Essays in Empirical Policy Evaluation:
COVID-19 fiscal policy and the early release of superannuation

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November 2023

A thesis submitted for the degree of Doctor of Philosophy of
The Australian National University

Preliminaries

Candidate's declaration

I certify that the intellectual context of this thesis is the product of my own work.

This thesis contains no material that has been accepted for the award of any other degree or diploma in any university. The publication status and extent of my contribution to individual chapters is outlined below.

Chapter 2, Too much of a good thing? Australian cash transfer replacement rates during the pandemic, was co-authored with Robert Breunig. I developed the research questions and design and took sole responsibility of data curation and analysis. I shared the write-up with my co-author.

(Published in *Australian Economic Review,* 2023)

Chapter 3, COVID-19 private pension withdrawal and unemployment tenures, was co-authored with Timothy Watson and Robert Breunig. I developed the research questions and design and took sole responsibility of data curation and analysis. I wrote the first draft of the paper which I shared with my co-authors. Robert Breunig then redrafted it for journal submission.

(Released as IZA discussion paper no. 15399, 2022).

Chapter 4, Early pension withdrawal as stimulus, was co-authored with Steven Hamilton and Geoffrey Liu. I was solely responsible for data curation and analysis associated with administrative datasets. My co-author, Steven Hamilton, prepared the draft for journal submission. We contributed in equal measure to the development of research questions and research design.

(Released working paper, 2023).

Chapter 5, COVID-19 has exposed the weaknesses in the Australian tax system: tax reform will be required for recovery, was co-authored with Robert Breunig. I developed the research questions, design and took sole responsibility of data curation and analysis, and shared the write-up with my co-author.

(Published in *Australian Journal of Labour Economics,* 2020)

Other than where noted above, the thesis contains no material previously published or written by another person, except where due acknowledgement is made in the text.

Tristram Sainsbury

November 2023

However beautiful the strategy, you should occasionally look at the results.

Ian Gilmour, in *Dancing with Dogma: Britain under Thatcherism* (1992)

All truth passes through three stages.

First it is ridiculed.

Second it is violently opposed.

And third it is accepted as self-evident.

Arthur Schopenhauer, as quoted in *Seeds of Peace: A Catalogue of Quotations* (1986)

by Jeanne Larson and Madge Micheels-Cyrus, p. 244

Thesis dedicated to Lisa

Acknowledgements

This dissertation is a product of just over three years that I spent as a Sir Roland Wilson Scholar at the Australian National University, from February 2020 (a few weeks after the first COVID-19 case was diagnosed in Australia) to May 2023. As with all major projects, it would not have been possible without contributions from a range of individuals and institutions, as well as a dose of good fortune.

I am indebted to my thesis supervisor, Robert Breunig. I couldn't have hoped for a better guide to academia. You were patient as I realised the need to change the direction of my research. I have valued your clarity of thought and your good humour. You helped me get to Chicago. And you provided brilliant counsel throughout a protracted data negotiation.

I would like to thank panel member Matthias Sinning, as well as Bob Gregory, Steve Hamilton and Ryan Edwards who all have been generous in sharing wisdom, at the points when I needed advice most.

I am also deeply grateful to the guidance of Sally-Anne Henfry, Fiona Scotney, Rebecca Gibb, the Sir Roland Wilson Foundation and to an amazing coterie of fellow SRW scholars, who made completing a thesis during a pandemic a lot more fun and a lot less isolating.

A highlight of the Sir Roland Wilson scholarship is the financial support to study abroad. Deep thanks go to Dan Black, who kindly agreed to host me for a rewarding spell at the Harris School of Public Policy, University of Chicago.

This whole doctoral endeavour wouldn't have been possible without Maryanne Markvocic, Phil Gaetjens, Graeme Davis, Marisa Purvis-Smith, Matt Flavel, Katrina Di Marco, Steven Kennedy, David Gruen, and Martin Parkinson. Thanks for believing in me.

I was only able to reach for the frontier once armed with high quality data. And for data access I have been in the hands of a wide list of dedicated public servants from the Australian Treasury, Department of Social Services, Australian Taxation Office and the Australian Bureau of Statistics. The list that is regrettably too long to mention specifically, but you know who you are! Thank you one and all.

Last, but by no means least, to my wonderful wife Lisa. I would not have been able to get through this without you. I have leaned heavily on you as confident and counsel; something especially important when enduring the isolation imposed by both PhD and pandemic. Thank you for your patience, forbearance, support and encouragement. And especially for your understanding during the countless times I have been distracted and lost in thought when you needed me to be present.

It's been quite the journey.

Abstract

This thesis provides the first detailed evaluation of the Australian government's decision in March 2020 to permit the early release of up to $20,000 in lump sum withdrawals from people's superannuation (private pension) accounts. It makes several contributions to economic literature. First, we detail the broad scope and extensive level of support supplied by major Australian COVID-19 transfers (wage subsidy, supplemented unemployment payments and lump-sum superannuation withdrawals) and outline some direct distributional dimensions to the actions. The analysis serves to highlight important macroeconomic trade-offs that were implicit in Australia's pandemic fiscal strategy, and asks: at what point governments can 'too much of a good thing' with crisis payments? Second, we focus on how superannuation withdrawal affected rates of exit from unemployment payments. We study a population of half-a-million individuals who found themselves newly on an unemployment payment in the initial months of the pandemic. We estimate that receiving a lump sum resulted in a significant delay in exit from unemployment payments, reinforcing one of the most well-established findings in empirical economics. We also observe a significant (and uncosted) corresponding increase in expenditure on outlays and find no evidence that delayed exit from unemployment payments resulted in higher wages upon return-to-work. Third, we turn to the role that the lump-sum withdrawals played in stimulating consumption. We find a high marginal propensity to spend of at least 0.43 within eight weeks, spread broadly across spending categories (including around half or more on non-durables) and across withdrawers. We calibrate a heterogeneous-agent model, demonstrating that only under present bias ($\beta = 0.58$) can we reconcile the observed magnitude and frequency of the spending response and pre-withdrawal saving behaviour. The program therefore presents a sharp trade-off between effective macroeconomic stimulus and suboptimal retirement saving policy. Finally, we detail how the extraordinary level of fiscal response during COVID-19 has put pressure on an Australian tax system under strain from long-term structural forces and the tax-free and tax-reduced status of certain sources of income. Ultimately, comprehensive reform will be needed.

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Chapter 1: Introduction

This thesis provides the first detailed evaluation of the Australian government's decision in March 2020 to permit the early release of up to $20,000 in lump sum withdrawals from people's superannuation (private pension) accounts. The program was a novel policy experiment, legislated urgently and with limited public debate. With 3 million individuals withdrawing $38 billion, the program was also large in scale: the second largest measure in the Australian fiscal response to the COVID-19 pandemic and among the larger crisis response actions in Australian history. The level of access surprised many and the consequences of action (and channels of program effect) were not particularly well understood at the time. I was originally motivated by a two-fold desire: to better understand an important component of the response to COVID-19, and to provide insight that can help inform decision-makers responding to future shocks.

Of the thesis's four substantive chapters, three are empirical in nature. These chapters examine distributional, consumption and unemployment tenure dimensions to the measure, with the distributional considerations situated among other major Australian COVID-19 transfers. The analysis for these chapters relies on novel whole-of-population sets of administrative program records, supplemented with unemployment, wage, demographic and bank transaction records. The final chapter then explores the implications of COVID-19 for Australian tax reform.

A summary of each thesis chapter follows.

Three of the largest Australian fiscal measures initiated in response to COVID-19 were cash transfers targeted at individuals: an $88 billion wage subsidy; early access to $38 billion in withdrawals from private pension accounts; and $52 billion in (supplemented) working-age benefit payments to the unemployed, students and parents. **Chapter 2: Too much of a good thing? Australian cash transfer replacement rates during the pandemic** examines the scope and direct distributional consequences of these main forms of cash transfer. It establishes five stylised facts around the nature of income redistribution in Australia during the early part of COVID-19. These are: 1. The scale of fiscal intervention was extensive. 2. The level of transfer per recipient was substantial. 3. The transfers created a two-tier welfare system that directed more support to those with higher capacities. 4. The shift in income distribution was short-lived. And 5. Total gross income flows among the adult Australian population were higher during the early stages of COVID-19 than pre-COVID-19. As a descriptive exercise, the analysis does not provide information about the 'impact' of pandemic policies and is limited to what can be directly measured. It does, however, raise an important question for decision-makers facing future shocks: at what point is there 'too much of a good thing' with crisis cash transfers?

Chapters 3 and 4 then evaluate two different channels of effect of the up-to-$10,000 lump sum superannuation withdrawals.

Chapter 3: COVID-19 private pension withdrawal and unemployment tenures focusses on rates of exit from unemployment payments. We study a population of half-a-million individuals who found themselves newly on an unemployment payment in the initial months of the COVID-19 pandemic. Roughly two in five withdrew. We estimate that receiving a lump sum resulted in a significant delay in exit from unemployment payments. To illustrate, receiving a lump sum of up to $10,000 from superannuation accounts at the most acute phase of the pandemic (between April and June 2020) resulted in a 31% lower exit rate from unemployment payments inside the first six months of a spell on benefits, and 13% inside a year of spell. The job-seeking deterrence is ultimately temporary, but it took close to eighteen months for a convergence in exit rates between withdrawers and those that didn't withdraw. 162,000 withdrawers with completed spells on average spent an additional 7 weeks on unemployment payments, translating to 8 million additional days in aggregate, and implying $580 million in additional pandemic fiscal expenditure. We also find no evidence that delayed exit from unemployment payments resulted in a higher return-to-work wage among withdrawers.

Chapter 4: Early pension withdrawal as stimulus turns to the role that the large lump-sum withdrawals played in stimulating consumption. These transfers were much larger than those typically considered in the crisis response literature and represented a liquidity shock, holding lifetime income constant. Using administrative and high-frequency bank transactions data, we find a marginal propensity to spend of at least 0.43–0.48 (90% of this in four weeks), high given the transfer size. Gambling was the largest discernible spending category (larger than credit card repayments). Low rates and levels of saving and high levels of gambling before withdrawal strongly predict withdrawal and spending. We calibrate a heterogeneous-agent model, demonstrating that only under present bias ($\beta = 0.58$) can we reconcile the observed magnitude and frequency of the spending response and pre-withdrawal saving behaviour. In selecting strongly on the present-biased, the program presents a sharp trade-off between effective macroeconomic stimulus and suboptimal retirement saving policy.

The thesis concludes with **Chapter 5: The urgent need for tax reform in Australia in the COVID-19 world.** We examine how the economic shock and government response to COVID-19 highlight weaknesses in Australia's tax system. COVID-19 places pressure on a system under strain from long-term structural forces and the tax-free and tax-reduced status of certain sources of income. Returning to a sound structural budget position cannot be accomplished through passive action that relies on 'natural' revenue growth from current tax sources. We argue that discussions should focus on comprehensive reform. We also highlight how reducing reliance on income (particularly labour) taxes and applying a more equal tax treatment to different individuals and income sources over time are priorities which will support improved well-being and labour market activity.

Collectively, the four papers paint a somewhat sobering picture of program effect.

Superannuation withdrawal provided easy and rapid access to large sums of otherwise preserved savings, with light terms of eligibility and strong incentives to do so. These features of support contributed to it becoming effective at stimulating consumption. That support was able to be delivered with an overall budgetary cost to government that is much lower than transfers financed directly through the public balance sheet. Moreover, as a pure liquidity effect that aids in consumption smoothing following a shock to earnings, withdrawals were able to support higher consumption outcomes at a point of acute stress for many households. These features of support suggest that withdrawals will have some ongoing appeal to all governments facing economic shocks.

The stimulus did, however, come with trade-offs. Those who withdrew were more likely to be biased towards the present at the exclusion of the future, and so were susceptible to making the kinds of short-term decisions that deliver immediate welfare benefits but net long-term welfare costs. Those that were unemployed and withdrew stayed longer on unemployment benefits without generating better paying job matches. This feature of support – along with the potential tax savings achieved by those who withdrew and then then contributed 'catch up' funds (not studied here) – meant the fiscal cost to government was materially higher than originally advertised. Further, while the job-seeking deterrence was temporary, there is a prospect that any (hypothetical) future withdrawals may promote long-term unemployment if they were to be implemented in response to shock that preceded a sluggish, drawn-out labour market recovery.

It is important to recognise the limits to our findings. We provide but a partial accounting of full effect of withdrawals. For example, we have not attempted to calculate the economic and public health benefits from people not working and interacting with others (at a time when both the individual risks and social costs of them doing so may have been higher), the extent of income tax savings achieved through catch up contributions, the broader impact of withdrawals on lifetime consumption opportunities, and the impact of withdrawals on retirement balances. All are important for the question of whether access to working-life superannuation withdrawals should be repeated during future shocks, and, if so, what form that should take.

Chapter 2: Too much of a good thing? Australian cash transfer replacement rates during the pandemic[1]

Also published as Breunig, R. and Sainsbury, T. (2023), Too Much of a Good Thing? Australian Cash Transfer Replacement Rates During the Pandemic. *The Australian Economic Review* 56 (1), pp 70-90.

Available at: https://onlinelibrary.wiley.com/doi/full/10.1111/1467-8462.12501

Abstract

During the early stages of the COVID-19 pandemic in 2020 the Australian federal government temporarily expanded the level of cash relief available to the working-age population through supplemental benefit payments, a wage subsidy and allowing lump sum withdrawals from private pensions. Here we examine the scope and direct distributional consequences of these measures. Two in five working-age Australians received at least one of these three forms of transfer over a 12-month window. The median recipient had close to half their pre-COVID-19 income 'replaced' by transfers. The programs interacted to create a two-tier welfare safety net that put in place a poverty-alleviating income floor for workers in low-earning occupations and those on unemployment benefits, and provided job certainty and greater direct income support to those with higher incomes. Aggregate weekly incomes were higher during the initial period of COVID-19 than they were pre-COVID-19. Descriptive exercises, such as this, do not provide information about the 'impact' of pandemic policies and are limited to what they directly measure. That noted, we raise an important question for decision-makers facing future shocks: at what point is there 'too much of a good thing' with crisis cash transfers?

[1] We thank Steven Hamilton and Jeff Borland for helpful comments. Any errors or omissions are those of the authors. Tristram Sainsbury acknowledges the support of the Sir Roland Wilson foundation in funding his PhD research.

2.1 Introduction

During the early stages of the COVID-19 pandemic in 2020 the Australian federal government temporarily expanded the level and types of fiscal relief available to the working-age population. Three of the largest measures were cash transfers targeted at individuals: an $88 billion wage subsidy; early access to $38 billion in withdrawals from private pension accounts; and $52 billion in (supplemented) working-age benefit payments to the unemployed, students and parents.[23] We use the term 'transfer' here as a generic label for all three programs even though the pension account program allowed individuals to access money from their own superannuation accounts—see below. These emergency cash transfers were in place for a year, designed to alleviate hardship at a point of acute stress, and would replace a portion of the pre-pandemic earnings of healthy individuals who found their income-earning capacity suddenly and unexpectedly constrained.

In this article, we combine administrative data on weekly Australian wage earnings with the universe of administrative records to examine the scope and some distributional dimensions to the three emergency COVID-19 cash transfers over the 12 months between 28 March 2020 and 28 March 2021. In doing so we provide five stylised facts around the nature of income redistribution during the early part of COVID-19.

First, the scale of fiscal intervention was extensive. In total 6.5 million working-age Australians (42% of the working-age population) accessed the three programs over the 12-month period. We find that transfers represented 20% of aggregate wages over this time.

Second, the level of transfer per recipient was substantial. We find that the median recipient had 46% of their weekly pre-COVID-19 wages replaced by the transfers. The average was 42% of pre-COVID-19 wages.

Third, there was significant heterogeneity in program receipt. In effect, a two-tier welfare system was created. *Tier one* centred around the fortnightly supplements to benefits payments. The supplement rate was initially set at $550 a fortnight, doubling the maximum basic rate of unemployment payment. Supplements were disproportionately accessed by workers in low-wage occupations and welfare recipients in the bottom quintiles of the earnings distribution. These supplements can be characterised as putting in place a poverty-alleviating income floor.

Tier two centred around the access to an $10,000 lump sum pension withdrawal and the $750 per week JobKeeper wage subsidy. The latter served the twin purposes of providing employment certainty and guaranteeing payments to workers at least at the minimum wage. These two programs were accessed disproportionately by the middle and upper-middle segments of the income distribution, by males, and by workers in managerial, technician and trades occupations.

Fourth, taken together, the programs resulted in strong, if short-lived, shifts in the income distribution. The mass of population at the bottom of the income distribution fell, with the number below the $450 weekly Henderson poverty line falling by approximately 1.8 million individuals during the most acute six-month phase of the pandemic. They increased the population mass in two regions: among lower-middle incomes of $500–$800 per week, and upper-middle incomes of $1,300–$2,300 per week.

And fifth, a combination of resilience in wage-earning (among transfer recipients and non-recipients) and the COVID-19 transfers served to *increase* total gross income flows among the adult Australian population in 2020.[4] This is unusual among adverse macroeconomic shocks. It is standard to anticipate a drop in aggregate income flows in the immediate aftermath of a shock. The broadly accepted role of counter-cyclical economic policy is to 'fill the income hole' and partly ameliorate that income loss, and in so doing smooth consumption. Instead, the transfers (and other fiscal and monetary actions) were so large and comprehensive that they converted a counter-cyclical crisis response into a pro-cyclical income stimulus.

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[2] Estimating the total magnitude of COVID-19 fiscal stimulus in a way that captures combined Commonwealth, State and Territory spending and related cost relief, loan relief and payment deferrals. We note that the magnitude of fiscal transfers are multiples (as a share of GDP) of the stimulus deployed during other recent crisis responses.
[3] All figures are in Australian dollars unless otherwise stated.
[4] Our observation is consistent with the preliminary and partial estimates included in Borland and Charlton (2020).

The transfers existed, in principle, to allow Australia to pursue a highly restrictive ‘COVID-zero’ approach until the nation was sufficiently vaccinated and could pivot to a longer-term ‘living with COVID’ approach. It should not be forgotten that Australia avoided potentially calamitous outcomes due, in part, to the scale and speed of the policy response (Kennedy 2022) and due, in part, to a more mild experience of COVID-19 than was initially feared. Decision-makers had to contend with acute uncertainty alongside the sense of urgency. It was not known at the outset how long emergency measures would be needed, in what form and if the ‘vaccination strategy’ would prove successful.

Our analysis serves to expose important macroeconomic trade-offs that were implicit in Australia's pandemic fiscal strategy. At an aggregate level, transfers worth 9% of annual GDP proved impossible to sustain over even the initial two-year phase of COVID-19. The measures instead lasted for six months in a generous form and six months in a reduced form before ceasing. We highlight how the income stimulus coincided with stronger consumption outcomes, an unprecedented labour market recovery and a rapid increase in the household savings rate in 2020–2021. In the longer term the income stimulus has an associative link with price pressures (including housing and wages), pressure on the public balance sheet through elevated public debt and pressure on the private pension balance sheets for some.

In addition, at an individual level, we reveal inconsistencies in the experience of the same Australians at different ‘waves’ of COVID-19. The first two waves were accompanied by comprehensive government support. Subsequent waves only received piecemeal substitutes that varied by state. The rationale for preferencing the protection of incomes in 2020 over incomes in 2021 remains unclear. Furthermore, Australians in different positions were treated differently, but this was accomplished through more direct transfers (and greater employment certainty) being directed towards those with generally higher capabilities. It represents a departure from a generally accepted rationale behind redistribution whereby those with lower capabilities receive greater assistance.

Our observations raise questions that can inform future crisis strategy. Chiefly: is there a point where the level of cash transfer provided during a crisis becomes excessive, such that the costs of additional transfers outweigh the benefits? Or, to put it another way, when is there ‘too much of a good thing’? Secondly, given the transitory and indeterminate nature of shocks, how comprehensive do transfers that are unveiled at the outset need to be? What role should contingent clawbacks and scale-ups, using real time data, play in crisis response? And how can decision-makers adapt for an Australian public discourse that seemingly expects large up-front announcements to assure confidence?

Those noted, we urge caution in interpreting what our observations imply about the suitability of pandemic economic policy. This is true in terms of specific measures and the overall approach. Descriptive exercises like ours do not support concrete statements about the distributional ‘impact’ of policy. They are limited in that they do not construct counterfactuals (the Australian economy would likely have looked very different in the absence of ameliorating measures) and do not identify the mechanisms through which emergency actions operate. We are also reliant on indicators that only reveal direct, rather than indirect, income effects of COVID-19 actions. For example, we can measure the direct statutory incidence of transfers, such as when someone receives a wage subsidy, but do not estimate the true incidence of the transfers, such as how much higher someone's earnings are due to the subsidy. Moreover, we do not measure indirect macroeconomic effects of confidence-assuring actions.

Next, we first define the population, data set and variables of interest. Then we delve into the policy context and the change in income flows among the adult population. We examine a distributional breakdown of transfers by program type, income quintile, calendar month, occupation, age, sex and state. We wrap up with brief concluding comments.

2.2 Data, Definitions and Sample Construction

In this article we present analysis for the working-age Australian population, which we define as those aged between 16 and 65 who have reported a superannuation balance to the Australian Taxation Office (ATO) pre-COVID-19.[5] The population is approximately 15.2 million individuals (92% of the adult population aged 16–65 and 60% of the estimated resident Australian population; Australian Bureau of Statistics, 2022).

Our main variables of interest are COVID-19 transfers and salary and wage earnings, on a weekly basis. For COVID-19 transfers, we rely on administrative program records that allow us to view daily applications for the release of superannuation, fortnightly JobKeeper wage subsidy payments, and day of receipt of social security benefit payments directed at working-age individuals that attracted a COVID-19 supplement.

COVID-19 supplements were provided for a range of unemployment, student/youth and parenting payments (Ferlitsch 2022). Approximately 74% of the payment recipients we study here received the main unemployment payment, JobSeeker. An additional 14% were youth payments (Youth Allowance, Austudy and Abstudy) and 12% were Parenting Payments (Parenting Payment Single and Parenting Payment Partnered). For convenience we refer to such payments as 'unemployment payments', even though we recognise that recipients are allowed to work a small amount. We do not include pensions such as disability and old-age pensions.

We treat COVID-19-related superannuation lump sums as 'crisis insurance payments' that are comparable to the other major COVID-19 transfer payments. The superannuation system in 2020 had important features of social insurance: contributions that are withheld from employee remuneration during a working relationship[6] are then made accessible upon application during an adverse economic shock. We acknowledge that the primary financing mechanism for withdrawals is through reductions in an individual's private pension account balance, whereas wage subsidy and unemployment payments are financed through direct government outlays. This will have long-term distributional considerations and potential impacts on retirement incomes. Such longer-term considerations are beyond the scope of this analysis but would be valuable areas of future inquiry.

For earnings, we refer to an individual's total weekly salary and wage earnings across all jobs as reported in the ATO's single touch payroll series.[7] We then calculate 'income' (the measure we use for calculating income replacement rates) as the sum of the three major sources of COVID-19 cash transfer plus earnings. This variable represents an individual's total gross earnings from labour market activity, supplemented by transfers, prior to taxation and deductions, and excluding superannuation payments. For distributional comparisons we use administrative records on sex, occupation, residential geography and prior incomes sourced through income tax returns.

Caution is advised when interpreting the output. While earnings and transfers are important, they provide an incomplete picture of living standards. Incomes diverge from consumption for many reasons and can be large for the short durations we analyse here. Further, while we note that the vast majority of working-age Australians who report positive earnings report very small amounts of investment income, what we observe should be considered a partial measure of income. Turnover from small businesses, income from assets such as rent (including imputed rents), dividends, interest payments, trust distributions and superannuation income streams are excluded from our analysis. In addition, the comprehensive suite of programs that Australian governments provided in response to COVID-19 included in-kind support, such as payment deferrals on bills (and through banks, mortgages), free child care and changes to superannuation drawdown requirements that are omitted from our analysis.

2.3 Policy Context

The emergence of the COVID-19 pandemic in late 2019 in China, and early 2020 elsewhere, started a period of great uncertainty and fear in Australia. By early March 2020, there was a combination of: rapidly

[5] We rely on the ATO's Member Account Attribute Service (MAAS) and Member Account Transaction Service (MATS) for balance information. The closest pre-COVID-19 fiscal year is the 1 July 2018–30 June 2019 income year, which records balances as at 30 June 2019.

[6] Superannuation balances are also generally inaccessible prior to retirement. There are some limited exceptions to withdraw balances (from voluntary and compulsory contributions and earnings) in the case of terminal diagnosis or severe hardship, as well as the hypothecation of a small pool of nominated voluntary contributions for contributing towards the purchase of a first home.

[7] The total wages concept in Single Touch Payroll covers salary payments, labour hire payments and foreign income, fringe benefits (when the amount is recorded) and bonuses that are reported as normal payments. As such it aligns with the Australian System of National Accounts (except for superannuation and severance and termination payments, which are absent). For further information, see Australian Bureau of Statistics (2021).

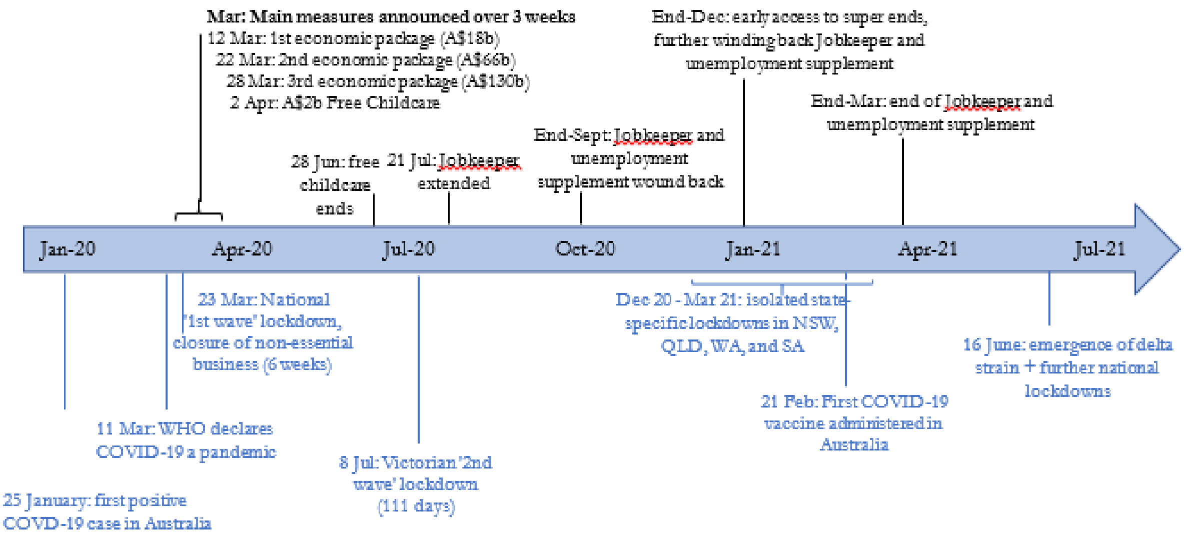
growing case counts and fears that Australia could experience five to 15 million cases and 50,000–150,000 deaths[8] (Kelly 2020; Our World in Data OWID 2022); hospital systems under strain in Italy (Horowitz 2020) and New York (Mangan 2020); and the beginnings of the most dramatic quarterly labour market (and other important economic indicators) fluctuations in Australian history (Australian Bureau of Statistics 2020; Borland and Charlton 2020).

Australia's initial, twofold response to the pandemic was announced predominantly during March 2020. On one dimension was a 'COVID-zero' approach to health outcomes, which would last for the best part of the subsequent two years (Shergold et al. 2022). This approach involved a set of unprecedented and severe regulations, on both the virus-infected and the healthy, centred on restricting international movements, quarantining inbound travellers and minimising domestic in-person exchanges. The second dimension was an unprecedently large fiscal intervention involving $314 billion (15.2% of GDP) in fiscal outlays across federal and state levels of government (Kennedy 2022). Figure 2.1 briefly summarises some major components of this response across an 18-month window from January 2020 to June 2021.

The primary COVID-19 cash transfers were unveiled as part of three economic packages. On 12 March 2020 came the announcement of 'one-off' payments to recipients of a wide range of working-age welfare payments, which would consist of two $750 payments and two further $250 payments (Commonwealth of Australia 2020a). Then, on 22 March 2020, the one-off payments to the unemployed, students and those on parenting payments were superseded by fortnightly supplements to be paid on top of their regular payments. In addition, Australians impacted by the pandemic through lost hours, jobs or turnover would be able to access up to $20,000 from lump sum withdrawals from private pension accounts. Within a week, on 28 March 2020, came the announcement of a third package comprising the JobKeeper wage subsidy.

During an initial six-month window, from 28 March to 28 September 2020, the wages of eligible employees in JobKeeper-eligible firms would be subsidised by a flat-rate $1,500 a fortnight. The employee would receive a wage that was at a minimum the fortnightly subsidy, regardless of number of hours worked in the job pre-pandemic, and would retain a connection with their employer. For individuals, in firms that qualified, the wage subsidy was guaranteed for the full six months, irrespective of future activity. Approximately three-quarters of recipients were signed up by the first payment.

Figure 2.1. Timeline of Selected COVID-19 Measures and Restrictions on Activity



Australians not eligible for the wage subsidy (working in a non-covered firm or lacking a sufficiently strong employment link to a qualifying firm) were expected to rely on access to unemployment payments or the continued operation of their employer, such as for university employees. Terms of access to out-of-work

[8] These estimates reflect statements by Deputy Chief Medical Officer Paul Kelly that between 20% and 60% of the Australian population could contract COVID-19 and an assumed death rate of 1% of infected individuals.

payments were relaxed, with usually strict asset tests (including those applying to partners) raised or removed.[9] The (supplemented) maximum basic rate of unemployment benefit was $1,115 per fortnight.

After the initial six months, rates of payment of wage subsidy and supplemental benefits were gradually removed and conditionality returned. Payment rates were reduced and conditionality strengthened at end-September 2020. Payment rates were again reduced at end-December 2020. The temporary COVID-19 transfers were fully removed on 28 March 2021, a year after the first payments.

In addition to these payments, individuals were able to withdraw lump sums from superannuation. They could access the program up to twice across a nine-month window—once from 20 April to 30 June and again from 1 July to 31 December 2020—and withdraw up to $10,000 in each lump sum. To be able to withdraw, applicants had to have sufficient retirement balances, and self-assess that they met certain hardship qualification criteria (such as experiencing a 20% decline in hours worked, being made redundant or in receipt of an unemployment benefit). Withdrawals were tax-free, the self-assessment form a check-a-box exercise with minimal upfront substantiation, the lump sums were generally processed within a week, and access did not affect eligibility for other COVID-19 programs (Sainsbury, Breunig and Watson 2022).

Table 2.1 shows the weekly payment rates for each program across the 12 months and compares the level of transfer with the minimum and median wage. Pre-pandemic the JobSeeker unemployment payment replaced a relatively small fraction of the minimum wage (38%) and median wage (about 25%). The change implied by the COVID-19 transfers was stark. From March to September 2020, supplemented unemployment payments would replace three-quarters of the minimum wage and half the median wage. The JobKeeper subsidy would compensate the minimum wage fully and replace close to two-thirds of the median wage. Augmenting the JobKeeper payments with two $10,000 lump sums from superannuation could generate total transfer income worth double the minimum wage over the six-month window.

Table 2.1. Rate of covid transfers compared to minimum and median wage

Variables	*Weekly rate of payment ($)* *(1)*	*Replacement of minimum wage $753.80 (%)* *(2)*	*Replacement of median pre-COVID-19 wage of wage earners $1,160 (%)* *(3)*
Pre-covid			
Jobseeker	283	37.5	24.4%
I. Apr - Sep 2020			
Jobseeker (supplemented)	558	74.0	48.1%
JobKeeper wage subsidy	750	99.5	64.7%
II. Sep - Dec 2020			
Jobseeker (supplemented)	408	54.1	35.2%
JobKeeper wage subsidy			
Full time	600	79.6	51.7%
Part time	375	49.7	32.3%
III. Jan-Mar 2020			
Jobseeker (supplemented)	358	47.5	30.8%
JobKeeper wage subsidy			
Full time	500	66.3	43.1%
Part time	325	43.1	28.0%
Superannuation			
Annualised over 6 months			
Withdraw $10,000 once	385	51.0	33.2
Withdraw $10,000 twice	769	102.0	66.3
Annualised over 12 months			
Withdraw $10,000 once	192	25.5	16.6
Withdraw $10,000 twice	385	51.0	33.2

Data: Australian Taxation Office and Department of Social Services

[9] See Ferlitsch (2022), Klapdor (2020) and Commonwealth of Australia (2020b) for details regarding unemployment payments, Sainsbury, Breunig and Watson (2022), Australian Taxation Office (2021), and Commonwealth of Australia (2020c) on superannuation withdrawals, and Treasury (2021), Watson, Trevala and Sainsbury (2022) and Commonwealth of Australia (2020d) on the JobKeeper wage subsidy

Note: Pre-COVID-19 wage calculated as the median weekly wage among those with non-zero payroll for the eight weeks from 10 January 2020 to 5 March 2020

2.3.1 Two in Five Adults Received a COVID-19 Transfer over a 12-Month Period

A wide range of Australians—6.5 million people in total, or 42% of the working-age Australian population—accessed a collective $148 billion through the transfers[10] over 12 months (Table 2.2). 3.3 million working-age Australians received JobKeeper, 2.6 million accessed superannuation and 2.4 million received an unemployment or student payment. Just under three-quarters of the recipient population accessed one program, and a quarter accessed two. While program conditions made simultaneous access to both JobKeeper and unemployment payments difficult, a small share (approximately 200,000) accessed both programs across the year, and approximately 160,000 accessed all three measures.

Table 2.2 reveals that transfers were targeted towards those at a generally earlier stage of life. Transfer recipients were younger, with lower pre-COVID-19 average taxable income, superannuation balance and pre-COVID-19 earnings, when compared with non-recipients. They were also more likely to be male and have children, but less likely to have reported a partner on their tax return.

The transfers replaced a sizeable component of recipients' incomes. The 6.5 million program recipients received on average $442 per week in transfers, or $22,982 over the year. This represents 43% of the year's income for the group. By program, JobKeeper recipients received the largest amount at $432 weekly ($22,447 over the year; 37% income), super withdrawers accessed on average $257weekly ($13,365 over the year; 23% income), and unemployment payment recipients on average $303 weekly ($15,747 over the year; 40% income). Those who accessed multiple programs received transfers that re-placed a significant share (one half to three-quarters) of their total pre-COVID-19 income.

Table 2.2. COVID-19 transfers and observed characteristics by program type.

28 Mar 2020 – 28 Mar 2021	No transfer (1)	Any transfer (2)	One program Jobkeeper (3)	Super (4)	Unemp (5)	Two programs Jobkeep + Super (6)	Super + Unemp (7)	Jobkeep + Unemp (8)	All three programs Jobkeep + Super + Unemp (9)
Count	8,788,819	6,460,669	2,351,336	1,078,407	1,251,847	628,888	776,211	211,817	162,163
Pre-COVID-19 means									
Pre COVID-19 weekly , earnings	974	857	1109	948	439	1030	589	629	747
2019 taxable wage	48,152	39,614	50,352	47,920	17,509	49,155	28,252	25,947	34,552
2019 pension balance	134,886	77,973	123,061	66,691	38,098	74,226	42,986	35,591	44,395
Population characteristics									
Mean age	41.5	39.4	41.8	38.7	37.5	39.6	37.3	34.9	37.3
Share Female	49.9	46.8	44.3	45.1	54.2	37.7	48.0	60.3	50.3
Share with spouse	60.8	48.2	61.3	52.8	25.9	55.7	28.8	25.9	34.7
Share with child	38.8	39.9	41.1	48.5	24.5	47.7	39.9	25.9	41.7
Program means (1 April 2020 – 31 Mar 2021)									
Weekly income	1016	1025	1160	1189	601	1284	924	765	1063
COVID-19 transfer	0	442	429	259	324	722	584	551	847
JobKeeper	*0*	*224*	*429*	*0*	*0*	*445*	*0*	*420*	*430*
Withdrawal	*0*	*105*	*0*	*259*	*0*	*277*	*239*	*0*	*256*
Unemployment	*0*	*113*	*0*	*0*	*324*	*0*	*345*	*131*	*161*

Data: Australian Taxation Office and Department of Social Services

[10] The population we observe accessed $148 billion in COVID-19 transfers, or 84% of the $177 billion in total fiscal outlays associated with the programs: $75 billion through the JobKeeper program (86% of $88 billion total program expenditure), $35 billion in superannuation withdrawals (94% of $37.8 billion total program expenditure) and $38 billion in unemployment payments (73% of $52 billion estimated total program expenditure)

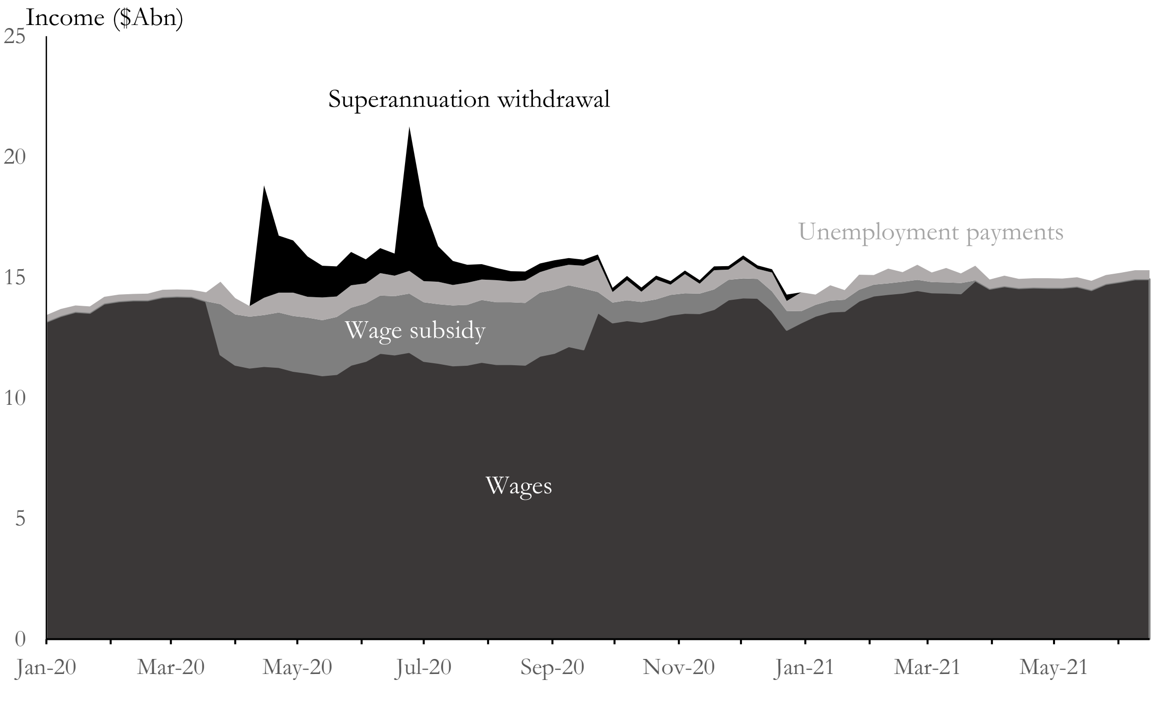
The size and scope of transfers represented a significant short-term injection of income into the Australian economy (Figure 2.2).

The wage subsidy comprised approximately one-sixth of payroll wages over six months. Unemployment payments increased by approximately one-twelfth of payroll wages. And there are brief spikes in which pension withdrawals totalled one-third of weekly pay-roll wages in some weeks. The transfers, when combined with an unexpected resilience in aggregate wage flows, meant that income flows to the working-age Australian population exceeded pre-COVID-19 levels across 2020 and into 2021.

The extent of transfer is surprising and unusual. Aggregate income flows generally fall in the immediate aftermath of large adverse macroeconomic shocks. The role of counter-cyclical economic policy is to partly ameliorate that income loss and help smooth consumption. The comprehensive suite of government actions in response to COVID-19 instead represents a significant pro-cyclical aggregate demand stimulus.

Figure 2.3 relates the positive income shock with measures of output, unemployment, consumer spending, key asset indices and household saving. The Australian economy experienced a short and sharp recession with successive declines in output in the March and June 2020 quarters. Output returned to pre-COVID-19 levels by early 2021. The negative labour market shock was similar: large but short-lived. Unemployment rates doubled from March to July but peaked after one quarter and were largely reversed by June 2021.

Figure 2.2: Weekly income for the working age population.

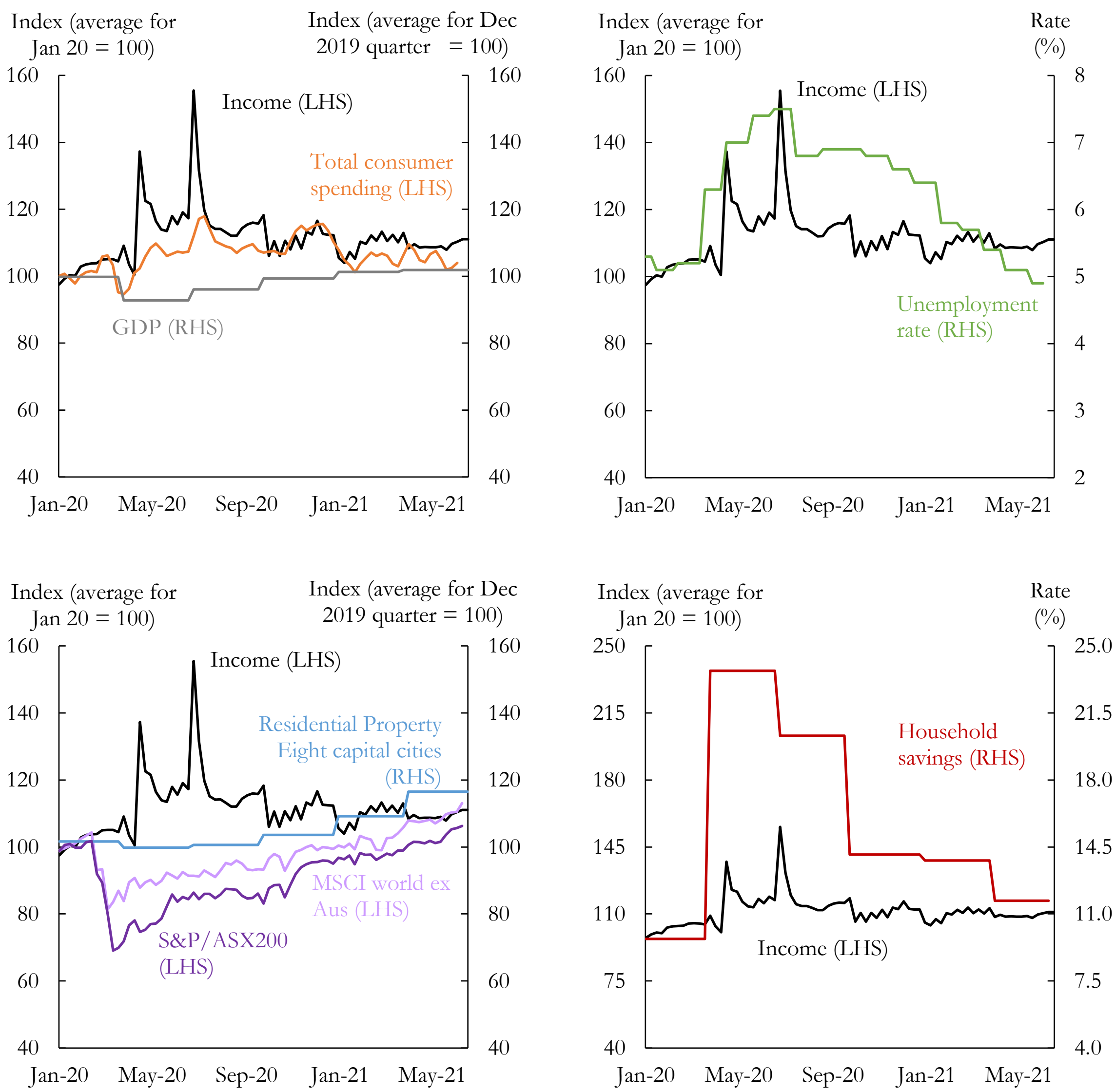


Data: Australian Taxation Office and Department of Social Services
Notes: The working age Australian population has been constructed as those aged 16-65 who possess a superannuation balance prior to COVID-19.

The negative shocks to consumer spending and asset markets proved similarly short-lived. With a boost to weekly incomes, resilient consumer spending and restrictions on people's activities, it is perhaps unsurprising to observe a substantial short-term boost in the household savings ratio. In general, income flows increased, and Australia experienced a mild, short-lived recession.

In the next section we will examine some distributional outcomes 'purchased' via the transfers.

Figure 2.3. Output, Labour Market, Consumption, Asset Markets, Household Savings



Data: Australian Taxation Office, Department of Social Services, Australian Bureau of Statistics, S&P, E61 Institute.

2.4 COVID-19 Transfers and the Protection of Living Standards

We focus on the extent to which measures relieved poverty, changed the income distribution and replaced pre-pandemic earnings. We start by examining the change in the income distribution.

2.4.1 Shifting the Income Distribution

Figure 2.4 presents histograms of the weekly income distribution up to $2,500 weekly ($130,000 yearly).[11] It shows an upwards shift in the overall income distribution from COVID-19 transfers, consistent with Figure 2.2.

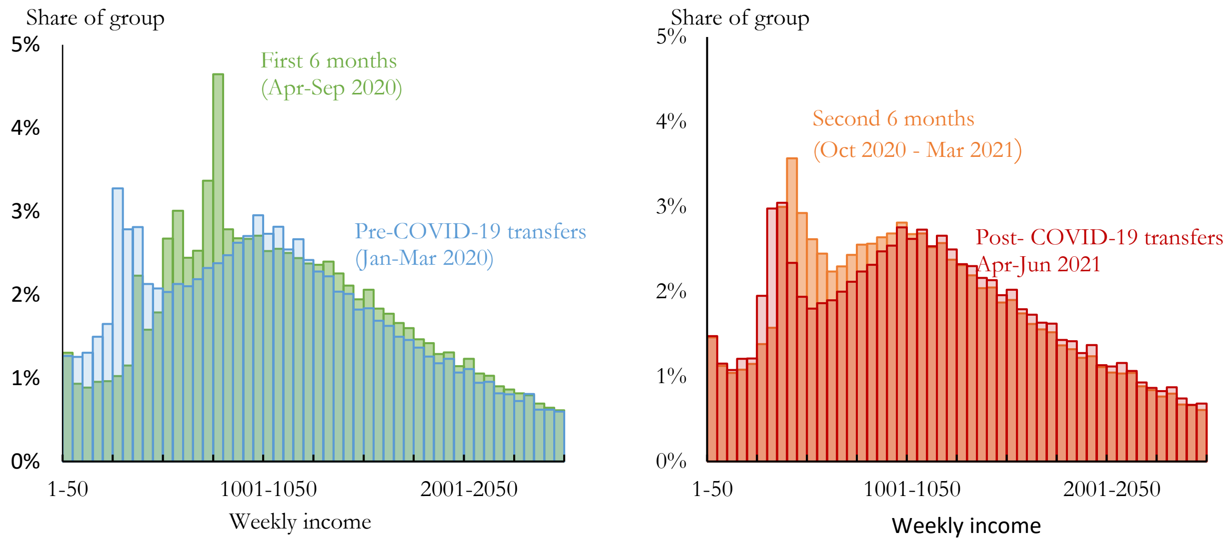
Changes in the income distribution were most pronounced among two main groups of the population. The first was the bottom of the distribution. Figure 4a compares an eight-week pre-program window

[11] Figures showing the income distribution at higher levels, available from the authors upon request, show no unexpected features.

(10 January–5 March 2020) with the initial, generous six months of assistance (April–September 2020). Prior to the measures, approximately 20 percent of income earners were below $500 weekly and a further 19% were between $501 and $900 weekly. With COVID-19 transfers, approximately 5.9% of income earners—or 2.1 million Australians — 'moved' from weekly incomes of $1–$500 to incomes of $501–$900. This represents a significant shift of population mass from the bottom to the lower-middle range.

Figure 2.4. Distribution of weekly incomes (earnings and transfers)

(a) Initial COVID-19: January – September 2020 (b) Phase down: October 2020 – June 2021



Data: Australian Taxation Office and Department of Social Services
Notes: Presents incomes of $1-$2500 weekly.

The second is an additional mass forming in the upper-middle-income range. Close to one million additional people were found in the $1,301–$2,300 weekly range from April to September 2020, compared to the pre-COVID-19 window. Figure 2.4b then presents the income distribution as time progressed—when the transfers were wound back between October 2020 and March 2021 (in orange) and then removed (April to June 2021). As measure intensity reduced, the population mass gradually re-turned to its pre-COVID-19 shape.

2.4.2 Fewer Individuals with Incomes Below Poverty Lines

Australia does not have an official poverty line, and assessments of poverty are inherently subjective. That noted, and as Cowgill and Coates (2021) point out, two measures for the poverty line are commonly used. The Henderson poverty line was defined initially by the 1973 Commonwealth Commission of Inquiry into Poverty and is updated quarterly by the Melbourne Institute, with the June 2020 quarter rate set at $455 per week for a single person not in the workforce (Melbourne Institute 2020). The relative poverty line is set at half median household income. Lacking a measure of household income, we instead compute half the median weekly individual earnings across the 78 weeks of our sample from January 2020 to June 2021, which is $362[12].

During the eight-week pre-program window (Table 2.3, specification 1), approximately 6.6 million working-age individuals received weekly incomes that would place them below the Henderson poverty line. During the six-month April–September window (specification 2), approximately 1.8 million fewer individuals received incomes below the Henderson poverty line. Table 3 also shows how income earning was affected at the intensive margin (people on low earnings pre-COVID-19 earning more during the COVID-19 period) and extensive margin (people with no earnings pre-COVID-19 earning during the

[12] For our calculations we use rounded figures: relative poverty line $350, Henderson poverty line $450.

COVID-19 period). There was a 27% reduction in the population on low or no weekly incomes: 1.2 million fewer individuals without an income, and 600,000 with (nonzero) incomes of $450 or less.

Table 2.3 Change in Incomes

		Pre-COVID-19 (10 Jan 2020 – 5 Mar 2020) (1)	Change from pre-COVID-19 period to: Initial 6-months (28 Mar 2020 – 30 Sep 2020) (2)	6-month extension (1 Oct 2020 – 28 Mar 2021) (3)	Post measures (29 Mar 2021 – 30 Jun 2021) (4)
Weekly incomes					
No earnings or transfer	# (m)	4.7	- 1.2	- 0.7	- 0.2
	Δ		-25.4%	-15.0%	-5.0%
Receive earnings + transfers	# (m)	10.6	+1.2	+0.7	+0.2
	Δ		11.3%	6.7%	2.2%
Incomes below poverty lines					
Henderson poverty line (~$450)	# (m)	6.6	-1.8	0.9	-0.4
	Δ		-27.2%	-13.2%	-5.4%
Relative poverty line (~$350)	# (m)	6.1	-1.7	-1.1	-0.4
	Δ		-28.4%	-17.9%	-6.9%
At other points in the income distribution*:*					
501-1000 weekly	# (m)	2.5	0.9	0.3	- 0.1
	Δ		37.4%	12.8%	-5.9%
1001-1500 weekly	# (m)	2.5	0.3	0.1	0.1
	Δ		10.9%	5.5%	3.8%
1501-2000 weekly	# (m)	1.5	0.3	0.1	0.2
	Δ		21.9%	9.6%	11.0%
2001+ weekly	# (m)	1.9	0.3	0.2	0.3
	Δ		13.5%	7.9%	13.2%

Data: Australian Taxation Office and Department of Social Services

It would be a mistake to infer that all of those receiving low (or no) payroll earnings are experiencing a low living standard. For example, a part-time minimum wage worker might live in a household that earns above-median income. Living standards are also influenced by a wide range of factors, including home ownership and other assets, health outcomes and consumption possibilities. It is, however, reasonable to conclude that a combination of COVID-19 transfers and continued earning ensured that many Australians would not face the prospect of income poverty for a brief window in 2020. The poverty-alleviating feature of COVID-19 transfers holds irrespective of the poverty line chosen.

Our observations align with Phillips, Gray and Biddle's (2021) simulations, which estimate significant reductions in income poverty in Australia in 2020. Acknowledging differences in measurement and composition of poverty that cloud comparisons, we note that the directional trend makes Australia (along-side Canada; Bernard and Zhang 2022) some-thing of an outlier among the international community. Among advanced economies, the poverty rate increased in 2020 in the United States (Shrider et al. 2021), Sweden, Ireland, Italy, Spain, Portugal and Greece, and stayed stable in other continental European nations (Eurostat 2021, 2022) and New Zealand (StatsNZ 2022). Worldwide, the World Bank estimates that 119-124 million people were pushed into extreme poverty due to the pandemic (Mahler et al. 2021).

2.4.3 Income Replacement

Alongside changes in the income distribution, evaluating the success of transfers typically relies on measures of their 'replacement rate'. Replacement rates aim to measure the amount of pre-benefit private income replaced directly by transfers. Here we report the well-established concept of statutory replacement rates: the ratio of (pre-tax) transfers during COVID-19 to (pre-tax) pre-COVID-19 earnings (Ganong, Noel and Vavra 2020). We calculate replacement rates across income quintile, calendar month, program type, age, sex, occupation and state.

By Quintile

Table 2.4 presents the level of transfer by quintile. Two main observations stand out. First, there is significant heterogeneity in transfer receipt across the earnings distribution. Transfers were more likely to be received by those in the middle of the distribution (people earning approximately $17,000–$47,000 in taxable wages in 2019). More than half of the middle quintile received a transfer, and the average amount transferred to this group ($232 per week) was the highest. In all, 25% of total program expenditure ($36.8 billion) went to the middle quintile. Conversely, those at the edges of the earnings distribution were least likely to access a COVID-19 transfer. At the top end, this is likely to partly reflect program eligibility. In particular, those with high earnings were unlikely to be eligible for unemployment payments. At the bottom end, among those with very low taxable incomes, the population comprises a mix of those with high means (notwithstanding low incomes) and low means.

Second, transfers comprised a greater share of income among those in the bottom quintiles. Table 2.4 shows the income growth for an individual earning the median income in each quintile, including and excluding transfers. The lower the starting earnings, the greater the contribution of transfers to incomes.

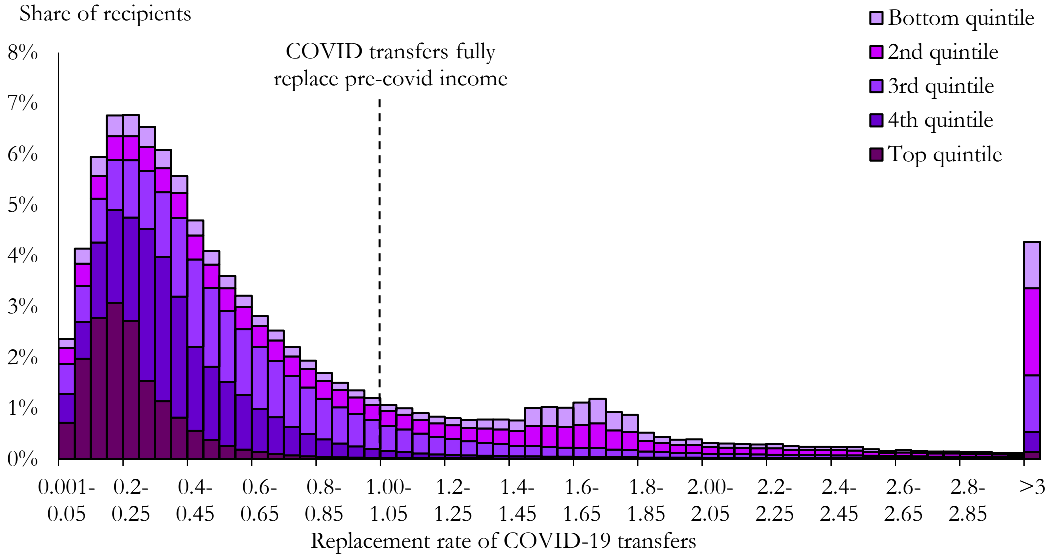
Figure 2.5 presents the distribution of replacement rates by quintile. The shape of the distribution highlights one further observation: for most program recipients, transfers were a partial supplementation of their pre-COVID-19 earnings. The median replacement rate was 0.46 (46% of pre-COVID-19 earnings), and three-quarters of recipients had a replacement rate of less than one.

Table 2.4. COVID-19 transfers by quintile

2019 taxable wage quintile	Population	Pre-COVID-19 income ($ per week)	Average weekly transfer 28 Mar 2020 to 28 Mar 2021 (share of quintile accessing program)				Median change in income	
			Any	Jobkeeper	Unemployment	Super	Ex. Transfers	Incl. transfers
Bottom quintile ($0)	3,049,898	$322	167 (37%)	66 (15%)	68 (18%)	32 (13%)	-42.6%	+72.6%
2nd quintile ($0-$17,608)	3,049,898	$339	196 (45%)	76 (18%)	85 (25%)	35 (16%)	-28.6%	+65.4%
3rd quintile ($17,609 - $47,353)	3,049,898	$656	232 (53%)	121 (28%)	58 (22%)	53 (22%)	-10.3%	+14.8%
4th quintile ($47,354 - $78,248)	3,049,897	$1,114	208 (46%)	124 (29%)	21 (10%)	63 (22%)	-3.8%	+4.4%
Top quintile ($78,249+)	3,049,897	$2,190	134 (31%)	88 (21%)	6 (3%)	39 (13%)	0.0	+2.5%
Total	15,249,488	$924	187 (42%)	95 (22%)	48 (16%)	45 (17%)	-5.5%	+10.2%

Data: Australian Taxation Office and Department of Social Services.
Notes: For constructing quintiles have included those who did not lodge a tax return in 2018-19 among those with no taxable wage.

