



**Long term economic  
scenario forecasts**

Australian Energy Market Operator

April 2019

# Contents

Glossary	5
Executive summary	8
1. Scenario results	14
1.1 Neutral scenario	14
1.2 Weak scenario	19
1.2.1 Results	19
1.3 Strong scenario	24
1.3.1 Results	24
1.4 Commodity-driven strong scenario	29
1.4.1 Results	29
References	33
Appendix A : Comparison with other forecasts	34
A.1 Comparison with Relevant State Treasuries	34
A.2 Comparison with 2018 forecast vintage	36
Appendix B : Forecast accuracy	37
B.1 Gross State Product	37
B.2 Gross Value Added for Industrial Production	38
B.3 Gross Value Added for Services sector	39
B.4 \$A/\$US exchange rate	39
Appendix C : Charts – Comparison with other forecasts	40
Limitation of our work	43
General use restriction	43

# Charts

Chart 1 :	Real GDP, % deviation from neutral	10
Chart 2 :	Real HDI and GDP in 2040-41, % deviation from neutral	10
Chart 3 :	Services and industrial production GVA in 2040-41, % deviation from neutral	11
Chart 4 :	\$/US\$ exchange rate in all scenarios	12
Chart 1.1 :	Annual GSP growth, 2016-17 to 2040-41 (%)	15
Chart 1.2 :	Annual real household disposable income growth, 2016-17 to 2040-41 (%)	15
Chart 1.3 :	Annual industrial production growth, 2016-17 to 2040-41 (%)	16
Chart 1.4 :	Annual services sector GVA growth, 2016-17 to 2040-41 (%)	17
Chart 1.5 :	Weak scenario real GSP, % deviation from neutral	20
Chart 1.6 :	Weak scenario real household disposable income, % deviation from neutral	21
Chart 1.7 :	Weak scenario industrial production GVA, % deviation from neutral	21
Chart 1.8 :	Weak scenario services GVA, % deviation from neutral	22
Chart 1.9 :	Strong scenario real GSP, % deviation from neutral	25
Chart 1.10 :	Strong scenario industrial production GVA, % deviation from neutral	26
Chart 1.11 :	Strong scenario real household disposable income, % deviation from neutral	26
Chart 1.12 :	Strong scenario services GVA, % deviation from neutral	27
Chart 1.13 :	Commodity-driven strong scenario real GSP, % deviation from neutral	30
Chart 1.14 :	Commodity-driven strong scenario real household disposable income, % deviation from neutral	30
Chart 1.15 :	Commodity-driven strong scenario industrial production GVA, % deviation from neutral	31
Chart 1.16 :	Commodity-driven strong scenario services sector GVA, % deviation from neutral	32
Chart 1.17 :	Commodity-driven strong scenario \$/US\$ exchange rate	32
Chart A.1 :	Comparison of neutral and VIC treasury forecasts (%)	34
Chart A.2 :	Comparison of neutral, WA treasury forecasts and WA GSOO 2018 (%)	35
Chart A.3 :	Comparison of neutral and QLD treasury forecasts (%)	36
Chart C.1 :	NSW neutral and Treasury GSP forecast (%)	40
Chart C.2 :	NSW population forecasts (%)	40
Chart C.3 :	VIC neutral and Treasury GSP forecasts (%)	40
Chart C.4 :	VIC population forecasts (%)	40
Chart C.5 :	QLD neutral and Treasury GSP forecasts (%)	40
Chart C.6 :	QLD population forecasts (%)	40
Chart C.7 :	SA neutral and Treasury GSP forecasts (%)	41
Chart C.8 :	SA population forecasts (%)	41
Chart C.9 :	WA neutral and Treasury GSP forecasts (%)	41
Chart C.10 :	WA population forecasts (%)	41
Chart C.11 :	TAS neutral and Treasury GSP forecasts (%)	41
Chart C.12 :	TAS population forecasts (%)	41
Chart C.13 :	ACT neutral and Treasury GSP forecasts (%)	42
Chart C.14 :	ACT population forecasts (%)	42
Chart C.15 :	Exchange rate forecasts, \$/US\$	42

# Tables

Table B.1:	Actual and forecast GSP growth, 2017-18	38
Table B.2:	Actual and forecast GVA Industrial Production growth, 2017-18	38
Table B.3:	Actual and forecast Services GVA growth, 2017-18	39
Table B.4:	Actual and forecast \$A/\$US exchange rate, 2016-17 to 2017-18	39

# Glossary

## Acronym

ABS

ACT

AEMO

GDP

GSOO

GSP

GVA

HDI

NSW

QLD

SA

TAS

VIC

WA

## Fullname

Australian Bureau of Statistics

Australian Capital Territory

Australian Energy Market Operator

Real Gross Domestic Product

Gas Statement of Opportunities

Real Gross State Product

Real Gross Value Added

Real Household Disposable Income

New South Wales

Queensland

South Australia

Tasmania

Victoria

Western Australia

# Overview of macroeconomic scenarios

## Neutral

The central outcome for the Australian economy. The short term economic outlook is driven by public expenditure and a low Australian dollar. Longer term trends are shaped by population and productivity growth.

### Key assumptions

- Most likely path for the Australian economy
- ABS population growth assumptions anchor the forecasts
- Longer term economic growth depends on population and productivity growth

## Weak

Countries shy away from global engagement resulting in less efficient allocation of resources. Global and domestic economic growth decline relative to the neutral scenario with lower productivity, trade and migration.

- Increase/decrease in world GDP growth informed by the US Energy Information Administration (EIA)
- Lesser impact on world industrial production
- Increase/decrease in population growth across all states and territories based on ABS population projections
- Rise/fall in labour productivity

## Strong

Successful implementation of long term structural reforms to increase trade in goods and services as well as movement of people across borders. The impact of these reforms is an increase in trade, productivity and migration.

- Strong global GDP growth
- Short term boost to world industrial production
- Increased population growth especially in mining areas in the short run
- Rise in labour productivity

## Commodity strong

The commodity-driven strong scenario is driven by faster than expected growth in the Chinese economy due to increased fiscal stimulus on infrastructure, higher than what is assumed in the neutral scenario. There is an increase in the demand and price of Australian commodity exports which boosts terms of trade and economic growth in the short term.

## Neutral in 2040 - 41

Real GDP **\$3,442 B**  
 Industrial production GVA **\$544 B**  
 Services GVA **\$2,114 B**  
 Real HDI **\$2,173 B**

### Alternative scenarios in 2040-41 (% from neutral)

	Weak	Strong	Commodity strong
Real GDP	12.8% ▼	14.2% ▲	13.8% ▲
Industrial production GVA	11.5% ▼	12.1% ▲	19.8% ▲
Services GVA	13.3% ▼	14.2% ▲	11.4% ▲
Real HDI	19.2% ▼	26.2% ▲	35.8% ▲
Most affected	Queensland, Victoria New South Wales	Queensland, Victoria New South Wales	Western Australia

# Executive summary

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The Australian Energy Market Operator (AEMO) engaged Deloitte Access Economics to provide long term economic forecasts for four AEMO specified scenarios. These economic forecasts are key inputs to AEMO's energy demand forecasts published in the Electricity Statement of Opportunities and Gas Statement of Opportunities reports. The work covers all states and territories except for the Northern Territory. Forecasts from 2018/19 to 2040/41 are provided for real Gross State Product (GSP), real Household Disposable Income (HDI), Gross Value Added (GVA) for the industrial production sector and the services sector, and the \$A/\$US exchange rate at the national level. Industrial production is an aggregate measure of mining, manufacturing and utilities industry activity. Services activity includes all remaining industries except for agriculture and construction.

The four scenarios Deloitte Access Economics has modelled are the neutral, weak, strong and commodity-driven strong scenarios. The key high level results for the four AEMO specified scenarios are outlined in this summary, with further details provided in the report.

## Neutral Scenario

The neutral scenario represents the central outcome for the state and territories. The forecast combines the Australia Bureau of Statistics (ABS) Population Series B assumptions with the economic outlook from Deloitte Access Economics' December 2018 Business Outlook publication.<sup>1</sup> The ABS population projections are used to anchor the forecasts to a transparent publicly available source of information.

Under the neutral scenario, the short term prospects for the economy remain robust, with all states and territories expected to experience continued economic growth. However, there are several risks to the outlook including a reduction in credit supply that has led to declining property prices and falling rates of housing construction. Consumer spending has also softened amid weak real wage growth which is expected to drag on growth in 2019. However, elevated public expenditure and investment, and rising commodity export volumes is expected to offset the downside risks in the short term.

In the long run, key determinants of growth are population and productivity. While the Australian population is expected to continue to grow, the rate of growth is expected to slow due to population ageing. On the other hand, it's expected that continuing technological innovation will maintain stable productivity growth over time, in line with long run historical trends.

<sup>1</sup> ABS Cat. No 3220.0, Population Projections, Australia, 2017 (base) – 2066. Available at: <https://www.abs.gov.au/AUSSTATS/abs@.nsf/mf/3222.0..>

## Weak, strong and commodity-driven strong scenarios

The assumptions and drivers underlying AEMO's weak and strong scenarios are aligned with the slow and fast change scenarios outlined in AEMO's Planning and Forecasting Consultation Paper 2019.<sup>2</sup> The weak scenario sees countries shying away from international engagement resulting in greater inefficiency and lower productivity. Global and domestic economic growth decline relative to the neutral scenario with lower productivity, trade and migration. In contrast, the strong scenario is based on the successful implementation of long term structural reforms to increase trade in goods and services as well as movement of people across borders. The impact of these reforms is an increase in trade, productivity and migration. Neither of the scenarios incorporate significant fluctuations in the price of industrial resources. Hence, broad based decline/increase in economic growth across states and territories is expected in these scenarios.

The main drivers underlying the weak and strong scenarios are as follows:

- Increase/decrease in world GDP growth, with a lesser impact on world industrial production growth, informed by the US Energy Information (EIA) International Energy Outlook 2017.<sup>3</sup>
- Increase/decrease in population growth across Australia's states and territories based on ABS Population Projections.
- Increase/decrease in labour productivity in response to global and domestic economic conditions.

The commodity-driven strong scenario is driven by faster than expected growth in the Chinese economy due to increased fiscal stimulus on infrastructure, higher than what is assumed in the neutral scenario. There is an increase in the demand and price of Australian commodity exports which boosts terms of trade growth and economic growth in the short term. However, the growth in demand for exports to China isn't expected to last given the large amount of debt already accumulated by the Chinese economy. Fortunately, the short lived commodity boom results in greater wealth and enables the Australian government to invest in productivity enhancing technologies which supports longer run growth.

## Results

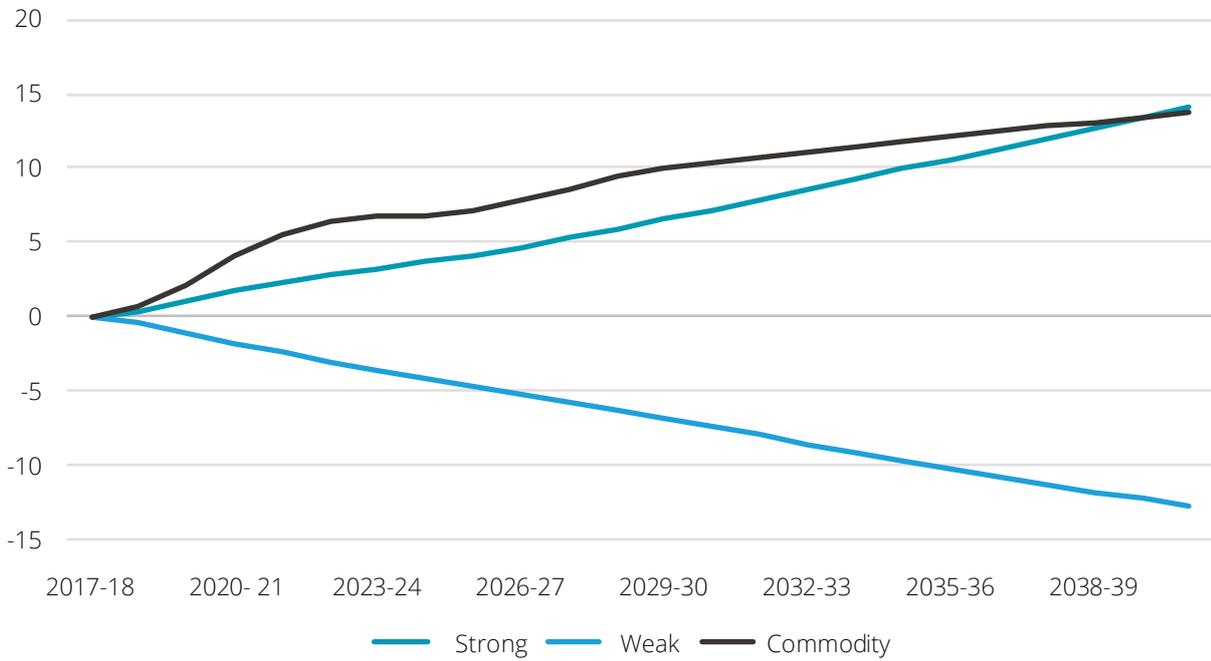
The impact on real GDP in the weak/strong scenarios relative to the neutral scenario is largely symmetrical and linear in nature, as illustrated in Chart 1. In contrast, the impact on real GDP in the commodity-driven strong scenario is non-linear as it incorporates commodity effects in the short term before shifting to a productivity driven shock in the long term.

In the weak/strong scenarios, the states with heavy concentration of services industries such as NSW and VIC are more exposed, and hence sees the greatest deviations in real GSP. In the commodity-driven strong scenario, WA sees the greatest deviation in real GSP given its exposure to commodity exports.

2 AEMO 2019 Planning and Forecasting Consultation Paper. Available at: [https://www.aemo.com.au/-/media/Files/Electricity/NEM/Planning\\_and\\_Forecasting/Inputs-Assumptions-Methodologies/2019/2019-Planning-and-Forecasting-Consultation-Paper.pdf](https://www.aemo.com.au/-/media/Files/Electricity/NEM/Planning_and_Forecasting/Inputs-Assumptions-Methodologies/2019/2019-Planning-and-Forecasting-Consultation-Paper.pdf)

3 International Energy Outlook 2017. Available at: [https://www.eia.gov/outlooks/ieo/pdf/0484\(2017\).pdf](https://www.eia.gov/outlooks/ieo/pdf/0484(2017).pdf).

