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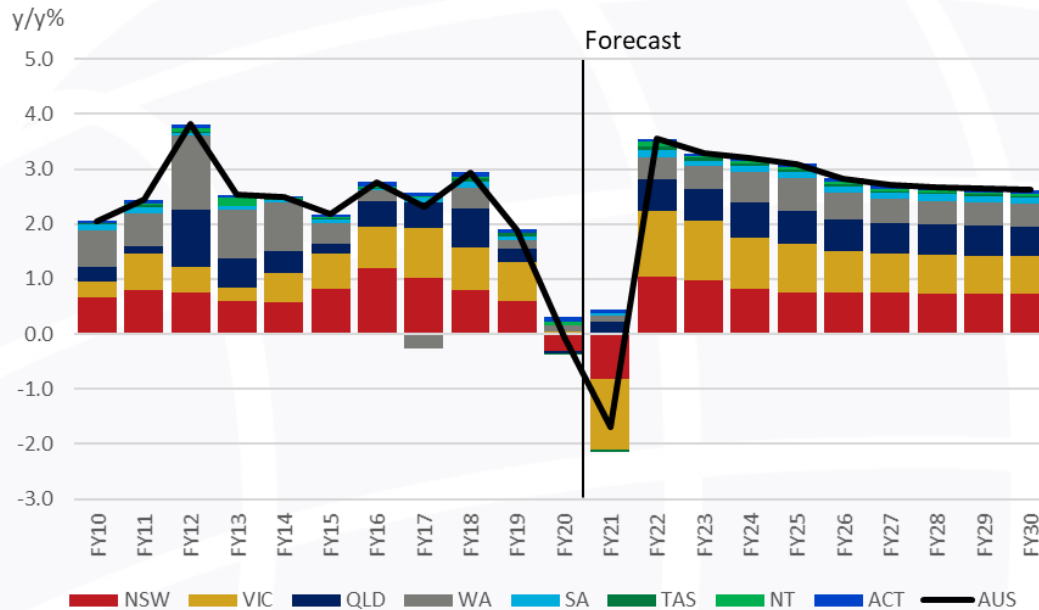
MACROECONOMIC FORECASTS UPDATE

PREPARED FOR THE AUSTRALIAN ENERGY MARKET OPERATOR

16 October 2020



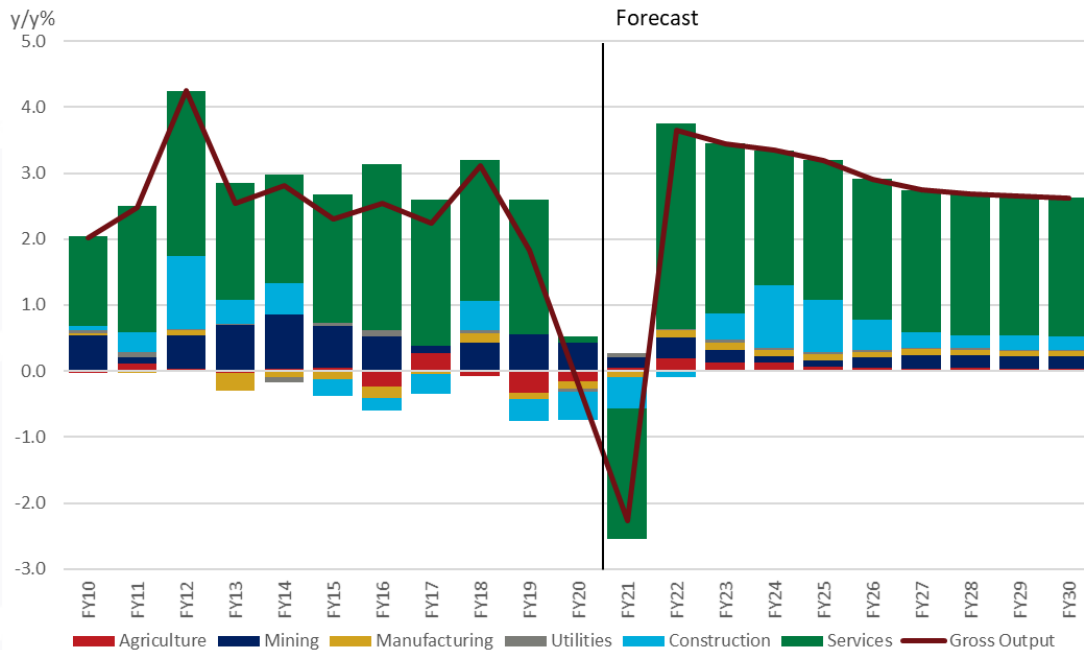
Fig 1. State Contribution to YoY% in GDP (FY00-50)



- While the pandemic has touched all sectors of the economy, due to the restraints placed on migration and people movement, we expect the services intensive states of NSW and VIC to be the worst affected. Indeed the recent national accounts data confirms this.
- QLD and WA have fared better, in part due to their lower exposure to overseas migration, and due to the resilience of their mining sector, which has benefited from elevated commodity prices and a temporary depreciation of the AUD.
- At a national level we expect further contraction through FY21, as the drags from the continued border closure and second lockdown in VIC weigh on national economic growth but across states we expect trends to diverge with the sectors that are less exposed to services trade already showing signs of recovery.
- After the current headwinds abate, the services intensive states (NSW + VIC) will lead the rebound and continue to drive growth in the long-run, followed by the mining states of QLD & WA.



Fig 2. Industrial Contribution to YoY% in Gross Output (FY10-30)



- Dissecting the growth outlook by industrial composition, we expect services to bear the brunt of the contraction in FY21, contracting 2.8%, followed by construction, particularly for residential construction, weighed down by the pause on population growth.
- Mining, and to a lesser degree utilities, are the only sectors expected to exhibit growth in FY21. The mining sector will continue to service the infrastructure needs of the Asian economies.
- As with the downturn, we expect the services sector to lead the recovery in economic growth. For hospitality in particular, this is contingent on the re-opening of the international (and in FY21 domestic) borders, which will enable the resumption of international migration and travel.
- Over the long-term services and construction will continue to be key the drivers of growth, to meet the needs of the growing population base.



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CENTRAL SCENARIO: ASSUMPTIONS & RESULTS



- BIS Oxford Economics has been re-engaged by AEMO to produce the macroeconomic forecasts that are used as input into AEMO's FY21 suite of gas and electricity forecasting and planning publications.
- The core indicators produced by BIS Oxford Economics are:
 - *Population forecasts*
 - *Gross State Product & Gross Domestic Product*
 - *State Final Demand*
 - *Household Disposable Income*
 - *Consumer Price Inflation (Australia only)*
 - *USD/AUD*
 - *Industrial Sector forecasts (at ANZSIC Division level by state)*

This slide deck has been developed to provide further context on the key trends in the forecasts. This deck focusses on key changes to our past projections. Where forecasts were updated in April, we have compared to these projections. For indicators where we did not revise the forecasts in April, we have provided comparisons to the March forecasts.



The forecasts have been produced for AEMO's three scenarios, defined as follows:

- **Central scenario:** reflects the current transition of the energy industry under current policy settings and technology trajectories, where the transition from fossil fuels to renewable generation is generally led by market forces and supported by current federal and state government policies.
- **Slow Change scenario:** reflects a general slow-down of the energy transition. It is characterised by slower advancements in technology and reductions in technology costs, low population growth, and low political, commercial, and consumer motivation to make the upfront investments required for significant emissions reduction.
- **Step Change scenario:** reflects strong action on climate change that leads to a step change reduction of greenhouse gas emissions. In this scenario, aggressive global decarbonisation leads to faster technological improvements, accelerated exit of existing generators, greater electrification of the transport sector with increased infrastructure developments, energy digitalisation, and consumer-led innovation.

