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DO HIGHER UNEMPLOYMENT BENEFITS REDUCE INCENTIVES TO WORK? INSIGHTS FROM THE CORONAVIRUS SUPPLEMENT

Erin Clarke, Matt Nolan, and Ali Vergili

The introduction of the JobSeeker Coronavirus Supplement was designed to support households that experienced job loss during the pandemic. However, did the increase in the benefit payment during 2020 reduce the incentive for people to work?

To explore this, we compare Australians who received the Supplement to similar New Zealanders living in Australia. New Zealanders were ineligible for the Supplement but faced the same job market and health challenges as the broader population.

Using this approach we found that:

- the chance of a recipient finding a job declined by 19%, while job separations rose by 64% following the introduction of the Supplement,
- there is no evidence of higher labour earnings for recipients of the Supplement in future years.

Overall, our results suggest that a 10% increase in unemployment benefits would lead to a 2.1% decline in job-finding rates, increasing the average time spent out of work by a recipient by approximately one week.

As the Supplement was intended to support households and prevent the spread of a communicable disease during a pandemic, the reduction in labour supply is not a negative outcome of the policy in 2020. However, it also suggests that, under normal economic circumstances, higher benefit rates will reduce job search by recipients in Australia.

This research note investigates the impact of the $550 JobSeeker Coronavirus Supplement - a near doubling of the unemployment benefit - on the labour market decisions of Australians during the COVID-19 pandemic. Using the fact that New Zealanders in Australia were unable to access the Supplement, we find that the Supplement had a sizeable effect on incentives to work.[1]

On the 22nd of March 2020, the Australian government announced the Coronavirus Supplement, a temporary $550 a fortnight increase in the JobSeeker Payment (JSP). The Supplement was set to take effect from the 27th of April 2020 and was initially scheduled to end on the 24th of September 2020. On the same day, the government also announced a relaxation of JobSeeker eligibility criteria, including the suspension of mutual obligations requirements and modifications to asset and income tests to broaden payment accessibility.[2]

This announcement coincided with a nationwide lockdown to prevent the spread of the COVID-19 virus. Eight days later (on the 30th of March 2020) the JobKeeper program was introduced to supplement other interventions by keeping individuals tied to their current employers.

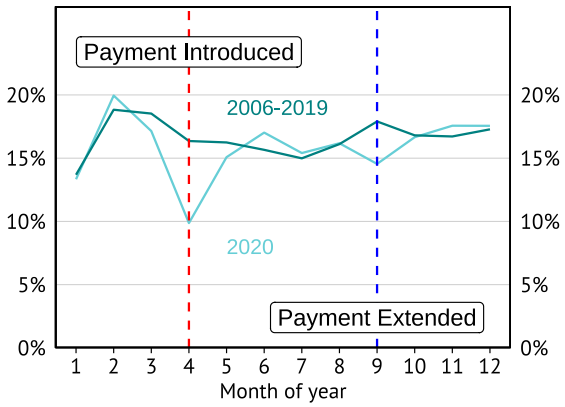
Due to heightened uncertainty and the introduction of government-mandated lockdowns, the near-doubling in the benefit level was not expected to have significant labour supply effects. A combination of extremely low labour demand and widespread self-isolation had already discouraged workforce participation. The expected benign labour supply effects appeared to be confirmed by public data at the time, as the rate of job finding during 2020 was similar to previous years, suggesting the Supplement did not influence labour supply behaviour (Figure 1) (Borland, 2020).

We investigate whether the effects were benign by comparing Australian JobSeeker recipients to similar New Zealanders living in Australia. Critically, New Zealanders in Australia were eligible for most COVID response policies, but were excluded from the JobSeeker payment and therefore the Supplement. Using New Zealanders we can account for other factors that will have influenced labour supply behaviour at the same time (i.e. fears of the virus, government lockdowns) to focus on the effects of the supplement (see Appendix A.1).

1 The code for this analysis can be found at https://github.com/Zjub/TVHENZ/tree/main/e61%20Projects/COVID%20Aust%20NZ.
2 For further details on the changes to JobSeeker eligibility requirements and other relevant COVID policies, see Appendix E.1.

Figure 1: Job-Finding Rate*

Percentage per month



Sources: ABS; e61

Labour Supply responses

Job-Finding Rates

The job-finding rate measures the proportion of individuals who are out of work and find a job in a given week. This rate is influenced by two primary factors: the availability of jobs (labour demand) and the effort individuals invest in job search (labour supply).

An increase in unemployment benefit payments reduces the expected return from job search. This reduction in job-search intensity will lead to a decline in the job-finding rate. For this reason, changes in job-finding rates serve as a critical indicator of the labour supply effects of benefit policies (Barbanchon et al., 2024). A detailed review of related empirical findings is available in Appendix B.2.

During the COVID-19 pandemic, three key factors contributed to the decline in job-finding rates — two of which were unrelated to the Coronavirus Supplement. First, employment opportunities decreased as businesses faced operational restrictions and lower demand. Second, elevated health concerns made in-person work riskier, discouraging individuals from seeking jobs. Finally, the introduction of the COVID Supplement and the removal of mutual obligation requirements (alongside a temporary easing of income and partner income tests) increased the income of those who were not working, potentially reducing job search efforts.[3]

The labour supply response to higher benefit levels should occur when the payment change is *announced* - as individuals reassess the net value of not working at that time. However, when higher benefits were announced there was also emergency lockdowns and heightened COVID-19 contagion risks. As a result, the observed decline in job-finding activity is likely influenced by all three factors.

In order to isolate the labour supply response to the change in the benefit rates we require a comparison group who could not receive the benefit but was exposed to the same labour market and health shocks. This allows us to establish a clean counterfactual for what individuals would have done in the absence of the payment increase. To achieve this we leverage a comparison group of New Zealanders living in Australia during this period. As discussed further in Appendix A.1, this population faced the same local labour market and health shocks, but did not receive the Coronavirus Supplement payment.

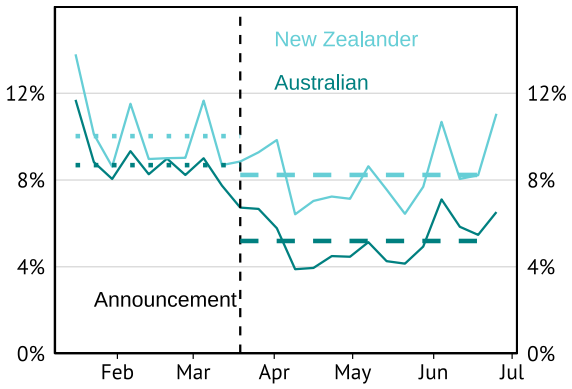
To ensure a robust comparison, we matched individuals on the basis of criteria that reflected they were in the same labour market. This included living in the same Statistical Area Level 4 (SA4) region, being in the same age range, and working in the same industry and occupation. Additionally, we matched on prior income levels, whether they have a spouse, and spousal income to ensure similar eligibility for the JSP. A more detailed discussion on this matching process can be found in Appendix A.1.4.

Building on the matched sample, we quantify the impact of the policy change by fitting a regression model to estimate the job-finding rate. This model controls for citizenship status, a binary indicator for the period before or after the policy announce-

3 Details on these changes are outlined in Appendix E.1

Figure 2: Job-Finding Rates*

By citizenship in Australia, matched



* Proportion of those out of work finding employment, weekly
** Dotted lines refer to the average for the group, in the pre-period. Dashed is the post-period.
Sources: ABS; e61

ment, and an interaction term between these two factors. The interaction term captures the change in the difference between the job-finding rates of New Zealanders and their matched Australian counterparts following the policy announcement. In Figure 2, the change in the gap between the dotted and dashed lines illustrates this differential impact.

Although New Zealanders generally have higher job-finding rates than Australians, this gap expanded significantly after the announcement of the Coronavirus Supplement (Figure 2). Given that both groups were subject to similar regional labour market and health shocks, we infer that this widening disparity was primarily driven by the announcement of the Supplement and other JobSeeker benefit changes.

As shown in Appendix A.2.4, Table A.2, our analysis finds that the Australian job-finding rate declined by 1.7 percentage points (19% reduction) after the announcement of the Supplement. This decline corresponds to an extensive margin labour supply elasticity of -0.21, consistent with estimates from international studies (Bachas et al., 2020; Finamor & Scott, 2021; Ganong et al., 2024; Marinescu et al., 2021).[4] This response occurred during a period of historically weak labour demand and under temporary benefit extensions - both factors that are likely to dampen labour supply adjustments.

These findings are also robust to an alternative regression discontinuity design (RDD) approach modelling the difference in discontinuities at the announcement date, as detailed in Appendix D.

Separation Rates

Higher benefit payments can potentially incentivise individuals to voluntarily leave their jobs, which would be reflected in an increase in the *separation rate*. The historic nature of these voluntary separations have been outlined in Hayward et al. (Forthcoming). During 2020, voluntary separations were relatively elevated (Appendix A.3) highlighting the importance of this margin.

The timing of the policy's introduction — coinciding with widespread COVID-19 lockdowns — makes it crucial to disentangle the effects of the Coronavirus Supplement from broader pandemic-induced labour market disruptions. Lockdowns, along with heightened public health concerns, triggered a surge in job separations across the board, underscoring the importance of using a robust control group for comparison. We again use New Zealanders in Australia to analyse separation.

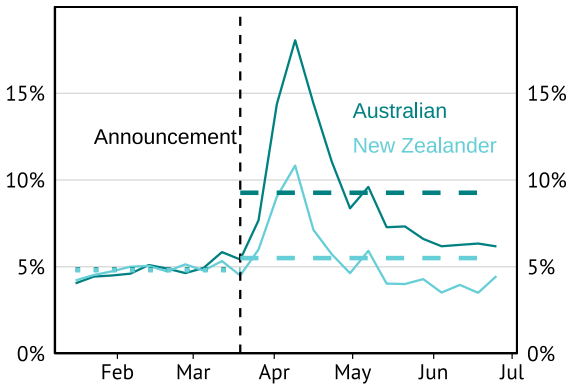
Figure A.2 illustrates the separation rates for matched New Zealanders and Australians. While both groups experienced an increase in separations during April 2020 — consistent with the impact of lockdowns — the rise was significantly steeper for Australians. Moreover, the Australian separation rate remained persistently higher throughout much of the first half of 2020. This divergence suggests that, beyond the shared pandemic-induced factors, the introduction of the Coronavirus Supplement played a key role in driving the observed differences in separation behaviour.

Using a similar regression approach as outlined earlier (shown in Appendix A.2.4, Table A.3), we estimate that the separation rate for Australians was 3.7 percentage points higher – a 64% increase – as a result of the Coronavirus Supplement and

4 Labour supply elasticity is calculated as the percentage change in the job-finding rate (-19%) divided by the percentage change in benefits (90%).

Figure 3: Separation rates*

By citizenship in Australia, matched



* Proportion of those working who leave employment, weekly
** Dotted lines refer to the average for the group, in the pre-period. Dashed is the post-period.
Sources: ABS; e61

JobKeeper policy. Alternative methods to test the robustness of this result are given in Appendix D.4 and A.4 which suggest that the effect on separations for the Supplement alone will be smaller.

Supplemented with evidence from Barbanchon et al. (2024) and Luo and Nolan (2025) and given the significance of the JobKeeper program on worker choices noted in Andrews et al. (2023), Bradshaw et al. (2023), and Watson et al. (2022) we would be cautious interpreting this separation result outside of the COVID context.

When considering both job-finding rates and separation rates, the announcement of the Coronavirus Supplement appears to have significantly increased the likelihood of Australians leaving and remaining out of employment. While this behaviour might initially seem counterproductive, it is important to contextualise these findings within the broader public health crisis of the time. The heightened health risks associated with COVID-19 may have made the decision to stay out of employment both rational and socially beneficial, as reduced workplace interactions likely curbed the spread of the virus. Nonetheless, these results underscore the substantial role that financial disincentives can play, even in a period of historically low labour demand. The Supplement's introduction clearly influenced employment decisions, underscoring the balance between income support and labour market incentives.

Part of this sizeable response in both job-finding and separation rates may be attributed to the *temporary relaxation of mutual obligations* at the same time. As noted by Nolan (2023), mutual obligations have previously been identified as a key factor in limiting labour supply responses to benefit abatement, particularly on the hours or intensive margin. Furthermore, evidence from Chan et al. (2024) demonstrates that the introduction of mutual obligations in the 1990s had a substantial impact on labour supply decisions. While both Breunig et al. (2003) and Borland and Tseng (2007) show how specific job search rules imposed in these obligations matter. We discuss this more below.

Benefit rates or mutual obligations

The COVID Supplement continued, in a changed form, after its announced end date in September. On 21 July the Government formally announced an *extension of the supplement* - but at a reduced rate.

By this stage the economy had begun to partially reopen, raising concerns that the high effective marginal tax rates associated with the initial Supplement could discourage individuals from returning to work (Australian Parliament House, 2020). However, an extension had been deemed to be necessary due to rolling outbreaks and the lockdowns in Victoria from late-June. With COVID continuing to persist, further support to households was deemed to be appropriate.

The labour supply effects of this later policy announcement are less clear and are discussed further in Appendix E.2.

