BIS OXFORD ECONOMICS

2020 MACROECONOMIC PROJECTIONS REPORT: FINAL

PREPARED BY BIS OXFORD ECONOMICS FOR THE AUSTRALIAN ENERGY MARKET OPERATOR

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TABLE OF CONTENTS

1. Introduction 7
2. Scenario Assumptions 8
2.1. Demographic assumptions framework 8
2.2. Drivers of migration 8
2.3. Central case migration assumptions 8
2.4. Slow change and step change migration assumptions 9
2.5. Economic Assumptions 10
3. Central scenario: Demographic projections 11
3.1. State level projections 12
3.1.1. New South Wales 12
3.1.2. Victoria 13
3.1.3. Queensland 13
3.1.4. South Australia 14
3.1.5. Western Australia 14
3.1.6. Tasmania 15
3.1.7. Northern Territory 16
3.1.8. Australian Capital Territory 17
4. Central scenario: National outlook 18
4.1. National Economic Outlook 18
4.1.1. International conditions 18
4.1.2. Gross Domestic Product 19
4.2. Foreign Exchange Rate 20
4.3. Industrial production 21
4.3.1. Mining Sector Outlook 22
4.3.2. Manufacturing Sector Outlook 23
4.3.3. Utilities Outlook 23
4.4. Services Sector Outlook 24
5. Central scenario: States outlook 27
5.1. New South Wales 27
5.2. Victoria 29
5.3. Queensland 30
5.4. South Australia 31
5.5. Western Australia 33
5.6. Tasmania 34
5.7. Northern Territory 35
5.8. Australian Capital Territory 37
6. Slow change scenario 39

6.1. Population 39
6.2. Macroeconomic outlook 40
6.3. Sector breakdown 41
6.4. Relative states performance 42
7. Step change scenario 44
7.1. Population Forecasts 44
7.2. Macroeconomic Outlook 45
7.3. Sectoral Composition of GDP 46
7.4. Relative states performance 47
Appendix A: Oxford Economics GEM Model and Australia State Forecasts 48
Global Economic Model 48
Structure of the GEM 49
Modelling the macro outlook for states 50
Appendix B: BIS Oxford Economics vs. ABS Population Forecasts 52
8.1. Comparison of assumptions for NOM and NIM 52
8.2. Implications for population projections 53
Appendix C: Comparison with other forecasts 59
Appendix D: Comparison with previous projections 60
Appendix E: Downside Risks to Baseline Forecasts 61
Abbreviations 63

Executive Summary

In this report we present the economic projections for three of the Australian Energy Market Operator's (AEMO) alternative outlooks for the Australian economy, the Central scenario, Slow Change scenario and the Step Change scenario. The analysis was conducted using AEMO's core assumptions for each scenario coupled with BIS Oxford Economics' suite of quantitative models for the Australian economy, that enable rigorous modelling at the macro, industry and state level.

Central scenario

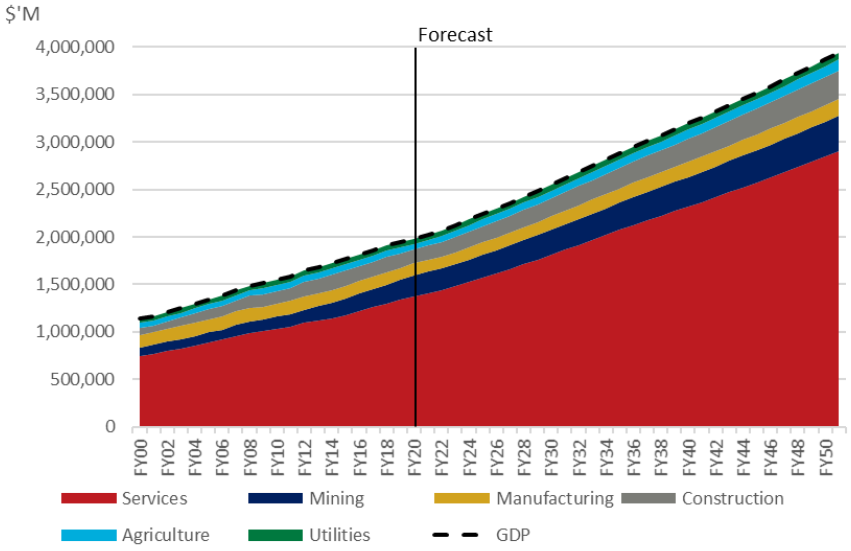
The Central scenario encapsulates the most likely outcome for Australia's economy over the next thirty years. It is built up using mid projections for population growth and assumes a continuation of current policies and trends in technological progress (including current policies towards the uptake of renewable energy and transformation of the power network). In this scenario, moderate improvements are made in energy efficiency, and some fuel switching away from fossil fuels towards low emissions sources takes place. Relative to history, technological progress is slower, with the economy held back by the secular stagnation[1] trends that have impacted all developed economies over the last decade.

After recording below-trend growth of 2% in FY19, cyclical headwinds are continuing to weigh on the economy. Residential construction is continuing to trend down, with the leading indicators (particularly building approvals) implying that the drag will extend until the end of 2020. Momentum in consumer spending also remains subdued, with households choosing to increase their savings and pay down debts, rather than increase spending. And the economy is now facing two major exogenous shocks, with the bushfires and coronavirus outbreak both hitting the country in Q1. Growth momentum is expected to slow further in FY20, to 1.8%, before a modest acceleration to 2.2% in FY21. The recovery in momentum is expected to begin in earnest in late FY21. The latest building approvals data suggests that residential construction activity will begin to rebound in early 2021. And the next wave of mining projects are now getting underway, with the central case assuming that those that have been granted FID (or are in the final stage of internal review to reach this) move into the construction phase over the next 1-2 years. Consumer spending is also expected to recover, as confidence rebounds amid continued employment growth and modest gains in wages. Individuals are also set to benefit from income tax cuts that are legislated for 1st July 2022 and (more substantively) 1st July 2024. Together, these shifts will drive the pace of growth close to 3% p.a. in the mid-2020s. Momentum is then expected to slow gradually over the long run, to 2% p.a. by 2050, constrained by the rate of population growth and technological progress.

Across the sectors, further rapid increases in mining sector output in the near term will structurally increase the sector's share of GDP, although a partial reversal is expected over the near term as other sectors recover from their cyclical low. Services will also increase their share, while the manufacturing sector is expected to continue to decline in relative terms.

[1] Secular stagnation has manifested itself in a number of different channels across developed economies, including chronic weakness in private sector investment, relatively low levels of government investment (in some cases), and slower productivity growth, all of which weigh on GDP growth and improvements in living standards.

Figure 1 Gross Domestic Product by industry sector breakdown – History & Forecast



Source: BIS Oxford Economics

Across the states, the relative winners are those where population growth is strongest and/or where recent underperformance results in a strong cyclical upturn in the near term. Of the largest states, VIC is the strongest performer and NSW and SA the weakest; VIC will continue to benefit from robust population growth, while NSW and SA experience the opposite. QLD and WA are also expected to see relatively robust growth over the forecast horizon, with both economies expected to see a cyclical upturn driven by mining investment activity and a return to relatively fast population growth in the medium and long term.

Table 1-1 GDP & GSP, Compounded Annual Growth Rate (CAGR)

	AUS	ACT	NSW	QLD	SA	TAS	VIC	WA	NT
FY 20-25	2.5%	3.0%	2.1%	2.6%	1.7%	2.1%	3.0%	2.4%	2.4%
FY 25-30	2.6%	3.0%	2.3%	2.6%	1.9%	1.9%	3.0%	2.7%	2.5%
FY 30-35	2.5%	2.9%	2.4%	2.5%	1.8%	1.8%	2.7%	2.6%	2.7%
FY 35-40	2.1%	2.5%	2.0%	2.2%	1.6%	1.5%	2.2%	2.2%	2.6%
FY 40-50	1.9%	2.3%	1.9%	2.0%	1.4%	1.5%	2.0%	2.0%	2.6%

Source: BIS Oxford Economics

The trends in GSP are reflected in household income. Once again VIC, QLD and WA are outperformers, while NSW and SA lag behind, reflecting their growth fundamentals. But NSW remains a relatively high-income state as a result of the industry composition of its economy (particularly the focus on high value add services such as financial intermediation).

Table 1-2 Household disposable income, CAGR

	AUS	ACT	NSW	QLD	SA	TAS	VIC	WA	NT
FY 20-25	2.7%	3.1%	2.3%	2.6%	1.8%	2.4%	3.4%	3.1%	3.2%
FY 25-30	2.8%	3.4%	2.5%	2.9%	2.3%	2.7%	3.0%	3.4%	3.9%
FY 30-35	2.5%	3.1%	2.2%	2.6%	2.0%	2.4%	2.7%	3.0%	3.6%
FY 35-40	2.1%	2.6%	1.9%	2.1%	1.6%	2.0%	2.2%	2.5%	3.2%
FY 40-50	1.9%	2.4%	1.7%	1.9%	1.4%	1.8%	2.0%	2.2%	3.1%

Source: BIS Oxford Economics

Alternative scenarios

The Slow Change and Step Change scenarios respectively capture outcomes for the economy where population growth (particularly Net Overseas Migration) and technological progress lag behind (outpace) the central case. As a result of these trends, GDP growth is materially weaker (stronger) than the central case, as highlighted by the table below.

Table 1-3 GDP y/y growth Central vs. Alternative Scenarios, Australia, CAGR

	Central	Slow_Change	Step_Change
2020-25	2.5%	2.1%	2.8%
2025-30	2.6%	2.3%	2.8%
2030-35	2.5%	2.1%	2.8%
2035-40	2.1%	1.8%	2.4%
2040-51	1.9%	1.6%	2.2%

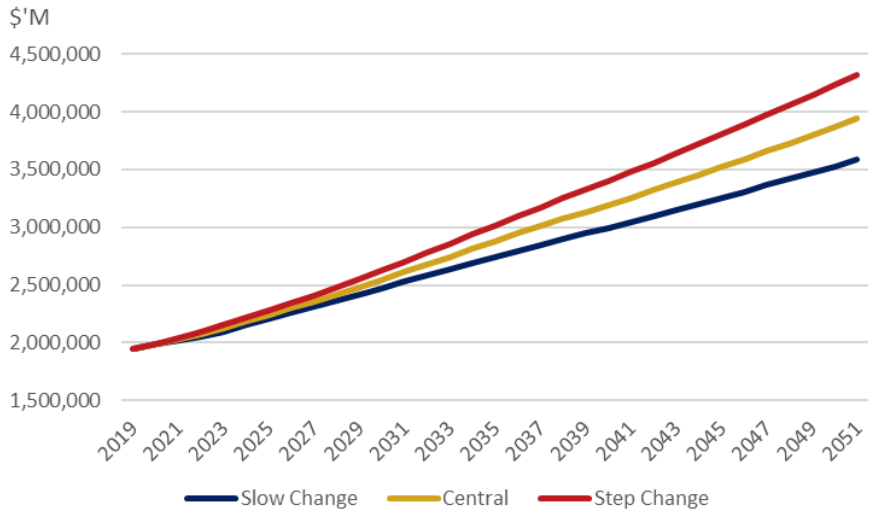
Source: BIS Oxford Economics

Both alternative scenarios capture significant differences in productivity improvements and economic growth across the global economy. In particular, the Slow Change scenario is characterised by a slower pace of technological progress, including a moderation in the pace of globalisation (which is critical to facilitating technological improvements via cross-country spillovers). Crucially for Australia, this results in lower absolute demand for commodities (with some of the investment projects expected to commence in the central case assumed to not proceed), despite the commodity intensity of production being higher (as a result of slower technological progress). The reduction in demand for commodities weighs on the AUD, which depreciates relative to the central case. Conversely, the opposite transmission is observed in the Step Change scenario, and as a result the AUD equilibrates at a higher level than the central case.

Across the states, the largest relative loser in the Slow Change case is NSW. Weaker NOM into the state disproportionately weighs on the state's productive potential, as does the slower transition to high value add services. In contrast WA is a relative winner; although absolute output from the mining sector is lower (as outlined above), its share of GDP increases as a result of the increase in the commodity intensity of output.

In the Step Change scenario, the broadly symmetrical scenario assumptions mean that the reverse outcomes materialise; NSW is the biggest relative winner, while WA sees its share of GDP decline by more than any other state.

Figure 2 Gross Domestic Product: Central vs. Alternative Scenarios



Source: BIS Oxford Economics

1. Introduction

BIS Oxford Economics has been commissioned by the Australian Energy Market Operator (AEMO) to produce the economic and population forecasts that feed into AEMO's three key scenarios for their 2020 suite of energy outlook reports:

- **Central Scenario:** the central pathway for Australia's energy transition, defined by current policies and the most likely trajectory for technological progress and economic development.
- **Slow Change Scenario:** a more moderate energy transition characterised by a slower consumer response, reduced investment appetite and lower government involvement. This scenario is also characterised by a subdued pace of economic and population growth (compared to the central scenario), and a weaker AUD.
- **Step Change Scenario:** strong action on climate change leads to a step change in the pace of the reduction of greenhouse gas emissions. Underpinning this is a faster pace of technological improvements and increased infrastructure developments, and a more aggressive profile for consumer-led innovation and emissions reduction. This scenario is also characterised by stronger economic and population growth than the central scenario, and a stronger AUD.

This report has been produced to accompany a set of quantitative macroeconomic forecasts for the three scenarios outlined above. This report has been structured as follows:

Chapter 2: Outlines the economic and demographic assumptions for each of the three scenario settings

Chapters 3 & 4: Presents the economic and demographic projections for the *Central Case* scenario

Chapters 5 & 6: Presents the economic and demographic projections for the two alternative scenarios

Appendix A: Details BIS Oxford Economics' proprietary global, industry and state models.

Appendix B: Provides a comparison of BIS Oxford Economics population forecast to ABS Series B

Appendix C: Provides a comparison of BIS Oxford Economics forecasts to public forecasts

Appendix D: Provides a comparison of the current central case projections with the forecasts from the 2019 report.

2. Scenario Assumptions

2.1. Demographic assumptions framework

As part of our coverage of Australia's economy, BIS Oxford Economics produces internal population forecasts that are consistent with economic developments across the country. The core demographic assumptions (such as fertility rate, births and deaths) that primarily drive the Natural Increase (NI) in the population, are taken from ABS Series B; we see these variables as being largely unaffected by economic developments, and we therefore treat them as exogenous assumptions. In contrast, analysis of the historical data highlights that migration flows are linked to economic fundamentals, and we therefore model these series endogenously.

2.2. Drivers of migration

As migration trends are more closely tied to economic fundamentals (both at home and externally), BIS Oxford Economics takes an independent house view on Net Interstate Migration (NIM) and Net Overseas Migration (NOM)[2]. Historically, changes in NIM have been associated with the relative economic performance of the states. The mining investment boom and subsequent downturn over the last decade has resulted in the level of NIM and NOM (as a proportion of total NOM) into WA and QLD rising above historical averages in the years 2011-13, before a sharp fall back over 2013-16 when engineering construction activity entered a sharp downturn. Most recently, both states have seen a reversal (particularly of the fall in NIM), in line with the trough of mining investment activity.

The level of NOM is also influenced by external economic conditions, which influence both the net supply of skilled labour (both temporary and permanent migrants) and the net supply of international students. Fluctuations in the net supply of skilled labour are impacted by relative economic conditions in Australia compared to the rest of the world[3], while net student arrivals are determined by the relative competitive of Australia as a destination for higher education, the size of the student-age population, and average income levels in the source country[4].

2.3. Central case migration assumptions

Given the current trends in the national economy and the pipeline of major construction activity which typically drives flows in construction workers, our baseline forecast (which is the basis for the central base) assumes the following migration trajectories:

- NOM is projected to fall back slightly over the near term, driven by an improvement in economic conditions globally, which gently discourages temporary worker arrivals. A pick-up is expected over the medium term, underpinned by an acceleration in the domestic economy as the current headwinds abate.
- NOM is expected to settle at 250,000 p.a. in the long run, close to its current level. Across the states, relative to their current levels NOM into QLD and WA is expected to recover. These shifts will be offset by declines in NOM into NSW and VIC.
- Similar to NOM, the anticipated economic recovery in QLD and WA is expected to drive a recovery in NIM into both WA and QLD. These shifts will be offset by falls in NIM into

[2] See Appendix B for a summary of the assumptions underpinning ABS Series B projections, which is used as a point of comparison for the central case.

[3] Our analysis suggests that changes in conditions within Australia are a more important driver. For example, the high levels of NOM seen in the early 2010s were largely a result of the mining investment boom.

[4] The drivers listed typically drive gross student arrivals in any given year. The outflow of students is largely determined by the inflow in previous years, reflecting the fact that most foreign students return to their country of origin after they have completed their course of study.

NSW and VIC, with NSW projected to see a more substantial downward correction given the expected relative underperformance of its economy.

- In the long run, we expect NIM to be elevated in WA and QLD compared to its historical average over the long run. This reflects an assumed higher level of NIM (given the larger population base) and ongoing attractiveness of both states to locals. These assumptions are exactly offset with lower levels of NIM for VIC and NSW (and proportional to total flows, SA), with NSW once again the relative underperformer.

2.4. Slow change and step change migration assumptions

The following table outlines the assumptions for NOM, NIM and NI that underpin the population forecasts across the slow change and step change scenarios.

Figure 3 Population & Demographic Assumptions

	Slow Change Scenario	Step Change Scenario
Net Overseas Migration	**Cyclical drivers:** A weaker domestic economy makes it more difficult for overseas job seekers, deterring migration while a weaker global economy dampens migration of foreign students. NOM is lower as a result. Across the states we would not expect to see a significant change in the distribution, as all states are subject to both drivers (although to different degrees). **Structural drivers:** Coupled with the economic shifts outlined previously, this scenario could be characterised by a lower visa processing cap for permanent migrants. This shift would be consistent with the broader economic narrative of weaker global growth as a result of limited increases in globalisation, and a potential rolling back of some of the international integration already established.	**Cyclical drivers:** A stronger domestic economy attracts more overseas job seekers while a stronger global economy boosts overseas migration more broadly, with more foreign students migrating for tertiary study. Although characterised by an acceleration in the shift away from high emissions resources such as coal, demand for iron ore, other minerals and cleaner fuels such as natural gas increases, as a result of stronger global growth. This in turn drivers demand for labour in WA and QLD. **Structural drivers:** The cyclical drivers outlined are assumed to be maintained into the long run, as government policy globally results in a step change in the trajectory for the global economy. In addition, as part of a broader improvement in the trading environment and global integration, the cap on permanent migrants is assumed to be raised.
Net Interstate Migration	**Cyclical drivers:** We would expect this scenario to be characterised by generally weaker-than-baseline demand for commodities globally, which weighs on the investment intentions (and broader economies) of WA and QLD in particular. This outcome would be consistent with a weaker pace of interstate migration into both states relative to the baseline in the near term. **Structural drivers:** We would expect the cyclical shifts seen in NIM to be at least partially maintained into the long run. Therefore, if all else is held constant, the total population will be *lower* in the destination states and *higher* in the origin states than in the central scenario. But the changes relative to baseline are likely to be relatively limited.	**Cyclical drivers:** The impact of this scenario on NIM is ambiguous. Typically, stronger mining construction activity triggers an increase in NIM into WA and QLD. But in this case the shift away from dirty commodities and an acceleration in technological progress to reduce emissions more broadly could dampen NIM, as the skills needed in WA and QLD to implement these changes are highly specialised and not available locally. **Structural drivers:** As outlined previously, we would not necessarily see a shift in NIM in this case, with competing drivers cancelling each other out.
Natural Increase	ABS Series B	ABS Series B

2.5. Economic Assumptions

The central scenario is developed using BIS Oxford Economics' Global Macro, Industry and Local Area models[5]. In the absence of policy and technology shocks, that fundamentally alter the profile for technological progress, this represents the most likely pathway for the domestic and global economy, which will then feed into the central pathway story for energy transition.

Around the central case we have constructed assumptions for the slow change and step change scenarios, that focus on varying key assumptions for technological progress (including its profile with respect to commodities consumption), labour force participation, and capital accumulation. As part of this exercise, we have explicitly considered the political environment (both domestically and globally), and the impact of these changes on commodity prices and the AUD, with some differentiation expected across the commodities spectrum.

The following table outlines the scenario variations, relative to the Central scenario, for the components that drive the macroeconomic forecasts.

Figure 4 Alternative Scenario Assumptions

	Slow Change Scenario	Step Change Scenario
Consumption	Weaker than central scenario, driven by lower household disposable income per capita and slower population growth.	Stronger than central scenario, driven by higher household disposable income per capita and stronger population growth.
Investment (Public & Private)	Lesser appetite for investment by both government and private sector than the central scenario and in the long run reinforced by slower population growth requiring less investment (such as in residential construction) than the central scenario.	More aggressive appetite for investment by both government and private sector than the central scenario and in the long run reinforced by stronger population growth requiring more investment.
Foreign Trade	Weaker global growth and higher trade barriers leading to reduced foreign trade	Stronger global growth and reduced trade barriers leading to greater foreign trade
Technological Progress	Slower pace of technological progress than the central scenario, partly due to lower levels of investment.	Faster pace of technological progress than the central scenario due to higher levels of investment and a more conducive policy environment.
Capital & Labour Productivity	Reduced productivity, partly linked to a less supportive policy environment.	Increased productivity as a function of technological progress
Global Economic Growth	Weaker global growth as a result of slower productivity and population growth. These limit increases in demand for commodities generally as the level of demand is lower, but there could be some support for coal and other dirty commodities if we also assume less progress towards achieving emissions abatement targets.	Stronger global growth as a result of faster productivity and population growth.
AUD	The AUD is weaker than central case as a result of general weakness in commodity markets.	The strength in global demand underpins demand for commodities generally, providing support to prices and the AUD. But the impact is heterogeneous across the commodities spectrum, to reflect policy objectives with respect to emissions abatement.

[5] For a more detailed outline of these models please see Appendix B.