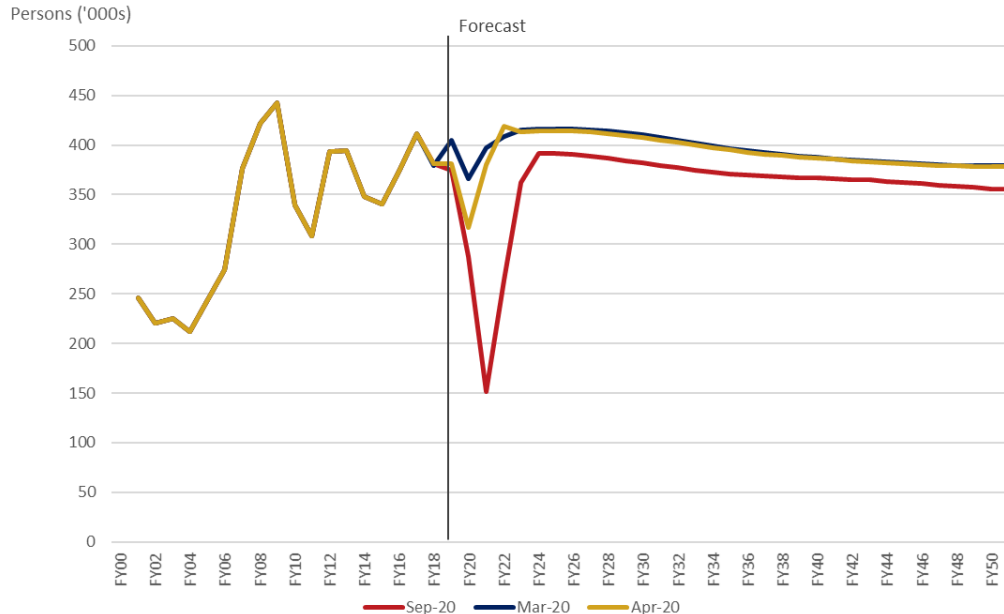
Source: https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/inputs-assumptions-methodologies/2020/2020-forecasting-and-planning-inputs-assumptions-and-scenarios-report-iasr.pdf?la=en



- Key changes in assumptions to baseline from early 2020 forecasts:
 - International borders remain closed until mid-2021
 - More permanent loss of migration over this period that is not recovered after borders reopen.
 - While annual migration levels return to our previous projections, this results in permanently **lower** levels of long-run population for a given year than in our pre-COVID forecasts.
 - We have also revised our fertility rate assumptions down to 1.7 births per women.
 - Initial impact of pandemic less severe than anticipated, but recovery more drawn out (not least because of Victoria second wave and lengthy closure of border)
 - Deeper hysteresis effects reduce productive potential relative to pre-COVID forecasts.



Fig 3. Population Change, Australia (FY00-50)



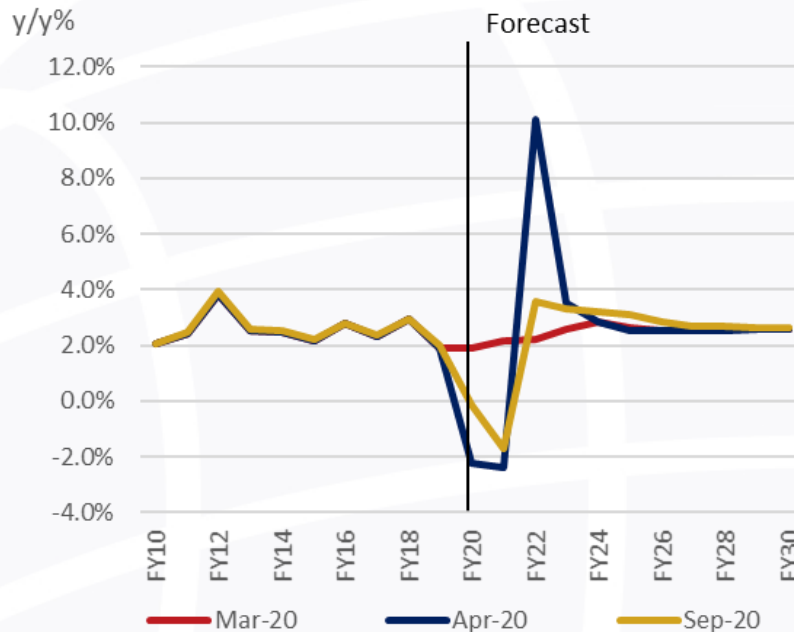
Source: BIS Oxford Economics/ ABS

- With the evolving COVID pandemic it has become more apparent that international border closures will be in place for longer.
- As outlined in the previous slide, we now expect borders to effectively remain closed until FY22.
- Consequently, we have a much more pronounced drop off in population growth through FY20 and FY21. As in the April forecasts, we assume that some of the fall over this period is not recovered (such as international students who decided to pursue their studies elsewhere). Therefore, the fall in migration is much more pronounced for FY21 in our September forecasts.
- As seen following past recessions, under uncertain economic conditions, families delay having children. As a result we have revised down our fertility rate assumptions leading to a slower population change over the long-run than in our March and April forecasts.



CENTRAL CASE: GROSS DOMESTIC PRODUCT (1)

Fig 4. YoY% Change in GDP



Source: BIS Oxford Economics/ Haver Analytics

Table 1. YoY% Change in GDP

	FY20	FY21	FY22	FY25	FY30
Apr-20	-2.2%	-2.4%	10.1%	2.54%	2.56%
Sep-20	-0.2%	-1.7%	3.6%	2.68%	2.61%

- The September national accounts data indicated that GDP contracted by 0.2% FY20 compared to our April forecast of -2.2%.
- Notwithstanding the second wave and subsequent lockdown in Victoria, the recovery in economic activity has been more robust than we previously anticipated.
- The income support provided by the government has supported consumer spending (particularly on goods), and underpinned a significant uptick in retail spending, with WA and TAS leading the rebound.
- Loose monetary policy and the HomeBuilder scheme are also helping to drive residential construction activity, most obviously in WA and QLD.
- We have revised up our overall growth outlook for FY21 to a 1.73% contraction compared to 2.39%.
- As a result of the more prolonged border closures we do however expect the economy will take longer to recover, with a slower rebound now projected for FY22, and there will be some permanent scarring.

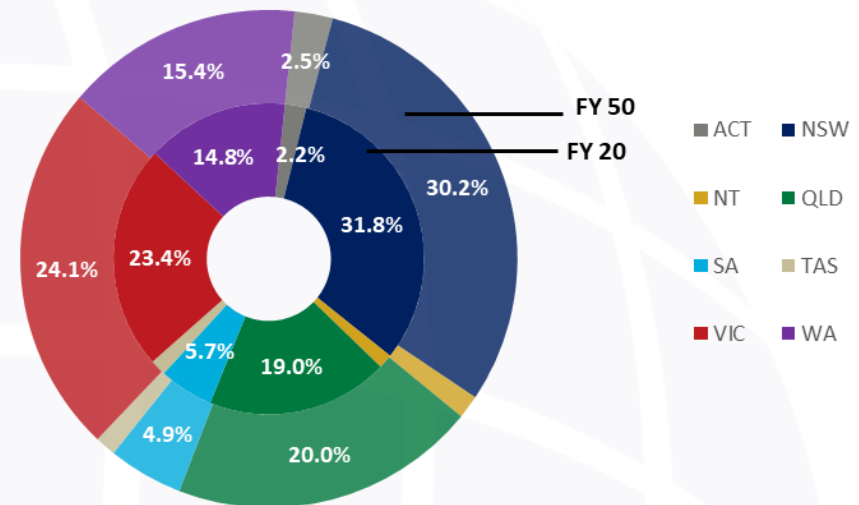


CENTRAL CASE: GROSS DOMESTIC PRODUCT (2)

Table 2. Gross Domestic Product & Gross State Product, Compounded Annual Growth Rate (CAGR)

	FY20-25		FY25-50	
	Mar-20	Sep-20	Mar-20	Sep-20
AUS	2.5%	2.5%	2.2%	2.6%
NSW	2.1%	2.3%	2.1%	2.2%
VIC	3.0%	1.7%	2.3%	2.1%
QLD	2.6%	2.7%	2.2%	2.2%
WA	2.4%	2.7%	2.3%	2.3%
SA	1.7%	1.8%	1.6%	1.7%
TAS	2.1%	1.9%	1.7%	1.5%
NT	2.4%	2.4%	2.6%	2.3%
ACT	3.0%	2.8%	2.6%	2.3%

