**METHODOLOGICAL PAPER**

**Modelling the impact of
COVID-19 at the Australian
Local Government Area (LGA) level**

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**April 2020**

**Draft for comment.**

***Methodological Paper – Master V2/COVID-19 Methodological papers***

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# The impact of the COVID-19 LGA economies – 2020 to 2023

## 1. Overview

NIEIR has estimated the potential impacts of coronavirus on economic activity, employment and sectors at the LGA level.

The methodological framework is based on the standard textbook input-output and interregional multiplier framework. The modelling framework involves estimating the direct impact of the policy response to COVID-19 on final demand for each industry and then calculates the multiplier effects using NIEIR’s regional database. That is, assumptions are made about the household, business and government suppression rates directly flowing from the measures introduced to contain the virus. The impact of economic measures is also incorporated into the modelling.

The modelling assumes that core social distancing measures are maintained into June. At this stage the assessment of the impact of the COVID-19 is restricted to the June Quarter.

This paper provides further detail about the methodology and assumptions applied.

The modelling is based on information available mid-April 2020. This model will be updated as more information is known. For example, it is assumed as of early May:

* The household consumption expenditure suppression rate of 35 per cent may be relaxed based on recent analysis of ABS data. A figure of <25% is becoming likely (p.6). This will likely reduce impacts for some industries.
* Education impacts, particularly on schools, will be revised downward as schools have remained open with impacts falling more on casuals.
* The assumption of welfare payment recipients spending all extra payments may be revised considering ABS household survey findings showing increased saving. This will present a downside risk.

## 2. Study objective

The ultimate objective of this study is to estimate the impact of the COVID-19 virus on LGA economic activity such as gross state product and employment growth over the 2020 to 2023 period along with disaggregated industry outcomes. That is, from the first quarter of calendar year 2020 to the fourth quarter of calendar year 2023. However for the first stage of the process the focus is on the June Quarter 2020.

Less is known about the recovery phase beyond 2020.2 as its path depends on the development of a vaccine and the effectiveness of economic policy. The economy is in uncharted territory - nobody knows for sure how the economic measures will work. This means forecasts need to be continually monitored as more information is known. We will turn our attention to the recovery phase beyond 2020.2 over the coming months.

The quick acceptance of the policy authorities of the need for draconian social distancing measures over the week ending 27 March 2020 was largely due to the mantra “do the maths”, focussing on straight forward use of three data parameters, namely:

1. the infection rate;
2. the death rate; and
3. ICU bed capacity,

which, by simple arithmetic, led to the transparent conclusion that there was no alternative to the measures implemented.

In the economic sphere, a similar simple and transparent approach is adopted herein with the minimum of complexity. However, the framework is capable of taking account of the actual and potential stimulus packages that have been, and will be, introduced to dilute the direct economic impact of the virus.

## 3. The COVID-19 scenario

In the first instance the assumption of the first stage of the study in relation to the COVID-19 virus are that the core industry social distancing measures in place in mid-April are assumed to be maintained into June.

## 4. The methodological framework

The modelling framework adopted for the study is the same as the one used to derive the economic assessment tool available on council websites (economy.id). That is, a local input-output framework built around the 86 2-digit ANZSIC industries which are integrated with every other LGA in Australia via inter-regional trade flow relationships.

The framework is outlined in Appendix A.

The methodological steps are straight forward. Firstly, quantify the direct impact of the policy response to COVID-19 on individual industry outputs and final demand components, such as consumption and exports, and then apply all direct impacts to the modelling framework.

The central modelling assumption is that the parameters assessed at the national level to determine the COVID-19 policy response on the economy apply equally to all LGAs. Future work may allow this assumption to be relaxed.

Table 4 gives the values of critical modelling parameters that are superimposed on the modelling framework to obtain plausible assessments from the impact of COVID-19. Their role is outlined in the text below.

## 5. Suppressed and unsuppressed industries

Industries are separated into suppressed and unsuppressed industries. Suppressed industries would be those that satisfy the following criteria:

* have lagged adjustment drivers that are unresponsive to short-run adjustments in demand via the input-output framework; or
* have a large degree of uncertainty as to how they will respond to the COVID-19 policy settings; or
* have a high degree of certainty as to how they will respond to the COVID-19 policy measures which is the case for the industries that have largely ceased operation as a result of social distancing measures.