**Chart 1: Real GDP, % deviation from neutral**

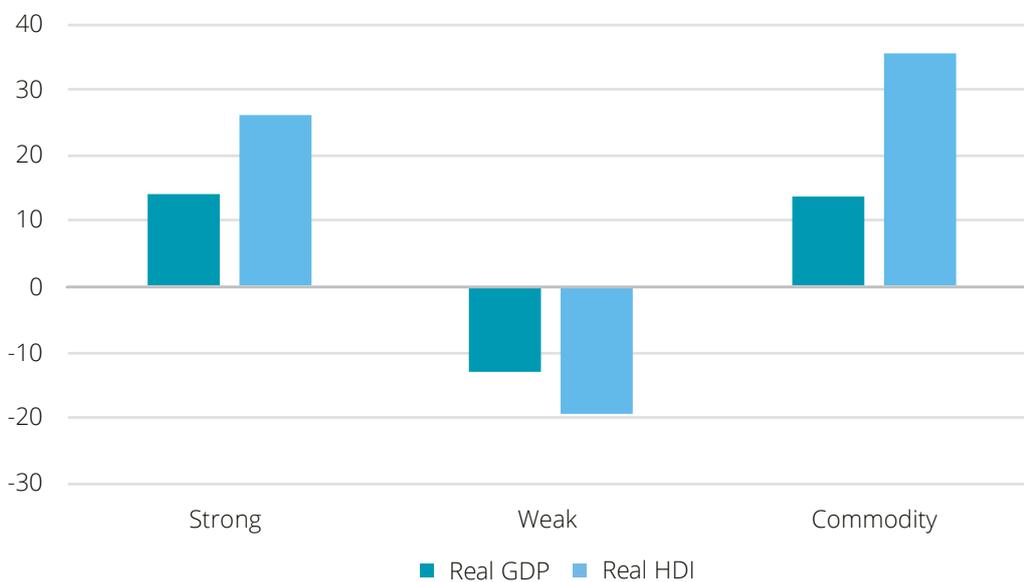


Source: ABS Cat No. 3220.0, 5206.0, 5220.0; Deloitte Access Economics.  
 Note: First forecast period is 2018-19.

The weak and strong scenarios can usefully be thought of as persistent shocks to real household disposable income growth which flows through to the economy affecting industry activity and economic growth. As per Chart 2, real household disposable income is more affected than real GDP in these scenarios because it is directly exposed to both:

- The reduction/increase in population growth which leads to slower employment growth.
- Lower/higher labour productivity which leads to changes in real wage growth.

**Chart 2: Real HDI and GDP in 2040-41, % deviation from neutral**



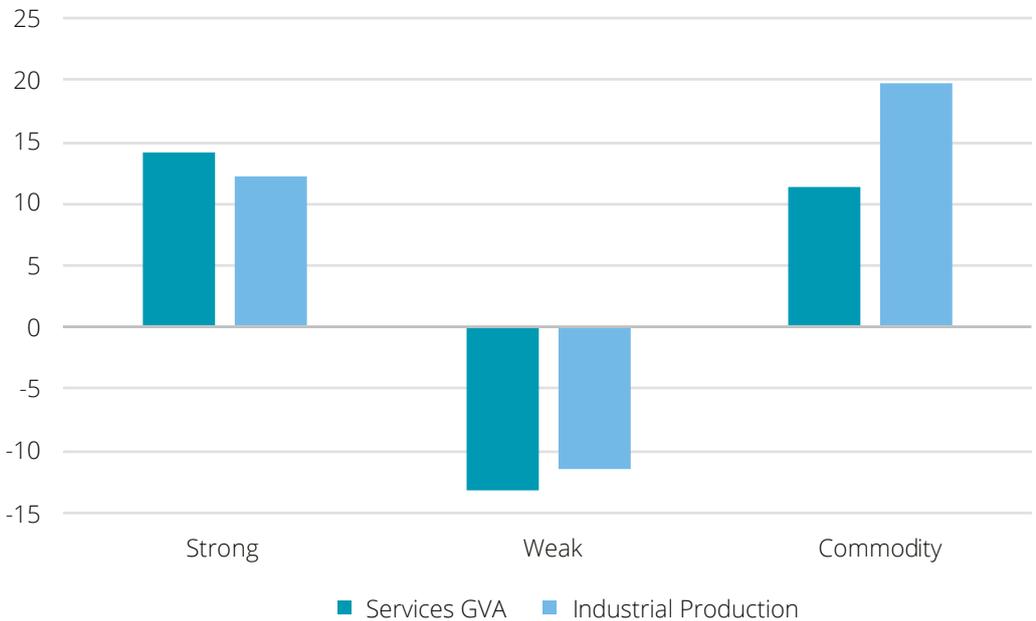
Source: ABS Cat No. 3220.0, 5206.0, 5220.0; Deloitte Access Economics.

With this in mind, service industries are found to be most affected in the weak and high scenarios because:

- They tend to sell to domestic consumers who are affected by lower/higher real income.
- They tend to rely more heavily on labour input, which is more/less scarce and more/less productive.

This contrasts with industrial production related industries which are more likely to sell to international customers or other businesses, and are more capital intensive and therefore rely less on labour input.

**Chart 3: Services and industrial production GVA in 2040-41, % deviation from neutral**

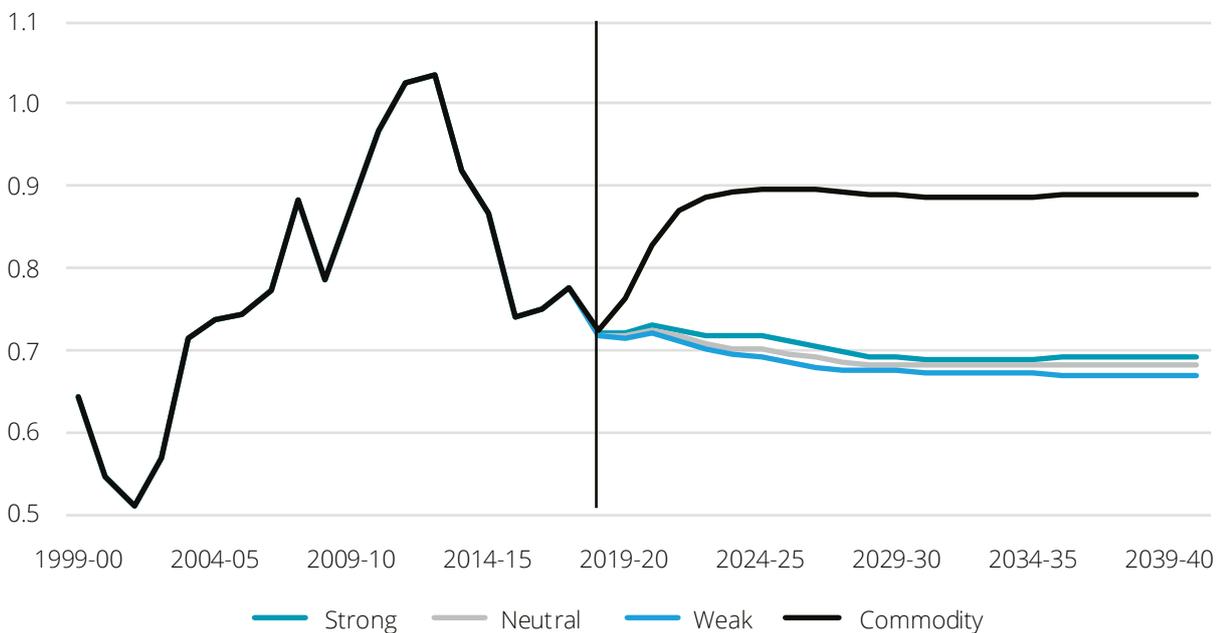


Source: ABS Cat No. 3220.0, 5206.0, 5220.0; Deloitte Access Economics.

Considering the results above, the state economies that are most affected in the weak and high scenarios are NSW, VIC and QLD because they experience large population shifts and have a relatively large reliance on the service industries.

Finally, high commodity prices defines the high commodity scenario relative to the weak and strong scenarios. As per Chart 4, the high commodity prices is assumed to lead to a higher exchange rate relative to the other three scenarios. This combination of factors drives resources towards mining and explains the outperformance of industrial production relative to the services sector and the fact that WA outperforms the rest of Australia's states and territories in this scenario.

**Chart 4: \$A/\$US exchange rate in all scenarios**



Source: ABS Cat No. 3220.0, 5206.0, 5220.0; Deloitte Access Economics.  
 Note: First forecast period is 2018-19.

# Neutral

The central outcome for the Australian economy. The short term economic outlook is driven by public expenditure and a low Australian dollar. Longer term trends are shaped by population and productivity growth.



Real GDP

**\$3,444B**



Industrial production GVA

**\$544B**



Services GVA

**\$2,114B**



Real HDI

**\$2,173B**



# 1. Scenario results

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This chapter describes the results for four scenarios specified by AEMO - the neutral, weak, strong and commodity-driven strong scenarios. Results are presented for every state and territory except the Northern Territory.

## 1.1 Neutral Scenario

The neutral scenario forecast is developed by combining the Australian Bureau of Statistics (ABS) Population B Series with the outlook for the economy from the December 2018 Business Outlook publication.<sup>4</sup> The ABS Population B series are projections based on historical trends for mortality, life expectancy, net overseas migration and net interstate migrations. The ABS population projections are used to anchor the forecasts to a transparent publicly available source of information.

Australia's economic outlook remains solid even though challenges are mounting in the short run. The combination of a mini-credit crunch, an East Coast drought and falling rates of housing construction will see growth pegged back by a little during 2018-19, and also see the growth gaps between the states and territories easing.<sup>5</sup>

Over the long term, we expect economic growth to return to trend based on growth in the labour force and productivity. Productivity is expected to lift and wage growth is expected to pick up, with broad unemployment measures down and rates of underemployment starting to return to longer term averages.<sup>6</sup> We expect that growth in productivity stays at around 1.3%, equal to the average of the last 40 years.

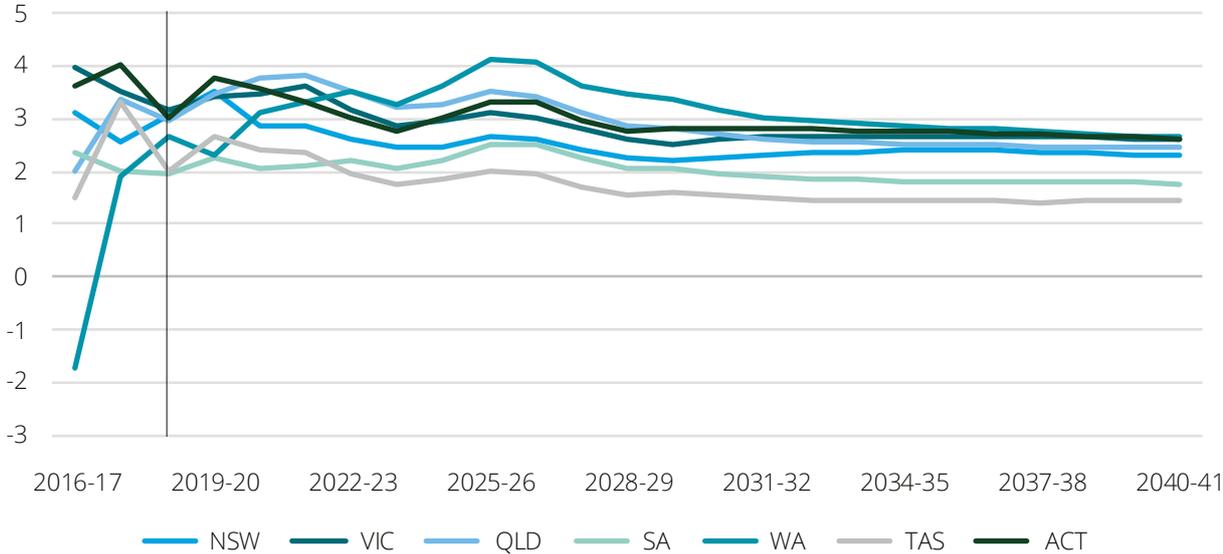
The differences in economic growth across the states can be explained largely by differences in population growth and the demographics composition. Overall, the effect of an ageing population on labour force participation will outweigh the move to higher participation rates for older Australians, reducing growth in the labour force. This is expected to be particularly detrimental for the Tasmanian (TAS) and South Australian (SA) outlooks due to the older demographics in both states. On the other hand, Western Australia (WA), Victoria (VIC) and the Australian Capital Territory (ACT) are expected to grow the fastest, aligned with the relatively higher population growth and younger demographics in these states.

4 ABS Cat. No 3220.0, Population Projections, Australia, 2017 (base) – 2066. Available at: <https://www.abs.gov.au/AUSSTATS/abs@nsf/mf/3222.0>

5 Deloitte Access Economics note that the latest release of the Australian National Accounts data in March 2019 has seen a slowdown in economic growth for the Australian economy. Growth in the global economy has also slowed. We are currently monitoring the situation on an ongoing basis. However, we do not believe that the economy is likely to significantly underperform our expectations, views which are echoed by the RBA in their latest forecasts as well. There are two key reasons underlying this view. First, the global slowdown has been modest so far, coming after two years of excellent growth. While the news isn't as good as it has been, it isn't that bad either. Central banks are already responding, and a number of governments have increased expenditure to support growth as well. This should limit the downside risks. Second, the slowing global economy and a pick up in the pace of house price losses have trimmed Australian growth below trend, which will come through in 2019 and 2020. However, the recent slowdown in growth has occurred against the backdrop of momentum in national income that has been doing well. At the same time, the greatest falls have also occurred in the strongest parts of the Australian economy – New South Wales (NSW) and VIC. Against this backdrop, it's believed that these challenges remain manageable.

6 In this instance, productivity is defined as total GDP divided by total employment. The average growth rate of productivity over the last 40 financial years is 1.3%.