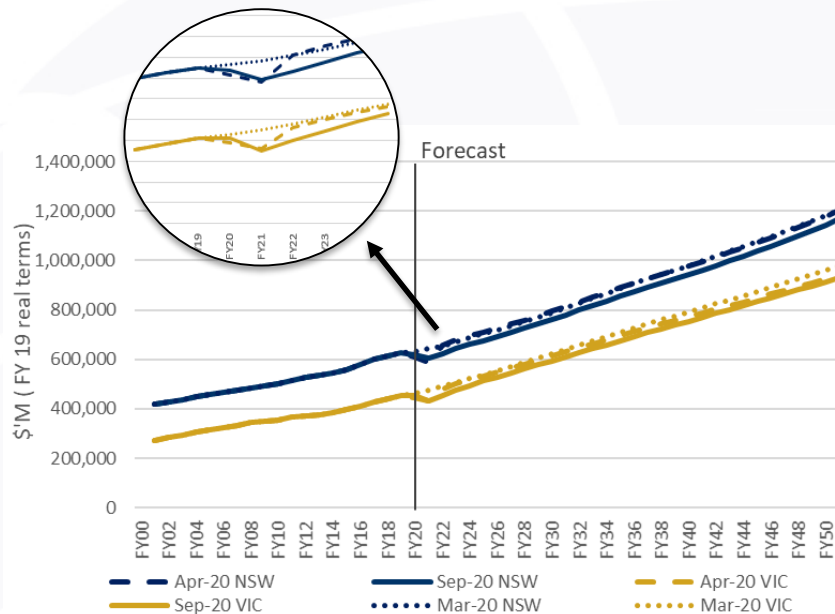
Fig 5. State Breakdown of GDP: FY20 vs. FY50



GDP in FY20: \$2.0 trillion
GDP by FY50: \$3.9 trillion



Fig 6. Gross State Product, NSW & VIC, FY00-50 (FY 20 Real terms)



Source: BIS Oxford Economics/ Haver Analytics

NSW

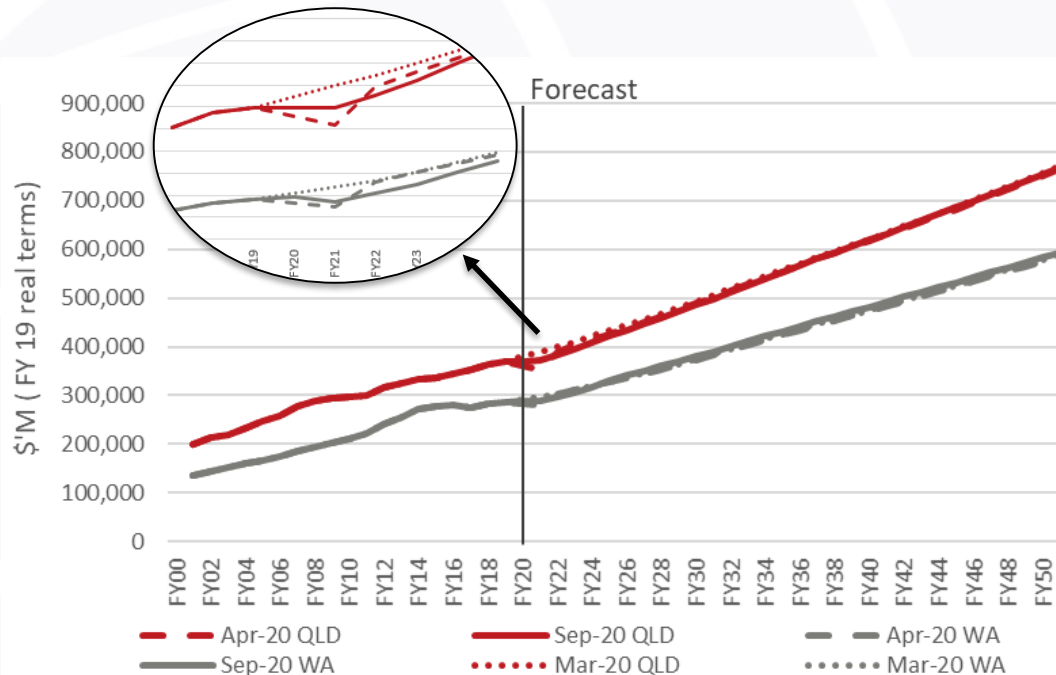
- In line with the national narrative we have revised up our near-term outlook, we now project a 1.0% contraction in FY21, with the services and construction sector to see the largest falls.
- In comparison to April, we now expect the recovery will be more prolonged, not reaching trend until the mid-2020s and due to the revised population projections, GDP for a given year will be permanently lower.

VIC

- The combination of the second wave of COVID-19 cases and the state's structural exposure to the most impacted sectors (international students and visitors) will result in the sharpest downturn in economic activity this year. This had started to materialize in the June quarter, with State Final Demand contracting by 8.5%. A further decline in Q3 is inevitable given the severe lockdown restrictions the state, and Melbourne in particular have endured in the September quarter.
- We expect the state's economy to recover in 2021 but with limits on travel likely to remain in place for some time, normalization will be a gradual process. In the long run we still expect the state to outperform the national average, but the gap is projected to narrow. Victoria's economy has been partially driven by rapid expansions in higher education and the tourism sector more broadly, and we expect there to be some long term loss of output in these areas as a result of the pandemic.



Fig 7. Gross State Product, QLD & WA, FY00-50 (FY 20 Real terms)

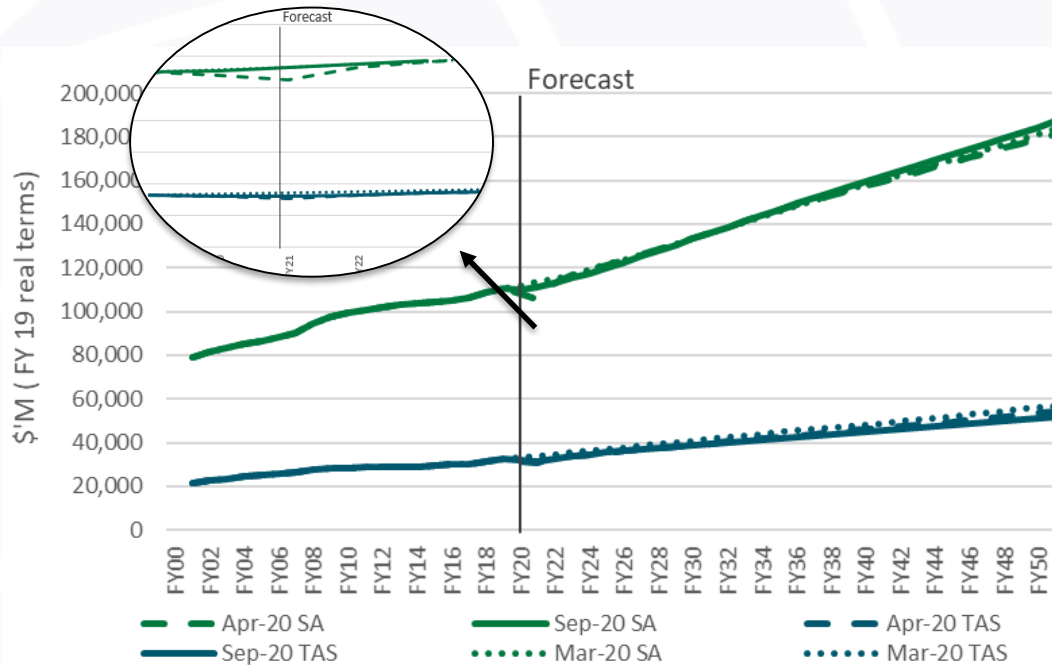


Source: BIS Oxford Economics/ Haver Analytics

- WA and QLD have generally been more successful at containing the virus and keeping local transmission at bay, effectively allowing the state economies (in isolation) to get back to activity as normal.
- Moreover, the industrial make up for these state has meant their exposure to the pandemic is much more limited.
- For this reason, we expect a quicker recovery and less permanent scarring, resulting in a similar long-term trajectory to the April forecasts.
- Indeed for QLD the recent labour market and retail turnover data suggests that the recovery is more advanced than in NSW and VIC, with 75% of the jobs lost since March already recovered (ahead of the national average).
- For WA domestic demand appears to have rebounded strongly after the 6% contraction in State Final Demand in Q2 – retail turnover in August was 16.2% higher than a year earlier, well ahead of the 5.4% increase at the national level.



