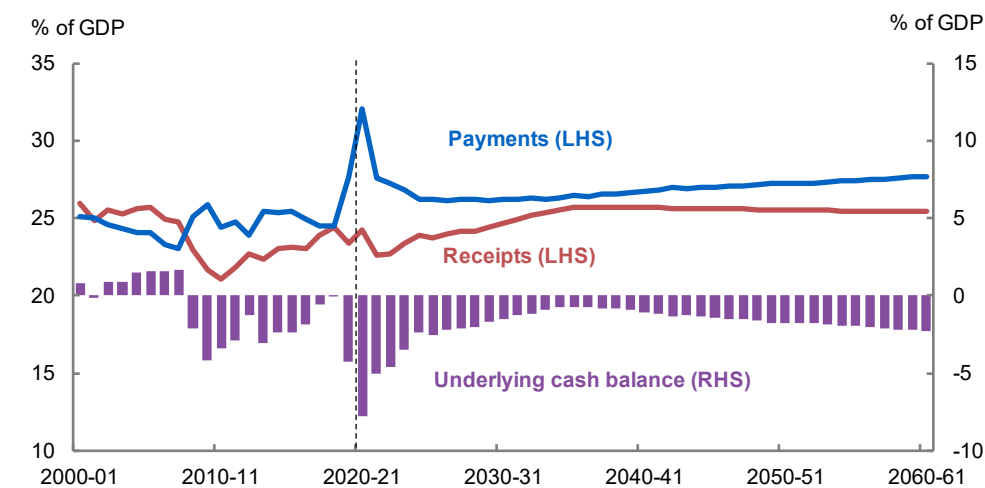
Note: Net Future Fund earnings are excluded from receipts before 2020-21.
Source: Treasury.

The underlying cash balance trajectory has similarities to those in previous reports (Chart 6.3). It begins with a period of improvement before deteriorating towards the end of the projection period. There are 2 main differences between the underlying cash balance trajectory in this report and those in previous reports.

The first difference is that the initial period of improvement occurs over a longer period compared with previous reports. This is predominantly due to tax receipts being projected to increase for longer before reaching the tax-to-GDP cap, reflecting the nature of the shock. The longer period of improvement in the underlying cash balance is also driven by the assumption that government bond yields transition to a long-run trend from a lower rate and at a slower pace, compared with previous reports. This results in lower interest payments early in the projections.

The second difference is that the trajectory deteriorates less towards the end of the projection period as payments in the long run grow more slowly than in previous reports. This reflects lower non-demographic growth, particularly for health, compared with previous reports.

Chart 6.3   Underlying cash balance across intergenerational reports

Source: Treasury.
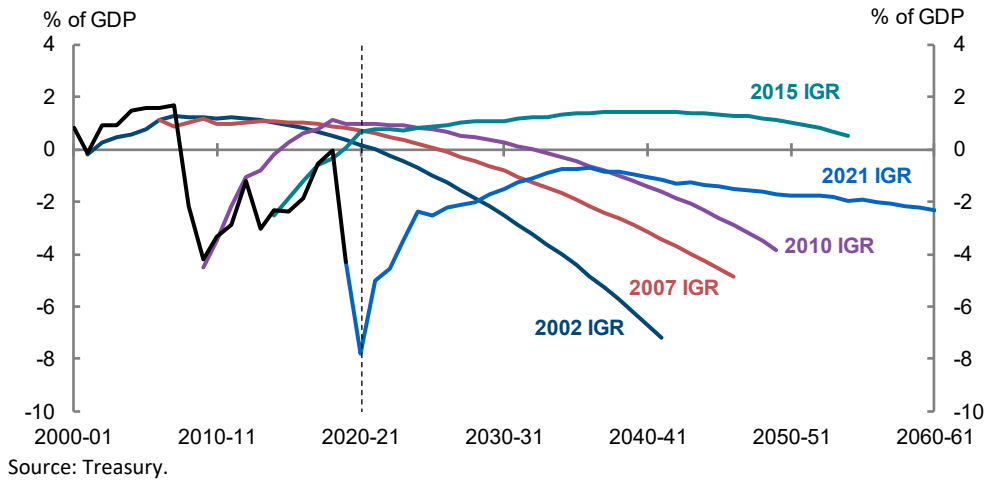
Box 6.1 Impact of COVID-19 on the budget

The COVID-19 pandemic is expected to have a long-term fiscal impact. Understanding the magnitude and duration of this impact helps to ensure Australia is adequately prepared for future shocks.

The budget impact of COVID-19 can be illustrated by comparing the projections in this report with the medium-term projections in the 2019-20 Mid-Year Economic and Fiscal Outlook (MYEFO), which was the last budget update published before the onset of the pandemic.[68]

While the economic projections in this report assume the pandemic subsides, the size of the economy is projected to be permanently smaller than in the 2019-20 MYEFO due to the impact of the pandemic on the population (Box 1.1 in Part I).

As a result, government receipts are lower as a share of the economy but also in nominal terms over the forward estimates and medium term. In the long term, tax receipts are projected to reach the tax-to-GDP cap but at a lower level as a consequence of the economy being permanently smaller.

The Government's temporary measures to support the economy and jobs increased payments significantly in the forward estimates. Beyond the forward estimates, projected payments remain higher than at the 2019-20 MYEFO partly due to Government commitments to the provision of essential services, including the NDIS, aged care and child care.

Together, these factors result in the underlying cash balance being significantly lower than projected in the 2019-20 MYEFO and this lower balance persisting over time. At the 2019-20 MYEFO, the underlying cash balance was projected to be a surplus of 1.7 per cent of GDP in 2029-30. This compares to a deficit of 1.7 per cent of GDP in 2029-30 projected in this report. This difference is equivalent to around $109 billion.

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68   Not all changes in projections since the 2019-20 MYEFO are due to the effects of the pandemic. There have been changes to modelling methodology and to government policy and economic conditions unrelated to COVID-19.

Chart 6.4   Underlying cash balance
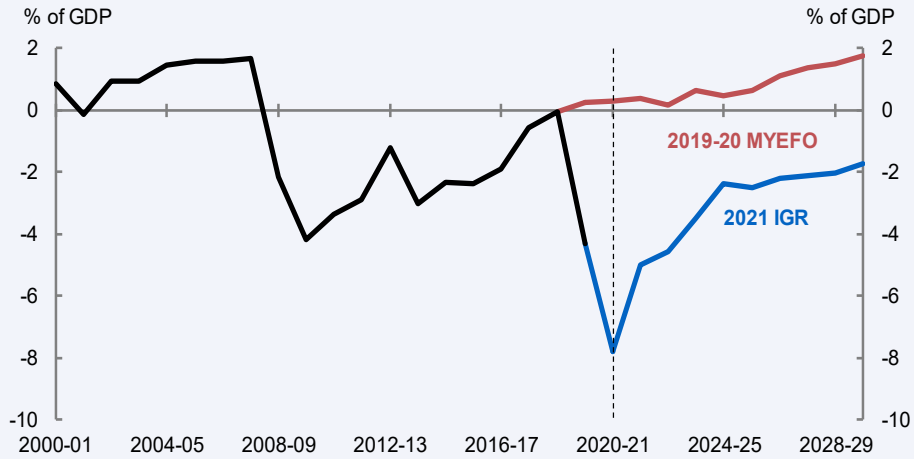
Source: Treasury.

In the 2019-20 MYEFO, gross debt was projected to be 14.6 per cent of GDP in 2029-30 compared with 51.4 per cent of GDP in this report.

Chart 6.5   Face value of gross debt
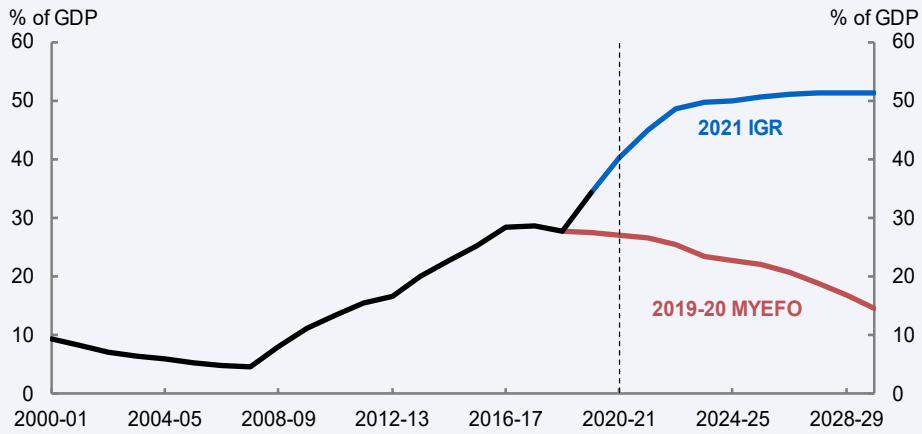
Source: Australian Office of Financial Management and Treasury.

Primary balance

The primary balance includes the same expenditure and receipts as the underlying cash balance but excludes interest payments and receipts. By excluding net interest, the primary balance can highlight imbalances between government receipts and spending.

The primary balance is expected to be a deficit of 7.1 per cent of GDP in 2020-21, before returning to balance in 2033-34 and reaching a surplus of 0.4 per cent of GDP in 2035-36. The primary balance is projected to remain in surplus until 2047-48 before falling to a deficit of 0.6 per cent of GDP in 2060-61 (Chart 6.6). These projected primary surpluses and small primary deficits in the long term indicate Australia's fiscal sustainability. They show the capacity of government to fund ongoing spending needs largely from receipts.

The difference between the underlying cash balance and primary balance projections reflects net interest. This difference is relatively small initially due to the low cost of borrowing. However, government bond yields are assumed to rise from the medium term, which increases projected interest payments as debt is issued or refinanced.[69] Net interest is projected to increase from 0.7 per cent of GDP in 2020-21 to 1.7 per cent of GDP by 2060-61. This increase is sufficiently large for the projected primary balance to be in surplus between 2033-34 and 2047-48 while the underlying cash balance remains in deficit.

Chart 6.6   Primary balance, underlying cash balance and net interest
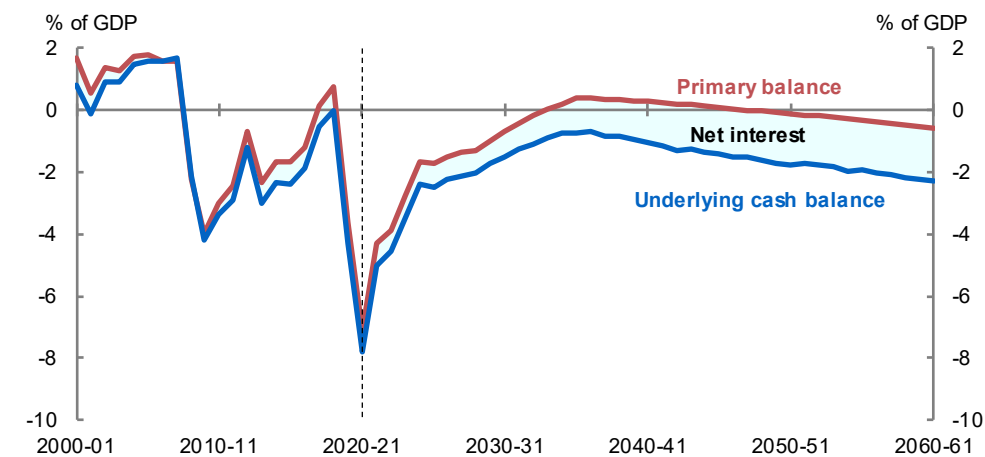
Source: Treasury.

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69   A bond's yield is the return an investor receives each year over the bond's term to maturity.

Net debt

Net debt is the sum of interest-bearing liabilities less the sum of selected financial assets. Net debt is a broader measure of fiscal sustainability than gross debt as it includes cash-like assets on the government's balance sheet as well as the market value of Australian Government Securities (AGS) on issue. It provides an indicator of the government's ability to meet its future debt obligations.

Net debt is projected to peak at 40.9 per cent of GDP in 2024-25, before falling to 28.2 per cent of GDP in 2044-45 and then increasing to 34.4 per cent of GDP by 2060-61.

Chart 6.7   Net debt
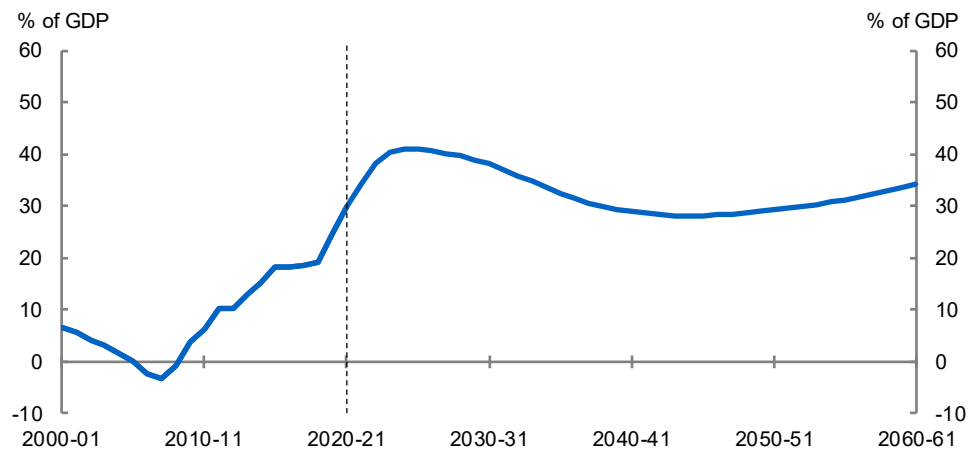
Source: Treasury.

Previous intergenerational reports projected similar profiles with net debt as a share of GDP initially improving, before increasing over the long term. While net debt as a share of GDP increases towards the end of the projection period in this report, this growth is slower than in most previous reports. This difference reflects a longer period of improvement in the underlying cash balance, lower interest costs and slower growth in payments as a share of GDP over the 40-year period.

Chart 6.8   Net debt across intergenerational reports

Source: Treasury.
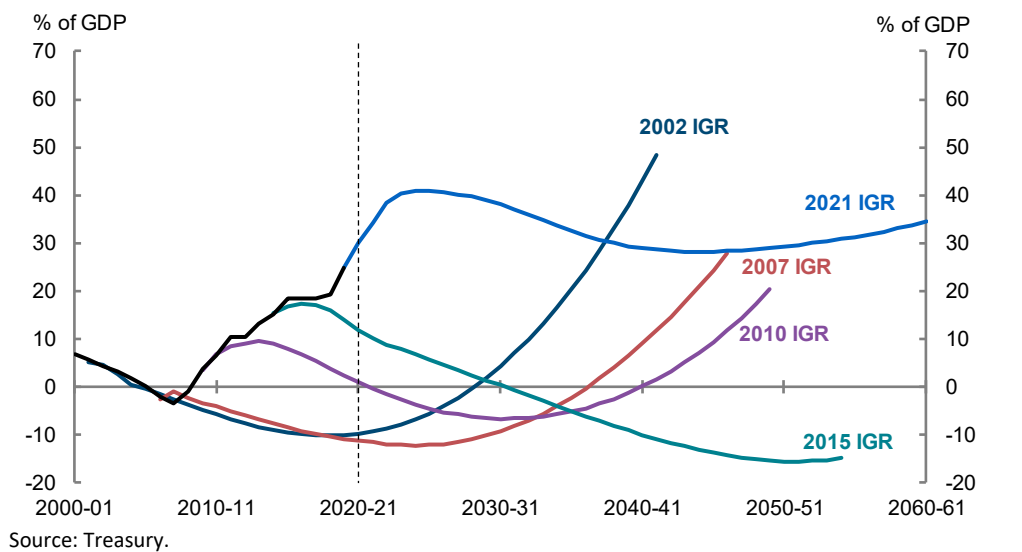
Australia entered the COVID-19 pandemic with a lower net debt-to-GDP ratio than many advanced economies and currently has a lower debt burden than a majority of comparable countries. In 2021, total government net debt (including state government debt) is estimated to be 48.8 per cent of GDP, less than half the average of G20 advanced economies.

Chart 6.9   International comparisons of net debt, 2021
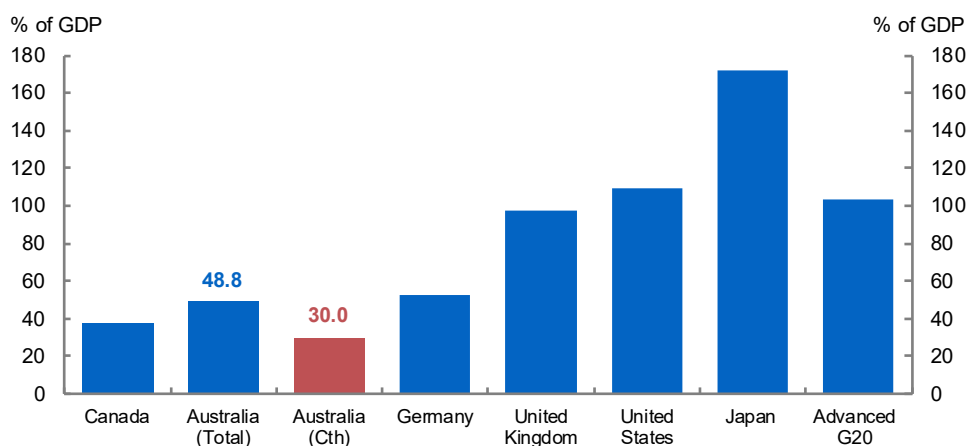
Note: International comparisons of government debt are not directly comparable to other debt metrics included in this report because international comparisons prepared by the IMF include total government debt (inclusive of state and local debt), include slightly different assets and liabilities, and are prepared on a calendar year basis. The Australian Government debt figure is based on debt as at 30 June 2021, rather than a calendar year basis. It is reported on a Uniform Presentation Framework basis, so it includes slightly different assets and liabilities to IMF measures.
Source: IMF estimates, April 2021, and Treasury.

Gross debt

Gross debt is an important indicator of fiscal sustainability. The face value of gross debt is the amount the government owes on maturity to investors holding AGS. The level of gross debt changes when bonds are issued, repurchased or mature.

Australian Government gross debt has risen sharply. As a share of GDP, it is now higher than at any time since the 1950s when Australia was still paying down debt associated with the Second World War. Gross debt is projected to peak at 51.5 per cent of GDP in 2028-29, before falling to a low of 36.8 per cent of GDP in 2047-48. This is driven by low borrowing costs relative to economic growth, and primary surpluses. Gross debt is then projected to rise to 40.8 per cent of GDP by 2060-61.

Gross debt can also be measured in market value terms, which is the price AGS could be sold for in financial markets. The market value of gross debt is projected to decline from a high of 53.2 per cent of GDP in 2024-25 and follow the same trajectory as the face value of gross debt at the end of the projection period.

Chart 6.10 Gross debt
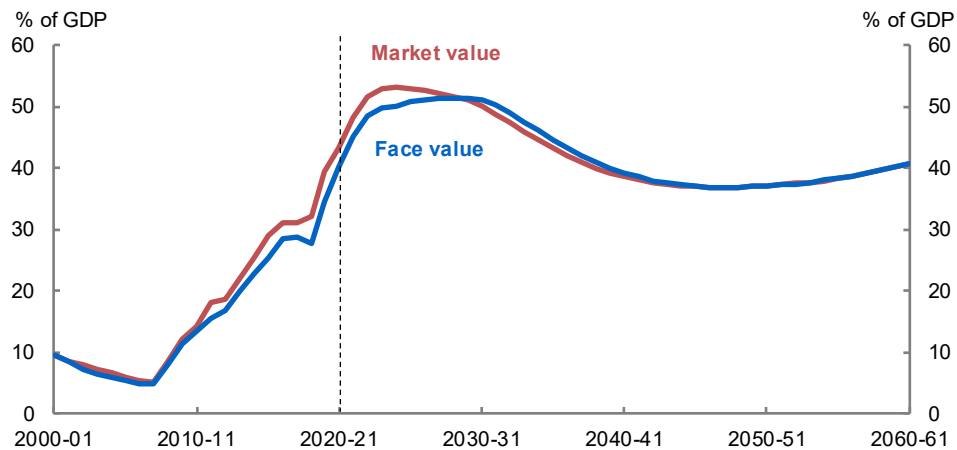
Source: Final Budget Outcome; Australian Office of Financial Management; and Treasury.

A key focus of the Government's medium-term fiscal strategy is to grow the economy in order to stabilise and then reduce debt as a share of the economy. The transition to the medium-term fiscal strategy will occur once the economic recovery from the COVID-19 pandemic is secure. Stabilising and reducing debt as a share of the economy will help counteract the fiscal pressures projected to arise over time.

While the response to the COVID-19 pandemic has resulted in a rapid increase in government borrowing, historically low yields on government bonds mean that interest payments are assumed to remain below 0.9 per cent of GDP until 2024-25. These payments are then projected to increase over time as government debt is financed, and reissued, at higher rates. This reflects an assumption that the 10-year bond yield gradually converges to around 5 per cent by 2039-40, consistent with long-term nominal GDP growth.

Over much of the medium and long term, the cost of borrowing on the total stock of AGS is therefore at or below nominal GDP growth, as the average yield on total portfolio issuance is below that on new issuance. This curbs total interest payments on government debt. Interest payments are projected to increase over the projection period and reach 1.9 per cent of GDP by 2060-61. The sensitivity of the fiscal projection to assumptions about future yields is discussed in Box 6.3.

Chart 6.11 Interest payments on government debt
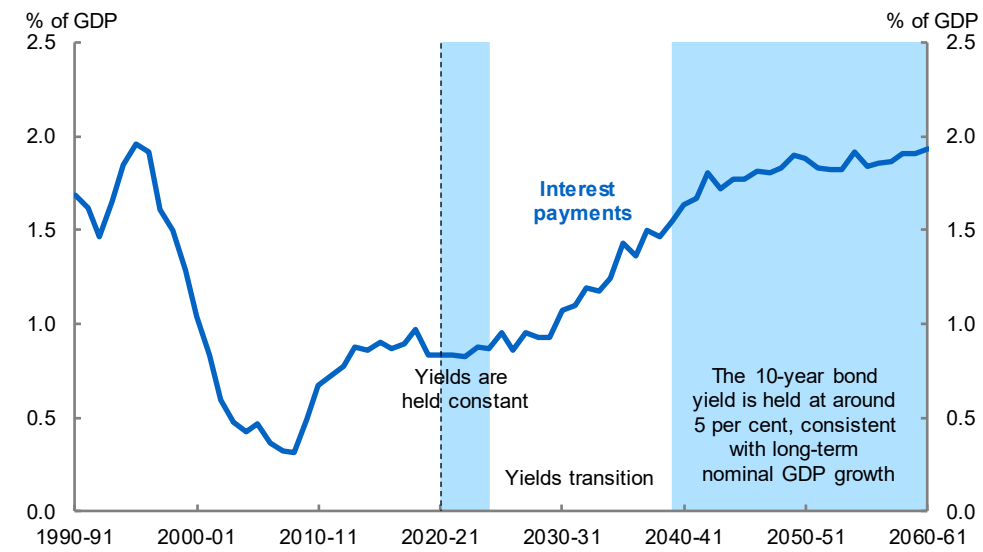
The trajectory of gross debt as a share of the economy will depend largely on future economic growth, the primary balance and yields on government debt. Chart 6.12 illustrates that the largest positive contribution to gross debt is projected to come from GDP growth, which declines slightly over time as discussed in Part I. Projected primary surpluses also improve the debt-to-GDP ratio between 2033-34 and 2047-48 before primary deficits increase debt as a share of GDP.

Chart 6.12 Contributions to changes in gross debt
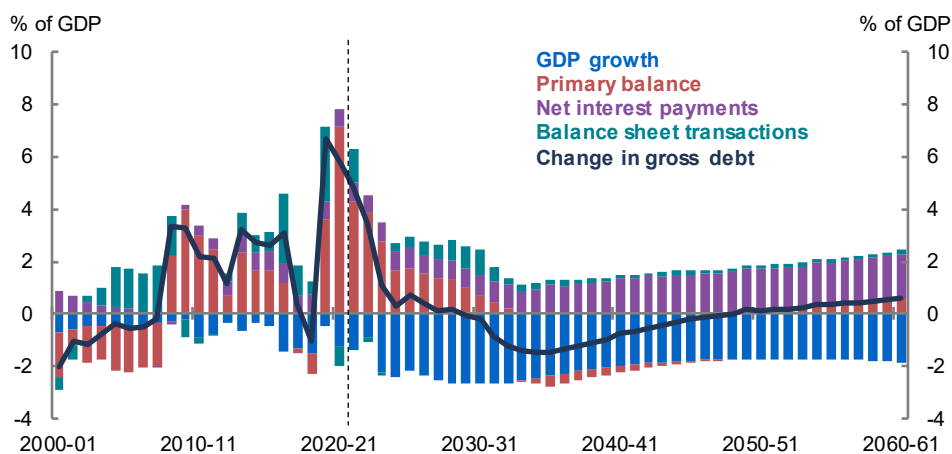
Note: Components below the horizontal axis in the chart contribute to reductions in the debt-to-GDP ratio, while components above contribute to increases in the debt-to-GDP ratio.
Source: Treasury.

These projections reflect an underlying assumption that the 10-year government bond yield remains at or below the rate of economic growth over the next 40 years. This is a technical assumption and should not be interpreted as a forecast. This assumption is consistent with past experience, where yields on Australian Government 10-year bonds have been lower than nominal GDP growth in 31 of the last 50 years, averaging 0.6 percentage points lower over this period. The bond yield assumptions also reflect developments in global bond yields in recent decades.

Chart 6.13 Nominal GDP growth and the nominal 10-year bond yield
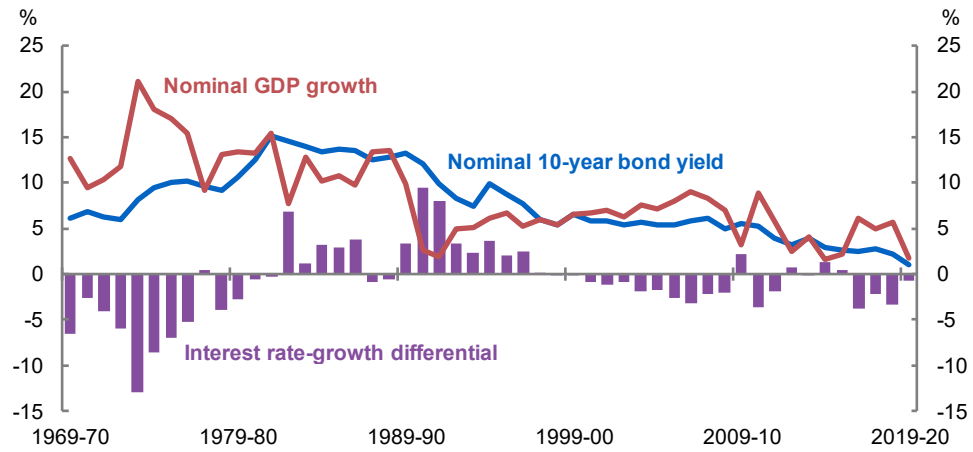
Source: Reserve Bank of Australia and ABS.

Box 6.2   The trend decline in government borrowing costs

Notwithstanding a recent uptick, global government bond yields have been trending downwards for several decades. Australian bond yields have generally moved in line with this global trend. Because Australia is a small open economy, the government's cost of borrowing can be thought of as a function of a common global real yield determined in the international sovereign bond market plus a country-specific risk premium and the expected rate of inflation. While the rate of inflation in many countries, including Australia, has trended down over this period, real yields – yields adjusted for inflation – have also trended downwards.