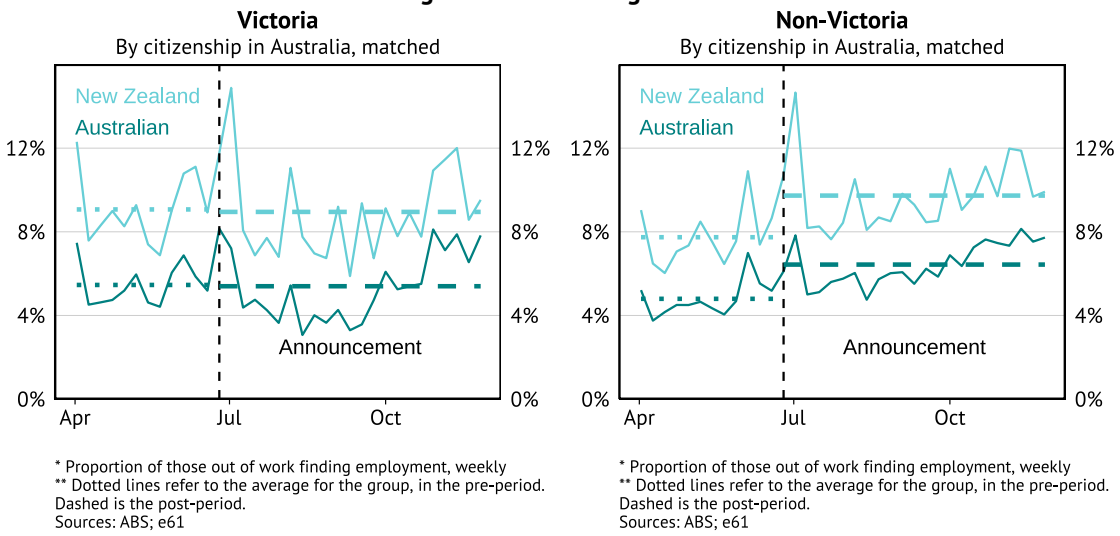
The limited observed labour supply response to the July Supplement Extension can be explained by two key hypotheses. First, participants may have anticipated the extension, meaning that there was no additional financial incentive to reduce job search effort. Second, the reintroduction of mutual obligation requirements alongside the extension may have counteracted the disincentive effects of higher payments by encouraging increased job search effort.

Understanding the role of mutual obligations is also important for interpreting the labour market response to the March announcement. If the reintroduction of mutual obligations played a significant role in moderating the July labour market response, then the drop in job-finding rates in March may have been the result of an *easing in obligations* rather than the increased payment rate.

Mutual obligations were reinstated gradually across all Australian states from early June 2020. However, the July Supplement Extension provides a unique opportunity to assess these dynamics, as it included differential treatment in the reintroduction of major mutual obligation requirements: Victoria was excluded from the reintroduction of this set of mutual obligations due to its prolonged lockdown (Appendix B.4).

To investigate the contribution of this set of mutual obligations, we separately estimate the changes in the job-finding rate between Australians and New Zealanders following the July announcement for those in Victoria and those across the rest of the country. Our results show no difference in the *relative* job-finding response in Victoria relative to the rest of the country, despite the differing mutual obligation policies.[5]

Figure 4: Job-Finding Rates*



* Proportion of those out of work finding employment, weekly
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Sources: ABS; e61

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This finding indicate that the *temporary* lifting of mutual obligation requirements was not a primary driver of the limited response in July. Instead, the lack of a strong labour market response likely reflects anticipation of the policy extension by recipients prior to its official announcement. The lack of a differential response is shown in regression form in Appendix A.2.4.

Furthermore, the lack of a response to these temporary differences in mutual obligations in July implies that the *temporary* easing of obligations in March is also unlikely to have been the key driver of the earlier observed decline in job-finding rates. As a result, the evidence points to the payment rate increase – along with the changes in asset/income tests and eligibility criteria – as the primary factors influencing labour supply behaviour following the March announcement.

Income profiles of recipients

A longer period of job search during COVID may have had socially positive implications for two reasons:

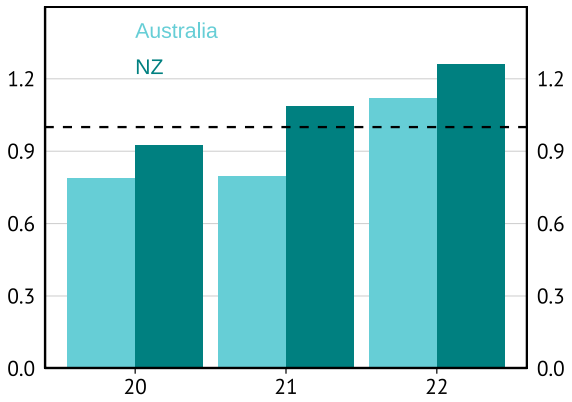
- The health crisis associated with COVID meant that delaying re-entry into the labour market reduced the likelihood of contracting and spreading the disease, protecting both workers and the broader community.
- Additional time to search for work during a period of low labour demand may have allowed individuals to find a job that better matched their skills and preferences.

If additional time to search did improve job match quality in this environment, we would expect individuals who had access to this safety net to have higher future earnings than those who did not. However, this is not the case.

5 Identification of the individual job-finding rate effects relies on New Zealanders and Australians experiencing the same job-finding consequences due to the lockdown status of the state. If lockdowns also reduce the *difference* between these groups, this approach may understate the effect of mutual obligations.

Figure 5: Income Outcomes

For employed individuals



Sources: ABS; e61

In Figure 5 we show the earnings of our matched groups of New Zealanders and Australians relative to their labour earnings in Financial Year 2019. Both groups experienced an earnings penalty during 2020, and this penalty persisted into 2021 for Australians but not for New Zealanders. By 2022, the earnings trajectory of Australians had not caught up to their New Zealand counterparts. If there had been a large match quality dividend associated with access to the Supplement, we would expect Australians' relative earnings to be higher.

This finding does not rule out the potential for unemployment benefits to generate improvements in job match quality through extended job search periods. However, this is unlikely to be the case given the international literature suggests a lack of such match quality benefits (Barbanchon et al., 2024).

Conclusion

This analysis provides new insights into the labour market impacts of the Australian Coronavirus Supplement introduced during the COVID-19 pandemic, leveraging New Zealanders residing in Australia as a control group to isolate the effects of increased unemployment benefits on job-finding and separation rates. Our findings indicate a significant 19% decline in job-finding rates and a 64% increase in separation rates among Australians, emphasising the disincentive effects of higher benefit levels. These results are consistent with international evidence and underscore the policy trade-offs between providing financial support and maintaining labour market incentives.

These results are consistent with the broader analysis of the behavioural implications of COVID supports in Australia. Sainsbury et al. (2022) estimate the labour supply responses to the early superannuation withdrawal scheme, finding larger labour supply effects. Both estimates suggest that, even during a period of restricted labour demand like the COVID pandemic, temporary changes to benefit support systems can influence labour market behaviour.

The fact that there were labour market responses during a pandemic does not suggest the policies were poorly designed or poorly targeted. In fact, higher levels of income support that enable individuals to opt out of work may be desirable when faced with a pandemic - given that COVID is a communicable disease and a reduction in human contact mitigates it's transmission.

However, given these labour supply responses occurred during the pandemic, we would expect similar effects to occur in more standard economic conditions. This confirms that changes to the JobSeeker payment rate will influence job search behaviour.

While potential labour supply responses should be considered when evaluating changes to benefit rates, a reduction in labour supply does not undermine the justification for increasing payments. Beyond serving as insurance against job loss, unemployment benefits play a vital role in preventing poverty and maintaining a social safety net.

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A.1. Why are New Zealanders a good control group?

The identification in this micronote depends on the use of New Zealanders as a control group.

The relationship between Australia and New Zealand is unique. In the 1900 Commonwealth of Australia Act, New Zealand was included as one of the States ("Commonwealth of Australia Constitution Act 1900", 1900), and due to this in the Australian Constitution New Zealanders are also given special protections.

In Australia, New Zealanders are given a special visa on arrival (Special Category Visa - subclass 444) and are free to work permanently in Australia. The visa is cancelled and renewed as New Zealanders leave and return from Australia. New Zealanders also have access to Medicare and the Family Tax Benefit. However, New Zealanders are **not eligible** for transfer payments (either the JobSeeker payment or payments for services like the National Disability Insurance Scheme). Time limited eligibility is given after 10 years, with a New Zealander able to receive up to six months of JobSeeker payments. Prior to 2001, New Zealanders were effectively treated as Australian citizens with full access to these payments.

During COVID some support systems could be received by New Zealanders even though other non-citizens were ineligible - namely Early Release of Superannuation, the JobKeeper program, and one-off payments associated with the Family Tax Benefit. Further details about the nature of these support programs will be included in a future supplementary appendix.

In normal economic times a New Zealander who leaves or loses their job would be able to travel back to New Zealand and receive the New Zealand JobSeeker payment after a stand-down period. However, during COVID it was extremely difficult to move to New Zealand - with both the New Zealand and Australian borders shut, limited flights, and compulsory quarantine periods in facilities that had a backlog of bookings.

For our analysis we focus on New Zealanders who stayed in Australia over 2020 who had been in the country for less than 10 years, and were still on the Subclass 444 Special Category visa by March 2021.

Although this refers to a large number of individuals in Australia on these visas (250,000, Department of Home Affairs (2021)), as we are only focused on those ineligible for benefit payments and who experience a period out of work in 2020 the numbers are much lower. We use a total of approximately 80,000 New Zealanders - 23,000 of which are matched with Australian JSP recipients and 57,000 that are not.

A.1.1 Datasets used

Employment records are calculated using a weekly version of the Single-Touch Payroll (STP) data for 2020. This is pay-as-you go based wage records provided by businesses to the Australian Tax Office.

There has been a progressive increase in the number of firms included in the STP data every July. For this reason we have excluded individuals who transitioned to businesses that were only observed in the STP data post-June 2020. This removes a significant number of businesses, but has very little effect on our sample.

The demographic characteristics of the individual worker (age, location, gender) are taken from the combined demographic data provided by the ABS. Visa status is defined using Home Affairs Visa data in PLIDA, with New Zealanders identified as those on Subclass 444 Special Category visa and Australians identified as individuals that are not observed in the Visa data or as recorded as having taken up citizenship prior to 2020.

Family status and spousal income is identified using ATO records in Personal Income Tax records. This will understate the number of couples in the data due to missing returns. Occupation is also identified from this data.

Receipt of family and income support payments is sourced from the DOMINO dataset. This is used to confirm that New Zealanders that were found were ineligible for the JobSeeker payment, and to identify which Australians were recipients and

which were not. A recipients was classified as an individual who received the JobSeeker Payment at any stage in 2020 - even if just for a day.

Business tax return information (BLADE) is only used to identify the industry the individual is working in.

A.1.2 Dataset construction

In this note we use integrated ABS microdata, combining information from PLIDA and BLADE. The data products used and what they are used for are outlined above, with sample restrictions further discused in Appendix A.2.

We create a weekly dataset of individuals who are either Australians or New Zealanders who experience a job separation.

We classify individuals who are observed as not working for four consecutive weeks. The start date for the out of work period is the last date of employment income in a job match, while the end date is the week prior to them reappearing in the STP data.

The denominator for the job-finding rate is the sum of individuals that are identified as out of work in a given week, while the numerator is the number of people that were out of work during the prior week and are in employment now.

For the separation rate, the denominator is the number of people who are employed out of a sample of individuals that will be displaced during the year. The numerator is the number of people who were employed in the prior week and leave employment in this week.

This implies that, for our separation rate estimates, there is a mass of missing always employed individuals that influences the result (but is irrelevant for the job-finding rate estimates). This inflates the size of the separation rate and the percentage point change - but does not influence the percentage change.

The reason why we focused on this more restricted sample was two-fold:

- At the time of analysis the full dataset including always employed individuals was too large to analyse.
- Given the limited demographic data we wanted to compare outcomes of groups of ”eventually treated” individuals - in order to compare individuals with a similar fragile attachment to work in this environment.
- The separation rate work was undertaken on a dataset that was consistent with the job-finding work.

For the job-finding rate estimates we are unable to identify individuals who were not in the STP or DOMINO data in 2020. This is likely to be biased towards an exclusion of New Zealanders due to their inability to access the payment. To make sure we have a like for like comparison, we have fully excluded individuals who are out of work for the entire year.

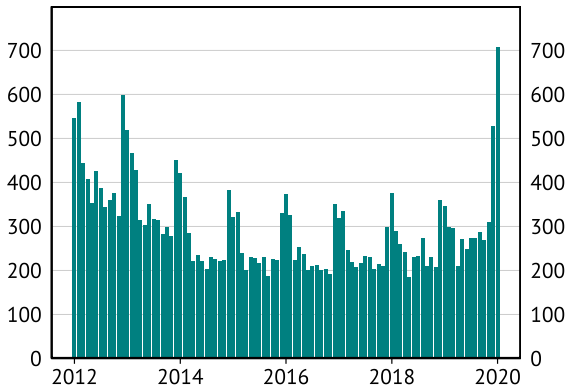
A.1.3 New Zealander Arrival and Departures

To help motivate New Zealanders as a control group we both want to show that there were limited departures from Australia (as this may generate selection on unobservables for New Zealanders that remain in the country) and show that New Zealanders are similar to Australians on observable characteristics. For the first of these we show the distribution of arrival dates for the New Zealanders we are looking at, and the aggregate level of departures during this period.

Above is the distribution of arrival dates of New Zealanders in our sample. This reflects 29,000 individuals.

Figure A.1: Arrival date of New Zealanders*

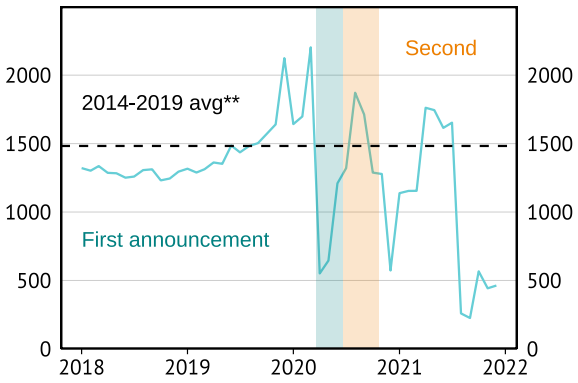
Arrival month of New Zealanders in Australia



* Dates for New Zealanders who are in Australia for analysis
Sources: ABS; e61

Figure A.2: NZ Departures to New Zealand*

Monthly, seasonally adjusted



* Arrivals from Australia of New Zealand citizens
** Average until September 2019
Sources: e61; Stats NZ

A.1.4 Propensity Score Matching

The characteristics of New Zealanders and Australians still differs between these two groups. As a result, we use propensity score matching to identify Australian's who look most similar to the New Zealanders in our sample. The analysis presented in this note is based on the *matched pairs* of New Zealanders and Australians through 2020.

We match on characteristics related to JobSeeker eligibility and labour market outcomes. These include: SA4 and State, age (in 10-year bins), industry (1-digit ANZSIC code), occupation (1- and 2-digit ANZSCO codes), whether the individual has a spouse, their income ventile, and their partners income ventile.