Chart 1.1: Annual GSP growth, 2016-17 to 2040-41 (%)



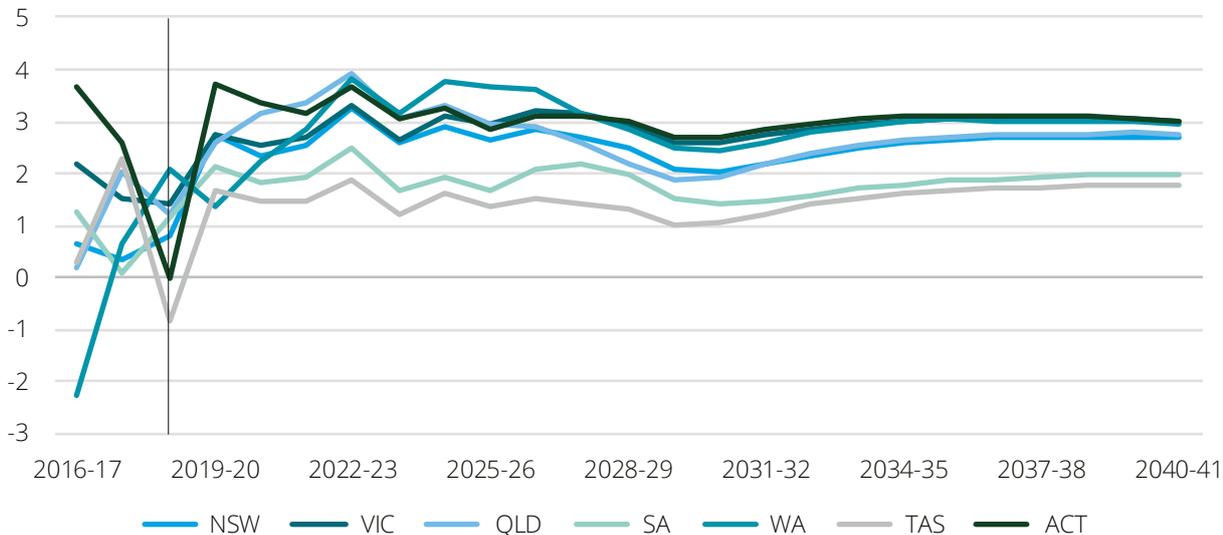
Source: ABS Cat No. 3220.0, 5206.0, 5220.0; Deloitte Access Economics.

Note: First forecast period is 2018-19.

Overall, growth in **real household disposable income** (HDI) is expected to be soft in 2018-19. Economy wide structural forces, including reduced bargaining power and low productivity means that national wages growth remains below historical trends. Deloitte Access Economics expects wage growth to increase from 2019 onwards as continued economic growth and employment gains improves the bargaining position of employees. Over the long term, real household disposable income is expected to grow on the back of productivity induced real wages growth and increased employment.

From 2018-19, real household disposable income is expected to grow at the slowest pace in TAS and VIC who are facing a relatively higher cost of living pressure compared to other states, without a commensurate rise in wages.

Chart 1.2: Annual real household disposable income growth, 2016-17 to 2040-41 (%)

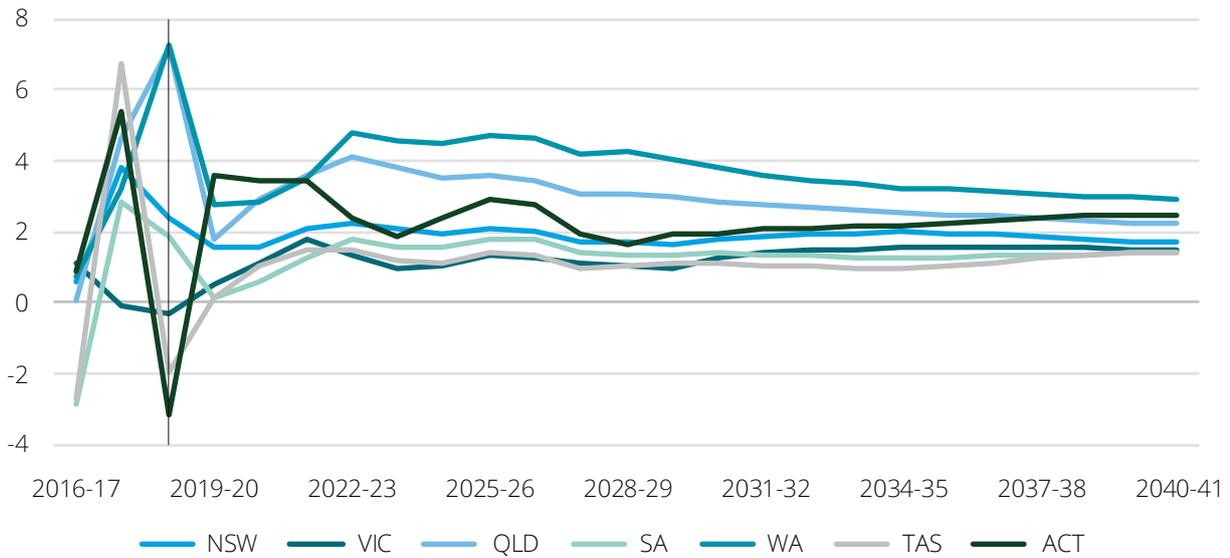


Source: ABS Cat No. 3220.0, 5206.0, 5220.0; Deloitte Access Economics.

Note: First forecast period is 2018-19.

**Industrial production** activity is an aggregate measure of mining, manufacturing and utilities industry activity. In general, industrial production is expected to shrink as a proportion of Australia's economic output as the manufacturing sector continues its long term decline and the services sector continues apace. WA and Queensland (QLD) are expected to lead industrial production growth boosted by mining production activity resulting from healthy iron ore prices and LNG production. In comparison to the mining intensive states, NSW, VIC, SA and TAS are expected to experience slower growth in industrial production, partly due to the slowdown in manufacturing activity and a shift towards service sectors.

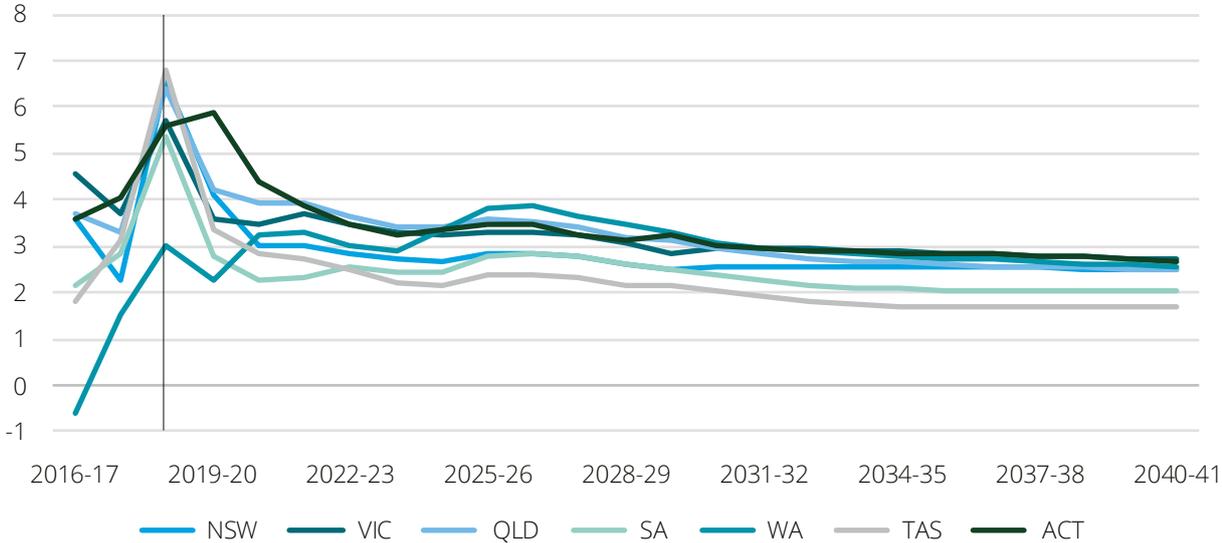
**Chart 1.3: Annual industrial production growth, 2016-17 to 2040-41 (%)**



Source: ABS Cat No. 3220.0, 5206.0, 5220.0; Deloitte Access Economics.  
 Note: First forecast period is 2018-19.

**Services activity** includes all industries except for agriculture, construction and the industries included in industrial production. These industries have been significant drivers of Australia's economic prosperity over the past several decades, with their share of the economy continuing to increase. Structural and demographic changes in the economy mean that future growth is expected to be dominated by the health care and social assistance industry, financial and insurance services and professional, scientific and technical services. The ageing population will drive growth in the health care industry and low interest rates will continue to encourage greater levels of financial activity. The growth of knowledge intensive technologies and industries will favour growth in professional, scientific and technical services.

Chart 1.4: Annual services sector GVA growth, 2016-17 to 2040-41 (%)



Source: ABS Cat No. 3220.0, 5206.0, 5220.0; Deloitte Access Economics.

Note: First forecast period is 2018-19.

In this scenario, the **\$A/\$US exchange rate** is expected to depreciate to approximately 72 cents in 2018-19 as the gap between Australian and global interest rates continue to narrow and Chinese economic growth slows. The Reserve Bank of Australia (RBA) has continued to keep the official cash rate at a record low of 1.5 per cent since August 2016. In contrast, the US Federal Reserve has raised its rates nine times since December 2015. This gap is expected to widen as the US Federal Reserve continues to gradually increase interest rates while the RBA holds them steady or even cuts rates. This reflects the lower unemployment rate and tighter labour market in the US compared to Australia. After 2018-19, the exchange rate is expected to be relatively steady.

# Weak

Countries shy away from global engagement resulting in less efficient allocation of resources. Global and domestic economic growth decline relative to the neutral scenario with lower productivity, trade and migration.



Real GDP

**12.8%** ▼



Industrial production GVA

**11.5%** ▼



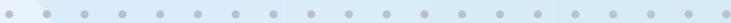
Services GVA

**13.3%** ▼



Real HDI

**19.2%** ▼



Most affected States

Queensland

New South  
Wales

Victoria

## 1.2 Weak Scenario

The assumptions and drivers underlying the AEMO weak scenario is aligned with the slow change scenario outlined in AEMO's Planning and Forecasting Consultation Paper 2019.

The weak scenario is triggered by countries increasingly moving away from international engagement resulting in resources being less efficiently utilised across the world. This scenario results in a decrease in potential economic growth. Notably, the scenario is not expected to see significant fluctuations in the price of industrial resources and hence the exchange rate. Hence, a significant change in demand for resource commodities is not expected.

The main drivers underlying this scenario are:

- Decrease in world GDP growth relative to the neutral scenario, but with a muted impact on world industrial production growth and therefore a relatively small impact on commodity prices. The magnitude of the growth difference is informed by the US Energy Information Administration (EIA) International Energy Outlook 2017 low economic growth scenario.<sup>7</sup> The EIA has developed a reference case in which global growth continues based on current trends, continual improvement in known technologies and is based on views on various economic forecasters and demographers. The weak scenario reflects the low economic growth case in which global growth remains below the reference case for several decades.
- Decrease in population growth across Australia's states and territories informed by a modified Series C projection from the ABS Population Projections. The modified Series C assumes a lower mortality and net overseas migration relative to Series B.<sup>8</sup>
- Decrease in productivity growth for Australia due to a number of factors such as: a reduction in skilled migration, a global slowdown in trade leading to a less efficient allocation of resources, and reduced investment in future productivity enhancing capital due to a greater level of uncertainty and risk premia.

### 1.2.1 Results

The weak scenario can usefully be thought of as a persistent shock to real household disposable income growth which flows through the economy affecting industry activity and economic growth. In this scenario household incomes are exposed to both:

- The reduction in population growth which leads to slower employment growth.
- Lower labour productivity which leads to slower real wage growth and shifts income away from households.

With this in mind, service industries are found to be most affected in this scenario because:

- They tend to sell to domestic consumers who are constrained by lower real income.
- They tend to rely more heavily on labour input to produce. Labour input is more scarce and less productive in this scenario than under the neutral scenario.

7 This is the latest International Energy Outlook 2017 that contains high and low world economic growth scenarios.

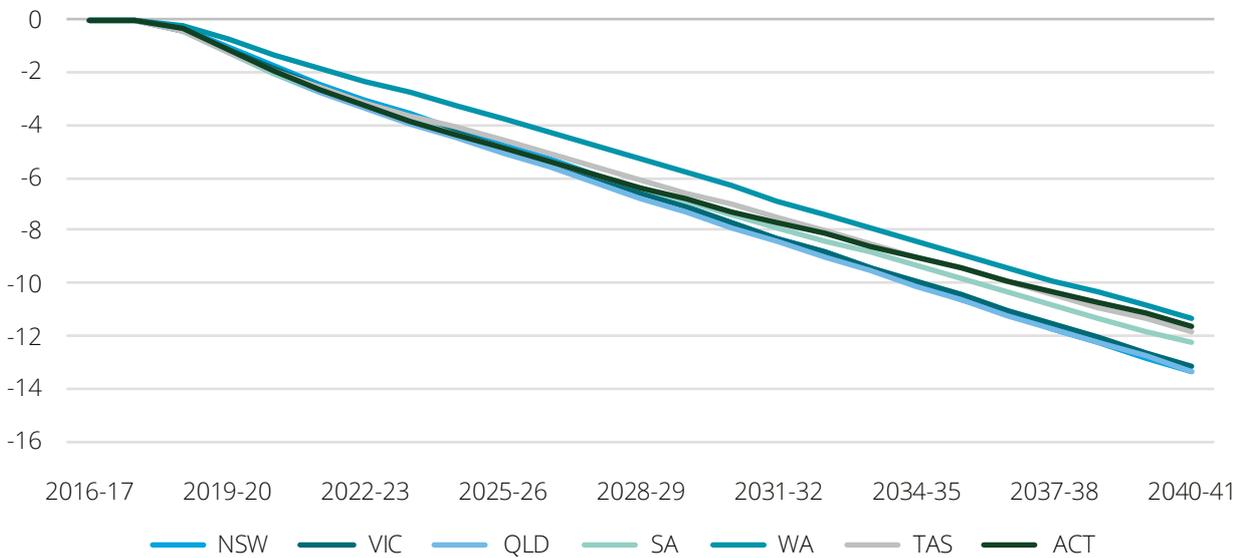
8 The ABS Series C population projections is based on ABS Cat. No 3220.0, ABS Population Projections, Australia, 2017 (base) – 2066. The modified ABS Series C population projections is generated from ABS.Stat by keeping the same settings as in ABS Series B population projections, with the exception of the settings on Net Interstate Migration which has been changed from Low to Medium. This assumption implicitly assumes that there is minimal movement of people across states in the weak scenario relative to the neutral scenario, an impact small enough to be regarded as negligible.

This contrasts with industrial production related industries which are more likely to sell to international customers or other businesses, and are more capital intensive and therefore rely less on labour input.