Chart 6.14 Real 10-year government bond yields
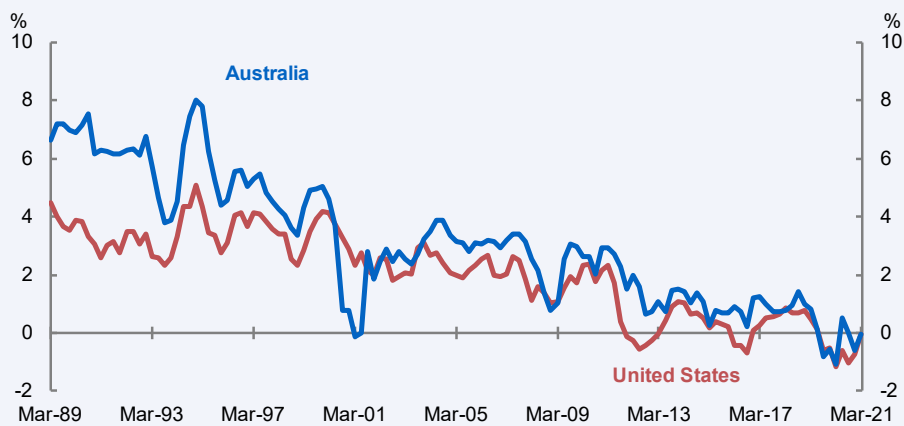
Note: Real interest rates constructed using 'core' inflation (consumer price index excluding volatile items (Australia) or food and energy (United States)).
Source: Bloomberg; US Bureau of Labor Statistics; ABS; and Reserve Bank of Australia.

In broad terms, the downwards trend in global real interest rates is thought to be caused by a sustained excess supply of funds (savings) relative to demand (investment). In turn, this results in a lower cost of funds – the interest rate. Economic researchers have identified several factors as likely being the most important drivers of this savings-investment imbalance: an ageing population, a slowdown in trend productivity growth, and an increased demand for safe assets.[70]

Rising living standards have meant that life expectancy has increased in many countries across the world, including Australia (see Chapter 2 – Population). Theory suggests that increased life expectancy initially raises savings as people accumulate assets to support themselves during longer periods of retirement, putting downwards pressure on interest rates. These savings are then drawn

down as people retire, which could eventually begin to put upwards pressure on interest rates over the longer term.

Many countries have experienced a slowdown in productivity growth since the Global Financial Crisis (see Chapter 4 – Productivity). Slowing productivity growth reduces the returns to capital and, therefore, investment demand. It also reduces expected household incomes and wealth, discouraging consumption today and encouraging saving for future consumption. The combination of reduced demand and increased supply of funds puts downwards pressure on yields.

Another factor that may be contributing to the trend decline in yields is increased demand for 'safe assets'. In response to the financial crises of the 1990s and 2000s, many emerging market economies accumulated precautionary foreign exchange reserves, and regulatory changes required financial institutions to hold more safe assets as collateral. The combined effect is that demand for safe assets has outstripped supply.

From a fiscal sustainability perspective, changes in public debt as a share of GDP are driven by the difference between yields and economic growth, along with the primary balance. A higher interest rate on government debt increases the cost of servicing newly issued debt.[71] However, if economic growth exceeds these yields, it may be sufficient to improve debt as a share of the economy over time even if the primary balance is in deficit.

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70   Other factors that have been put forward include increasing inequality, investment-specific technical change, expansionary monetary policies and global deleveraging. Furman, J., & Summers, L., 'A reconsideration of fiscal policy in the era of low interest rates.' *Peterson Institute for International Economics*. Online publication. (November 2020).

71   The fact that the Australian Government primarily issues at a fixed interest rate means that changes in interest rates will affect the servicing costs of newly issued or refinanced debt, and not the servicing costs of already existing debt.

Box 6.3   Sensitivity of fiscal projections to yield assumptions

Under the baseline projections, the 10-year government bond yield is assumed to gradually converge to a long-run rate of around 5 per cent, consistent with the nominal GDP growth rate, over the period from 2025-26 to 2039-40.

There are both upside and downside risks to this baseline projection. The following analyses the sensitivity of the fiscal projections to different yield assumptions, while holding other economic parameters unchanged.

A lower yield assumption assumes that the 10-year bond yield remains at current levels until 2031-32, before converging to the long-run rate of around 5 per cent by 2046-47.

The higher yield assumption assumes that the 10-year bond yield immediately converges from current levels over 5 years to the long-run rate.

Chart 6.15 10-year bond yield assumptions
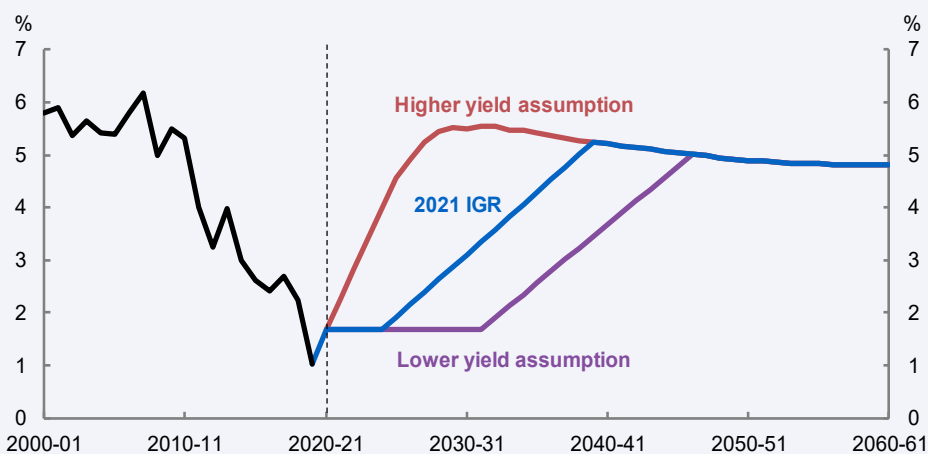
Source: Reserve Bank of Australia and Treasury.

Under the lower yield assumption, the cost of servicing government debt is reduced, which results in a projected improvement in the underlying cash balance of around 0.4 percentage points of GDP by 2060-61. This reduces gross debt by 8.3 percentage points of GDP by 2060-61.

Under the higher yield assumption, there is a projected deterioration in the underlying cash balance that builds to around 0.6 percentage points of GDP by 2060-61. This would increase gross debt by 14.0 percentage points of GDP by 2060-61.

Chart 6.16   Impact on underlying cash balance of alternative yield assumptions
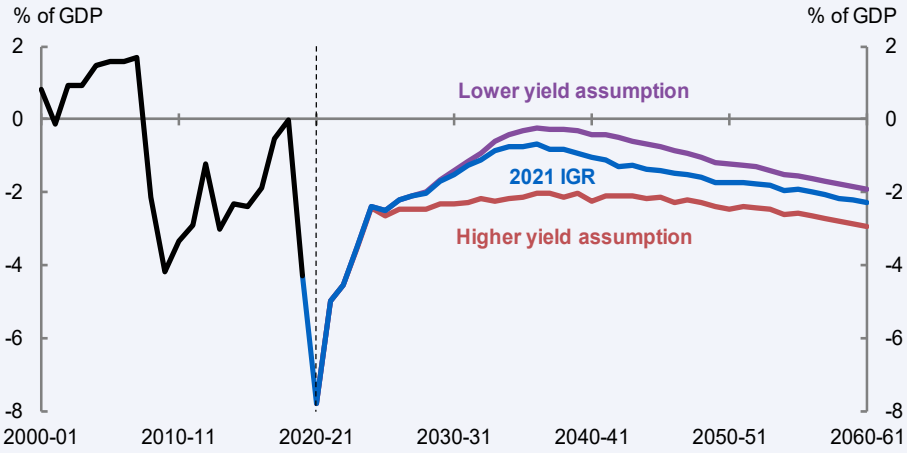
Source: Treasury.

Chart 6.17 Impact on gross debt of alternative yield assumptions
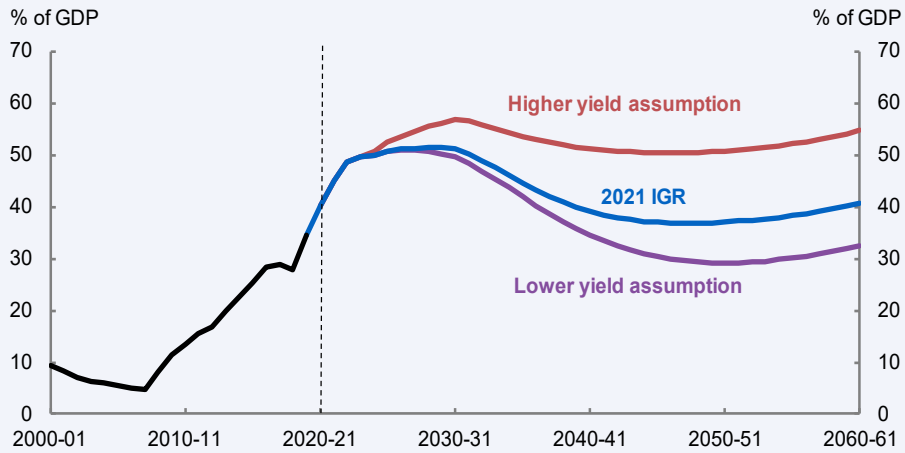
Source: Australian Office of Financial Management and Treasury.

Net financial worth

Net financial worth is the government's financial assets (liquid assets and equity investments) minus its total liabilities. A negative net financial worth means that the government holds more liabilities than financial assets.

Net financial worth projections follow a similar profile to the other debt metrics explained above. Net financial worth is expected to be -46.4 per cent of GDP in 2024-25. Net financial worth then improves to -31.8 per cent of GDP in 2044-45 as the government pays down debt as a share of the economy. Net financial worth then deteriorates to -38.5 per cent of GDP by 2060-61, as debt increases again as a share of the economy.

Chart 6.18 Net financial worth

Source: Treasury.
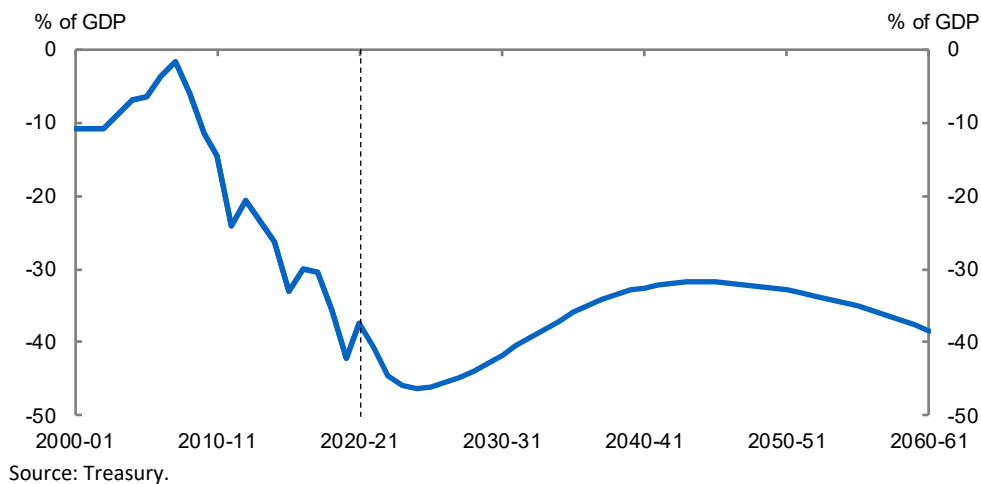
Fiscal strategy

The immediate priority of the Government's economic recovery plan is to support confidence, employment and economic growth to minimise the impact of the COVID-19 pandemic.

Past experience indicates that the budget can take many years to recover from economic shocks. In part, this reflects the long-lasting impact that a shock can have on the labour market and earnings. This underscores the importance of securing a strong recovery to limit these long-term effects.

Once the economic recovery is secure and the unemployment rate is back to pre-crisis levels or lower, the Government's medium-term fiscal strategy aims to stabilise and then reduce debt as a share of the economy. This will ensure Australia retains the capacity to respond to future shocks without compromising fiscal sustainability.

It is important to rebuild this fiscal space over time to ensure we can respond to adverse events, while carefully balancing the cost to the economy. Historically, countries with more fiscal space have responded to crises with more expansionary fiscal policy, and have experienced less severe downturns.[72] Australia entered the crisis induced by the COVID-19 pandemic in a stronger fiscal position than most other advanced economies, which provided the flexibility to respond decisively.

Having adequate fiscal policy space is particularly important for Australia as a small open economy that currently has limited conventional monetary policy space and is subject to fluctuations in its terms of trade and cost of capital caused by global factors.

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72   Ò. Jordá, M. Schularick, & A. M. Taylor 'Sovereigns Versus Banks: Credit, Crises, and Consequences' *Journal of the European Economic Association*, 14(1), 45–79. (February 2016); C. D. Romer & D.H. Romer 'Why Some Times Are Different: Macroeconomic Policy and the Aftermath of Financial Crises'. *Economica*, 85(337), 1-40. (January 2018).

7.   Government spending

Overview

Total government spending as a share of the economy is projected to fall from a pandemic-induced high, before gradually increasing as a share of the economy over the next 40 years.

Real government spending per person is expected to be $22,420 in 2021-22, increasing to $38,680 by 2060-61.

Health and aged care are projected to be the fastest growing areas of spending over the next 40 years. Growth in these areas reflects pressures from the ageing of the population as well as non-demographic factors such as technology, changing consumer preferences and rising incomes.

Strong growth in health and aged care spending is partially offset by slower growth in payments to individuals, Age and Service Pension, and education spending. While these will remain substantial components of government spending, they are expected to account for a smaller share of total spending over time.

Interest payments are projected to increase over the next 40 years. This results from the need to fund higher spending over time as well as an assumption that government bond yields will return to higher rates in the long term.

Projections for demand-driven programs, such as health and payments to individuals, are based on current policy settings projected over the long term with reference to long-term demographic and economic growth trends. Projections for non-demand driven programs such as infrastructure and defence grow in line with the economy and are assumed to remain a constant share of GDP in the long run.

In the absence of policy changes, nominal government spending is generally not very responsive to changes in the economy in the short term. While payments to individuals are typically countercyclical – increasing when the economy worsens and decreasing when the economy improves – many other areas of government spending are not as responsive.

The trajectory of government spending depends heavily on long-standing policy settings and overarching trends and pressures. In the longer term, changes to economic

variables such as population and prices will affect government spending. Many government payments are indexed, which means that changes in prices influence the amount of total government spending. Changes to the size and age structure of the population also directly affect the demand for government services and have flow-on effects for total government spending.

Australia is currently in the middle of an important demographic transition, as people in the baby boomer generation reach 65. This has already driven a rapid fall in the ratio of working-age people to those over 65 in the past decade, which will continue for the next decade. The effect of population ageing on a given area of government spending will depend on several factors, including the composition of recipients, how demand for services varies with age, and how demand is expected to change in the future. For instance, as the baby boomer generation ages, demand for health services will increase, and there will be an increasing demand for aged care. In contrast, other areas of government spending such as payments to families and education will see a reduction in growth.

Chart 7.1   Increase in age-groups – 5-year moving average
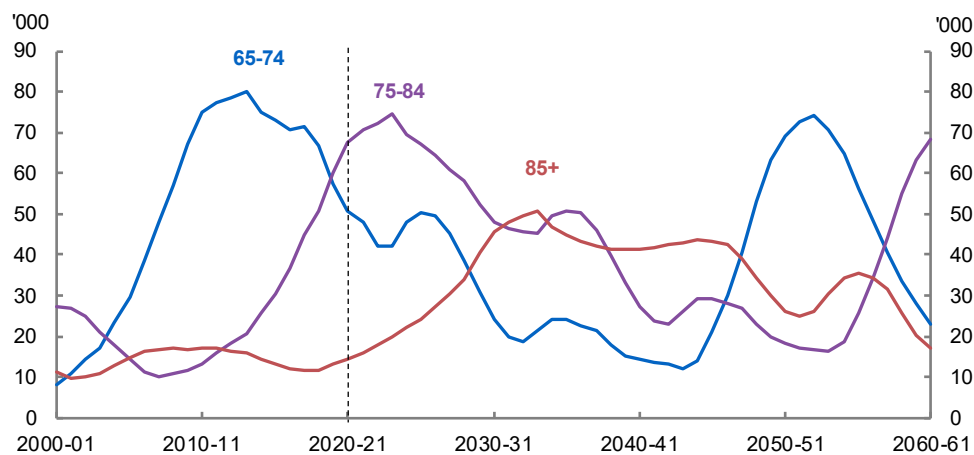
Source: ABS Demographic Statistics and Treasury.

Projections of total spending

Australian Government support during the pandemic means that total government payments in 2020-21 are expected to reach 32.1 per cent of GDP. Spending has not been this high since the Second World War. However, since support during the pandemic is targeted and temporary, total spending as a share of the economy is expected to fall quickly as the economy recovers.

Total spending is projected to decrease to 26.2 per cent of GDP in 2024-25. Payments increase gradually from the 2030s as a share of the economy, and by 2060-61 total government spending is projected to be 27.7 per cent of GDP. The increase in payments as a share of GDP is mainly driven by growth in health spending, but also aged care

spending and interest payments. Increases in these payments more than offset decreases in some other payment categories as a share of GDP, such as payments to individuals and education.

Chart 7.2   Government spending
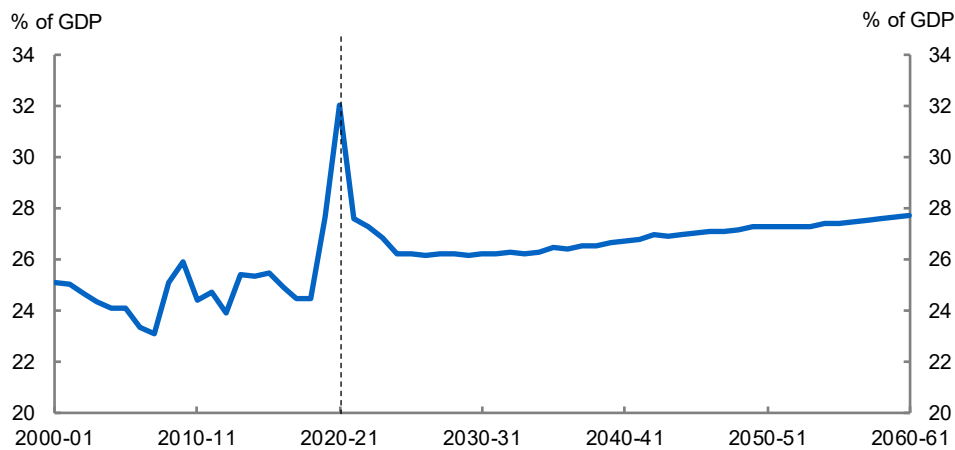
Source: Treasury.

Total payments, in real terms, are projected to grow at 2.5 per cent a year on average from 2021-22 to 2060-61. This compares to real average annual growth of 3.4 per cent over the past 40 years.

Australian Government real spending per person is projected to nearly double over the next 40 years. Real government spending per person is projected to increase from $22,420 in 2021-22 to $38,680 by 2060-61.

The projected trajectory for government spending has similarities with previous intergenerational reports. Previous reports projected spending profiles that increased as a share of GDP over the long term, reflecting spending pressures from ageing and other non-demographic factors (Chart 7.3). A key difference in this report compared with previous intergenerational reports is that projected payments in the long run grow more slowly. This reflects lower non-demographic growth, particularly for health, compared with previous reports.

Aside from 2020-21 and 2021-22, the level of total payments is projected to be lower than it was in the 2015 Intergenerational Report. This reflects lower population projections and weaker price and wage growth, which affects indexation of government payments. Lower levels of projected spending also reflect ongoing efforts to constrain spending growth and target spending to priority areas. However, total payments as a share of the economy are projected to be higher than in the 2015 Report, reflecting both the projections of a smaller economy as a result of the COVID-19 pandemic and structural spending increases in the NDIS, aged care and child care.

Chart 7.3 Government spending across intergenerational reports
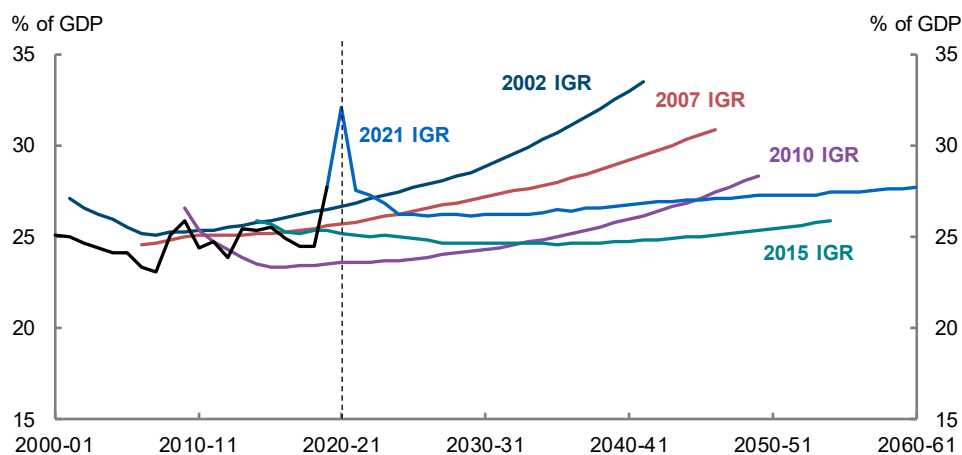
Note: Interest and GST payments have been incorporated into the 2002 and 2007 Intergenerational Report projections for comparability.
Source: Treasury.

Changes to the composition of government spending

As a share of GDP, health spending is projected to increase from 4.6 per cent in 2021-22 to 6.2 per cent in 2060-61, substantially due to rising incomes, changes in consumer preferences and the costs of using new health technology. Aged care spending is projected to significantly increase, albeit from a much smaller base, from 1.2 per cent of GDP in 2021-22 to 2.1 per cent of GDP in 2060-61. This is largely driven by demographics over the next decade, after which non-demographic factors become the predominant drivers of growth.

Meanwhile, spending on the Age and Service Pension is projected to fall from 2.5 per cent of GDP in 2021-22 to 2.1 per cent of GDP in 2060-61. Other payments to individuals are also projected to fall from 3.9 per cent of GDP in 2021-22 to 2.7 per cent of GDP in 2060-61. While increasing in absolute and real terms, these payments decrease as a share of GDP since nominal GDP is expected to grow faster than those payments, which largely depend on a combination of indexation rates (including CPI), wage cost indexes and population growth.

Interest payments are projected to increase from 0.8 per cent of GDP in 2021-22 to 1.9 per cent of GDP in 2060-61. This results from the need to fund projected higher spending over time as well as an assumption that government bond yields will return to higher rates in the medium and long term (Chapter 6 – Budget projections).

Chart 7.4   Composition of government spending over time
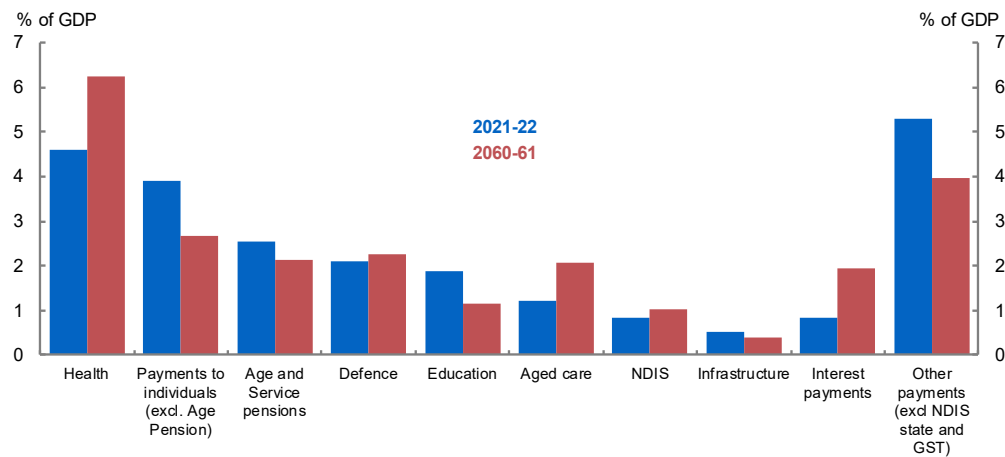
Note: Other payments in this chart includes a range of payments such as funding for the Australian Public Service, superannuation, official development assistance, law and order, the arts, community development and tourism. It excludes GST payments and state government contributions to the NDIS.
Source: Treasury.

The composition of total spending is expected to change over the next 40 years. Health, aged care, and interest payments are projected to increase as a proportion of total spending over time. This is partly offset by slower growth in Age and Service Pension, other payments to individuals, and education. This results in these payments falling as a share of total spending over time. Health accounts for the largest compositional shift over the next 40 years. It is projected to increase from 19.0 per cent of total government spending in 2021-22 to 26.0 per cent in 2060-61.

Other pressures on government spending are likely to become more prominent over the next 40 years. These include challenges posed by climate change and other risks to the natural environment. There will also be spending pressures, as well as opportunities for efficiencies and new solutions, presented by technological changes.

7.1   Health

The Australian, state and local governments share responsibility for the health system. The Australian Government is the largest single source of funding for the system, providing around 41 per cent of total health spending. State and local governments contribute around 27 per cent, with private contributions making up the remaining 32 per cent.

In Australia, health spending has generally grown faster than the rest of the economy over the past 40 years. This trend of rising health spending as a share of GDP can be attributed to demographic and non-demographic factors. These factors include an ageing population, rising incomes and technological advancement. The response to COVID-19 has had a significant effect on near-term health spending and has seen the introduction of technologies, like telehealth, that will shape the health system and public consumption into the future.

Australian Government health spending is projected to continue to increase as a share of GDP from 4.1 per cent in 2018-19 to 6.2 per cent in 2060-61. Real per person health spending is also projected to increase from $3,250 in 2018-19 to $3,970 in 2031-32, continuing to grow to $8,700 in 2060-61. This spending varies by age with people aged over 55 years using the health system at a higher rate than the average person (Chart 7.1.2).

Chart 7.1.1   Historical health spending

Source: AIHW health spending database.
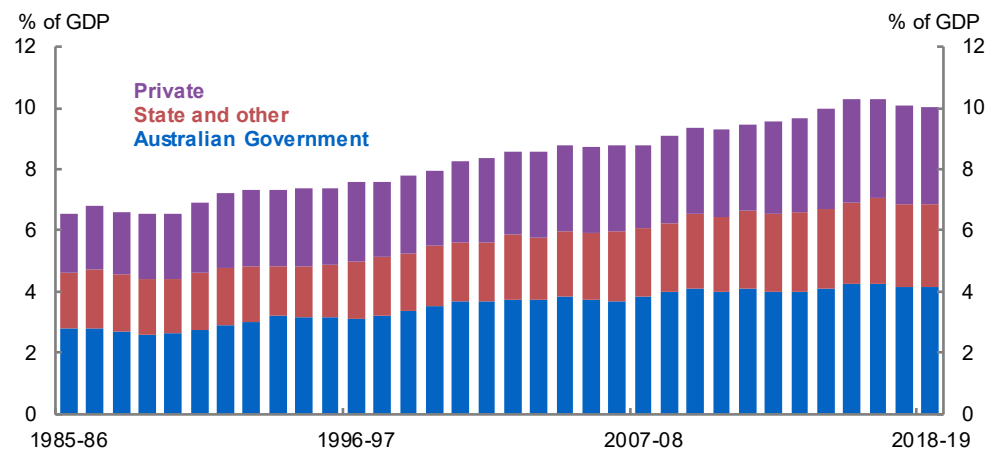
Chart 7.1.2   Australian Government health spending by major programs and age in 2019-20
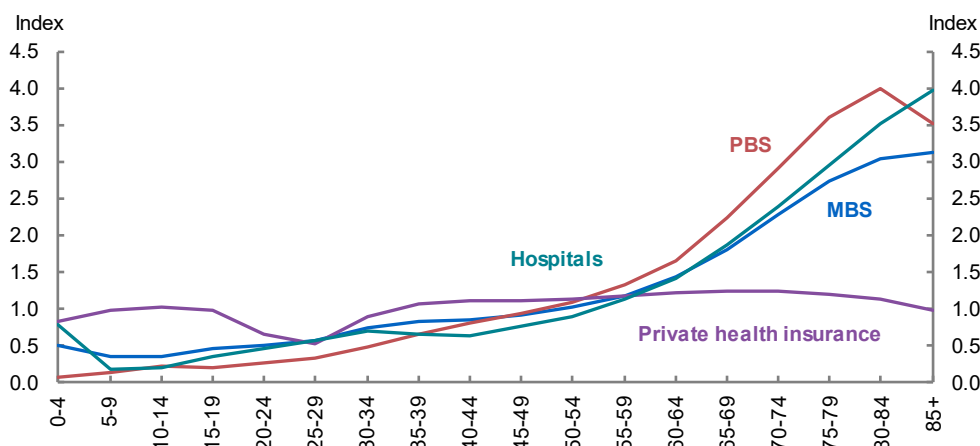
Note: Index of average cost per person in 2019-20. A value of 1 denotes the average person's spending on each health program.
Source: Department of Health.