The matching model is a nearest-neighbour model. This involves estimating the propensity score which is based on a probit model that estimates the probability someone is a New Zealand citizen based on the observable characteristics above. We then 1:1 match Australians and New Zealanders based on their propensity scores.

An individual that is matched into a given group remains in that group for the entire analysis. The matching is undertaken on an initial cross-section of demographic data that is available in order to form these groups.

The matching process used is relatively coarse given the limited demographic data used. The use of prior income ventiles is an attempt to capture some information about the earnings history we are comparing, and compare individuals on similar trajectories. However, we could not use more than one year of history due to the censoring of income from New Zealand arrivals - we do not observe the earnings history of New Zealanders who were in New Zealand. Adding an additional year of earnings history to our matching process does not change our results.

The quality of this match is shown in the balance statistics in the next section.

A.2. Sample description and Balance Tests

In the analysis we use Single Touch Payroll (STP) data merged with Home Affairs Visa data to identify Australians and New Zealanders who are earning employment income through a STP participant enterprise. Due to data limitations we restrict our dataset to only Australians and New Zealanders (as defined above) who experience time out of work during 2020. This generates our *Australia New Zealand STP dataset*.

Given this we then match New Zealanders to their most similar Australian as discussed above to produce our *Full Matched* data. We then take the Australians who receive the JSP during 2020 and their matched New Zealand counterparts as our dataset for analysis.

A.2.1 Job-Finding Rate and Separation Rate definitions

Given the samples defined above, in this section we define the Job-Finding and Separation Rates and how they can be compared to standard rates in labour force statistics.

The Job-Finding Rate will capture all individuals who spent a **period of at least four weeks out of work** and then were reemployed in 2020. This is the ratio of two terms - the stock of people out of work, and the flow of individuals entering employment. We will miss the following flows:

- Individuals who reentered employment in a firm that was not in STP prior to July 2020.
- Individuals who exited a firm that was not in STP prior to July 2020.
- Individuals who were out of work for the entirety of 2020.
- Individuals who only exited the labour market "temporarily" and then reentered.

Overall, it is unclear if this will then over or underestimate the aggregate Job-Finding Rate.

The Separation Rate is significantly different to the aggregate concept. The key distinction is that we do not count *individuals who were employed for all of 2020*. As a result, relative to the aggregate number our separation rate is higher in level terms.

However, this does not a priori bias the difference in the separation rate between the groups. As a result, using this narrower group to define our separation rates provides a conservative estimate of the proportional change in Separation Rates.

A.2.2 Balance: Individual characteristics

The analysis begins with a comprehensive dataset of 3,252,076 Australians and 80,005 New Zealanders identified from Single Touch Payroll (STP) data merged with Home Affairs Visa data, focusing on those who experienced time out of work during 2020.

Using 1:1 propensity score matching, each New Zealander is paired with the most similar Australian, resulting in the Full Matched dataset of 80,005 individuals per group (Table A.1). For the final analytical sample, Australians who received JobSeeker Payment (JSP) during 2020 (22,873 individuals) and their matched New Zealand counterparts (22,859 individuals) are selected.

Table A.1: Sample Composition: Australians and New Zealanders

	Matched (JSP)	Matched (non-JSP)	Matched (total)	Initial individuals
Australians	22,873	57,132	80,005	3,252,076
New Zealanders	22,859	57,146	80,005	80,005

The matched samples of New Zelanders and Australians look very similar across key individual characteristics. However, several notable differences emerge when comparing the two groups both internally and against the broader Australian population. To illustrate these distinctions, we present graphical comparisons of the relative shares of individuals across various characteristics. These comparisons are presented in two ways: first by comparing the Australian's and New Zealanders within the two matched groups (matched JSP, full matched); and second by comparing the chartacteristics of the two matched groups with the broader population of Australian Citizens and New Zealanders residing in Australia.[6]

6 Other visa holders are excluded from this comparison, as they are not part of our analysis and their inclusion could bias the observed characteristics.

Age distribution: The ages of matched New Zealanders and Australians is generally well balanced within the two matched groups (A.3). However, our sample of matched individuals is *younger* than the broader population (see A.4).

Industry: Industry is also well balanced within the two matched groups (see A.5). When compared to the greater population, our matched sample has a relatively higher share of Industry Division N (Administrative Support Services) than the broader population.

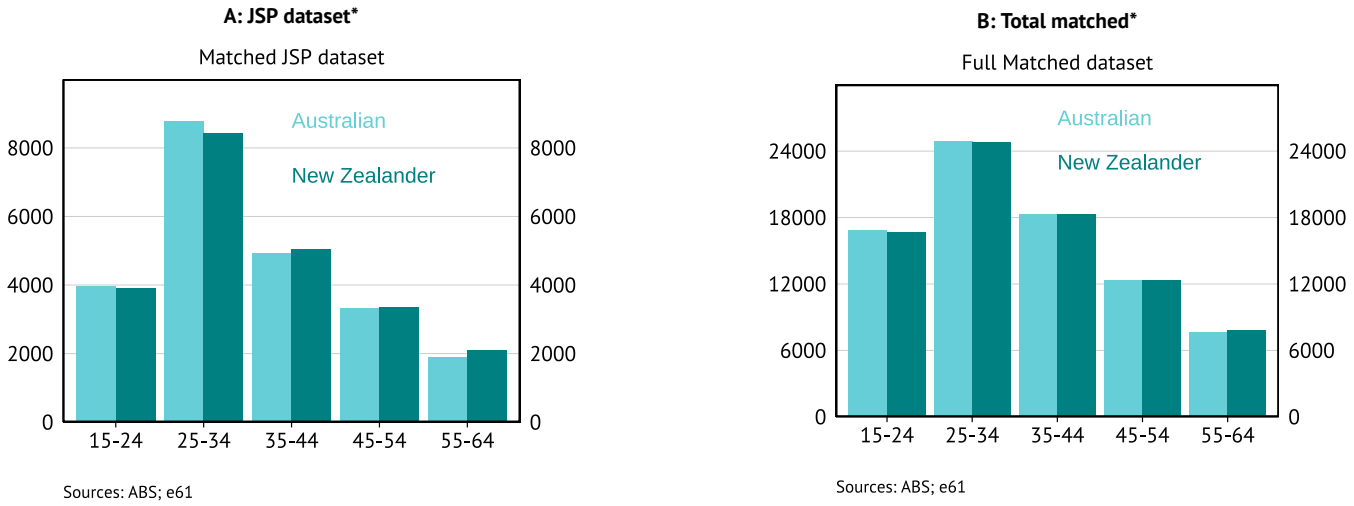
Occupation: Occupation is well balanced within the two matched groups. However, our samples have a higher share of lower-skill requirement occupations (7 - Machinery Operators and Drivers, and 8 - Labourers) than the greater population.

State: Regional distribution is well balanced within both matched groups. However, when the matched groups are compared to the general population, there are fewer individuals in NSW (1), South Australia (4), Tasmania (6), and ACT (8), and more individuals in QLD (3) and Western Australia (5) than the broader population.

Prior income: In terms of prior income, the New Zealanders and Australians in the full matched data set look very similar. However, in the matched group of JSP recipients and matched New Zealanders, the New Zealander group have higher prior-income than their matched Australian JSP recipients.

Spousal income: Similarly, spousal income is consistent across the full matched dataset. However, in the matched JSP group, the spouses of New Zealanders earn more on average than the spouses of matched Australian JSP recipients.

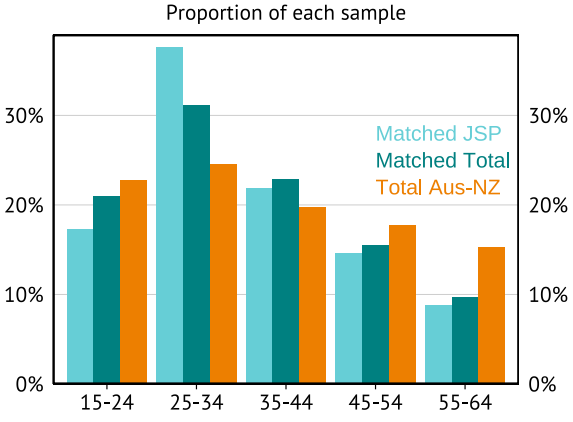
Figure A.3: Age Distribution



Sources: ABS; e61

Sources: ABS; e61

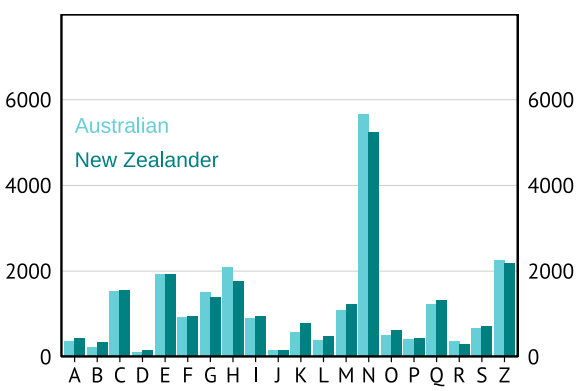
Figure A.4: Age Distribution by sample*



Sources: ABS; e61

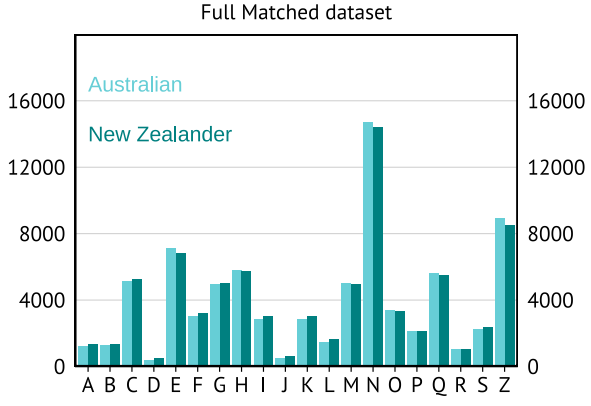
Figure A.5: Industry Distribution

A: JSP dataset*



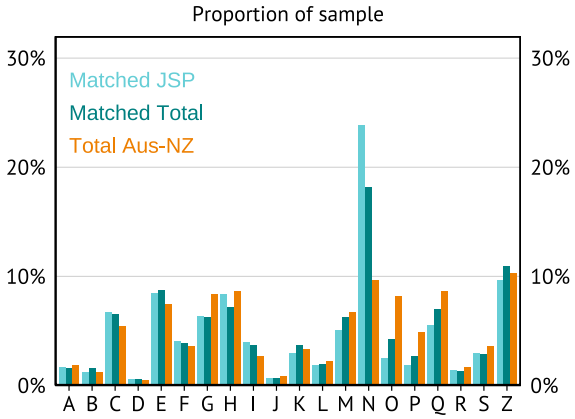
Sources: ABS; e61

B: Total matched*



Sources: ABS; e61

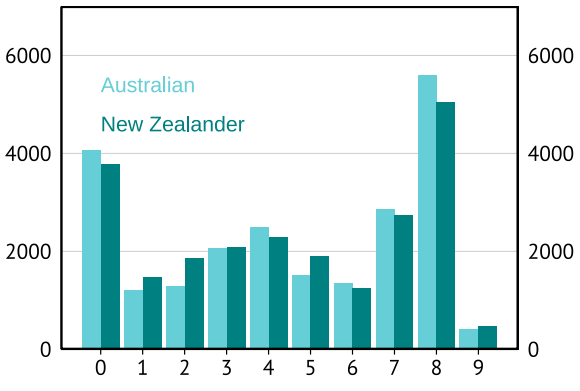
Figure A.6: Industry Distribution by sample*



Sources: ABS; e61

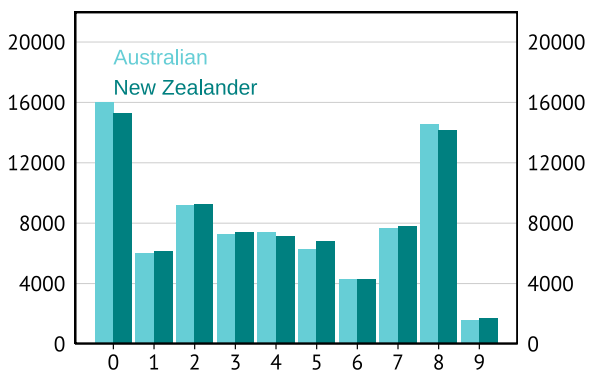
Figure A.7: Occupation Distribution

A: JSP dataset*



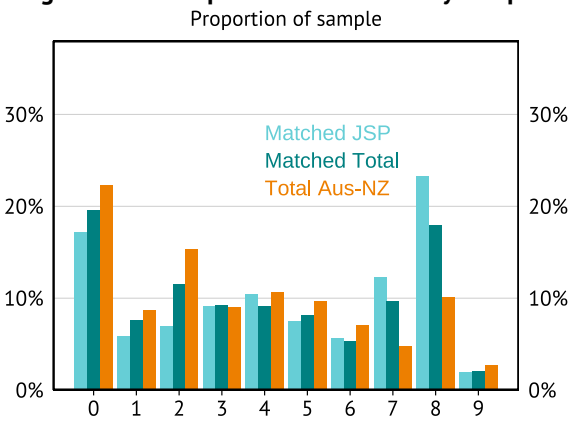
Sources: ABS; e61

B: Total matched*



Sources: ABS; e61

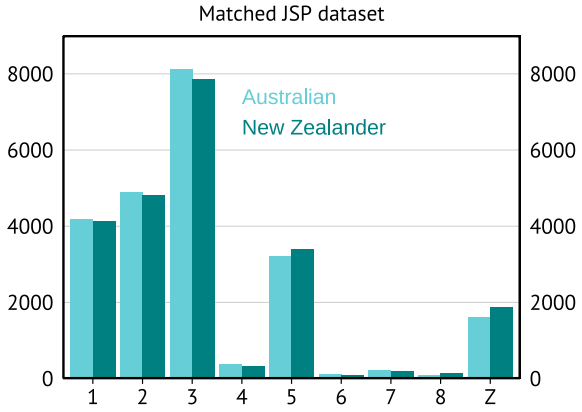
Figure A.8: Occupation Distribution by sample*