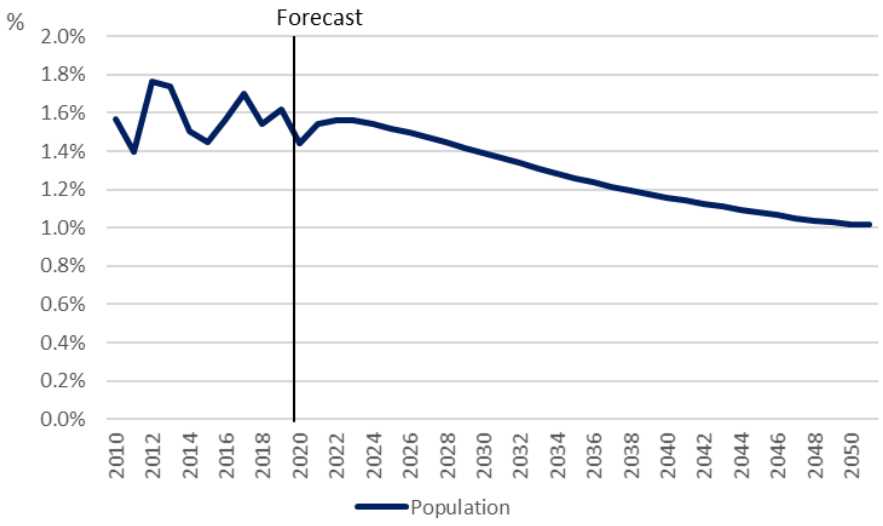
3. Central scenario: Demographic projections

- **Overseas migration flows will account for an ever-increasing proportion of population growth, as the ageing population and further falls in the birth rate weigh on the natural increase of the population**
- **NSW will continue to attract significant numbers of international migrants, but a rise in interstate outflows will be a drag, resulting in the state's population share falling from 32% to 29% by 2050.**
- **Significant overseas and interstate inflows into VIC and QLD will result in an increase in population shares, from 26% to 28% and 20% to 22% respectively.**

This chapter presents the central scenario outcomes for the key economic variables at a national and state level. Demographics data recently published by the ABS reveals that the Australian population grew by 1.5% over the year to June 2019. This was on par with growth seen in the year prior and remains above the long run average. Approximately 382,000 persons were added to Australia's population over the twelve months, lifting the estimated resident population to 25.4 million.

The pace of population growth is expected to hold steady over the near term, before entering a structural decline, from its current 1.5% p.a. to 1% p.a. by FY51. While this is a product of several factors, a key driver is the structural decline in the average number of births per female. This rate has fallen steadily for a number of decades and is now 1.74 (it has not been at or above the replacement rate of 2.1 since the 1970s). As a result (and despite continued positive NOM), the growth rate of population will moderate over time.

Figure 5 Population y/y change, Australia

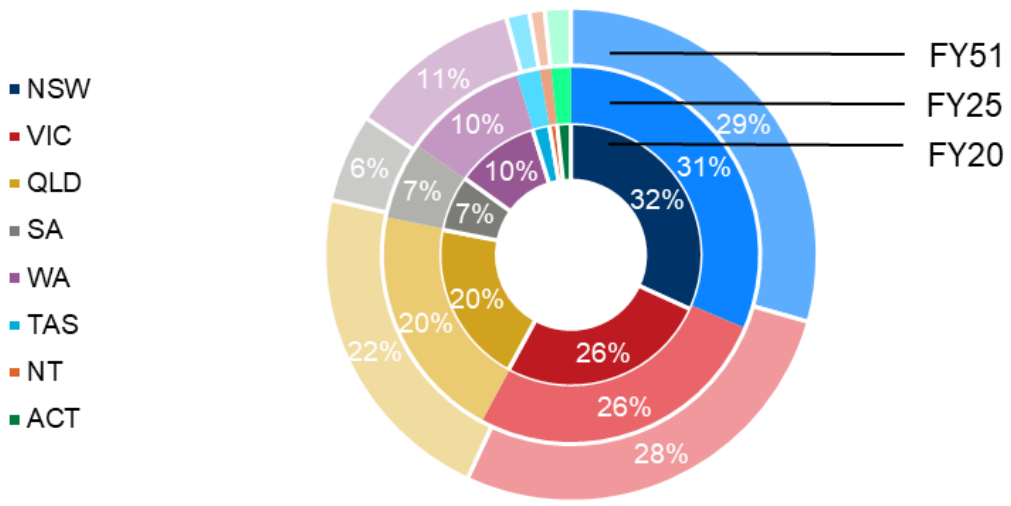


Source: BIS Oxford Economics/ ABS

3.1. State level projections

Across the states, NSW is expected to grow at a slower pace than the national average, reducing its share of the population from 32% currently to 29% in FY51. Much of this redistribution will be driven by net interstate migration. The mining states (QLD & WA) and VIC are expected to increase their share of the population. ACT, TAS and NT are expected to broadly retain their share of the population over the outlook period while SA loses share marginally.

Figure 6 Share of national population

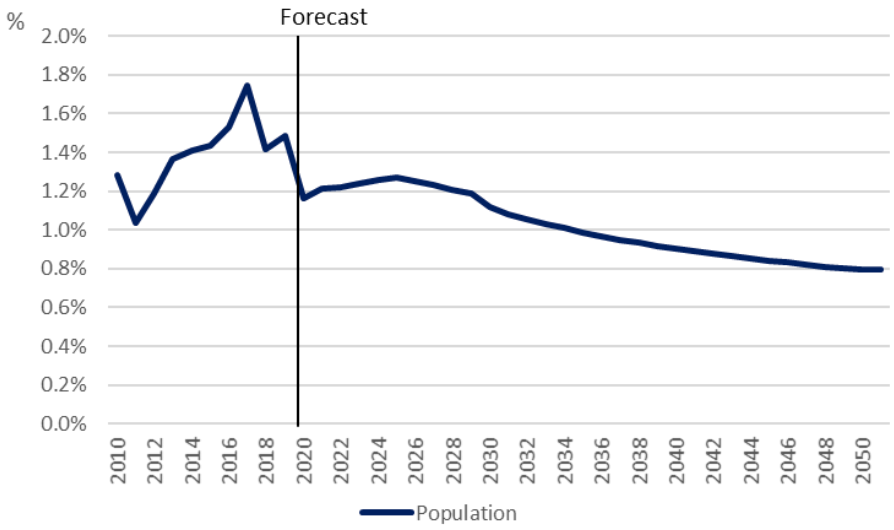


Source: BIS Oxford Economics/ ABS

3.1.1. New South Wales

Population growth in NSW has trended down over the last few years as both interstate and overseas migration have slowed. We expect NOM to continue contracting to FY21 as soft economic growth and elevated living costs put a drag on temporary worker migration. After this, as the headwinds unwind, we expect to see modest recovery.

Figure 7 Population y/y change, NSW



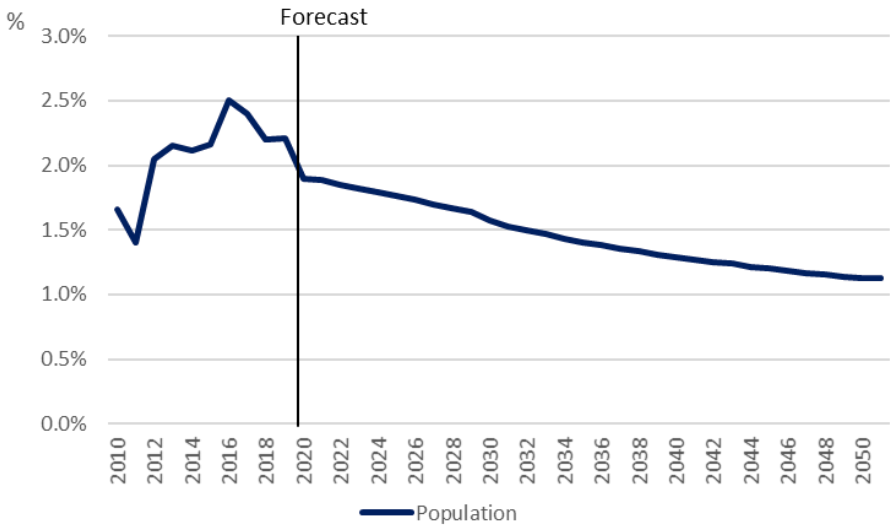
Source: BIS Oxford Economics/ ABS

Following an unusually strong period of interstate migration into the state (FY14-16), NIM flows have fallen back over the last two years, and now sit around historical averages. We expect NIM to fall further as the state's economic slow-down deepens, bottoming in FY21. As the economy recovers, increasing demand for labour, we expect a modest rebound in NIM which will push up population growth over FY25-28 before a slight easing into the long run trends. Over the long run, NSW is expected to remain the single biggest recipient of NOM but continued negative NIM will mean that population growth lags behind the national average.

3.1.2. Victoria

VIC has experienced a sharp uptick in population growth in the last few years, from both overseas and interstate migrants. While growth still remains elevated, outpacing the national average, it's showing signs of cooling. The net inflow of international students has moderated (as a result of outflows ticking up), and inward migration has also fallen back. Looking ahead, we expect NOM and NIM to continue to fall in the near term. Net interstate migration is expected to slow further over the next four years as economic conditions continue to improve in other parts of the country (particularly QLD and WA). And a greater concentration of overseas migration will also flow to other regions, particularly the mining areas, as their economic momentum picks up and generates more jobs. In the long-run, population growth in VIC is expected to converge to national trends.

Figure 8 Population y/y change, VIC



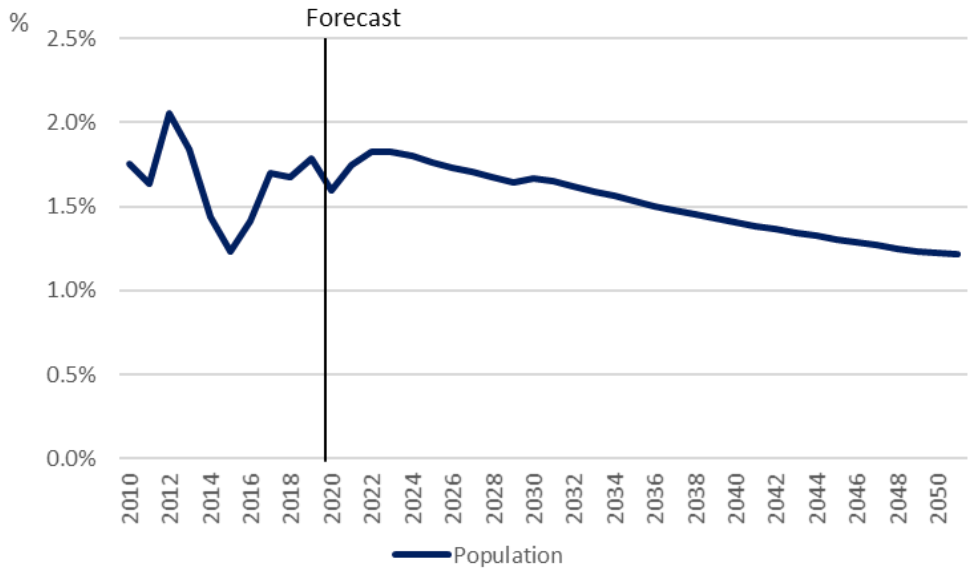
Source: BIS Oxford Economics/ ABS

3.1.3. Queensland

Following a period of sluggish migration growth in FY13-16, QLD has seen some recovery in general migration trends, as the drag from the end of the mining boom abated. But migration in FY19 has again slowed slightly, mirroring the general economic performance of the state. The slowdown has been solely driven by NIM, with NOM continuing to increase in FY19.

We project inward migration to slow further in FY20 (albeit only modestly), with a rise in NOM broadly offset by a decline in NIM. But FY20 is expected to be a trough in the current cycle. The next round of mining sector investment is set to kick off in 2020, which will generate jobs within the sector as well as in secondary markets, such as construction, and attract more migrants. Over the long run, QLD is expected to maintain its outperformance of the national economy.

Figure 9 Population y/y change, QLD

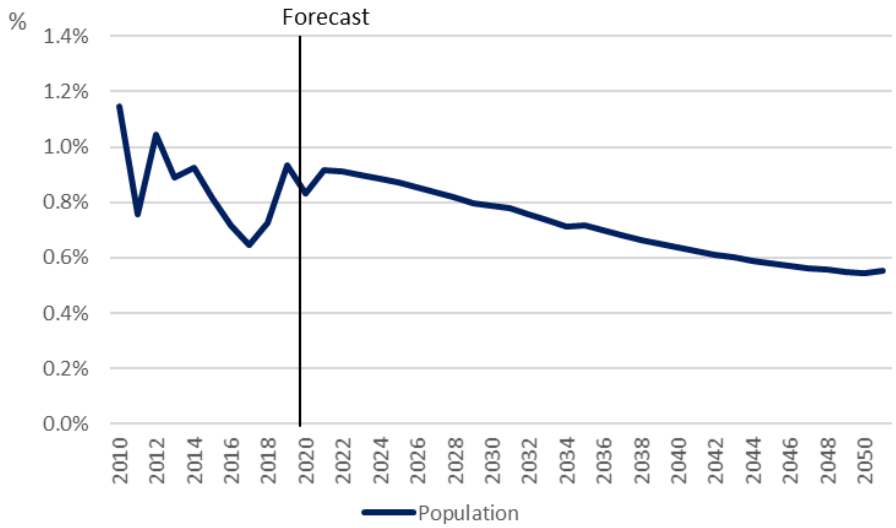


Source: BIS Oxford Economics/ ABS

3.1.4. South Australia

Population growth slowed considerably over FY16-18, in line with a soft patch in the local economy. The decline was most noticeable in NIM as people moved interstate in search of more job opportunities. This trend reversed in FY19, as government investment in the defence sector in the state is reviving jobs growth. We expect a further increase in migration inflows in FY20, before they stabilise at their long run level. The pick-up in migration inflows is modest and will not lift SA's population growth significantly, and the state will remain a relative underperformer over the forecast horizon.

Figure 10 Population y/y change, SA



Source: BIS Oxford Economics/ ABS

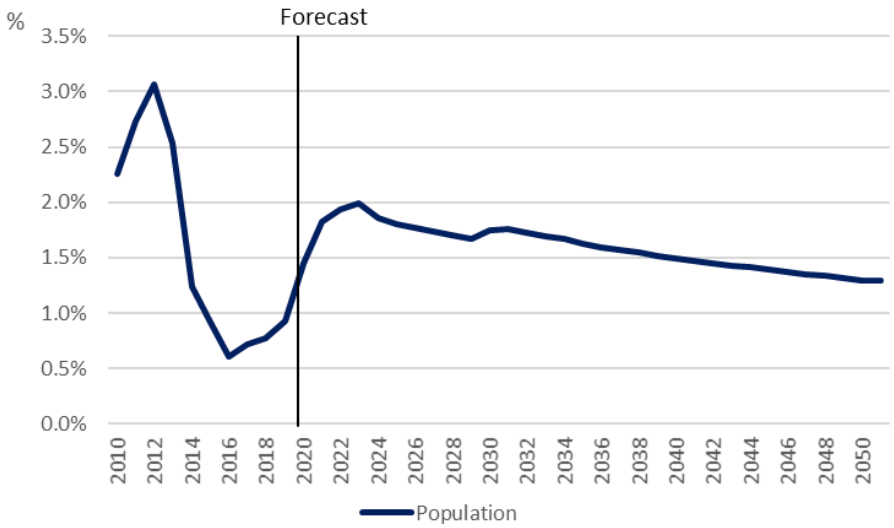
3.1.5. Western Australia

The mining investment boom and bust led to a significant swing in migration inflows and population growth in WA. The pace of population growth fell sharply between FY12 and FY16, from 3.1% p.a. to just 0.6%. Since then there has been a slow and steady improvement, with

population growing by 1.1% in FY19. Underpinning this has been improvements in both NOM and NIM, and more recently a rebound in NI.

Going forward the sequential impact of the next wave of investment and pick up in construction activity, and subsequent rise in labour demand is expected to drive a further acceleration in population growth that is met by migration. Over the short term, we expect population growth to accelerate to 2.0% in FY23. Although this is a fairly rapid pace of increase, it is somewhat modest when compared to the mid-2000s, when the growth rate went from 1.4% y/y in FY04 to 3.1% in FY08. The more moderate profile reflects the fact that the boom in mining investment forecast in the early 2020s will be less pronounced than the one that has just ended.

Figure 11 Population y/y change, WA



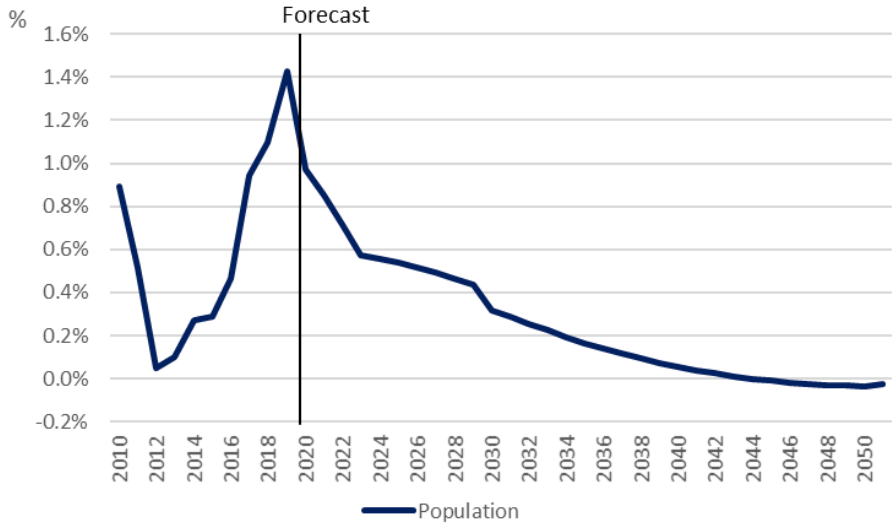
Source: BIS Oxford Economics/ ABS

3.1.6. Tasmania

In recent years TAS has experienced strong migration inflows into the state from both overseas and interstate migration. Overseas migration has been concentrated on international students, while interstate inflows has been driven by robust growth in the local economy, with migrants seeking job opportunities as economic growth in other states has softened.

NOM rose slightly in FY19 and is expected to tick up again in FY20. After this, levels are expected to decline as an appreciation in the Australian dollar weighs on TAS's export industries (slowing jobs growth). We expect the trend in interstate migration to also unwind as job opportunities in other states improve flow – we expect net interstate migration to fall back into negative territory by FY30.

Figure 12 Population y/y change, TAS

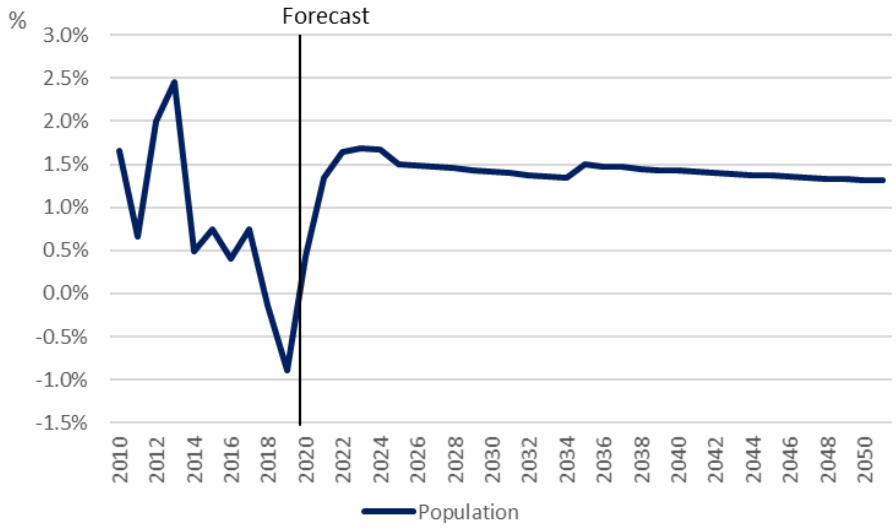


Source: BIS Oxford Economics/ ABS

3.1.7. Northern Territory

After contracting over FY17-18, population growth has rebounded in FY19 for both interstate and overseas migrants. Going forward, we expect this trend to continue, as the next cycle of mining investment ramps up and jobs growth attracts more migrants into the state; NIM is expected to turn positive in FY22. After this NOM will moderate while NIM reverts back to an outflow, attracted by opportunities in other states. Population growth then transitions to its long-run trend by the mid-2030s.

Figure 13 Population y/y change, NT

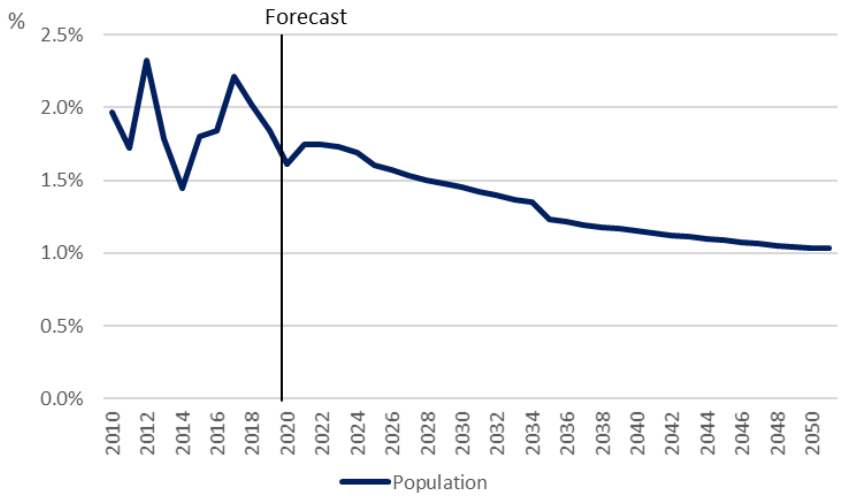


Source: BIS Oxford Economics/ ABS

3.1.8. Australian Capital Territory

Population growth in ACT has slowed recently, following a period of high growth, but remains elevated compared to historical levels. We expect another modest pick-up in the near term as the economy gathers pace. Most of the pick-up in growth will come from NOM while NIM is expected to hold steady, maintaining its current elevated levels over the 2020s before winding down to its long-run trend in the 2030s. Over the long-run, population will grow in line with the national trend.

