Fiscal Policy in the COVID-19 era

Chris Murphy

Arndt-Corden Department of Economic

Crawford School of Public Policy

Australian National University

Chris.Murphy@anu.edu.au

Abstract

This paper analyses the origins of the COVID-19 V-shaped recession in Australia and the appropriateness of the fiscal policy response. This fiscal response has included the JobKeeper program, accelerated depreciation of new investment, and lump sum payments to businesses, all of which are temporary. The first version of JobKeeper involved three forms of over-compensation, two of which were addressed when JobKeeper was extended. The discretionary fiscal expansion, which also includes some more long-lasting measures, is incorporated in the *baseline* scenario from a macro-econometric model. The hypothetical *automatic stabilisers* scenario shows that, without the fiscal expansion, the economic downturn in 2020-2021 would have been more severe, although high inflation in 2023-2025 would have been avoided. A *no COVID* scenario shows that the V-shaped recession was due mainly to government suppression of household consumption of certain services. The lessons for any future pandemic are to ensure that the macroeconomic response lasts only as long as the government suppression of economic activity and that is carefully designed to avoid overcompensation.

Key words: COVID-19, macroeconomics, models, forecasting, JobKeeper, taxation

JEL Codes: C54, C68, E37, E62, H32, H68

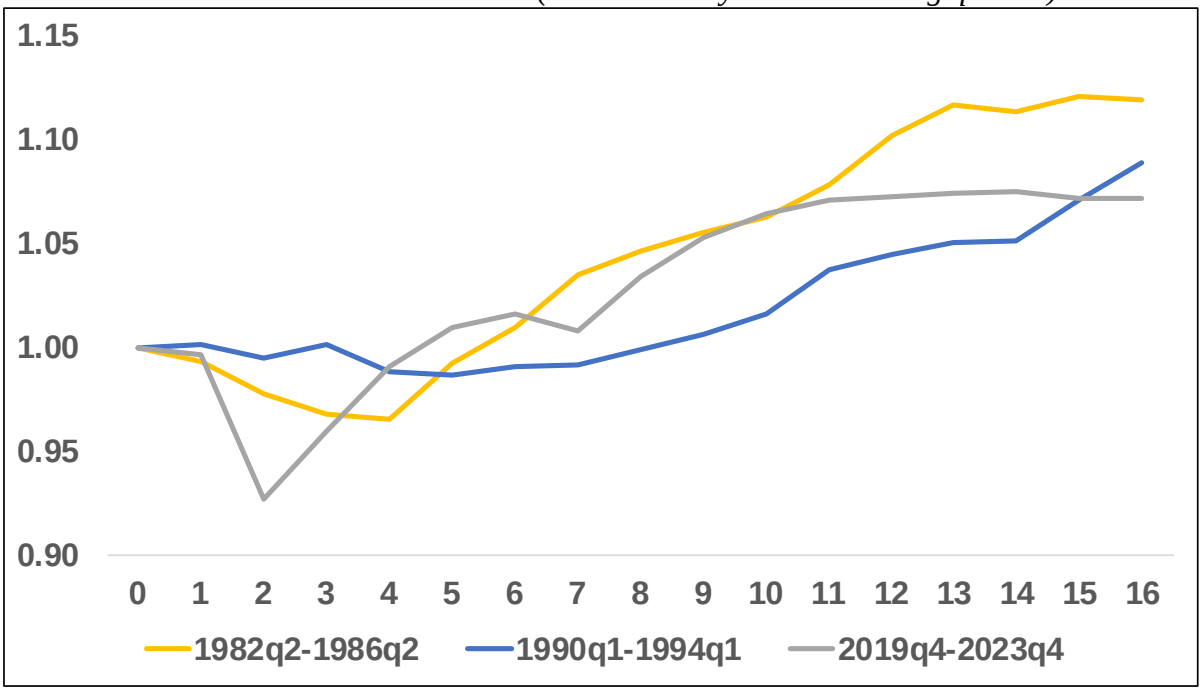
Fiscal Policy in the COVID-19 era[1]

1 Introduction

This paper analyses the origins of the COVID-19 recession in Australia and the appropriateness of the fiscal policy response. The recession, which followed government suppression of certain economic activities to combat the COVID-19 pandemic, was countered with a highly expansionary fiscal policy.

The dimensions of the COVID-19 recession are very different from the previous recessions of the last 40 years (Chart 1.1). This recession began with the largest and quickest decline in real GDP, with GDP down by 7 per cent after only two quarters. This was followed by an unusually quick recovery, with the loss in GDP largely unwound only two quarters later. In short, the COVID-19 recession followed a deep V shape rather than the shallow U shape of the two proceeding recessions.

Chart 1.1. Real GDP in three recessions (scaled to unity in each starting quarter)



Note:

1. The GDP path for the COVID-19 recession (2019q4-2023q4) is based on historical data to 2021q2 and a baseline forecast for 2021q3-2023q4.

To analyse the reasons for this unusual V-shaped recession and the appropriateness of the fiscal policy response, this paper uses a macro-econometric model of Australia (Murphy, 2020) to construct three scenarios (Chart 1.2). The *baseline* scenario factors in the COVID-19 shocks

[1] I would like to acknowledge the helpful comments on an earlier version of this paper from participants at an Arndt-Corden Department of Economics seminar, ANU.

to the economy and the expansionary fiscal policy introduced in response. Its path for real GDP appears as both the *2019q4-2023q4* line in Chart 1.1 and the *baseline* line in Chart 1.2.

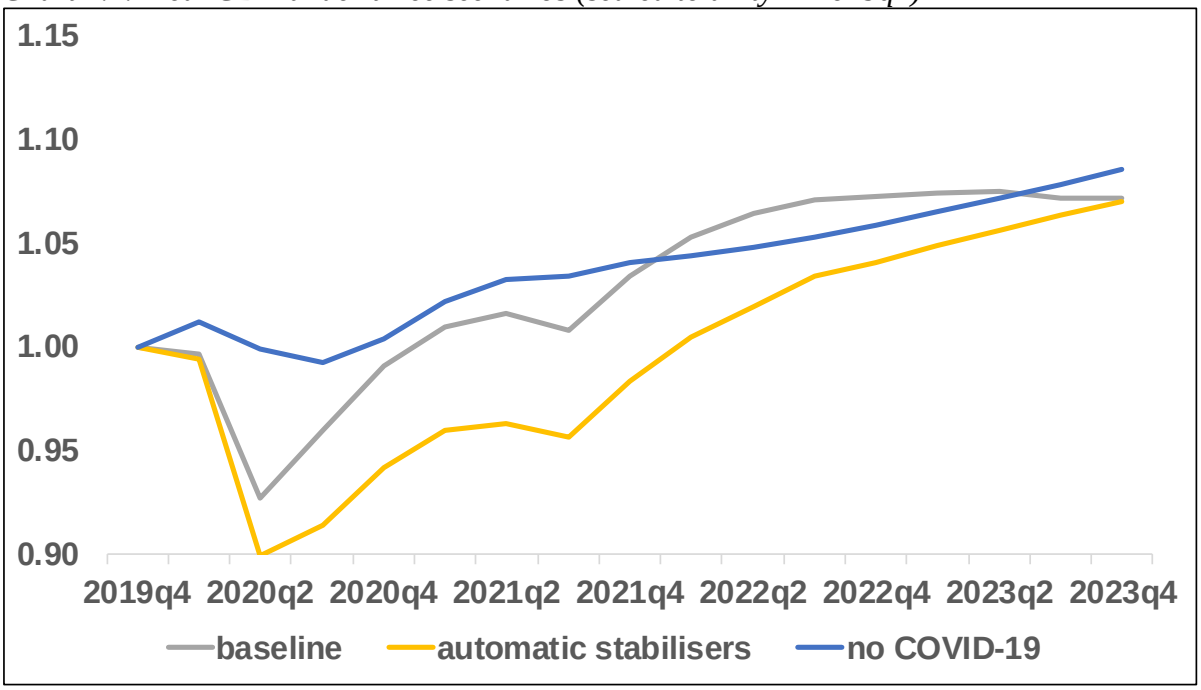
The *automatic stabilisers* scenario simulates a hypothetical situation in which there was no fiscal expansion in response to COVID-19. This results in a lower simulated path for real GDP over the four years that are shown. For example, the maximum decline in real GDP is 10 per cent instead of 7 per cent.

Thus, this paper finds that the fiscal expansion was successful in reducing the depth of the recession. However, it also draws some lessons concerning the nature and longevity of this fiscal expansion. For example, in the *baseline* scenario, an over-extension of expansionary macro policy leads to high inflation in 2023 to 2025.

The *no COVID-19* scenario simulates another hypothetical situation. There is no COVID-19 pandemic. This involves removing both the main economic shocks from COVID-19 and the expansionary fiscal policy that was introduced in response. This results in the economy growing relatively smoothly. Shocks on the economy apart from COVID-19 are not removed so growth is not completely smooth.

The aim of constructing the *no COVID-19 scenario* is to better understand the reasons for the unusual deep V-shaped recession by isolating the main COVID-related economic shocks that caused it. A better understanding of the macroeconomic impacts of COVID-19 may lead to improvements in the way macro models capture pandemics and it may also assist policy makers in responding to any future pandemics.

Chart 1.2. Real GDP under three scenarios (scaled to unity in 2019q4)



Compared to other Australian macro-econometric models, the model used in this paper has two advantages in analysing the COVID-19 recession and the fiscal policy response. It contains more industry detail useful in capturing how the COVID-19 economic restrictions have

impacted unevenly across the economy. Following recent model development work, it also contains more fiscal detail, which is useful in analysing the fiscal response.

The centrepiece of the fiscal expansion, the JobKeeper program, is also analysed from a microeconomic perspective in this paper. Treasury (2020) provides evidence that JobKeeper met its three main objectives. Those objectives were to keep workers in an unbroken relationship with the businesses who employ them, help those businesses remain viable, and provide workers and business owners with some compensation for their income losses from the COVID-19 restrictions. However, we find that some businesses that were not impacted by COVID restrictions were nevertheless more profitable if they chose to operate far enough below normal levels to be eligible for JobKeeper, than if they chose to operate normally and forego JobKeeper. JobKeeper provided a profit motive for some businesses to restrict production and active employment.

The rest of this paper is organised as follows. Section 2 provides an overview of the macro model used for the scenario analysis, with a particular focus on the fiscal detail. Section 3 develops the *baseline* scenario. It sets out the main model inputs used to capture the COVID-19 restrictions and the fiscal policy responses, and the resulting macroeconomic outlook. Section 4 examines the JobKeeper program from a microeconomic perspective, focussing on the issue that JobKeeper gave some businesses that were not impacted by COVID-19 a profit motive to operate at below normal levels. Section 5 presents the *automatic stabilisers* scenario and compares its macroeconomic outcomes with those under the *baseline* scenario with its large discretionary fiscal expansion. Section 6 constructs the *no COVID-19* scenario, and compares it with the *baseline* scenario to improve our understanding of the unusual COVID-19 recession.

2 Macro model

2.1 General description

The model used to generate the three scenarios is the latest in a long series of macro-econometric models of the Australian economy developed by this author. The models have been used to produce forecasts and analyse macro policies in government, academia and the private sector. These models have included the AMPS model (Murphy et al., 1986), the Murphy model or MM (Murphy, 1988a, 1988b; Murphy, 1992) and MM2 (Powell and Murphy, 1997). The author has developed similar models for the governments of New Zealand, Singapore and Malaysia.

These models have a common base in that they are New Keynesian, with a Keynesian short run, neoclassical long run and forward-looking behaviour in financial markets. The more recent models fully integrate multiple industries and can be characterised as dynamic CGE models. The Keynesian short run arises from sticky prices for labour and goods sold domestically, while prices for traded goods are assumed to be flexible. Apart from the original AMPS model that used half-yearly data, the models all use quarterly data.

As macro-econometric models, these models aim to balance principles from macroeconomic theory with econometric analysis of historical data. DSGE models generally place more weight on the theory while VAR models usually place more weight on the data. In the author's view all three types of models have their place.

This study has both forecasting and policy analysis aspects and requires significant industry and fiscal detail. Macroeconometric models offer the balance between theory and data and the flexibility for large scale modelling that is useful in this situation.

The latest macro model (Murphy, 2020) was developed and refined over the period from 2013 to 2020. Other comparable Australian models are EMMA at the Treasury (Bullen et al., 2021) and MARTIN at the Reserve Bank of Australia (Ballantyne et al., 2020). Compared to EMMA and MARTIN, the macro model used here has finer industry and fiscal detail. The finer industry detail is helpful in allowing for the uneven impacts across the economy of the COVID-19 economic restrictions, while the fiscal detail is useful in modelling the fiscal policy response.

The macro model identifies six broad industries. For clarity, Australian Bureau of Statistics (ABS) names for relevant industry divisions are shown in parentheses.

- Agriculture ('agriculture, forestry and fishing')
- Mining
- Manufacturing
- Government services ('public administration and safety', 'education and training' and 'health care and social assistance')
- Other private services (all industries not included elsewhere)
- Housing services ('residential property operators').

In the first five industries, output is produced using a combination of intermediate inputs, labour, non-dwelling structures capital, machinery and equipment capital and a fixed factor. The fixed factor accounts for a relatively high share of value added in agriculture, where it represents agricultural land, and mining, where it mainly represents mineral resources.

In the remaining industry, housing services, output is produced using a combination of intermediate inputs, dwelling structures capital, housing land and capitalised ownership transfer costs. The capitalised ownership transfer costs represent the depreciated value of past investments in housing mobility. They are included as an input in producing housing services to recognise that households invest in moving house so that their housing characteristics, such as size and location, better match their changing circumstances.

Of the six broad industries, other private services is the largest, accounting for 60 per cent of total employment in 2019, prior to the COVID-19 pandemic. It is also the industry that was most affected by the government COVID-19 economic restrictions.

The main features of the 2019 version of the macro model have already been described in more detail in Murphy (2020) and so are not discussed further here. However, there was further model development work in 2020, mainly focussing on further developing the fiscal detail.

This fiscal development work was partly prompted by a desire to use the model to analyse the fiscal responses to COVID-19 in this paper. This further developed fiscal detail, contained only in the latest, 2020 version of the model, is discussed separately below.

In the latest macro model, there are 55 estimated equations. The estimation method used is OLS. The estimation period generally starts in the September quarter 1985, but more recent start dates are used in cases where structural change is considered to be an issue. The estimation period usually ends in the most recent quarter for which there is a full set of data, currently the June quarter 2021.

Because of the disturbance to some economic relationships from COVID-19, the estimation period is currently truncated to end in the March quarter 2020, so the last five quarters of historical data are withheld from estimation. This remaining data is used to calculate the equation residuals. These residuals are inspected to ascertain which equations have run off track over the period from the June quarter 2020 to the June quarter 2021 as a result of COVID-19. This information is important in developing this paper's *no COVID-19* scenario, as explained in section 3. In the *baseline* scenario, special attention is paid to generating plausible forecasts for the off-track residuals.

There are a total of 790 equations. These include the estimated equations, calibrated equations for equilibrium supply-side relationships in each industry, asset accumulation equations and accounting identities.

For the model inputs, there are 116 exogenous variables. The more important categories of exogenous variables are for the world economy, population, productivity growth in each industry and budget policy.

2.2 Fiscal detail

In the macro model, the government budget refers to the budgets of all three levels of government (federal, state and local) consolidated together. Following the development work in 2020, there are now model levers for changing fiscal policy in all of the following areas.

- General government final demand
  - consumption
  - investment
- General government transfers
  - age-related
  - child-related
  - disability-related
  - unemployment-related
  - other transfers to private sector
  - transfers overseas
- Personal income tax
- Company income tax
  - tax rate

    - option for immediate expensing for machinery & equipment
    - option for immediate expensing of structures
- GST
    - rate
    - option for fully broadening the base in any industry
- payroll tax
- land-related taxes (municipal rates, state government land tax)
- conveyancing duty
- mining royalties
- other production taxes in each industry
- other product taxes
- target for the net public debt to GDP ratio

In most cases, a change to a given fiscal lever has the main behavioural effect in the model that would be expected from a public economics perspective. Changes in the modelled corporate tax provisions alter the user cost of capital for each type of capital in each industry, leading to changes in optimal capital stocks. Broadening the GST base reduces distortions in the pattern of consumption across the six industries. Reducing conveyancing duties reduces ownership transfer costs, inducing substitution away from housing structures and housing land and towards investment in housing mobility in producing housing services.

The model ensures long run fiscal sustainability by using a fiscal policy rule. Under that rule, the rate of labour income tax, *POLLAB*, adjusts automatically and gradually to achieve a long run target, *RPUBLIT*, for the ratio of public debt, *PUBLI*, to smoothed nominal GDP, *SGDPZ*.

$$\Delta\, POLLABN_t = GDPZ_t/WBILL_t \cdot \left\{\begin{array}{l} 0.08 \cdot [PUBNB_{t-1}/SGDPZ_{t-1} - GRZ_t/(1+GRZ_t) \cdot RPUBLIT_t] \\ \quad + 0.008 \cdot [PUBLI_t/SGDPZ_t - RPUBLIT_t/(1+GRZ_t)] \end{array}\right\}$$

$$POLLAB_t = POLLABN_t + POLLABX_t$$

The target for public borrowing, *PUBNB*, that is consistent with this debt target is also included in the rule to reduce volatility in the tax rate in targeting debt. In the long run, this level of public borrowing results in public debt growing at the same rate as nominal GDP, namely *GRZ*.

Alongside this endogenous component of the rate of labour income tax, *POLLABN*, is an exogenous component, *POLLABX*, to allow for discretionary changes in the tax rate in determining the final tax rate, *POLLAB*. Finally, because the tax base is the wage bill (*WBILL*) whereas the debt target refers to nominal GDP (*GDPZ*), changes in the tax rate are re-scaled by the ratio of *GDPZ* to *WBILL*. This maintains the effectiveness of changes in the tax rate in achieving the debt target when the labour share of GDP changes.

3 Baseline scenario

The *baseline* scenario described here is the first of the three scenarios generated using the macro model. The *baseline* is used as the point of reference in analysing the macroeconomic

effects of the fiscal response in the *automatic stabilisers* scenario of section 5, and of COVID-19 in the *no COVID-19* scenario of section 6. The *baseline* scenario allows for the government COVID-19 restrictions as well as the fiscal policy response to the recession induced by those restrictions.