Sources: ABS; e61

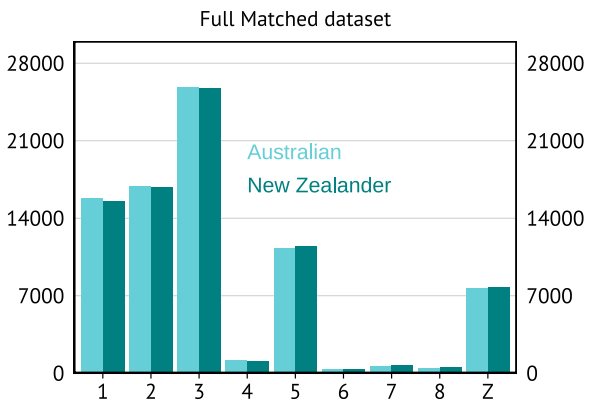
Figure A.9: Region Distribution

A: JSP dataset*



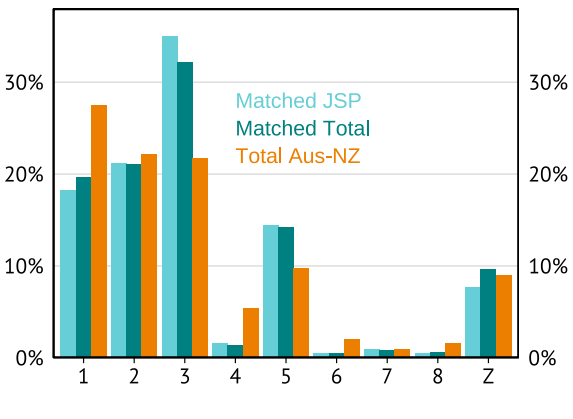
Sources: ABS; e61

B: Total matched*



Sources: ABS; e61

Figure A.10: Region Distribution by sample*



Sources: ABS; e61

A.2.3 Balance: Pre-displacement income

Figure A.11: Prior Income Distribution

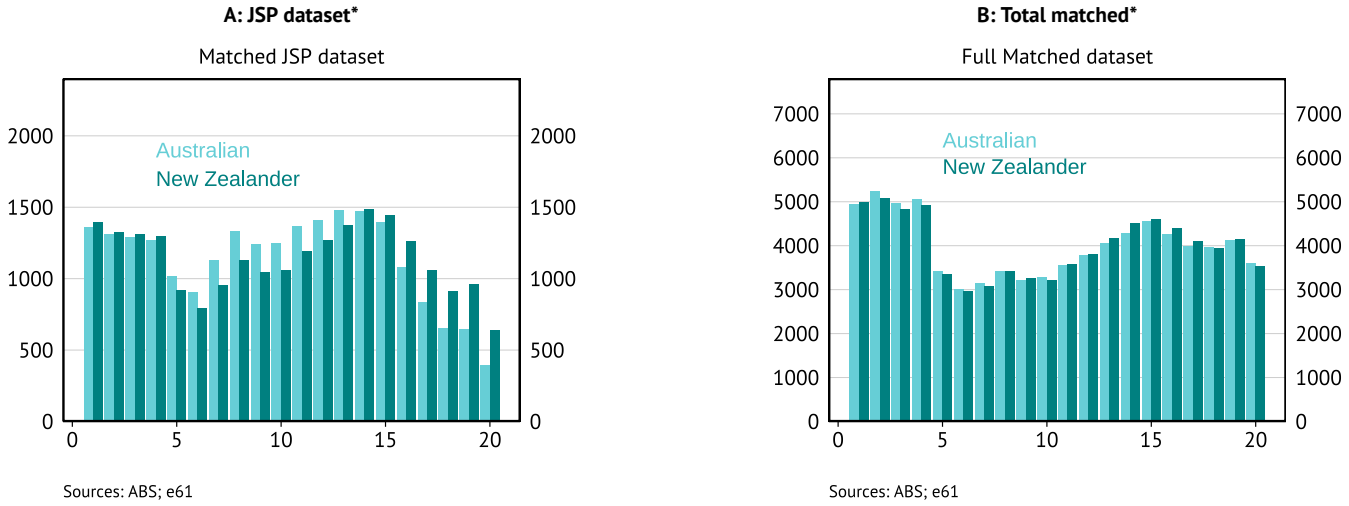
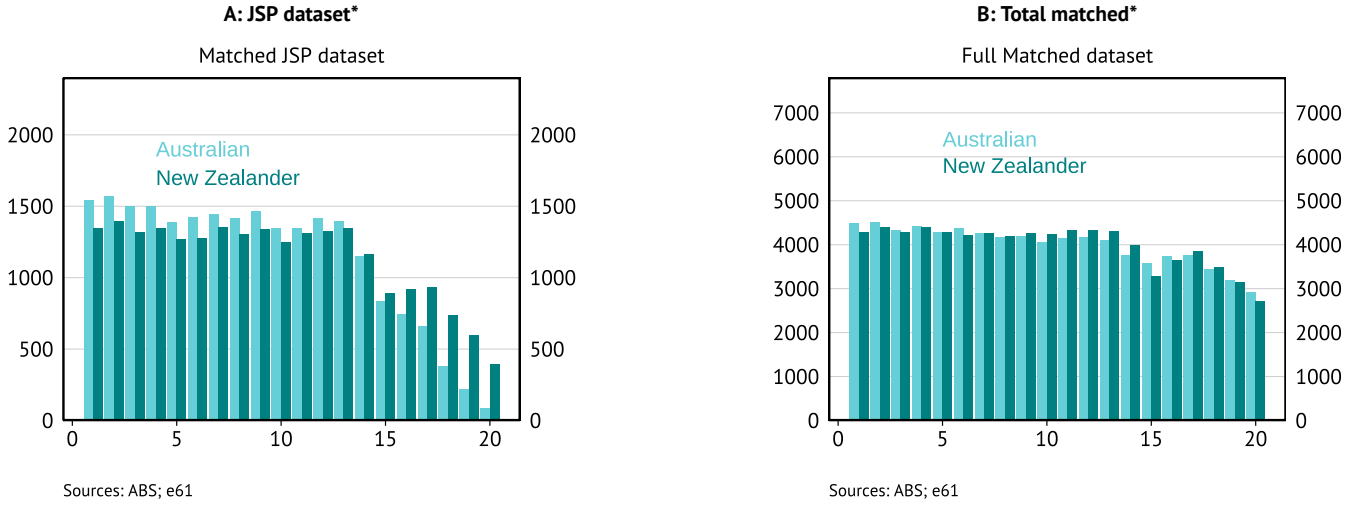


Figure A.12: Spouse Income Distribution



A.2.4 Regression tables

Table A.2: Regression Results: Job-Finding Rate

	Estimate	Std. Error	t value	Pr(> |t|)
(Intercept)	0.100231***	0.004422	22.66886	$< 2.2 \times 10^{-16}$
aus	-0.013373**	0.006253	-2.13872	0.0380
pre_post	-0.017893***	0.005789	-3.09073	0.0035
aus:pre_post	-0.017058**	0.008187	-2.08356	0.0430
Observations		48		
Standard-errors		IID		
RMSE		0.013387		
Adj. R^2		0.619106		

Significance codes: 0.01 '***' 0.05 '**' 0.1 '*'

In Table A.2 the regression results for the difference-in-difference exercise are reported. The intercept tells us the average Job-Finding Rate for New Zealanders in Australia prior to the March announcement. The *aus* coefficient tells us how much lower the Australian Job-Finding Rate was prior to the announcement. The *pre-post* term tells us how much lower the Job-Finding Rate was for New Zealanders after the announcement date, while the *aus:pre-post* plus the *pre-post* term reflects how much lower the Job-Finding Rate for Australians was.

As a result, it is the *aus:pre-post* term that reflects the difference between the two groups - and thereby represents our estimated treatment effect. The 1.7% drop in the Job-Finding Rate for Australians is statistically significant at the 5% level, and economically large as discussed in the main note.

Table A.3: Regression Results: Separation Rate

	Estimate	Std. Error	t value	Pr(> |t|)
(Intercept)	0.048043***	0.007585	6.334202	1.09×10^{-7}
aus	0.000399	0.010726	0.037165	0.9705
pre_post	0.006991	0.009931	0.703991	0.4852
aus:pre_post	0.037228**	0.014044	2.650801	0.0111
Observations		48		
Standard-errors		IID		
RMSE		0.022964		
Adj. R^2		0.369338		

Significance codes: 0.01 '***' 0.05 '**' 0.1 '*'

Table A.3 represents a similar exercise for the separation rate in March. This provides the estimate of a 3.7% increase in job separations due to the announcement.

However, the JobKeeper policy was introduced two-weeks after JobSeeker and will have influenced these results. According to Bradshaw et al. (2023) the key labour market effects of JobKeeper were during the first month of the program, as a result we can judge the result by including a dummy variable for this period (JK_month).

Table A.4: Regression Results: Proportion (Model 1)

	Estimate	Std. Error	t value	Pr(> |t|)
(Intercept)	0.048043***	0.004866	9.872959	1.64×10^{-12}
aus	0.000399	0.006882	0.057928	0.9541
pre_post	-0.003935	0.007070	-0.556561	0.5808
JK_month	0.030593***	0.008583	3.564396	0.0009
aus:pre_post	0.026009**	0.009999	2.601180	0.0128
aus:JK_month	0.031414**	0.012138	2.587996	0.0132
Observations		48		
Standard-errors		IID		

Significance codes: 0.001 '***', 0.01 '**', 0.05 '*'

This reduces the size of the estimated effect to 2.6ppts from 3.7ppts above. This remaining effect may still be influenced by JobKeeper - especially as New Zealanders did not have access to other forms of benefit payments. Future analysis on JobKeeper use will be needed to understand the key driver of the separation result.

Tables A.5 and A.6 represent the regression for Victoria and Australia excluding Victoria respectively, during the July announcement (which is dated to the lockdown on the 25th of June). For both groups there is no statistically significant difference between the response of the Australian and New Zealand groups to the announcement.

In Victoria Job-Finding Rates were relatively unchanged before and after the announcement, while over the rest of Australia Job-Finding Rates rose by 1.7% over the following period. However, this increase occurred for both Australian and New

Table A.5: Regression Results: Job Finding Rate July - Victoria

	Estimate	Std. Error	t value	Pr(> |t|)
(Intercept)	0.092772***	0.004875	19.029542	$< 2.2 \times 10^{-16}$
aus	-0.036116***	0.006895	-5.238316	1.8186×10^{-6}
pre_post	-0.004537	0.006149	-0.737764	0.4633
aus:pre_post	0.000605	0.008696	0.069568	0.9448
Observations		70		
Standard-errors		IID		
RMSE		0.017068		
Adj. R^2		0.504603		

Significance codes: 0.001 '***' 0.01 '**' 0.05 '*'

Table A.6: Regression Results: JFR July non-Victoria

	Estimate	Std. Error	t value	Pr(> |t|)
(Intercept)	0.079692***	0.003700	21.536592	$< 2.2 \times 10^{-16}$
aus	-0.030722***	0.005233	-5.870778	1.5476×10^{-7}
pre_post	0.017177***	0.004667	3.680430	4.7051×10^{-4}
aus:pre_post	-0.001674	0.006600	-0.253632	0.8006
Observations		70		
Standard-errors		IID		
RMSE		0.012955		
Adj. R^2		0.636533		

Significance codes: 0.001 '***' 0.01 '**' 0.05 '*'

Zealand citizens in Australia. This indicates that the unique economic conditions in Victoria were leading to differing labour market conditions than the rest of the country.

However, as there is no difference in the response between Australians (who were eligible for the JSP) and New Zealanders (who were not) these results indicate that the lack of a labour supply response to the announcement was not due to the reintroduction of mutual obligations - as those obligations were not reimposed in Victoria.

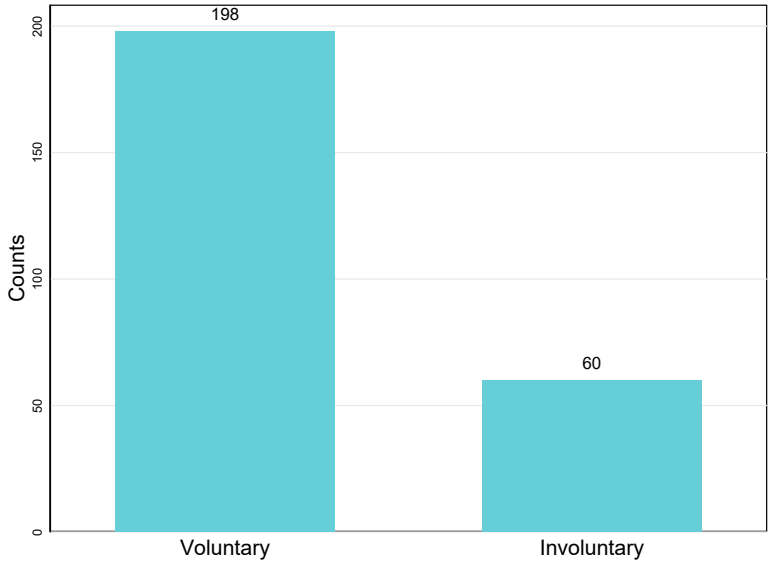
A.3. Labour Force Survey Insights

A.3.1 Details of Job-Finding in Australia

Using HILDA data, we can run a quick descriptive analysis to look at those who became reemployed after a spell of unemployment in 2020. We can then split these job-finding numbers into whether the individual became unemployed voluntarily or involuntarily. The data indicate that there were 258 individuals who became re-employed during 2020. Of these, 198 (76.7%) of those who found jobs separated voluntarily from their previous job, compared to 60 (23.3%) that separated involuntarily from their previous job.

