



Australian Government
Productivity Commission

PC PRODUCTIVITY INSIGHTS

JUNE 2021 | ISSN 2652-5461

RECENT DEVELOPMENTS

Features

The first recession in 28 years

Industry-level productivity performance

Structural effects of COVID-19

Decade in review: slowest growth in 60 years

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An appropriate reference for this publication is:

Productivity Commission 2021, *PC Productivity Insights: Recent Developments*, Canberra, June.

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The Productivity Commission

The Productivity Commission is the Australian Government's independent research and advisory body on a range of economic, social and environmental issues affecting the welfare of Australians. Its role, expressed most simply, is to help governments make better policies, in the long-term interest of the Australian community.

The Commission's independence is underpinned by an Act of Parliament. Its processes and outputs are open to public scrutiny and are driven by concern for the wellbeing of the community as a whole.

Further information on the Productivity Commission can be obtained from the Commission's website (www.pc.gov.au).

Foreword

Welcome to the second Productivity Commission (PC) *Productivity Insights* of 2021. Each year, we provide an analysis of Australia's recent productivity performance, a key determinant of our long-run prosperity.

COVID-19 has ended Australia's enviable 28-year recession-free streak, and caused a severe contraction in economic activity in 2019-20. The productivity impacts of this downturn were stark and sometimes counterintuitive. In addition, the interpretation of this year's national accounts is complicated by potential measurement issues. Multifactor productivity fell for the first time in nearly a decade but labour productivity actually grew due to labour shifting to higher productivity industries. Most industries experienced a contraction in both output and labour inputs.

The industry level results also reflected the unusual nature of the COVID-19 recession. Some hard hit industries, such as *arts and recreation*, experienced an increase in productivity, perhaps reflecting that their most experienced (and most productive) workers remained employed. However, many workers lost their jobs and overall output fell, which is not captured in measures of productivity. This highlights that productivity is not always synonymous with wellbeing, which clearly fell in the early months of COVID-19.

A few industries even managed to expand their output in 2019-20. Despite recent trade tensions, the *mining* industry — especially *oil and gas extraction* — experienced strong growth in inputs and outputs. Likewise, the *computer systems and related services* component of *professional, technical and scientific services* experienced a boost in output, likely driven by the needs of a workforce adapting to the working from home induced by COVID-19.

The early months of the pandemic saw rapid rises in unemployment and falls in investment, participation rates, and hours per worker. However, in the months since the end of the financial year, labour markets have recovered strongly (although unemployment remains slightly elevated, as of May 2021). Investment, especially dwelling construction, has also rebounded strongly. This swift recovery mainly reflects the containment of COVID-19 and removal of most domestic restrictions (though international borders remain closed) combined with the extraordinary levels of government assistance (primarily through the JobKeeper, Cashflow Booster and HomeBuilder programs).

COVID-19 has also triggered a number of developments with implications for productivity growth and the structure of the economy. Business exits, which normally spike during a downturn, barely budged, while insolvencies halved. Preventing business closures during the pandemic undoubtedly cushioned the downturn, maintained the viability of inherently efficient businesses and helped smooth recovery. However, maintenance of assistance to firms as the effects of COVID-19 recede may support less productive firms and stymie future

productivity growth. And if working from home and online retail continue at higher levels than pre-COVID, then productivity may be impacted, though it is still too soon to tell.

The decade ending 2019-20 was the worst decade of growth in 60 years, and even if the last year of growth is excluded then this nine-year period still compares unfavourably to past decades. This mainly reflects a global productivity slowdown and the end of the mining investment boom, which has subdued investment and, through lower terms of trade, reduced the purchasing power of Australian incomes.

Michael Brennan

Chair

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Productivity insights: recent developments

Key points

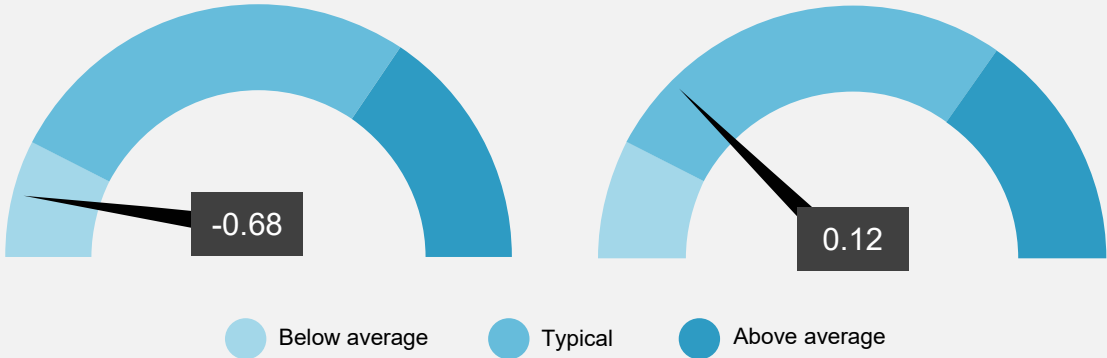
- COVID-19 brought Australia's first recession in 28 years with large, immediate effects on labour markets, economic activity and productivity.
 - GDP fell 0.3 per cent and GDP per capita fell 1.7 per cent in 2019-20. Despite this, capital income in the market sector was up 4.5 per cent while hourly wages increased by 5 per cent, mainly due to the significant levels of government assistance provided in 2020.
 - Labour productivity increased 0.5 per cent across the economy and 0.56 per cent in the market sector. These increases were mainly due to labour reallocating from low productivity industries to higher productivity sectors.
 - Multifactor productivity fell for the first time in nearly a decade (0.68 per cent) while capital deepening was higher than in any of the previous five years (2.5 per cent), reflecting that labour hours fell more sharply than the capital stock, and potential measurement issues.
 - Many industries saw labour productivity increase as hours fell more than their output, likely reflecting that the least experienced workers are usually the first to go.
- The COVID-19 recession precipitated a sudden rise in unemployment and falls in investment and hours worked during the first half of 2020, especially in the face-to-face service industries such as *accommodation and food services* and *retail trade*. Participation rates also fell.
- The second half of 2020 saw investment, hours worked per worker and participation rapidly recover to pre-COVID levels. As at May 2021, unemployment remains slightly elevated.
- The speed of recovery largely reflects the nature of the shock, large (temporary) subsidies and concessions from all levels of government (particularly the JobKeeper and Cashflow Booster programs) as well as containment of the pandemic.
- Some responses to the pandemic that emerged in 2020 may affect the structure of the economy and long-term productivity growth:
 - Business exits rose less than in previous recessions, likely due to changes in insolvency laws and subsidies (JobKeeper). Exits will likely rise now these programs have ended.
 - More employees will likely work from home more frequently post-COVID, with unclear ramifications for productivity.
 - Online retail surged during 2019-20 but whether this is a temporary blip or an acceleration of the trend to online shopping is unclear.
- Even excluding 2019-20, the past decade of economic growth has been, on a per person basis, the slowest in 60 years. This reflects the global slowdown in productivity growth, and the end of the mining investment boom, which delivered the double whammy of slower growth in production and a lower sale price on exports relative to imports (though the terms of trade and mining investment have improved in the last few years of the decade).

Productivity at a glance

Multifactor productivity performance

Multifactor productivity 2019-20

Five-year average



Labour productivity performance

Labour productivity 2019-20

Five-year average

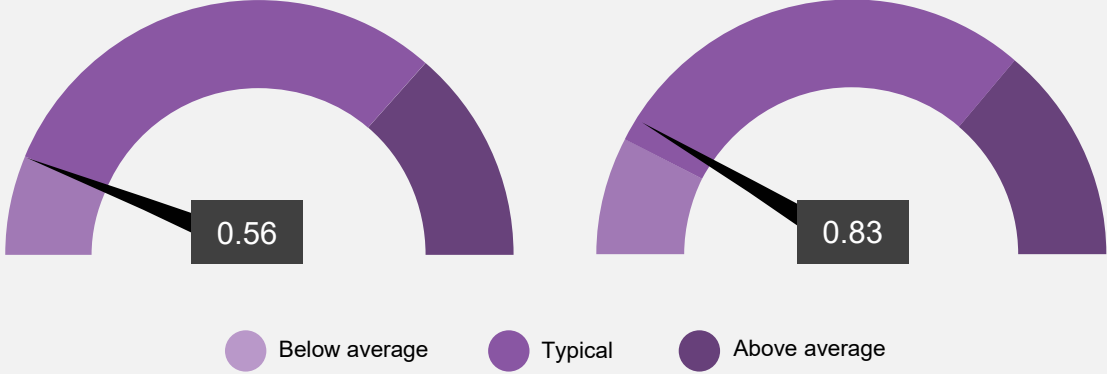


Table 1 **Aggregate productivity statistics^a**
Per cent^b

	Long-term growth rate	Most recent five years	Latest years	
	1994-95 to 2019-20	2014-15 to 2019-20	2018-19	2019-20
Whole Economy				
Output (real GDP)	3.0	2.0	2.2	-0.3
GDP per capita	1.6	0.4	0.5	-1.7
Hours worked	1.5	1.5	2.2	-0.8
Labour productivity	1.5	0.5	0.0	0.5
Terms of trade	2.3	2.3	5.7	0.8
Gross national income per capita	2.1	1	1.9	-0.2
Gross domestic income per capita	2.0	1	1.9	-1.4
Market Sector				
Output (GVA)	3.2	1.6	1.7	-1.2
Inputs	2.4	1.2	1.5	-0.5
Hours worked	1.1	0.8	1.5	-1.7
Capital Services	4.1	1.7	1.6	1.0
Labour productivity	2.0	0.8	0.2	0.6
MFP	0.8	0.1	0.2	-0.7

^a Some figures will not appear to add correctly due to rounding to one decimal place, for example labour productivity growth and hours growth not appearing to add to GVA. Gross value added (GVA) output is Gross domestic product (GDP) less taxes less subsidies on products and the statistical discrepancy. Labour productivity is the growth in output per unit of labour input. Multifactor productivity growth is the growth in gross value added less the growth of hours worked and capital services, each weighted by their share of total factor income. ^b All values are in real, chain weighted, terms.

Sources: Estimates based on: ABS (2018, *Australian System of National Accounts, 2019-20*, Cat. no. 5204.0, tables 1, 5, 15, 46 and 58); ABS (2020, *Estimates of Industry Multifactor Productivity, 2019-20*, Cat. no. 5260.0.55.002, tables 1, 6 and 14) and ABS (*Labour Account, Australia*, Cat. no. 6150.0.55.003, Aug 2020, table 1).

Table 2 **Industry productivity growth, 2019-20^a**
Per cent

	Output (GVA)	Hours worked	Capital services	Labour productivity	MFP
Market sector (16 industries)					
Agriculture, forestry and fishing	-8	2.8	-0.7	0	-8.3
Mining	4.9	1.7	1.04	3.2	3.7
Manufacturing	-1.7	2.3	-1.07	-3.9	-2.8
Electricity, gas, water and waste services	-1.8	0.5	2.38	-2.3	-3.6
Construction	-4.6	-2.1	0.89	-2.6	-3.6
Wholesale trade	-1.4	-0.7	-0.44	-0.7	-0.8
Retail trade	-0.5	-5.3	-0.4	5.1	3.6
Accommodation and food services	-11	-10.8	0.09	-0.3	-2.8
Transport, postal and warehousing	-6.1	-6.1	2.92	0	-3.7
Information media and telecommunications	0.9	-6.1	3.73	7.4	1.6
Financial and insurance services	1.8	2.5	0.16	-0.7	0.9
Rental, hiring and real estate services	-2.1	2	2.26	-4.1	-4.2
Professional, scientific and technical services	2.6	3.2	3.83	-0.6	-0.7
Administrative and support services	-4.9	3.4	-0.83	-8	-7.8
Arts and recreation services	-6.2	-14.9	3.69	10.2	3.2
Other services	-5.2	-8.2	4.19	3.3	1.5
Non-market sector					
Public administration and safety	4.7	-1.8	NA	6.6	NA
Education and training	1.8	-1.6	NA	3.5	NA
Health care and social assistance	4.4	6.3	NA	-1.8	NA
All industries	0	-0.8	NA	0.8	NA

^a Some figures will not appear to add correctly due to rounding to one decimal place, for example labour productivity growth and hours growth not appearing to add to GVA.

Sources: Estimates based on: ABS (2020, *Australian System of National Accounts, 2019-20*, Cat. no. 5204.0, tables 1, 5, 15, 46 and 58); ABS (2020, *Estimates of Industry Multifactor Productivity, 2019-20*, Cat. no. 5260.0.55.002, tables 1, 6 and 14) and ABS (*Labour Force, Australia, Detailed, Quarterly*, Cat no. 6291.0.55.003, Aug 2019, table 11).

Box 1 Productivity: a primer*What is productivity?*

Productivity is a measure of the rate at which output of goods and services are produced per unit of input (labour, capital, raw materials, etc.). It is calculated as the ratio of the quantity of output produced to some measure of the quantity of inputs used. Many factors can affect productivity growth. These include technological improvements, economies of scale and scope, workforce skills, management practices, changes in other inputs (such as capital), competitive pressures and the stage of the business cycle.

What are the main measures?

There are two metrics that are most commonly used to measure aggregate productivity. Labour productivity is the ratio of output to hours worked. Output is typically defined as gross value added (the total value of a firm's production minus intermediate inputs, inputs produced by other firms). Over the long term, wages generally grow in step with labour productivity and as such it is a key determinant of income growth. Multifactor productivity (MFP) is the ratio of output to combined input of labour and capital. It is generally considered to be a better measure of technological change and efficiency improvements than labour productivity. Usually, the growth in labour productivity exceeds the growth in multifactor productivity. The difference between the two is the contribution from 'capital deepening'. That is, the accumulation of more and better capital equipment over time helps to make workers more productive.

What parts of the economy are we measuring?

The most accurate estimates of productivity are for those industries where prices are set in markets — known as the 'market sector' — and where it is therefore easier to measure output (in terms of real industry gross value added). This publication provides estimates for the two market sectors used by the Australian Bureau of Statistics (ABS) — the 12 and 16 industry sectors — the latter distinguished by the fact that less historical data are available. Both labour productivity and MFP measures are available. Labour productivity can also be measured for the whole economy (in terms of real GDP per hour worked). Labour productivity measured in this way contributes to growth in living standards (commonly measured as GDP per capita) but is a poorer indicator of technological change and efficiency improvement because of the difficulty measuring output in health, education and public administration.

How can productivity be compared across countries?

While productivity growth rates can be compared readily across countries, productivity level comparisons require estimates of relative price levels across countries. International comparisons of labour productivity levels typically reflect conversion to US dollars per hour worked based on current year purchasing power parity. International comparisons of multifactor productivity levels require further assumptions about fair rates of return to capital and are not widely published.

Productivity growth is a key source of long-term economic and income growth, and as such, is an important determinant of a country’s average living standards. Conceptually, it seeks to quantify how efficiently resources, such as capital and labour, but also land, energy, environmental services, and other unpriced public goods, are used to produce output — the goods and services we consume every day.

This *Productivity Insights* paper analyses the most recent productivity trends at a highly-aggregated level, comprising labour productivity for the whole economy and both labour productivity and multifactor productivity for the market sector and its component industries. Annual data can be volatile, and subject to revisions and cyclical shocks. Medium-term trends over the past five years or longer periods generally provide a clearer guide to developments in the economy.

This year’s data present additional conceptual and practical challenges to their interpretation due to both the effects of the COVID-19 pandemic itself, and the programs various governments put in place to manage its health and economic consequences (box 2). In this context, a few seemingly anomalous events have occurred — labour productivity rose while both output and labour hours fell, incomes grew as physical output fell, and hourly wage growth was its highest since the end of the mining boom. These outcomes are largely explained by the unique circumstances of the COVID-19 pandemic and its aftermath, and for this reason, a cautious interpretation of this year’s national accounts is necessary. The next few years of data will help interpret productivity outcomes over 2020.

Box 2 Productivity measurement in a pandemic

Issues in measuring productivity

COVID-19 and the policy responses to it create several issues in measuring productivity as well as avenues for mismeasurement. Overall, it appears there is more scope for *underestimation* of MFP in 2019-20 from the various effects of COVID-19 .

Gross value added

Gross value added (GVA) is the main measure of output in productivity measurement. It is equal to gross output (total production) minus intermediate inputs (inputs supplied by other firms). A key assumption the ABS makes in estimating GVA is that GVA, gross output and intermediate input usage all grow proportionally to one another (and so growth in total sales can be used to proxy growth in GVA). The ABS initially thought the COVID-19 recession might violate this assumption but data from the *Business indicators* survey and the *Business impact of COVID-19* survey indicated to the ABS that this was not the case. The significant government assistance programs, such as JobKeeper and Cashflow Booster, did not directly affect the measurement of GVA as subsidies are included in factor incomes but not GVA.

(continued next page)

Box 2 (continued)

Labour inputs

Two types of labour inputs are used in productivity statistics: simple hours worked estimates and quality adjusted labour inputs (QALI), which adjust labour inputs by weighting labour hours from those with different skill and education characteristics differently. Labour hours measurement is not directly affected by the introduction of JobKeeper, as this does not directly affect how many hours an employee works. However, it may indirectly contribute to employees working additional low marginal value hours. That is, an employer whose workers now have zero marginal cost (due to the flat rate of JobKeeper subsidy) may use labour to perform low value tasks due to the weak business environment creating few opportunities for higher value tasks.

Whether or not this constitutes mismeasurement of the labour input is debateable though, as the time spent doing low value work is still usage of a labour input that has an opportunity cost in terms of leisure. QALI measures may need to be adjusted in response to the introduction of short, highly discounted, online courses at higher education levels to upskill or retrain workers displaced by the pandemic when the 2021 Census is completed.

Capital inputs

Capital utilisation, which usually falls in a recession, is assumed to be constant by the ABS for the purposes of constructing estimates of capital inputs and productivity. This means that the likely fall in capital usage during COVID-19 was not measured by the ABS, and as a result, MFP was likely *underestimated* (due to the non-measured fall in inputs). The ABS has modelled the effect of mismeasurement of capital utilisation on MFP and found that when using the gap between potential output and actual output, economy-wide unemployment or economy-wide underemployment as proxies for capital utilisation, estimates of capital services growth (in the market sector) fell below official estimates for 2019-20 (and consequently MFP growth was estimated to be higher under these assumptions). However, when underemployment in the market sector specifically was used as a proxy for underutilisation, the estimates of capital services growth (and MFP growth) were almost the same as the official estimates. The ABS did not model the use of unemployment in the market sector specifically as a proxy for capital underutilisation, which may have yielded different results.

Another issue may be unforeseen obsolescence of capital due to COVID-19. For example, to the extent that the move to online retail has been accelerated by the pandemic (section 3), this may cause unforeseen obsolescence of the capital involved in brick and mortar retail operations. The ABS models the decline in efficiency of capital based on *foreseeable* obsolescence of capital, but one off structural events, like COVID-19, are not captured by these estimates. To the extent that unforeseen capital obsolescence has occurred, this may cause *overestimation* of capital services.

Labour and capital shares of income

The labour and capital shares of income are used to weight growth in labour hours and capital services respectively in the calculation of multifactor productivity. Certain payments developed in response to COVID-19, such as JobKeeper and Cashflow Booster, were counted as part of factor income (below) and resulted in the capital share of income increasing. This increased the weight given to the growth of capital (which was positive) and decreased the weight given to the growth in labour (which was negative), with the result that measured MFP growth was lower than it would have been without the effect of these payments.

(continued next page)

Box 2 (continued)

Capital and labour shares of income are used to weight growth in each of these inputs because they are assumed to represent the contribution to growth in production stemming from labour and capital. But to the extent that changes in these income shares have been driven by temporary changes in government policy, this raises the question of whether the income shares for this year may misattribute the contribution of different inputs in 2019-20. If this is the case, then it is likely that the effect is to cause an *underestimation* of MFP growth.

Selected other issues in measuring other national accounts

The numerous policy changes that occurred in response to COVID-19 required decisions on how to properly record the effects on the different components of the national accounts.

Classifying JobKeeper payments

JobKeeper had two key effects on the recording of the national accounts:

- JobKeeper payments were treated as ‘other subsidies on production’ paid from government to employees (that is, they raised factor income but not physical production)
- employees receiving JobKeeper are counted as employed and in receipt of a wage (even if they worked zero hours).

These decisions were made on the basis that JobKeeper preserves the employer-employee connection (even in the absence of actual work being done) and is sufficiently connected with production to be considered a subsidy on production rather than say a ‘social benefit’.

Classifying Cashflow Booster payments

Cashflow Booster, like JobKeeper, is classified as under ‘other subsidies on production’ which affects factor income but not measured production. This decision was made because entitlements were based on business activity statements which meant there was enough of a connection between the payments and the production process.

Sources: ABS (Economic measurement during COVID-19: Selected issues in the Economic Accounts, Cat. no. 5261.0; Productivity measurement in the time of a pandemic; Variations in the Utilisation of Productivity Inputs).

1 The first recession in 28 years

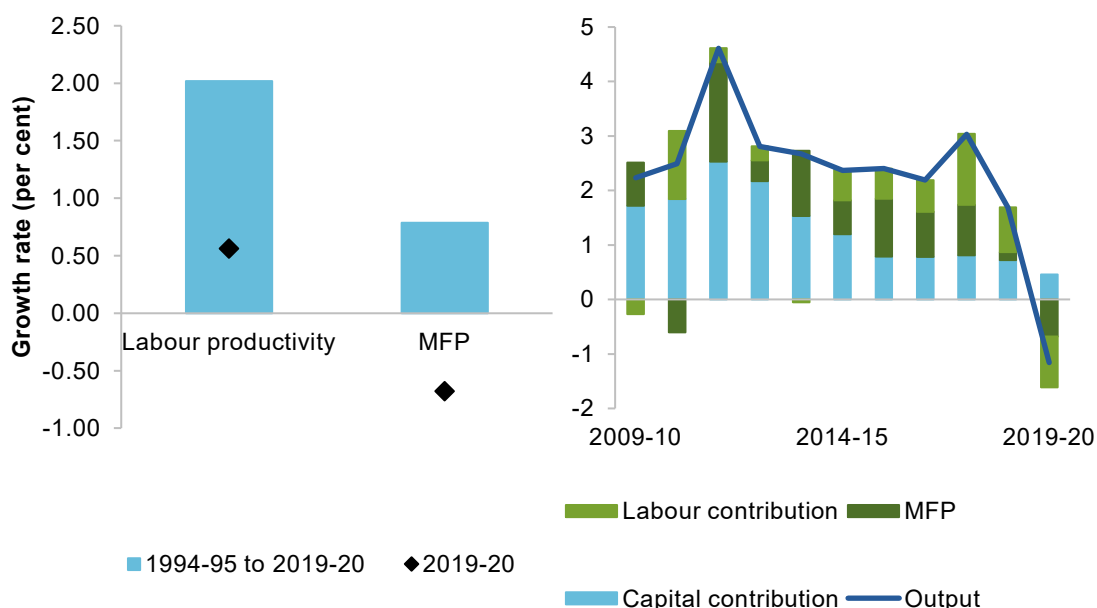
Australian gross domestic product (GDP) fell 0.3 per cent during 2019-20 causing the first recession in 28 years. Per person output (GDP per capita) and income (gross national income (GNI) per capita) also fell (1.7 and 0.3 per cent respectively), though a rise in the terms of trade (0.8 per cent) meant that income growth exceeded production growth (ABS 2020c).