This section is in three parts. The first part explains how the COVID-19 economic restrictions and how they have been captured in inputs to the model. The second part outlines the government's fiscal response and how that has been captured in the model. The final part sets out the resulting *baseline* scenario for the economy. This includes the outlook for GDP, unemployment, inflation and government finances. The *baseline* and the two other scenarios extend from the September quarter 2021 to the June quarter 2062. However, for the purposes of reporting the results in this paper, a 20-year horizon to the December quarter 2040 is sufficient, because by that time the model has largely converged to its new steady state path.

3.1 COVID-19 inputs

To generate the *baseline* scenario, we choose paths for the model inputs from the September quarter 2021 to the end in June quarter 2062.

The values for some model outputs in the September quarter 2021 are already known and so are imposed on the scenario. The main examples where September quarter outcomes are known are for the financial, commodity and labour markets. The September quarter outcomes for GDP, including its breakdown by industry and expenditure category, will not be known until the September quarter national accounts are released on 1 December, and so must be simulated by the model.

COVID-19 economic restrictions

COVID-19 and the government restrictions imposed in response have constricted the international movement of people and limited some domestic economic activities. International travel restrictions have severely restricted net overseas migration, inbound and outbound tourism and numbers of foreign students. Domestic social distancing restrictions have substantially constrained activity in the accommodation and food services industry division, and the arts and recreation industry division.

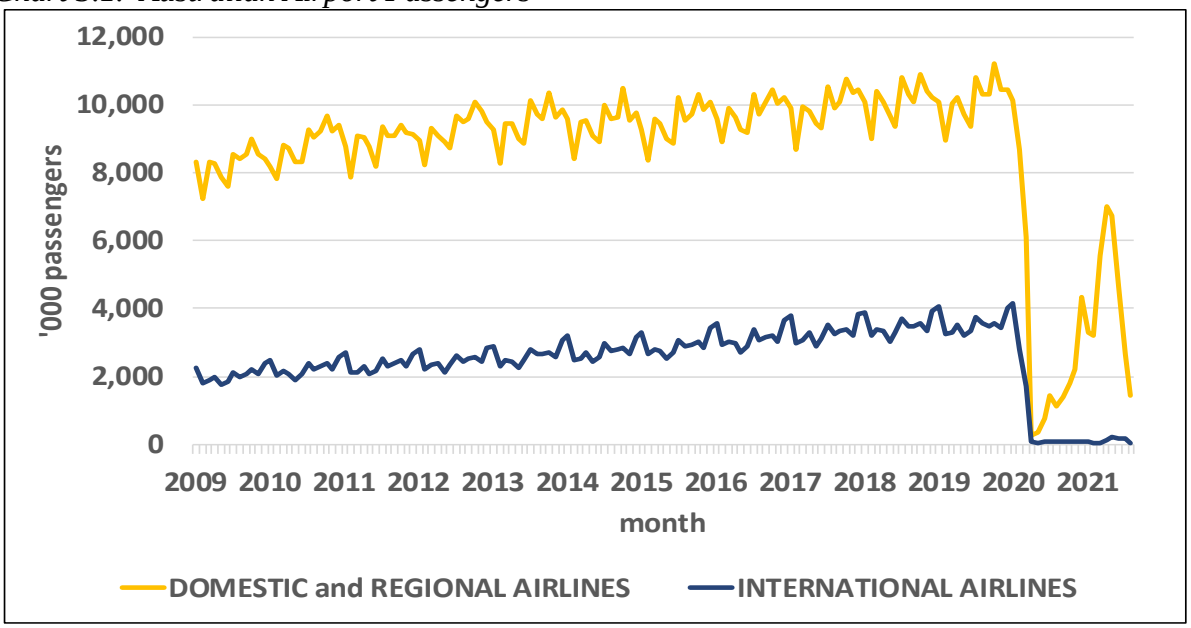
The government ban on international travel, imposed in March 2020, resulted in international passenger movements almost ceasing at Australian airports (Chart 3.1). International passenger movements slumped to 75 thousand in April 2020, compared to 3,503 thousand in the previous April. However, the ban on international travel is being phased out gradually, beginning in November 2021. The modelling assumes that restrictions on international movements of migrants, tourists and international students have been fully removed by late 2022.

Like the international travel ban, the domestic restrictions were first introduced in March 2020. The industry divisions most affected were the accommodation and food services industry and the recreation and culture industry. Unlike the international restrictions, the severity and

regional extent of these domestic restrictions has waxed and waned with COVID-19 outbreaks and recoveries from outbreaks.

In broad terms, passenger movements for domestic and regional airlines (Chart 3.1) have fluctuated inversely with the intensity of the domestic restrictions. While domestic passenger movements were still very low in August 2021 (the final month in Chart 3.1), they are likely to rise strongly towards the end of 2021 with the lifting of domestic restrictions in NSW and Victoria. The modelling assumes that domestic restrictions nationwide have been largely removed by 2022, with the policy shift from restrictions to vaccination to combat COVID-19.

Chart 3.1. Australian Airport Passengers



Sources: Bureau of Infrastructure, Transport and Regional Economics, Sydney Airport.

Table 3.1 summarises how model inputs have been set to capture COVID-19. The COVID-19 column shows the settings under COVID-19. Those settings are used in both the *baseline* scenario described here and the *automatic stabilisers* scenario covered in section 5. The no COVID-19 column shows the model settings in the hypothetical situation in which there was no COVID-19 pandemic. Those settings are used in the *no COVID-19* scenario described in section 6.

The COVID-19 model settings for international movements of people of explained first followed by the settings to capture domestic restrictions.

Table 3.1. Model Inputs in COVID and No COVID settings

		COVID-19		No COVID-19	
Description	**Variable Code**	**2020q2-2021q2**	**projection**	**2020q2-2021q2**	**projection**
international movements of people:					
net overseas migration (via demographic model)	NOM	actual (314k below normal)	310k below normal, normal from 2024/25	normal (200k per year)	normal (200k per year)
international tourism scale factor	DUMCV_TROTH	actual (0.02 to 0.05)	recovers to 0.81 in 2024q2	normal (1.00)	normal (1.00)
international student scale factor	DUMCV_TREDU	actual (0.87 down to 0.61)	0.44 in 2022 up to 0.84 in 2026	normal (1.00)	normal (1.00)
residuals of behavioural equations:					
Consumption residual	HCONZ_A	actual	phased to zero by 2022q4	zero	zero
Consumer demand system residuals	HCONZi_A	actual	decay to zero	zero	zero
wage residual	W_A	actual	zero	zero	zero
labour demand residuals	Ni_A	actual	long-term value	long-term value	long-term value
labour supply residual	LNSU_A	actual	long-term value	long-term value	long-term value
manufacturing export supply residual	BEXC_A	actual	long-term value	long-term value	long-term value

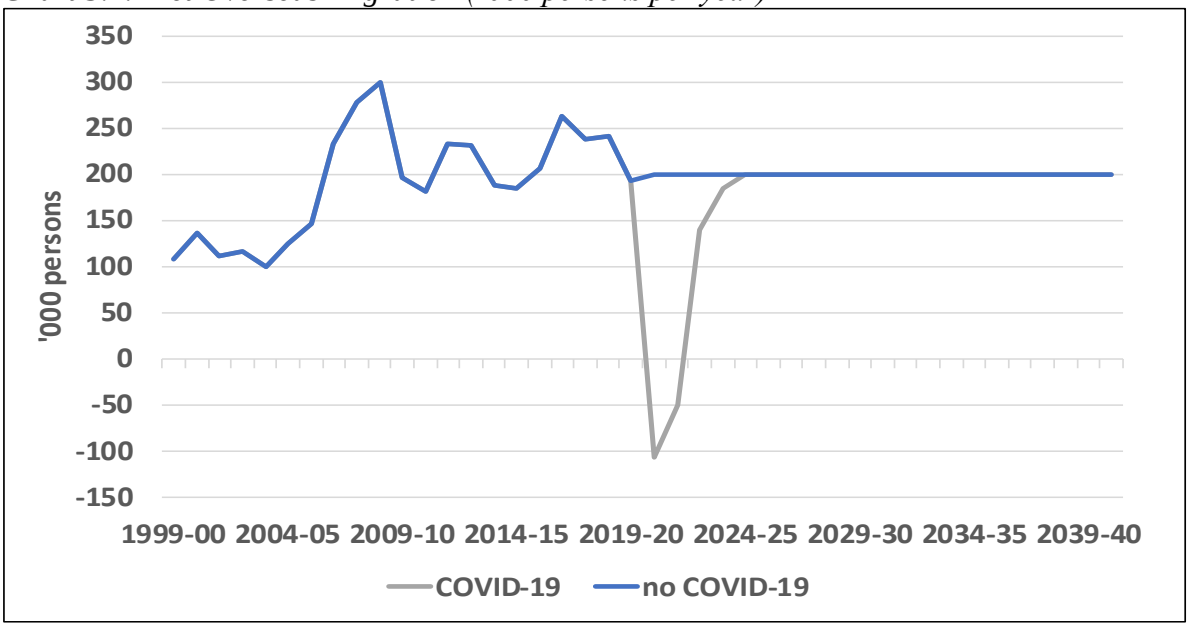
International movements of people

The model settings for international movements of people cover net overseas migration, international tourism and international students. These are discussed in turn.

The international travel ban reflected in Chart 3.1 has disrupted net overseas migration (NOM). NOM reversed from plus 193 thousand persons in 2019-20 to minus 107 thousand in 2020-21 (Chart 3.2). This occurred as potential new residents were barred from entering Australia while some Australian residents were permitted to return home. NOM is forecast to gradually recover to be 200 thousand from 2024-25 onwards. This is a little below pre-COVID-19 levels on the basis that migration from China to Australia may be held back by reduced government support in both countries.

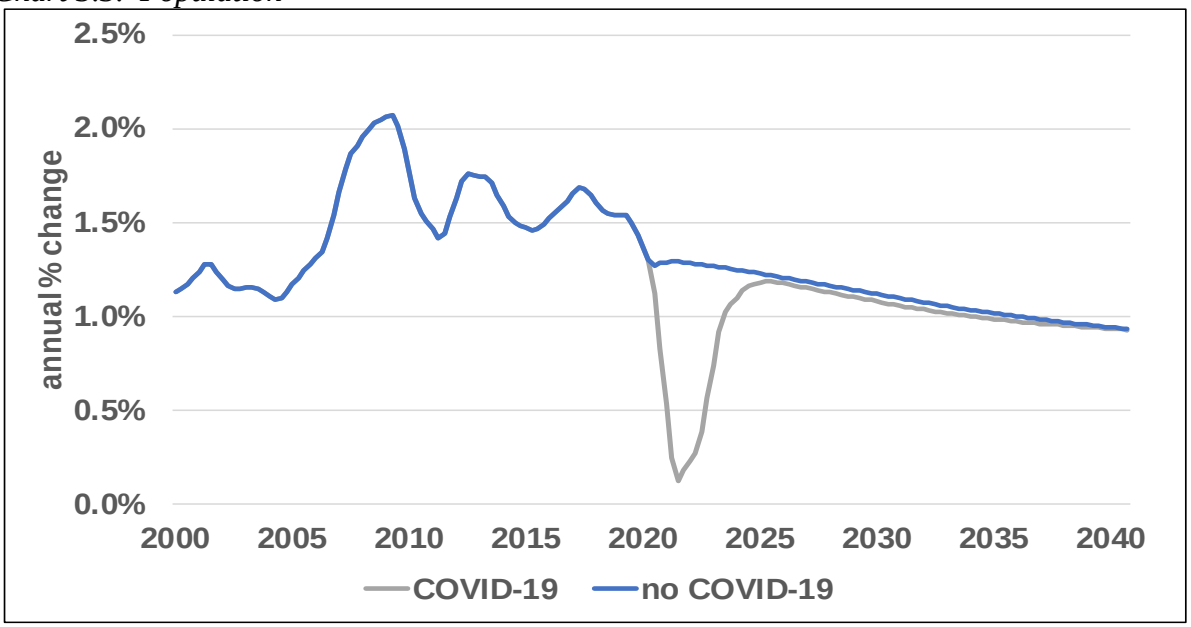
In contrast, in a hypothetical no COVID-19 situation, it is assumed that NOM would be steady at plus 200 thousand persons from 2019-20 onwards (Chart 3.2 and final column of Table 3.1). This would have avoided a loss in NOM of 314 thousand persons up to 2020-21 and a further loss of 310 thousand thereafter.

Chart 3.2. Net Overseas Migration ('000 persons per year)



This disruption to NOM from COVID-19 reduces population growth. In the year to the June quarter, population growth fell from 1.5 per cent in 2019 to an estimated 0.2 per cent in 2021 (Chart 3.3). Population growth is then forecast to partially recover to reach 1.1 per cent from 2024. These population projections are generated by a separate population model based on assumptions for NOM, fertility and mortality.

Chart 3.3. Population



Besides disrupting NOM, the international travel ban disrupted international travel and international study. This is reflected in both exports and imports of certain services.

Chart 3.4 shows the *baseline* scenario for real exports by industry. The more dramatic movements in the chart reflect the Australian restrictions on international travel.

Inbound tourism virtually disappeared under COVID-19, leading to the sharp fall seen in exports of tourism and other services. While it is assumed that restrictions on inbound tourism are lifted during 2022, it is assumed that reticence to travel due to COVID-19 does not fully dissipate until 2024, so the recovery in exports of tourism and other services is gradual (Chart 3.4). This is modelled using an international tourism scale factor (Table 3.1) that appears in this exports equation and is based on historical and projected international passenger movements (Chart 3.1). In contrast, in a hypothetical no COVID-19 situation, the tourism scale factor is always equal to unity, which is its maximum value (Table 3.1).

The Australian restrictions on international travel have also almost halted the intake of new international students to Australian universities, so that education and health exports have approximately halved (Chart 3.4). While the intake is assumed to return to near-normal from 2023, low intakes since 2020 mean that the population of international students in Australia, and their associated expenditures, will remain significantly below normal until 2026. This is modelled using an international student scale factor (Table 3.1) that appears in this exports equation and is based on simple modelling of historical and projected international student enrolments. In a hypothetical no COVID-19 situation, the student scale factor is always equal to unity, which is its maximum value (Table 3.1).

Chart 3.4. Real Exports by industry

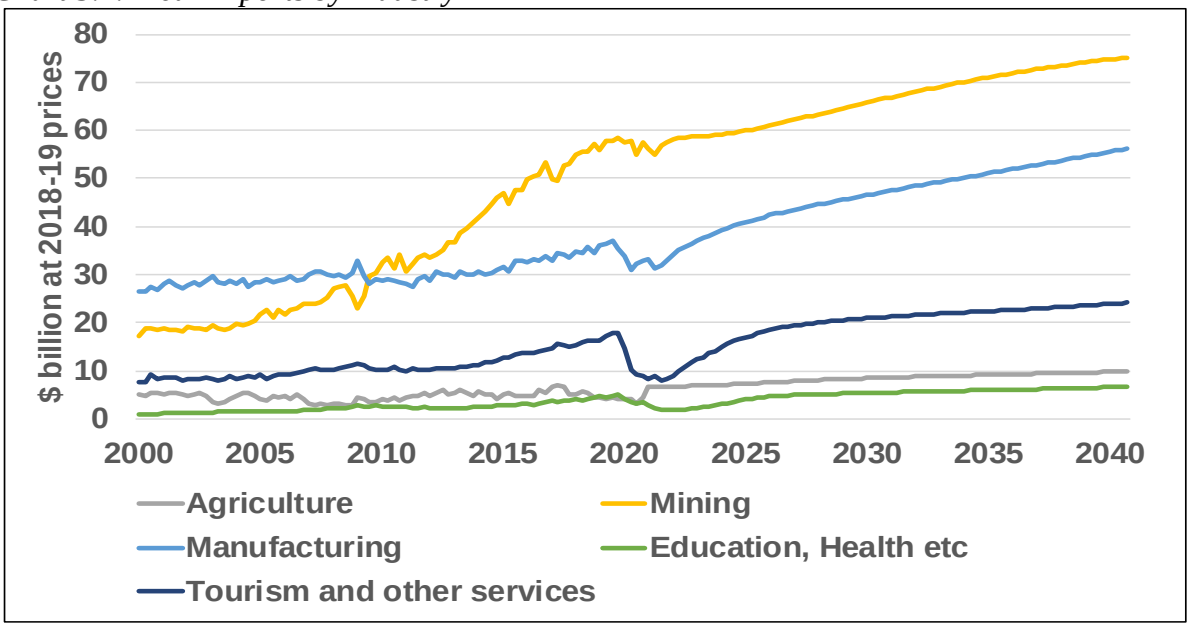
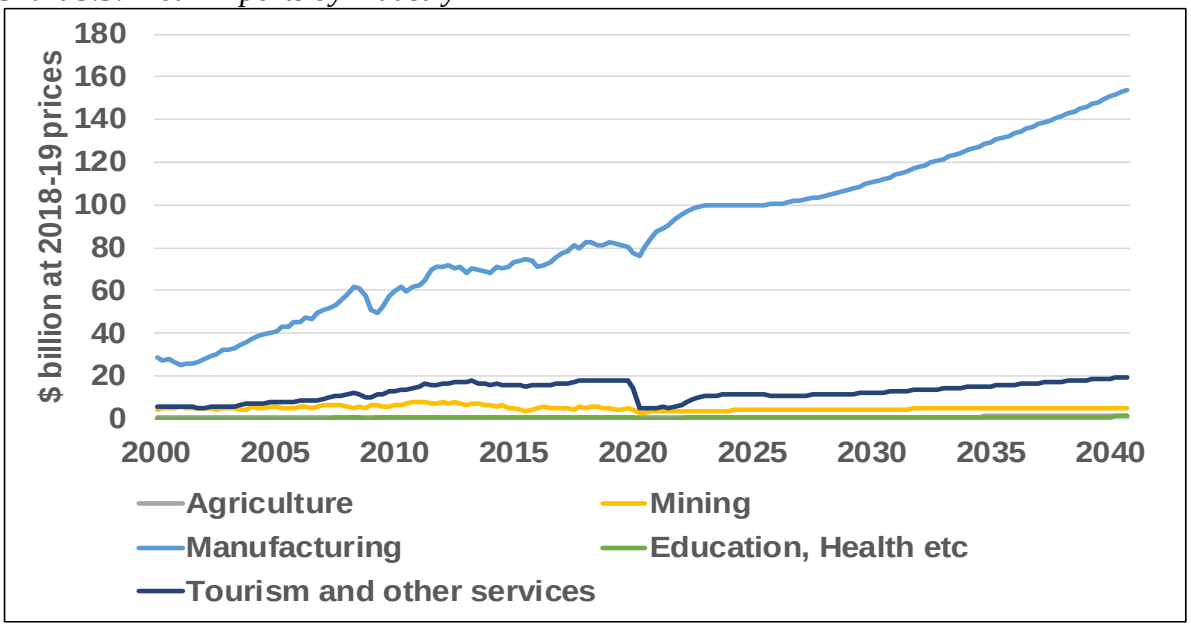


Chart 3.4 also shows weakness in manufacturing exports from 2020q2, and this weakness is not fully accounted for by the model behavioural equation for the supply of manufacturing exports. Given this timing, the resulting negative equation residuals are assumed to be due to COVID-19 factors. Hence, in a hypothetical no COVID-19 situation, the residuals for this equation are set to zero during the COVID-19 period (Table 3.1).