Figure 2.5. Distribution of replacement rates



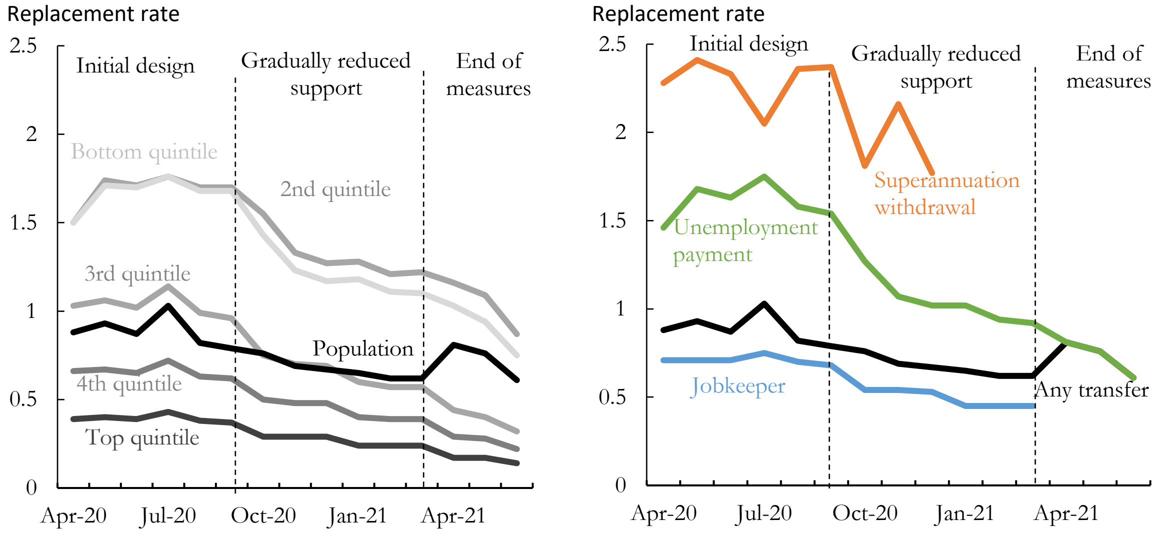
Data: Australian Taxation Office and Department of Social Services
Notes: The replacement rates presented are for 5.1m individuals who received COVID-19 transfer payments and also have weekly earnings in the pre-COVID-19 window.

By Calendar Month

Recall from Table 2.1 and Figure 2.1 that the profile of COVID-19 transfers changed over time. An initial six months of generous transfer preceded six months of gradual tightening of generosity. In addition, more than three-quarters of lump sum superannuation withdrawals were accessed be-tween 20 April 2020 and 31 July 2020. The monthly replacement rates by quintile presented in Figure 2.6 reflect this. A downward slope in replacement rates occurred as program conditions tightened. The experience of those in the bottom two quintiles has a similar shape to the unemployment payment recipients, while the experience of the third and fourth quintiles tracks the JobKeeper payment closely. Those who accessed a lump sum from superannuation experienced a dramatic income boost in the month of access.

Figure 2.6. Median rates of replacement of transfers

(a) By income quintile (b) By program type



Data: Australian Taxation Office and Department of Social Services

By Occupation

Table 2.5 shows how weekly incomes changed by occupation. The presence of transfers coincided with income growth amongst all occupation types. The lowest earning occupations experienced the greatest proportional gains. In addition, there was substantial heterogeneity in income replacement across occupations. High-earning occupations such as managers, technicians and trades workers received the greatest level of transfer from JobKeeper, on both a per-worker and per-recipient basis. Employment outcomes across these occupations were among the strongest, and workers in these occupations were significantly less likely to access unemployment payments. Unemployment payments were a more prominent consideration for workers in lower-earning occupations. A quarter of labourers, clerical and administrative workers and sales workers accessed an unemployment payment.

Table 2.5. Transfer by occupation

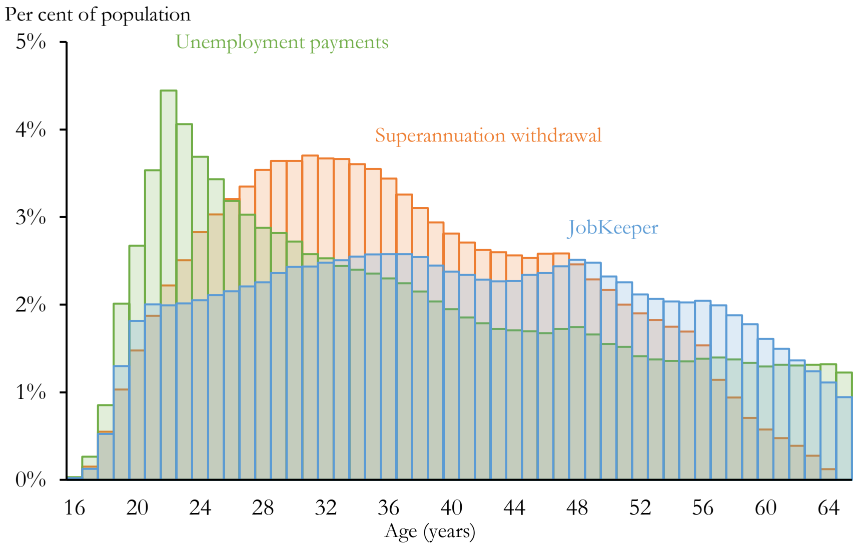
Occupation	Workers	Pre-COVID-19 income ($ per week)	Average weekly transfer 28 Mar 2020 to 28 Mar 2021 (share of occupation accessing program) Any transfer	Jobkeeper	Unemployment	Super	Median change in income Ex. transfers	Incl. transfers	Change in total persons employed May 20/ Feb20	Feb 21/ Feb20
Labourers	1.1m	802	237 (55%)	91 (22%)	73 (24%)	74 (31%)	-13.4%	+16.6%	-3.5%	-8.0%
Clerical + Administrative	1.4m	1,027	219 (42%)	104 (25%)	61 (12%)	55 (16%)	-11.8%	+15.7%	-1.0%	-2.9%
Sales Workers	0.9m	820	226 (54%)	116 (28%)	63 (24%)	48 (20%)	-13.3%	+14.3%	-13.0%	-1.5%
Community + Personal Service	1.3m	802	179 (50%)	106 (24%)	32 (23%)	41 (15%)	-8.4%	+9.1%	-21.9%	-3.4%
Machinery Operators + Drivers	0.6m	1,225	224 (52%)	87 (21%)	47 (17%)	91 (32%)	-8.4%	+10.1%	-2.6%	+3.1%
Technicians + Trades	1.2m	1,249	247 (54%)	145 (34%)	35 (14%)	67 (24%)	-13.3%	+6.7%	-6.0%	-2.0%
Professionals	2.4m	1,513	122 (29%)	81 (19%)	15 (6%)	26 (9%)	-0.8%	+7.3%	-1.7%	+4.4%
Managers	1.4m	1,606	211 (45%)	143 (32%)	20 (9%)	48 (17%)	-8.6%	+4.7%	-2.1%	+4.4%
Uncategorised	1.3m	108	219 (46%)	114 (25%)	61 (18%)	45 (18%)				

Data: Australian Taxation Office, Department of Social Services and Australian Bureau of Statistics.
Notes: Occupations are recorded from 2018-19 tax returns. Not shown here are 3.3 million individuals who did not file a tax return in the 2018-19 year.

By Age and Sex

Figure 2.7 and Table 2.6 reveal further heterogeneity in COVID-19 transfers by age and gender. Figure 2.7 depicts a strong skew towards younger age groups for unemployment payments. Superannuation withdrawals were also skewed younger, although having a sufficient balance to withdraw was an important limiting factor to take-up among those in their early 20s (Sainsbury, Breunig and Watson 2022). The more uniformly distributed take-up of JobKeeper payments across those of working age is noteworthy.

Figure 2.7. Share of recipient population by age



Data: Australian Taxation Office and Department of Social Services

Table 2.6 shows that males received moreCOVID-19 transfers in dollar terms than females. This is against a baseline of higherpre-COVID-19 earnings. COVID-19 transfers replaced a higher share of the pre-COVID-19 earnings of females (23% average and 50% median replacement rate) than for males (18% and 42%). Males were about 4 percentage points more likely to access JobKeeper and 3 percentage points more likely to withdraw from superannuation, while females were 2.5 percentage points more likely to access unemployment payments. A word of caution is advised in interpretation as our data only allow us to look at transfer receipt at the individual level and we are unable to say anything about effects at the household level.

Table 2.6. Transfer by sex

Sex	Population	Pre-COVID-19 income ($ per week)	Average weekly transfer Apr 2020 – Mar 2021 (share of population accessing program)				Median change in income		Change employment (total persons employed)	
			Any transfer	Jobkeeper	Unemployment	Super	Ex. transfers	Incl. transfers	May 20/Feb20	Feb 21/ Feb20
Female	7.4m	767	177 (44%)	86 (20%)	52 (17%)	39 (16%)	-4.6%	+12.3%	-7.5%	+0.1%
Male	7.8m	1,073	197 (41%)	103 (24%)	43 (15%)	50 (19%)	-7.1%	+8.3%	-5.8%	-0.3%

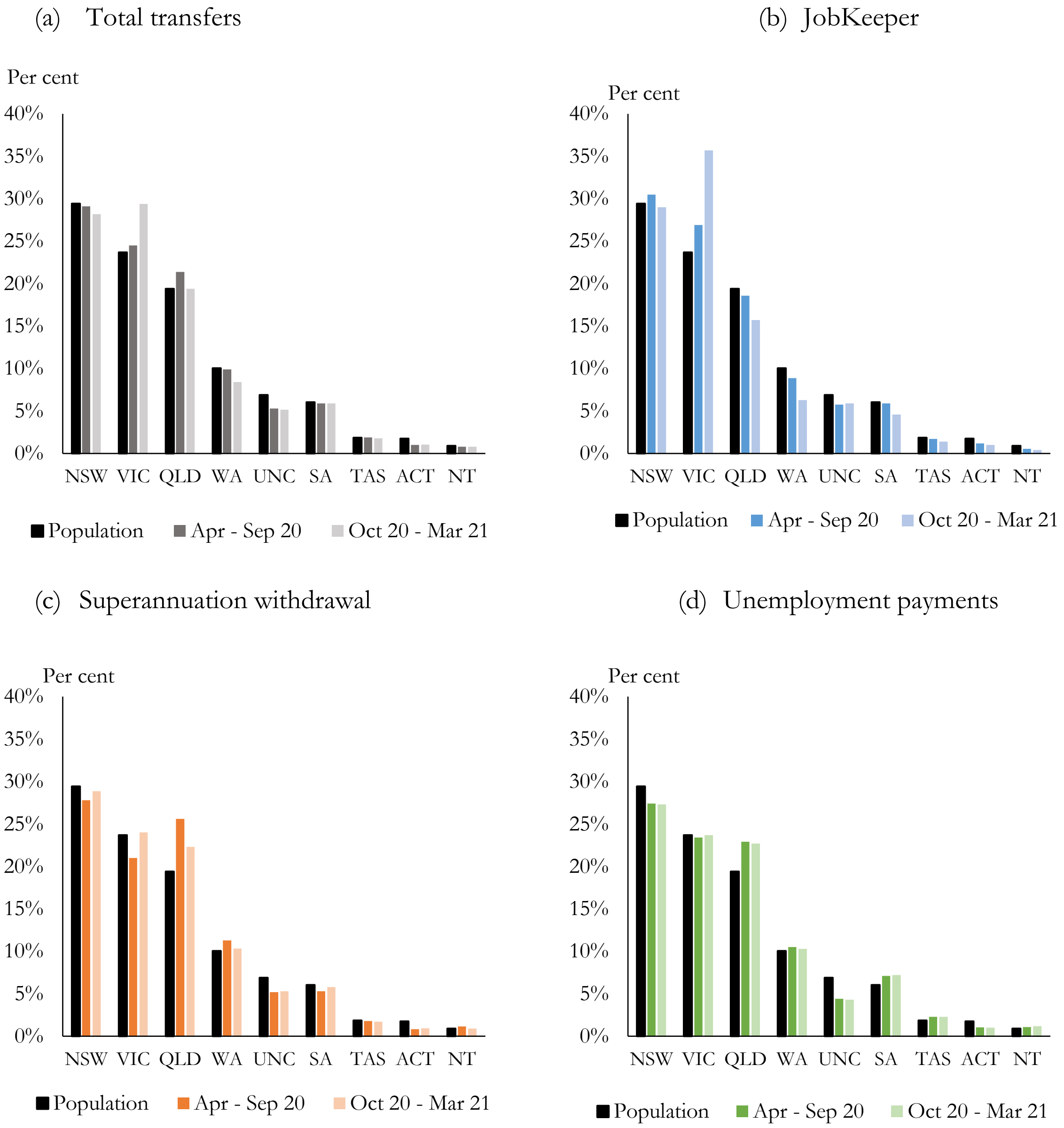
Data: Australian Taxation Office, Department of Social Services and Australian Taxation Office.
Notes: Occupations are recorded from 2018-19 tax returns. Not shown here are 3.3 million individuals who did not file a tax return in the 2018-19 year.

By State

Lastly, there is heterogeneity in COVID-19 transfers across geographic location. While the terms of access to COVID-19 transfers were the same across the population irrespective of geography, exposure to the virus differed by region. The precise actions for responding to the health emergency posed by COVID-19 were also largely left to state governments to determine. Recall from Figure 2.1 that residents in the south-eastern state of Victoria (particularly its capital city, Melbourne) were subject to a long, severe 'second-wave' lockdown from July to October 2020, which other parts of Australia avoided. Figure 2.8 shows how the prolonged restrictions on activity meant that Victorians were more likely to receive a COVID-19 transfer, and received a disproportionate share of JobKeeper payments.

Also of note is the effect on states featuring tourism-dependent regions such as Queensland, South Australia, the Northern Territory and Tasmania. These regions were able to remain effectively COVID-19 case free, yet their economies were severely affected by reduced international and domestic travel. These states experienced larger quarterly reductions in employment from February to May 2020. Their residents were more likely to make use of superannuation withdrawal and unemployment payments.

Figure 2.8. Share of population and major COVID-19 transfer by state



Source: Administrative COVID-19 program records, ABS National, state and territory population

2.5. Conclusion

In this paper we presented aggregate weekly income flows among the working-age Australian population over an 18-monthperiod from January 2020 to June 2021. Income flows were higher during the period in which COVID-19 transfers were present. We showed that the upwards shift in the income distribution was concentrated in three places: higher population mass at the lower-middle and upper-middle segments of the income distribution, and lower population mass at the bottom of the income distribution.

We also presented measures that reveal heterogeneity in COVID-19 transfers. In particular, we painted a picture of a two-tiered 12-month pandemic welfare system. A poverty-alleviating income floor was disproportionately accessed by two groups in Australian society: workers in low-earning occupations such as labourers, sales and clerical and administrative occupations, and welfare recipients in the bottom quintile of the earnings distribution. The more generous JobKeeper wage subsidy and superannuation withdrawal programs served the purpose of boosting incomes and providing employment certainty, was targeted more towards the middle and upper-middle segments of the income distribution, and was accessed disproportionately by males, and workers in managerial, technician and trades occupations. The transfers treated Australians in similar positions differently, and represent a departure from the traditional approach of redistributing from those with higher capacities to those with lower capacities.

Together, these two pieces of analysis raise important questions that we hope can help inform future crisis management. Chief among them is to ask at what point crisis responses might deliver 'too much of a good thing'. That said, we repeat our urge for caution when interpreting what our finding simply about Australian pandemic response. Descriptive exercises such as the one we conducted here do not provide information about the 'impact' of pandemic policies and are limited to what they directly measure.

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Chapter 3: COVID-19 early pension withdrawal and unemployment tenures[13]

A revised version of Sainsbury, T., Breunig, R. and Watson, T. (2022), "COVID-19 private pension withdrawals and unemployment tenures", *Tax and Transfer Policy Institute Working Paper 3/2023*.

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Abstract

This is the first study to evaluate effects of early pension withdrawal on unemployment duration in the COVID-19 context. We use novel, linked population administrative records to examine 529,703 Australians who became unemployed in the initial pandemic months. Receiving a lump sum of up to A$10,000 from superannuation accounts in the April-June 2020 period resulted in a 31% lower exit rate from unemployment inside the first six months on benefits, and 13% inside a year of unemployment spell. Receiving A$10,000 in July – December, either as a first or second payment, generated a similar increase in unemployment duration.

[13] We thank Paul Burke, Nathan Deutscher, Ben Dolman, Ryan Edwards, Mark Fabian, Bob Gregory, Adam Hawkins, Cecilia Karmel and Stewart Nixon for helpful comments on earlier drafts. We gratefully acknowledge the participants at seminars at the Tax and Transfer Policy Institute Seminar in December 2021, Department of the Treasury in February 2022, Department of the Prime Minister and Cabinet and Australian Taxation Office in March 2022, Crawford School at ANU and Department of Social Services in May 2022. Any errors or omissions are those of the authors. Tristram Sainsbury and Timothy Watson acknowledge the support of the Sir Roland Wilson foundation in funding their PhD research.

3.1 Introduction

In response to the economic downturn associated with the COVID-19 pandemic, the Australian Government allowed individuals to withdraw money from their superannuation funds. Superannuation, Australia's compulsory retirement income system, is normally not available to individuals prior to retirement from the workforce. The withdrawal possibility was made available to individuals suffering financial hardship due to COVID-19.

Using individual-level information from six administrative data collections of the Australian government, linked for the purpose of this study, we examine the experience of 529,703 individuals who became unemployed at the beginning of the pandemic and who were still unemployed on 18 April 2020 when the superannuation early release program began.

There were two opportunities to withdraw superannuation funds. The first was in the April-June 2020 period and the second was in the July – December 2020 period. An individual in our sample could make up to one withdrawal each period and two withdrawals in total (provided that she is still unemployed after 1 July). Individuals could withdraw up to A$10,000 (US$7,750) at each withdrawal opportunity subject to having enough funds in their personal superannuation account.

We examine the duration on unemployment benefits for those who withdrew money from their superannuation accounts compared to those who did not. In the raw data, those who chose to withdraw their superannuation, on average, were 45% less likely to have exited unemployment six months after becoming unemployed. 37% of those who did not withdraw had exited at this point while only 22% of those who withdrew had exited. Over longer time horizons, 9 to 12 months, those who withdrew were 10 to 20% less likely to exit unemployment than those who did not withdraw. These results are consistent for both the first and second withdrawal opportunities.

This unique pandemic stimulus program allowed eligible individuals to decide whether to access their superannuation funds based upon their own circumstances. This includes information about their re-employment prospects, their personal, financial situation and their ability to make up any lost retirement savings by making additional contributions in the future.

We devote the majority of the paper to establishing that the impact of superannuation withdrawal on unemployment duration has a strong causal component. Our rich data allow us to control for a wide range of observable characteristics. Importantly, we control for pre-pandemic characteristics including wages and superannuation balances which will be correlated with unobservable re-employment probabilities. We use a rich, parametric specification in a duration framework and employ matching techniques as a robustness check.

Our estimates are primarily based on comparisons between those who withdrew and those who did not. We also investigate whether there is an effect on the intensive margin although our ability to do this is somewhat limited. We examine whether those who stayed out of work longer because of withdrawing their superannuation were able to obtain higher-paying jobs than those who returned more quickly to the workforce. We examine the role of unobservables and liquidity by looking at how estimates differ based upon pre-COVID income and wealth. We show that there is no evidence that people remained unemployed past 1 July in order to make themselves eligible for a second opportunity to withdraw from their superannuation balance.

The parametric estimates and the matching estimates both produce impacts of superannuation withdrawal that are larger than those found in duration models without covariates. After controlling for observable characteristics, including pre-pandemic wages and superannuation balances, those who chose to withdraw superannuation at the first opportunity were 31% and 14% less likely to exit unemployment in months 4-6 and months 9-12 after beginning unemployment, respectively. Estimates without controls are 24% and 10%, respectively. Impacts for withdrawing at the second opportunity are slightly larger and controlling for observable characteristics also produces estimates that are larger than those in the model without controls.

The lump sum payments from superannuation are a pure liquidity injection—there was no requirement that individuals remain unemployed after receiving the funds. In fact, individuals could withdraw from superannuation and start a new job on the same day. Drawing together all our analysis, we conclude that the extra liquidity generated for individuals by withdrawing from superannuation led to longer durations on unemployment. This is a similar conclusion and similar impacts to Chetty (2008) who examines liquidity effects from severance payments. The payments we examine are very large—about 4 times bigger than those that Chetty examines. For the average person who withdrew, the liquidity represented about 25% of her pre-COVID annual earnings.

Our findings contribute to the literature on social insurance and unemployment. One of the most well-established results in labor economics is that social insurance payments lead to longer unemployment spells (Mortenson 1977, Moffitt 1985, Meyer 1990, Katz and Meyer 1990, Nekoei and Weber 2017, Jones and Marinescu 2022, and others)[14]. Chetty (2008) (building on Card et al. (2007) and Lalive (2007)) applies this logic to lump-sum severance payments and finds longer unemployment spells for those who receive them, particularly for constrained households. Our paper is also of interest in light of the emerging literature around the cyclicality of unemployment insurance (Ganong et al. 2021, Landais et al. 2018, Kroft and Notowidigdo 2016 and Schmeider et al. 2016) its links with job match quality (e.g. Van Ours and Vodopivec 2008).

Our paper is also the first to evaluate the effect of pension withdrawals on labor market behaviour. As such, we contribute to a new and growing literature focused on other aspects of pension withdrawals such as their consumption stimulatory effects, e.g. Kreiner et al. (2019) and Andersen (2020).[15] The Australian Bureau of Statistics (2021) estimates that close to 90% of withdrawn funds were consumed or used to pay down credit card or personal debt over the course of 2020. Hamilton et al. (2023) use bank consumer data to estimate that more than half of funds from withdrawals were consumed within 6 weeks of arrival in bank accounts.

The next section presents the key empirical fact that we are investigating. Section 3 briefly discusses the policy context. Sections 4 and 5 detail the theoretical framework, data and empirical strategy. In Section 6 we discuss the results and a range of extensions and robustness checks. We conclude in the final section and briefly discuss the policy implications of our findings.

3.2 Superannuation Withdrawal and Unemployment Duration

We start with graphical evidence about the correlation between superannuation withdrawal and unemployment duration. Figure 3.1 and 3.2 present Kaplan-Meier survival curves, which plot the raw probabilities of recipient 'survival' on unemployment payments, based on whether they were in the group that withdrew from superannuation or the group that did not (Kaplan and Meier, 1958). A probability of 1 means the entire population's spell on unemployment payments is continuing at a point in time, while 0 means full exit. A greater rate of exit is represented by a curve that is closer to zero.

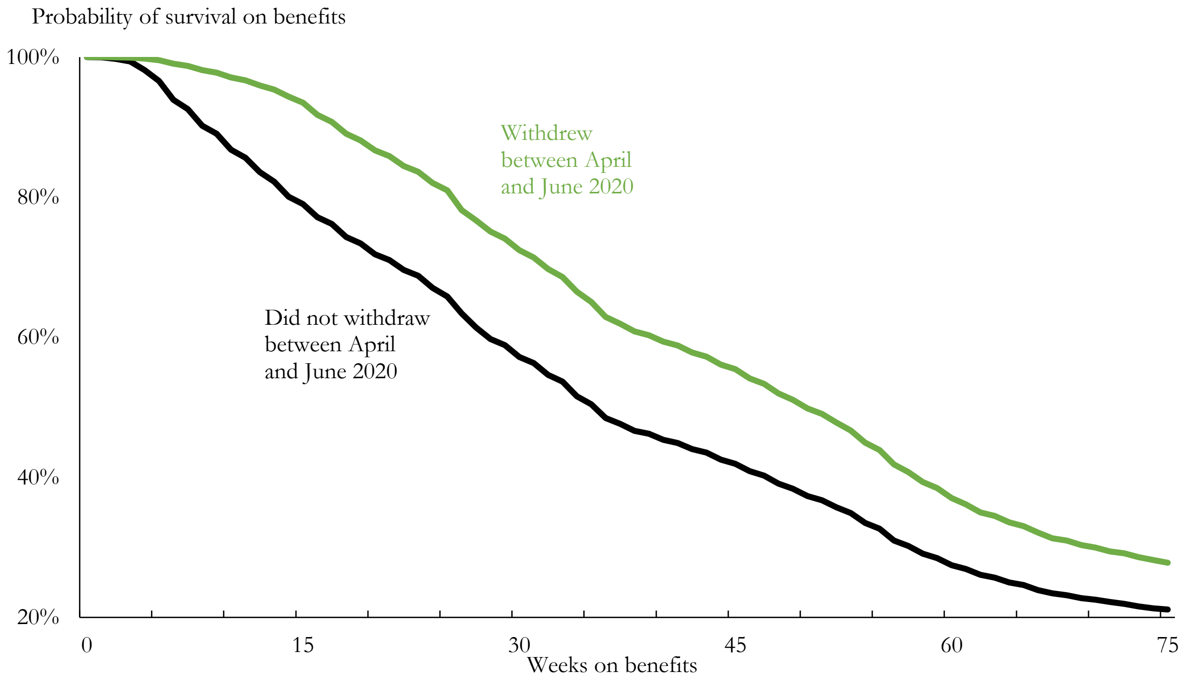
There is a substantial gap in survival rates between withdrawers and non-withdrawers, with those who withdrew more likely to remain on unemployment. The average difference in exit rates across the two

[14] Further, a broadly agreed goal of unemployment assistance is to help the unemployed smooth consumption until they find reemployment (Shimer and Werning 2008, Bloemen and Stancaneli 2005 and Andersson 2018). The early literature approach traded off the 'moral hazard' discouragement to seek employment with the consumption-smoothing benefits of payments (Mortensen 1977, Feldstein 1978, 2005, Kreuger and Meyer 2002, Lalive et al. 2006, Card et al. 2015). Chetty (2008) then decomposed both a welfare-enhancing 'liquidity' effect and a welfare-reducing moral hazard effect. Lump sums like the withdrawals we study represent a pure liquidity effect in the short term.

[15] Further evidence from Beshears et al. (2015) and Argento et al. (2015) in the US context, Agarwal et al. (2018) on Singapore's mandatory defined contribution plan, and Guo and Narita (2018) on Pacific island nation decisions to provide early access following a natural disaster, suggest that there is the potential for suboptimal decision-making at the individual level but potential short-term improvements to welfare associated with early withdrawals.

groups is 33%. However, Figure 3.1 reveals that the difference in exit is time-varying. At 13 weeks of spell on benefits, approximately 18% of non-withdrawers have exited compared to 5% of withdrawers; a 13 percentage point difference. This gap increases to 15 percentage points after 26 weeks (37% and 22% exit rates respectively), before gradually converging to 12 percentage points (64% and 52% exit rates respectively) after 52 weeks and 6 percentage points (76% and 70% exit rates respectively) by 30 June 2021. The divergence, then near convergence, between groups over time justifies our use of quarterly time interactions in our parametric estimates below.

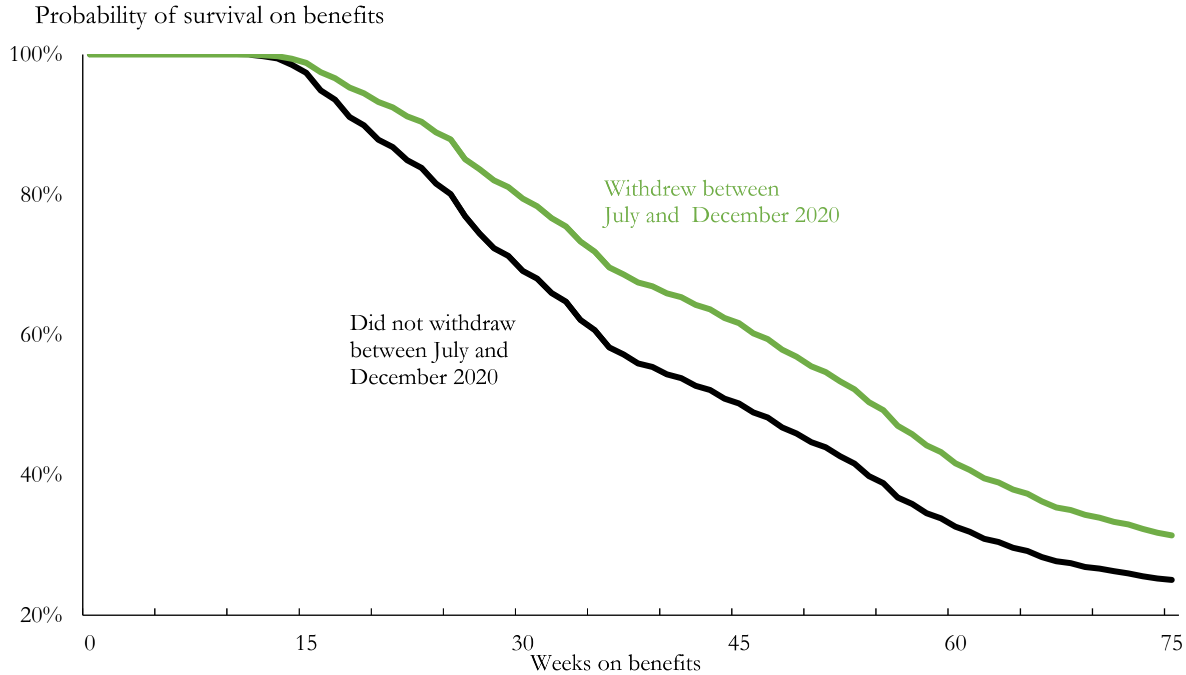
Figure 3.1. Probability of survival on unemployment payments, first tranche of withdrawals.



Data: Australian Taxation Office and Department of Social Services

Figure 3.2 compares individuals that took advantage of the second window to withdraw (from 1 July 2020 to 31 December 2020) with those that didn't, conditional on survival on benefits to 1 July 2020. This includes a sizeable group of about 45,000 individuals who withdrew at the first opportunity. By construction, this population has survived on benefits for the first 11 weeks. Exit rates between withdrawing and non-withdrawing groups are consequently similar inside the first quarter of spell. After that, the general pattern of behaviour (initial divergence then trend towards convergence, with withdrawers less likely to exit unemployment) appears consistent with the first withdrawal. An 8 percentage point gap in exit is present after 26 weeks (23% exit rate for non-withdrawers and 15% exit rate for withdrawers), which increases to 12 percentage points after 39 weeks (45% and 33% rates respectively) before gradually converging to 11 percentage points after 52 weeks (57% and 47% exit rates respectively) and 7 percentage points (72% and 65% exit rates respectively) by the end of the sample period.

Figure 3.2. Probability of survival on unemployment payments, second tranche of withdrawals.



Data: Australian Taxation Office and Department of Social Services

As discussed in more detail below, those who withdrew superannuation are different to those who did not, in ways that we can observe and ways that we cannot. The former include the characteristics presented in Tables 3.2 and 3.3 which shows that those who withdrew are at a later stage of life and household development. The latter might include unobserved understanding of someone's ability that makes them more optimistic of a short unemployment spell, or conversely that they have good prospects of 'gaining back' any superannuation withdrawals through higher future discretionary contributions. To the extent that such ability is concentrated among one group, and not correlated with what can be observed, the observed differences in time on unemployment may spuriously reflect the differences in inherent individual characteristics between groups, instead of the true relationship between superannuation withdrawals and subsequent exit from unemployment support. We will provide convincing evidence that there is a causal component to the differences in unemployment tenures between withdrawing and non-withdrawing groups.

3.3 Policy Context

3.3.1 Australian COVID-19 early access to pensions stimulus policy

On 22 March 2020, the Commonwealth Australian Government announced the second of three packages of measures that would form its substantive fiscal response to COVID-19. A key part of this set of measures was to allow individuals affected by the Coronavirus to access up to A$20,000 of private pension balances: A$10,000 between 19 April and 30 June 2020, and a further A$10,000 from 1 July-31 December 2020 (Commonwealth of Australia 2020a).

Australian and New Zealand citizens and permanent residents were able to self-assess eligibility to withdraw and apply to the Australian Taxation Office (ATO) for a determination that they were eligible for funds to be released. Eligibility is based on being *impacted* during the early months of the pandemic by lost hours, employment or income. Specifically, eligible applicants had to be impacted by Covid in one of the following ways: be unemployed; made redundant in 2020; eligible to receive the JobSeeker or related unemployment payment[16]; a sole trader whose business was suspended; experience a reduction in working hours by at least 20%; or be a sole trader with reduced turnover of at least 20% after 1 January 2020.

Eligibility was not necessarily correlated with experiencing hardship as a result of COVID-19. Income declines were potentially experienced pre-pandemic (a period that included the recovery from widespread and catastrophic bushfires). Receipt of other pandemic-related support measures did not affect eligibility for early release superannuation. The two other large pandemic stimulus measures that were introduced by the Australian government—a wage subsidy designed to keep workers linked to their pre-pandemic employer (Jobkeeper) and a substantial increase in out-of-work benefits (Jobseeker)—may have largely, fully or even over-compensated individuals for lost private income (for further discussion, see Breunig and Sainsbury (2023).

A$38 billion in total was withdrawn, about 1% of the total funds under management in the system. Three million applicants, approximately a fifth of the Australian population aged 16 to 65 who had superannuation accounts, withdrew an average of A$12,400 (US$8,700) (ATO 2020b). This far exceeded the Australian Government's expectations of A$27 billion being withdrawn (Mizen 2021).

The policy was unanticipated, the amounts were large, applying was easy and most people received money within a few days--see Appendix 3A for further discussion of the policy details and its context.

3.3.1 Australian COVID-19 early access to pensions stimulus policy

Our focus in this paper is on those who became unemployed in the early phases of the pandemic. Of the 3 million individuals that withdrew money from their personal superannuation funds in 2020, approximately 700,000 were recipients of unemployment benefits at some point between 1 January 2019 and 30 June 2021. By unemployment benefits, we mean JobSeeker payment, Newstart Allowance, Youth Allowance (Other) and Farm Household Allowance. These are the key payments targeted towards the working-age unemployed in Australia.[17] We refer to people receiving these payments as being "unemployed" even though they are allowed to work and receive a small income before losing eligibility for these payments. We refer to them as "becoming employed" or "leaving unemployment" when they cease receiving one of these payments.[18]

The majority of those on unemployment payments receive the JobSeeker payment. Prior to COVID-19, JobSeeker was paid at a base rate of A$565 per fortnight, 37% of the Australian minimum wage. The payment is subject to a complex range of income and asset thresholds, both for the individual and her partner. Recipients must also undertake what are termed 'mutual obligation' activities such as completing a minimum number of job applications within specified time limits.

During the pandemic, unemployment payment recipients automatically received a temporary Coronavirus Supplement payment worth $550 per fortnight between 27 April 2020 and 25 September 2020.[19] Income and asset thresholds and work search requirements were removed or relaxed considerably, and claims processes were accelerated (Commonwealth of Australia, 2020a and 2020b). These policies substantially reduced the impact of financial constraints for those who were unemployed and our results about the liquidity impacts of superannuation withdrawal need to be interpreted in light of these improved financial conditions for the unemployed.

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[16] JobSeeker is Australia's primary working-age unemployment payment. For basic details on eligibility rules, payment rates, mutual obligation tasks and activities necessary to secure the payment, and initial claim processing and management see Services Australia (2022).

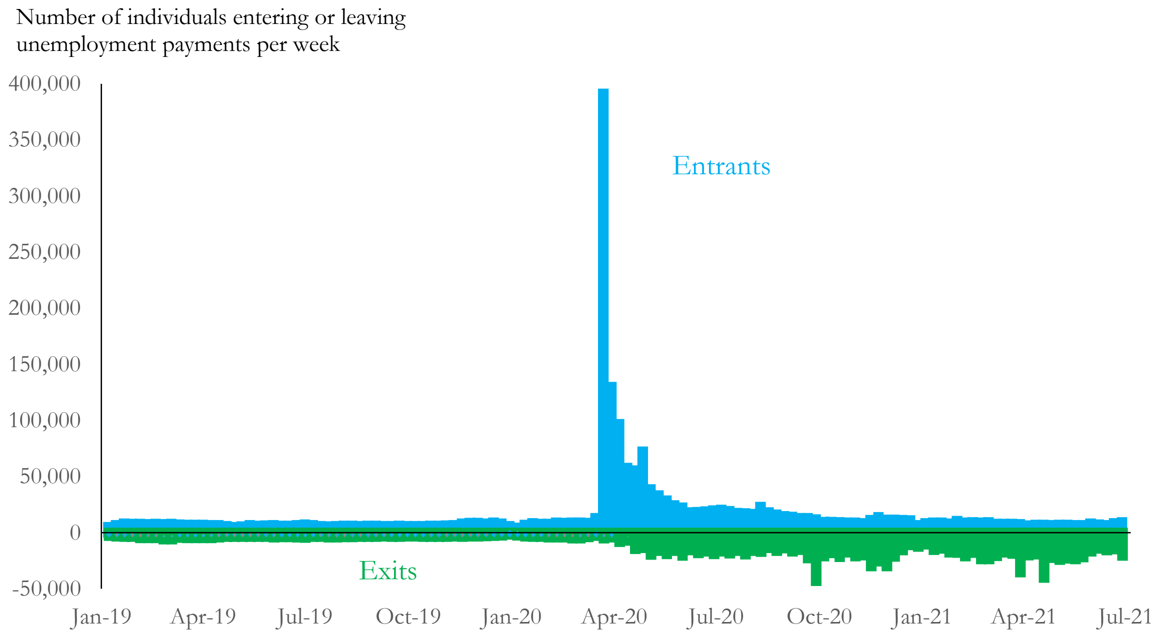
[17] We adopt a similar definition for payments to the unemployed as Frydenberg and Birmingham (2021).

[18] One concern might be that people leave unemployment payments and move to some other government payment. This is uncommon in our data. The largest payment to which the unemployed move is the Disability Support Pension (DSP) and of our 700,000 unemployed individuals only 1,434 switch to DSP.

[19] The supplementary payment was extended at reduced rates of $250 per fortnight between 26 September 2020 and 31 December 2020, and $150 per fortnight from 1 January 2021 to 30 March 2021. Income and asset thresholds and eligibility conditions were also progressively re-tightened at this time.

Figure 3.3 shows flows on and off unemployment payments from January 2019 through June 2021. The rapid pace of change in early 2020 is clearly evident as is the last week in March 2020 in which close to 400,000 individuals started a spell on payments. Appendix A provides additional context about unemployment patters in the early months of the pandemic.

Figure 3.3. Weekly income support flows for unemployment payments, January 2019- June 2021



Data: Department of Social Services.
Notes: Unemployment payment recipient is defined to include JobSeeker, Newstart Allowance, Farm Household Allowance and Youth Allowance (Other).

3.4 Conceptual Framework and Model

In this section, we first examine why people might have chosen to withdraw money from superannuation. Taking money out of their own personal account, ceteris paribus, means less savings available in retirement. To examine this, we extend the conceptual framework of Freebairn (1998) to evaluate the opportunity cost of saving through superannuation in terms of consuming or saving in other ways. Imposing current tax system parameters on this frame, along with defensible assumptions about future retirement circumstances, suggests that there was a tax system inducement to withdraw superannuation when people got the opportunity.

In the second part of this section, we motivate our examination of withdrawn superannuation funds as a liquidity effect. We draw on the job search model of Card et al. (2007) and applied in Chetty (2008), alongside the work of Lentz and Tranaes (2005). We also draw on the exposition in Andersson 2018. These studies provide a framework deriving a liquidity (wealth) effect and a moral hazard (substitution) effect that can be estimated.

3.4.1 The present value of lump sum pension withdrawals

We begin by showing that withdrawing superannuation may present a tax advantage for many individuals. Equations (1) – (3) show the value of remuneration R taken through one of three means: 1) wages (W) used for current consumption $R(W, C)$; 2) wages used for superannuation contributions (Su), whether voluntary or compulsory $R(W, Su)$; and 3) wages saved outside superannuation (Sa) and spent for pre-retirement purposes ($R(W, Sa)$), are as follows.

$$R(W, C) = W\left(1 - t_y\right) \tag{1}$$

$$R(W, Su) = W\left(1 - t_c\right)\left(1 + r(1 - t_e)\right)^n (1 - t_x)(1 - t_r)/(1 + d)^n \tag{2}$$

$$R(W, Sa) = W\left(1 - t_y\right)\left(1 + r(1 - t_i)\right)^m/(1 + d)^m \tag{3}$$

Where:

- W = wages
- t_c = tax rate on entry (contributions) into superannuation
- t_i = effective tax rate on (outside of super) savings
- t_e = tax rate on earnings in superannuation.
- t_r = effective tax rate associated with withdrawal of age pension benefits
- t_x= tax rate on fund withdrawals
- t_y = income tax rate
- n = number of periods to retirement withdrawal
- m = number of saving periods
- r = rate of return
- d = discount rate

With no marginal income tax consequence for withdrawn sums in the context of the program that we analyse, the present value of remuneration R held in super for consumption during retirement, taken as withdrawn super that is used for current year consumption, or saved outside super and consumed for pre-retirement purposes, can be calculated as variants on equations (1) to (3), respectively, where the marginal income or contributions tax do not apply (ty = tc = 0). After replacing remuneration drawn from wages (W) with funds in super (F) that can either withdrawn (Fwith) or held in super (Fheld), the present value calculations are as follows:

$$R(F_{with}, C) = F_{with} \tag{4}$$

$$R(F_{held}, Su) = F_{held}\left(1 + r(1 - t_e)\right)^n (1 - t_x)(1 - t_r)/(1 + d)^n \tag{5}$$

$$R(F_{with}, Sa) = F_{with}\left(1 + r(1 - t_i)\right)^m/(1 + d)^m \tag{6}$$

Table 3.1 presents the present values that would be realised based on 2019-2020 Australian tax system settings, as applied to $100 in funds held in superannuation to an individual that is of pre-retirement age. This $100 can be: withdrawn tax-free through the early access scheme and immediately consumed (equation 4 above; scenario 1 in Table 1); held in super (equation 5; scenarios 2-3); or withdrawn tax-free through the early access scheme and then saved outside super (equation 6; scenarios 4-8). Importantly the annual asset return (r = 4% pre-tax) and discount rate (d = 3%) are assumed to be the same for each savings option. The only differences between scenarios 2-8 is tax treatment. There are two sources of variation in tax treatment: the differing marginal tax rates that apply to the returns on savings (t_e and t_i), and the effective tax rate that stems from reduced public pension outlays when superannuation is withdrawn inside the part-pension taper rate[20] at retirement (t_r).

[20] The (public) age pension available to most Australians aged over 66 is paid at a maximum basic fortnightly rate (including a pension and energy supplement) of $987.60 ($25,678 annually) for single recipients Services Australia (2022). The rate of payment is subject to an income test and an asset test. For a single recipient, the age pension is reduced by 50 cents for each dollar earned over $180 per fortnight ($4,680 annual) with a fortnightly income 'cut off point' for part pension payments at $2,155 per fortnight ($56,030 annual). Column 3 in Table 1 is constructed based on the income taper rate. There is also an asset test for maximum

Table 3.1: Present value of $100 in superannuation

Year	Consumed	Saved for future consumption						
	$100 withdrawn for pandemic consumption	$100 held in superannuation t_c = 15% during accumulation phase +		$100 withdrawn from superannuation and saved outside of super				
		t_r = 0% In future, will receive full age pension or no pension	t_r = 50% In future, will receive part rate age pension	t_i = 0% Earnings within personal tax free threshold; CGT on owner-occupied housing	t_i = 7.5% Average effective tax rate on savings	t_i = 10.5% Effective tax rate implied by CGT discount at low personal MTR	t_i = 23.5% Effective tax rate implied by CGT discount at top personal MTR	t_i = 47% Top personal MTR
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
0	100							
1		100.4	50.2	101.0	100.7	100.6	100.1	99.1
5		102.0	51.0	104.9	103.4	102.8	100.3	95.8
10		104.0	52.0	110.1	107.0	105.8	100.6	91.8
25		110.2	55.1	127.3	118.5	115.1	101.5	80.7

Notes: CGT = capital gains tax; MTR = marginal tax rate. The following assumptions are included in these calculations. Saved funds (whether held in super or withdrawn and invested) earn a 4% annual pre-tax return, and agents have a 3% discount rate. Total savings (base $100 and any earnings) are assumed to be consumed in the year specified (where 0 is the pandemic year). Differences in present values calculated therefore reflect different tax treatment on savings options. Marginal tax rates on savings outside of superannuation are as specified and for simplicity are assumed to be collected on an annual basis. Note also that this implies capital gains are taxed on an accrual basis. For assets taxed on a realisation basis, such as housing, the estimates therefore understate the true present value from saving.

3.4.2 A no-brainer for many to withdraw

Individuals in our sample are generally in the lower half of the income distribution. In Australia, about one third of people will receive no pension, one third will receive a full pension and one third will receive a part pension. Our population is most likely to either be in the full- or part- pension group.

For individuals who expect to receive a part pension, withdrawing and consuming is superior in present value to keeping the money in superannuation. For individuals who expect to receive no pension, the present value of withdrawing from superannuation is larger than keeping the money in superannuation provided they can access relatively low tax savings vehicles. There are many such options. Investments in pre-existing, owner-occupied housing attracts a zero tax rate. Recycling money and investing it in superannuation also achieves very low tax rates.[21] There are also other options--Varela et al. (2020) estimate that the average marginal effective tax rate across all assets in Australia is around 7.5%.

The calculations underpinning Table 3.1 are simple and stylized and should be considered as illustrative. They nonetheless reveal that many working age Australians had a tax-induced incentive to withdraw once the opportunity presented itself.

A range of other considerations are also likely to have been important to withdrawal decisions. For many, the value of $10,000 in super is lower than $10,000 in hand. Workers have no input into the level of compulsory contributions made by their employers on their behalf. Financial planning also demands complex decisions, and may not be clear to savers how (or if) marginal superannuation savings will be used in retirement (Daley and Coates 2019, Deetlefs et al. 2019).

pension payments to single recipients at $270,500 for those who own their home, and $487,000 for those that don't. The age pension is then reduced by $3 per fortnight per $1,000 in assets. A part pension can be paid if assets are worth up to $599,750 for those who own their own home or $816,250 otherwise.

[21] 2,435 individuals made voluntary, concessionally taxed contributions of exactly the same amount that they withdrew. 171,790 individuals who withdrew from superannuation also made additional, concessionally taxed, voluntary contributions in the same year in which they withdrew. All these individuals achieved a tax savings through this behaviour.

Bateman et al. (2022) surveyed individuals who accessed the early release program and found that most people withdrew money for immediate needs but that a substantial amount of people were motivated by concerns about the future. They withdrew the money to provide insurance against potential worsening effects of the pandemic and possible future illiquidity. People used the $10,000 limit as an anchor in deciding how much to withdraw, as is also evident in our data.

Moreover, the retirement income system is itself complex and hard to navigate (Commonwealth of Australia 2020c, Productivity Commission 2018). Australian policymakers have frequently amended superannuation laws and rules over a period stretching into decades. This has contributed to a widespread perception (rightly or wrongly) that there will be significant change in retirement income conditions by the time the current working age population retires.

Against a backdrop of super containing uncertain and poorly understood value, individuals were, in effect, gifted an option with strong up-front value. A time-limited (and unexpected) opportunity to access otherwise 'stranded' assets, tax-free. Furthermore, it was offered during the most acute phase of a rapidly deteriorating shock. Withdrawals could be partially compensated through increased (part) age pension payments in retirement. In addition, those who withdrew would also have an opportunity to 'catch up' on withdrawn retirement balances through voluntary payments once the immediate crisis had averted, benefiting in the process from a potential income tax saving (Sainsbury and Breunig 2020). In many ways, it is surprising that more people didn't withdraw their funds.

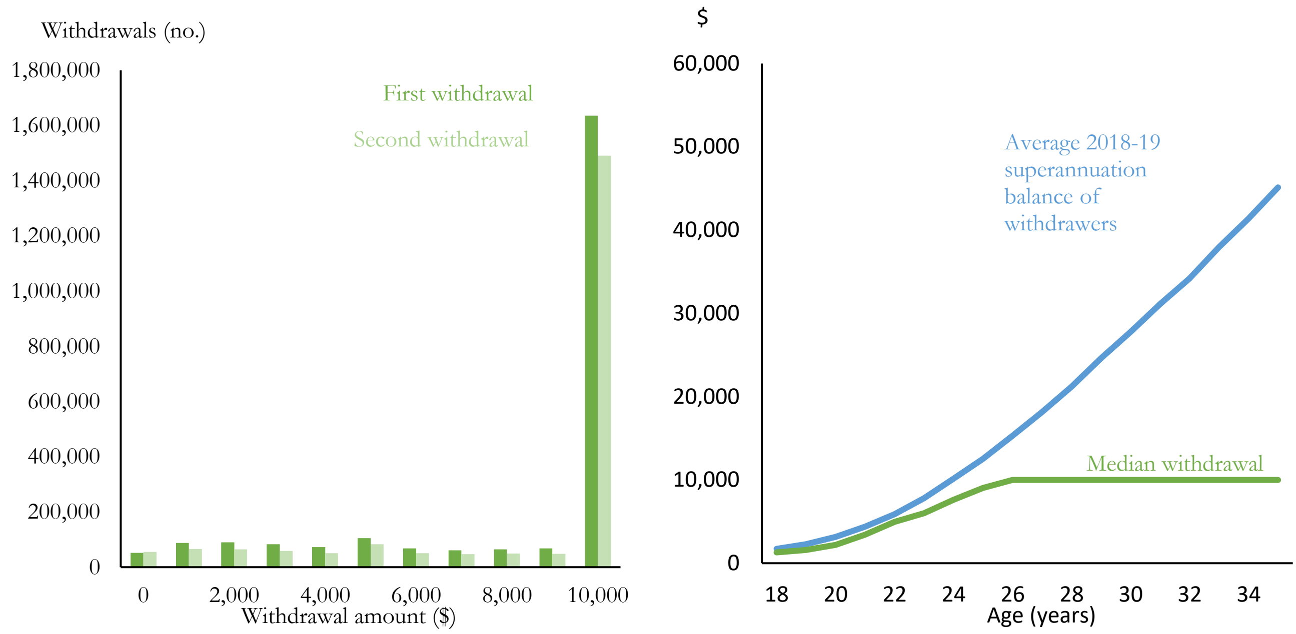
3.4.3 Withdrawal amounts were determined primarily by program conditions

Figure 3.4 highlights the main constraint on sums withdrawn appears to have been the conditions of the program. Figure 3.4a confirms that the most common withdrawal outcome (chosen by more than 70% of withdrawers in first withdrawal and 60% in second withdrawal) was the $10,000 maximum amount. Figure 3.4b then suggests that the main constraint on withdrawal sums appears to be having the balance available to fund it. Younger ages (those at or below 25) withdrew less. Once cohorts reach age 26, the median outcome was to withdraw the full amount. Even for those below 25, close to three-fourths withdrew 80% (or more) of their pre-Covid-19 balance at the first withdrawal opportunity alone.

For the purposes of evaluating the impact of superannuation withdrawals on unemployment tenures, we will approach the modelling of superannuation withdrawals as conceptually akin to a lump sum stimulatory payment (rather than as a thorough, precise, and rational accounting of borrowing against future retirement balances). We treat projections for how withdrawals affect someone's income over their working life and balance at retirement as outside the scope of analysis. That noted, we view calculating the longer-term consequences of withdrawals on future incomes as a valuable avenue for future research.

Figure 3.4. Withdrawal amounts were determined primarily by program conditions

(a) The modal outcome was to withdraw $10,000 (b) Younger ages withdrew less (and had less of a starting balance to draw from)



Source: Author calculations based on ATO superannuation COVID-19 early release program and superannuation balance records.

3.4.4 Unemployment tenure consequences of superannuation lump sum withdrawals: a job search model

Model setup

We consider a model with discrete time periods t = 0,1,2,…,T-1,T weeks from 23 January 2020 to 30 June 2021, where T = 75 weeks. We adopt assumptions in a similar manner to Chetty (2008). The interest rate and the time discount rate are both 0 for the window (noting that Card et al. (2007) illustrate how both can be relaxed in a more general specification). Jobs pay a fixed wage w_t (less an income tax τ) and last for the remainder of the timespan when found. If people are unemployed they receive unemployment benefit payment b with a strict condition that the benefit level is less than the after-tax employed wage: $b < w_t - \tau$. People have assets A_t, exert search effort s_t, which is normalised to equal the probability of finding a job, and face search costs ψ (s_t).

For the jobseeker, the value function of finding a job is:

$$V_t(A_t) = \max_{A_{t+1} \geq L} v(A_t - A_{t+1} + w_t - \tau) + V_{t+1}(A_{t+1}) \tag{7}$$

The value function of being unemployed (not finding a job) is:

$$U_t(A_t) = \max_{A_{t+1} \geq L} u(A_t - A_{t+1} + b_t) + J_{t+1}(A_{t+1}) \tag{8}$$

The agent's challenge is to choose s_t to maximise their expected utility at the beginning of period *t*, taking into account the cost of search:

$$J_t(A_t) = \max_{s_t} s_t V_t(A_t) + (1 - s_t) U_t(A_t) - \psi(s_t) \tag{9}$$

Where $J_{t+1}(A_{t+1})$ is the value of entering the next period unemployed. Note that $V_t(A_t)$ and $U_t(A_t)$ are both assumed to be concave to enable an optimum search function to be derived,[22] while the search cost function $\psi(s_t)$ is strictly increasing and convex. Further, consumption in period t is given by $c_t^e = A_t - A_{t+1} + w_t - \tau$ if employment is found, and $c_t^u = A_t - A_{t+1} + b_t$ if employment is not found. Following this, $v(c_t^e)$ and $u(c_t^u)$ denote the consumption utility that the agent derives from being in a state of employment and unemployment respectively.

Optimal Search Intensity. Agents are unemployed at time t=0. The analytical goal is to determine the optimal search intensity of the agent, which depends on the difference in value of finding a job and remaining unemployed. For each period that the agent is unemployed, they choose s_t to maximise the expected utility at the beginning of period *t*, taking into account the cost of search.

The associated first order condition for optimal search intensity from expression (9) will equate the marginal cost of search effort with the marginal benefit of search effort:

$$\frac{\partial J_t(A_t)}{\partial(s_t)} = 0 \equiv \psi'(s_t{}^*) = V_t(A_t) - U_t(A_t) \tag{10}$$

This paper's empirical analysis relies on the comparative statics of expression (10). Specifically, three relations can be derived directly by differentiating s_t with respect to the benefit level b_t, asset level A_t and wage w_t respectively, and invoking the envelope theorem. From these, the effect of an exogenous lump sum cash grant, such as a superannuation withdrawal or severance pay, on search effort can be decomposed into a liquidity effect and a moral hazard effect.

The liquidity effect of a change in assets on search effort can be expressed as:

$$\frac{\partial s_t{}^*}{\partial A_t} = \frac{v'(c_t^e) - u'(c_t^u)}{\psi"(s_t)} \leq 0 \tag{11}$$

and reflects the difference in marginal utility of being employed or unemployed. If an agent's consumption is substantially lowered when unemployed, the lump sum reduces search effort: it raises the value of being unemployed relative to the value of being employed. Conversely, if an agent is able to smooth their consumption during unemployment – say by drawing on a buffer stock of savings – then the lump sum can be anticipated to not affect search behaviour much[23]. Estimating if lump sum payments have an effect on unemployment durations therefore is a test of people's access to (social) insurance. In a pandemic setting, where a wide range of economic actors face a shared and unanticipated shock, the consideration becomes especially important.

The moral hazard effect of a change in (effective) wage on search effort can be expressed as:

$$\frac{\partial s_t{}^*}{\partial w_t} = \frac{v'(c_t^e)}{\psi"(s_t)} > 0 \tag{12}$$

The moral hazard effect will be strictly positive, owing to the cost of search being strictly increasing and convex, and marginal utility of consumption being positive. A higher benefit lowers an agent's effective

[22] $V_t(A_t)$ is unambiguously concave, which follows from assuming that people hold jobs for the remainder of the analysis period once found. While $U_t(A_t)$ must be assumed to be concave, Lentz and Tranaes (2005) show that concavity arises unless researchers introduce a wealth lottery into the job search model – something we do not attempt here. Further Aguiar and Hurst (2005) provide evidence around the within-period separability between consumption and search effort for the unemployed (the authors observe this in the US; we assume that it applies to the Australian context).

[23] Note that a non-zero liquidity effect also requires the presence of agents in society that face credit constraints and incomplete insurance markets. For example, if (state-contingent) insurance markets were complete, then consistent with the permanent income hypothesis with unrestricted borrowing, $c_t^e = c_t^u$ and $\frac{\partial s_t{}^*}{\partial A_t} = 0$. The more closely c_t^e approximates c_t^u, the lower the contribution of the liquidity effect (relative to the moral hazard) effect. Conversely, the tighter the asset constraints - or perhaps a choice to lower c_t^u in order to build or maintain a precautionary stock of savings – the larger the expected liquidity effect of unemployment payments.

wage, and thereby reduces the incentive to search (through a substitution effect as their relative value of leisure increases).[24]

In addition, the effect of a change in benefit on search effort can be expressed as

$$\frac{\partial s_t{}^*}{\partial b_t} = \frac{-u'(c_t^u)}{\psi''(s_t{}^*)} \tag{13}$$

By inserting expressions (12) and (13) into expression (11) and rearranging, the effect of an increase in benefit on search intensity can be decomposed into the liquidity ($\frac{\partial s_t}{\partial A_t}$) and moral hazard ($\frac{\partial s_t}{\partial w_t}$) effects:

$$\frac{\partial s_t{}^*}{\partial b_t} = \frac{\partial s_t}{\partial A_t} - \frac{\partial s_t}{\partial w_t} < 0 \tag{14}$$

In terms of direction of effect, both moral hazard and liquidity terms contribute negatively to the effect of benefits on search intensity (unemployment durations). The liquidity effect is non-positive as explained in expression (11), and the moral hazard term is positive, as explained in expression (12).

Any effect of the COVID-19 superannuation withdrawals on unemployment tenures can be interpreted as a 'pure' liquidity effect. This is because the withdrawals did not carry any subsequent conditions around how people must behave (notwithstanding that access to a lump sum payment was conditional on satisfying program eligibility criteria).

The empirical goal of this study is to estimate this liquidity effect.[25]

3.5 Data and Empirical Strategy

3.4.1 Estimating the impact of superannuation on unemployment tenures: A hazards approach

The ideal way to estimate the liquidity effect would be a randomized experiment in which some job losers were given lump-sum payments (or annuities) but others were not. Unfortunately (at least from an experimental design perspective), we are unable to perform a randomized experiment in which some job losers are required to withdraw while others are not. Before we outline the estimation approach, including our approach to handling possible non-random selection, we first detail the data, sample and the headline descriptive statistics.

3.5.2 Data

The analysis relies on a wide range of linked comprehensive sets of de-identified unit record level administrative records. In combination, the datasets provide an unprecedented continuous series of welfare payments, COVID-19 crisis support program and wage outcomes for the full Australian population. All datasets were collected by government agencies in the course of administering the Australian tax and transfer system.

The outcome of interest is the length of stay of unemployment benefit recipients on the unemployment benefit. For unemployment spell and payments information, we rely on the Department of Social Services (DSS) Data Over Multiple INdividual Occurrence (DOMINO) longitudinal dataset. We observe tenures

[24] There is also an income effect – an increase in wage rate increases permanent income – but by assuming that unemployment benefit effects on permanent income levels are negligible, $\frac{\delta s_t{}^*}{\delta w_t}$ will represent a pure substitution effect.

[25] For further detail we refer readers to Chetty (2008), who details a (benevolent) social planner's objective, theoretical case for calculating optimal unemployment benefits in a static and dynamic case, and the assumptions required to translate empirical estimates from hazard functions to the theoretical welfare gains associated with an increase in benefit levels. We also note that a liquidity contribution (like a benefit payment) in a more general model (Card et al. 2007) could potentially increase the reservation wage and match quality. Loosely, the rationale is more liquidity gives more flexibility to hold out for a better match.

(measured from the calendar day a spell begins to the day it ceases), payment types and payment amounts for all individuals who had unemployment spells during the 30 months from January 2019 to June 2021.