Figure 14 Population y/y change, ACT



Source: BIS Oxford Economics/ ABS

4. Central scenario: National outlook

- **Cyclical headwinds will continue to weigh on the economy in the near term, limiting GDP growth to 2% over the next two years, before a rebound in residential construction, the next wave of mining projects, and a pick-up in consumer spending drive the pace close to 3% p.a. in the mid-2020s. Coronavirus and bushfires are expected to add a further near term drag with growth ending at 1.9% for FY20.**
- **Growth is expected to slow gradually over the long run, to 2% p.a. by 2050, constrained by the rate of population growth and technological progress. The pace of productivity improvements is not expected to match historical performance, as a result of secular stagnation trends taking hold of the world economy.**
- **Across the sectors, further rapid increases in mining sector output in the near term will structurally increase the sector's share of GDP in the near term. Services will also increase their share, while the manufacturing sector is expected to continue to decline in relative terms.**

4.1. National Economic Outlook

This section discusses the international and national economic and industry trends with some consideration for the state level dynamics that drive the national outlook. For a more detailed state level discussion, please see Chapter 5.

4.1.1. International conditions

After reaching a cyclical peak in the first half of 2018, momentum in the global economy slowed considerably last year. Aggregate demand was weighed down by political uncertainty around the US-China trade relationship and the outcome of Brexit negotiations in Europe, the end of fiscal support in the US (following the tax cuts and additional spending announced in Q1 2018), as well as the policy-induced recession in the German manufacturing sector. Together, these drags dampened trade flows and industrial production across developed economies and emerging markets, and ultimately resulted in the widespread easing of monetary policy.

Moving through 2019, there was a significant risk that slower momentum would morph into a recession in one or more countries; markets were particularly concerned about the outlook for the US and Europe. But conditions have held up in the US, underpinned by continued improvements in the labour market and positive consumer sentiment, and it seems likely that the economy will avoid a recession. But growth in 2020 will be weak, not least as a result of the near term drag from the coronavirus, which is disrupting travel (and increasingly global supply chains). We expect the US economy to expand by 1.5% y/y, well below trend growth of over 2% pa.

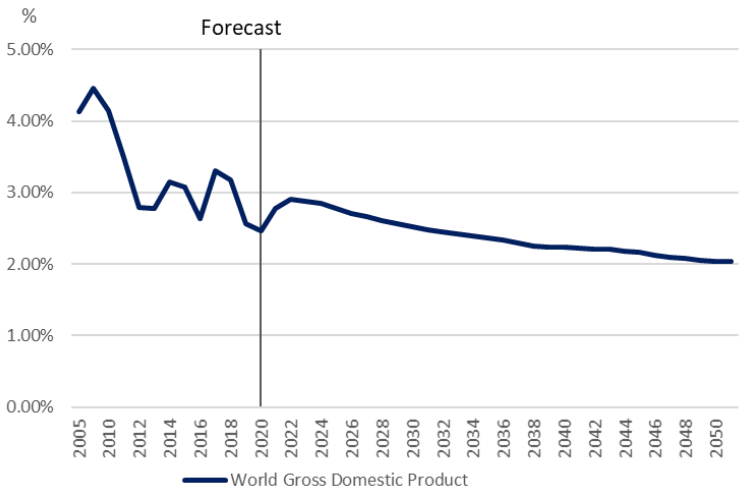
Across emerging markets, China has led a downturn over the last 18 months or so, with the impact of the trade war with the US and a limited fiscal and monetary response weighing on GDP. But as in the case of the US, there were some modest signs of improvement in late 2019, with import volumes (a good proxy for domestic demand) through the last four months of the year, and the Purchasing Manager's Index business surveys also trending up. But in the near term, growth momentum is expected to stall as a result of the coronavirus outbreak. In response to the disease, the Chinese authorities have imposed travel bans (by extending the Chinese New Year holiday) and non-essential production shutdowns in the Wuhan province where the outbreak is concentrated. While we expect the outbreak to be contained by the end of Q1 2020,

with the pace of growth in new infections now falling back[6] (although the number of new cases continues to rise), the disruption from the outbreak will be considerable in the near term. Growth in China's economy is expected to drop to around 4% y/y in Q1, 2%pts below our previous baseline. And although we expect a V-shaped recovery, with a bounce back in activity beginning in Q2, the economy is expected to expand 5.4% this year, down from our previous forecast of 6%.

The weak finish to 2019 and the drag from the coronavirus outbreak means we expect the world economy to expand by just 2.3% in 2020, its slowest pace since the global financial crisis. After this a modest cyclical upturn is expected to materialise (partly a result of disruption from the outbreak fading in 2021), before growth falls back and then trends lower over the medium and long term. Driving the moderation in momentum will be slower population growth, which is set to materialise across most economies, and the continued impact of secular stagnation (which has materialised as chronically low aggregate demand, and very weak growth in productivity).

After sharp falls associated with the virus outbreak, the improving economic conditions will provide some support to commodity prices. But any improvement is expected to be modest across the main commodity markets, particularly for the dirtier fossil fuels such as steam coal, where a number of governments are now signalling that they won't be replacing this capacity like-for-like.

Figure 15 Gross Domestic Product (y/y change) - World



Source: BIS Oxford Economic/ Haver Analytics

4.1.2. Gross Domestic Product

Broadly speaking, in the near term our central scenario is characterised by the continuation of subdued growth (relative to potential) of Australia's economy, with headwinds from the bushfires, coronavirus outbreak, residential construction downturn and weak consumer spending dampening domestic demand and GDP. Helping to offset these drags are continued strength in net exports (partly linked to stagnant imports, as a result of weak domestic demand), notwithstanding the drag on services exports from coronavirus-related travel restrictions, and further increases in government consumption, and from late 2020 onwards government investment. The mining sector is also expected to be supportive, with a number of replacement capital and expansion projects kicking off in 2020 and 2021. In contrast, the outlook for non-mining business investment is showing only tentative signs of improvement, and with domestic

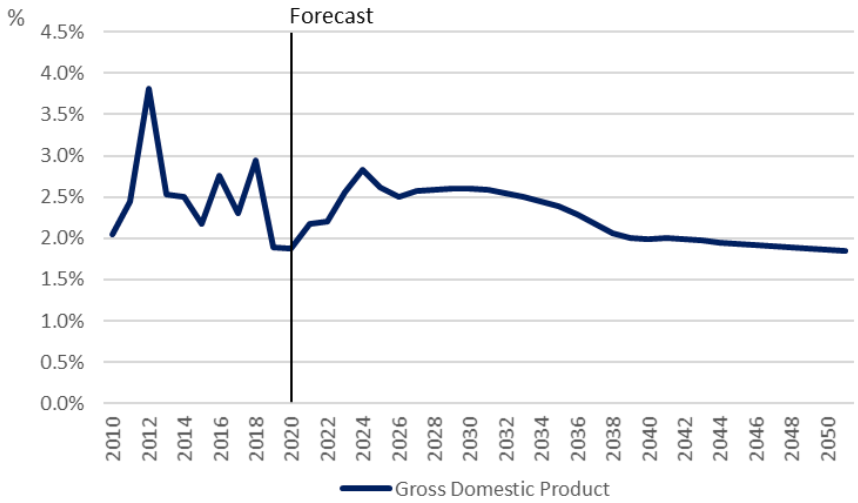
[6] This information is as-of 11th February 2020.

demand still weak there is a risk that firms put their current expansion plans on hold – we are cautiously optimistic about the outlook.

Overall, we expect the economy to expand by around 1.8% in FY20 with a modest rebound to 2.2% in FY21. The upturn in FY21 will be driven by bushfire reconstruction activity, a recovery in services exports following the end of the coronavirus outbreak, and the beginning of an upturn in residential construction activity. We then expect the economy to accelerate through the mid-2020s as the current headwinds from residential construction and consumer spending unwind, triggering a sharper recovery in non-mining business investment. Beyond FY25, the cyclical factors are expected to unwind driving growth back to historical average before gradually transitioning to long-run trend.

Over the long run, Australia's economy will be driven by growth in its labour supply, capital accumulation and technological progress. In line with our broader house view, we expect labour productivity growth to recover from its current cyclical low, but for the pace to be significantly weaker than has been seen in the past; an average of 0.8% pa in the 2030s and 2040s, compared to 1.5% pa over the last 25 years or so. Coupled with a gradual slowing in population growth (see Chapter 3), GDP growth is expected to slow to around 2% pa over the next 30 years.

Figure 16 Gross domestic product (y/y change), Australia



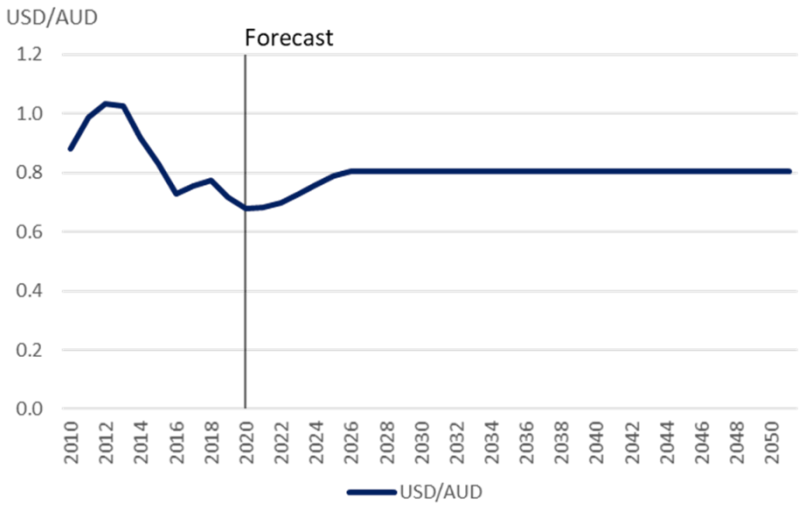
Source: BIS Oxford Economic/ Haver Analytics

4.2. Foreign Exchange Rate

After a period of relative calm, where the exchange rate stayed around 75 cents per USD, the AUD steadily depreciated in 2018 and H1 2019, to its current level of just under 70 US cents. Initially the depreciation was driven by rising interest rates in the US set against no movement in the cash rate from the RBA; higher interest rates make US assets more attractive to hold all other things equal, resulting in a shift of assets towards USD and away from AUD.

But over H1 2019, the differential between the Federal funds reserve rate and the RBA's cash rate has not changed, but the AUD continued to depreciate. Driving this further loss of value were concerns about the outlook for China's economy and commodity prices given the risk of a global recession. Moving forward, we expect the exchange rate to remain below US 70 cents in the near term. After this, improving domestic economic conditions will allow the RBA to raise the cash rate, closing the differential with the Federal Funds rate and driving an appreciation in the AUD. Ultimately, we expect the exchange rate to appreciate to around 80 US Cents per AUD.

Figure 17 Foreign Exchange Rate (USD/AUD)



Source: BIS Oxford Economics/ Haver Analytics

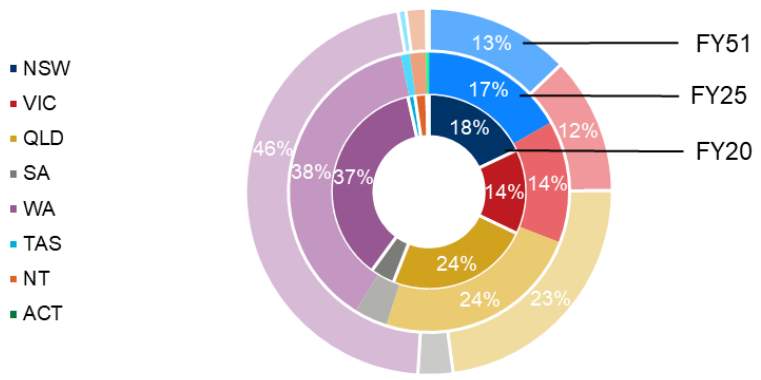
4.3. Industrial production

Industrial production (excluding construction) is comprised of three main sectors:

- Mining (55% of industrial production GVA)
- Manufacturing (31%)
- Utilities (14%)

At the state level, NSW, QLD and WA account for the majority of activity in the sector. For NSW, manufacturing accounts for the majority of activity, while mining is the key driver in QLD and WA. The continuation of the structural decline of manufacturing over time means that NSW's share of output is set to fall back over the forecast horizon. QLD is also expected to drop back, but WA is expected to accelerate; mining sector output in the state is expected to grow strongly, underpinned by rising demand for cleaner fuels (natural gas) and commodities related to infrastructure investment and new technologies, such as iron ore, nickel, and lithium.

Figure 18 States share of industrial production (gross value added)



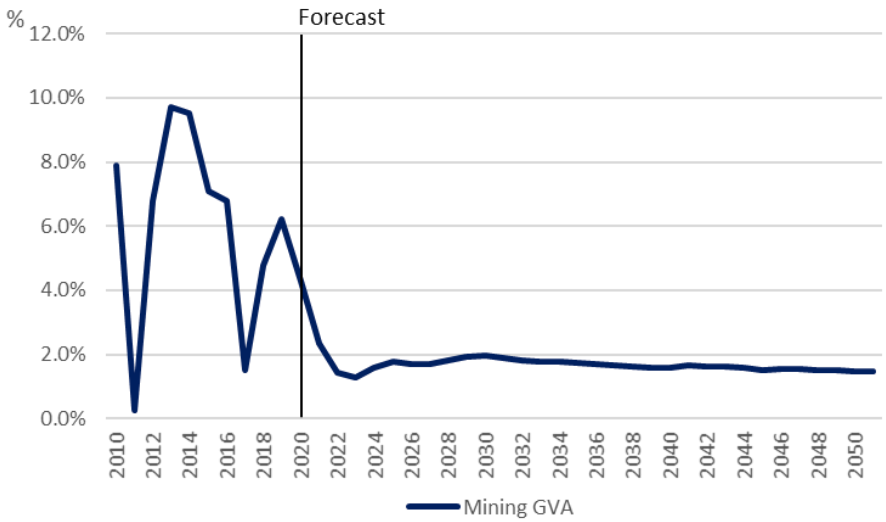
Source: BIS Oxford Economics/ Haver Analytics

4.3.1. Mining Sector Outlook

Mining gross value added for Australia has generally seen strong growth in the last three years, largely as a result of the LNG sectors in QLD and more recently WA[7]. Growth in iron ore production has also been robust, although adverse weather was a significant drag on output in FY19. In contrast, increases in coal production have been more modest, lagging well behind the rest of the sector over the last four years. While demand for metallurgical coal remains robust, given its use in steel production, the global shift towards cleaner fuels is weighing on thermal coal, both in terms of demand and investment in new supply capacity.

Going forward, we expect the pace of growth in mining sector activity to fall back in the near term, as the last of the projects in the current investment cycle reach nameplate capacity. Momentum is then expected to build modestly in the mid-2020s, as the next round of investment translates to a rebound in production growth. But with a significant proportion of the investment intended to replace existing capacity and the investment upturn expected to be much more modest than the previous boom, we do not expect GVA growth to reach the rapid rates seen in the 2010s. Over the longer-term outlook, growth will continue to moderate, as a slowing global population will require less incremental infrastructure investment.

Figure 19 Mining GVA (y/y change): Australia



Source: BIS Oxford Economics/ Haver Analytics

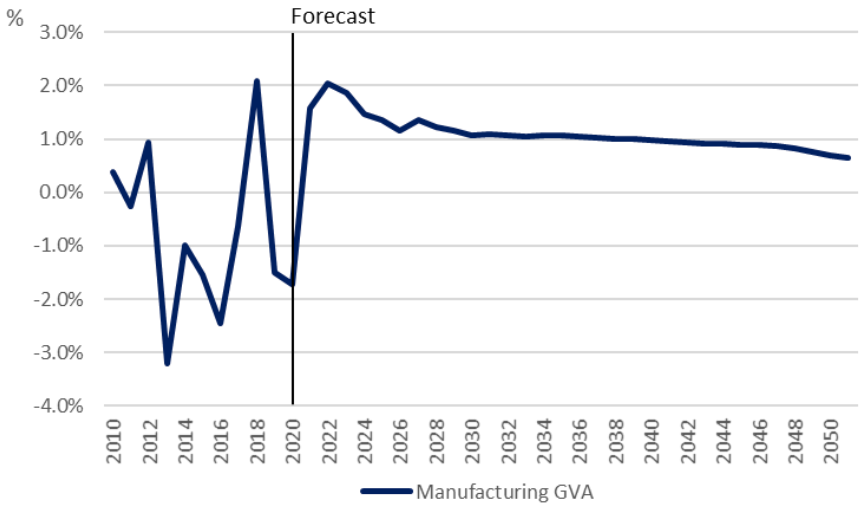
Regional resource endowments mean that WA and QLD will continue to dominate the mining sector. WA in particular is expected to see robust growth in output, driven by iron ore, oil & gas, and base metals, such as Nickel and Lithium – a number of expansion projects in the Pilbara and in and around the offshore natural gas fields have been announced and will commence construction shortly. QLD's mining sector is expected to lag behind. Further expansion in LNG capacity will be supportive, but the outlook for coal production is mixed. Metallurgical coal is projected to continue to increase production volumes, but growth in thermal coal is likely to be more subdued. The latest round of investment projects include Saraji East, Peabody's Olive Downs and Adani's Carmichael project.

[7] We note that WA has been exporting LNG since the early 1990s, but that the volume of these has increased substantially in the last five years.

4.3.2. Manufacturing Sector Outlook

After a rebound in FY18, the manufacturing sector returned to its recent trend for falling output, contracting 1.5% in FY19. This contraction was broad-based, with only NT and TAS seeing positive growth (4.1% and 3.0%, respectively). With many manufacturing sectors competing globally, slower growth momentum in the world economy was a major drag which should reverse over the next 12-18 months. But the sector has also been hampered by the long run structural decline in Australia's cost competitiveness (relative to international producers) in the manufacturing sector.

Figure 20 Manufacturing GVA (y/y change)



Source: BIS Oxford Economics/ Haver Analytics

With the global economy still subdued and domestic demand also weakening, the manufacturing sector is expected to contract further in FY20. But this is expected to be a cyclical low, and by FY21 we expect the sector to rebound as conditions domestically and internationally improve.

Despite the streamlining of the manufacturing sector over the last decade[8] we expect manufacturing sector growth to continue to lag behind other sectors. NSW will see the fastest decline in manufacturing activity, with its relatively high wages hampering the sector. In contrast the mining states (QLD and WA) will exhibit the strongest growth, increasing their share of activity. In these states, the outlook for the manufacturing sector is more stable, benefiting from the value chain linkages to the mining sector.

4.3.3. Utilities Outlook

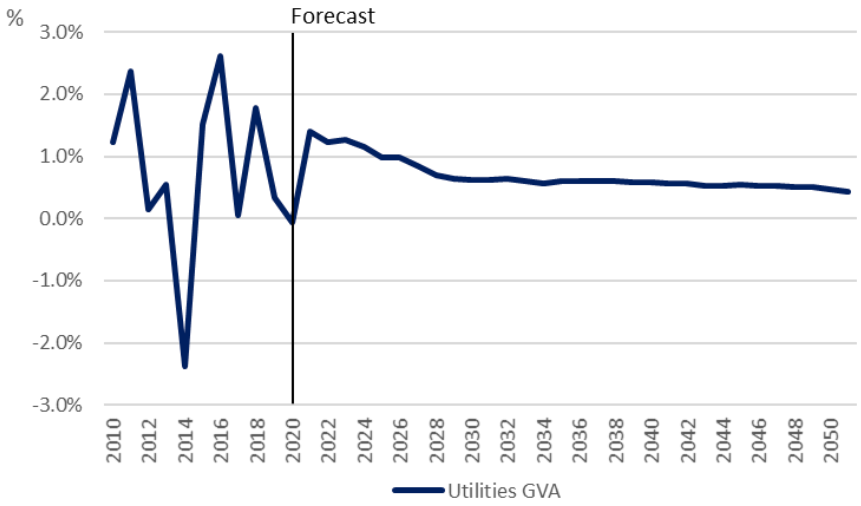
Utilities GVA had stagnant growth over FY19 and we expect FY20 to finish on a similar note. Beyond this, utilities will see some rebound as ramp up in construction work done in renewable electricity generation (across FY18-19) translates into higher levels of production – the stagnation of electricity prices in recent years is expected to result in some additional demand (particularly from households)[9]. Water supply is also expected to evolve, with the Sydney Desal plant coming

[8] As a result of the strength of the AUD through the mining investment boom and Australia's relatively high wages, the manufacturing sector has contracted in absolute terms over the last decade, with GVA falling by 7% between 2009 and 2019. The end of car production in late 2017 marked the end of this transition, with the sector now focused on food processing, processing activities related to commodities, and other high value add sectors such as pharmaceuticals.

[9] The outlook for the utilities sector and its consistency with AEMO's Integrated System Plan (ISP) was discussed with the AEMO team. As outlined in the main text, the fuel source for electricity only has an impact if it changes the cost of production, the price of output, and if this then alters demand. The profile for utilities GVA is consistent with the trajectory

online (with additional expansions expected) amidst the current drought environment. But the impact on GVA in the utilities sector is expected to be modest, given the relatively inelastic nature of demand. These combination of factors is expected to drive a modest recovery in growth to 1.3% p.a. over FY21-22 before winding down to long-run trend (0.7% p.a.) – the relatively slow pace of growth (when compared to other sectors) reflects ongoing improvements in water and energy efficiency.

Figure 21 Utilities GVA (y/y change)



Source: BIS Oxford Economics/ Haver Analytics

4.4. Services Sector Outlook

The services sector comprises of the Australia and New Zealand Standard Industrial Classification (ANZSIC) groups F – S[10]. Over the last two decades we have seen relatively rapid growth in the services sector, led by NSW and VIC. Most of this growth has come from the Finance and Insurance, Professional Services and Health and Aged Care services sectors.

Table 4 Composition of Services GVA: FY20 vs. FY51

for production costs outlined in the ISP and has been agreed with AEMO; broadly speaking, it captures consistent incremental improvements in energy efficiency by households and businesses, with the speed consistent with what has been seen historically.