Chart 3.5 shows the *baseline* scenario for real imports by industry. Again, the more dramatic movements in the chart reflect the Australian restrictions on international travel.

Chart 3.5. Real Imports by industry



The Australian restrictions on international travel have a similar effect on outbound tourism to their effect on inbound tourism. Hence, imports of tourism and other services were very low while restrictions on international movements of people are in place. This is modelled using the same international tourism scale factor that is employed in the corresponding exports equation. This weakness in outbound tourism broadly offsets the potential impact on GDP of the weakness in inbound tourism.

Domestic restrictions

At the broadest industry level, domestic social distancing regulations have substantially directly constrained employment in the accommodation and food services industry division, and the arts and recreation industry division (ABS, 2021). Looking at the finer subdivision level, activity has also been constrained in air and space transport, administrative services and personal and other services.

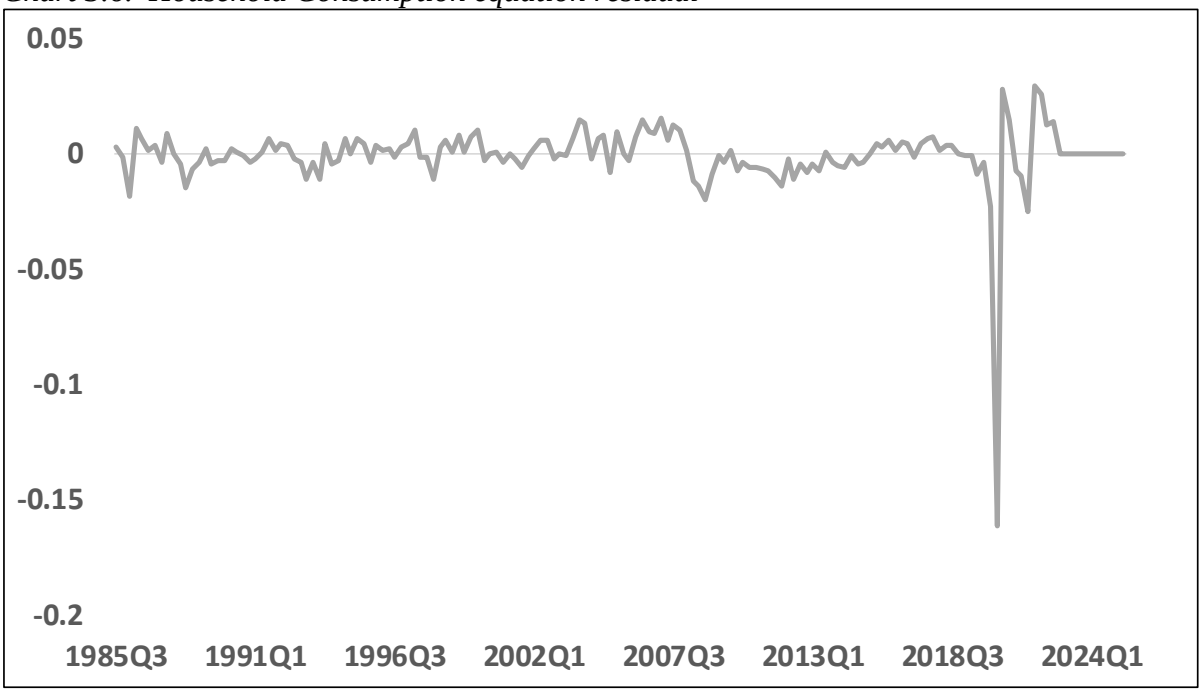
Interestingly, some industry divisions appear to have thrived during the COVID-19 recession. These include the financial and insurance services industry division and the public administration and safety industry division.

In any case, in terms of the modelling, all of the industry divisions and subdivisions most directly constrained by the COVID-19 restrictions fall within the model's broad other private services industry. The model's other five broad industries have been directly affected by the restrictions to a lesser extent or not at all.

The introduction of the COVID-19 restrictions led to a dive in household consumption in the June quarter 2020. This dive cannot be explained by the usual economic fundamentals appearing in consumption equations. It also seems at odds with the emphasis placed on habit persistence in most consumption equations.

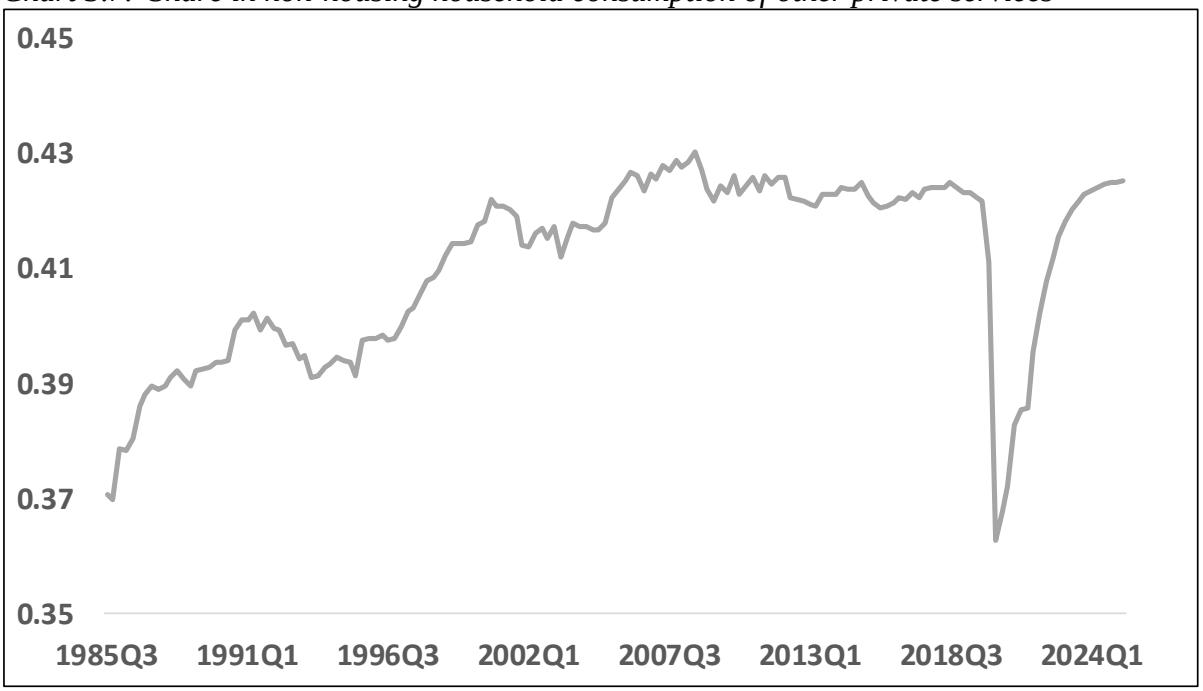
In any case, this dive in household consumption resulted in an extraordinary consumption equation residual in the June quarter 2020 of -16.1 per cent (Chart 3.6). This is 23 times the equation's standard error of 0.7 per cent.

Chart 3.6. Household Consumption equation residual



Examination of the components of household consumption show that this fall in aggregate consumption was concentrated within the category of consumption produced by the other private services industry. Thus, the share of (non-housing) household consumption accounted for by other private services dived from 41 per cent to 36 per cent (Chart 3.7).

Chart 3.7. Share in non-housing household consumption of other private services



It is unlikely to be a coincidence that the fall in household consumption was concentrated in the same industry as the COVID-19 social distancing restrictions, the other private services industry. Thus, the sharp decline in real household consumption appears to be largely due to the suppression of consumption of other private services under the COVID-19 restrictions.

Thus, this paper attributes the extraordinary recent residuals in the aggregate consumption equation and the consumption demand system largely to the impact of the COVID-19 restrictions. Hence, in a hypothetical no COVID-19 situation, those residuals are set to zero (Table 3.1).

The three model scenarios will show that the sharp fall in real household consumption resulting from the restrictions was the main driver of the deep V-shaped COVID-19 recession. However, the somewhat unusual response of the labour market also influenced the economy's recessionary path. The behaviour of labour demand, labour supply and wages are now considered in turn.

Historically, employment responds only gradually to changes in output demand, and this is often attributed to adjustment costs. However, in the June quarter 2020, there was a synchronised fall in both real GDP and employment of 7 per cent.

This atypical dynamics in employment could be explained by the unusual nature of the economic shock from the COVID-19 restrictions. The restrictions forced some businesses to cease operations, potentially resulting in the synchronised falls in both output and employment. In any case, the unusually quick response in employment resulted in noticeably negative residuals in most of the industry employment equations in the June quarter 2020. Hence, in a hypothetical no COVID-19 situation, those residuals are set to zero (Table 3.1).

The labour force participation rate usually fluctuates in a reasonably predictable pro-cyclical way. However, in the COVID-19 recession, the labour force participation rate plunged initially in the June quarter 2020 before fully recovering in the next two quarters before falling more modestly in the September quarter 2021. This erratic behaviour resulted in equation residuals ranging from the equivalent of minus six to plus seven times the equation standard error.

This behaviour of the labour force participation rate merits further study. One plausible explanation is that when JobKeeper was fully operating, it provided some support to the labour force participation rate, as intended. In any case, it seems unlikely that the labour force participation rate would have displayed the same erratic behaviour in the absence of the COVID-19 recession and associated fiscal policy response. Hence, in a hypothetical no COVID-19 situation, the residuals of the labour force participation rate equation are set to zero (Table 3.1).

Finally, the model's measure of wages, average compensation of employees in the national accounts, has also behaved unusually in the COVID-19 recession. In the June quarter 2020, model wages rose by a high 3.0 per cent, despite the weak labour market. This resulted in a wage equation residual that is four times the equation standard error. At the same time, other

measures of wages that are not affected by compositional changes behaved in a more predictable way.

The likely explanation for the out-of-step increase in average wages on a national accounts basis is a compositional shift away from part-time employment at the onset of the COVID-19 recession. (In the June quarter 2020, full-time employment fell 3 per cent but part-time employment fell 10 per cent.) Hence, in a hypothetical no COVID-19 situation, the residuals of the wage equation are set to zero (Table 3.1).

3.2 Fiscal Response

The pre-COVID starting point for fiscal policy was set out by the Australian Government (2019) in the 2019-20 MYEFO issued in December 2019. The subsequent COVID fiscal policy responses are conveniently summarized in the 2020-21 Budget (Australian Government, 2020) and the 2021-22 Budget (Australian Government, 2021). Thus, this paper takes into account the fiscal policy measures announced over that interval from December 2019 to May 2021[2].

All measures over this period are included in the modelling, irrespective of whether they were explicitly introduced in response to COVID-19, because all measures can have a macroeconomic impact. However, the bulk of the budget cost incurred over this period from new measures reflected measures introduced in response to COVID-19.

This COVID-19 fiscal expansion was mainly designed to compensate economic agents for income losses as a result of the international and domestic restrictions introduced in response to COVID-19. The measures and their budget costs are summarised in Table 3.2. The total budget cost to 2024-25 is $359 billion in 2018-19 prices.

Table 3.2. Budget Cost of COVID-era Fiscal Policy Measures
($ billion at 2018-19 prices)

Policy Measure	19-20	20-21	21-22	22-23	23-24	24-25	total
JobKeeper	34	52	0	0	0	0	87
accelerated depreciation until 2022-23	0	5	17	17	2	6	47
boosting cash flow for employers	14	19	0	0	0	0	34
JobSeeker supplements	6	15	2	2	2	2	28
bring forward of stage 2 income tax cuts	0	7	16	2	0	0	25
other policy measures	3	33	38	27	28	11	139
Total	57	131	72	47	32	19	359

Sources: Australian Government (2020, 2021).

Note: the nominal costs of the measures published in the budget documents were converted to 2018-19 prices using forecasts for the GDP price deflator contained in Australian Government (2021).

Table 3.3 shows how these fiscal policy measures have been translated into model inputs. The fiscal expansion column shows the model settings under the actual fiscal expansion in response

[2] This cut-off date of May 2021 may be extended to later in 2021 in view of the additional fiscal measures announced in response to outbreaks of the delta variant of COVID-19.

to COVID-19, as set out in Table 3.2. Those settings are used in the *baseline* scenario described here. The automatic stabilisers column shows the model settings in the hypothetical situation in which there was no fiscal expansion. Those settings are used in the *automatic stabilisers* scenario of section 5 and the *no COVID-19* scenario described in section 6.

Table 3.3. Model Inputs in Fiscal Expansion and Automatic Stabilisers settings

		Fiscal Expansion		Automatic Stabilisers	
Description	**Variable Code**	**2020q2-2021q2**	**projection**	**2020q2-2021q2**	**projection**
spending:					
business subsidies	RTPNOi	50% of JobKeeper	2019 effective rates	2019 effective rates	2019 effective rates
business transfers	RPUBNB	boosting cashflow, 50% of JobKeeper	2019 effective rates	2019 effective rates	2019 effective rates
government final demand	GCON, CFGG	actual	6.5% to 2.5% additional	projected from 2019 base	projected from 2019 base
gap between benefit and survey unemployment	RLMR	actual	3.0% to 0.5% of labour force	normal (0.5% of labour force)	normal (0.5% of labour force)
unemployment benefit rate (relative to wage)	POLUNEMP	actual	10% above 2019 rates	2019 effective rates	2019 effective rates
other household transfer rates (relative to wage)	POL(CHILD, AGED, DISAB, OTHER)	actual	2019 effective rates	2019 effective rates	2019 effective rates
taxes:					
effective average personal income tax rate	POLLAB	0.228 in 2020/21	0.230 in 2021/22, then 24.0, 24.3, 23.1	0.242 in 2020/21	0.244 in 2021/22, then 24.0, 24.3, 23.1
immediate write-off of machinery and equipment	POLIO	0.28 in 2020q2-q3, then 0.67	0.67 to 2023q2, then zero	zero	zero
average payroll tax rate	POLPAY	actual	2019 effective rates	2019 effective rates	2019 effective rates
monetary policy:					
90-day bill rate	RS90	actual (near zero)	monetary rule	monetary rule (with zero lower bound)	monetary rule

The measure with the largest Budget cost of $87 billion (in 2018-19 prices) is JobKeeper (Table 3.2). JobKeeper was initially introduced for the June and September quarters of 2020. It provided businesses who *expected* to experience a decline in turnover in the June quarter beyond a specified percentage with a flat rate payment of $1,500 per fortnight for each eligible employee, who in turn had to be paid at least that amount. The JobKeeper payments continued into the September quarter irrespective of whether a business did or did not return to normal operations in that quarter.

JobKeeper was extended by another two quarters with three significant modifications. First, the rate of payment was phased down, and second, a lower rate was introduced for part-time employees. Finally, JobKeeper switched from a forward-looking to a backward-looking measure of the turnover of a business in assessing eligibility. The forward-looking measure was based on the expectations of the business for its turnover in the coming June quarter 2020, whereas the backward-looking measure was based on actual turnover in the previous quarter.

JobKeeper was not extended again so it was no longer in operation from the June quarter 2021. Deciding how to model JobKeeper is complicated by the fact that its effects vary with the circumstances of the businesses who receive it. There are three main cases to consider.

First, there are those businesses who ceased operations while the restrictions are in place. They pass on the JobKeeper payments to their inactive employees, providing those employees with a superior alternative to the JobSeeker payment available from Centrelink. In that case JobKeeper can be considered as a government transfer payment to the inactive employees, with the business acting as an intermediary. The business receives no benefit from JobKeeper other than keeping the inactive employees on its payroll.

Second, there are those businesses who continued to receive JobKeeper even though they have returned to normal operations. For example, the effect of the JobKeeper eligibility arrangements was that any business that returned to normal operations at the end of the June, September or December quarters 2020 would continue to receive JobKeeper in the next quarter.

Further, under the original forward-looking eligibility test, any business that in the month of March 2020 expected a decline in turnover in the June quarter 2020 that did not actually eventuate, could nevertheless receive JobKeeper for the June and September quarters 2020. Thus, some businesses operating normally received JobKeeper for a significant period of time.

Under normal operations, the employees of the business would generally be receiving their normal remuneration for their normal work. Any JobKeeper payments become a windfall gain to such businesses, and can be considered as a lump sum government transfer payment to the business owners.

Third, there are businesses that were operating, but at below their normal level, so some of their employees are active and some are inactive. For those in-between businesses, JobKeeper acts as a government transfer payment to the inactive employees and a wage subsidy for the active employees.

The problem arises that some businesses may have had a profit motive to operate in this in-between mode even if they were not subject to restrictions and so could operate at their normal level. That is, for some businesses, it may have been more profitable to operate at below normal capacity to be eligible for JobKeeper, than to operate at full capacity without JobKeeper. If so, this potential disincentive effect of JobKeeper could reduce levels of output and active employment. This issue is assessed in section 4 but is not factored into the modelling scenarios.

In any case, JobKeeper is complex from an economic perspective. Based on the three cases considered above, it was partly a government transfer payment to employees, partly a government transfer payment to business owners and partly a wage subsidy.

The other major policy measure involving payments to businesses was ‘boosting cash flow for employers’. It had a Budget cost of $34 billion in 2018-19 prices (Table 3.2). Employing businesses with an annual turnover of up to $50 million received two payments totalling between $20,000 and $100,000. The exact amount of the payments depended primarily on the amount of tax that a business had withheld from wages and salaries in either the March month or the March quarter 2020.