Notwithstanding the recession, both whole economy and market sector labour productivity rose (0.50 and 0.56 per cent respectively), though this growth was below the long-term average (1.5 and 2 per cent since 1994-95 respectively) (ABS 2020c, 2020e). This increase was due to labour hours falling by more than output during the COVID-19 recession. Market sector MFP fell (0.68 per cent) for the first time in nearly a decade (figure 1) and capital per hour of labour (capital deepening) increased (2.5 per cent) more than it has in any

of the past five years due to a combination of modest capital services¹ growth and a large fall in hours worked.

Figure 1 Labour productivity and MFP were well below their long-run average in 2019-20

Growth in market sector labour productivity and MFP in 2019-20 and their averages since 1994-95 (left); contributions to market sector value added (output) growth from hours worked (labour), capital services (capital), and MFP between 2009-10 and 2019-20 (right)



Source: ABS (*Estimates of Industry Multifactor Productivity, 2019-20*, Cat. no. 5260.0.55.002., tables 1-19).

Anatomy of a recession

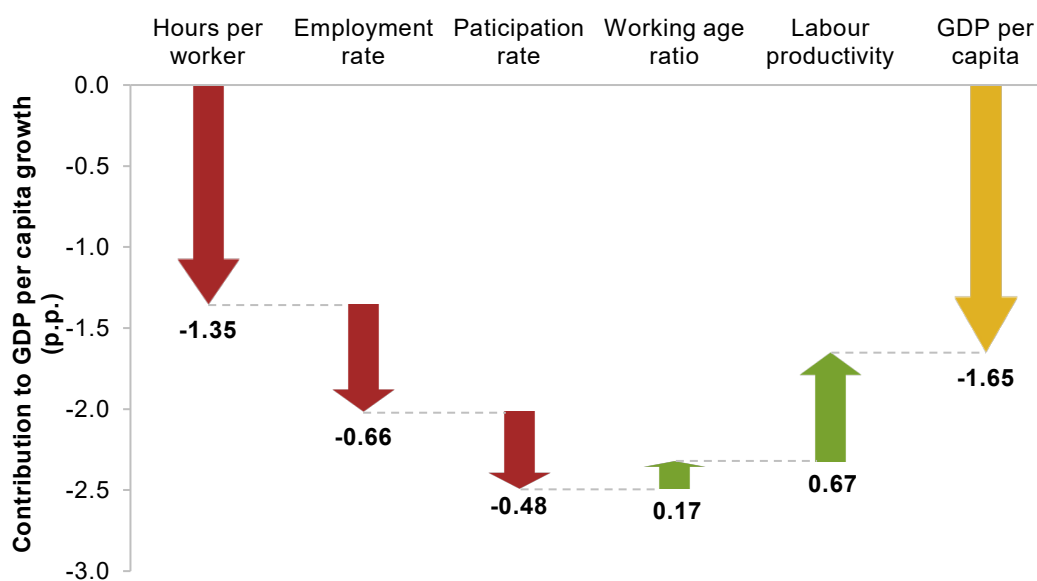
Figure 2 decomposes the 2019-20 fall in GDP per capita into the contributions from changes in hours worked per employee, the employment rate (1 minus the unemployment rate), the participation rate (the proportion of the population aged 15 and over that are employed or seeking employment), the working age ratio (ratio of working age to total population) and labour productivity. Overall, the largest contributor to the fall in GDP per capita was from lower hours per worker (about 82 per cent of the fall), with increases in unemployment and lower participation making up the remainder. Partially offsetting this, the share of the

¹ Capital services reflect the amount of 'service' each asset provides during a period. For each asset, the services provided in a period are directly proportional to the asset's productive capital value in the period. As an asset ages and its efficiency declines so does the productive capital value and the services the asset provides.

population aged 15 and over rose slightly and labour productivity rose, mainly from the effect of labour redistribution between industries (section 2).

Figure 2 Hours per worker, employment and participation fell while labour productivity rose

Contributions to GDP per capita from changes in hours per worker, the employment rate, the participation rate, the working age ratio^a and labour productivity in 2019-20



^a The working age ratio is the ratio of the civilian population aged 15 and over to the total population.

Sources: Commission estimates using hours actually worked, employment and the size of the labour force from ABS (*Labour Account Australia, September 2020*, Cat. no. 6150.0.55.003, table 1); civilian population aged 15 and over ABS (*Labour force Australia, January 2021*, Cat. no. 6202.0, table 1); the implied population growth in ABS (*Australian National Accounts: National Income, Expenditure and Product, September 2020*, Cat. no. 5206.0., table 1).

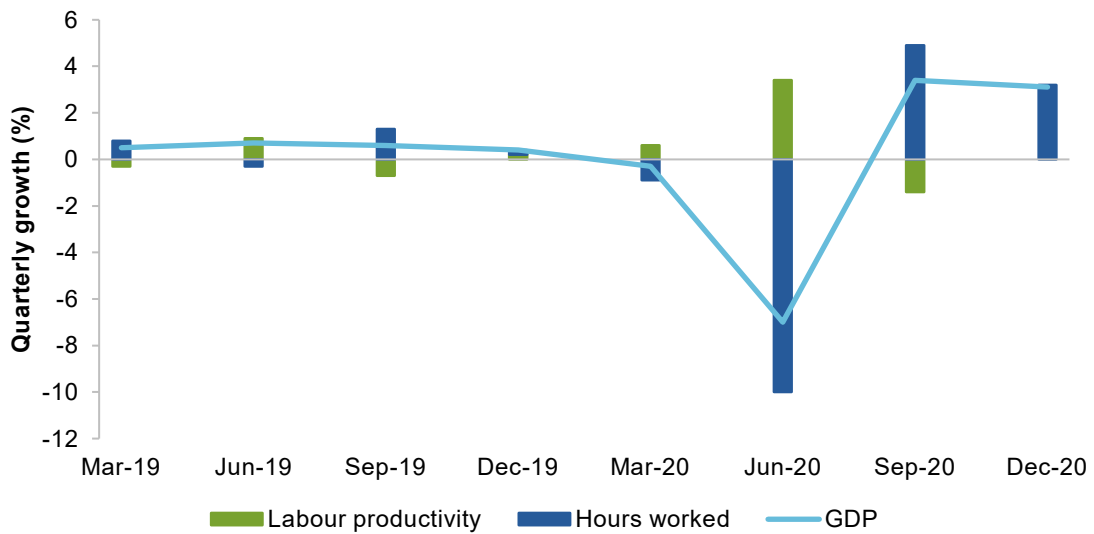
Almost all of the fall in GDP in 2019-20 was driven by the significant fall in the June 2020 quarter (7 per cent fall in quarterly GDP), with significant recovery in the following quarters (figure 3). It can be seen that hours worked fell more sharply than GDP in the June quarter and then recovered more strongly in subsequent quarters. As a result, labour productivity spiked in the early parts of the recession (partly driven by a reallocation of labour from lower productivity industries to higher productivity industries, section 2) before then falling slightly. Hours falling faster (and recovering faster) than output also likely reflects that less experienced (and so less productive) workers are often the first to be made redundant, as well as some short term stickiness of capital (capital is often retained during recessions given the costs of disposal, while workers can be made redundant more easily) meaning that there was capital deepening despite subdued investment. However, this capital-deepening is likely overestimated once utilisation is properly accounted for (box 2).

Since the end of the 2019-20 financial year however, it appears that many labour market indicators have returned to pre-COVID levels. For example, average hours worked per employee across the economy had almost normalised by December 2020 (figure 4). Similarly, participation rates had returned to pre-COVID levels by February 2021, with only unemployment rates remaining slightly elevated (figure 5).

So far, the recovery in employment has been much faster than previous recessions despite a larger, faster initial fall (figure 6). For example, during the 1991-92 recession, employment levels fell 3.6 per cent below pre-recession levels and it took over four years (49 months) for employment to recover back to pre-recession levels. By contrast, from February 2020, employment levels fell over 7 per cent in four months with the recovery effectively complete after twelve months. Though the withdrawal of stimulus measures may cause some reversals.

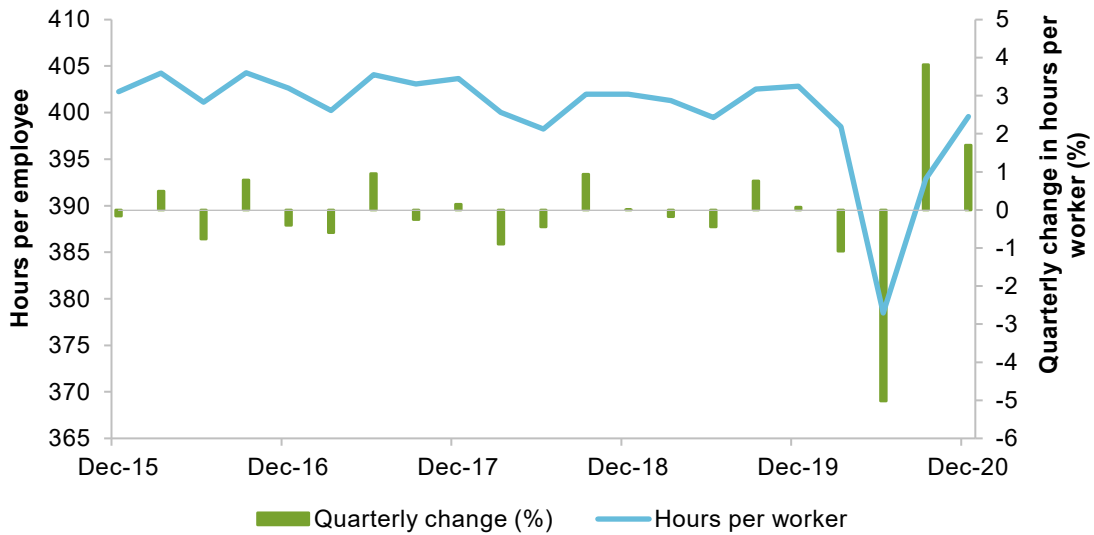
Figure 3 Almost all of the fall in real GDP occurred in the June quarter, with some recovery in subsequent quarters

Quarterly growth in GDP, labour productivity and hours worked (all seasonally adjusted) between March 2019 and December 2020



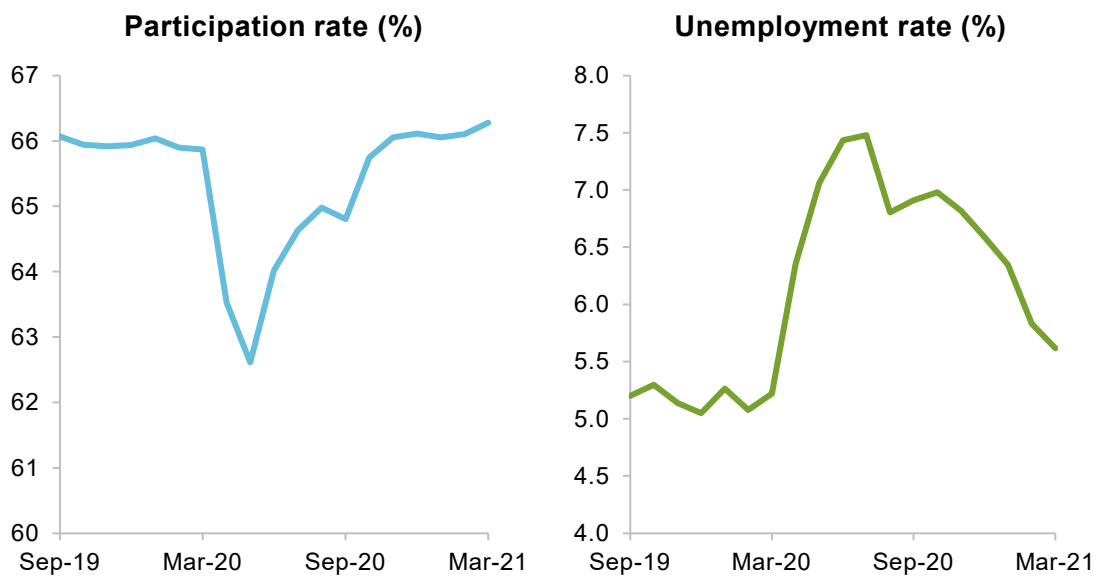
Source: ABS (*Australian National Accounts: National Income, Expenditure and Product, December 2020*, Cat. no. 5206.0., table 1).

Figure 4 Hours worked per employee had almost recovered to pre-COVID levels by the end of 2020 ...
 Hours worked per worker (per quarter, seasonally adjusted) levels and growth rates between December 2015 and December 2020



Source: ABS (*Labour Account Australia, December 2020*, Cat. no. 6150.0.55.003, table 1).

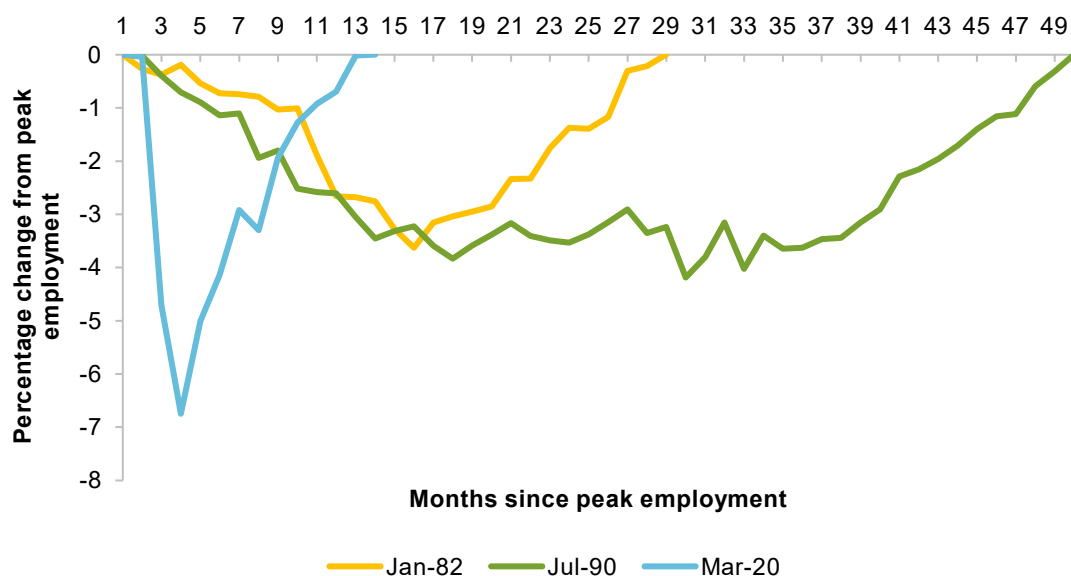
Figure 5 ... and participation had recovered but the unemployment rate still remains slightly above pre-COVID levels
 Monthly participation rate (left) and monthly unemployment rate (right) (both seasonally adjusted) between August 2019 and February 2021



Source: ABS (*Labour force Australia, March 2021*, Cat. no. 6202.0, table 1).

Figure 6 **COVID-19 caused a larger but briefer fall in employment relative to previous recessions**

Percentage fall in employment (seasonally adjusted) from peak employment^a levels and the number of months since employment peaked



^a 'Peak employment' is defined as the largest past level of total employment since February 1978. Only falls in employment that included periods where employment was more than one per cent lower than its peak were included in this chart.

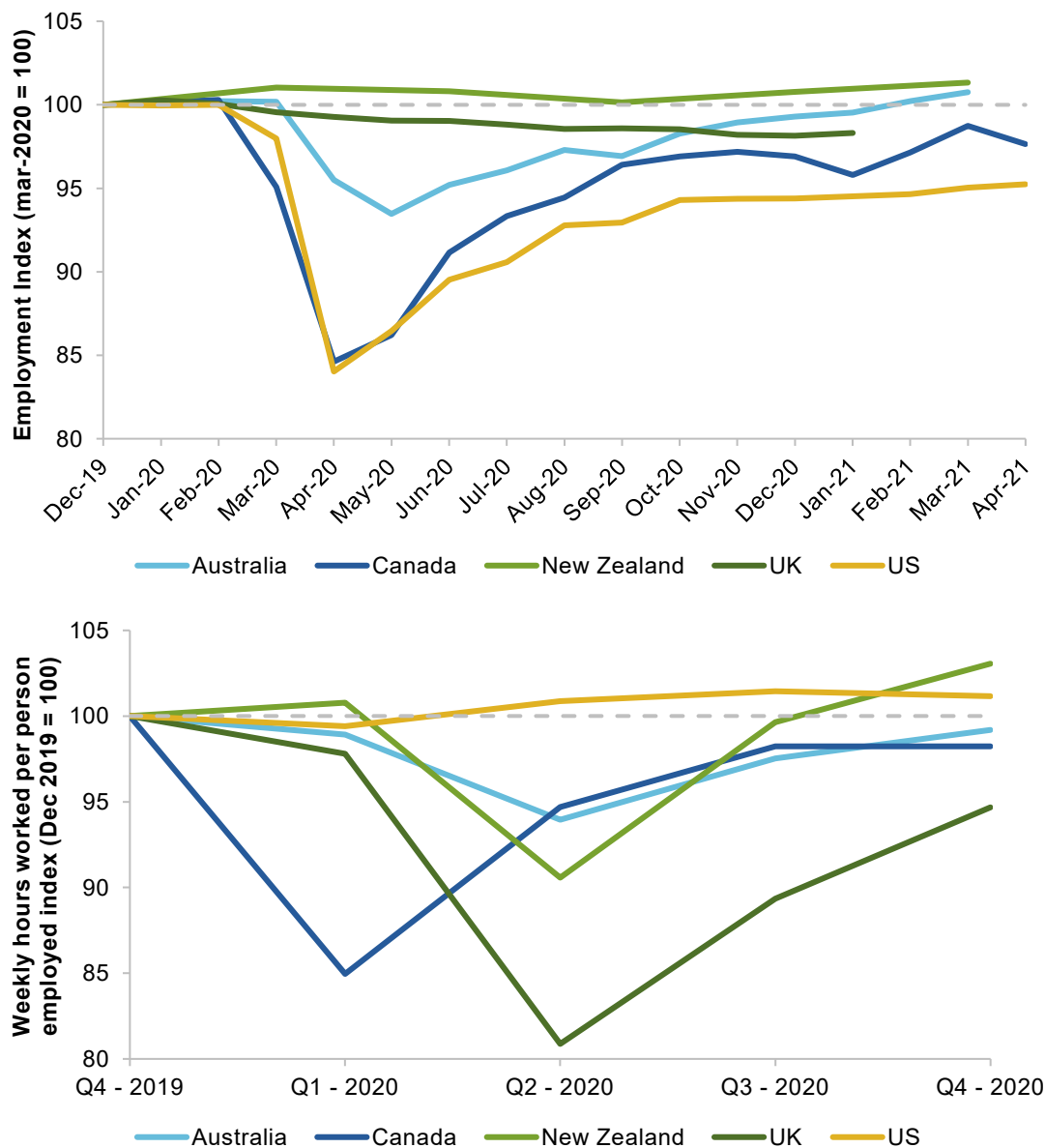
Source: Commission estimates based on ABS (*Labour force Australia, March 2021, Cat. no. 6202.0, table 1*).

Relative to other developed countries, Australia's recovery is also impressive (though not unique). In figure 7, while Australia's initial fall in employment was more severe than in the United Kingdom or New Zealand², it also recovered faster than some countries whose economies were hit hard by COVID-19, such as the United States. The lack of a significant fall in employment in the United Kingdom in response to COVID-19 is noteworthy given its GDP fell about 19 per cent in the June quarter of 2020 (figure 8). This likely reflects that government programs that aimed to preserve the employer-employee relationship caused the reduction in labour input usage to come through reduced hours worked per employee rather than through a reduction in the number of employees. Indeed hours per employee per week fell 5.4 hours between the March and June 2020 quarters in the United Kingdom but only fell by about 1.5 hours in Australia between the March and June quarters (ABS 2020f; ONS 2021b).

² New Zealand only has quarterly data on employment (more frequent figures are available on jobs), if monthly data were available it may have shown a larger decrease during the worst months of COVID-19.

Figure 7 **Australia's recovery in employment is impressive, though not unique ...**

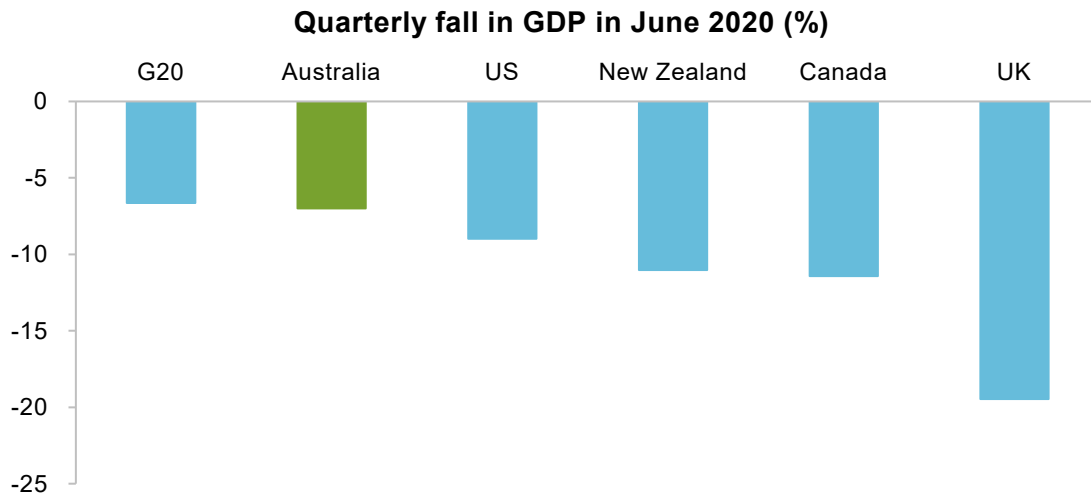
Employment^a (monthly, seasonally adjusted)^b as a proportion of December 2019 levels in select countries and quarterly hours worked in all jobs^{c,d} (seasonally adjusted)^e per worker per week (index) in select countries between December 2019 and April 2020 (top and bottom).