To identify those who withdrew funds from superannuation, we draw on the superannuation early release scheme program records administered by the Australian Taxation Office (ATO). We observe for each of the 3 million program applicants the reason for application, date of ATO approval (if approved), fund type and amount applied for.[26] We supplement this with superannuation balance information for the 2018-19 year (the last complete year pre-covid) for all individuals[27].

A strength of our analysis is that it draws on rich personal and household demographic information. Through the Australian Bureau of Statistic's Multi Agency Data Integration Project (MADIP) database we observe, for the full Australian population and at time of program commencement, an individuals' location, industry, age, gender and 5 years of personal income tax records (between 2015-16 and 2019-20). For the population receiving an unemployment payment we can also observe home ownership status, marital status, number of children and highest level of educational attainment. Payroll records only cover employees not sole traders (Frydenberg and Birmingham 2021).

3.5.3 Sample selection

As indicated above, we define the population on unemployment benefits to be individuals that are in receipt of regular payment through the JobSeeker, Newstart, Youth Allowance (Other), or Farm Household Allowance programs. Such payments were eligible for supplementary COVID-19 assistance.

We focus on those of working age (16 to 65) – male and female – who commenced an unemployment spell during the initial months of COVID-19. Inflows into our sample are individuals that began receiving one of these payments over the three-month period from 23 January 2020 (when the first COVID-19 positive case in Australia was detected) to 18 April 2020 (after which the superannuation early release program began). The measure of unemployment tenures comes from the administrative records documenting the day that the spell on payments began to the day that it ceased.

We condition selection on an individual's latest unemployment spell. This means that we do not examine individuals with a second (or more) spell on unemployment benefits after the superannuation early release program had commenced. We also only examine individuals whose benefit spells are ongoing from 19 April 2020. These two restrictions ensure that withdrawal is plausibly related to their COVID-19-related spell on unemployment benefits[28] and that our estimates are consistent with the job search theory assumption that 'jobs' (exit from unemployment payments), when found, last for the remainder of the timespan. This also means that someone's pre-COVID-19 employment history – or prior interactions with the income support system more broadly – does not affect selection.[29]

In combination, these choices mean that the entire sample is eligible to withdraw within a reasonably short timespan (no more than 85 days) after beginning a spell on unemployment payments. Focusing on new payment recipients reduces the influence of the long-term unemployed who might differ dramatically in characteristics from those who joined the unemployment benefit system on account of COVID-19. Further, the program design conditions mean that we are not concerned that individuals are commencing

[26] 3.05 million people lodged 4.78 million applications. 232,000 applications were rejected resulting in 4.55 million approved applications from about 3 million people.

[27] Pre-covid superannuation balances are as reported to the ATO through Member Account Attribute Service and Member Account Transaction Service for the 2018-19 financial year.

[28] Recall that there are a number of conditions of eligibility for withdrawal. The administrative records only record one reason per applicant and do not document how many different ways applicants were eligible.

[29] In Appendix 3D we demonstrate that our estimates are robust to these sample selection conditions. We restrict ages to 22-58 to minimize the impact of education or retirement decisions. We examine: the approximate 13,000 'early exits' who began spells after 23 January 2020 but left on or prior to 18 April 2020; how estimates vary based on the week spells began for each week within the 23 Jan-18 April window; estimates by week that withdrawal took place for a single cohort commencing spells in the week commencing 19 March; and extend the start date six months earlier, to October 2020, and later, to 30 June 2020. Each variation to sample has no material impact on our results.

unemployment spells in order to withdraw superannuation (e.g. this rules out the possibility that our estimates are inadvertently reflecting reverse causality).[30]

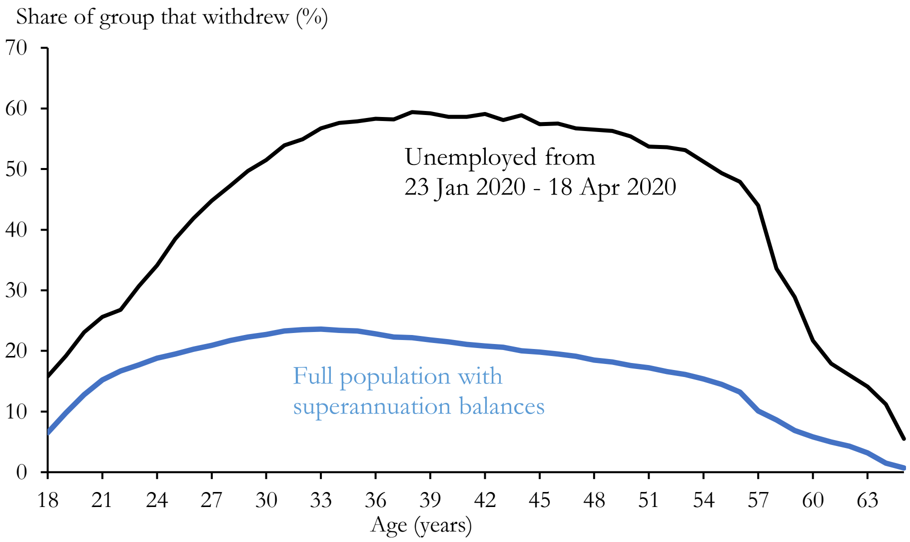
Finally, we remove those with missing information on historical wage and salary information from personal income tax returns (from 2015-16 to 2018-19) and recorded pre-COVID-19 superannuation balances. An absence of recorded information on these two primary financial metrics can be anticipated to correlate with poorer labor market performance and a lower capacity to engage with government administrative processes. Perhaps unsurprisingly, those without information of the two covariates have different population characteristics, are far less likely to withdraw, and have different labor market experiences to those with these sources of information.[31] As a robustness check, Appendix E presents a comparison of the population differences and the associated estimated labor market effects in models without controls where we can include the individuals with missing covariates.

3.5.4 Population characteristics: comparing withdrawers and non-withdrawers

The population comprises over half a million (529,703) individuals with full covariate information.

Figure 3.5, Table 3.2 and Table 3.3 highlight how those who began unemployment spells in the initial months of COVID-19 are different in important respects from the broader population. Figure 3.5 shows that they were more likely to withdraw from superannuation. 236,380 (45%) of our sample population participated in at least one of the two tranches of the early release program, compared to 18% of those with superannuation balances, many of whom were not eligible for the superannuation release program. This limits the generalisability of findings to those who commenced spells in the initial months of COVID-19. It also reveals that the age profile of those who withdrew is older than the population of superannuation holders.

Figure 3.5. A greater share of newly unemployed during COVID-19 withdrew



Notes: The population of newly unemployed during COVID-19 individuals are those who commenced unemployment spells between 23 January and 18 April 2020.

[30] While receipt of a qualifying payment was a sufficient condition for withdrawal eligibility, individuals' ability to access the program on the much less onerous basis of a 20% reduction in hours means that choices to become unemployed are motivated predominantly by other considerations than eligibility to withdraw.

[31] See Appendix Table 3.E6. For variables that can be treated as categorical (gender, marital status, children, state, sector) we assign unobserved values an 'uncategorized' label. We present sensitivity analysis associated with the exclusion of each covariate in the results section, and discuss the level of 'uncategorized' variables further in Appendix 3B.

Table 3.2. Population characteristics, first withdrawal

Characteristic	Don't withdraw first opportunity*	First withdrawal (19 Apr-30 Jun 2020)			Pooled	Began most recent spell in calendar year 2019
		All withdrawers	*Of which: withdraw both times***	*Of which: withdraw first only*		
	(1)	(2)	*(3)*	*(4)*	(5)	(6)
Sample size (n)	323,268	206,435	*150,662*	*55,773*	529,703	176,908
Share of population in group	61	39	*28*	*11*	100	n/a
Median withdrawal	n/a	10,000	*10,000*	*8,681*	10,000	9,465
Median 1 July 2019 balance	15,587	28,396	*36,701*	*9,960*	20,623	15,382
Mean 1 July balance	50,288	50,687	*58,639*	*29,210*	50,444	43,467
Mean annual wage (2016-19 fiscal years)	33,298	41,383	*44,779*	*32,208*	36,449	28,847
Spells on unemployment						
Share on unemployment payments at end June 2021	23.8	30.2	*32.5*	*24.0*	26.3	48.8
Average tenure of completed spells (weeks)	29.4	34.7	*36.7*	*29.9*	31.3	49.4
Average tenure of incomplete spells (weeks)	66.7	66.6	*66.6*	*66.7*	66.7	103.5
Population Characteristics						
Age	36.6	37.4	*38.7*	*34.0*	36.9	38.7
Share female	52.5	41.1	*39.1*	*46.4*	48.0	44.5
Share married	32.6	37.0	*36.2*	*39.1*	33.8	17.7
Share homeowner or mortgagee	27.8	23.6	*24.1*	*22.4*	26.1	17.5
Share with children	15.8	35.1	*37.6*	*28.3*	20.3	18.8
Education level: share of population						
Up to but not including Year 12	11.7	15.2	*15.8*	*13.6*	13.1	13.4
Year 12	27.7	23.2	*21.8*	*27.0*	25.9	22.6
Post-secondary	25.6	35.7	*37.7*	*30.2*	29.6	40.4
Tertiary	35.0	25.9	*24.8*	*29.1*	31.4	23.6

Data: Australian Taxation Office and Department of Social Services.

Notes: *The population who did not withdraw in the first tranche includes 29,945 individuals who withdrew after 30 June 2020. This construction enables a meaning comparison of the decision to withdraw at the first opportunity. ** The 150,662 individuals that withdrew twice include 7,070 who exited unemployment before 1 July 2020. They have been grouped with other individuals who withdrew twice, despite their second withdrawal being not plausibly related to an ongoing unemployment spell. The study population is conditioned on those who commenced spells on unemployment between 23 January 2020 and 18 April 2020 and remained on payments until at least 19 April 2020. Population characteristic and education percentages are calculated based on the population with non-missing values only.

Table 3.3. Population characteristics, second withdrawal.

Characteristic	Don't withdraw in second opportunity* (1)	Second withdrawal (1 July-31 Dec 2020) All withdrawers (2)	*Of which: withdraw both times (3)*	*Of which: withdraw second only (4)*	Pooled (5)
Sample size (n)	276,551	173,537	*143,592*	*29,945*	450,088
Share of population in group	61.4	38.6	*31.9*	*6.7*	100
Median withdrawal		10,000	*10,000*	*10,000*	10,000
Mean 1 July 2019 balance	48,473	55,320	*58,478*	*40,175*	51,114
Median 1 July 2019 balance	13,098	33,071	*36,458*	*16,921*	20,862
Mean annual wage (2016-19)	32,011	42,658	*44,505*	*33,802*	36,116
Spells on unemployment					
Share of group still on unemployment payments at end of June 2021	28.1	35.4	*34.1*	*41.5*	30.9
Average tenure of completed spells (weeks)	35.9	39.2	*38.5*	*42.5*	37.1
Average tenure of incomplete spells (weeks)	66.7	66.6	*66.6*	*66.8*	66.7
Population Characteristics					
Age	36.8	38.4	*38.8*	*36.5*	37.4
Share female	51.3	40.1	*38.9*	*46.6*	47.0
Share married	32.9	33.1	*34.4*	*27.1*	33.0
Share homeowner or mortgagee	27.2	23.2	*23.7*	*20.5*	25.7
Share with children	15.8	27.7	*29.3*	*19.9*	20.4
Education level: share of population					
Up to but not completing Year 12	12.2	15.5	*15.7*	*14.5*	13.5
Year 12	26.7	22.1	*21.6*	*24.2*	24.9
Post-secondary	26.1	37.3	*37.9*	*34.9*	30.5
Tertiary	35.0	25.1	*24.8*	*26.4*	31.1

Notes: The population who didn't withdraw in the second opportunity includes 45,562 individuals who withdrew prior to 30 June 2020 but did not withdraw at the second opportunity. The study population is conditioned on those who commenced their unemployment spells between 23 January 2020 and 18 April 2020 and remained on support until at least 1 July 2020. There are approximately Population characteristic and education percentages are calculated based on the population with non-missing values only.

These 236,380 withdrew a total of $3.3 billion, at an average of $13,810 per individual. Of these withdrawers, 150,662 (close to two-thirds) withdrew both times, 55,773 (close to a quarter) withdrew the first time only and 29,945 (one-eighth) withdrew the second time only. To place the group in the context of the overall early release program, the sample represents approximately 8% of withdrawers and 9% of the early release program's total amount withdrawn.

Tables 3.2 and 3.3 reveal systematic differences in population characteristics between those who withdrew and those who didn't, and between the population receiving unemployment benefits in the early months of COVID-19 and unemployment benefit recipients in the more 'normal' times of 2019.

Relative to the 2019 unemployment payment recipient population, new COVID-19 unemployment payment recipients experience stronger outcomes across observed financial and socio-demographic variables (Table 3.2). Relative to those who didn't withdraw, those who withdrew are more likely to have: a higher recent (4 year historical) income; a higher pre-COVID-19 superannuation balance; be male; be married; and have children. These relative differences apply to those who withdraw at the first opportunity (Table 3.2) and those who withdraw at the second opportunity (Table 3.3).

Tables 3.2 and 3.3 also provide an initial indication that withdrawing and non-withdrawing groups experienced different tenures on unemployment.

Consider just those that withdrew during the first opportunity (column (2) of Table 3.2). Withdrawers were on average 6.4 percentage points less likely to have completed their spell on unemployment benefits by 1 July 2021 than those who didn't withdraw (column (1)). When considering average tenures of those with completed spells, withdrawers were on benefits for an average of 5.3 weeks (37 calendar days) longer than nonwithdrawers.

A similar story emerges when considering those who withdrew at the second opportunity (Table 3.3). The population sample reduces by approximately 79,000 after conditioning sample selection on an individual's survival on unemployment benefits to 1 July 2020. Even for this population, non-withdrawers were on average 7 percentage points more likely to have completed their spell on unemployment payments by 1 July 2021 than those who withdrew. When considering average tenures of those with completed spells, those who withdrew during the second opportunity were on government support for an average of 3.3 weeks (23 calendar days) longer than non-withdrawers.

Those who became unemployed during COVID-19 (Column 5 in Table 3.2) were materially different from recipients of those payments drawn from the more 'normal' times of 2019 (Column 6 in Table 3.2). In particular, they had stronger historical financial outcomes and socio-demographic characteristics and experienced shorter spans on unemployment. The second comes from comparing those who withdrew once (Column (4) in both Tables 3.2 and 3.3) compared with those that withdrew twice (Column (3) in both Tables 3.2 and 3.3). The single-withdrawing populations had much lower pre-Covid wage and superannuation balances than those who withdrew twice.

3.5.5 Model specification

Setup

First withdrawal

We deploy a Cox hazards model to estimate the effects of lump sums on tenures on unemployment benefits.[32]

The standard Cox model with covariates, X, can be written as:

$$\lambda(t, \mathrm{X}) = \lambda_0 e^{\beta \mathrm{X}} \tag{15}$$

For individual *i*, the model can be written as:

$$\lambda(t, \mathrm{x_i}) = \lambda_0 e^{\beta' \mathrm{x}_i} \tag{16}$$

x_i is measured for individual *i* at the beginning of the study period, that is January 2020.

To allow for the changing dynamics of the labour market as the pandemic evolved, we estimate a (non-proportional hazards) Cox model with time-dependent covariates. We divide the 75 weeks of spells into 6 quarterly intervals (where $q_0 = 0$; $q_1 = 13$; $q_2 = 26$; $q_3 = 39$; $q_4 = 52$; $q_5 = 65$; $q_6 = 75$, measured in weeks) such that $0 = q_0 < q_1 < \ldots < q_6$ and $\beta = \beta_k$ on $[q_{k-1}, q_k)$. $I_{[q_{k-1}, q_k)}$ is an indicator function equal to one for the quarterly interval $[q_{k-1}, q_k)$ and zero otherwise.[33]

To estimate the effect of receiving a lump sum payment at the first opportunity to withdraw, we define an indicator variable, *FIRST*, equal to one if the individual withdrew and equal to zero if the individual did not withdraw between 19 April 2020 and 30 June 2020.

[32] Thomas and Reyes (2014) and Therneau et al. (2022) provide clear expositions of the approach. Among an extensive set of studies, Fisher and Lin (1999) and Zhang et al. (2018) provide a more detailed explanation of the use of time-varying coefficients and covariates in Cox models.

[33] We note that fitting the X using partial likelihood is equivalent to estimating β_k using the survival data in the interval [tk−1, tk), by excluding all those data points i such that Xi < tk−1, and treating all those i such that Xi ≥ tk as censored.

We then divide our covariates x_i into two groups: those for which we assume the effects are fixed over time, x_i; and those for which we allow the impact to change each quarterly interval z_i.

Eight time fixed covariates x_i are modelled: age (years); sex (male or female); marital status (married or not); home ownership status (home owner or not); highest level of education (excl. tertiary); industry pre-covid (classified in accordance with Divisions in the ANZSIC 2006 (Australian Bureau of Statistics 2022); children in household (children or no children); geographic location when early release program began (excl. Victoria).

Five time varying covariates z_i are modelled on the quarterly basis: location in Victoria (in light of a 139-day outbreak and 112-day lockdown in the city of Melbourne between June and October 2020 that was not experienced by other Australian States or Territories (Andrews 2020; and BBC 2020)); tertiary education; log of average wage from 2015-16 to 2018-19; log of average superannuation balance as at 30 June 2019; receipt of the JobKeeper wage subsidy (receipt or not).[34]

This produces an estimating equation:

$$\begin{aligned} \ln \lambda(t, \mathrm{x_i}, z_i) = {} & \alpha_t + \beta_1 I_{[q_0,q_1)} FIRST_i + \beta_2 I_{[q_1 q_2)} FIRST_i + \cdots + \beta_6 I_{[q_5,q_6)} FIRST_i + \\ & \gamma' x_i + \rho_1' I_{[q_0,q_1)} z_i + \rho_2' I_{[q_1,q_2)} z_i + \cdots + \rho_6' I_{[q_5,q_6)} z_i \end{aligned} \tag{17}$$

Where: α_t is the estimate of the baseline hazard rate at week *t*. β_1 through β_6 capture the effects of taking a lump sum withdrawal across the six quarters of data. γ and ρ_q capture the effects of the covariates at different quarters q_i.

Second withdrawal

For those who withdrew in the second period, we add a condition on the sample that individuals must have survived on unemployment benefits continuously until 1 July 2020. We then repeat our Cox model with time-varying covariates approach, using the following form:

$$\begin{aligned} \ln \lambda(t, \mathrm{x_i}, z_i) = {} & \alpha_t + \beta_1 I_{[q_0,q_1)} SECOND_i + \beta_2 I_{[q_1 q_2)} SECOND_i + \cdots + \beta_6 I_{[q_5,q_6)} SECOND_i + \\ & \gamma' x_i + \rho_1' I_{[q_0,q_1)} z_i + \rho_2' I_{[q_1,q_2)} z_i + \cdots + \rho_6' I_{[q_5,q_6)} z_i \end{aligned} \tag{18}$$

Where α_t, I, γ', ρ', z_i, and q_i are specified as above. The β_i terms now estimate the effect of taking a lump sum withdrawal of up to $10,000 between 1 July 2020 and 31 December 2020 on quarterly exit rate.

Per $1,000 withdrawn

We further estimate the impact of withdrawing a marginal $1,000, WITH (a censored variable taking on values 0,1000,2000,…,20000 for each $1,000 withdrawn) instead of a binary indicator of program participation, recognising that each individual was able to withdraw up to $20,000 in total between 19 April and 31 December 2020. We estimate the following form:

$$\begin{aligned} \ln \lambda(t, \mathrm{x_i}, z_i) = {} & \alpha_t + \beta_1 I_{[q_0,q_1)} WITH_i + \beta_2 I_{[q_1 q_2)} WITH_i + \cdots + \beta_6 I_{[q_5,q_6)} WITH_i + \\ & \gamma' x_i + \rho_1' I_{[q_0,q_1)} z_i + \rho_2' I_{[q_1,q_2)} z_i + \cdots + \rho_6' I_{[q_5,q_6)} z_i \end{aligned} \tag{19}$$

Where α_t, I, γ', ρ', z_i, and q_i are specified as above. The β_i terms now estimate the effect of withdrawing $1,000 from superannuation on quarterly exit rate.

In the results section we will present output associated with models with no controls (i.e. assuming $\gamma' = \rho' = 0$) and models with full covariate information.

[34] A robustness check, involving a more complicated alternative model where all covariates enter with time-varying effects on a quarterly basis, reveals no material change in the estimated effect of superannuation on welfare spells.

3.6 Results

3.6.1 Basic estimates

We first estimate a baseline Cox proportional hazards model with quarterly interactions and no controls. We then estimate the same model using the full set of covariates as defined above.

The results for first and second withdrawal are presented in Table 3.4. In Table 3.5 we present a comparison between those who withdrew once and those who withdrew twice. In Table 3.6, we present the results for the impact of withdrawing a marginal A$1,000.

Table 3.4. Exit rates associated with participation in early release of superannuation program: withdraw in first and second windows

Variable	First withdrawal (19 April -30 June 2020)		Second withdrawal (July -Dec 2020)	
	Baseline (1)	Full controls (2)	Baseline (3)	Full controls (4)
Sample size (N)	2,322,730	2,322,730	2,212,274	2,212,274
Unique Obs (N_u)	529,703	529,703	454,008	454,008
Exits from unemployment payments	381,042	381,042	308,425	308,425
Estimated change in exit rate for quarterly epochs in spell:				
Weeks 1-13	-0.759***	-0.775***	-0.553***	-0.620***
	(0.005)	(0.005)	(0.032)	(0.030)
Weeks 14-26	-0.241***	-0.311***	-0.384***	-0.448***
	(0.005)	(0.005)	(0.005)	(0.005)
Weeks 27-39	-0.186***	-0.251***	-0.275***	-0.339***
	(0.006)	(0.005)	(0.005)	(0.005)
Weeks 40-52	-0.099***	-0.133***	-0.134***	-0.162***
	(0.008)	(0.008)	(0.006)	(0.008)
Weeks 52-65	-0.012	-0.077***	-0.068***	-0.134***
	(0.008)	(0.008)	(0.008)	(0.007)
Weeks 66-75	0.051	-0.039	0.024	-0.073***
	(0.028)	(0.026)	(0.029)	(0.026)
Control specifications				
Covariates with time-invariant effects: Age, gender, home ownership, marital status, children, school leaver, certificate education, State (excl. Victoria), sector of employment.		X		X
Covariates with time-varying effect: log of superannuation balance, log of average wage 2015-16 - 2018-19, state of Victoria, tertiary education, JobKeeper payment.		X		X
Floating baseline (week spell began)		X		X
Model fit				
Concordance	0.553	0.677	0.539	0.649
Wald test	19,480	128,513	6,948	72,583

Data: Australian Taxation Office and Department of Social Services

Notes: *** p < 0.01 ** p < 0.02 * p < 0.05. Coefficients can be interpreted as the change in the unemployment benefit exit rate associated with the withdrawal from superannuation. Standard errors, in parentheses, are clustered at the individual level. Columns 1 and 3 present a baseline specification that includes no controls. Columns 2 and 4 include covariates. The study population for first withdrawal is conditioned on those who commenced their unemployment benefit spells between 23 January 2020 and 18 April 2020 and remained on support until at least 19 April 2020. The sample for the second withdrawal is drawn from the same group, but conditioned on those who remained on support until at least 1 July 2020. Wald Test p-values are less than 2xe-16 in all cases. Concordance standard errors are zero to three decimal places.

Those who withdrew from superannuation exhibited a significantly lower propensity to exit unemployment benefits in the subsequent 18 months compared to those who didn't. Receipt of a superannuation lump sum between mid-April and June 2020 is estimated to lower the exit rate inside the first quarter of an unemployment spell by 76% in the baseline (no control) setting (specification 1) and 78% in the full control specification (specification 2). The role of withdrawals diminished over time. Inside the first six months of spell, based upon the model with a full set of controls, lump-sum withdrawal reduced exit by 31%. Inside a year, withdrawal was estimated to have experienced a significant 13% lower rate of exit.

The effect of withdrawals on unemployment payment tenures diminished over time, as one might expect as individuals deplete the lump sum over the course of their spell. However, after a year, those who withdrew still experienced a significant 8% reduction in exit compared to those who didn't. It takes until the sixth quarter of spell for exit rates of withdrawers and non-withdrawers to converge – reflected by a gap in exit that had narrowed to a statistically insignificant 5%.

The rate of convergence is similar for those that withdrew in the second opportunity (specifications 3 and 4 in Table 3.4). As noted above, an important caveat around estimates of the first quarter in these two specifications is that the full sample of those withdrawing twice had been on benefits for a minimum 10 weeks. Beyond that first quarter, the estimates appear similar to those that withdrew during the first opportunity, albeit with a one quarter lag. Receipt of a superannuation lump sum predominately in July or August 2020 is estimated to lower the exit rate by 34% in the third quarter, 14% in the fifth quarter and 8% in the sixth quarter in the full control specification (specification 4).

The effect of withdrawing more than once

In Table 3.5, we compare the 85,718 who withdrew once to the 293,323 who never withdrew (columns two and three) and separately compare the 150,662 who withdrew twice to the 293,323 who never withdrew (columns four and five). Those who withdrew once withdrew A$7,360 on average (median of A$9,400) and those who withdrew twice withdrew A$17,480 on average (median A$20,000).

Table 3.5 provides two insights. First, program participation is important. A single withdrawal results in a significant reduction in exit rates. Second, the extent of program participation is important. Those who took advantage of lump sums during both windows of opportunity had lower exit rates, when compared to those taking advantage of only one of the lump sums. The effect was particularly pronounced in the initial three quarters of spells. It is indicative of an intensive margin effect: those that withdrew more spend longer on payments.

Effects per $1,000 withdrawn

Exit rates can also be estimated conditional on the dollar value of withdrawal across the period. Under the full control specification, each $1,000 withdrawn reduces exit rates by 10.9% inside the first quarter of spell, 1.6% inside the first three quarters of spell, and 0.7% inside a year. For those that withdrew the average of approximate $13,800, this translates to a 23% reduction in exit rates in quarters 2 and 3, a 10% reduction in the fourth quarter, and 7% in the fifth quarter. As above, the estimated effect of withdrawal is no longer statistically significant by the 6th quarter of a spell. [35] The similar-but-lagged pattern of effect across the two tranches of program leads us to focus on examining withdrawals as two distinct lump-sum payments.

Controlling for past income, home ownership and superannuation assets should help to reduce bias from unobserved characteristics associated with employment and income. As a further check, we estimate the model on a matched sample to see whether our results hold when we compare groups with similar observable characteristics.

35

Table 3.5. Exit rates associated with participation in early release of superannuation program: withdraw once and withdraw twice

Variable	Withdraw once (Apr - Dec 2020) Baseline (1)	Withdraw once (Apr - Dec 2020) Full controls (2)	Withdraw twice (Apr - Dec 2020) Baseline (3)	Withdraw twice (Apr - Dec 2020) Full controls (4)
Sample size (N)	1,406,660	1,406,660	1,903,404	1,903,404
Unique Obs (N_u)	379,041	379,041	443,985	443,985
Exits from unemployment payments	288,876	288,876	321,128	321,128
Estimated change in exit rate for quarterly epochs in spell:				
Weeks 1-13	-0.489***	-0.499***	-0.986***	-0.987***
	(0.007)	(0.007)	(0.017)	(0.017)
Weeks 14-26	-0.288***	-0.316***	-0.398***	-0.480***
	(0.007)	(0.007)	(0.005)	(0.005)
Weeks 27-39	-0.238***	-0.269***	-0.265***	-0.352***
	(0.007)	(0.007)	(0.006)	(0.006)
Weeks 40-52	-0.126***	-0.161***	-0.137***	-0.188***
	(0.010)	(0.010)	(0.008)	(0.008)
Weeks 52-65	-0.053***	-0.093***	-0.048***	-0.143***
	(0.010)	(0.010)	(0.008)	(0.008)
Weeks 66-75	0.030	-0.079*	0.049	-0.084***
	(0.036)	(0.034)	(0.031)	(0.029)
Control specifications				
Covariates with time-invariant effects: Age, gender, home ownership, marital status, children, school leaver, certificate education, State (excl. Victoria), sector of employment.		X		X
Covariates with time-varying effect: log of superannuation balance, log of average wage 2015-16 - 2018-19, state of Victoria, tertiary education, JobKeeper payment.		X		X
Floating baseline (week spell began)		X		X
Model fit				
Concordance	0.579	0.690	0.579	0.690
Wald test	18,756	126,692	18,756	126,692

Data: Australian Taxation Office and Department of Social Services

Notes: *** $p < 0.01$ ** $p < 0.02$ * $p < 0.05$. Coefficients can be interpreted as the change in the unemployment benefit exit rate associated with the withdrawal from superannuation. Standard errors, in parentheses, are clustered at the individual level. Columns 1 and 3 present a baseline specification that includes no controls. Columns 2 and 4 include covariates. The study population for first withdrawal is conditioned on those who commenced their unemployment benefit spells between 23 January 2020 and 18 April 2020 and remained on support until at least 19 April 2020. The sample for the second withdrawal is drawn from the same group, but conditioned on those who remained on support until at least 1 July 2020. Wald Test p-values are less than 2xe-16 in all cases. Concordance standard errors are zero to three decimal places.

Table 3.6. Exit rates per $1,000 withdrawn from superannuation.

Variable	**Per $1000 withdrawal (April -December 2020)** Baseline (1)	Full controls (2)
Sample size (N)	2,322,730	2,322,730
Unique Obs (N_u)	529,703	529,703
Exits from unemployment payments	381,042	381,042
Estimated change in exit rate based on for quarterly epochs in spell:		
Weeks 1-13	-0.096*** (0.001)	-0.109*** (0.001)
Weeks 14-26	-0.008*** (0.000)	-0.017*** (0.000)
Weeks 27-39	-0.009*** (0.000)	-0.016*** (0.000)
Weeks 40-52	-0.005*** (0.001)	-0.007*** (0.001)
Weeks 52-65	0.001 (0.000)	-0.004*** (0.001)
Weeks 66-75	0.006*** (0.002)	-0.001 (0.002)
Control specifications		
Covariates with time-invariant effects: Age, gender, home ownership, marital status, children, school leaver, certificate education, State (excl. Victoria), sector of employment.		X
Covariates with time-varying effect: log of superannuation balance, log of average wage 2015-16-2018-19, Victoria and tertiary education (all interacted with quarter)		X
Floating baseline (week spell began)		X
Model fit		
Concordance	0.535	0.669
Wald test	6,786	117,871

Data: Australian Taxation Office and Department of Social Services

Notes: *** $p < 0.01$ ** $p < 0.02$ * $p < 0.05$. Standard errors, in parentheses, are clustered at the individual level. Columns 1 and 3 present a baseline specification without controls; Columns 2 and 4 include the controls. The study population is conditioned on those who commenced their unemployment spells between 23 January 2020 and 18 April 2020 and remained on support until at least 19 April 2020. Coefficients can be interpreted as the change in the exit rate associated with the withdrawal from superannuation. Wald Test p-values are less than 2xe-16 in all cases.

3.6.2 Matching

Matches are based on a limited subset of characteristics: a person's age, key observed continuous financial variables (an individual's wage, superannuation balance) and industry of employment and occupation reported in their 2019-20 tax return. We make use of two techniques: Coarsened Exact Matching and Nearest Neighbour matching techniques. Of the two, Coarsened Exact Matching produces better matches and has a lower efficiency trade-off (further detail about our approach to covariate matching is provided in Appendix 3D).

Using matching procedures instead of saturated regression will not explain much of the gap between withdrawers and non-withdrawers.

Figure 3.6. Probability of survival on unemployment payments, first tranche of withdrawals (unmatched and matched samples)

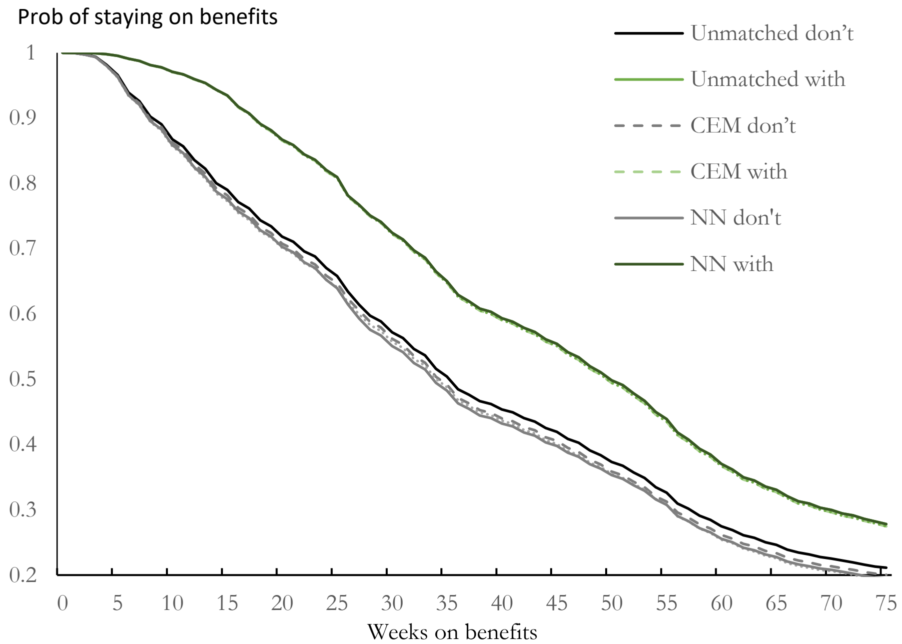


Table 3.7 reinforces how similar the estimated effects of withdrawal are from the three different techniques for incorporating population heterogeneity. The variation in estimates in any given quarter is small relative to the significant estimated effect size, at up to 3 percentage points. There are no quarters where the modelling choice results in a loss of statistical significance or sign change.

3.6.3 The role of covariates

As noted above, controlling for a range of life circumstances leads to stronger and more persistent estimates of the effect of withdrawals on unemployment payment tenures. A closer examination of the estimated coefficients of the controls used also provides some useful insights into the nature of the recipient population. (Appendix 3.C contains full model estimates and Appendix Table 3.C5 shows that the estimated effects of withdrawal are robust to the exclusion of individual covariates. Appendix Figure 3.C1 shows how re-employment prospects varied by sector of (pre-spell) employment).

Figure 3.7 depicts the estimated coefficients of covariates with time-invariant effects. The coefficients can be interpreted as the change in exit rates for individuals entering the unemployment benefits system in a particular week, relative to a baseline male unmarried individual with year 12 education living in NSW in the week commencing 5 March 2020. Home ownership, being married, being female, and being located in one of the states that had lower COVID-19 caseloads in 2020 and the first half of 2021 are estimated to improve exit (Australian Department of Health, 2022). Conversely, additional years of age, having children in the household, and being educated at a school leaver or certificate level (lower levels than high school or university completion) are estimated to reduce exit.

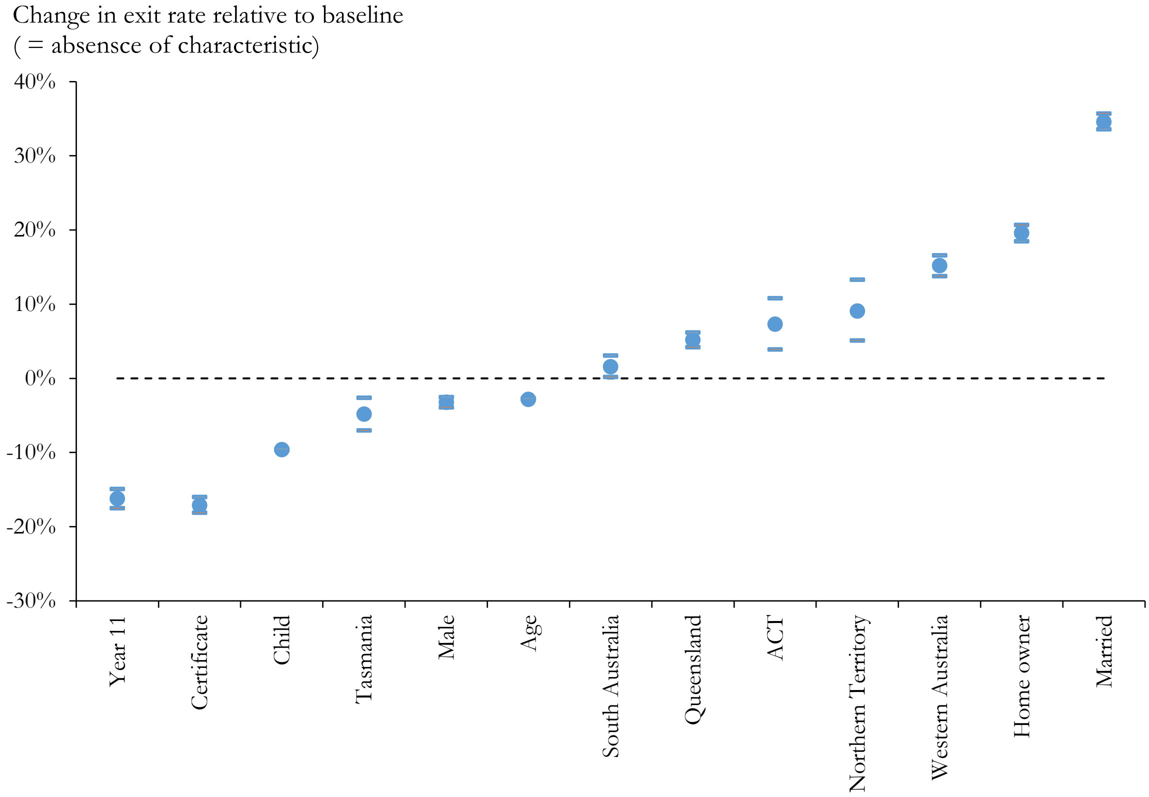
Table 3.7. Exit rates associated with participation in early release of superannuation program (estimates based on matched samples)

Variable	First withdrawal (April -June 2020)			Second withdrawal (July-December 2020)		
	Full controls on unadjusted population (1)	Coarsened Exact Matching (2)	Nearest Neighbour Matching (3)	Full controls on unadjusted population (4)	Coarsened Exact Matching (5)	Nearest Neighbour Matching (6)
Number of unique obs:		529,703			454,008	
Matched Control	NA	306,217	NA	306,217	NA	306,217
Matched Treated	NA	202,771	NA	202,771	NA	202,771
Unmatched Control	323,268	17,051	323,268	17,051	323,268	17,051
Unmatched Treated	206,435	3,664	206,435	3,664	206,435	3,664
Estimated change in exit rate based on for quarterly epochs in spell:						
Weeks 1-13	-0.777***	-0.783***	-0.779***	-0.623***	-0.654***	-0.623***
	(0.005)	(0.005)	(0.005)	(0.113)	(0.028)	(0.031)
Weeks 14-26	-0.317***	-0.273***	-0.303***	-0.448***	-0.451***	-0.449***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Weeks 27-39	-0.257***	-0.215***	-0.240***	-0.337***	-0.339***	-0.339***
	(0.005)	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)
Weeks 40-52	-0.140***	-0.146***	-0.145***	-0.165***	-0.201***	-0.183***
	(0.008)	(0.007)	(0.008)	(0.008)	(0.007)	(0.008)
Weeks 52-65	-0.084***	-0.100***	-0.078***	-0.136***	-0.182***	-0.136***
	(0.008)	(0.007)	(0.008)	(0.007)	(0.007)	(0.008)
Weeks 66-75	-0.047	-0.018	-0.009	-0.078***	-0.072**	-0.070**
	(0.026)	(0.027)	(0.030)	(0.026)	(0.026)	(0.029)
Model fit						
Concordance	0.643	0.562	0.562	0.638	0.532	0.532
Wald test	128,513	17,548	20,964	72,583	5,962	9,136

Data: Australian Taxation Office and Department of Social Services

Notes: *** $p < 0.01$ ** $p < 0.02$ * $p < 0.05$. Coefficients can be interpreted as the change in the exit rate associate with the withdrawal from superannuation. Standard errors, in parentheses, are clustered at the individual level. The study population for first withdrawal is conditioned on those who commenced their unemployment spells between 23 January 2020 and 18 April 2020 and remained on support until at least 19 April 2020. The sample for the second withdrawal is conditioned on those who remained on support until at least 1 July 2020. Standard errors and confidence intervals have been estimated based on bootstrap techniques as recommended in Abadie and Speiss (2019) and detailed in Greifer (2022).

Figure 3.7. Change in exit rate due to assorted covariates, first withdrawal



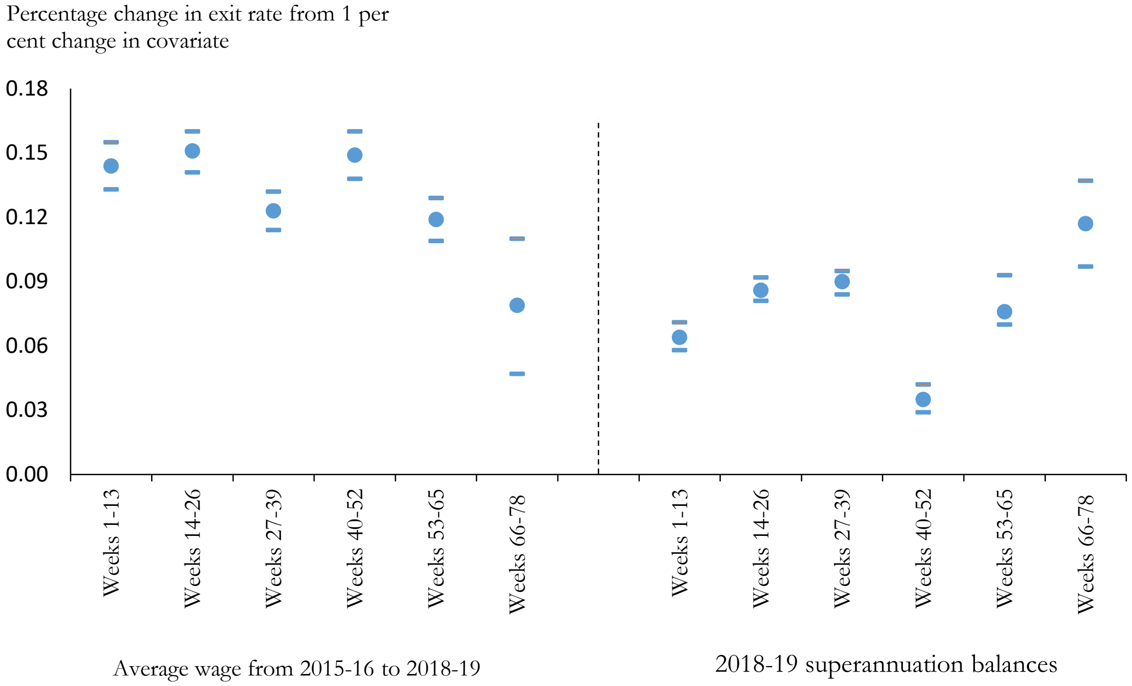
Data: Australian Taxation Office and Department of Social Services
Notes. Presents coefficient estimates of the covariates from the Cox estimation generated alongside the estimates produced in specification 2 in Table 3.4. Upper and lower bounds calculated based on a 95% confidence interval have also been presented for each estimate. See Appendix 3.B for values.

Covariates with significant time-varying effects are in line with our a priori expectations (Figures 3.8 and 3.9). Higher prior wages result in improved exit rates but the effect diminishes over the 18 months. Higher pre-covid superannuation balances have a relatively constant effect over the first year of spell, with improved exit after a year. Being located in Victoria initially reduces exit from unemployment in the quarters where Victoria experienced a protracted and severe lockdown, and then improved exit rates once those restrictions were lifted. Tertiary qualifications reduced exit rates in the first six months but resulted in improved chances of exit the longer an unemployment payment spell persisted.

The week in which an unemployment payment spell began also influenced an individual's subsequent reemployment experience, in terms of both re-employment prospects and wages. Figure 3.10 presents the coefficients of the weekly dummy variables in the full control specification for the first withdrawal. All coefficients can be interpreted as the change in exit rates for individuals entering the unemployment benefit system in a particular week, relative to a baseline week commencing 5 March 2020. It shows that people who became unemployment benefit recipients as the pandemic progressed appeared to be 'better quality' workers. Holding all else constant, those on unemployment benefits in April exited payments at more than twice the rate of those in February or January. Further, there is no significant week-on-week variation before March, or after March[36], although there is an important shift that takes place over the month of March.

[36] This observed trend continues with a wider 9-month sample begins in October 2019 and ends in June 2020.

Figure 3.8. Change in exit rate, assorted covariates with time-varying effects, first withdrawal



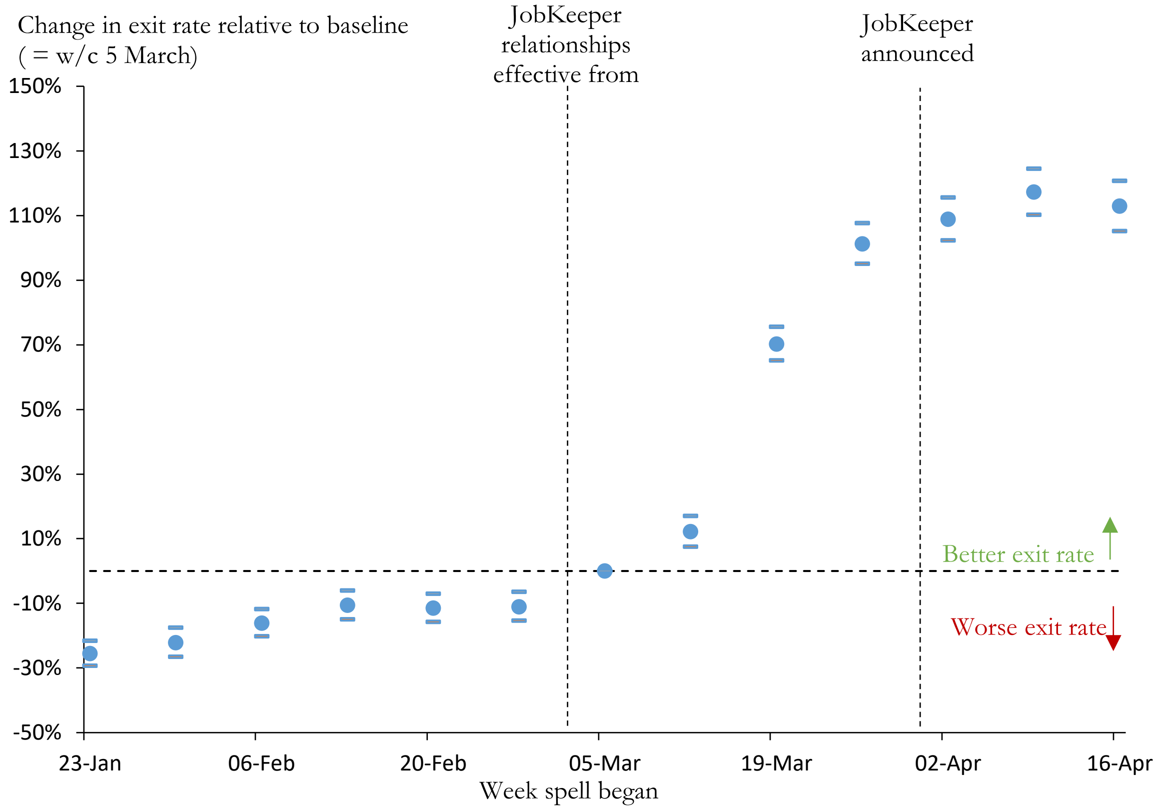
Data: Australian Taxation Office and Department of Social Services

Figure 3.9. Change in exit rate, covariates with time-varying effects, first withdrawal

Data: Australian Taxation Office and Department of Social Services
Notes: Presents coefficient estimates of the covariates from the Cox estimation generated alongside the estimates produced in specification 2 in Table 3.4. Upper and lower bounds calculated based on a 95% confidence interval have also been presented for each estimate. See Appendix 3.B for values.

The most obvious explanation for this change stems from the introduction of the JobKeeper program[37]. JobKeeper affected the population in two major ways. It directly subsidized the (re-)employment of a sizeable number of the unemployed. In addition, the wage subsidy substantially altered the population of potential unemployment benefit recipients – from the full population on unemployment payments in February 2020, to the full population minus around 3.2 million wage subsidy recipients by April 2020. A gradual transition over 3 weeks, rather than a sharp one at point of announcement, appears to be a product of the announcement of the policy on 28 March, but with a date of effect for employment relationships backdated to 1 March 2020.

Figure 3.10. Exit rate by week unemployment payment spell began, first withdrawal



Data: Australian Taxation Office and Department of Social Services
Notes. Presents coefficient estimates of the covariates from the Cox estimation generated alongside the estimates produced in specification 2 in Table 4. Upper and lower bounds calculated based on a 95% confidence interval have also been presented for each estimate. See Appendix B for values.

3.6.4 Did longer job search lead to better job matches?

Next, we explore whether those who withdrew superannuation used the additional time on unemployment to find a better job match than those who did not withdraw and returned to work more quickly. While we cannot examine many characteristics of new jobs, we find no evidence of a positive impact on pay. If anything, we find evidence that those who stayed out of work longer due to withdrawing superannuation ended up with lower paying jobs than those who did not withdraw.

Sample construction for wage growth estimates

We start with the 529,713 individuals in our main sample. Selecting only those with completed spells of less than 65 weeks (which ensures that there are 4 weeks earnings pre and post spell) and individuals who have a wage in both the pre- and post- spell windows (which ensures both numerator and denominator are

[37] Note that the measures targeted at individuals such as JobKeeper, JobSeeker supplements and superannuation withdrawals are prominent measures, but are only a part of the extensive suite of support measures provided to individuals, business and community groups across multiple levels of government.

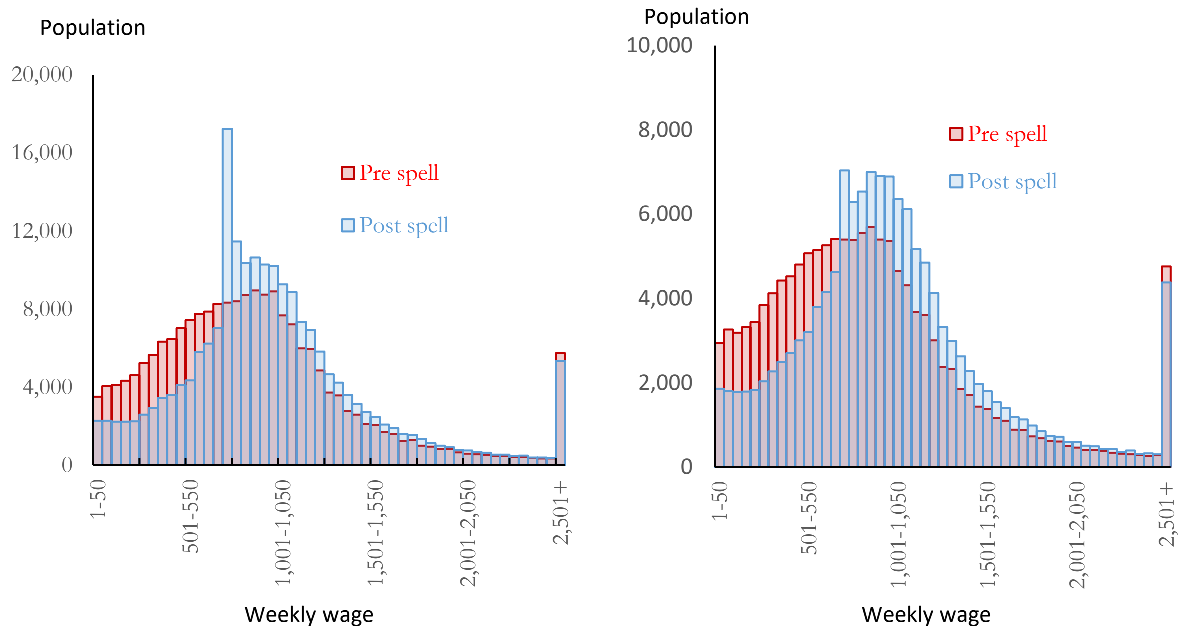
nonzero) reduces the sample size to approximately 203,000 individuals. This ensures that sample counts pre- and post- spell are the same.

Figure 3.11 presents the resulting histogram of pre- and post- spell earnings for the group. There's a clear spike that coincides with the initial JobKeeper rate of $750 per week (Figure 3.11a). Excluding approximately 65,000 in the sample who were JobKeeper recipients at some point from April 2020 to March 2021 then accounts for most of the spike (Figure 3.11b), but with a mass still forming above $750 per week.

Figure 3.11. Histogram of weekly wages, pre- and post-unemployment spell.

a. Population including Jobkeeper recipients (N = 203,000)

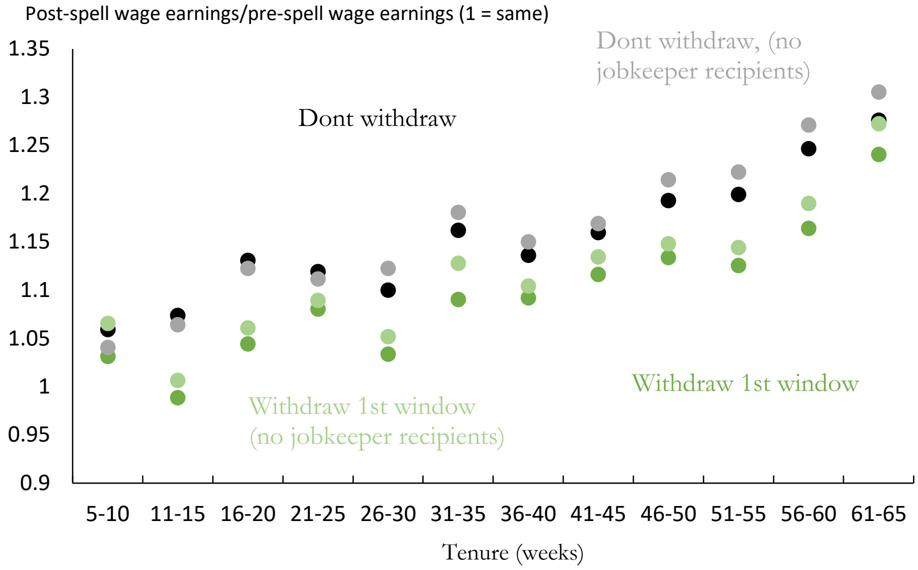
b. Population excludes Jobkeeper recipients (N = 137,000)



The population receives a wage premium post-spell on average. Individuals on very low pre-unemployment wages shift to higher points of the distribution. Breunig and Sainsbury (2023) show how a population-wide shift in income distribution was temporary, and correlated with the 12 months in which story which was confined to the period emergency support measures were in place.

Note also that including or excluding Jobkeeper recipients does not provide a material change to the wage premium estimates (Figure 3.12). Employers had to pay more post-spell than pre-spell to many low-earning individuals. The reasons include a combination of labour market recovery and crisis support transfers (and other relief) that increase the reservation wage. We will proceed with the larger sample.

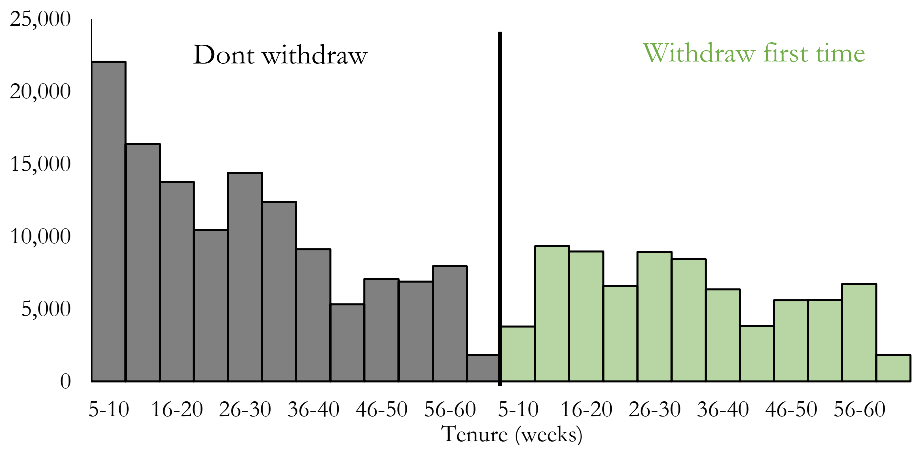
Figure 3.12. Ratio of average wages in 4 weeks pre- and post- unemployment payment spell, by tenure length



Notes: Pre- and post- spell total wages have been calculated as the average sum of total wage received by individuals in the four weeks before and after their unemployment spell concludes, respectively. Individuals with no wage have been excluded for the purposes of calculations. Treating an absence of wage as zero wage in all weeks generates similar charts. Calculations for week ending 30 January, and spells concluding after 7 June 2021 have been excluded to ensure that each worker has a capacity to produce income four weeks before or after their spell has concluded.

Figure 3.13 highlights this there are roughly double the number of non-withdrawers as withdrawers, and non-withdrawers have more of a skew towards lower tenures.

Figure 3.13. Histogram of weekly wages, pre- and post-unemployment spell.



No evidence of improved pay

There is no evidence that superannuation withdrawal led to better job matches upon re-employment. Waiting helps to get a better job, but super withdrawal doesn't necessarily help.

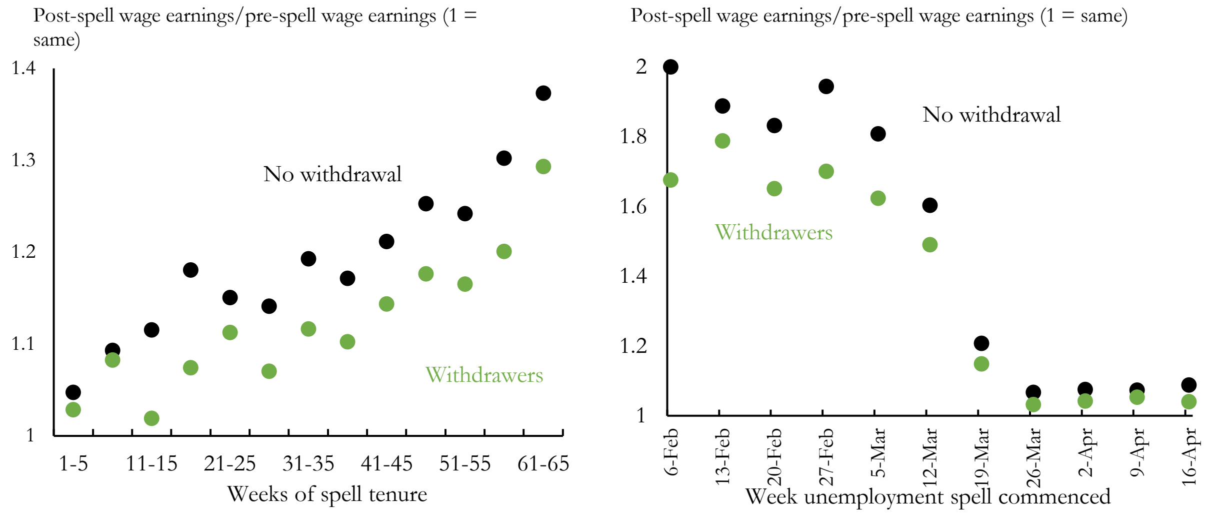
Figure 3.14 compares the average wage in the four weeks prior to an unemployment spell commencing, and the four weeks after unemployment, by length of time spent unemployed and by week that the unemployment spell commenced.[38] We see that those who withdraw experience a smaller increase in wages

[38] Average weekly wages have been calculated based on the weekly wage data reported in Single Touch Payroll (STP). Approximately 61% of the sample received wages that were reported in STP in the 4 weeks prior to their spell. Approximately 51% of the sample that received wages that were reported in the STP system the 4 weeks after their spell ceased. Results are unaffected by inclusion or exclusion of zero wages.

upon re-employment than those who did not withdraw. Figures 3.15a-d then reveal that Coarsened Exact and Nearest Neighbour matching procedures produce similar wage results.