Figure A.13: Job Finding in Australia*

by type of job loss



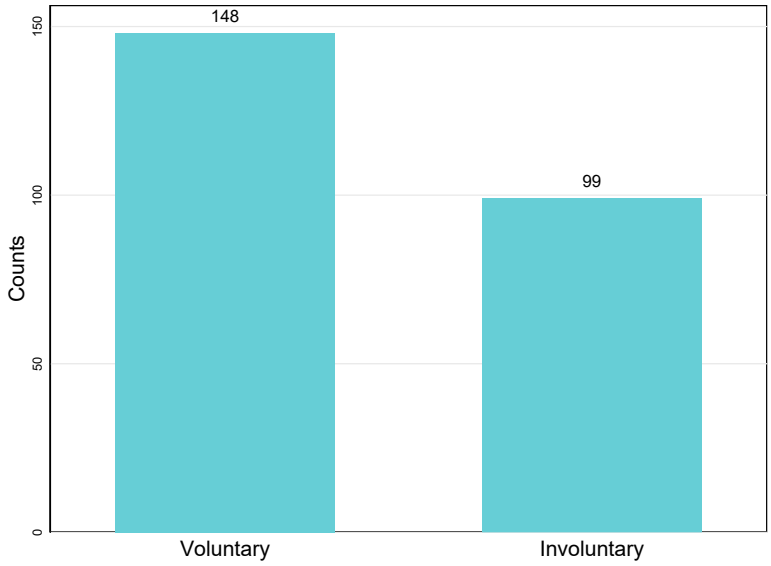
Sources: e61 Institute; HILDA Release 22

A.3.2 Details of Separation in Australia

Using survey data, we can get an idea of the incidence of voluntary and involuntary job loss. A quick descriptive analysis indicates that there were 247 job separations observed in 2020 in the HILDA data. Of these, 148 (59.9%) were voluntary, while 99 (40.1%) were involuntary.

Figure A.14: Separation in Australia*

by type of job loss



Sources: e61 Institute; HILDA Release 22

This compares to a near equal split in separation reasons in the HILDA waves prior to COVID Hayward et al. (Forthcoming).

In a future supplementary appendix, we will also include information from the Australian Labour Force Survey to see to verify that voluntary separations were truly higher in 2020.

A.3.3 Typical replacement rates for recipients

In Australia the payment is a flat amount, as a result the replacement rate will depend on pre-displacement income. Using HILDA we find the following pre-displacement annual earnings for those who experience a transition into unemployment and benefit receipt.

Single/ Partnered	Dependents	Gross Weekly Wage	Replacement Rat
Partnered	No Children	$939.56	42%
Partnered	Children	$1023.34	53%
Single	No Children	$927.95	47%
Single	Children	$836.92	64%

Where we use the alpha version of the e61 Tax Calculator[7] to estimate the individual level replacement rates for these average JobSeeker recipients in the current benefit system.[8]

A.4. Duration estimates

In the note we claim that an elasticity of -0.21 would lead to individuals spending around a week longer out of work, on average.

This estimate comes from applying the estimated elasticity to the entire population, and using an average duration of 40 weeks as outlined in Cassidy et al. (2020). The average Job-Finding Rate for a duration of 40 weeks is approximately 2.4%, and the number of weeks increases by around 0.85 after this rate is reduced by 2.1%.

If instead we only applied it to the population in the study, the prior Job-Finding Rate was 8.9% and the increase in duration would be a couple of days from a base of 11 weeks.

7 https://matthewmaltman.shinyapps.io/ComparisonShiny/
8 Real Wage, 2024 prices. Assuming zero partner income, and no Commonwealth Rent Assistance. One four year old child for the dependent examples. Base working income inclusive of social support.

B.1. Models of labour market search

If individuals could immediately move into and out of work, with immediate access to benefit support, then we would not expect an announcement effect. Instead we would see individuals change behaviour as the payment itself changes.

Search theory originates from the seminal works of McCall (1970), who introduced the concept of reservation wages, and Mortensen (1970), who formalised the dynamic search process with stochastic job offers. Building on these ideas, Diamond (1982) examined the role of equilibrium in matching markets, highlighting the potential inefficiencies caused by search frictions, which were further developed in the Diamond-Mortensen-Pissarides (DMP) framework Pissarides (2000). This canonical model incorporates firm-side behaviour and wage determination, showing how unemployment, job vacancies, and wages co-evolve over time.

Subsequent research extended the theoretical framework to examine the role of policy interventions. For instance, Lentz and Mortensen (2005) integrate heterogeneity in worker productivity and unemployment insurance, showing how policies impact job-finding and separation rates. Cahuc et al. (2006) introduced on-the-job search into matching models, demonstrating how worker-firm bargaining and mobility shape labour market dynamics.

Key implications of these models include:

Announcement Effects: When policy changes are anticipated, individuals adjust their search behaviour before implementation. Theoretical models suggest that this effect arises because workers optimise based on expected utility from benefits and wages (Chetty, 2008). For example, Mortensen and Pissarides (1999) showed how anticipated policy changes, such as unemployment benefit reforms, influence labour market transitions even before enactment.

These effects are especially important when considering RDD or DiD studies of policy changes. Decreuse and Wilemme (2024) outlines that the literature analysing extensions in benefit exhaustion dates tend to mildly overstate the labour supply responses by not taking into account anticipatory effects. It is for this reason that we use announcement dates as our treatment dates in this note.

Trade-offs: Higher benefits increase the utility of remaining unemployed but reduce search intensity and job-finding rates. This trade-off is central to discussions of optimal benefit design (Chetty, 2006; Shimer & Werning, 2007). Acemoglu and Shimer (1999) argue that higher unemployment benefits may increase aggregate productivity by allowing workers to search longer for better job matches. However, this must be balanced against moral hazard effects, as modelled by Hopenhayn and Nicolini (1997), who provide conditions under which unemployment insurance can balance incentives and social welfare. These theoretical advancements underscore the interplay between search intensity, unemployment benefits, and job-match quality, offering policymakers a structured way to evaluate labour market interventions.

B.2. International Labour supply elasticities

The literature on labour supply elasticities in response to changes in unemployment benefits reveals a consistent pattern: increases in benefits tend to prolong unemployment durations, but the magnitude of this effect varies by context and methodology. Elasticities typically range from 0.3 to 0.6, meaning a 10% rise in benefits increases unemployment duration by 3–6%. While reduced benefits often increase re-employment rates (e.g. Uusitalo & Verho, 2010), extended durations may improve job-match quality (Caliendo et al., 2013) - although there is mixed evidence regarding the net effect on job-match quality from higher replacement rates Barbanchon et al. (2024). Sanctions and expiration spikes significantly raise job-finding rates (Abbring et al., 2005; Røed & Zhang, 2003). The evidence underscores nuanced trade-offs between unemployment duration and job quality.

B.3. Australian Labour Supply estimates

B.3.1 Non-COVID period

The number of the Australian papers looking at labour supply outcomes due to changes in taxes and transfers provide uncompensated wage elasticities - the percentage change in hours worked relative to the percentage change in the wage rate - using discrete hours structural labour supply models (Breunig et al., 2008; Duncan & Harris, 2002; Kalb, 2002).

Across these papers hours elasticities are estimated to be about -0.25 to -0.7 for most population groups, with elasticities above 1 for sole parents (verified with quasi-experimental evidence in Cai et al., 2008).

Another strand of related literature reviews the degree of bunching in the tax system in Australia, and insights that gives for the elasticity of taxable income - and indirectly the intensive margin labour supply responses to changes in marginal tax rates. Both Johnson et al. (2024) and Breunig et al. (2024) investigate bunching, showing significant bunching at both marginal tax rates changes and round numbers. The majority of this bunching appears to be due to tax planning behaviour, rather than intensive margin labour supply responses. In terms of benefit payments, Nolan (2023) finds a lack of bunching at abatement thresholds also suggesting a lack of clear intensive margin labour supply responses,

Finally, Australia has relatively unique active labour market programs that make significant use of privately provided employment services and defined job search based mutual obligation criteria. Investigating the use of jobseeker diaries (Borland & Tseng, 2007), intensive search rules for the long-term unemployed (Breunig et al., 2003), and the 1990s introduction of mutual obligations (Chan et al., 2024) indicate that the incentives embedded in these systems have a major impact on the labour market choices of unemployed individuals on the JobSeeker payment.

B.3.2 COVID period

The most relevant estimate from the COVID period is the job-finding rate elasticity from the early release of superannuation (Sainsbury et al., 2022). Exits from the unemployment benefit were 32-34% lower within six months from accessing the program, relative to a control group of those who did not access the payment.

There have also been a number of pieces investigating the labour supply responses to another COVID policy - the JobKeeper payment. This payment was a wage subsidy, with estimates suggesting that around 300,000 employment relationships were kept in place due to this subsidy - largely during the first months of the program (Bishop & Day, 2020; Borland & Hunt, 2021, 2023; Bradshaw et al., 2023; Watson et al., 2022).

In terms of analysis of benefit policy changes the literature has so far focused on scene setting. Borland (2020) made the real time case for why it is likely that the supplement had a limited labour supply response. Breunig and Sainsbury (2023) instead pointed out the very high replacement rates that were provided by the supplement. Furthermore, by using STP data they show the sharp change in the wage distribution associated with the JobKeeper payment - indicated its defacto role as a benefit payment by shifting the wage distribution for those to the left of the payment level to the right.

B.4. The role of Mutual Obligations

A significant number of research pieces in Australia have found that the application of mutual obligations (such as job search diaries and required job applications) are extremely important for explaining the labour supply choices of benefit recipients in Australia (Borland & Tseng, 2007; Breunig et al., 2003; Chan et al., 2024; Nolan, 2023). Furthermore, there is growing international recognition of the importance of such conditions (Barbanchon et al., 2024).

When the future payment increase was announced there was also a relaxation of these mutual obligations as outlined in Parliamentary Library (2020). For our key job-finding rate results, it could be the case that the sudden decline in search activity is due to weaker search requirements rather than the change in the payment rate.

The purpose of our comparison of Victoria and non-Victoria at the date of the second announcement is to indicate that mutual obligation requirements did not appear to be the primary driver of this result. The logic is as follows - when the extension of the JobSeeker Supplement was announced on 21 July there was an announcement that certain mutual obligations would be reintroduced in every state except Victoria. Therefore if there was a similar change in behaviour in Victoria as in other States, then it does not appear that the announcement of mutual obligation changes was the driver.

In Australia these obligations were fully suspended between 24 March and 8 June. Until 4 August this was entirely voluntary, and after this date there was an expectation to start a job plan, attend meetings, and make job applications. However, until 25 September there was no penalty for missing these obligations - unless the individual turned down an appropriate job. From 25 September mutual obligations were largely reinstated - except for in Victoria.

We argue that the announcement in July made it clear that such activities were necessary and could lead to financial penalties across the rest of Australia - and also made it clear that such requirements would not be enforced in Victoria. As a result, expectations formed around this date (as earlier as the reintroduction of lockdowns in June). These differential expectations should start to drive differential outcomes between New Zealanders and Australians if the application of mutual obligations was a major driver for these job search trends.

Given the lack of a difference between Victoria and other states, we view this as evidence that the key driver of job-finding trends was due to payments. However, mutual obligations are a major part of the Australian policy landscape, and further analysis that considers benefit changes in the absence of mutual obligations changes would build a richer picture of labour supply responses.

Paper	Country	Method	Finding
Ganong et al. (2024)	USA	Event study analysis	A 10% increase in benefits leads to an increase in unemployment duration by approximately 0.6% to 2.2%.
Lichter and Schiprowski (2021)	Germany	RDD	Extending benefit duration by one month reduces the probability of exiting unemployment by approximately 10%.
Caliendo et al. (2013)	Germany	RDD	The extension of benefit duration increases the average time individuals remain unemployed by about two months.
Abbring et al. (2005)	Netherlands	Hazard rate model	Unemployment insurance (UI) sanctions raise the re-employment rate by approximately 40% for men and 60% for women.
Bennmarker et al. (2007)	Sweden	DiD	A 10% increase in benefits results in a 3–4% increase in unemployment duration.
Røed and Zhang (2003)	Norway	Hazard rate model	A 10% increase in unemployment benefits leads to an approximate 9.5% reduction in the job-finding hazard rate for men and a 3.5% reduction for women.
Uusitalo and Verho (2010)	Finland	DiD	A 10% reduction in benefits leads to a 4% increase in the re-employment rate.
Rebollo-Sanz and Rodríguez-Planas (2020)	Spain	RDD	Reducing benefit levels (through a decrease in the replacement rate from 60% to 50% after six months) increases the job-finding rate by approximately 41% and reduces the expected duration of unemployment by 14%.
Marinescu et al. (2021)	USA	DiD	The additional $600 benefit did not significantly discourage job-seeking or reduce employer vacancies during the pandemic period.
Marinescu and Skandalis (2021)	USA	DiD	A 10% increase in benefits results in a 2% reduction in job search activity.
Van Ours and Vodopivec (2005)	Slovenia	Hazard rate model	The reduction in benefit duration led to a higher exit rate from unemployment.
Schmieder and Von Wachter (2016)	Multiple countries	DiD, RDD, RKD	A 10% increase in benefits is associated with a 4–6% increase in unemployment duration.
Leibovici et al. (2023)	USA	DiD	A $600 UI benefit increase, extended duration, and expanded eligibility during the pandemic slowed employment recovery by 3.4 percentage points and extended unemployment duration by 8%.

Table B.1: Summary of Studies on Unemployment Insurance and Job-Finding Rates

C.1. Specification

This research note uses a standard pre-post difference-in-difference design (commonly termed a 2x2 DiD). The DiD methodology allows us to estimate the causal effect of a policy intervention by comparing outcomes across treated and control groups, before and after the intervention.

Let Y_{gt} represent the job-finding rate for group g at time t, where $g \in \{\text{AUS, NZ}\}$ and $t \in \{\text{Pre, Post}\}$. The model can be expressed as:

$$Y_{gt} = \alpha + \beta D_g + \gamma T_t + \delta(D_g \times T_t) + \epsilon_{gt},$$

where:

- α is the baseline job-finding rate for the control group (New Zealanders) in the pre-intervention period.
- β captures differences in job-finding rates between Australians and New Zealanders in the pre-intervention period.
- γ represents the time effect common to both groups (e.g., changes in labour market conditions unrelated to the policy).
- δ is the DiD estimate, capturing the additional change in job-finding rates for Australians relative to New Zealanders following the introduction of the Coronavirus Supplement.
- ϵ_{gt} is the error term.