Past intergenerational reports have projected that spending on health would rise to between 5 and 8 per cent of GDP by the end of their projection periods. However, the projected outlook for health spending has generally been lower over successive reports.

Chart 7.1.3   Health spending projections across intergenerational reports
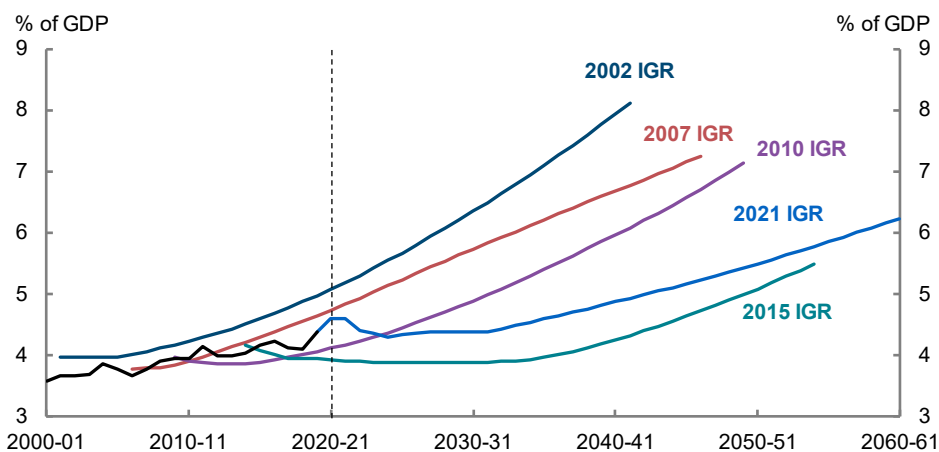
Source: Treasury.

Components of current health spending

Major health programs funded by the Australian Government include the Medicare Benefits Schedule (MBS) and the Pharmaceutical Benefits Scheme (PBS). In addition, the Australian Government makes a major contribution to the funding of public hospital services provided by state governments, subsidises the cost of private health insurance and provides financial support for medical research, public health, Indigenous health services and medical workforce development.

Medicare has been Australia's universal health care scheme since 1984. It funds medical services, public hospitals, and medicines. Medicare guarantees all Australians access to a wide range of health and hospital services at low or no cost, including health services provided by GPs, medical specialists, nurses, and other allied health professionals. In total, over 428 million MBS services were provided in 2019-20, with total benefits of $24.7 billion. On average, more than 8 out of every 10 visits to the GP involved no out-of-pocket cost for the patient in 2019-20.

The PBS subsidises the cost to patients of a wide range of prescription medicines. The PBS is a demand driven program. Advances in medical technology and the development of new treatments are leading to more medicines being made available to Australians. At the same time, the Government has implemented PBS pricing policies to keep the costs of these medicines low for the Government and consumers.

The Australian Government provides a significant contribution to assist states with the costs of delivering public hospital services. Funding for public hospital services was agreed through the 2020-25 Addendum to the National Health Reform Agreement (NHRA) which was signed in May 2020. Under the NHRA the Australian Government is expected to invest more than $130 billion in demand driven public hospital funding over 5 years from 2020-21. Advances in medical technology and treatment innovations are leading to life-saving treatments being made available in hospitals around the country.

Private health insurance is an important part of the Australian health system, with 13.9 million Australians covered by either general or hospital treatment policies and $21.9 billion in total private health insurance benefits provided in 2019-20. In 2020-21, the Australian Government will spend around $6.7 billion in means-tested subsidies to make private health insurance more affordable.

The Australian Government makes significant investments in medical research to improve the health of Australians by supporting the development of new medicines, treatments, and devices. The Medical Research Future Fund (MRFF) was established in 2015 to provide a sustainable source of funding for Australian health and medical research. The Australian Government contributed to the MRFF until it reached $20 billion in July 2020. The Future Fund invests this money and every year the Government uses some of the returns from this investment to pay for medical research initiatives. The Government has released a 10-year investment plan that outlines how the MRFF will provide over $5 billion for medical research over the decade to 2027-28.

Real spending across these major health programs has increased steadily over the past 2 decades, albeit with differences across the programs. Public hospital spending by the Australian Government has increased the fastest, with average growth of 4.4 per cent per year which is more than double the rate of population growth. Growth in private health insurance spending by the Australian Government has been more moderate, growing at 3.4 per cent per year over the period, with MBS and PBS spending growing at average rates of 4.2 per cent and 3.8 per cent per year, respectively.

Chart 7.1.4   Australian Government real spending on major programs
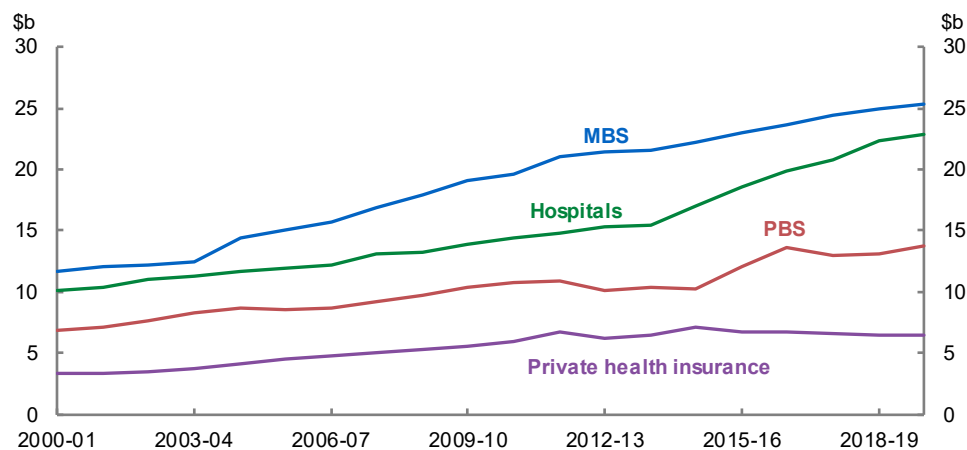
Note: Total spending in 2020-21 dollars. Data exclude spending on veterans' health.
Source: Treasury.

Healthcare reform

The Government has implemented major reforms over the past decade to ensure Australians are able to access the essential health services they need while maintaining a sustainable health system. Activity-based funding introduced as part of the 2011 NHRA has delivered improved efficiency of public hospital funding while ensuring high-quality care is delivered across Australia.

Recognising the joint responsibility for different aspects of the health system, national partnership agreements (such as the NHRA) between the Australian Government and the states include performance and accountability measures to further improve the efficiency of the healthcare system.

Ongoing reform and monitoring of the MBS and PBS have ensured that these programs continue to operate efficiently while supporting access to new treatments and medicines. In 2020, the MBS Review Taskforce completed its review of over 5,700 items on the MBS. In the 2020-21 and 2021-22 Budgets, the Government committed more than $20 million to support the implementation of the Taskforce recommendations and to establish an ongoing review process. This will continue to ensure the MBS meets the goals of affordable and universal access, best practice healthcare, and value for individual patients and the health system. Reforms to the way the Government pays for medicines listed on the PBS have ensured that Australians have been able to access new and innovative medicines while maintaining affordability for consumers and sustainability for the Government.

There has also been an increased focus on primary health care at the local level, immediate investments in infrastructure to alleviate pressure on the public hospital system and better integration and smoother transitions for patients across the health system.

Drivers of future health spending

As in other developed countries, Australian Government spending on healthcare has generally grown faster than GDP. Underpinning increases in real health spending are demographic factors (such as population growth and ageing) and non-demographic factors such as technology, changing consumer preferences and rising incomes (Chart 7.1.5). Government policy decisions on the design of health programs also have a significant impact on total health spending.

Demographic factors are projected to account for just under half the increase in real spending per person over the next 40 years. This reflects that older people need to use more health services, so as the population ages health system costs increase. In 2019-20, Australian Government spending on Medicare and the PBS for the average person aged 85 years and older was around 3 times higher than the average across all ages. Recent evidence suggests those aged 65 and over were 4 times more likely to

have co-morbidities than people aged 15 to 44.[73] Compared with the previous 40 years, demographic changes are projected to contribute less to health expenditure growth. This is due to the expected moderation of population growth and the diminishing effect of ageing over the projection period.

The cost and prevalence of chronic conditions are relevant to future health spending. Chronic conditions are long lasting with persistent effects, and include conditions such as arthritis, back pain, cardiovascular disease, diabetes, and mental health conditions. These conditions tend to develop gradually and become more common with age. In 2017-18, 1 in 2 Australians had 1 or more of 10 selected chronic conditions. As the population ages, chronic conditions will increase overall health spending. Most care for chronic conditions is provided in the primary health care setting by general and allied health practitioners. Effective primary health care is important to help prevent unnecessary hospitalisations from chronic conditions and improve health outcomes.

The Government has invested an additional $2.3 billion in the National Mental Health and Suicide Prevention Plan, which will provide critical services and supports to improve mental health services, with a focus on prevention, early intervention and a national network of mental health treatment centres. The Productivity Commission's 2020 Inquiry Report into mental health estimated that the direct cost to the Australian economy of mental illness and suicide is up to $70 billion per year. The productivity implications of mental ill-health include people requiring time off work to maintain their wellbeing and reduced productivity in the workplace due to psychological distress.

Health costs have also been growing independently of the size and ageing of the population. Non-demographic growth factors place pressure on government to increase spending on health in excess of what would be expected from demographic changes. These factors, such as rising incomes and technological advancement, contribute to an increased quantity and quality of health services and products consumed and demanded. Governments must choose how to respond to these pressures. Several studies have found that changes in national income are the largest driver of government spending on health internationally.

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73 51 per cent compared with 12 per cent. Source: Australian Institute of Health and Welfare, *Australia's Health 2020* (Canberra: AIHW, July 2020).

**Chart 7.1.5   Drivers of real Australian Government health spending –
average annual growth**
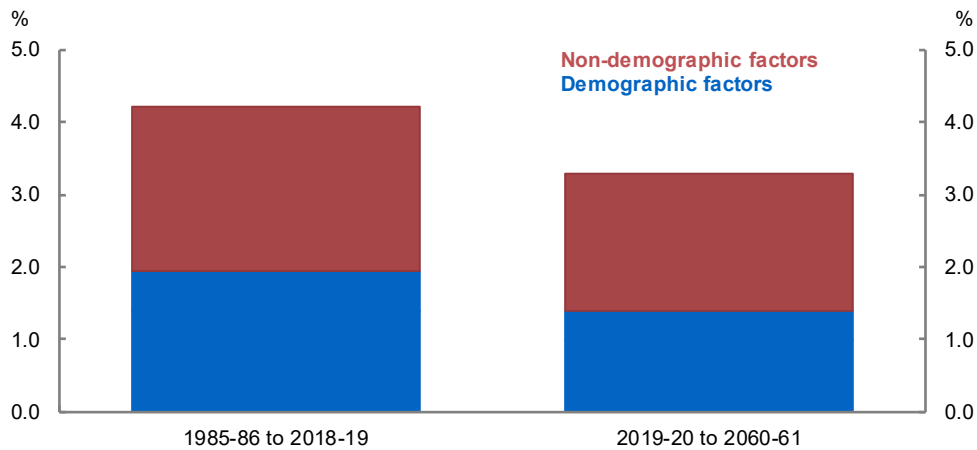
Note: The chart displays average annual growth rates of the different factors contributing to real Australian Government health spending projections (2020-21 dollars).
Source: Treasury.

In terms of price, while new treatments are often initially more expensive than pre-existing treatments, they can improve patient outcomes and be more cost effective in the long term. This is particularly the case when taking whole-of-patient care costs into account. For example, genomic testing is a costly emerging technology. It is likely to be used more frequently in the future due to its potential to diagnose health conditions and diseases earlier, as well as to provide better prevention and treatment options than traditional approaches. As the cost of this new technology falls over time, it is likely to become more cost-effective for a wider range of conditions.

Improvements in health technology affect the quantity and price of health services. By enabling interventions that were previously not possible, technology can boost the supply of, and demand for, health services.

These non-demographic factors have been more significant drivers of the growth in health spending than demographic factors and this trend is projected to continue. Non-demographic factors are projected to account for just over half the increase in real spending per person over the next 40 years.

Components of future health spending

The major components of Australian Government health spending are projected individually for 10 years into the future. From 2032-33 onwards, total Australian Government health spending is projected in aggregate based on the long-term trend in spending on health by all levels of government. By using information on health spending by age and gender, these projections account for the diverse ways Australians engage with the health system. These projections suggest that the Australian Government health budget will face greater pressure over the longer term.

Funding for public hospitals is projected to be the fastest growing component of Australian Government health spending, nearly doubling in nominal terms between 2020-21 to 2031-32. In real terms, Australian Government funding for public hospitals is projected to grow from $880 per person in 2020-21 to $1,190 per person in 2031-32.

MBS spending is projected to increase by 70 per cent between 2020-21 and 2031-32, with real spending per person projected to increase from $1,110 to $1,280 over the period. Real spending on the PBS is projected to increase from $540 to $590 per person over the period.

Chart 7.1.6   Australian Government health spending by components
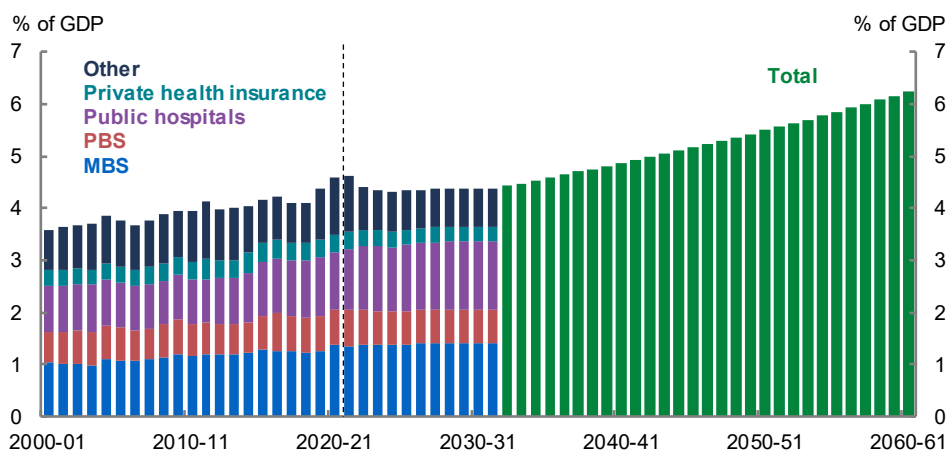
Source: Treasury.

Government policy settings can directly influence the speed with which innovative treatments and clinical care are developed and adopted in clinical settings. For instance, the MRFF has served as a source of funding for initiatives such as the 'Genomics Health Futures Mission' to improve testing and diagnosis for many diseases, help personalise treatment options to better target and improve health outcomes, and reduce unnecessary interventions and health costs. Other innovative treatments include medicines that can be taken in the community setting that replace therapies that would have been given in a hospital setting. For example, new oral anti-cancer medicines are being made available through the PBS, such as ibrutinib for chronic

lymphocytic leukaemia, which can be used instead of chemotherapy-immunotherapy infusible regimens.

The COVID-19 pandemic demonstrated how decades of investment have built a world-class health system that supports positive health outcomes for Australians and is agile to respond to community health needs. While uncertainty remains about future risks to the health of Australians, investments in medical research will support the Australian health system to continue to innovate and prepare to respond.

7.2   Aged care

The Australian Government provides funding for residential aged care and a range of community aged care services, including care in the home. In 2018-19, the Australian Government funded around 80 per cent of total aged care spending, with user contributions largely making up the remaining 20 per cent.

Aged care is provisioned across a spectrum of support ranging from limited assistance with daily tasks at home through to intensive supervision within a residential aged care facility. The Commonwealth Home Support Programme (CHSP) provides entry-level home support for older Australians needing assistance to continue living independently. The Home Care Packages Program assists people living at home and offers choice and flexibility in the way care and support are provided. Residential aged care provides a range of supported accommodation services for older Australians who are unable to continue living independently in their own homes.

Australian Government spending on aged care has increased by over 40 per cent in real terms since 2012-13. While the number of people living in residential aged care facilities has remained relatively stable in recent years, the number of people accessing a Home Care Package has increased markedly, growing from around 60,000 in June 2015 to around 170,000 by December 2020.

The reforms announced as part of the 2021-22 Budget will deliver a substantial structural increase in the level of funding for aged care. By 2023-24, Australian Government spending on aged care is expected to be around $4.5 billion higher per year as a result of the reforms (an increase of around 17 per cent). This represents an increase in annual spending equivalent to around 0.2 percentage points of GDP.

The number of older Australians requiring aged care services is expected to increase as the population ages. In the near term, the impacts of the baby boomer generation moving into their 70s and 80s will be particularly marked. A key driver of aged care spending is the number of people over the age of 70. The number of people aged 70 and over is expected to more than double over the next 40 years, reaching around 6.9 million people by 2060-61.

However, the relative impact of population ageing will fall over the next 40 years, and non-demographic factors are projected to become the dominant driver of spending growth in aged care over the long term. This is a result of slowing growth in the number of people aged 70 and over in the generation following the baby boomer generation.

Non-demographic factors include pressures arising from changing consumer preferences, higher real incomes, and the changing incidence of frailty and disease among users of the aged care system. Historically, non-demographic factors have placed pressure on government spending over and above what might be expected as a result of demographic factors alone.

Chart 7.2.1   Aged care spending
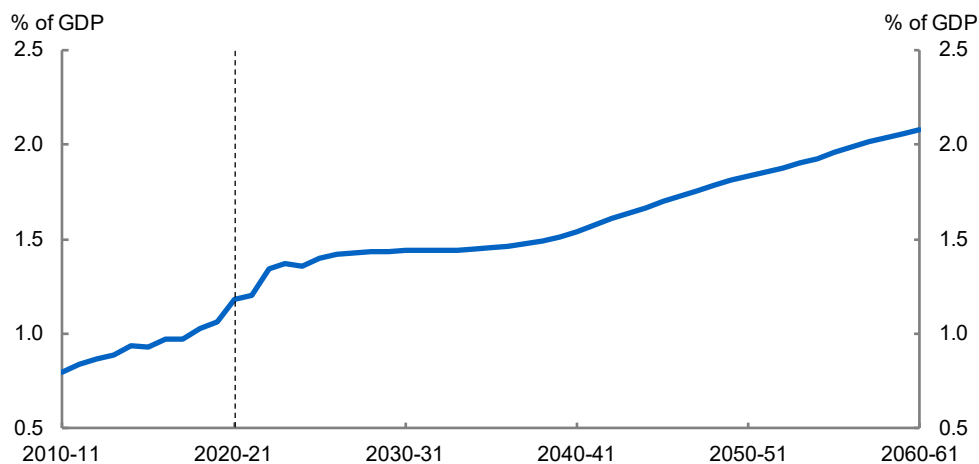
Source: Treasury.

Aged care spending is expected to increase substantially as a share of the economy, from 1.2 per cent of GDP in 2020-21 to 2.1 per cent of GDP in 2060-61 (or $113 billion in 2020-21 dollars). This reflects population growth and ageing, as the baby boomer generation enters aged care eligibility age, and non-demographic factors. Real per person aged care spending is projected to increase from $5,460 to $12,500 for people aged 65 and over. These projections are on average 0.2 percentage points of GDP higher than was expected at the time of the 2015 Intergenerational Report.

Drivers of aged care spending

Transformation of the aged care sector

The Government is making major reforms to the aged care sector that will occur in stages over many years. The Government has already made large investments to improve the safety and quality of residential aged care services and improve access through additional home care packages. Other initiatives will also improve workforce recruitment, retention, and quality in the aged care sector.

The Government's reforms to aged care will be underpinned by a new consumer-focused Aged Care Act, supported by strengthened governance arrangements. The role of the Independent Hospital Pricing Authority will also be expanded to help ensure that aged care costs are directly related to the care provided. These transformations cater to changing community expectations about how and where care is delivered, which will increase aged care costs.

Box 7.2.1   Royal Commission into Aged Care Quality and Safety

The Royal Commission into Aged Care Quality and Safety was established on 8 October 2018 to examine:

- the quality of aged care services currently provided
- the extent of substandard care, including mistreatment and all forms of abuse
- how best to deliver aged care services
- the future challenges and opportunities for delivering accessible, affordable, safe and high-quality aged care services in Australia.

The Final Report of the Royal Commission was tabled in Parliament on 1 March 2021 and included 148 recommendations for major reform of the aged care system.

The Government response to the Final Report of the Royal Commission has accepted or accepted-in-principle 126 of the 148 recommendations. In addition, there are a further 4 recommendations where the Government supports an alternative approach to implementation. A small number of recommendations continue to be considered.

The 2021-22 Budget included a record increase in funding for aged care services of $17.7 billion over the next 5 years.

The response to the findings and recommendations of the Royal Commission has significantly increased Australian Government spending on aged care and will continue to do so in the medium and long term.

In addition to the Royal Commission, the COVID-19 pandemic has reinforced the importance of Australia having a robust aged care sector that can manage – and adapt to – unforeseen, sudden health shocks.

Changing needs and preferences

The aged care system will also need to respond to changing preferences and community expectations about how and where care is delivered. Continuous reforms to aged care since the mid-2000s, such as increasing availability of care in the home, have been accompanied by a shift in Australians' care preferences as they age. The majority of older people prefer to remain in their own home, delaying entry into residential care until later in life, if at all.

This preference has increased demand for home care packages, including demand for higher level supports in the home. Changes to the overall burden of disease in old age have also affected residential care needs. At least half of residential aged care residents

have a dementia diagnosis and are more likely to have higher care needs than residents without dementia.

The increased preference for care in the home has contributed to individuals entering residential aged care being typically older with higher levels of frailty, lower levels of acuity and requiring increased levels of care. Residential aged care providers are having to change from offering predominantly low care over a longer period towards high care for a shorter period. The average length of stay in residential aged care has decreased gradually from 3.30 years in 2003 to 2.96 years in 2019. The average length of support in home care was 5 months shorter than in permanent residential care. Gender also plays a role in the length of time spent in care. Women spend 5 months longer in home care on average than men and 10 months longer in residential care.

Risks and uncertainties

There are uncertainties around the long-term projections of aged care spending. Many interrelated factors will determine aggregate spending, including developments in labour productivity and wages in the sector, demand, and consumer preferences. Technological improvements in the delivery of care have the potential to reduce cost pressures in the system. The ability of aged care providers – both in-home and residential – to leverage these improvements to provide cost-effective models of care will be a key determinant of the extent to which these advancements place downward pressure on government spending over the long term.

The implementation of the Government's response to the Final Report of the Royal Commission will require further consideration. For example, the Government has committed to undertake further work on the design of the in-home care program which will require careful consideration to ensure the system remains sustainable. Developments in wages for the aged care workforce will be another key determinant of costs in the system over the long term.

7.3   National Disability Insurance Scheme

The National Disability Insurance Scheme (NDIS) is a mechanism to provide reasonable and necessary supports for people with disability. It provides support to Australians with permanent and significant disability, their families and carers.

The NDIS has been available since 1 July 2013, with trial sites in 4 states, and began transitioning towards full scheme in July 2016. As at 31 March 2021 there were 450,000 participants in the scheme, with around half of these receiving support for the first time.[74]

This is the first Intergenerational Report in which the NDIS has been available across all of Australia. Uncertainty remains around the full cost of the scheme as participant numbers continue to grow at a higher-than-expected rate. The scheme is projected to mature (that is, no remaining unmet need) by the end of the decade and growth is then expected to be in line with population projections.

The Australian and state governments jointly fund the scheme which is administered by the National Disability Insurance Agency (NDIA). The NDIS is funded under the terms of full scheme bilateral agreements between the Australian and state governments (except Western Australia which operates under a transition agreement until 30 June 2023, with a full scheme bilateral agreement expected to commence from 1 July 2023).

Total government spending on the NDIS is projected to increase from 1.2 per cent of GDP in 2020-21 to 1.5 per cent of GDP in the medium term as the scheme reaches maturity. This is before levelling out at 1.4 per cent of GDP in the long term when participant growth is in line with population forecasts and costs increase by a combination of CPI and Average Weekly Earnings (Chart 7.3.1). This is nearly 30 per cent higher than the 2015 Intergenerational Report, which projected NDIS spending to be broadly stable at 1.1 per cent of GDP between 2019-20 and 2054-55. Average real spending per NDIS participant is now projected to increase from $56,620 in 2020-21 to $80,830 in 2060-61. The median real spend per NDIS participant was around $25,000 in 2020-21.

It is expected that state government spending will fall as a proportion of total scheme costs from 40 per cent in 2020-21 to around 25 per cent in 2060-61. This reflects that state government contributions are growing at a fixed rate which is lower than the overall growth rate of the NDIS. The Australian Government's share of spending will grow from 0.7 per cent of GDP in 2020-21 to around 1 per cent by 2031-32.

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74   National Disability Insurance Agency, *NDIS Quarterly Report to Disability Ministers, March 2021*.

Chart 7.3.1   Total government NDIS spending
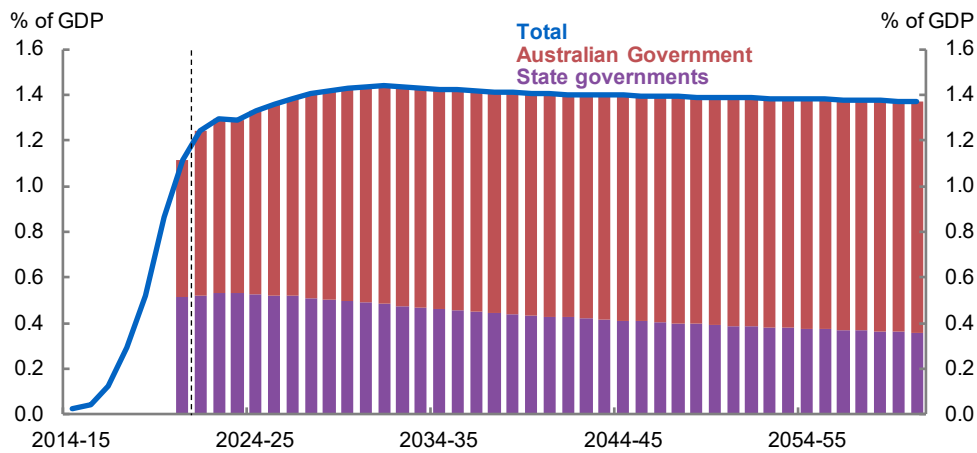
Note: Total government spending includes spending by the Australian Government and state governments. The Australian Government contribution does not include payments made under the DisabilityCare Australia Fund or NDIA agency costs.
Source: Department of Social Services; NDIA annual reports (2013-14 to 2019-20); and Treasury.

Drivers of NDIS spending

The drivers of NDIS spending are the average cost per participant and the number of participants in the scheme. The average cost per participant is a function of both a participant's plan and a participant's utilisation rate (the amount of their plan a participant actually uses).

It is expected that average participant costs will increase as the scheme matures, because:

• often an individual's needs will increase over time, due to ageing and the degenerative nature of some disabilities

• over time, participants tend to utilise a greater portion of their plan budgets.

However, recent average participant costs have grown at a higher-than-expected rate. Average annualised payments per participant have increased by 12.5 per cent per year between 2018 and 2021, well above wage increases in the sector which ranged between 1.4 and 2.3 per cent per year.[75]

Participant numbers have also increased at a rate faster than previously estimated. There are now 450,000 participants in the scheme, with participant numbers continuing to grow at higher rates than population growth, meaning the number of participants at scheme maturity will be much higher than the Productivity

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75   National Disability Insurance Agency, op. cit, Figures 3 and 4.