With this in mind, the state economies that are likely to be most affected experience a large population shift relative to baseline, and have a relatively large reliance on service industries.

The deviations from the neutral scenario for GSP are shown in Chart 1.5 below. The most heavily affected states in this scenario are NSW, VIC and QLD. As expected, these states are most reliant on service sectors. WA GSP declines by the least amount relative to the neutral scenario as the resource state is more dependent on the industrial production industries.

**Chart 1.5: Weak scenario real GSP, % deviation from neutral**

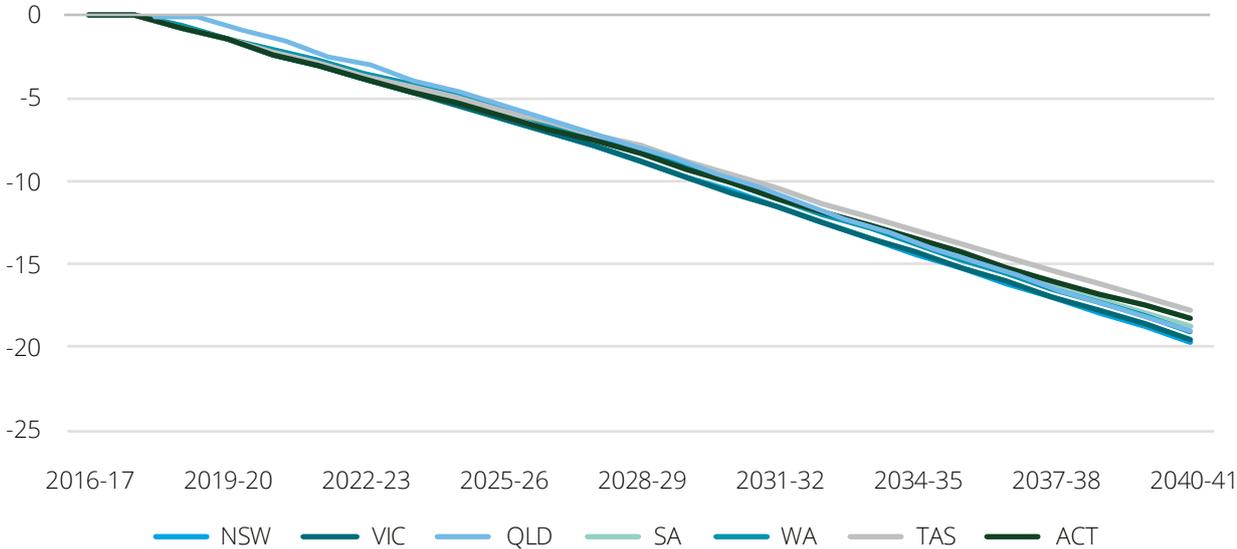


Source: ABS Cat No. 3220.0, 5206.0, 5220.0; Deloitte Access Economics.

Note: First forecast period is 2018-19.

The deviation of real household disposable income in this scenario relative to the neutral scenario is shown in Chart 1.6. Notably, the deviation of real household disposable income is greater than the impact on economic output as the decline in employment demand and productivity place even greater pressure on labour income. Again, NSW and VIC are most affected but WA are ranked third. The difference in WA's ranking relative to GSP reflects the fact that WA suffers the greatest loss of population in this scenario. The modified ABS Series C population projections assumes lower fertility, medium life expectancy and lower net overseas migration, resulting in the largest decline in population for WA relative to ABS Series B compared to other states.

**Chart 1.6: Weak scenario real household disposable income, % deviation from neutral**



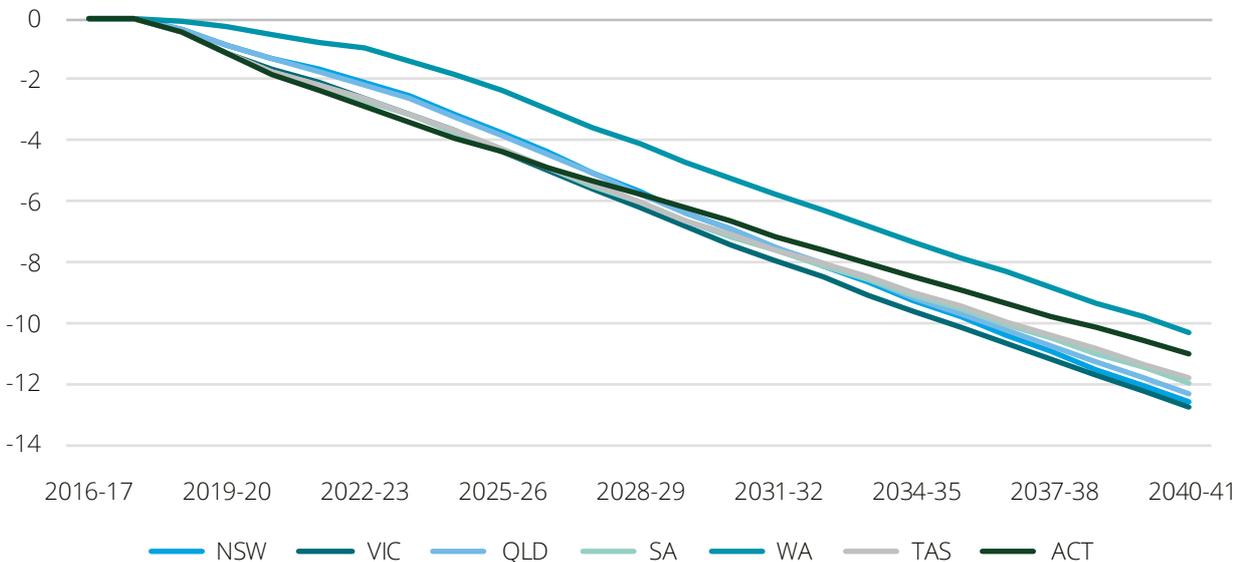
Source: ABS Cat No. 3220.0, 5206.0, 5220.0; Deloitte Access Economics.

Note: First forecast period is 2018-19.

Industrial production and service activity estimates are based on forecasts of the underlying industries for each category. These industry forecasts respond to the macroeconomic changes to the economy resulting from the shocks described above.

Chart 1.7 illustrates the deviation of each state’s industrial production relative to the neutral scenario. NSW and VIC experience the greatest decline in industrial production. This is because manufacturing and utilities – both of which rely on domestic growth – holds a greater share of industrial production in these states. On the other hand, WA enjoys a lot of mining activity which isn’t very labour intensive and is destined for international markets – both factors that limit the exposure of this industry to this scenario.

**Chart 1.7: Weak scenario industrial production GVA, % deviation from neutral**

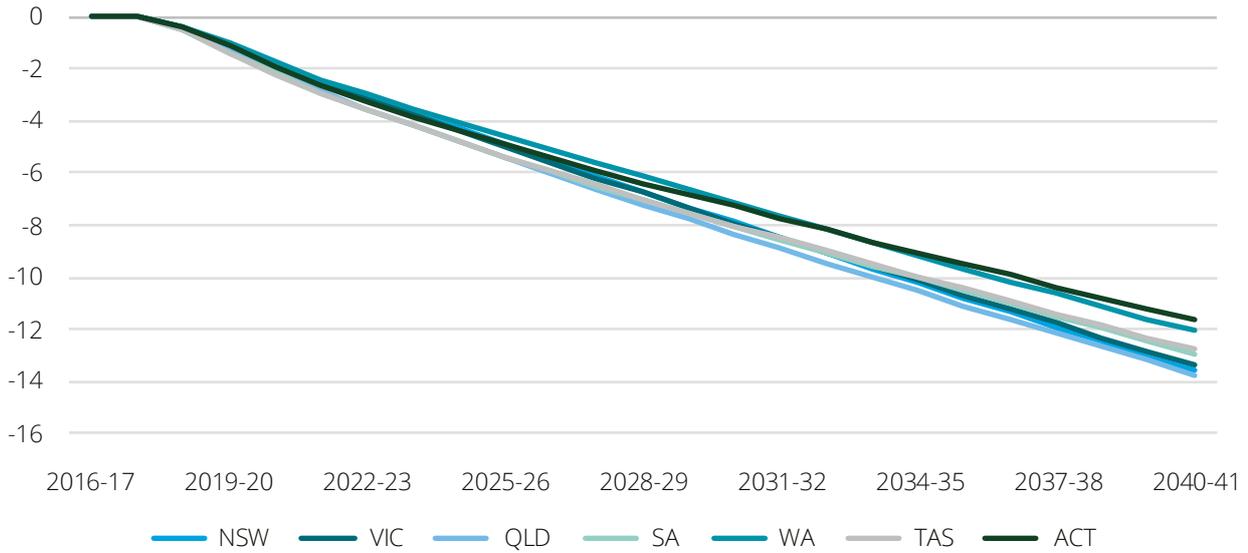


Source: ABS Cat No. 3220.0, 5206.0, 5220.0; Deloitte Access Economics.

Note: First forecast period is 2018-19.

Services activity forecasts reflect the broader economic activity of each state. Chart 1.8 illustrates the deviation of each state's services activity relative to the neutral scenario. NSW, VIC and QLD are the most affected as overall economic activity in these states are most affected by the shocks. More importantly, the service industries are more affected than industrial production given the exposure of these industries to the domestic economy and household consumers.

**Chart 1.8: Weak scenario services GVA, % deviation from neutral**

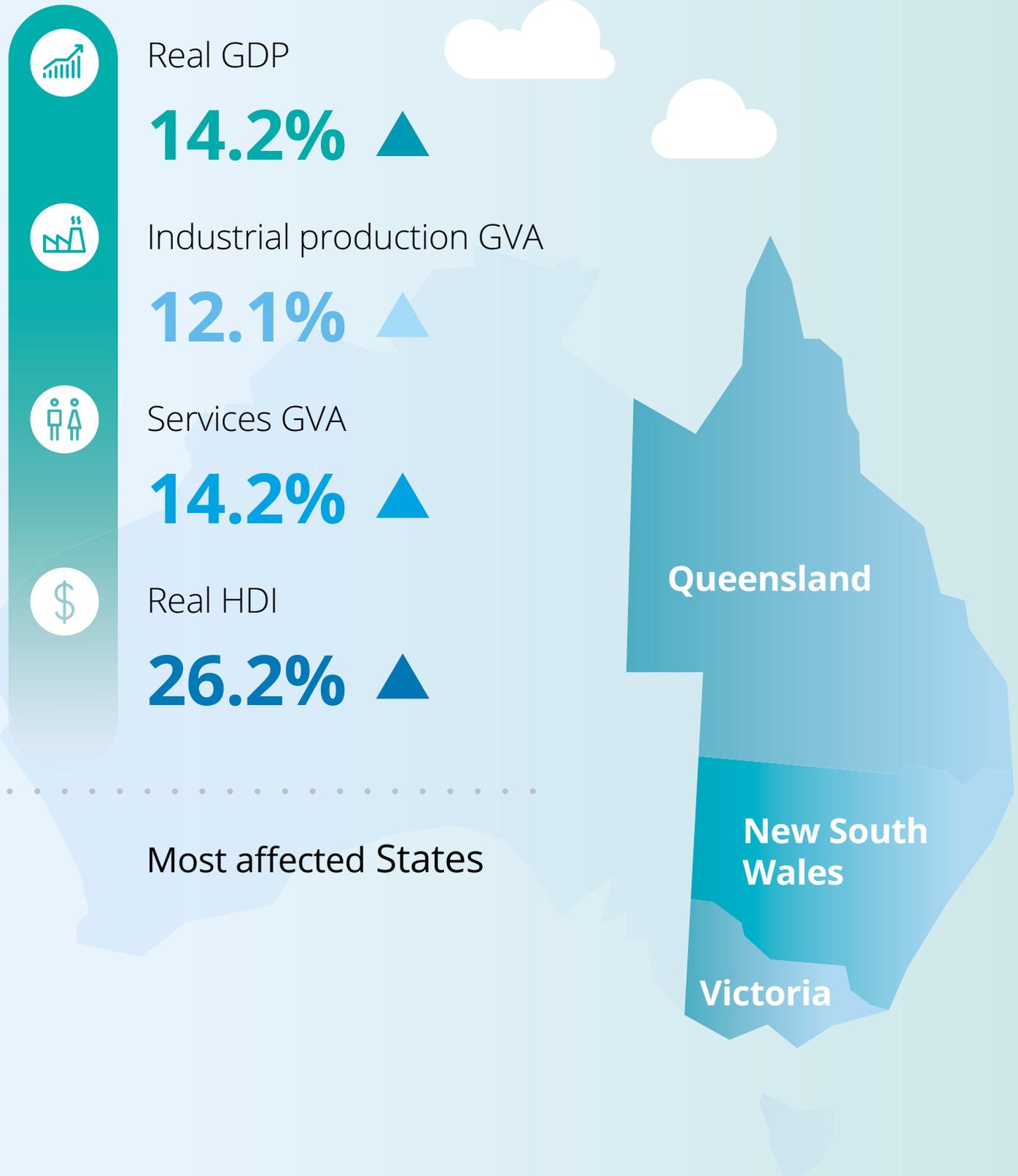


Source: ABS Cat No. 3220.0, 5206.0, 5220.0; Deloitte Access Economics.

Note: First forecast period is 2018-19.

# Strong

Successful implementation of long term structural reforms to increase trade in goods and services as well as movement of people across borders. The impact of these reforms is an increase in trade, productivity and migration.



### 1.3 Strong Scenario

The assumptions and drivers underlying the AEMO strong scenario is aligned with the fast change scenario outlined in AEMO's Planning and Forecasting Consultation Paper 2019.

The strong scenario is based on a broad based expansion of global economic growth potential supported by the successful implementation of long term structural reforms to increase trade in goods and services and movement of people across borders. This scenario is not expected to see significant fluctuations in the price of commodity resources.

The main drivers underlying this scenario are:

- Increase in world GDP growth, but with a muted impact on world industrial production growth and therefore a relatively small effect on commodity prices. The magnitude of the shock is informed by the US Energy Information Administration (EIA) International Energy Outlook 2017 high economic growth scenario.<sup>9</sup> The EIA has developed a reference case in which global growth continues based on current trends, continual improvement in known technologies and is based on views on various economic forecasters and demographers. The strong scenario reflects the high economic growth case in which global growth remains above the reference case for several decades.
- Increase in population growth across Australia's states and territories is informed by a modified Series A forecast from the ABS Population Projections. The modified Series A relies on higher fertility rates, higher life expectancy and net overseas migration leading to higher population growth.<sup>10</sup>
- Increase in productivity growth due to a number of factors including: an increase in skilled migration and a gradual increase in global trade consistent with an increase in investment in future productivity enhancing capital due to a lower level of uncertainty and risk premia. The increase in global trade also leads to greater demand for Australian exports while stronger economic growth in Australia also lifts imports.