Fig 8. Gross State Product, SA FY00-50 (FY 20 Real terms)

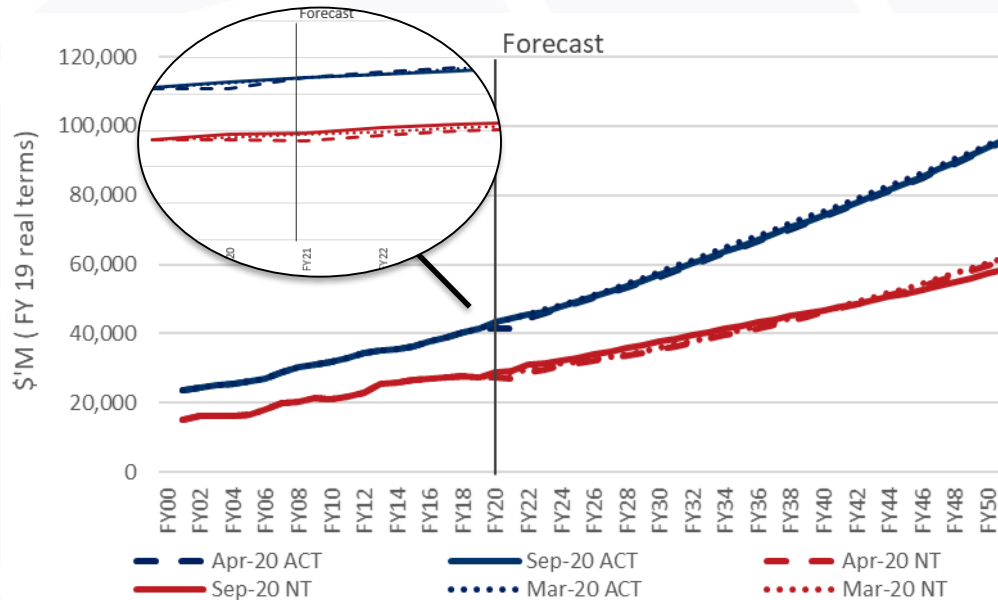


Source: BIS Oxford Economics/ Haver Analytics

- SA has performed better than expected. This is explained by relatively better health outcomes in SA allowing for a faster rebound in activity as well as support from public spending, with a number of defence programs based in Adelaide.
- Retail turnover has rebounded strongly (up 10% y/y in August), and employment is just 1.8% below its pre-pandemic level.
- Over the long-run however, we still expect SA's economy to underperform against the rest of the economy, reflecting the state's demographic outlook.
- In contrast, while TAS also had successful domestic outcomes, its exposure to tourism and international students has meant the state economy has taken a big hit (with retail spending remaining 10% below its pre-COVID peak). We also expect the pandemic will do more permanent damage to the state economy.
- This is reflected in our long-term downgrade of GSP for Tasmania compared with our April forecasts.



Fig 9. Gross State Product –NT & ACT

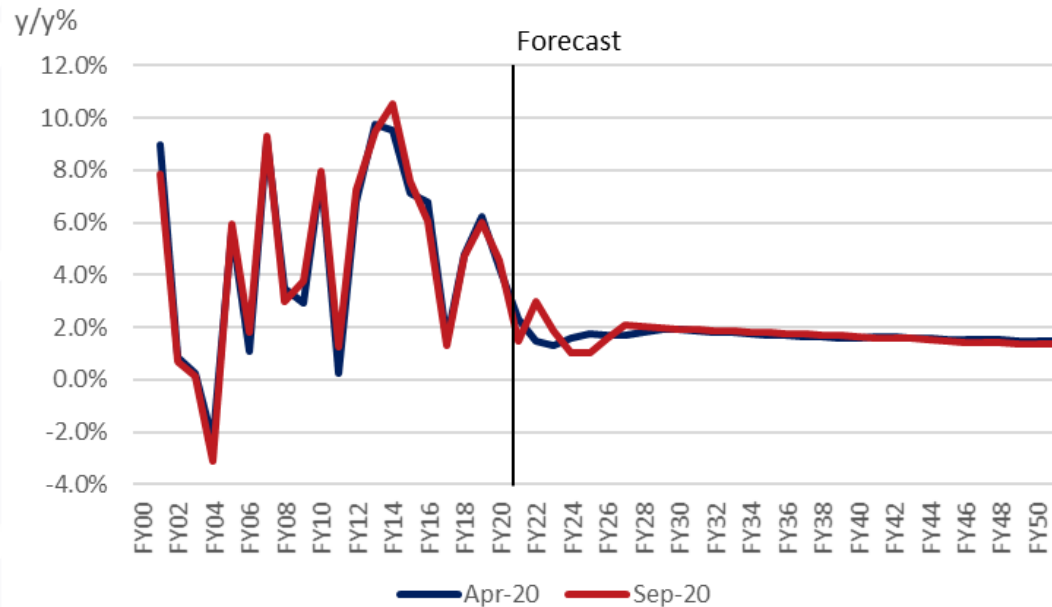


Source: BIS Oxford Economics/ Haver Analytics

- Although ACT won't be immune to the economic impact of the coronavirus pandemic, the dramatic increase in government support for the economy has resulted in employment already surpassing its pre-COVID peak.
- Despite this the pandemic's impact has been felt, particularly in the consumer services and hospitality sectors – with spending in cafes and restaurants almost 20% below its pre-pandemic levels in August. The loss of international students is also being felt. The removal of interstate and international border restrictions will be key to the recovery in these sectors of the economy.
- Given the dominance of mining for NT, the immediate impact of the pandemic on NT has been comparatively mild and has benefited on the health from being relatively isolated. As a result, we expect the state to outperform this year, with a modest fall in GSP projected.
- The long-run effects of the pandemic will be limited for both these economies, resulting in relatively similar growth trajectories to the April forecasts in the long-run.



Fig 10. YoY% Change in Mining GVA

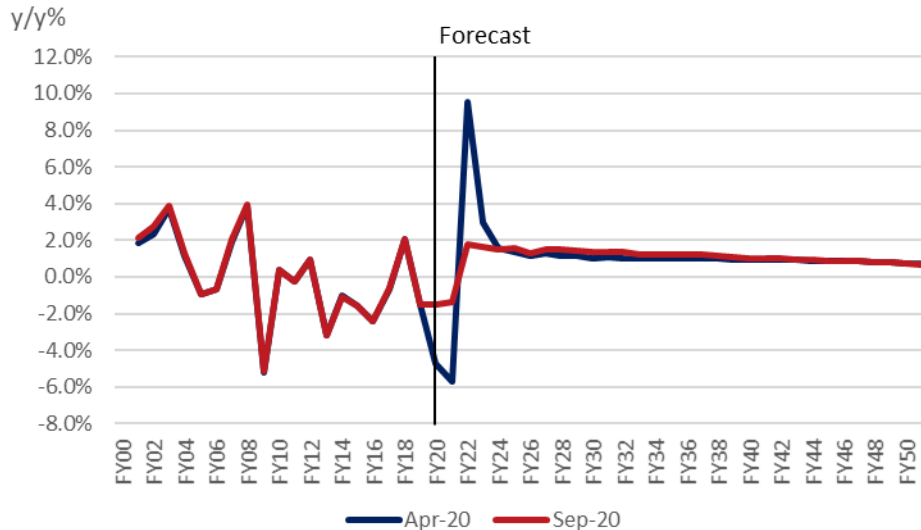


Source: BIS Oxford Economics/ Haver Analytics

- While broadly in line with our previous forecasts, we have upgraded the near term outlook for Mining GVA, underpinned by an improved outlook for the key commodities for Australia's mining states (namely iron ore; coal and copper) and a recovery in demand from key Asian markets of China and India.
- LNG is an exception to this narrative. Growth in natural gas production expected to continue slowing as production at the major facilities approaches nameplate capacity. Over the long-term, with increased policy led shifts towards renewable sources of energy, we anticipate a gradual displacement of global demand for LNG in the long run. As such our projections for this sub-sector are relatively benign.