^a Employment in Australia, the US and UK counts those aged 16 and over, while in the UK and Canada those aged 15 and over are counted. ^b Employment in New Zealand is presented on a quarterly basis because monthly number of employed persons statistics do not exist for this country (number of filled jobs statistics exist, but these not necessary correspond to number of employed persons). ^c Only non-farm private employees are shown for the US (the rest of the data is all employees) ^d Hours worked in Australia, Canada and New Zealand count those aged 15 and over, while the US and the UK count those aged 16 and over. ^e Canadian hours worked is not seasonally adjusted.

Sources: ABS (*Labour Force, Australia, March 2021*, Cat. no. 6202.0., tables 1 and 19); Bureau of Labor Statistics (US) (2021); Office of National Statistics (UK) (2021a) and (2021b); Statistics Canada (2021) and (2021); Stats NZ (2021).

Figure 8 **... and GDP fell by a smaller amount in June 2020**
Quarterly fall in GDP (June 2020, seasonally adjusted) in select countries



Source: OECD (2021).

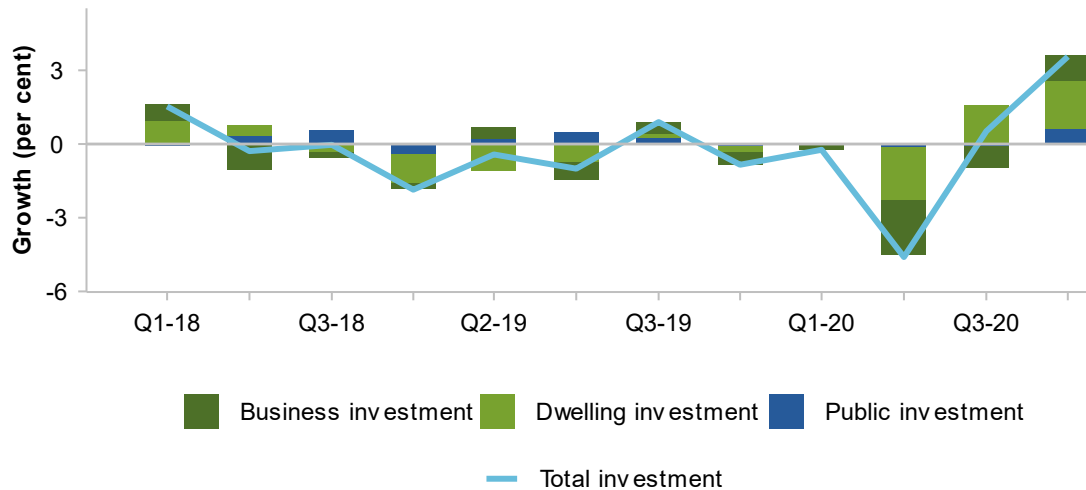
Investment collapsed in June 2020, with a construction-driven recovery following

Simultaneous to the collapse in employment in the June 2020 quarter, private investment fell by about 4.5 per cent, before then recovering in subsequent quarters. This recovery was mostly due to the significant rise in dwelling investment (figure 9). The HomeBuilder program, rising real estate prices and the associated increase in dwelling construction commencements, likely contributed to this rise (section 2). Despite the significant fall in investment during the June quarter, the capital stock continued to grow throughout the pandemic, mainly reflecting that while investment was lower than in previous quarters, it still outpaced depreciation (figure 10). The persistence of capital stock growth throughout the pandemic along with the fall in hours worked explains why most industries experienced measured capital deepening during 2019-20 (section 2).³

³ As discussed in section 2, this capital deepening is likely overestimated when the fall in capital utilisation is accounted for.

Figure 9 Like hours worked, growth in investment fell dramatically in June before rebounding in December ...

Quarterly growth in total investment and contributions from business, dwelling, and government investment^a (chain volume measures, seasonally adjusted)

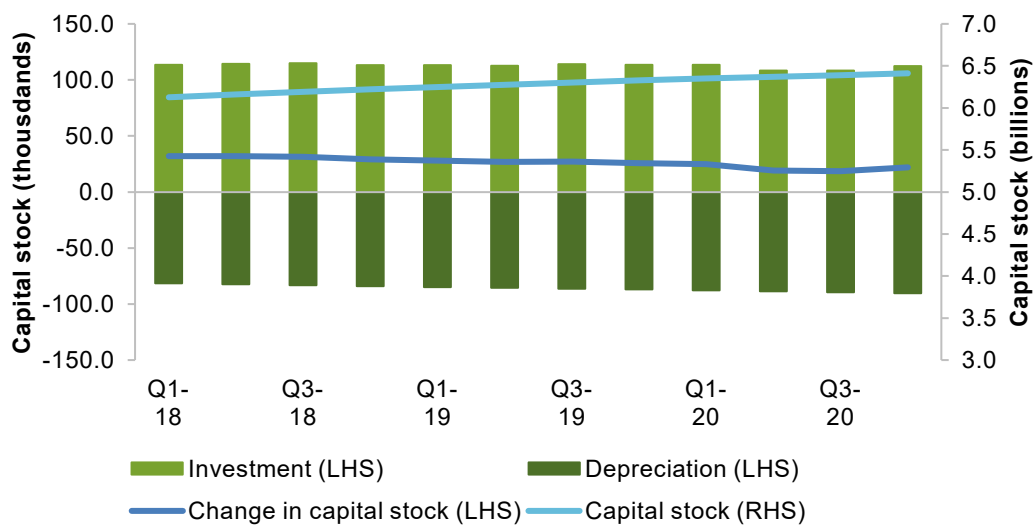


^a Government investment is the sum of general government and public corporations' investment.

Source: ABS (*Australian National Accounts: National Income, Expenditure and Product December 2020*, Cat. no. 5206.0, tables 3 and 12).

Figure 10 ... however, capital stock was positive throughout the period

Net capital stock, investment, depreciation and change in capital stock (current prices, seasonally adjusted)



Sources: ABS (*Australian National Accounts: National Income, Expenditure and Product December 2020*, Cat. no. 5206.0, table 12 and *Australian System of National Accounts 2019-20*, Cat. no. 5204.0, table 57).

A quick recovery

The relatively swift recovery of employment, investment and hours worked largely reflects the unusual nature of the shock itself, the success of the restrictions put in place by governments and the significant subsidies to businesses and workers by government.

The economic effects of COVID-19 were very industry-specific and likely to reverse once the crisis abated. That is, it primarily affected face-to-face service industries and these industries were likely to bounce back once restrictions were removed. For example, while the *accommodation and food*, and *arts and recreation* industries reduced their workforce between 30 and 40 per cent between the February 2020 and May 2020 quarters, for most other industries the falls in employment were much smaller and a few industries (such as *agriculture, forestry and fishing* and *electricity, gas, water and waste services*) increased their workforce. And as at February 2021, both *accommodation and food*, and *arts and recreation* had increased their workforce so that both industries were above 90 per cent of their employment levels at the same time the year before (ABS 2021c).

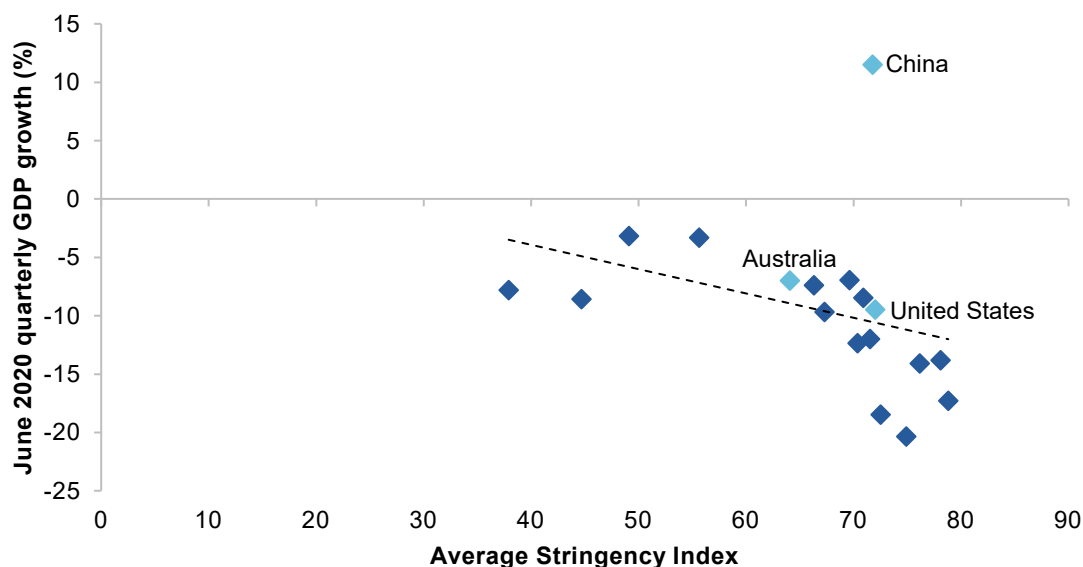
Another reason why employment recovered faster than in previous recessions is that the virus was successfully suppressed. This itself is attributable to a number of factors including Australia's relative isolation (as an island), the amount of voluntary social distancing, the timing and stringency of government measures to contain COVID-19, and the degree of compliance with these measures. The economic effects of restrictions to contain COVID-19 likely differed in the short and long terms. The Oxford COVID-19 Government Response Tracker⁴ estimated the stringency of COVID-19 restrictions for various countries (Hale et al. 2021). Generally countries that had more stringent responses to COVID-19 had larger falls in GDP in the June quarter (figure 11), indicating a short-term trade-off between public health and economic growth. Studies that include various controls and that distinguish between different types of restrictions also show that many restrictions have a short-term negative effect on GDP growth (König and Winkler 2021; Liming et al. 2020).

However, the longer term economic effects of restrictions aimed to limit the spread of COVID-19 are less clear. It is possible that restrictions to reduce COVID-19 trade-off short-term pain with long term gain. Some researchers have analysed Google data on mobility which showed countries with more stringent restrictions ultimately had briefer and less severe reductions in mobility of citizens in face-to-face service sector establishments (Charumilind et al. 2020; Kochończyk and Lipniacki 2021). This is thought to occur because in the absence of government restrictions, citizens voluntarily reduce their spending and face-to-face interactions by a degree significant enough to reduce economic activity *but not* significant enough to limit the spread of the virus. Further, other studies have found that government restrictions explain only a small fraction of the decline in foot traffic to brick and mortar businesses due to COVID-19, with the majority occurring because of *voluntary* reductions in outings of consumers due to fear of infection (Goolsbee and Syverson 2021).

⁴ The Oxford COVID-19 Government Response Tracker collates publicly available information on 20 indicators of government responses. The stringency index contains information on the strictness of 'lockdown style' policies that primarily restrict people's behaviour (Hale et al. 2021).

Figure 11 **In the short term, more stringent restrictions were associated with more severe economic contractions**

Average stringency of COVID-19^a restrictions by country^b and their quarterly GDP growth (seasonally adjusted) in June 2020



^a Average stringency index through the June quarter. ^b The list of countries included in the chart is: South Korea, the United Kingdom, Denmark, Spain, Japan, Canada, Finland, Netherlands, United States, Mexico, Germany, Indonesia, Portugal, Italy, China, Sweden, France and Australia.

Sources: ABS (*International comparisons*), which presented data from Hale et al. (2021); OECD (2021).

The other factor that aided in a swift recovery was the extensive government stimulus, the bulk of which was provided through the JobKeeper and Cashflow Booster programs (box 3). The aims of the different government programs varied, but they jointly aimed to:

- maintain the employee-employer relationship — this would reduce the search costs of matching employees and employers once the crisis ended and prevent an atrophy of skills, ensuring a faster return to work for employees post-COVID-19
- prevent the closure of businesses that would be viable once the pandemic ended — this prevents an atrophy of the skills of business owners, the loss of relationships between businesses, suppliers and customers, as well as preventing the disposal of capital. Essentially this reduced the level of investment (tangible and intangible) that would be necessary to restart the economy once the pandemic ended
- provide an income to individuals affected by COVID-19 — aside from the equity justifications, this would also reduce the barriers to complying with (and resisting) COVID-19 restrictions, helping to ensure a shorter health and economic crisis
- provide stimulus to the economy — this would limit the job losses by expanding the parts of the economy that were least affected by COVID-19 restrictions, potentially absorbing some of the slack from other sectors.

Jobkeeper

On 30 March 2020, in response to deteriorating economic conditions and expectations of worse to come, the Australian Government announced the JobKeeper Payment. This scheme had three objectives: supporting business and job survival, preserving the employment relationship, and providing needed income support. The payment was originally designed to run to 27 September 2020, but on 21 July 2020 it was extended until 28 March 2021 (Treasury 2020c).

Rate of payment

At its commencement, the Jobkeeper payment consisted of a flat fortnightly \$1500 per employee wage subsidy (that businesses could top up if they wished) that was required to be fully passed onto workers.

From 28 September 2020 to 3 January 2021, the JobKeeper Payment rates were reduced to:

- \$1200 per fortnight for all eligible employees who were working in the business or not for-profit for 20 hours or more a week on average in the four weeks of pay periods before either 1 March 2020 or 1 July 2020, and for eligible business participants who were actively engaged in the business for 20 hours or more per week on average
- \$750 per fortnight for other eligible employees and business participants.

From 4 January 2021 to 28 March 2021, the JobKeeper Payment rates were again reduced to:

- \$1000 per fortnight for all eligible employees who were working in the business or not for-profit for 20 hours or more a week on average in the four weeks of pay periods before either 1 March 2020 or 1 July 2020, and for business participants who were actively engaged in the business for 20 hours or more per week on average
- \$650 per fortnight for other eligible employees and business participants (Treasury 2020c).

Eligibility

Only workers that were full-time, part-time (for any amount of time) or those that were casually employed for 12 months or more were eligible. Businesses were eligible for this payment if they anticipated a decline in turnover for a month or quarter during the program compared with a similar period in 2019 (or met an alternative test). Different threshold rates of decline applied depending on entity size and type — over 15, 30 or 50 per cent depending on whether the entity was: a charity, a business with \$1 billion or less in annual turnover, or a business with more than \$1 billion in turnover, respectively. Certain categories of organisations, such as government or universities, were not eligible for the scheme regardless of turnover (Treasury 2020c).

From 28 September 2020, businesses and not-for-profits needed to reassess their eligibility against actual Goods and Services Tax (GST) turnover in the September quarter 2020 to be eligible for JobKeeper Payments from 28 September 2020 to 3 January 2021 (Treasury 2020c).

From 4 January 2021, businesses and not-for-profits were required to again further reassess their turnover to be eligible for the JobKeeper Payment. This required them to meet the relevant decline in turnover test with reference to their actual GST turnover in the December quarter 2020 to be eligible for the JobKeeper Payment from 4 January 2021 to 28 March 2021 (Treasury 2020c).

(continued)

Cost and impact of the program

Jobkeeper was, after some revisions, budgeted at \$70 billion and expected to cover 3.5 million employees (Treasury 2020d). ABS data shows that the cost of the program for the 2020 calendar year was about \$78.7 billion.

Two reviews have considered the employment effects of the Jobkeeper subsidy. The three month review by Treasury (2020d) argued that the plateauing of employment falls in April (a month after the introduction of Jobkeeper) was evidence that Jobkeeper had put a break on employment losses. Bishop and Day (2020) analysed the employment outcomes of individuals who were just below the eligibility requirement of 12 months casual employment to those who were just over the threshold, and estimated that about a fifth of the casual workers just above the threshold continued to be employed as a result of the program. Extrapolating from this figure, Bishop and Day estimated that about 700 000 fewer jobs were lost during the first four months of the COVID-19 employment fall as a result of Jobkeeper.

This extrapolation has two assumptions behind it: that the effect Jobkeeper had on the employment of casuals can be extrapolated to full and part-time employees, and that there are no indirect effects of Jobkeeper on employment (say, through boosting consumer demand and so raising the demand for labour). This omission (though necessary) likely means that Bishop and Day's analysis is indicative of the *lower bound* of the employment effect of JobKeeper.

Cashflow Booster

On 24 March 2020, the Australian Government introduced a new payment to provide temporary cash flow support to small and medium businesses and not-for-profit organisations that employed staff during the economic downturn associated with COVID-19. The payment consisted of tax-free cash flow boosts of between \$20 000 and \$100 000 to eligible businesses, delivered through credits in the activity statement system when eligible businesses lodged their activity statements. This payment was split between the activity statements for two quarters March 2020 and June 2020, with no further payments being made after this date (Treasury 2020a).

Businesses were eligible to receive the cash flow boost provided they were a small or medium business entity, including not-for-profit organisations, sole traders, partnerships, companies or trusts, that met all of the following requirements:

- held an Australian Business Number (ABN) on 12 March 2020 and continues to be active
- had an aggregated annual turnover under \$50 million (generally based on prior year turnover)
- made eligible payments that the business is required to withhold from (even if the amount required to be withheld is zero) (Treasury 2020a).

In addition, the business also needed to have either:

- derived business income in the 2018-19 income year and lodged its 2019 tax return on or before 12 March 2020
- made GST taxable, GST-free or input-taxed sales in a previous tax period (since 1 July 2018) and lodged the relevant activity statement on or before 12 March 2020 (Treasury 2020a).

As at 30 November 2020, Cashflow Booster was estimated to have cost \$34.31 billion (excluding administrative costs) given to about 806 635 businesses (an average cost of \$42 534 per business) who employed about 6.53 million people (ATO 2020). No reviews have yet been conducted to determine the effect of the program on employment or other economic outcomes.

The Australian, State and Territory Governments appear to have achieved these aims. Bishop and Day (2020) studied the causal effect of JobKeeper and found that the job losses in the first four months of the program would have been about 700 000 greater without the program. Note that the design of this analysis could only detect the effect of the subsidy on those who were eligible for the program relative to those who were not. This meant it could not detect the indirect effects that the subsidy might have had on employment through raising aggregate demand, and so these estimates are likely a lower bound of the true estimate. The Commission is not aware of any evaluations of the Cashflow Booster program.

Most research seems to agree that temporary increases to unemployment benefits ('JobSeeker') and the introduction of JobKeeper led to an almost unprecedented rise in income support for many. For example, while criticising subsequent cuts to JobKeeper and JobSeeker, Phillips, Gray and Biddle (2020, p. iv) estimated a microsimulation model of the effects of these programs and found:

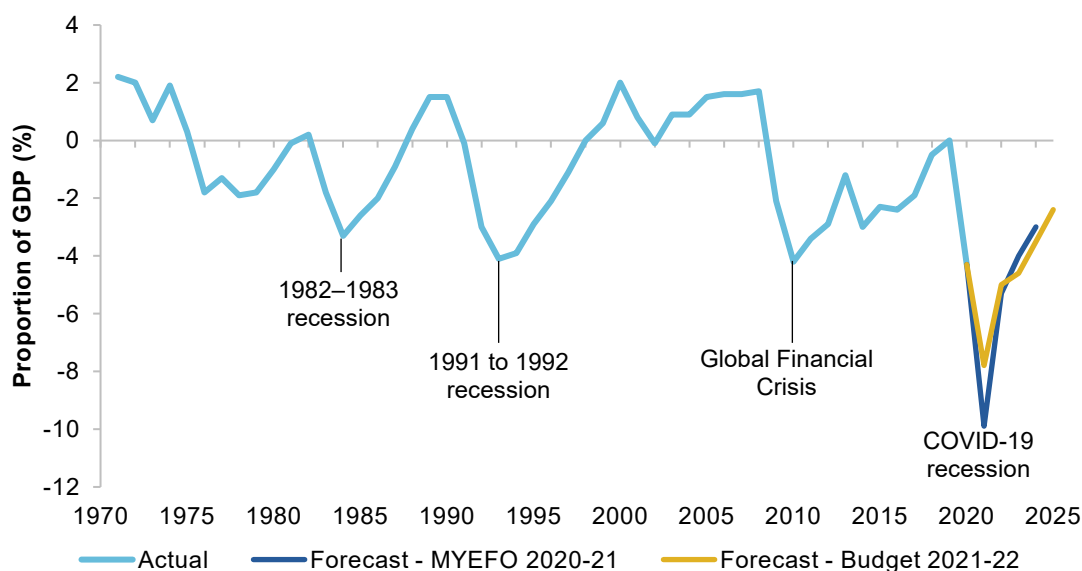
As a result of the introduction of the original JobKeeper and the JobSeeker Supplement, the poverty gap and the number of persons in poverty is not only lower than in the absence of a policy response [to COVID-19] but also much lower than pre-COVID times. The poverty gap has been lowered by 39 per cent and the number of people in poverty has been lowered by around 32 per cent [relative to pre-COVID-19 levels].

That is, for a great number of low-income households, measures to reduce the economic effects of COVID-19 appear to have increased their incomes (relative to pre-COVID) and reduced the degree and rates of poverty. Likewise, Treasury's (2020d) three-month review of JobKeeper found that 'around a quarter of JobKeeper recipients had an income increase in their JobKeeper job relative to their February earnings in that same job'.

Estimating the effectiveness of economic stimulus provided by governments is difficult. Ideally an analysis would take into account the size of the multiplier (that is, for every \$1 in the deficit, how much does overall production increase), and adjust for the fact that the budget deficit is affected by both discretionary (infrastructure spending or policy changes) and automatic (falls in tax revenue and increases in welfare spending) factors. And this analysis of spending should also combine the joint effect of federal, state and local government spending. Nonetheless, even without these adjustments, the level of stimulus provided by the Australian Government appears significant (figure 12). In particular, the underlying cash balance is forecast to fall lower than levels incurred by the recession of the early 1990s or that incurred by the Australian Government during the Global Financial Crisis. It seems likely that this significant level of stimulus (unparalleled since the world wars) increased economic growth during the COVID-19 health crisis.

Government policy also appears to have reduced the rate of business failures, and especially the rate of insolvency (below).

Figure 12 **The faster recovery was partly driven by the Australian Government's large deficit^{a,b}**
 Australian Government underlying cash balance as a proportion of GDP



^a Between 2005-06 and 2019-20, the underlying cash balance is equal to cash receipts from operating activities and sales of non-financial assets plus net earnings from the Future Fund minus cash payments for operating activities, purchases of non-financial assets and net cash flows from financing activities for leases.

^b MYEFO refers to the mid-year economic and financial outlook which updates fiscal and economic estimates from the previous budget.

Sources: Australian Government (2020, 2021).