Unlike JobKeeper, this cash flow boost was not specifically targeted at businesses who had experienced turnover declines from COVID-19. Rather, the amount of the payments was determined from business activity statements that largely referred to the pre-COVID period.

This retrospective nature means that businesses could not change the amount they received by changing their behaviour. Consequently, the cash flow boost operated as a government lump sum transfer payment to the business owners. The aim of this transfer was to assist businesses to stay viable.

On the basis of the above analysis, broad modelling assumptions were made about the economic treatment of the two programs in the model.

JobKeeper payments are allocated 50 per cent to lump sum transfer payments (to businesses and households) and 50 per cent to subsidies to businesses (Table 3.3). The subsidies to businesses correspond to the JobKeeper payments made to the in-between businesses with respect to their active employees, while the transfer payments correspond to the other JobKeeper payments. This 50/50 split is only a broad estimate.

The payments under the boosting cash flow for employers program are treated entirely as lump sum transfers to business owners (Table 3.3). In the macro model, government transfer payments to either the household or business sector are treated as transfer payments to the private sector as a whole.

In contrast, the Australian Bureau of Statistics (2020a) announced prior to the release of the June quarter 2020 national accounts that it would be treating both JobKeeper and 'boosting cash flow for employers' as production subsidies rather than transfer payments. Using reasoning from the 2008 international system of national accounts (SNA2008), the ABS essentially argues that both payments are made to businesses and that the amounts of the payments are related to production values, so they should be classified as production subsidies.

Irrespective of whether the ABS treatment is technically consistent with SNA2008, it conflicts with the above economic analysis of the likely economic effects of the measures. Furthermore, simulations with the macro model show that if these extraordinarily large measures were to be (mis)interpreted as production subsidies, a large deflation would be forecast. Instead, wages and prices were virtually static in the June quarter 2020, further calling into question the ABS treatment.

In another fiscal measure, a supplement of $550 per fortnight was paid to Jobseeker and related recipients in the June and September quarters 2020, phased down to $250 in the December quarter and $150 in the March quarter 2021. This was replaced with a permanent supplement of $50 per fortnight from the June quarter 2021, adding about 10 per cent to the original payment rate (Table 3.3).

The Budget cost to 2024-25 of these JobSeeker measures was $28 billion in 2018-19 prices (Table 3.2). Thereafter, the annual budget cost of the permanent 10 per cent increase in payment rate is $2 billion in 2018-19 prices.

Accelerated depreciation of business investment has been made available under a series of three programs at a total cost of $47 billion in 2018-19 prices. The most recent and generous of these, the temporary full expensing program, allows for full immediate expensing of certain investments undertaken up until 2022-23. It is subject to an eligibility cap of $5 billion in annual turnover. These accelerated depreciation measures apply to machinery and equipment, but not building or engineering structures.

These immediate expensing provisions are modelled on an accrual basis when the assets are purchased (2019-20 to 2022-23), rather than on a cash basis when the reduction in tax liability is received in the following financial year (2020-21 or 2023-24). This is to better capture the likely timing of the stimulus to investment.

Following the recent model development work in the area of fiscal policy, the macro model now fully provides for immediate expensing provisions. Further, it had already distinguished between investment in machinery and equipment, which is eligible for immediate expensing, and investment in structures, which is not eligible. These model features mean it can be used to appropriately capture the economic impact of these accelerated depreciation measures. This is achieved via the model input *POLIO* (Table 3.3).

The fiscal expansion in response to COVID-19 also brought forward previously planned personal income tax cuts. The so-called stage 2 personal income tax cuts were introduced in 2020-21 instead of 2022-23, while maintaining the original timetable for abolishing the Lower and Middle Income Tax Offset (LMITO) in 2022-23. No change was made to the stage 3 personal income tax cuts, which are legislated to be introduced in 2024-25. The budget cost of the bringing forward of the stage 2 tax cuts was $25 billion in 2018-19 prices (Table 3.2). The resulting changes in the average rate of personal income tax are introduced to the model through the model input *POLLAB* (Table 3.3).

The remaining fiscal policy measures are shown in Table 3.2 as the single line item ‘other policy measures’. These other measures have a combined budget cost of $139 billion in 2018-19 prices. Some of these measures have significant ongoing budget costs. For example, the response to the Aged Care Royal Commission entails a permanent, annual cost of about $5 billion. For modelling purposes, these remaining policy measures are assumed to add to government final demand (Table 3.3).

Table 3.2 does not include some other fiscal measures introduced in response to COVID-19. This includes state government measures and Federal Government measures introduced since the May 2021 Budget. Hence, the *baseline* scenario captures most, but not all, of the fiscal expansion introduced in response to the COVID-19 recession.

This fiscal expansion involves a large build-up in public debt. After 2024-25, the fiscal policy rule outlined in section 2.2 is allowed to operate to reduce public borrowing and gradually stabilise the public debt to GDP ratio. This involves substantial increases in the average rate of personal income tax *POLLAB* beyond 2024-25.

3.3 Baseline scenario

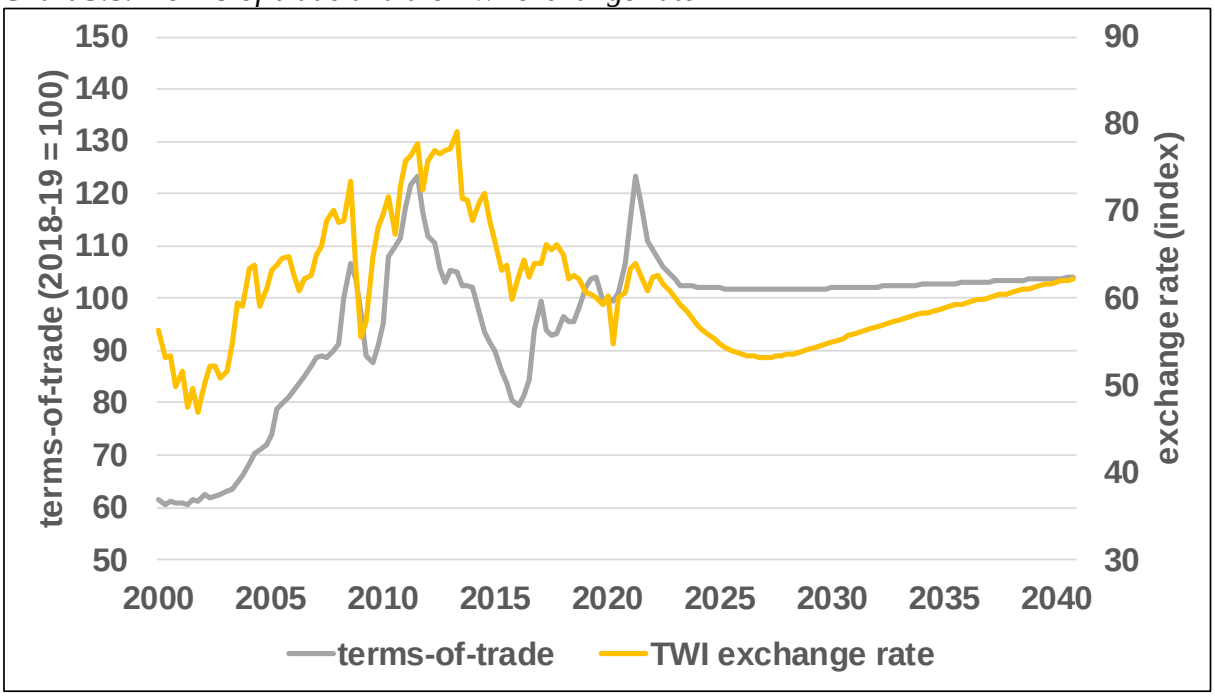
The *baseline* inputs were fed into the macro model to generate the *baseline* scenario. We consider in turn the projected outcomes for the terms-of-trade, public finances, GDP, the labour market, inflation and interest rates.

Terms of Trade

Iron ore prices have retreated in recent months, which will reduce the terms-of-trade from its peak in the June quarter 2021. The terms-of trade is projected to decline further to level out at a more normal level similar to its level in 2018-19 (Chart 3.8). This profile for the terms-of-trade supports the TWI exchange rate at an index value above 60 in the long run.

However, in the next few years the exchange rate is expected to depreciate temporarily. This compensates holders of foreign securities with capital gains for the lower interest rates prevailing offshore. The outlook for Australian interest rates is discussed later.

Chart 3.8. Terms-of-trade and the TWI exchange rate



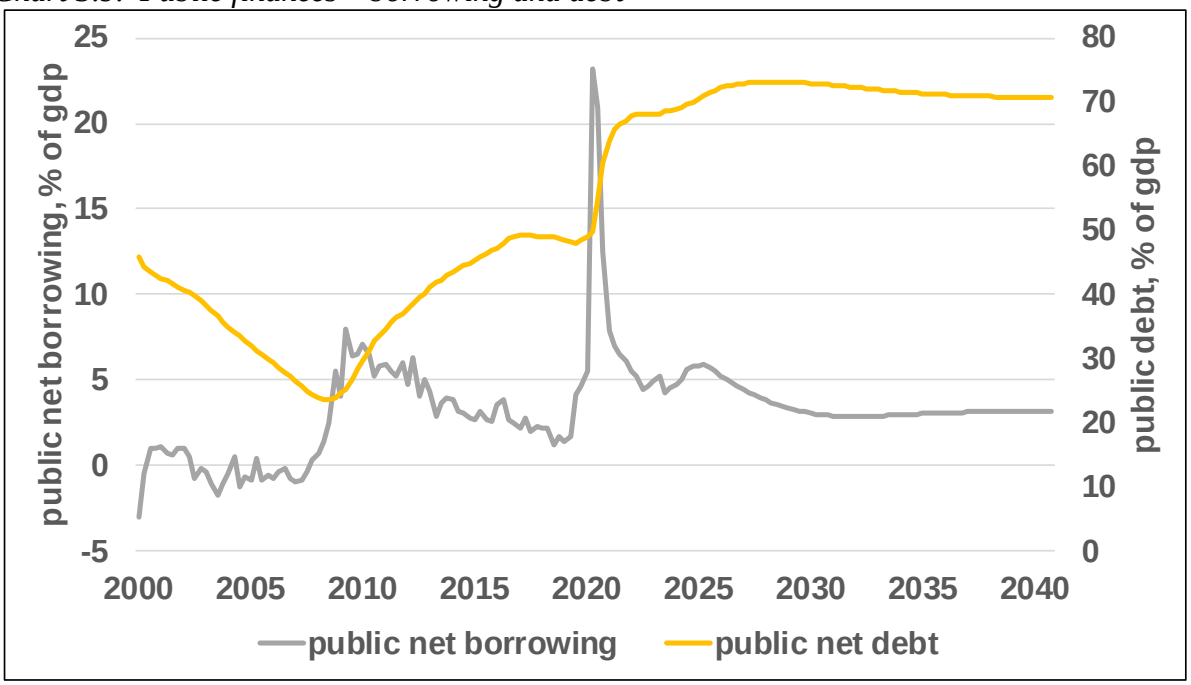
Public finances

Table 3.2 showed that the fiscal expansion in response to COVID-19 has added considerably to public borrowing. This is reflected in the enormous spike in public net borrowing seen in Chart 3.9. While public debt relative to annual GDP was on a downward path pre-COVID, during COVID it has leapt considerably. It is assumed that the implied government target for the public debt to GDP ratio is adjusted upwards to accommodate this actual higher debt ratio.

The public debt ratio shown in Chart 3.9 is higher than the ratio shown in the Federal Budget because the model measure of public debt is broader than the budget measure. The model measure includes state and local government debt in additional to federal government debt and

also includes debt of non-financial public enterprise in addition to debt of the general government sector. However, the movements in the budget and model ratios are similar.

Chart 3.9. Public finances – borrowing and debt

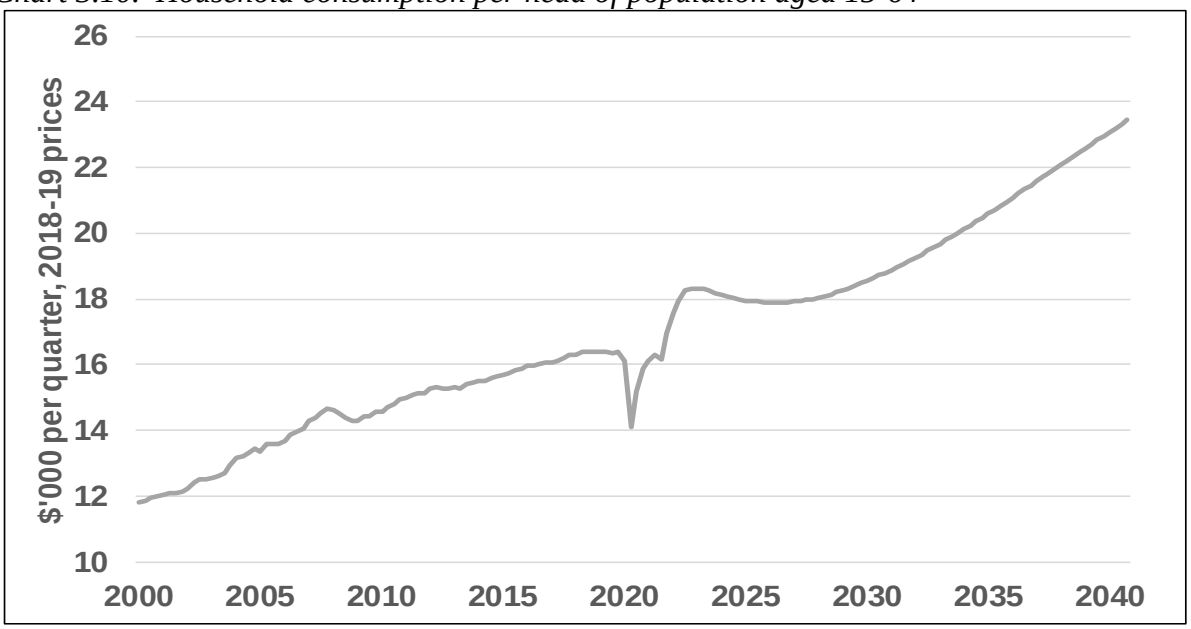


Real Gross Domestic Product (GDP)

As discussed earlier, the domestic economic restrictions greatly and abruptly weakened household consumption (Chart 3.10). The economic restrictions have suppressed consumer spending on the accommodation and food services industry, the arts and recreation services industry, air passenger transport, administrative services and personal and other services, in particular. As a result, real household consumption fell dramatically in the June quarter 2020.

With the easing of domestic restrictions in late 2021, household consumption is forecast to rebound dramatically in the four quarters to the September quarter 2022. Suppressed consumption since the June quarter 2020 and the large fiscal expansion have left consumers with ample spending power.

Chart 3.10. Household consumption per head of population aged 15-64



This weakness in real household consumption is the main contributor to weakness in real GNE in 2020-2021 (Chart 3.11). Similarly, the recovery in consumption in 2022 leads to a recovery in real GNE. Household consumption has not only been the main driver of fluctuations in real GNE, it has also been the main driver of fluctuations in real GDP. For example, in the June quarter 2020, real GNE fell by 8 per cent and real GDP by 7 per cent. Similarly, the strong recovery in household consumption forecast in the four quarters to the September quarter 2022 translates into a strong recovery in real GDP, which is up 6 per cent.

Chart 3.11. Real GNE and GDP

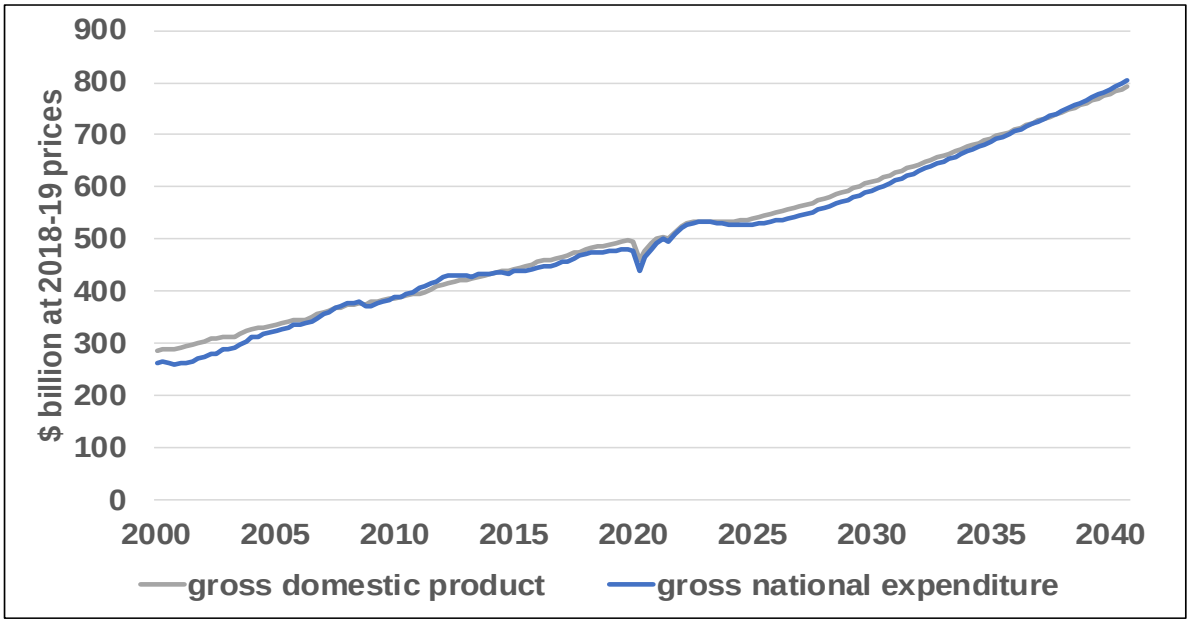
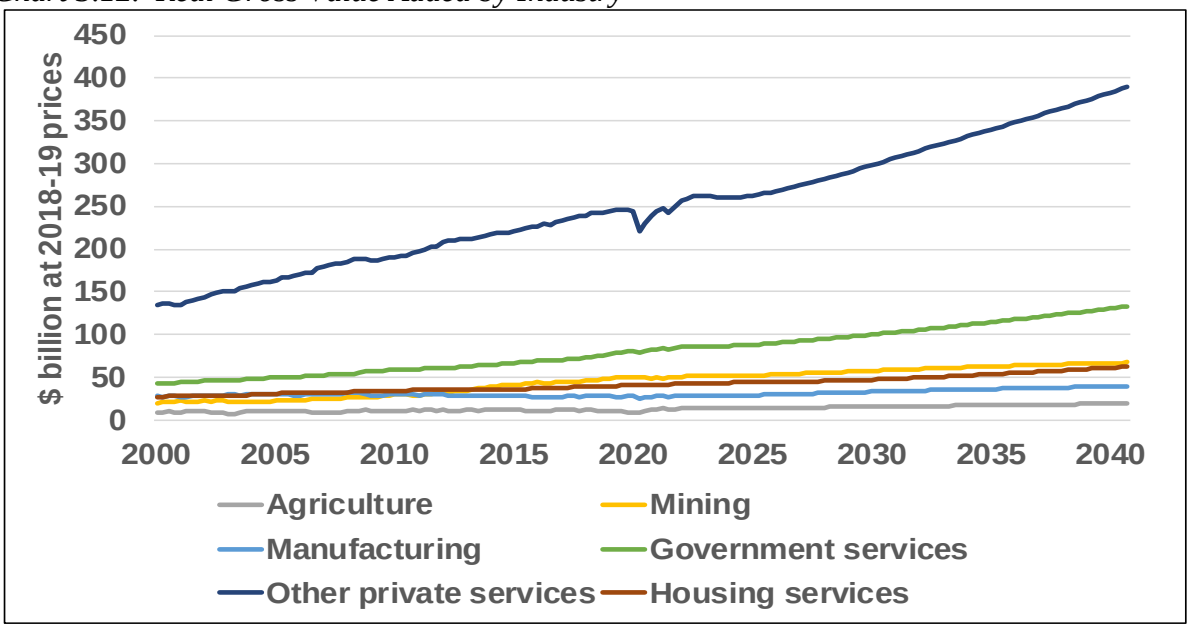


Chart 3.12 shows the uneven spread of the temporary GDP downturn across industries. The downturn is seen to be concentrated in the other private services industry. As noted earlier,

this is mainly because the domestic economic restrictions chiefly constrained consumer sales by this industry.