Fig 11. YoY % Change in Manufacturing GVA

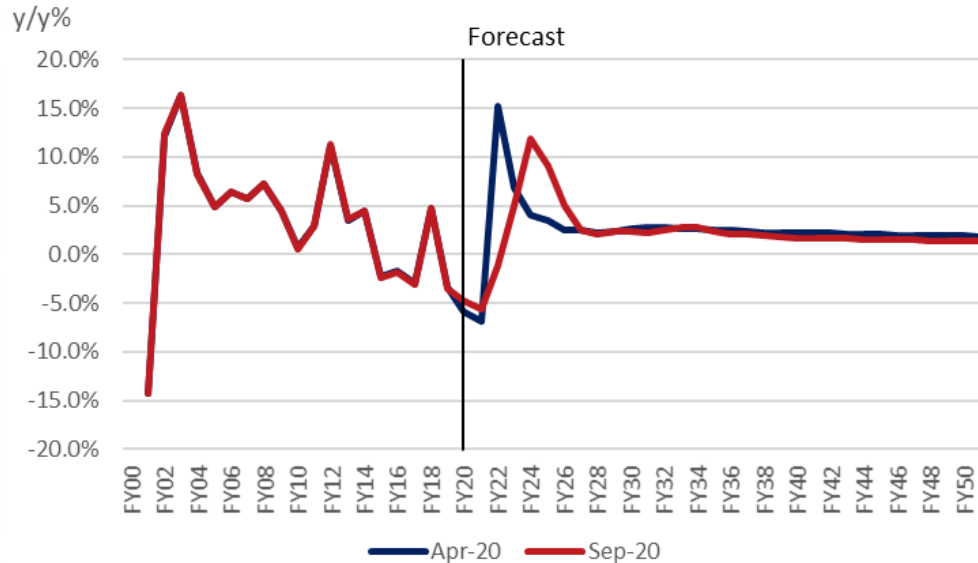


Source: BIS Oxford Economics/ Haver Analytics

- Manufacturing, particularly related to mining, has proved more resilient than initially anticipated, contracting by 1.5% for FY20.
- Notwithstanding this, given how the pandemic is evolving on the global front, with many economies starting to see a second wave of cases erupt, we expect global momentum to slow. As a result we predict a further 1.4% contraction in Manufacturing GVA for FY21 followed by a much more gradual recovery, not reaching trend until FY25.



Fig 12. YoY % Change in Construction GVA

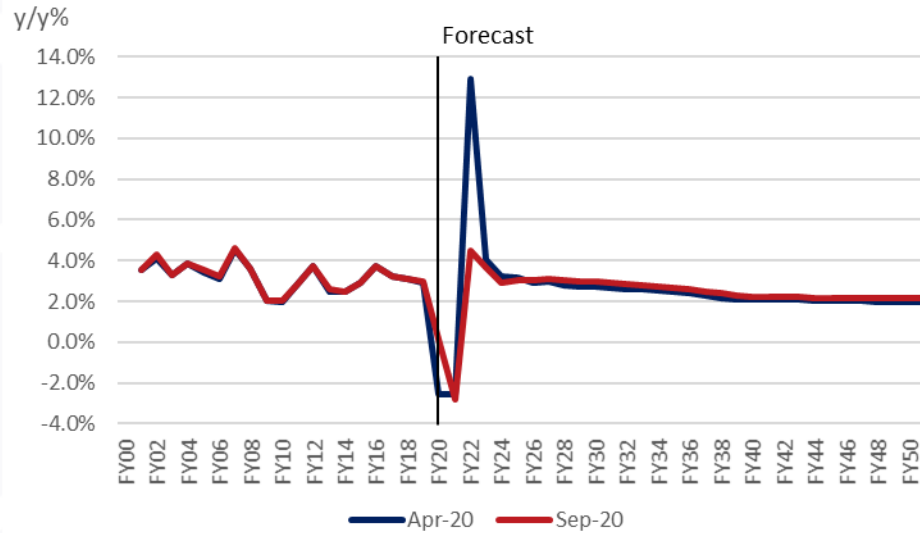


Source: BIS Oxford Economics/ Haver Analytics

- Construction will be severely impacted by the coronavirus pandemic, falling 4.7% in FY20 and expected to fall almost 6% further in FY21.
- Moving into the medium term, we now expect a more modest pace of growth, with the downgrade to net overseas migration expected to weigh on activity, particularly in the residential sector.
- Commercial building construction sector is also expected to moderate sharply, with a number of office, retail and education projects put on hold.
- Going forward, the recovery in construction will take some time. Engineering construction will be a near term driver, with a number of mining sector projects already in the pipeline and the Federal and state governments providing additional funding to accelerate public sector activity. The building construction sector will also be supported by accommodative monetary policy and fiscal stimulus in the form of state schemes as well as the federal HomeBuilder program.
- Once overseas migration is allowed to resume this will further fuel the recovery in construction, with nearly 12% growth expected in FY24.



Fig 13. YoY % Change in Services GVA

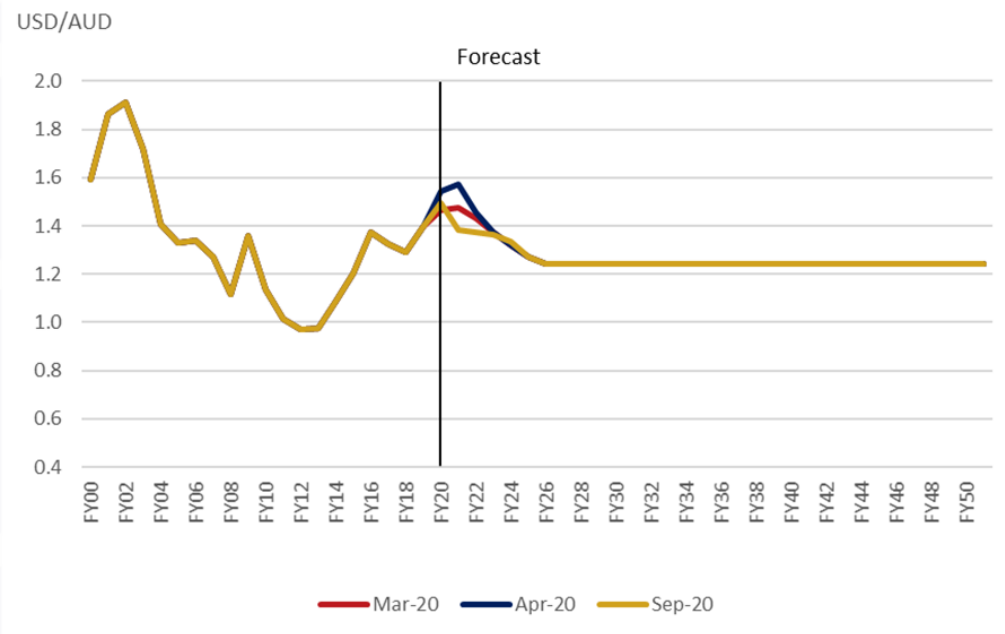


Source: BIS Oxford Economics/ Haver Analytics

- Services GVA on the whole ended relatively flat for FY20 (0.1% growth). Within the Services sector, private services fell by 1.5%, which was offset by a 4.0% surge in public services. Unsurprisingly, this was led by public administration and health services.
- Going forward, growth in the public sector will moderate sharply, as spending to combat the pandemic winds down (though it will remain elevated in FY21 and FY22).
- Some private sector activity has been able to return (and for many businesses, the WFH transition was largely successful), but with restrictions still in place and consumers cautious, large parts of the hospitality and arts sectors are still not fully operational.
- Therefore we expect to see the drag from private services dominate the trend for services as a whole, with the sector contracting by 2.8% in FY21.
- Relative to our April forecast, the near term fall in output was much less pronounced than we expected. But we now expect a more protracted recovery, with a larger drag in the long run.



Fig 14. Exchange Rate Forecast



Source: BIS Oxford Economics/ Haver Analytics

- The substantial disruptions created by the coronavirus pandemic resulted in wild swings in a number of currencies, including the AUD; after reaching a trough of 0.58 USD in late March, the currency has recovered to 0.71 USD (as-at 16 October 2020).
- Looking ahead, we continue to expect global recovery will take some time. The size of the shock to output, with many countries grinding to a complete halt in March/April, has prompted central banks around the world to dramatically ease their policy settings, flooring their policy interest rates and implementing unconventional policies (such as QE).
- We expect it will be some time before these policy settings are reversed, and that this will be a gradual process. Recovery in real economic activity will also be slow moving, with global headwinds expected to persist for some time yet.
- Consequently, we do not expect exchange rates to stabilise at their long-run equilibrium until the second half of the 2020s.