Business entries and exits

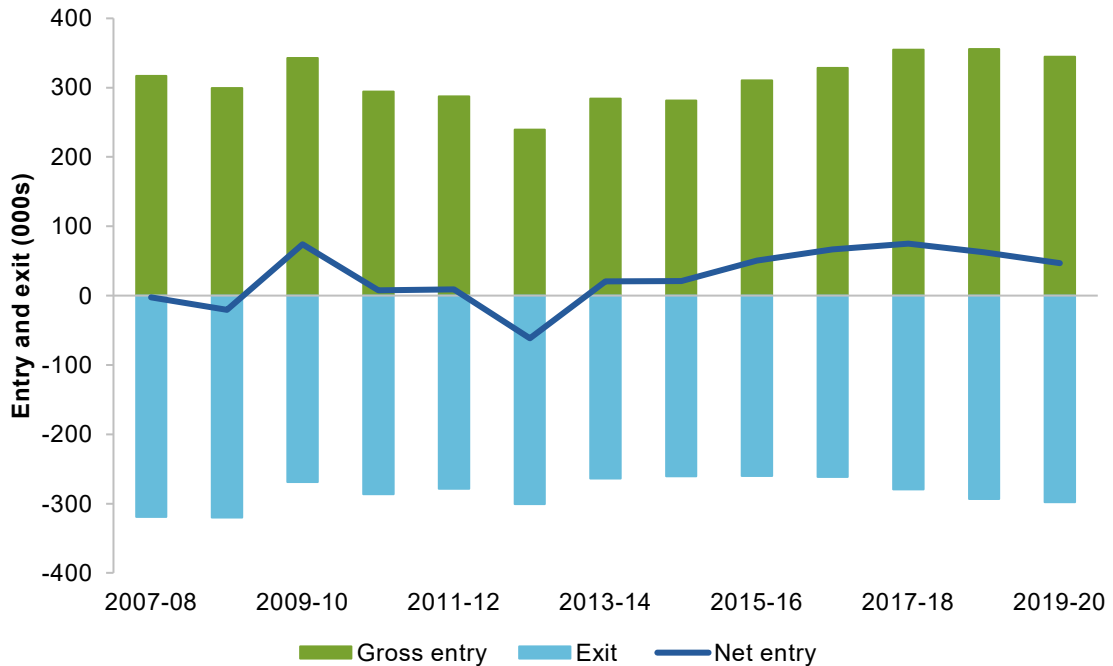
The COVID-19 recession has so far been marked by a relatively small change in the rates of business entry and exit (figure 13). Indeed, more businesses decided to open than to close during 2019-20. Even in some of the industries worst affected by COVID-19 — such as *retail trade* and *accommodation and food services* — more businesses decided to open than to close (table 3). Indeed, *none* of the service industries affected by shutdowns had a net rate of business exit except for *information media and telecommunications*.

Previous recessions, and even non-recessionary slowdowns in growth (such as the Global Financial Crisis and the end of the mining investment boom), tended to be accompanied by higher rates of business exit and slower rates of business entry. Part of the difference could be the nature of the shock itself: some businesses may have believed a fall in profits would only be a temporary consequence of the pandemic, and so, where it was feasible, preferred to hibernate through the downturn than to permanently cease operations. And government policy actively tried to achieve this outcome by providing extensive subsidies for wages and business cashflows (box 2), various stimulus measures, increases to unemployment benefits and changes to insolvency laws (box 3). The combined effect of these policies was to reduce

the cost of employment, increase the profitability of businesses and ultimately reduce the pressure on businesses to close.

Figure 13 Annual rates of business entry and exit barely changed in response to COVID-19 ...

Counts of business entry and exit from 2007-08 to 2019-20



Source: ABS (*Counts of Australian Businesses including Entries and Exits*, Cat. no. 8165.0., table 1).

Figure 14 suggests that government policy had a more significant effect on insolvencies than on overall business exits, as insolvencies in 2019-20 were 44 per cent lower than the 15-year average. The effect of delaying insolvency on exits, independent of other policies, is difficult to determine. Not all insolvent businesses will exit the market and not all businesses that exit the market do so because they are insolvent. Many businesses that are unable to meet their debt obligations re-negotiate existing payments and agreements with employees, landlords, banks and other creditors to continue trading while they find avenues to boost cashflows. This was the case in 2012 when Nine Entertainment (Channel 9 — unable to meet their debt obligations — sold the firm to creditors Oaktree Capital, Apollo Global Management and Goldman Sachs in an equity for debt swap (Bowden, Poole and James 2012). Additionally, most firms leave the market for reasons other than insolvency⁵, for example a family business closing as the founder retires or private companies (without debt obligations) becoming unprofitable. These caveats aside, insolvency is a cause of business exit and the

⁵ Almost 300 000 firms exited the market in 2019-20 and only 7362 firms filed for insolvency over the same period.

significant relaxation of insolvency laws likely resulted in numerous firms remaining in the market that would have otherwise ceased operations.

Table 3 ... and most industries experienced an increase in net entrants during 2019-20

Per cent of firms exiting and entering in 2019-20

<i>Industry</i>	<i>Entry rate (per cent)</i>	<i>Exit rate (per cent)</i>	<i>Net entrants (per cent)</i>
Agriculture, Forestry and Fishing	6.7	7.7	-1.0
Mining	10.4	11.3	-0.9
Manufacturing	10.9	11.0	-0.1
Electricity, Gas, Water and Waste Services	15.1	12.6	2.5
Construction	14.9	14.3	0.6
Wholesale Trade	13.5	12.8	0.7
Retail Trade	14.4	13.6	0.8
Accommodation and Food Services	16.7	16.0	0.7
Transport, Postal and Warehousing	24.6	19.1	5.5
Information Media and Telecommunications	15.3	15.7	-0.5
Financial and Insurance Services	11.4	9.1	2.2
Rental, Hiring and Real Estate Services	10.7	8.8	1.8
Professional, Scientific and Technical Services	15.7	13.2	2.5
Administrative and Support Services	20.6	16.0	4.5
Public Administration and Safety	17.2	16.6	0.6
Education and Training	17.3	13.5	3.8
Health Care and Social Assistance	13.6	8.6	5.0
Arts and Recreation Services	17.5	13.1	4.4
Other Services	15.8	12.9	2.9

Source: ABS (*Counts of Australian Businesses including Entries and Exits*, Cat. no. 8165.0., table 2.

Box 4 **Temporary relaxation of insolvency laws**

On 24 March 2020, in response to fears of mass business exodus, the Australian Government announced a temporary relief for financially distressed businesses that would remain in place until 1 January 2021. The primary objective of this scheme was to provide temporary relief to viable and profitable businesses that could face temporary financial distress due to the economic impacts of COVID-19 and health measures enacted to prevent its spread.

The key elements of the package were:

- a temporary increase in the threshold at which creditors can issue a statutory demand for payment on a company (from \$2000 to \$20 000) and the time companies have to respond to statutory demands (from 21 days to 6 months)
- the threshold for the minimum amount of debt required for a creditor to initiate bankruptcy proceedings against a debtor (individual) increased from \$5000 to \$20 000 (this applied for six months). Individuals also benefited from the increased timeframe to respond to statutory demands from 21 days to 6 months
- temporary relief for directors from any personal liability for trading while insolvent
- providing temporary flexibility in the *Corporations Act 2001* to provide targeted relief for companies from provisions of the Act to deal with unforeseen events that arise as a result of the coronavirus health crisis.

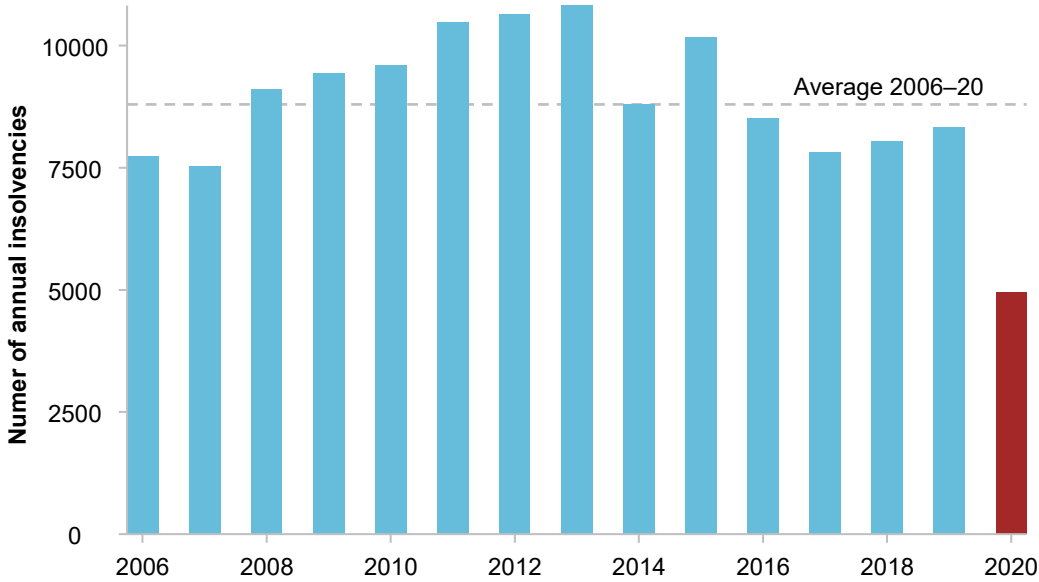
The rise in thresholds will primarily benefit small businesses due to the relatively small increase. The other changes will benefit insolvent businesses (or near insolvent) that are facing the likelihood of closure.

To the extent that government policy did limit the usual increase in business exits seen in a recession, it was arguably justified by the unique nature of the COVID-19 economic shock. A traditional downturn places disproportionate pressure on the least profitable and therefore often least productive firms in each industry. As a result, greater rates of exit can cause an exodus of low productivity firms which can lead to a relocation of inputs from lower to higher productivity firms, raising average productivity. However, the COVID-19 shock stemmed from a temporary health crisis and affected industries based on how intensely they were involved in face-to-face transactions with customers, rather than how productive they were. Therefore, in the absence of intervention, it is not certain that an exodus of firms would have reallocated labour from lower to higher productivity firms. Additionally, in the short term, a sudden rise in business exits could have had a destabilising effect on the macroeconomic environment, worsening any downturn even further.

Now that most forms of government assistance — such as JobKeeper, Cashflow Booster and temporary changes to insolvency rules — have ended it seems likely that business exits (and especially insolvencies) will increase. While this will present short term challenges, in the absence of evidence of severe macroeconomic instability, policymakers should resist the urge to protect failing businesses in industries that are no longer significantly affected by

COVID-19.⁶ Propping up businesses is likely to hinder the reallocation of inputs from unproductive to productive uses and reduce the incentives for business owners to innovate.

Figure 14 **Annual insolvencies decreased dramatically in 2020**
Companies entering administration between 2006 and 2020



Source: ASIC (2020).

Factor income grew while production fell

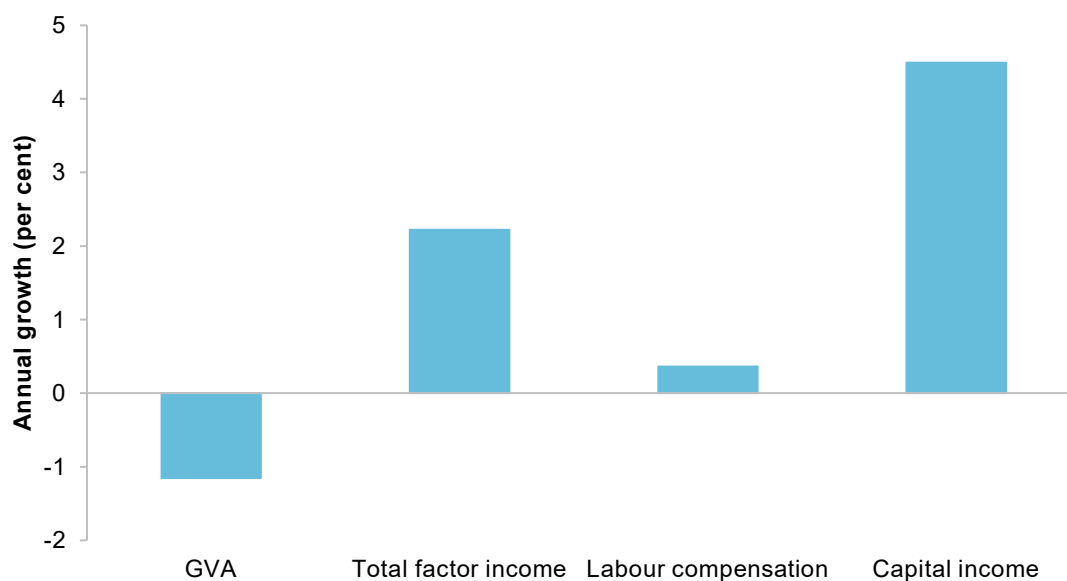
One metric that demonstrates the magnitude of the Australian Government’s response to COVID-19 is the divergence between physical production and factor incomes (wages and profits). Usually during a recession, both physical production (GDP) and the income from production (‘total factor income’) fall, with capital income tending to fall more than wages. However, in 2019-20 both labour compensation and capital income grew while production fell (figure 15). And profits increased more than labour compensation.

Through the JobKeeper and Cashflow Booster programs, 8 per cent of factor income (wages plus capital income) was directly funded by the Australian Government in the final nine months of the 2020 calendar year (figure 16). And for some industries this figure was much higher: 30 per cent of the income generated in the *accommodation and food services* industry and 29 per cent of the income in *other services* came from the Australian Government.

⁶ Some assistance may be justified for industries that are still affected by border closures such as airlines, tourism operators or possibly higher educational institutions.

Generally, industries that were more affected by COVID-19 received more government assistance, though this is difficult to quantify.⁷

Figure 15 **Income rose while production fell ...**
Real^a growth in total factor income^b and gross value add, labour compensation and capital income in the market sector in 2019-20



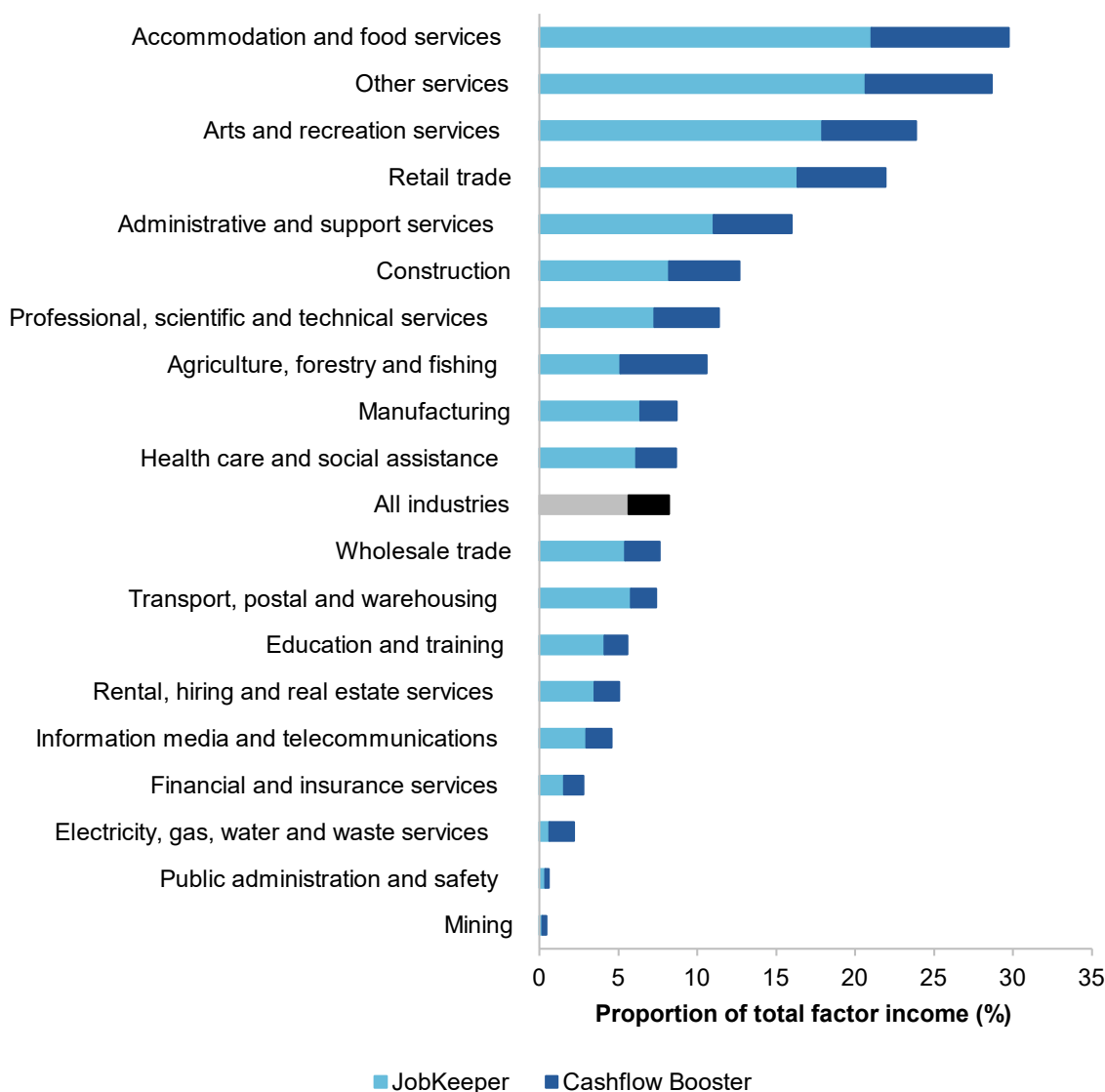
^a Real means deflated by the implicit deflator for market sector gross value add. ^b Total factor income is the sum of gross mixed income, profits and wages. It measures the income generated by Australian production.

Source: ABS (*Australian National Accounts: National Income, Expenditure and Product, September 2020*, Cat. no. 5206.0., table 6).

⁷ One could, for example, plot the level of assistance (perhaps as proportional to total factor income) by industry against the fall in employment, revenues (excluding subsidies) or output but this would fail to account for the effect that assistance likely also affected the size of the falls in these variables as well.

Figure 16 ... due to significant levels of government aid through 'Jobkeeper' and 'Cashflow Booster'

JobKeeper and Cashflow Booster payments to industry as a proportion of total factor income between April 2020 and December 2020



Source: Commission estimates using ABS (*Australian National Accounts: National Income, Expenditure and Product, December 2020*, Cat. no. 5206.0., tables 1, 45).

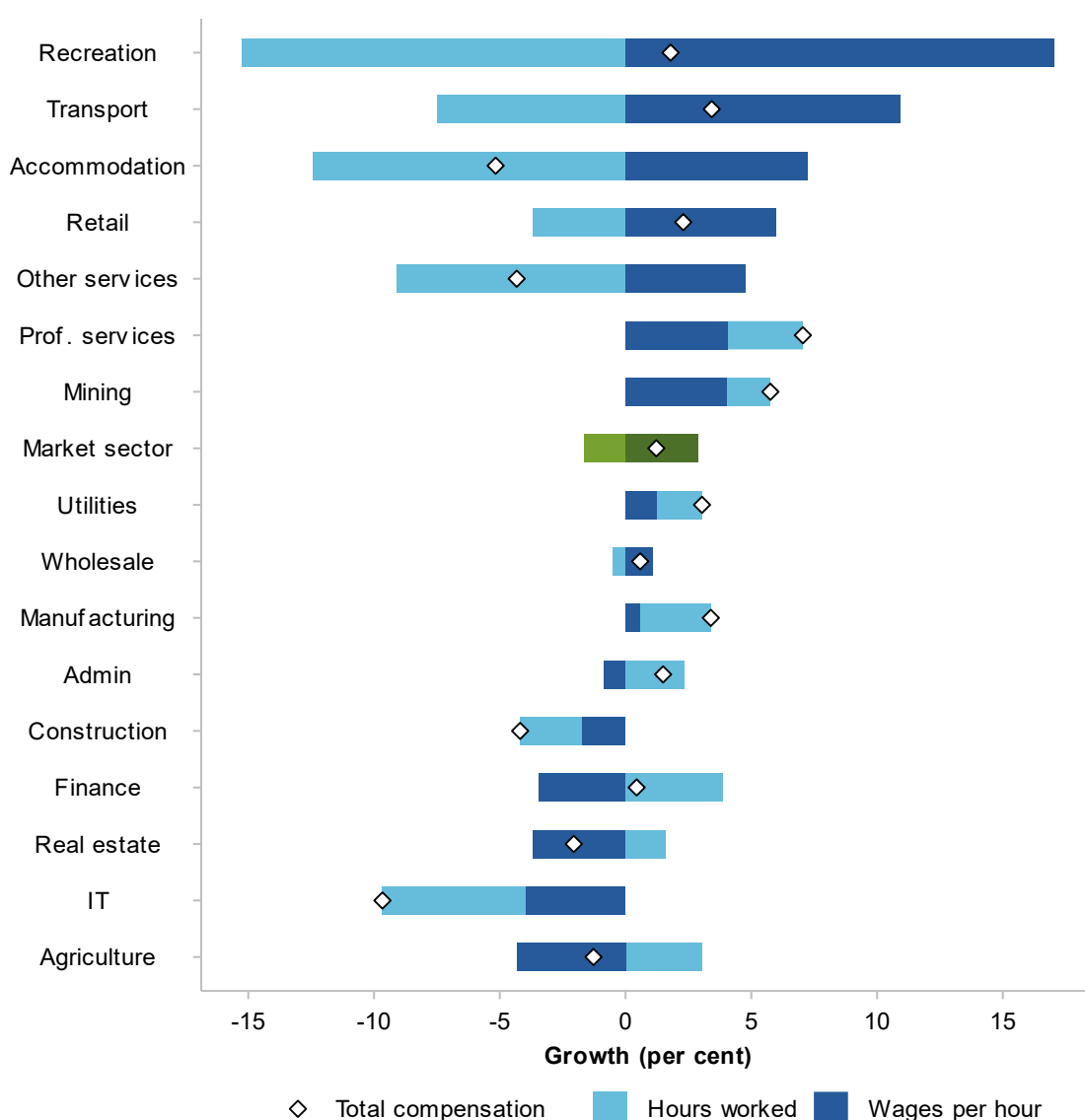
Hard hit industries experienced the largest increases in hourly wages

One of the combined effects of COVID-19 and the government assistance designed to mitigate its economic fallout was a large hourly wage increase for industries that had the largest falls in hours worked (figure 17). For example, despite being one of the hardest hit industries in 2019-20, the hourly wage in the *arts and recreation* industry increased over 10 per cent (its

highest annual rate of increase on record) even though its total labour compensation (wages times hours worked) increased slight (1.8 per cent). In many cases, this outcome was driven by JobKeeper initially paying a fixed subsidy that was not proportional to the number of hours worked, so as revenues declined many firms chose to retain workers on JobKeeper at reduced hours but similar (and in some cases higher) total take home pay.