In general, therefore, by suppressed industries is meant industries that are largely unresponsive to short-run variations in demand.

Table 2 gives the classifications of the 86 ANZSIC industries into suppressed and unsuppressed industries. Agriculture is clearly a suppressed industry with output in 2020.2 determined by past agricultural prices and the weather over 2019-20. The construction industries are not responsive to short-run variation in demand and have a high degree of uncertainty as to their COVID-19 response. Construction industries will be impacted by social distancing policies to an extent and will most certainly be impacted by supply chain constraints due to unavailability of components from overseas suppliers. In the September quarter the impact on construction activity is likely to be stronger as new projects are postponed or cancelled.

The remaining suppressed industries in Table 2 are industries whose activities have been particularly curtailed by social distancing measures.

## 6. COVID-19: The public policy response and preventing the doom loop

As at 23th April 2020 the public policy response to the COVID-19 virus has been:

1. social distancing measures involving the closure of businesses that require large population gatherings, such as cafes, restaurants, sports, gyms, arts and entertainment facilities. General retail establishments have not been closed as yet. But the decline in foot traffic has induced many establishments to close;
2. also social distancing has involved the closure of some state borders as well as the international border; and
3. fiscal and monetary measures designed to offset and cushion, the impact of the COVID-19 virus on the economy with the weight of policy focusing on cushioning the impact which is appropriate for a supply side shock.

#### Monetary measures

The Reserve Bank of Australia (RBA), on the 19March 2020, reduced the cash rate to 0.25 per cent and announced that the bank was targeting the three year Government Bond Rate interest rate to also be 0.25 per cent. This is being done to shelter domestic market interest rates from overseas trends. As argued in Appendix B this is unlikely to be successful.

The RBA also announced a short-term funding facility for the banking system to support businesses. The total access to funding of banks will amount to $90 billion to the end of September to provide low cost loans to their clients.

To encourage banks to increase net lending to the private sector over last year’s lending new measures were introduced. For every extra dollar of lending to large businesses the banks will have access to an extra dollar of funds from the RBA. For every extra dollar of funding to small and medium businesses (SMEs) the banks will receive extra funding from the RBA of five dollars.

#### Fiscal measures

In terms of fiscal policy, the Commonwealth Government has announced:

1. a scheme to boost business cash flow via payments based on employee costs, by its administrative features, is equivalent to a wage subsidy;
2. increases in social security payment rates for both working age and non-working age beneficiaries;
3. a 50 per cent guarantee for up to $40 billion in new loans by financial institutions to a maximum of $250,000 for small and medium businesses; and
4. a minimum payment of $1,500 per fortnight for employees that have been stood down, or would have been stood down (JobKeeper).

The States have announced complementary measures equal to 15 to 20 per cent of the Commonwealth Government’s effort, equivalent to approximately $10 billion. The quantity of funds available to support the economy for the June quarter appears to be in the vicinity of $30 billion.

In terms of understanding the nature of the policy response, a distinction should be made between policy measures designed to:

1. offset the negative economic shock of the COVID-19 virus; and
2. mitigate the shock of the virus and the bringing forward of the financial crisis.

Measures that offset the impact of COVID-19 are measures that are designed to create replacement economic activity to that eliminated by the COVID-19 virus. The components of the public policy response that are designed to offset the impact of the virus are:

* increased payments for existing social security recipients;
* increased government expenditure on health expenditures in response to the virus; and
* interest rate reductions and the availability of low cost interest rates and investment allowances to encourage new investment.

#### JobKeeper Payment Scheme

On 30 March 2020 the Commonwealth Government announced a JobKeeper Payment Scheme.

The key eligibility criteria for the Scheme are:

1. businesses with a turnover of less than $1 billion and their turnover is reduced by more than 30 per cent relative to comparable monthly period a year ago; and
2. businesses with a turnover of $1 billion or more and their turnover will be reduced by more than 50 per cent relative to comparable monthly period a year ago.

If businesses meet the eligibility criteria then the government will provide $1,500 per fortnight per employee.