#### 1.3.1 Results

Similar to the weak scenario, this scenario can usefully be thought of as a persistent shock to real household disposable income growth which flows through the economy affecting industry activity and economic growth. In this scenario household incomes are exposed to both:

- The increase in population growth which leads to faster employment growth.
- Higher labour productivity which leads to faster real wage growth and shifts in income towards households.

With this in mind, service industries are found to be most affected in this scenario because:

- They tend to sell to domestic consumers who enjoy higher real income.
- They tend to rely more heavily on labour input to produce. Labour input is more abundant and more productive in this scenario than under the neutral scenario.

<sup>9</sup> This is the latest International Energy Outlook 2017 that contains high and low world economic growth scenarios.

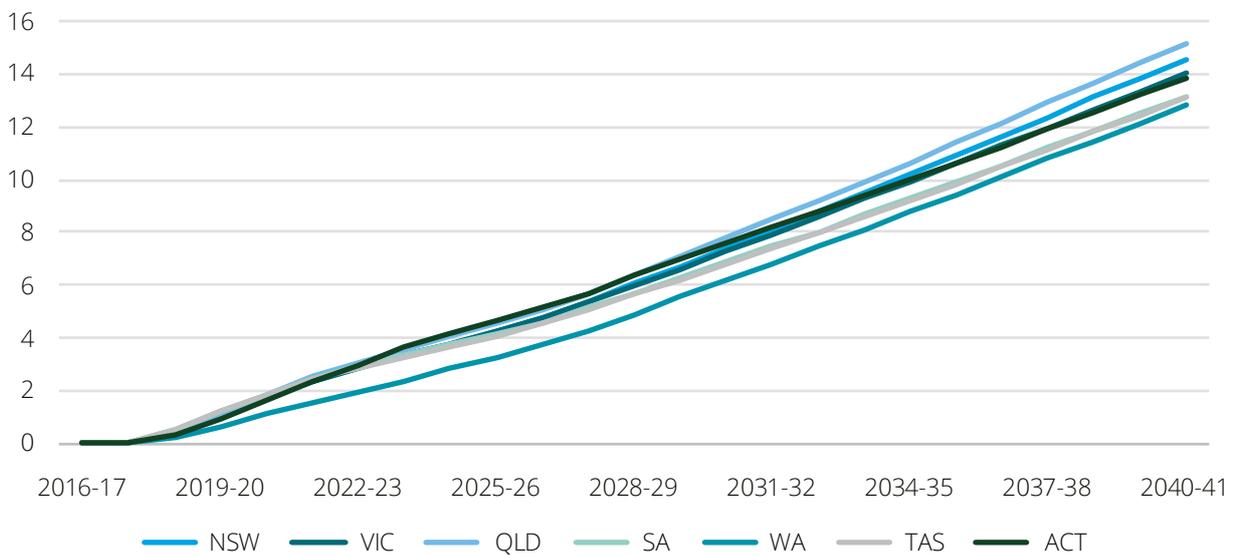
<sup>10</sup> The ABS Series A population projections is based on ABS Cat. No 3220.0, ABS Population Projections, Australia, 2017 (base) – 2066. The modified ABS Series A population projections is generated from ABS.Stat by keeping the same settings as in ABS Series A population projections, with the exception of the settings on Net Interstate Migration which has been changed from High to Medium. This assumption implicitly assumes that there is minimal movement of people across states in the strong scenario relative to the neutral scenario, an impact small enough to be regarded as negligible.

This contrasts with industrial production related industries which are more likely to sell to international customers or other businesses, and are more capital intensive and therefore rely less on labour input.

With this in mind, the state economies that are likely to be most affected experience a large population shift relative to baseline, and have a relatively large reliance on service industries.

This scenario provides a general uplift in economic activity across all states (as shown in Chart 1.9 below). QLD, NSW and VIC top the rankings given stronger global growth supports increased movements of people across borders and greater inward migration to Australia. What's more, these states have a greater exposure to the services sector.<sup>11</sup>

**Chart 1.9: Strong scenario real GDP, % deviation from neutral**



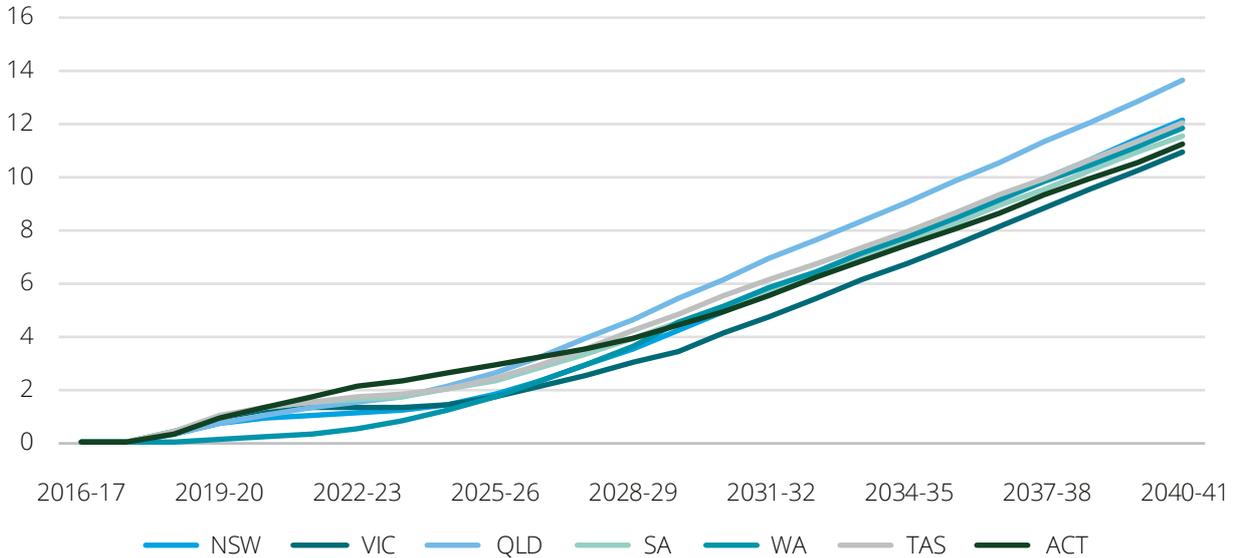
Source: ABS Cat No. 3220.0, 5206.0, 5220.0; Deloitte Access Economics.

Note: First forecast period is 2018-19.

Improvements in global growth and a relatively subdued impact on the exchange rate also creates positive dividends for industrial production industries. Although this is not a commodity-driven scenario, world demand for Australian commodities and energy resources sees the resource intensive states of WA and QLD experience solid industrial production gains over the forecast period.

<sup>11</sup> The finance industry is the least affected services industry in this scenario given its exposure to higher interest rates and B2B demand. Given NSW and VIC are heavily exposed to the finance industry, the overall effect of the service industry profile is muted in these States relative to QLD.

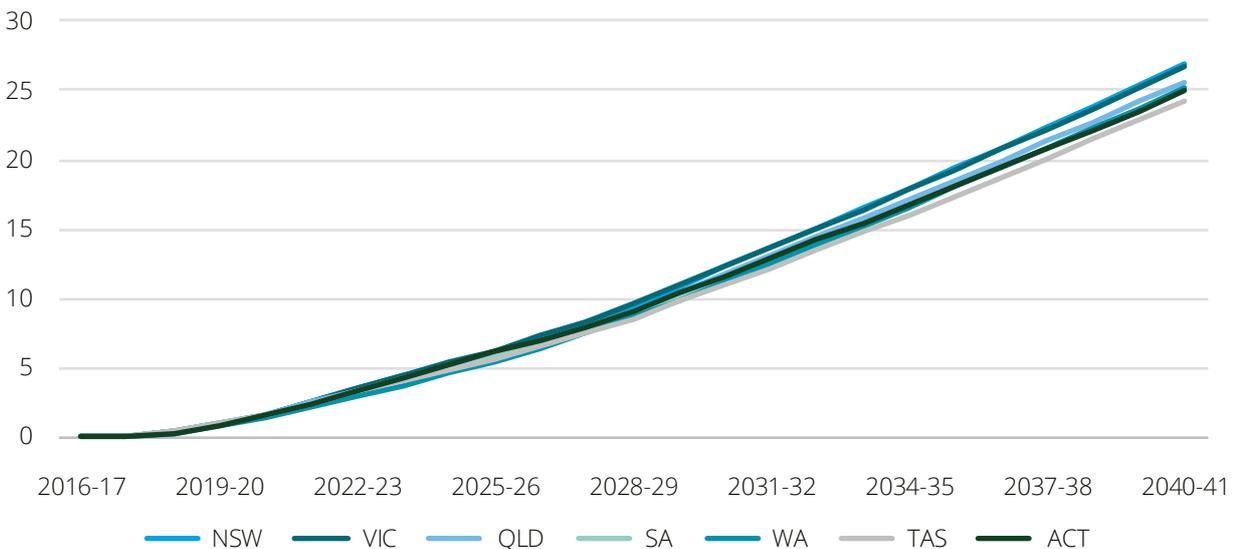
**Chart 1.10: Strong scenario industrial production GVA, % deviation from neutral**



Source: ABS Cat No. 3220.0, 5206.0, 5220.0; Deloitte Access Economics.  
 Note: First forecast period is 2018-19.

The deviation in real household disposable income relative to the neutral scenario is illustrated in Chart 1.11. The dispersion between states is minimal. However, the deviation of real household disposable income is larger than the impact on economic output as there is an upside potential to wages and hence disposable income, given the relatively subdued low wage growth the economy has seen in recent years. As real unit labour costs increase in this scenario, capital intensive industries begin to substitute away from labour. As such, states such as WA experience a weaker employment effect and a smaller increase in real household disposable income than what we would expect from the GSP results.

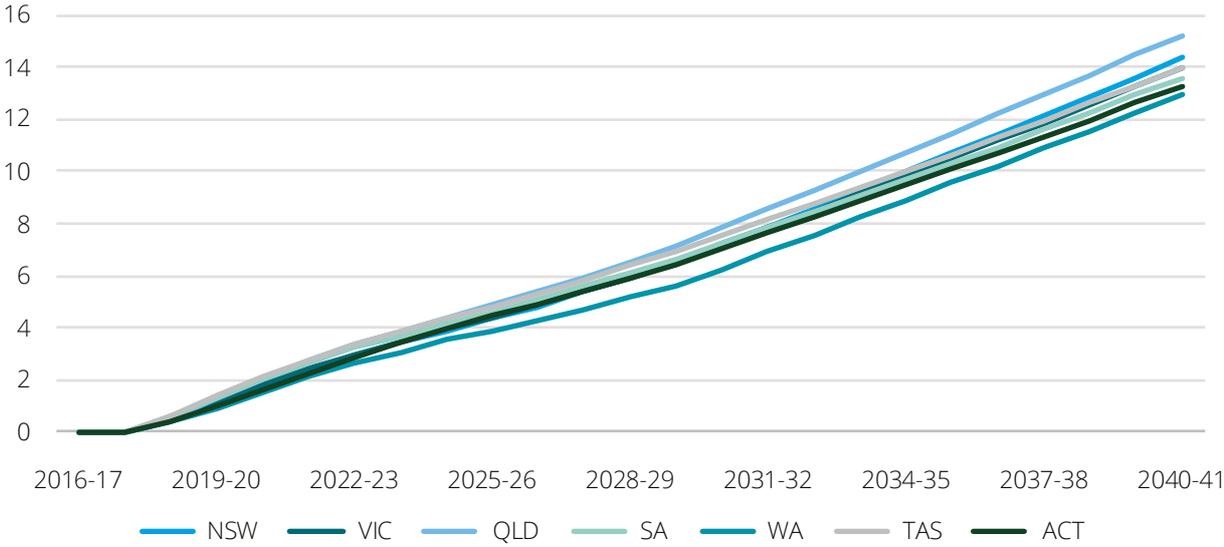
**Chart 1.11: Strong scenario real household disposable income, % deviation from neutral**



Source: ABS Cat No. 3220.0, 5206.0, 5220.0; Deloitte Access Economics.  
 Note: First forecast period is 2018-19.

Services activity forecasts reflect the broader economic activity of each state. Chart 1.12 represents the deviation of each state’s services activity relative to the neutral scenario. The states with the strongest GSP growth also experience the largest service gains, as population growth drives demand in consumer-related industries, such as professional services and retail trade.

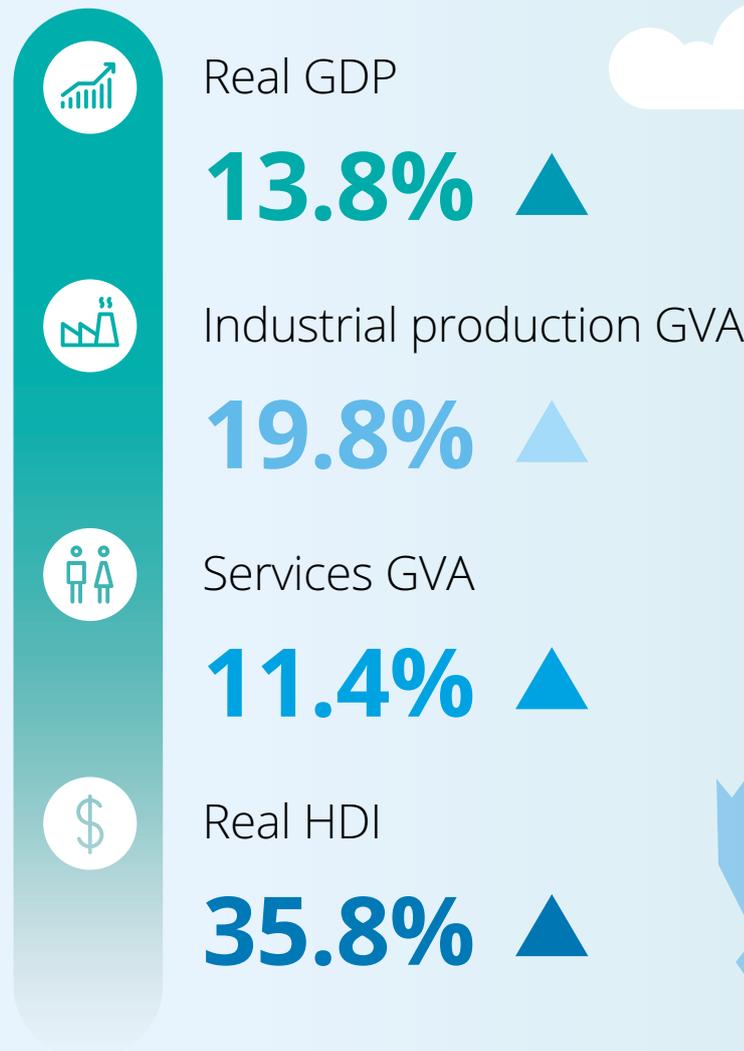
**Chart 1.12: Strong scenario services GVA, % deviation from neutral**



Source: ABS Cat No. 3220.0, 5206.0, 5220.0; Deloitte Access Economics.  
Note: First forecast period is 2018-19.