Figure 17 Industries that shed the most labour in 2019-20 tended to experience the highest wage increases

Growth in total compensation and contributions from hours worked and wages per hour^a by market sector industries in 2019-20



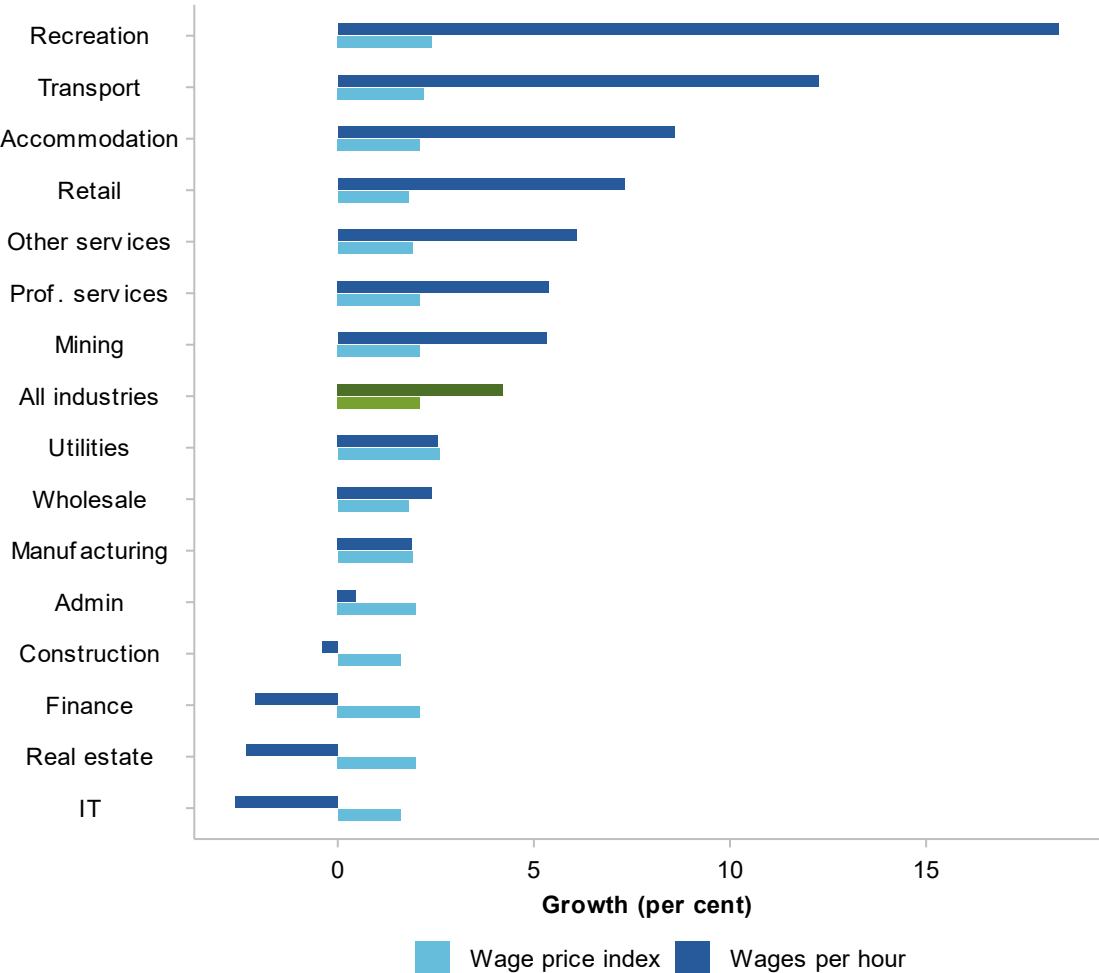
^a Compensation is the labour share of total factor income deflated by the consumer price index (CPI).

Sources: Commission estimates using ABS (*Australian System of National Accounts, 2019-20*, Cat. no. 5204.0., table 46 and *Estimates of Industry Multifactor Productivity, 2019-20*, Cat. no. 5260.0.55.002., table 14 and *Consumer Price Index, December 2020*, Cat. no. 6401.0, table 1 and *Labour Account Australia, September 2020*, Cat. no. 6150.0.55.003, tables 1-19).

Further evidence of the effect of JobKeeper on hourly wages can be seen in figure 18, where wage growth per hour measured by the wage price index (which includes, among other things, JobKeeper payments (ABS 2020g)) grew slower than wage growth per hour measured by total factor income multiplied by the labour share of income in some of the industries hardest hit by COVID-19, such as *arts and recreation; transport, postal and warehousing; and accommodation and food services*.

Figure 18 COVID-19 and JobKeeper meant broad and narrow definitions of wage growth did not align

Wages^a per hour worked and wage price index growth by market sector industries^b in 2019-20



^a Wages **per hour** are the labour share of total factor income ^b All industries includes non-market industries for the wage price index but does not include agriculture, forestry and fishing, for the **broader** wages per hour measure, all industries only refers to market sector industries.

Sources: Commission estimates using ABS (*Australian System of National Accounts, 2019-20*, Cat. no. 5204.0., table 46 and *Estimates of Industry Multifactor Productivity, 2019-20*, Cat. no. 5260.0.55.002., table 14 and *Wage Price Index, December 2020*, Cat. no. 6345.0, table 5a and *Labour Account Australia, September 2020*, Cat. no. 6150.0.55.003, tables 1-19).

2 Industry-level productivity performance

Although labour productivity rose across the market sector in 2019-20, outcomes varied significantly by industry (figure 19). Six out of the sixteen market sector industries increased their labour productivity, with the largest increase occurring in *arts and recreation*. Generally, most of the industries with the largest labour productivity increases were industries that had large falls in hours worked due to COVID-19 restrictions (such as *retail trade*) combined with either only a relatively small fall or in some rare cases an increase in output.

There are several possible causes of some industries experiencing larger falls in labour hours than in output. In many cases, the first workers to be made redundant may have been the least experienced (and often least productive). And capital, in the absence of its physical destruction, tends to be harder than labour to decrease at the economy-wide level in the short term because even if investment falls to zero⁸ the capital stock will only decrease by the rate of depreciation. Evidence of this stickiness of capital during COVID-19 can be seen in figure 20, where capital increased in most industries even while labour hours fell significantly. This stickiness of capital relative to labour can result in measured capital deepening in the short term, notwithstanding that the utilisation of capital (which is not directly measured)⁹ likely fell. In other words, recorded increases in capital deepening and labour productivity may to some degree reflect overestimation of capital services during this short and unusually volatile period.

Another possibility is that there are compositional changes within division-level (one digit) industries. That is, within the division level industry, it could be that the least productive subdivision (two digit) industries were the ones that shed the most labour causing average productivity within the whole industry to rise. This possibility is not directly testable because hours worked data is not available in the ABS's *Labour Account* dataset¹⁰ and GVA estimates are not available for all subdivision level industries.

It is also possible that the small fall in output relative to a large fall in hours worked experienced by many industries is indicative of COVID-19 forcing firms to innovate during the pandemic. For example, many firms have implemented labour saving technology such as digital screens to take orders at restaurants or firms using virtual reality to allow customers to try on clothes online before purchasing them. However, this explanation cannot be directly tested as the effects of technology on the MFP statistics cannot be readily disentangled from the various other effects.

⁸ Falls in investment can also be partially offset by the build of inventories that tends to occur in the early stages of a recession.

⁹ Utilisation of capital is assumed to be constant over time. To avoid the issues of utilisation fluctuating across the business cycle from affecting productivity statistics, the ABS (2015, pp. 427, 431, 444) prefers to compare average productivity growth across 'productivity cycles' (essentially between peak to peak deviations from long-term MFP growth). The ABS (2020h) has also produced experimental estimates of modelling utilisation of capital and show this does not appear to alter estimates of multifactor productivity by very much.

¹⁰ The ABS's *Labour Force Survey* does have hours worked at the subdivision level but as this is a household dataset it sometimes conflicts with the national accounts (which balance the results of business and household surveys via the *Labour Account*).

Some of the industries with the largest falls in hours worked and output are the expected results of the COVID-19 health crisis. *Accommodation and food services*, and *arts and recreation* both involve significant face-to-face contact with customers and so were strongly affected by voluntary increases in social distancing as well as mandatory lockdowns and other measures. Though in the former, only output fell, not labour hours (figure 19).

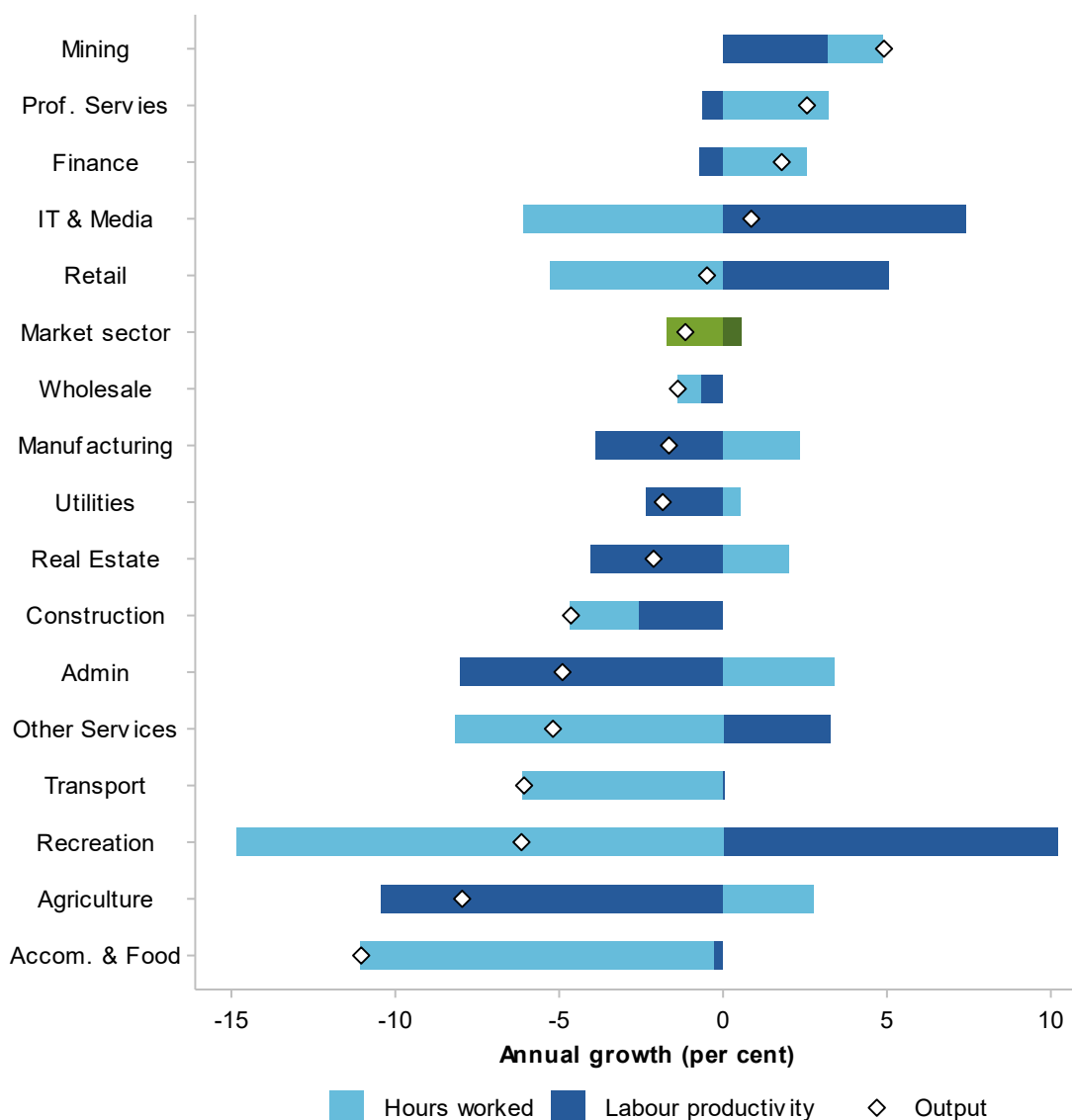
Other division level industries experienced falls in hours and output due to particular subdivision industries experiencing very large falls in demand. For example, while the *road transport* component of the *transport, postal and warehousing* division industry had a small increase in output (1.7 per cent), the *air and space transport* component had a large decline in output (27 per cent annually) causing overall *transport, postal and warehousing* output to fall (6.1 per cent). Likewise, according to the ABS, falls in hours worked in *information media and telecommunications* are due to a fall in the *other information and media services* subdivision industry, likely reflecting, ‘declines in cinema attendance as social distancing restrictions were introduced and cancellation of advertising campaigns’ (ABS 2020a).

The labour productivity growth rates in a few other industries also appear to have also been driven by particular subdivision industries. *Construction* experienced a decline in output (4.6 per cent) due to a fall (8.2 per cent) in the June 2020 quarter that was driven by a large fall (12.6 per cent) in output in the *construction services* (such as plumbing, electrical and air conditioning) subdivision industry. However, construction activity has picked up significantly in the final quarter of 2020 (ABS 2021b).

This pickup in construction activity likely reflects the (interrelated) effects of the HomeBuilder program (Treasury 2020b) and recent rises in residential dwelling prices. A few key attributes of the recovery in construction activity hint at its causes: recent rises in construction activity have only occurred in residential construction, this increase only occurred in the final quarter of 2020 and new dwelling commencements have increased more than actual work done (that is, there will likely be significant future construction work but the program has not produced much work yet). The number of new private sector house commencements were below their levels at the same point the year before for most of 2020 but then jumped 27 per cent between the September and December quarters (ABS 2021a). Likewise, while the value of residential construction work done increased 2.7 per cent in the December 2020 quarter, non-residential and engineering (construction that does not have a roof such as roads, rail and pipeline works) construction both fell (ABS 2021b).

Figure 19 **Growth in output, hours worked, and labour productivity varied significantly by industry**

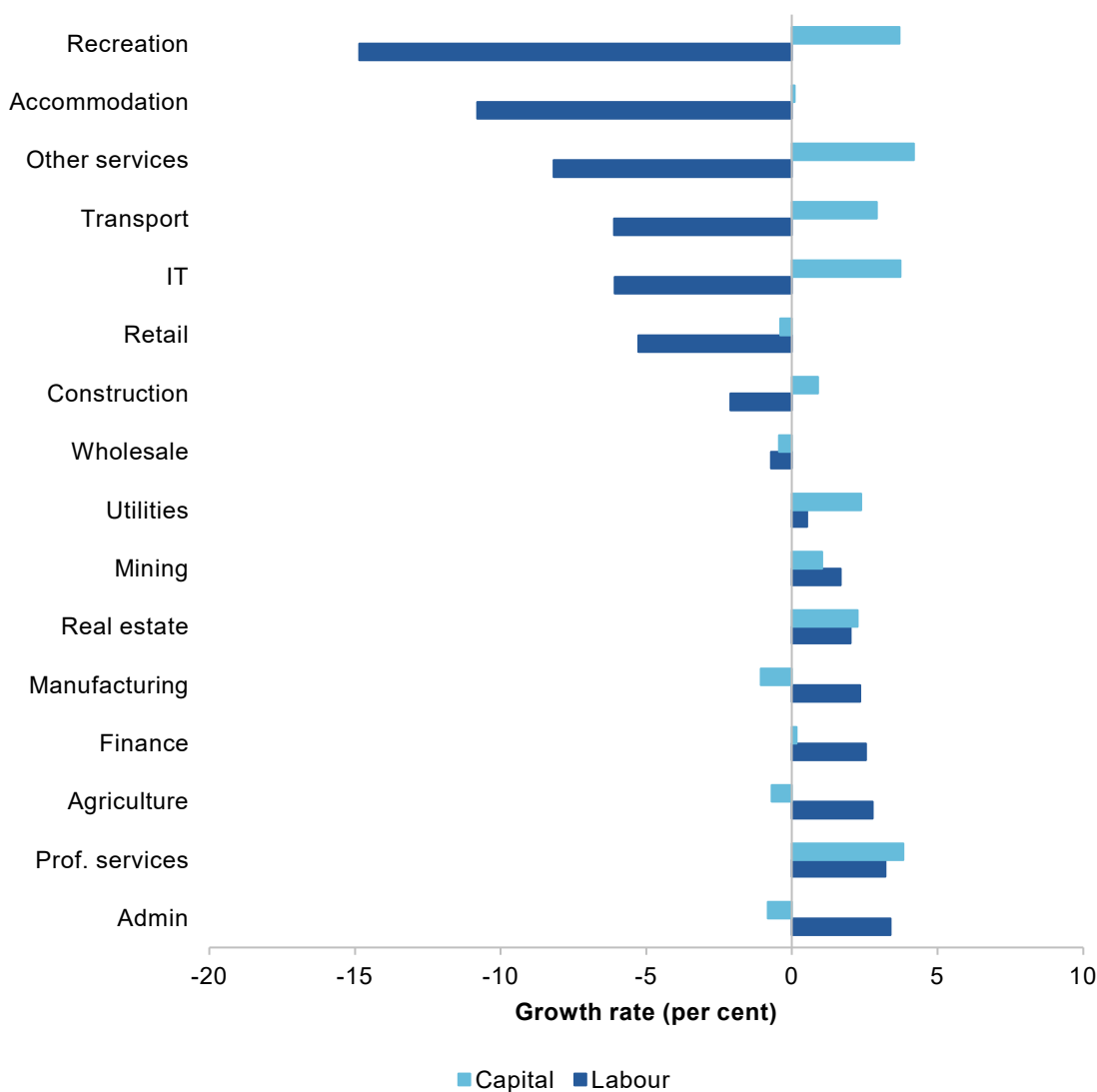
Output growth and the contributions from labour productivity growth and hours worked growth in market sector industries^a in 2019-20



^a Prof. services, finance, IT, retail, wholesale, utilities, real estate, admin, transport, recreation, agriculture, accommodation represent professional, scientific, and technical services, financial and insurance services, information media and telecommunications, retail trade, wholesale trade, electricity, gas, water and waste services, rental, hiring and real estate services, administrative and support services, transport, postal and warehousing, arts and recreating services, agriculture, forestry and fishing, accommodation and food services respectively.

Source: ABS (*Estimates of Industry Multifactor Productivity, 2019-20*, Cat. no. 5260.0.55.002., tables 6, 9 and 10).

Figure 20 In many industries capital rose while labour fell
Capital services and hours worked growth in 2019-20



Source: ABS (*Estimates of Industry Multifactor Productivity, 2019-20*, Cat. no. 5260.0.55.002., tables 9 and 10).

The HomeBuilder program and the recent rises in residential dwelling prices also explain why the construction boom occurred only in late 2020 and was focused on residential construction. In particular, the fact that HomeBuilder only applied to residential construction and it allowed work to commence up to 18 months after eligible contracts were signed and these contracts could be signed up to 31 December 2020 (Treasury 2020b), means that a significant lag between the initiation of the program and construction rising is to be expected. The timing of the rise in residential construction may also reflect recent rises in residential dwelling prices — the weighted average of the eight Australian capital cities price index fell 1.8 per cent in the June 2020 quarter but climbed 3 per cent in the December 2020 quarter (ABS 2021d).

Some industries experienced falls in output and hours worked as a combination of downstream falls in consumer demand that were likely exacerbated by COVID-19 restrictions. *Manufacturing* output fell (1.6 per cent), driven by falls in *petroleum, coal, chemical and rubber products* (2.1 per cent) and *other manufacturing* (5.9 per cent, includes jewellery, silverware and recreational products) (ABS 2020c).

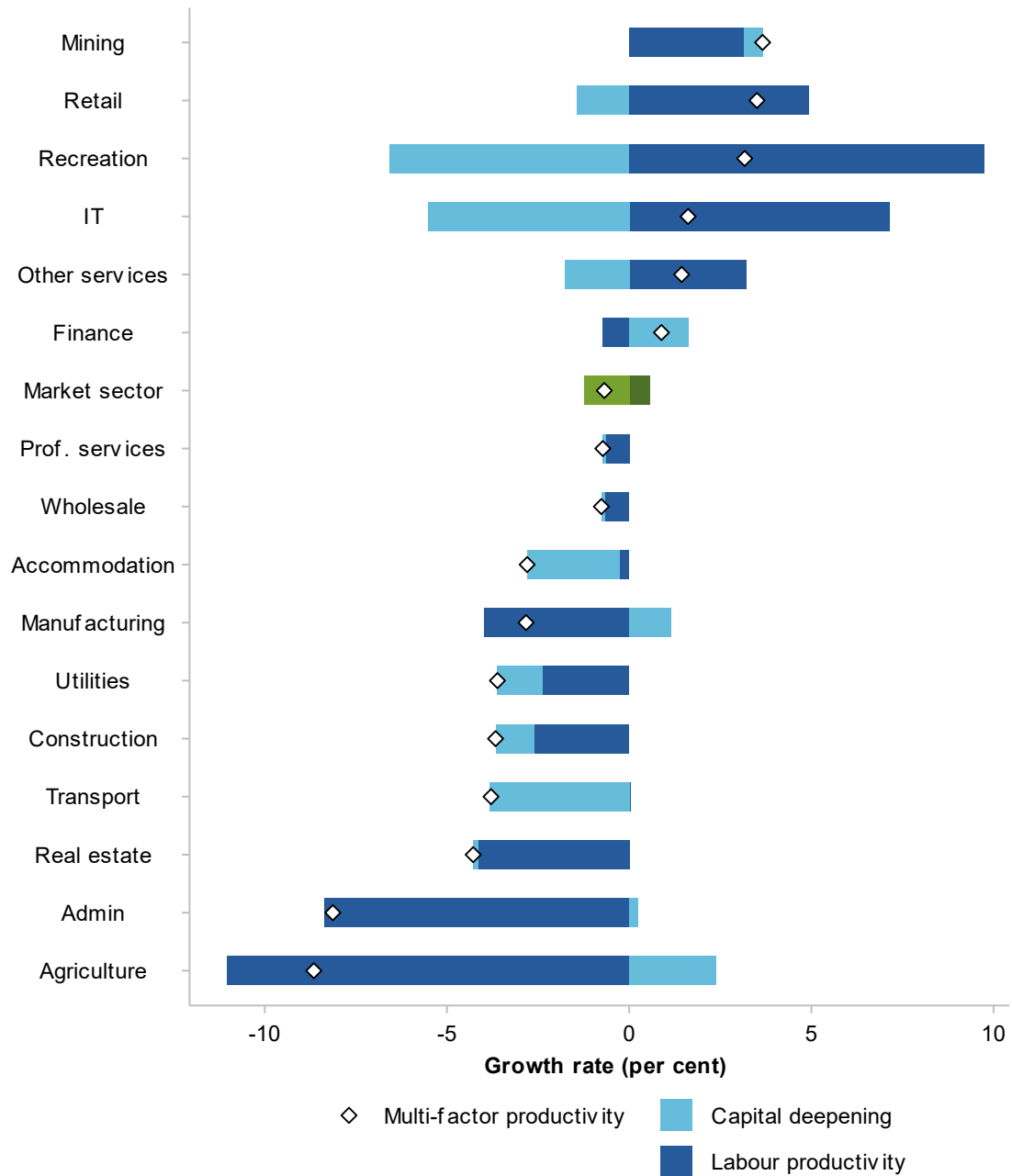
Commodities were less affected by COVID-19 than most other sectors. The *agriculture, forestry and fishing* industry continued its drought-driven decline in output seen in previous years (though the GVA data for the final quarters of 2020 show that La Nina has already boosted output (ABS 2020b)) that was likely exacerbated by the labour shortages caused by the closure of international borders. Despite recent trade tensions, the *mining* industry — especially *oil and gas extraction* — experienced strong growth in inputs and outputs, with *mining* labour productivity rebounding after a poor performance the previous financial year, increasing 3.2 per cent in 2019-20 (it fell 3.2 per cent in 2018-19).