Chart 3.12. Real Gross Value Added by Industry

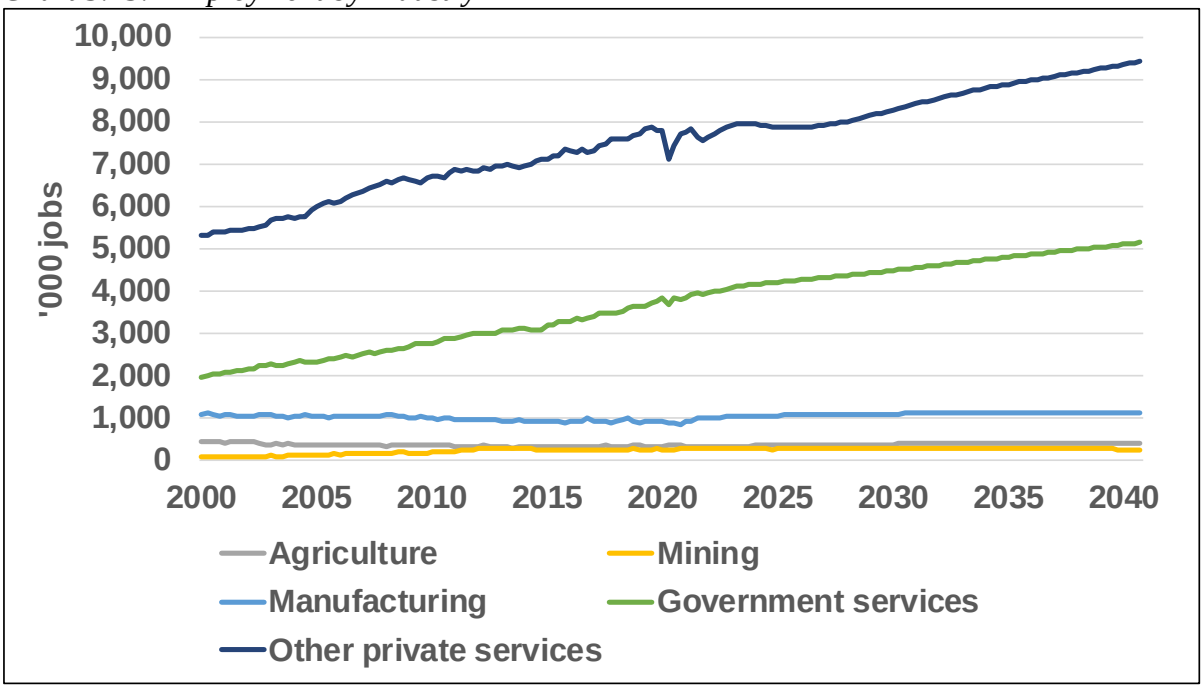


Labour Market

Similarly, the downturn in employment, like the downturn is real Gross Value Added, was concentrated in the other private services industry (Chart 3.13). In seasonally adjusted terms, employment in that industry fell dramatically from 7.8 million in February 2020 to 7.1 million in May 2020. In the other four employing industries taken together, employment fell relatively modestly over the same quarter, from 5.3 million to 5.1 million.

The strong recovery in real GDP is expected to be followed by a strong recovery in employment. Employment is forecast to rise by 4 per cent in the four quarters to the December quarter 2022.

Chart 3.13. Employment by Industry



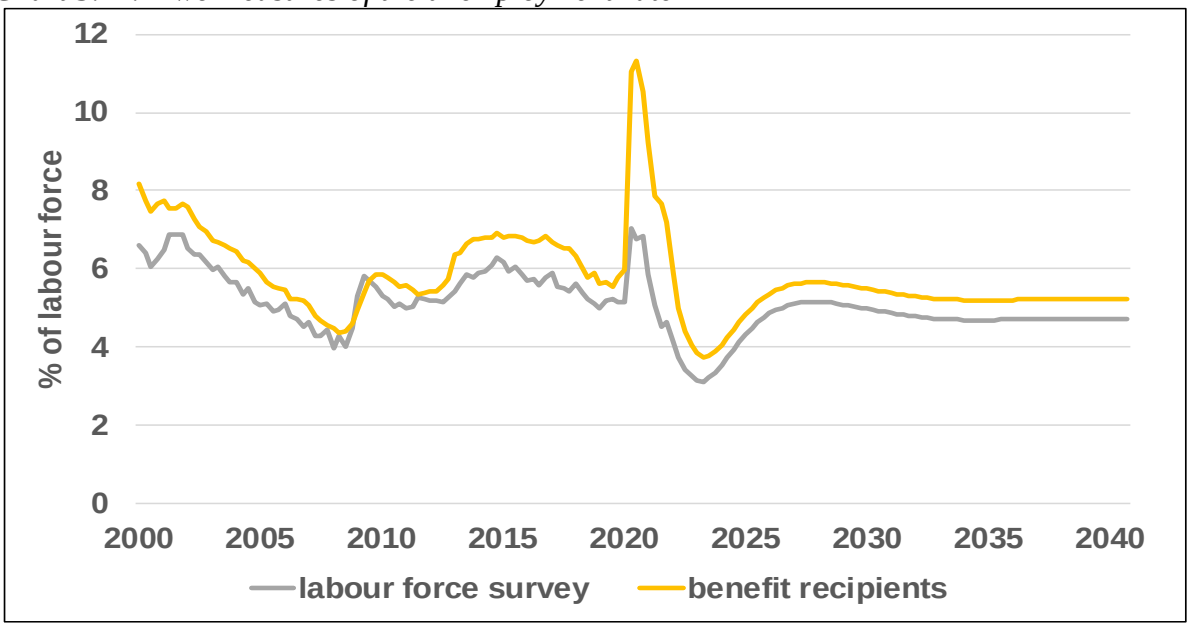
The downturn in employment in the recession led to a much larger increase is unemployment as measured by people receiving unemployment benefit (those on Jobseeker and Youth Allowance (other)) than as measured by the ABS Labour Force Survey (Chart 3.14). The true picture probably lies in between.

Employees who were inactive and in receipt of JobKeeper from their employer were regarded as employed in the labour force survey, resulting in lower survey unemployment estimates than if they were regarded as unemployed.

At the same time, the government suspended the requirement to be actively seeking work to be eligible for unemployment benefit. This would have resulted in higher benefit unemployment numbers than if the 'work test' were not suspended.

JobKeeper has ended and the work test is gradually being re-instated. Thus, it is forecast that the current large gap between the two measures gradually narrows to restore the historical relationship between the two measures (Chart 3.14).

Chart 3.14. Two measures of the unemployment rate

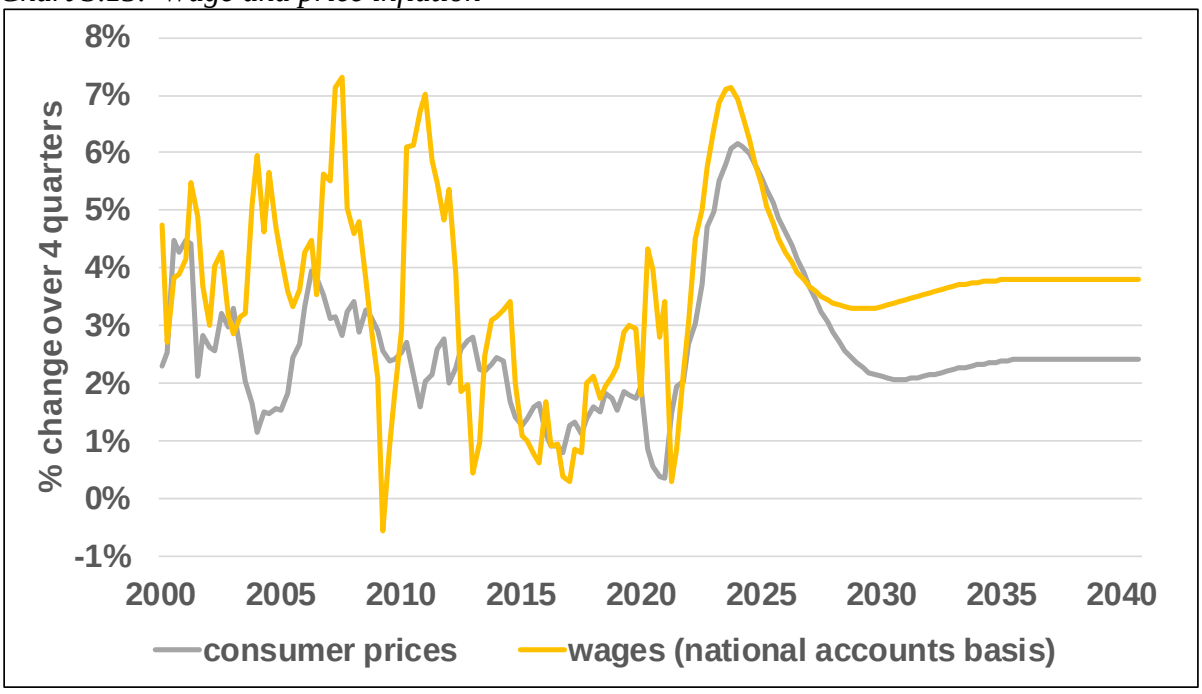


The forecast jump in employment of 4 per cent during 2022 sends survey unemployment down to just over 3 per cent. This is well below the estimated NAIRU of 4.5 per cent, resulting in a very tight labour market.

Inflation

The very tight labour market that develops in 2022 pushes up wage inflation and consumer price inflation (Chart 3.15), which peak at the end of 2023. The forecast peaks are 7 per cent for wage inflation and 6 per cent for consumer price inflation.

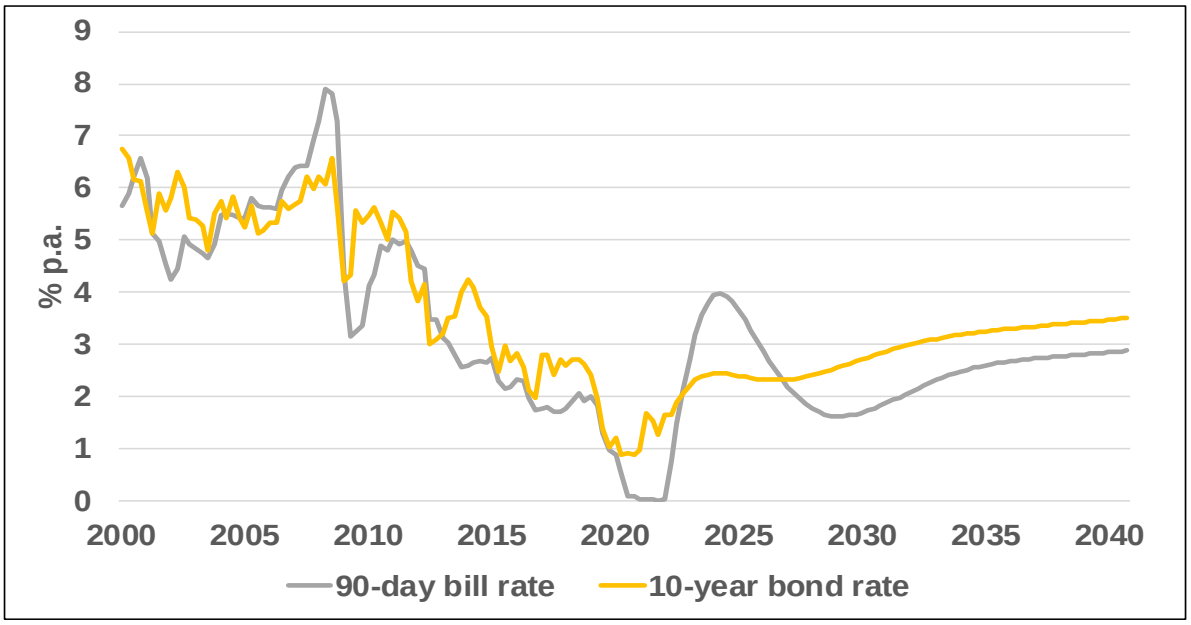
Chart 3.15. Wage and price inflation



Interest rates

This developing environment of low unemployment and inflation leads the Reserve Bank to start lifting the cash rate in the first half of 2022. In parallel, the 90-day bill interest rate rises, and reaches a peak of 4 per cent in the first half of 2024 (Chart 3.16).

Chart 3.16. Interest rates



Macroeconomic stability, with inflation in the two to three per cent target range and unemployment close to the NAIRU, is only achieved from 2028.

The simple lesson from this is that this has not been the usual shallow U-shaped recession that the economy rolls in and out of relatively slowly with macroeconomic policy swinging similarly slowly. The recession arrived abruptly with economic restrictions on consumption of certain services and is likely to end abruptly as those restrictions are lifted. This is best met with a similarly abrupt shift from expansionary to broadly neutral fiscal and monetary policy. However, in the *baseline* scenario macroeconomic policy transitions slowly leading to macroeconomic instability.

4 JobKeeper

This section investigates whether some businesses that were not impacted by COVID-19 restrictions were nevertheless more profitable if they chose to operate far enough below normal levels to be eligible for JobKeeper, than if they chose to operate normally and forego JobKeeper. That is, it considers whether JobKeeper provided a profit motive for some businesses to restrict production and active employment.

4.1 JobKeeper program

JobKeeper was initially introduced for a six month period. In the June and September quarters 2020, it provided eligible businesses with a payment of $1,500 per fortnight for each eligible employee. To be eligible, larger businesses must have expected a decline in turnover of at least 50 per cent, while for smaller businesses the required decline was a less demanding 30 per cent. A business was considered larger if its annual turnover exceeded $1 billion.

To be eligible, an employee had to be an Australian resident who, at 1 March 2020, was either a full-time employee, a part-time employee or as a casual employee who had worked at the business for at least 12 months, and who was still retained in employment. Businesses were required to pay eligible employees an amount at least equal to the amount of the JobKeeper payment that they receive with respect to that employee.

JobKeeper was extended for a further six months. Under the extension, lower and different rates were paid for full-time and part-time employees. In the December quarter 2020, the rate for full-time employees was $1,200 per fortnight and for part-time employees $750 per fortnight. In the March quarter 2021, the respective rates declined to $1,000 per fortnight and $650 per fortnight respectively. JobKeeper ceased from the June quarter 2021.

In its initial review of JobKeeper, The Treasury (2020) stated that the three main aims of the program are to keep workers in an unbroken relationship with the businesses who employ them, to help those businesses remain viable, and to provide workers and business owners with some compensation for their income losses from the COVID-19 restrictions. The Treasury review provided evidence that those objectives were being met.

4.2 The production disincentive effect

As explained in section 3, JobKeeper over-compensated some business owners. This is because they were able to continue to receive payments for some time after returning to normal operations or they received payments by expecting a decline in turnover that did not eventuate.

A second form of over-compensation could arise when the original JobKeeper payment of $1,500 per fortnight exceeded the usual wage received by a part-time employee. If COVID restrictions made such an employee inactive, they were better off financially to remain inactive with their existing employer and receive JobKeeper, than to obtain active part-time employment with an alternative employer at their usual part-time wage. This second form of over-compensation acted as a potential disincentive to labour supply and thus could suppress active employment. It was addressed after the program had run for six months, when a different

and lower rate of JobKeeper payment was introduced for part-time employees, as detailed above.

This section is concerned with a third form of over-compensation under JobKeeper. As noted above, it investigates whether JobKeeper provided a profit motive for some businesses to restrict production and active employment.

The general nature of this problem can be seen by examining the revenue and expenses of an 'average' Australian business. Business revenues and costs are taken from the ABS (2020b) input-output tables[3]. These revenues and costs were then re-expressed on a 'per business' basis by dividing by the number of economically active businesses at 30 June 2019 sourced from ABS (2020a). This gives the revenue and expenses shown in the final column of Table 4.1. Employment in this average business is 5.4 persons, and is calculated by dividing average total employment in 2019 (ABS, 2020e) by the number of economically active businesses (ABS, 2020a).

Table 4.1. Revenue and expenses of an 'average' business
($'000 per year)

operating level	**0%**	**50%**	**70%**	**100%**
revenue	0	683	956	1,366
jobkeeper	212	212	212	
inactive labour	-212	-106	-64	
active labour	0	-201	-282	-403
other variable costs	0	-361	-506	-723
profit	**0**	**226**	**317**	**240**

Profit is calculated as revenue less labour and other variable costs. It corresponds to gross operating surplus in the national accounts[4], which in turn broadly matches the accounting concept of EBITDA. As such, it represents profits before the deduction of depreciation, corporate tax or net interest expense.