However, the income support for employees that would otherwise have been stood down or retrenched is not the only direct economic stimulus from the JobKeeper Scheme. The remaining employees of businesses with a 30 per cent fall in sales or more, that is, if the business is not closed, will also receive the $1,500 per fortnight. The estimate of this benefit, that is payment of benefits to employees who would not have become unemployed, is of the order of $cvm10 to $cvm15 billion for the June quarter. In the analysis below and is made clear by the data in Table 1, part of this is allocated to expenditure support in the June Quarter and part is allocated to fixed cost support which

#### Preventing triggering the doom loop

In terms of new policy responses, the first requirement of policy is that that everything is done to prevent a ‘doom loop’ from occurring. This is where cascading defaults of rent and debt service threatens the solvency of the banking system and a massive decline in new credit availability. The analysis here is focussed on the Type II multiplier impacts of social distancing, both in Australia and also overseas via the decline in national and LGA exports. In the third round of a ‘doom loop’ scenario the closure of establishments results in inability to pay the fixed costs of rents and debt servicing, which in turn prevents landlords and households servicing their mortgages, which in turn degrades the capital base of banks, which in turn forces the banks into reducing new lending and, on a mass scale, threatens them with bankruptcy.

This in turn would require government to recapitalise the banks via the RBA effectively partially or fully nationalising the banks and imposing a disproportionate cost on bank shareholders. Far better to put the economy in hibernation and short-circuit the ‘doom loop’ by the government directly paying part of the fixed (rent and mortgage) costs of impacted businesses and households. The alternative is to pay the banks and other institutions directly similar amounts of funds after wide spread institutional collapse has occurred but at the cost of massive social and economic damage ensuring a long-term depression.

 It is to the credit of Australian Governments that as of mid-April 2020 the scale of the economic policy response to COVID-19 is adequate to doom loops been generated at least for 2020.

#### The classification of economic policy response measures

The economic measures outlined above in response to the economic dislocation created by COVID-19 can be allocated to one of the following categories:

1. offset measures designed to act as direct positive stimulus to gross product, thereby offsetting the direct impact on gross product and employment from social distancing policies resulting in the closure or significantly reduced activity in the enterprises directly subject to the measures. Increases in demand for medical services, security services, etc. would be included in this category of responses along with increasing income support for existing social security recipients. Also included would be investment, tax allowances to encourage new investment;
2. mitigation measures designed to limit the flow on negative impact from the direct industry shock. Measures included in this category would include enhanced payments to the newly employed whether with unemployment or employed status; and
3. fixed cost assistance, or doom loop prevention, measures. Fixed cost assistance measures would include measures designed to enhance household and business abilities to pay fixed costs, such as rent, debt service costs and utility fixed costs, to prevent the capital base of the financial system from being degraded by defaults and bad debt charges. Also included in these measures would be financial assistance measures to strengthen household and business balance sheets.

Fixed cost assistance measures are outside the scope of this analysis in the sense that their main impact is to prevent economic activity and employment falling below the levels assessed in this study. What is important, however, is the allocation of the funds for assistance measures between the three categories.

Table 1 outlines, at the national level, the allocation of general government funding (that is excluding direct funding from financial institutions) from the various measures introduced for the June quarter 2020. The total funding formally incorporated into the model assumptions is $62 billion. About $35 billion of this is allocated to JobKeeper and JobSeeker payments to the newly effectively unemployed and an additional $18 billion to support household consumption via JobKeeper payments for those retained in employment and the boosting business cash flow scheme. The impact of this at the national level is shown in the last column of Table 2. Further as additional $20 billion is allocated to fixed cost payment support which plays no direct role in the analysis in that its role is to prevent gross product and employment falling further than what is shown for the individual LGAs.

## 7. The direct impact on final demand – National household, business and government demand suppression

The direct impacts of COVID-19 involves a sharp fall in final demand from households and businesses. Final demand is the demand for goods, which are not used to produce other goods (as opposed to intermediate demand). Intermediate demand also falls via business suppression and multiplier effects.

#### Households

Given any economic negative shock, there will be immediate increases in the household savings ratio. Households fearful of unemployment, or at least reduced income, will reduce expenditures to build up financial assets and/or pay down debt. Using the Global Financial Crisis (GFC) as an example, between the December quarter 2007, before the developing crises became self-evident, and the June quarter 2009, the net household savings ratio rose from 1.6 per cent to 9.4 per cent. The implied increase in the household savings ratio from direct social exclusion expenditure reduction is estimated at 21 percentage points, or approximately twice the GFC increase. This would be sufficient to satisfy the precautionary motive for increases in the household savings ratio.