Certain other industries appeared to do well through COVID-19. For example, the *computer systems and related services* subdivision of *professional, technical and scientific services* experienced a boost in output, likely driven by the needs of a workforce adapting to the working from home induced by COVID-19. Likewise, *financial and insurance services* experienced growth in output and labour productivity, mainly due to the *finance* subdivision benefiting from ‘a significant rise in deposit balances as businesses and households increased liquidity in response to COVID-19’ (ABS 2020a).

MFP fell in most industries to a greater degree than labour productivity (figure 21). Generally, MFP fell for most of the same reasons that labour productivity fell but usually by a greater amount due to the stickiness of capital causing some (potentially mismeasured, box 2) capital deepening. Examples of this are the *accommodation and food services*, and *transport, postal and warehousing* industries where sticky capital and falling labour hours caused significant capital deepening that meant labour productivity did not fall as much as MFP.

Figure 21 MFP largely followed the same trends as labour productivity with some differences due to capital falling less than labour

Multifactor productivity growth and contributions from capital deepening and labour productivity in market industries in 2019-20



Source: ABS (Estimates of Industry Multifactor Productivity, 2019-20, Cat. no. 5260.0.55.002., table 6).

Labour reallocation between industries had a positive effect on productivity

Aggregate labour productivity increases can come from two sources. There are productivity gains due to firms using labour more efficiently (*within* effects) and there are the gains from labour moving from low to high productivity industries (*between* effects). To understand the effects of changes in the distribution of labour across industries, the ABS decomposes market sector labour productivity growth into its contributions from the direct (within industries) effect and the reallocation (between industries) effect (appendix 1). Under this approach, industries have positive reallocation effects if they experience an increase in their labour inputs and their industry share of output (GVA) is greater than their industry share of labour (that is, they are higher than average labour productivity), or if they experience a fall in labour hours and their share of output is smaller than their share of hours (that is, they are lower than average labour productivity). An industry can increase its *share* of total labour inputs even if its number of labour inputs *falls* so long as its use of labour inputs falls proportionally less than the market sector average.

In 2019-20, productivity growth was driven primarily by between effects; low productivity industries — such as *retail trade* and *accommodation and food services* — shed labour while higher productivity sectors — such as *mining* and *financial and insurance services* — maintained or grew their share of the workforce (table 4). Part of why this labour reallocation occurred, despite the implementation of JobKeeper and other subsidies, may reflect the heavy use of casual workers in retail and hospitality who may not have been eligible for JobKeeper (box 3). Some industries, such as *mining* and *arts and recreation*, had significant contributions from within industry productivity growth but numerous other industries, such as *agriculture, forestry and fishing* and *manufacturing*, experienced significant offsetting within industry productivity declines.

Figure 22 shows the changes in hours worked in each industry, ordered by relative labour productivity. This confirms that higher productivity industries such as *mining, financial and insurance services* and *electricity, gas waste and water services* increased their labour input usage, likely because these industries were little affected by COVID-19 restrictions. Whereas services with more face-to-face interactions, and lower relative labour productivity, such as *other services, accommodation and food services*, and *retail trade* decreased their labour input usage.

Table 4 Industry contribution to market sector labour productivity growth

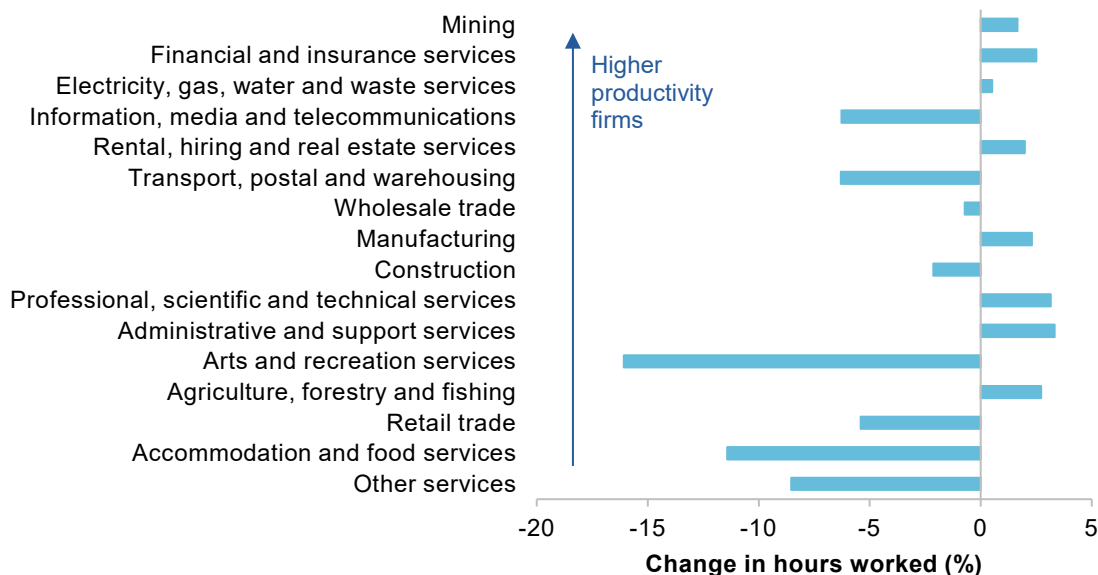
Contributions from 'gross' labour productivity growth, labour reallocation and total industry contribution

<i>Industry</i>	<i>Contributions to growth</i>		
	<i>Gross labour productivity growth</i>	<i>Labour reallocation</i>	<i>Total industry contribution</i>
Agriculture, forestry and fishing	-0.33	-0.04	-0.37
Mining	0.46	0.19	0.65
Manufacturing	-0.33	-0.05	-0.38
Electricity, gas, water and waste services	-0.08	0.01	-0.07
Construction	-0.28	0.07	-0.21
Wholesale trade	-0.04	-0.01	-0.05
Retail trade	0.30	0.29	0.59
Accommodation and food services	-0.01	0.50	0.49
Transport, postal and warehousing	0.00	0.06	0.06
Information media and telecommunications	0.23	-0.05	0.18
Financial and insurance services	-0.09	0.18	0.09
Rental, hiring and real estate services	-0.17	0.03	-0.14
Professional, scientific and technical services	-0.07	-0.07	-0.14
Administrative and support services	-0.42	0.03	-0.39
Arts and recreation services	0.46	0.07	0.29
Other services	-0.33	-0.01	0.33
Market sector	-0.62	1.57	0.95

Source: ABS (*Estimates of Industry Multifactor Productivity*, table 22).

Figure 22 **Lower productivity industries experienced more contraction in their workforces than higher productivity industries**

Change in hours worked in 2019-20 by industry, with industries ordered (descending) by their relative labour productivity^a



^a Relative labour productivity for an industry was estimated as the ratio of the two year average share of gross value added from the *Australian System of National Accounts* to the two year average share in hours worked in the *Labour Account* (this is mathematically equivalent to ranking industries by their two year average labour productivity).

Sources: Commission estimates using ABS (*Australian System of National Accounts, 2019-20*, Cat. no. 5204.0., table 5; *Estimates of Industry Multifactor Productivity, 2019-20*, Cat. no. 5260.0.55.002., tables 1–19; *Labour Account Australia, December 2020*, Cat no. 6150.0.55.003., tables 2–20).

3 Structural effects of COVID-19

COVID-19 caused a number of structural changes that may have permanent productivity implications. For example, it forced consumers and businesses to experiment with virtual transactions such as online shopping, working from home and video link delivery of services (such as telehealth). COVID-19 also resulted in a number of policy changes that may have long-term structural effects including the JobKeeper program and temporary changes to insolvency laws.

Determining the degree to which economic trends observed during COVID-19 are transitory or permanent depends upon the effect of this recession on skills, consumer preferences, capital and regulatory frameworks. For example, it is possible that the increase in online shopping that occurred during COVID-19 will have a lasting effect on preferences between online and in person products, or between goods from different industries. This would likely have downstream effects on the composition of labour, output, and capital, as well as the

investment firms make in developing new practices and products. Telehealth and other innovations could provide a productivity boost, and improve access to health care.

Some of the structural impacts evident during COVID-19 are examined below, particularly whether they are likely to persist and their possible effects on productivity.

Will labour reallocation have a lasting impact on productivity?

As discussed above, over 2019-20 there was a reallocation of labour away from some relatively low labour productivity industries to those with higher productivity. However, under the broadest definition of industry, by February 2021, employment in most industries had moved close to their pre-COVID levels. For example, the *arts and recreation services*, and *food and accommodation services* industries, which experienced the largest falls in employment between February and May 2020 (36 per cent and 31 per cent respectively), are now only a little below their pre-COVID levels of employment (2 per cent and 7 per cent respectively) (figure 23). Some industries, such as *electricity, gas, waste and water services* and *retail trade* are above their pre-COVID levels of employment (14 per cent and 6 per cent respectively).

The subdivision, Australian and New Zealand Standard Industrial Classification (ANZSIC 2 digit) industry numbers show similar patterns, though some industries are still far from complete recovery. For example, while *air and space transport* lost about 34 per cent of its workforce between February and May 2020, as at February 2021, it was still 22 per cent below its pre-COVID level (not seasonally adjusted, appendix A). Likewise, while the *food and beverage services* component of the *accommodation and food services* industry has recovered to being only 7 per cent below its pre-COVID levels, the *accommodation* component is 24 per cent below its February 2020 level (appendix A).

It remains unclear whether the workforce will return to its pre-COVID structure, or whether its composition will be permanently altered.

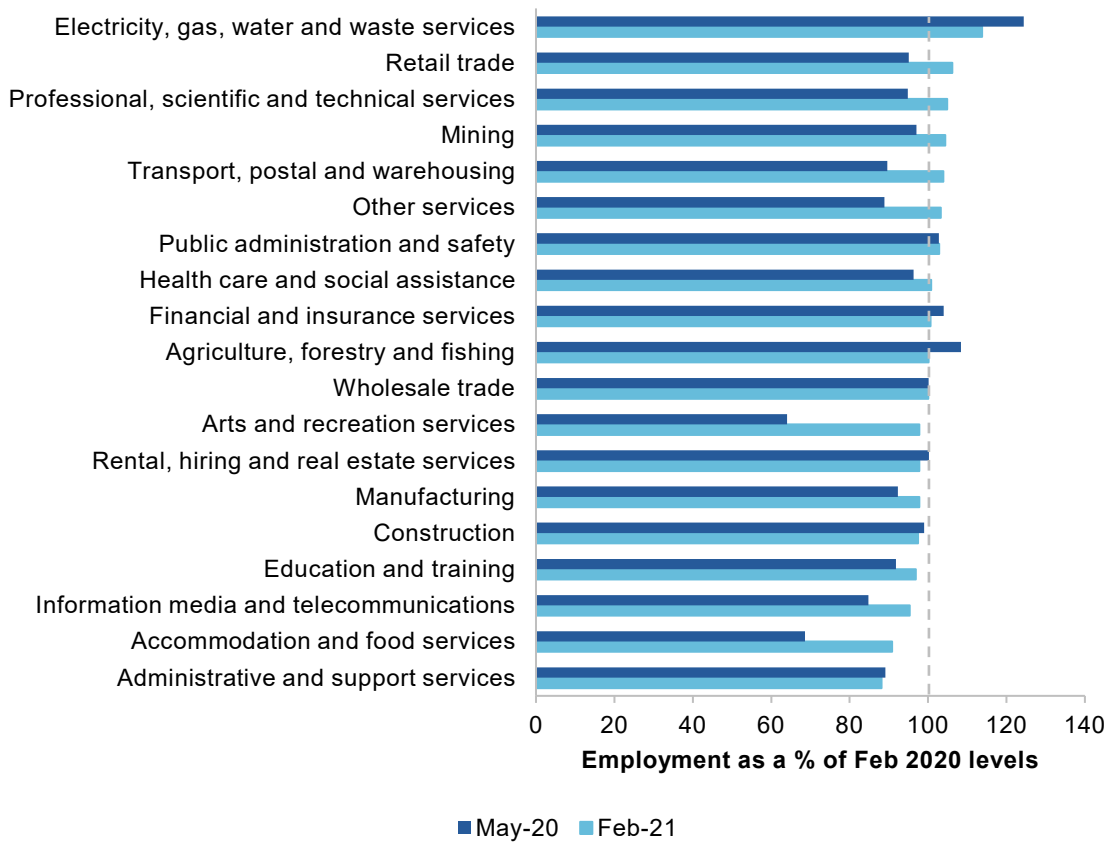
One factor that may encourage the composition of labour to return to its pre-COVID pattern is the apparent stickiness of capital. During the COVID-19 induced recession, labour plummeted while capital services grew (figure 1 above), both in aggregate and for 12 different industries. Many of the industries that shed the most labour were the industries that experienced the most capital service growth in 2019-20. For example, *arts and recreation* decreased its labour by about 15 per cent while increasing its capital services by approximately 3 per cent (figure 20).

As a result, industries that shed labour during 2019-20 are likely to have underutilised capital on hand. This means there are fewer obstacles to them expanding their workforce if consumer demand returns to pre-COVID levels and if workers wish to return (and continue to have the relevant skills).

However, several other structural changes may hinder this process. For example, consumers may have discovered a preference for online delivery of goods and services (below) that

limits the bounce back of brick and motor mortar stores. And workers who have been out of an industry for a significant period of time may have reskilled for a different role and not want to return. And if increased capacity to work remotely and more online shopping persist (below), then more jobs could be offshored, changing the structure of industry.

Figure 23 At the broadest level of aggregation, employment in most industries is close to pre-COVID levels
 Employment (seasonally adjusted) by industry division as a proportion (%) of February 2020 (pre-COVID) levels in May 2020 and February 2021



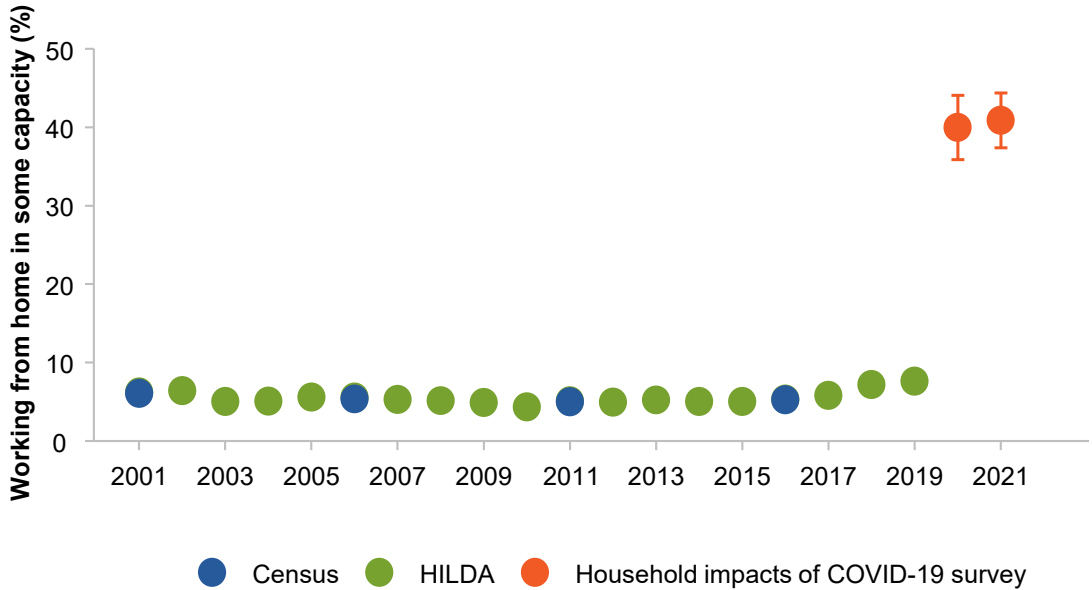
Source: ABS (*Labour Force, Australia, Detailed, February 2021*, Cat. no. 6291.0.55.001, table 04).

Working from home

In perhaps the most transformative economic change of 2020, the proportion of Australians working from home was higher than ever before (figure 24). Recent survey estimates are only available for September 2020 onwards and not on the proportion of people who worked from home during the period April-May 2020 (when most of the country was in lockdown), which was presumably a higher proportion of the workforce. Census and Household, Income

and Labour Dynamics in Australia (HILDA) data tend to indicate the proportion of the workforce working from home was negligible prior to the pandemic.

Figure 24 The proportion of individuals working from home increased markedly in 2020 and 2021
 Proportion of people working from home^a



^a Data from HILDA shows the percentage of people who have a formal agreement to work from home. Census data shows the percentage who responded that they worked from home — rather than an alternative mode of commuting to work — on the day of the Census. Household impacts of COVID-19 survey data shows the percentage of respondents who worked from home in the last four weeks before the interview.
 Sources: ABS (Selected Living Cost Indexes, Feb. 2021, Cat. no. 6467.0, Internet Activity, Australia, 2018, Cat. no. 8153.0, Census of Population and Housing, 2001, 2006, 2006, 2016, Cat. no. 2037.0.30.001, Household impacts of Covid-19 survey, 2021, Cat. no. 4940.0).

The available evidence indicates that working from home is likely to be higher post-COVID than it was pre-COVID, and that this is preferred by both employees and employers. Australian survey data in Beck and Hensher (2020) indicate that both Australian workers and managers would prefer employees to continue working from home to a greater extent than pre-COVID, but the preferred number of days employees want to work from home is *less* than managers would prefer. This in contrast to a US survey by Barrero, Bloom and Davis (2020) that found employees desired to work from home *more* than their employers were planning to allow post-COVID (though both the preferences of employees and stated plans of employers indicated a desire for greater working from home than pre-COVID).

If working from home does increase significantly post-COVID-19, the overall effect on productivity and welfare is unclear. On the one hand, employees regain the time that would have been spent in transit in additional time outside of work. If as a back of the envelop estimate, one takes the average travel time of 56 minutes per day and multiplies by the

median wage¹¹, this equates to \$34 worth of additional time per employee per day (Melbourne Institute 2021). This would lead to much higher wellbeing but no measured productivity improvement. Alternatively, if it leads to additional hours of work, output will grow; the effects on productivity are still unclear. And if fully remote working persists for many jobs, there is potential for better matching between employers and employees as neither will be restricted by geography.

On the other hand, working from home can have some downsides. Some managers may also struggle to adjust to long-term working from home due to historical reliance on in-person monitoring of their employees' activities. And it is also possible that prolonged working from home reduces opportunities for the serendipitous exchange of ideas that can often only occur in person. Finally, the little survey data that exists suggests that most employees would prefer a mixed arrangement of working both in the office and at home some of the time (Barrero, Bloom and Davis 2020; Beck and Hensher 2020).

COVID-19 forced investment, both tangible (computers and home office equipment) and intangible (new systems and employee capability), in working from home capacity. This investment revealed new information to both employees and employers about the benefits and costs of working from home arrangements. So long as employees and employers are free to bargain under fair conditions, the welfare implications of this forced investment will likely be positive, even if the productivity implications are (ex-ante) more ambiguous.

Acceleration in the transition to online retail

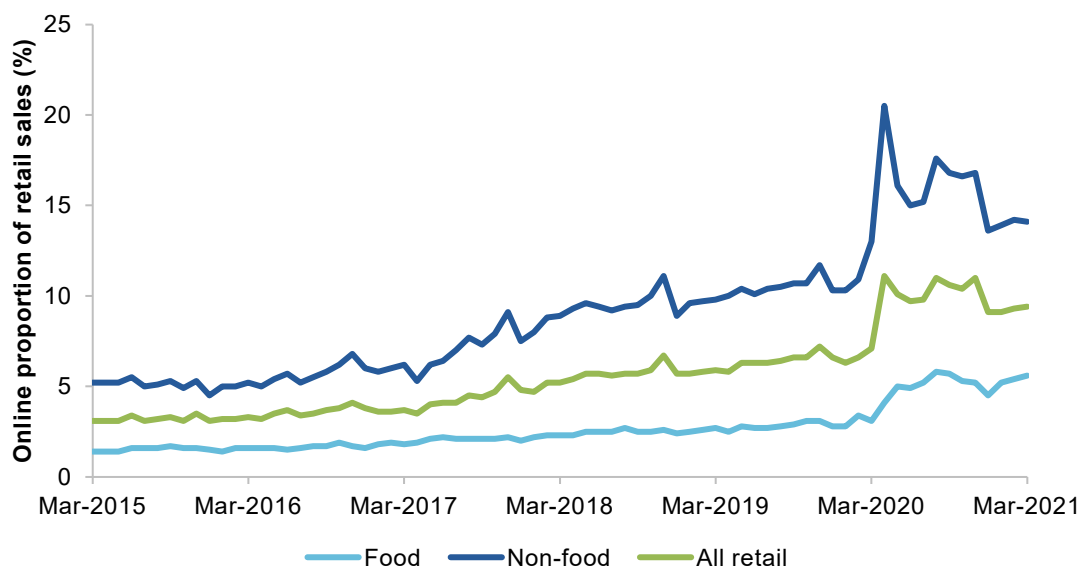
The move towards online sales had begun long before COVID-19 but in April 2021, due to the loss of in-person shopping (or the ability to leave the house more generally), consumers significantly increased their relative consumption of online goods (figure 25). Online sales have since fallen as a proportion of retail but still remain above pre-COVID levels. Whether or not this acceleration of the move to online shopping proves to be permanent is uncertain.

To the extent that COVID-19 has hastened the longer-term structural shift towards online sales, this is likely to have beneficial effects on productivity. The Commission (2021) has previously discussed how online delivery of services (such as retail) increase the scope for innovation and productivity improvement by increasing the scale of operations, intensifying competitive pressures and increasing the size of markets from particular localities to most of the world.

¹¹ The median wage was estimated to be \$36 in August 2020 (ABS 2020d).