In the table, a business that ceases operations while the restrictions are in place has an operating level of 0%. It is required to pass on the JobKeeper payments to its inactive employees, providing those employees with a superior alternative to the JobSeeker payment. With employment of approximately 5.4 persons, the 'average' business passes on JobKeeper of $1,500 per fortnight per person, for a total payment on an annual basis of about $212,000.

As shown in the table, this business has a profit of zero (on an EDITDA basis) because it has ceased operations. Because it may have expenses of a capital nature that are usually funded out of profits, such as interest payments on debt, this business faces a risk of becoming unviable.

[3] The housing services sector is excluded because, as a non-employing sector, it was not eligible for JobKeeper. In measuring labour costs, compensation of employees in each industry is upscaled to take into account the labour contribution of the self-employed, a necessary adjustment because the self-employed are eligible for JobKeeper.
[4] after the adjustments described in the preceding footnote

As noted earlier, larger business are eligible for JobKeeper provided their turnover falls within a ceiling set at 50 per cent of normal (i.e. pre-COVID-19) turnover. The profit situation for a business operating at that ceiling is shown in Table 4.1 in the column for an operating level of 50%. It shows that business revenue, payments to active labour and other variable costs are 50 per cent of normal levels. The business is entitled to receive the full JobKeeper payment of about $212,000, of which 50 per cent must be paid to the 50 per cent of employees who are inactive. These profit calculations assume that the business pays the usual wage to employees who are active, but pays the JobKeeper rate to employees who are inactive.

As shown in the table, this business makes a profit of about $226,000, despite operating at only 50 per cent of normal levels. This is similar to its profit in normal circumstances of about $240,000. Hence, if it does not face economic restrictions, but JobKeeper is in place, from a profit perspective it would be a finely-balanced decision whether it operates at 50 per cent of normal levels with JobKeeper or it operates normally without JobKeeper. To the extent that businesses chose the first option, production and active employment are lower.

Turning to the case of a smaller business, as previously stated, smaller business are eligible for JobKeeper as long as their turnover falls within a ceiling set at 70 per cent of normal levels. The profit situation for a smaller business operating at that ceiling is shown in the table in the column for an operating level of 70%.

Profit is calculated in the same manner as for the business operating at 50 per cent of normal levels. The higher level of operations in this case generates higher profits, while the same level of JobKeeper receipts is received as in the previous cases. This boosts profit to about $317,000. This is well above the profit of about $240,000 obtained by operating at the normal level and foregoing JobKeeper. That is, JobKeeper provides over-compensation. These calculations suggest that it is quite likely that JobKeeper provided many smaller businesses with a profit motive to limit operations to 70 per cent of normal.

A convenient way of testing for over-compensation is to calculate the breakeven ceiling, *cp*. This is defined as the ceiling, expressed as a proportion of usual turnover, at which profit is the same irrespective of whether a business operates at that ceiling with JobKeeper or at full operations without JobKeeper.

The formula for the breakeven ceiling is derived by setting usual profit, π, equal to profit obtained operating at an eligibility ceiling for JobKeeper. At that reduced level of operation, turnover and variable inputs, and hence profit, are scaled down by the ceiling proportion, *cp*, on the assumption that active employees are paid their usual wage. In addition, the JobKeeper payment, *jk*, is obtained. Finally, the business is required to pay the proportion of employees who are inactive, *1-cp*, their share of the JobKeeper payment.

$$\pi = cp \cdot \pi + jk - (1 - cp) \cdot jk$$

If the JobKeeper payment, *jk*, exceeds usual labour costs, *lab*, then a business operating under JobKeeper is also required to make a top up payment to active employees to raise their wage rate to the JobKeeper rate.

$$\pi = cp \cdot \pi + jk - (1 - cp) \cdot jk - cp \cdot (jk - lab)$$

Taking both of these cases into account, the breakeven condition for operating under JobKeeper simplifies to the following.

$$\pi = cp \cdot \pi + cp \cdot minimum(jk, lab)$$

This leads to the following simple formula for the breakeven ceiling proportion. The higher is the JobKeeper payment relative to usual profits, the lower is the breakeven ceiling[5]. This implies that breakeven ceilings will be lower in industries that are more labour intensive or pay lower wages per worker.

$$cp = \pi \; / \; (\pi + minimum(jk, lab)\;)$$

Using the data for the average business (Table 4.1) in this formula gives a breakeven ceiling of 53 per cent of turnover.

$$cp = 240 \; / \; (240 + 212\;) = 0.53$$

To the extent that a business is able to operate above this breakeven ceiling, and still remain eligible for JobKeeper, then it will make more than its usual profit at full operations without JobKeeper. This is because the wage subsidy it receives for active employees from JobSeeker exceeds the profits it foregoes by operating within the JobKeeper revenue ceiling.

In effect, such a business is being over-compensated for the government restrictions by JobKeeper. A profit-maximising business would choose to limit its operations so that it is eligible for JobKeeper.

The ceiling for larger businesses of 50 per cent falls just below the breakeven ceiling, and hence it is slightly more attractive to operate normally. However, the ceiling for smaller businesses of 70 per cent was well above the breakeven ceiling, making it much more profitable to keep operations at the ceiling and retain JobKeeper than to return to operate at normal capacity.

The calculations so far only provide a rough guide because they refer to economy-wide averages that may not be typical of the main industries affected by COVID-19 economic restrictions. At the 1-digit ANZSIC level, those industries are Accommodation and Food Services and Arts and Recreation services, as noted earlier.

Much of the Accommodation and Food services industry, which also includes beverage services, was operating at below normal levels because of social distance regulations. Employment was down by 15 per cent from 900,000 in August 2019 to 761,000 in August 2020. In the June quarter 2020, JobKeeper payments were equivalent to 45 per cent of compensation of employees.

The Arts and Recreation services industry includes sports and recreation activities, heritage activities, arts activities and gambling activities. All of these activities have been reduced by

[5] If Jobseeker payments exceeds usual labour costs, this is re-expressed as *the higher is usual labour costs relative to usual profits, the lower is the breakeven ceiling*.

COVID-19 restrictions. Employment was down by 15 per cent from 242,000 in August 2019 to 207,000 in August 2020. In the June quarter 2020, JobKeeper payments were equivalent to 49 per cent of compensation of employees.

The analysis of Table 4.1 was applied to each of these two industry divisions. The results are displayed in Tables 4.2 and 4.3. The breakeven ceiling for each industry is given in Table 4.4 in the column headed JK 1.0.

Both industries are relatively labour intensive and pay below average wages. This means that their breakeven ceilings are relatively low (Table 4.4). The two industries are now considered in turn.

Accommodation and Food Services is a labour-intensive industry and pays below average wages per worker. Wages per worker are low partly because wage rates are low and partly because around 60 per cent of employment is part-time. For all of these reasons, JobKeeper provides this industry with a high level of support relative to usual profits. Indeed, JobKeeper payments exceed the usual wage bill (Table 4.2).

Consequently, the breakeven ceiling for Accommodation and Food services is very low, at only 21 per cent of turnover (Table 4.4). Hence, businesses operating at the existing ceilings for JobKeeper eligibility of 70 per cent for smaller businesses and 50 per cent for larger businesses are over-compensated by JobKeeper. Profits are over double what they would be operating at normal levels without JobKeeper.

Table 4.2. Revenue and expenses of an 'average' Accommodation and Food Services business ($'000 per year)

operating level	**0%**	**50%**	**70%**	**100%**
revenue	0	477	667	953
jobkeeper	374	374	374	
inactive labour	-374	-187	-112	
active labour	0	-187	-262	-336
other variable costs	0	-264	-369	-528
profit	**0**	**213**	**298**	**89**

The Arts and Recreation services is only a little more labour-intensive than the average industry. However, wages per worker are low, partly because wage rates are low and partly because around 50 per cent of employment is part-time. Consequently, the breakeven ceiling for Arts and Recreation services is low at only 32 per cent of turnover. Hence, businesses operating at the existing ceilings for eligibility are highly over-compensated by JobKeeper.

Table 4.3. Revenue and expenses of an 'average' Arts and Recreation services business ($ per year)

operating level	**0%**	**50%**	**70%**	**100%**
revenue	0	663	928	1,325
jobkeeper	329	329	329	
inactive labour	-329	-165	-99	
active labour	0	-175	-245	-350
other variable costs	0	-411	-575	-822
profit	**0**	**242**	**338**	**154**

Overall, the potential for JobKeeper to over-compensate business owners is greater in the industries that were most affected by the COVID-19 restrictions. Over-compensation means it will generally be more profitable to operate at the eligibility ceiling for JobKeeper than to return to normal operations without JobKeeper, if feasible. This is true for both smaller and larger businesses.

The phasing down in JobKeeper rates of payment under the extension to JobKeeper went some way to addressing the over-compensation problem, as shown in Table 4.4. As detailed earlier, in the December quarter 2020, the standard JobKeeper rate for a full-time employee was reduced, and the rate for part-time employees was reduced below the rate for full-time employees. This regime is referred to as JK 2.0 in Table 4.4. Both rates fell further in the March quarter 2021 under JK 3.0. As payment rates were reduced, the option for a business of staying on JobKeeper became less attractive, and so the breakeven ceilings rose.

For example, JK 2.0 and JK 3.0 lifted the JobKeeper breakeven ceiling for the Accommodation and Food services industry from 21 per cent to 28 per cent and then 31 per cent. However, for both industries, the JobKeeper breakeven ceilings remained below 50 per cent. Businesses in these three industries were still more profitable if they restricted their operations sufficiently to remain eligible for JobKeeper.

Table 4.4. Breakeven ceilings for versions of JobKeeper (% of turnover)

	JK1.0	JK2.0	JK3.0
Accommodation and Food Services	21%	28%	31%
Arts and Recreation Services	32%	42%	46%
Average business	53%	62%	66%

This over-compensation problem, with its potential to act as a disincentive to production and active employment could be addressed in one or both of two ways in any future version of JobKeeper.

The first way would be to better ensure that JobKeeper is better targeted at businesses that are not able to operate normally because of restrictions. This could involve limiting JobKeeper to particular industries or regions where restrictions apply. It would also involve ensuring that JobKeeper is removed as soon as restrictions are removed. The idea behind this approach is to ensure that JobKeeper is not available to businesses that are able to operate as normal.

The second way would be to redesign the payments so that a business operating at or near the eligibility ceiling receives lower payments than a business that has had to cease operations. The idea behind this approach is to remove over-compensation. Some of the savings could be re-directed to better compensating businesses that are forced to cease operations or operate at very low rates.

5 Automatic stabilisers scenario

The *baseline* scenario presented in section 3 incorporated the large discretionary fiscal expansion implemented in response to the COVID-19 recession. To analyse the macroeconomic effects of that discretionary stimulus, this section simulates a hypothetical situation in which there was no discretionary stimulus, resulting in fiscal policy relying only on the automatic stabilisers. The path of the economy under this *automatic stabilisers* scenario is then compared with the path under the *baseline* scenario to examine whether the discretionary stimulus of the later helped to stabilise the economy.

5.1 Scenario Inputs

Tables 3.2 and 3.3 detailed how the *baseline* scenario allowed for the fiscal expansion. The *automatic stabilisers* scenario removes that fiscal expansion. In terms of Table 3.3, this entails replacing the values for the model fiscal inputs shown in the 'fiscal expansion' column with the values shown in the 'automatic stabilisers' column.

The removal of the fiscal expansion has feedback effects on the two rules used for macro policy in the model. The implications for fiscal and monetary policy rules are now considered in turn.

Without the fiscal stimulus, public borrowing and debt are lower under the Automatic stabilisers scenario than under the *baseline* scenario. Under the fiscal policy rule described in section 2.2, this would automatically lower the rate of tax on labour income, relative to its path in the *baseline* scenario. However, this would introduce fiscal stimulus into the *automatic stabilisers* scenario, clouding the comparison with the *baseline* scenario.

To avoid this, the fiscal rule is overwritten up until 2024-25. In its place, the rate of tax on labour income until 2024-25 is based on government policy before and after the fiscal expansion. As explained in section 3.2, the only change in personal income tax policy under the fiscal expansion was to bring forward the stage 2 personal income tax cuts from 2022-23 to 2020-21. This, in 2020-21 and 2021-22, personal income tax rates are higher in the *automatic stabilisers* scenario than in the *baseline* scenario, but otherwise they are the same (Table 3.3).

Beyond 2024-25, the fiscal policy rule is allowed to operate in both scenarios. Under the fiscal policy rule, the same target is used for the public debt to gdp ratio in both cases. This is so a difference in the public debt target does not cloud a comparison of the simulated outcomes.

In the model, a Taylor rule is used for monetary policy as described in Murphy (2020). Without the fiscal stimulus, unemployment is higher and inflation is lower under the *automatic*

stabilisers scenario than under the *baseline* scenario. Under the Taylor rule, this would automatically lower the short-term interest rate, relative to its path in the *baseline* scenario. However, because the short-term interest rate is already near-zero in the *baseline* scenario, the initial simulation of the *automatic stabilisers* scenario showed the short-term interest rate becoming negative to an implausible extent. Monetary policy runs out of room.

To avoid this, up until the June quarter 2022, the monetary policy rule is overwritten and instead the path for the short-term interest rate is set equal to its path in the *baseline* scenario. Thereafter, the monetary policy rule operates as usual to pursue the inflation target.

With monetary policy running out of room, more of the weight of macro stabilisation policy falls on fiscal policy. This is likely to mean that the desirable level of fiscal policy stimulus is larger than would otherwise be the case.

5.2 Automatic stabilisers scenario

The model inputs just described were fed into the macro model to generate the *automatic stabilisers* scenario. We calculate deviations of the *automatic stabilisers* scenario outcomes from the *baseline* scenario outcomes. Thus, the deviations that are presented show the effects of *not* implementing the fiscal expansion.

Chart 5.1 shows a massive spike in public net borrowing in the *baseline* scenario against a relatively small spike in the Automatic Stabilisers scenario. Hence the massive increase in public net borrowing was primarily discretionary, with a secondary contribution from the automatic stabilisers i.e. most of borrowing increase was been due to discretionary policies rather than a weak economy.

Chart 5.1. Public finances – public net borrowing

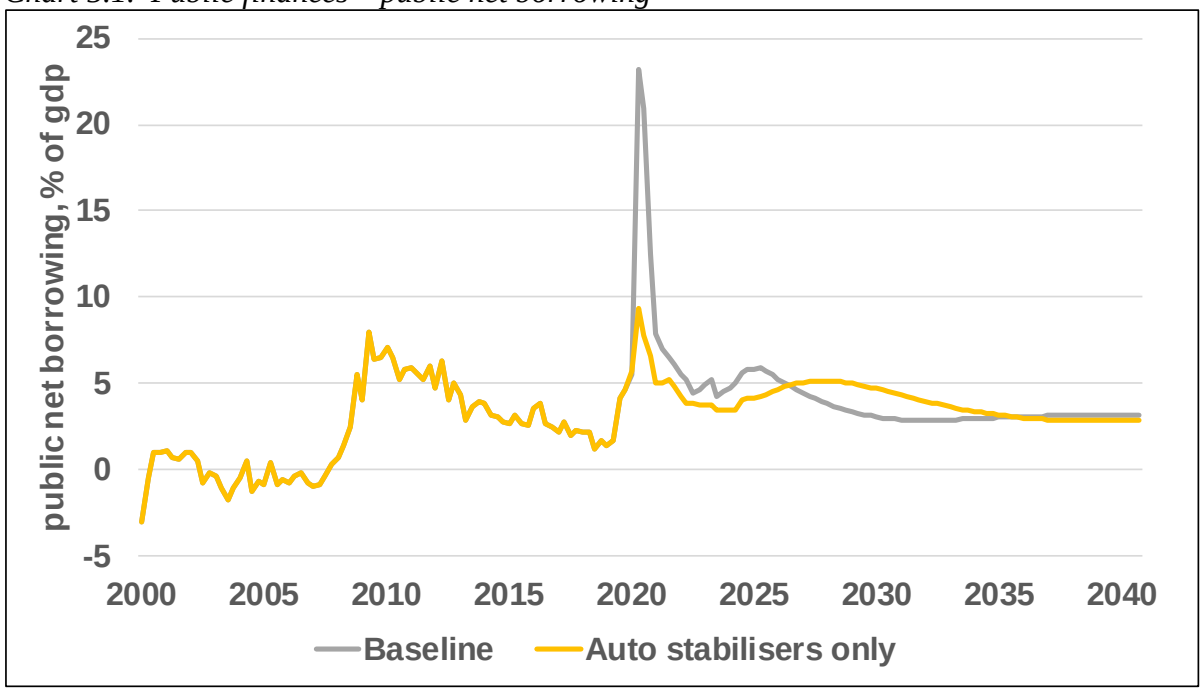
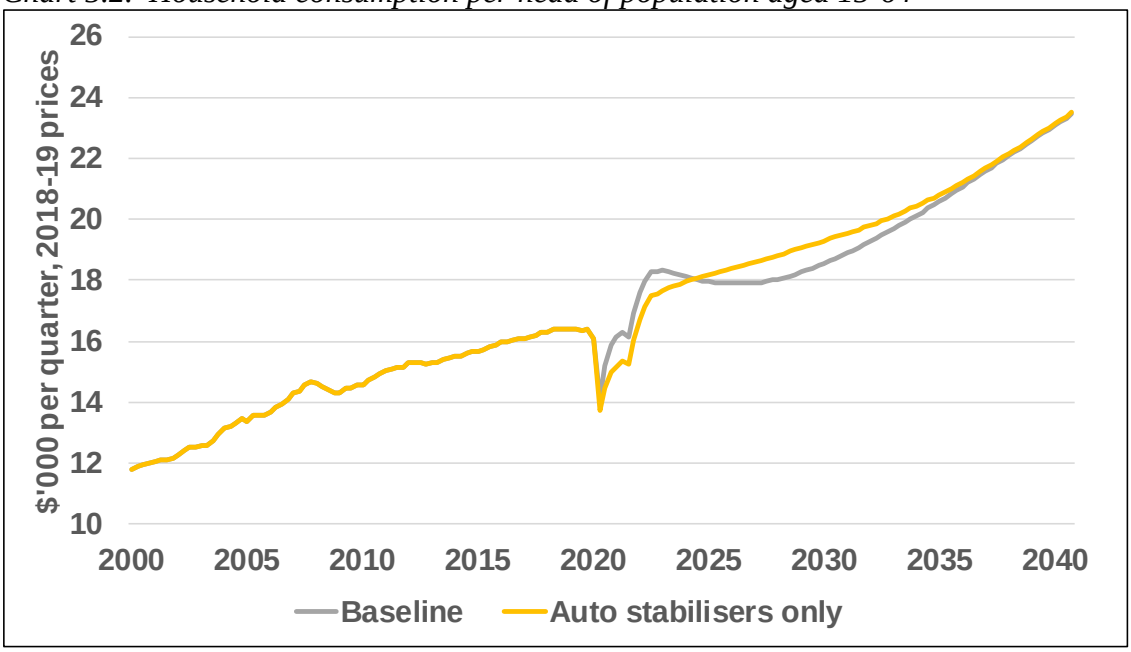