Figure 3.14. Ratio of average wages in 4 weeks pre- and post- unemployment payment spell

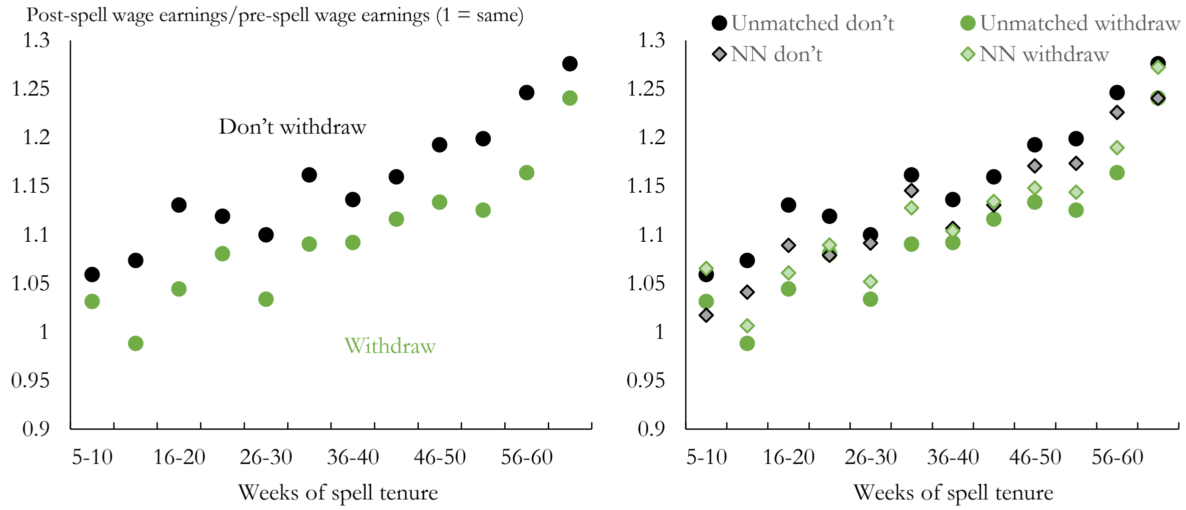
a. by length of tenure | b. by week spell commenced



Notes: Pre- and post- spell total wages have been calculated as the average sum of total wage received by individuals in the four weeks before and after their unemployment spell concludes, respectively. Individuals with no wage have been excluded for the purposes of calculations. Treating an absence of wage as zero wage in all weeks generates similar charts. Calculations for week ending 30 January, and spells concluding after 7 June 2021 have been excluded to ensure that each worker has a capacity to produce income four weeks before or after their spell has concluded.

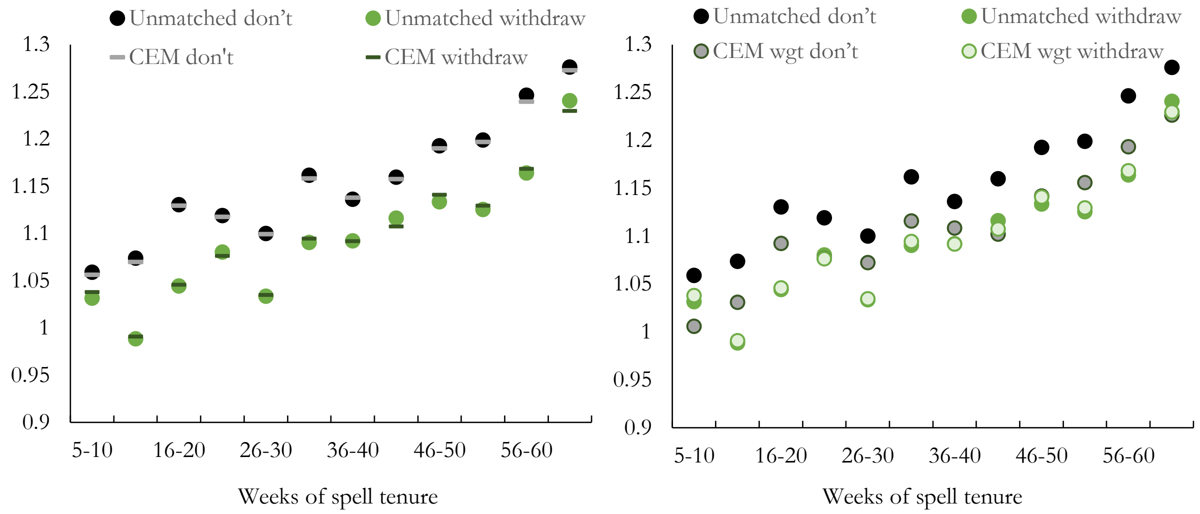
Figure 3.15. Ratio of average wages in 4 weeks pre- and post-unemployment payment spell, by length of tenure (estimates produce by matching).

a. Base (unmatched, unweighted) sample mean ratio | b. Compare base to sample after NN matching



c. Compare base to sample after CEM matching

d. Compare base to weighted (unmatched) sample with weights produced by CEM matching



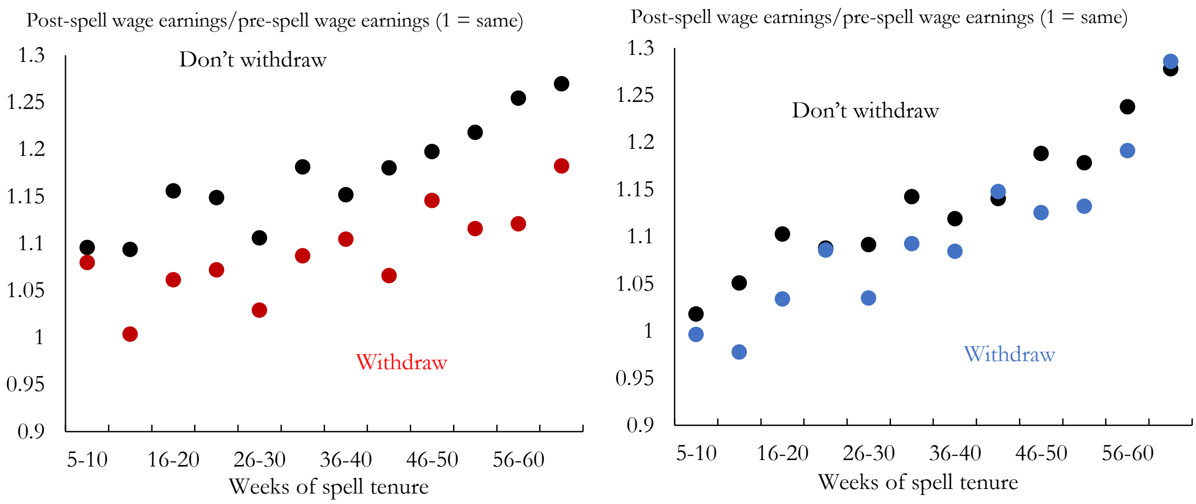
Notes: Pre- and post- spell total wages have been calculated as the average sum of total wage received by individuals in the four weeks before and after their unemployment spell concludes, respectively. Individuals with no wage have been excluded for the purposes of calculations. Treating an absence of wage as zero wage in all weeks generates similar charts. Calculations for week ending 30 January, and spells concluding after 7 June 2021 have been excluded to ensure that each worker has a capacity to produce income four weeks before or after their spell has concluded.

Beneath the population-wide trend there might be differences in wage gains or the effect of withdrawal for important subgroupings of the population, such as females (as an imperfect proxy for part time workers) or those on low wages. Figure 3.16 shows that the dividing the population on the basis of sex and pre-covid wage might change the rate of wage growth as tenure increases, and the extent of wage penalty associated with withdrawal, but it does provide evidence to suggest the direction of conclusions should be reconsidered.

Figure 3.16. Ratio of average wages in 4 weeks pre- and post-unemployment payment spell, by length of tenure, by sex and pre-covid wage

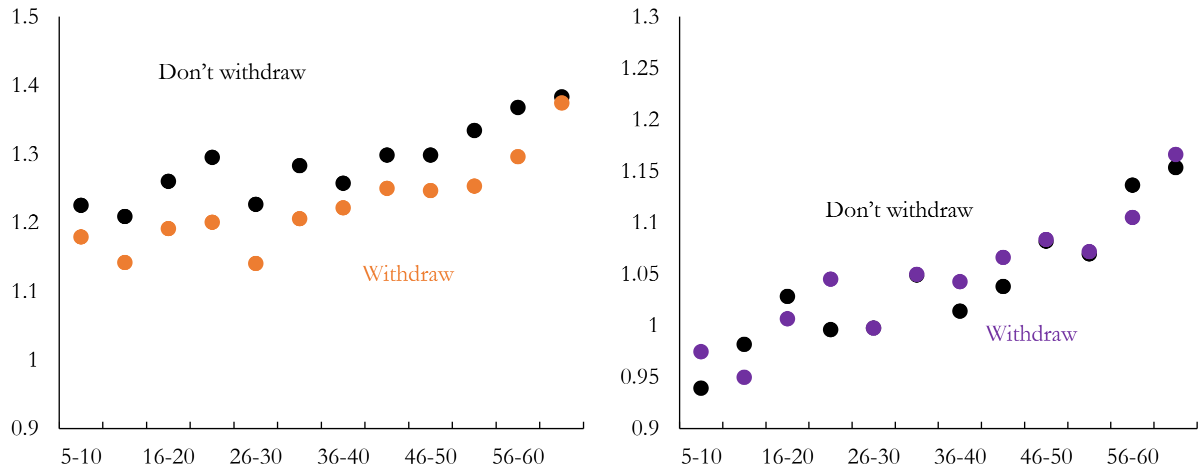
a. Female

b. Male



c. Below-median (~$33k) historical wage

d. Above-median (~33k) historical wage



Notes: Pre- and post- spell total wages have been calculated as the average sum of total wage received by individuals in the four weeks before and after their unemployment spell concludes, respectively. Individuals with no wage have been excluded for the purposes of calculations. Treating an absence of wage as zero wage in all weeks generates similar charts. Calculations for week ending 30 January, and spells concluding after 7 June 2021 have been excluded to ensure that each worker has a capacity to produce income four weeks before or after their spell has concluded.

Table 3.8 complements the visual presentation with differences in means associated with withdrawal: the results of a basic linear regression of the immediate wage gain associated with exit from benefits on a dummy variable for withdrawal in the first window and no other controls. The immediate wage gain is calculated as post-spell earnings in 4 weeks after the week the spell concludes less ‘pre-spell’ earnings in 4 weeks prior to the week the spell commences. The basic calculation is then repeated for samples split by sex, the extent to which an industry was affected by covid-19 (‘hard’ hit if the industry suffered employment losses in both industry unemployment rate from Q1-Q2 2020 and YoY Q2 2020 to Q2 2021, otherwise ‘soft’ hit if industry known, or unspecified if not), and whether individuals are above or below pre-covid median wage.

There is a large wage gain associated with exit from benefits ($127 per week represents approximately 12% wage premium overall) and $11 per week from each additional week of tenure. Withdrawing removes a large portion of these gains. Both wage premium and withdrawal effects are larger for females, individuals in hard-hit (or unspecified) industries, and those on below-median pre-covid wages (the latter is unsurprising given the histograms in Figure 3.13).

Table 3.8. Linear regression of wage gain on withdrawal

	Wage gain per week weeks ($)	With no controls		After controlling for age, sex, wage, balance, occupation, etc.	
		Marginal effect of:		Marginal effect of:	
	(Intercept)	Withdrawal	Additional week tenure	Withdrawal	Additional week tenure
Full Pop	126.8***	-102.9***	11.5***	2.2	7.3***
	(20.0)	(18.2)	(0.6)	(19.1)	(0.6)
Sex					
Female	218.9***	-181.9***	8.8***	-66.3***	6.5***
	(22.4)	(21.4)	(0.6)	(22.2)	(0.7)
Male	22.9	-40.5	14.3***	58.7	8.3***
	(34.2)	(29.9)	(0.9)	(31.3)	(1.0)
Working in industry that was:					
Hard-hit	98.4*	-130.1***	10.7***	-54.8	6.4***
	(43.4)	(38.2)	(1.2)	(39.8)	(1.2)
Soft-hit	13.8	169.8*	13.9***	146.8	8.7***
	(89.7)	(78.1)	(2.4)	(81.4)	(2.5)
Other/unspecified	147.5***	-131.1***	11.4***	7.4	7.6***
	(22.9)	(21.3)	(0.7)	(22.2)	(0.7)
Pre-covid wage					
Above-median	-221.5***	68.6*	12.1***	28.8	7.9***
	(34.7)	(31.5)	(1.0)	(32.2)	(1.0)
Below-median	478.6***	-54.3***	7.5***	-22.1	5.9***
	(19.8)	(18.9)	(0.6)	(19.6)	(0.6)

Notes: *** 1% significance ** 2% significance, * 5% significance

3.6.5 Intensive margin

In Table 3.5 above, we provide evidence that there is an effect on the intensive margin as well as on the extensive margin. Those who withdrew twice, and withdrew more, stayed out of employment longer. An additional robustness check is to evaluate whether individuals with larger balances stayed on unemployment benefits longer.

Recall that withdrawal amount is an increasing function of balance as, for those with balances below $10,000, superannuation balance was the main determinant of how much they withdrew. We partition the population on the basis of each $1,000 in pre-covid balance up to $20,000, and a group for those with balances above $20,000. Figure 3.10 shows the probability, in each of the first six months, of remaining on unemployment by pre-covid superannuation balance. There is no adjustment for covariates (that is, these graphs are pre-controls). We use pre-covid balances rather than actual amount withdrawn because it is pre-determined and not subject to the choice of the individual program participant.

The graph illustrates the main effect that we have already estimated—non-withdrawers leave unemployment at higher rates and faster than those who accessed the early release superannuation program. It also shows different patterns in the relationship between pre-covid superannuation balances and tenures on unemployment benefits for the two groups.

For those who accessed the early superannuation release program, the decrease in probability of leaving unemployment is consistent with an intensive margin effect which occurs for those with balanced about $8,000. Greater superannuation balances, and thus greater capacity to withdraw, seems to lead to longer spells on unemployment for those who withdraw.

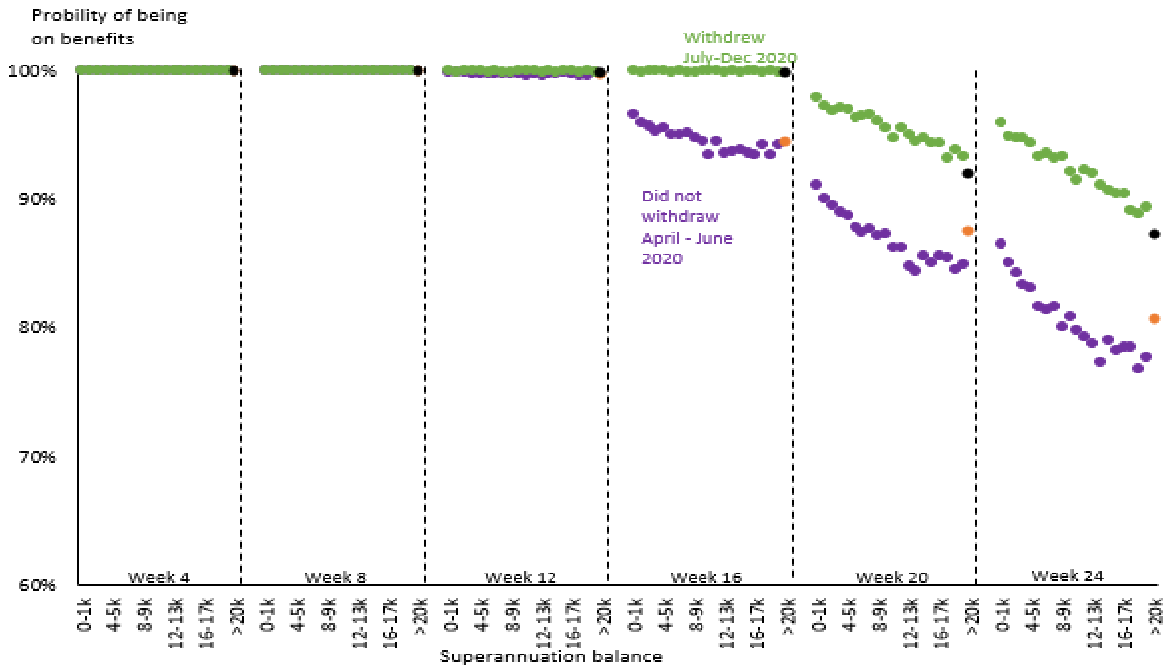
It is important to recognize that individuals with very low superannuation balances are usually young, earn lower wages and have limited labor market experience. They are small in number in our data and very different than the other individuals in our data. Balances below $10,000 are correlated with other measures of disadvantage, limiting the strength of inference possible.

Finally, note that the sample sizes are small for all points except the $21,000+ group which contain the vast majority of data. The jump upwards in unemployment duration for this group is most likely driven by the role of other assets as this group is wealthier than the groups with balances below $21,000. We explore this further in the robustness checks below.

Figure 3.17 presents quarterly estimates (and confidence intervals) from the Cox model for the first withdrawal in which we interact superannuation balance and lump sum withdrawal.

There is only a clear estimated difference in exit rates in the first quarter of spell. In this first quarter, those with higher pre-COIVD-19 balances experience a lower exit rate than those with lower pre-COIVD-19 balances. This provides further evidence regarding the intensive margin of the liquidity effect that we estimate, but one that appears to be of relatively short duration.

Figure 3.17. Probability of survival on unemployment benefits by pre-covid balance, second withdrawal



Data: Australian Taxation Office and Department of Social Services

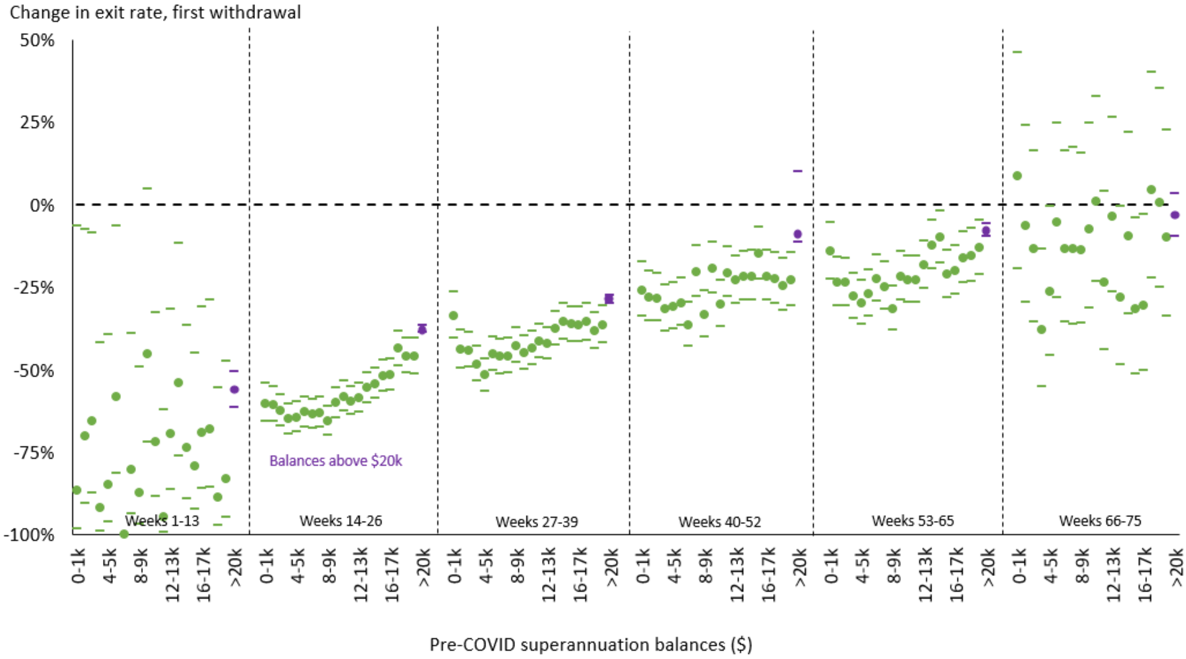
The inference from Figures 3.17 and 3.18 is that withdrawers with higher balances (and greater withdrawals) initially stay out of the labor force for longer.

Two final observations relating to the intensive margin are in order. First, for those with very low balances, the intensive margin (how much they withdrew) plays a role, but is less significant than the extensive margin (the choice of whether to withdraw or not). Recall that there is a 78% estimated cohort-wide reduction in exit rates during the first quarter of spells for those who withdrew. For those whose balances are up to A$1000, the estimated reduction in exit rates is 61%. The corresponding estimate for those whose balances are 10 times larger (A$9,001-A$10,000) is 71%, and those whose balances are 20 times larger ($19,001-$20,000) is 82%.[39] The relative importance of the extensive margin in private pension savings is consistent with Chetty et. al (2014), who estimate that around 85% of Danish individuals are passive savers, for whom participation in retirement savings via defaults has a more meaningful effect on retirement savings than

[39] These results are available upon request from the authors.

changes in the price of retirement savings (such as via tax rates). Sobeck and Breunig (2020) find a similar large role for passive savers in the Australian context.

Figure 3.18. Change in exit rate associated with withdrawals, by pre-covid balance, second withdrawal



Data: Australian Taxation Office and Department of Social Services

In all, the picture that is painted is that those with higher balances exited unemployed payments at a faster rate than those with lower balances. The size of withdrawals delayed this trend for a few months. The direction of the intensive margin effect provides further evidence of a causal role for superannuation withdrawals on unemployment durations.

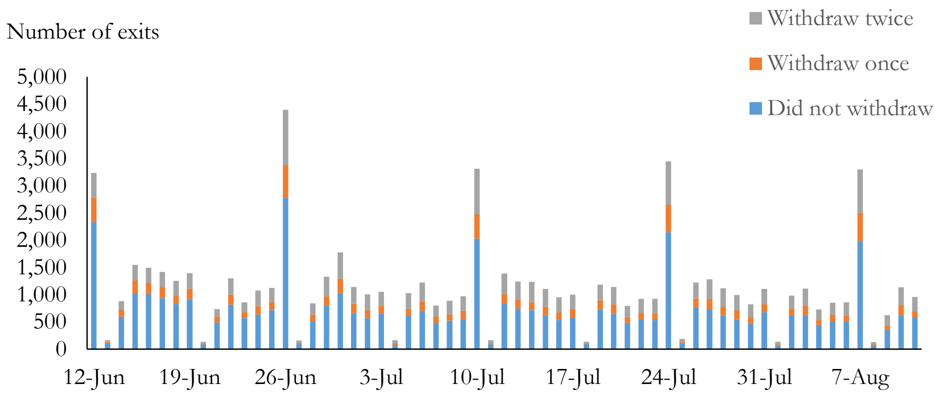
3.6.6 Other robustness checks

We split the data by pre-COVID wage to compare high (above sample median) and low wage workers. We find that the impact of withdrawal on extending unemployment spells is larger for those with lower pre-COVID wages. This is consistent with pre-COVID wages providing information about unobservable human capital characteristics which influence re-employment.

We also split the data by imputed wealth, using the split sample IV technique of Angrist and Krueger (1995) combined with data from the nationally-representative Household Income and Labor Dynamics in Australia (HILDA) survey (Wilkins et al., 2021). We find that those with higher predicted assets (again splitting the sample by median assets) stay unemployed longer and that the effect of withdrawal is larger for those with higher predicted assets. This is consistent with the liquidity effects that are produced by the withdrawn superannuation funds. All of these results are available from the authors upon request.

One possible source of endogeneity is that individuals chose to stay unemployed until 1 July 2021 in order to get access to the second opportunity to make a withdrawal from their superannuation. If this were the case, we would expect a large surge in exits from unemployment in July and August. We do not see this (Figure 3.19). The pattern of daily exits from unemployment does not change over this time period and is clearly explained by a spike in exits on a fortnightly basis on Fridays, with no other discernible trend over a three-month window.

Figure 3.19. Number of daily exits by withdrawal type, 12 June - 11 August 2020



3.7 Discussion and Conclusion

The Australian government's pandemic stimulus policy which allowed individuals to access their private retirement funds led to longer spells on unemployment for those who chose to withdraw some of their superannuation savings. Controlling for observable characteristics increases the effect of superannuation withdrawal prolonging unemployment spells. With rich administrative data, we are able to control for pre-pandemic wages and retirement assets. This helps to reduce any bias from unobservable characteristics that might be correlated with the propensity to access the superannuation withdrawal program and simultaneously correlated with re-employment probabilities. Matching estimates, based on observable characteristics, confirm these results.

Additional liquidity associated with access to retirement savings resulted in longer spells on unemployment. Importantly, access to superannuation is a pure liquidity effect as there were no administrative requirements that required people to demonstrate continued unemployment after receipt of the superannuation dollars. In fact, individuals could withdraw from their retirement savings and immediately find a new job with no negative repercussions.

The program was announced after our entire analysis sample had become unemployed so it is not possible for our results to be driven by people becoming unemployed in order to access their superannuation funds. In fact, unemployment was not a requirement for program participation, so it seems unlikely that individuals would choose unemployment when there were less damaging financial paths to program access.

Taken together, these results point to a causal effect on unemployment duration of the liquidity provided by access to private retirement savings.

Our results that liquidity injections lead to longer unemployment are consistent with Chetty (2008) and a range of other studies. Our study, and many others, point to potentially negative labor supply effects associated with "free money". These results are relevant for debates about the desirability of universal basic income programs. We conjecture that the negative effects we find on re-employment would have been much worse had the Australian government not been simultaneously stimulating the economy in a wide variety of ways including the substantial wage subsidy program provided through JobKeeper. Were a policy such as this implemented during more "normal" times, the unemployment effects may well have been even stronger.

A second important element of this policy is that allowing individuals to access their own retirement funds, would appear, at first inspection to provide government with a way to stimulate the economy which does not appear on the government's balance sheet. As individuals access their own funds, there are no government outlays such as those that are required in providing additional cash payments to the unemployed. Our results, however, suggest that there is a hidden cost of the program. In Australia, all unemployed individuals have access to Australia's universal system of payments. Longer unemployment spells therefore lead to larger outflows from government coffers in terms of increased unemployment benefits.

Of the 391,000 individuals who complete unemployment spells in our population, 162,000 individuals withdrew from superannuation and spent 7.2 weeks (approx. 50 days) longer on unemployment benefits. Our back of the envelope calculations indicate that these 8.1 million additional person-days of unemployment resulted in AU$580million (approximately US$400 million) of additional benefit payments. So what appears to be a `costless' program to government is in fact quite expensive when we take into account the unemployment response to the extra liquidity provided by the early access to superannuation program.

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Appendices

3.A Australian COVID-19 early access to pensions policy and the broader context

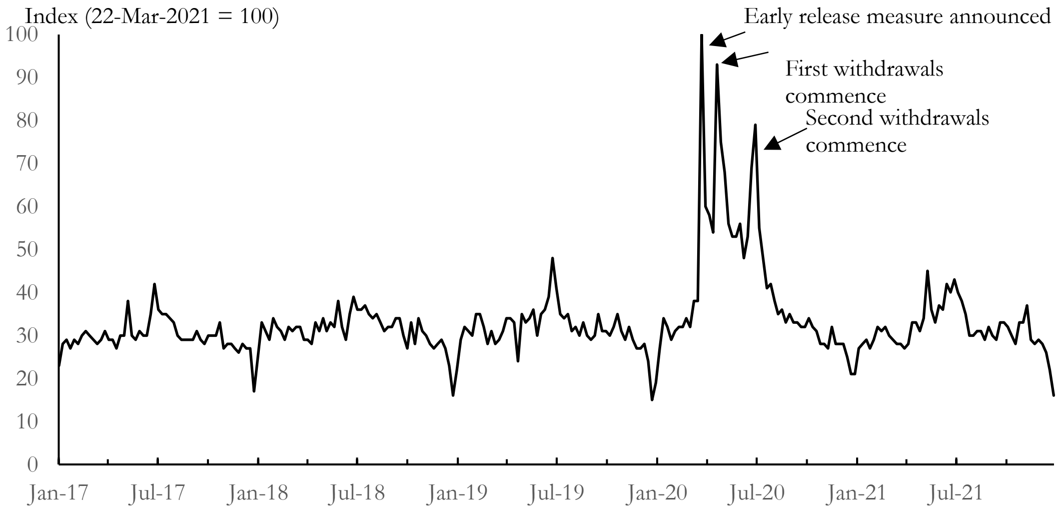
The A$38 billion in total superannuation withdrawn represented 1% of the A$3 trillion in aggregate superannuation balances or 2.1% of Australian 2019-20 GDP. This marks the measure as the second largest 2020 stimulus action (behind only the A$88 billion JobKeeper wage subsidy[40]) and among the larger discretionary stimulus actions in Australian history. Three million applicants, or approximately a fifth of the Australian population aged 16 to 65 who had superannuation accounts, withdrew an average of more than A$12,400 (US$8,700) (ATO 2020b). The volume of applications exceeded the Australian Government's initial expectations of A$27 billion being withdrawn (Mizen 2021).

The use of superannuation withdrawals as part of the 2020 stimulus measures was noteworthy for five reasons.[41]

First, it meant that some of the economic support payments provided in response to COVID-19 were financed by a corresponding reduction in pension wealth, rather than as lump sums funded directly through government borrowing and future tax increases.

Second, the policy was unanticipated. As a suggestive illustration, google search behaviour around the terms 'superannuation', 'super release', 'early' and 'withdraw' saw a sudden and dramatic spike immediately after the measure was announced. Two further spikes occurred during the weeks that the withdrawal periods began. All three occasions were outside the range of usual search interest in the terms over the five years from January 2017 to December 2021 (Figure 3.A1).

Figure 3.A1. Frequency of weekly Google search trends for terms 'superannuation', 'super release', 'withdraw', and 'early access', Jan 2017-December 2021.



Data: Google trends.

Third, the policy was transparent, easy to access and involved rapid turnarounds. Applications were processed through the MyGov online government services portal. The application was a simple check-a-box exercise that could be completed by applicants within 5 minutes (Charlton 2020). Applicants were required to self-assess eligibility but did not need to supply substantiating documentation. The ATO would assess applications – within four working days but usually within 24 hours – and issue a determination to the individual and their super fund for release of funds within 5 working days. Up to A$10,000 was

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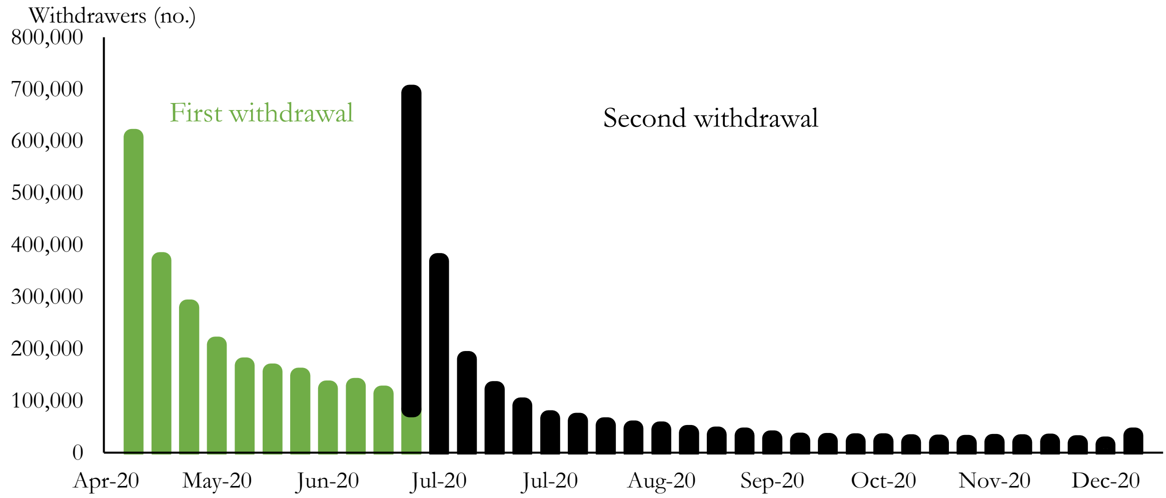
[40] The JobKeeper wage subsidy, which was announced on 28 March 2020 and in duration for 12 months, provided employers that were facing significant reductions in turnover and that met other eligibility criteria a flat A$1500 fortnightly payment (initially) for qualifying employees (Commonwealth of Australia (2020d).

[41] The first four are common with Denmark's experience in 2009 (Kreiner et al., 2019).

transferred on average in 3 working days (Australian Prudential Regulatory Authority, 2021). More than 50% of applications for each withdrawal opportunity occurred within the first 20 days of availability (Figure 3.A2). In total, A$28 billion – three quarters of the released funds - was approved in the three months from 19 April to 18 July 2020.

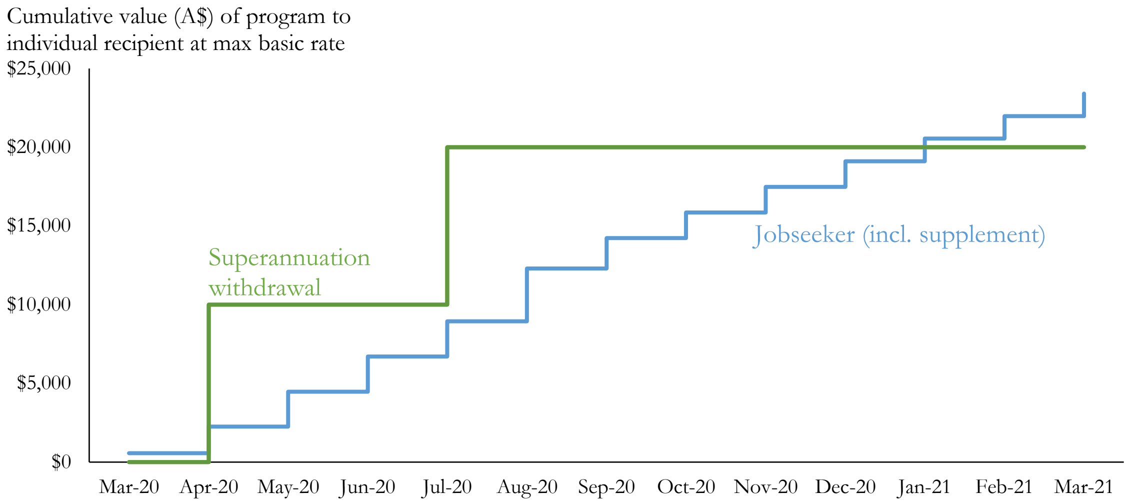
Figure 3.A2. Weekly applications: an initial rush to withdraw in both windows of opportunity



Data: Australian Taxation Office.

Fourth, the size of the lump sum was significant. The average program-wide $12,400 ($US8,700) withdrawal amount was equivalent to approximately a fifth of average 2018-19 taxable income for withdrawers (ATO 2021a, ATO 2021b). It was also equivalent to 5 months of unemployment support at the supplemented rates that were being paid to individuals during the COVID-19 pandemic (Figure 3.3). Individuals could access $20,000 and couples $40,000 tax-free, with 10 weeks between the start of the first opportunity and the start of the second. By way of comparison, average withdrawals were four times larger than the similar Danish 2009 early access scheme which permitted only modest withdrawals (an average of US$2,200 (Kreiner et al. 2019), and more than double the average US$4,000 severance payments studied by Chetty 2008). Figure 3.A3 demonstrates that access to superannuation provided an earlier and, at least initially, much larger stimulus than the fortnightly support delivered through unemployment payments.

Figure 3.A3. Superannuation withdrawals provided more cash support, earlier, than jobseeker payments



Fifth, the COVID-19 lump sums represent a significant departure from Australia's overarching philosophy of preserving private pension savings (built primarily through compulsorily contributions out of wages) for use during retirement. Prior to 2020, Australians generally needed to reach a certain age – called the preservation age (58 years in 2021) – and meet other qualifying criteria (such as retiring) to access retirement funds. The age limit has been strictly enforced, with only limited exceptions based on compassionate grounds associated with extreme financial hardship or being at an end stage of life prior to reaching retirement.[42] The early access scheme represents the first Australian use of private pension savings as a social insurance mechanism against an economic shock.

Unemployment in Australia in the early stages of the pandemic

As pointed out above in section 3.3, the week of March 20 produced a large spike in unemployment. It also produced a frenzied week of policy activity. Particular features were: on 22 March the supplementary unemployment payments and associated relaxations in thresholds and mutual obligation actions were announced (Murphy 2020); on 23 March lengthy physical unemployment queues were observed and described as reminiscent of the Great Depression (Wright and Bagshaw 2020); on 23 and 24 March the MyGov portal was overwhelmed due to unprecedented demand, which was initially incorrectly attributed to hacking (McIlroy and Fowler 2020); by 27 March the Finance Minister had announced that the government was working on a wage subsidy (Cormann 2020); and on 28 March the Prime Minister and the Treasurer had announced it (Morrison and Frydenberg, 2020).

The last week of March 2020 was the beginning of a period of approximately 10 weeks of 'acute downturn' in the Australian economy where the volume of individuals on unemployment spells increased in net terms by about 800,000 (an effective doubling from pre-Covid stocks). After that brief window, the prospects of unemployment recipients in Australia improved considerably. A 10-week period from June to August 2020 saw net inflows onto, and outflows from, unemployment payments largely stabilising. From September 2020 to 30 June 2021, Australia's rapid labor market recovery coincided with a strong net exit from unemployment payments, in the order of half-a-million individuals. The Australian labor market's rapid recovery, combined with its closed borders, led to reports of worker shortages by mid 2021 (SMP 2022, Agarwal and Bishop 2022). There was no lack of jobs for unemployment recipients.

Out of the 3 million individuals that withdrew money from their personal superannuation funds in 2020, approximately 700,000 were recipients of unemployment benefits at some point between 1 January 2019 and 30 June 2021. By unemployment benefits, we mean JobSeeker payment, Newstart Allowance, Youth Allowance (Other) and Farm Household Allowance. These are the key payments targeted towards the working-age unemployed in Australia.[43] This group is of interest for a number of reasons. The membership was all eligible for the early release of superannuation. The average weekly wages of this group were consistently below that of the rest of the Australian community. And as Figure 3.4 reveals, those that withdrew from superannuation during COVID-19 and received unemployment payments were comparatively higher earning (relative to those that didn't withdraw); a relationship that is reversed in the general community[44].

[42] Specifically, the strict preservation rules are relaxed in exceptional cases based on "compassionate grounds" such as paying for medical treatment, managing terminal conditions or the costs of death funeral and burial, and for the long-term unemployed to meet their essential living costs of living. In addition, there are certain rules around those transitioning to retirement and aged over the preservation age. Further, since 2017 those looking to buy a first home have been able to make voluntary contributions into superannuation and withdraw those contributions (at point of home purchase. The First Home Saver Scheme is distinct from COVID-19 early access arrangements, though, in operating as a hypothecated savings vehicle; that no compulsory contributions could be used as part of the scheme.

[43] We adopt a similar definition for payments targeted at the unemployed as in Chart 4.8 in Frydenberg and Birmingham (2021). We do not analyse withdrawal behaviour of those on old age and disability pensioners, or other allowances.

[44] This reflects the highly targeted nature of unemployment payments in Australia, which results in welfare support being received by individuals who have on average very low incomes (and low superannuation balances).

3.B Goodness of fit and diagnostic tests

In this Appendix, we explain the model goodness of fit measures relied upon for assurance of a robust and well-specified calibration of the Cox Proportional Hazards model. Figures 3.A1, 3.A2 and 3.A3 then present the output of three diagnostic tests that provide assurance around different aspects of model selection: proportionality of hazards, influencing observations and collinearity. In each case we find no material concerns about the model specification.

Model Goodness of Fit

We rely on two measures of model goodness of fit (Therneau and Grambsh, 2000). The first are the concordance statistics reported in regression tables. If y_i and x_i are observed and predicted data values, respectively, in the most common case $x = \hat{}\eta$, the linear predictor from a fitted model (Therneau and Atkinson, 2022). The concordance is then defined $P(x_i > x_j \mid y_i > y_j)$, the probability that the prediction x goes in the same direction as the actual data y (ibid). The concordance statistic is the fraction of concordant pairs – times when the pair of observations *i* and *j* where the prediction and the actual data go in the same direction. The reported values of the models with full control specifications all lie close to 0.65, which is fairly typical value when looking for indicators good fit.

In those tables we also present a statistic for overall (global) model significance: the Wald test. In each case the statistics are very large, irrespective of the model specification we choose, and the tests overwhelmingly supports a conclusion that the model is significant.

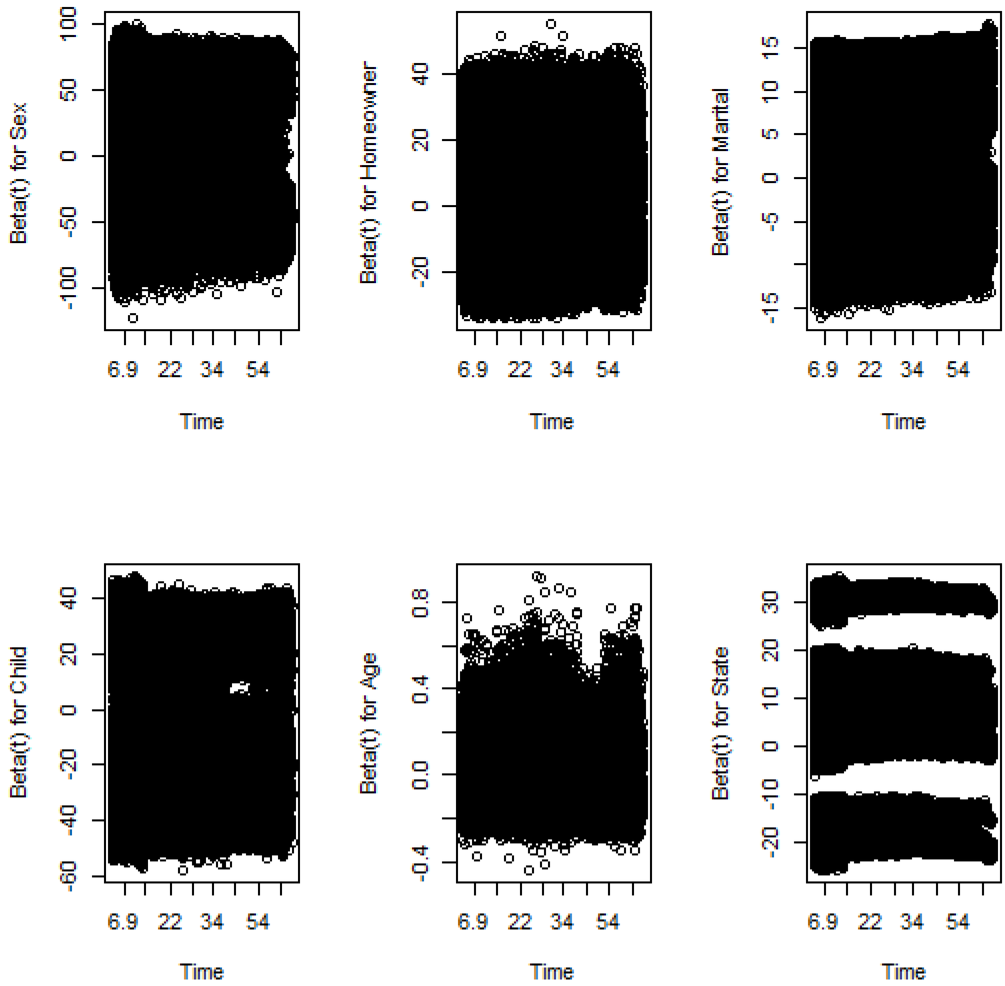
Diagnostic tests

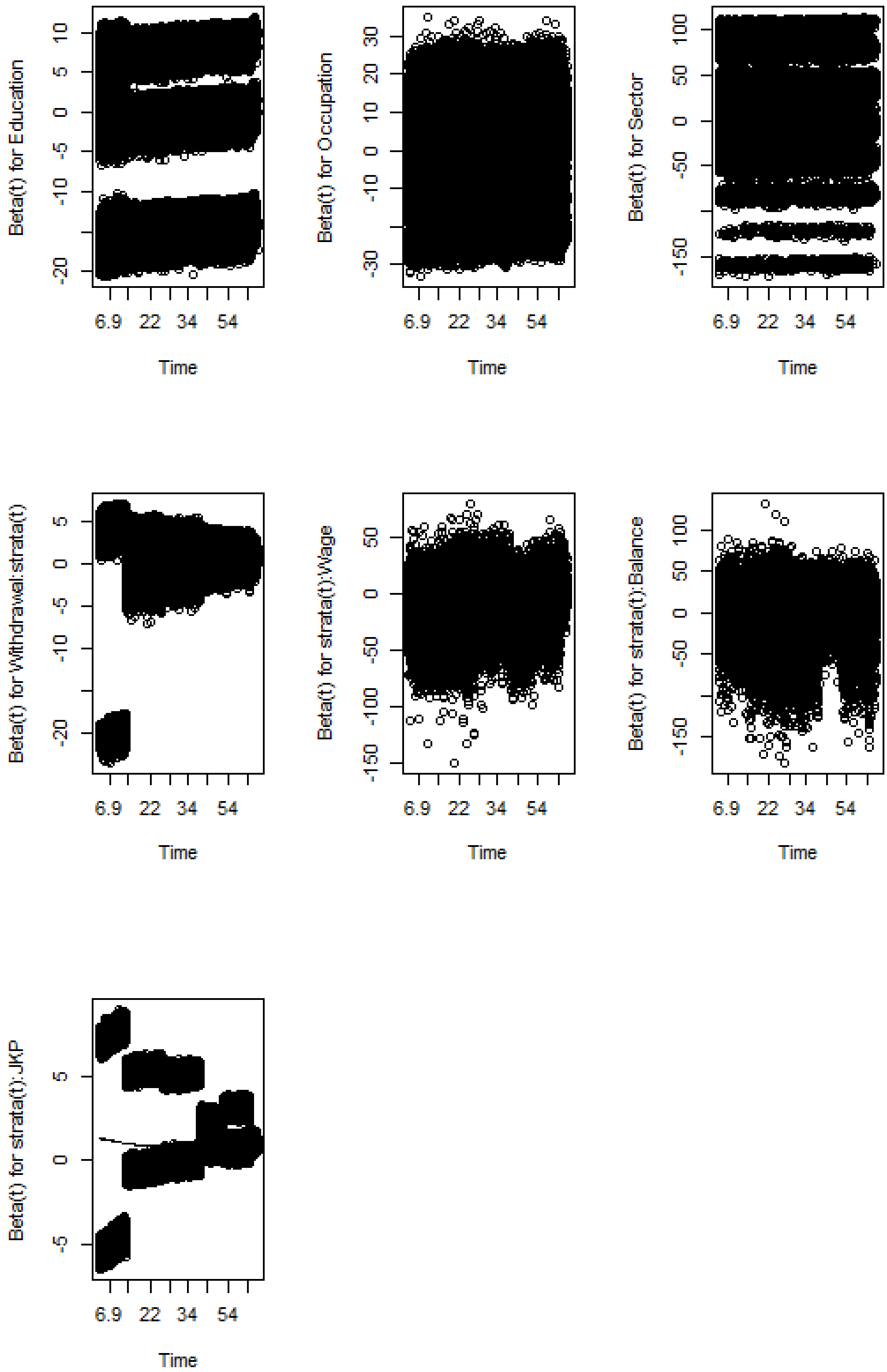
The assumption of proportionality of hazards is arguably the key assumption for a Cox model. It indicates that the estimated coefficients from a Cox model about the ratio of hazards for any two individuals is constant over time (Grambsch and Therneau, 1994).

We have found here that any statistical tests of proportionality of hazards (such as through the cox.zph specification in R statistical software) will suggest that proportionality of hazards does not hold for our specification. To an extent this is substantively true for a basic specification of hazards. Our analysis shows clearly that exit rates vary over time (as would be expected based on theory) and that a step model allowing for time-varying covariates is accordingly an appropriate approach. In addition, the statistical tests' power to credibly detect a trend from 0 appears to deteriorate with larger sample sizes. From a preliminary inspection, hazards that the tests conclude are proportional if N < 10,000 in this dataset are no longer assessed as proportional if N > 10,000 – even if the 10,000 includes smaller subgroups that are all individually measured as proportional. This is clearly an issue when the scale of sample is over half a million individuals.

Instead of potentially spurious tests, we rely on graphical diagnostics plotting the scaled Schoenfeld residuals (Grambsch and Therneau, 1994). There is no discernible trend (Figure 3.B1).

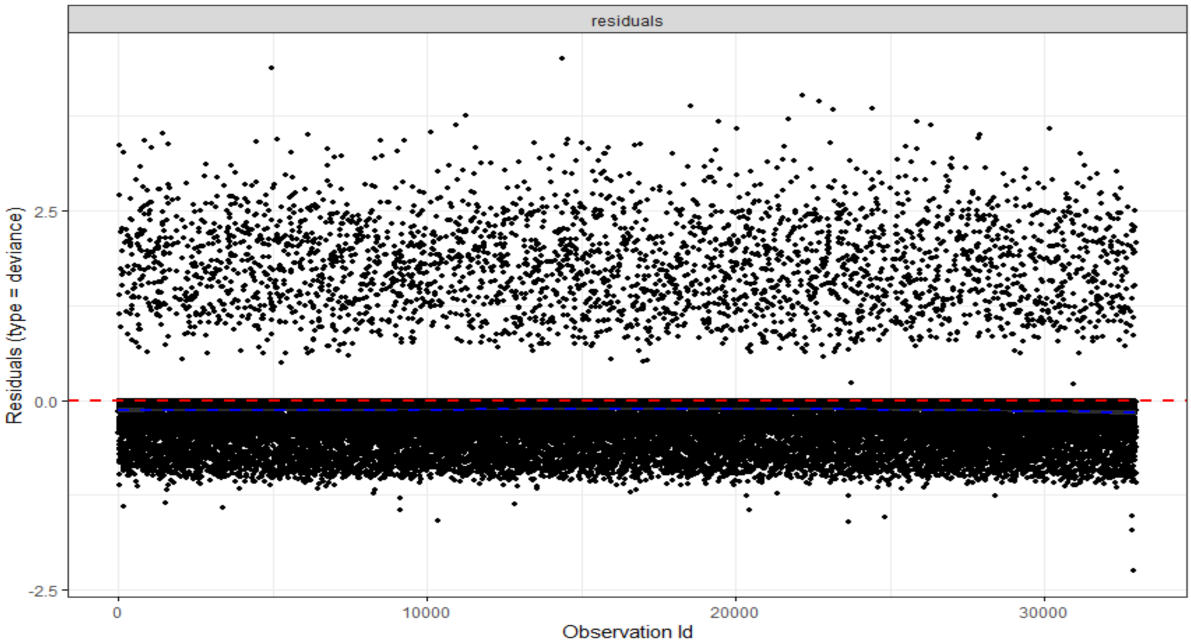
Figure 3.B1. Visual test for proportionality of hazards





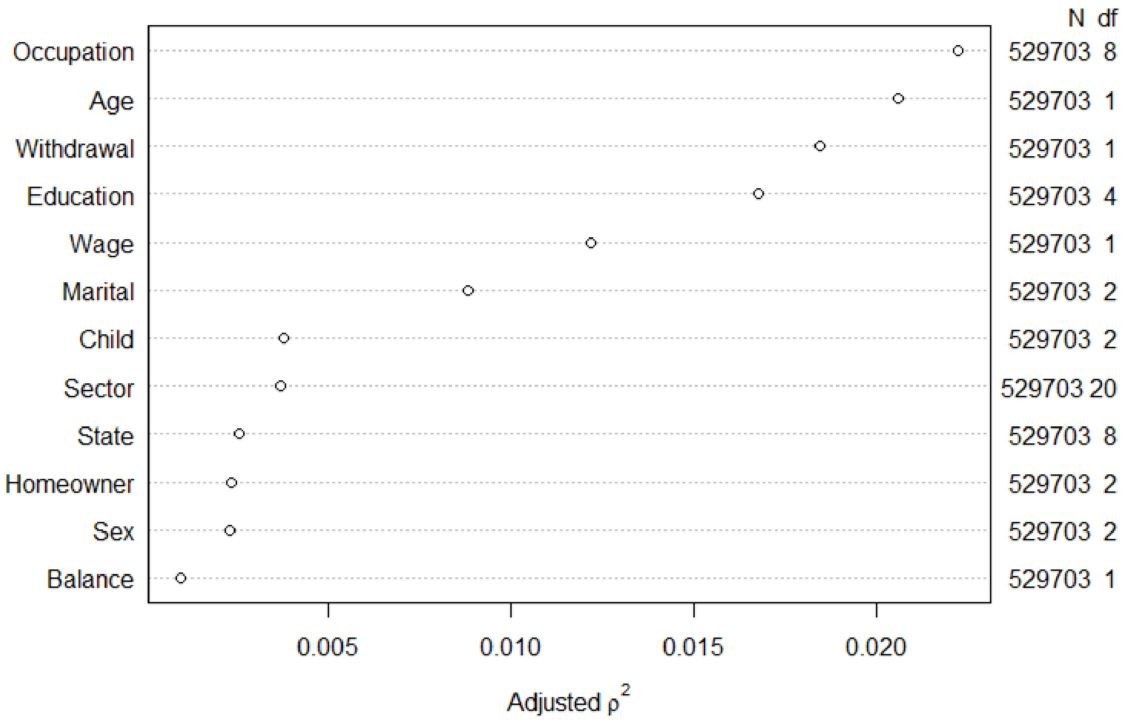
Regarding influencing observations, a plot of martingale residuals from the Cox regression for the first withdrawal (Figure 3.B2) demonstrates no discernible trend or deviation from zero that would indicate that an influencing observation plays an outsized role on the regression output. The large sample size provides a sense-check that no single observation will play an outsized role on our estimates.

Figure 3.B2. Test for influencing observations



Regarding collinearity, all estimates of Spearman's correlation coefficient are close to 0 (Figure 3.B3) suggesting that there are no material collinearity issues to be concerned with.

Figure 3.B3. Test for collinearity



3.C Full set of covariate estimates based on the full controls specification, 1st withdrawal, 2nd withdrawal and marginal $1,000 and extra results.

In Tables 3.4 and 3.5 we presented the estimated effects of superannuation withdrawals on unemployment spells under two specifications: no controls and a full specification of covariate controls. In Tables 3.C1, 3.C2, 3.C3 and 3.C4 we present the full set of covariate estimates associated with the first and second withdrawals and per $1,000 withdrawn. The data for first withdrawal in Tables 3.C1-C4 underpins the estimates presented in Figures 3.7-3.10.