The treatment effect δ is identified under the assumption of parallel trends, which states that in the absence of the policy intervention, the change in job-finding/separation rates over time would have been the same for Australians and New Zealanders. The DiD estimate can be calculated as:

$$\hat{\delta} = (\bar{Y}^{\text{AUS}}_{\text{Post}} - \bar{Y}^{\text{AUS}}_{\text{Pre}}) - (\bar{Y}^{\text{NZ}}_{\text{Post}} - \bar{Y}^{\text{NZ}}_{\text{Pre}}),$$

where $\bar{Y}^{g}_{t}$ represents the average job-finding rate for group g at time t.

To estimate the treatment effect using a regression model, we specify:

$$Y_{gt} = \alpha + \beta_1 D_g + \beta_2 T_t + \beta_3 (D_g \times T_t) + \epsilon_{gt},$$

where:

- D_g is a binary variable equal to 1 for Australians and 0 for New Zealanders.
- T_t is a binary variable equal to 1 for the post-intervention period and 0 for the pre-intervention period.
- β_3 corresponds to the DiD estimate δ.

In our context, Y_{gt} represents the aggregate weekly job-finding/separation rate for Australians and New Zealanders. The DiD estimate δ captures the differential change in job-finding rates between the two groups after the introduction of the Coronavirus Supplement, isolating the policy's impact under the parallel trends assumption.

An alternative specification for analyzing the labour supply responses to the policy announcement is the Regression Discontinuity Design (RDD). This approach leverages the sharp change in policy at a specific cutoff to estimate its causal effect on the job-finding/separation rate.

D.1. Australia and New Zealand RDDs

We estimate separate sharp regression discontinuity models for Australians and New Zealanders to measure the effect of the policy announcement on job-finding/separation rates. The running variable X represents time relative to the policy announcement, with $X = 0$ marking the exact policy implementation date.

Let:

- Y_{gt}: Job-finding/separation rate for group g at time t,
- D_t: Indicator variable for the post-policy period, where $D_t = 1$ if $X_t \geq 0$,
- X_t: Running variable, representing time relative to the policy announcement,
- c: Cutoff at the policy announcement.

The RDD model is specified as:

$$Y_{gt} = \alpha + \tau D_t + f(X_t) + \varepsilon_{gt},$$

where:

- τ: Treatment effect of the policy announcement on the job-finding/separation rate, estimated by the discontinuity at $X_t = c$,
- $f(X_t)$: Flexible function of the running variable X_t to account for underlying time trends. Typically, this is a polynomial or piecewise linear function, with separate trends fitted on either side of the cutoff,
- ε_{gt}: Error term capturing unobserved factors.

The treatment effect τ is identified by comparing the predicted job-finding/separation rate just before and just after the policy announcement:

$$\hat{\tau} = \lim_{X_t \to c^+} \widehat{f}(X_t) - \lim_{X_t \to c^-} \widehat{f}(X_t),$$

where $\widehat{f}(X_t)$ denotes the estimated relationship between the running variable and the outcome.

For each group this provides an estimate of the local treatment effect at the cutoff/announcement date $X_t = 0$, controlling for pre-existing trends in job-finding/separation rates.

D.2. RDD of differences

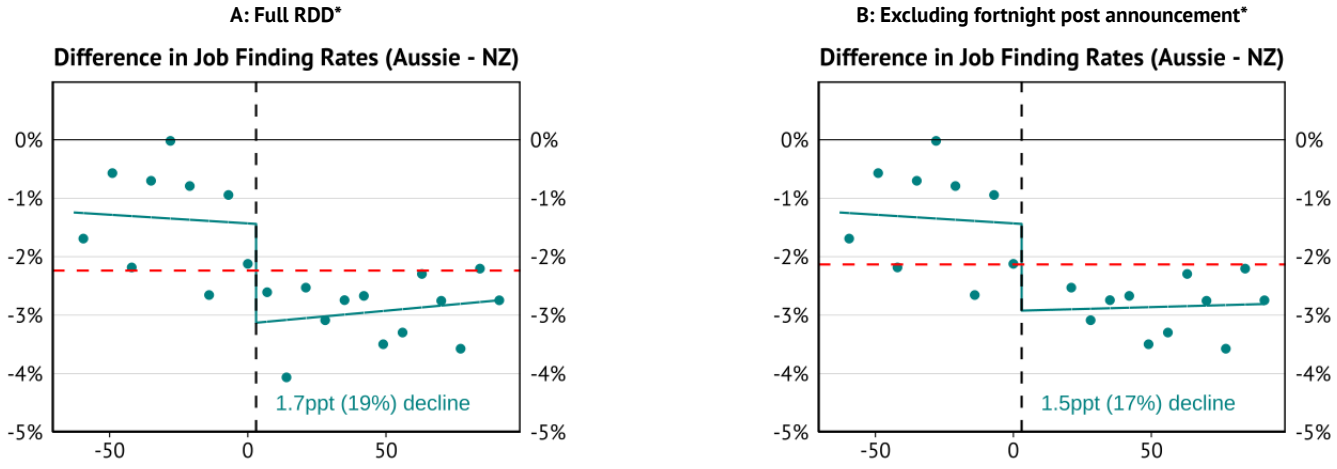
Identification in the above RDDs relies on no other treatments occurring at the same date. However, this was not the case - at the same time uncertainty due to COVID rose, lockdowns were introduced, and a series of other policy interventions were made.

However, business employment intentions, fear of COVID, and most other policy interventions were applied to both New Zealanders and Australians in Australia. As a result, we can estimate a similar model looking at the *difference in discontinuties* between these two groups in order to estimate the effect of a change in the benefit rate and mutual obligations - as New Zealanders do not have access to the benefit system.

This is a similar approach to the 2x2 DiD mentioned above, except that we can allow for trends, and also allow for differential trends before and after the policy change.

D.2.0.1 Job-Finding Rates

Figure D.1: Difference in Job-Finding Rates: First Announcement



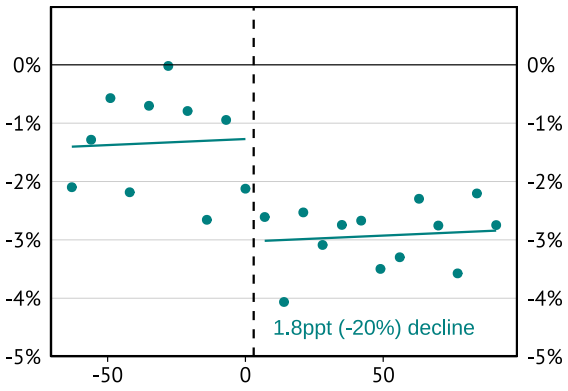
* Job Finding Rate is the proportion of those out of work who find a job in the week.
** Matching on firm and personal characteristics: Occupation, region, prior earnings, spouse and their prior earnings, and industry.
Sources: ABS; e61

This exercise is similar to that applied in the note. However, the key difference is the inclusion of time trends AND differential time trends before and after the policy change.

Intuitively, we would expect the time trend to be effected by the change in the benefit payment - as it was a temporary change in the benefit. Since it is a temporary change, the present value of staying on the benefit declines over time, which in turn will reduce the incentive to keep search effort low. Given this, we would expect the treatment effect to decline somewhat over time (depending on expectations about when the payment will cease).

However, we can also check the result when the time trend is estimated over the entire sample. This gives the following:

Figure D.2: Fixed Trend JFR*



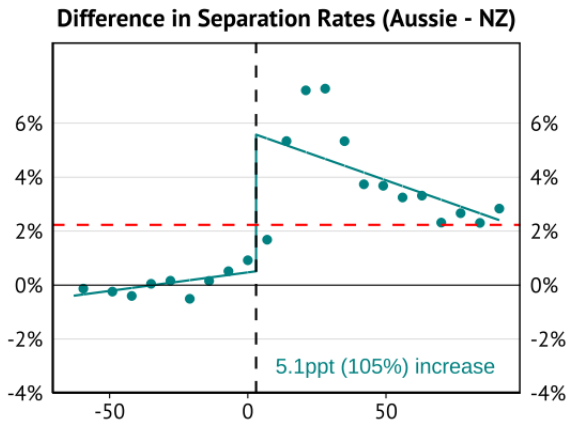
* Job Finding Rate is the proportion of those out of work who find a job in the week.
** Matching on firm and personal characteristics: Occupation, region, prior earnings, spouse and their prior earnings, and industry.
Sources: ABS; e61

As we can see in Figure D.3, a regression discontinuity design gives similar results to the 2x2 difference in difference design show in the main note.

D.2.1 RDD results

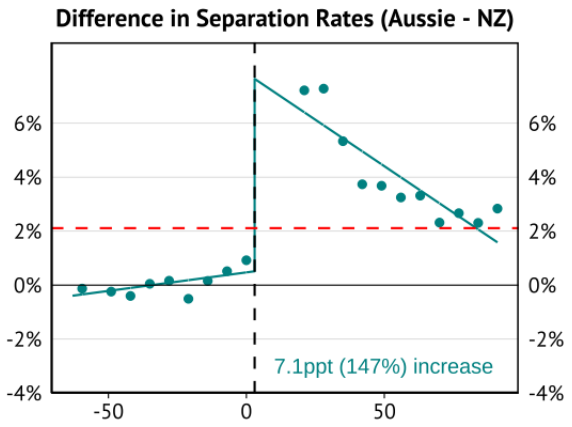
Figure D.3: Difference in Separation Rates: First Announcement

A: Full RDD*



* Separation Rate is the proportion of those in work who persistently leave a job in the week.
** Matching on firm and personal characteristics: Occupation, region, prior earnings, spouse and their prior earnings, and industry.
Sources: ABS; e61

B: Excluding fortnight post announcement*



* Separation Rate is the proportion of those in work who persistently leave a job in the week.
** Matching on firm and personal characteristics: Occupation, region, prior earnings, spouse and their prior earnings, and industry.
Sources: ABS; e61

D.2.1.1 Separation Rates

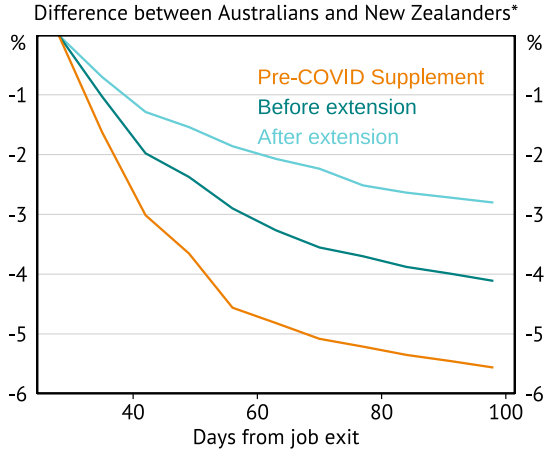
The Separation Rate exercise provides a much larger estimate of the increase in separation rates than the 2x2 diff-in-diff design - given the relatively sharp increase observed among Australians during April.

This differential trend around the discontinuity may be credible, as the present value of the Supplement is declining in the period post-treatment in the plots shown. However, it may also reflect differential use of JobKeeper - given this was the only way that New Zealanders were able to access a policy that provided them a type of benefit payment.

D.3. Difference in Hazard Rates

As our tax data starts in 2020, we have limited information to account for the *duration* of time out of work - except for individuals who receive the JobSeeker payment. An alternative that allows us to track the hazard rate related to those who enter unemployment in a given month.

Figure D.4: Relative probability of non-employment*



* For those who were not employed for at least 30 days.
** The groups reflect the date of entry into joblessness relative to the annoucement date of the policy.
Sources: ABS; e61

D.4. Alternative samples and sensitivity

A major concern with our matching exercise is selection on unobservables - namely that New Zealanders and Australians may differ in unobserved ways which could explain why their job-find and separation rates differed. Furthermore, it could be that there are simply differential seasonal changes in the two groups. We look at this further below.

There are a number of alternative samples that we can use as defacto placebo tests for our approach in this note. The two we focus on are:

- The estimated treatment effect is we use the same date in 2022 (once COVID interventions have finished).
- The estimated treatment effect for the ”untreated” matched sample (Australian’s who do not receive the JSP in 2020 and their matched New Zealanders).

D.4.1 Placebo check of 2022

It may be the case that this difference is a seasonal difference between the two groups that occurs for unobserved reasons. To test for this we also estimate the same model using the STP data from 2022. Doing this we find that there is no significant difference between the groups.

Figure D.5: Job-Finding Rates - 2022 placebo*

By citizenship in Australia, matched, 2022

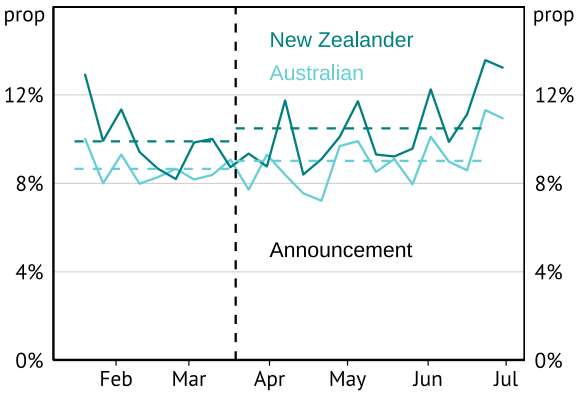


Table D.1: Regression Results: JFR 2022

	Estimate	Std. Error	t value	Pr(> |t|)
(Intercept)	0.098996***	0.004501	21.992095	$< 2.2 \times 10^{-16}$
aus	-0.012433.	0.006366	-1.953009	0.057197
pre_post	0.005875	0.005694	1.031804	0.307802
aus:pre_post	-0.002266	0.008052	-0.281425	0.779704
Observations		48		
Standard-errors		IID		
RMSE		0.012929		
Adj. R^2		0.19087		

Significance codes: 0.001 '***' 0.01 '**' 0.05 '*' 0.1 '.'