Commission's initial estimate of 411,000. Growth is particularly high in children and those aged over 65 compared with earlier estimates.

Participant growth across all age cohorts is expected to slow over the next decade, reflecting the NDIS reaching maturity, with the existing pool of eligible people with significant and permanent disability having already joined the scheme. Once the scheme reaches maturity, growth in the number of participants is expected to be broadly in line with overall population growth, but average participant costs are expected to continue to grow at a faster rate than CPI, as NDIS support costs are largely driven by wage costs.

Certain cohorts of participants naturally incur higher costs. For example, those in supported independent living arrangements represent only around 5 per cent of all participants but around a third of total scheme costs. In response to the interim report from the Royal Commission into Aged Care Quality and Safety, the Government has committed to have no people under the age of 65 living in residential aged care by 2025. The NDIS has reduced the number of young people in residential aged care by 30 per cent over the last 3 years.[76] Supported independent living costs are likely to grow as more young people leave residential aged care facilities.

Another cause of higher-than-expected participant growth is because participants are not exiting the scheme due to improvements in their level of function at the expected rate.

Under the baseline projection participant growth slows from the current pace to 2 per cent annual growth at the end of the medium term. Similarly, the growth in the average cost per participant is expected to track economic factors (a combination of wage growth and CPI) by the end of the medium term.

As the scheme is still maturing, projections are subject to significant uncertainty. Further, total scheme costs are affected by policy changes and the administrative decisions of the NDIA.

Risks and uncertainties

An independent review in 2019 identified opportunities to make NDIS processes simpler, more straightforward and remove legislative barriers to positive participant and provider experiences. The 2019 review noted that some people with disability have financial barriers to producing information to support NDIA decision making about their eligibility for the scheme and supports in their plans. More recent analysis by the NDIA found those with higher socio-economic status tended to receive higher plan budgets. This is most likely due to the cost of obtaining evidence to prove functional ability.[77] The Australian Government is consulting on the best way to resolve issues of fairness and consistency.

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76   National Disability Insurance Agency, op cit.
77   ibid., Figure 2.

The Government Response to the Royal Commission into Violence, Abuse, Neglect and Exploitation of People with Disability will likely place additional pressure on the NDIS. The Royal Commission will report to Government by September 2023. Population ageing and reforms to aged care will likely increase demand on the care workforce. Coupled with increasing demand across the broader care sector this will place upwards pressure on disability sector staffing costs and, therefore, NDIS costs. Given the NDIS is a significant area of government spending – and a relatively new scheme compared to other government programs – it will be important to closely monitor and review NDIS data on an ongoing basis to ensure financial sustainability into the future.

7.4   Retirement income system

Australia's retirement income system consists of 3 pillars: the Age Pension, the superannuation guarantee, and voluntary savings. These pillars work together to provide all Australians with an adequate retirement income.

The Age Pension is a taxpayer-funded, means-tested payment that provides a safety net to ensure older Australians with limited means achieve a minimum standard of living. The Age Pension also supplements the retirement incomes of many through a part pension.

The superannuation guarantee is a form of compulsory savings through which employers are required to contribute a portion of an employee's earnings to a superannuation fund.

Voluntary savings include all other private savings – voluntary superannuation contributions, housing, and other financial and non-financial assets – only some of which are saved for the purpose of generating retirement income.

Most Australians' retirement incomes are a combination of 2 or 3 of the above pillars. The Age Pension is the main component for many people.

The Australian Government directly supports the retirement income system by funding the Age Pension, mandating provision of the superannuation guarantee, and providing tax concessions on superannuation and other forms of voluntary savings. Outside the retirement income system, the Government also provides support to older Australians through subsidised health and aged care.

The Retirement Income Review recently reported on the current retirement income system, providing a fact base in the context of Australia's ageing population. The Review found the retirement income system is effective, sound and broadly sustainable, but it can be improved. The Review also found that the superannuation system largely supports intergenerational equity by encouraging people to rely on their own savings to meet their retirement income needs.

The Age Pension

The Age Pension is a non-contributory payment with eligibility based on age and residence requirements. The rate of payment is dependent on the current level of a person's income or assets (means test), rather than on past income or contributions made during an individual's working life. The targeting of support through eligibility criteria and the means test has kept expenditure levels contained and ensures sustainability of the Age Pension for future generations, particularly in the face of an ageing population.

Over the next 40 years, spending on the Age and Service Pension is projected to fall from around 2.7 per cent of GDP in 2020-21 to 2.1 per cent of GDP in 2060-61,[78] reflecting the maturation of the superannuation system.[79] Compulsory superannuation has been effective in increasing individual retirement savings and reducing reliance on the Age Pension as a primary source of retirement income. As younger generations retire with greater superannuation savings, the total proportion of older Australians receiving the Age Pension will continue to decline.

The proportion of older Australians receiving the Age Pension declines even though the number of older Australians increases. The total number of Australians of Age Pension age and over is expected to roughly double to over 8 million by 2060-61, yet the proportion of people of Age Pension age and over receiving the Age Pension is projected to decline by over 10 percentage points by 2060-61.

The trend towards more people receiving a part-rate pension (rather than the full-rate pension) is expected to continue, with the proportion of all Age Pension recipients receiving a part-rate pension projected to rise by around 25 percentage points to almost 60 per cent in 2060-61.

Chart 7.4.1   Persons of Age Pension age or over, by pension category
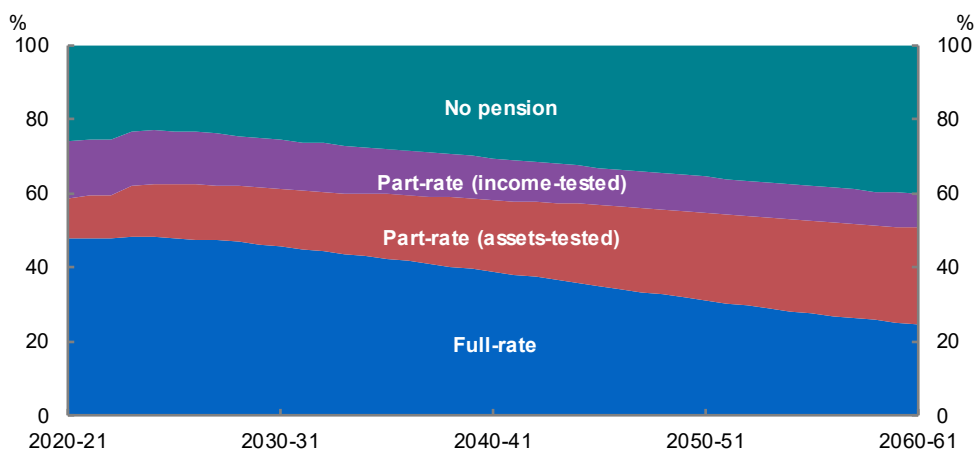
Note: Age Pension recipients include Age, Service, Carer and Disability pension recipients. For further information, see the Appendix.
Source: Treasury.

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78   Projections incorporate Age Pension and similar payments to veterans and war widows.

79   All Treasury modelling in this chapter is consistent with current policy and includes the legislated increase in the superannuation guarantee to 12 per cent by 1 July 2025, increasing the Age Pension eligibility age to 67 years by 1 July 2023, and increasing the superannuation preservation age to 60 years by 1 July 2024. The modelling also accounts for the impacts of COVID-19 Early Release of Superannuation.

The superannuation system

Since the introduction of compulsory superannuation in 1992, employers have been required to make minimum payments to a complying superannuation fund to help employees save for retirement. This rate is currently 9.5 per cent and is legislated to rise to 12 per cent by 1 July 2025.

Australians are also able to make additional voluntary contributions to superannuation in order to boost their retirement incomes. Superannuation benefits are generally preserved until the age of 55 years (increasing to 60 years by 1 July 2024).

The superannuation system is still maturing, but around 16 million Australians already collectively own around $3 trillion in superannuation assets. This stock of retirement assets is the fourth largest in the world. It is an important pool of savings for investment and for funding retirement incomes. The value of these savings will continue to grow as the system matures into the 2040s.

As at 31 March 2021 the superannuation system had assets under management valued around 157 per cent of GDP.[80] It is projected this will grow to around 244 per cent of GDP by 30 June 2061. Of this amount, it is estimated that almost three-quarters of funds under management will be held in the accumulation phase.

Chart 7.4.2   Total value of superannuation assets under management
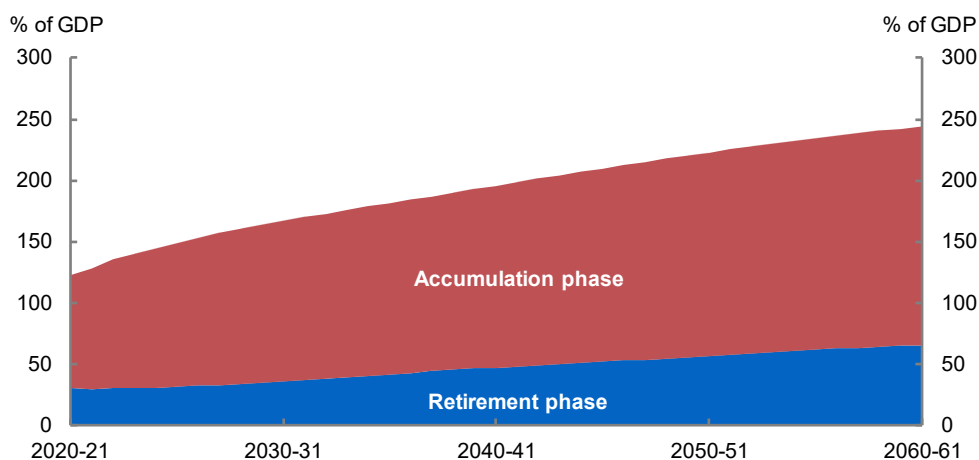
Note: Includes superannuation balances for defined contribution funds for people over 25 years. Excludes defined benefits, regulatory capital and life office statutory funds. For further information, see the Appendix. Source: Treasury.

During the COVID-19 pandemic, eligible individuals were able to access up to $20,000 of their superannuation under the Government's COVID-19 early release scheme. At

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80   Treasury calculations based on Australian Prudential Regulation Authority, Quarterly Superannuation Statistics (March 2021) and ABS Australian National Accounts: National Income, Expenditure and Product (March 2021).

the conclusion of the scheme, over 3 million people were approved by the Australian Taxation Office to withdraw their superannuation under the scheme, to a total value of $37.8 billion. While the early release scheme provided a vital means of support for people in financial distress during the pandemic, it is projected to result in only a modest reduction in total funds under management.

Superannuation flows and balances

A maturing superannuation system will see most Australians retire with higher balances. This is due to future retirees benefiting from contributions and strong superannuation returns over a longer period. Drawdowns from superannuation are estimated to increase over time from around 2.3 per cent of GDP in 2020-21 to 6.0 per cent of GDP in 2060-61. However, while drawdowns from superannuation are expected to increase as the population ages, the total size of superannuation assets under management is expected to continue to grow due to growth in contributions and earnings.

Chart 7.4.3   Flows into and out of superannuation accounts
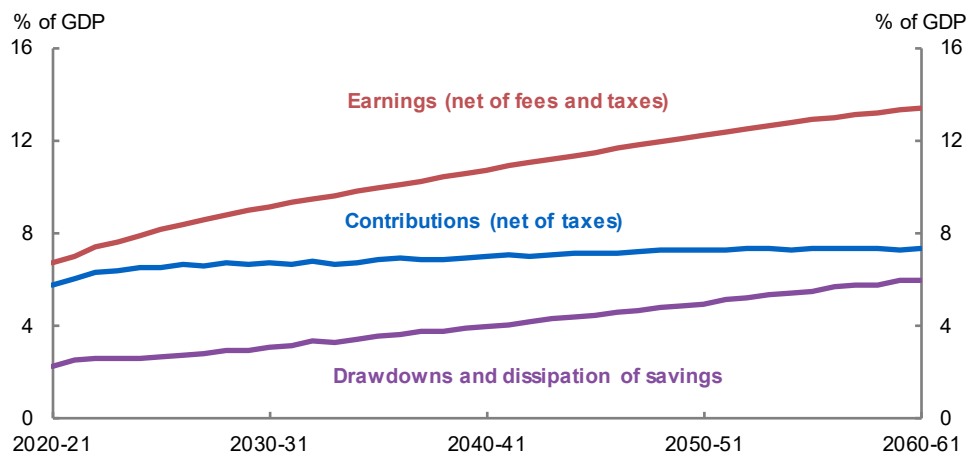
Note: For further information, see the Appendix.
Source: Treasury.

Treasury projections suggest that the median superannuation balance at retirement will increase from around $125,000 in 2020-21 to around $460,000 in 2060-61, as measured in 2020-21 dollars. In 2020-21 around two-thirds of Australians retiring will have a superannuation balance under $250,000. In 2060-61, it is projected that only a quarter of Australians will retire with a superannuation balance below this amount, as measured in 2020-21 dollars. This is due to a maturing superannuation system.

Chart 7.4.4   Distribution of superannuation balances at retirement
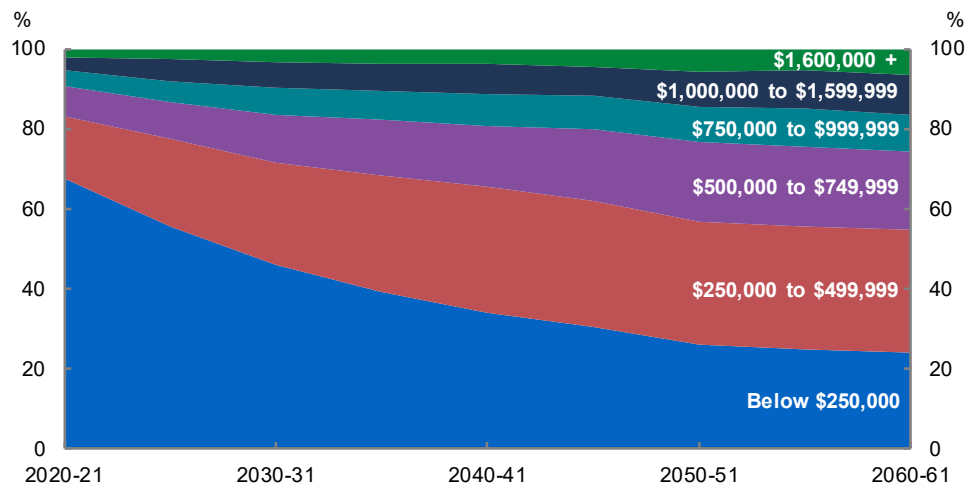
Note: Values are in 2020-21 dollars and deflated by average weekly earnings. Superannuation balances include amounts in both the accumulation and retirement phase. For further information, see the Appendix. Source: Treasury.

The Retirement Income Review noted that differences in retirement savings between men and women reflect the accumulated economic disadvantages faced by women in working life. On average, compared with men, women have lower wages, are more likely to work part-time, take more career breaks, and experience worse financial impacts from divorce. These factors contribute to the gender gap in superannuation balances at retirement. The main driver of the gap will continue to be the working life earnings gap between men and women, rather than retirement income system settings.

The gender gap in superannuation balances is expected to narrow substantially as the superannuation system matures and women benefit from greater labour force participation. In the future, more women will have superannuation and spend more years contributing to their superannuation, including through higher voluntary contributions.

Chart 7.4.5   Projected distribution of superannuation balances at retirement by gender
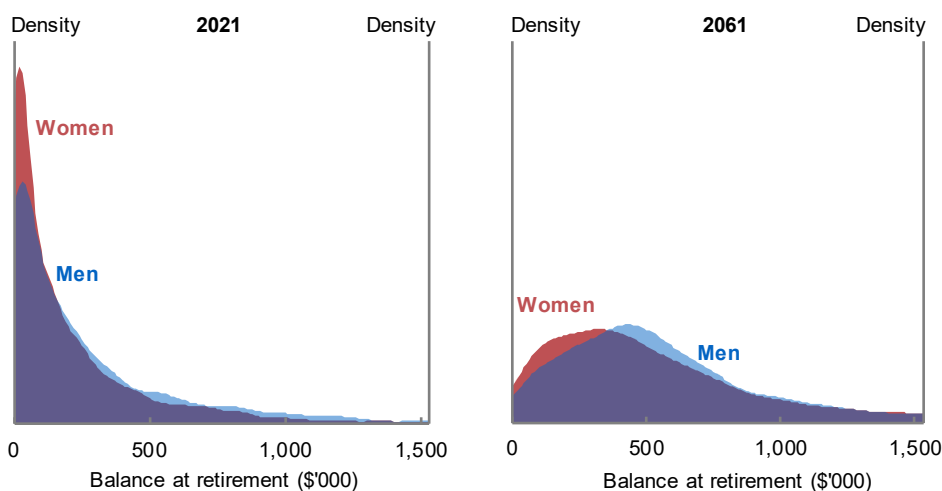
Note: Values are in 2020-21 dollars, combined for the 3 trailing years, and deflated by Average Weekly Earnings. Superannuation balances include amounts in both the accumulation and retirement phase. For further information, see the Appendix.
Source: Treasury.

Superannuation tax concessions

Superannuation is generally taxed more concessionally than other forms of savings, such as bank deposits, given superannuation cannot be accessed until retirement.[81] Superannuation contributions and fund earnings in the accumulation phase are generally taxed at the concessional rate of 15 per cent, while benefits in the retirement phase are tax exempt.

The cost of superannuation tax concessions represents forgone tax revenue for the government.

Projections of contributions concessions are a function of wage growth, contributions rates and population growth; all of which are projected to remain broadly stable in the long term. Although contributions under the superannuation guarantee are legislated to rise from 9.5 per cent to 12 per cent by 1 July 2025, contributions concessions are projected to remain steady as a proportion of GDP over the period to 2060-61.

Earnings concessions projections are dependent on both the growth of the superannuation system and the forecast rates of return. As both are assumed to exceed GDP growth, earnings concessions are projected to increase in the long term.

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81   With some small exceptions for early release of superannuation, including those made during the COVID-19 pandemic.

Overall, tax concessions as a proportion of GDP are projected to increase from around 2.0 per cent in 2020-21 to 2.9 per cent in 2060-61. The increase is driven primarily by earnings tax concessions rising from around 1.0 per cent of GDP in 2020-21 to 1.9 per cent of GDP in 2060-61, while contributions tax concessions are projected to remain largely unchanged at 1.0 per cent of GDP during the same period (Chart 7.4.6).

Aggregate cost of the retirement income system

The total projected cost of Age Pension expenditure and superannuation tax concessions together is expected to increase from around 4.5 per cent of GDP in 2020-21 to 5.0 per cent of GDP in 2060-61. As a result of the maturing of the superannuation system, government spending on the Age Pension is projected to decline as a proportion of GDP but the cost of superannuation tax concessions is projected to grow. By around 2040, the cost of superannuation tax concessions will exceed the cost of Age Pension expenditure.

While the aggregate cost of the retirement income system is projected to increase, this is against a backdrop of an ageing population. In addition, the maturing superannuation system should generally also result in future retirees being better off than current retirees, with more income available to support their living standards during retirement.

Chart 7.4.6   Cost of the retirement income system
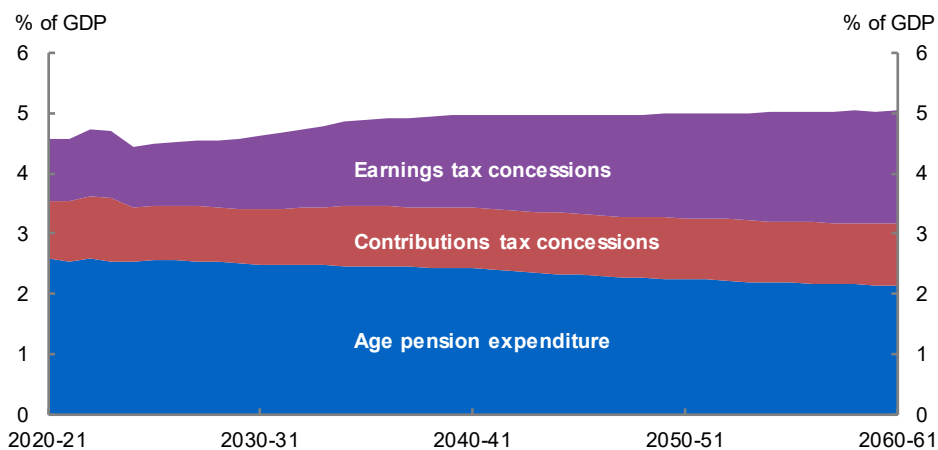
Note: Includes service pensioners. For further information, see the Appendix.
Source: Treasury.

Gradual changes have helped the system remain sustainable over time. Such changes have included gradually increasing the Age Pension age to 67 years and improving Age Pension targeting through means testing. In the 2016-17 Budget, a number of changes were made to the taxation of superannuation, including limiting the amount that can be held in the concessionally-taxed environment. The Government has also

implemented short-term changes such as revisions to the minimum drawdown rates in response to the COVID-19 pandemic. The flexibility and responsiveness of the system helps protect it, and all Australians, against short-term and long-term shocks and changes that might affect their retirement incomes.

7.5 Income support and family assistance payments

The Government provides income support to individuals who require assistance. These payments fall across 2 broad groups: working-age payments and family payments. These are in addition to the Age Pension, which is discussed in Section 7.4.

Income support and family payments totalled around $83.5 billion in 2021-22, which is around 3.9 per cent of GDP. The 2 largest components are the Disability Support Pension and the Family Tax Benefit, with expenditure of $17.7 billion and $18.6 billion in 2021-22 respectively.

Chart 7.5.1   Composition of payments to individuals
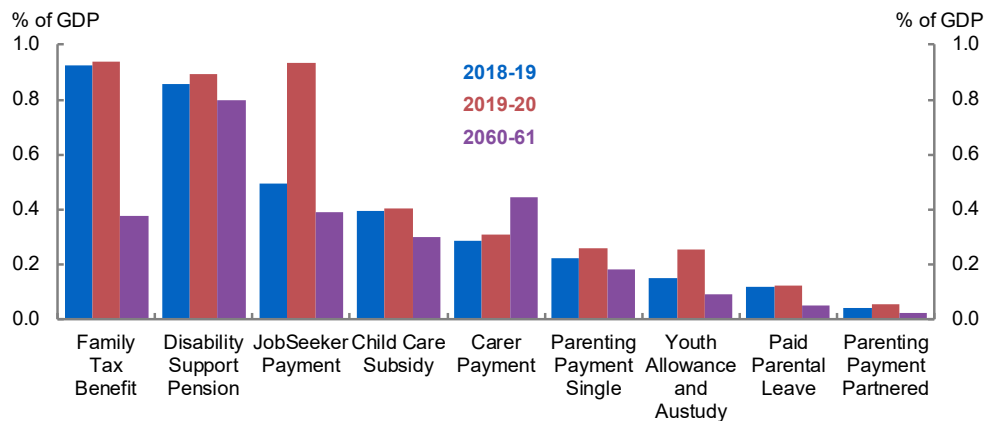
Note: Excludes the Age Pension.
Source: Treasury.

Payments to individuals are projected to be 2.7 per cent of GDP by 2060-61 (Chart 7.5.2). Across the total Australian population (not just payment recipients), real spending per person on payments to individuals is projected to increase from $3,240 in 2021-22 to $3,710 in 2060-61. The 2015 Intergenerational Report projected spending on payments to individuals to fall from 4.6 per cent of GDP in 2014-15 to 3.4 per cent of GDP by 2054-55. The relative reduction in family assistance payments through the Family Tax Benefit, Child Care Subsidy and Paid Parental Leave is due to demographic changes. The proportion of the population aged less than 15 is projected to fall from 18.4 per cent in 2021-22 to 15.8 per cent in 2060-61. The subsequent rise in the proportion of the population aged above 16 results in a larger cohort receiving the Carer Payment in 2060-61.

Chart 7.5.2   Payments to individuals
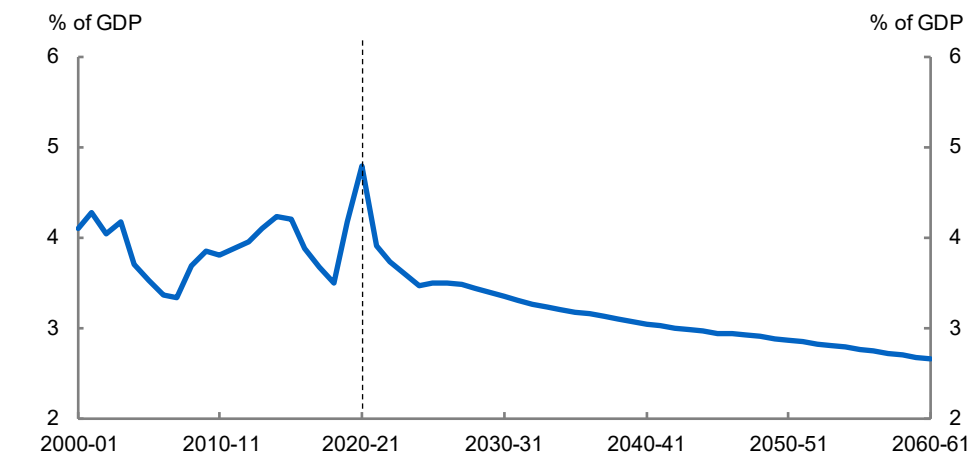
Source: Treasury.

The primary drivers of spending on payments to individuals are the number of recipients and the amount of the payment. Population is the main factor in determining the number of recipients and the majority of payments are indexed to CPI. As GDP growth is projected to be greater than CPI growth, payments are projected to fall as a proportion of GDP.

As part of the COVID-19 response, additional income support has been provided to assist individuals and families. This has resulted in a temporary increase in government spending on payments to individuals in the short term. However, this is not expected to affect spending over the medium and long term. The Government is providing around $34.0 billion in support over 5 years from 2019-20 through the social security system with measures including the temporary Coronavirus Supplement, Economic Support Payments and the expansion to income support payment eligibility criteria. Following this temporary additional support, the Government permanently increased the rates of working-age payments, including JobSeeker Payment, by $50 per fortnight from 1 April 2021. This has resulted in a structural increase in government spending on payments to individuals.

Working-age payments

The Government provides assistance to people of working age who are in need. This includes people who are unable to earn an income because of disability or caring responsibilities.

The Government also provides income support to assist job seekers unable to support themselves. This is targeted to those most in need and designed to encourage self-reliance and participation in the labour force.

The main payments to people of working age are the Disability Support Pension, JobSeeker Payment, Parenting Payment, Carer Payment, and Youth Allowance.

Working-age payments are projected to decline from 2.5 per cent of GDP in 2021-22 to 1.9 per cent of GDP in 2060-61. The 2015 Intergenerational Report projected that working-age payments would fall from 2.8 per cent of GDP in 2014-15 to 2.4 per cent of GDP in 2054-55. Changes to spending on working-age payments since the 2015 Intergenerational Report reflect greater targeting of payments, including participation requirements, Family Tax Benefit indexation freezes, as well as adding and extending waiting periods for some payments.

Total JobSeeker Payment expenditure rose in 2019-20 and 2020-21 as a result of the additional temporary support in response to the COVID-19 pandemic. This included the fortnightly Coronavirus Supplement, a once-off $750 Economic Support Payment and expanded eligibility criteria. The number of people receiving unemployment benefits peaked during 2020 at around 1.5 million in May 2020. This is expected to return to lower levels over the long term. As at 11 June 2021, there were around 1 million JobSeeker Payment recipients. Compared with 2018-19 (prior to COVID-19), JobSeeker Payment expenditure falls as a percentage of GDP by 2060-61 as payment rates are indexed to CPI, which is forecast to grow more slowly than nominal GDP.