Table 3.C1. Covariates estimated with time-invariant effect

Variable	First withdrawal	Second withdrawal	Per $1000 withdrawn
Age	-0.028***	-0.027***	-0.027***
	(0.000)	(0.000)	(0.000)
Sex (baseline: female)			
Male	-0.032***	-0.018***	-0.035***
	(0.004)	(0.004)	(0.004)
Uncategorised	-0.011	-0.007	-0.015
	(0.025)	(0.028)	(0.024)
Home ownership (baseline: homeowner)			
Not homeowner	-0.164***	-0.138***	-0.173***
	(0.004)	(0.004)	(0.004)
Uncategorised	-0.049	-0.024	-0.056***
	(0.024)	(0.027)	(0.023)
Marital status (baseline: married)			
Not married	-0.257***	-0.254***	-0.253***
	(0.003)	(0.003)	(0.003)
Uncategorised	-0.137***	-0.100***	-0.131***
	(0.008)	(0.009)	(0.008)
Children in household (baseline: no children)			
Child	0.063***	-0.050***	0.067***
	(0.005)	(0.005)	(0.004)
Uncategorised	-0.033***	-0.034**	-0.043***
	(0.005)	(0.006)	(0.004)
Location (baseline: New South Wales)			
Queensland	0.052***	0.072***	0.044***
	(0.005)	(0.006)	(0.005)
Western Australia	0.152***	0.152***	0.150***
	(0.007)	(0.008)	(0.007)
South Australia	0.016**	0.019**	0.023**
	(0.007)	(0.008)	(0.007)
Tasmania	-0.048***	-0.032**	-0.044***
	(0.012)	(0.013)	(0.011)
Northern Territory	0.091***	0.056**	0.086***
	(0.021)	(0.023)	(0.021)
Australian Capital Territory	0.073***	0.047**	0.088***
	(0.017)	(0.02)	(0.017)
Uncategorised	0.027***	0.041***	0.028***
	(0.008)	(0.009)	(0.008)
Education (baseline: year 12)			
Year 11	-0.162***	-0.147***	-0.172***
	(0.007)	(0.008)	(0.007)
Certificate	-0.171***	-0.157***	-0.177***
	(0.005)	(0.006)	(0.005)
Uncategorised	0.102***	0.068***	0.102***
	(0.006)	(0.006)	(0.006)

Table 3.C2. Covariates: industries and occupations

Covariate	First withdrawal	Second withdrawal	Per $1000 withdrawn
Industry (baseline: Accommodation and Food Services)			
Administration and Support	-0.057***	-0.068***	-0.059***
	(0.016)	(0.017)	(0.016)
Agriculture	-0.032	-0.052	-0.024
	(0.024)	(0.027)	(0.026)
Arts and Recreation	-0.035*	-0.056***	-0.019
	(0.017)	(0.019)	(0.018)
ATO use only	-0.079***	-0.085***	-0.076***
	(0.016)	(0.018)	(0.016)
Construction	-0.014	-0.005	-0.012
	(0.017)	(0.018)	(0.017)
Education and Training	0.039	-0.003	0.057***
	(0.020)	(0.022)	(0.021)
Electricity, Gas, Water and Waste Services	-0.121	-0.134*	-0.128*
	(0.060)	(0.064)	(0.060)
Financial Services	-0.021	-0.019	-0.024
	(0.032)	(0.035)	(0.032)
Health Care and Social Assistance	0.068***	-0.009	0.073***
	(0.021)	(0.021)	(0.021)
Information Media and Telecommunications	0.0	-0.019	0.018
	(0.023)	(0.025)	(0.023)
Manufacturing	-0.003	-0.009	-0.003
	(0.021)	(0.023)	(0.021)
Mining	-0.015	-0.053	-0.013
	(0.102)	(0.105)	(0.102)
Other services	0.033	-0.032	0.035***
	(0.018)	(0.018)	(0.018)
Professional Scientific and Technical Services	0.007	-0.023	0.015
	(0.017)	(0.018)	(0.017)
Public Administration and Safety	-0.136***	-0.135***	-0.153***
	(0.035)	(0.037)	(0.034)
Real Estate	0.045	0.047	0.048
	(0.027)	(0.030)	(0.028)
Retail Trade	-0.056***	-0.072***	-0.057***
	(0.017)	(0.018)	(0.017)
Transport, Postal and Warehousing	-0.036*	-0.059***	-0.053***
	(0.017)	(0.017)	(0.016)
Uncategorised	-0.021	-0.048***	-0.008
	(0.015)	(0.015)	(0.015)
Wholesale Trade	-0.019	-0.039	-0.015
	(0.027)	(0.029)	(0.027)
Occupation (baseline: Clerical and Administrative Workers)			
Community and Personal Service Workers	0.052***	0.059***	0.051***
	(0.007)	(0.008)	(0.007)
Labourers	-0.154***	-0.146***	-0.166***
	(0.007)	(0.007)	(0.006)
Machinery Operators and Drivers	-0.097***	-0.085***	-0.105***
	(0.007)	(0.009)	(0.008)
Managers	0.089***	0.104***	0.083***
	(0.009)	(0.010)	(0.009)
Professionals	0.142***	0.114***	0.149***
	(0.009)	(0.010)	(0.009)
Sales Workers	-0.039***	-0.042***	-0.036***
	(0.007)	(0.008)	(0.007)
Technicians and Trades Workers	0.068***	0.072***	0.063***
	(0.008)	(0.009)	(0.008)
Uncategorised	-0.017***	-0.024***	-0.021***
	(0.007)	(0.008)	(0.007)

Table 3.C3. Week unemployment spell began

Covariate	First withdrawal	Second withdrawal	Per $1000 withdrawn
Baseline:			
Apr-16	1.129***	1.103***	1.184***
	(0.058)	(0.060)	(0.061)
Apr-09	1.173***	1.154***	1.228***
	(0.055)	(0.057)	(0.058)
Apr-02	1.089***	1.052***	1.132***
	(0.049)	(0.050)	(0.051)
Mar-26	1.013***	0.961***	1.043***
	(0.045)	(0.045)	(0.047)
Mar-19	0.703***	0.673***	0.716***
	(0.032)	(0.033)	(0.033)
Mar-12	0.122***	0.124***	0.124***
	(0.025)	(0.026)	(0.025)
Feb-27	-0.110***	-0.113***	-0.113***
	(0.023)	(0.025)	(0.023)
Feb-20	-0.114***	-0.136***	-0.120***
	(0.023)	(0.024)	(0.023)
Feb-13	-0.106***	-0.120***	-0.112***
	(0.024)	(0.025)	(0.024)
Feb-06	-0.161***	-0.185***	-0.170***
	(0.023)	(0.023)	(0.023)
Jan-30	-0.221***	-0.239***	-0.233***
	(0.025)	(0.026)	(0.024)
Jan-23	-0.255***	-0.273***	-0.266***
	(0.021)	(0.022)	(0.021)

Table 3.C4. Time varying covariates

Covariate		**First withdrawal**	**Second withdrawal**	**Per $1000 withdrawn**
Log continuous variables (effect of 1% change in variable on hazard rate)				
Average wage 2015-16 to 2018-19	1-13 weeks	0.142*** (0.006)	0.143*** (0.059)	0.124*** (0.006)
	14-26 weeks	0.151*** (0.005)	0.166*** (0.005)	0.147*** (0.005)
	27-39 weeks	0.122*** (0.005)	0.125*** (0.005)	0.122*** (0.005)
	40-52 weeks	0.152*** (0.006)	0.152*** (0.006)	0.152*** (0.006)
	53-65 weeks	0.120*** (0.005)	0.122*** (0.005)	0.121*** (0.005)
	66-75 weeks	0.078*** (0.017)	0.077*** (0.017)	0.078*** (0.017)
2018-19 superannuation balance	1-13 weeks	0.061*** (0.003)	0.074*** (0.021)	0.057*** (0.003)
	14-26 weeks	0.084*** (0.003)	0.112*** (0.003)	0.091*** (0.003)
	27-39 weeks	0.084*** (0.003)	0.101*** (0.003)	0.100*** (0.003)
	40-52 weeks	0.087*** (0.003)	0.035*** (0.003)	0.034*** (0.003)
	53-65 weeks	0.030*** (0.003)	0.078*** (0.003)	0.075*** (0.003)
	66-75 weeks	0.072*** (0.011)	0.119*** (0.011)	0.115*** (0.011)
Binary variables (effect of condition on hazards)				
JobKeeper	1-13 weeks	2.601*** (0.105)	0.222*** (0.070)	2.592*** (0.104)
	14-26 weeks	0.839*** (0.017)	0.769*** (0.01)	0.823*** (0.017)
	27-39 weeks	0.686*** (0.016)	0.680*** (0.014)	0.678*** (0.016)
	40-52 weeks	0.133*** (0.014)	-0.131*** (0.014)	0.129*** (0.013)
	53-65 weeks	-0.235*** (0.014)	0.235*** (0.014)	-0.231*** (0.014)
	66-75 weeks	-0.032 (0.043)	-0.033 (0.043)	-0.037 (0.042)
State: Victoria	1-13 weeks	-0.159*** (0.008)	-0.294*** (0.043)	-0.141*** (0.008)
	14-26 weeks	-0.343*** (0.006)	-0.346*** (0.006)	-0.341*** (0.006)
	27-39 weeks	-0.112*** (0.007)	-0.107*** (0.007)	-0.112*** (0.007)
	40-52 weeks	0.230*** (0.012)	0.241*** (0.012)	0.229*** (0.012)
	53-65 weeks	0.163*** (0.011)	0.172*** (0.011)	0.161*** (0.011)
	66-75 weeks	0.076** (0.034)	0.086*** (0.034)	0.074** (0.034)
Education: Tertiary	1-13 weeks	-0.198*** (0.010)	-0.116 (0.056)	-0.171*** (0.010)
	14-26 weeks	-0.095*** (0.009)	-0.111*** (0.009)	-0.091*** (0.009)
	27-39 weeks	-0.048** (0.009)	-0.064*** (0.010)	-0.050** (0.009)
	40-52 weeks	0.174*** (0.014)	0.164*** (0.014)	0.172*** (0.014)
	53-65 weeks	0.160*** (0.013)	0.148*** (0.013)	0.155*** (0.013)
	66-75 weeks	0.100** (0.041)	0.092*** (0.041)	0.095** (0.041)

Extra results

Table 3.C5. Exit rate estimates when excluding selected covariates, first withdrawal

Length of spell	Full controls (1)	Super balances (2)	Log of average pre-covid wages (3)	Week of spell (4)	Sex (5)	Home (6)	Marital (7)	Child (8)	Education (9)	Location (10)	Industry (11)
		Full control estimates of withdrawal in first opportunity, adjusted by not controlling for:									
Obs	2,232,730	2,232,730									
Events	381,042	381,042									
Weeks 1-13	-0.775***	-0.772***	-0.772***	-0.776***	-0.775***	-0.777***	-0.773***	-0.777***	-0.775***	-0.773***	-0.775***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Weeks 14-26	-0.311***	-0.299***	-0.301***	-0.315***	-0.312***	-0.319***	-0.307***	-0.317***	-0.315***	-0.298***	-0.312***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Weeks 27-39	-0.251***	-0.236***	-0.242***	-0.253***	-0.252***	-0.259***	-0.247***	-0.257***	-0.256***	-0.245***	-0.251***
	(0.005)	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Weeks 40-52	-0.133***	-0.123***	-0.118***	-0.133***	-0.134***	-0.143***	-0.128***	-0.140***	-0.148***	-0.139***	-0.133***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.007)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Weeks 52-65	-0.077***	-0.058***	-0.065***	-0.074***	-0.078***	-0.089***	-0.073***	-0.085***	-0.092***	-0.081***	-0.077***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.007)	(0.008)	(0.007)	(0.008)	(0.008)	(0.008)
Weeks 66-75	-0.039	-0.011	-0.034	-0.027	-0.040	-0.052	-0.037	-0.047	-0.052	-0.040	-0.039
	(0.026)	(0.027)	(0.027)	(0.027)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)

Data: Australian Taxation Office and Department of Social Services

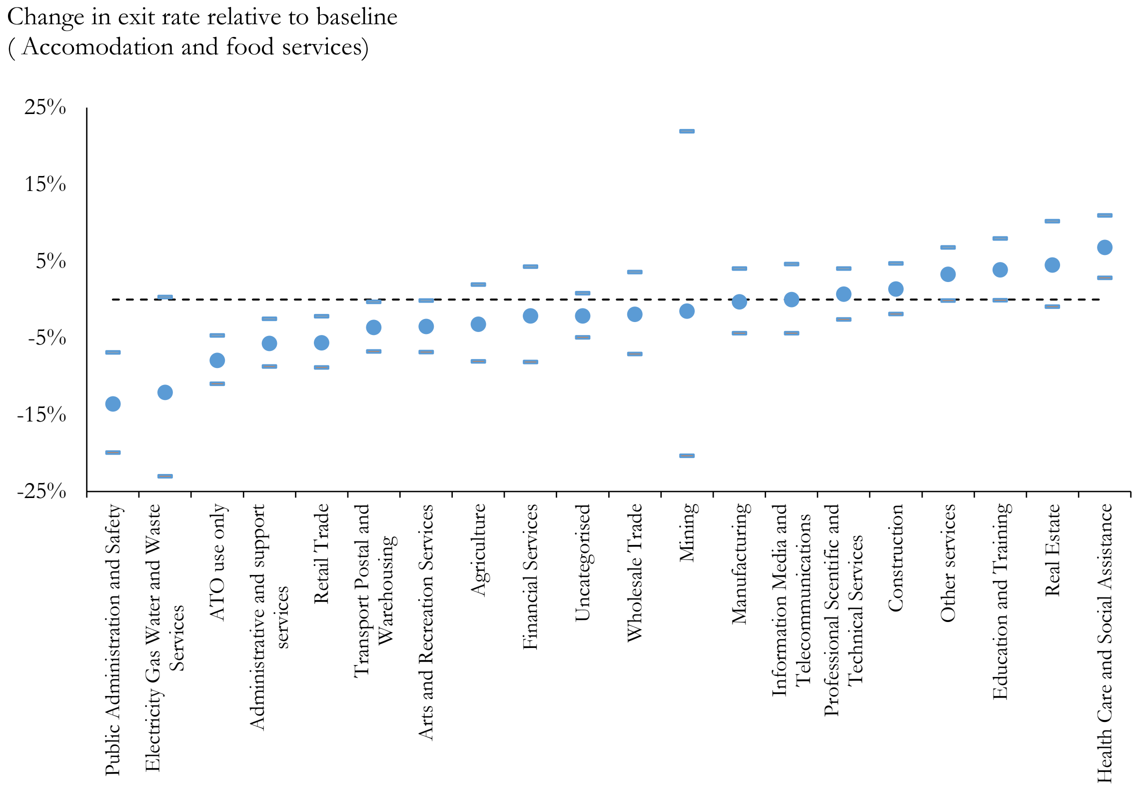
Notes: *** p < 0.01 ** p < 0.02 * p < 0.05. Coefficients can be interpreted as the change in the exit rate associate with the withdrawal from superannuation. Standard errors (transformed to account for log-linear model specification) are clustered at the individual level and are in parentheses. The study population for first withdrawal is conditioned on those who commenced their unemployment spells between 23 January 2020 and 18 April 2020 and remained on support until at least 19 April 2020.

Re-employment prospects also varied by sector of (pre-spell) employment (Figure 3.C6) and occupation (Figure 3.C7).

Individuals made employed in Electricity, Gas, Water and Waste Services (labelled 'public utilities' as shorthand), Administration and Support, Retail, Agriculture, Transport and Mining experienced comparatively worse subsequent exit, while recipients from Healthcare and Social Assistance, Education and Training, Science and Technical, Real Estate and Media and Telecommunications were more likely to exit unemployment payments.

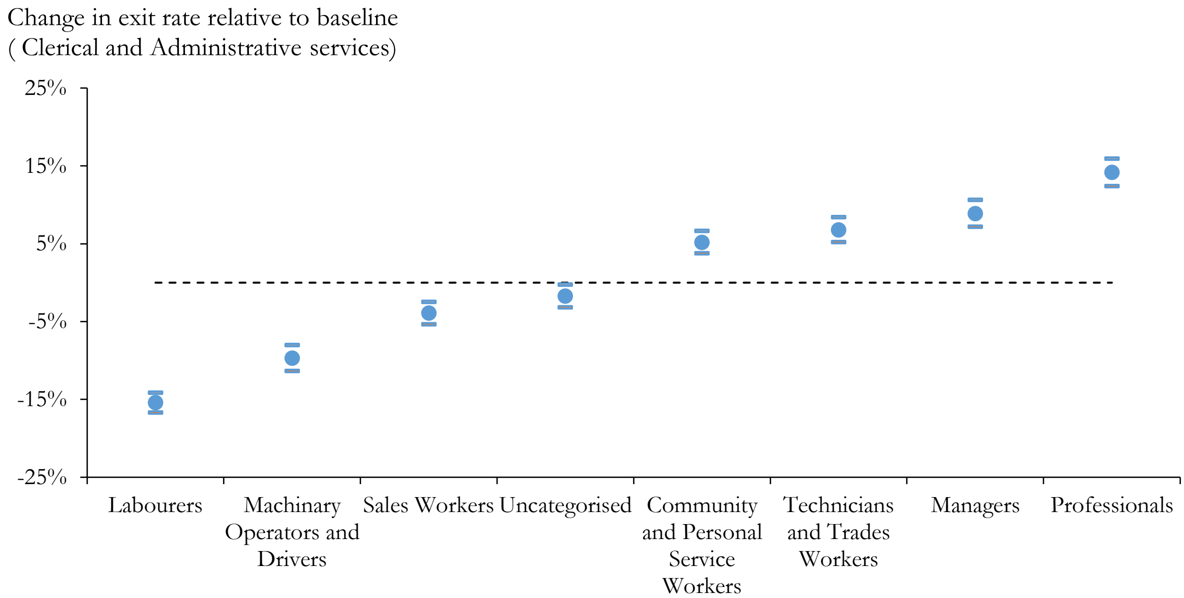
Those leaving 'white collar' occupations such as Professionals and Managers experienced comparatively better subsequent exit from unemployment than those leaving 'blue collar' occupations such as labourers and machinery operators and drivers.

Figure 3.C1 Change in exit rate by industry of employment, first withdrawal



Data: Australian Taxation Office and Department of Social Services
Notes. Presents coefficient estimates of the covariates from the Cox estimation generated alongside the estimates produced in specification 2 in Table 4. Upper and lower bounds calculated based on a 95% confidence interval have also been presented for each estimate. See Appendix B for values.

Figure 3.C2. Change in exit rate by occupation, first withdrawal



Data: Australian Taxation Office and Department of Social Services
Notes. Presents coefficient estimates of the covariates from the Cox estimation generated alongside the estimates produced in specification 2 in Table 4. Upper and lower bounds calculated based on a 95% confidence interval have also been presented for each estimate. See Appendix B for values.

3.D Covariate adjustment

Matching methods are increasingly used to evaluate the effect of policy treatments in observational studies when there is a non-random assignment of treatment, such as this study. We treat matching as a sensitivity check. With financial variables (an individual's wage, superannuation balance and to a lesser extent their sector when this information is available) most likely to be correlated with unobserved ability, we have focussed on matching these covariates.

Checking initial imbalance

On average the population of unemployment benefit recipients that didn't withdraw in the first opportunity are younger, earn less and have lower pre-covid superannuation balances (Table 3.D1).

Table 3.D1. Means before matching, first withdrawal

Covariate	Means Treated	Means Control	Std. Mean Diff.	Var. Ratio	eCDF mean	eCDF Max
Distance	0.43	0.36	0.57	1.01	0.16	0.22
Age (years)	37.40	36.64	0.07	0.60	0.07	0.15
Log wage 2016-19	11.52	11.16	0.36	0.78	0.11	0.16
Log pre-covid superannuation balance	10.12	9.53	0.44	0.51	0.10	0.18
Industry						
Agriculture	0.02	0.01	0.04	.	0.01	0.01
Mining	0.06	0.04	0.07	.	0.02	0.02
Manufacturing	0.01	0.01	0.02	.	0.00	0.00
Electricity Gas Water and Waste Services	0.02	0.03	-0.07	.	0.01	0.01
Construction	0.04	0.03	0.08	.	0.02	0.02
Wholesale trade	0.08	0.04	0.15	.	0.04	0.04
Retail Trade	0.01	0.02	-0.07	.	0.01	0.01
Accommodation and Food Services	0.00	0.00	0.02	.	0.00	0.00
Transport Postal and Warehousing	0.00	0.00	0.02	.	0.00	0.00
Information Media and Telecommunications	0.02	0.02	-0.01	.	0.00	0.00
Financial Services	0.01	0.01	-0.03	.	0.00	0.00
Real Estate	0.01	0.01	0.03	.	0.00	0.00
Professional, Scientific and Technical Services	0.00	0.00	0.01	.	0.00	0.00
Administrative and Support Services	0.04	0.04	0.03	.	0.01	0.01
Public Administration and Safety	0.05	0.05	-0.01	.	0.00	0.00
Education and Training	0.00	0.00	0.03	.	0.00	0.00
Health Care and Social Assistance	0.01	0.01	0.01	.	0.00	0.00
Arts and Recreation Services	0.03	0.02	0.04	.	0.01	0.01
Other Services	0.06	0.03	0.13	.	0.03	0.03
ATO Use Only	0.53	0.64	-0.22	.	0.11	0.11
Uncategorised	0.01	0.00	0.02	.	0.00	0.00
Occupation						
Clerical and Administrative Workers	0.08	0.09	-0.05	.	0.01	0.01
Community and Personal Service Workers	0.15	0.18	-0.09	.	0.03	0.03
Labourers	0.15	0.11	0.11	.	0.04	0.04
Machinery Operators and Drivers	0.08	0.04	0.12	.	0.03	0.03
Managers	0.09	0.07	0.07	.	0.02	0.02
Professionals	0.07	0.10	-0.11	.	0.03	0.03
Sales Workers	0.08	0.11	-0.11	.	0.03	0.03
Technicians and Trades Workers	0.14	0.10	0.12	.	0.04	0.04
Uncategorised	0.16	0.19	-0.08	.	0.03	0.03

While for most sectors (as self-recorded in 2019-20 tax returns) there is no major compositional difference in populations, there are proportionally fewer withdrawers when no sector is nominated (uncategorised), and proportionally more withdrawers when construction, transport, post and warehousing, or administrative and support services are nominated. The general levels of imbalance appear mild (on the basis of variance ratio for the overall distance measure is close to 1, although standardized mean difference and eCDF are not close to 0 and variance of ratio of each of the individual covariates are not close to 1). Note that with sector, there is a large share of individuals that did not nominate an industry on their 2019-20 tax returns (an issue with discuss further in Appendix 3.E).

The overall picture is similar for the second withdrawal (Table 3.D2). The general levels of imbalance, as signified by variance ratios further from 1 and standardized mean difference and eCDF still away from 0, suggest that there is a stronger case for balancing when considering the second withdrawal.

Table 3.D2. Means before matching, second withdrawal

Covariate	Means Treated	Means Control	Std. Mean Diff.	Var. Ratio	eCDF mean	eCDF Max
Distance	0.42	0.30	0.79	0.93	0.21	0.31
Age (years)	38.66	36.65	0.19	0.55	0.09	0.22
Log wage 2016-19	11.65	11.15	0.52	0.68	0.15	0.23
Log pre-covid superanuation balance	10.44	9.52	0.80	0.36	0.16	0.30
Industry						
Agriculture	0.02	0.01	0.05	.	0.01	0.01
Mining	0.06	0.04	0.08	.	0.02	0.02
Manufacturing	0.01	0.01	0.03	.	0.00	0.00
Electricity Gas Water and Waste Services	0.02	0.03	-0.09	.	0.01	0.01
Construction	0.05	0.03	0.10	.	0.02	0.02
Wholesale trade	0.09	0.04	0.17	.	0.05	0.05
Retail Trade	0.01	0.02	-0.08	.	0.01	0.01
Accommodation and Food Services	0.00	0.00	0.02	.	0.00	0.00
Transport Postal and Warehousing	0.00	0.00	0.03	.	0.00	0.00
Information Media and Telecommunications	0.02	0.02	-0.03	.	0.00	0.00
Financial Services	0.01	0.01	-0.03	.	0.00	0.00
Real Estate	0.01	0.01	0.04	.	0.01	0.01
Professional, Scientific and Technical Services	0.00	0.00	0.01	.	0.00	0.00
Administrative and Support Services	0.04	0.04	0.03	.	0.01	0.01
Public Administration and Safety	0.05	0.05	-0.01	.	0.00	0.00
Education and Training	0.00	0.00	0.04	.	0.00	0.00
Health Care and Social Assistance	0.01	0.01	0.02	.	0.00	0.00
Arts and Recreation Services	0.03	0.02	0.05	.	0.01	0.01
Other Services	0.06	0.03	0.13	.	0.03	0.03
ATO Use Only	0.51	0.64	-0.26	.	0.13	0.13
Uncategorised	0.01	0.00	0.03	.	0.00	0.00
Occupation						
Clerical and Administrative Workers	0.08	0.09	-0.04	.	0.01	0.01
Community and Personal Service Workers	0.14	0.18	-0.13	.	0.04	0.04
Labourers	0.15	0.11	0.11	.	0.04	0.04
Machinery Operators and Drivers	0.08	0.04	0.15	.	0.04	0.04
Managers	0.10	0.07	0.09	.	0.03	0.03
Professionals	0.07	0.10	-0.13	.	0.03	0.03
Sales Workers	0.08	0.12	-0.14	.	0.04	0.04
Technicians and Trades Workers	0.15	0.10	0.15	.	0.05	0.05
Uncategorised	0.15	0.19	-0.10	.	0.04	0.04

We will present two matching techniques: coarsened exact matching and nearest neighbour matching.

Coarsened exact matching

Coarsened exact matching does not result in dropping many observations. As reported in Table 3.6, approximately 85% of control units (277,218 of the 323,268 in first withdrawal and 230,329 out of 276,551 in second withdrawal) and 90% of treated units (187,406 out of 206,435 in first withdrawal and 157,287 out of 173,537 in second withdrawal) remain after matching via coarsened exact matching.

Figures 3.D1 and 3.D2 are Love plots that provide a visual assessment of the quality of matches. It reveals that the while the ummatched data is generally good, coarsened exact matching achieves improved and overall very good balance.

In addition, Figures 3.D3 and 3.D4 are eQQ plots on the non-categorical covariates age, wage and superannuation balance. It shows that while (points far from the solid diagonal lines) are areas of the covariate distributions that differ between treatment and control groups.

Figure 3.D1. Love plots of covariate balance, coarsened exact matching, first withdrawal

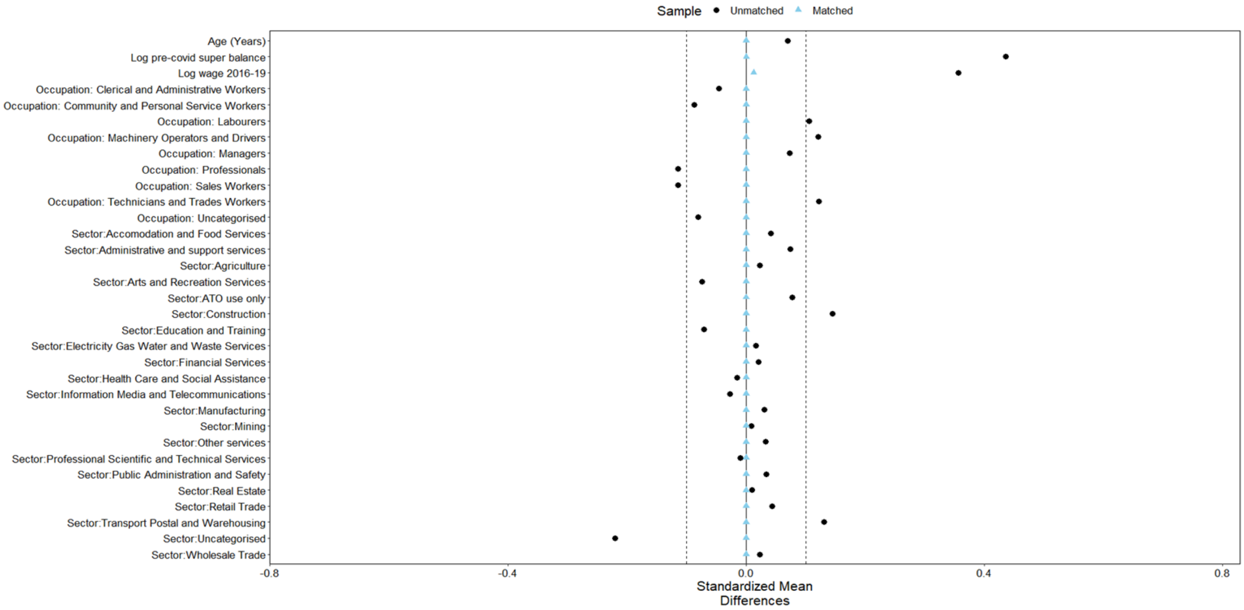


Figure 3.D2. Love plots of covariate balance, coarsened exact matching, second withdrawal

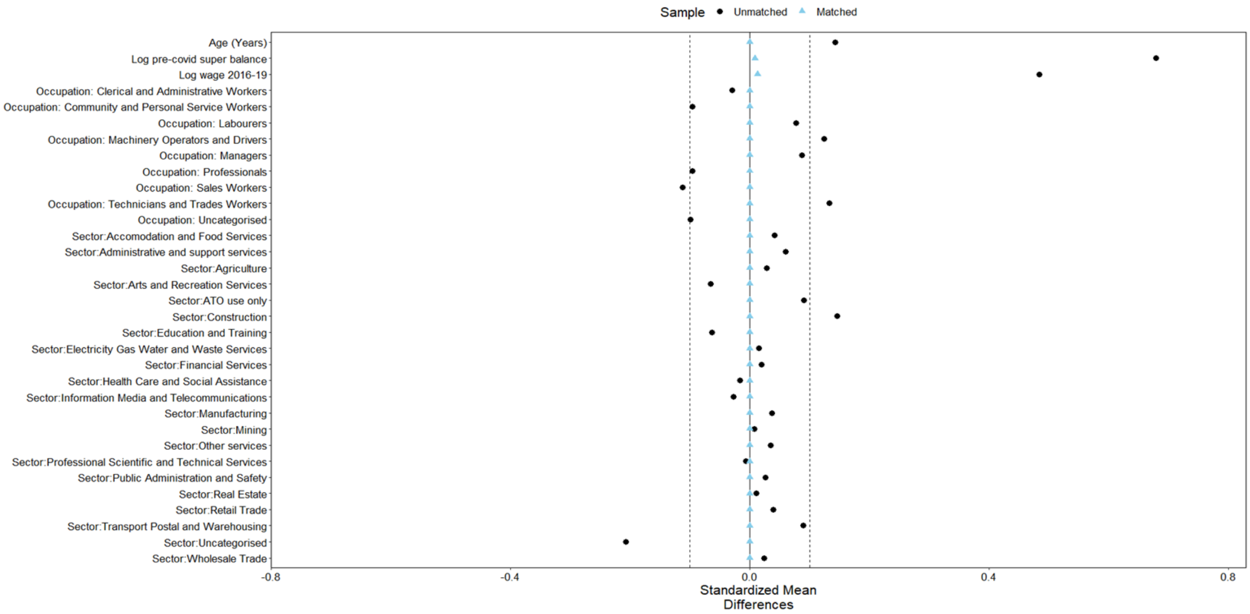


Figure 3.D3. QQ plots, coarsened exact matching, first withdrawals

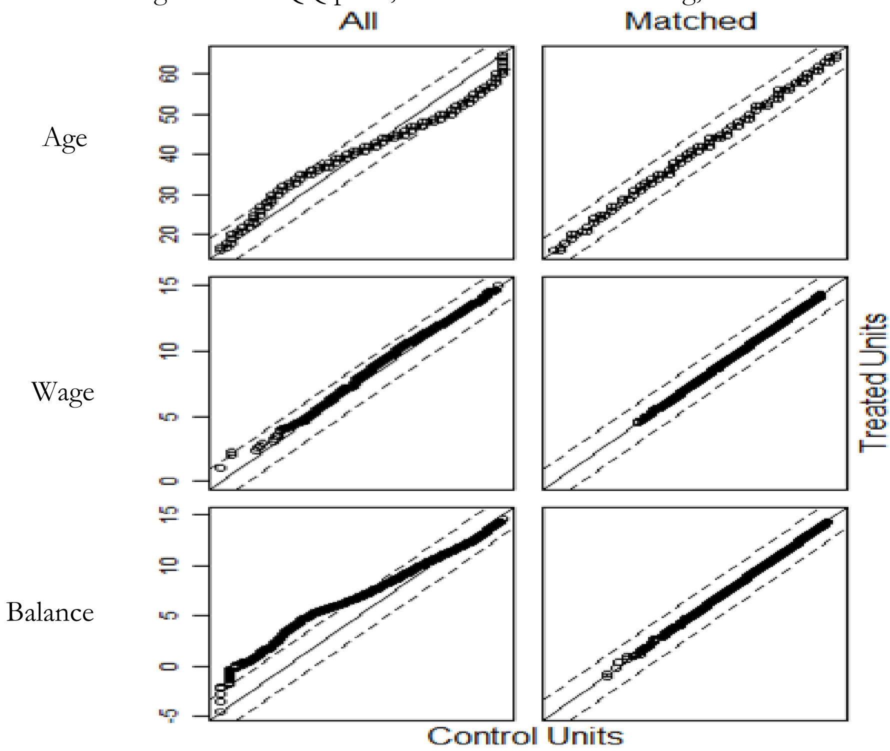
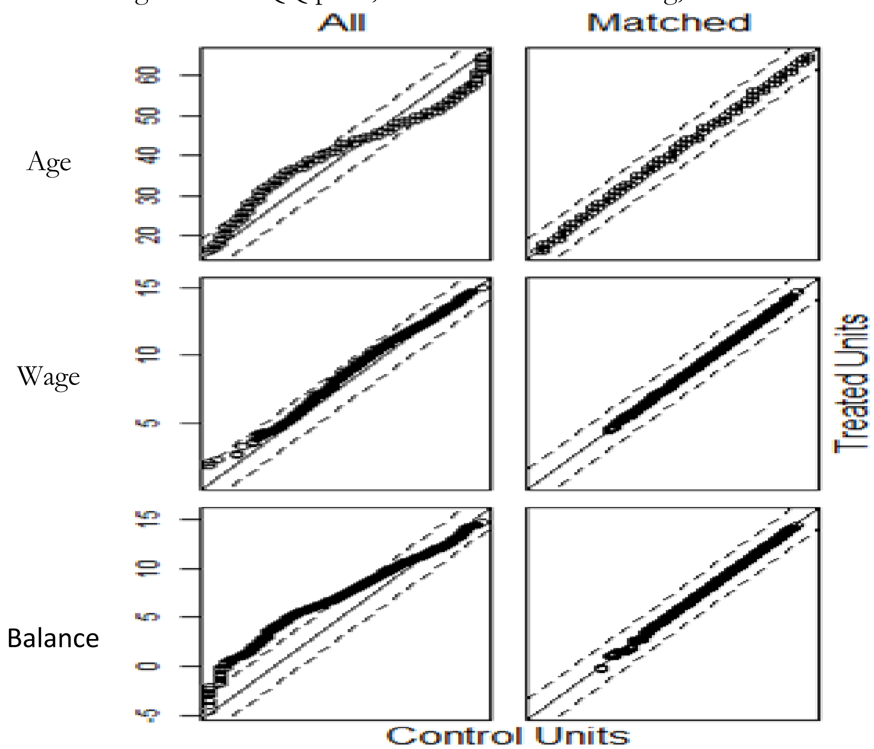


Figure 3.D4. QQ plots, coarsened exact matching, second withdrawal



Nearest Neighbour Matching

Matching using nearest neighbour matching requires us to drop more observations. Approximately 2/3 of control units (206,435 of 323,268) and all of 206,435 treated units remain after matching for the first withdrawal, with a similar proportion for the second. Table 3.D2 shows that the imbalances in the unadjusted population that were measured by the standardized mean differences, variance ratios and cumulative density function statistics are now gone. The variance ratio values are close to one, the standardized mean difference and empirical cumulative density function estimate are close to 0.

Assessing the quality of matches:

The primary visualisation of the quality of matches in terms of covariate balance is the Love plot. Nearest neighbour techniques improve the quality of matches in both first and second withdrawal (Figures 3.D5 and 3.D6). We accompany this by examining the balance of covariates using eQQ plots. (Figures 3.D7 and 3.D8). Coarsened exact matching appears, overall, to produce a better quality of matches. The unmatched data used in the full parametric model are, based upon Figures 3.D4 and C5, well matched across the majority of characteristics. The main differences are in wages and pre-existing superannuation balances.

Figure 3.D5. Love plot of covariate balance, nearest neighbour matching, first withdrawal

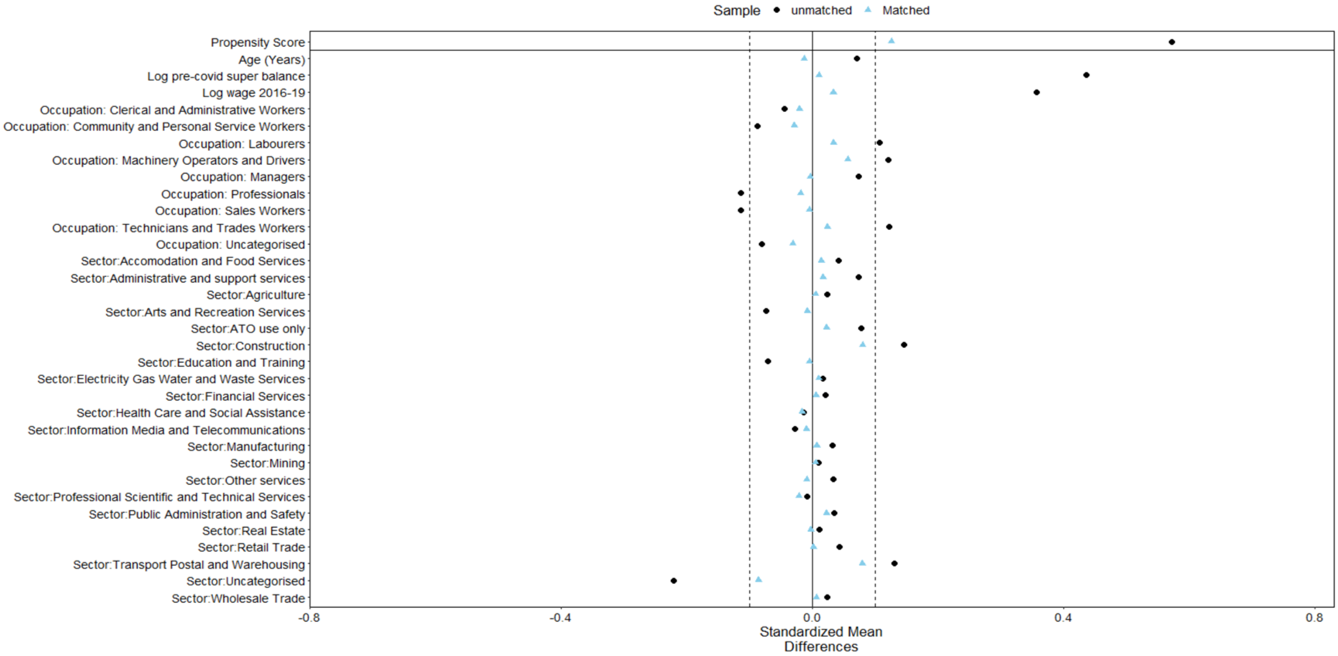


Figure 3.D6. Love plot of covariate balance, nearest neighbour matching, second withdrawal

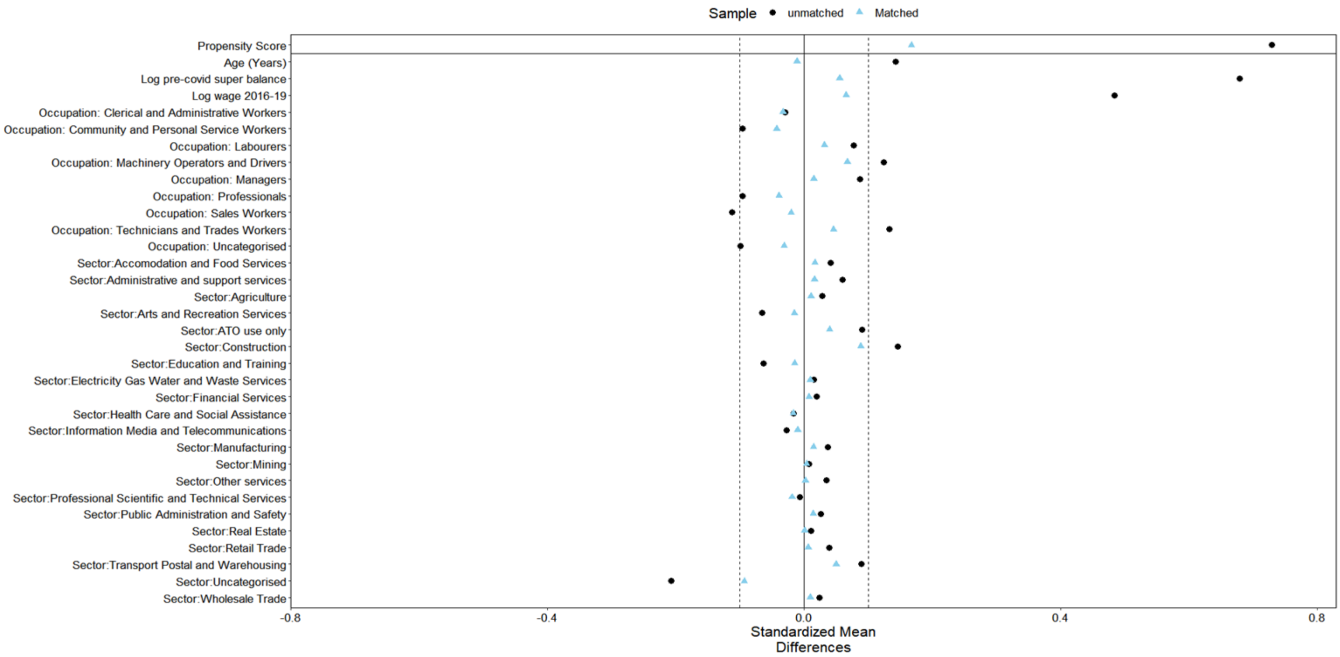


Figure 3.D7. QQ plots, nearest neighbour matching, first withdrawal

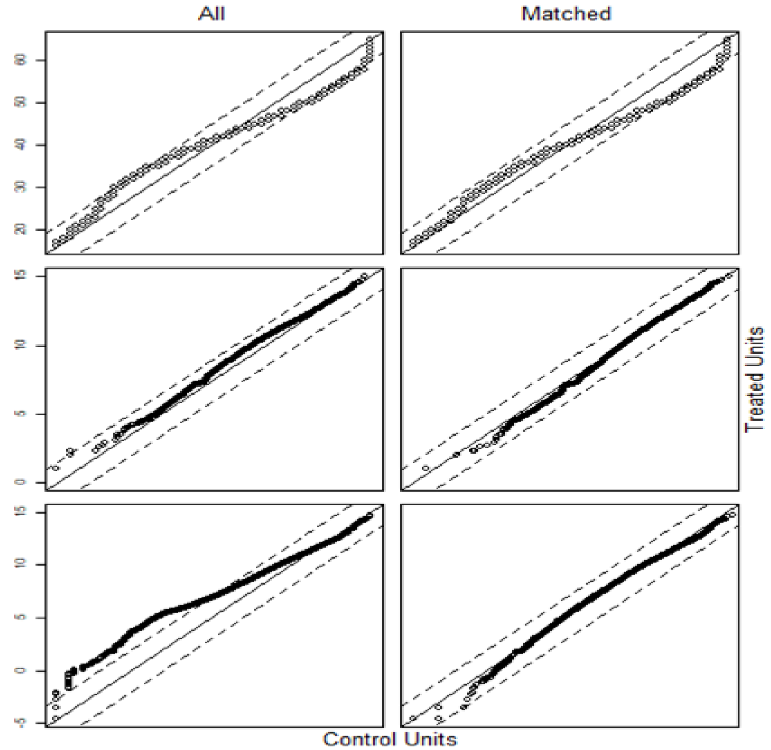
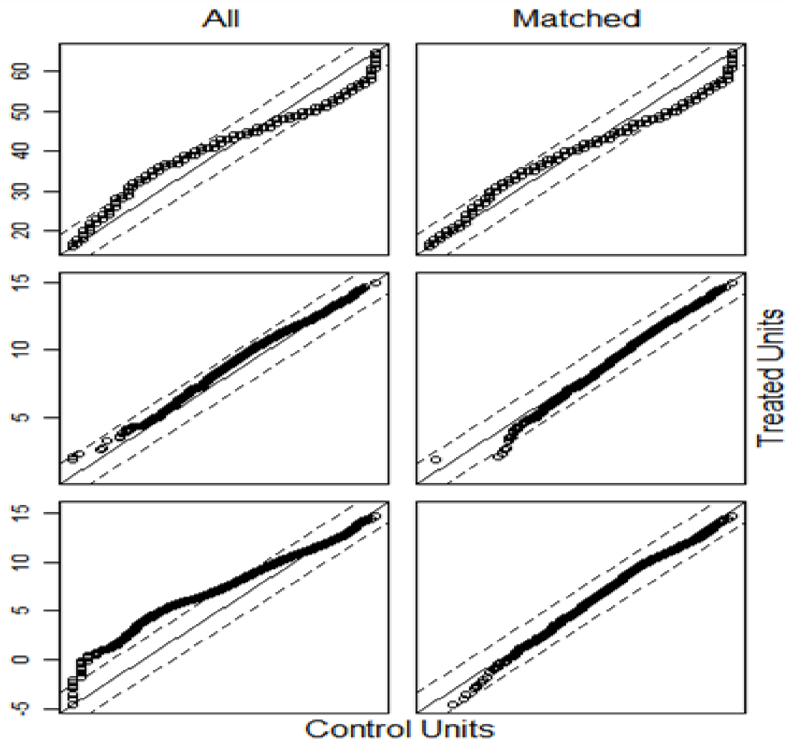


Figure 3.D8. QQ plots, nearest neighbour matching, second withdrawal



3.E Sample selection

Estimates by week that unemployment spells commenced

The population has been selected on the basis of inflows onto unemployment benefits over a three month window from late-January 2020 to mid-April 2020. We have detailed how this was a period of significant disruption in Australian social and economic life, with the introduction of lockdowns from March 18, the rapid rollout of major fiscal support measures, and dislocation in the labour market. This necessitates an examination of the sensitivity of estimated withdrawal effects over the course of the three month window.

The estimated effect of withdrawal varies by week that an unemployment spell commences (Table 3.E1). In broad terms, the effects of withdrawal for those who began their spells in late March most closely resembles the pooled estimates presented in Table 4 for the overall first withdrawal window. For those whose spells commenced between late January and mid-March, withdrawal's effect was more temporary, and more pronounced in early quarters.

Part of the explanation stems from the large volume of spells commencing in late March. Over half the population was in receipt of a payment in the week from 19 to 25 March and more than 80% of the population (436,935 individuals) began their spells over the three weeks from 19 March to 8 April. While one approach could have been to estimate our models based upon a narrower pool of unemployment benefit recipients from this three week period, what is revealed in Table 3.E1 is that drawing from earlier (and later) weeks in the pandemic does not materially affect our results.

Table 3.E1. Sensitivity of estimated effect of withdrawal to week that unemployment spell begins

	Week that unemployment spell begins												
Variable	Jan	February				March					April		
	23 Jan – 29 Jan	30 Jan – 5 Feb	6 Feb – 12 Feb	13 Feb – 19 Feb	20 Feb – 26 Feb	27 Feb – 4 Mar	5 Mar – 11 Mar	12 Mar – 18 Mar	19 Mar – 25 Mar	26 Mar – 1 Apr	2 Apr – 8 Apr	9 Apr – 15 Apr	16 Apr – 18 Apr
N	27,487	18,803	26,821	27,038	28,065	27,923	44,676	41,676	1,306,497	343,657	234,637	137,937	57,513
Unique N	4,658	3,206	4,635	4,725	4,943	4,868	7,995	7,733	293,947	83,297	59,691	35,441	14,564
Withdraws	1,864	1,319	1,880	1,937	1,963	1,997	3,306	3,316	116,609	31,946	21,936	12,873	5,489
Events	2,102	1,460	2,187	2,276	2,325	2,301	3,989	4,233	213,043	63,984	45,395	26,950	10,797
Estimated exit rate from first withdrawal													
Weeks 1-13	-0.958***	-0.904***	-0.821**	-0.752***	-0.887***	-0.870***	-0.848***	-0.832***	-0.791***	-0.778***	-0.762***	-0.695***	-0.682***
	(0.391)	(0.298)	(0.169)	(0.146)	(0.131)	(0.135)	(0.09)	(0.071)	(0.007)	(0.012)	(0.014)	(0.018)	(0.027)
Weeks 14-26	-0.629***	-0.588***	-0.557***	-0.490***	-0.339***	-0.362***	-0.319***	-0.341***	-0.317***	-0.318***	-0.275***	-0.284***	-0.294***
	(0.076)	(0.089)	(0.071)	(0.071)	(0.082)	(0.082)	(0.06)	(0.054)	(0.007)	(0.012)	(0.014)	(0.019)	(0.029)
Weeks 27-39	-0.129	-0.357***	-0.139	-0.190*	-0.162***	-0.223***	-0.137***	-0.271***	-0.294***	-0.211***	-0.215***	-0.191***	-0.206***
	(0.098)	(0.097)	(0.094)	(0.082)	(0.082)	(0.077)	(0.063)	(0.051)	(0.007)	(0.014)	(0.017)	(0.023)	(0.037)
Weeks 40-52	-0.162	-0.116	0.071	-0.125	-0.049	-0.221***	-0.109	-0.013	-0.162***	-0.134***	-0.121***	-0.103***	-0.055***
	(0.088)	(0.111)	(0.111)	(0.093)	(0.099)	(0.080)	(0.070)	(0.072)	(0.01)	(0.019)	(0.022)	(0.029)	(0.026)
Weeks 53-65	0.006	-0.011	0.006	-0.006	0.135	-0.029	-0.051	0.013	-0.099***	-0.074***	-0.113***	-0.095***	-0.065
	(0.088)	(0.1)	(0.081)	(0.079)	(0.09)	(0.076)	(0.058)	(0.063)	(0.01)	(0.02)	(0.023)	(0.031)	(0.054)
Weeks 66-75	-0.018	0.012	0.037	-0.099	0.213	0.072	-0.243	0.047	-0.085***	0.047			
	(0.1)	(0.139)	(0.127)	(0.122)	(0.174)	(0.173)	(0.12)	(0.173)	(0.032)	(0.125)			
Concord-ance	0.618	0.639	0.623	0.627	0.621	0.621	0.621	0.635	0.667	0.667	0.654	0.649	0.648
Wald	512	317	450	519	948	516	711	982	65,650	19,163	11,726	6,466	2,633

Another potential source of heterogeneity stems from the timing of withdrawal. Table 3.E2 presents the estimated effect of withdrawals for those who began their spells during just one week, from 19-25 March. This sub-population of individuals could withdraw in the first tranche of withdrawals at a gap of between a month and 14 weeks after their unemployment benefit spell commenced.

Table 3.E2 shows that the estimated effect of withdrawals also varies with timing of withdrawal. For example, for those who waited until the end of the period to withdraw, the chance of remaining on benefits immediately after withdrawal approached 1. In general, the estimates are consistent in significance and magnitude to the pooled estimates for this sub-sample of the population.

There may be a kind of mechanical bias inherent in most of our results. Such bias may arise due to two factors: withdrawers included in the sample are (by definition) unemployed at the time they make their withdrawal, and there is heterogeneity in the timing of the withdrawal. Together, they imply that even if withdrawal decisions are random, and withdrawal has no causal effect on exit rates, we would find that withdrawers have higher exit rates than non-withdrawers, especially in earlier periods after withdrawal.

There are three reasons to not be concerned with the role that such mechanical bias might play in our results, however. First, we take some comfort in the first column of Table 3.E2 (which would be most impacted by this bias) are consistent with the results presented above. In addition, preliminary analysis of two variations of Table 3.E2 produced no material causes to change interpretation (and the results are available upon request to the authors). The first is by considering re-basing the estimation according to the time since withdrawal was taken, rather than length of spell. The second is by restricting the sample to a) only those who were unemployed on a particular day, and then comparing to those who withdrew on a single day (such as within a week or two of commencing an unemployment payments spell).

Table 3.E2. Sensitivity of estimated effect of withdrawal to the week that withdrawal occurs

Variable	For population commenced unemployment spell between 19 – 25 March, month that first withdrawal takes place:										
	April	May					June				
	19 Apr – 25 Apr	26 Apr – 2 May	3 May – 9 May	10 May – 16 May	17 May – 23 May	24 May – 30 May	31 May – 6 Jun	7 Jun – 13 Jun	14 Jun – 20 Jun	21 Jun – 27 Jun	28 Jun – 30 Jun
Withdrawers	60,328	14,813	9,282	6,646	5,126	4,858	4,124	3,422	2,967	3,387	1,656
Weeks gap from spell to withdrawal	4	5	6	7	8	9	10	11	12	13	14
Estimated exit rate from withdrawal											
Weeks 1-13	-0.784*** (0.009)	-0.729*** (0.018)	-0.730*** (0.022)	-0.725*** (0.026)	-0.782*** (0.031)	-0.833*** (0.035)	-0.864*** (0.041)	-0.901*** (0.051)	-0.959*** (0.080)	-0.998*** (0.369)	N/A
Weeks 14-26	-0.309*** (0.009)	-0.328*** (0.016)	-0.267*** (0.020)	-0.289*** (0.024)	-0.347*** (0.026)	-0.288*** (0.027)	-0.314*** (0.029)	-0.301*** (0.032)	-0.279*** (0.034)	-0.310*** (0.031)	-0.356*** (0.044)
Weeks 27-39	-0.303*** (0.008)	-0.274*** (0.016)	-0.256*** (0.020)	-0.260*** (0.023)	-0.242*** (0.026)	-0.286*** (0.026)	-0.268*** (0.028)	-0.252*** (0.031)	-0.251*** (0.033)	-0.270*** (0.031)	-0.214*** (0.044)
Weeks 40-52	-0.156*** (0.012)	-0.171*** (0.022)	-0.116*** (0.028)	-0.201*** (0.032)	-0.144** (0.036)	-0.109*** (0.038)	-0.109*** (0.040)	-0.148*** (0.043)	-0.156*** (0.046)	-0.137*** (0.043)	0.01*** (0.067)
Weeks 53-65	-0.093*** (0.012)	-0.093** (0.021)	-0.056*** (0.027)	-0.120** (0.030)	-0.125** (0.034)	-0.070* (0.036)	-0.070*** (0.039)	-0.037*** (0.043)	-0.014*** (0.046)	-0.132*** (0.040)	-0.152*** (0.058)
Weeks 66-75	-0.103*** (0.039)	-0.070 (0.070)	-0.094 (0.088)	-0.120 (0.099)	0.084 (0.124)	-0.035 (0.121)	-0.035 (0.120)	0.275 (0.171)	-0.230 (0.140)	0.085 (0.148)	-0.008 (0.203)
Concordance	0.668	0.668	0.667	0.667	0.667	0.667	0.667	0.667	0.667	0.667	0.666
Wald	55,450	45,338	43,997	43,550	43,052	43,086	42,911	42,700	42,411	42,373	190,236

Extending and constricting the sample selection window

Table 3.E3. Sensitivity of estimates to changing the sample selection window

Length of spell	Extend sample earlier: from 18 October 2019 to 18 April 2020		Extend sample later: from 23 Jan 2020 to 30 June 2020		Restrict age range to 22 - 58 year age group	
	First	Second	First	Second	First	Second
	(3)	(4)	(5)	(6)	(7)	(8)
Obs	2,562,886	2,446,732	2,934,050	2,803,427	2,017,347	1,918,864
Unique Obs	576,576	494,453	701,301	603,601	454,758	384,892
Withdrawals	225,268	191,470	247,390	215,907	194,866	164,502
Events	397,675	323,269	510,888	420,507	329,765	266,724
1-13 weeks	-0.775***	-0.623***	-0.736***	-0.720***	-0.782***	-0.720***
	(0.005)	(0.030)	(0.004)	(0.010)	(0.005)	(0.010)
14-26 weeks	-0.321***	-0.451***	-0.311***	-0.443***	-0.302***	-0.443***
	(0.005)	(0.005)	(0.004)	(0.004)	(0.005)	(0.004)
27-39 weeks	-0.257***	-0.343***	-0.197***	-0.291***	-0.241***	-0.291***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.005)
40-52 weeks	-0.136***	-0.168***	-0.154***	-0.166***	-0.139***	-0.166***
	(0.007)	(0.007)	(0.006)	(0.006)	(0.008)	(0.006)
53-65 weeks	-0.080***	-0.135***	-0.056***	-0.119***	-0.085***	-0.119***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)	(0.007)
66-78 weeks	-0.025*	-0.058***	-0.038	-0.071***	-0.011	-0.071***
	(0.018)	(0.018)	(0.026)	(0.026)	(0.030)	(0.026)
Model fit:						
Concordance	0.696	0.675	0.669	0.651	0.682	0.651
Wald test	161,321	100,282	152,271	100,334	114,795	100,334

We also examine how estimated effects of lump sum withdrawals change when varying two assumptions underpinning sample selection.

On the first assumption, restricting the age range of study to a narrower cohort of individuals aged 22-58 (rather than 16-65) ensures a tighter targeting to JobSeeker (and Newstart) recipients who have accessed superannuation early. At the bottom end of the age spectrum, the age of eligibility for JobSeeker is 22, while job seekers aged 16-21 instead receive Youth Allowance. At the top end of the age spectrum, the age at which retired individuals can access their superannuation if retired is 58 for current retirees. Those under the age of 58 face stronger restrictions on being able to access their superannuation, so restricting the sample will ensure that estimates are confined to individuals whose option value associated with withdrawing is higher. By adding those aged 16-21 and those aged 59-65 into our sample, we increase the overall sample size by 75,000. These include 12,000 individuals who withdrew at the first opportunity and 9,000 who withdrew at the second opportunity.

The second assumption concerns the range of dates during which individuals commenced their spells. We look at two separate extensions to the 3-month window. Extending the sample two months later, to 30 June 2020, increases the starting sample size by an additional 170,000 individuals, including an additional 41,000 withdrawers for the first opportunity and 42,000 for the second opportunity. Extending the sample 3 months earlier, to 18 October 2020, picks up those who commenced a spell on unemployment benefits in the six months prior to program commencement (while maintaining the condition that individuals must still be receiving the payment when the superannuation early release program began). Extending the sample earlier results in 50,000 additional observations, of which 19,000 withdrew the first time and 18,000 the second time. Extending the timeframe earlier produces marginally stronger estimated effects for withdrawers. Extending the timeframe later does not change the headline outcomes meaningfully.

Early exits

Constructing the population such that both withdrawing and non-withdrawing populations were on benefits as at 19 April 2020, when ATO processing of applications for the early withdrawal program had commenced, resulted in the dropping of 12,983 individuals whose (last) spells ended prior to the early release program commencing. Table 3.E4 compares the population characteristics of the group of 'early exits' with the pooled population. Holding all else equal, those who exited unemployment support quickly did so on average within 2.6 weeks; more than 10 times more rapidly than the general population of COVID-19 unemployment benefit recipients. The group had lower historical incomes and superannuation balances than the general population of COVID-19 unemployment benefit recipients. They were also younger, less likely to be married, have children, and more likely to be female.

Excluding early exits is likely biasing our estimates towards zero.

Table 3.E4. Comparing population means of early exits (who were excluded from the sample)

Characteristic	Early exits	Population
Sample size (n)	12,983	529,703
Share of study population in group	2.5	100
Mean 1 July 2019 balance	40,957	50,444
Median 1 July 2019 balance	15,914	20,623
General employment prospects		
Share of group still on unemployment benefits at end of June 2021	0	26.3
Average tenure of completed spells (weeks)	2.6	31.3
Prior year wage		
Mean annual wage (2016-19 fiscal years)	34,730	36,449
Population Characteristics		
Age	33.5	36.9
Share female	56.6	48.0
Share married	29.3	33.8
Share homeowner or mortgagee	25.6	26.1
Share with children	18.7	20.3

Missing values associated with sample selection

Missing data poses a challenge to most empirical studies. Table 3.E5 summarises the level of missingness that is associated with each main covariate.

Table 3.E5. Number of complete and missing observations for each covariate.

Variable	Number complete observations	Number missing observations	Share of observations that are missing
Age*	728,348	-	-
Week spell begins*	728,348	-	-
JobKeeper	728,348	-	-
Home	725,230	3,118	0.4
Sex	725,135	3,213	0.4
Marital	703,828	24,520	3.4
State	691,329	37,019	5.4
2018-19 superannuation balance	612,142	116,206	16.0
Average prior year wage (2016-2019)	554,103	174,245	23.9
Occupation	452,813	275,535	37.8
Children in household	394,398	333,950	45.8
Education level	357,020	371,328	51.0
Industry	264,063	464,285	63.7

* No missing values after constraining the sample to those aged 16-65 and those commencing spells between 23 January 202 and 18 April 2020.

As a general observation, the variables relevant for determining asset and income tests and payment amounts, such as home ownership and partner status, have little missingness. This is not surprising as such information is collected as part of the administration of payments. Variables about individual characteristics sourced from ABS population demographic data sets (such a gender and location) also have very low levels of missingness. Educational attainment and the presence of children in the household (as reported on social security records), and sector (as reported in 2019-20 income tax returns) have higher levels of missingness.

Incorporating information only about individuals with complete information may yield inferences that are substantially different from those that would be obtained had no data been missing (see e.g. Carroll et al. 2020). To reduce the impact of missingness, we construct an "uncagetorised" category which we set equal to one when an individual has a missing value. We do this for home ownership, sex, marital status, state, presence of children, education level and industry. This allows us to keep the maximum number of observations in the sample. This approach will not work for continuous variables and, thus, we drop any observation which has a missing value for 2018-19 superannuation balance, prior year wages, age and the week that spells began.

This results in 198,645 "incomplete cases" which were dropped from our initial sample of 728,348 individuals producing our estimation sample of 529,703 cases with complete information (including 'uncategorised' variables).