Table 2 shows the household and business demand suppression rates directly flowing from the measures introduced to contain the virus. The household suppression rates are the estimated decline in household expenditure on each industry’s sales as a direct result of social distancing/isolation policies, either because of regulations preventing businesses from operating or because customers themselves do not wish to venture out if there is not an online alternative. Thus, from Table 2 the output of the creative arts industry is assumed to decline by 90 per cent l from formal social distancing impacts. Note in Table 2 a negative suppression factor represents an increase in expenditure.

For suppressed industries like creative arts the output is reduced directly. For unsuppressed industries like pulp and paper production the impact on gross output will be determined by the impact on each of the final demand components of pulp and paper production and how the outcome for all other industries that input paper products via the input-output framework. From Table 2 the direct impact on national paper products manufacturing is a decline of 16 per cent from social distancing.

Also included is a general household consumption suppression rate of 35 per cent for the Central scenario. This general suppression rate or parameter p4 in Table 5 applies to all industries in Table 2 that do not receive a specific social distancing direct impact. In late March it appeared that Australian general retail sector may well be subject to a mandatary shut down order as has occurred overseas. In this case p4 was set at 50 percent. However if Australia manages to keep the rate of infections low as is the case at the second week of April then this may not be necessary and existing regulations may be able to stand allowing a modest level of general retail activity allowing some of the stores which closed at the end of March to reopen. That is future revisions may see this parameter reduced to 25 percent or below. However, its impact is likely to be limited because of shift to on-line purchases and the high import content of general consumer merchandise.

Schools may or may not be closed for the quarter. But there will no doubt be online activities which will employ a significant proportion of teachers. Hence the decline in the sector will be constrained.

As a result of the suppression measures outlined in the first column of Table 2 the fall in household consumption is assessed at $cvm71 billion in terms of purchases of National purchases of goods and services. This includes the consumption foregone for the supressed industries. Given that total National household consumption purchases was $cvm260 billion in 2019.2 at factor cost this implies a 27 percentage point rise in the household saving rate. This is a core driver of the decline in economic activity.

The food service industry requires special mention. The 80 per cent decline for output of this industry allows for the fact that this industry offers existing take away services which will not be impacted to the same extent as in-house services. In addition from Table 2, it is estimated that the increased demand for takeaway services to compensate for lost in-house dining will sum to $cvm3.3 billion in 2020.2. This means that the fall in food services will not be 80 per cent but less than this. The actual fall in direct sales for food services is approximately two thirds.

#### Businesses

The business suppression rate captures the fact that with many employees working from home many business inputs, especially those using the services of other industries, or intermediate usage, will not happen or will be postponed until the economy re-establishes a degree or normalcy. Some industries will be particularly sensitive to this outcome, such as the professional, scientific and technical services industry, the computer design industry and the administrative services industry. From the table it is assumed that intermediate sales of these industries will fall by 40 per cent in the June quarter. Those industries directly adversely impacted by the household consumption suppression factor will be similarly impacted in terms of their intermediary sales as they are in terms of sales to the household sector unless they are a suppressed industry. Overall, total intermediate usage demand, because of business suppression effects, is assumed to decline by $cvm26 billion in June quarter though the net effect will be less than this as the impact on suppressed industries has to be excluded as this is already included in their output decline.

#### Government

There is a mixed outcome for government expenditure. Even if schools are largely closed many teachers will be paid. All health care costs can be expected to increase as shown in the table. In addition, column 5 of the table 2 gives an estimate that $400 million will be spent on medical equipment. The overall positive and negative impact on Government consumption balance suppression factors and exogenous spend gives a positive $2 billion increase for June quarter.

## 8. The direct impact on final demand – International exports

For the past five years NIEIR has been using a model of the world economy consisting of 56 countries and country groups to forecast 66 export categories by world region. Table 3 gives the projected growth in GDP for each country/region as a result of the virus from 2020 and 2021 which drive the model.