Chart 7.5.3   Working-age payments
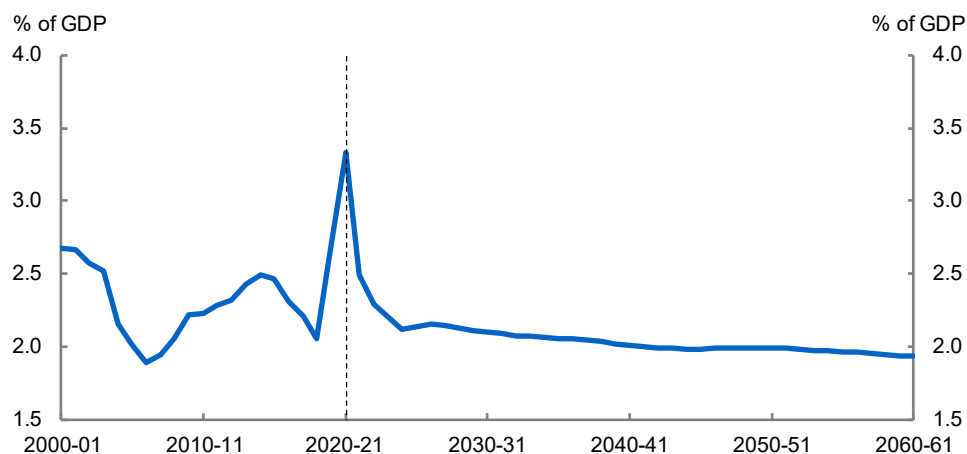
Source: Treasury.

In early 2020, reforms to working-age payments replaced 7 different payments with the JobSeeker Payment and strengthened participation requirements for job seekers. The new arrangements deliver a more equitable social security system by ensuring people in similar circumstances have similar participation requirements and payments. At the time of transition, recipients on other payments had no change to their payment rate or received a higher rate if they transferred to the Age Pension, with no material impact on long-term government spending.

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Box 7.5.1   Changes to the JobSeeker Payment

In response to COVID-19, the Government temporarily expanded eligibility criteria for certain income support payments, including the JobSeeker Payment, waived asset testing and waiting periods to receive payment, adjusted mutual obligation requirements, increased the income free area and partner income test, and introduced the Coronavirus Supplement. The amount of the Coronavirus Supplement was gradually reduced as economic conditions improved. From 27 April to 24 September 2020 the rate was $550 per fortnight. From 25 September to 31 December 2020 the rate was $250 per fortnight. And from 1 January to 31 March 2021 the rate was $150 per fortnight.

The Government permanently increased the rates of working-age payments, including JobSeeker Payment, by $50 per fortnight from 1 April 2021. The JobSeeker Payment income free area was also permanently increased to $150 per fortnight from 1 April 2021, and mutual obligation requirements were strengthened. These changes result in a structural increase to working-age payments.

Family payments

Payments to families include the Family Tax Benefit, Child Care Subsidy and Paid Parental Leave scheme. The Family Tax Benefit is designed to assist low- and middle-income families with the costs of raising dependent children.

The Government also provides funding for early childhood education to help parents balance their work, training and caring responsibilities. The Government supports child care so parents can work, study, learn, volunteer or transition to work. In 2018, the Government implemented the New Child Care Package which replaced the previous Child Care Benefit and Child Care Rebate. The Package introduced a single means-tested Child Care Subsidy for families, paid directly to approved child care providers and aimed at supporting workforce participation. These arrangements are designed to ensure that more financial support is targeted to the families who work the most and earn the least.

Box 7.5.2   Changes to Child Care Subsidy

In the 2021-22 Budget, the Government announced changes to the Child Care Subsidy to reduce workforce disincentives and help families to make employment and care choices that work best for them. From July 2022, where families have multiple children aged 5 and under in child care, the Child Care Subsidy will be increased by 30 percentage points for the second or subsequent child, up to a cap of 95 per cent. The annual cap will also be removed for all families.

Families with multiple children in formal child care arrangements face workforce disincentives due to the out-of-pocket expense associated with having multiple children in child care. The changes to the Child Care Subsidy are intended to reduce disincentives, resulting in additional child care hours used and greater labour force participation.

Paid Parental Leave provides parents with financial security to take time off work to care for their baby during the early months of life, while supporting women to maintain their connection with the workforce and facilitate women's labour force participation.

Spending on assistance to families is projected to fall from 1.4 per cent of GDP in 2021-22 to 0.7 per cent in 2060-61 (Chart 7.5.4). Demographic change is a key driver of the reduction in spending on family assistance. The proportion of the population aged less than 15 is projected to fall from 18.4 per cent in 2021-22 to 15.8 per cent in 2060-61.

Improvements in the targeting and sustainability of family payments also contribute to the fall in projected spending on assistance to families. For example, the 2017-18 Budget introduced a consistent 30-cents-in-the-dollar income test taper for families receiving Family Tax Benefit Part A with a household income in excess of the Higher Income Free Area (currently $98,988) from 1 July 2019.

Chart 7.5.4   Family assistance payments
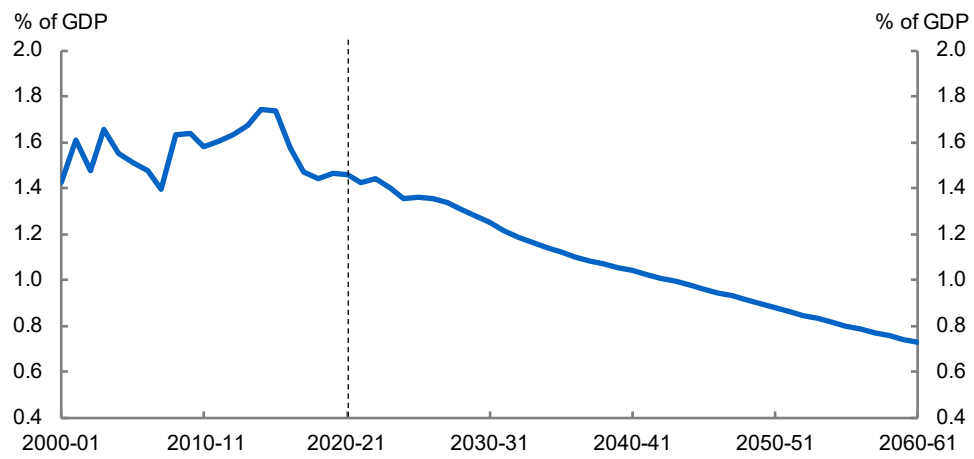
Source: Treasury.

7.6   Education and training

The Australian Government provides funding for the delivery of education and training services to support human capital, improve productivity and labour market outcomes, and social opportunity. Education and training services in Australia comprise schools, vocational education and training (VET) and higher education.

Across all levels of government, the Australian Government provides slightly more than a third of total education and training spending, with state and local governments contributing slightly less than two thirds.

Australian Government spending on education is estimated to be around 1.9 per cent of GDP, or around $40 billion, in 2021-22. Schools spending is expected to make up more than half of that spending, with this share remaining relatively constant over the next 40 years. Higher education spending is expected to make up around a quarter, with its share increasing slightly over the next 40 years. VET spending makes up the remainder.

The bulk of Australian Government education spending is on government and non-government schools delivered as specific purpose payments to state governments under the needs-based funding model. Funding for non-government schools is principally provided by the Australian Government, whereas funding for government schools is primarily provided by state governments. The Australian Government is expected to spend around $24.4 billion on government and non-government schools in 2021-22.

The Australian Government is the main government provider of funding for higher education institutions. This is delivered through: the Commonwealth Grant Scheme, which subsidises tuition costs; research block grants, which support higher education research; and a range of smaller supporting and enabling programs. The Australian Government also provides financial assistance to students through the Higher Education Loan Program (HELP) which removes up-front cost barriers to higher education (Chapter 9 – Major assets and liabilities).

The Australian Government and state governments share responsibility for funding the VET system. The Australian Government provides block funding to the states via various national partnership agreements to support their training systems. In addition, the Australian Government directly supports many VET activities, including support for apprenticeship initiatives, foundation skills and the VET Student Loans (VSL) Scheme.

Total Australian Government spending on education and training is projected to increase in absolute terms, with real spending per person expected to increase from $1,540 in 2021-22 to $1,620 in 2060-61. If HELP loans and VSL are taken into account, then real spending per person is expected to increase from $1,830 in 2021-22 to $2,040 in 2060-61.

While increasing in absolute and real terms, spending on education and training is projected to decrease from 1.9 per cent of GDP in 2021-22 to 1.2 per cent in 2060-61. The decrease in spending as a per cent of GDP occurs because the growth in nominal GDP is expected to be greater than the growth in spending which is largely dependent on a combination of indexation rates (including CPI), wage cost indexes and population growth. This decrease as a share of GDP largely reflects slowing population growth. The trend is similar to the 2015 Intergenerational Report which projected spending on education and training would decline to 1.0 per cent of GDP by 2054-55.

Chart 7.6.1   Australian Government spending on education and training
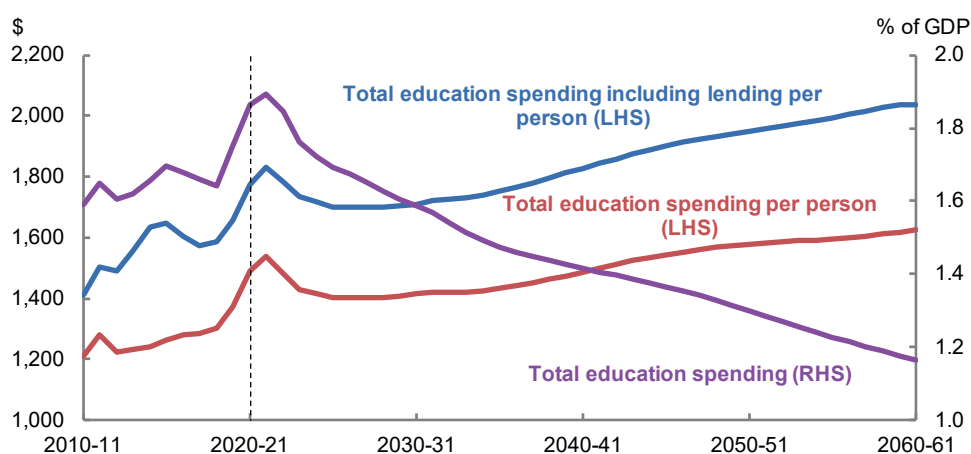
Note: Spending per person is expressed in 2020-21 dollars.
Source: Treasury.

Real spending (including lending) on tertiary education per person in the tertiary education population is expected to increase from $1,600 in 2021-22 to $1,840 in 2060-61.[82] Real spending on schools per person in the school-age population is expected to increase from $5,040 per person in 2021-22 to $6,490 per person by 2060-61.[83]

For the VET sector, the Australian Government is currently negotiating a new National Skills Agreement with states to ensure Australians can access high quality and relevant training to attain the skills necessary for jobs that emerge through the next decade and beyond. Through the Heads of Agreement for Skills Reform, all governments have agreed priorities for a new National Skills Agreement which includes increasing real investment in VET, and adopting a new funding model which is linked with efficient pricing. If agreed, the new National Skills Agreement is expected to increase total

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[82]   Tertiary education spending per person is based on the population aged 17 to 59, reflecting both the age distribution of the student population in tertiary education, as well as the general benefit provided to Australians from the Australian Government's investment into university research.

[83]   School education spending per person is based on the population aged 4 to 18.

education spending due to a change in indexation. As negotiations are ongoing with states, any agreed changes resulting from the new National Skills Agreement are not included in this report's projections of VET spending.

Support measures during the COVID-19 pandemic – such as the Boosting Apprenticeship Commencements wage subsidy and the Supporting Apprentices and Trainees wage subsidy – saw a sharp increase in spending beginning in 2019-20. These measures are time-limited.

Over the next 40 years, Australian Government spending on education and training is expected to be influenced by population growth and the proportion of the population participating in education.

A key driver of government education spending is the number of students participating in education and training. The proportion of the population in the principal age group for education (5 to 24 years old) has decreased from 27.5 per cent in 2001-02 to an estimated 24.6 per cent in 2021-22. It is expected that the proportion of the population in this age group will fall to 22.1 per cent by 2060-61.

The proportion of students attending non-government schools is also an important driver of education spending. Funding to non-government schools has been increasing steadily in line with the increasing proportion of students enrolled in non-government schools: rising from 22.3 per cent in 1980 to 34.4 per cent in 2020. The higher number of students increases total costs to the Australian Government.

The Australian Government has implemented a number of reforms to the education and training sector in the past 5 years. These reforms have had – and will continue to have – an impact on the Australian Government's spending on the sector.

The Australian Government has, since 2018, focused on increasing support to underfunded schools through the Quality Schools reforms. Funding has been targeted to underfunded schools and distributed on a needs basis to disadvantaged cohorts ensuring all schools are able to meet the educational needs of their students.

The Australian Government has introduced reforms to higher education funding designed to ensure the tertiary education system addresses the changing needs of the labour market. From 2021, the Job-ready Graduates Package redesigned the Commonwealth Grant Scheme funding clusters and student contribution bands, restored CPI indexation of Bachelor student places and provided additional funding towards growth in outer metro and regional areas to ensure university places grow over the long term. It also introduced a new National Priorities and Industry Linkage Fund to incentivise universities towards more industry engagement. The reforms better align higher education funding with the costs of delivering a university education. The changes to government course contributions are intended to encourage students to study in areas of industry need.

7.7   Other spending

Infrastructure

The Australian Government is continuing to invest in road and rail infrastructure projects across Australia to support jobs and drive growth, meeting our national freight challenge and getting Australians home sooner and safer. The Australian Government's rolling 10-year infrastructure pipeline has grown from $75 billion in 2018-19 to $110 billion at the 2020-21 and 2021-22 Budgets. This is largely delivered through grants to the states to deliver priority projects.

Future demand for infrastructure will be directly affected by population growth, technological change, developments in the domestic and global economy, environmental adaptation and sustainability, and consumer preferences. Infrastructure funding is projected to grow in line with the economy over the long term.

Infrastructure is an enabler of economic development. It directly supports economic activity and sustains employment. The Government's investment in infrastructure will support productivity growth and meet the future needs of Australians through reduced congestion, expanded national freight links, better connected regions and improved road safety. Financially viable, high-quality public infrastructure will also attract private sector investment. Governments also assist private investment in infrastructure by providing accurate information and addressing regulatory barriers.

Australia's growing population underscores the importance of infrastructure planning, investment and demand management. As the population grows, particularly in the major cities, average travel times and congestion are increasing. For the potential economic and fiscal benefits of population growth to be fully realised, existing road and rail infrastructure needs to be better maintained and utilised, and new investment needs to be targeted to deliver the highest benefit. New infrastructure and better use of existing networks can reduce travel times and vehicle operating costs. It can deliver a more reliable transport network for commuters, freight and other business.

While the long-term impact of the COVID-19 pandemic on consumer behaviour remains uncertain, potential changes – such as increased remote working arrangements and population growth in regional areas – may affect the requirements and distribution of future infrastructure investment.

As a non-demand driven program, infrastructure spending is assumed to remain largely stable as a share of the economy over time. Infrastructure spending by the Australian Government is projected to be 0.4 per cent of GDP over the long run.

Defence

The Australian Government provides funding for the delivery of Navy, Army, Air Force and intelligence capabilities, support for Australian military operations overseas, and strategic policy advice for the defence of Australia and its national interests. The Government has decoupled the Defence budget from GDP forecasts to avoid the need to adjust spending plans in response to fluctuations in GDP. Defence funding certainty is important, including to respond to new challenges as they emerge in a security environment different from the relatively more benign one of the past. It also ensures that the planning and execution of long-term Defence programs are not subject to the volatility of linking funding with GDP.

Total Defence funding increased to 2.1 per cent of GDP in 2020-21, meeting the 2 per cent of GDP commitment set out in the 2016 Defence White Paper. Defence funding is projected to increase to around 2.3 per cent of GDP in 2031-32, broadly consistent with the profile set out in the 2020 Force Structure Plan and 2020 Defence Strategic Update. In the long term, Defence spending is then assumed to grow in line with the economy.

This projected funding profile has been revised up since the 2015 Intergenerational Report, in which Defence expenditure was projected to increase to 2 per cent of GDP by 2023-24 and then remain at a constant share of the economy through to 2054-55. This was consistent with Government commitments at the time.

8.   Revenue

Overview

The COVID-19 pandemic has resulted in a significant fall in tax receipts as a share of GDP. Tax receipts are now expected to reach the Government's tax-to-GDP cap in 2035-36, 4 years later than previously expected.

Personal income tax receipts are projected to grow faster than other sources of revenue over the period until the tax-to-GDP cap is reached.

Without raising additional revenue from existing taxes or imposing taxes on new sources, personal income tax receipts will form a greater proportion of total tax receipts in the long term as a result of bracket creep. Company tax receipts will likely continue to be volatile, while indirect and consumption-based tax receipts will form a smaller proportion of total tax receipts than in the past. Shifts in technology, demographics and geopolitical factors are also likely to affect the structure of the tax system in the future.

Non-tax receipts are projected to decline as a share of the economy in the long run, as the Future Fund is drawn down and growth in state contributions to the National Disability Insurance Scheme (NDIS) is capped at a fixed rate.

In 2021-22, 92.4 per cent of total receipts are expected to come from taxation. This is projected to increase to 94.0 per cent in 2060-61.

The largest source of tax revenue is income tax, comprised of personal income and corporate tax, with the vast majority of the remainder coming from taxes on goods and services. Non-tax revenue includes interest received on government loans, interest and dividends from investments like the Future Fund and user charges for some government services.

The Government is committed to maintaining a sustainable tax burden

The Government's medium-term fiscal strategy is underpinned by a policy to maintain the tax-to-GDP ratio at or below 23.9 per cent.[84] This tax-to-GDP cap of 23.9 per cent is based on the average tax-to-GDP ratio in the years between the introduction of the goods and services tax and the Global Financial Crisis, 2000-01 to 2007-08. This report assumes that tax receipts do not exceed this proportion of GDP. Australia's tax-to-GDP ratio has ranged between 20 and 25 per cent of GDP over the past 30 years. Similar to other advanced economies, Australia's tax-to-GDP ratio grew over the twentieth century in line with an expanding role of government.

Chart 8.1   Composition of Australian Government tax receipts
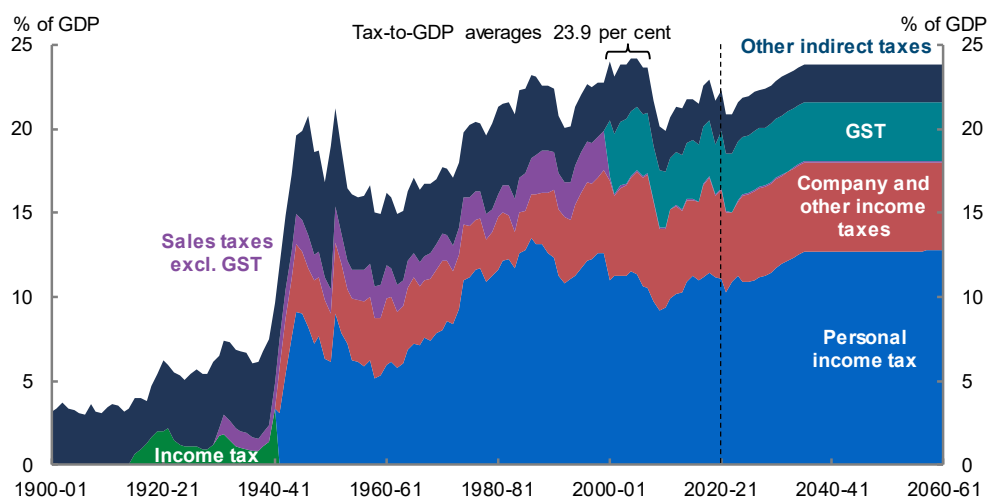
Note: Reporting of tax receipts has changed across time. At present, personal income tax includes individuals and other withholding taxes, and the Medicare levy. Company and other income taxes includes company tax, superannuation fund taxes, fringe benefits tax, and petroleum resource rent tax.
Source: Treasury.

Tax receipts fell significantly as a share of GDP as automatic stabilisers took effect in response to COVID-19 and the Government took additional steps to deliver temporary and targeted stimulus and recovery measures. The tax-to-GDP ratio is projected to reach a low of 20.9 per cent in 2021-22, around 2.5 percentage points lower than projected at the 2019-20 Mid-Year Economic and Fiscal Outlook. Tax receipts are now expected to reach the tax cap in 2035-36, 4 years later than previously expected.

Tax receipts are then projected to remain at the Government's tax-to-GDP cap of 23.9 per cent until 2060-61, in line with the fiscal strategy. This long-term assumption is unchanged and the tax revenue projection methodology is similar to that used in previous reports.[85]

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84   2021-22 Budget Paper No 1, *Statement 3: Fiscal Strategy and Outlook.*
85   For further information, see the Appendix.

Tax receipts drive the profile for total receipts as a share of GDP until the tax-to-GDP cap of 23.9 per cent is reached in 2035-36. From that time until the end of the projection period, changes in total receipts as a share of GDP are driven by non-tax receipts which are not constrained by the tax-to-GDP cap.

Chart 8.2   Composition of total Australian Government receipts

Source: ATO Taxation Statistics; ABS Australian National Accounts; and Treasury.
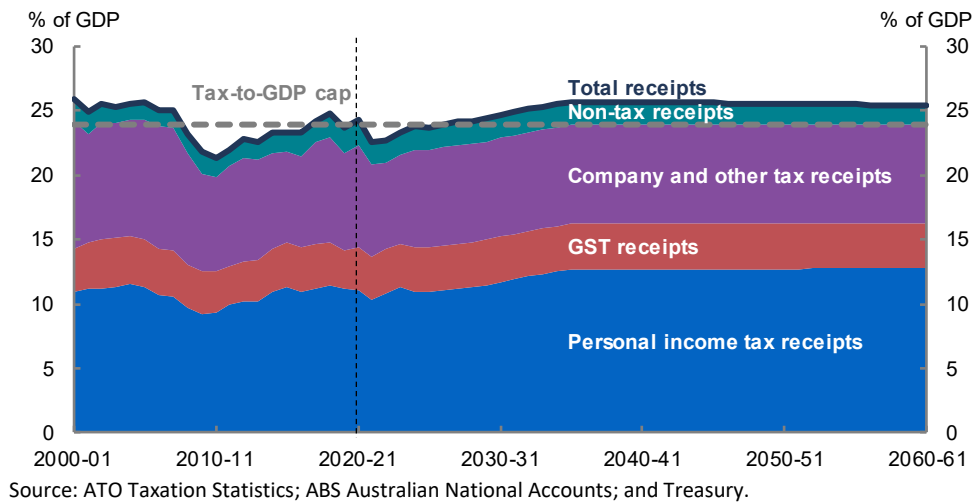
Box 8.1   Long-run tax assumptions across intergenerational reports

To project tax receipts over the next 40 years, every intergenerational report has maintained a long-term limit on the ratio of tax-to-GDP. Once tax receipts reach the tax-to-GDP limit, they are projected to remain constant for the remainder of the projection period. The tax-to-GDP limits chosen have varied between the equivalent of 23.5 per cent and 23.9 per cent, and have been based on historical averages and fiscal strategies.[86] The Government's fiscal strategy applies a tax-to-GDP cap of 23.9 per cent which is based on the average tax-to-GDP ratio from 2000-01 to 2007-08, and is current government policy.

Chart 8.3   Path back to long-run tax assumption
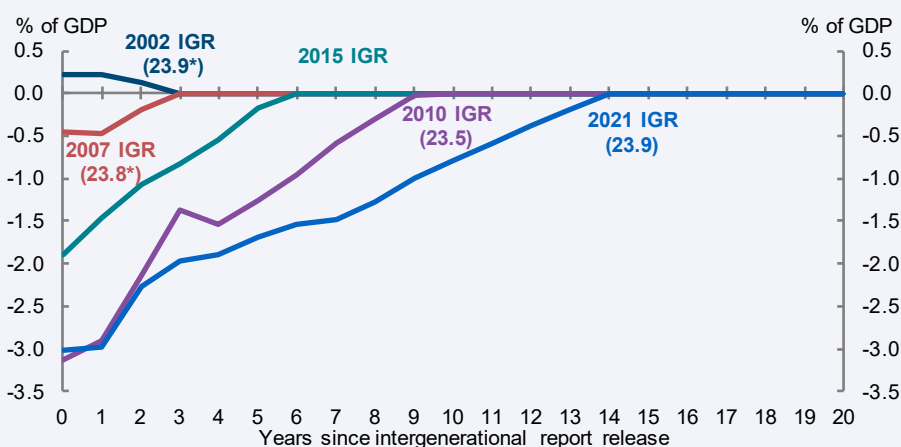
Notes: Long-run tax assumptions for 2002 and 2007 Intergenerational Reports are re-stated to include GST and incorporate revisions to GDP.
Source: Treasury.

In this report, tax receipts are projected to reach the tax-to-GDP limit in 14 years (2035-36), reflecting the ongoing impact of the pandemic. In previous reports it took between 3 years and 10 years to reach the tax-to-GDP limit, reflecting different technical assumptions and outlooks for wages and prices.

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86   The 2002 and 2007 Intergenerational Reports excluded GST from the calculation of Australian Government tax receipts. The assumed limits have also been revised to incorporate historical revisions to GDP. See page 126 of the 2010 Intergenerational Report for more information.

8.1   Personal income tax

Over time, inflation and increases in nominal wages increase an individual's average personal income tax rate. The effect of this is to increase the proportion of an individual's income that is taxed at their highest marginal tax rate.

Consistent with previous intergenerational reports, current projections assume that ongoing wages growth will cause personal income tax receipts to grow faster than GDP. This increased personal income tax revenue will increase the tax-to-GDP ratio up to the point where the cap is reached.

Personal income tax receipts are projected to be 11.1 per cent of GDP in 2020-21. By 2024-25, this is projected to decrease to approximately 10.9 per cent largely as a result of the commencement of stage 3 of the *Personal Income Tax Plan* on 1 July 2024. By 2031-32, personal income tax receipts are projected to increase to 11.9 per cent of GDP, due to income and wages growth.

Personal income tax receipts are expected to grow to 12.7 per cent of GDP when the tax cap is reached in 2035-36. When the cap is reached, personal income tax receipts will comprise around 53.1 per cent of total taxation receipts, compared with 49.6 per cent in 2020-21.

Chart 8.1.1   Personal income tax receipts
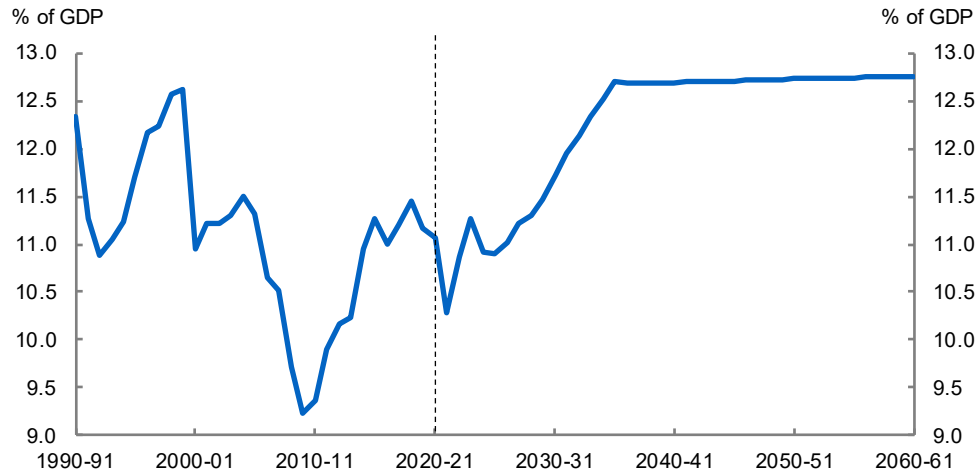
Source: ATO Taxation Statistics; ABS Australian National Accounts; and Treasury.

The share of total income tax filers who are net taxpayers has declined from around 84 per cent in 1990-91 to 76 per cent in 2017-18. This is consistent with increases in the effective tax-free threshold and the ageing population over this period. The effective tax-free threshold has increased from $5,250 in 1990-91 to $23,226 for

resident taxpayers, $33,898 for singles over 66 and $30,592 each for couples over 66 years of age in 2020-21.[87]

The ageing population has contributed to a decline in net taxpayers as a share of the total population. The majority of Australians of retirement age pay little or no income tax, and the proportion of older Australians who pay personal income tax has generally declined over time, largely due to the introduction of age-related tax offsets and changes to the taxation of superannuation income.