Table 3.E6. Population characteristic comparisons of missing values and study population

Characteristic	Incomplete cases (missing continuous covariates)	Population
Sample size (n)	198,645	529,703
Share of population in group	37.5	100
Median withdrawal	10,000	10,000
Median 1 July 2019 balance	12,727	20,623
Share with balance at 1 July 2019	41.5	100
General employment prospects		
Share of group still on unemployment benefits at end of June 2021	41.6	26.3
Average tenure of completed spells (weeks)	34.5	31.3
Average tenure of incomplete spells (weeks)	67.1	66.7
Prior year wage		
Mean annual wage (2016-19 fiscal years)	17,541	36,449
Share with wage	12.3	100
Population Characteristics		
Age	38.3	36.9
Share female	45.0	48.0
Share married	35.0	33.8
Share homeowner or mortgagee	25.0	26.1
Share with children	31.5	20.3

Notes: only taking the averages of those who are present in the sample

Table 3.E6 reveals that the differences in characteristics between complete cases and incomplete cases are large. The incomplete population experiences a significantly lower propensity to withdraw from superannuation (15% of the population withdrew compared to 45% for those with complete data). The lower propensity to withdraw is correlated with: a much lower propensity to have a superannuation balance or wage; a significantly lower wage or salary (in instances where such variables are observed); a much greater probability of continuing to receive unemployment benefits after 75 weeks; and longer tenures on unemployment payments for those who have completed spells (Table 3.E7). For these individuals the effect of withdrawal on unemployment tenures is also weaker and more short-term.

The population differences are likely to arise due to correlations in financial and labour market outcomes. In particular, a lack of recorded information on key financial metrics may be correlated with poorer labour market performance and a lower capacity to engage with government administrative processes.

Table 3.E7. Effect of missingness on estimated exit rates, first withdrawal

	First withdrawal			
	Full sample	Population (Complete cases)	Population (Complete cases)	Incomplete cases
	No controls	Full controls	No controls	No controls possible
	(1)	(2)	(3)	(4)
Sample (N)	3,214,282	2,322,730		891,552
Unique IDs (N_u)	728,348	529,703		198,645
Withdrawals	265,840 (36% of sample)	236,380 (45% of complete cases)		29,460 (15% of incomplete cases)
Exits from unemployment (N_e)	506,633 (70% of sample)	390,555 (74% of complete cases)		116,078 (58% of incomplete cases)
	Estimated impact of superannuation withdrawal on hazard rate			
Weeks 1-13	-0.705***	-0.775***	-0.759***	-0.542***
	(0.005)	(0.005)	(0.005)	(0.019)
Weeks 14-26	-0.111***	-0.311***	-0.241***	-0.013
	(0.008)	(0.005)	(0.005)	(0.019)
Weeks 27-39	-0.050***	-0.251***	-0.186***	0.044
	(0.008)	(0.005)	(0.006)	(0.019)
Weeks 40-52	-0.025***	-0.133***	-0.099***	-0.017
	(0.008)	(0.008)	(0.008)	(0.021)
Weeks 53-65	0.144***	-0.077***	-0.012	0.171***
	(0.008)	(0.008)	(0.008)	(0.022)
Weeks 66-75	0.249***	0.039	-0.051	0.356***
	(0.03)	(0.026)	(0.028)	(0.085)

We are unable to credibly extend an assumption that missing characteristics are missing at random. This motivates our choice to present analysis based on complete cases only. Tables 3.E6 and 3.E7 also reinforce the context-specific nature of our results. The population of unemployment benefit recipients that was not examined in this study are different in meaningful ways from those that were. Caution is advised when attempting to infer the results for the broader population of working age Australians in recent years.

Chapter 4: Early pension withdrawal as stimulus[45]

Also published as Hamilton, S.†, Liu, G.‡, Miranda-Pinto, L., and Sainsbury, T.§ (2023), "Early pension withdrawal as stimulus", *Tax and Transfer Policy Institute Working Paper 3/2023*.

Available at: https://taxpolicy.crawford.anu.edu.au/publication/ttpi-working-papers/21069/early-pension-withdrawal-stimulus

Abstract

During the COVID-19 pandemic, the Australian government allowed the withdrawal of up to A$20,000 (around half median annual wage income) from mandatory private retirement accounts, ordinarily inaccessible until retirement. One in six withdrew A$38 billion (2% of GDP). These transfers were much larger than those typically considered in the literature and represented a liquidity shock, holding lifetime income constant. Using administrative and high-frequency bank transactions data, we find a marginal propensity to spend of at least 0.43–0.48 (90% of this in four weeks), high given the transfer size. Gambling was the largest discernible spending category (larger than credit card repayments). Low rates and levels of saving and high levels of gambling before withdrawal strongly predict withdrawal and spending. We calibrate a heterogeneous-agent model, demonstrating that only under present bias (β = 0.58) can we reconcile the observed magnitude and frequency of the spending response and pre-withdrawal saving behaviour.

[45] We thank Lucas Rosso for excellent research assistance. We thank Robert Barro, James Bishop, Olivier Blanchard, Chris Edmond, Peter Ganong, Richard Holden, Daniel Jaqua, David Laibson, Nicholas Li, Flavio Menezes, Bruce Preston, Terhi Ravaska, Peter Siminski, Mathias Sinning, Ellen Stuart, Alex Tabarrok, Stan Veuger, seminar participants at e61, The George Washington University, The University of Melbourne, the Australian National University, the Productivity Commission, the Department of Prime Minister and Cabinet, the Australian Workshop on Public Finance, the Australia-New Zealand Labour Econometrics Workshop, the WHY–DC Symposium on Policy Evaluation and Causal Inference, the Behavioural Insights Team, the CESifo Conference on Macroeconomics and Survey Data, the International Institute of Public Finance annual congress, and anonymous referees for their helpful feedback. We thank Andrew Charlton for his involvement early in the life of the project. The views in this paper are those of the authors and do not necessarily reflect the views of the International Monetary Fund.

4.1 Introduction

There is a vast literature documenting much larger responses to cash transfers than would be predicted under the permanent-income hypothesis and Ricardian equivalence (Ricardo, 1820; Friedman, 1957; Barro, 1974). [46] Cash transfers are a tiny fraction of lifetime income, so a rational, forward-looking, and liquid person would increase consumption only by a tiny fraction in response—or not at all given higher future taxes. Scholars have proposed two explanations for these responses: 'behavioral', considering deviations from rational, forward-looking behavior such as present bias (Angeletos, Laibson, Repetto, Tobacman and Weinberg, 2001; Parker, 2017; Laibson, Maxted and Moll, 2021); [47] and 'rational', considering liquidity constraints, taking as given rational and forward-looking behavior (Zeldes, 1989; Deaton, 1991; Carroll, 1997; Kaplan and Violante, 2014). Which prevails has implications for policy: if a consumer is rational and forward-looking, easing their liquidity constraint raises their welfare; if they are present-biased, it could lower it. [48]

Under typical cash stimulus, in the order of US$1,000, it can be difficult empirically to distinguish between these explanations. In this paper, we leverage high-frequency bank-transactions and administrative data to study the effects of a very large and unexpected liquidity shock to a broad swath of the population. In this setting, the alternative consumption models generate clearly divergent predictions. During the COVID-19 pandemic, the Australian government for the first time allowed eligible people to withdraw up to A$20,000 (US$13,600) [49] across two tranches from their private retirement savings accounts (called 'Superannuation', or 'Super'), normally inaccessible until retirement. [50],[51] This was a large, voluntary, and direct transfer from a withdrawer's future self: the modal withdrawal by the modal-aged withdrawer can be expected to reduce their balance at retirement by more than $120,000 in today's dollars.[52] In practice, one in six working-age people (or one in four 34-year-olds) participated, withdrawing $38 billion (2% of GDP) in total.

Two features of this setting frame our analysis. First, because withdrawals were optional, we can examine separately the decision to withdraw and to spend conditional on withdrawal. The sign of this selection effect is ambiguous ex ante. Because withdrawals could effectively be re-contributed pre-tax (implying a subsidy of up to $7,528), there was a strong financial incentive to withdraw.[53] And because contributions are mandatory (at 10.5% of wage earnings) and otherwise inaccessible until retirement, the program offered a one-time opportunity to rebalance the portfolio towards higher liquidity. On the other hand, frictions may have prevented withdrawals, such as the mechanism proposed by Attanasio, Kovacs and Moran (2020), in which people deliberately choose low liquidity as a commitment device.

Second, the transfers were an order of magnitude larger than those typically considered in the literature but did not affect permanent income. As noted by Laibson et al. (2021, p.32), to the extent that models with standard preferences can generate large consumption responses, these responses decline rapidly with transfer size. For example, Kaplan and Violante (2014) predict that, with liquidity constraints alone, the marginal propensity to consume (MPC) falls from 0.20 to 0.03 as the transfer size rises from US$500 to

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[46] Examples include Johnson, Parker and Souleles (2006), Shapiro and Slemrod (2009), Sahm, Shapiro and Slemrod (2010), Parker, Soulless, Johnson and McClelland (2013), Broda and Parker (2014), and Agarwal and Qian (2014). Several recent studies have documented large responses to transfers received during the COVID-19 pandemic, including Chetty, Friedman, Hendren and The Opportunity Insights Team (2022), Yannelis and Amato (2022), Karger and Rajan (2021), Kubota, Onishi and Toyama (2021), Baker, Farrokhnia, Meyer, Pagel and Yannelis (2020b), Baker, Farrokhnia, Meyer, Pagel and Yannelis (2020a), and Coibion, Gorodnichenko and Weber (2020).

[47] Pfäuti, Seyrich and Zinman (2023) offer the alternative behavioral explanation that a subset of people are persistently over-confident / over-optimistic, with similar behavioral implications to present bias.

[48] Maxted (2022) finds the welfare cost of present bias is equivalent to a consumption tax of up to 17.2%.

[49] All figures are in Australian dollars unless otherwise stated. As of 2021, in PPP terms, US$1 bought A$1.45.

[50] We estimate at least 70% of working-age people were eligible to withdraw under the program.

[51] We know of two papers on this program. Sainsbury, Breunig and Watson (2022) use the same admin data to study the effect of program participation on employment outcomes. Wang-Ly and Newell (2022) study the program using coarser and more limited data (e.g., monthly, no admin data) from an Australian bank, but find a similarly large spending response.

[52] Based on historical 30-year net returns of 8.3%, average inflation of 2.5%, and a retirement age of 65.

[53] People could contribute pre-income-tax an additional $25,000 per year at a concessional tax rate of 15%.

US$5,000. Present bias boosts the consumption response substantially even under large transfers (Laibson et al., 2021). As we show, out of a single Super withdrawal the two models predict consumption responses that differ by an order of magnitude.

We begin by using administrative records on the full working-age population and a large panel of weekly bank transactions to study selection into the program. We find the vast majority remained constrained even after accessing roughly half median annual wage income in liquidity: five in six withdrew as much as possible, nearly half withdrew in the first 10 days, and three quarters who had funds remaining after the first round withdrew again. Those in 'blue-collar' occupations and those located farther from cities were far more likely to withdraw. Withdrawers had slightly lower wages, but this was persistent not transitory: wages were lower in the two months prior, the three years prior, and the life to date, and there was no discontinuity in weekly wages upon withdrawal. But withdrawers had far lower rates of saving and levels of savings, both immediately prior to withdrawal and in the three years prior, and they had substantially lower stock and investment property holdings. These features were particularly pronounced among those who withdrew earlier or again.

Next we study the effect of the program on spending. Using modern differencein-differences techniques (Callaway and Sant'Anna, 2021; Sun and Abraham, 2021) and exploiting the differential timing of withdrawal, we find a high marginal propensity to spend (MPX) out of the first withdrawal of at least 0.43 (0.01) over eight weeks, [54] spread broadly across categories and with at least 60% of discernible spending on non-durables. This spending response was very sharp, with 71% occurring within two weeks and 90% within four weeks. The MPX out of the second withdrawal, which two-thirds returned for and which occurred after activity had recovered, was 0.48 (0.01). Applying quantile difference-in-differences to spending changes, we find that the MPX was near-uniformly distributed up to 0.95 but with a long right tail (5% had an MPX of greater than one and 1% greater than 2.3). Among withdrawers, there were strong negative relationships between the MPX and several measures of pre-withdrawal financial health, and strong positive relationships with pre-withdrawal gambling and cash withdrawal. The least-liquid 40% spent more than double that of ($2,500 more than) the most-liquid 20%.

Finally, to interpret our results, we develop a heterogeneous-agent model with two assets, income risk, and borrowing constraints in the spirit of Kaplan, Moll and Violante (2018), but with naively present-biased households as in Laibson et al. (2021). With exponential-discounting but liquidity-constrained households and calibrated at the monthly frequency, the model fails to match the evidence; households smooth the transfers excessively even if at their borrowing limit. With impatient households (very high but still exponential discounting), the model can match the average MPC, [55] but not the heterogeneity in MPCs and liquidity, and with an unrealistically low subjective discount factor (0.15 annually). We obtain the best fit with naively present-biased households, with a present-bias parameter ($\beta = 0.58$) of similar magnitude to recent estimates (e.g., Ganong and Noel (2019); Gerard and Naritomi (2021)). Not only does the model match the average MPC and average liquid-assets-to-income ratio, but also the joint distribution of liquidity and MPC. The calibration frequency is critical. Liquidity constraints alone can match the data at an annual frequency, but this breaks down at higher frequencies as the liquidity shock is a larger multiple of wages and the spending response is condensed.

Our findings have direct implications for the design of private retirement saving systems, which have gained renewed interest as the US Social Security trust funds near depletion. The US 401(k) system is unique in its high degree of liquidity (Beshears, Choi, Hurwitz, Laibson and Madrian, 2015), loosened further during the pandemic. Australia has had a privatized social security system since 1993, with mandatory saving and withdrawals not permitted before retirement. The Super withdrawal program was an unexpected shock to this system. In practice, the vast majority of those who were eligible chose not to access their retirement savings when given a one-off chance to do so, while those who did appeared overwhelmingly to be driven

[54] Excluding debt repayments and external transfers, which will have accounted for additional spending.

[55] The model is calibrated using MPCs, which we assume are 60% of the observed MPXs reflecting our estimated lower bound on the share of non-durables in the total discernible spending impact.

by present bias. The clear implication is that, as a matter of retirement saving policy, illiquidity would seem to be welfare-improving in the aggregate.

At the same time, we find withdrawals generated at least 0.8% of GDP in direct spending, almost entirely within a four-month period. Based on the stated up-front fiscal cost of 0.06% of GDP, this implies a direct fiscal multiplier of 13.4, at least an order of magnitude larger than with cash stimulus (Ramey, 2019). [56] By generating a high MPX, the program raised the numerator; by being self-financed, it lowered the denominator. The government announced the fiscal cost as just $1.2 billion (reflecting foregone taxes over four years) and framed it as giving people access to "their own money". Under fiscal constraints, this self-financing can enable additional stimulus, but this comes at the cost of the sub-optimal future consumption of the present-biased. It is an open question whether macro-stability should be funded by the lower future retirement balances of the few or higher future taxes on the many, the consequences of which depend on the tax and transfer system.

To the best of our knowledge, the Super withdrawal program is unique in the literature in generating very large transfers to a broad swath of the population, holding lifetime income constant. Studies of stimulus checks consider transfers in the order of US$1,000, the responses to which may not differ markedly under different consumption models. Transfers from the Alaska Permanent Fund were larger (US$3,900 for an average family), but still far smaller than the Super withdrawals (up to US$27,000 for a family) and received regularly (Hsieh, 2003; Kueng, 2018). Lottery winnings are the largest transfers considered in the literature, but they increase lifetime income, often substantially (Imbens, Rubin and Sacerdote, 2001; Kuhn, Kooreman, Soetevent and Kapteyn, 2011; Fagerang, Holm and Natvik, 2021; Golosov, Greber, Mogstad and Novgorodsky, 2021).

The one direct precedent was in Denmark in 2009, studied by Kreiner, Lassen and Leth-Petersen (2019). There are some important differences between their setting and ours. The Danish system was relatively new and small: it was introduced 11 years earlier and had been closed to contributions for five years (vs 27 years earlier and ongoing for Super); contributions were 1% of earnings (vs 10.5% for Super); and all savings received the same, flat return subject to income taxes on withdrawal (vs no taxes on withdrawal and other tax concessions for Super). Consequently, after taxes, the average withdrawal was US$1,900, an order of magnitude lower than the modal Super withdrawal of US$13,600. The authors combine survey data on spending with administrative data on assets to establish a relationship between liquidity-constraint tightness, as measured by the marginal interest rate, and spending. In contrast, our focus—aided by rich, high-frequency administrative and bank transactions data as well as unique features of the Super withdrawal program—is on why there is an association between liquidity and spending.

In that respect, we contribute to an emerging literature across diverse settings in which high-frequency spending data reveals an excess sensitivity of spending to income that can only be rationalized by present bias. Ganong and Noel (2019) consider the exhaustion of unemployment benefits in the US, documenting a nondurables spending decline of 12%, consistent with a large share of recipients being present-biased ($\beta = 0.5$). Gerard and Naritomi (2021) consider São Paulo, Brazil, where workers laid off without cause are entitled to severance of 4.7 months' wages on average, estimating a spending jump of 35% despite a permanent-income decline of 14%, consistent with present bias ($\beta = 0.44$). Gelman (2022) finds that present bias ($\beta = 0.9$) best explains spending responses in the US to paychecks and tax returns. We also contribute to the literature on retirement saving, in particular to studies on early withdrawals, including Goda, Jones and Ramnath (2022), Coyne, Fadlon and Porzio (2022), Goodman, Mortensen, Mackie and Schramm (2021), Andersen (2020), Beshears, Choi, Harris, Laibson, Madrian and Sakong (2020), and Argento, Bryant and Sabelhaus (2014).

We proceed as follows. In Section 2, we describe the policy context and data. In Section 3, we study selection along three dimensions: whether people withdrew; how early they withdrew; and whether they

[56] There are challenges in measuring comprehensively the fiscal multiplier (Nakamura and Steinsson, 2018, 2014). Our setting enables sharp identification of a direct increase in consumer spending in a short window of time driven by policy.

withdrew a second time. In Section 4, we estimate the spending responses to each withdrawal and how it was allocated across categories. In Section 5, we consider heterogeneity in the response. In Section 6, we develop and calibrate a heterogeneous-agent model to compare our results to predictions under different consumption models. And in Section 7, we conclude.

4.2 Preliminaries

4.2.1 Policy

Australia has a compulsory, defined-contribution private retirement saving system called Superannuation (or 'Super').[57] All employers are required to contribute an additional 10.5% of pre-tax wages to their employees' accounts, inaccessible outside exceptional circumstances until age 58 if retired or 65 if working. For most people, Super is tax-preferred over most other forms of saving: employer contributions are made pre-income-tax, then taxed at 15% on entering the fund (compared to a modal marginal income tax rate of 34.5% and a top rate of 47%); before retirement, cash returns are taxed at 15% and capital gains at 10%; and in retirement neither returns nor withdrawals are taxed. Additional voluntary contributions can be made, up to $27,500 per year before tax and $100,000 per year after tax, but less than 1% of people are above the pre-tax cap.[58] The median growth fund had an annual return net of fees and taxes of 9.5% over 10 years and 8.3% over 29 years.[59]

On March 22, 2020, during the initial COVID-19 outbreak, the Australian government announced eligible people could withdraw up to $10,000 from their Super accounts by June 30, followed by another $10,000 from July 1, the first time broad early access had been granted. Notably, the government eschewed the universal cash transfers employed in other countries during the pandemic and which an Australian government of the opposite major party had implemented during the Global Financial Crisis. Cash transfers were limited to lump-sum payments for those receiving government benefits, alongside wage subsidies and supplemental unemployment insurance. Announcing the program, the then-Prime-Minister said it would "help Australians access more of their own resources to get through this time of crisis". [60] The government stated the fiscal cost as $1.2 billion, which reflected only foregone taxes over four years (not the $38 billion eventually withdrawn). [61] The government would later add broad eligibility conditions. [62],[63] Applications for the first round opened around a month later on April 20 via the 'myGov' online portal. Applicants were to nominate a withdrawal amount and a reason for withdrawing, self-assessing eligibility. Applications were processed in three days on average, at which time the withdrawal was deposited into the applicant's bank account.

Australia's experience of the pandemic was far milder than most other countries'. Australia closed its borders, with international travel virtually impossible for noncitizens and highly restricted for citizens for the first 18 months. From March 28, all international arrivals had to complete two weeks of hotel quarantine. Public health measures were imposed locally until cases were eliminated. Australia's per-capita death rate was less than a tenth that in the US. Meanwhile, Australia had a large federal fiscal response at 17% of GDP (excluding 2% of GDP in Super withdrawn). The Super withdrawal program was part of the second of three rounds of fiscal support announced during March 12–30. [64] While the initial outbreak

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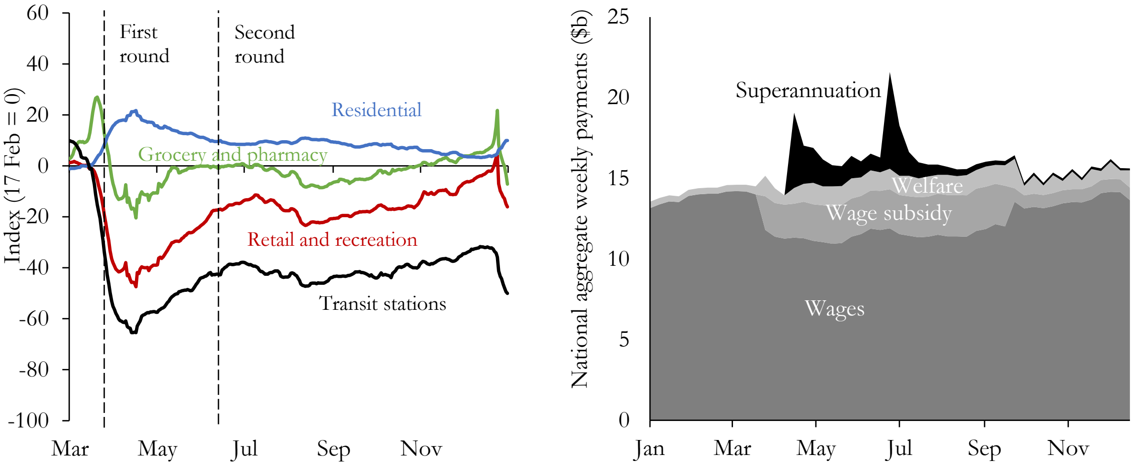
[57] A more detailed description with references can be found in Appendix 4A.
[58] See Chan, Morris, Polidano and Vu (2022) for a study of the income and saving responses to these concessions.
[59] People can choose between portfolios based on risk. Typically, people keep their savings in a 'growth' fund for most of their working life and switch to a more conservative fund near retirement.
[60]https://www.smh.com.au/politics/federal/a-support-package-built-on-debt-and-hope-but-approach\-mustchange-20200322-p54cpa.html.
[61]https://ministers.treasury.gov.au/ministers/josh-frydenberg-2018/media-releases/supporting-australianworkers-and-business.
[62] This included those who: were unemployed; were in receipt of certain government benefits (e.g., unemployment insurance); had been made redundant or had their working hours reduced by at least 20% on or after 1 January 2020; were a sole trader whose business was suspended or had experienced a reduction in turnover of at least 20%; or were on a temporary visa and met certain conditions (e.g., not being able to me.
[63] https://treasury.gov.au/sites/default/files/2020-04/Fact_sheet-Early_Access_to_Super.pdf
[64] Hamilton (2020) compares the Australian and US fiscal responses. Breunig and Sainsbury (2023) consider the distribution of fiscal transfers. Bishop and Day (2020) and Watson, Tervala and Sainsbury (2022) study Australia's wage subsidy program.

generated a substantial reduction in mobility, this recovered rapidly as cases were eliminated (Figure 1a), and the decline in personal net income excluding Super withdrawals was negligible (Figure 1b). Through May and June, all domestic restrictions lifted nation-wide. [65]

Figure 4.1: Economic activity indicators in Australia during 2020

(a) Mobility indicators by establishment (b) Working-age payments by type



Data: Google trends
Note: Google mobility data records physical locatins people may have visited

Data: Australian Taxation Office and Department of Social Services

4.2.2 Data

We rely on two data sources: administrative data covering all working-age Australians, which allow us to study the withdrawals; and bank transactions data covering a subset of working-age Australians, which allow us to study how the withdrawals were used. We are not permitted to link individuals across the two datasets, instead using each for different parts of the analysis, as noted. On the measures we observe in both datasets, including state, sex, welfare receipt, and the wage distribution, they appear quite similar (Appendix 4C). Elias (2022) presents evidence high-frequency spending records in the bank transactions data closely match those from other sources, including official statistics.

We access the administrative data via the Australian Bureau of Statistics' Multi Agency Data Integration Project (MADIP), which links de-identified, individual-level datasets across agencies. For our purposes, these cover all working-age (16–65) Australians who reported positive superannuation balances in the financial year before the pandemic (July 1, 2018 to June 30, 2019, or 2018-19), which yields a sample of 15.2 million (versus 25 million in the population).

In MADIP, we observe age, sex, and location at the suburb level. Via personal tax records, we observe: occupation; a spouse indicator; the number of dependents; three years of tax 8 returns, including the income derived from wages, interest, rent, and dividends; the superannuation balance at June 30, 2019; all superannuation contributions for 2018-19; and all information on the superannuation withdrawal program for all 4.5 million approved applications,[66] including the withdrawal amount, date, and the reason. Via the Single Touch Payroll system, we observe all weekly pre-tax wages. Via the welfare payment system, we observe all weekly government benefits, including unemployment benefits and pandemic support payments. We also observe all fortnightly wage subsidies each worker's employer received.

[65]https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/rp/rp2021/Chronologies/COVID-19StateTerritoryGovernmentAnnouncements#_Toc52275795
Hamilton (2020) compares the Australian and US fiscal responses. Breunig and Sainsbury (2023) consider the distribution of fiscal transfers. Bishop and Day (2020) and Watson, Tervala and Sainsbury (2022) study Australia's wage subsidy program.
[66] 3.05 million people lodged 4.78 million applications, of which 232,000 were rejected.

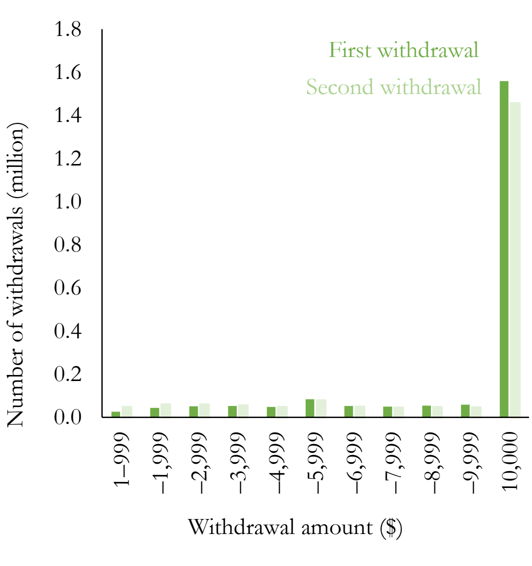
The bank transactions data are provided by Illion, one of Australia's three large credit bureaus. Data are collected during credit-check events initiated by Illion clients, including telcos, utilities, and financial institutions (more than 6,000 in total). When an individual triggers a credit-check event, Illion collects all bank transactions across their accounts, including transactions made with associated debit and credit cards over the prior 13 weeks. The original transactions data include the date and time the transaction was processed (usually within a few business days for card purchases and instantly for transfers), description, transaction type (e.g., card payment, direct debit, external transfer), transaction value, and account.

The dataset we use is an aggregated version of this transaction-level data. Transactions are classified by Illion into spending categories (e.g., supermarkets, retail, department stores) and income categories (e.g., wage income, Super withdrawal, welfare income) using the transaction description and type. External transfers are not counted towards spending. Single transactions are aggregated into weekly transaction amounts across all accounts for each spending and income category. This results in an individual-level panel of weekly spending and income by category, with a 13-week observation window for each individual.

Observing a limited window for each individual introduces the possibility of assigning someone who withdrew superannuation before the start of their window as not having withdrawn. For the sample of withdrawers in the first round, we exclude those who: 1) did not have a recorded superannuation withdrawal, and 2) had an observation window that began after April 19 (the week preceding the first withdrawals). The second superannuation withdrawal sample was constructed identically, but relative to June 21. Among those we do observe having withdrawn superannuation, we drop those for whom we do not observe three weeks of pre-withdrawal data. For the first round of withdrawals, we do not consider transactions beyond June 28 to avoid contamination by the second round. No other modifications were made to the data for the main analysis. This generates samples of around 340,000 and 410,000, respectively.

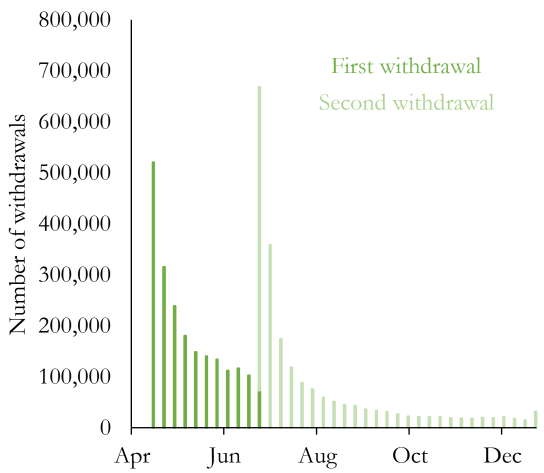
Figure 4.2. Number of withdrawals

(a) Number of withdrawals by amount



Data: Australian Taxation Office

(b) Number of withdrawals by week



Data: Australian Taxation Office

4.3 Withdrawal

4.3.1 Withdrawers v non-withdrawers

We begin with some descriptive facts about withdrawal. Around one in six (2.6 million) working-age people withdrew a total of $37.8 billion (around 1% of assets or 2% of GDP). Around three quarters in each round withdrew the maximum $10,000, with the modal withdrawal across both rounds $20,000 and the average withdrawal $13,584 (Figure 4.2a). Among those who withdrew less than $10,000 in the first round, one third drained their account, suggesting they were constrained by their available balance, so only around one in six chose an 'interior' withdrawal amount. Around three quarters of those who had a positive balance remaining after withdrawing in the first round withdrew again in the second round, with the pattern of withdrawal amounts similar to the first round (Figure 2a). Including those who didn't withdraw, the average withdrawal was 9% of balances; among those who withdrew, it was 51%. In the two rounds, 25% and 30% withdrew in the first three days and 40% and 48% in the first 10 days (Figure 4.2b).

Next, we compare the withdrawers and non-withdrawers on the basis of a variety of pre-treatment variables.[67] In the first column of Table 4.1, we present estimated means among the non-withdrawers, and in the remaining columns we present estimated differences in means between the withdrawers and non-withdrawers, with the third through fifth columns including controls for pre-treatment wages and then cumulatively for the variables listed under 'Demographics'. Those who withdrew were on average three years younger, five percentage points more likely to be male, 12 percentage points more likely to be single, and eight percentage points more likely to have dependents.

In probing the motivation for withdrawal, we are particularly interested in withdrawers' financial circumstances. Those who withdrew had lower wages, both during the month before withdrawals commenced (3% lower) and during the three years before (8% lower). We find no change in individual-level weekly wages coincident with withdrawal.[68] Withdrawers had around half the Super balances of non-withdrawers, which mechanically reflects lower wages over the working life to date.[69] Collectively, these results indicate that the difference in wages was persistent, being present in the month prior, the three years prior, and the working life to date. Because the withdrawers were not on average suffering a temporary wage shortfall, this does not seem to be a motivation for withdrawal.

For further context, in Figure 4.3 we present the age distributions of the withdrawers and non-withdrawers along with the associated probability of withdrawal by age. As noted earlier, the withdrawers were three years younger on average, but this masks a compression of the age distribution among the withdrawers. The withdrawers were underrepresented up to age 23 and beyond age 51, with a modal age of 33. The maximum take-up rate was among those aged 34, at 23%.[70,71]

Finally, in Table 4.2, we divide the Australian working-age population by occupation and location and calculate withdrawal rates among these divisions.[72] There was strong variation in withdrawal along both dimensions. Withdrawal was highest in 'blue-collar' professions and lowest in 'white-collar' professions, with teachers the lowest-withdrawing occupation at 6.3% and construction and mining laborers the highest at 40.2%. Withdrawal was also strongly, monotonically, and negatively related to the proximity to cities, with those in very remote areas 40% more likely to withdraw than those in major cities. In the most remote locations, more than half of people withdrew; in Australia's capital just 3–5% withdrew.

[67] While withdrawal was subject to the eligibility criteria described earlier, eligibility was self-assessed. As discussed in Appendix 4B, we estimate at least 70% were eligible, and conditioning on eligibility doesn't alter meaningfully any of the patterns observed in Table 4.2.
[68] This is based on an event study on wages using the same method we apply to spending later (Appendix 4D).
[69] This persistence of lower wages is consistent with Parker (2017), who relates it to the MPC.
[70] This rises to 27% at an earlier age of 32 when we consider take-up only among the eligible (Appendix 4B).
[71] The drop in take-up at age 57 coincides with the age individuals could begin to access their Super if they were retired.
[72] Appendix 4F includes a full break-down of occupation into 46 categories.

Table 4.1: Estimated differences in means between withdrawers and non-withdrawers in the first round

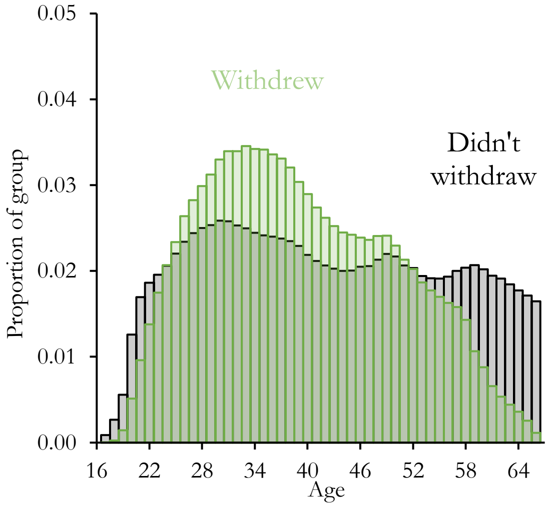
	Non-withdrawer	Withdrawer (difference)				
Controls	None	None	Wages	Plus age	Plus all	Data
Demographics						
Age	41.09	-2.68	-2.09			A
	(0.00)	(0.01)	(0.01)			
Female	0.49	-0.05	-0.08	-0.07		A
	(0.00)	(0.00)	(0.00)	(0.00)		
Had spouse	0.57	-0.12	-0.09	-0.06		A
	(0.00)	(0.00)	(0.00)	(0.00)		
Had dependents	0.38	-0.08	0.09	0.10		A
	(0.00)	(0.00)	(0.00)	(0.00)		
Long-term financials						
Annual wage income	47,340	-4,050				A
	(15)	(35)				
Superannuation balance	121,398	-61,237	-48,383	-35,882	-34,520	A
	(66)	(157)	(143)	(133)	(134)	
Interest income	420	-314	-306	-258	-261	A
	(1)	(2)	(2)	(2)	(2)	
Rental income	958	-369	-296	-240	-229	A
	(1)	(3)	(3)	(3)	(3)	
Dividends	1,106	-857	-809	-657	-669	A
	(4)	(10)	(9)	(9)	(9)	
Voluntary superannuation	2,467	-2,199	-2,159	-1,692	-1,637	A
	(4)	(11)	(11)	(11)	(11)	
Short-term financials						
Weekly wage income	786	-21				B
	(2)	(7)				
Saving/spending	0.37	-0.20	-0.22			B
	(0.01)	(0.03)	(0.03)			
Savings/spending	5.38	-3.31	-3.34			B
	(0.07)	(0.25)	(0.24)			
Debt payment/spending	0.14	0.01	0.01			B
	(0.00)	(0.00)	(0.00)			
Had negative balance	0.09	0.02	0.02			B
	(0.00)	(0.00)	(0.00)			
Data	N					
A: Administrative data	15,249,488					
B: Bank transactions data	336,809					

Data: Australian Taxation Office and Illion.

Notes: Results are from simple linear regressions of outcomes on a binary first-withdrawal indicator, controlling cumulatively for wages and the 'Demographics' variables. Wage control for Demographics and Long-term Financials is average pre-tax wage income in the prior three years. Spouse and dependents are from the tax return in the financial year prior to withdrawal (July 1, 2018–June 30, 2019). Long-term financials except superannuation balance and voluntary superannuation are averages across the three prior tax returns (2016–17, 2017–18, and 2018–19). Superannuation balance is as at June 30, 2019. Voluntary superannuation contributions are for the prior year (2018–19). Annual wage income is pre-tax and weekly wage income is post-tax. All short-term variables are averages for the month prior to program commencement. Standard errors in parentheses. All estimates statistically significant at the 95% level.

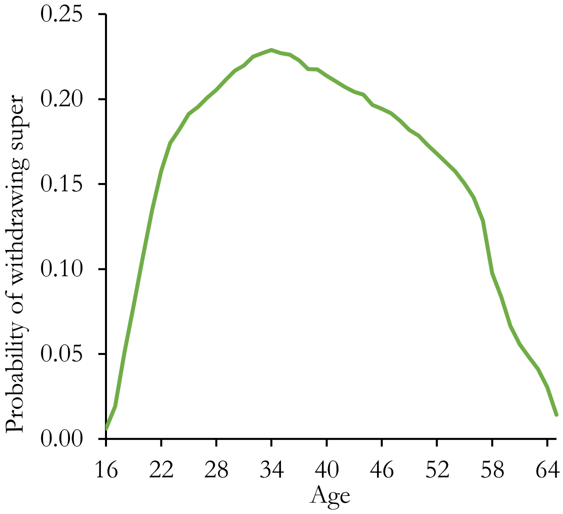
Figure 4.3. The relationship between withdrawal and age

(a) Age histogram by withdrawal status



Data: Australian Taxation Office

(b) Probability of withdrawal by age



Data: Australian Taxation Office

Table 4.2: Withdrawal rates by occupation and location

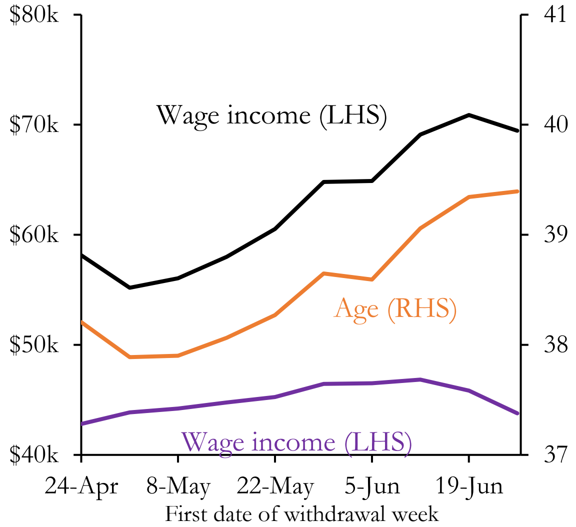
	Withdrew (%)
Occupation	
Machinery operators and drivers	32.3
Labourers	30.5
Technicians and trades workers	24.4
Community and personal service workers	22.7
Sales workers	20.0
Managers	16.8
Clerical and administrative workers	15.4
Professionals	9.4
Location	
Very remote	24.2
Remote	21.1
Outer regional	19.5
Inner regional	18.1
Major cities	17.3

Data: Australian Taxation Office and Australian Bureau of Statistics
Note: Occupation based on tax return in prior financial year.
Location based on suburb from combined administrative data.

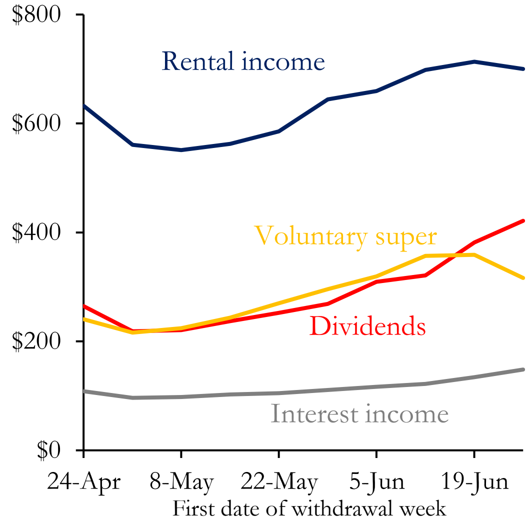
4.3.2 Timing

People faced not only a choice of whether to withdraw but also how soon to withdraw. The differences between the withdrawers and non-withdrawers in Table 4.1 were greater the earlier the withdrawal (Figure 4.4). Setting aside the first and last weeks, which may be subject to idiosyncratic factors, the average Super balance of a withdrawer increased by 28% over the intervening seven weeks, average wages by 4.5%, and average age by 1.5 years. Average pre-withdrawal interest, dividends, and rental income all increased with the withdrawal date, a relationship that remained statistically significant even after controlling for the characteristics conditioned on earlier (Appendix 4G). With the program having offered temporary access to ordinarily inaccessible wealth, the front-loading of withdrawals suggests urgency.

Figure 4.4. Average characteristics by withdrawal week during the first round.



Data: Australian Taxation Office



Data: Australian Taxation Office

4.3.3 Second withdrawal

In addition to having a choice of whether and when to withdraw, people could also withdraw a second time, 72 days after applications for the first withdrawals opened. 54% withdrew in both rounds, 24% in only the first, and 21% in only the second. An advantage of observing the second withdrawal is that it came well after the initial pandemic shock, once it had become clear health and economic outcomes in Australia would be contained. During May and June 2020, domestic restrictions eased nation-wide. While both rounds were announced in late March, the first round opened at the peak while the second round opened after activity had recovered substantially (Figure 4.1a). Because people were given a second opportunity to withdraw, we can also measure the intensity of desire for liquidity.

Focusing on those who had a positive superannuation balance remaining after withdrawing in the first round, we observe similar patterns among those who withdrew a second time as among those who withdrew at all or withdrew earlier (Table 4.3). Those who withdrew a second time did have higher wages, were slightly older, and had higher superannuation balances. But this is expected, as we removed those having drained their accounts in the first round, who were disproportionately lower-income, younger, and with lower superannuation balances. Even so, those who withdrew twice had 22% less interest income, 36% lower voluntary superannuation contributions, 14% less in dividends, and 6% lower rental incomes. When we condition on wages and age, these differences all increase substantially. Overall, those with persistently less liquidity were more likely to seek additional liquidity, to seek it sooner—and to seek it a second time.

Table 4.3. Differences in means between those who did and did not withdraw a second time.

	Withdrew first only	Withdrew first and second (difference)			
Controls	None	None	Wages	Plus age	Plus all
Wages	43,173	4,897			
	(54)	(64)			
Age	37.88	1.82	1.67		
	(0.01)	(0.02)	(0.02)		
Super balance	55,652	16,226	11,774	6,024	6,024
	(128)	(150)	(139)	(128)	(128)
Interest income	137	-30	-32	-40	-38
	(1)	(2)	(2)	(2)	(2)
Rental income	707	-43	-122	-160	-130
	(5)	(6)	(6)	(6)	(6)
Dividends	317	-43	-52	-87	-80
	(7)	(9)	(9)	(9)	(9)
Voluntary Super	394	-142	-161	-194	-190
	(4)	(5)	(5)	(5)	(5)
N = 1,862,516					

Data: Australian Taxation Office

Note: Results are from simple linear regressions of outcomes on an indicator for withdrawing in the second round, controlling cumulatively for the wages and 'Demographics' variables listed in Table 2. Excluded from the regression are those who did not withdraw in the first round as well as those who did but drained their balance. Variable definitions as per 'Demographics' and 'Long-term financials' in Table 2.

4.4 Spending

4.4.1 Marginal propensity to spend

In the previous section, we saw that low pre-withdrawal liquidity is strongly predictive of withdrawal, the urgency of withdrawal, and repeated withdrawal. Participation was not driven by temporary wage or liquidity shortfalls as those differences were permanent. As noted by Parker (2017), this suggests a behavioural explanation. Our descriptive findings on age, occupation, and location point in a similar direction. Low liquidity presents a fundamental identification challenge because both rational and behavioural motives imply low liquidity—we simply can't tell whether that low liquidity is a consequence or cause of the motivation. In this section, we study the spending response to distinguish between the two.

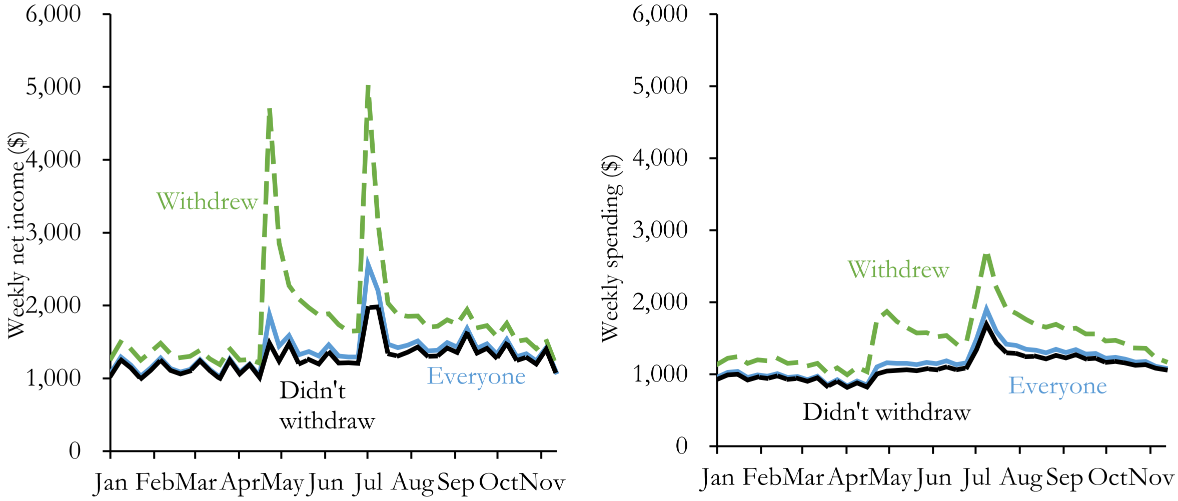
Our spending measure includes all debits associated with an individual's bank accounts (such as with a debit or credit card), cash withdrawals, and 'buy now, pay later' repayments. It excludes all debt repayments and external transfers. In Australia, cash transactions fell from 40% in 2007 to just 10% in 2019 (compared to 22% in the US). [73,74] In a 2019 official survey, 12% of those who reported holding cash outside their wallet did so to fund a large purchase, suggesting cash withdrawals overwhelmingly are used for immediate consumption. [75] Because we exclude all debt repayments and external transfers, which account for some spending, our measure can be viewed as a conservative lower bound on true spending.[76]

We begin by plotting average income and spending among all units in the bank transactions data by 2020 calendar week, with the timing of each round clearly visible (Figure 4.5). There is a sharp spike in income coincident with the first weeks of withdrawals in late April and early July, and concomitant but more diffuse increases in spending, mirroring the timing of withdrawals we saw in the administrative data (Figure 4.1b).

[73] https://www.rba.gov.au/publications/bulletin/2020/mar/pdf/consumer-payment-behaviour-in-australia.pdf
[74] https://www.atlantafed.org/banking-and-payments/consumer-payments/survey-of-consumer-payment-choice
[75] https://www.rba.gov.au/publications/bulletin/2020/jun/pdf/cash-use-in-australia-results-from-the-2019-consumer-payments-survey.pdf.
[76] We focus on the MPX rather than MPC because the bank transactions data cannot precisely be disaggregated into durables and non-durables. But we do observe spending categories likely to include only non-durables, which we consider later.

There are two issues with this aggregate view. First, there were concomitant income shocks, including supplementary unemployment insurance, wage subsidies, cash transfers, and tax refunds distributed from July, which explain the concomitant spikes in non-withdrawer income. Second, withdrawals occurred over time in each round, with the calendar-based income and spending profiles aggregating potentially heterogeneous income and spending shocks across cohorts at different times relative to withdrawal.

Figure 4.5. Average weekly income and spending in 2020 by group



Data: Illion

Data: Illion

Accordingly, we consider the effect of withdrawal on income and spending in an event study, with non-withdrawers serving as our comparison group (we consider identification later). We take the approach of Callaway and Sant'Anna (2021) and Sun and Abraham (2021), estimating average treatment effects on the treated (ATTs) separately for each cohort (those who withdrew in a given week) then averaging across cohorts weighted by size. This addresses several problems with the two-way fixed-effects estimator commonly used in event studies (de Chaisemartin and D'Haultfœuille, 2020; Callaway and Sant'Anna, 2021; Goodman-Bacon, 2021; Sun and Abraham, 2021; Borusyak, Jaravel and Spiess, 2022; Wooldridge, 2022).[77]

Specifically, in Figure 4.6, we display cohort-specific event-study plots reflecting estimates of the following standard interacted TWFE model:

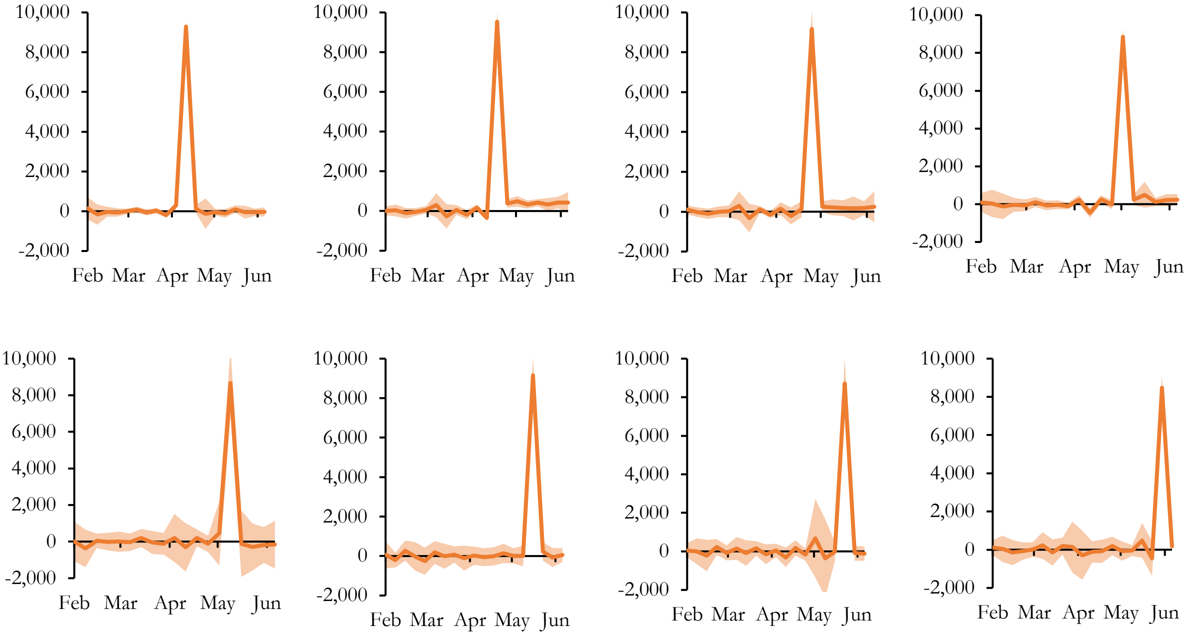
$$Z_{it} = \alpha_i + \lambda_t + \sum_{\ell \neq -1} \delta_{e\ell}\left(1\{\mathrm{E}_i = e\} \cdot \mathrm{D}_{it}^{\ell}\right) + \varepsilon_{it}$$

where Z_{it} is the outcome for unit *i* in time t (either income or spending), α_i is an individual fixed effect that controls for all time-invariant unit-level characteristics, λ_t is a time fixed effect for each week, ℓ refers to event time (periods relative to treatment), e refers to the cohort receiving the treatment at a given time, Ei refers to the time when unit i receives the treatment, and D_{it}^{ℓ} it is a treatment dummy. Never-treated units are coded as $\mathrm{D}_{it}^{\ell} = 0$ in all periods. The method effectively computes, *for each cohort*, the average difference across treated and never-treated units between the outcome in the current period and that in the period prior to treatment.

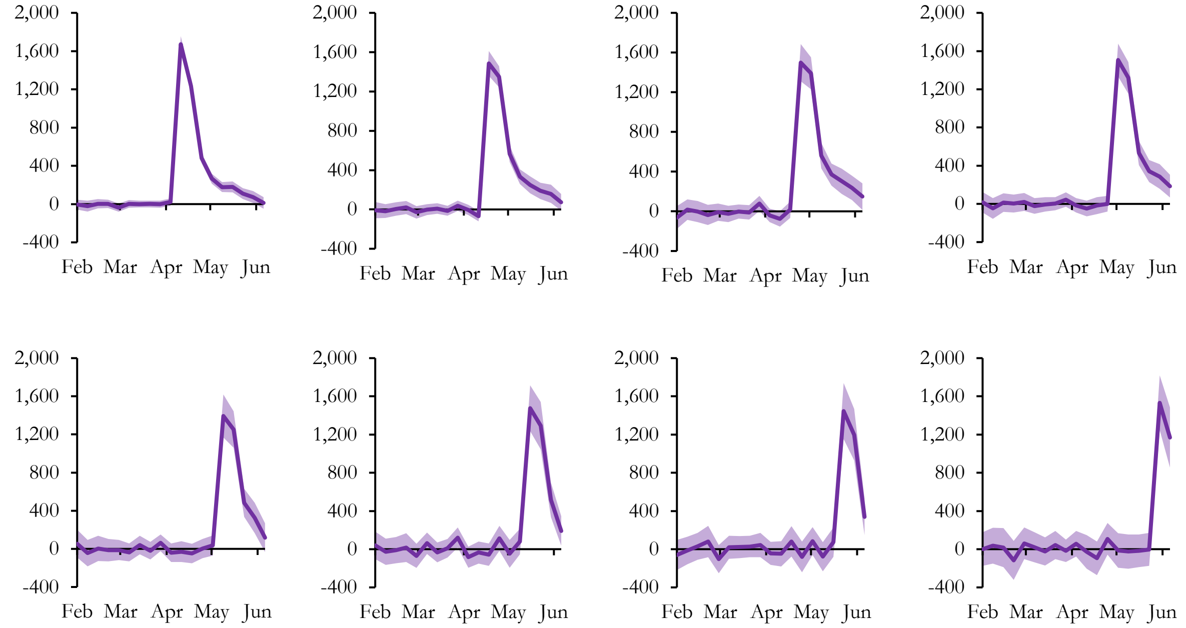
[77] Of concern are situations in which: different units are treated at different times; there is no 'never-treated' group; there are heterogeneous treatment effects across cohorts; or time-varying controls are used. For a review of these developments see Roth, Sant'Anna, Bilinski and Poe (2022).

Figure 4.6. Estimated cohort ATTs ($) of the first withdrawal by calendar week

(a) Income



(b) Spending



Data: Illion

Notes: Results are cohort ATTs estimated via the R package, 'did', which implements Callaway and Sant'Anna (2021). Comparison group is the never-treated. Estimation is 'doubly-robust', with standard errors computed using the bootstrap procedure of Callaway and Sant'Anna (2021). Confidence intervals are at the 95% level. Cohorts 1 to 4 are displayed left-to-right in the top rows; cohorts 5 to 8 left-to-right in the bottom rows. Calendar time is truncated on the right to avoid contamination by the second withdrawals, beginning on July 1. The 'did' package, by default, uses a 'varying' base period when estimating cohort ATTs for the pre-treatment periods, where the base period is the period immediately prior. This is why estimates for the period immediately prior to withdrawal (and their confidence-interval estimates) are not zero. For all post-treatment estimates, the period immediately prior to treatment is used as the base period.

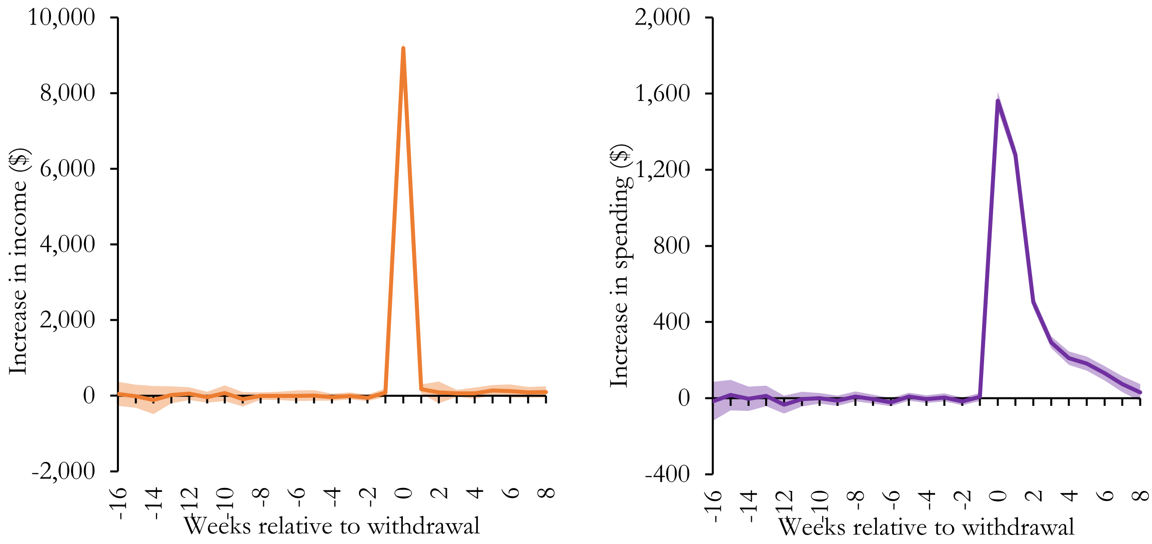
We display these event-study plots aggregated using cohort share weights, $\text{ATT}_\ell = \sum_e \delta_{e\ell} \cdot \Pr[\text{E}_i = e]$ in Figure 4.7.[78] We then sum our ATTs across the post-treatment periods for which we observe a positive treatment effect on spending, which based on Figure 4.7b is eight weeks.[79] To construct the MPX, we need to divide this the withdrawal amount.[80] But because non- superannuation-withdrawal income may vary post-treatment between the withdrawers and non-withdrawers, instead we divide by the income analogue of our cumulative aggregate spending ATT:

$$MPX = \frac{\sum_{\ell=0}^{7} \text{ATT}_\ell^X}{\sum_{\ell=0}^{7} \text{ATT}_\ell^Y} = \frac{\sum_{\ell=0}^{7} \sum_{e=1}^{8} \delta_{e\ell}^X \cdot \Pr\,[\text{E}_i = e]}{\sum_{\ell=0}^{7} \sum_{e=1}^{8} \delta_{e\ell}^Y \cdot \Pr\,[\text{E}_i = e]}$$

Where X is spending and Y is income.[81] We estimate standard errors via bootstrap.

Figure 4.7. Estimated ATTs of the first withdrawal by event week

(a) Income (b) Spending



Data: Illion

Notes: Results are averages of cohort ATTs in Figure 6 weighted by cohort size, estimated via the R package, 'did', which implements Callaway and Sant'Anna (2021). Comparison group is the never-treated. Estimation is 'doubly-robust', with standard errors computed using the bootstrap procedure of Callaway and Sant'Anna (2021). Confidence intervals are at the 95% level. The 'did' package, by default, uses a 'varying' base period when estimating cohort ATTs for the pre-treatment periods, where the base period is the period immediately prior. This is why estimates for the period immediately prior to withdrawal (and their confidence-interval estimates) are not zero. For all post-treatment estimates, the period immediately prior to treatment is used as the base period.