[10] For the ANZSIC division classifications please see https://www.abs.gov.au/ausstats/abs@.nsf/Latestproducts/1292.0Search12006%20(Revision%202.0)

	2020	2051
Accommodation & Food Services	3.8%	3.8%
Administrative and Support Services	5.8%	4.8%
Arts and Recreation Services	4.6%	3.4%
Education & Training	7.8%	6.2%
Finance and Insurance	14.6%	16.8%
Health Care & Social Assistance	12.2%	15.3%
Information Media and Telecom	3.7%	3.7%
Other Services	2.0%	2.2%
Prof, Scientific & Technical Services	11.3%	12.0%
Public Administration and Safety	8.8%	7.9%
Rental, Hiring and Real Estate Services	5.0%	4.1%
Retail Trade	6.7%	6.3%
Transport, Postal and Warehousing	7.7%	7.8%
Wholesale Trade	6.0%	5.8%

Source: BIS Oxford Economics/ Haver Analytics

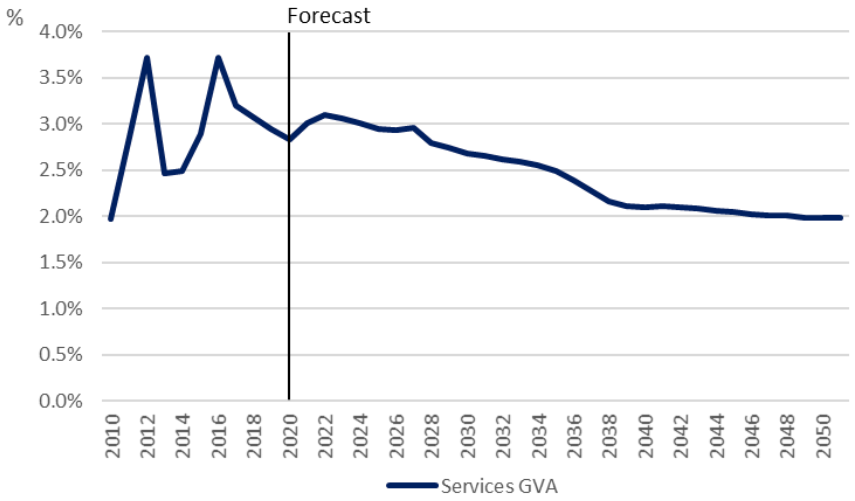
Over the last two years, services growth has wound down slightly, on the back of soft consumer spending, particularly hurting the retail and wholesale trade services sectors. While a slow-paced recovery in these sub-sectors will continue to be a drag on services over FY20, we expect to see a recovery in growth beyond that as consumer sentiment rises, boosting domestic spending. A general improvement in the economy will also attract more foreign job seekers, increasing the total population, which will in turn elevate demand for services further. A relatively weak exchange rate over the next couple of years will provide an additional cyclical boost to education and tourism related services, by making Australia a more attractive destination for foreigners.

The coronavirus outbreak will place a significant drag on services related to tourism, particularly accommodation and food services, wholesale and retail trade, and transport services. As a result, accommodation and food services output is expected to stagnate in FY20, before rebounding strongly in FY21 as travel restrictions removed and conditions return to normal.

Sectors that are associated with the public sector (education, health and public services), which makes up 29% of Services GVA, have grown robustly in recent years. Helped by additional international students and the rollout of Gonski 2.0 funding, momentum in the education sector picked up to 2.3% in FY19 compared to 1.4% the previous year. Healthcare has also had a strong growth spurt over the last two years, owing to the roll out of the National Disability Insurance Scheme (NDIS). However, with this nearing completion, we expect growth to wind down to historical levels quite quickly from 7.5% in FY19 to 3.1% by FY21.

Services currently make up 61.4% of GDP (FY19), and we expect this share to rise to 67.3% by FY51. Driving this increase will be high value add, high demand sectors such as health care services, which we expect to grow rapidly in order to meet the demands of an aging population. This sub-sector is projected to see the biggest rise in output over the forecast period, gaining a 3.1% pt share of total Services GVA.

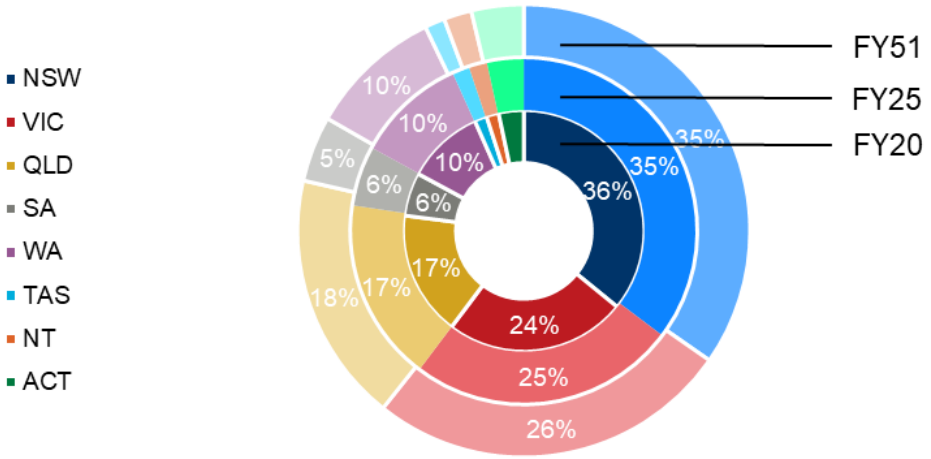
Figure 22 Services sector GVA (y/y change)



Source: BIS Oxford Economics/ Haver Analytics

Consistent with historical trends, NSW will continue to record robust growth (and the largest absolute increase) in services sector output, with financial services, healthcare and professional services leading the way. QLD will see the fastest pace of growth in the short-to-medium term, largely as the economy recovers from subdued growth in FY19. Meanwhile, VIC is expected to moderate in the near term, coming off a very high period of recent economic growth led by unprecedented migration into the state. However, VIC will remain the second highest contributor to Services GVA in absolute terms, after NSW.

Figure 23 States share of services GVA



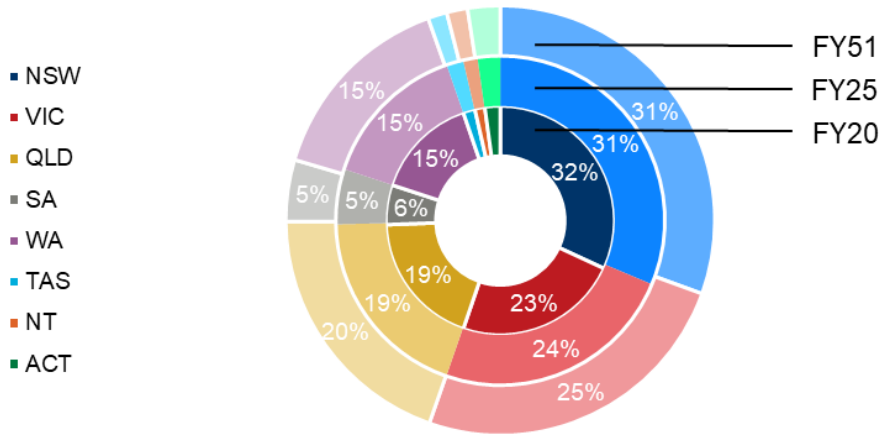
Source: BIS Oxford Economics/ Haver Analytics

5. Central scenario: States outlook

- **In the near-term NSW is expected to underperform, with the ongoing residential construction downturn and weakness in consumer spending weighing on GSP growth.**
- **Residential construction is also a drag on VIC. But continued high levels of population inflows are underpinning robust growth in demand, which is feeding through to GSP. WA is also outperforming the rest of the economy, as a result of the ramp up in LNG activity.**
- **Over the long run, the relatively slow pace of population growth in NSW will result in its share of GDP declining. VIC will see its proportion of output increase the most in absolute terms, as a result of its large size and robust population growth trajectory. QLD and WA will also increase their share, while SA and TAS will continue their trend decline (as a result of their weaker population demographics).**

NSW and VIC will contribute the most to incremental output over the forecast period, concentrated in the services and construction sectors. QLD and WA will be the next highest performing states. While services are also a strong driver for these states, mining and manufacturing play a much bigger role, particularly in WA where we expect these sectors to contribute 39% of total increase in output in the state, over the forecast period.

Figure 24 States shares of GDP



Source: BIS Oxford Economics/ Haver Analytics

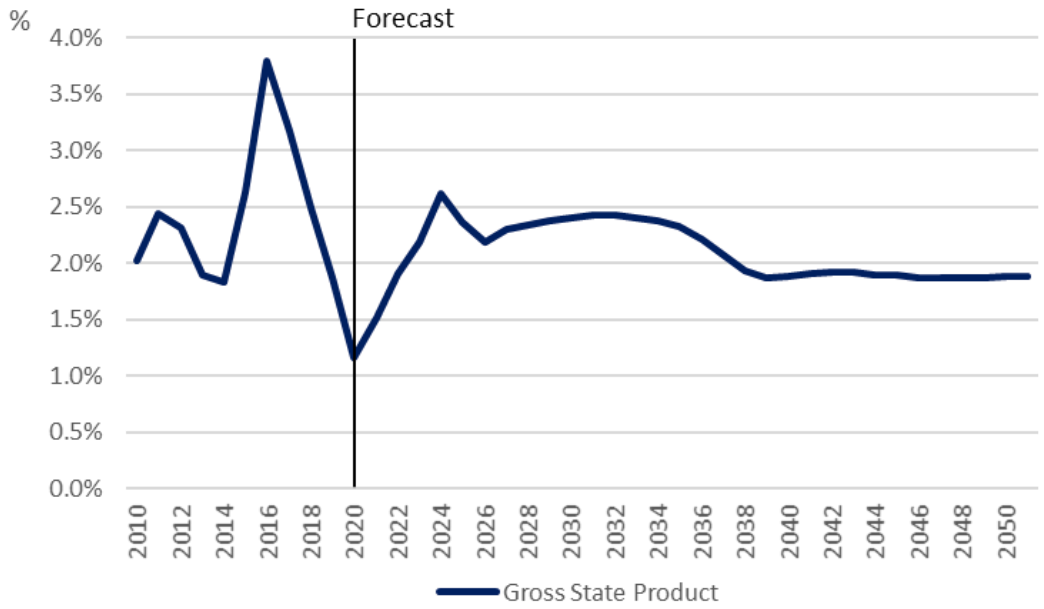
5.1. New South Wales

After a period of outperformance momentum in NSW's economy has slipped back in recent years, with GSP increasing by 1.9% in FY19. The main drags on momentum remain the housing

market and consumer spending. Residential construction activity contracted 4.2% in FY19, while demand for services related to property transfers fell 21.1% (after a 12.3% decline in FY18). Although turnover in the housing market has stabilized (and prices have rebounded sharply), the downturn in construction activity has much further to run. And with several infrastructure projects nearing final or intermediate stage completion, government spending will be less supportive in the near term. The severe drought is also having a negative impact upon the agriculture sector, but we expect to see a recovery if rainfall returns to normal levels.

Given the headwinds[11], we expect the pace of growth to slow further in FY20, to just over 1% p.a. While the extent of the impact from the recent bushfires is yet to be seen, the risks to the agricultural sector outlook remain on the downside, and the latest retail turnover data indicate that consumer confidence and spending have also been adversely impacted; spending in NSW fell (in volume terms) in Q4 2019, in contrast to the national total which saw an uptick in growth momentum. Moving into the mid-2020s the economy is expected to accelerate, driven by a recovery in housing construction, a rebound in agriculture activity, and the abatement of the structural headwinds weighing on household spending. Over the longer term, services will contribute the most to economic growth, as the state continues to transition to high value-added sectors such as financial services.

Figure 25 GSP (y/y change): NSW

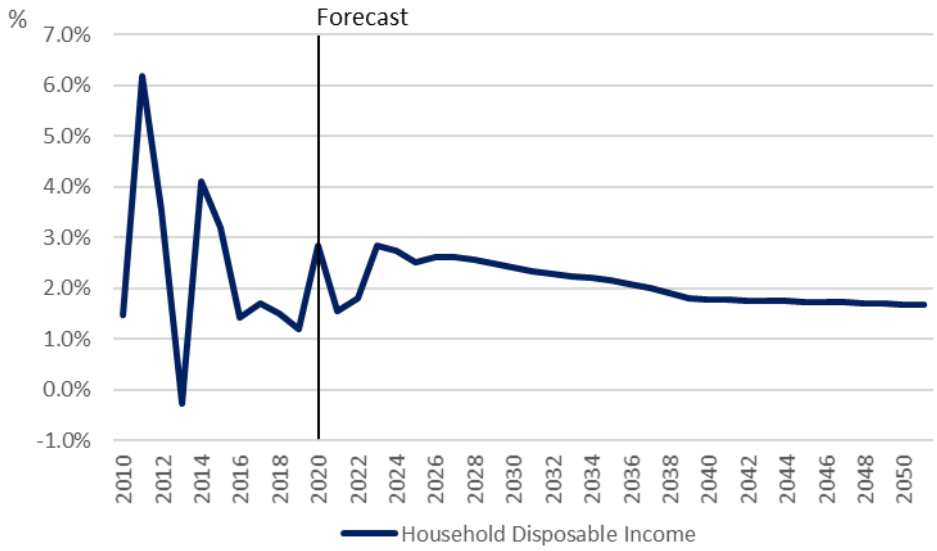


Source: BIS Oxford Economics/ Haver Analytics

Household disposable income showed an uptick in growth in FY19, propped up by labour demand in the public sector. As this slows and the downturn in residential construction continues to be a drag on private sector labour demand, increased capacity in the labour market will weigh on wage growth in the near term. Beyond FY22, as the economy recovers and labour demand picks up again, wage growth will resume, lifting growth in household disposable income. In the long-run income growth is expected to match GSP (implying labour's share of output remains constant), slowly declining to 1.8% p.a. by FY51.

[11] The drag from the bushfires will be concentrated in NSW, and the state is also very exposed to the negative effects of the Coronavirus (via international tourists and students).

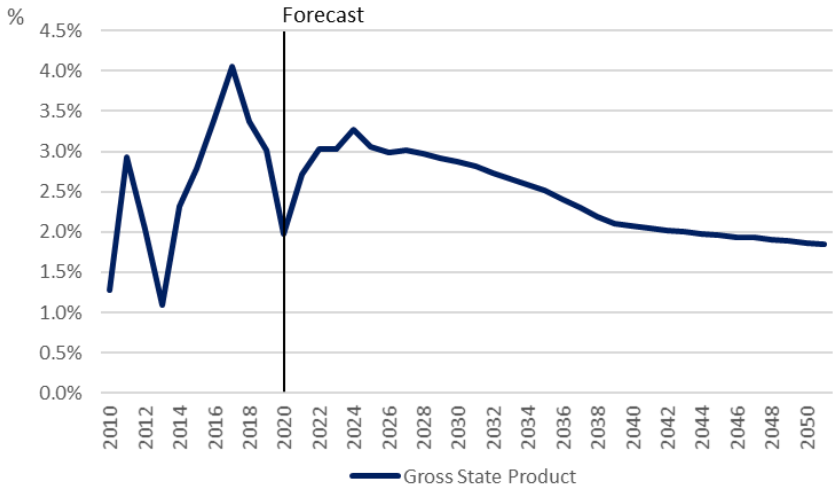
Figure 26 Household disposable income (y/y change): NSW



5.2. Victoria

Although momentum has moderated, the Victorian economy continues to outperform the rest of the economy, with GSP rising 3% in FY19. Looking forward, growth is expected to soften, hampered by the residential downturn, weaker consumer sentiment, and lower turnover in the housing market. The lower A$ is providing a significant boost to the state's key trade-exposed industries, namely agriculture, manufacturing, education and tourism. But uncertainty in the global economy could put a drag on these sectors in the near-term. Domestic oriented service sectors will provide some support, particularly those exposed to government spending such as healthcare, education, and professional and technical services and administration. Publicly funded infrastructure projects are also supporting activity, and unlike NSW activity levels are not expected to fall back sharply.

Figure 27 GSP (y/y change): VIC



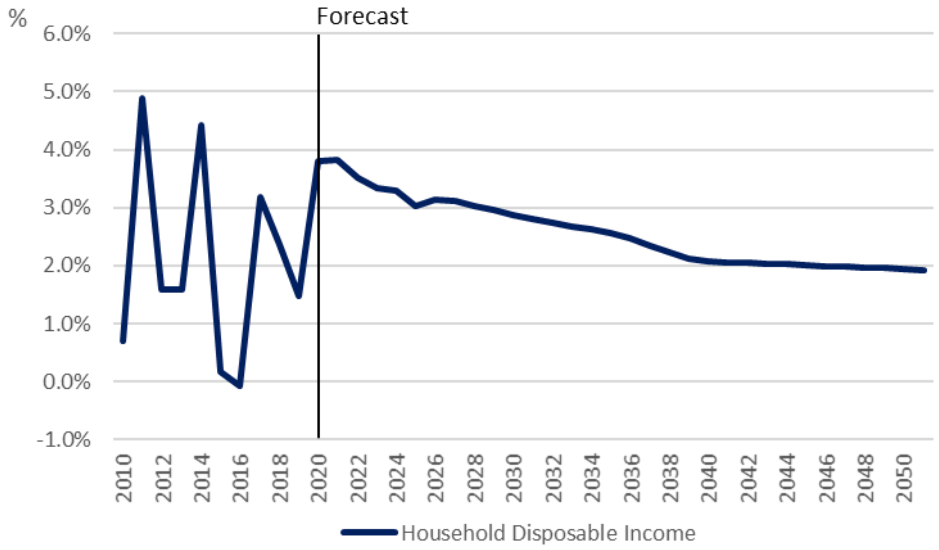
Source: BIS Oxford Economics/ Haver Analytics

Over the forecast period, services and construction are expected to outperform the other sectors. Mining has a subdued growth outlook, growing on average by 0.9% per annum, as it faces

headwinds from international competition and environmental policy pressures, given the major output of the VIC mining sector is emissions intensive (brown coal and oil and gas).

As in the rest of the economy, the public sector has accounted for the majority of new jobs over the last year, which has helped to maintain the unemployment rate at around 4.5%. We expect employment growth, and consequently real household disposable income, to remain healthy and track ahead of the national average over the medium term. This largely reflects the demographic outlook for VIC. Although inward migration flows are now falling, they will remain comfortably in positive territory, which will allow employment and output growth to stay ahead of the pack in the long run. The long-run growth rate for household disposable income in VIC will settle at 2.3% p.a.

Figure 28 Household disposable income (y/y change): VIC



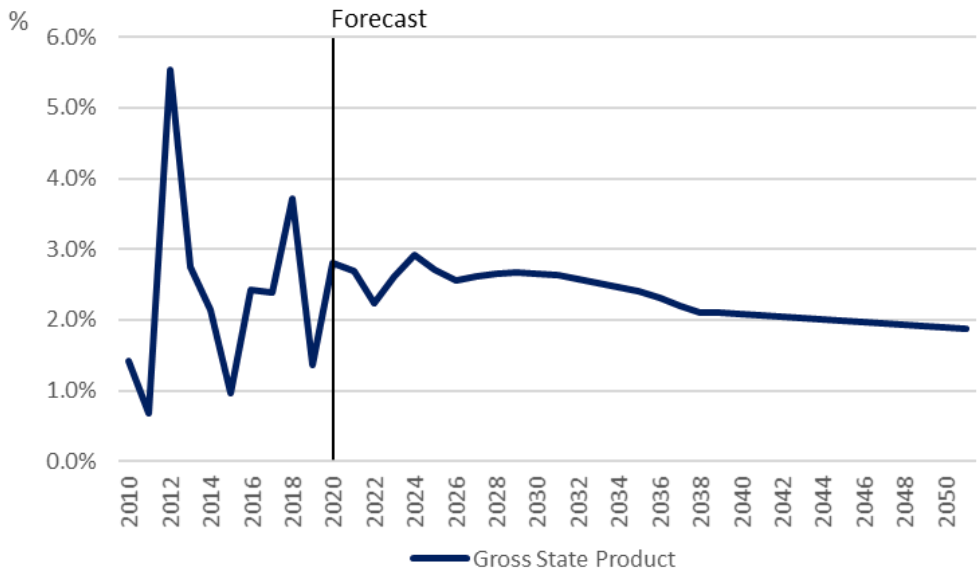
Source: BIS Oxford Economics/ Haver Analytics

5.3. Queensland

QLD's economy was surprisingly weak in FY19, with growth in GSP falling back to just 1.4%. Demand was dragged down by a sharp fall in business investment and a moderation in consumer spending growth. Looking ahead, we expect momentum to build, driven by a pick-up in mining investment and non-mining exports such as education and tourism, which are being supported by the relatively weak AUD. Residential construction activity should also pick up relatively soon, with the approvals data appearing to reach a trough in recent months (unlike NSW and VIC, where approvals are still declining).

Over the long-run, services and construction sectors will drive the major share of economic growth, making up over 80% of total GVA by FY51.

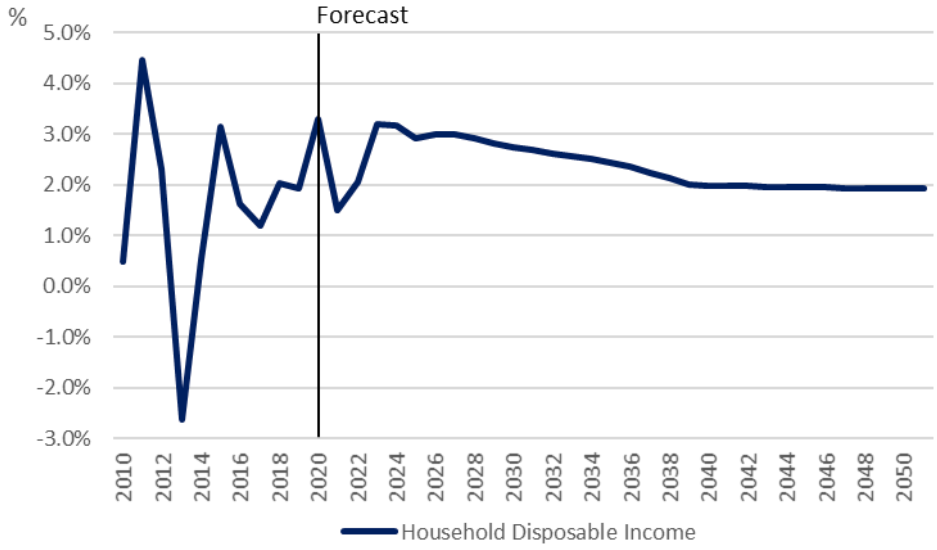
Figure 29 GSP (y/y change): QLD



Source: BIS Oxford Economics/ Haver Analytics

Growth in household disposable income has been relatively robust in recent years, underpinned by solid gains in non-employment income including interest earnings and rental income from investment properties. A slight moderation is expected in the near term, given the stagnation in dwelling rents in recent months, before a pick-up in the mid-2020s as the next round of investment in the mining sector takes off. Income growth is expected to reach a cyclical peak around 3.3% p.a., before tracking GSP growth in the long run.