Chart 8.1.2   Proportion of Australians who pay income tax by age
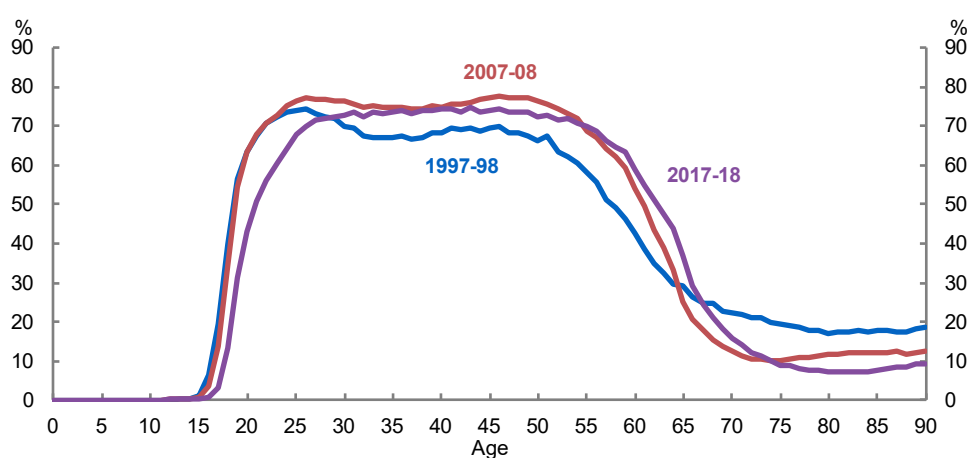
Source: ATO Longitudinal Information Files; ABS National, state and territory population; and Treasury.

More than 80 per cent of taxpayers' total income is derived from salary and wages. The share of income from salary and wages has been broadly stable since the Global Financial Crisis, but was around 3 percentage points lower than current levels in the mid-2000s. This was due to elevated income from interest and dividends, as well as historically high net capital gains. Salary and wage income is projected to make up the bulk of total income despite population ageing.

Income from capital gains has been highly volatile, reaching a peak of 4.8 per cent of income in 2006-07, before declining to under 2 per cent in 2008-09. Over the past 10 years, the share of income from capital gains has again increased, largely offset by a falling share from interest, dividends and net rent.

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87   Effective tax-free thresholds are the level of income at which an individual will first start paying tax, taking into account tax offsets that are available to all individuals (or all individuals above a certain age) such as the low and middle income tax offset and the seniors and pensioners tax offset.

8.2   Goods and services tax

Australia relies less on GST revenues than other advanced economies that rely on value-added taxes, largely because the GST is levied at a lower rate.[88] The GST is projected to continue to provide a stable base to help fund state government services, remaining at around 3.5 per cent of GDP over the next 40 years.

As the GST is levied on a reasonably broad base of consumption, it is generally less subject to fluctuations from year-to-year due to changes in economic activity. Since the introduction of the GST in 2000-01, GST receipts have ranged between 3.0 and 3.9 per cent of GDP, reaching a peak in 2003-04 before falling to 3.4 per cent of GDP in 2020-21. This fall has largely been the result of changing household consumption patterns, with a higher proportion of income being spent on services which are not subject to GST, including healthcare, education and rent. This fall was partially offset after 2012-13 by higher housing investment increasing GST receipts from the construction of new dwellings.

The COVID-19 pandemic has had a large impact on GST receipts, as the pandemic initially caused a large decrease in household consumption before it recovered strongly.[89] Going forward, there are both upside and downside risks to the projections for GST. Population ageing and real income growth may contribute to increased GST-exempt private health spending as a share of consumption. Alternatively, ageing may decrease GST-exempt education spending as a share of private consumption.

Chart 8.2.1   Goods and services tax receipts
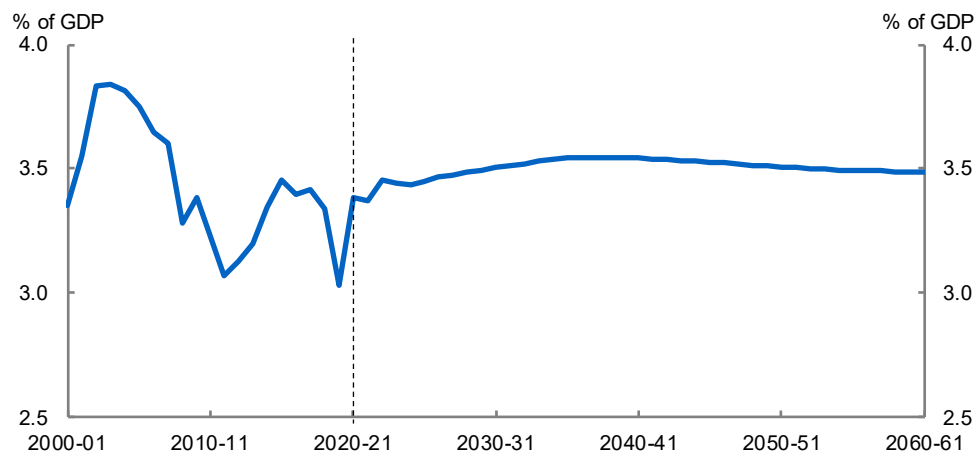
Source: ATO Taxation Statistics and Treasury.

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88   OECD Revenue Statistics 2020 and OECD Consumption Tax Trends 2020.

89   In addition to COVID-19's effects on household consumption, support to businesses provided by the ATO contributed to the decline and recovery of GST receipts. For more information, see 2021-22 Budget Paper No 1, *Statement 5: Revenue*, Box 5.3.

8.3   Company and other taxes

Company tax

While company tax receipts are expected to remain around the current share of GDP, they are expected to fluctuate considerably from year-to-year, continuing the volatility seen historically.

The company tax base is highly concentrated in relatively few taxpayers. The 10 companies that pay the most tax accounted for more than one quarter of total company tax paid in 2018-19, and the top 100 companies accounted for over 48 per cent.[90]

Chart 8.3.1   Company and other tax receipts
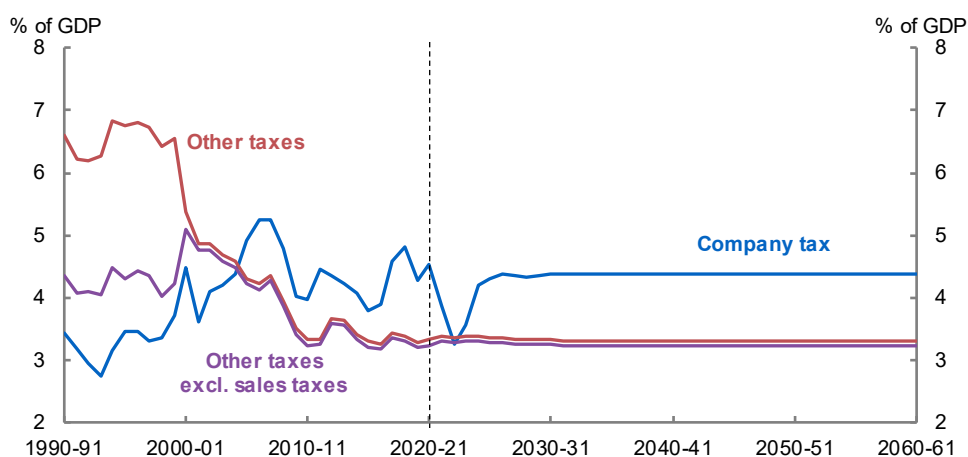
Source: ATO Taxation Statistics; ABS Australian National Accounts; and Treasury.

The concentration of revenue collected from the financial services industry and the resources industry presents risks for Australia's revenue base. The main company taxpayers are more exposed to industry and firm-specific trading conditions with company tax receipts sensitive to fluctuations in commodity prices. This means company tax revenue is harder to predict and will continue to create challenges for longer-term government budgeting and planning.[91]

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90   ATO Taxation Statistics, ATO *Corporate tax transparency: report of entity tax information.*
91   For more information, see 2021-22 Budget Paper No 1, *Statement 8*, Box 8.1.

Chart 8.3.2   Composition of company tax payable
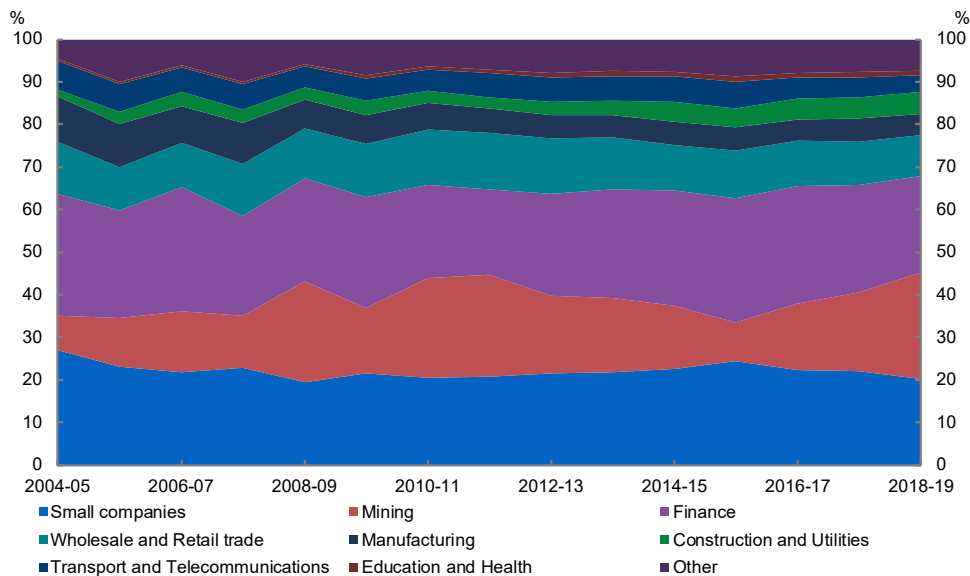
Note: 'Small companies' are companies across all industries with turnover less than $10 million.
Source: Treasury analysis of company tax return data.

Australia's company tax revenue is dependent on, and responsive to, the evolving size and role of multinational companies, as well as global trends in company investment and profits, which have become increasingly mobile. It is likely to be shaped by changes to the international tax framework. Statutory headline company tax rates have been declining globally since the 1980s, with Australia following this trend. For example, small and medium businesses wll face a tax rate of 25 per cent from 1 July 2021, the lowest rate in more than 50 years.

Australia's headline rate of 30 per cent for companies with a turnover above $50 million is high amongst OECD economies. However, there are some signs that the international trend may be reversing with the UK and the US recently announcing their intention to increase rates and the G7 committing to a global minimum tax of at least 15 per cent on a country-by-country basis.

Other taxes

The remaining taxes outside personal income tax, company tax and GST are projected to be 3.3 per cent of GDP in 2020-21, and remain at this level until 2060-61.

These taxes include a mix of direct and indirect taxes, notably: excise and customs duties, superannuation fund taxes, fringe benefits tax, petroleum resource rent tax, wine equalisation tax, luxury car tax and the major bank levy.

Excises are volumetric taxes levied on specific goods, so changes to consumption patterns or technological change may alter the demand for excisable goods. Australia's

main excise bases are fuel, tobacco and alcohol. Each of these has a risk of narrowing over time due to improvements in fuel efficiency, the long-term decline in smoking rates, and lower per person alcohol consumption.

Policy decisions have also significantly diminished the contribution other indirect taxes make to total tax receipts over the past 30 years, with the largest being the replacement of wholesales sales tax with GST, the pausing of fuel excise rate indexation from 2000-01 to 2014-15, and signing free trade agreements with key trading partners.

8.4   Non-tax receipts

Despite some fluctuations over the next 40 years, non-tax receipts are projected to decrease as a share of the economy from 2.0 per cent of GDP in 2020-21 to 1.5 per cent of GDP in 2060-61. With tax receipts capped at 23.9 per cent of GDP, the decrease in non-tax receipts has the effect of reducing total receipts as a share of GDP over the long term.

This decrease is mainly due to a reduction in NDIS state contributions and Future Fund earnings as a share of GDP.

In line with bilateral agreements, contributions from the states for the NDIS are capped at 4 per cent growth per year. This means that contributions increase in nominal terms but decrease as a share of GDP over time since nominal GDP is projected to grow faster than this rate.

Future Fund receipts in the form of interest receipts and dividends peak in 2033-34 and then decrease as a share of GDP. This projected decline is mainly due to the assumption that drawdowns from the Future Fund will commence in 2031-32, when the target asset level is reached. Other non-taxation receipts, such as interest earnings on smaller investment funds, are assumed to grow in line with the economy over the long run.

Chart 8.4.1   Non-tax receipts

Source: Treasury.
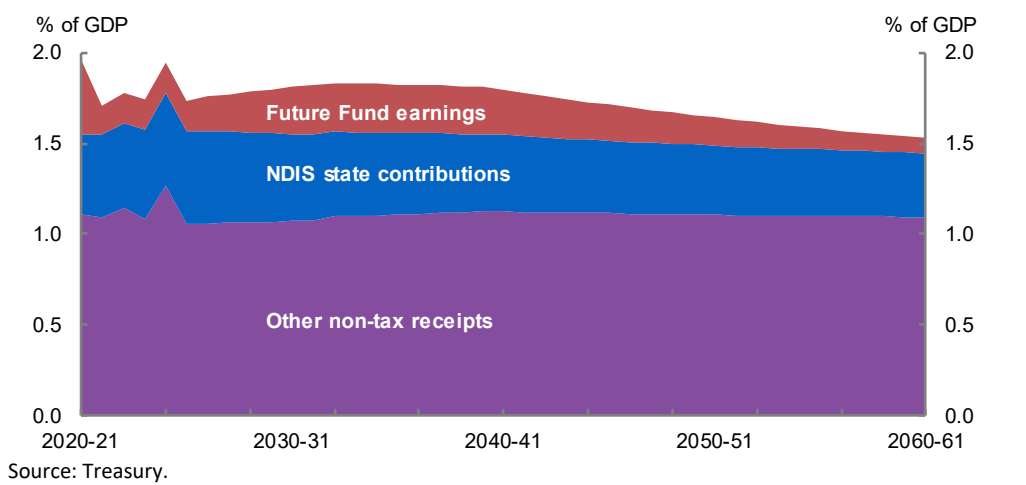
9. Major assets and liabilities

Overview

Major assets and liabilities are published in the government's balance sheet. Maintaining a strong balance sheet leaves countries better positioned to respond to long-term challenges and economic downturns.

The government's balance sheet comprises liabilities – including Australian Government Securities (AGS) and the unfunded superannuation liability – and assets, of which the Future Fund is largest.

Over the next 40 years, total liabilities as a share of the economy are projected to increase following the COVID-19 pandemic, before decreasing and then broadly stabilising over time. Total assets are projected to gradually decrease as a share of the economy.

The balance sheet measures changes in the value of government assets and liabilities over time. This value is affected by changes in the economy, valuation changes, and new additions to the balance sheet. Government decisions affecting spending or taxation flow through to the balance sheet as, for instance, changes in cash reserves or debt. The government may also directly use the balance sheet for policy purposes, including through the creation of investment funds and loan programs.

Chapter 6 – Budget projections sets out the key balance sheet aggregates, including gross debt, net debt and net financial worth.

This chapter contains detailed information on the Australian Government's major assets and liabilities and how they are likely to change in value over the next 40 years.

Chart 9.1   Total assets and liabilities
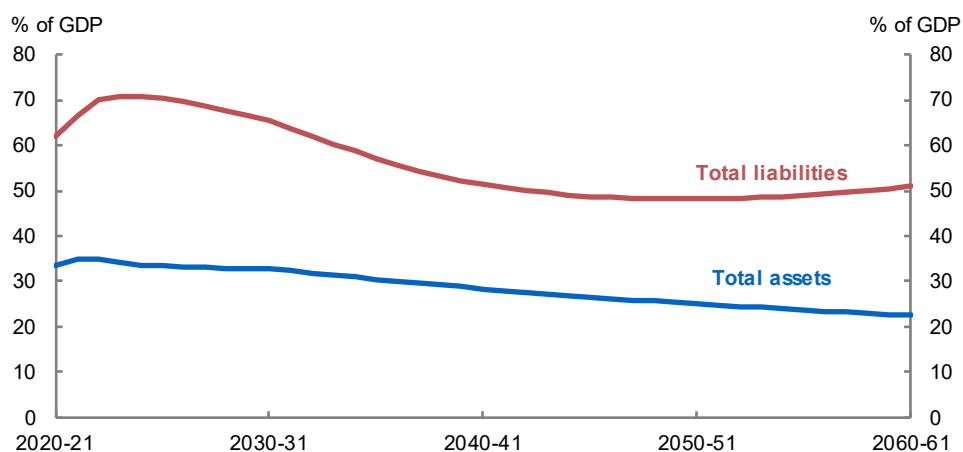
Source: Australian Office of Financial Management and Treasury.

Major liabilities

Liabilities on the government's balance sheet are broadly categorised as interest bearing liabilities (the majority of which is the market value of AGS) and provisions and payables (the largest of which is the Australian Government's superannuation liability).

Total liabilities as a share of the economy are projected to initially increase over the forward estimates, peaking in 2023-24 at 70.8 per cent of GDP. This reflects the increase in government debt due to the COVID-19 pandemic. Total liabilities then decrease and broadly stabilise at the end of the projection period, at around 51 per cent of GDP. This reflects the profile of AGS along with reductions in the superannuation liability over the next 40 years.

AGS at market value are expected to represent around 70 per cent of total liabilities in 2020-21, increasing to around 80 per cent by 2060-61, as the superannuation liability reduces. Other borrowing, provisions and payables represent around 13 per cent of total liabilities by 2060-61.

Chart 9.2   Components of total liabilities
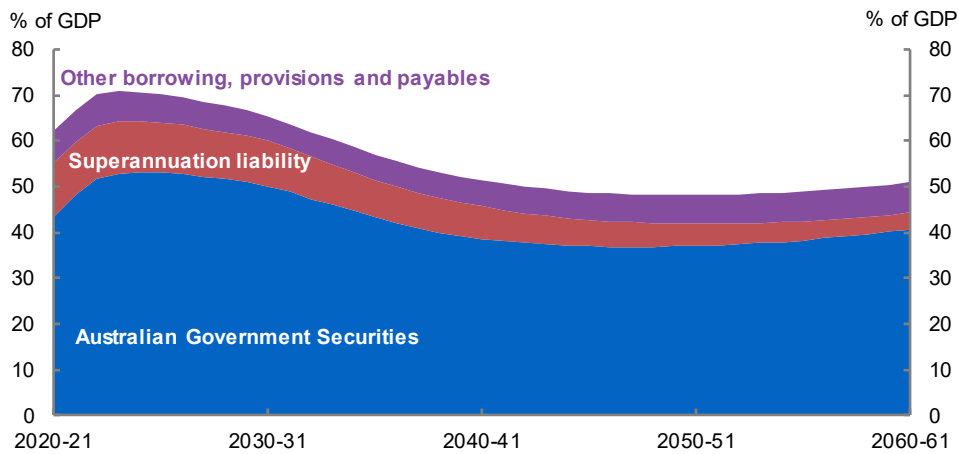
Note: Other borrowing, provisions and payables include a range of categories such as other employee liabilities, provisions (including subsidies), lease liabilities and loans.
Source: Australian Office of Financial Management and Treasury.

Australian Government Securities

The government finances its activities through receipts or borrowing. It borrows by issuing AGS when receipts fall short of payments.

AGS are measured at market value in the government's balance sheet. The market value is the amount holders could sell AGS for in financial markets. AGS on issue have increased sharply as a consequence of the Government's response to the COVID-19 pandemic.

The market value of AGS is projected to peak at 53.2 per cent of GDP in 2024-25, before falling to 36.8 per cent of GDP in 2047-48, supported by low borrowing costs relative to economic growth, and a period of primary surpluses. The market value of AGS is then projected to increase to 40.8 per cent of GDP by 2060-61 as spending pressures grow and receipts are constrained by the tax-to-GDP cap (Chart 9.3).

Chart 9.3   Market value of Australian Government Securities
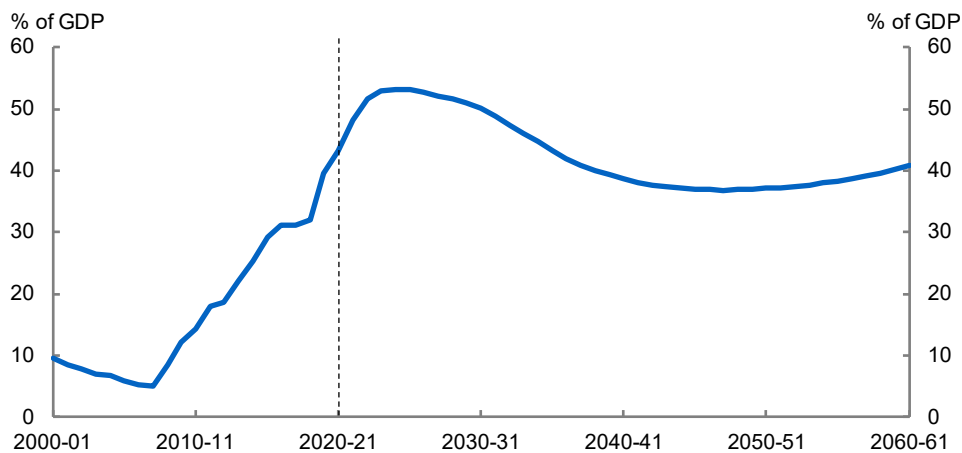
Source: Final Budget Outcome; Australian Office of Financial Management; and Treasury.

Government employee superannuation

The largest liability on the government's balance sheet after AGS is the unfunded public sector superannuation liability.

An unfunded superannuation scheme involves the government paying public servants a defined benefit largely as an annual pension on retirement, but not provisioning for this. These schemes were once the predominant means of providing superannuation to public servants but almost all are now closed to new members.[92]

It is projected that the unfunded superannuation liability will fall over the next 40 years, from 11.8 per cent of GDP in 2020-21 to 3.6 per cent of GDP by 2060-61 (Chart 9.4). This is primarily a function of the move away from unfunded superannuation schemes to funded superannuation schemes that provision for superannuation based on the accumulation of regular contributions and earnings.

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92   The 4 major defined benefit superannuation schemes in 2020-21 are closed to new members (the Commonwealth Superannuation Scheme, the Public Sector Superannuation Scheme, the Defence Force Retirement and Death Benefits Scheme, and the Military Superannuation and Benefits Scheme). Australian Defence Force Cover remains open to new members and is projected to become the major defined benefit superannuation scheme over the long run.

Chart 9.4   Unfunded superannuation liability
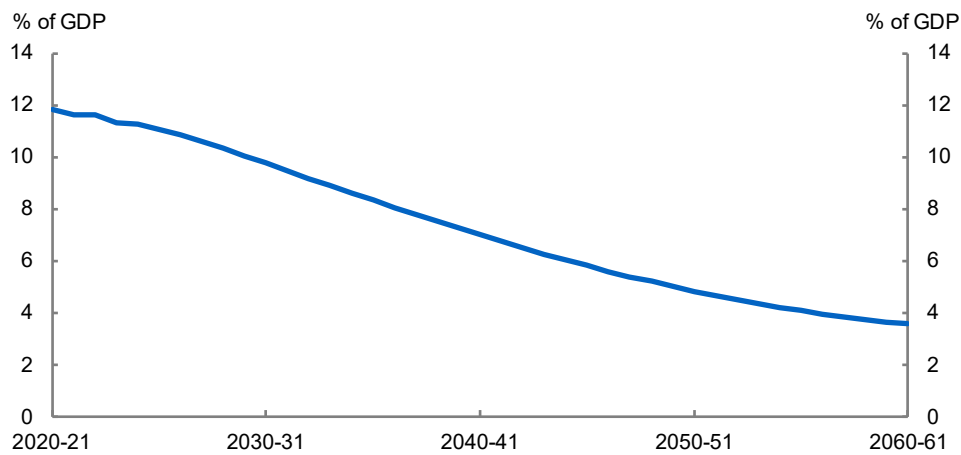
Source: Australian Government Actuary and Treasury.

Major assets

Assets on the government's balance sheet are categorised as financial and non-financial assets. Financial assets include investments, loans, equity, advances and cash. Non-financial assets include equipment, buildings, heritage and cultural assets, land, inventories and intangibles.

The government's total assets are projected to decrease from 33.7 per cent of GDP in 2020-21 to 22.5 per cent of GDP in 2060-61 (Chart 9.5). This largely reflects a projected reduction in the value of the Future Fund since drawdowns are assumed to commence from 2031-32.

Chart 9.5   Components of total assets
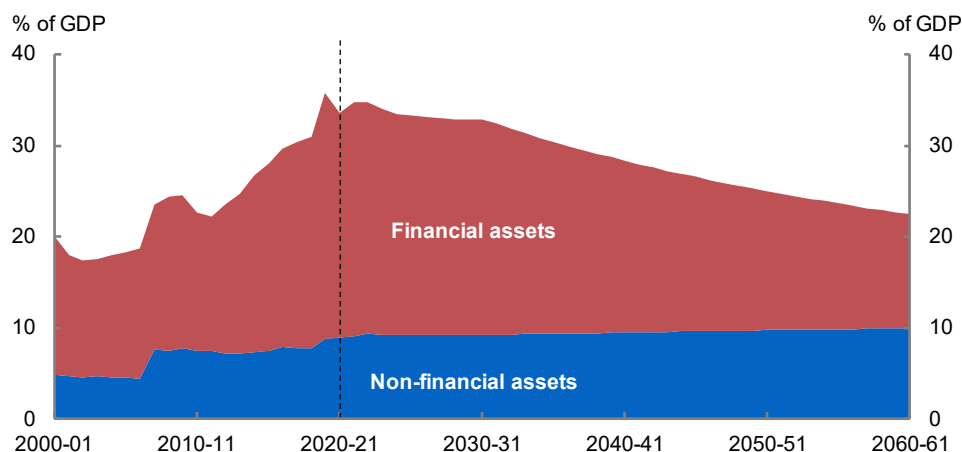
Source: Final Budget Outcome and Treasury.

Financial assets

Financial assets have grown over recent history, with total financial assets expected to increase from 14.8 per cent of GDP in 2011-12 to 24.8 per cent of GDP in 2020-21. These arrangements are funding infrastructure (Western Sydney Airport, Inland Rail and the Northern Australia Infrastructure Facility), communications (National Broadband Network), the unfunded superannuation liability (the Future Fund) and energy (Clean Energy Finance Corporation and Snowy 2.0).

Financial assets include investments on which the government aims to earn a financial return in the form of interest, dividends, or capital gains. These investments may be held for liquidity management reasons or for policy purposes. Instruments issued to manage government liquidity may, for example, be in the form of term deposits the government holds with the Reserve Bank of Australia. Investments that use the balance sheet for policy purposes can be integral to the achievement of government objectives that boost productivity, drive economic growth, deliver critical infrastructure and provide important services for Australian citizens, businesses and communities.

Government investment funds

A large component of financial assets is government-owned investment funds, which are generally classified as investments for policy purposes. There are currently 6 Australian Government investment funds – the Future Fund, the Medical Research Future Fund, the DisabilityCare Australia Fund, the Aboriginal and Torres Strait Islander Land and Sea Future Fund, the Future Drought Fund, and the Emergency Response Fund.

The creation of an investment fund affects different measures of debt differently. It generally has no impact on net worth and net financial worth as the financial assets of

the fund offset the additional borrowing. Creating an investment fund increases net debt to the extent that the fund's investments are in equity assets (shares), which are not included in the calculation of net debt.

The Future Fund is the largest government investment fund. It was established in 2006 to help fund the cost of the unfunded public sector superannuation liability. The government has provided the Future Fund with $60.5 billion of seed funding.

Following the challenging investment environment caused by the COVID-19 pandemic, the Future Fund's return in 2019-20 was -0.9 per cent, however returns have rebounded in 2020-21. At 31 March 2021, the Future Fund was valued at $178.6 billion and delivered a 10-year return of 9.1 per cent per year, exceeding the investment target of 6.1 per cent per year.