The fall in world GDP of 12 per cent, from Table 3, for calendar year 2020 is consistent with falls in some high income countries of between 20 and 30 per cent in June quarter providing easing of lock-down restrictions is achieved over the second half of 2020. It is becoming increasingly clear that some countries will be in a better position to do this than others. The example of the United States in particular has not had an efficient medical response to the first wave of the virus is also the country that is likely to ease restrictions too early and be subject to a severe second wave of virus lock-downs which, on a whole of country basis, may be more severe than what has been imposed to date. If this is the case, then the annual GDP fall in US GDP for 2020 could be in excess of 20 per cent.

Developing countries can be expected to have a delayed response to the virus and, as a consequence, a delayed recovery. For the June quarter, the decline in international exports across the states is between 15 and 25 per cent. Given the lag between country GDP and Australian exports, the largest impact on Australian exports can be expected in the September quarter, which is beyond the scope of the current estimates.

It should be noted that a substantial part of international export impacts on the domestic economy is nullified by the effective closure of some of the suppressed industries.

For each LGA, estimates of international exports are made for all 86 industries. For each industry, the individual direct impact is assumed to be the same impact as the assessed corresponding industry impact from the trade model at the national or state level.

## 9. The direct impact on final demand – Policy intervention: Increased welfare payments for existing recipients

As of 22 March 2020 the Government has announced two measures that will increase the income of existing social security recipients. Working age social security recipients will receive an additional fortnightly payment of $550 for six months. Other welfare recipients will receive an additional payment of $750 per quarter. This is all assumed to be spent with the additional consumption expenditure for the National economy from these measures assessed at just under $cvm7.0 billion, which by definition equals the estimated increase in income. The consumption pattern by industry is the average of old households and working age not in employment households.

This completes the exogenous adjustments to final demands. The National expenditures are allocated to individual LGAs using the most appropriate indicator. For example the $cvm7.0 billion of increased benefit to existing welfare recipients is allocated on the basis of LGA cash benefit share in the national total as at 2019.2.

## 10. The direct impact on LGA final demand – Total impact

The National expenditures are allocated to individual LGAs using the most appropriate indicator. For example the $cvm7.0 billion of increased benefit to existing welfare recipients is allocated on the basis of LGA cash benefit share in the national total as at 2019.2. Each LGAs direct shock from the increase in the household savings ratio is obtained by multiplying the suppression factors in the first column in Table 2 by the each LGAs household consumption expenditure estimates at the 86 industry level at at 2019.2.

## 11. The critical modelling parameters – Those with direct impact on economic activity

Table 4 gives the critical modelling parameter values used to determine the impacts. The focus for this section is on those parameters which directly impact on economic activity.

#### The general household and government consumption suppression ratio

In response to any negative economic shock there will be immediate increases in the household savings ratio. Households fearful of unemployment, or at least reduced income, will reduce expenditures in order to build up financial assets and/or pay down debt. Using the Global Financial Crisis (GFC) as an example, between the December quarter 2007, before the developing crisis became self-evident, and the June quarter 2009, the net household savings ratio rose from 1.6 per cent to 9.4 per cent. From Table 1, the implied increase in the household savings ratio from direct social exclusion expenditure reduction is 21 percentage points, or approximately twice the GFC increase. This would be sufficient to satisfy the precautionary motive for increases in the household savings ratio.

However, social distancing will also increase the household savings ratio above the levels calculated in Table 1 simply because people will avoid congregating in places of high concentrations of population, such as shopping malls. This means that general goods purchases will be postponed and services deferred, perhaps to the extent that much general retail is closed for up to four to five weeks in the June quarter. To allow for this the general household consumption suppression ratio is set at 35 per cent – a general 35 per cent decline in household consumption expenditure for those industries where there is not a specific social distancing reduction. The overall decline in consumption expenditure becomes, from Table 1, 26 per cent with a similar percentage point increase in the household net saving ratio (from a low base).

#### The government consumption suppression ratio

Governments too will have forced savings simply because households and businesses will not be in a position to undertake new initiatives with government or complete existing initiatives. The savings here are assessed at a modest 1 percentage point.

#### The income offset ratio

The parameter p1 in Table 5 is the average income received by the newly unemployed as a ratio to income received in work. If set at zero it would mean that the newly unemployed would receive no income. The average dollar per hour worked of those losing employment is calculated at an average of $49 per hour, though those on the minimum wage will lose less – $19.50 per hour.