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ALTERNATIVE SCENARIO FORECASTS



- For the long term trajectories we construct the step change and the slow change scenarios using the same core fundamental variations as last year. Namely:
 - **Population:** We apply the deviation between ABS's series A to B and C to B assumptions for overseas migration to our latest central population projections resulting in **higher** population in *Step Change* and **lower** population in *Slow Change* to Central.
 - **Energy Transition:** The alternate energy transition pathways are captured by a **faster** composition change from emissions intensive sectors (such as mining) to less intensive sectors (such as services) in *Step Change* scenario. This composition change is **slower** in a *Slow Change* scenario than Central.
 - **Global confidence:** We apply a **positive** confidence shock in the step change scenario and a **negative** confidence shock in the slow change scenario which generates higher (lower) consumer spending and business investment in the step change (slow change) scenario.

Given the uncertainty presented by the current pandemic, we construct the near term pathway for these scenarios based on the health outcomes from COVID-19 as shown in the next slide.



Health Outcomes



Policy Response



Demographic Shock



Economics Outcomes

- **Step Change:** Globally cases are brought under control; vaccine is available and mass administered quicker than baseline.
- **Slow Change:** Globally cases continue to rise; domestically cases re-erupt and managed through repeated partial lockdowns.

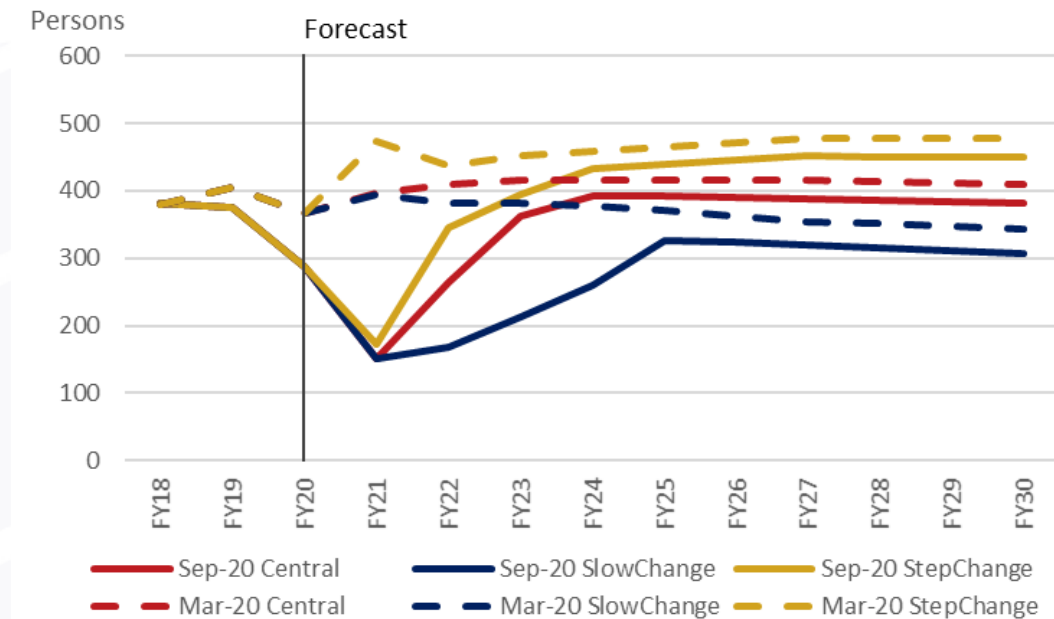
- **Step Change:** Faster unwinding of state and international borders restrictions.
- **Slow Change:** Delayed unwinding of state and international border restrictions.

- **Step Change:** Faster rebound in net overseas migration and normalisation of interstate migration patterns. Higher levels of permanent overseas migration.
- **Slow Change:** Slower normalisation of migration patterns. Lower levels of permanent overseas migration

- **Step Change:** Higher population growth and limited hysteresis effects drive higher output and higher income growth than baseline.
- **Slow Change:** Lower population growth and more profound and longer lasting hysteresis effects driver lower output and income growth than baseline.



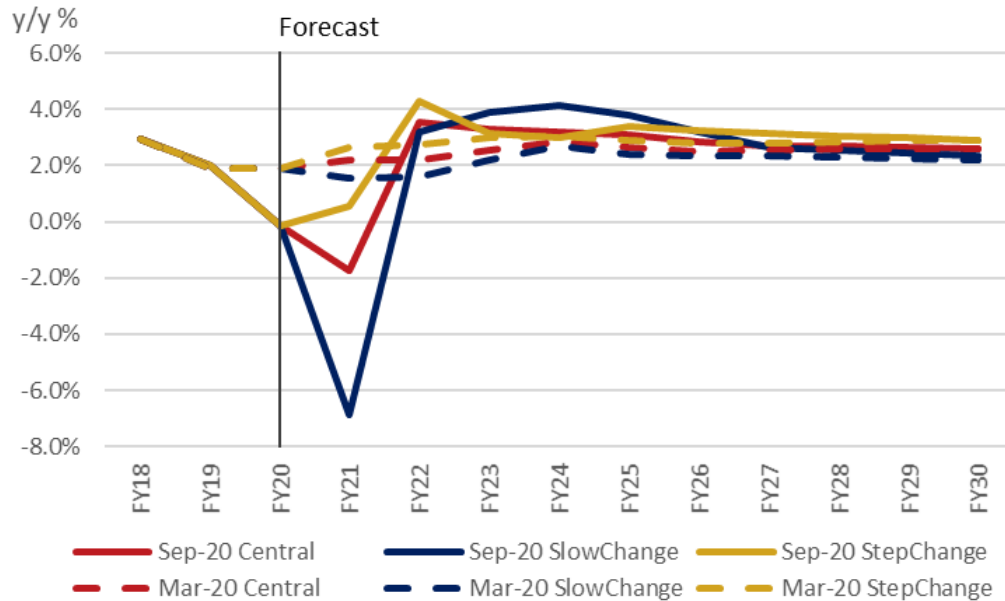
Fig 15. Population Change, Australia – all scenarios



- We hold the demographic factors (birth rate, death rate and age and gender distributions) same across all three scenarios and drive population change by our migration assumptions. Consequently, consistent with the central scenario, the population projections have been revised down in the step change and slow change compared with our March forecasts.
- In the near term, the trajectory is determined by the case outcomes, as outlined in the previous slide. In the near term, we see limited upside to the migration profile while worse health outcomes delay the recovery in the slow change.
- Consequently, the dispersion across scenarios in the near term is asymmetric, reflecting the materially greater downside risk to the immediate outlook.
- Beyond the pandemic, these pathways are broadly symmetric.



Fig 16. YoY% Change in GDP by scenario (FY18-30)

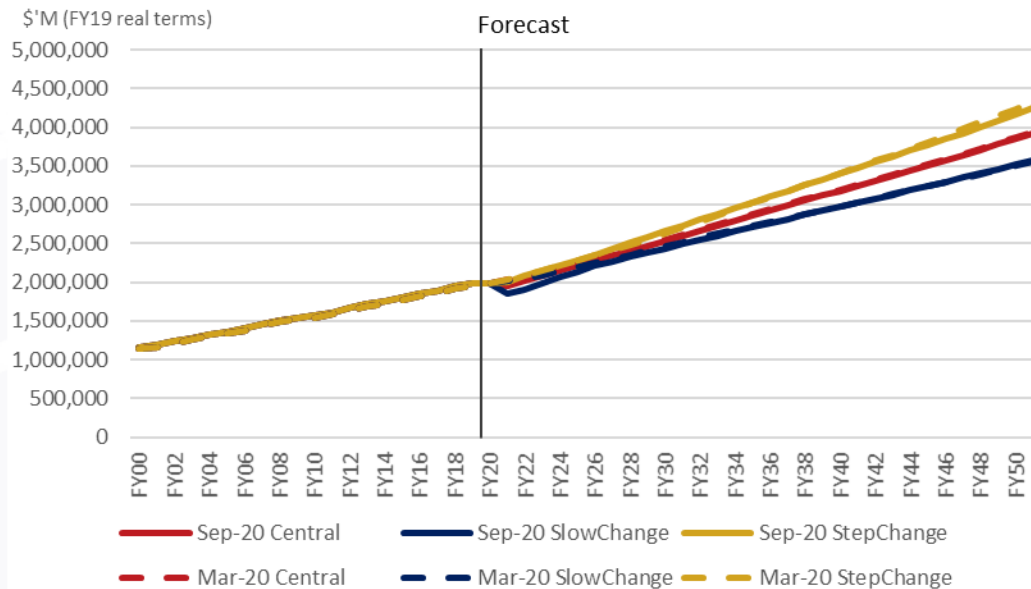


Source: BIS Oxford Economics/ Haver Analytics

- In line with the demographic profile and the migration policy responses in the two alternative scenarios, we have a stronger (milder) contraction in the slow change (step change) for GDP growth in FY21, as shown in Fig 16.
- It follows that the step change will have a quicker rebound, getting back to trend by FY23 while recovery is much slower in the slow change scenario, not reaching trend until the late-2020s.
- As illustrated in the next slide, cumulatively we have higher GDP in the step change and lower GDP in the slow change.
- However, due to some permanent loss of migration in FY20-21, we expect GDP will be cumulatively *lower* by 2050 in all scenarios, compared with the March forecasts which did not have a material downgrade for COVID-19.