The projected value of the Future Fund is based on an assumption about when drawdowns commence. The *Future Fund Act 2006* states that the government can begin drawing down from the Future Fund at the earlier date of 1 July 2020 or when the opening balance of the Future Fund reaches the target asset level. The target asset level is the projected Future Fund balance that would offset the projected unfunded superannuation liability accrued up to the same point in time. The Government has announced its intention to not draw down on the Future Fund until at least 2026-27. In this report, drawdowns are assumed to begin from 2031-32, which is when the balance of the Future Fund is projected to reach the target asset level.

Chart 9.6   Future Fund closing balance
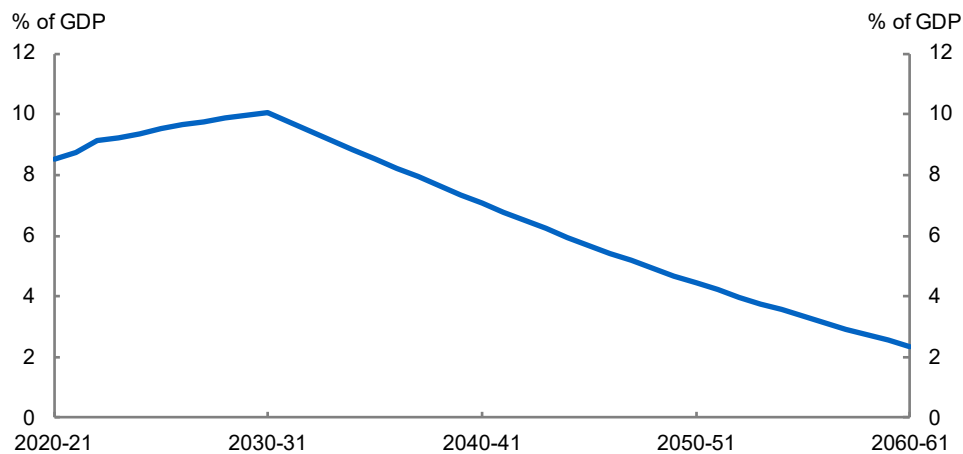
Source: Australian Government Actuary and Treasury.

Higher Education Loan Program (HELP)

HELP loans represent a financial asset on the government's balance sheet as they are expected to be repaid by students in the future. The value of HELP increases when new loans are issued and through indexation on existing loans, and declines as loans are repaid and as debts are written off.

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As at 30 June 2021, the fair value of HELP is estimated to be $48.5 billion.[93] Over the next 40 years, it is projected that HELP will reduce from 2.4 per cent of GDP in 2020-21 to 1.8 per cent of GDP in 2060-61. The fall in the fair value of HELP at the start of the projections period is driven by an assumed increase in the discount rate applied to projected HELP repayments. The fall in HELP as a share of the economy over the 40-year projection period reflects that new issued loans are projected to grow in line with the growth in student numbers and prices, and assumed to grow slower than nominal GDP. This is partially offset by growth in repayments, as repayment thresholds are grown in line with CPI, consistent with legislation. As wages are projected to grow faster than CPI, this results in an increase in the number of debtors required to make a repayment which increases the value of the HELP asset over time.

Chart 9.7   HELP fund closing balance
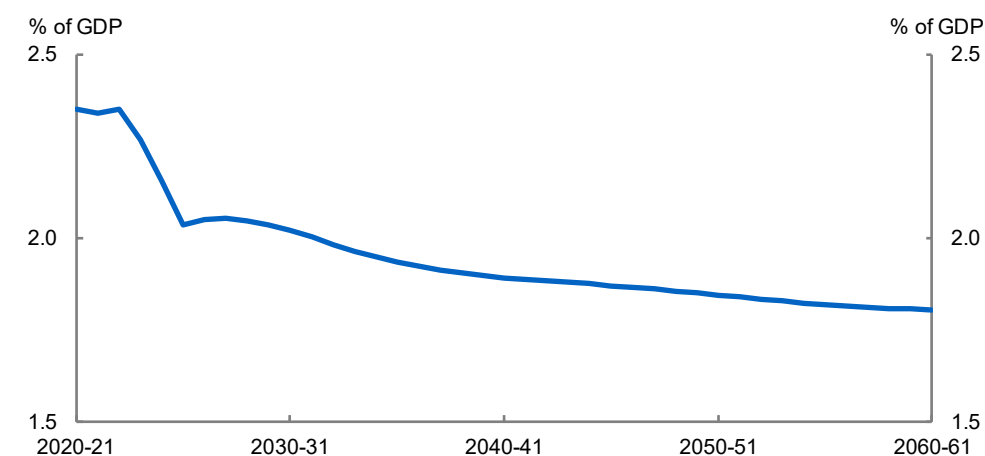
Source: Australian Government Actuary; Department of Finance; and Treasury.

Non-financial assets

Non-financial assets are projected to increase from 26.4 per cent of total assets in 2020-21 to 44.2 per cent of total assets in 2060-61. This reflects that non-financial assets are projected to increase from 9.0 to 9.9 per cent of GDP over the next 40 years but financial assets decrease over time as a share of the economy. The largest component of non-financial assets is defence acquisitions, which are included in the overall funding for Defence (Section 7.7).

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93   HELP debt is reported at the fair value which is conceptually close to the market value of the HELP debt, or the estimated value for which the HELP debt could be sold. HELP comprises several programs, including HECS-HELP, FEE-HELP, OS-HELP, SA-HELP and VET FEE-HELP.

Appendix

Overview

This appendix outlines the modelling methodologies and assumptions underpinning the projections in this report and provides a summary of key results. In general, the methodologies used throughout this report are similar to those used in previous intergenerational reports.

The economic and fiscal projections incorporate a range of assumptions and judgements. These reflect the best information, as well as detailed analysis of historical trends and current policy, available at the time of preparing the report.

There is considerable uncertainty in quantifying and modelling economic and fiscal outcomes over the next 40 years. The projections contained in this report are intended to capture the main trends and trajectories that will influence outcomes in our future. Uncertainties have been increased by the COVID-19 pandemic, the impacts of which continue to unfold.

1.   Projections Summary

Table A1.1   Demographic projections

	2020-21	2030-31	2040-41	2050-51	2060-61
Population (millions)	25.7	28.8	32.2	35.6	38.8
0-14	4.8	4.8	5.2	5.8	6.1
15-64	16.6	18.3	20.2	22.1	23.8
65-84	3.8	4.8	5.5	6.0	6.9
85 and over	0.5	0.8	1.3	1.7	1.9
Life expectancy at birth (years)					
Male	81.4	83.1	84.5	85.8	86.8
Female	85.4	86.6	87.6	88.5	89.3
Total fertility rate	1.61	1.62	1.62	1.62	1.62
Old-age dependency ratio	3.9	3.2	3.0	2.9	2.7
Net overseas migration (per cent of total population)	-0.4	0.8	0.7	0.7	0.6

Note: Life expectancy figures are calculated using the period method. The old-age dependency ratio refers to the number of people of traditional working age (15-64) for every person 65 and older.
Source: McDonald (2020) for fertility projections only and Treasury.

Table A1.2   Economic and fiscal projections

	2020-21	2030-31	2040-41	2050-51	2060-61
Economic projections					
Real GDP growth (%)	1.2	2.9	2.7	2.4	2.3
Real GDP per person ($)	76,700	89,600	105,700	122,400	140,900
Real GDP per person growth (%)	1.1	1.7	1.6	1.4	1.4
Real GNI per person ($)	77,900	85,400	99,100	113,100	128,900
Real GNI per person growth (%)	4.7	1.6	1.4	1.3	1.4
Total participation rate 15-64 (%)	78.9	79.9	81.3	81.5	81.5
Total participation rate 15+ (%)	65.8	64.9	64.9	64.5	63.6
Male 15+	70.8	69.0	68.9	68.6	67.6
Female 15+	61.0	61.0	61.1	60.7	59.9
Fiscal projections (% of GDP)					
Underlying cash balance	-7.8	-1.5	-1.1	-1.8	-2.3
Primary balance	-7.1	-0.7	0.3	-0.1	-0.6
Gross debt	40.2	51.2	39.2	37.1	40.8
Net debt	30.0	38.2	29.0	29.3	34.4
Net financial worth	-37.4	-41.8	-32.5	-32.9	-38.5

Source: Treasury.

Table A1.3   Projections of major components of Australian Government spending (per cent of GDP)

	2020-21	2030-31	2040-41	2050-51	2060-61
Payments to individuals					
Disability Support Pension	0.9	0.7	0.7	0.8	0.8
Family Tax Benefit	0.9	0.7	0.5	0.5	0.4
Child Care Subsidy	0.4	0.5	0.4	0.4	0.3
Parenting Payment Single	0.3	0.2	0.2	0.2	0.2
Parenting Payment Partnered	0.1	0.0	0.0	0.0	0.0
Paid Parental Leave	0.1	0.1	0.1	0.1	0.1
JobSeeker Payment	1.4	0.6	0.5	0.5	0.4
Youth Allowance and Austudy	0.3	0.2	0.1	0.1	0.1
Carer Payment	0.3	0.4	0.4	0.4	0.4
Total payments to individuals	**4.8**	**3.3**	**3.0**	**2.9**	**2.7**
Health	**4.6**	**4.4**	**4.9**	**5.5**	**6.2**
Age and Service Pension	**2.7**	**2.5**	**2.4**	**2.2**	**2.1**
Defence	**2.1**	**2.3**	**2.3**	**2.3**	**2.3**
Education	**1.9**	**1.6**	**1.4**	**1.3**	**1.2**
Aged care	**1.2**	**1.4**	**1.5**	**1.8**	**2.1**
National Disability Insurance Scheme (Australian Government)	**0.7**	**1.0**	**1.0**	**1.0**	**1.0**
Public Sector Superannuation	**0.4**	**0.4**	**0.4**	**0.3**	**0.2**
Total payments	**32.1**	**26.2**	**26.8**	**27.3**	**27.7**
Total payments (excl. interest)	**31.3**	**25.2**	**25.1**	**25.4**	**25.8**

Source: Treasury.

Table A1.4   Projections of major components of Australian Government spending (real spending per person, 2020-21 dollars)

	2020-21	2030-31	2040-41	2050-51	2060-61
Payments to individuals					
Disability Support Pension	710	660	770	950	1110
Family Tax Benefit	730	580	560	550	530
Child Care Subsidy	350	440	450	440	420
Parenting Payment Single	240	180	210	230	250
Parenting Payment Partnered	60	30	30	30	30
Paid Parental Leave	90	80	80	80	70
JobSeeker Payment	1140	540	550	550	550
Youth Allowance and Austudy	260	140	130	130	130
Carer Payment	250	310	420	530	620
Total payments to individuals	**3840**	**2980**	**3200**	**3480**	**3710**
Health	**3670**	**3970**	**5120**	**6670**	**8700**
Age and Service Pension	**2190**	**2210**	**2540**	**2730**	**2990**
Defence	**1640**	**2030**	**2390**	**2760**	**3170**
Education	**1490**	**1410**	**1490**	**1580**	**1620**
Aged care	**950**	**1280**	**1620**	**2230**	**2900**
National Disability Insurance Scheme (Australian Government)	**540**	**890**	**1060**	**1250**	**1440**
Public Sector Superannuation	**330**	**360**	**400**	**380**	**320**
Total payments	**25680**	**23360**	**28100**	**33120**	**38680**
Total payments (excl. interest)	**25020**	**22410**	**26380**	**30830**	**35980**

Source: Treasury.

Key concepts

Gross Domestic Product (GDP) measures the output (goods and services) produced in the Australian economy in a given period.

Nominal GDP measures the value of the output produced in Australia at current prices. For example, nominal GDP in 2020 is calculated using prices for goods and services in 2020. Nominal GDP has a significant implication for tax revenue and the fiscal position.

Real GDP measures the total value of output produced in Australia using the prices of a chosen base year. It removes the effect of price changes, allowing a focus on changes in quantities of output.

Real GDP per person measures the average level of output produced per person, which is the most widely used comparative indicator of economic performance and an indication of average living standards.

Potential GDP estimates the highest sustainable level of economic output, or the economy's productive capacity. Potential GDP grows through the accumulation of factors that expand the economy's productive capacity. Potential GDP is estimated based on an analysis of trends in population, productivity and participation. As spare capacity in the economy is absorbed over time, real GDP converges towards its potential level.

The economy is at **full capacity** when actual output equals potential output.

Spare capacity occurs when actual economic output is below potential. This means there are economic resources (such as labour) that are being underutilised.

Gross National Income (GNI) measures how much Australia earns, rather than what output is produced in the economy. It is used as an indicator of Australia's standard of living. GNI measures total income received in Australia from its residents and businesses in Australia and abroad. It can be measured in real or in nominal terms similar to GDP.

Real GNI per person is often used as a measure of a country's economic prosperity, because it captures a country's average real income per person from the economic activity of its residents and businesses, regardless of whether they are located in the country or abroad. Higher commodity prices (and hence terms of trade) have a direct impact on real incomes and hence GNI.

The **terms of trade** measure export prices relative to import prices. They have a significant influence on Australia's GNI and nominal GDP. Favourable terms of trade, or periods when export prices are high relative to import prices, imply that Australia is able to buy more imports for a given amount of exports.

Labour productivity is a measure of output per hour worked. It depends on growth in underlying productivity and the productive capital stock. Underlying productivity, also known as labour augmenting technical change, reflects changes in productivity that are specific to labour that are unrelated to growth in the productive capital stock. Increases

in underlying productivity lead to complementary increases in the productive capital stock, but this takes time due to costs of adjustment.

The **consumer price index (CPI)** measures the prices of a representative basket of goods and services consumed in Australia.

The **GDP deflator** measures the level of prices across the goods and services contained in GDP.

The **Non-Accelerating Inflation Rate of Unemployment (NAIRU)** is the rate of unemployment that can be sustained without generating inflationary pressures.

The **level** of a variable indicates its absolute size. For example, in real GDP it indicates 'how big' the economy is.

The **growth rate** of a variable indicates its rate of change. For example, in real GDP it indicates 'how fast' the size of the economy is changing over time.

2. Methodology and assumptions

2.1 Economic projections framework

The long-run economic projections in this report build on those in the 2021-22 Budget.

This report generates a projection for real GDP using information and assumptions about the trajectories of the population, participation and productivity.

On the nominal side, key non-rural commodity export prices are projected based on cost curve analysis. Domestic prices return over time to the mid-point of the Reserve Bank of Australia's inflation target band.

A macroeconometric model of the Australian economy is used to combine these assumptions and trend inputs to generate a projection for real and nominal GDP.

Population projections

The population projections in this report use the cohort-component method outlined in the 2020 Population Statement and the 2021-22 Budget.[94] The assumptions for the components of population growth are the same as for the 2021-22 Budget but extend to 2060-61.

Assumptions about fertility, mortality and net overseas migration are made over:

• the near term – the forecast period, between 2020-21 and 2024-25, and

• the longer term – the projections period, between 2025-26 and 2060-61.

Population projections are estimated for each single year of age (0 to 120) and sex from 2020-21 to 2060-61.

Fertility

Future births are estimated by applying age-specific fertility rate assumptions to the female population aged 15 to 49 in each year, based on projections by Peter McDonald, Professor of Demography at the University of Melbourne's Melbourne School of Population and Global Health.[95]

Mortality

Future deaths are estimated by applying age and sex-specific mortality rate assumptions to the population.

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94   Centre for Population, *Population Statement 2020* (Canberra: Centre for Population, 2020).
95   P. McDonald, *A Projection of Australia's Future Fertility Rates* (Canberra: Centre for Population 2020).

Assumptions about future mortality rates are based on life tables produced by the ABS, to which the Australian Government Actuary's mortality improvement factors are applied.[96]

Net overseas migration

Forecasts for net overseas migration (NOM) use detailed historical data on international arrivals and departures and offshore visa grants data from the Department of Home Affairs. Initial NOM forecasts are estimated based on arrivals and departures of broad migrant categories prior to the COVID-19 pandemic. These initial forecasts are then adjusted to capture the likely impact of the pandemic. The adjusted NOM forecasts for the period 2020-21 to 2024-25 are included in the population projection baseline.

From 2025-26 onwards, NOM is assumed to remain at a fixed level of 235,000. The age and sex distribution of both arrivals and departures are assumed to reflect the 5-year historical average distribution observed from 2012-13 to 2017-18.

The NOM assumption of 235,000 people per year over the long run reflects:

- the Government's migration planning levels (reviewed and set by the Government on a yearly basis) of:
  - the permanent Migration Program (190,000 people per year from 2023-24)
  - the Humanitarian Program (13,750 people per year)
- the flows of temporary migrants who reside in Australia for several years but do not transition to permanent residency (assumed to be a net inflow of 66,250 people per year, based on a historical average of the net inward flow of such migrants prior to the onset of the COVID-19 pandemic)
- the flows of Australian citizens (assumed to be a net outflow of around 15,000 people per year, based on a historical average), as well as the number of permanent residents who subsequently emigrate (assumed to be a net outflow of around 20,000 people per year, based on a historical average).

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96   ABS, *Life Tables, 2017-19,* (2020).

Table A2.1.1   Population projection assumptions

Intergenerational Report	Total fertility rate	Net overseas migration	Period life expectancy at birth in year 2050 (years)		Population June 2050
	Babies per woman	People	Males	Females	People, millions
2021	1.6	235,000	85.7	88.4	35.3
2015	1.9	215,000	87.5	90.1	37.8
2010	1.9	180,000	87.7	90.5	35.9
2007	1.7	110,000	87.6	90.2	28.5
2002	1.6	90,000	83.2	88.2	25.7

Note: The 2050 year was chosen for comparability as historical intergenerational reports do not project life expectancies and populations beyond this year. The projections data for 2002, 2007 and 2010 reports were published in the 2015 Intergenerational Report.
Source: Treasury.

Modelling the economic and fiscal impacts of different migrant streams

The lifetime economic and fiscal impacts of different groups of permanent migrants shown in Charts 2.9 and 2.10 have been estimated using Treasury's OverLapping Generations model of the Australian economy (OLGA) and Fiscal Impact of New Australians (FIONA) model, respectively. OLGA is a lifecycle dynamic general equilibrium model that has been calibrated to Australian data. FIONA is a demographic cohort model designed to estimate the fiscal impact of permanent migrants to Australia over their remaining lifetimes.

Both the OLGA and FIONA sets of results presented in this report show a longitudinal perspective on migration, capturing the economic (as measured by real GDP) and fiscal impact of a single cohort of permanent migrants – the 2018-19 cohort – over their remaining lifetimes in Australia.

Both models present the results in net present values in 2018-19 dollars. OLGA is a real model with all prices assumed to grow at a common notional rate, so net present values are calculated using a real discount rate.

The FIONA model calculates the net present value using a nominal discount rate, broadly reflecting the government's cost of borrowing over the long term.

Both sets of results are best interpreted by comparing estimates of different migrant groups (or between migrant groups and the general Australian population), rather than focusing on absolute dollar values. This is because the relativities between groups are robust to different modelling choices and assumptions over the long run, whereas the absolute level estimates vary much more widely.

The OLGA and FIONA results presented in this report do not capture the broader economic, social or environmental effects of migration such as technology spillovers or

congestion. The FIONA results presented here do not capture the fiscal impacts of migration on state or local governments.

Lifetime contributions to GDP, as estimated using the OLGA model

The skill distribution of the permanent migrant cohort is calibrated to tax and Census data collected from earlier permanent migrant cohorts. Labour market outcomes are then determined endogenously in the model.

The age distribution of the permanent migrant cohort in OLGA is calibrated to the age distribution of the 2018-19 permanent migrant cohort. OLGA only directly captures those migrants who arrive aged 21 to 95.

Aside from age and income earning ability, all other economic characteristics of migrants are assumed to be the same as for an equivalent Australian resident. These include, among other things, wealth, entrepreneurship, propensities to save and consume, and English-speaking ability. Variations in these factors from the resident population will likely affect the analysis of more disaggregated visa classes but are not expected to have a significant effect on the estimates of broader categories reported in this report.

In OLGA a permanent migrant is assumed to pay the same taxes and receive the same amount of government transfers as a resident of the same age and income-earning ability. For simplicity the debt-to-GDP ratio has been held constant with the net fiscal impact of migrants offset through changes to personal income tax.

The OLGA results reflect changes in aggregate outcomes, some of which will be distributed to the resident population.

Lifetime fiscal impact, as estimated using the FIONA model

The FIONA model has been developed to estimate the fiscal impact of permanent migrants over their remaining lifetimes in Australia. The model also estimates the value of taxes paid and the costs of services received by the general Australian population to enable comparison to the permanent migrant cohort.

The results in Chart 2.10 relate only to tax revenues retained and government expenses incurred by the Australian Government (a subset of FIONA estimates, which extend to the state government level). The model captures personal income tax and indirect taxes as well as the visa application charges paid by migrants prior to securing permanent residency. Taxes not directly attributable to individuals such as company income tax are not included. On the spending side, FIONA incorporates estimates for Australian Government expenditure on aged care, education, health, infrastructure, payments to individuals, and settlement services. Defence spending is not included.

Participation rate projections

The increase in the total participation rate since the first Intergenerational Report in 2002 has been larger than projected and future projections for participation rates have been successively revised upwards.

The participation rate projections in this report are based on a new methodology, as explained in detail in Treasury Working Paper 2021-02 *Australian Labour Force Participation: Historical Trends and Future Prospects.*[97] This methodology considers how participation rates have historically varied over the lifecycle and how these lifecycle participation profiles have shifted between different generations. Importantly, this means that participation rates at later stages of life for a given generation partly depend on the observed participation for that generation at younger ages.

Productivity projections

Labour productivity is typically defined as output per hour worked. Factors that can affect labour productivity include workers' skills, technological change, management practices and the productive capital stock.

The 2015 Intergenerational Report used an aggregate approach to model labour productivity. The macroeconomic projections in this report adopt a more sophisticated approach to projecting labour productivity, consistent with the 2021-22 Budget.

The approach now incorporates a direct role for changes in the productive capital stock to lead to changes in labour productivity. Labour productivity growth depends on both underlying productivity and the productive capital stock.[98]

Underlying productivity reflects changes in productivity that are specific to labour, and unrelated to growth in labour and capital inputs. Underlying productivity is unobserved and so is typically modelled to reflect the remaining component of output growth that is unexplained by increases in labour and capital inputs.

Underlying productivity growth is assumed to converge over a 10-year period to 1.5 per cent per year, consistent with the average growth rate in labour productivity over the 30 years to 2018-19. The COVID-19 pandemic has had significant impacts on the drivers of labour productivity growth, which may impact the accuracy of the labour productivity measure in 2019-20.[99]

The productive capital stock refers to the productive assets available to assist in producing output. It increases with business investment and decreases due to the depreciation of existing assets.

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97   L. Gustafsson, 'Australian Labour Force Participation: Historical Trends and Future Prospects', *Treasury Working Paper* 2021-02 (2021).

98   Underlying productivity is also known as labour augmenting technical change.

99   ABS, 'Productivity measurement in the time of a pandemic*', Estimates of Industry Multifactor Productivity, 2019-20 financial year*.

Long-run growth in the stock of productive capital is linked to growth in underlying productivity. This reflects an assumption that, in the long run, labour (adjusted for underlying productivity) and capital shares of output are constant.

Nominal GDP, prices and wages

Output prices are a volume-weighted average of the price received for goods and services sold domestically and internationally.

High export prices often occur in periods of strong demand for Australia's bulk commodities. For example, from the mid-2000s to 2011, strong demand for Australia's major commodity exports, particularly from China, drove a significant increase in the prices of iron ore and thermal and metallurgical coal. From 2011-12 to 2015-16, key commodity prices retreated from these record highs, resulting in large falls in the terms of trade. Consistent with the approach to commodity prices in the 2021-22 Budget, the real prices of Australia's commodity exports are expected to fall until 2025-26, before stabilising at their long-run levels thereafter. This report uses the same export price projections from the 2021-22 Budget. The terms of trade are projected to return to and remain around the 2006-07 level from 2025-26 to 2060-61.

Domestic prices are projected to return over time to the mid-point of the RBA's inflation target band of 2 to 3 per cent. Over the long run, output prices are projected to grow by 2.5 per cent per year, consistent with Australia's medium-term inflation target. Wages are projected to grow by around 4.0 per cent per year, consistent with domestic inflation and long-run labour productivity growth converging to 1.5 per cent per year.

2.2   Aggregate fiscal projections

The Model of Fiscal Aggregates and Scenario Analysis (MFASA) used to prepare the aggregate fiscal projections in this report draws together the outputs of a wide range of separate but consistent models that project economic parameters, tax receipts, payments (for example, health, aged care, and higher education), and the balance sheet (for example, investment funds).

MFASA 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.

Figure A2.2.1 Preparing fiscal aggregates
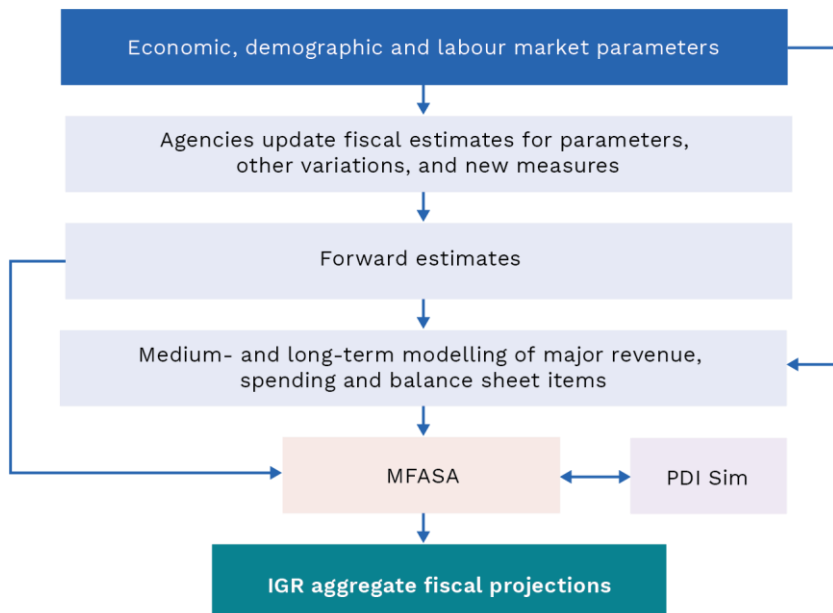
Source: Treasury.

The forward estimates and medium-term projections published in this report are consistent with those published in the 2021-22 Budget. The forward estimates form the basis for the projections and are grown by relevant economic and demographic parameters to create the medium- and long-term projections. Projections of revenue, spending and the Government's balance sheet are compiled in MFASA. Any components that are not explicitly modelled are grouped and grown by an aggregate growth factor, such as nominal GDP.

The modelled and non-modelled components are combined to calculate the financing task in each year. This is comprised of the underlying cash balance excluding interest payments on Australian Government Securities (AGS) plus balance sheet flows.

The financing task is inputted into PDI Sim, along with the level of AGS at the end of the forward estimates, and the assumed AGS yield curve in each year (Section 3 of this Appendix includes more information on the bond yield assumptions). PDI Sim then calculates interest payments and the level of AGS, which are inputted back into MFASA to generate the aggregate fiscal projections.

2.3   Revenue projections

This report projects that tax receipts will increase from current levels to reach a long-run constant tax-to-GDP ratio of 23.9 per cent. This ratio is consistent with the Government's Fiscal Strategy and is based on the average tax-to-GDP ratio of the years

following the introduction of the GST and prior to the Global Financial Crisis (2000-01 to 2007-08 inclusive).

The projections methodology is similar to previous reports, relying on the broad correlation between major elements of nominal GDP (such as compensation of employees, gross operating surplus and nominal consumption) and their respective tax bases (personal income tax, company tax, GST and other excise and customs duty).

Medium- and long-term revenue projections

The assumption that the tax-to-GDP cap would constrain tax receipts is 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 advanced economies

- that a strict no-policy-change scenario was unrealistic as it would imply increases in average tax rates on personal income each year

- the emphasis of the reports rested on pressures that demographic change was likely to impose on future government spending.