# Commodity Strong

The commodity-driven strong scenario is driven by faster than expected growth in the Chinese economy due to increased fiscal stimulus on infrastructure, higher than what is assumed in the neutral scenario. There is an increase in the demand and price of Australian commodity exports which boosts terms of trade and economic growth in the short term.



Most affected State

## 1.4 Commodity-driven strong scenario

The commodity driven strong scenario is triggered by faster than expected growth in the Chinese economy in the short run. This is a result of the additional fiscal stimulus the Chinese government has implemented via infrastructure expansion on top of what is considered in the neutral scenario, ignoring the massive domestic debt the economy has been incurring. In turn, the Australian and global economies benefit.

The increased demand for resources from China increases the prices for Australian commodity exports (most important of which are coal and iron ore), which in turn increases the value of exports as well as the volume of exports.

This commodities boom is relatively short lived, particularly compared to the length of the boom at the start of this century. In the medium term, the Chinese economy is not expected to continue growing at above trend as global interest rates rise to curb inflationary pressure. However, investments made during the boom will sow the seeds of longer term productivity growth ensuring Australia's persistently increasing prosperity relative to the neutral outlook.

In the short term, the stronger than expected growth in the Chinese economy results in an increase in the inflow of migration, particularly in the mining states. However, in the long term, all forecast regions should benefit more or less equally from stronger inward migration, particularly as the impact of higher productivity starts flowing through the economy.<sup>12</sup>

### 1.4.1 Results

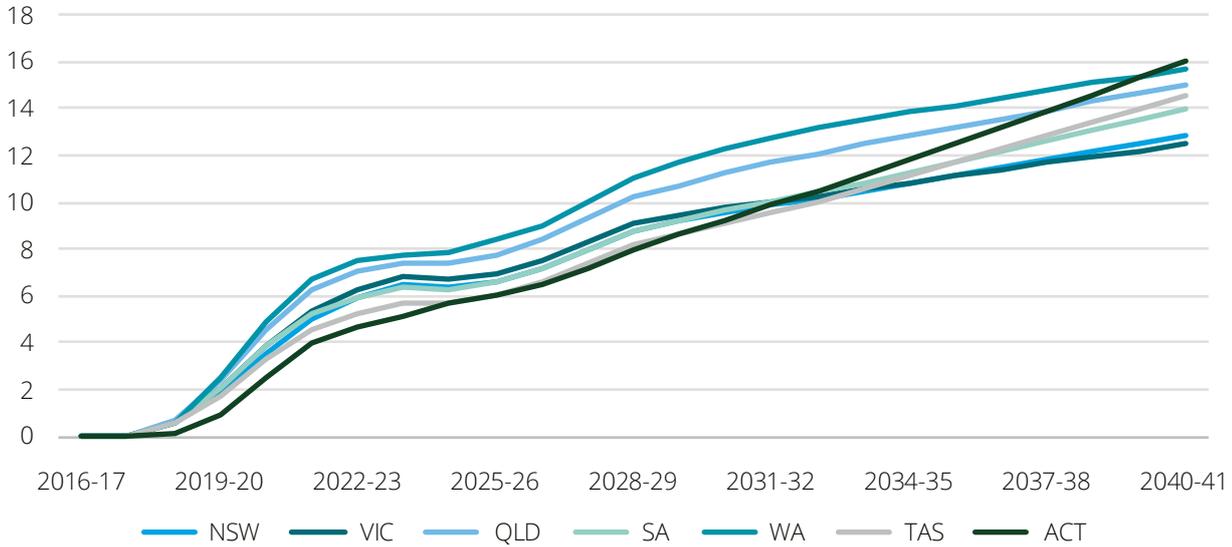
In the short run growth is improved as Chinese growth exceeds expectations, driving up the price of Australian resources. As expected, the biggest winners are the resource rich states of QLD and WA.<sup>13</sup> Other states also benefit from increased domestic demand and broader global growth. In the long run, growth reverts to depend more on population and productivity, both of which are assumed to be higher than in the neutral scenario.

Resource intensive states also see a larger increase in population, helping to drive longer term GSP growth. Productivity growth is enhanced across states and territories as firms and governments invest more in capital and technology, this ensures broad based gains in growth across states.

12 The ABS population projections Series A cannot be used for the commodity-driven high scenario as the relativities between states' population are not aligned with the expectations of what would happen in a mining boom, i.e. WA is expected to experience much higher population growth, in contrast to the second slowest population growth depicted in Series A. Hence, a bespoke set of population projections that reflects state population relativities similar to what we would expect in a scenario that is driven by commodity price rises in the short term, and by productivity in the long term.

13 In this scenario, WA GSP grows by an average 3.8% in the forecast period, lower than the growth seen during the recent mining boom but higher than the 3.1% average growth rate expected in the neutral scenario. It is assumed that WA alleviates any capacity constraints in this scenario. As the recent mining boom aptly showed, WA has a remarkable ability to respond to high commodity prices.

**Chart 1.13: Commodity-driven strong scenario real GDP, % deviation from neutral**

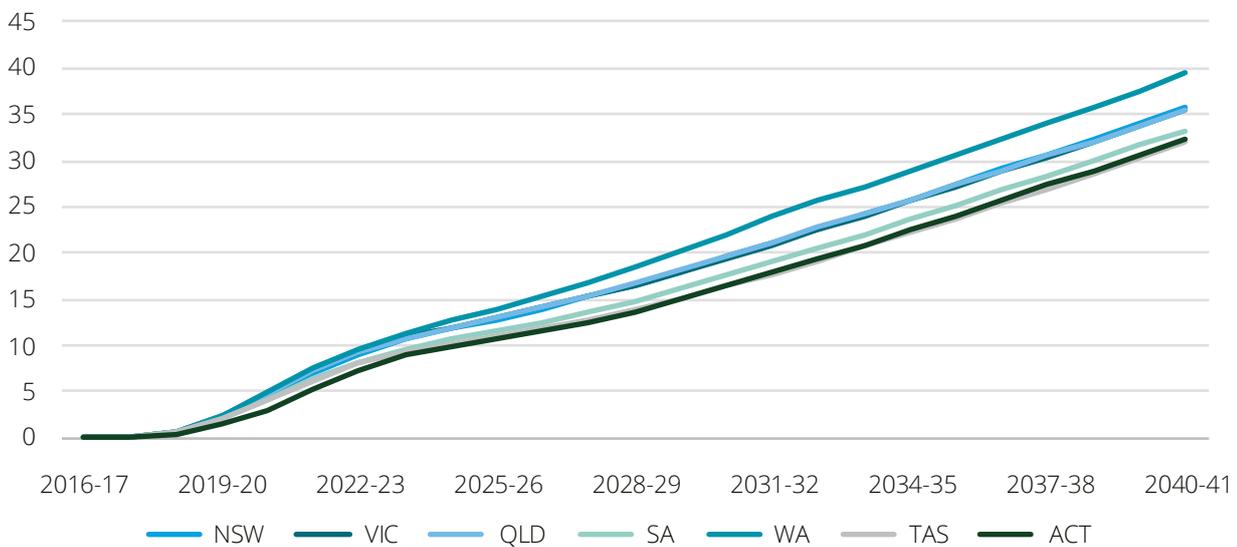


Source: ABS Cat No. 3220.0, 5206.0, 5220.0; Deloitte Access Economics.

Note: First forecast period is 2018-19.

The deviations for real household disposable income are larger than those for GDP. Resource rich states benefit from the largest income gains, before longer term trends like population and productivity determine income growth in the long run. Similar to the strong scenario, there is an upside potential for wages considering the current low wages growth environment. The wealth accumulated in the short run from the increase in commodity prices have also helped the more labour-intensive service industries, resulting in greater real household disposable income for everyone. The average forecast real household disposable income growth rate between 2017-18 and 2040-41 is expected to be 4%, a little less than the comparative average growth rate during the mining boom (2003-04 to 2011-12) which was 4.6%.

**Chart 1.14: Commodity-driven strong scenario real household disposable income, % deviation from neutral**



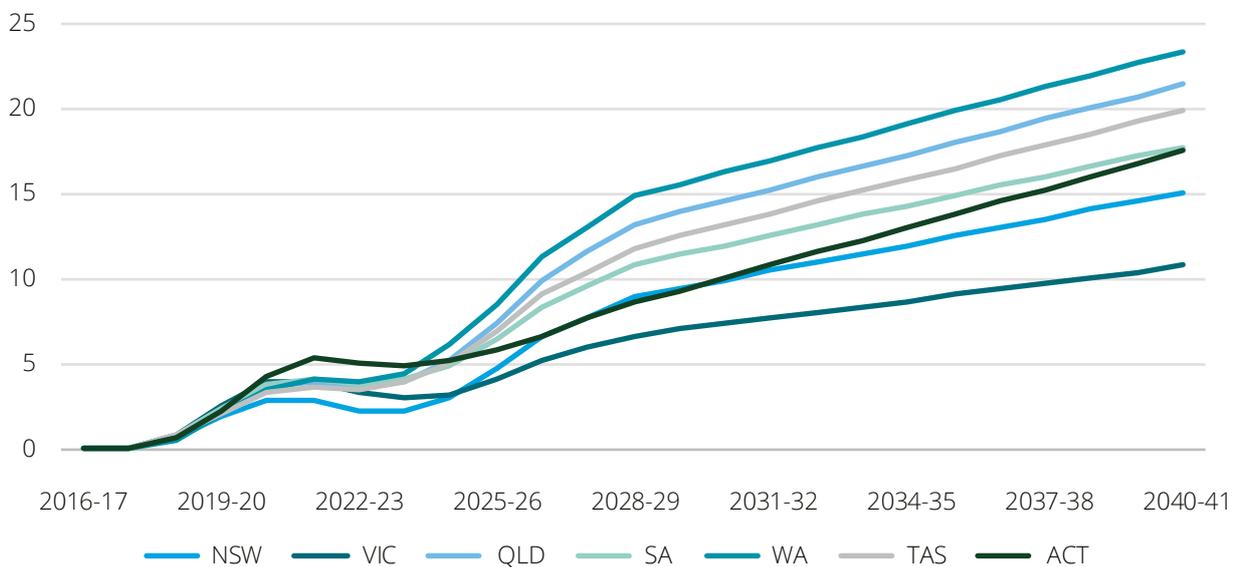
Source: ABS Cat No. 3220.0, 5206.0, 5220.0; Deloitte Access Economics.

Note: First forecast period is 2018-19.

Industrial production GVA sees outsized gains relative to GSP, largely due to the boost to the mining industry. Increased demand for Australian resources directly increases output from the sector, in particular in WA and QLD, which have larger shares of industrial production in GSP. In this scenario, WA sees a delayed rise in mining as it takes time for mining expansions to come online. Mining production is expected to kick off strongly after the first few years, driving a clear gap in industrial production between the resource reliant states and the remaining states.

States other than QLD and WA that have a relatively high reliance on mining, such as TAS, will tend to see greater growth in industrial production than states less reliant on mining such as SA. At the same time, higher rates of household and business formation in other states produces gains for the electricity, gas and water industry output in the short term.

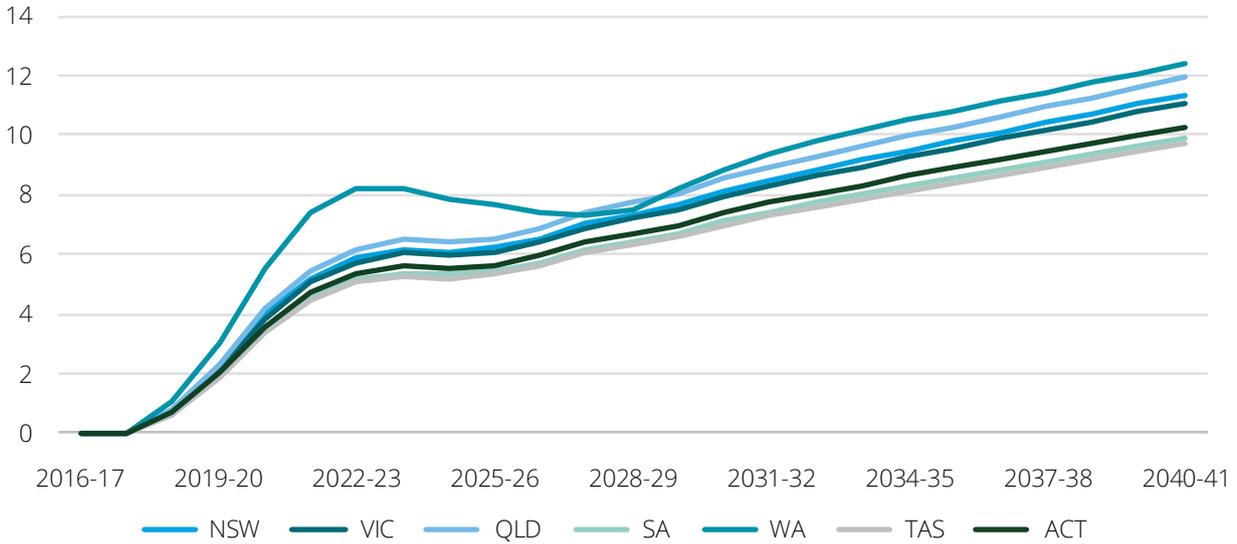
**Chart 1.15: Commodity-driven strong scenario industrial production GVA, % deviation from neutral**



Source: ABS Cat No. 3220.0, 5206.0, 5220.0; Deloitte Access Economics.  
 Note: First forecast period is 2018-19.