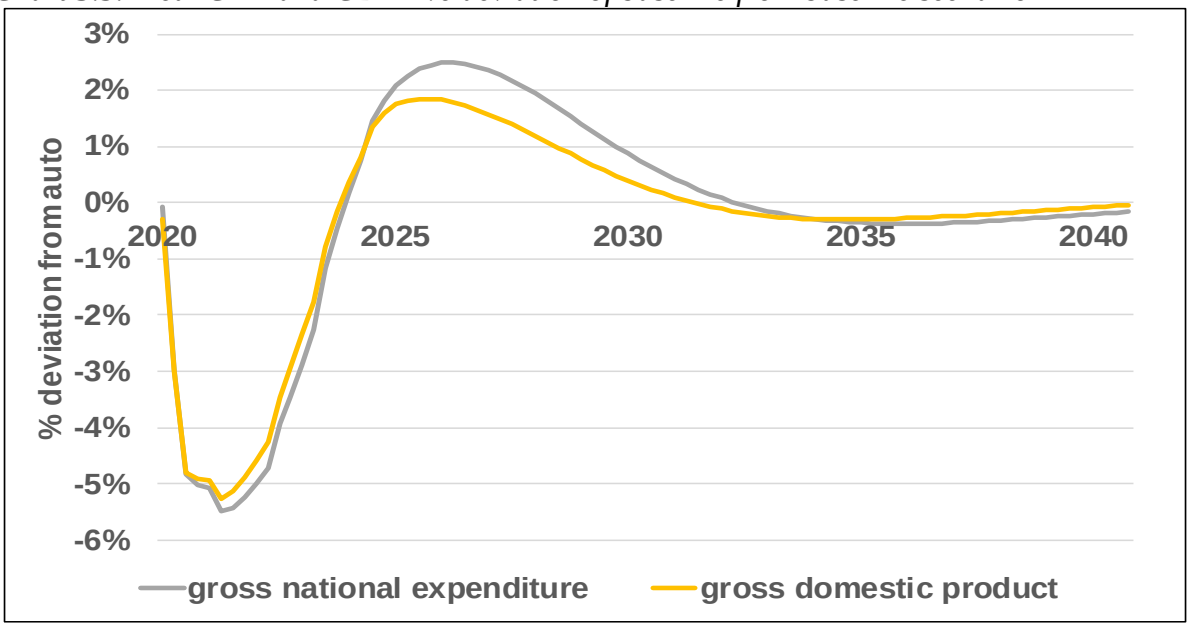
Chart 5.2 shows how the fiscal expansion supported real household consumption through the COVID-19 recession. In 2020-2021, real consumption is an average of 5 per cent higher in the *baseline scenario* than in the *automatic stabilisers* scenario in 2020-2021. However, consumption remains elevated by the same percentage in 2022, after the recession has finished. Households have ample spending power from the suppression of their spending during the recession and the fiscal transfers they received but have not yet spent.

Chart 5.2. Household consumption per head of population aged 15-64



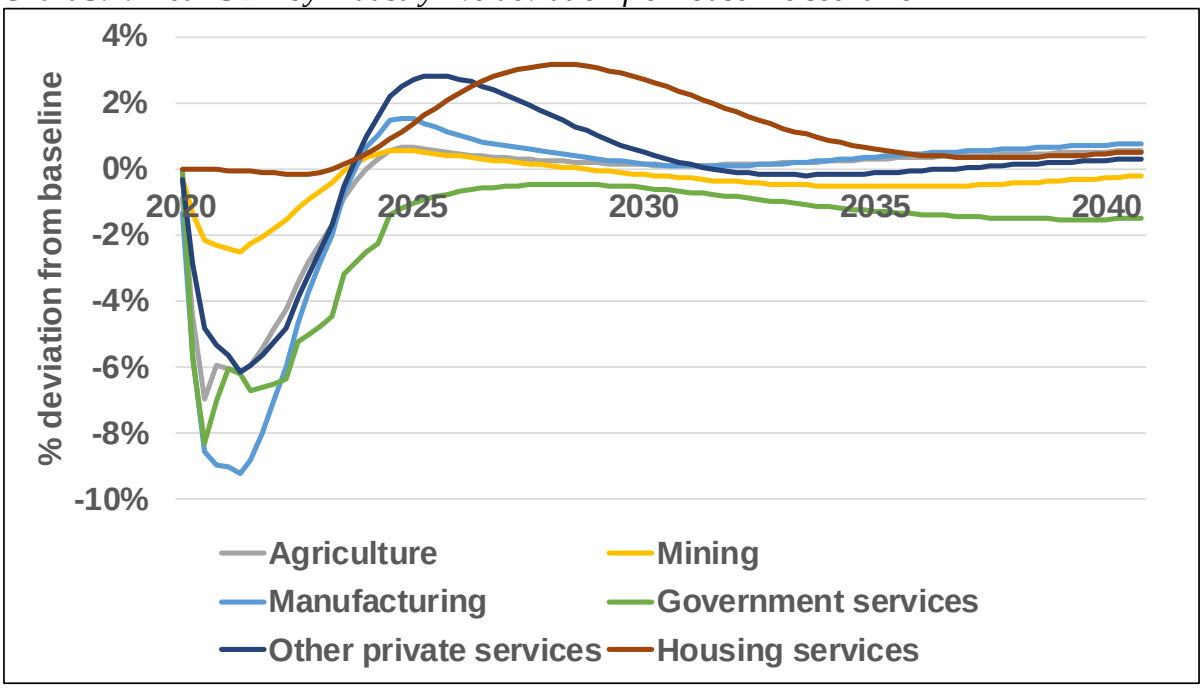
The higher level of real household consumption under the fiscal stimulus of the *baseline* scenario flows through to high real GNE and GDP (Chart 5.3). While the preceding charts showed both scenarios, Chart 5.3 shows the percentage deviations of outcomes in the *automatic stabilisers* scenario from the *baseline* scenario, to make the differences between the two scenarios more apparent. Without the fiscal expansion of the *baseline* scenario, real GNE and GDP are lower by about 3 per cent in 2020 and 5 per cent in 2021. However, they remain 4 per cent lower in 2022, after the recession has finished, because the fiscal expansion continues to elevate household consumption in the *baseline* scenario, as explained above.

Chart 5.3. Real GNE and GDP - % deviation of baseline from baseline scenario



The loss in GDP from the absence of the fiscal expansion seen in Chart 5.3 is distributed unevenly across the six industries of the model. Agriculture, manufacturing, other private services and government services experience the largest losses in percentage terms (Chart 5.4). These industries have significant exposure to household and government consumption, which are supported by fiscal expansion in the *baseline* scenario. Impacts on housing services are minimal as those services are driven by the existing stock of dwellings.

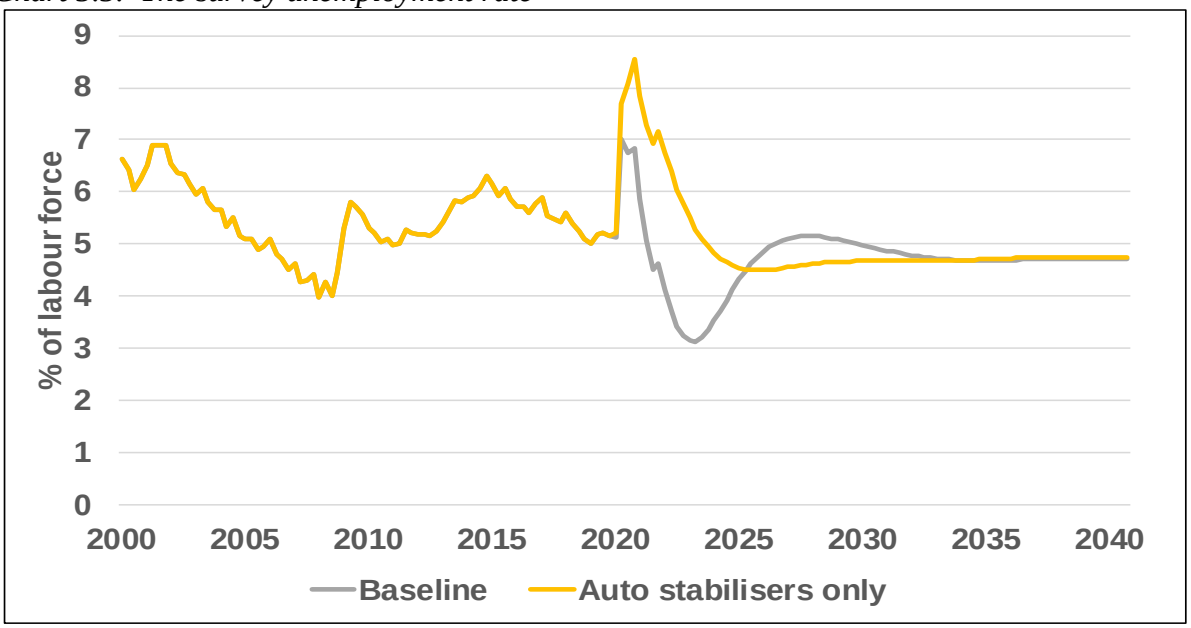
Chart 5.4. Real GDP by Industry - % deviation from baseline scenario



The boost to economic activity from the fiscal expansion lessens the depth of the COVID-19 recession not only in terms of real GDP, but also in terms of unemployment (Chart 5.5). During

the 2020-2021 downturn, unemployment is up to 2.5 percentage points lower in the *baseline* scenario than in the *automatic stabilisers* scenario.

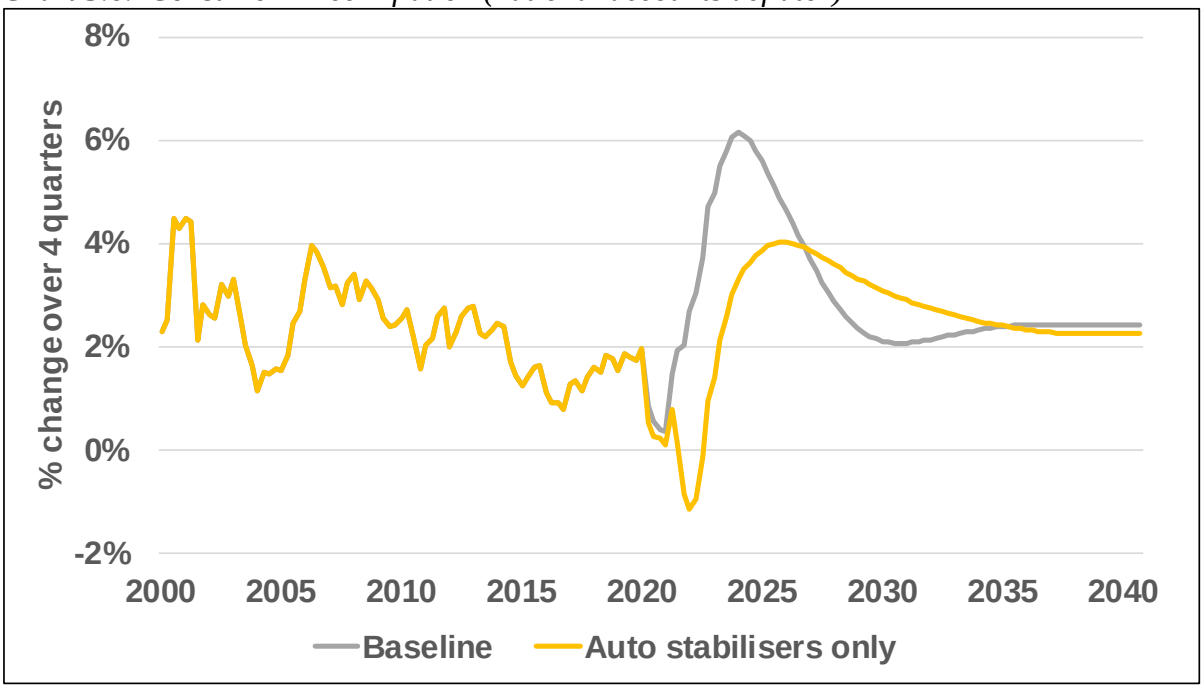
Chart 5.5. The survey unemployment rate



However, this continues after the end of the recession. By the end of 2022, unemployment is just above 3 per cent in the *baseline* scenario whereas it is just below 6 per cent in the *automatic stabilisers* scenario. The NAIRU lies in between at an estimated 4.5 per cent. This suggests that fiscal expansion was the appropriate policy, but it may have been applied too strongly and for too long.

Similarly, the fiscal stimulus lessens the deflationary impact of the COVID-19 recession. Chart 5.6 shows that inflation becomes negative without the fiscal stimulus, while remaining positive with the fiscal stimulus. However, the tight labour market that develops in the *baseline* scenario in 2022 drives inflation to a forecast peak of 6 per cent by the end of 2023. Inflation peaks at only 4 per cent in the automatic stabilisers scenario.

Chart 5.6. Consumer Price Inflation (national accounts deflator)



These simulated outcomes for inflation, like the simulated outcomes for unemployment, are consistent with the interpretation that fiscal expansion was the appropriate policy, but it may have been applied too strongly and for too long. The same could be true for monetary policy.

6 No COVID-19 scenario

The *baseline* scenario presented in section 3 incorporated the COVID-19 recession of 2020-2021 and the fiscal expansion introduced in response. To help understand the origins of that recession, this section simulates a hypothetical situation in which there were no COVID-19 pandemic.

The *no COVID-19 scenario* involves removing both the economic shocks from COVID-19 and the expansionary fiscal policy that was introduced in response. It will be seen that this results in the economy growing relatively smoothly. Shocks on the economy apart from those related to COVID-19 are not removed so growth is not completely smooth.

The aim of constructing the *no COVID-19* scenario is to better understand the reasons for the unusual deep V-shaped recession by isolating the main COVID-related economic shocks that caused it. A better understanding of the macroeconomic impacts of COVID-19 may lead to improvements in the way macro models capture pandemics and it may also assist policy makers in responding to any future pandemics.

6.1 Scenario Inputs

Table 3.1 detailed how the *baseline* scenario allowed for COVID-19 in the model inputs while Table 3.3 showed how it allowed for the fiscal expansion. The *no COVID-19* scenario removes both of these shocks. In terms of Table 3.1, this entails replacing the values for the model

inputs shown in the 'COVID-19' column with the values shown in the 'no COVID-19' column. In terms of Table 3.3, it entails replacing the values for the model fiscal inputs shown in the 'fiscal expansion' column with the values shown in the 'automatic stabilisers' column.

These changes to model inputs in the *no COVID-19* scenario has implications for the two rules used for macro policy in the model. The implications for fiscal and monetary policy rules are now considered in turn.

Without COVID-19 and the fiscal stimulus, public borrowing and debt are much lower under the *no COVID-19* scenario than under the *baseline* scenario. Hence, beyond 2024-25, a much lower target for the ratio of public debt to GDP is adopted in the *no COVID-19* scenario compared to the other two scenarios. However, up to 2024-25 the fiscal policy rule is over-written and instead the rate of personal income tax follows the same path as in the *automatic stabilisers* scenario.

Without the COVID-19 recession and the associated fiscal stimulus, interest rates remain positive under the Taylor rule for monetary policy. Hence, the monetary policy rule is allowed to operate throughout, unlike in the *automatic stabilisers* scenario.

6.2 No COVID-19 scenario

The model inputs just described were fed into the macro model to generate the *no COVID-19* scenario. We calculate the deviations of the *no COVID-19* scenario outcomes from the *baseline* scenario outcomes. Thus, the deviations that are presented show the effects of no COVID-19.

Chart 6.1 shows the massive spike in public net borrowing in the *baseline* scenario is almost non-existent under the *no COVID-19* scenario. This is consistent with the idea that the adjustments to the model inputs to construct the *no COVID-19* scenario were successful in removing the COVID-19 recession and its associated fiscal expansion. Interestingly, the chart also suggests that government policy had achieved a sustainable fiscal position before COVID-19 struck.

Chart 6.1. Public finances – public net borrowing

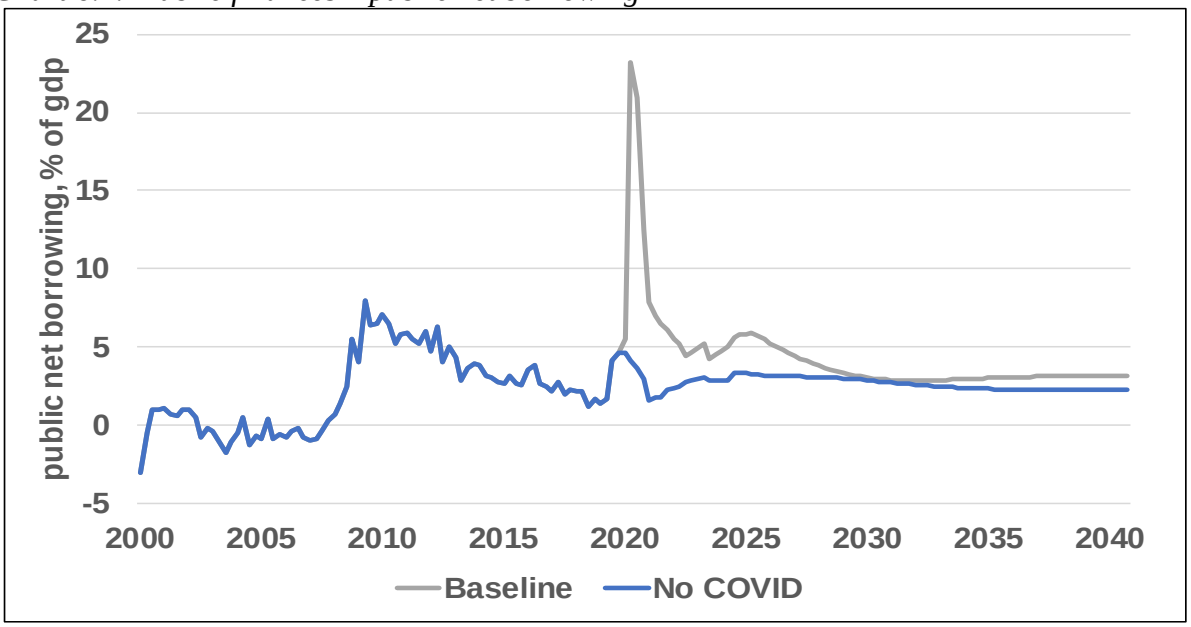


Chart 6.2 shows that the erratic fluctuations in household consumption present in the *baseline* scenario are largely absent from the *no COVID-19* scenario. Again, this is consistent with the idea that the adjustments to the model inputs to construct the *no COVID-19* scenario achieved their objective.