However, Australia does have a safety net. The basic payment depends on family structure, whether the recipient is single or partnered and on the number of his/her dependent children. The payment also depends on a means test. An assumed average eligible payment of $24,000 per year represents $14.4 an hour for a recipient who worked 32 hours per week. In normal circumstances the offset ratio is 14.4/49 or 0.29.

However, the Commonwealth Government in its policy measures has increased the payments by $550 a fortnight, or $8.50 an hour for a 32 hour working week, giving an income offset ratio of 0.47. It is likely that other measures will be introduced to increase the income offset ratio, for example by easing income, asset and partner tests, so a value of 0.55 is adopted here for both scenarios.

For those eligible business the JobKeeper payment scheme provides a 52 per cent income offset compared to the actual income lost. However some eligible employees will also be able to claim additional social security benefits and hence the setting of 0.55 will also be retained for all payments for the newly unemployed with either employed or unemployed statistical status.

What should the ratio optimally be? Probably not more than 0.6 since the expected 26 percentage point rise in the net household saving ratio, coupled with reductions in work transport and appearance costs, would mean that a 0.6 ratio would allow a typical unemployed (even if counted as employed) household to maintain the same average living standard as an equivalent employed household given the overall constraints on spending.

#### Lagged adjustment parameter – the deferred cost ratio

The adjustments described by the multiplier calculations shown in Appendix A will take time, because they require a sequence of interactions between households and businesses and between businesses. The time period to complete the sequence of interactions involved in each multiplier relationship is likely to be greater than one quarter. Allowance is made for this by the p6 parameter given in Table 5. A p6 parameter setting of 0.25 in normal times would be reasonable allowing for a quarter of the total impact to flow into the next quarter, indicating that businesses are hesitate to respond promptly to falls in demand. For COVID-19 this is not the case as businesses will have a much better idea of what lies ahead for the next three months than is what is generally the case. Accordingly, for the Central scenario the value of the p6 parameter is reduced to 0.05. That is the fall-off in demand is so dramatic that businesses respond very promptly to scale back production.

#### The contingency ratio

Many things have not been explicitly taken into account that are known to be important. For example, supply chain impacts where the unavailability of key component inputs into production will curtail domestic production. To allow for factors not included a contingency of up to 20 per cent could be allowed for. However the individual LGAs will have a much better idea of what should be allowed so the value of p7 parameter is set at 0.0. If a parameter value of 20 percent is set by an individual LGA then all results should be scaled up by multiplying by 1.2. This allowance could cover a general reduction in industry productivity from workplaces applying social distancing rules.

## 12. Critical modelling parameters: Those with direct impact on labour market outcomes

Given the gross domestic product and gross state product outcomes, the parameters that will determine the change in employment relative to change in gross product are:

* the elasticity of hours worked with respect to the real hourly wage, or the small business employment generation potential parameter;
* the elasticity of hours worked with respect to change in industry gross product, or the productivity suppression parameter; and
* the elasticity of employment with respect to changes in hours worked, or the job sharing parameter.

Typical absolute values of these parameters will be between zero and one. The actual parameter settings for all LGAs are given in Table 4.

The value of the elasticity of hours worked with respect to the change in industry gross product (or sales) determines the extent that a loss in sales is translated into a loss in measured hours of work. A value of 0.0 for the p2 parameter means that a loss of sales, no matter how large, does not impact on the hours of work. Employees are simply transferred to other activities unconnected to the support of current sales. A value of 1.0 means that the percentage fall in hours of work will be the same as the fall in sales. The JobKeeper Scheme effectively pushes this parameter towards 1.0 as it reduces the moral demands on employers to protect employment as best as they can. Therefore, it is assumed that firms’ main objectives are to protect enterprise productivity as a result of a fall in demand and the p2 value is set at 0.95. The job sharing employment parameter or the elasticity of employment with respect to hours worked is set at 0.9 from Table 4..