Similarly, this report also assumes a period of adjustment before tax receipts reach their long-term level, building off the projections and methodology in the 2021-22 Budget. The tax-to-GDP ratio is projected to rise from 20.9 per cent of GDP in 2021-22 to 23.9 per cent of GDP in 2035-36. Tax receipts are then projected to remain at 23.9 per cent until 2060-61.

Non-tax receipts are a relatively small component of total receipts and are projected as part of MFASA.

Policy assumptions

With no policy change, tax collections historically would have risen much faster than GDP over time, resulting in a tax-to-GDP ratio considerably higher than actually occurred. This reflects increasing tax rates on personal income over time due to the progressivity of the personal income tax scale and the fact that the personal income tax thresholds are set in nominal terms.

The broad stability of the historical tax-to-GDP ratio is largely the result of policy adjustments, particularly periodic adjustments to the personal income tax scale.

The projections from 2020-21 out to 2035-36 are based on a 'no policy change' scenario, and include the effects of existing policy such as the Government's *Personal Income Tax Plan*. Beyond 2035-36, the estimates are prepared using a 'top-down' approach, assuming a constant tax-to-GDP ratio of 23.9 per cent of GDP. Within the overall long-run assumption, GST receipts (and the associated Commonwealth payments to the states) are assumed to comprise around 3.5 per cent of GDP.

The assumption that the aggregate tax-to-GDP ratio remains constant is not intended to imply that receipts from all heads 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 tax receipts varying over the long term as a share of GDP. For example, there has been a long-run decline in excise and excise-equivalent customs duty as a share of nominal GDP. Should this trend continue over the long run, a constant tax-to-GDP ratio would imply that other taxes would increase as a share of total tax.

2.4   Spending projections

Health

General methodology

This report uses a similar modelling methodology to previous intergenerational reports. Health expenditure beyond the forward estimates is projected initially on the basis of individual component models for public hospitals, pharmaceutical benefits, medical benefits and private health insurance rebates. The share of health spending made up by each component has changed significantly over time. Expenditure not captured in the component models, such as veterans' health, public health programs and medical research, is held constant as a percentage of nominal GDP.

Component models are used to project the cost of health services per person from the end of the forward estimates to 2031-32. The uncertainty around the distribution of health expenditure between the components of health spending increases with the length of the projection period. Because of this, from 2032-33 onwards, an aggregate model is used to project total Australian Government health spending.

This long-run model assumes growth in the non-demographic factor trends towards a historical non-demographic growth rate for health spending by all levels of government. This is broadly consistent with the approach used in the 2010 and 2015 Intergenerational Reports.

The use of component models for the short term and an aggregate model for long term projections seeks to balance the desire for more detailed projections against the uncertainty as to whether recent trends in individual components of government health spending will be representative of longer-term trends. Long-term modelling on a component basis could risk underestimating future spending pressures, which are driven by a variety of factors including technological change, demographic change and income growth.

Medical benefits

The medical benefits component model includes spending under the Medicare Benefits Schedule.

Projections are derived by combining non-demographic growth in current spending on medical benefits per person for age and gender cohorts with estimates of population (excluding the veterans' population) and CPI growth.

The non-demographic growth rate is derived from trends in historical Medicare Benefits Schedule expenditure data. Real age-adjusted spending per person is calculated by adjusting historical spending for CPI growth and changes in the size and age structure of the population. An exponential trend is applied to this historical series, generating a non-demographic growth rate which is then applied as a constant percentage increase in spending across all age and gender cohorts.

Because veterans receive medical services under separate arrangements from the Medicare Benefits Schedule, they are not included in the MBS projections. Spending on medical benefits for veterans is included as other health spending consistent with government budget presentation.

The age profile of medical benefits spending shows that spending per person is higher for older age groups than for younger age groups (Table A2.4.1). Spending per person on medical benefits peaks for those aged above 85.

Table A2.4.1   Index of the age profile of medical benefits spending per person, 2019-20

Age Group	Male	Female
0-4	0.50	0.45
5-9	0.36	0.31
10-14	0.33	0.34
15-19	0.36	0.57
20-24	0.34	0.71
25-29	0.36	0.81
30-34	0.44	1.04
35-39	0.54	1.12
40-44	0.62	1.08
45-49	0.73	1.09
50-54	0.87	1.18
55-59	1.07	1.28
60-64	1.34	1.46
65-69	1.77	1.79
70-74	2.28	2.19
75-79	2.83	2.60
80-84	3.21	2.84
85+	3.39	2.96
Weighted average	**0.86**	**1.13**

Note: Index of average cost per person = 1.
Source: Department of Health, and Treasury.

Pharmaceutical benefits

The pharmaceutical benefits model covers spending under the Pharmaceutical Benefits Scheme and the Repatriation Pharmaceutical Benefits Scheme.

Projections are derived by applying non-demographic growth to current spending on pharmaceutical benefits per person for each age group in each gender. Population and CPI projections are then applied to derive nominal projections of spending. Expenditure on the Repatriation Pharmaceutical Benefits Scheme is included in the projections.

A non-demographic growth rate for each age and gender cohort is derived from trends in historical data on pharmaceutical benefits expenditure. Real per person expenditure for cohorts is calculated by adjusting historical expenditure for growth in CPI, with a linear trend applied to the series to calculate the non-demographic growth factors. Non-demographic growth is projected forward as a constant real dollar increase in spending each year for each age group and gender.

The age profile of pharmaceutical benefits spending shows that spending per person is higher for older age groups than for younger age groups (Table A2.4.2). Spending per person on pharmaceutical benefits peaks for those aged 80 to 84.

Table A2.4.2   Index of the age profile of pharmaceutical benefits spending per person, 2019-20

Age Group	Male	Female
0-4	0.09	0.08
5-9	0.16	0.12
10-14	0.26	0.20
15-19	0.23	0.23
20-24	0.26	0.28
25-29	0.34	0.35
30-34	0.43	0.47
35-39	0.55	0.65
40-44	0.69	0.82
45-49	0.85	0.93
50-54	1.05	1.04
55-59	1.33	1.27
60-64	1.67	1.55
65-69	2.36	2.09
70-74	3.13	2.73
75-79	4.01	3.28
80-84	4.57	3.59
85+	4.27	3.17
Weighted average	**1.01**	**0.99**

Note: Index of average cost per person = 1.
Source: Department of Health, and Treasury.

Hospitals

Government spending on public hospitals is projected based on the parameters of the 2020-25 National Health Reform Agreement (NHRA) over the medium-term period. Under the NHRA the Commonwealth is expected to invest more than $130 billion in demand driven public hospital funding over 5 years from 2020-21. Between 2020-21 and 2031-32, Australian Government spending on public hospitals grows by an average of 6.4 per cent per year.

Spending on hospital services for veterans has been included in the other health spending category consistent with government budget presentation.

Private health insurance rebate

The Government's contribution to an individual's private health insurance rebate is indexed annually by the lesser of the change in CPI or the actual average increase in the premium charged by insurers. Accordingly, the private health insurance rebate model projects spending based on growth in the CPI and population.

The current proportion of private health insurance holders in each 5-year age cohort is assumed to remain constant beyond the forward estimates. The projection model assumes zero non-demographic real growth, as increases in private health insurance prices are capped at the CPI and increases in demand are assumed to be primarily driven by demographic factors.

The proportion of individuals holding private hospital cover is higher for older Australians, with 53 per cent of men aged 65 to 79 holding coverage. For women, those aged 70 to 74 are most likely to hold coverage.

Table A2.4.3   Proportion of the population holding private health insurance cover, 2019-20

Age Group	Male	Female
0-4	0.36	0.35
5-9	0.43	0.42
10-14	0.45	0.45
15-19	0.44	0.44
20-24	0.29	0.31
25-29	0.20	0.24
30-34	0.35	0.40
35-39	0.44	0.48
40-44	0.47	0.50
45-49	0.47	0.50
50-54	0.48	0.50
55-59	0.49	0.51
60-64	0.51	0.53
65-69	0.53	0.55
70-74	0.53	0.56
75-79	0.53	0.54
80-84	0.51	0.50
85+	0.47	0.43
Total	**0.42**	**0.45**

Source: Treasury estimates based on data from the Department of Health.

Other spending

Other health spending includes all other Australian Government health spending. Major components of this expenditure include:

- spending on veterans' health care

- population health and safety programs, health and research

- health workforce programs including payments to general practitioners for infrastructure, training and support, and the Practice Incentives Program.

For the purposes of this report, other health spending also includes expenditure on measures to address the COVID-19 pandemic, including purchases of personal protective equipment and COVID-19 vaccines, as well as funding provided to the states and territories through the National Partnership Agreement on COVID-19 Response. As this spending is expected to cease before the end of the forward estimates it does not flow through to the long-run projections.

Other health spending excluding veterans' health care is assumed to remain constant as a proportion of GDP. This approach is consistent with how other non-demographic payments, other than interest payments, are modelled.

Veterans' health care includes all spending on veterans' health care administered by the Department of Veterans' Affairs except spending on the Repatriation Pharmaceutical Benefits Scheme, which is included in the pharmaceutical benefits projections.

Veterans' spending per person on medical benefits is assumed to be equivalent to the general population, while spending per person on hospitals is assumed to grow at the same rate it does over the forward estimates. Residual veterans' health spending per person is projected as a constant proportion of GDP per person.

Aggregate model

Over time, spending on different components of Australia's health system will grow at different rates, both in the short and medium term. These differences reflect a range of factors including advances in medical technology and policy choices (for example, periods when there is a greater focus on preventative health). History also suggests these differences are unlikely to remain consistent over the long term. For this reason, the projection transitions to an aggregate model of health expenditure from 2031-32.

Real spending per person in each age and gender group is grown by an aggregate non-demographic growth rate. This expenditure is combined with changes in Australia's demographics and forecasts of CPI growth to produce nominal expenditure projections for the years from 2032-33 to 2060-61.

The non-demographic growth rate is calculated from the growth in real, age-adjusted spending per person from all governments. The growth rate is derived from the series of all government health spending adjusted for CPI growth and changes in the size and age structure of the population. The non-demographic growth rate is determined by fitting an exponential trend to the series and is estimated using the past 20 years of historical data. This reflects the most recent period of growth in age adjusted health spending per person but is still long enough to abstract from cyclical changes.

Table A2.4.4   Health spending data sources

Pharmaceutical benefits

Age-cost profiles
Five year age-cost profiles by gender from 2002-03 to 2019-20. Data includes all Pharmaceutical Benefits Scheme and Repatriation Pharmaceutical Benefits Scheme spending administered by the Department of Human Services and sourced from the Department of Health. Where expenditure was not attributed it was imputed to have been distributed according to the profile of expenditure which was attributed.

Historical program spending
Pharmaceutical Benefits Scheme and Repatriation Pharmaceutical Benefits Scheme data from the Department of Health.

Medical benefits

Age-cost profiles
Five year age-cost profiles by gender from 1984-85 to 2019-20. Data includes Medicare Benefits Schedule paid by the Department of Human Services and sourced from the Department of Health. Where expenditure was not attributed it was imputed to have been distributed according to the profile of expenditure which was attributed.

Historical program spending
Medicare Benefits Schedule data from the Department of Health.

Hospitals

Age-cost profiles
Five year age-cost profiles by gender provided by the Department of Health.

Historical program spending
Australian Government funding for public hospitals from the Australian Institute of Health and Welfare and Department of Health.

Private Health Insurance

Proportion of individuals holding hospital cover
Calculated using data from the Australian Prudential Regulation Authority provided by the Department of Health.

Historical program spending
Private Health Insurance Rebate spending from the Department of Health and the Australian Taxation Office.

Other Health

Historical program spending
Healthcare spending on veterans from Commonwealth budget papers and Department of Veterans' Affairs Annual Reports.

Veterans' population
Veterans' population historical data and projections supplied by the Department of Veterans' Affairs.

Source: Treasury.

Aged care

Long-term projections involve judgements around how long trends in spending for different components are likely to continue. The changes to aged care modelling balance the desire for policy insight with the need for internal consistency and transparency in the long-term projections. These changes also align the modelling for aged care spending with the modelling approach taken for other health expenditure. Recent literature on health and aged care spending in Australia has shown that simple demographic models do not adequately explain changes in these expenditures (for example, models that derive predicted healthcare expenditure as a product of age and gender specific per person health care costs and population projections corresponding to those age and gender characteristics). These studies have also highlighted that non-demographic factors are important in driving costs, primarily as a result of technological improvements leading to more expensive medical interventions and increased consumer expectations.[100]

Projections of aged care spending over the next 40 years are based on historical trends in the cost of aged care services per head of population by age and gender, combined with projected population changes, CPI growth, and estimated non-demographic factors.

In general, projections are derived by first applying an estimated non-demographic growth rate to the current aggregate spending per person. These estimates are then increased by projected population growth and CPI growth to derive a nominal projection of spending.

For simplicity, the modelling approach estimates one non-demographic growth rate for total aged care spending, rather than for individual age cohorts. The non-demographic growth rate is derived from trends in the historical data. This is done by first adjusting historical aged care spending data for CPI growth and changes in the size and age structure of the population to derive a series of real, age-adjusted aged care spending per person. The non-demographic growth rate is then determined by fitting a trend to this series. For spending on aged care, an exponential trend fits the data more closely than a linear trend, so non-demographic growth is projected as a percentage increase in spending each year.

Modelling approaches for aged care expenditure have varied across intergenerational reports. But ultimately, they capture and project similar effects, leading to similar estimates of growth in aged care spending as a proportion of GDP over the long term. Aged care spending for the 6 years beyond the end of the forward estimates (over the medium-term period to 2030-31) is based on growth in aged care spending at a component level. From 2031-32 onwards (that is, the long term), this report uses a model of total Australian Government aged care spending that assumes that

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100   A. Harris and A. Sharma, 'Estimating the future health and aged care expenditure in Australia with changes in morbidity', *PLOS ONE,* 13(8), 2018.

non-demographic growth increases to the historical growth rate for aged care spending.

The growth in aged care spending is driven by both non-demographic factors and growth in the number of people aged 85 and over (the age cohort who make up the vast majority of aged care usage). The relative impact of recipient growth falls over the projection period and the growth in costs becomes the dominant factor in aged care spending growth. This is a result of the decreased growth in the number of people aged 85 and over as the smaller cohort which follows the baby boomers moves into aged care eligibility ages.

Non-demographic factors could include government policy decisions, changing consumer preferences and real wage developments. Population growth and price growth are relatively stable contributors to aged care spending growth. Growth in the estimated non-demographic factor has been volatile over history, largely reflecting policy adjustments over the past 2 decades as consumer preferences have changed and people's desire and ability to age at home has grown. As a result, there can be large variability in the historical average non-demographic growth rate depending on the time period over which it is calculated. The approach used in this report assumes that growth in the non-demographic factor converges to its 20-year historical average over a 10-year period to smooth the transition and avoid sharp adjustments between the end of the medium term and the beginning of the long-term period.

National Disability Insurance Scheme

The National Disability Insurance Scheme (NDIS) is a mechanism for funding long-term care and support for people with disability. This is the first Intergenerational Report in which the NDIS has been geographically available across all of Australia. The total cost of the scheme is a function of both the growth in average package costs and the number of scheme participants.

Prior to 2013-14 and the establishment of the NDIS, the Australian Government provided funding to states and territories for specialist disability services, including under the National Disability Agreement and the Commonwealth, State and Territory Disability Agreement, contributing $1.2 billion in 2013. The Commonwealth also provided funding directly to national programs (for example, the Home and Community Care Program). The Australian Government still provides additional support for people with disabilities outside the NDIS through specialist programs, income support and employment support.

The 2015 Intergenerational Report projected NDIS expenditure based on the Productivity Commission's 2011 inquiry report into Disability Care and Support. Since then the model used for projections of NDIS spending has been updated to incorporate additional data that has become available as the scheme has been rolled out nationally, and as more participants have joined the scheme. This report takes a different approach and combines projections provided by the Department of Social Services for the 10 years to 2031-32 with a long-run aggregate model.

As at 31 March 2021 there were 450,000 participants in the NDIS. This number is expected to increase at around 5 per cent per year over the next 10 years as eligible Australians are brought onto the Scheme. From 2031-32 the number of NDIS participants is expected to grow in line with population growth. The projections assume no change in age-specific disability rates and distinguish between NDIS participants aged between 0 to 64 and 65+.

Projections of package costs are based on an average across all NDIS participants. Growth in average annualised payments per participant has averaged 12 per cent per year since April 2017. From 2024-25 onwards average package costs are projected to grow by a combination of wages (Average Weekly Earnings) and price inflation (CPI). This assumption reflects the fact that the main driver of NDIS costs is provider wages, along with a small capital component.

The Australian and state governments jointly fund the NDIS, with state funding contributions determined by bilateral agreements between the Australian and state governments. State funding contributions to the NDIS are expected to grow in line with their bilateral agreements, with the Australian Government responsible for the remaining cost.

The model also includes funding for the National Disability Insurance Agency (NDIA), which the Australian Government provides. Over the projection period these costs are expected to increase in line with CPI.

Income support payments

Comprehensive policy models

Age and Service Pension

Age and Service Pension expenditure, as well as other projections related to the retirement income system, are produced using Treasury's Model of Australian Retirement Incomes and Assets (MARIA). MARIA is a long-term, population-level, dynamic microsimulation model of Australia's retirement income system. MARIA begins with 2015-16 administrative base data supplemented with survey data from the HILDA Survey and the ABS Survey of Income and Housing. The model is run on a representative sample of this complete dataset.

MARIA uses Treasury analysis to develop input parameters that simulate the characteristics of each individual for every year of the model run, based on their characteristics in the previous year. These characteristics include household composition, labour force participation, income, and compulsory and voluntary superannuation contributions. Some characteristics are not modelled dynamically year-on-year, but rather imputed at the point of retirement. These characteristics include home-ownership status and non-superannuation savings. The imputation is based on factors such as age, education level, work experience and superannuation balance.

MARIA's key output is defined contribution superannuation amounts held by individuals, both accumulation throughout working life and drawdown in retirement. MARIA can therefore also project the aggregate defined contribution funds under management in the superannuation system.

MARIA projects Age Pension spending and coverage based on the simulated superannuation assets, imputed non-superannuation assets and deemed income of individuals and their partners.

Long-run estimates of superannuation tax concessions

The long-run value of superannuation tax concessions (benchmark variations) is estimated using MARIA on a revenue forgone basis. The cost of tax concessions is estimated independently each year (that is, there is no dynamic impact of the removal of concessions over time). These estimates broadly replicate the methodology and benchmark used in the Tax Benchmarks and Variations Statement, and include: combined estimates of capital gains and earnings tax concessions provided to superannuation funds (reflecting a combined C1 and C4 estimate from the Tax Benchmarks and Variations Statement); and contributions tax concession estimates (reflecting a combined C2 and C3 estimate from the Tax Benchmarks and Variations Statement).

Unlike the Tax Benchmarks and Variations Statement, the long-run estimates in MARIA have been constructed on an additive basis to facilitate analysis of trends. The value of superannuation tax concessions is estimated by adding contributions and earnings to taxable income in 2 stages and applying the progressive income tax rates at each stage. The value of the earnings tax concession is the difference between the total value of concessions and value of contributions tax concessions.

From 2035-36, several personal income tax thresholds and offsets that comprise the benchmark are assumed to be indexed to wage growth.

Coverage trend models

Coverage trend models are used where spending is strongly related to participation rates for a payment and the unit cost growth is linked to a price index. These models are used to project spending on Disability Support Pension, Parenting Payment Single, Parenting Payment Partnered, JobSeeker Payment, Youth Allowance (Student and Other) and Austudy, Carer Payment, Family Tax Benefit, Paid Parental Leave, and Child Care Subsidy.

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 spending. The standard unit cost is usually independent of age or gender and assumed to grow in line with either wages or CPI growth (or a combination) in the future. The projection of coverage may involve non-linear techniques such as logistic functions.

Table A2.4.5   Income support payment projection methodologies

	Coverage rates	Future trends	Unit cost growth outside forwards estimates
Disability Support Pension	Based on age and gender	Logistic curves used to taper growth	AWE
Parenting Payment Single	Based on age and gender	Based on current take-up ratios	AWE
JobSeeker Payment	Based on age and gender	Based on current take-up ratios	CPI
Youth Allowance (Other)	Based on age and gender	Based on current take-up ratios	CPI
Parenting Payment Partnered	Based on age and gender	Based on current take-up ratios	CPI
Carer Payment	Based on age and gender	Logistic curves used to taper growth	AWE
Youth Allowance (Student)	Based on age and gender	Based on current take-up ratios	CPI
Austudy	Based on age and gender	Based on current take-up ratios	CPI
Family Tax Benefit	Based on age	Based on current take-up ratios	CPI
Child Care Subsidy	Based on age	Based on current take-up ratios	CPI

Source: Treasury.

Education

The Australian Government's Job-ready Graduates Package is included in the projections for higher education spending from 2021. The indexation of the cap on Commonwealth Grant Scheme (CGS) funding for universities has been revised to reflect the CPI. Location specific university funding under the CGS is included in the projections.

Since 2018 the Australian Government has increased support to underfunded schools though the Quality Schools reforms. As part of these reforms, the Australian Government implemented the Schooling Resource Standard (SRS), which is an estimate of how much total public funding a school needs to meet its students' education needs, which is an important factor influencing schools spending. Average funding amounts per student are indexed to the SRS, and student growth is based on population projections by age. Vocational education and training (VET) participation rates for apprentices and students are projected to grow in line with the general population. The average funding amount per student is indexed to wages.

Defence

Defence spending projections are based on nominal projections over the period to 2031-32, consistent with current Government spending commitments at the 2021-22 Budget. From 2032-33, defence funding is assumed to grow at the same rate as nominal GDP growth.

GST payments

As the GST is passed on to the states, GST payments are assumed to equal GST receipts plus the GST pool boost in the long run.

Other spending

A range of government spending is not explicitly modelled, including spending on the Australian Public Service, law and order, the arts, community development and tourism. This 'other spending' component is calculated as the residual of total payments over the forward estimates (sourced from the Australian Government financial statements) and total modelled payments. Over the medium and long run, this component is indexed to nominal GDP growth.

2.5   Balance sheet items

Investment Funds

Investment funds are modelled over the projection period based on indexation assumptions, such as CPI, and investment mandates.

The Future Fund is modelled based on the Government's current investment mandate, which states that the benchmark annual average return is equal to at least CPI plus 4 to 5 per cent per year. For modelling purposes, drawdowns from the Future Fund are assumed to commence the year after the size of the fund equals the target asset level, which is projected to occur in 2031-32. Drawdowns are assumed to be equal to the Government's annual unfunded superannuation payments, consistent with the intent of the Fund's establishment.

Modelling assumes that the holdings of the Future Fund are broadly allocated between 2 financial asset classes: investment (cash and other liquid assets such as interest-bearing liabilities) and equity holdings, with the asset portfolio weighted towards investment products. This is consistent with the current asset allocation of the Fund.

Higher Education Loan Program (HELP)

Projections of the HELP receivable rely on a microsimulation model of incomes and repayment parameters using data on the income and transactions of HELP debtors provided by the Australian Taxation Office. The model simulates future incomes for each individual with an outstanding HELP debt based on the incomes reported to date and a limited number of demographic variables. The simulated income profiles allow future repayments against the outstanding debt to be estimated as well as estimating debt that is not expected to be repaid. The discount rate applied to projected repayments is assumed to increase over the forward estimates from a current rate of 1.3 per cent per year and is then held constant at 5 per cent from 2025-26 onwards.

The repayment pattern generated by the model for debt incurred in the most recent financial year is applied to debt that is expected to be incurred in future years. This approach implicitly assumes that any growth in the aggregate debts being incurred, over and above normal indexation rates, is the result of increased numbers of students rather than higher average debts in real terms.

Repayment prospects of VET debtors are modelled separately to non-VET debtors, relying on their income profiles available to date and a broadly similar methodology to that used to project non-VET debtors.

Government employee superannuation

Projections of the unfunded defined benefit superannuation liability, and the associated Commonwealth cash outlays, are based on actuarial valuations and demographic and economic assumptions.

The 4 major defined benefit superannuation schemes in 2020-21 are closed to new members (the Commonwealth Superannuation Scheme, the Public Sector Superannuation Scheme, the Defence Force Retirement and Death Benefits Scheme, and the Military Superannuation and Benefits Scheme). Australian Defence Force Cover remains open to new members and is projected to become the major defined benefit superannuation scheme over the long run.

3.   Sensitivity analysis

Different variables will produce different outcomes from those assumed in modelling and projections. Sensitivity analysis assesses the significance of uncertainty by considering alternative assumptions for the main variables. This analysis can illustrate the impact of small changes in assumptions on economic and fiscal aggregates.

Sensitivity analyses have been performed for the purpose of this report:

- Sensitivity of economic and fiscal aggregates to proportional migration projections (Box 2.1, Chapter 2 – Population).

- Sensitivity of economic and fiscal aggregates to lower trend productivity growth (Box 4.2, Chapter 4 – Productivity).

- Sensitivity of the fiscal aggregates to lower and higher bond yield assumptions (Box 6.3, Chapter 6 – Budget Projections).

Tables A3.1 and A3.2 contain additional information and results of the population and productivity sensitivity analyses. The sensitivity analyses are prepared with alternative economic parameters, payment, receipt and balance sheet inputs into MFASA.

Table A3.1   Assumptions underlying sensitivity analysis

	Baseline	Proportional migration	Lower productivity growth
Economic			
Labour productivity growth (per cent)	1.5	1.5	1.2
Demographic			
Long-term annual net overseas migration from 2031-31 to 2060-61	235,000 people	0.82 per cent of population	235,000 people

(a)   Under the proportional migration sensitivity analysis, net overseas migration reaches 327,000 people per year in 2060-61, compared with 235,000 per year in the baseline population projections.

(b)   Under the productivity sensitivity analysis, growth in underlying productivity is assumed to converge to the average of the most recent productivity cycle of 1.2 per cent by 2024-25 and remain at that rate of growth for the remaining period.

Table A3.2   Sensitivity analysis results

	Baseline		Migration	Productivity
	2020-21	**2060-61**	**2060-61**	**2060-61**
Economic				
Real GDP growth (%)	1.2	2.3	2.6	2.0
Real GDP per person growth (%)	1.1	1.4	1.5	1.1
Real GDP per person ($)	76,700	140,900	141,500	127,600
Labour force participation	65.8	63.6	64.3	63.6
Labour force size (millions)	13.7	20.7	21.7	20.7
Old-age dependency ratio	3.9	2.7	2.8	2.7
Spending (per cent of GDP)				
Health	4.6	6.2	6.1	6.9
Aged care	1.2	2.1	2.0	2.3
Age and Service Pension	2.7	2.1	2.1	2.1
Payments to individuals	4.8	2.7	2.7	2.8
Education	1.9	1.2	1.2	1.3
Fiscal projections (% of GDP)				
Underlying cash balance	-7.8	-2.3	-1.8	-4.5
Primary balance	-7.1	-0.6	-0.3	-1.9
Gross debt	40.2	40.8	35.8	63.9
Net debt	30.0	34.4	29.6	57.1
Net financial worth	-37.4	-38.5	-33.4	-55.7

Note: Results in this table may differ from those presented in this report due to rounding.
Source: Treasury.

Bond yield sensitivity analyses

This report employs a technical assumption for baseline bond yields. Following a period of fixed nominal yields, the 10-year bond yield converges linearly from 2024-25 over 15 years to a long-run 10-year bond yield of around 5 per cent, consistent with long-run nominal GDP growth. Bonds with other tenors have differing yields but are constructed around the 10-year bond rate profile.

The lower and higher bond yield sensitivity analyses included in this report illustrate the impact of changes in the yield assumption in isolation. There are 2 main fiscal components that are calculated separately and then combined to estimate the impact of the alternative yield assumption on fiscal aggregates.

Firstly, the effect of the alternative yield assumption on government investment fund interest and dividend receipts and term deposit drawdowns is calculated. These impact the financing task and flow through to interest payments on government debt. Secondly, the effect of the alternative yield assumption on bond yields is calculated, which flows through to interest payments.