The increase in services sector GVA across states is smaller compared to the increase in industrial production. In the short run, the services sector in all states benefits from higher global growth and the increase in domestic demand that flows from greater mining sector activity. As a result, WA and QLD sees a greater immediate increase in services sector GVA relative to the neutral scenario in the short run. Beyond the short run, the Australian and state governments are able to invest in the productivity enhancing technology and infrastructure, resulting in higher productivity across all states. As a result of an increase in productivity, and as the impact of the short term rise in resource export prices subside, the impact on services sector GVA across states is expected to be less divergent. The services sector is less exposed to the end of the boom in commodity prices than industrial production and therefore suffers a smaller relative slow down.

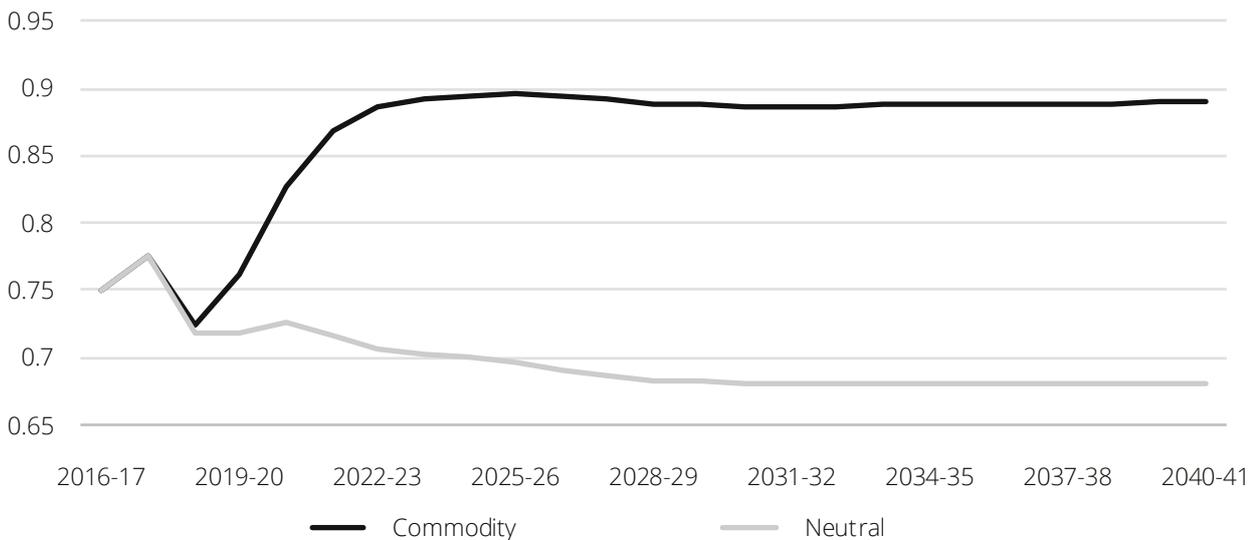
**Chart 1.16: Commodity-driven strong scenario services sector GVA, % deviation from neutral**



Source: ABS Cat No. 3220.0, 5206.0, 5220.0; Deloitte Access Economics.  
 Note: First forecast period is 2018-19.

In the short to medium term, the \$A/\$US exchange rate experiences a significant appreciation relative to the neutral scenario as commodity prices see large increases due to the additional demand for commodities. This reflects the sensitivity of the \$A to fluctuations in commodity prices. Following that, there is little change in the deviation as supply of Australia’s resources increases to meet higher demand.

**Chart 1.17: Commodity-driven strong scenario \$A/\$US exchange rate**



Source: ABS Cat No. 3220.0, 5206.0, 5220.0; Deloitte Access Economics.  
 Note: First forecast period is 2018-19.

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# Appendix A: Comparison with other forecasts

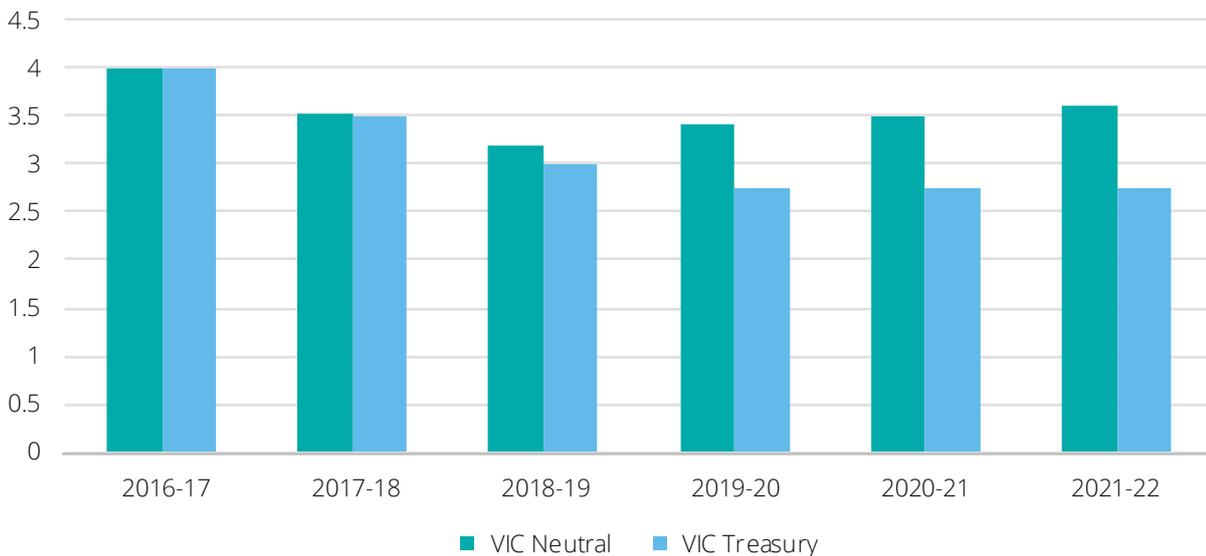
## A.1 Comparison with Relevant State Treasuries

Forecasts of Gross State Product (GSP) growth from the neutral scenario are compared to forecasts and projections of state and territory Treasury departments.<sup>14</sup>

The neutral scenario GSP forecasts for NSW, SA, TAS and ACT economies are similar to the forecasts published by the relevant treasuries.<sup>15</sup> Where the forecasts differ, the differences can mostly be explained by differences in population assumptions.

For VIC, WA and QLD, the neutral scenario GSP forecasts are significantly different from the forecasts produced by the relevant treasuries. The forecast GSP growth in VIC in the neutral scenario is stronger than the treasury forecasts as well as last year's forecasts. Most of the difference between last year's and this year's forecasts are due to the significant upward revision in ABS population projections for VIC. We also note that VIC treasury's GSP forecasts have remained largely the same despite the rather significant change in their population assumptions from the 2017-18 budget to the 2017-18 budget update.

Chart A.1 Comparison of neutral and VIC treasury forecasts (%)



Source: Deloitte Access Economics, Department of Treasury and Finance Victoria.

<sup>14</sup> We have also compared the neutral scenario forecasts to the forecasts provided in the Intergenerational Report (IGR) 2015. The IGR 2015 focuses on the Australian economy rather than the states and territories over a forecast period of 40 years. The real GDP growth and population forecasts for the Australian economy in the neutral scenario are similar to the forecasts provided in the IGR 2015 for 2024-25 and 2034-35. In 2024-25, the forecast real GDP growth for the neutral scenario and IGR 2015 are 2.9% and 2.8% respectively, with the population forecast to reach 27.8 million and 28 million respectively. Similarly, in 2034-35, the forecast real GDP growth for the neutral scenario and IGR 2015 are 2.5% and 2.8% respectively, with the population forecast to reach 31.6 million and 32 million respectively.

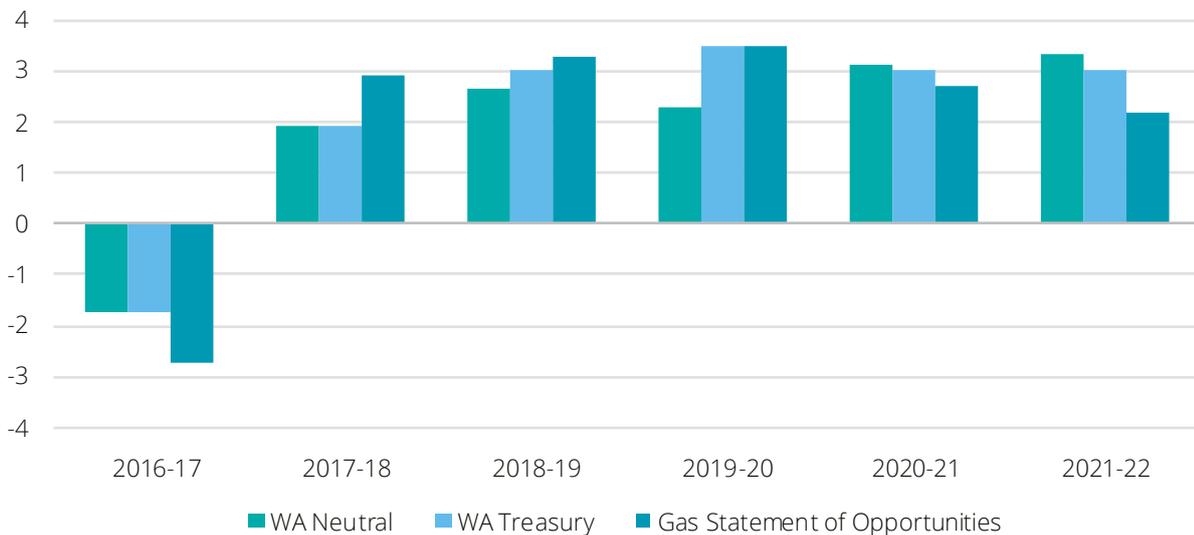
It is however important to note that the forecasts in the IGR 2015 are based on inputs and information available up to that point. There are additional years of data available since the release of the IGR 2015.

<sup>15</sup> The full set of comparison charts between the neutral scenario forecasts for all states (except NT) and the forecasts published by the relevant treasuries are available in Appendix C.

Comparisons for the WA GSP forecasts are presented in Chart A.2 against WA Treasury and the WA gas statement of opportunities (GSOO) released in December 2018. Between 2018-19 and 2021-22, the average GSP growth rate for the neutral scenario is 2.8%, slightly below the 3.1% from WA Treasury and the 2.9% from WA GSOO 2018.

Across the three sets of forecasts, the WA GSOO 2018 results in the lowest implied average productivity growth rate of 1.3% for the 2018-19 to 2021-22 period, as represented by the average GSP per capita growth rate. The implied average productivity growth rates for the neutral forecast and WA treasury are 1.7% and 1.6% respectively. Notably, all three forecasts are significantly below the historical (1986-87 to 2017-18) average per capita growth of 2.5% to reflect the end of the mining boom.

**Chart A.2 Comparison of neutral, WA treasury forecasts and WA GSOO 2018 (%)**

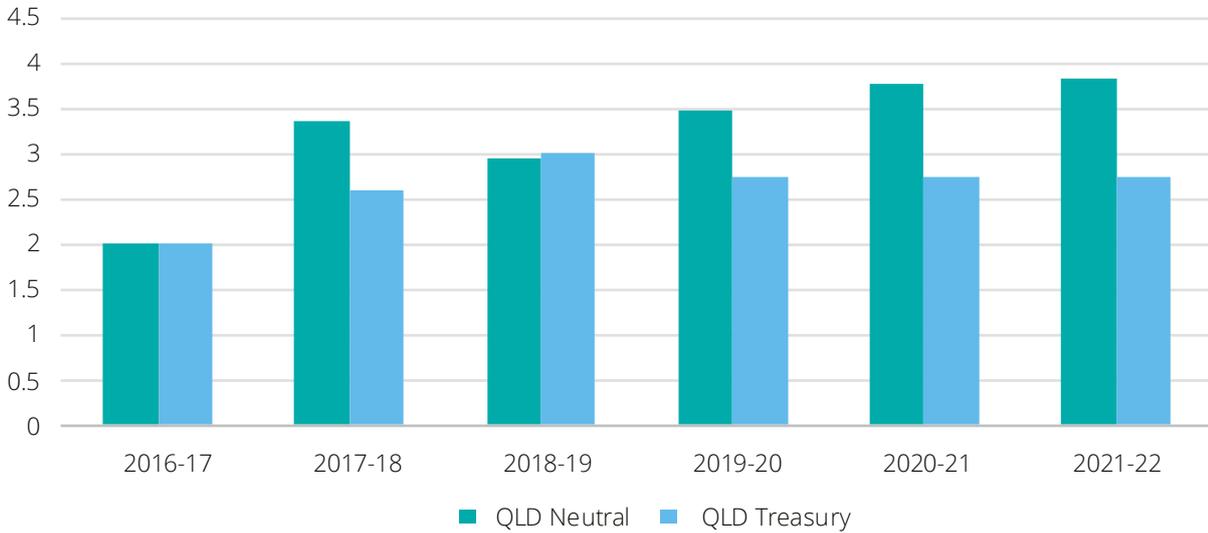


Source: Deloitte Access Economics, Department of Treasury Western Australia, Western Australia Gas Statement of Opportunities (December 2018).

The neutral scenario predicts materially greater growth for QLD than published in the 2018-19 QLD Budget. The underlying cause of the difference is that the Neutral scenario is predicting a cyclical upswing in domestic activity from 2019-20 while the QLD Budget makes the assumption “that growth is expected to grow by 2¾% per annum, consistent with the State’s longer-run potential” from 2020-21.<sup>16</sup>

16 Queensland Budget Strategy and Outlook 2018-19, page 25. Available at: <https://budget.qld.gov.au/files/BP2-2018-19-2%20Economic%20Performance.pdf>. The forecasts for QLD economic growth remains unchanged in the Queensland 2018-19 Mid-Year Fiscal and Economic Review.

**Chart A.3 Comparison of neutral and QLD treasury forecasts (%)**



Source: Deloitte Access Economics, Queensland Treasury.

**A.2 Comparison with 2018 forecast vintage**

The underlying population forecasts is the main reason driving the differences between the current forecasts provided to AEMO and last year’s forecasts. The population assumptions from the forecasts delivered last year were based on the ABS B Series projections from 2012. This series has since been updated to reflect the most recent census data.

NSW and VIC saw population growth rates revised up across the forecast horizon, resulting in GSP forecasts being pushed upwards throughout the outlook. QLD and SA had downward revisions to population growth rates which lowered GSP forecasts relative to last time across the outlook.