#### JobKeeper parameters

The JobKeeper scheme introduces the need to define the employment impacts. On one hand, the ABS Labour Force Survey will count JobKeeper recipients as employed irrespective of how they answer the other labour market test questions. On the other hand, many JobKeeper recipients will be working 0 hours and not participants in the economy or adding value to production. From this perspective the scheme represents an outsourcing of Centrelink social security costs to businesses. For this reason we have split the employment impacts into:

* not on JobKeeper – unemployed as defined by the ABS; and
* JobKeeper – effectively not working (i.e. 0 hours) or contributing to economic activity

The first step in evaluating the JobKeeper component is to make estimates of the share of businesses being subject to more than a 30 per cent decline in sales. This will be linked to the average industry decline in sales. The greater the percentage decline in average sales the greater the share of employment will be in enterprises which have a 30 per cent decline in sales. Probability distributions will be used to provide estimates by industry. The probability distributions were applied to the average sales decline for each industry to estimate sales decline for those enterprises which experienced more than a 30 per cent decline. The same national probability distributions are applied at LGA level.

In addition not all employees in eligible organisations will be eligible for JobKeeper payments, for example, when the business does not register because in does not plan to reopen or where casuals are no eligible. Hence to the eligible pool of JobKeeper employment is discounted by the p9 parameter in Table 4 which is set at 0.8.

#### The real wage elasticity: SME employment generation potential

The hours worked-real wage elasticity measures the sensitivity of hours worked to real wages. If p8 equals 1.0, a 1 per cent reduction in the real wage rate would result in a 1 per cent gain in hours worked. If the parameter equals zero there is no impact on hours worked.

The importance of the parameter for this study is the Commonwealth Government’s boosting business income scheme, which is essentially a wage subsidy scheme which works as follows. To be eligible for the scheme the enterprise must have a turnover under $50 million. Such businesses are to receive a monthly credit equal to three times the monthly withholding income tax on employees, which continues per month until the cumulative payments equal $50,000 for a three month period. After the cap is reached there will be no further payments over the June to September months, when the payment will be $12,500 or 25 per cent of the cap. The three-fold credit rule will continue until this further cap is reached. When parameter adjustments, complementary programs and state program contributions are allowed for it is assumed that $20 billion will be available for the program for the June quarter. This will represent 8 per cent of national wage and salary costs. The program accordingly has the potential to offset at least some of the direct impact of hours lost from the social distancing measures.

What the actual offset to the fall in hours of work will be will depend on the size of the p8 parameter. Based on the historical data, an elasticity of -0.6 would be justified and this is assumed for the Central scenario. A p8 value of -0.6 would mean that whatever the fall in gross product the fall in hours worked would be approximately 5 per cent less.

There are a number of problems with the scheme. Firstly, to receive the wage credit enterprises have to remain open. This will not be the case for many businesses that are subject to the direct impact of social distancing measures. To offset this it is assumed that the maximum payments ceiling is steadily increased to compensate for the continued degrading of the scheme’s effectiveness by actual employment losses, so that the full $20 billion expenditure for 2020.2 is applied.

A week later the Government solved the problems with this scheme by introducing the JobKeeper payment scheme. By being able to retain employees with a government payment, businesses which had even shut can now benefit from the boosting business income scheme. Secondly, for the businesses eligible for the JobKeeper scheme employees can be retained at no cost invaliding a high value for the p8 parameter.

However, a value of 0 for the p8 parameter is also not justified since some businesses will not be eligible for the JobKeeper scheme who are eligible for the boosting business income scheme. Accordingly, for the Central scenario the value of p8 is set at -0.05.

#### The productivity suppression parameter

The value of the elasticity of hours worked with respect to the change in industry gross product (or sales) determines the extent that a loss in sales is translated into a loss in measured hours of work. A value of 0.0 for the p2 parameter means that a loss of sales, no matter how large, does not impact on the hours of work. Employees are simply transferred to other activities unconnected to the support of current sales. A value of 1.0 means that the percentage fall in hours of work will be the same as the fall in sales. With a p2 value of 0.0, the impact of the decline in sales is absorbed by a fall in productivity, whereas a p2 value of 1.0 means that productivity is unaffected by a fall in sales, and the full impact of a fall in sales is a fall in hours of work.

The value of p2 will certainly be less than one. Most businesses are subject to short-run economies of scale, which means that productivity increases when output expands and declines when output contracts. In part this is due to part of the labour employed being assigned to overhead functions not related to short-run variations in output.