Figure 25 **COVID-19 appears to have accelerated the move towards online retail but this might be transitory**

Proportion of retail sales (seasonally adjusted) that are made online, by food and non-food components by month between March 2015 and March 2021



Source: ABS (*Retail Trade, Australia, March 2021*, Cat. no. 8501.0, table 23).

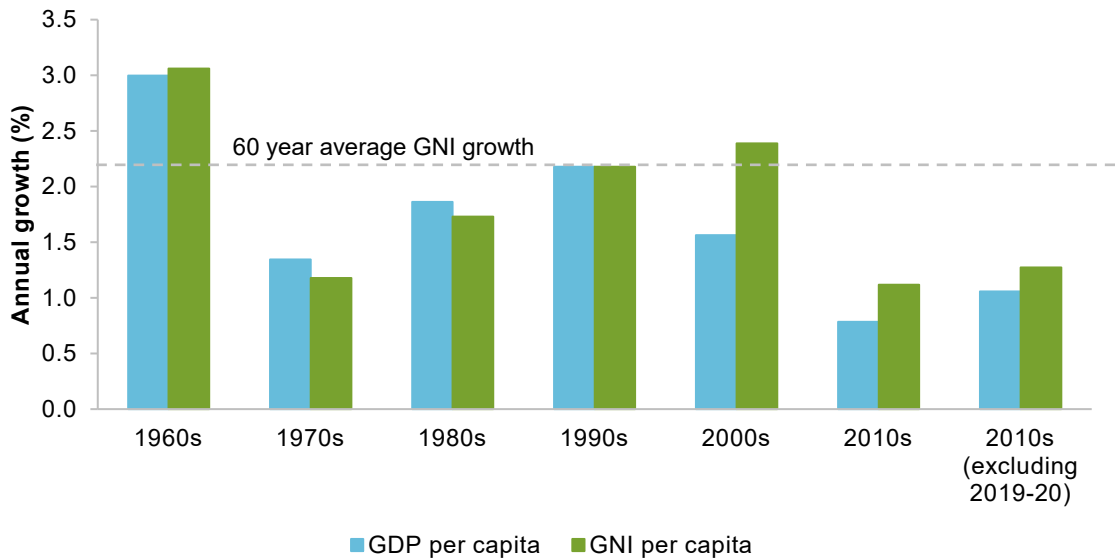
4 Decade in review: slowest growth in 60 years

The past decade of economic growth marks the slowest in at least 60 years on a per person basis (figure 26), both in output per person (GDP per capita) and income per person (gross national income, GNI, per capita). This is the case whether or not one includes the latest year of data¹² (which includes the effect of COVID-19). Examining the level of Australian incomes over the past few decades demonstrates the consequences of this slow growth on the typical household. In figure 27 it can be seen that GNI per capita grew strongly between 1999-00 to 2011-12 but then fell until 2015-16 before then growing (at a reduced rate) until 2018-19. If pre-2011-12 growth rates (1959-60 to 2011-12) had persisted until 2019-20 ('counterfactual GNI' in figure 26), then GNI would have been about \$11 500 per person in 2019-20. That is, average incomes would have been about a tenth higher than they were had this faster growth persisted.

¹² If one both excludes 2019-20 and looks at gross national income per capita rather than gross domestic product per capita, then the period 2010 to 2019 had slightly faster growth (1.27 per cent) than the 1970s mainly because of a slightly smaller outflow of foreign income (figure 26).

Figure 26 The last decade had the slowest per capita growth of production and income in 60 years even before COVID-19

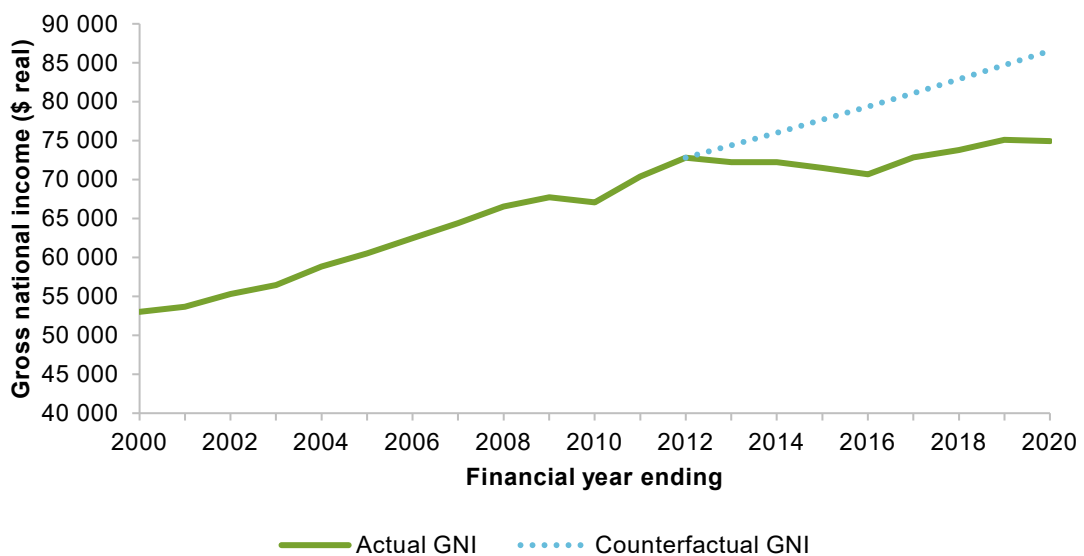
Annual average growth in gross domestic product per capita and gross national income per capita by decade



Source: ABS(Australian System of National Accounts, 2019-20, Cat. no. 5204.0, table 1).

Figure 27 Had growth continued at its pre-2012 rate, then average incomes would have been \$11 500 higher in 2019-20

Actual GNI per capita (real) and counterfactual GNI per capita had pre-2011-12 growth rates persisted to 2019-20

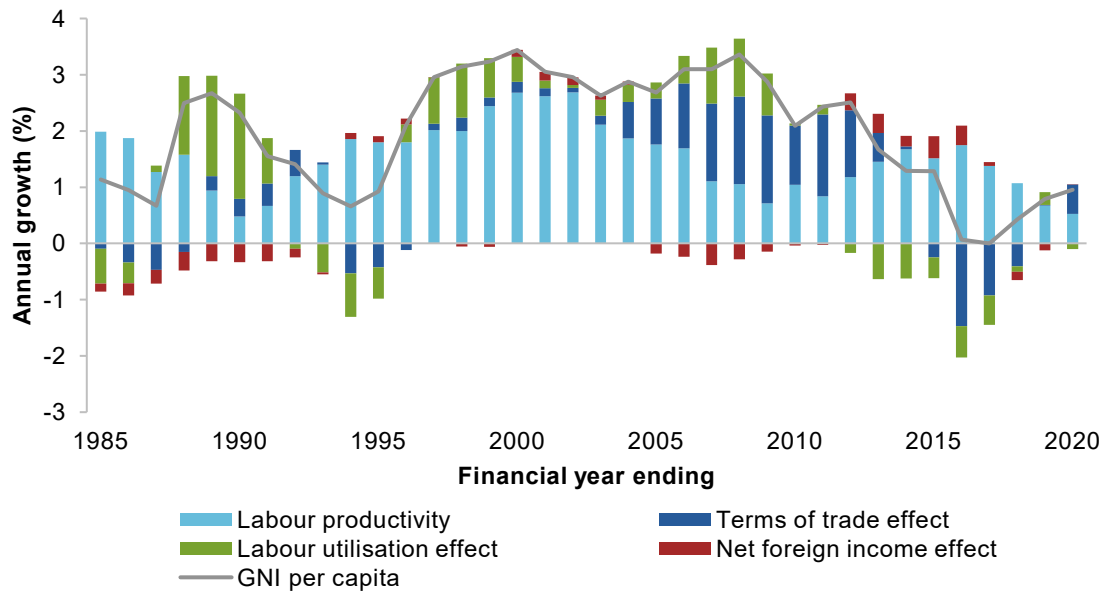


Source: Commission estimates using ABS (Australian System of National Accounts, 2019-20, Cat. no. 5204.0, table 1).

Growth in incomes (GNI per capita) can be decomposed into the contributions from labour productivity (production per hour), labour utilisation the terms of trade (which boost the income from production) and the net flow of foreign income (the income from overseas assets owned by Australians minus the income paid to foreigners from domestic assets). Figure 27 indicates that that the first three factors were key to the slow growth seen in the decade 2009-10 to 2019-20 with net inflows of foreign income partially offsetting these in the beginning of the decade. In particular, a slowdown in productivity that began in the late 2000s appears to have been exacerbated by falling labour utilisation and falling terms of trade that dragged on growth. Figure 28 also indicates that growth in incomes has picked up since 2016, mainly due to improvements in the terms of trade and stable labour utilisation.

Figure 28 Slow income growth is due to slow labour productivity growth along with declining terms of trade and labour utilisation ...

Five year lagged average growth in gross domestic income and labour productivity, and the contributions from labour utilisation^a the terms of trade^b and the net inflow of foreign income^c



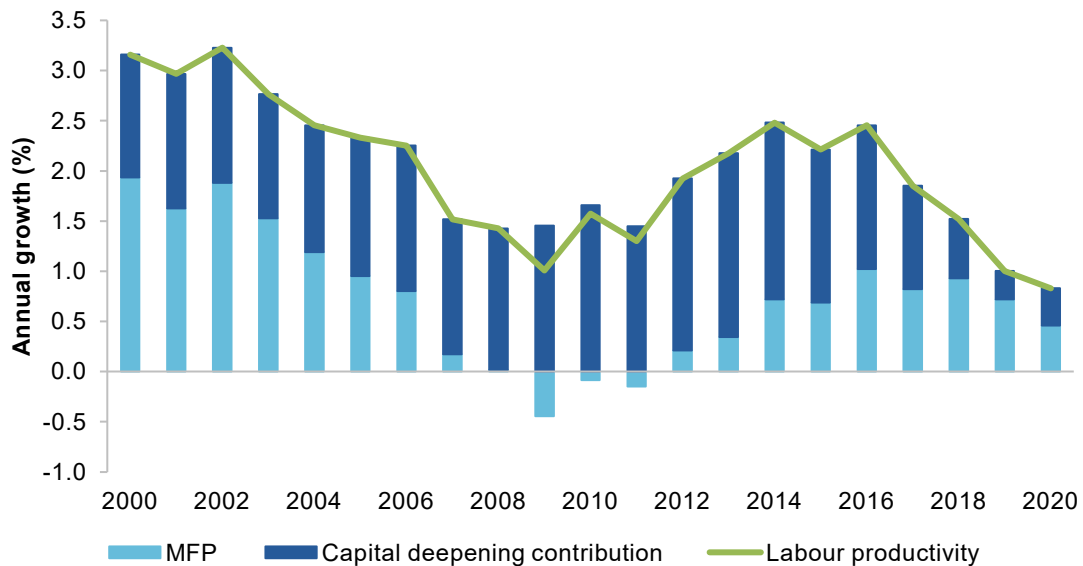
^a The effect of labour utilisation is defined as the difference between GDP per capita growth labour productivity growth. ^b The terms of trade effect is defined as the difference GDP and GDI growth. ^c The effect of the net inflow of foreign income is defined as the difference between growth in GNI and GDI.

Source: Commission estimates using ABS (*Australian System of National Accounts, 2019-20*, Cat. no. 5204.0, table 1).

The slowdown in labour productivity growth in Australia is itself mainly due to slower growth in capital deepening in the latter part of the 2010s that was not offset by increased MFP growth (figure 29). The end of the mining investment boom is the main cause of both these trends. During the mining boom, high mineral prices drove greater mining investment which increased economy-wide capital deepening. But much of this additional investment was used to exploit marginal reserves that had a significant lag between the time of original investment and the time

the mines came online, which had the effect of lowering measured MFP growth both in mining and in the whole economy (figure 30). Additionally, the mining boom reallocated capital from capital with higher rental costs of capital (rental cost is inversely related to the expected life of an asset) with lower rental costs, reducing the growth rate in capital services over the last decade (box 5). When the mining investment boom ended in about 2012-13, mining investment (and economy-wide capital- -deepening) fell while MFP growth increased as new mines came online (increasing mining output with minimal additional inputs).

Figure 29 **... and slower capital deepening in the latter half of the 2010s ...**
Five year lagged average growth in MFP, labour productivity and the contribution from capital deepening^a

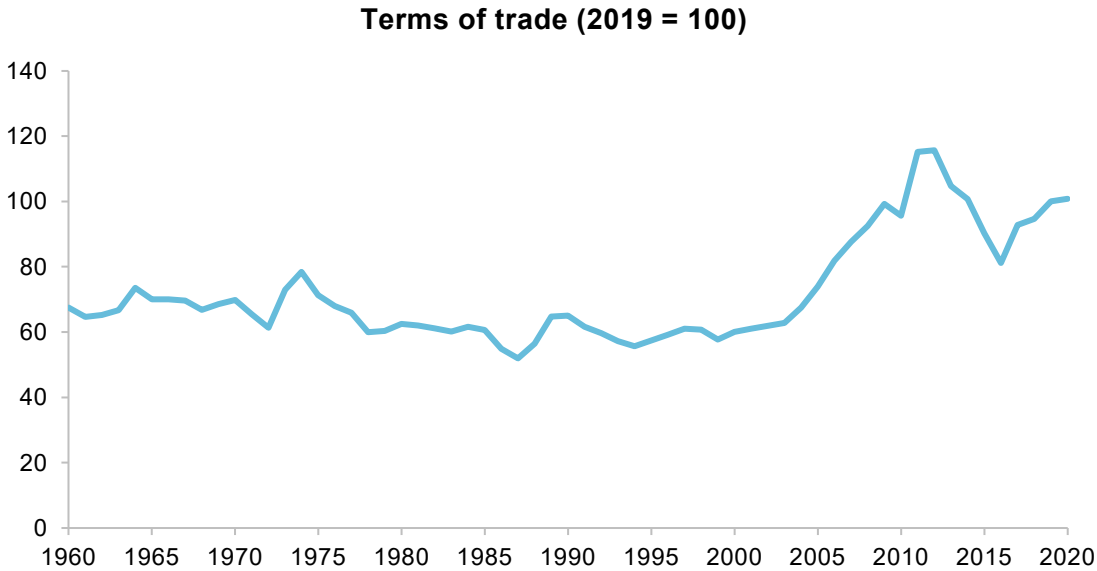
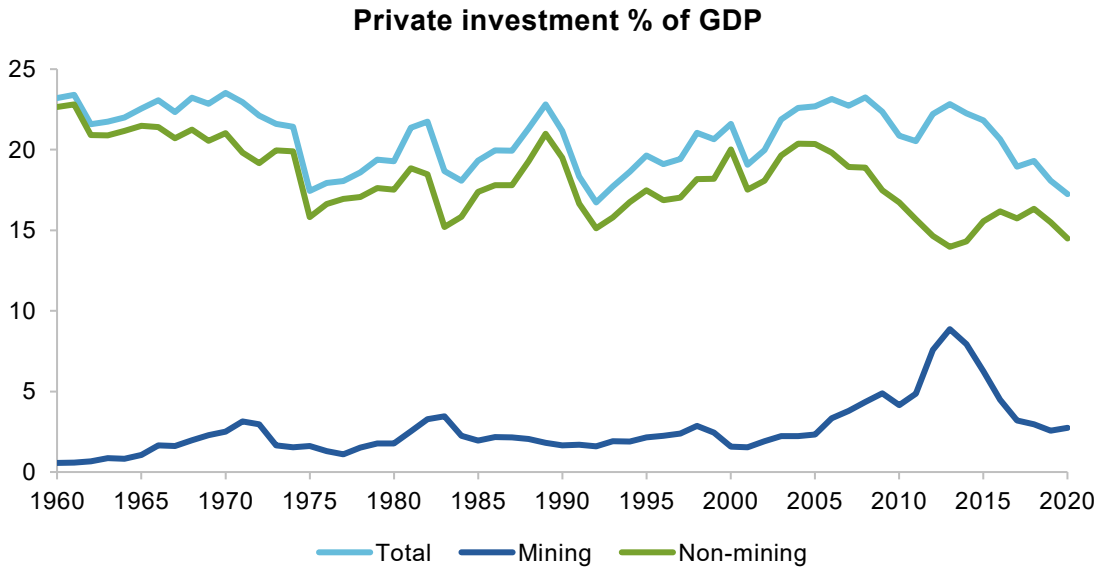


^a The contribution from capital deepening is the difference between growth in labour productivity and growth in MFP.
Source: ABS (*Estimates of Industry Multifactor Productivity, 2019-20*, Cat. no. 5260.0.55.002, tables 1–19).

The longer-term slowdown in MFP growth in Australia is consistent with a global slowdown that began in about 2005. Indeed, Australia’s slowdown in productivity is actually less pronounced than that experienced in most other advanced economies, and for a time its effects on living standards were masked by the mining investment boom. Nonetheless, the effect has been to contribute to a slump in growth in living standards. The Commission (2017, 2019, 2020) has previously summarised the numerous theories thought to explain slower global productivity growth. Whatever the ultimate causes, it is unlikely that domestic policy factors play a strong role given how widespread the slowdown is, unless there are a common policy flaws across the developed world. But whether or not the main factors behind Australia’s slower growth in GDP per capita are the direct result of policy decisions, how governments respond will have a lasting effect on living standards.

Considering that Australia’s poor economic performance in the 1970s was a key justification for the economic reforms of the 1980s and 1990s, the fact that the last decade of growth was *even worse* warrants further reflection.

Figure 30 ... which was due to the end of the mining investment boom
 Private investment as a % of GDP in mining, non-mining and in total (top) and the terms of trade from 1960 to 2020 (bottom)



Source: ABS(Australian System of National Accounts, 2019-20, Cat. no. 5204.0, tables 1 and 52).

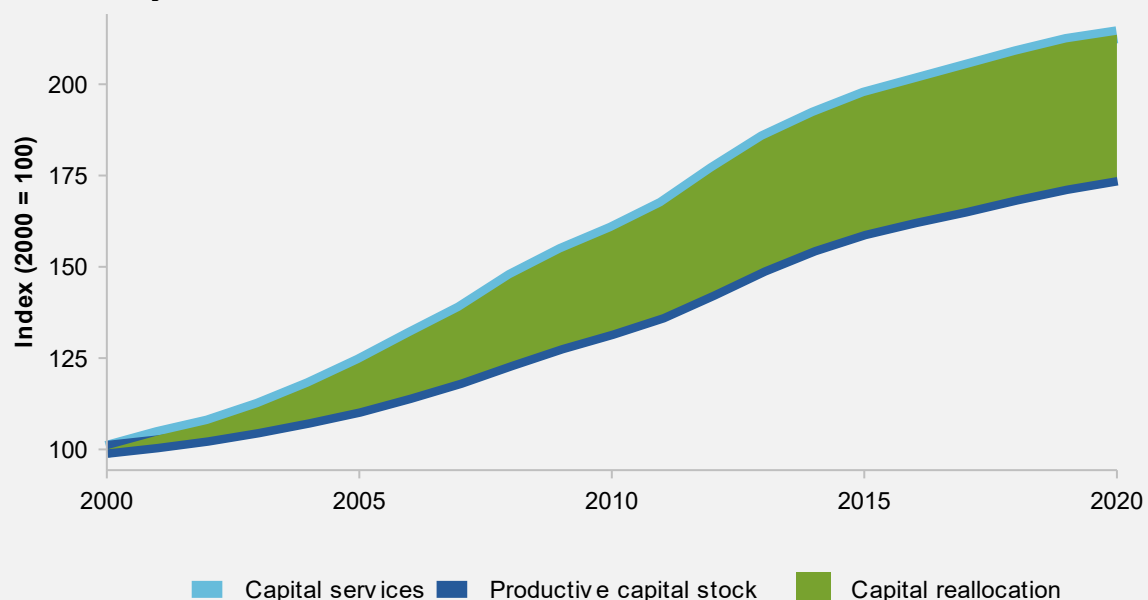
Box 5

Reallocation contributed to capital deepening until the mining boom

For the purposes of productivity measurement, the capital input is measured in terms of capital services'. Capital services reflect the amount of 'service' that each assets provides during a period. For each asset the services provided in a period are directly proportional to the assets productive capital value in the period (productive capital stock) and in equilibrium, the value of capital services is equal to the gross returns (or rents) to owners of capital (ABS 2015). Assets that use up their usefulness in a short period of time (such as computers) typically have higher rental costs because they need to cover the cost of their purchase over a shorter time than say buildings. There are two components that determine the flow of capital services: the rental price of capital for each asset industry combination (in that period) and the volume of productive capital stock for each asset industry combination (in that period). Note that these rental prices only change the *weights* given to growth in the volume of a particular asset, so a theoretical doubling of all rental prices would have no effect on aggregate capital growth.

Growth in capital services can be decomposed into the contributions from productive capital stock growth and capital reallocation area (figure below). Capital reallocation refers to the change in the composition of capital throughout the economy and can be positive (if there is relatively more investment in higher rental price assets) or negative (if there is relatively more investment in lower rental price assets). Since the start of the twenty-first century about 20 per cent of Australia's growth in capital services can be attributed to capital reallocating to high rental price assets.

Capital reallocation contributed to 20 per cent of capital service growth in the 21st century



This reallocation did not occur uniformly over the period. The figure below demonstrates that most of the growth in capital services from reallocation occurred in the first decade of the twenty-first century. After 2010, growth in capital services due to reallocation slowed significantly, becoming negative after 2015. The significant shift in magnitude and sign of the effect of reallocation is likely due to two reasons. First, the positive effect during the beginning of the twenty-first century was, in large part, because computers at the time, had significantly higher rental prices (returns) compared to other types of capital which decreased over time as computer usage increased.