Figure 30 Household disposable income (y/y change): QLD



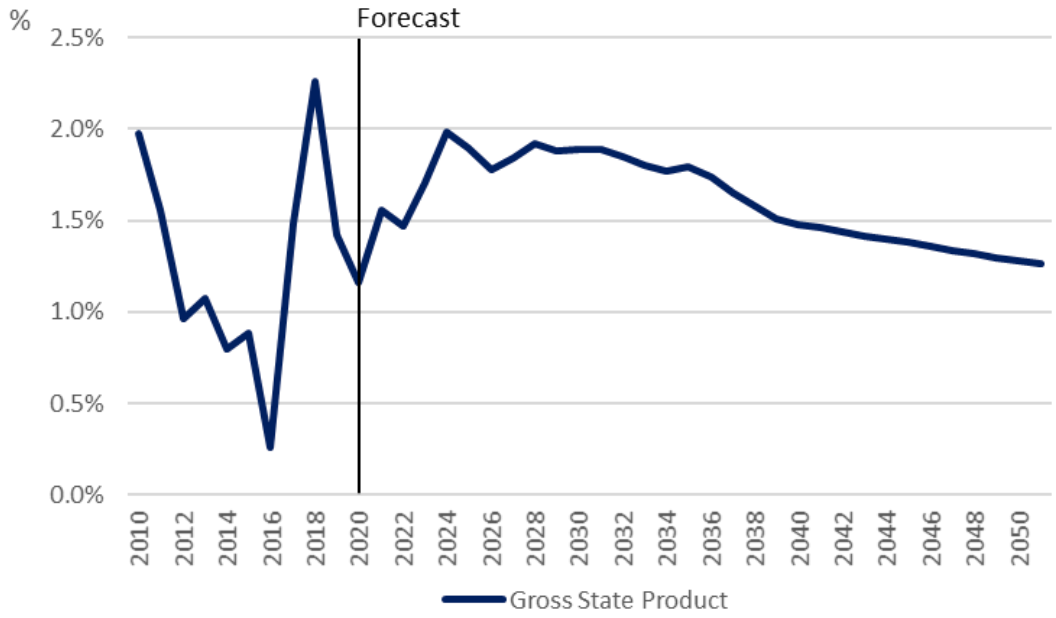
Source: BIS Oxford Economics/ Haver Analytics

5.4. South Australia

Momentum in SA's economy slowed in FY19, with GSP increasing 1.4% y/y after a 2.3% rise in FY18. But this pace is a marked improvement on the years following the financial crisis, when SA's economy was hampered by the strength of the AUD, which accelerated the decline in the local manufacturing sector. Looking ahead, we expect the pace of growth to hold steady in the

near term. Supporting the economy are international student inflows and the Federal government's decision to base shipbuilding, bus building, other defence activities and the Australian Space Agency in Adelaide is supporting business investment activity. But the ongoing drought and weakness in consumer sentiment and spending is weighing on the economy.

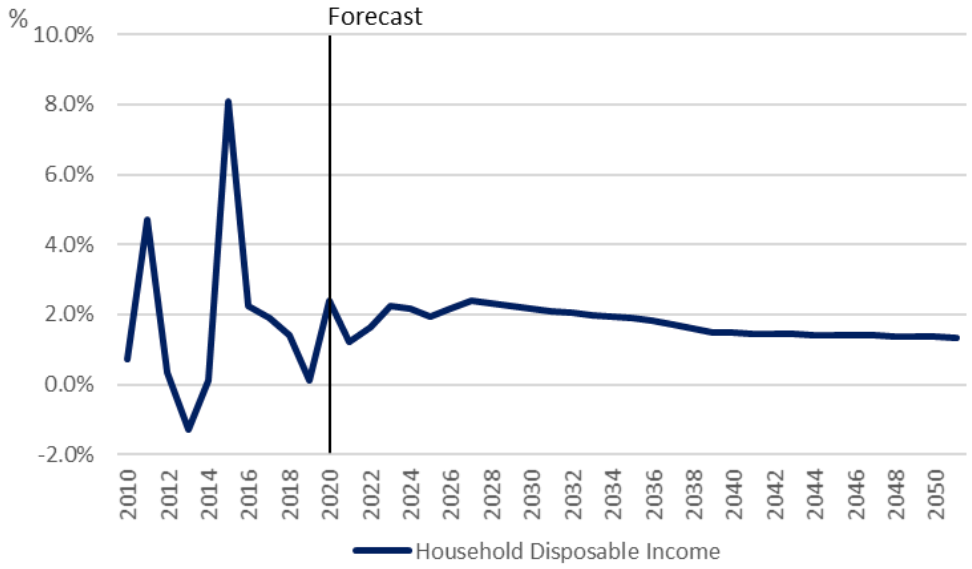
Figure 31 GSP (y/y change): SA



Source: BIS Oxford Economics/ Haver Analytics

In line with its demographics, the pace of employment growth in SA generally lags behind the rest of the economy. This slower pace is reflected in household disposable income, which is expected to broadly move in line with GSP over the forecast horizon.

Figure 32 Household disposable income (y/y change): SA



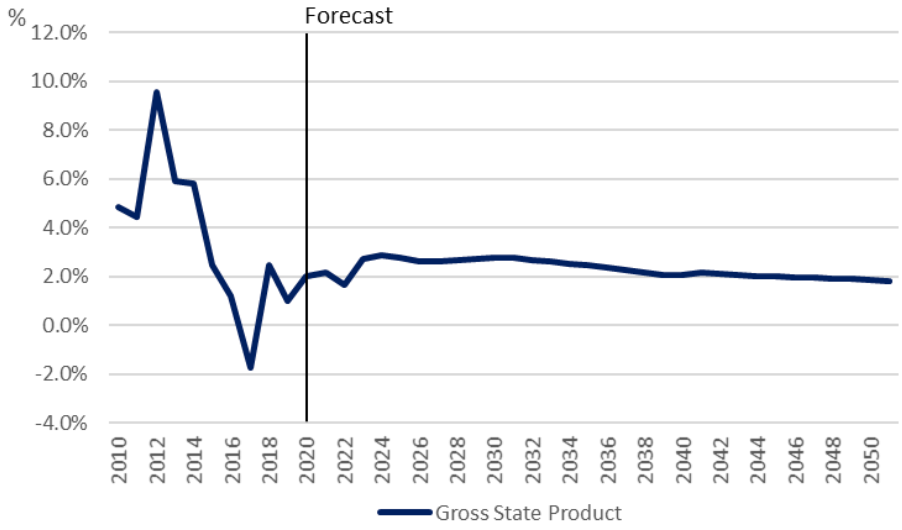
Source: BIS Oxford Economics/ Haver Analytics

5.5. Western Australia

Momentum in WA's economy remains very weak, with State Final Demand (SFD) contracting once again in FY19 (by 1.0%), the fifth year in six of contraction[12]. Domestic spending is being weighed down by further falls in mining investment (linked to the final completion of the LNG installations), weakness in consumer spending and a downturn in residential construction activity. In contrast, the move of the mining sector from investment to production is driving GSP, which increased 1% p.a. in FY19.

Looking ahead, we expect the gap between SFD and GSP to close. Mining production growth is set to moderate in the near term, but the next round of mining investment projects are now in the pipeline and expected to kick off over the next 12-24 months[13]. This activity will drive investment spending and the construction sector and will spill over to a number of other areas, including financial services, rental, hiring & real estate, and professional services. The uptick in activity is expected to drive inward migration and employment into WA, and this in turn will feed back to consumer-exposed sectors such as retail trade. Negative base effects[14] will limit growth in GSP this year to 2.0%, with a slight pick-up (to 2.2%) in FY21.

Figure 33 GSP (y/y change): WA



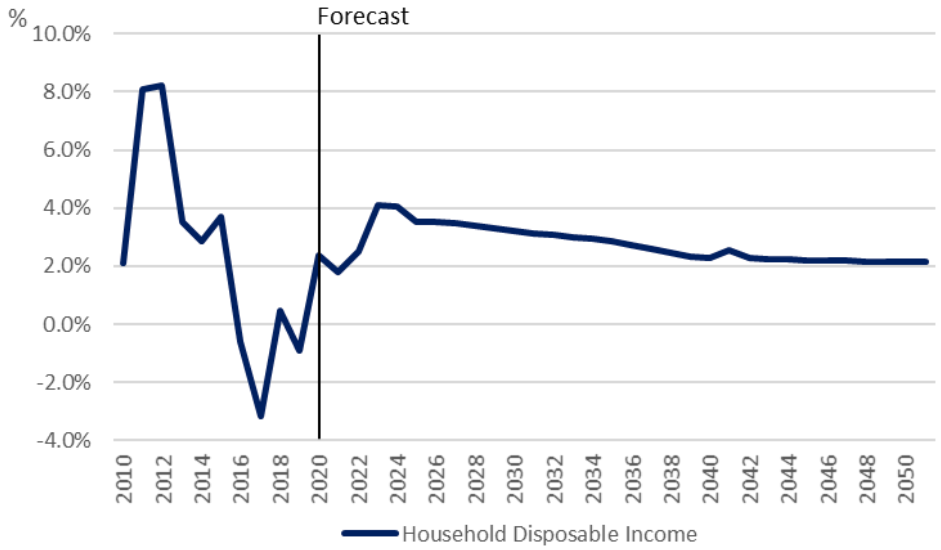
Source: BIS Oxford Economics/ Haver Analytics

The growth rate of household disposable income has broadly tracked GSP in recent years. The sharp slowdown in wages growth coupled with falls in employment in 2015 and 2016 weighed heavily on income growth through this period, with momentum recovering since then as conditions in the labour market have improved. We expect a slight fall back in the pace of growth

[12] SFD in WA contracted each year of FY14-FY17. It then increased modestly in FY18, by 0.6%, before declining again in FY19.
[13] The central case assumes that all projects which have reached FID/are in the final stages of approval proceed and are completed. Other projects which have been announced but are in the early stages of planning are not assumed to go ahead (the exception to this is Pluto Train 2, which is assumed to proceed given that the Scarborough development has received FID). The specific assumption for each major project were developed in consultation with AEMO.
[14] Base effects refer to a distortion in reporting over a period of time due to spikes in data at lower frequency over that time period (e.g. monthly or quarterly spikes impacting reporting of year-to-date figures).

in the near term, in line with the recent weakening of employment growth, before a pick-up in the early 2020s. But with wages growth generally subdued across the economy and considerable spare capacity in the labour market, we do not expect wages growth to take off despite the anticipated turnaround in mining investment activity. Over the long run, as in other states income is expected to broadly track in line with GSP.

Figure 34 Household disposable income (y/y change): WA



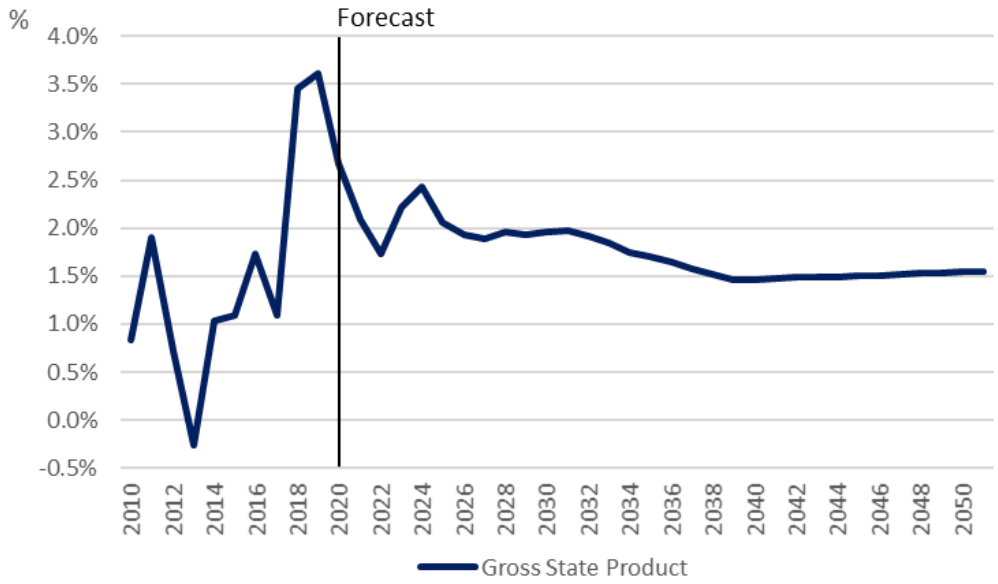
Source: BIS Oxford Economics/ Haver Analytics

5.6. Tasmania

Bucking the national trend, growth momentum in TAS has picked up in the last three years. Against a backdrop of a weaker AUD, the economy has benefitted from a surge in tourist arrivals and the continued development of high value add manufacturing sectors, such as food processing. These developments have driven a rebound in business investment and encouraged migration into the state, which has in turn fuelled growth in private consumption. GSP grew 3.5% in FY18 and maintained similar pace (3.6%) in FY19.

Looking forward, GSP is expected to slow over the 2020s, reverting to a trend pace that is moderately slower than the national average. Driving this will be a moderation in inward migration, with workers attracted to other states as their economic outlook improves.

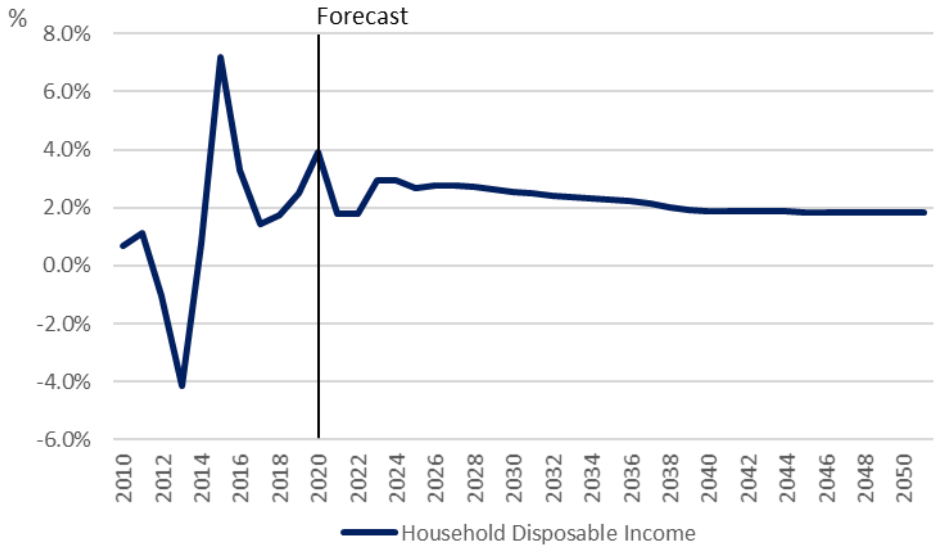
Figure 35 GSP (y/y change): TAS



Source: BIS Oxford Economics/ Haver Analytics

The near-term improvement in the state economy has bolstered household disposable income growth, with the strength in employment feeding through to total earnings. Looking ahead the expected return of migration movements to historical trends and moderation of GSP and employment growth is expected to weigh on household disposable income growth.

Figure 36 Household disposable income (y/y change): TAS



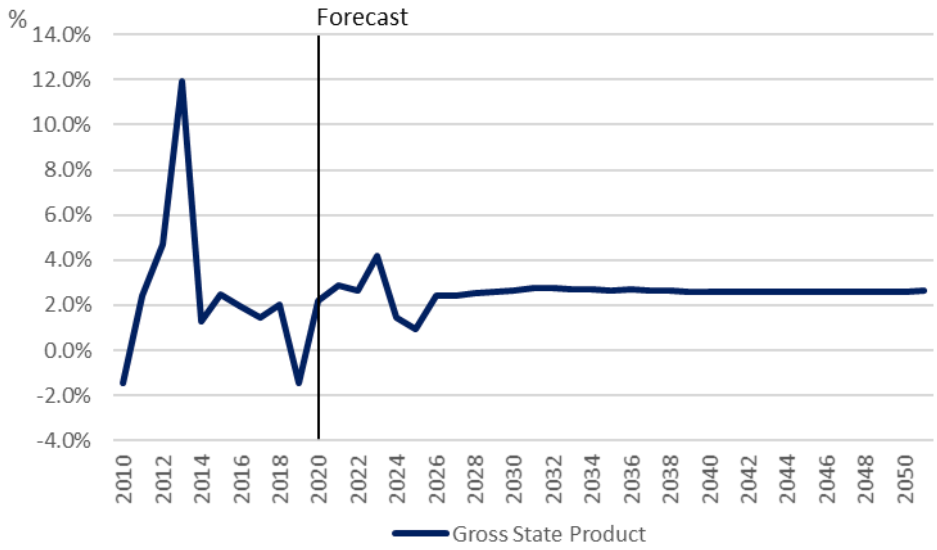
Source: BIS Oxford Economics/ Haver Analytics

5.7. Northern Territory

Like WA, the NT economy has been buffeted by the end of the current boom in LNG investment activity. SFD fell 16.3% in FY19, and although mining GVA grew by an impressive 46%, this was not enough to offset falls in construction and other sectors – GSP fell 1.5% y/y. Looking ahead, we expect modest growth in SFD and GSP in FY20 and FY21, underpinned by mining

exploration activity and the beginning of engineering construction for the next LNG expansion phase. This activity is expected to reach a cyclical peak in the mid-2020s. Over the long-term NT is expected to record relatively robust growth in output, with ongoing capital replacement and investment in new capacity driving construction sector activity.

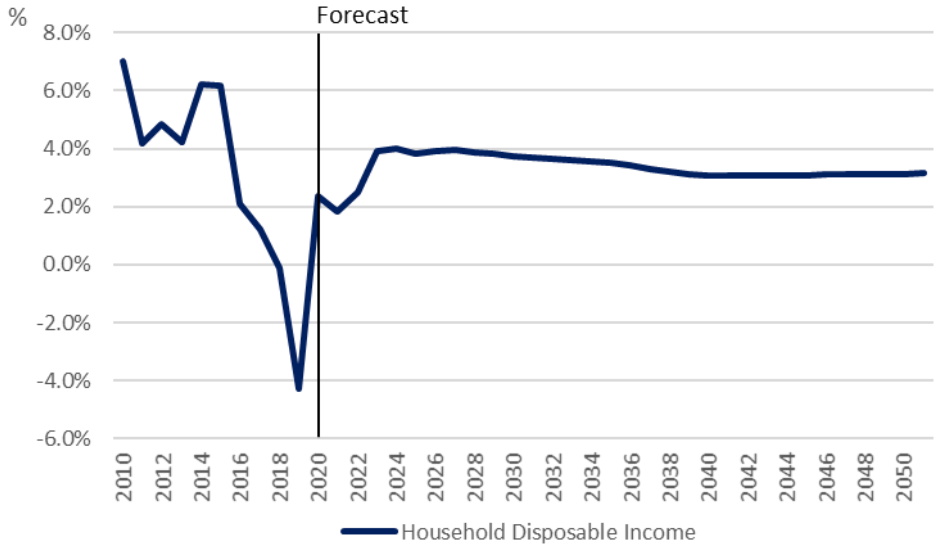
Figure 37 GSP (y/y change): NT



Source: BIS Oxford Economics/ Haver Analytics

In line with the state economy, income growth contracted sharply in FY19. A sharp fall in income from employment was the main driver, with employment dropping 4% y/y, with the construction sector leading the way. Looking ahead, we expect a recovery in the pace of growth, as the local economy bounces back over the near term. In the long run, income growth is expected to trend in line with GSP.

Figure 38 Household disposable income (y/y change): NT



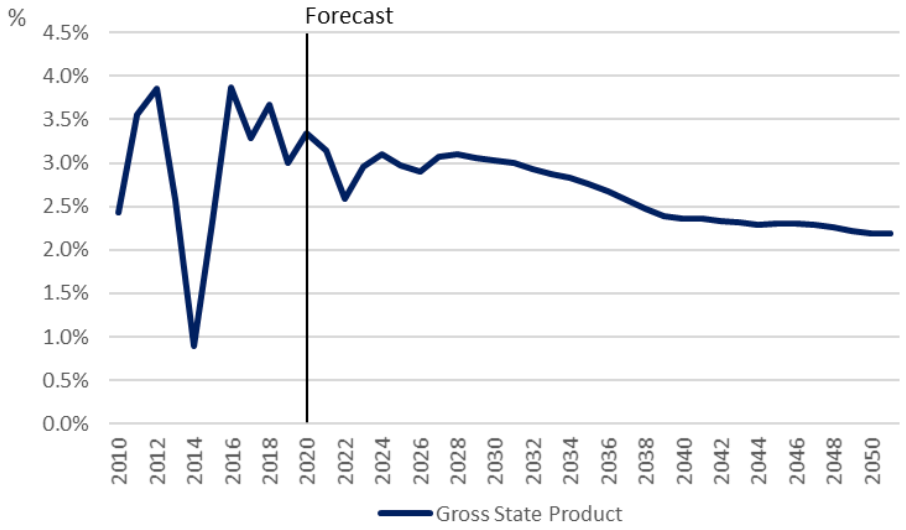
Source: BIS Oxford Economics/ Haver Analytics

5.8. Australian Capital Territory

Home to the Australian Public Service, the Australian Capital Territory's economy is based around service delivery and public administration. The ACT economy continued its strong run of growth last financial year, recording 3% growth after 3.3% in FY17 and 3.7% in FY18. With government spending growth expected to remain robust we expect a further solid gain this year, before a moderation of the pace in the early 2020s. Public administration makes up 26% of the economy, as a result of the Federal civil service being concentrated in the capital territory. Despite the continued push for fiscal prudence and a balanced budget, employment has grown strongly this year. Many other sectors are indirectly tied to the public sector, such as professional services, financial intermediation and information and communications. Healthcare, construction and education are also major industries, in terms of GVA.

Given the concentration of the service sector in ACT, it is no surprise that over the forecast period, the primary driver responsible for 99% of state economic growth is services. Within the services sector, much of the growth comes from public services.