In Table 4.4, we display the resultant estimates. Our estimated MPX of 0.43 over eight weeks is high in the context of estimates of the effects of far smaller cash transfers—Leigh (2012), for example, estimates an almost-identical MPX of 0.41–0.42 out of $950 stimulus checks distributed in Australia during the Global Financial Crisis. Because we exclude debt repayments and external transfers, our estimate should be seen as a conservative lower bound on the true spending impact. The income and spending shocks are also large relative to their pre-withdrawal levels. The first round raised income by 93% over eight weeks. In the month

[78] The tight correlation between the TWFE and aggregate consumption paths following Super withdrawal (Figures 4.7 and 4.5), and our use of high-frequency consumption data, address issues with the US Great Recession stimulus literature raised by Orchard, Ramey and Wieland (2023).

[79] Appendix 4H includes estimated weekly cohort ATTs for income and spending.

[80] This is similar to Flynn and Smith (2022), who estimate the effect of Clean Water Act funding on capital investment by dividing the effect on average capital investment by the effect on average grant funding.

[81] While the 95% confidence interval for the estimated income ATT shown in Figure 7 contains zero, the weekly point estimates are modestly but consistently positive—evidently driven by a small but statistically significant and persistent increase in income for the second cohort, as can be seen in Figure 6a. Attributing all additional post-treatment spending to Super would upwardly bias our MPX estimate. But note that 94% of the total income increase over eight weeks is Super.

before withdrawal, the withdrawers spent $1,107 per week on average. Our estimates indicate spending was 129% higher over two weeks and 46% over eight weeks.

Table 4.4. Estimated cumulative aggregate ATTs

Outcome	First Withdrawal	Second withdrawal
Income	9,343	10,314
	(294)	(274)
Spending	4,033	4,982
	(59)	(169)
MPX	0.43	0.48
	(0.01)	(0.01)
N	337,223	410,761

Data: Illion

Notes: Results are based on cohort ATTs estimated via the R package 'fixest' (estimates in Appendix 4H), which implements Sun and Abraham (2021). We compute weekly aggregate ATTs by averaging across cohorts weighted by cohort share and accumulate over the first eight post-treatment weeks. MPX is spending divided by income. All standard errors (in parentheses) are estimated via a standard bootstrap procedure.

The sharpness of the spending impact, observable via our high-frequency bank transactions data, is notable. Leading studies of the spending impact of transfers have tended to focus on an annual or quarterly frequency due to data availability (e.g., Parker et al. (2013)). Broda and Parker (2014) show that two-thirds of nondurable expenditures driven by rebates in the US in 2009 occur within a month and Aladangady, Aron-Dine, Cashin, Dunn, Feiveson, Lengermann, Richard and Sahm (2023) show that Earned-Income Tax Credit recipients spend 30% of their tax refunds within two weeks. In our setting, given a transfer much larger than in these prior studies, we see an even sharper spending impulse: 39% within a week, 71% within two weeks, 83% within three weeks, and 90% within four weeks. By the eighth week, spending had returned to its pre-withdrawal level.

Observing spending out of the second withdrawals allows us to probe further the desire to spend, and to gauge the spending impact in a more plausibly externally valid context. By July, when second withdrawals began, public health restrictions had lifted and case numbers had been reduced to zero. This may address suspicions that the large observed spending impact of the first withdrawals was driven by panic or early pandemic-related spending. The estimated MPX for the second withdrawal was even higher at 0.48 with a similarly sharp spending profile (Appendix 4I).

4.4.2 Identification

It is necessary to make a parallel trends assumption in order for our estimated ATTs to identify causal effects: that, following withdrawal, average income and spending among the withdrawers would have evolved similarly to those among the nonwithdrawers had the withdrawers not withdrawn. This assumption does not require randomization of withdrawal nor even balance of observed variables. There are two potential threats to identification under this design: that withdrawers' and nonwithdrawers' income or spending were on different trends leading up to withdrawal, or that the income or spending of only the withdrawers or non-withdrawers was subject to a confounding effect at the time of withdrawal.

Under the TWFE specification, we are making a comparison between withdrawers and non-withdrawers conditional on all observed and unobserved time-invariant but group-specific and time-varying but common characteristics. Thus the withdrawers and non-withdrawers can have very different incomes or spending so long as these differences are stable around withdrawal, and their incomes or spending can be subject to pandemic-related shocks so long as they are common to the two groups. And recall that we have addressed bias due to differential concomitant income shocks by dividing by our estimated cumulative aggregate income ATTs.

In Figures 4.6 and 4.7, one can observe clearly the evolution of tightly parallel pre-trends in every cohort and all withdrawers overall, even without conditioning on additional time-varying covariates. There is also no evidence of anticipation by any cohort or overall, which supports identification but is also interesting. The ability to withdraw was announced a month before the first withdrawals and almost half of withdrawals occurred in the first 10 days. The absence of an anticipatory effect on spending is consistent with liquidity being a constraint on spending.

Next, in Figure 4.6, there does not appear to have been any post-withdrawal confounder that, in calendar time, applied only to the withdrawers or non-withdrawers. Moving between cohorts, the withdrawal date advances by a week, each income spike advances by a week, and each spending spike advances by a week. The dynamic paths of income and spending were similar across cohorts, with spending consistently elevated over the first two weeks then tapering down over the subsequent six weeks. This suggests against a confounding event on a given date.

There remains a potential for a confounding effect on either group at the time of withdrawal within each cohort (in event rather than calendar time). Reverse causality is one possibility; this is a form of selection bias, with never-treated units switching to the treated group at the time of treatment. For this to be a major concern, given the large share of the withdrawers in the population and the large treatment effect among that group, it would have resulted in a noticeable decline in spending among the non-withdrawers as those whose spending would have been elevated even in the absence of withdrawal selected out of non-withdrawal.

The aggregate spending in Figure 4.5 suggests against this. Not only did spending among non-withdrawers not decline upon withdrawal, but spending in aggregate across all units (uncontaminated by selection bias as all units are present at all times) rose at a rate greater than would be explained by withdrawals alone. This was also the case with the second withdrawals, addressing concerns this may have been due to early pandemic-related spending (e.g., panic buying or home office purchases). For additional robustness, in Appendix 4D we present the result of an event study on weekly wages, which one might not expect to be affected by withdrawal but may have been associated with selection, showing no concomitant effect.

Lastly, there is the question of external validity. It is worth reiterating that our estimates are average treatment effects on the *treated*. As shown earlier, the withdrawers differed markedly from the non-withdrawers; in particular, having had persistently poorer financial health. While this in and of itself does not threaten identification, to the extent it explains selection it may still have mediated the spending induced by the program, and thus have implications for the external validity of the estimates. This effect is *ex ante* theoretically ambiguous because liquidity-constrained withdrawers may have withdrawn to finance spending or to rebuild liquidity. *Ex post*, the high spending we observe is consistent with the former. But there is no suggestion our MPX estimates apply to the broader population.

4.4.3 Spending categories

In Figure 4.8, we present estimated cumulative aggregate ATTs for each spending category we observe.[82] The largest share of spending was 'uncategorized'— in reality, this will have been spread across the other categories. ATM withdrawals constituted the other large category. Recall that Australia is mostly a cashless society, with cash accounting for just 10% of consumer spending. In a 2019 survey, just 12% of those holding cash outside their wallet did so to save for a large purchase, which suggests cash withdrawals were not only likely predominantly used for spending but spending predominantly on non-durables. [83] Also, we include debt repayments for scale, though these are not included in our aggregate spending estimates.

All other categories had spending impacts below $400 (or less than 5%). Spending was highly dispersed: of the 40 other discernible categories, 26 had spending impacts statistically significant at the 99% level, three at the 95% level, two at the 90% level, and only nine (personal care, car rentals, children's retail, insurance, donations, subscription TV, gyms and fitness, transport, and public transport) not statistically significant at the 90% level. Gambling was the third-largest discernible category.

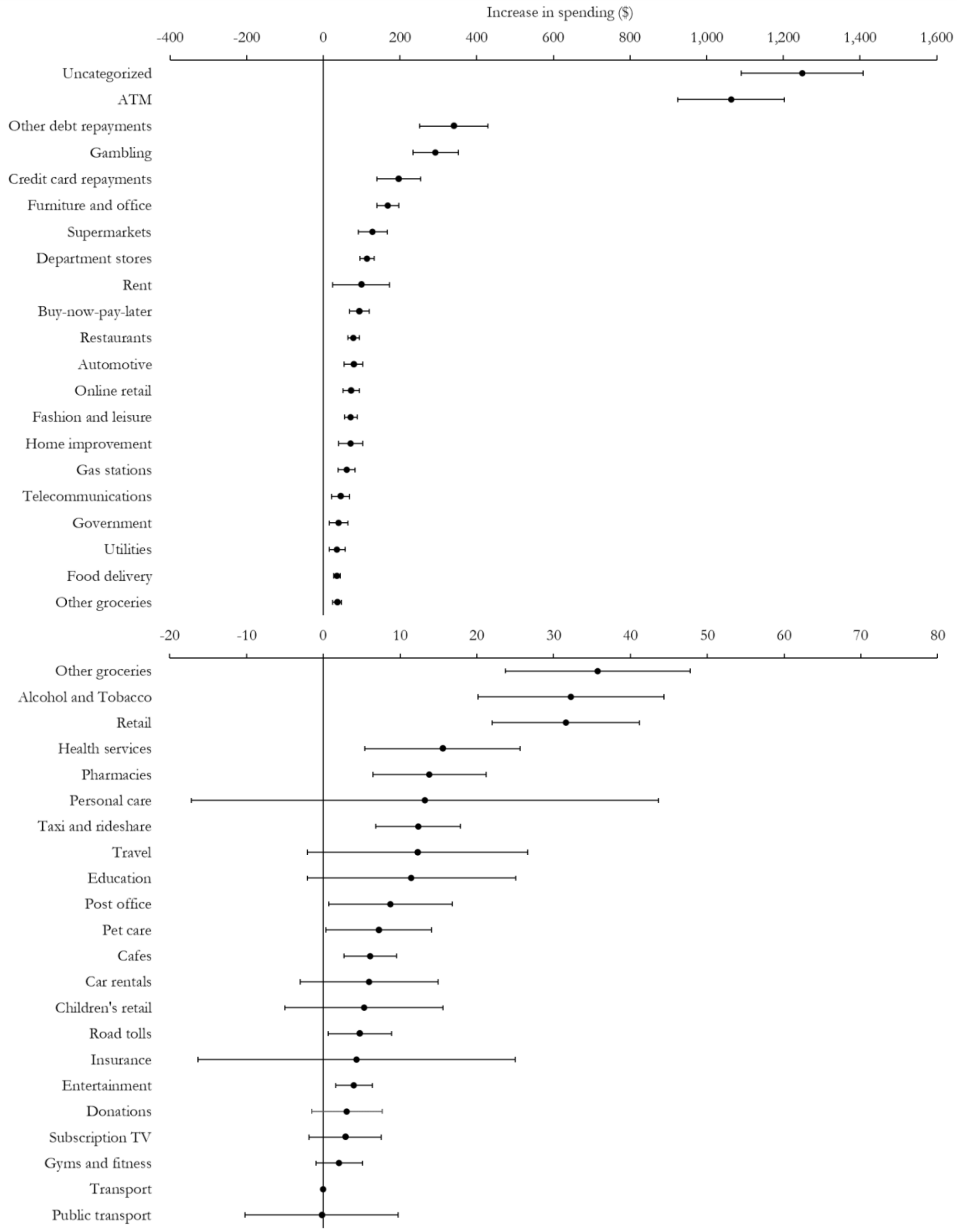
We cannot distinguish perfectly between durables and non-durables, but many of the spending categories that had highly statistically significant spending impacts are clearly non-durables (e.g., food delivery and supermarkets); overall, categories that are clearly non-durables sum to 60% of the spending impact across all discernible categories. [84] This is conservative as the other categories (e.g., retail) will also have included spending on non-durables. If we assume the same share of non-durables spending within uncategorized and ATM withdrawals, then our estimates imply a lower bound on the marginal propensity to consume (MPC) out of the first withdrawal of 0.26 (0.29 for the second withdrawal).

[82] A corresponding table of results can be found in Appendix 4J

[83] https://www.rba.gov.au/publications/bulletin/2020/jun/pdf/cash-use-in-australia-results-fromthe-2019-consumer-payments-survey.pdf

[84] Clearly non-durable categories include gambling, supermarkets, rent, restaurants, gas stations, government, utilities, food delivery, other groceries, alcohol and tobacco, health services, pharmacies, personal care, taxi and rideshare, travel, education, post office, pet care, cafes, car rentals, road tolls, insurance, entertainment, donations, subscription TV, gyms and fitness, transport, public transport, totalling $1,039.26 out of $1,720.82 in total discernible spending.

Figure 4.8. Estimated cumulative ATTs of the first withdrawal by category



Data: Illion

Notes: Results are based on cohort ATTs estimated via the R package 'fixest', which implements Sun and Abraham (2021). We compute weekly aggregate ATTs by averaging across cohorts weighted by cohort share. We then accumulate over the first eight post-treatment weeks. The 'did' and 'fixest' statistical packages do not generate standard error estimates for cumulative ATTs. Moreover, when summing coefficients across time, one requires the variance-covariance matrix from the estimation procedure, and this is only generated for the cohort regressions rather than the weighted average aggregate regressions. To derive analytically standard errors for our spending category cumulative aggregate ATT estimates, we take the variance-covariance matrix from the cohort regression and exploit the fact that: 1) Cov $\left(\sum_{i=1}^{m} a_i X_i, \sum_{j=1}^{n} b_j Y_j\right) = \sum_{i=1}^{m} \sum_{j=1}^{n} a_i b_j \mathrm{Cov}(X_i, Y_j)$ and 2) SE$(X_i + X_j) = \sqrt{\mathrm{Var}(X_i) + \mathrm{Var}(X_j) + 2 \cdot \mathrm{Cov}(X_i, X_j)}$. Confidence intervals are at the 95% level.

4.5 Heterogeneity

4.5.1 MPX distribution

In our bank transactions data, we observe individual income and spending before and after withdrawal, allowing us to estimate individual-level treatment effects. Specifically, for each treated unit we compute the difference in average spending between the three weeks before and the three weeks after withdrawal, then divide by the withdrawal amount (Figure 4.9b).[85,86] As is evident in Figure 9b, these estimates are subject to error. But because we observe a pre-period for both the withdrawers and non-withdrawers, we can remove its time-invariant component specific to the withdrawers and its time-varying component common to both groups.

To isolate the time-invariant component, among the same individuals we repeat the exercise just described on a timeframe three weeks earlier, computing average spending in the three weeks before withdrawal, subtracting average spending in the three weeks before that, and then dividing by the withdrawal amount (Figure 4.9a). As expected, this is random noise centered near zero. To isolate the time-varying component, we compute the same two estimates among the non-withdrawers, but scaled by the average withdrawal amount among the withdrawers.

These spending differences then serve as the four quadrants in a two-by-two difference-in-differences setup, but applied to quantiles rather than the mean; i.e., quantile difference-in-differences (Athey and Imbens, 2006). This differs from the standard quantile regression approach taken in previous studies (Misra and Surico, 2014). In Figure 4.9c, we display our estimates by centile with 95% confidence intervals estimated via bootstrap. Each point is the upper bound of MPXs for a given share of withdrawers (e.g., half of the observations have an MPX of 0.51 or less).

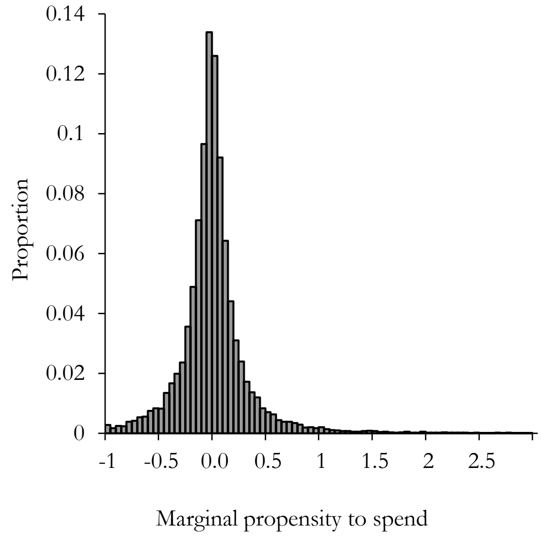
This distribution has two notable features. First, for the lowest 95%, the distribution is near-uniform (the dashed 45-degree line). This part of the distribution is neither bimodal (with excess mass at zero and one) nor strongly right-skewed (with excess mass at zero). This near-uniformity is also present in the density estimated by Karger and Rajan (2021) for the US pandemic stimulus, though that density had a spike at zero. Second, the distribution has a long right tail, with 5% having an MPX above one (and the top 1% above 2.3). One possibility is that they faced lumpy expenditures with insufficient liquidity, and the withdrawal bridged that gap.

[85] This is similar to the approach taken by Karger and Rajan (2021) in studying the 2020 US stimulus program.

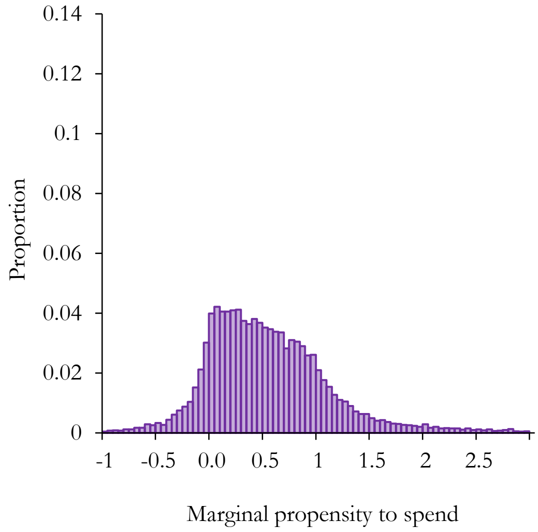
[86] Because the spending impact lasted eight weeks on average, this will underestimate the true treatment effect—though 83% of additional spending occurred in the first three weeks. Extending our individual-level estimates to eight weeks would require us to extend the pre-period, cutting the sample size and making it impossible to estimate a placebo-period distribution, given we observe each unit only for a 90-day window.

Figure 4.9. Estimated quantile treatment effects of withdrawal on spending among the treated

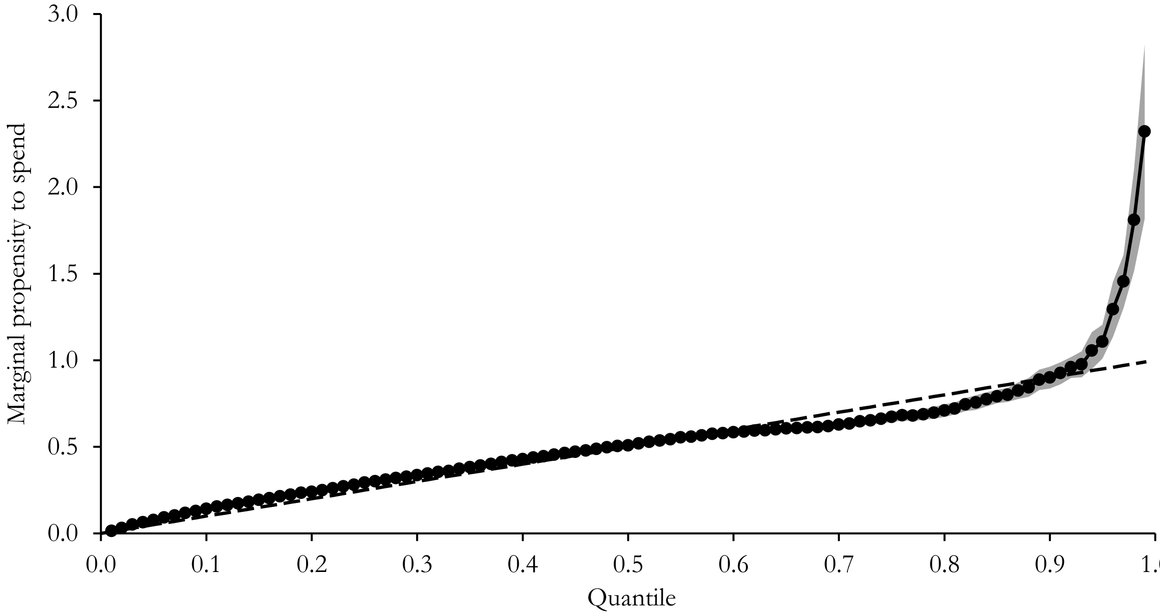
(a) Pre-treatment MPX distribution among treated



(b) Post-treated MPX distribution among treated



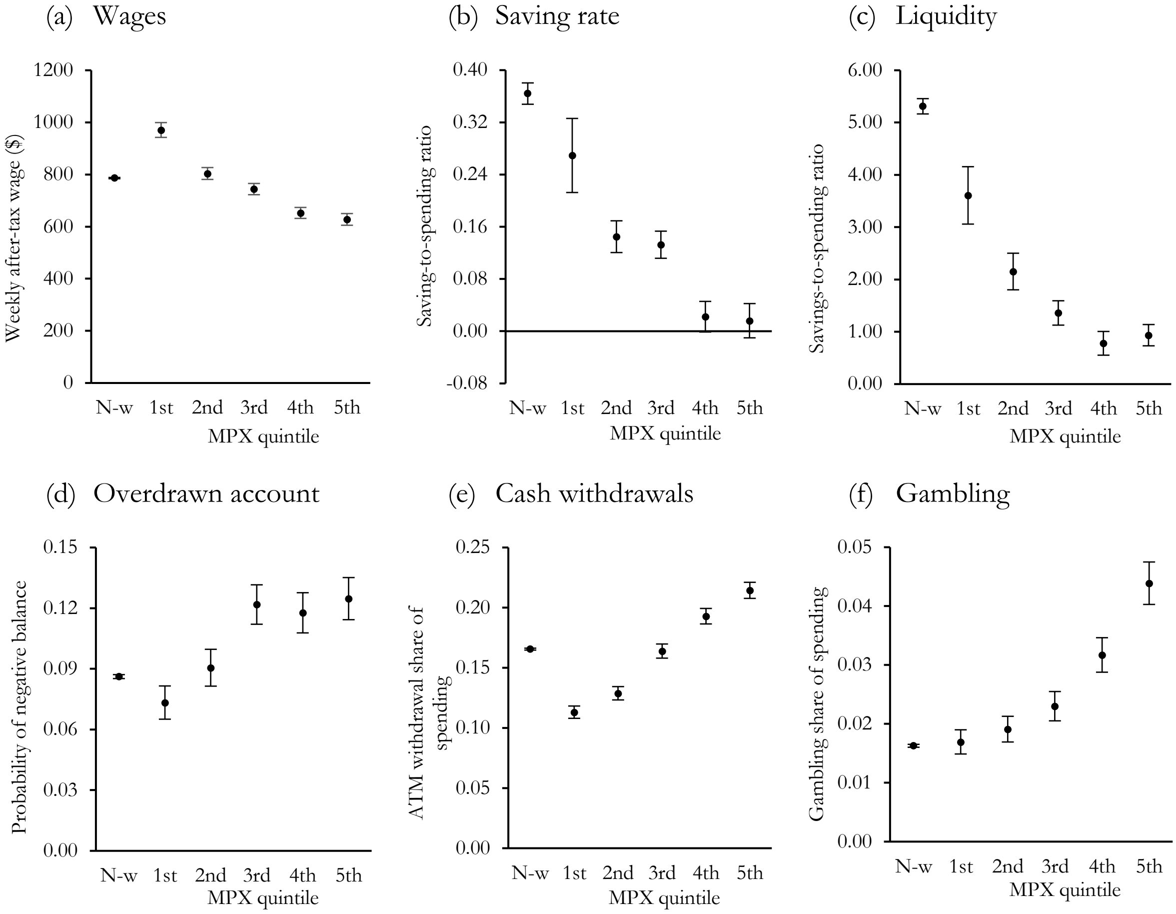
(c) Quantile difference-in-differences of MPX



Data: Illion

Notes: Subfigures (a) and (b) display histograms (bin size 0.05) of individual-level MPX estimates via simple differences in spending across consecutive three-week periods among the withdrawers. Each unit's spending difference is divided by its eventual withdrawal amount to generate an individual-level MPX estimate. The treatment period (subfigure (b)) compares three weeks either side of withdrawal; the placebo period (subfigure (a)) compares three weeks prior to treatment and the three weeks prior to that. Subfigure (c) displays quantile difference-in-differences (qdid) estimates (by centile) with 95% confidence intervals estimated via bootstrap. The qdid estimates are constructed by computing the difference in the individual-level MPX at each quantile between the post-treatment period (subfigure (b)) and pre-treatment period (subfigure (a)) among those who withdrew, and subtracting the corresponding differences among those who did not withdraw. An MPX of 0.5 at a quantile of 0.5 indicates that the median of the individual-level MPX distribution rose 0.5 units more among those who withdrew than among those who did not. The dashed line indicates estimates under a uniform distribution.

Figure 4.10. Estimated pre-treatment variable means by estimated MPX quintile vs non-withdrawers



Data: Illion
Notes: Non-withdrawers on the left; recall they are roughly five times the withdrawers in number. Withdrawers are divided into quintiles based on the following MPXs: (-0.56, 0.09], (0.09, 0.34], (0.34, 0.63], (0.63, 0.97], (0.97, 2.7]. The 4% of withdrawers with MPXs outside this range are omitted. Outcomes are averages during the month prior to withdrawal. 95% confidence intervals shown.

4.5.2 MPX predictors

In Section 4.3, we found that withdrawers had far worse financial health. Now we investigate how that covaries with their propensity to spend. In Figure 4.10, having split the withdrawer sample into MPX quintiles, we display estimated means of pre-treatment variables by quintile. For reference, we present on the left of each panel the mean among the non-withdrawers (a group five times larger).

Poorer pre-treatment financial health strongly predicts greater spending, consistent with the literature on substantially smaller transfers (Johnson et al., 2006; Broda and Parker, 2014; Kreiner et al., 2019). Wages vary modestly across the MPX distribution, falling 35% between the first and fifth quintiles, with half this decline between the first two quintiles. The variation in financial health is more dramatic. Between the first and second MPX quintiles, the saving rate halves and liquidity almost halves. The 40% with MPXs exceeding 0.63 (around $6,000 of additional spending over eight weeks) were saving nothing and had savings at or below monthly spending. Even the 40% with MPXs between 0.09 and 0.63 had savings to cover no more than an additional month of spending, saving less than 15% of outlays. The 60% with MPXs of 0.34 or more were nearly twice as likely to have an overdrawn account than the 20% with MPXs of 0.09 or less.

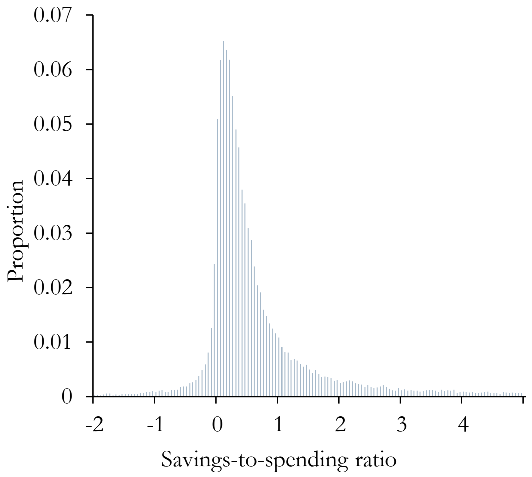
We also include two pre-treatment spending categories that were strongly related to the MPX: ATM withdrawals and gambling. As noted earlier, Australia is predominantly a cashless society, at least in formal markets. And gambling is more lightly regulated than in the US (online betting is legal, for example), with higher average losses[87]. Recall these two categories were the largest and third-largest discernible uses of withdrawn funds. Both ATM withdrawals and gambling prior to withdrawal were strongly predictive of MPX. Indeed, between the lowest and highest MPX quintiles, the rate of pre-treatment gambling more than doubled.

Comparing to the non-withdrawers is informative. There was a modest difference in wages between the withdrawers and non-withdrawers, but low spenders had higher wages than the non-withdrawers and high spenders had lower wages. This same pattern applied to cash withdrawals. Contrast this with the saving rate, liquidity, and gambling: for all three, the average for every MPX quintile was lower (higher in the case of gambling) than the average among the non-withdrawers. It was a similar story with the probability of being overdrawn, with all but the lowest MPX quintile having a higher probability than the non-withdrawers.

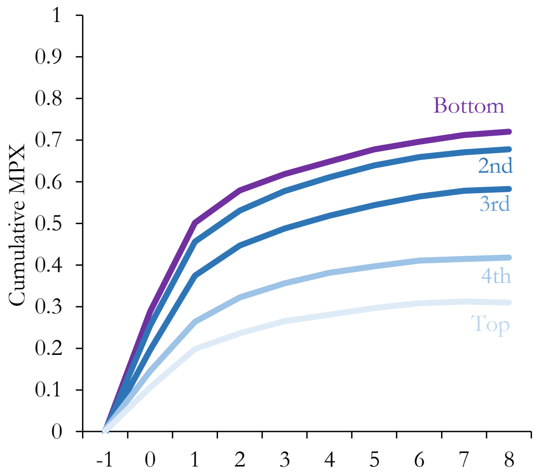
While there was variation among the withdrawers, they appear divisible: around 20% had MPXs below 0.09 and financial health that was similar to the non-withdrawers; the remaining 80% had MPXs above 0.09 and far worse financial health than the non-withdrawers. Various measures decline rapidly with the MPX and then plateau, with the top 60% homoegeneous along multiple dimensions.

Figure 4.11. The relationship between liquidity and spending

(a) Liquidity histogram



(b) Spending by liquidity quintile



Data: Illion
Notes: Liquidity is savings divided by spending on average during the month prior to withdrawal. For each liquidity quintile, we estimate cohort ATTs via the R package, 'did', which implements Callaway and Sant'Anna (2021). We compute weekly aggregate ATTs by averaging across cohorts weighted by cohort share. We then accumulate these by week and divide by the average withdrawal amount in the relevant liquidity quintile.

[87] https://www.nytimes.com/2018/04/04/world/australia/australians-gambling-betting-machines.html

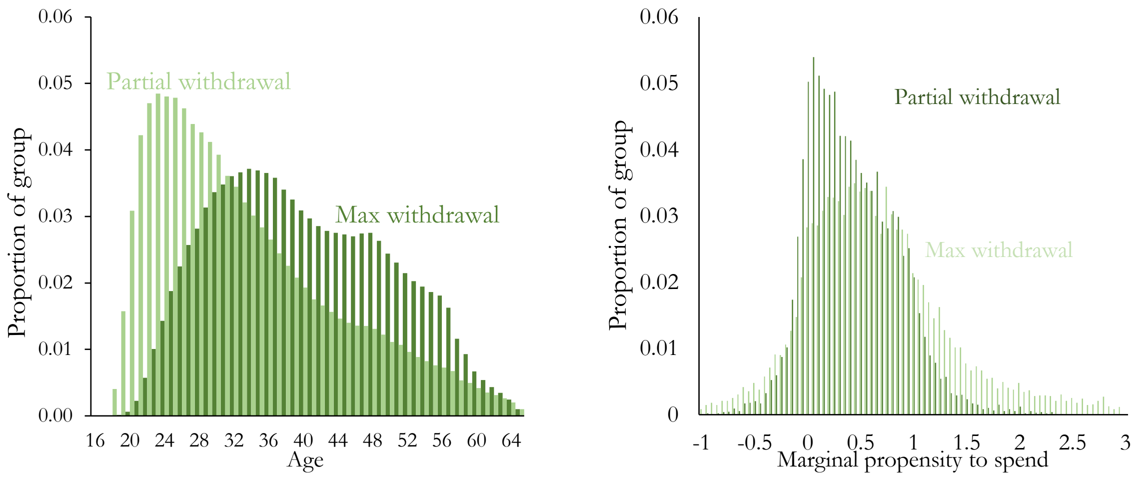
4.5.3 Liquidity

To assess the relationship between financial health and the MPX with greater precision, we focus on the ratio of savings to spending (a measure of liquidity) just prior to withdrawal. In Figure 4.11a, we present the estimated density of liquidity among the withdrawers, the average of which (2.07) was substantially lower than that among the non-withdrawers (5.38). We then divide the liquidity distribution into quintiles and estimate our main difference-in-differences regression separately for each quintile. We then accumulate the resulting weekly spending impacts following withdrawal and divide by the average withdrawal amount in each quintile.

The results are displayed in Figure 4.11b, and indicate a substantial and monotonic increase in the MPX, for every week post-treatment, as liquidity declines. The MPX among the bottom two liquidity quintiles is similar, with the least-liquid 40% having an MPX (0.68–0.72) more than double that among the most liquid 20% (0.31). This translates to additional spending of around $2,500 over eight weeks—equivalent to almost an entire month's post-tax wages for the former group.

Figure 4.12. The relationship between age, withdrawal amount, and spending

(a) Age histogram by withdrawal amount (b) MPX histogram by withdrawal amount



Data: Australian Taxation Office
Notes: First withdrawal. Only working-age people with positive superannuation balances includes.

Data: Ilion
Notes: First withdrawal. Individual-level MPXs estimated via simple difference in spending three weeks before and after withdrawal. Bin size is 0.05

4.6 Interpretation

4.6.1 Two-asset heterogeneous-agent model

In this section, we develop a theoretical framework to interpret the evidence quantitatively. The framework includes the following key ingredients: i) incomplete markets (partial equilibrium), income risk, and borrowing constraints (Huggett, 1993); ii) two assets, a liquid asset and an illiquid asset that is costly to adjust (Kaplan and Violante, 2014); and iii) naively present-biased households (Laibson et al., 2021).[88] We focus on non-durables as durables are difficult to discern in our data, and the non-durables MPX is closer to the theoretical MPC concept (Laibson, Maxted and Moll, 2022). We calibrate the model for the sub-population of withdrawers.

As in Kaplan et al. (2018), time is continuous and households maximize the present discounted value of utility:

$$\max_{\{c_t, d_t\}} \mathbb{E}_0 \int_0^{\infty} e^{\varrho t} u_t(c_t) dt,$$

subject to:

$$\dot{b}_t = (1 - \xi) w_t z_t + (r^b + \phi \cdot 1(b < 0) b_t - d_t - \chi(d_t, a_t) - c_t$$

$$\dot{a}_t = r^a a_t + \xi w_t z_t + d_t$$

$$a_t \geq 0$$

$$b_t \geq \underline{b}$$

$$\chi(d, a) = -\chi_0 \cdot \min\{d, 0\} + \frac{\chi_1}{2} \left(\frac{\min\{d,0\}}{a}\right)^2 a + \chi_2 \cdot \max\{d, 0\} + \frac{\chi_3}{2} \left(\frac{\max\{d,0\}}{a}\right)^2 a$$

where z_t is productivity following a Poisson process, c_t is consumption, b_t is liquid asset holdings, a_t is illiquid asset holdings, w_t is the wage, d_t is deposits into the liquid asset, r^b is the risk-free return on the liquid asset, ϕ is the wedge on liquid asset borrowing ($b < 0$), r^a is the risk-free return on the illiquid asset, ξ is the fraction of labor income deposited into the illiquid account at no cost (pension saving), $\underline{b}$ is the borrowing limit, $\chi(d, a)$ is the asymmetric cost of (voluntarily) adjusting illiquid asset holdings, and ϱ is the discount rate adjusted by ζ, the death rate, given an average lifespan of 45 years (540 months).

Following Laibson et al. (2021), we accommodate present-biased households featuring quasi-hyperbolic discounting with a naive perception that their future selves will behave as rational households. In particular, for these households, we assume the following instantaneous gratification discounting function:

$$D(t) = \begin{cases} 1 & \text{if } t = 0 \\ \beta e^{-\rho t} & \text{if } t > 0 \end{cases}$$

When $\beta = 1$, we recover the exponential discounting in Equation (1). As demonstrated by Laibson et al. (2021), the consumption policy rules for constant relative risk-aversion (CRRA) preferences are:

$$\text{for all } b > \underline{b}, \qquad c(x) = \beta^{-\frac{1}{\gamma}} \hat{c}(x)$$

$$\text{for all } b = \underline{b}, \qquad c(x) = \left\{ \min\left(\beta^{-\frac{1}{\gamma}} \hat{c}(x), (1 - \xi) y + r\underline{b}\right) \right\}$$

in which $\hat{c}(x)$ is the consumption policy function the naive household considers it will adopt in the future.

[88] Alternative approaches include: Beraja and Zorzi (2023), in which durables consumption is lumpy and the MPC does not decrease substantially with transfer size; and Miranda-Pinto, Murphy, Walsh and Young (2023), in which non-durables consumption jumps following the liquidity shock for households that were unable to cover expenditures before withdrawal.

Present bias differs from impatience (high but exponential discounting) in several important ways. In particular, the portfolio choice of a present-biased household is more akin to that of a patient household. Intuitively, for a present-biased household, consumption decisions are small decisions on a flow variable, while illiquid assets' adjustments are lumpy and large decisions on a stock variable.

4.6.2 Calibration

In Table 4.5, we report the externally calibrated parameters in our model. We set the monthly interest rate on illiquid assets using the observed returns on Australian pension savings. The median return (net of fees and taxes) on Australian pension savings for the last 29 years is 8.3%, which implies an annual real return, net of average inflation (2.58%), of 5.72% (0.47% per month). The real return on liquid wealth (2% per year) is from Kaplan et al. (2018). The monthly wedge on borrowing ϕ is 0.75%, which we obtain from the 14.18% interest on unsecured personal loans from the Reserve Bank of Australia, net of average inflation. The income process follows Achdou, Han, Lasry, Lions and Moll (2022), adapted to a monthly frequency. We discretize an AR(1) process, with annual persistence $\varrho_z = 0.9$ and standard deviation $\sigma_z = 0.2$ (Guvenen, Kambourov, Kuruscu, Ocampo and Chen, 2023), into a monthly two-state Poisson process with income states $z_1 = 0.94$ and $z_2 = 1.06$, and a jump probability of 0.88. The borrowing limit b is one-third of monthly wages ($-w/3$), which corresponds to around a $2,000 credit card limit.

Our internal calibration entails finding the discount rate ϱ and, where applicable, the present-bias parameter β that match the average MPC in the data. We obtain the average MPC out of pension withdrawals by multiplying the average MPX by our lower bound on the share of non-durables in the spending response, which is 60%. Because we are interested in the heterogeneity of spending responses, the empirical MPX we use is that from Figure 9c. In this case, the weighted average MPX equals 0.52, which implies a target average MPC of 0.31. We calculate the model's implied average MPC out of a two-wage windfall, as the first or second withdrawal.

Table 4.5. Externally calibrated parameters

Parameter	Description	Value	Source/Target
Preferences			
γ	Risk Aversion	2	Standard
ζ	Death rate	1/(45x12)	Avg. lifespan of 45 years
Assets			
$\underline{b}$	Borrowing limit	-w/3	Basic credit card limit Australia
ω	Interest rate wedge	0.75%	Reserve Bank of Australia
r^b	Liquid asset return	0.17%	Kaplan et al. (2018)
r^a	Illiquid asset return	0.47%	Australian Super
ξ	Share of income automatically deposited	10.5%	Australian regulation
χ_0	Adj. cost linear component withdrawals	1.1	Arbitrarily large (policy)
χ_1	Adj. cost convex component withdrawals	12	Arbitrarily large (policy)
χ_2	Adj. cost linear component deposits	0.002	Arbitrarily small (policy)
χ_3	Adj. cost convex component deposits	0.01	Arbitrarily small (policy)
Income process			
z_1, z_2	Income states	0.94,1.06	Guvenen et al. (2023)
λ_1, λ_2	Income jumps	0.887	Guvenen et al (2023)

Table 4.6. Calibration results

Moment	(1) Data	(2) Exponential benchmark	(3) Exponential impatient	(4) Present biased
Preferences				
ρ	-	0.4%	17%	0.4%
β	-	1	1	0.58
Calibration target				
Average MPC	31%	2.9%	31.2%	31.3%
Additional moments				
Liquid assets to income	-	319%	1.9%	51.9%
Share at borrowing constraint	-	10.2%	94.4%	92.3%

Note: In this table, we report the calibrated parameter values along with the model-implied moments for three versions of the model. In column (1), we report the average MPC out of the first withdrawal. In column (2), we show the parameter values and the moments from a model with exponential discounting and a standard calibrated value for the monthly subjective discount rate, ϱ. In column (3), we provide the subjective discount rate that can match the average MPC in the data, assuming exponential discounting (β = 1). In column (4), we report the calibrated present-biased parameter, β, for a standard discount rate ϱ, as in column (2).

In Table 4.6, we report moments for three versions of the model. In Column 2, we show the model-implied moments of a standard exponential calibration in which we assume ϱ = 0.4%, which is equivalent to a monthly subjective discount factor of $1/(1 + 0.4\% + \zeta) = 0.99$ and an annual discount factor of 0.93, as in Kaplan et al. (2018). This calibration delivers an average MPC, out of a two-wage windfall, of 2.9%, which is an order of magnitude smaller than that observed in the data. In Column 3, we allow the discount rate ϱ to vary so as to match the observed average MPC. The implied calibrated discount rate is 17%, which is equivalent to an annual discount factor of 0.15, substantially below calibrated values in the literature.43 In the final column, we report our naively present-biased calibration. Given a standard value of ϱ = 0.4%, the calibrated value of the present-bias parameter β is 0.58, which lies between the values obtained by Ganong and Noel (2019) ($\beta \in [0.5, 0.9]$) and Gerard and Naritomi (2021) (β = 0.44).

In the final two rows of Table 4.6, we report additional moments that shed light on the key differences between the models. First, the three models have very different implications for liquid asset holdings. While the standard exponential model delivers an excessive liquid-savings-to-income ratio (319%), the model with high impatience delivers too little savings (1.9%). The present-biased model has an average ratio of liquid assets to income of 51.9% which is indeed close to the one observed in the data. [89] In the final row, we report the share of households at the borrowing limit. The model displays shares of 10.2%, 94.4%, and 92.3% in the exponential benchmark, impatient, and the present-biased cases, respectively.

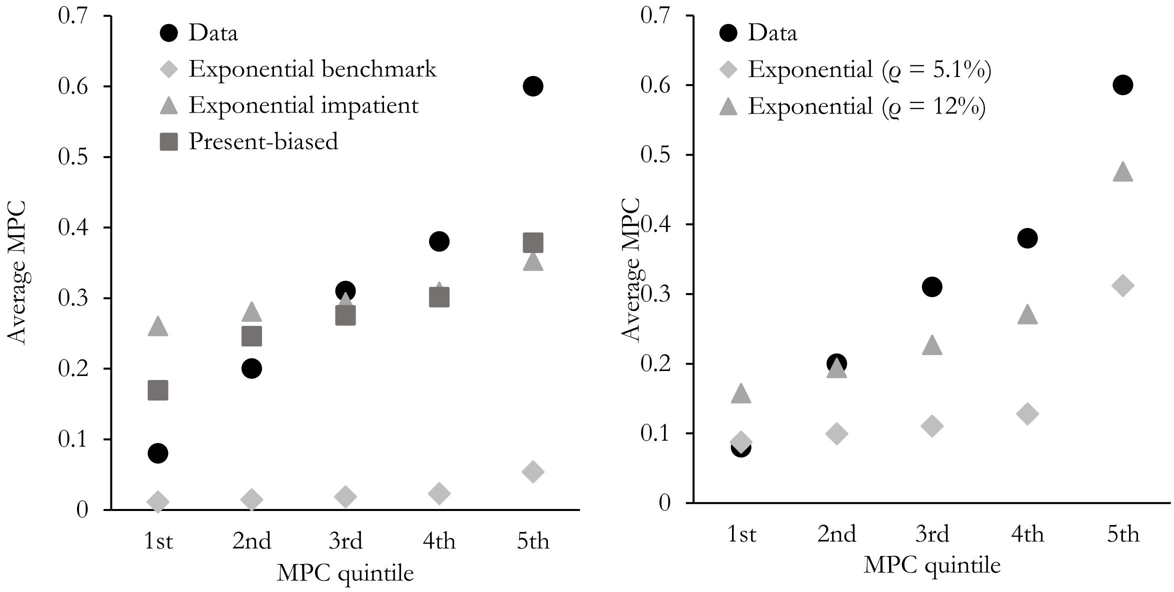
4.6.3 MPC heterogeneity

Next we study the fit of the models in terms of MPC heterogeneity and the empirical relationship between liquidity and spending responses. In Figure 4.12a, we display the average MPC by MPC quintile for each of the three models. One can see that the exponential benchmark delivers very limited heterogeneity in consumption responses (noted also by Laibson et al. (2021)). Even the top quintile, mainly composed of liquidity-constrained households, displays a small average MPC of 5.3%. On the other hand, while the model with extremely impatient households is able to match the average MPC, it fails to deliver sufficient MPC heterogeneity. The present-biased model provides the best fit to the data.

[89] We do not explicitly target the liquid asset holdings as in our data we do not have information on the stock of debt (only flow debt payments) or the stock of additional liquid savings (we only have information on checking and savings accounts).

Figure 4.12. Calibrated average MPC by MPC quintile

(a) MPC heterogeneity by model at monthly frequency (b) Exponential discounting at annual frequency

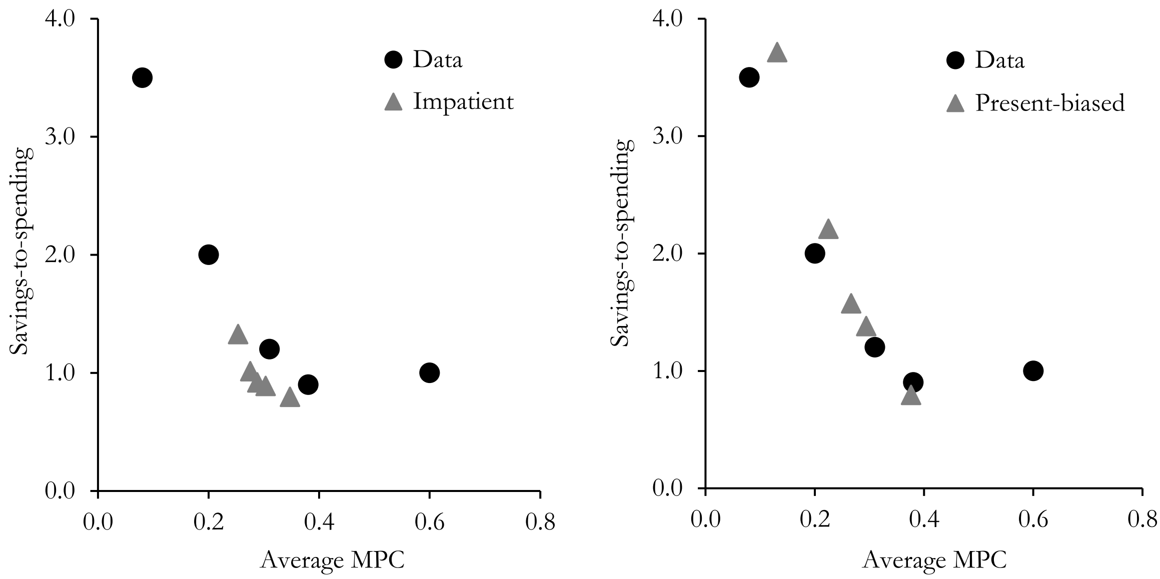


Notes: On the vertical axis, we report the average MPC of the corresponding MPC quintiles in the horizontal axis. To obtain the average MPC, we use the weights from the stationary distribution of assets.

We now investigate the model-implied relationship between liquidity and average MPC by MPC quintile. In Figures 4.13a and 4.13b, we display results for the exponential-impatient and present-biased models, respectively. It is clear that the model with impatient households not only lacks MPC heterogeneity but also fails to match the heterogeneity in liquid asset holdings. On the other hand, the model with present-biased households is very close to replicating the observed relationship between liquidity and MPC. The one exception is the very highest MPC quintile, in which the observed MPC is 0.6 but the model can only deliver an MPC of 0.38. In evaluating the strongly right-skewed MPX distribution in Section 5, we posited that the top 5% having MPXs significantly exceeding one may be due to lumpy expenditures in the presence of liquidity constraints. Since our model does not include this feature, this lack of fit in the right tail is unsurprising.

Figure 4.13. Calibrated average MPC by MPC quintile

(a) MPC heterogeneity by model at monthly frequency (b) Exponential discounting at annual frequency



Notes: On the vertical axis, we report the average MPC of the corresponding MPC quintiles in the horizontal axis. To obtain the average MPC, we use the weights from the stationary distribution of assets.

4.6.4 Importance of high-frequency data

A key insight of the calibration exercise is the importance of high-frequency (at least monthly) data. To draw this out, we ignore the high-frequency spending patterns and calibrate our model with aggregated annualized data. We thus consider both withdrawals, which for the modal withdrawer represented $20,000 (in the order of half annual wages). In Figure 4.12b, we report the average MPC across the MPC distribution. We plot the results for a standard discount factor value (0.93 annual) and for a value that matches the average MPC (0.31) in the data (0.87 annual). At the annual frequency, a two-asset heterogeneous-agent model with borrowing constraints is able to explain the observed consumption patterns.

However, such a calibration is misleading, for a few reasons. First, the majority of the spending increase occurred within just the first two weeks after withdrawal. Thus, a calibration that targets the annual MPC implicitly imposes a counterfactually "smoother" spending impulse. Second, at the annual frequency, the relative size of the liquidity injection is four times smaller than at the monthly frequency. While the two pension withdrawals represent a liquidity injection of half average annual wage, the first (or second) withdrawal represents more than two months of wages. This is an important consideration as the spending responses in the models considered here decrease considerably with the size of the transfer. Third, the discount factor at the annual frequency is significantly smaller than the discount factor at the monthly frequency, implying a higher degree of impatience.

4.7 Conclusion

The Super withdrawal program gave people a seemingly one-off chance to withdraw $20,000 from their retirement accounts before retirement at an expected cost to their balance at retirement of perhaps $120,000 in today's dollars. Those who chose to withdraw were strongly selected—younger, with very little assets, very low rates of saving, more likely to be in blue-collar occupations and to live in rural or remote areas, with much greater spending in cash and on gambling. And, overwhelmingly, they did not use their withdrawals to repair their financial circumstances—indeed, the worse their circumstances, the less likely they were to do so. The magnitude and frequency of their spending is inconsistent with rational, forward-looking behaviour.

A natural question is why their behaviour was so strongly time-inconsistent. The clinical psychology literature suggests a link between gambling and impulsivity, implying a link between impulsivity and present bias in our setting (Maclaren, Fugelsang, Harrigan and Dixon, 2011). The survey evidence of Parker (2017), that the consumption response is associated with sophistication and planning, and impatience, is consistent with this, and implies a role for better financial literacy (Lusardi and Mitchell, 2014; van Rooji, Lusardi and Alessie, 2012). Given the broad swath of the population—roughly one in four 34-year-olds—that withdrew, our evidence suggests a high lower bound on the number of present-biased people in the population. By withdrawing, participants have revealed their type (a 'tag' as per Akerlof (1978)), which facilitates linking to administrative data so that we may learn more about the present-biased in future research.

To the extent the Super withdrawal program overcame fiscal constraints, it may have improved macro-stability, improving welfare. The present-biased will pay in sub-optimal future consumption—but this is also true of cash stimulus, which can be saved rather than spent. By connecting directly the individual-level costs and benefits of using cash transfers to stabilize the economy (as opposed to an indirect connection via higher future taxes), the program highlights a quirk of cash stimulus generally. The greater the present bias, the more effective it is (Laibson et al., 2021). But those induced to spend make themselves worse off (and others better off (Auclert, Rognlie and Straub, 2023)), at least directly, by not saving to offset future taxes. The net impact depends on the properties of the tax and transfer system. The application of a comprehensive welfare frame to stimulus under present bias is critical to designing optimal macro-stabilization policy (Maxted, 2022). Channelling Tobin (1977): just how many Harberger triangles does it take to fill an Okun's gap?

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Appendices

4A Detailed description of the superannuation system

Australia has a compulsory, defined-contribution private retirement saving system, called 'superannuation'.[90] Under the system, all employers are required to contribute an additional 10.5% (rising to 12% by 2026) of the pre-tax wages (including bonuses but excluding overtime) of their employees to a private pension account.[91] The median balance by age in 2019 is shown in Table 4.A1.[92]

Table 4.A1. Median superannuation balance by age

Age	Median Balance ($)
20	3,264
30	34,908
40	82,208
50	124,146
65	207,071

Data: Australian Taxation Office
Note: Balances as at 30 June 2019

Compulsory contributions are made by employers and subject neither to personal nor to corporate income tax. They are taxed at a flat rate of 15% when they enter the fund (compared to a modal marginal income tax rate of 34.5% and a top rate of 47%). People can contribute voluntarily up to an additional $27,500 per year pre-tax and $100,000 post-tax (both also attracting the standard 15% tax on entry). Before the retirement phase, cash returns on superannuation are taxed at 15% and capital gains at 10%, levied on the fund. Withdrawal is prohibited until age 58 if retired (rising to 60 by 2024) or 65 if still working, and is tax-free.[93] All returns generated during the retirement phase are untaxed.

Superannuation is not paid on welfare payments, including paid parental leave. Sole traders do not have to make superannuation contributions for their own earnings. Historically, superannuation payments were compulsory for all workers with gross earnings of at least $450 per month, with this minimum recently removed. Superannuation is paid on "ordinary time earnings", which is the gross amount the employee earns for their ordinary hours of work (before tax). It includes commissions, allowances, and bonuses, but excludes overtime.

For almost everyone, superannuation is highly tax advantaged relative to other forms of saving,[94] at the cost of being perfectly illiquid until retirement. Super is the only form of pre-tax saving, and cash returns to all other forms of savings are taxed at full marginal personal rates (more than two times the superannuation tax rate for the median taxpayer and more than three times for those in the top 3.6%). This includes interest, dividends, and rental income from investment properties. All capital gains (held for more than a year and excluding the primary residence) are taxed at half the marginal income tax rate (17.25% for the median

[90] All details in this subsection can be found on the website of Australia's tax authority: https://www.ato.gov.au.

[91] On all wage earnings up to $240,880 per year.

[92] Superannuation was introduced in 1983 and the mandatory contribution amount has increased over time, the median balance in the cross section increases less with age than the median currently young person can expect their own balance to increase over their working life.

[93] There are limited circumstances in which working-age people can access their superannuation early. See: https://www.ato.gov.au/individuals/super/withdrawing-and-using-your-super/early-access-to-your-super/

[94] The one exception is the primary residence, which is untaxed (but mortgage interest on the primary residence is not tax-deductible) and does not affect eligibility for the public pension (described later).

individual and 23.5% for those in the top 3.6%) upon realization. Australia does not have a step-up in basis for inherited assets.[95]

Employers allocate employees to a default fund, but employees can instead nominate an alternative fund, and recent reforms have encouraged competition between and consolidation across funds. Within their nominated superannuation fund, account holders can typically choose an investment strategy with a particular risk–return trade-off. Superannuation funds invest in listed assets but also make direct investments in unlisted assets like infrastructure. People can also manage their own superannuation savings via a 'self-managed superannuation fund', with around 3% of all superannuation account holders doing so.

There are $3.5 trillion (160% of GDP) in total superannuation assets, constituting one of the largest private pension pools in the world.[96] Over the past decade, the median 'growth' fund has achieved an average annual return of 9.5% after taxes and fees. Over the 29 years the Super system has existed, the average annual return has been 8.3%, with four years posting losses (the largest of which was 21.5% in 2008).[97] There are 128 superannuation funds, many of which were initiated by the labour movement ('industry' funds), which agitated for the establishment of the superannuation system.[98] In Australia, the superannuation system is strongly affiliated with the centre-left Australian Labor Party, which introduced the system. The centre-right Liberal Party government, which introduced the early superannuation release program, would later propose that first-home buyers be able to access superannuation for a home deposit. This was strongly opposed by the then-Labor-Opposition on the basis that early access undermines the superannuation system.

Alongside superannuation, Australia also has a public pension system paying up to around $900 per fortnight to those aged 67 or older, a rate which is means-tested on the basis of current income and assets (including superannuation but excluding the primary residence). For those who own their own home and with assets of more than $280,000 ($419,000 for couples), every $1,000 in additional superannuation reduces the pension for which they are eligible by $3 per fortnight. This means those with assets of more than $609,250 ($915,500 for couples) are ineligible to receive a public pension.

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[95] Other than the primary residence of the deceased, which remains exempt from capital-gains tax provided it is sold within two years.

[96] https://www.oecd.org/daf/fin/private-pensions/Pension-Funds-in-Figures-2021.pdf

[97] https://www.superguide.com.au/comparing-super-funds/super-funds-returns-financial-year

[98] See Mees (2017) for a history of the establishment of the superannuation system.

4B Eligibility

In Section 4.3, we compared those who withdrew with those who did not without regard for the eligibility conditions of the program. While the tax authority administering the program appears not to have engaged in any systematic compliance or enforcement activity, ex ante participants may have expected it to do so, or felt a moral obligation to conform to the rules. The application process generated very little friction, requiring the applicant to fill out a short online form but not requiring them to substantiate their eligibility in any way. The funds were then deposited into the applicant's bank account in just a few days.

During the application process, applicants had to nominate a criterion according to which they were eligible. In the first withdrawal, 48% stated a reduction in working hours, 19% each being unemployed and being eligible to receive a government benefit (government payments go to more than a quarter of the population, akin to the US Child Tax Credit), 9% being a sole trader shut down or with a reduction in turnover, 3% having been made redundant, and 2% being a visa holder facing hardship. We do not observe a withdrawer's true eligibility, nor whether they believed they were eligible. But because we observe weekly wage earnings and welfare payments, we can construct a proxy for eligibility which would seem to reasonably approximate the three largest and fifth-largest categories, covering 89% of applicants according to their self-nominated reason for eligibility. Consistent with the eligibility conditions listed in Appendix 4A, we define someone as eligible if they experienced a 20% decline in weekly wages or received a welfare payment between January 8 and June 25.

According to this measure, 70% of the population were eligible to withdraw superannuation.[99] While 17% of the working-age population withdrew superannuation, 20% of those eligible withdrew, and 11% of those ineligible withdrew. This suggests 18% of those who withdrew were ineligible—or, put differently, the compliance rate was 82%. One potential limitation is that we don't observe hours, only earnings. It is possible, however unlikely, that an observed reduction in wages is due to a reduction in the wage rate rather than hours, upon which eligibility was contingent. But while that means our measure could exclude some who are eligible, it also means it could include some who are ineligible. We also don't observe business turnover or visa status, which may have triggered eligibility for sole traders and foreign workers, respectively. But if we exclude the 11% claiming sole-trader or visa eligibility, the compliance rate is a little higher at 86%.