Fig 17. GDP projections by scenario (FY00-51)



Source: BIS Oxford Economics/ Haver Analytics

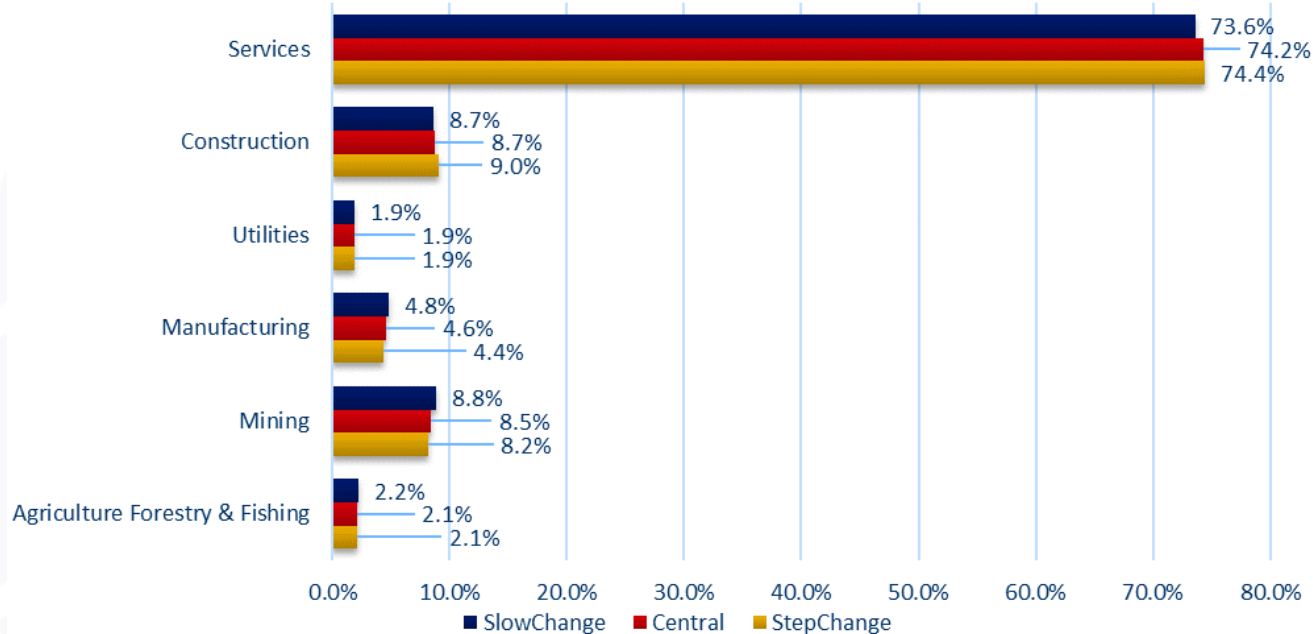
Table 3. Cumulative GDP from FY20 : Mar-20 vs. Sep-20

		FY20	FY25	FY50
		\$'M	\$'M	\$'M
Mar-20	Central	1,983,772	12,634,544	89,403,223
	Slow Change	1,983,772	12,484,300	84,481,487
	Step Change	1,983,772	12,771,736	94,329,523
Sep-20	Central	1,983,055	12,402,800	88,781,004
	Slow Change	1,983,055	11,918,290	83,607,037
	Step Change	1,983,055	12,693,009	94,022,062



ALTERNATIVE SCENARIOS: INDUSTRIAL COMPOSITION

Fig 18. Industrial Composition of GDP by Scenario (FY50)

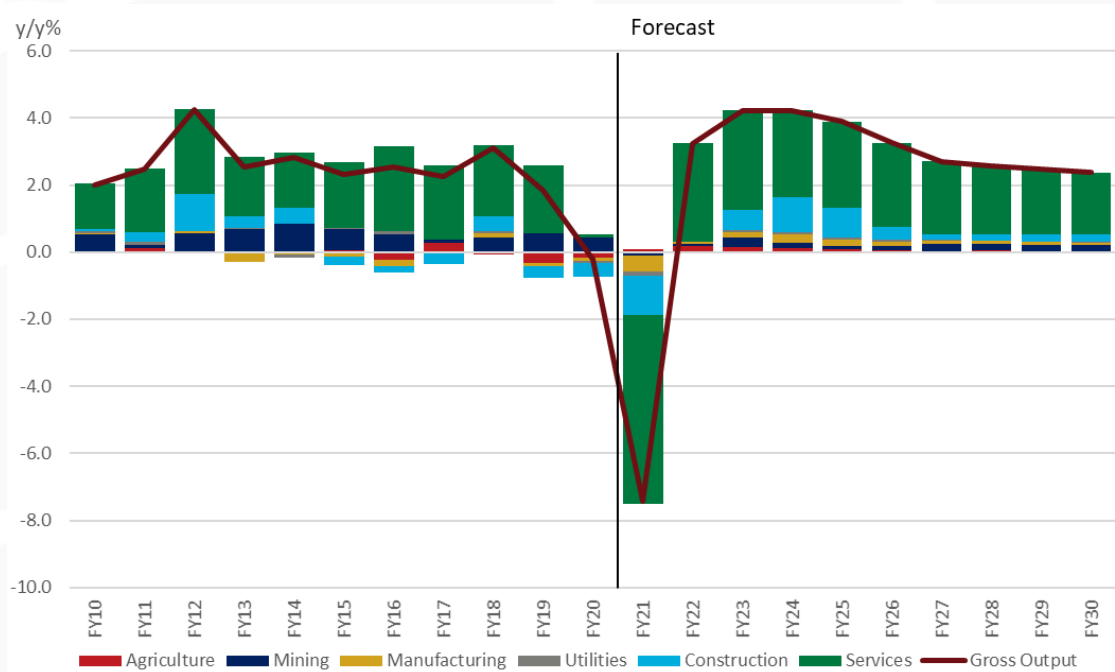


- In the step change scenario, characterised by a faster transition to a lower emissions pathway, we continue to project a faster structural shift away from manufacturing and mining towards services leading to these sectors comprising a *lower* share of the industrial makeup by FY50.
- By the same logic, with a slower than BAU emissions transition pathway in the slow change scenario, mining and manufacturing make up a *higher* share of the industrial landscape.
- The reverse is true for the services and construction sectors.
- Utilities and Agricultural shares remain unchanged.