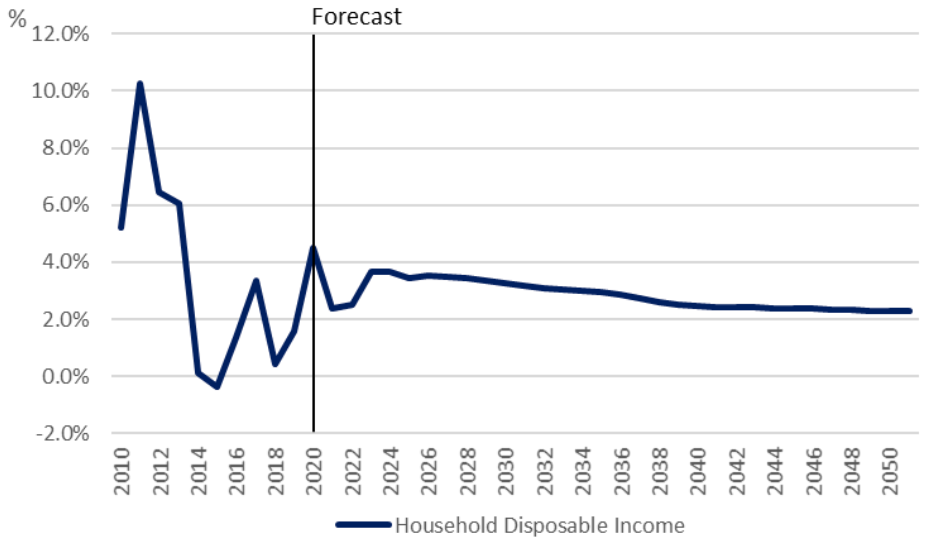
Figure 39 GSP (y/y change): ACT



Source: BIS Oxford Economics/ Haver Analytics

The labour market in ACT remains tight, with the unemployment rate dropping below 3% in 2019. This will place upward pressure on wages growth and consequently household disposable income. Over the medium-term we expect the pace to moderate somewhat, as economic conditions improve in other parts of the country (and so attract workers), and labour market tightness subsides, dampening income growth. In the long-run, income growth trends with economic growth, and is projected to gradually slow to around 2.3% pa.

Figure 40 Household disposable income (y/y change): ACT



Source: BIS Oxford Economics/ Haver Analytics

6. Slow change scenario

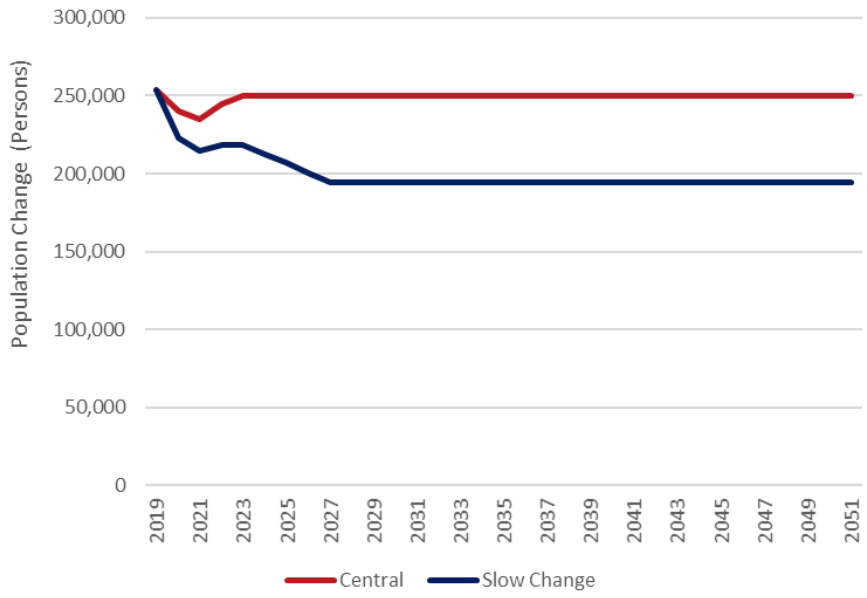
- **Lower levels of net overseas migration coupled with weaker productivity growth result in lower GDP growth compared to Central scenario, lowering long-run growth by 0.3% Pt. to 1.6% p.a. by the end of the forecast horizon.**
- **Mining increases its share of GDP relative to the central case, as a reduction in global commodity efficiency (a result of slower technological progress) increases demand for commodities per unit of output. Set against this shift, construction and services have lower shares of GDP.**
- **The relative importance of overseas migration as a driver of population growth means that VIC and NSW's share of GDP declines in the long run, while the mining heavy states of WA and QLD increase their contribution to GDP.**

The slow change is characterised by lower population growth (particularly net overseas migration), a slower pace of technological progress, and weaker pace of investment growth (both globally and nationally).

6.1. Population

The slower pace of globalisation and weaker economic outlook for Australia discourages inward migration, particularly of temporary and permanent skilled workers. As a result, NOM is lower in the Slow Change case relative to the central scenario. The difference in NOM has been benchmarked against the ABS Series C assumptions for NOM, which results in it being 50,000 p.a. lower in the long run.

Figure 41 Net Overseas Migration, Central Scenario vs. Slow Change Scenario: Australia



Source: BIS Oxford Economics/ ABS

As a result of the lower profile for NOM, the growth rate for Australia's population is 0.2 % Pt. lower than the Central scenario over the forecast horizon, resulting in a 2.14 million (5.6%) reduction in the resident population in FY51.

The weaker population growth accrues to the states in proportion to their composition of NOM, consistent with the ABS Series C assumptions. As a result, this also changes the composition of the population components (NIM, NOM, NI) for the states. For instance, NSW and SA, where NOM is the largest driver population growth, see the greatest impact from the NOM shock. In contrast, in QLD, where NIM is a more significant driver of growth, the impact of the lower levels of NOM is less pronounced.

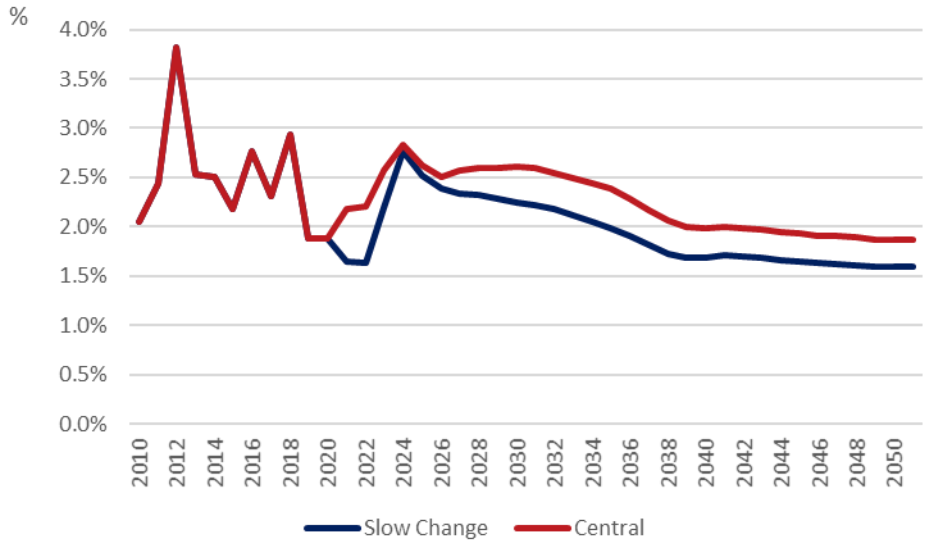
6.2. Macroeconomic outlook

Population growth and economic growth share a symbiotic relationship. While in the short-term, migration movements correspond to economic signals, in the long-run population drives underlying demand, ultimately dictating the economy's investment needs, final consumption and output levels.

In a Slow Change scenario, the weaker outlook for the population feeds through to the labour market, dampening labour supply growth. Although this results in a slightly faster approach to full employment in the near term (compared to the central scenario), which in turn leads to a pick-up in wages growth, in the long run real wages are lower than the central case. This is a result of the weaker profile for technological progress (see below), which feeds through to labour productivity. Over the long run, the slower population growth drives lower economic growth.

We have also assumed a slower pace of technological progress, consistent with a moderation in the pace of globalisation and less progress towards reducing the commodity and emissions intensity of output globally. This results in a decline in labour and capital productivity and further slows economic growth. Reduced labour productivity also places downward pressure on wage growth and disincentivises firms to invest, which in turn reduces productivity growth further as the ageing capital stock embodies an older vintage of technology.

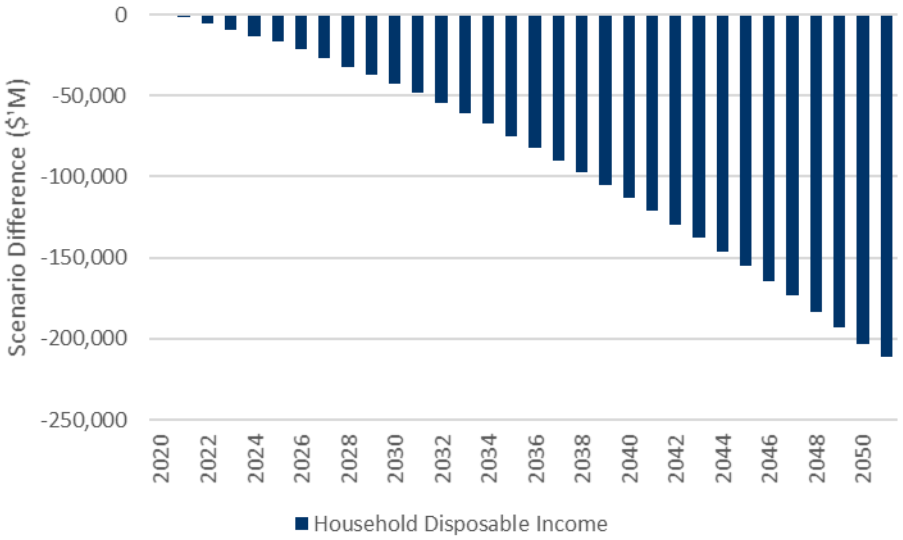
Figure 42 GDP y/y Change: Australia



Source: BIS Oxford Economics/ ABS

Household Disposable Income follows economic growth trends. In a Slow Change scenario, a fall in labour productivity and further slowing of economic growth reduces final output, resulting in lower income growth over time.

Figure 43 Change in Household Disposable Income: Slow Change Scenario vs. Central Scenario



Source: BIS Oxford Economics

Relative to the central case the AUD is weaker. This structural shift is primarily a result of the weaker outcome for commodity prices, which in turn is associated with the slower pace of technological progress and therefore GDP growth seen globally in this case; although the commodity intensity of production is higher, absolute consumption is lower as a result of the lower level of output. Relative to the central case outcome of 80 US cents, the AUD settles at around 75 US cents per AUD.

6.3. Sector breakdown

The weaker profile for population growth, investment and technological progress does not impact all sectors equally. The mining sector is a relative winner in this scenario, increasing its share of GDP. This outcome is related to technological progress, which partly manifests itself as commodity efficiency. In the Slow Change world, where the rate of progress is weaker, the commodity intensity of production falls by less over time, resulting in a higher level of commodity use and demand relative to the central scenario. Therefore, while in aggregate we expect mining activity to decline (a result of lower output), the *share* of mining will increase. This outcome also encapsulates the impact of the slower transition away from coal and gas that is a result of the less supportive policy environment and slower transition of consumption patterns.

Related to this assumption, a number of large-scale mining investment projects that are assumed to proceed in the central case are shelved[15]. These include:

- Iron ore: Robe Valley expansion, West Angelas expansion
- Natural gas: Equus gas project

[15] Major projects that are assumed to proceed in the central case include the Scarborough gas field expansion and the Thunderbird mineral sands project.

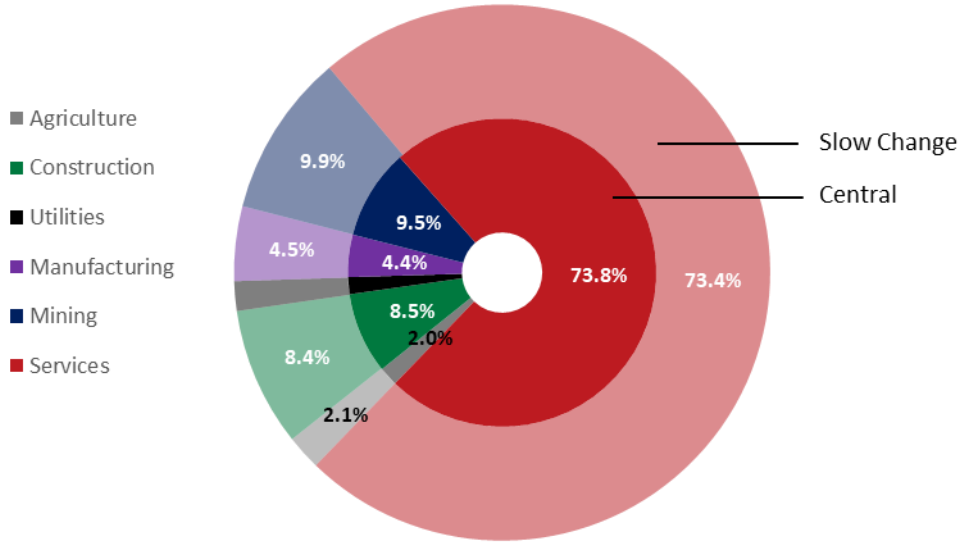
- Coal: Glen Core Liddell coal expansion, Aquila Eagle Downs metallurgical coal expansion, Peabody Eaglefield coal expansion

- Other minerals: Cadia Expansion (stage 1)

In contrast to mining, construction is a relative loser in this scenario. The weaker outlook for investment that is partly a result of slower technological progress which reduces demand for new construction, while slower population growth lowers the amount of infrastructure investment (both new and replacement) needed to adequately support the local population. With respect to the energy transformation pathway, engineering construction activity is dampened as there are fewer greenfield investments into renewable generation. While some of this drag is offset by maintenance of existing generation capacity, we expect the aggregate effect to be a reduction in construction activity.

The service sector also sees a modest decline in its share of output, which is a result of weaker technological progress and the slower pace of income growth, which slightly slows the general long run trend of services increasing its share of output over time.

Figure 44 Industry Share of GDP (FY51): Slow Change Scenario vs. Central Scenario



Source: BIS Oxford Economics

6.4. Relative states performance

At a state level, NSW and WA have the biggest swings in share of GDP in the Slow Change scenario, followed by VIC and QLD. This is a trickledown effect of the shift in industry composition (see section 6.3), coupled with the asymmetric impact of the different population assumptions compared to the central case.

As the composition of the NSW economy is weighted towards the construction and services sectors, it is naturally a relative loser in this scenario. Coupled with this, NSW is disproportionately affected by the lower level of NOM that characterises the scenario, as NOM accounts for a relatively large proportion of the annual increase in population. But the dampening impact of weaker demand for commodities globally, and the impact this has on economic activity in WA and QLD offsets some of the drag. Overall, NSW makes up 30.5% of GDP by FY51 compared to 32%

in the central scenario. VIC also sees a slight decline in its share of output, but less pronounced as a result of the more favourable population dynamics.

In contrast, the gain to mining of GDP share in a Slow Change scenario accrues largely to the mining states of WA and QLD. WA has a more pronounced swing because mining makes up a much larger portion of the state's economy (36% currently) compared with QLD (15% currently).

Figure 45 Percentage Point Change in State Composition of GDP from Central to Slow Change FY 51

Source: BIS Oxford Economics

7. Step change scenario

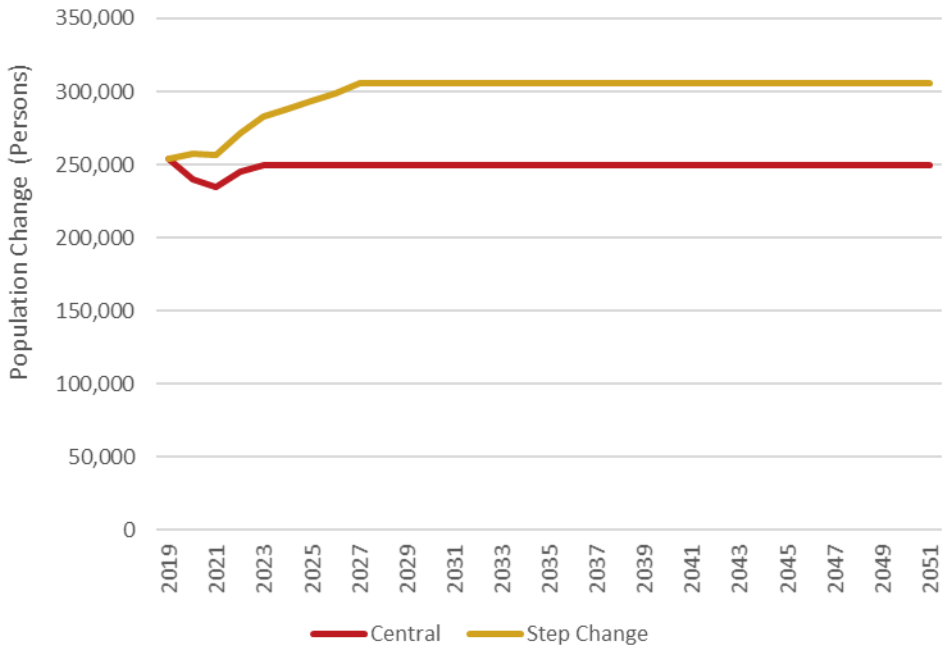
- **Higher levels of net overseas migration coupled with improved resource productivity result in higher GDP growth compared to Central scenario, increasing long-run growth by 0.3 % Pt. to 2.1% p.a in FY51.**
- **Mining reduces its share of GDP as a result of lower commodity intensity of production relative to the baseline. In contrast, Construction and Services increase their share of GDP, a result of stronger investment activity (including the infrastructure investment needed to accelerate the energy transition) and services demand from faster population growth.**
- **NSW and VIC increase their share of GDP relative to the baseline, while the mining heavy states of WA and QLD reduce their contribution to growth.**

The step change scenario is characterised by stronger population growth, faster technological progress (including more rapid progress in the energy consumption transition) and a more rapid pace of investment growth (both globally and nationally).

7.1. Population Forecasts

Consistent with the scenario narrative of a faster pace of globalisation and the opening up of economies globally, the Step Change scenario assumes a faster pace of NOM than the central case. The higher level of NOM has been benchmarked against the ABS Series A projection, with NOM increasing by around 50,000 p.a. relative to the central case.

Figure 46 Net Overseas Migration, Central Scenario vs. Step Change Scenario: Australia



Source: BIS Oxford Economics/ ABS

The dispersion between the Central and Step Change scenarios gradually widens over FY21-27 before stabilising. The short-run differences are marked by cyclical factors, with NOM rising back to the levels observed in the early 2010s. Once reached, NOM remains stable over the forecast period. This results in the growth rate of total population being 0.2% Pt. higher than the Central scenario, with the resident population being 2.27 million (6.0%) higher in FY51.

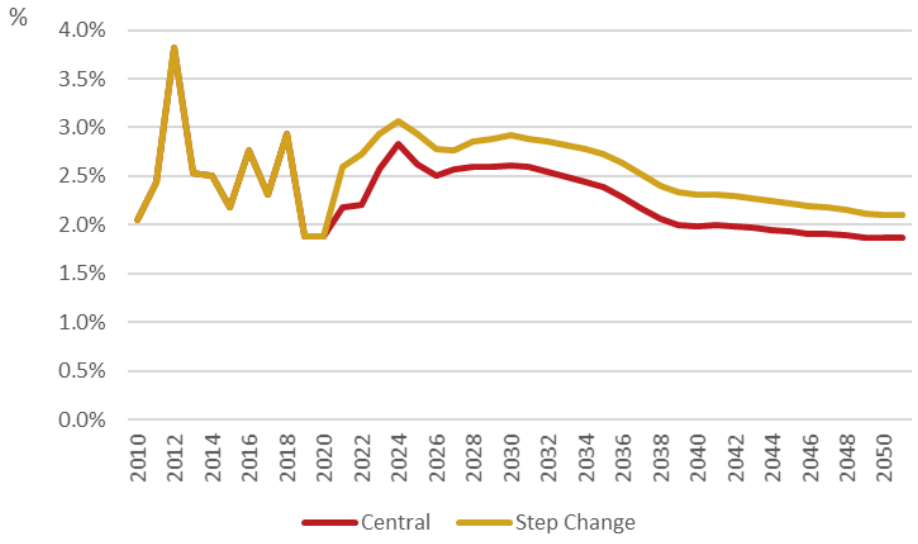
Across the states, NSW and SA are the most sensitive to the positive NOM shock, as overseas migration accounts for a relatively large proportion of the annual increase in the population. In contrast, the impact on QLD is more limited.

7.2. Macroeconomic Outlook

In contrast to the Slow Change scenario, the acceleration in population growth in this case leads to an increase in the labour supply in the near term. This in turn results in a slower transition back to full employment as the cyclical recovery takes place in the early 2020s, but over the long run employment growth is faster, leading GDP growth to stabilise at a higher base.

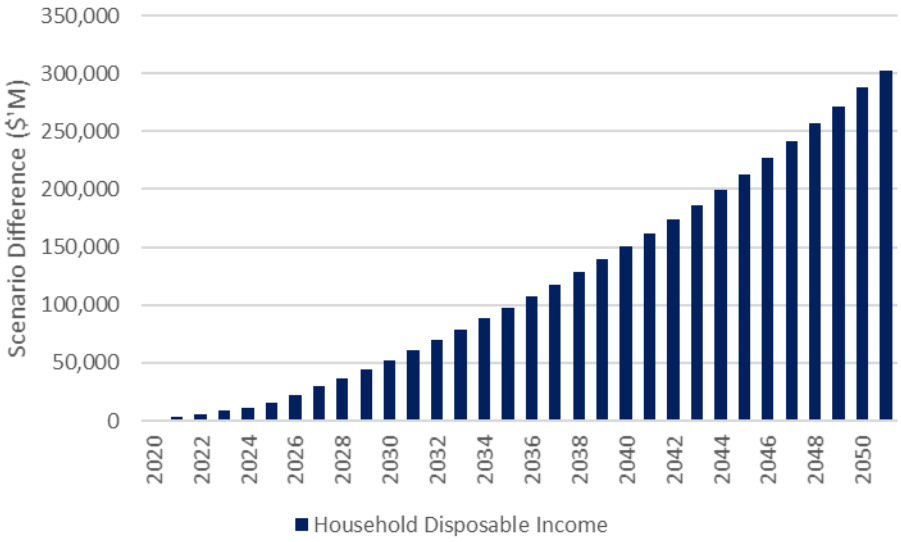
Added to this, the acceleration in technological progress, from a more aggressive investment environment, has the added effect of increasing labour and capital productivity and further accelerating economic growth in a Step Change scenario. Increased labour productivity, as an outcome of greater technical progress, also places upward pressure on wages growth, helping to drive increases in household income over the long run.