Chart 6.2. Household consumption per head of population aged 15-64

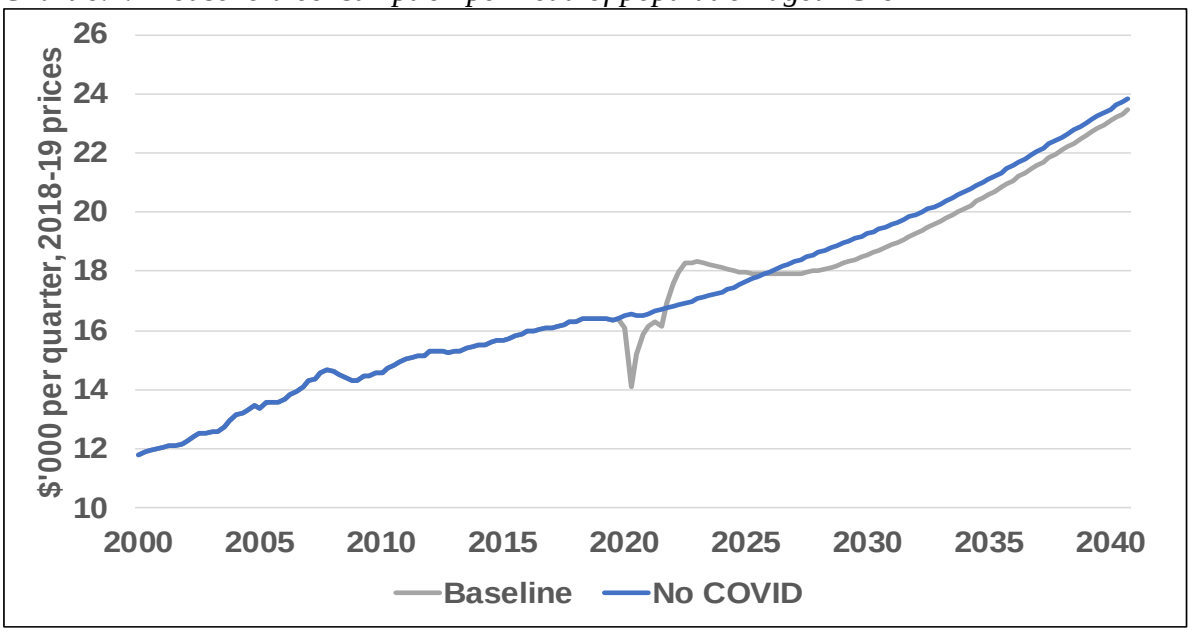


Chart 1.2 has already shown that real GDP, like real consumption, grows fairly smoothly under the *no COVID-19* scenario. Again, this is consistent with the idea that the *no COVID-19* scenario serves its purpose of removing COVID-19 related shocks.

Using another perspective, Chart 6.3 shows the deviations in real GNE and real GDP in the *no COVID-19* scenario relative to the *baseline* scenario. Economic activity would have been much higher in 2020-2021 without COVID-19. Real GDP would also have been about three

per cent higher in the long run, because net overseas migration would have been maintained at normal levels over the period from 2020-21 to 2023-24, resulting in a higher labour supply.

Chart 6.3. Real GNE and GDP - % deviation of baseline from baseline scenario

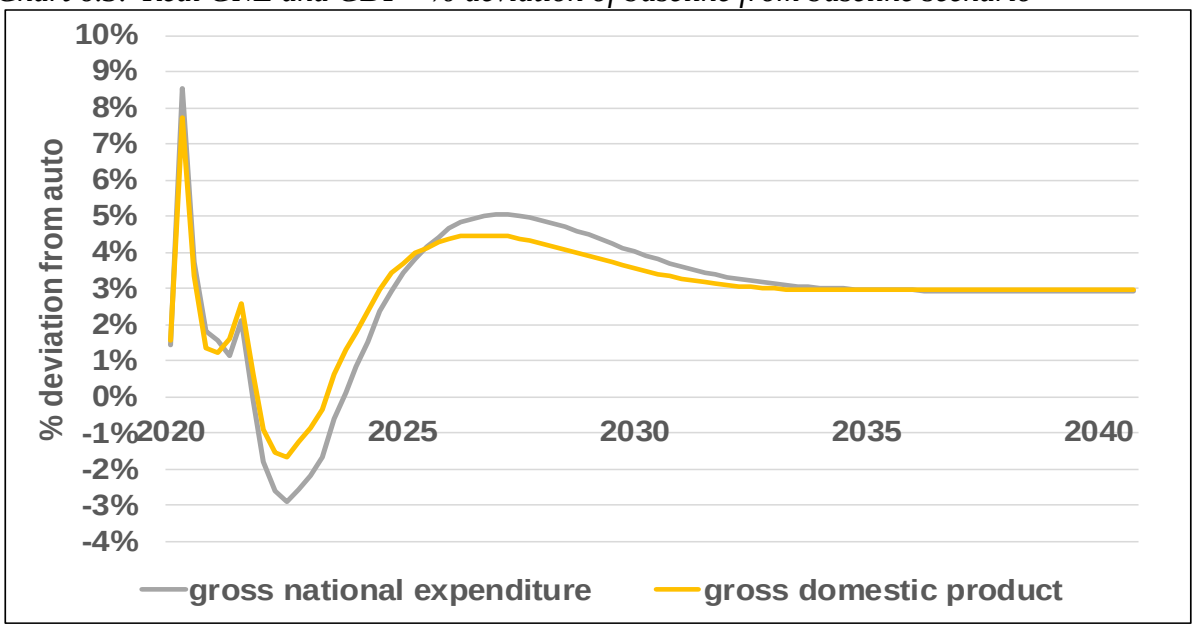


Chart 6.4 shows that this gain in real GDP without COVID-19 would have been shared in by most industry sectors. The exception is government services, which would not have benefited from the COVID-19 fiscal expansion. The chart also shows that the export-oriented mining industry has been largely insulated from COVID-19

Chart 6.4. Real GDP by Industry - % deviation from baseline scenario

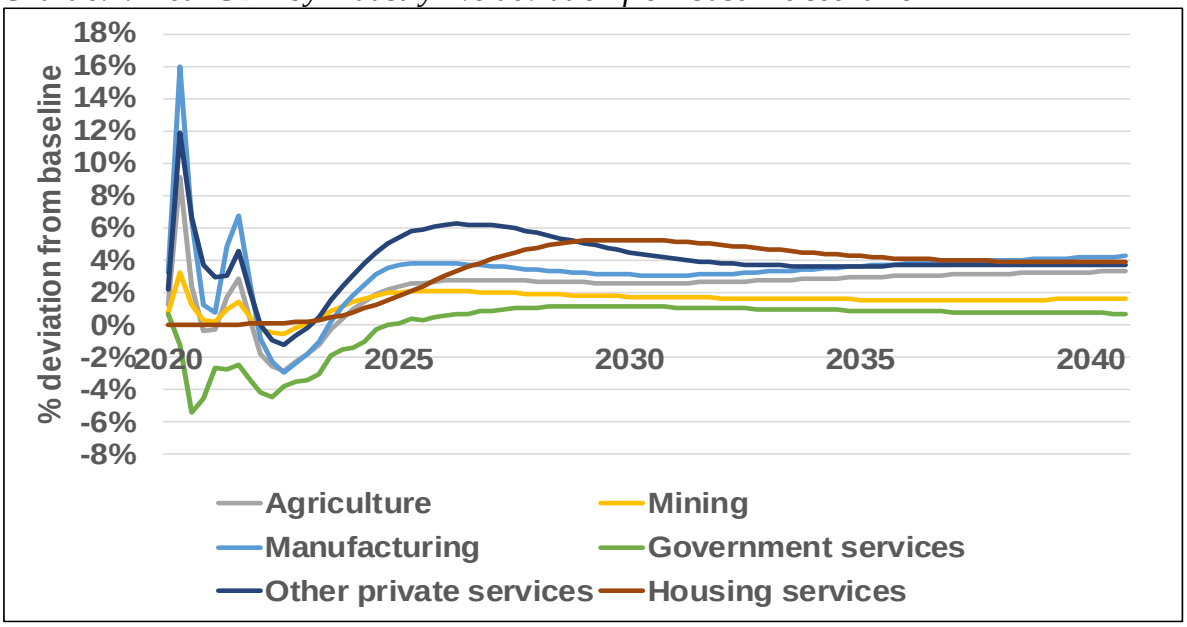
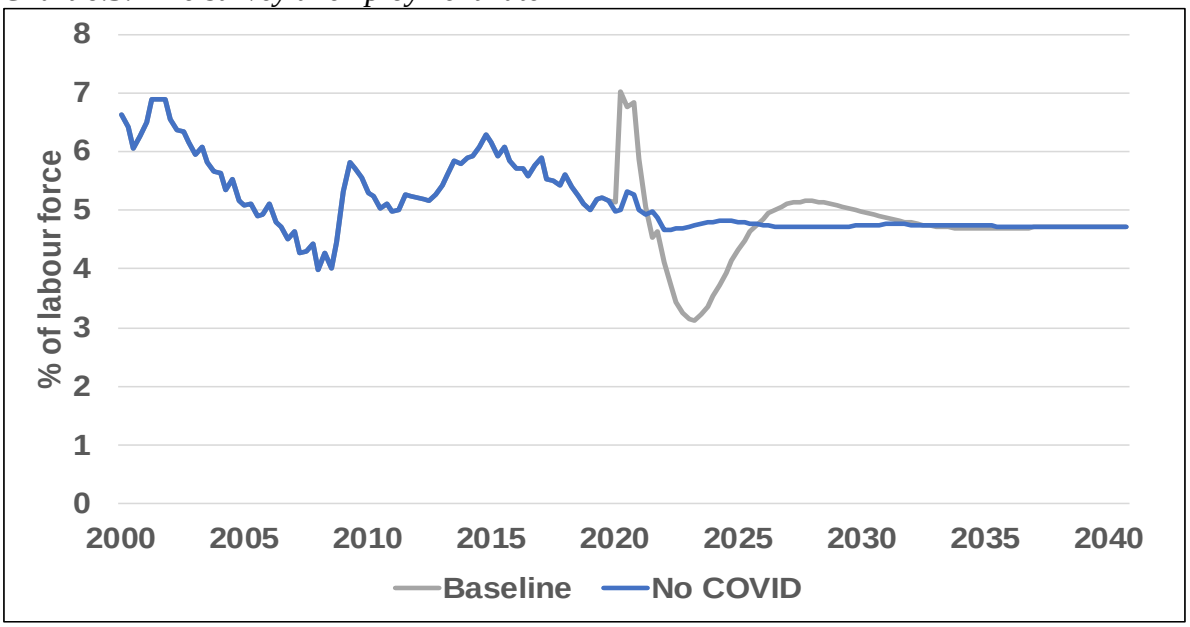


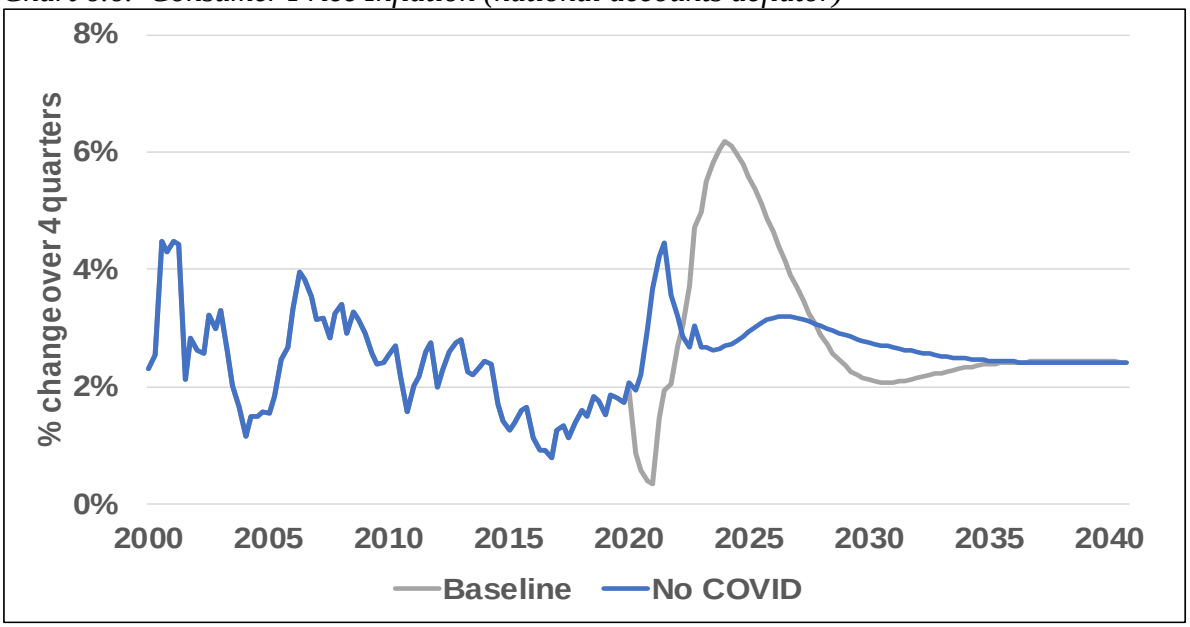
Chart 6.5 indicates that, before COVID-19, the labour market was on track to stabilise at an unemployment rate near the NAIRU. COVID-19 has disrupted this.

Chart 6.5. The survey unemployment rate



Similarly, Chart 6.6 indicates that, before COVID-19, monetary policy was broadly on track to return annual inflation to the target range of 2 to 3 per cent. COVID-19 and the associated fiscal expansion have made this task more difficult. It also appears from the projected high peak in inflation in late 2023 shown in the modelling, that monetary policy may be remaining too expansionary for too long.

Chart 6.6. Consumer Price Inflation (national accounts deflator)



The most important result from the *no COVID-19* scenario is that the adjustments made to model inputs (set out in Tables 3.1 and 3.3) appear to have largely captured the economic shocks from COVID-19 and the associated policy response. This strongly suggests that the deep V-shaped COVID-19 recession is largely attributable to the temporary suppression of consumption of certain services under the COVID-19 restrictions. So, with the restrictions

lifting quickly, we should expect the economy to lift quickly as well. Similarly, fiscal and monetary policy should move quickly to more neutral settings.

References

Australian Bureau of Statistics (2020a), 'Counts of Australian Businesses, including Entries and Exits', February, Canberra.

Australian Bureau of Statistics (2020b), 'Australian National Accounts: Input-Output Tables, 2017-18', May, Canberra.

Australian Bureau of Statistics (2020c), 'Economic Measurement during COVID-19: Selected issues in the Economic Accounts', May, Canberra.

Australian Bureau of Statistics (2020d), 'Weekly Payroll Jobs and Wages in Australia', August, Canberra.

Australian Bureau of Statistics (2020e), 'Labour Force, Australia, Detailed', August 2020, Canberra.

Australian Bureau of Statistics (2020f), 'Australian National Accounts', June quarter 2020, Canberra.

Australian Bureau of Statistics (2021), 'Labour Force, Australia, Detailed', August 2021, Canberra.

Australian Government (2019), 'Mid-Year Economic and Fiscal Outlook', Canberra, December.

Australian Government (2020), 'Budget Paper No. 1 2020-21, Canberra, 6 October.

Australian Government (2021), 'Budget Paper No. 1 2021-22', Canberra, 11 May.

Ballantyne, A., Cusbert, T., Evans, R., Guttmann, R., Hambur, J., Hamilton, A., Kendall, E., McCririck, R., Nodari, G. and Rees, D. (2020), 'MARTIN Has Its Place: A Macroeconometric Model of the Australian Economy', *Economic Record*, 96, 225-251.

Bullen, J., Conigrave, B., Elderfield, A., Karmel, C., Lucas, L., Murphy, C., Ruberl, H., Stoney, N., and Yao, H. (2021), 'The Treasury Macroeconometric Model of Australia: Modelling Approach', Treasury Paper 2021-09, 3 September.

McKibbin, W. and Fernando, R. (2020), 'Global macroeconomic scenarios of the COVID-19 pandemic', CAMA Working Paper 62/2020, June.

Murphy, C.W., Bright, I.A., Brooker, R.J., Geeves, W.D. and Taplin, B.K. (1986), 'A Macroeconometric Model of the Australian Economy for Medium-term Policy Analysis', Office of the Economic Planning Advisory Council Technical Paper, No. 2, Canberra, 178 pp.

Murphy, C. (1988a), ‘An Overview of the Murphy Model’, in Burns, M.E. and Murphy, C.W. (eds), ‘Macroeconomic Modelling in Australia’, *Australian Economic Papers*, Supp.

Murphy, C. (1988b), ‘Rational Expectations in Financial Markets and the Murphy Model’, in Burns M.E. and Murphy C.W. (eds), ‘Macroeconomic Modelling in Australia’, *Australian Economic Papers*, Supp.

Murphy, C. (1992), ‘The Steady State Properties of a Macro-econometric Model’ in C. Hargreaves (ed.), *Macroeconometric Modelling of the Long Run*, Edward Elgar, London, 159-205.

Murphy, C.W. (2020), ‘Decisions in Designing an Australian Macroeconomic Model’, *Economic Record*, 96, 252-270.

Powell, A. and Murphy, C. (1997), *Inside a Modern Macroeconomic Model — A Guide to the Murphy Model*, second ed., Springer, Berlin.

The Treasury (2020), ‘The Job-Keeper Payment: three-month review’, June, Canberra.