Table D.2: Regression Results: SR 2022

	Estimate	Std. Error	t value	Pr(> |t|)
(Intercept)	0.064546***	0.003083	20.936526	$< 2.2 \times 10^{-16}$
aus	0.017154***	0.004360	3.934516	2.9246×10^{-4}
pre_post	-0.002285	0.003900	-0.585968	0.560891
aus:pre_post	-0.007567	0.005515	-1.372054	0.177002
Observations		48		
Standard-errors		IID		

Significance codes: 0.001 '***' 0.01 '**' 0.05 '*'

D.4.2 Non-treated matched unit comparison

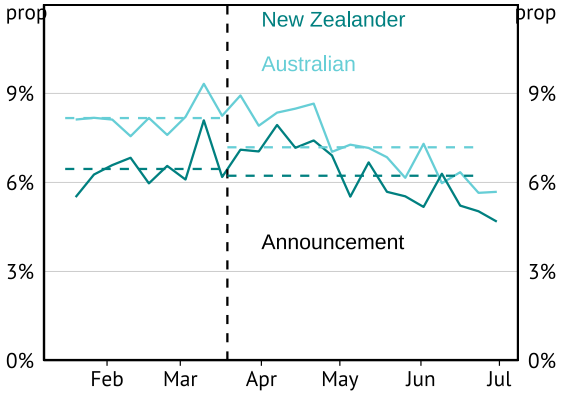
One threat to our identification is that we haven't properly captured the inherent risk of separation of job finding for the two groups. For example, when we select Australian JobSeeker recipients we are selecting a group of individuals whose outcome is that they have been out of work or have separated from their job - while we are matching against a sample of New Zealanders who may not have.

We partially account for this by only looking at New Zealanders and Australians who spend some time out of work during 2020 (either entering work during the year, or separating at some point over the year). But this remains a concern - especially for the separation rate results.

However, we can check to see if this is a concern by looking at the flip-side of this result - the matched New Zealanders and Australians who do not receive JSP in 2020.

Figure D.6: Separation Rates - 2022 placebo*

By citizenship in Australia, matched, 2022



Intuitively, if there was no effect and we had randomly assigned New Zealanders to Australians, then if this bias led to New Zealanders having a higher job-finding rate than Australians on the JSP, it would also lead to a lower job-finding rate for the Kiwis matched with Australians that do not receive the JSP.

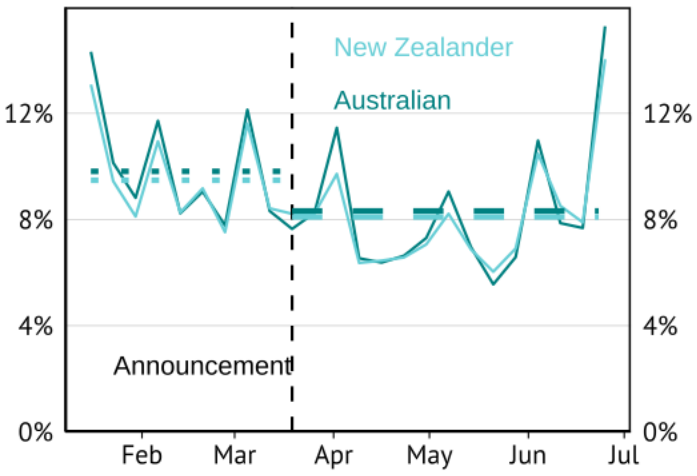
We investigate this for both the job-finding and separation rates below.

D.4.2.1 Job-Finding Rates

Figure D.7: Job-Finding Rates - non-JSP*

Job Finding Rates*

By citizenship in Australia, matched



* Proportion of those out of work finding employment, weekly
** Dotted lines refer to the average for the group, in the pre-period. Dashed is the post-period.
Sources: ABS; e61

The 2x2 DiD analysis suggests that there was no significant change in the Job-Finding Rate between the pre and post announcement periods for the untreated group.

The RDD approach D.8 does show a jump in the relative Australian Job-Finding Rate around the discontinuity. However, this jump is largely due to the four weeks directly around the discontinuity.

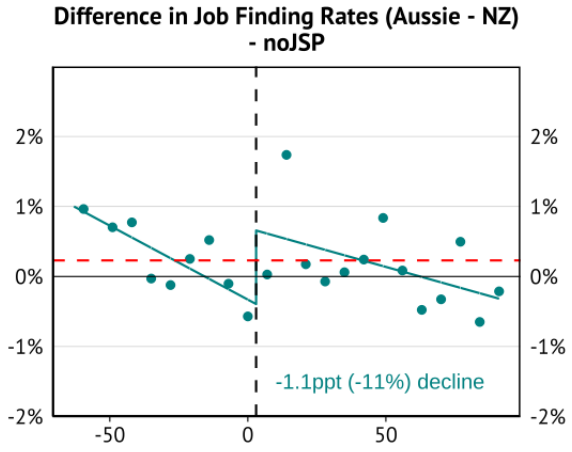
Table D.3: JFR Regression No JSP

Variable	Estimate	Std. Error	t value	Pr(> |t|)
(Intercept)	0.094786	0.007138	13.278419	$< 2.2 \times 10^{-16}$ ***
aus	0.003349	0.010095	0.331754	0.74165
pre_post	-0.013844	0.009346	-1.481260	0.14566
aus:pre_post	-0.001086	0.013218	-0.082196	0.93486

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
RMSE: 0.021612 **Adj. R^2:** 0.039243

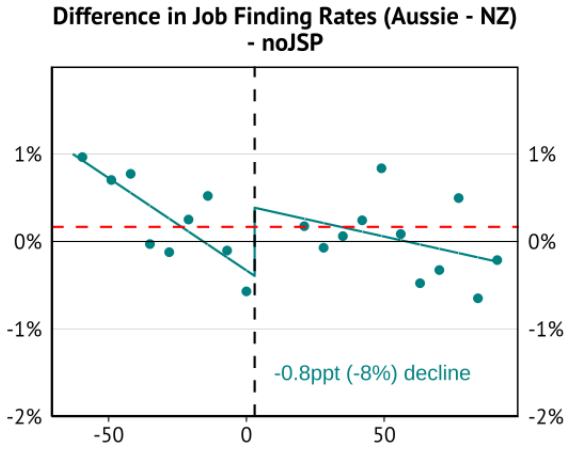
Figure D.8: Difference in Job-Finding Rates (non-JSP group): First Announcement

A: Full RDD*



* Job Finding Rate is the proportion of those out of work who find a job in the week.
** Matching on firm and personal characteristics: Occupation, region, prior earnings, spouse and their prior earnings, and industry.
Sources: ABS; e61

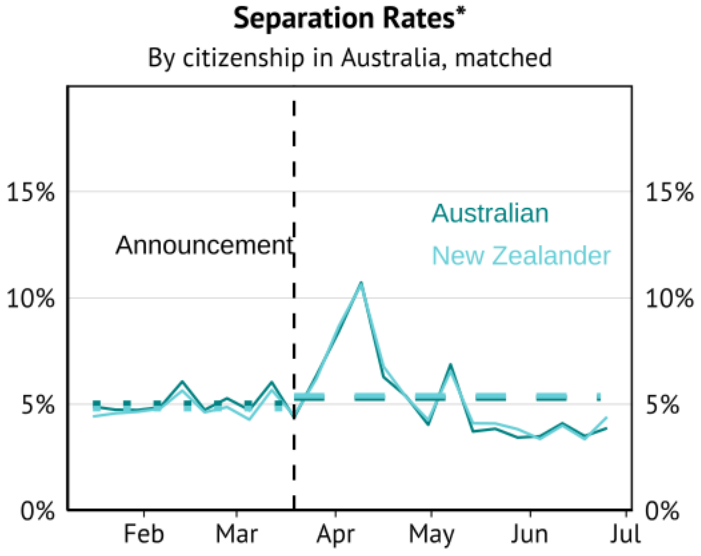
B: Excluding fortnight post announcement*



* Job Finding Rate is the proportion of those out of work who find a job in the week.
** Matching on firm and personal characteristics: Occupation, region, prior earnings, spouse and their prior earnings, and industry.
Sources: ABS; e61

D.4.2.2 Separation Rates

Figure D.9: Separation Rates No JSP*



* Proportion of those working who leave employment, weekly
** Dotted lines refer to the average for the group, in the pre-period.
Dashed is the post-period.
Sources: ABS; e61

Table D.4: Separation regression - No JSP

Variable	Estimate	Std. Error	t value	Pr(> |t|)
(Intercept)	0.094786	0.007138	13.278419	$< 2.2 \times 10^{-16}$ ***
aus	0.003349	0.010095	0.331754	0.74165
pre_post	-0.013844	0.009346	-1.481260	0.14566
aus:pre_post	-0.001086	0.013218	-0.082196	0.93486

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
RMSE: 0.021612 **Adj. R^2:** 0.039243

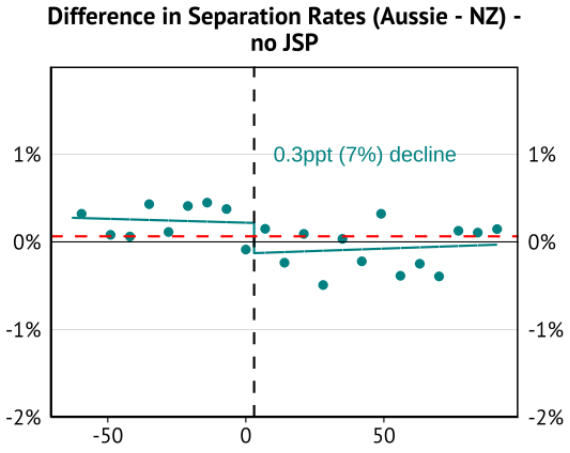
The 2x2 DiD analysis suggests that there was no significant change in the Separation Rate between the pre and post announcement periods for the untreated group.

The RDD results point to a small reduction in separation rates for New Zealanders relative to Australians.

Overall, for both separation and job-finding rates there is little evidence that our difference-in-difference estimates are systematically biased by selecting individuals who are more likely to have been selected for unobserved reasons.

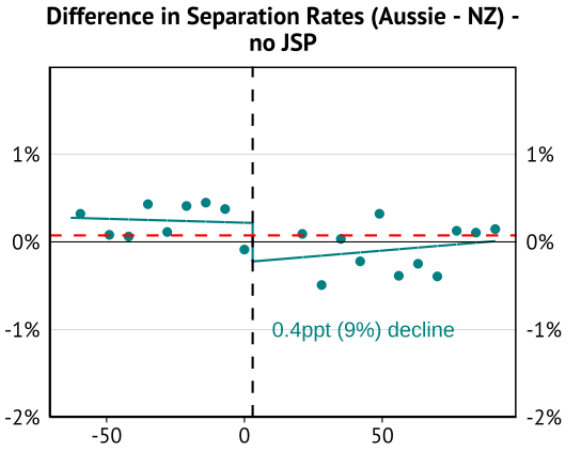
Figure D.10: Difference in Separation Rates (non-JSP group): First Announcement

A: Full RDD*



* Separation Rate is the proportion of those in work who persistently leave a job in the week.
** Matching on firm and personal characteristics: Occupation, region, prior earnings, spouse and their prior earnings, and industry.
Sources: ABS; e61

B: Excluding fortnight post announcement*



* Separation Rate is the proportion of those in work who persistently leave a job in the week.
** Matching on firm and personal characteristics: Occupation, region, prior earnings, spouse and their prior earnings, and industry.
Sources: ABS; e61

E.1. Changes to Income Support during 2020

In response to the economic challenges presented by the COVID-19 pandemic, the Australian government implemented several temporary income support measures in 2020. These measures aimed to support individuals and businesses affected by widespread economic disruptions, particularly those who experienced job losses or reduced work hours. Together, these programs formed a comprehensive social protection response, offering immediate financial relief in an effort to reduce the broader economic impact of the pandemic on both individuals and businesses in Australia. The main income support programs introduced or adjusted were the JobSeeker Payment, Coronavirus Supplement, JobKeeper Payment, Economic Support Payment and Early Release of Superannuation. Each is detailed below.

E.1.1 JobSeeker Payment

The JobSeeker Payment (known as NewStart up until the 20th of March 2020) is Australia's main unemployment benefit. It provides financial support to individuals aged 22 to age pension age who are actively seeking employment or unable to work due to illness or disability. To access the payment, you must meet certain eligibility criteria, including an Income Test, Asset Tests, partnership status, parenthood status and Mutual Obligations requirements.

Prior to the pandemic, the base fortnightly rate for a single adult without dependents was AUD$565.70. However, in anticipation of increased unemployment due to COVID-19, the JobSeeker Payment was expanded by including a temporary Coronavirus Supplement, significantly increasing recipients' total income. At the same time, Mutual Obligations requirements and the Assets Tests were lifted, the income test became less stringent, and some administrative changes were made such that more people could access the payment more easily while easing the administrative burden on Services Australia [9].

E.1.2 The Coronavirus Supplement

The Coronavirus Supplement was introduced as a temporary addition to existing welfare payments, including the JobSeeker Payment, to mitigate the income shocks caused by the pandemic [10]. From March 27, 2020, to September 24, 2020, eligible recipients received an additional AUD 550 per fortnight, effectively doubling their income support. As the pandemic's economic effects persisted, the supplement was extended but gradually reduced: from September 25, 2020, to December 31, 2020, it provided AUD 250 per fortnight; from January 1, 2021, to March 31, 2021, it further decreased to AUD 150 per fortnight before being phased out altogether. The full timeline of the Coronavirus Supplement is outlined in Table E.1 below.

9 The administrative changes included: Claimants were no longer required to verify their identity in-person; Partnered claimants were no longer required to have their partner confirm the relationship; Claimants of Rent Assistance not required to complete a Rent Certificate or provide a formal tenancy agreement; Claimants were not required to show their bank account balances; Claimants were not required to provide an Employment Separation Certificate; amongst others

10 Other income support recipients eligible for the Coronavirus supplement included recipients of: Youth Allowance student, Youth Allowance job seeker, Parenting Payment Partnered, Parenting Payment Single, Sickness Allowance, Austudy, ABSTUDY living allowance, Widow Allowance, Partner Allowance, Farm Household Allowance, Special Benefit, Veterans' student payments

Date	Coronavirus supplement changes and related announcements
22-Mar-2020	Announcement of $550 per fortnight Coronavirus Supplement
27-Apr-2020	Coronavirus Supplement Begins
22-Jun-2020	Major lockdowns and first mention of an extension of Coronavirus Supplement
21-Jul-2020	Announcement: Coronavirus Supplement first extension at reduced rate of $250 per fortnight during extension period officially announced
25-Sep-2020	First extension of Coronavirus Supplement in effect
10-Nov-2020	Announcement: Coronavirus Supplement second extension at a reduced rate of $150 per fortnight
01-Jan-2021	Second extension of Coronavirus Supplement in effect
31-Mar-2021	Coronavirus Supplement ends

Table E.1: Timeline of Coronavirus Supplement

E.1.3 Other relevant government support

E.1.3.1 JobKeeper program

The JobKeeper Payment was a wage subsidy designed to support businesses directly impacted by COVID-19 restrictions. It's main goals were to: Support business and job survival while health restrictions were in place; Preserve employer-employee relationships to protect valuable organisational and intangible capital, and; Provide income support to businesses and workers. Between March 30, 2020, and September 27, 2020, eligible employers received AUD 1,500 per fortnight per retained employee. After this period, payments became dependent on the number of hours worked by employees. From September 28, 2020, full-time employees received AUD 1,200 per fortnight, while part-time employees (20 hours or fewer per week) received AUD 750. In January 2021, these rates were reduced again until the program concluded in March 2021.