Figure 47 GDP y/y Growth, Central Scenario vs. Step Change Scenario: Australia



Source: BIS Oxford Economics/ Haver Analytics

Figure 48 Change in Household Disposable Income: Step Change Scenario vs. Central Scenario



Source: BIS Oxford Economics

Relative to the central case the AUD is stronger. This structural shift is primarily a result of the stronger profile for commodity prices, which in turn is associated with the faster pace of technological progress and therefore GDP growth seen globally in this case; although the commodity intensity of production is lower, absolute consumption is higher as a result of the increase in output. Relative to the central case outcome of 80 US cents, the AUD settles at around 85 US cents per AUD.

7.3. Sectoral Composition of GDP

The mining sector is a relative loser in the Step Change scenario. In an aggressive investment environment that results in more rapid technological progress, commodity intensity improves, i.e. less of a commodity is required to develop the same level of output. Consequently, mining's share of output declines, even though in level terms we have a higher level of Mining GVA compared to the central case. While the shift in commodities consumption is assumed to be global, for Australia, a further impetus to this change is the energy transition narrative. In the Step Change scenario, we have a more rapid transition away from traditional energy sources of coal and gas (production of which comes under Mining GVA) towards renewable sources. This reduces domestic demand for commodities and compounds the decline in Mining GVA's share of GDP.

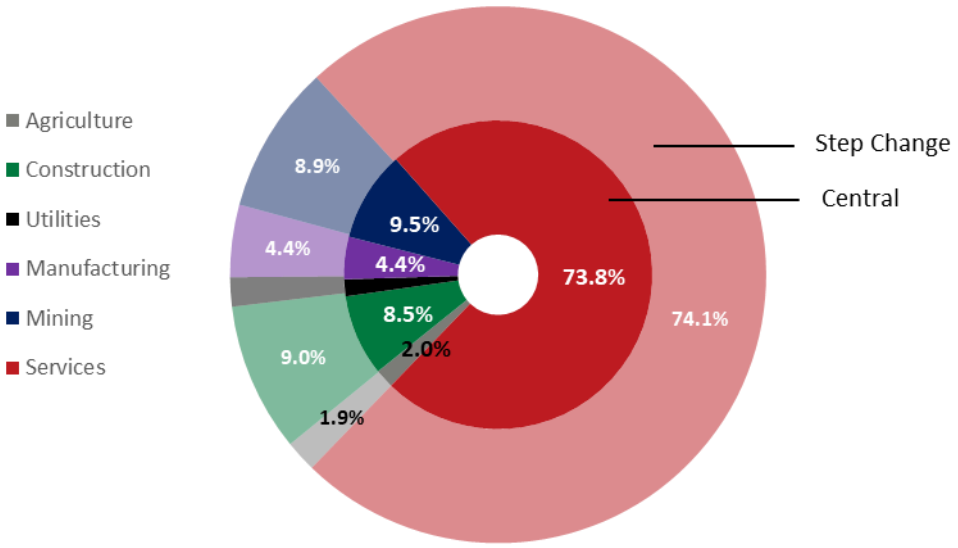
In line with this outlook, the following mining investment projects are expected to proceed:

- Gorgon 4th train (natural gas, WA)
- Browse LNG (natural gas, WA)
- Greenbushes Stage 3 (lithium, WA)
- Olympic Dam brownfield expansion (copper, SA)

For construction, the share of GDP increases. This largely reflects the additional investment required to service the larger population (including new infrastructure that is needed to ensure the work force is productive and efficient), but it also captures the impact of the transition of the

energy sector. As the construction of renewable generation sources is hastened and new grid technologies are adopted and implemented, additional investment is needed to operationalise these changes.

Figure 49 Industry Share of GDP (FY51): Step Change Scenario vs. Central Scenario

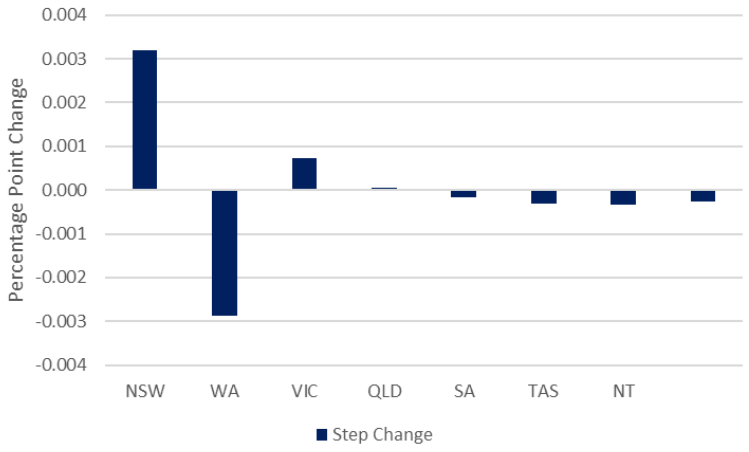


Source: BIS Oxford Economics

7.4. Relative states performance

As in the case of Slow Change, NSW and WA dominate the relative swing in state composition for the Step Change scenario, this time in reverse directions. NSW gains share, as it accrues a greater portion of the NOM uplift that was introduced, which drives demand for residential construction and for services sector activity. VIC, which also has a solid Services and Construction base, follows suit. While in WA and QLD, the Mining sector weighs down their contribution to GDP. This is more pronounced for WA due to the much greater dominance of the Mining sector in the state.

Figure 50 Percentage Point Change in State Composition of GDP from Central to Step Change, FY 51



Source: BIS Oxford Economics

Appendix A: Oxford Economics GEM Model and Australia State Forecasts

This section provides an overview of Oxford Economics Global Economic Model and Cities & Regions model which underpin our Australia macro and State forecasts.

Global Economic Model

The Oxford Global Economic Model (GEM) is the most widely used commercial International Macro Model, with clients including international institutions, Ministries of Finance and central banks around the world, and a large number of blue-chip companies. In addition, the GEM is used internally within Oxford Economics, for both baseline forecasting and simulating alternative scenarios for the world economy and individual economies.

The GEM has constantly evolved over the past three decades, reflecting continuous interaction between the Global Economic Model and changing conditions in the policy sphere, private sector, and global institutions. It is intended for use both by Oxford Economics and by clients to produce forecasts for a wide range of international macroeconomic and related variables, and for "what-if" scenario analysis. Clients can produce forecasts using the model either with a detailed internal forecasting exercise or simply by taking the Oxford Economics baseline and adjusting a small number of key inputs/assumptions. Scenario analysis can focus on the expected impact of a particular event or policy change or cover a wider range of alternative outcomes for stress testing.

It has long been one of Oxford Economics' guiding principles that many of the most important and interesting macroeconomic issues are inherently international. Globalization means that policy makers and analysts must form judgements about developments in their domestic economy and in the economies of countries with which they have trade and financial ties. For instance, a shift in US monetary policy has global repercussions; fossil fuel and commodity price shocks are significant source of terms of trade movements in Europe; governments increasingly collaborate over monetary, fiscal and environmental policies. These stylized facts imply that single country econometric models, which treat world trade, world prices and exchange rates as exogenous, are not best suited to analysing some of the most important issues of interest to financial and business economists.

The root cause of this integration is the massive increase in trade and capital flows between countries in the post-war period, and Oxford Economics' client base is testament to the growth in interest in international issues. With offices throughout the world, in the UK, elsewhere in Europe, the US and Asia, Oxford Economics aims to combine access to local information and expertise with a global outlook to provide a truly international service. The Oxford Global Economic Model reflects this priority, as coverage of the major trading countries has deepened and widened.

The current Oxford Model improves on previous vintages by incorporating descriptions of 80 individual countries. The model is "well-behaved" in the sense that it has a coherent long-run equilibrium embedded which the model will tend to converge to in the long run for a wide range of sensibly calibrated shocks.

It maintains the tradition of allowing for significant cross-country differences in economic structure, but ensures that those differences truly reflect economic, as opposed to economic model-builders', idiosyncrasies. Where possible, and it is possible in the majority of cases, the functional form for equations is left the same across countries. The exceptions chiefly reflect examples where countries are heavily dependent on particular sectors such as oil and emerging market countries where Foreign Direct Investment (FDI) plays a major role in the economy. Where the data allow, some countries have more detail on trade, distinguishing fuel and non-fuel and modelling profit and dividend receipts.

Parameters across countries differ, and this means that different countries exhibit different behaviour in response to shocks (although economy structure also accounts for variations). Now, however, tracing the root cause of these differences, and attributing them to underlying behaviour or structure, is much simpler. For instance, real wage rigidity is higher in some countries than others, and specific coefficients in wage and price equations reflect this. Unemployment will tend to rise further and faster in these countries in response to an adverse demand shock, even though the functional form of wage and price equations is identical across countries.

Structure of the GEM

Very broadly, the Oxford Global Economic Model is Keynesian in the short-run and monetarist in the long-run. This means that increased demand will lead to higher output and employment initially, but eventually this feeds through into higher wages and prices. Given an inflation target, interest rates have to rise, reducing demand again ('crowding out'). In the long run, output and employment are determined by 'supply side' factors. Interactions between countries through trade, exchange and interest rates, capital flows and oil/commodity prices are modelled in detail.

Within this theoretical framework, the structure of each country in the Oxford Global Economic Model can be generalized as follows:

- Consumption - function of real income, wealth and interest rates.
- Investment - 'q' formulation with accelerator terms.
- Exports - depend on world demand and relative unit labour costs.
- Imports - depend on total final expenditure and competitiveness.
- Real wages depend on productivity and unemployment relative to NAIRU.
- Prices are a mark-up on unit costs, with profits margins a function of the output gap.
- Monetary policy endogenised. Options include Taylor rule, fixed money and exchange rate targeting.
- Exchange rate determined by uncovered interest parity (UIP) in the short run and equilibrium exchange rates in the long run.
- Expectations are generally adaptive, with an option to use forward-looking expectations on a model-consistent basis for certain key financial variables.
- Countries are linked in the Oxford Global Economic Model via:
- Trade (Exports driven by weighted matrix of trading partners' import demand).
- Competitiveness (IMF relative unit labour costs where available, relative prices elsewhere).
- Interest Rates and Exchange Rates.
- Commodity Prices (e.g. oil, gas and coal prices depend on supply/demand balance; metal prices depend on growth in industry output).
- World Price of Manufactured Goods.

Country model detail

The structure of each of the country models is based on the income-expenditure accounting framework. However, the models have a coherent treatment of supply. In the long run, each of the economies behaves like the classic one sector economy under Cobb-Douglas technology (production function). Countries have a natural growth rate, which is determined by capital stock, labour supply adjusted for human capital, and total factor productivity. Output cycles around a deterministic trend, so the level of potential output at any point in time can be defined, along with a corresponding natural rate of unemployment.

Firms are assumed to set prices given output and the capital stock, but the labour market is characterized by imperfect competition. Firms bargain with workers over wages but choose the optimal level of employment. Under this construct, countries with higher real wages demonstrate higher long-run unemployment, while countries with more rigid real wages demonstrate higher unemployment relative to the natural rate.

Inflation is a monetary phenomenon in the long run. All of the models assume a vertical Phillips curve, so expansionary demand policies place upward pressure on inflation. Unchecked, these

pressures cause an unbounded acceleration of the price level. Given the negative economic consequences of this (as seen in the 1970s in developed economies and more recently in some emerging markets), most countries have adopted a monetary policy framework which keeps inflation in check. The model mirrors this, by incorporating endogenous monetary policy. For the main advanced economies, monetary policy is underpinned by the Taylor rule, captured using an inflation target, such that interest rates are assumed to rise when inflation is above the target rate, and/or output is above potential. The coefficients in the interest rate reaction function, as well as the inflation target itself, reflect assumptions about how hawkish different countries are about inflation. (A by-product of this system is that scenarios under fixed interest rates only make sense in the short-run. A scenario which imposes a fixed interest rate, and therefore assumes a lack of monetary policy, in conjunction with a vertical Phillips curve, would result in accelerating - or decelerating - inflation after several years.)

Demand is modelled as a function of real incomes, real financial wealth, real interest rates and inflation. Investment equations are underpinned by the Tobin's Q Ratio, such that the investment rate is determined by the return relative to the opportunity cost, adjusted for taxes and allowances. Countries are assumed to be "infinitely small", in the sense that exports are determined by aggregate demand and a country cannot ultimately determine its own terms of trade. Consequently, exports are a function of world demand and the real exchange rate, and the world trade matrix ensures adding-up consistency across countries. Imports are determined by real domestic demand and competitiveness.

Expectations

The Oxford Global Economic Model standard mode assumes adaptive rather than forward looking expectations because we believe that introducing expectations on the basis of economic theory is more advantageous than using the forward-looking assumption ubiquitously. There is disagreement among economists about whether forward looking expectations are consistent with observed data, which become even more acute in light of the difficulties with obtaining accurate data on expectations for model-building purposes. Instead, we generally adopt adaptive expectations, which are introduced using a framework in which expectations are formed using the actual predicted values from the model. Exogenous variables are assumed to be known a priori. Where appropriate, the model does introduce expectations implicitly and explicitly, therefore accounting for how and the extent to which agents respond to information about changes in fundamentals. An example of this includes our derivation of exchange rate forecasts which implicitly capture expectations: in the short run, the exchange rate is driven by movements in domestic interest rates relative to the US, therefore accounting for uncovered interest rate parity. Another example is our use of a variable for forward guidance to capture expected movements in interest rates. In addition, there is an option to use forward-looking expectations explicitly on a model-consistent basis for certain key financial variables.

Modelling the macro outlook for states

Forecasts at the state level are built up on an industry basis, to accurately incorporate state characteristics relative to the national picture.

To produce state level forecasts, we therefore begin by modelling national level forecasts for value added and employment for each industry, by combining the macroeconomic forecasts outlined above with an input-output framework to quantify the impact of changes in final demand and intermediate demand on each sector. For example, developments in public administration will be closely related to government spending and the retail sector is influenced by consumer spending.

The latest available data for each State and City is collected from the Australian Bureau of Statistics. All data is subjected to numerous checking procedures to ensure accuracy and timeliness. All sub-national data is aligned to national aggregates.

The forecasts and data produced above are fed into Oxford Economics' suite of sub-national models to produce forecasts for each State. These models predominately adopt a top-down approach, and flow from the macro level to the State. Forecasts for value added and employment by industry at the State level are produced by a set of equations that take account of the historical relationship between growth and productivity trends in each industry in each State compared with the performance of the industry at the national average. This means the States with the strongest forecast will be those who have an advantageous industrial structure (i.e. a relatively high concentration of activity in an industry which are expected to perform strongest in Australia), and those for which there is evidence that the State has a particular competitive advantage in a particular sector (this is illustrated by the historical data showing a stronger performance in an industry in the State than nationally).

The State forecasts produced by this 'demand side' approach is reviewed and adjusted where necessary to ensure they are consistent with long run supply side considerations, including demographic change (which incorporates official population projections) and labour market efficiency. Household incomes are influenced by demographic and employment trends, and consumer spending and retail sales by income trends.

Appendix B: BIS Oxford Economics vs. ABS Population Forecasts

As outlined in the Scenario Assumptions section, BIS Oxford Economics forecasts for population are produced using ABS Series B assumptions for Natural Increase (itself a function of total fertility rates and death rates for the population) and our assessment of Net Overseas and Net Interstate migration (NOM & NIM), which are linked to fundamental economic drivers. For NOM, we consider both recent trends and economic drivers of inflows by major type of migrant (students, temporary workers and permanent migrants), linking these flows to domestic and international economic conditions. For NIM, we consider historic trends and local economic conditions, particularly in the labour market which we see as a major driver of migration regionally.

In previous economic forecasts, ABS series B projections for population have been used. The latest projections therefore use the same assumptions for Natural Increase (in terms of birth and death rates) but differ with respect to NOM and NIM. Section 2 outlines our assumptions for NOM and NIM. The ABS assumptions can be summarised as:

- **NOM national:** For the years through to FY22, the ABS have used the baseline scenario produced by the Department of Home Affairs. After this, the level of NOM transitions to 225,000 pa, which it reaches in FY27. The level is then constant after this date. The figure 225,000 is the average level of NOM over the period FY08-FY17 (the decade prior to the projections being compiled).
- **NOM state:** NOM into each state is calculated as the national total multiplied by each state's assumed share. The share for each state in the long run (FY27 onwards) is defined by the average over the decade FY08-FY17. From FY18 to FY27, the share for each state linearly transitions from its FY17 level to the long run value.
- **NIM:** As with NOM, the ABS uses past NIM levels to define its projections. For Series B, NIM in the long run is broadly set to equal the average level over the period FY08-FY17, although some adjustments are necessary to ensure that the sum of NIM is zero. Over the short and medium term, the levels of NIM transition to the long run, with adjustments made to ensure the sum is zero in all years.

8.1. Comparison of assumptions for NOM and NIM

The charts below compare NOM and NIM for the states for our projections with the ABS Series B projections16. The key differences are as follows:

NSW, VIC and QLD

- Over the near term, we are less optimistic about the outlook for NOM in the three largest states. The largest difference (in absolute and percentage terms) is NSW, where we expect NOM to be almost 20,000 lower in the early years of the forecast horizon. Over the medium term, our projections for all three states converge to the ABS series and then rise above them. This is because we are assuming a higher level of NOM at the national level in the long run (250,000 v. 225,000).
- Across the states, we expect QLD to capture a significantly larger share of NOM, and NSW a significantly smaller share. VIC's share is broadly similar across the two set of projections.

[16] Note that as FY18 and FY19 are now actual estimates for NOM and NIM we have not compared these values to the ABS projections for these years.

- We are assuming significantly lower levels of NIM for NSW throughout the forecast horizon. This reflects our view that NIM for NSW will fall back to close to long run historical averages, after it rose significantly through the mining investment downturn.
- Conversely, for QLD we are expecting significantly higher levels of NIM over the forecast horizon, driven by improving economic conditions in the near term, with the high level sustained over the long run. For VIC our projections for NIM are somewhat lower than Series B across the forecast horizon.

SA, WA, TAS, NT and ACT

- We are projecting higher levels of NOM compared to series B for SA, WA and TAS. For WA, the difference is more pronounced in the near term, when we expect a sharp pick-up in NOM driven by a rebound in mining engineering construction activity. This pattern is also true of TAS, where we expect the recent strength in NOM to be maintained over the near term before a drop back in the medium term. In contrast, for SA are projections are generally only modestly higher than the ABS throughout the forecast horizon.
- The pattern in NOM for SA, WA and TAS is generally replicated in NIM. The main exception is TAS, where we are modestly less optimistic in the long run.
- For NT and ACT we expect NOM to be lower than the Series B projections in the near term. This pattern reflects recent migration patterns, with estimated NOM in FY18 and FY19 falling short of the Series B projections. Over the long run our projection for NOM for both territories is broadly similar to Series B.
- The projections for NIM into ACT are broadly similar for both the short and long term. For NT we are modestly more optimistic, with the difference declining over time.

8.2. Implications for population projections

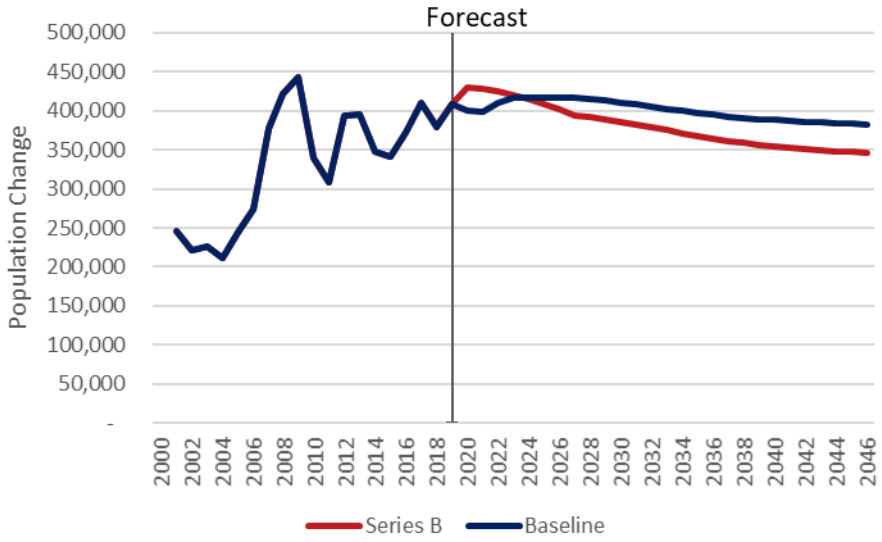
At the national level, in the near term (FY20 – FY23) our projection for total population is moderately lower than the ABS series B, due to the lower levels of assumed NOM into NSW, VIC and QLD. This position reverses in FY24, and remains the case in the long run, as we are assuming a higher level of NOM (250,000 v. 225,000)17.

Across the states, the key points of comparison are:

- Our projection for NSW is lower than ABS series B throughout the forecast horizon. This is due to the lower levels of NOM and NIM in the near term, and a lower level of NIM in the long run, which outweighs a slightly higher level of NOM.
- For VIC, our projections are slightly lower in the near term (due to lower levels of NOM and NIM), but this position reverses so that by FY51 we are slightly higher than series B (though the difference is small).
- Our projection for QLD is higher than series B throughout the forecast horizon. This is due to higher assumed levels of NIM in the near term, and higher levels of NOM and NIM in the long run.
- For SA and WA, our projections are higher throughout due to higher levels of NOM and NIM.