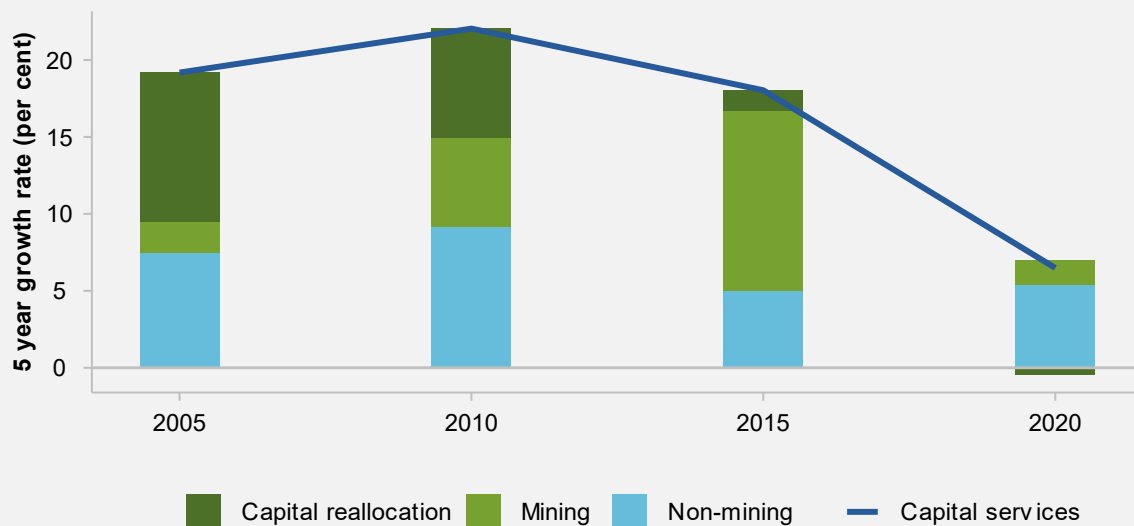
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Box 5 (continued)

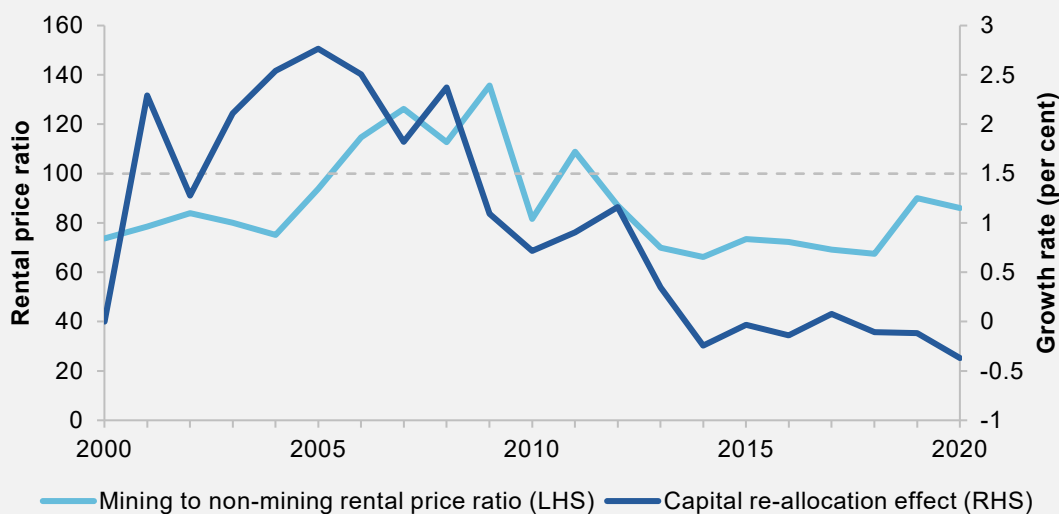
Second, the negative effect after 2010 was likely due to the mining boom. Mining capital tends to have a longer lifespan than capital in other industries which reduces the yearly rental prices for capital in the mining industries. Therefore, when investment surged during the mining boom (due to temporary higher rents from demand side factors), capital moved into an industry with lower rental prices, leading to in a negative reallocation effect over that period.

The bottom figure suggests that the mining boom likely contributed to the reduced effect of capital reallocation on capital service growth in the second half of the twenty-first century. This figure plots the rental price of mining capital against non-mining capital against the contribution to capital service growth from reallocation and shows that the capital reallocation effect closely followed the relative mining rental price after 2005.

The capital reallocation contribution fell after 2010 as mining investment rose



Capital reallocation closely followed mining rental prices after 2010



Sources: Commission estimates based on ABS (*Australian System of National Accounts, 2019-20, Cat. no. 5204.0, tables 13 and 58* and *Industry Estimates of Multifactor Productivity, 2019-20, Cat. no. 5260.0.55.002, tables 12 and 13*).

Appendix A: subdivision employment

Table A.1 **ANZSIC 2 digit employment levels**
Employment in subdivision industry as a proportion of February 2020 levels

<i>Anzsic 2</i>	<i>Anzsic 1</i>	<i>May-20</i>	<i>Aug-20</i>	<i>Nov-20</i>	<i>Feb-21</i>
		%	%	%	%
Agriculture	Agriculture, Forestry and Fishing	109	110	105	101
Aquaculture	Agriculture, Forestry and Fishing	56	50	63	56
Forestry and Logging	Agriculture, Forestry and Fishing	44	101	56	88
Fishing, Hunting and Trapping	Agriculture, Forestry and Fishing	101	106	136	101
Agriculture, Forestry and Fishing Support Services	Agriculture, Forestry and Fishing	109	92	84	117
Coal Mining	Mining	122	115	143	113
Oil and Gas Extraction	Mining	68	60	108	60
Metal Ore Mining	Mining	92	98	94	105
Non-Metallic Mineral Mining and Quarrying	Mining	63	91	89	97
Exploration and Other Mining Support Services	Mining	105	120	127	127
Food Product Manufacturing	Manufacturing	78	77	84	88
Beverage and Tobacco Product Manufacturing	Manufacturing	92	91	95	110
Textile, Leather, Clothing and Footwear Manufacturing	Manufacturing	91	94	88	106
Wood Product Manufacturing	Manufacturing	100	100	88	87
Pulp, Paper and Converted Paper Product Manufacturing	Manufacturing	97	107	101	95
Printing (including the Reproduction of Recorded Media)	Manufacturing	93	84	95	97
Petroleum and Coal Product Manufacturing	Manufacturing	70	107	64	70
Basic Chemical and Chemical Product Manufacturing	Manufacturing	94	98	105	111
Polymer Product and Rubber Product Manufacturing	Manufacturing	89	93	90	90

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Table A.1 (continued)

<i>Anzsic 2</i>	<i>Anzsic 1</i>	<i>May-20</i>	<i>Aug-20</i>	<i>Nov-20</i>	<i>Feb-21</i>
		%	%	%	%
Non-Metallic Mineral Product Manufacturing	Manufacturing	132	112	93	101
Primary Metal and Metal Product Manufacturing	Manufacturing	86	85	91	88
Fabricated Metal Product Manufacturing	Manufacturing	104	115	99	113
Transport Equipment Manufacturing	Manufacturing	114	101	89	91
Machinery and Equipment Manufacturing	Manufacturing	108	98	95	116
Furniture and Other Manufacturing	Manufacturing	104	103	110	99
Electricity Supply	Electricity, Gas, Water and Waste Services	136	113	99	107
Gas Supply	Electricity, Gas, Water and Waste Services	150	132	172	136
Water Supply, Sewerage and Drainage Services	Electricity, Gas, Water and Waste Services	119	116	142	118
Waste Collection, Treatment and Disposal Services	Electricity, Gas, Water and Waste Services	98	100	105	111
Building Construction	Construction	110	109	117	108
Heavy and Civil Engineering Construction	Construction	110	111	94	105
Construction Services	Construction	94	91	93	92
Basic Material Wholesaling	Wholesale Trade	94	94	96	111
Machinery and Equipment Wholesaling	Wholesale Trade	112	104	97	83
Motor Vehicle and Motor Vehicle Parts Wholesaling	Wholesale Trade	118	107	126	153
Grocery, Liquor and Tobacco Product Wholesaling	Wholesale Trade	113	121	105	112
Other Goods Wholesaling	Wholesale Trade	87	103	81	94
Commission-Based Wholesaling	Wholesale Trade	82	100	83	63
Motor Vehicle and Motor Vehicle Parts Retailing	Retail Trade	94	90	102	103
Fuel Retailing	Retail Trade	94	100	102	100
Food Retailing	Retail Trade	96	96	101	106
Other Store-Based Retailing	Retail Trade	91	96	106	107
Non-Store Retailing and Retail Commission-Based Buying and/or Selling	Retail Trade	118	104	82	80

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Table A.1 (continued)

<i>Anzsic 2</i>	<i>Anzsic 1</i>	<i>May-20</i>	<i>Aug-20</i>	<i>Nov-20</i>	<i>Feb-21</i>
		%	%	%	%
Accommodation	Accommodation and Food Services	78	86	82	76
Food and Beverage Services	Accommodation and Food Services	69	83	90	93
Road Transport	Transport, Postal and Warehousing	80	99	105	115
Rail Transport	Transport, Postal and Warehousing	94	100	103	99
Water Transport	Transport, Postal and Warehousing	101	85	113	71
Air and Space Transport	Transport, Postal and Warehousing	66	76	73	78
Other Transport	Transport, Postal and Warehousing	71	138	151	163
Postal and Courier Pick-up and Delivery Services	Transport, Postal and Warehousing	95	95	96	114
Transport Support Services	Transport, Postal and Warehousing	76	64	84	85
Warehousing and Storage Services	Transport, Postal and Warehousing	111	99	101	89
Transport, Postal and Warehousing nfd	Transport, Postal and Warehousing	80	0	45	49
Publishing (except Internet and Music Publishing)	Information Media and Telecommunications	77	82	75	90
Motion Picture and Sound Recording Activities	Information Media and Telecommunications	62	85	91	88
Broadcasting (except Internet)	Information Media and Telecommunications	141	117	92	114
Internet Publishing and Broadcasting	Information Media and Telecommunications	138	312	369	450
Telecommunications Services	Information Media and Telecommunications	93	93	95	91
Internet Service Providers, Web Search Portals and Data Processing Services	Information Media and Telecommunications	91	74	91	96
Library and Other Information Services	Information Media and Telecommunications	53	74	79	95
Finance	Financial and Insurance Services	98	100	97	101

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Table A.1 (continued)

<i>Anzsic 2</i>	<i>Anzsic 1</i>	<i>May-20</i>	<i>Aug-20</i>	<i>Nov-20</i>	<i>Feb-21</i>
		%	%	%	%
Insurance and Superannuation Funds	Financial and Insurance Services	104	104	98	100
Auxiliary Finance and Insurance Services	Financial and Insurance Services	108	102	111	102
Financial and Insurance Services nfd	Financial and Insurance Services	0	0	0	0
Rental and Hiring Services (except Real Estate)	Rental, Hiring and Real Estate Services	94	109	104	110
Property Operators and Real Estate Services	Rental, Hiring and Real Estate Services	104	99	95	95
Professional, Scientific and Technical Services (Except Computer System Design and Related Services)	Professional, Scientific and Technical Services	93	93	99	103
Computer System Design and Related Services	Professional, Scientific and Technical Services	98	102	105	110
Administrative Services	Administrative and Support Services	81	80	92	76
Building Cleaning, Pest Control and Other Support Services	Administrative and Support Services	92	99	106	99
Public Administration	Public Administration and Safety	100	103	103	99
Defence	Public Administration and Safety	131	130	122	118
Public Order, Safety and Regulatory Services	Public Administration and Safety	104	104	110	114
Preschool and School Education	Education and Training	94	104	110	103
Tertiary Education	Education and Training	112	114	101	88
Adult, Community and Other Education	Education and Training	75	81	80	90
Education and Training nfd	Education and Training	27	0	0	20
Hospitals	Health Care and Social Assistance	100	100	99	98
Medical and Other Health Care Services	Health Care and Social Assistance	96	105	101	103
Residential Care Services	Health Care and Social Assistance	98	98	90	90

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Table A.1 (continued)

<i>Anzsic 2</i>	<i>Anzsic 1</i>	<i>May-20</i>	<i>Aug-20</i>	<i>Nov-20</i>	<i>Feb-21</i>
		%	%	%	%
Social Assistance Services	Health Care and Social Assistance	90	92	96	107
Heritage Activities	Arts and Recreation Services	83	100	113	96
Creative and Performing Arts Activities	Arts and Recreation Services	67	87	110	112
Sports and Recreation Activities	Arts and Recreation Services	57	77	83	95
Gambling Activities	Arts and Recreation Services	60	77	83	93
Repair and Maintenance	Other Services	89	88	91	94
Personal and Other Services	Other Services	90	90	100	114
Private Households Employing Staff and Undifferentiated Goods- and Service-Producing Activities of Households for Own Use	Other Services	52	85	16	35

Source: ABS (*Labour Force, Australia, Detailed, March 2021*, Cat. no. 6291.0.55.001, table 06).

Appendix B: calculating the effect of reallocation and within industry growth on aggregate productivity

Discussed in the section 2 is an estimate of the industry contributions to market sector labour productivity growth under an alternative decomposition framework presented by the ABS.

The framework explains aggregate labour productivity growth in terms of the direct (within industry) effect and the reallocation (between industry) effects. The components are derived using industry productivity measures weighted by the relative industry shares and summed across all industries. This approach is considered a ‘bottom-up’ approach and traces the aggregate productivity performance to its industry origins (ABS 2015).

Formally the decomposition used in this paper is defined by equation 1:

$$\ln\left(\frac{ALP_T}{ALP_{t-1}}\right) = \sum_i w_{i,t} \ln\left(\frac{LP_{i,t}^v}{LP_{i,t-1}^v}\right) + \left[\sum_i w_{i,t} \ln\left(\frac{H_{i,t}}{H_{i,t-1}}\right) - \sum_i h_{i,t} \ln\left(\frac{H_{i,t}}{H_{i,t-1}}\right) \right] \quad (1)$$

Where:

ALP is the aggregate labour productivity (aggregate value added per hour);

LP_i^v is the value-added labour productivity for industry i ;

w_i is the two period average of industry i 's share in aggregate value added;

h_i is the industry i 's share in aggregate hours in period $t-1$; and

H is hours worked.

The first term in equation 1 is a ‘direct productivity effect’, which is equal to the weighted sum of industry value added productivity growth rates, with the industry shares in total value added as weights. This term captures the impact of productivity growth in each industry. As industry labour productivity rises, the aggregate labour productivity also improves in proportion to industries’ share in value added.

The second term in equation 1 is a ‘labour reallocation effect’ that captures the impact on aggregate output of the shift of labour between low-productivity-level industries and high-productivity-level industries. Aggregate productivity growth depends not only on the rates of productivity within industries but also on changes in the composition of industries. Faster employment growth in high-productivity-level industries contributes to improvements in the aggregate labour productivity growth by increasing the size of aggregate output given the same quantity of hours worked.

Abbreviations

ABN	Australian Business number
ABS	Australian Bureau of Statistics
ALP	Aggregate labour productivity
ANZSIC	Australian and New Zealand standard Industrial classification
ASIC	Australian Securities and Investments Commission
ATO	Australian Taxation Office
COVID	Coronavirus
CPI	Consumer price index
GDI	Gross domestic income
GDP	Gross domestic product
GNI	Gross national income
GST	Goods and services tax
GVA	Gross value added
HILDA	Household, Income and Labour Dynamics in Australia
IT	Information technology
MFP	Multifactor productivity
MYEFO	Mid-year economic and financial outlook
NA	Not applicable
NZ	New Zealand
OECD	Organisation for Economic Co-operation and Development
ONS	Office of National Statistics (United Kingdom)
PC	Productivity Commission
QALI	Quality adjusted labour inputs
UK	United Kingdom
US	United States of America

References

- ABS (Australian Bureau of Statistics) 2015, *Australian System of National Accounts Concepts, Sources and Methods*, Cat. No. 5216.0, Canberra.
- 2020a, *Australian National Accounts: National Income, Expenditure and Product*, Australian Bureau of Statistics, <https://www.abs.gov.au/statistics/economy/national-accounts/australian-national-accounts-national-income-expenditure-and-product/jun-2020#data-download> (accessed 27 April 2020).
- 2020b, *Australian National Accounts: National Income, Expenditure and Product, December 2020*, Cat. no. 5206.0., Canberra.
- 2020c, *Australian System of National Accounts, 2019-20*, Cat. No. 5204.0.
- 2020d, *Employee earnings, August 2020*, Cat. no. 6337.0, Canberra.
- 2020e, *Estimates of Industry Multifactor Productivity, 2019-20*, Cat. no. 5260.0.55.002., Canberra.
- 2020f, *Labour Account Australia, December 2020*, Cat. no. 6150.0.55.003., Canberra.
- 2020g, *Methods changes during the COVID-19 period*, Cat. no. 1359.0., Canberra.
- 2020h, *Variations in the Utilisation of Productivity Inputs*, Canberra, <https://www.abs.gov.au/articles/variations-utilisation-productivity-inputs> (accessed 5 May 2021).
- 2021a, *Building Activity, Australia, December 2020*, Cat. no. 8752.0., Canberra.
- 2021b, *Construction Work Done, Australia, Preliminary, December 2020*, Cat. no. 8755.0., Canberra.
- 2021c, *Labour Force, Australia, Detailed, March 2021*, Cat. no. 6291.0.55.003, Canberra.
- 2021d, *Residential Property Price Indexes: Eight Capital Cities*, Cat. no. 6416.0, Canberra.
- ASIC 2020, *Insolvency statistics - Series 1 Companies entering external administration and controller appointments*, web page, c=au;o=Australian Government;ou=Australian Government Australian Securities and Investments Commission, <https://asic.gov.au/regulatory-resources/find-a-document/statistics/insolvency-statistics/insolvency-statistics-series-1-companies-entering-external-administration-and-controller-appointments/> (accessed 18 May 2021).
- ATO (Australian Tax Office) 2020, *COVID-19 Boosting cash flow for employers interim report*, As at November 2020, Canberra, https://www.ato.gov.au/uploadedFiles/Content/SPR/downloads/covid_19_boosting_cash_flow_infographic.pdf (accessed 25 March 2021).
- Australian Government 2020, *Mid-Year Economic and Fiscal Outlook 2020-21 - Appendix D*, Canberra, https://budget.gov.au/2020-21/content/myefo/download/10_appendix_d.pdf (accessed 25 March 2021).
- 2021, *Budget Paper No. 1, Budget Strategy and Outlook 2021-22*, Canberra.
- Barrero, J., Bloom, N. and Davis, S. 2020, *Why Working From Home Will Stick*, 2020–174, Becker Friedman Institute for Economics Working Paper, University of Chicago.
- Beck, M. and Hensher, D. 2020, *Insights into Working from Home in Australia in 2020: Positives, Negatives and the Potential for Future Benefits to Transport and Society*, Working Paper, Institute of Transport and Logistics Studies, The University of Sydney Business School.

-
- Bishop, J. and Day, I. 2020, *How Many Jobs Did JobKeeper Keep?*, Reserve Bank of Australia, Sydney.
- BLS (Bureau of Labor Statistics) 2021, *Labor Force Statistics from the Current Population Survey*, Series id: LNS12000000.
- Bowden, P., Poole, N. and James, P. 2012, *Channel Nine and potential insolvency: still the one - Insolvency/Bankruptcy/Re-structuring - Australia*, <https://www.mondaq.com/australia/insolvency/bankruptcy/202508/channel-nine-and-potential-insolvency-still-the-one> (accessed 19 May 2021).
- Charumilind, S., Greenberg, E., Lamb, J. and Singhal, S. 2020, *COVID-19: Saving thousands of lives and trillions in livelihoods*, McKinsey & Company.
- Goolsbee, A. and Syverson, C. 2021, 'Fear, lockdown, and diversion: Comparing drivers of pandemic economic decline 2020', *Journal of Public Economics*, vol. 193.
- Government of Canada, S.C. 2021, *Actual hours worked by job type (main or all jobs), monthly, unadjusted for seasonality*, <https://www150.statcan.gc.ca/t1/tb11/en/tv.action?pid=1410003201> (accessed 19 May 2021).
- Hale, T., Angrist, N., Goldszmidt, R., Kira, B., Petherick, A., Phillips, T., Webster, S., Cameron-Blake, E., Hallas, L., Majumdar, S. and Tatlow, H. 2021, 'A global panel database of pandemic policies (Oxford COVID-19 Government Response Tracker)', *Nature Human Behaviour*, vol. 5, pp. 529–538.
- Kochańczyk, M. and Lipniacki, T. 2021, 'Pareto-based evaluation of national responses to COVID-19 pandemic shows that saving lives and protecting economy are non-trade-off objectives', *Scientific Reports*, vol. 11, no. 1, p. 2425.
- König, M. and Winkler, A. 2021, 'COVID-19: Lockdowns, Fatality Rates and GDP Growth: Evidence for the First Three Quarters of 2020', Springer, Germany, *Inter economics*, vol. 56, no. 1, pp. 32–39.
- Liming, C., Raitzer, D., Hasan, R., Lavado, R. and Velarde, O. 2020, *What works to control COVID-19? econometric analysis of a cross-country panel*, 625, ADB economics working paper series, Asian Development Bank.
- Melbourne Institute 2021, *The Household, Income and Labour Dynamics in Australia (HILDA) Survey, GENERAL RELEASE 19 (Waves 1-19)*, ADA Dataverse, <https://dataverse.ada.edu.au/citation?persistentId=doi:10.26193/3QRFMZ> (accessed 4 May 2021).
- OECD (Organisation for Economic Co-operation and Development) 2021, *Quarterly National Accounts : Quarterly Growth Rates of real GDP, change over previous quarter*, OECD Stat, <https://stats.oecd.org/index.aspx?queryid=350> (accessed 18 May 2021).
- ONS (Office for National Statistics) 2021a, *HOUR01 SA: Actual weekly hours worked (seasonally adjusted)*, <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/actualweeklyhoursworkedseasonallyadjustedhour01sa> (accessed 19 May 2021).
- 2021b, *Labour market statistics time series*, Series id. MGRZ, <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/timeseries/mgrz/lms> (accessed 11 May 2021).
- PC (Productivity Commission) 2017, *Shifting the Dial: 5 Year Productivity Review, supporting paper no. 1, Productivity and Income - the Australian Story*, Canberra.
- 2019, *PC Productivity Bulletin*, Canberra.

-
- 2020, *PC Productivity Insights*, Canberra.
- 2021, *Things you can't drop on your feet: An overview of Australia's services sector productivity*, PC Productivity Insights, Canberra, April.
- Phillips, B., Gray, M. and Biddle, N. 2020, *COVID-19 JobKeeper and JobSeeker impacts on poverty and housing stress under current and alternative economic and policy scenarios*, ANU Centre for Social Research and Methods.
- Statistics Canada 2021, *Table 14-10-0287-01 Labour force characteristics, monthly, seasonally adjusted and trend-cycle, last 5 months*, <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410028701> (accessed 18 May 2021).
- Stats NZ 2021, *Labour market statistics: March 2021 quarter*, <https://www.stats.govt.nz/information-releases/labour-market-statistics-march-2021-quarter> (accessed 18 May 2021).
- Treasury 2020a, *Boosting cash flow for employers*, Canberra, https://treasury.gov.au/sites/default/files/2020-04/fact_sheet-boosting_cash_flow_for_employers.pdf (accessed 25 March 2021).
- 2020b, *HomeBuilder*, Canberra, https://treasury.gov.au/sites/default/files/2021-04/HomeBuilderFS_20210417.pdf (accessed 21 April 2021).
- 2020c, *JobKeeper Payment Extension*, Australian Government, Canberra.
- 2020d, *The JobKeeper Payment: Three-month review*, Canberra.