Source: BIS Oxford Economics/ Haver Analytics



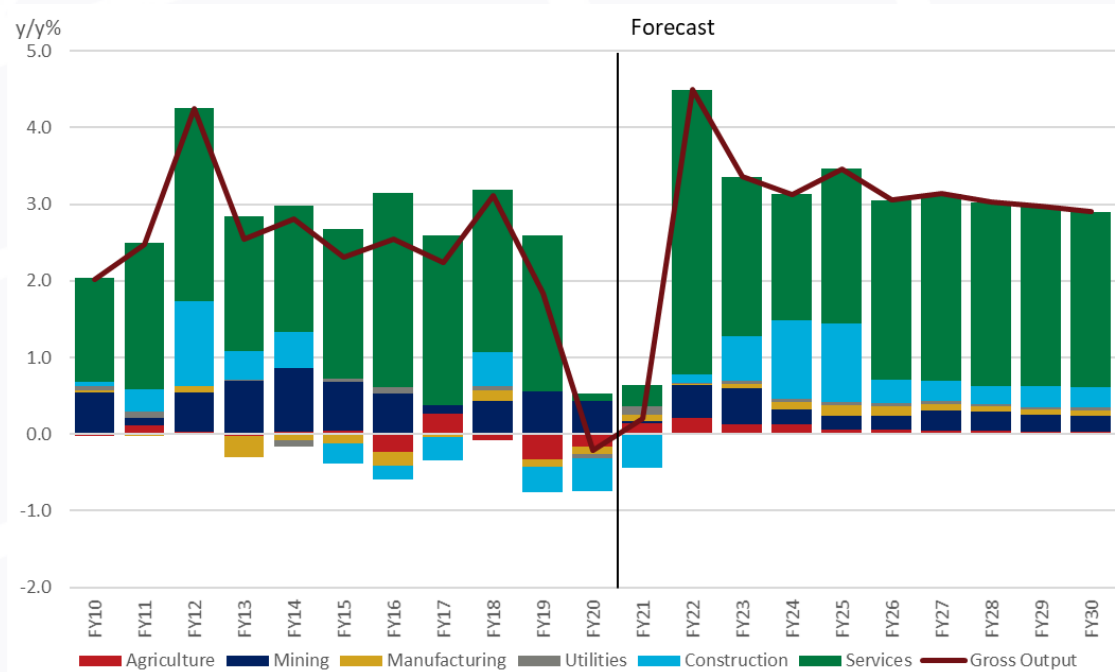
Fig 19. Industrial Contribution to YoY% growth in Gross Output (FY10-30) – Slow Change Scenario



Source: BIS Oxford Economics/ Haver Analytics



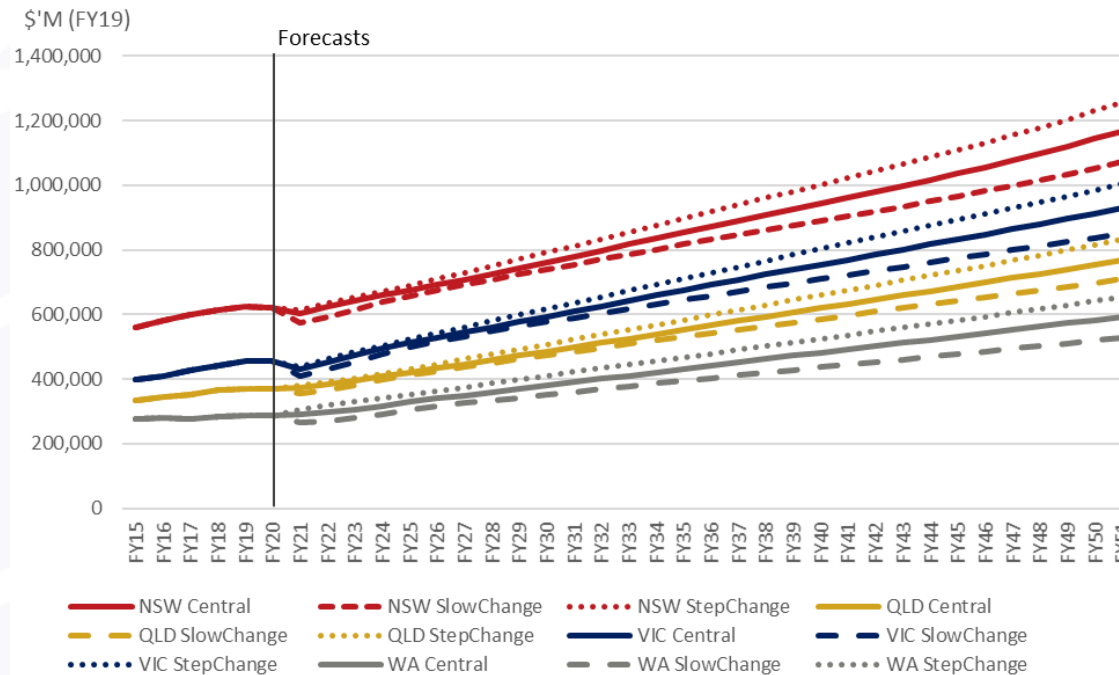
Fig 20. Industrial Contribution to YoY% growth in Gross Output (FY10-30) – Step Change Scenario



Source: BIS Oxford Economics/ Haver Analytics



Fig 21. Gross State Product, NSW, VIC, QLD & WA, FY00-50 (FY 19 Real terms)

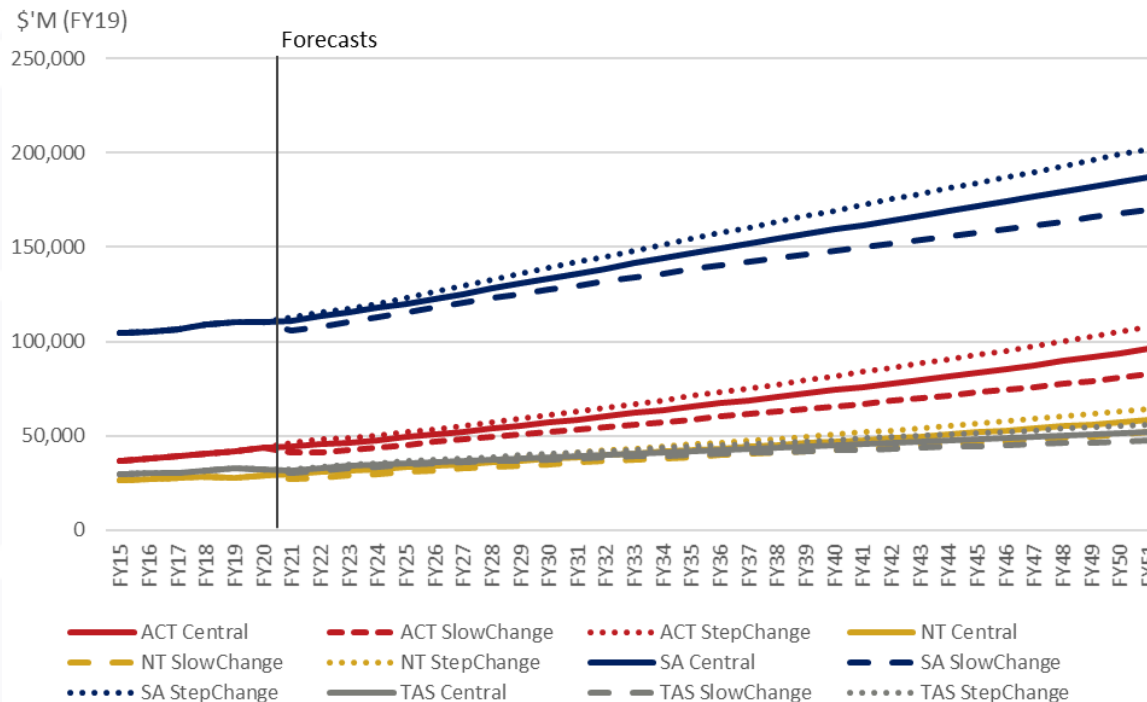


- Given the long-run economic outcomes are largely underpinned by the demographic profile, the trends seen across states for the central scenario are amplified in the alternative cases.
- In the step change, NSW & VIC see the largest gains followed by QLD & WA.
- Meanwhile, in the slow change we expect an even deeper near term contraction for NSW & VIC and more profound permanent scarring in the long term.
- As a result the dispersion across scenarios for these states is greater than that seen in WA & QLD.

Source: BIS Oxford Economics/ Haver Analytics



Fig 22. Gross State Product, SA, TAS, NT & ACT, FY00-50 (FY 19 Real terms)



- A similar trend persists for the smaller states.
- Tasmania's tourism and higher education sectors benefit from higher migration in step change; NT's mining sector is supported by a stronger global demand outcome; stronger domestic demand and government spending drive higher growth in SA & ACT.
- Symmetrically, a reversal of these factors driver a lower growth outcome for these states in the slow change scenario.

Source: BIS Oxford Economics/ Haver Analytics



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