WA experienced a downward revisions to population forecasts, with little change to GSP forecasts in the short term. This largely reflects the improvement in our expectations of economic growth per capita based on data released over the last 12 months. The weaker forecast exchange rate combined with increased LNG production and Chinese demand for iron ore also boosts the WA economy in the short term, while population plays a more significant role in the long run. Population projections for TAS and the Australian Capital Territory (ACT) were revised upwards before falling back towards previous growth over the longer term, this approximately matches the revisions to TAS and ACT GSP forecasts.

# Appendix B: Forecast accuracy

Appendix B assesses the forecast accuracy of the neutral scenario forecasts for 2017-18 provided to AEMO in 2018 against actual performance.

## B.1 Gross State Product

Table B.1 compares the GSP forecast growth rates for 2017-18 from the neutral scenario with the actual growth rates. Forecast performance is assessed using growth rates rather than level terms because the price basis of the series changes annually which affects the level observations but not the growth rates. Forecasts for NSW, VIC and WA were all close to the actual outcome estimates by the ABS.

Deloitte's growth forecasts for TAS and the ACT in the neutral scenario were below the actual GSP growth by more than 0.5 per cent, consistent with the population growth assumption being weaker than actual population growth.<sup>17</sup> TAS growth in 2017-18 is also helped by the low Australian dollar and continued growth in East Asia continuing to boost exports, making a significant contribution to growth. Population is a major driver of GSP growth. The ABS B series population projections (base year 2012) released in 2013 were used to drive the neutral scenario GSP forecasts. The exception to this is for WA where a combination of population forecasts from WA government and Deloitte Access Economics December 2017 Business Outlook publication were used to reflect the material difference between the ABS B Series and the expected population growth.

QLD actual GSP growth exceeded the neutral scenario forecast by Deloitte Access Economics, despite actual population growth coming under the ABS series B projection. The additional LNG capacity coming online in 2018 has contributed to a lift in export growth, supported by high commodity prices and a falling Australian dollar. Deloitte Access Economics' growth forecast for SA in the neutral scenario was above the actual growth rate, consistent with the population growth assumption being greater than actual population growth.

<sup>17</sup> The population growth assumption used in the neutral scenario in 2018 is Series B from the ABS Population Projections, Australia, 2012 (base) to 2101. Available at: <http://www.abs.gov.au/AUSSTATS/abs@.nsf/allprimarymainfeatures/A2C48F375A18E4C8CA25834C0010B2F7?opendocument>

**Table B.1: Actual and forecast GSP growth, 2017-18**

State/Territory	NSW	VIC	QLD	SA	WA	TAS	ACT
Forecast GSP growth (2017/18)	2.9%	3.4%	2.4%	3.0%	2.1%	2.0%	3.1%
Actual GSP growth (2017/18)	2.6%	3.5%	3.4%	2.0%	1.9%	3.3%	4.0%
Difference (Actual - Forecast)	-0.3%	0.1%	1.0%	-1.0%	-0.2%	1.3%	0.9%

Source: Deloitte Access Economics, ABS Australian National Accounts: State Accounts, 2017-18, cat no. 5220.0

## B.2 Gross Value Added for Industrial Production

Table B.2 shows actual and forecast growth rates for Industrial Production Gross Value Added (GVA) by state for 2017-18. Industrial production is defined as an aggregate measure of mining, manufacturing and utilities industry activity. Industrial production is particularly important for mining states such as QLD and WA as it comprises a significant share of the State's GSP.

The forecasts for NSW, QLD and the ACT were close to the actual outcome observed by the ABS. VIC saw lower actual industrial production growth than forecasted. The closure of the Hazelwood power station has resulted in a significant drop in utilities output, which also caused VIC to rely on power from other states for the first time in almost a decade. While mining activity in WA is unlikely to reach the levels seen in recent history, the rebound in commodity prices over the past three years has led to expectations of a bottoming out and eventual upturn in mining investment and activity. This turnaround in mining investment and activity in response to higher commodity prices is taking longer than anticipated, leading to industrial production growth below that forecast by Deloitte Access Economics.

**Table B.2: Actual and forecast GVA Industrial Production growth, 2017-18**

State/Territory	NSW	VIC	QLD	SA	WA	TAS	ACT
Forecast GVA growth (2017-18)	3.7%	1.4%	4.0%	3.6%	3.7%	5.7%	5.4%
Actual GVA growth (2017-18)	3.6%	-0.1%	4.3%	2.7%	2.6%	6.5%	5.5%
Difference (Actual - Forecast)	0.0%	-1.6%	0.3%	-0.9%	-1.1%	0.9%	0.1%

Source: Deloitte Access Economics, ABS Australian National Accounts: State Accounts, 2017-18, cat no. 5220.0

### B.3 Gross Value Added for Services sector

Table B.3 compares actual and forecast services GVA growth rates by state for 2017-18. Services is defined as an aggregate measure of economic activity in all industries except for agriculture, construction, mining, manufacturing and utilities.

Services GVA comprises over half of GSP in every state except for WA, suggesting that the performance of the GSP and services GVA for most states will be correlated. In NSW, expected flow on effects from the strength in construction and public investment were limited and constrained services activity. Stronger population growth and tourism helped to boost retail trade in VIC. Meanwhile, SA saw retail trade fall amid weak population growth and high electricity and petrol prices.

**Table B.3: Actual and forecast Services GVA growth, 2017-18**

State/Territory	NSW	VIC	QLD	SA	WA	TAS	ACT
Forecast GVA growth (2017-18)	4.3%	3.3%	3.4%	6.4%	1.7%	3.5%	8.1%
Actual GVA growth (2017-18)	2.3%	3.8%	3.4%	2.9%	1.6%	3.2%	4.1%
Difference (Actual - Forecast)	-2.0%	0.5%	0.0%	-3.4%	-0.1%	-0.3%	-4.0%

Source: Deloitte Access Economics, ABS Australian National Accounts: State Accounts, 2017-18, cat no. 5220.0

### B.4 \$A/\$US exchange rate

Between 2016/17 and 2017-18, the \$A/\$US exchange rate saw a 2.6 per cent appreciation, aligned with the forecasts we provided in 2018. Table B.4 shows actual and forecast growth for the \$A/\$US exchange rate for 2017-18.

**Table B.4: Actual and forecast \$A/\$US exchange rate, 2016-17 to 2017-18**

Variable	\$A/\$US exchange rate
Actual (2016-17)	0.75
Forecast (2017-18)	0.77
Actual (2017-18)	0.77
Forecast \$A/\$US exchange rate growth (2017-18)	2.6%
Actual \$A/\$US exchange rate growth (2017-18)	2.6%
Difference (Actual - Forecast)	0.0%

Source: Deloitte Access Economics, RBA.

# Appendix C: Charts – Comparison with other forecasts

Chart C.1 NSW neutral and Treasury GSP forecast (%)



Chart C.2 NSW population forecasts (%)



Chart C.3 VIC neutral and Treasury GSP forecasts (%)

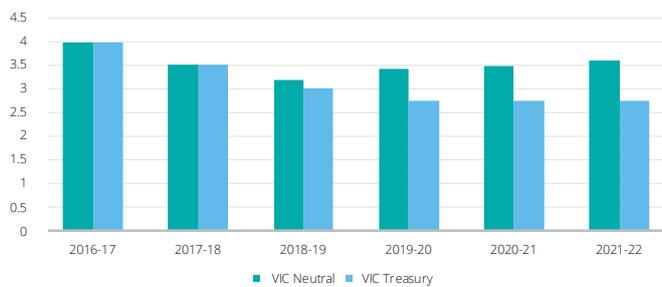


Chart C.4 VIC population forecasts (%)

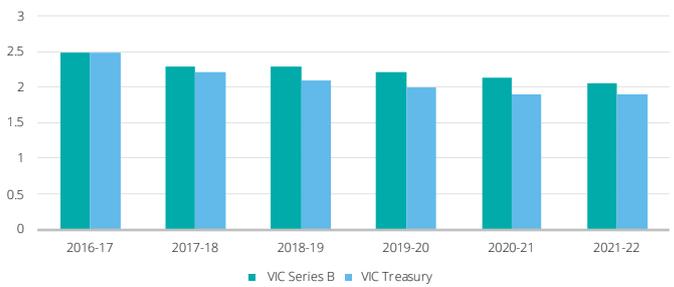


Chart C.5 QLD neutral and Treasury GSP forecasts (%)



Chart C.6 QLD population forecasts (%)

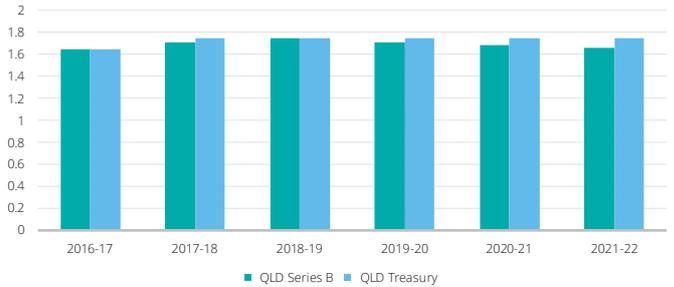


Chart C.7 SA neutral and Treasury GSP forecasts (%)

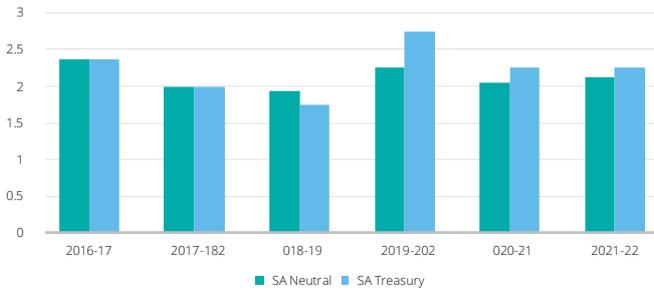


Chart C.8 SA population forecasts (%)

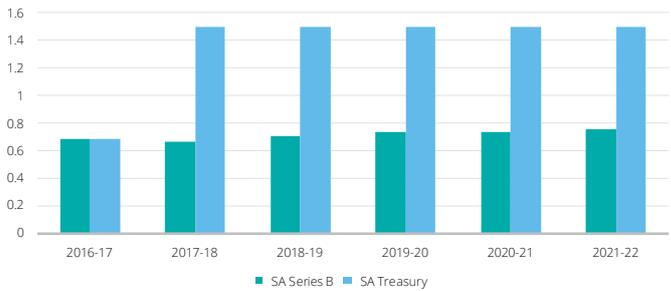


Chart C.9 WA neutral and Treasury GSP forecasts (%)

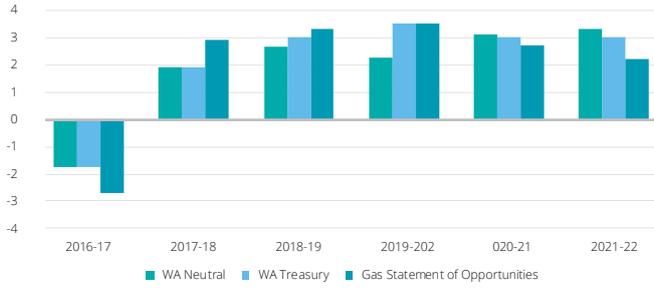


Chart C.10 WA population forecasts (%)

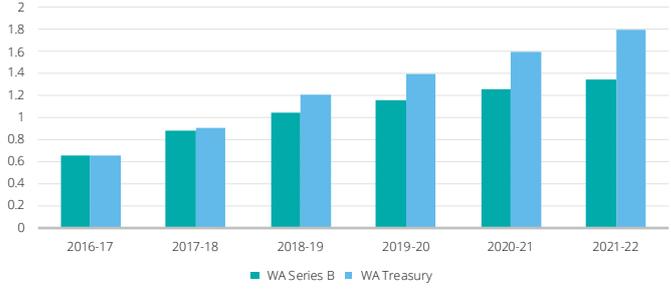


Chart C.11 TAS neutral and Treasury GSP forecasts (%)

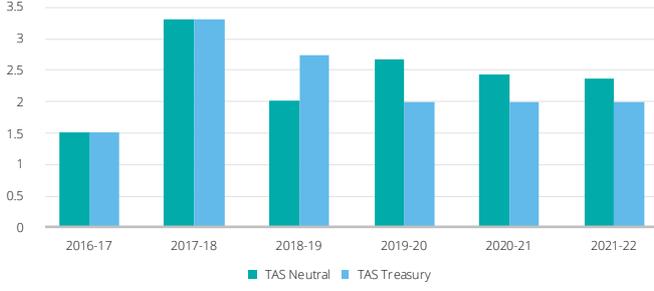
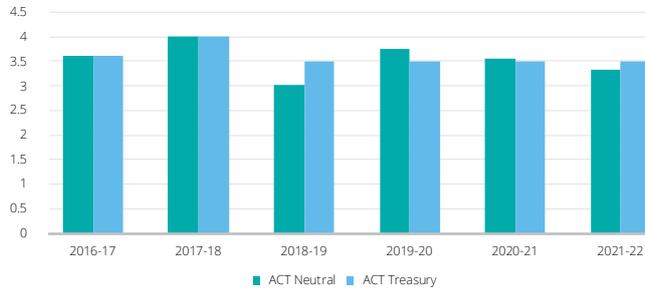


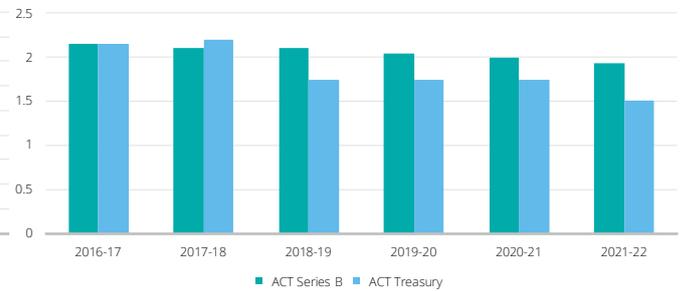
Chart C.12 TAS population forecasts (%)



**Chart C.13 ACT neutral and Treasury GSP forecasts (%)**



**Chart C.14 ACT population forecasts (%)**



**Chart C.15 Exchange rate forecasts, \$A/\$US**



# Contacts



**Kristian Kolding**

Partner  
kkolding@deloitte.com.au



**Dr Jasmine Zheng**

Manager  
jaszheng@deloitte.com.au

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