For small negative shocks to the economy a value of p2 of 0.75, or a short-run return to scale coefficient of 1.25, which is not inconsistent with historical benchmarks. The JobKeeper payment scheme however significantly retain staff using internal cash flow. Hence the value of p2 for the Central scenario is set at 0.95.

#### The job sharing parameter

The job sharing parameter is the elasticity of the change in employment with respect to change in hours of work available. A value of 0.0 means that given the fall in hours of work available, the hours of work are shared between existing employees, albeit at the same dollar per hour of work. An elasticity value of 1.0 means that there is no job sharing.

The historical record suggests a value of p3 in the vicinity of 0.75. However the scale of the negative shock and the JobKeeper payment scheme significantly reduces the incentive to job share. Hence, for the Central scenario, the value of p3 is set at 0.9.

## 13. Business investment and the financial crisis

As noted above the main objective of the measures to reduce the cost of credit and increase credit availability is not to add to demand but to stop demand falling from baseline measures. For the June quarter 2020, the level of business investment could have been around $60 billion nationally in the absence of COVID-19. The bringing forward of the financial crisis from the 2022-25 period to 2020 has placed a significant portion of this expenditure at risk and in addition risks the imposition significant additional negative shocks on industries as businesses are forced to close from bankruptcy.

The assumption made in this study is that the low cost loans, loan guarantees and investment support measures announced so far are successful in maintaining stability of investment by encouraging new investment to offset the fall off in investment flowing from the decline in industry activity and the investment decline from the pulling forward of the financial crisis, at least for the June quarter. This assumption will no doubt prove to be very optimistic. Even apart from the pulling forward of the financial crisis, the historical record shows that when GDP falls by 10 per cent for any quarter, the expected fall in business investment in the current quarter and the two subsequent quarters is 30 per cent. The world crisis will make this worse. The effectiveness of the effort to encourage new investment will become particularly important from the September quarter on in determining the pace of economic recovery.

The above issue arises from the financial crisis. Aside from this, however, COVID-19 will have a direct impact on construction activity via:

1. social distancing forcing a productivity loss on work sites; and
2. supply chain constraints from poor availability of components from overseas.

Table 2 shows the adjustments for the two construction suppressed industries from the productivity losses from the COVID-19 virus. The same percentages in Table 2 are applied equally to all LGAs.

## 14. Measured employment

At the LGA the model works out the fall in employment given the fall in sales and gross product and hours worked in accordance with the application of the relevant critical parameters. From this is taken the newly unemployed that are estimated to be on Jobkeeper payments to obtain the measured change in employment. The JobKeeper payments for those who are retained in employment enter the model via the Last column in Table 2.

## 15. The three measures of GDP

The ABS uses three measures of GDP, namely the demand, production and income measures. The ABS now reconciles the three measures via an input-output framework. However, the experience of the March quarter 2009 indicates that the ABS will do what it can to minimise its estimate of a negative economic shock on the economy. In present circumstances, the ABS could do this by putting greater weight on the income measure, say by simply taking the total wage level and deflating by a general deflator in which the wage level is inflated by government stimulus measures. The profit component of the income measure would fall in proportion to the demand side GDP fall but the real wage measure would fall significantly less, so restricting the measured fall in GDP to single digits for the 2020.2 quarter. The JobKeeper payments will enhance the ability of the ABS to do this, but it will not be ‘real’.

The GDP estimates shown here are demand or production side GDP estimates.

## 16. The longer run impact

The long-run damage to the economy from the impact of COVID-19 and perhaps most importantly the pulling forward of the financial crisis otherwise expected in 2003-25 will stem from:

1. permanently lost export markets as supply chains are disrupted and new long-run trading relationships established, including the use of domestic education institutions;
2. financial asset reductions and increased debt by the household sector weakening long-run spending capacity;
3. increased public sector debt requiring higher tax rates and lower expenditures if the COVID-19 programs are financed by sale of bonds to the public though this would be unnecessary and not appropriate as the debt can be financed by the Reserve Bank and then cancelled as it’s a clear desired case of the government lending to itself or what is commonly referred to as printing money;
4. increased debt by businesses reducing internal cash flows to support investment or staff;
5. higher real and nominal interest rates from the risk-off shock that will defy attempts by the monetary authorities to reduce interest rates; and
6. excess capacity in the world economy will increase competition in export markets and in particular give China a greater capacity to discriminate against Australian exports.