E.1.3.2 Economic Support Payment

The Economic Support Payment provided additional lump-sum payments to Australians already receiving certain government benefits, including the Age Pension, JobSeeker Payment, and Disability Support Pension. These payments were designed to offer additional financial assistance to more vulnerable households. Eligible individuals received two rounds of AUD 750 payments in April and July 2020, followed by a third AUD 250 payment in December 2020 and a fourth in early 2021. Importantly, from the second round of the payment, income support recipients who were receiving the Coronavirus Supplement were not eligible for the ESP.

E.1.3.3 Early Release of Superannuation

In addition to direct payments, the Australian government implemented the Early Release of Superannuation scheme, which allowed individuals facing financial hardship due to COVID-19 to access their retirement savings early. The scheme permitted eligible individuals to withdraw up to $10,000 from their superannuation accounts by June 30, 2020, and an additional $10,000 between July 1 and December 31, 2020. While this program provided immediate liquidity for those in need, it had potential long-term implications for retirement savings, as early withdrawals could diminish the compounding growth of individuals' superannuation balances.

E.2. Response to the July announcement

In the main note the announcement effect includes two policy changes - the suspension of mutual obligations and an increase in the present value of JobSeeker payments. Both of which were likely to end in September.

In June there was a sustained outbreak of COVID in Australia leading to a sharp lockdown in the state of Victoria. Following on from this it was clear that economic supports would be extended, but the exact nature of the extension was not clear until July 21st (Frydenberg, 2020). At this stage it was announced that, from September 25, the JobSeeker payment would remain at a temporarily higher rate - but that this increase would be smaller than the current Supplement ($250 per fortnight instead of $550 per fortnight). Furthermore, a second wave of mutual obligations would be reintroduced outside of Victoria.

As a result, this second announcement involved an increase in the present value of the payment rate and the expected reintroduction of significant mutual obligations - a change which may let us untangle what the relative role of the two policy changes was.

However, both the shock and the results from this exercise are quite unclear due to:

- Uncertainty about what constitutes the announcement date.
- Uncertainty about individuals expectations that the policy would be extended and in what form.
- Differing results from alternative methods.

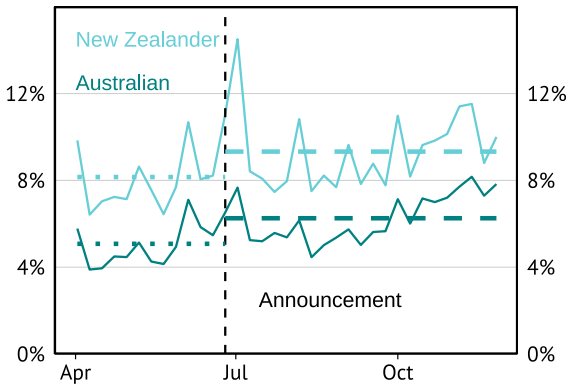
E.2.1 Job-Finding Results for July

In terms of the change in the present value of payments we would need to assume that individuals did not expect the policy to continue past its expiration date on 25 September. Looking at Reddit posts there was considerable uncertainty between April and June regarding whether this was the case. If individuals believed that an extension was likely in some form, the present value of the payment may not have changed by much.

Furthermore, the results are sensitive to the specification used. The 2x2 DiD shows no result, while the RDD estimate appears to be large given the size of the payment change. However, that estimate is strongly determined by values near the threshold, and so a null result appears to be more credible.

Figure E.1: Job-Finding Rate, second announcement*

By citizenship in Australia, matched



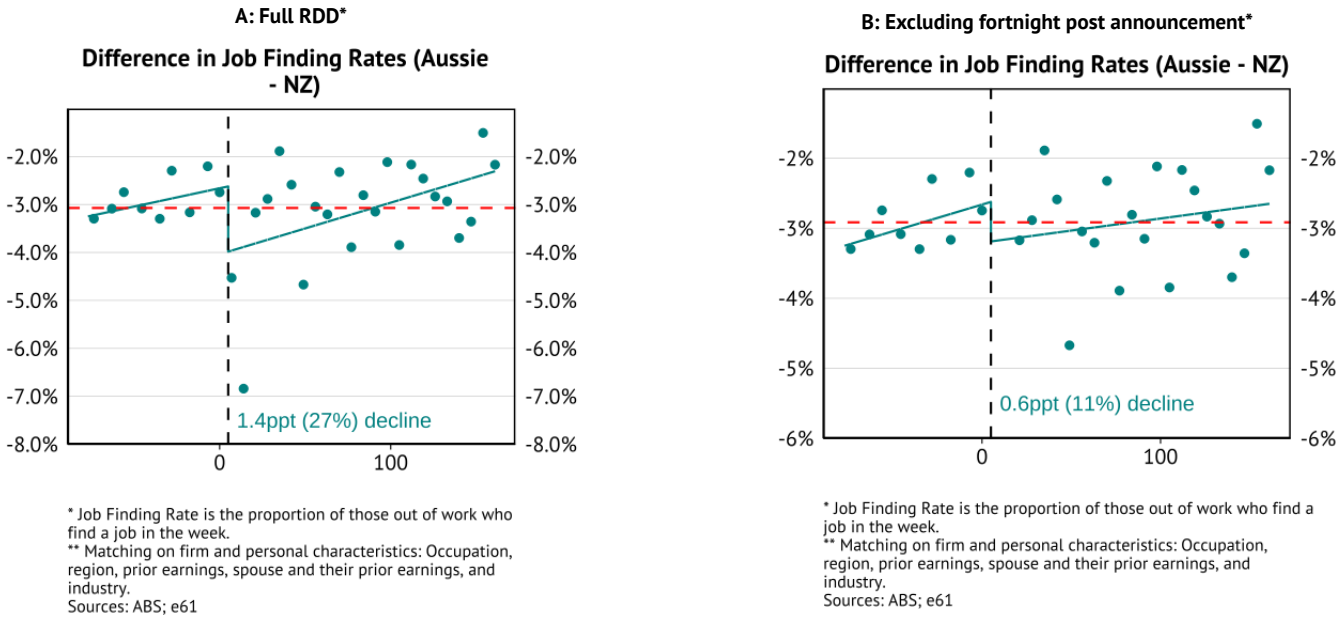
* Proportion of those out of work finding employment, weekly
** Dotted lines refer to the average for the group, in the pre-period. Dashed is the post-period.
Sources: ABS; e61

Table E.2: Job-Finding Rate, second announcement

Variable	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	0.081535	0.003890	20.960	<2.2e-16***
aus	-0.030766	0.005501	-5.592	4.6265e-07***
pre_post	0.011722	0.004907	2.389	1.9763e-02*
aus:pre_post	0.000057	0.006939	0.008	9.9351e-01

Significance codes: *** p < 0.001, ** p < 0.01, * p < 0.05
RMSE: 0.013619 Adj. R^2: 0.572693

Figure E.2: Difference in Job-Finding Rates (non-JSP group): First Announcement

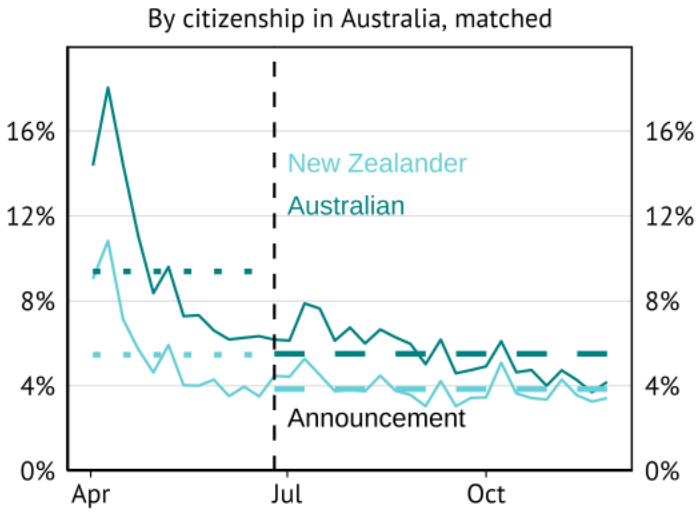


* Job Finding Rate is the proportion of those out of work who find a job in the week.
** Matching on firm and personal characteristics: Occupation, region, prior earnings, spouse and their prior earnings, and industry.
Sources: ABS; e61

E.2.2 Separation Rate Results for July

The 2x2 DiD for the separation rates shows a statistically significant decline in separation rates after the announcement. However, it is visually clear that the difference in separations rates is gradually closing through time.

Figure E.3: Separation Rate, second announcement*



* Proportion of those working who leave employment, weekly
** Dotted lines refer to the average for the group, in the pre-period. Dashed is the post-period.
Sources: ABS; e61

The RDD approach (dropping the high period of separations in April) accounts for this trend, and finds an increase in job separations around the time of announcement.

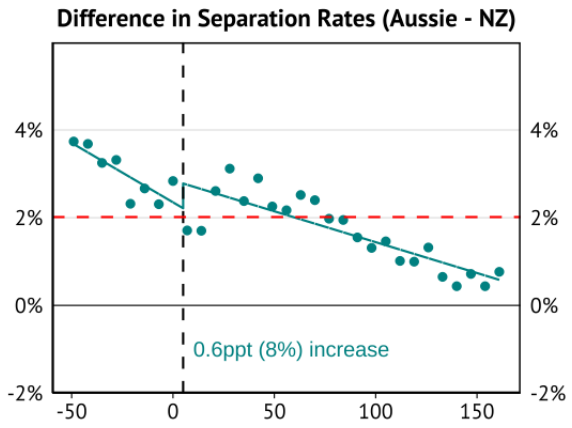
Table E.3: Separation Rates, second announcement

Variable	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	0.054654	0.005744	9.516	5.3277e-14***
aus	0.039226	0.008123	4.829	8.4929e-06***
pre_post	-0.016177	0.007244	-2.233	2.8947e-02*
aus:pre_post	-0.022577	0.010245	-2.204	3.1040e-02*

Significance codes: *** p < 0.001, ** p < 0.01, * p < 0.05

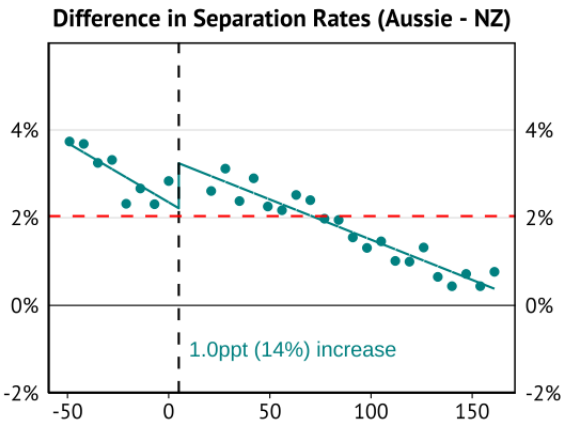
Figure E.4: Difference in Job-Finding Rates (non-JSP group): First Announcement

A: Full RDD*



* Separation Rate is the proportion of those in work who persistently leave a job in the week.
** Matching on firm and personal characteristics: Occupation, region, prior earnings, spouse and their prior earnings, and industry.
Sources: ABS; e61

B: Excluding fortnight post announcement*



* Separation Rate is the proportion of those in work who persistently leave a job in the week.
** Matching on firm and personal characteristics: Occupation, region, prior earnings, spouse and their prior earnings, and industry.
Sources: ABS; e61

F.1. ABS data use disclaimer

The results of these studies are based, in part, on data supplied to the ABS under the Taxation Administration Act 1953, A New Tax System (Australian Business Number) Act 1999, Australian Border Force Act 2015, Social Security (Administration) Act 1999, A New Tax System (Family Assistance) (Administration) Act 1999, Paid Parental Leave Act 2010 and/or the Student Assistance Act 1973. Such data may only be used for the purpose of administering the Census and Statistics Act 1905 or performance of functions of the ABS as set out in section 6 of the Australian Bureau of Statistics Act 1975. No individual information collected under the Census and Statistics Act 1905 is provided back to custodians for administrative or regulatory purposes.

Any discussion of data limitations or weaknesses is in the context of using the data for statistical purposes and is not related to the ability of the data to support the Australian Taxation Office, Australian Business Register, Department of Social Services and/or Department of Home Affairs' core operational requirements.

Legislative requirements to ensure privacy and secrecy of these data have been followed. For access to MADIP and/or BLADE data under Section 16A of the ABS Act 1975 or enabled by section 15 of the Census and Statistics (Information Release and Access) Determination 2018, source data are de-identified and so data about specific individuals has not been viewed in conducting this analysis. In accordance with the Census and Statistics Act 1905, results have been treated where necessary to ensure that they are not likely to enable identification of a particular person or organisation.

F.2. HILDA data use disclaimer

This paper uses unit record data from Household, Income and Labour Dynamics in Australia Survey [HILDA] conducted by the Australian Government Department of Social Services (DSS). The findings and views reported in this paper, however, are those of the authors and should not be attributed to the Australian Government, DSS, or any of DSS' contractors or partners. DOI:10.26193/24EJST

F.3. Acknowledgements

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Ultimately, the views expressed in this paper are those of the authors alone.