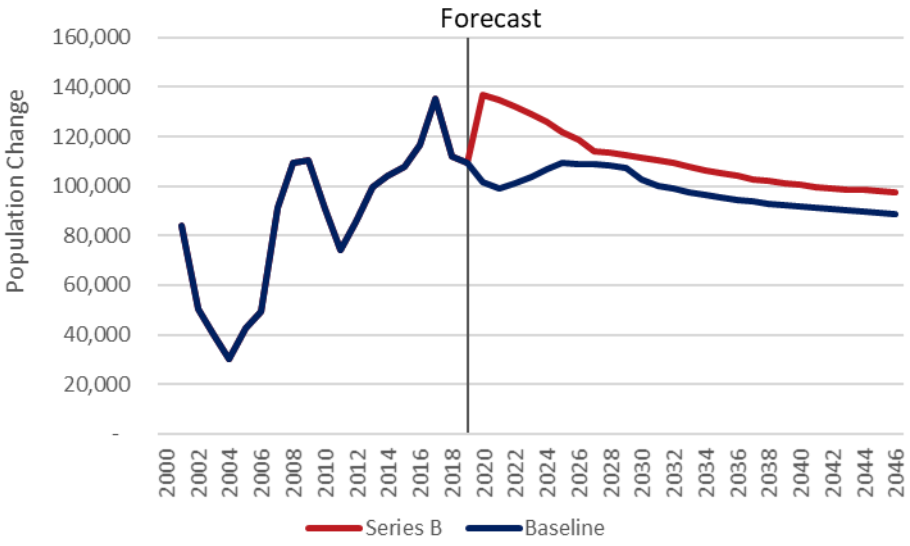
[17] It is worth noting that the difference in NOM also has implications for population growth via NI. So although we assume the same underlying assumptions for total fertility rates and death rates, the increase in the population due to NI differs between our projection and Series B, due to differences in our migration assumptions.

Figure: Population Change, ABS Series B vs. BIS Oxford Economics: Australia



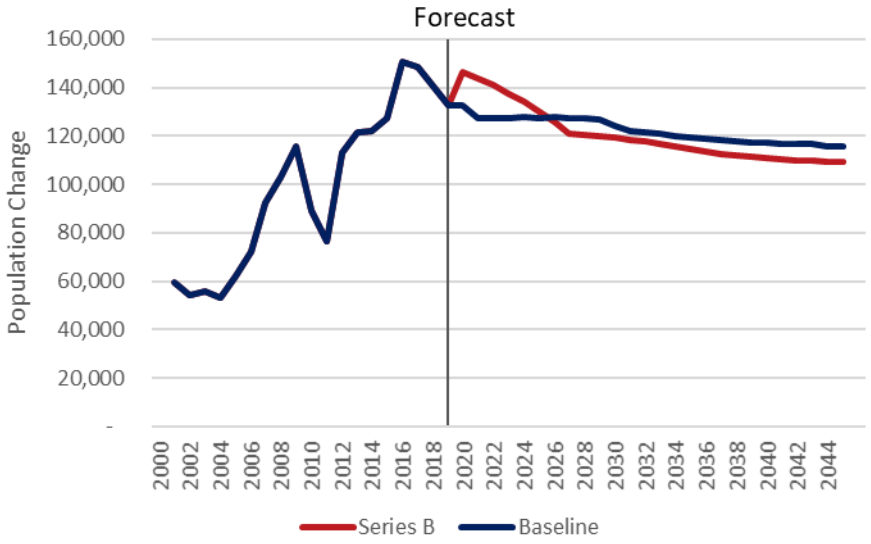
Source: BIS Oxford Economics/ Australian Bureau of Statistics

Figure: Population Change, ABS Series B vs. BIS Oxford Economics: NSW



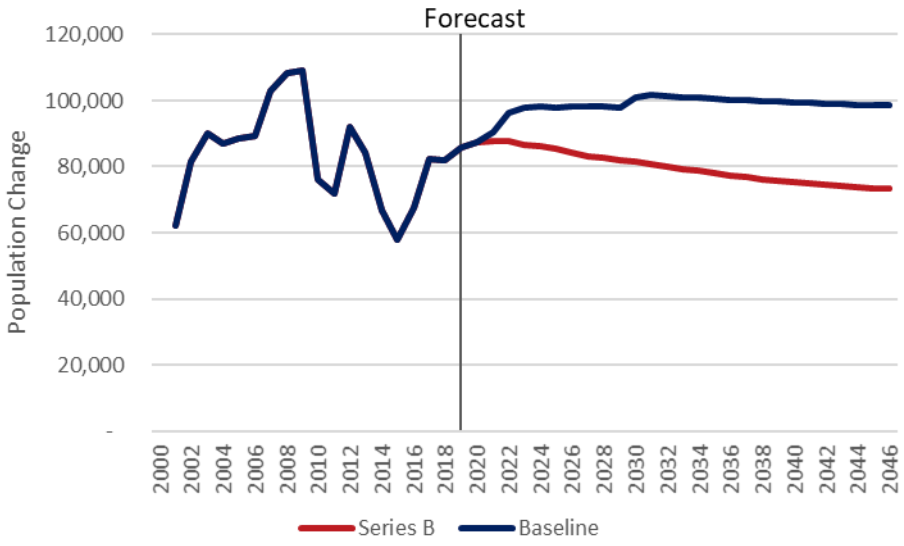
Source: BIS Oxford Economics/ Australian Bureau of Statistics

Figure: Population Change, ABS Series B vs. BIS Oxford Economics: VIC



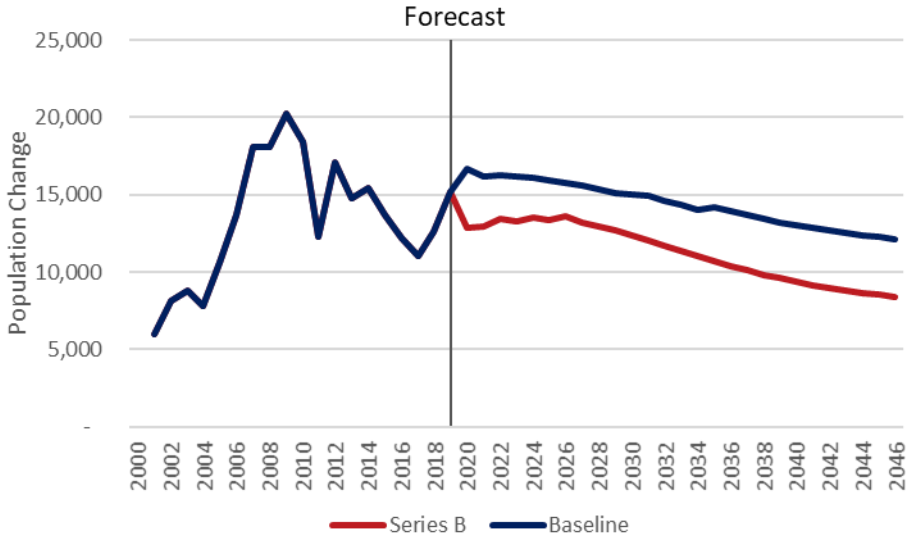
Source: BIS Oxford Economics/ Australian Bureau of Statistics

Figure: Population Change, ABS Series B vs. BIS Oxford Economics: QLD



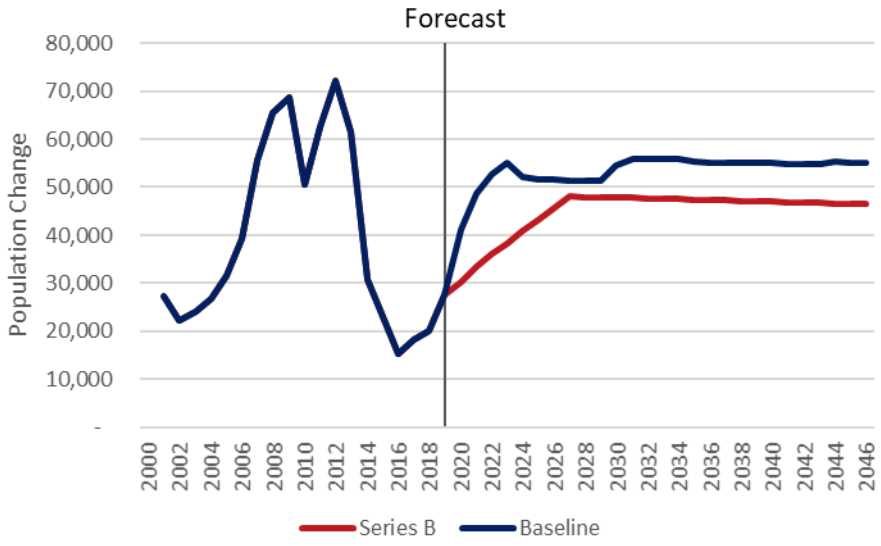
Source: BIS Oxford Economics/ Australian Bureau of Statistics

Figure: Population Change, ABS Series B vs. BIS Oxford Economics: SA



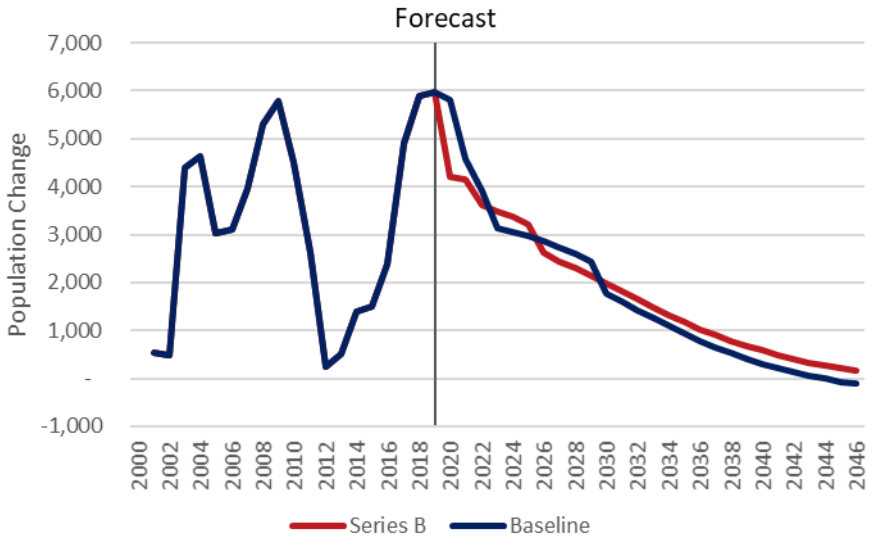
Source: BIS Oxford Economics/ Australian Bureau of Statistics

Figure: Population Change, ABS Series B vs. BIS Oxford Economics: WA



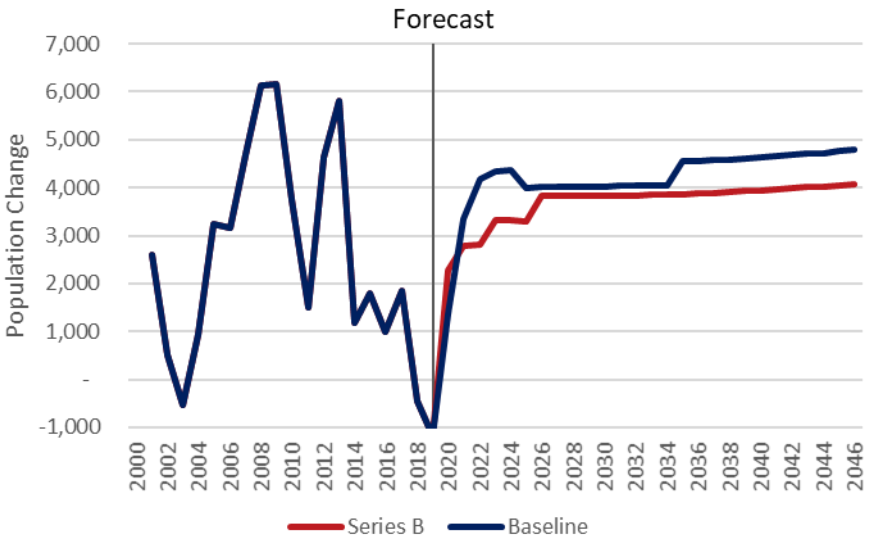
Source: BIS Oxford Economics/ Australian Bureau of Statistics

Figure: Population Change, ABS Series B vs. BIS Oxford Economics: TAS



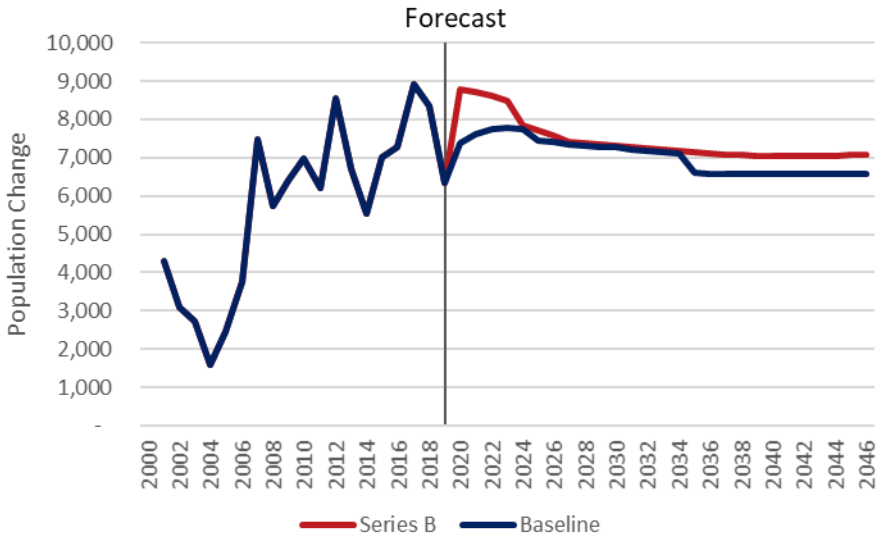
Source: BIS Oxford Economics/ Australian Bureau of Statistics

Figure: Population Change, ABS Series B vs. BIS Oxford Economics: NT



Source: BIS Oxford Economics/ Australian Bureau of Statistics

Figure: Population Change, ABS Series B vs. BIS Oxford Economics: ACT



Source: BIS Oxford Economics/ Australian Bureau of Statistics

Appendix C: Comparison with other forecasts

We use forecasts produced by state Treasury departments to benchmark our projections, and we focus our assessment on Gross State Product (GSP) as a common metric. The table below compares our projections to the treasury department for each state, for all years possible. We note the following key differences:

- We are generally less optimistic about the outlook for NSW. Although the NSW Treasury does not provide a breakdown of GSP by industry, our review of their mid-year financial statement suggests that a key difference in our near-term forecast is our view that construction activity will continue to decline, as a result of further declines in dwelling construction. Over the medium term, it is likely that our projection for slower population growth explains our slower pace of GSP growth.
- We are also less optimistic about the outlook for the Victorian economy, and also expect this is a result of our different view of the housing market and the impact of a further moderation in the pace of population growth. Over the medium term our projections are broadly similar.
- We are slightly more optimistic about the outlook for QLD's economy this year and expect a similar pace of growth in FY21.
- We are less optimistic about the outlook for South Australia in the near term, primarily as a result of the ongoing drought (which the SA Treasury expected to abate) and the further deterioration in consumer sentiment and spending. The gap between our projections and the SA Treasury projections gradually closes over the forecast horizon, reflecting our view that it will take some time for wages growth to pick up, and for consumer spending growth to accelerate.
- We are less optimistic about the outlook for WA's economy in the near term, but by FY23, our projections are in line with the 2.75% projection produced by the State Treasury.
- A similar pattern is seen in our projections for NT, and likely reflects our assessment of the pipeline of projects currently scheduled for the mining sector. Base effects result in higher growth for BIS Oxford Economics by FY23, compared with the State Treasury forecasts.
- Our projections for TAS and the ACT are broadly similar to their respective state treasuries.

Table: Central case projections v. state treasury projections, GSP, % y/y

		2020	2021	2022	2023
NSW	BISOE	1.2	1.5	1.9	2.2
	State Treasury	*2.5*	*2.5*	*2.5*	*2.5*
VIC	BISOE	2.0	2.7	3.0	3.0
	State Treasury	*2.5*	*2.75*	*2.75*	*2.75*
QLD	BISOE	2.8	2.7	2.2	2.6
	State Treasury	*2.5*	*2.75*	-	-
SA	BISOE	1.2	1.5	1.5	1.8
	State Treasury	*1.75*	*2.25*	*2.25*	*2.25*
WA	BISOE	2.0	2.2	1.7	2.7
	State Treasury	*3*	*2.5*	*2.75*	*2.75*
TAS	BISOE	2.7	2.1	1.7	2.2
	State Treasury	2.75	2	2	2
NT	BISOE	2.2	2.9	2.7	4.2
	State Treasury	*6.3*	*4.1*	*2.9*	*2.5*
ACT	BISOE	3.3	3.1	2.6	3.0
	State Treasury	3	3.25	3.25	3.25

For NSW, VIC, QLD, SA, WA and NT, forecasts drawn from state's mid-year update report

For TAS and ACT, forecasts drawn from 2019-20 state/territory budget

Appendix D: Comparison with previous projections

As we did not provide the previous set of long-term economic scenario forecasts it is not possible for us to conduct a detailed assessment of the differences in the previous central case projections with the latest projections. Instead, we have identified the following key points of difference, based on the current forecasts and the information reported in the 2019 summary report.

- The current projections see the AUD holding steady in the near term, at around 69 US cents per AUD, before appreciating to around 80 US cents per AUD by the late 2020s. In contrast, the 2019 central case projected a relatively steady AUD over the forecast horizon, at around 72 US cents per AUD. As noted in Section 2, we expect i) the closing of the gap between the Federal Funds rate and the RBA cash rate in the mid-2020s and ii) a general weakening of the USD over the medium term (driven by the structural drag from the twin current account and budget deficits) to weigh on the USD against all currencies.
- Although we see some of the weakening in labour productivity growth over the last decade as cyclical, we do not expect a return to trend growth levels (around 1.3% over the last 40 years). Instead, we expect labour productivity growth to average 1% pa in the long run[18]. As a result, it is likely that our projections for long run GDP growth for Australia are weaker than the 2019 projections.

The slower pace of productivity growth is reflected across the projections for all states and territories. We therefore consider the key differences in the outlook of the states relative to the national average.

- It is likely that we are more optimistic about the relative outlook for QLD. This reflects the faster projection for population growth relative to ABS Series B.
- In contrast, it is likely that we are less optimistic about the outlook for NSW and VIC. This again reflects our projections for population growth relative to Series B.
- We are less optimistic about the outlook for WA, particularly in the near term where we expect to see a much slower improvement in momentum. While we cannot comment on the detailed assumptions underpinning the previous projections, it is likely that we have more conservative assumptions with respect to mining engineering construction projects that will proceed during this period (this view is in line with AEMO's feedback with respect to the project pipeline).

[18] As discussed in Section 2, this reflects our more general view that the secular stagnation trends that have emerged in recent years are semi-permanent. We expect that developed economies' are no longer able to extract 'easy wins' with respect to productivity growth, and many of the improvements in technology recently have improved living standards but not necessarily increased output per worker.

Appendix E: Downside Risks to Baseline Forecasts

Since finalising the macroeconomic forecasts (11 February 2020) for AEMO, there have been material developments both globally and domestically in Australia from the impact of COVID-19. While the baseline forecasts took into account some of the early impacts of COVID-19, several new developments present downside risk to these forecasts. Namely:

- Outbreaks of COVID-19 have emerged in other parts of the world, with Europe now seen as the centre of the pandemic. Italy, Spain, France and other countries have had to resort to severe social distancing policies (lockdowns etc), and it is becoming increasingly clear that normal day-to-day life will be disrupted for quite some time.
- Australia has applied a two-week compulsory self-isolation period for anyone arriving from overseas, in addition to arrivals bans previously announced that target specific countries such as Korea and Italy.
- Within Australia, the number of reported cases is also on the rise and while most cases have originated from people entering Australia after picking up the virus in other countries, there have been several cases of human to human transmission on Australian soil[19], adding further uncertainty around the development of COVID-19 in the Australian context.

The damage done to business and consumer confidence will place a significant drag on activity in the first half of calendar 2020. Some of the key transmission channels through which we expect these impacts to materialise are:

- **Services trade**: The travel ban coupled with a sharp fall in demand for international travel has already impacted tourism related services. Education exports have also been hurt, with international students unable to commence their university year. Equally on the imports side, the virus is expected to curtail import of services with less overseas travel for Australians (for both business and leisure).

- **Supply chain disruptions**: The slower than anticipated return of activity to China's manufacturing sector will result in more prolonged supply chain disruption globally, slowing production and creating distribution bottlenecks. We anticipate the manufacturing and construction sectors will bear the brunt of this disruption, but there could also be an impact on retail, with some products not available or restricted in their supply.

- **Energy & Fuel**: Tepid global demand and distribution bottlenecks have also created uncertainty in energy and fuel markets. LNG has seen a strong dip in demand as China announced force majeure on gas imports, resulting in Chinese imports of LNG falling back sharply over January and February. Oil markets have been subject to further disruption, with the agreement between OPEC and Russia to limit production collapsing on 8th March, and Saudi Arabia subsequently announcing that they intend to increase production dramatically from April onwards. The impact on Australia's LNG industry remains uncertain at this point but there is downside risk to our projections.

- **Equity markets**: Equity markets (including the Australian Stock Exchange) have corrected sharply, as investors react to mounting uncertainty around the economic impacts of COVID-19. If this trend continues, and morphs into more general financial stress (corporate borrowing rates increasing sharply compared to bond yields, interbank markets ceasing to operate etc), this

[19] As at 10th March, 2020.

would place a further drag on growth. And it explains the rapid response of the RBA, with a 25bps rate cut announced on 3rd March.

Given these rapid developments and as this is still an ongoing issue, it is difficult to ascertain with any certainty the magnitude of the impacts and the time it will take the economy to recover from the disruption. But it is clear that the projections provided on 11 February do not include the full size of the likely downturn in activity or the most recent policy responses to support the outlook.

Abbreviations

Abbreviation	Definition
ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
AEMO	Australian Energy Market Operator
ANZSIC	Australia & New Zealand Standard Industry Code
CAGR	Compounded Annual Growth Rate
FY	Financial year, beginning 1st July
GDP	Gross Domestic Product
GSP	Gross State Product
GVA	Gross Value Added
NI	Natural Increase
NIM	Net Interstate Migration
NOM	Net Overseas Migration
NSW	New South Wales
NT	Northern Territory
% Pt.	Percentage point
QLD	Queensland
SA	Southern Australia
TAS	Tasmania
VIC	Victoria
WA	Western Australia
%pts	Percentage points