The main concern about eligibility is that it might explain the observed differences between those who withdrew and those who did not. For example, welfare recipients may both have lower liquidity than non-welfare-recipients and be overrepresented among the withdrawers not by choice but by eligibility. To assess the effect of eligibility, we recompute Table 4.2 but among the eligible (Table 4.A2). Note that we are unable to construct our eligibility proxy in the bank transactions data, so can only reproduce the items relying on our administrative data. While there are differences in levels because the eligible differ from the broader population, all of the same patterns observed in the general population are present among the eligible. There are negligible differences in demographics. The eligible non-withdrawers have higher wages and rental incomes and lower interest incomes, dividends, and voluntary superannuation contributions than the non-eligible non-withdrawers. The eligible withdrawers have higher wages and slightly lower interest incomes, rental incomes, dividends, and voluntary superannuation contributions than the non-eligible withdrawers, and almost identical superannuation balances. But, critically, eligibility does not affect the relationship between liquidity and withdrawal—all of the differences have the same directions and similar magnitudes.

[99] An Australian National Audit Office audit of Australian Taxation Office (ATO) program administration notes that by mid-June 2020 the ATO was able to reach a high degree of confidence with respect to the eligibility of around 70% of applicants. By end-July the ATO had assessed that around 90% were eligibility to apply, and under 0.02% of applications were affected by fraud. See: https://www.anao.gov.au/work/performance-audit/the-australian-taxation-office-management-risks-related-to-the-rapid-implementation-covid-19.

The relationship between age and withdrawal is only mildly affected by eligibility. In Figure 4.B1a, the probability of eligibility is around 70% from the mid-20s to late 50s. Eligibility is significantly higher for those in their late teens and early 20s due to a greater probability of having a reduction in working hours or being in receipt of a government benefit (due to the prevalence of the Youth Allowance payment). As shown in Figure 4.B1b, this translates into a probability of withdrawal among the eligible that has a very similar profile.

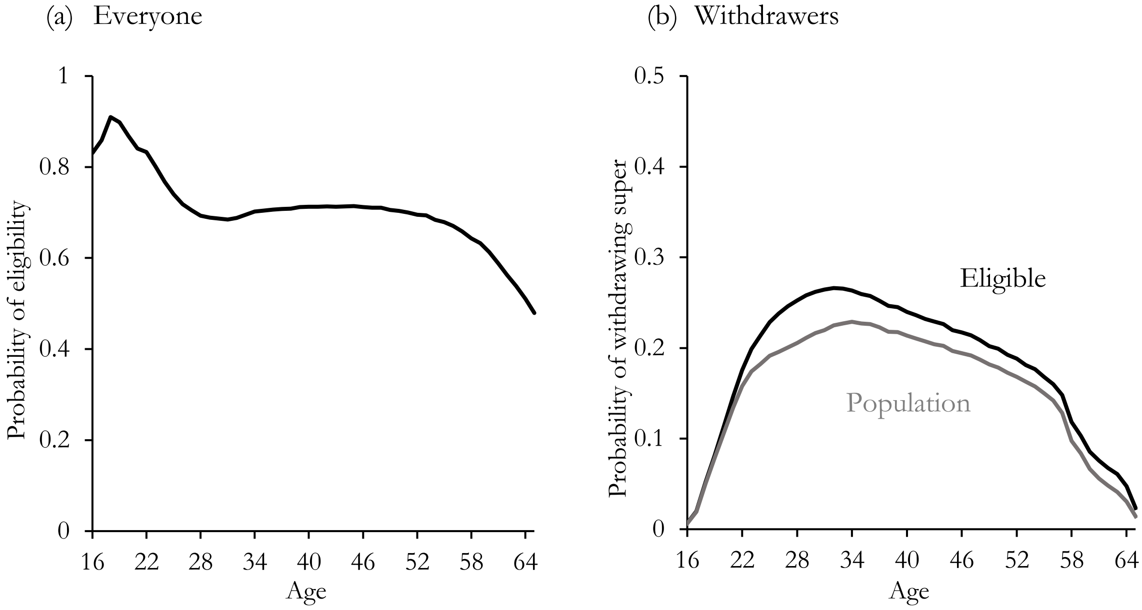
Table 4.B1. Estimated differences in means between eligible withdrawers and non-withdrawers for first withdrawal

	Non-withdrawer	Withdrawer (difference)			
Controls	None	None	Wages	Plus age	Plus all
Demographics					
Age	40.09	-2.16	-1.67		
	(0.00)	(0.01)	(0.01)		
Female	0.50	-0.06	-0.09	-0.08	
	(0.00)	(0.00)	(0.00)	(0.00)	
Had spouse	0.54	-0.11	-0.09	-0.07	
	(0.00)	(0.00)	(0.00)	(0.00)	
Had kids	0.38	0.07	0.09	0.10	
	(0.00)	(0.00)	(0.00)	(0.00)	
Long-term financials					
Wages	57,973	-11,051			
	(18)	(40)			
Super balance	117,658	-57,560	-39,575	-31,669	-30,830
	(65)	(145)	(130)	(120)	(121)
Interest income	343	-253	-219	-203	-185
	(1)	(2)	(2)	(2)	(2)
Rental income	1,014	-461	-239	-213	-190
	(5)	(3)	(3)	(3)	(3)
Dividends	801	-632	-468	-418	-394
	(3)	(8)	(8)	(8)	(8)
Voluntary Super	1,807	-1,569	-1,412	-1,221	-1,109
	(4)	(9)	(9)	(9)	(9)
N = 10,675,214					

Data: Australian Taxation Office.

Notes: Results are from simple linear regressions of outcomes on a binary first-withdrawal indicator, controlling cumulatively for the 'Demographics' variables, and only among those eligible according to our proxy. Wage control for Demographics and Long-term Financials is average pre-tax wage income in the prior three years. Demographics are from the tax return in the financial year prior to withdrawal (July 1, 2018–June 30, 2019). Long-term financials except Super Balance and Voluntary Super are averages across the three prior tax returns (2016–17, 2017–18, and 2018–19). Super balance is as at June 30, 2019. Voluntary Super contributions are for the prior year (2018–19). Short-term wages are from Single-Touch Payroll records and cover average pre-tax wages in the month before withdrawal.

Figure 4.B1. The relationship between eligibility and age



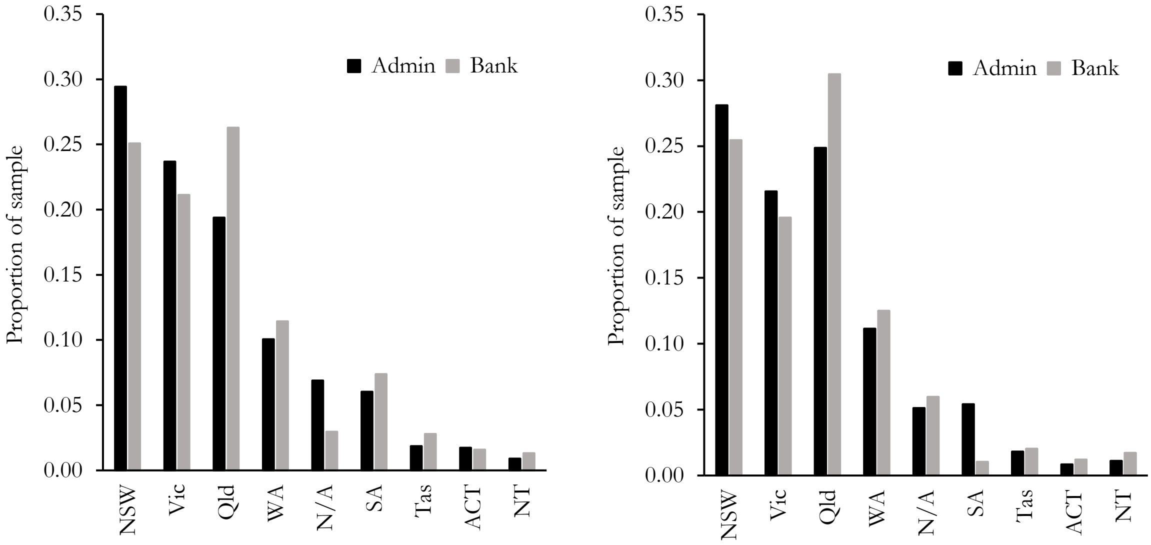
Data: Australian Bureau of Statistics and Illion

Note: Illion data are predicted based on transactions. Among the entire sample, location distributions are broadly similar, with Queensland overrepresented. Among the withdrawers, the two samples are more closely matched given Queensland is overrepresented among the withdrawers in the population.

4C Data comparison

Figure 4.C1. State distribution by sample

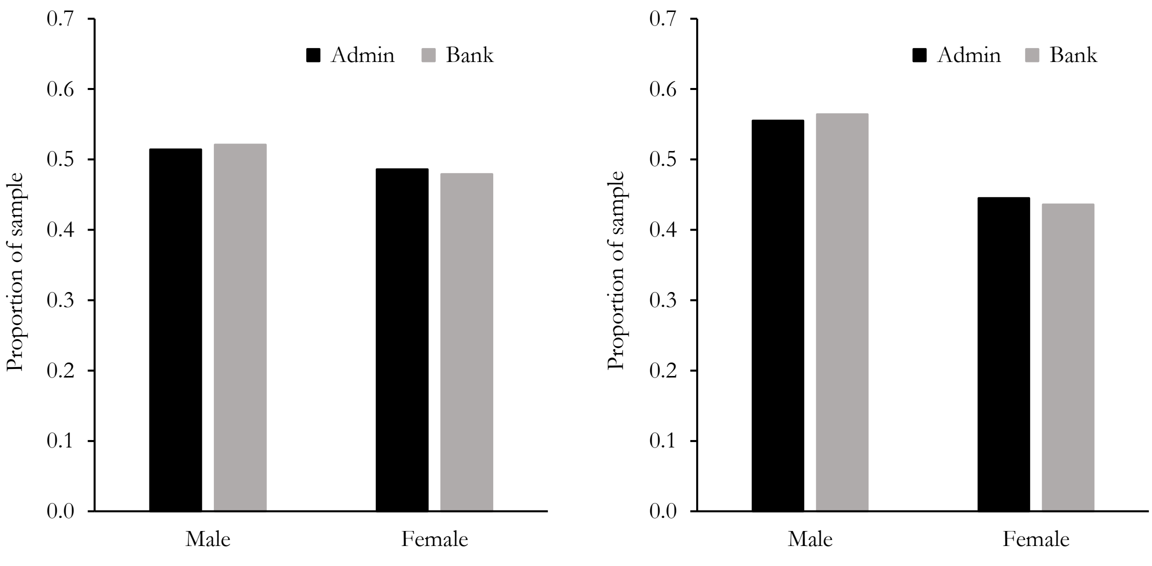
(c) Everyone (d) Withdrawers



Data: Australian Bureau of Statistics and Illion
Note: Illion data are predicted based on transactions. Among the entire sample, location distributions are broadly similar, with Queensland overrepresented. Among the withdrawers, the two samples are more closely matched given Queensland is overrepresented among the withdrawers in the population.

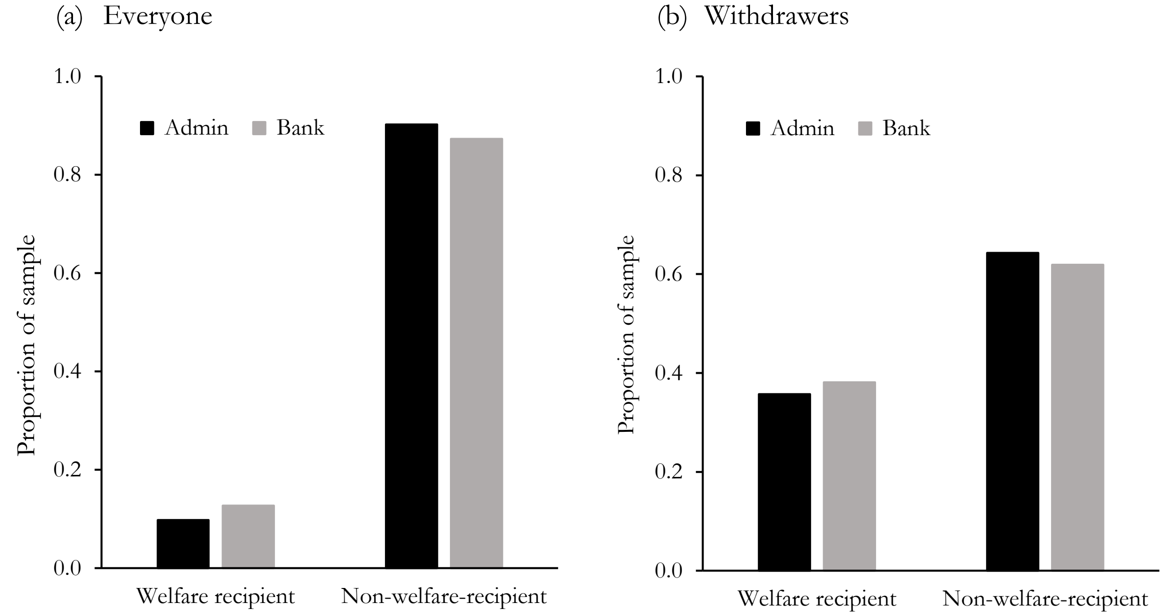
Figure 4.C2. Sex distribution by sample

(a) Everyone (b) Withdrawers



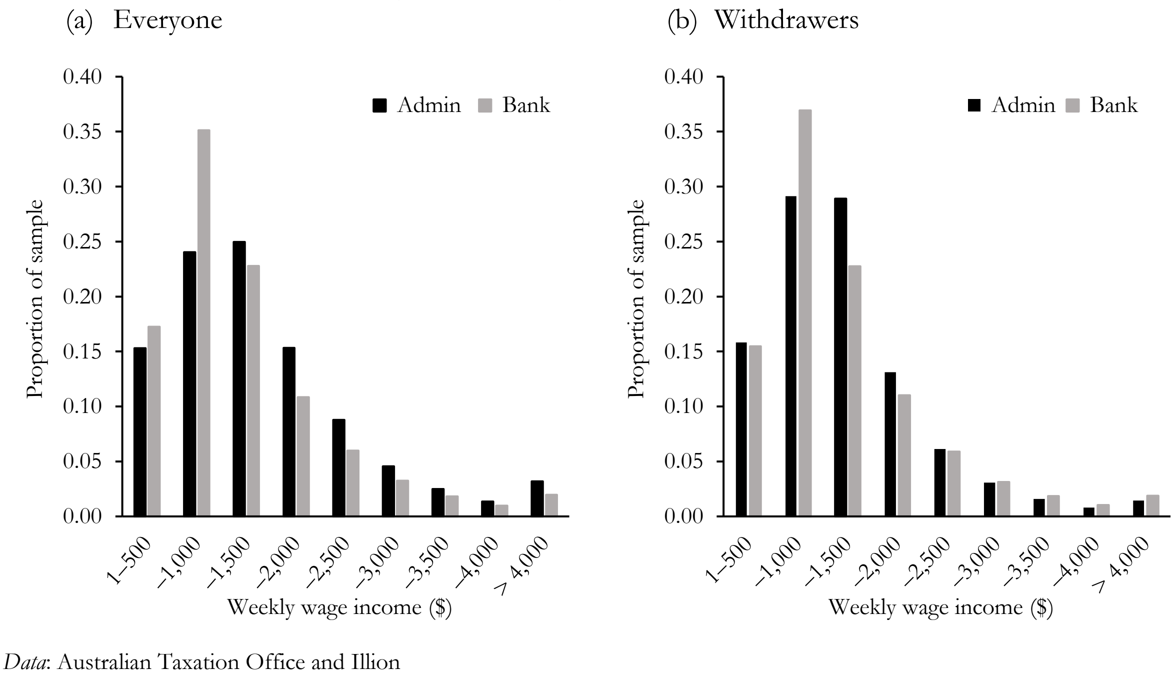
Data: Australian Bureau of Statistics and Illion
Note: Illion data are predicted based on transactions. Among the entire sample, the sex shares are similar (the self-employed, who are more likely to be male, are less likely to have Super and thus not to be in the population). Among the withdrawers, the shares continue to be similar despite the skewing towards men in the population.

Figure 4.C3. Welfare receipt distribution by sample



Data: Department of Social Services and Illion
Note: Welfare receipt defined as having been observed receiving a 'JobSeeker' payment. Among the entire sample, the welfare shares are similar, with a slight overrepesentation in the Illion data. Among the withdrawers, the shares are more similar despite the skewing towards welfare recipients in the population.

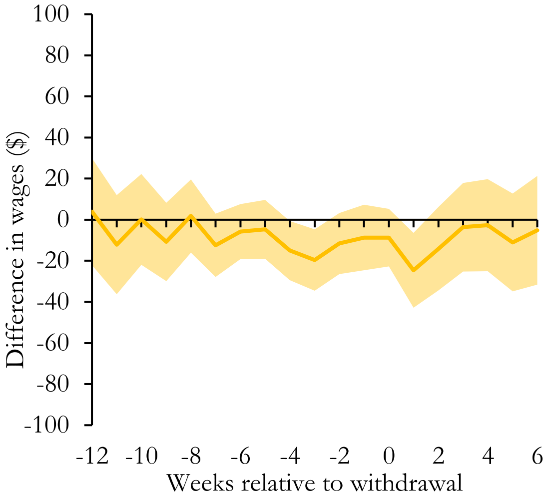
Figure 4.C4. Wage distribution by sample



Data: Australian Taxation Office and Illion
Note: Average weekly wages in March 2020. ATO wages are pre-tax and Illion wages are post-tax, so the Bank wage distribution is shifted left by at least 18% for all weekly wage amounts in excess of $350 (tax-free threshold). Among the entire sample, the Bank data are less right-skewed, being more concentrated around the mode. Because this is true for the withdrawers in the population, the withdrawer distributions are quite closely matched.

4D Wage event study

Figure 4.D1: Relationship between wages and withdrawal timing



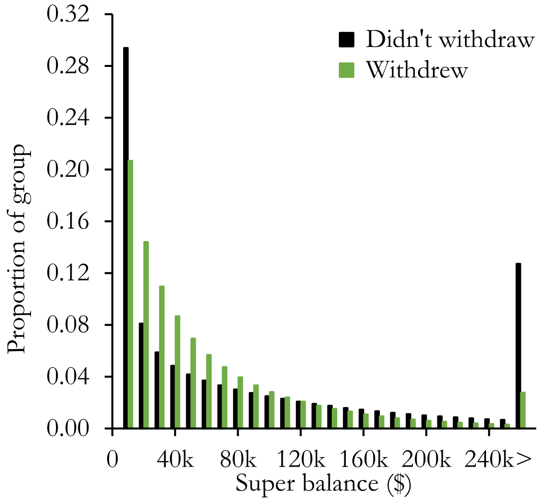
Data: Australian Taxation Office

Notes: Results are averages of cohort ATTs in Figure 6 weighted by cohort size, estimated via the R package, 'did', which implements Callaway and Sant'Anna (2021). Comparison group is the never-treated. Estimation is 'doubly-robust', with standard errors computed using the bootstrap procedure of Callaway and Sant'Anna (2021). Confidence intervals are at the 95% level.

4E Wage and Super balance densities

Figure 4.E1. Histogram of Super and wages by withdrawal status

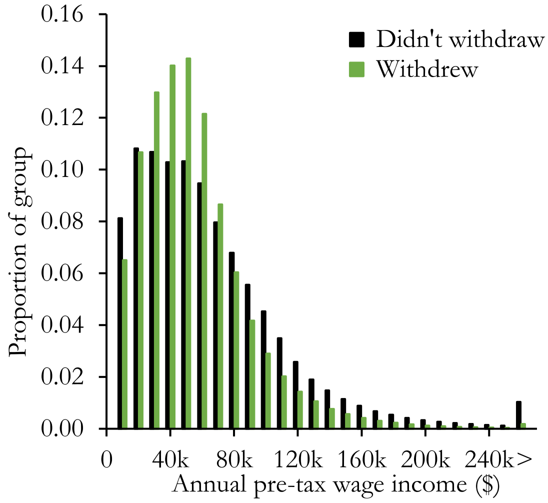
(a) Wage histogram by withdrawal status



Data: Australian Taxation Office

Notes: Wage income is average of the prior three financial years (2016–17, 2017–18, and 2018–19). Bin size is $10k, first bin includes $0, top bin is >$250k.

(b) Super histogram by withdrawal status



Data: Australian Taxation Office

Notes: Superannuation balance is as at June 30, 2019. Bin size is $10k, first bin includes $0, top bin is >$250k.

4F Withdrawal rate by occupation

Table 4.F1. Withdrawal rate by occupation

Occupation	Withdrew (%)
Construction and Mining Labourers	40.2
Mobile Plant Operators	36.7
Factory Process Workers	35.0
Machine and Stationary Plant Operators	32.9
Other Labourers	32.6
Food Trades Workers	32.4
Storepersons	32.0
Road and Rail Drivers	30.1
Construction Trades Workers	29.0
Cleaners and Laundry Workers	27.2
Automative and Engineering Traders Workers	26.4
Other Technicians and Trades Workers	26.2
Hospitality, Retail and Service Managers	25.3
Health and Welfare Support Workers	24.7
Sports and Personal Service Workers	24.6
Hospitality Workers	23.7
Carers and Aides	23.1
Farm Forestry and Garden Workers	22.4
Sales Representative and Agents	22.3
Skilled Animal, Agricultural and Horticultural Workers	21.4
Inquiry Clerks and Receptionists	20.4
Sales Support Workers	19.9
Sales Assistants and Salespersons	18.9
Food Preparation Assistant	18.7
Other Clerical and Administrative Workers	18.5
Electrotechnology and Telecommunications Traders Workers	17.8
Unspecified	17.7
Outside Labour Force	17.6
Clerical and Office Support Workers	17.0
Protective Service Workers	16.7
Farmers and Farm Managers	16.6
Engineer, ICT and Science technicials	16.0
Arts and Media Professionals	14.5
Numerical Clerks	14.4
Chief Executives, General Managers and Legislators	14.2
General Clerical Workers	14.1
Office Managers and Program Administrators	13.9
Specialist Managers	13.4
Personal Assistants and Secretaries	13.2
Business, HR and Marketing Professionals	11.8
No tax return	11.3
Health Professionals	10.5
Legal, Social and Welfare Professionals	9.4
Design, Engineering, Science and Transport Professionals	8.9
ICT Professionals	7.2
Education Professionals	6.3

Data: Australian Taxation Office
Note: Occupation based on tax return in prior financial year.

4G Week of withdrawal regressions

Table 4.G1. Relationships between observed variables and week of withdrawal during the first round

	Withdrew 1 May	Average change per week of withdrawal delay			
Controls	None	None	Wages	Plus age	Plus all
Wages	43,975	427			
	(55)	(15)			
Age	37.76	0.20	0.19		
	(0.02)	(0.00)	(0.00)		
Superannuation balance	54,299	2,337	1,919	1,348	1,357
	(130)	(35)	(32)	(29)	(29)
Interest income	93.64	4.89	4.70	3.88	3.54
	(1.50)	(0.40)	(0.40)	(0.40)	(0.40)
Rental income	537.99	24.27	17.49	13.89	11.92
	(5.07)	(1.36)	(1.34)	(1.34)	(1.34)
Dividends	203.37	20.91	20.10	16.68	16.52
	(7.39)	(1.99)	(1.99)	(1.99)	(1.99)
Voluntary superannuation	225.86	24.83	22.96	19.62	19.90
	(4.20)	(1.13)	(1.13)	(1.13)	(1.13)
N = 1,172,034					

Data: Australian Taxation Office.

Notes: Results are from simple linear regressions of listed outcomes on a category variable for withdrawal week during the first round (May 1 is zero and for subsequent weeks the indicator increases by one), controlling cumulatively for the wages and 'Demographics' variables listed in Table 2. The first and last weeks of the first withdrawals are excluded. This estimates the average increase by withdrawal week in pre-treatment characteristics controlling for wages and demographics; that is, whether the upward-sloping lines in Figure 4 remain upward sloping when we condition on wages and demographics. Note all coefficient estimates are positive and statistically significant at the 99% level or above. Variable definitions as per 'Demographics' and 'Long-term financials' in Table 2.

4H Estimated average treatment effects on the treated

Table 4.H1. Estimated ATTs on income of the first withdrawal

Week	Cohort								
	1	2	3	4	5	6	7	8	All
0	9,311.75	9,311.75	9,148.29	8,867.91	8,717.52	9,074.77	8,588.43	8,470.03	9,187.90
	(70.61)	(109.90)	(246.41)	(134.49)	(438.35)	(259.33)	(338.74)	(187.82)	(56.36)
1	121.26	345.18	238.20	219.74	-8.21	121.38	-205.44		166.35
	(56.10)	(64.98)	(81.01)	(83.84)	(280.05)	(130.61)	(157.48)		(36.10)
2	-127.72	402.63	157.62	463.05 -	-343.39	-124.70			54.44
	(170.12)	(77.41)	(97.77)	(178.25)	(314.98)	(135.81)			(88.37)
3	-71.44	191.60	161.68	46.11	-293.86				6.65
	(47.48)	(66.47)	(107.89)	(61.50)	(279.96)				(36.17)
4	-127.95	295.55	89.81	92.11					-17.50
	(62.42)	(55.75)	(154.85)	(85.98)					(41.58)
5	28.69	196.57	79.46						77.92
	(61.06)	(85.19)	(102.71)						(45.02)
6	-126.59	235.86 -							-16.98
	(98.42)	(95.40)							(74.96)
7	-151.02								-151.02
	(63.47)								(63.47)
Pr	0.43	0.19	0.10	0.09	0.06	0.05	0.04	0.03	1

Data: Illion
Notes: N = 337,223. Results are cohort ATTs estimated via the R package 'fixest', which implements Sun and Abraham (2021). Comparison group is the never-treated. Base period is the period immediately prior to treatment. Standard errors computed via a standard bootstrap procedure. Probabilities listed are cohort shares, which for each week are used to compute the weighted averages across cohorts in the right-most column.

Table 4.H2. Estimated ATTs on spending of the first withdrawal

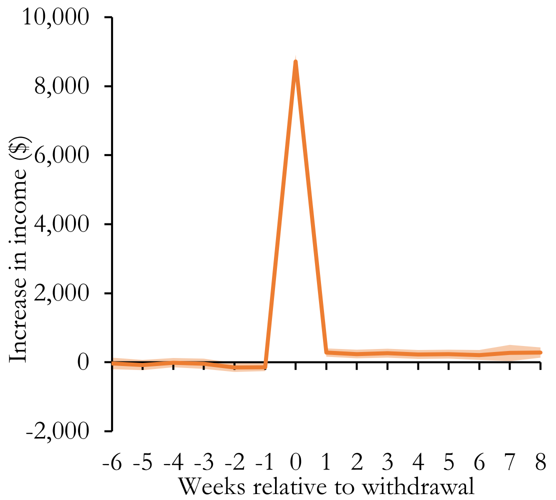
Week	Cohort								
	1	2	3	4	5	6	7	8	All
0	1,676.14	1,488.76	1,502.21	1,508.68	1,414.70	1,498.56	1,471.85	1,545.65	1,569.85
	(24.98)	(34.33)	(50.44)	(47.27)	(62.42)	(68.94))	(78.12)	(82.06)	(16.10)
1	1,229.40	1,344.43	1,384.28	1,313.06	1,252.23	1,295.65	1,217.15		1,279.86
	(19.58)	(30.81)	(46.20)	(43.88)	(54.07)	(66.72)	(71.88)		(13.26)
2	472.92	544.20	551.52	519.32	476.52	499.47			501.74
	(14.94)	(23.50)	(33.98)	(34.52)	(43.07)	(51.34)			(10.53)
3	247.78	303.65	346.69	306.09	284.20				278.13
	(13.36)	(21.91)	(32.48)	(31.10)	(42.99)				(9.77)
4	150.68	212.25	244.18	238.27					184.19
	(14.99)	(22.61)	(35.28)	(37.66)					(11.24)
5	134.43	133.79	160.12						137.34
	(15.43)	(24.13)	(36.34)						(12.35)
6	55.69	89.95							66.05
	(16.34)	(25.38)							(13.51)
7	15.58								15.58
	(16.92)								(16.92)
Pr	0.43	0.19	0.10	0.09	0.06	0.05	0.04	0.03	1

Data: Illion
Notes: N = 337,223. Results are cohort ATTs estimated via the R package 'fixest', which implements Sun and Abraham (2021). Comparison group is the never-treated. Base period is the period immediately prior to treatment. Standard errors computed via a standard bootstrap procedure. Probabilities listed are cohort shares, which for each week are used to compute the weighted averages across cohorts in the right-most column

4I Second withdrawal event study graph

Figure 4.I1 Estimated ATT of the second withdrawal by event week

(a) Income (b) Spending



Data: Illion

Notes: Results are averages of cohort ATTs weighted by cohort size, estimated via the R package, 'did', which implements Callaway and Sant'Anna (2021). Comparison group is the never-treated. Estimation is 'doubly-robust', with standard errors computed using the bootstrap procedure of Callaway and Sant'Anna (2021). Confidence intervals are at the 95% level. The 'did' package, by default, uses a 'varying' base period when estimating cohort ATTs for the pre-treatment periods, where the base period is the period immediately prior. This is why estimates for the period immediately prior to withdrawal (and their confidence-interval estimates) are not zero. For all post-treatment estimates, the period immediately prior to treatment is used as the base period. There was a permanent increase in income post-withdrawal. Because withdrawals occurred from July 1, they coincided with the start of the new financial year in Australia, typically when people receive a pay rise, a higher government benefit linked to inflation, or a tax refund. This income difference may reflect differences between withdrawers and non-withdrawers on these bases. By dividing the estimated spending impact by the estimated income impact when calculating the MPX, we remove upward bias driven by these other sources of income.

4J Category regression table

Table J1: Estimated cumulative aggregate ATTs (CAATTs) of the first withdrawal by category

Category	CAATT	Category	CAATT
Uncategorized	1,248.87***	Alcohol and Tobacco	32.27***
	(81.41)		(6.18)
ATM	1,063.88***	Retail	31.58***
	(71.04)		(4.90)
Other debt repayments	339.95***	Health services	15.54***
	(45.37)		(5.16)
Gambling	292.98***	Pharmacies	13.82***
	(30.21)		(3.76)
Credit card repayments	196.70***	Personal care	13.21
	(28.87)		(15.52)
Furniture and office	168.06***	Taxi and rideshare	12.35***
	(14.59)		(2.82)
Supermarkets	128.80***	Travel	12.27*
	(19.45)		(7.32)
Department stores	114.73***	Education	11.47*
	(9.48)		(6.93)
Rent	98.51***	Post office	8.75**
	(37.88)		(4.10)
Buy-now-pay-later	94.49***	Pet care	7.21**
	(12.99)		(3.51)
Restaurants	79.02***	Cafes	6.11***
	(7.46)		(1.74)
Automotive	78.82***	Car rentals	5.97
	(12.25)		(4.58)
Online retail	72.29***	Children's retail	5.29
	(10.86)		(5.25)
Fashion and leisure	71.67***	Road tolls	4.75**
	(8.47)		(2.12)
Home improvement	71.42***	Insurance	4.34
	(15.90)		(10.53)
Gas stations	60.78***	Entertainment	3.98***
	(11.21)		(1.21)
Telecommunications	44.88***	Donations	3.06
	(11.81)		(2.35)
Government	39.95***	Subscription TV	2.84
	(12.17)		(2.40)
Utilities	36.26***	Gyms and fitness	2.06
	(10.35)		(1.55)
Food delivery	35.80***	Transport	-0.02
	(4.14)		(0.05)
Other groceries	35.76***	Public transport	-0.21
	(6.15)		(5.08)
N = 337,223			

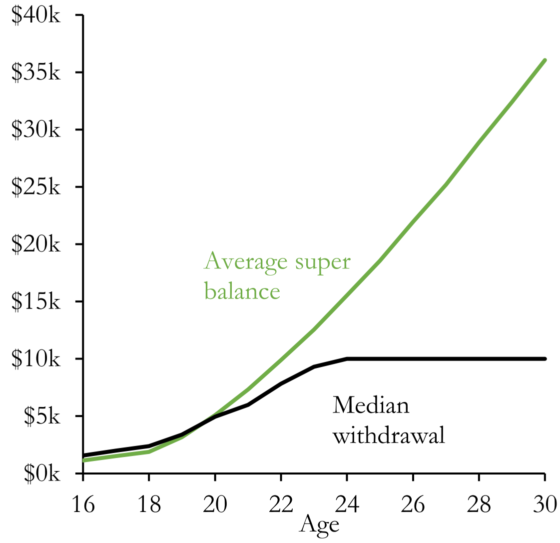
Data: Illion

Notes: *** p < 0.01; ** p < 0.05, * p < 0.1. Results are based on cohort ATTs estimated via the R package 'fixest', which implements Sun and Abraham (2021). We compute weekly aggregate ATTs by averaging across cohorts weighted by cohort share. We then accumulate over the first eight post-treatment weeks. Standard errors are computed analytically as per Sun and Abraham (2021).

4K Withdrawal and age

Figure 4.K1 The relationship between age and withdrawal amount

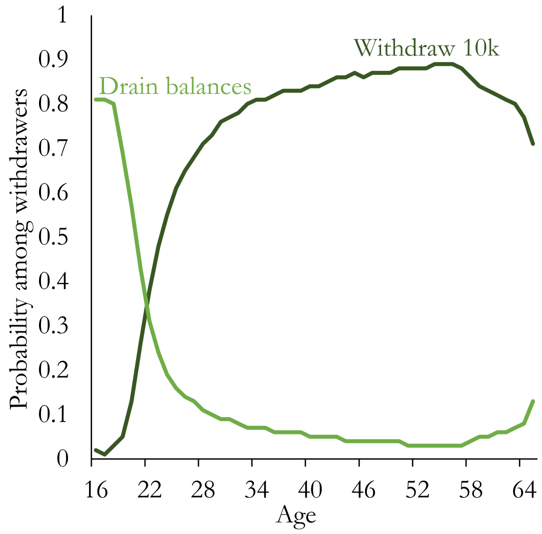
(a) Superannuation balance and withdrawal amount by age



Data: Australian Taxation Office

Notes: First withdrawal. Average superannuation balance as at June 30, 2019.

(b) Withdrawal cap and balance as constraints by age.



Data: Australian Taxation Office

Notes: First withdrawal. Drained balance if first withdrawal amount equal to superannuation balance on June 30, 201

Chapter 5: The urgent need for tax reform in Australia in the COVID-19 world

Also published as Sainsbury, T. and Breunig, R. (2022), The urgent need for tax reform in Australia in the COVID-19 world, *The Australian Journal of Labour Economics*, 23(2), pp. 211–229.

Available at: https://ajle.org/index.php/ajle_home/article/view/38.

Abstract

The economic shock and government response to COVID-19 highlight weaknesses in Australia's tax system. COVID-19 puts pressure on a system under strain from long-term structural forces and the tax-free and tax-reduced status of certain sources of income. Returning to a sound structural budget position cannot be accomplished through passive action that relies on 'natural' revenue growth from current tax sources. Discussions should focus on comprehensive reform. Reducing reliance on income (particularly labour) taxes and applying a more equal tax treatment to different individuals and income sources over time are priorities which will support improved well-being and labour market activity.

5.1 Introduction

A tax system can be considered sound when it is able to fulfil its basic financing role over time. How sound is the Australian tax system? And how necessary is tax reform to securing a sound foundation in the aftermath of Covid-19? These are the questions that we turn to in this article.

We first detail a framework for evaluating the tax system. We then explain how longer-term trends were ensuring that Australia's main sources of tax were all under pressure before Covid-19, and that the Australian tax mix renders any conversation about meaningful tax reform in Australia largely one about income taxation. We follow this by highlighting how 'tax free' designations on a range of income sources have led to the perverse outcome where it is now feasible for someone with household assets worth $10 million, generating a comfortable lifestyle, to pay less income tax than someone earning income close to the poverty line. In addition to flying in the face of common sense, such outcomes violate the core, broadly agreed upon, tax design principles of equity, efficiency and simplicity.

We also put forward a case for comprehensive, structural tax reform to be a central plank in efforts to manage the post-COVID-19 Australian economy. The debt repair challenge that Covid-19 (and associated government action) presents can be anticipated to prove too large to be addressed through passive action, such as allowing 'natural' revenue growth via bracket creep and from increased collections from companies when economic activity recovers to something resembling more 'normal' settings. The inevitable tax policy discourse can either be focused on constructive reform through a comprehensive and cohesive plan or be progressed as a series of ad hoc incremental changes at the Commonwealth and state government levels, each of which will be subject to attempted hijacking by special interests. And when considering reform options, important context is that Covid-19 represents a significant transfer from the current working age population to current older population. This has created potential space for a political narrative focused on tax reforms that benefit the working age population but that may adversely impact existing asset holders.

We conclude with a suggestion that a comprehensive tax reform agenda should focus on a fairer, simpler tax system that better supports economic growth and that has fewer fiscal vulnerabilities. This agenda should be delivered through action that reduces the share of income (particularly labour) taxes in the Commonwealth tax mix, and moving towards a more equal tax treatment applying to different individuals and income sources over time. Australia's heavy reliance on direct taxation--income and corporate tax—falls particularly heavy on workers. Stamp duty reduces worker mobility and the current system of savings taxation punishes active workers relative to (mostly retired) non-workers. More sensible taxation of savings, reducing the heavy reliance on direct taxation and switching from stamp duty to land tax will all contribute to increased labour market dynamism and job and wage growth.

5.2 Framework for assessing tax reform

A constructive conversation about taxation reform relies on a framework (or benchmark) for assessing taxation.

In general, there is some common foundational ground for assessing the Australian taxation system (see, for example, Tax and Transfer Policy Institute (TTPI) (2018). It is generally accepted that the tax system should pay for what we need in a stable and sustainable way. With economic growth as key to raising living standards, the tax system should minimize its distortions around decisions to work, invest and save (efficiency). At the same time, the tax system should treat people with equal ability to pay equally and expect those with a higher capacity to pay to contribute a greater amount (fairness). The tax system should also be easy to understand and not have lots of technical rules that savvy people can exploit to avoid paying taxes (simplicity)

The general acceptance around the basic pillars of efficiency, fairness, and simplicity are a result of decades of Australian public tax debate, underpinned by a number of major taxation reviews. Most notable among these are the 1975 Report of the Taxation Review Committee chaired by Justice Ken Asprey (the Asprey Report) and the 2009 Review of Australia's Future Tax System chaired by Ken Henry (the Henry Review).

The public policy reviews are supported and underpinned by an extensive public policy literature on optimal taxation theory that has its roots in Smith (1776), Ramsey (1927) and Mirrlees (1971). Among the number of highly valuable insights from the literature is the rule of thumb that a broad based and low rate form of taxation will prove to be less distortionary than a high rate, narrow base form of taxation (Mankiw et al. 2009); that taxation that is more neutral across tax forms will be less distortionary; and that the supply of savings is more elastic than income and therefore taxes on capital should be lower than taxes on income or consumption (Summers 1981).

The challenge for tax reformers comes about when considering the inherent trade-offs within and between the pillars. Any given proposal to change the tax (and transfer) system will not advance the basic pillars in an even way. Instead, changes require confronting trade-offs among and between the different pillars. The weighting put on subjective concepts such as fairness, in particular, will be based on individual philosophies, subjective valuations and analytical judgements. Invariably, the weightings we place on these concepts will diverge from the weighting others put on them.

Empirically, there is also uncertainty about the size and nature of distortions. For example, empirical studies have found large effects of tax settings on the composition of savings, but struggle to find large effects on the overall level of savings (see Varela, Breunig and Sobeck (2020).) Likewise, it may be hard to estimate the size of deadweight losses arising from different taxes. The evidence is not always unambiguous in helping to decide which taxes should be raised and which lowered.

There are also limitations on how prescriptive modern (post-Mirrlees 1971) optimal tax theory can be in informing these tradeoffs, given its dependence on a number of specific assumptions. These include the shape of the social welfare function, the degree to which returns are based on (unobserved) ability, and how taxpayers respond to higher rates. Differences in value judgements on these concepts and competing interpretations of the evidence can lead to a range of estimates for 'optimal' top marginal tax rates that vary from 0 (Tuomala 1990) to more than 80% (Piketty, Saez and Stancheva 2014). In addition, the narrow pursuit of (vertical) equity and efficiency objectives has generally led to the neglected (or absence of) consideration of crucial public finance principles such as the benefit principle, simplicity and horizontal equity.

A consequence is that economists are typically divided when asked questions about, for example, the desired shape of income taxes (Chicago Booth 2019). With economists sharply divided on the theory, it has proven nearly impossible to reach a public consensus around a raft of basic tax system design questions, such as how much revenue the tax system should raise, or how progressive specific taxes should be in order to facilitate the movement from those designated rich to those designated poor.

5.3 Tax sustainability: COVID-19 will place pressure on the Australian tax system

In the tax realm, COVID-19 can perhaps be best considered as source of pressure. The primary purpose of the tax system is to fund public services. And, as noted above, it is generally considered desirable that this be done in a fair, efficient and simple manner. COVID-19 will test the Australian taxation system on both these fronts.

COVID-19 has caused a profound shift in economic activity. People are behaving in ways that they don't ordinarily behave. Government actions to protect lives have further restricted opportunities and freedoms. Three months since the virus gained prominence within Western economies, it remains unclear how long emergency measures will need to be in place, and what form they will need to take.

The COVID-19 economic shock has both demand and supply shock characteristics, both of which will directly impact on Australia's tax system. The demand shock arises from whole populations going into quarantine across every major economy in the world, reducing demand for Australian-supplied goods and services. The supply shock has a genesis both in restricted domestic activity, largely as a result of what forms of economic behavior governments have determined to be legal, and from newfound global impediments to the flow of people and goods.

The government response to address the economic consequences of COVID-19 has been comprehensive. At the Commonwealth level, it is headlined by major short-term programs to fix deficiencies in the social safety net, through: increasing the rate of payment of unemployment assistance and relaxing asset tests around accessing it; providing a wage subsidy; allowing working age Australians early access to up to $20,000 from their superannuation balances; changing social security deeming rates for public pensions; and relaxing superannuation draw down requirements for retirees (Commonwealth of Australia 2020a).

Alongside direct income support for individuals, the Commonwealth Government, Reserve Bank of Australia and Australian Prudential Regulation authority have taken a number of coordinated steps to support the flow of credit, improve investment incentives, and provide loan guarantees for the banking sector (Ibid). Further, sectors and regions particularly affected by Covid-19 such as aviation, tourism, not-for-profits, construction, childcare and the university sectors have received targeted support at varying degrees of generosity. The Commonwealth's actions have been bolstered by a range of state government actions, including payroll tax relief for businesses, assistance for utility bills, cash payments to vulnerable households, support for health spending, and construction and infrastructure packages (IMF 2020).

While it is still too early to determine the distributional impacts of the shock or the impact of the myriad government measures to respond to it, it is apparent that a wide range of people have been affected detrimentally. In the face of declining incomes and reduced consumption, Australia's tax and transfer system is combining to dampen the negative impact on people and businesses. One consequence of the automatic stabilizer function and the new, temporary assistance programs has been a significant addition to Australia's public debt levels, shared across multiple levels of government. Early attempts at estimating medium-term fiscal consequences the shock at the Commonwealth level alone from PwC (2020) and the PBO (2020) suggest a revenue hole in the (broad) range of $10-$50 billion annually by 2029-30, with potentially deficits for a generation.

Australian Treasury Secretary Steven Kennedy has observed that heightened debt levels can be effectively managed through a sound structural budget and long-term focus on full employment (Karp 2020). A prospective and sizeable long run 'revenue hole' places tax sustainability as a central concern in ensuring that Australia has a sound structural budget. And tax sustainability takes on heightened interest considering

5.4 The Australian tax mix was under strain before COVID-19

At the Commonwealth government level, Australia's tax system is remarkably reliant on the direct taxation of people and businesses. While there are over 120 different taxes in Australia, in 2019-20, nine out of every ten dollars of tax raised by the Commonwealth government will be brought in from a narrow band of personal income taxes[100], corporate income taxes[101] and the GST (Frydenberg and Cormann 2020). Three quarters of Commonwealth taxes come from just the personal and corporate income taxes – representing approximately a sixth of Australia's GDP.

A point made in major Australian tax reviews, as well as in a range of publications from international institutions such the IMF and OECD, is that Australia's strong reliance on income taxes for revenue-raising makes us something of an outlier among the international community. Many OECD countries have broader and more diversified tax bases and make greater use of consumption and other income tax bases.

In addition, the three main sources of tax (personal, corporate and consumption) have become increasingly concentrated in recent decades.

[100] Personal income taxes here refers to individuals and other withholding taxes, fringe benefits tax and superannuation tax.
[101] Corporate income taxes here refers to company tax, the Petroleum Resource Rent Tax and the Bank levy.

Davis et al. (2019) estimate that since the mid-1990s, Australia's personal income tax base has become more concentrated on a narrow band of high-earning personal taxpayers. In any given year, close to 50% of Australia's personal income tax will be raised from the top 10% of income earners who are taxed at high marginal income tax rates. Around half of the adult population will not pay any income tax. The revenue-raising burden from corporate income taxes is even more concentrated than for personal taxpayers.

The ATO corporate tax transparency report for the 2017-18 year revealed that half of the $52 billion in corporate income tax payable in 2017-18 was paid by just 18 companies, predominately located in the banking and resources sectors (ATO2019a). The report also reveals that approximately half of the $83.5 billion in total company tax collected in 2017-18 was paid by approximately 170 companies. Regardless of the choice of base for calculating, it is clear that corporate income tax in Australia relies on a highly concentrated tax base.

Further, a succession of analyses from the likes of the Australian Treasury and Parliamentary Budget Office have shown that households spending more of their budgets on rent, health, education and international internet purchases over time has reduced the share of consumption that is subject to the GST, while the slow growth in the consumption of excisable goods has meant that associated excise and customs duties (an additional 8% of tax receipts) have undergone a gradual decline in revenue raising prominence.

A growing literature is raising concern around the longer-term sustainability of these sources of taxation. Notably, the Parliamentary Budget Office (2018) warned that based on recent trends and government policy settings, the coming decade could be anticipated to see pressure on all three of the personal income, corporate income and consumption tax bases. In sum, all of these problems will get worse with inaction.

Three trends were specifically highlighted: the ageing of the Australian population, combined with continued attractiveness of investing through superannuation, leading to an increasing proportion of labour income being taxed concessionally; ongoing pressure to lower company tax rates amid significant uncertainty in global corporate tax settings due to accelerating technological, global economic and commercial change; and structural trends in consumer behavior and technological change driving a continued downward trend in consumption taxes.

As a broad generalization, the baseline or 'status quo' pre-COVID-19 scenario suggested that if Australia were to merely retain revenue collections at current levels, then personal income taxpayers – and particularly a narrow group of higher-earning wage and salary earners already paying high tax rates – would be expected to shoulder more of the taxpaying burden.

Further, there are two reasons, one policy-based and one conceptual, to question how robust revenue from personal taxpayers will prove to be post-COVID-19. The policy-based consideration is that one of the features of eliminating the third tax threshold as part of the 7-year tax plan is to dampen the revenue raising potency of bracket creep for some time to come.

The conceptual consideration, raised in Sainsbury and Breunig (2020), comes from three observations: there are a wide range of legal tax planning opportunities available to some taxpayers; there are strong incentives for taxpayers at all income levels to find legal ways to reduce their tax bills; and there has been growth in the adoption of tax-effective vehicles over time. While the strategies are legal options for taxpayers within a comprehensive income tax system, which severely limits the data that can isolate their effect or extent, warning signs are evident.

For some, having the tax burden fall narrowly on high income earners is an attractive proposition. However, the reality is that this combination of opportunities for tax avoidance and a strong incentive created by high tax rates means that the tax burden falls quite heavily on some high income earners (those with limited flexibility around how they earn their income), while other high income individuals shoulder little or even none of the burden.

5.5 The approach to income taxation is leading to outcomes that are at odds to the principles of good tax design

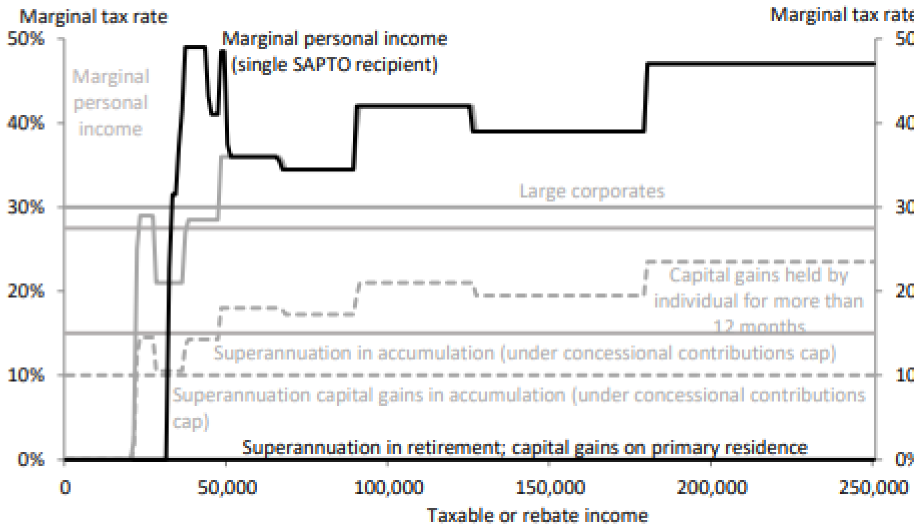
Based on the broadly-accepted Schanz-Haig-Simons[102] definition of income, Australia's hybrid[103] tax approach sees most forms of personal income (wages, salaries, interest, dividends and rent) taxed under a global regime at full progressive rates. Corporate income and some capital gains are taxed under the same global regime, but at flat rates. Some capital income receives discounted tax treatment under the global regime, while other capital income (linked to retirement savings) is taxed under its own schedule.

The result is a complex web of marginal income tax rates, with marginal personal tax rates generally higher than the tax rates that apply to companies, capital gains and superannuation. The main rates relating to personal, corporate and capital income are depicted in Figure 5.1.

The differentials in tax rates for different forms of income reflect a variety of economic and social policy goals that successive governments have introduced into the tax system, including progressive taxation, the desire to provide a discount for capital gains and supporting saving for retirement through superannuation. Like any complex system, some design features have a stronger rationale than others. But overall, the shape of Australia's tax system reflects the kind of uneasy compromises that policymakers have to constantly grapple with when attempting to deliver a system that Australians accept.

One prominent set of differentials are the three[104] major areas of tax-free income, emphasised by solid black lines in Figure 5.1. The first is capital gains on the primary residence, with no limits on how much can be realised tax-free. The second is the personal income tax-free threshold. For most Australians the tax-free threshold is $18,200. For Australians aged over 67 that are eligible for the seniors and pensioners tax offset (SAPTO), the threshold increases to $32,279 for an individual or $57,948 for a couple (ATO 2020b). And the third is tax-free superannuation in the retirement phase.

Figure 5.1 Main marginal income tax rates in Australia, 2019-20



Taxpayers combining these tax-free thresholds to their maximum extent can lead to stark differences in tax burdens across the Australian population. However, such differences can be difficult to identify and

[102] The comprehensive measure of income advocated for by Schanz (1896) and developed by Haig (1921) and Simons (1938) is generally considered by economists to be the best measure of wellbeing.

[103] Hybrid refers to a mixture of comprehensive and schedular income tax structures.

[104] In addition to these, interactions with a range of exemptions and deductions on the incomes that are available to businesses can also lead to zero (or low) tax rates.

measure through taxation data, given those within tax free thresholds are generally able to avoid lodging tax returns. That said, a more anecdotal approach can still be instructive.

To illustrate the differences, consider two individuals in the 2019-20 income year. Individual 1 and their partner both earn approximately $25,000 from casual employment. Individual 1 is carrying a small amount of debt and aspires towards home ownership in the future but has no assets. Individual 2 is a member of a couple that jointly (and fully) owns the following: a $5 million family home purchased 25 years ago and which for tax purposes is their primary residence; $3.2 million in assets held in a superannuation fund – that they are drawing down for a return of $128,000 per annum (and is carrying a reasonable stock of unused franking credits); and $1.8 million in a share portfolio held outside superannuation which yields annual dividends of $56,000, split equally between the two. Individual 2's household's $182,000 income stream, from share portfolio and superannuation investments, finances a comfortable lifestyle such that neither member of the household feels the need to work. The situations of the two individuals are summarised in Table 5.1.

Table 5.1 Income sources and associated tax liabilities for two stylised individuals, 2019-20 year

Individual 1		*Individual 2*	
Labour earnings	$25k	Labour earnings	$0
Income streams from assets	$0	Income streams from assets	
No assets as:		• Primary residence (unrealised)	$0
• Rents home		• Superannuation (4% draw down, half of $3.2 million portfolio)	$64k
• Just opened a superannuation balance		• Dividends outside superannuation (3% return, half $1.8 million portfolio)	$27k
• No dividend portfolio			
Total income	$25k	Total income	$91k
Total personal income tax	$1k	Total personal income tax	$0

Which individual pays more tax under the current Australian tax regime: the one with earnings that would be classified at or around the OECD's relative measure of poverty, or the member of a couple with $10 million in assets generating an income stream of $182,000? It may be surprising to discover that Individual 2 can pay not just less tax than Individual 1 (who pays approximately $1,000 in tax after factoring in personal income tax liability and relevant tax offsets and levies), but no tax. In fact, Individual 2 might be eligible to receive more in dividend refunds than Individual 1 earns.

Some additional details are required to understand how this is possible. Think about Individual 1 as someone aged in her early 20s and Individual 2 as a member of a retired couple aged in her late 60s or early 70s. These ages are important as the 'no tax' situation for Individual 2 only comes about after exploiting four separate settings in the tax system.

First, the value accruing in the primary residence is not taxed until the property is realised (sold) – and capital gains made by the primary residence are tax free in any case. Second, because the couple are over 60, the earnings they generate through superannuation are tax free, subject to various asset thresholds. Third, because she is over 67, she can take advantage of a significant offset built into the personal income tax system: the Seniors and Pensioners Tax Offset (SAPTO). SAPTO eligibility for the couple means that her tax-free threshold is in effect, $28,974; her "rebate income" falls below that at just $27,000 per member of the couple. Fourth, due to the presence of refundable dividend imputation and Individual 2 remaining within tax-free thresholds for all income streams, Individual 2 could generate up to $25,025 (based on a 27.5% corporate tax rate) or $27,300 (based on a 30% tax rate) in dividend refunds.

The key implicit principle driving the difference in tax burdens is that Individual 2's asset mix is what public policy settings have designated as warranting 'tax-free' status. Deviations from the 'Individual 2 formula' are a cause for higher taxes. And it's not clear that there is a link between those receiving zero tax rates and people's capacity to pay tax. Which raises serious questions about fairness.

Individuals benefiting from a tax-free (or tax-reduced) lifestyle are likely to view it as a great development that should be retained. However, as outlined extensively by Breunig and Sainsbury (2020), tax rate differentials are a problematic feature of the Australian tax system. We will draw out some of these specific arguments as they apply to zero tax rates (which can be thought of as an extreme tax outcome – the lowest bound of statutory tax rates and therefore having the potential to produce the highest differential with other rates in the system).

5.5.1 Less fair

First, a strong argument can be made that zero tax outcomes reduce the fairness of the tax system. Fairness is a challenging concept to objectively analyse. This is partly because notions of fairness are subjective. There is no single view on what is fair. People form value judgements based on morals and ethics, and arguments are drawn from a range of theories and philosophies of distributive justice (e.g. Konow 2003 and Davis et al. 2019).

That noted, Davis et al. (2019) observe that there are two fairness principles that are often invoked in evaluating the tax system which have attracted widespread political and community support within Australia over an extended period of time. These are the benefit principle, which can be generalised as taxation being the price of living in civilised society, and the capacity to pay principle, which can be generalised as an individual's capacity to pay tax increasing as his or her income (or wealth) increases. The capacity to pay principle can be further defined by two key concepts: horizontal equity (the notion that it is fair that persons in the same situation should be equally treated) and vertical equity (the notion that those in different situations should be differently treated, with those more favourably placed required to pay more)

The tax outcomes of Individual 1 and 2 can be objectively judged as unfair on both a horizontal and vertical basis. Start with horizontal equity. As noted above, Australia's tax system is highly complex with different income tax rates applying to companies, individuals, and superannuation funds. This means that two individuals in the same economic position can achieve markedly different tax outcomes at any given point in their life course (and across generations).

The unfairness extends to comparisons of lifetime incomes, not just at one point in time. Individual 1 could follow the same lifetime income course as Individual 2. In which case, Individual 1 would have the ability to achieve the same asset mix that Individual 2 has currently. After extending the (strong) assumption that there is no change in tax policy settings in the intervening (say 45) years, they could then feasibly realise the same tax-free lifestyle. On this superficial basis, it suggests that the tax system achieves some level of horizontal equity. However, Individual 1 might happen to generate more of their income in ways that attract a higher rate of tax, such as wage and salary income, holding money in savings accounts, or investing outside superannuation. In which case it becomes clear that those with the same income path can shoulder different tax burdens. Horizontal equity is thus undermined.

Vertical equity principles are similarly undermined. Most obviously it is because people with lower current capacity to pay tax are paying more tax. But it also extends to considerations over a lifetime. This is because the future is, by definition, uncertain, and it's not clear that Individual 1 will enjoy the same income path as

Individual 2. There are a range of reasons why people's income paths diverge, for example due to differences in (unobserved) abilities, different choices about investment (whether in financial or human capital), because of support received (whether by governments or through inheritances or other forms of private, family-driven assistance), motivations to invest in their capacity or take on high paying jobs, and sheer luck. In general a well-designed tax system will reward hard work and thrift but also provide some insurance against bad luck. The reality is that there is no real link between lifetime capacities, incomes and tax outcomes in Australia.

In a system so reliant on income taxation, the benefit principle can be undermined at the (somewhat extreme) point when people with high incomes are completely exempt from income tax. There are various points in life – such as early in life, when income levels are low and individuals might be investing in education, during periods of unemployment, due to sickness disability or later in life once one reaches retirement – where people's capacity to earn income might be impaired and thus their contributions to society might be anticipated to be low or zero (or a net recipient from other taxpayers). For some, these periods might extend across large portions of their lives.

However, it is hard to argue that those generating comfortable incomes through passive investment should not be making a contribution to the functioning of Australian society. The consideration becomes more acute when considering that, through the Australian dividend imputation system, these individuals are in the process of claiming full refunds on the taxes that the companies they invest in have previously paid[105]. And outcomes can become corrosive to society if there is a section of the population with strong incentives to preserve and increase the benefits they receive from government, no stake in minimising the tax burden of financing such benefits, and who possess the capacity to focus intensively on resisting constructive policy change.

5.5.2 Less efficient

A system designed with a number of large tax-free thresholds on widely-held assets and income sources also imposes deadweight costs and detracts from the efficient allocation of economic resources. This has important labour market implications with fewer jobs, lower productivity and less wage growth.

Tax exemptions lead to a tax system that is high rate and narrow base, in direct opposition to the key learnings from the optimal tax literature. It should be noted that a chief argument for tax-free thresholds is that they reduce the degree of 'churn' in the tax and transfer system, wherein welfare recipients both pay taxes (whether personal, on housing or through retirement incomes) and receive income support payments such as unemployment assistance or the old-age pension. Carling (2016) observes that a highly targeted welfare system with means testing has the potential to reduce instances of the sorts of extremely high effective tax rates that come as a result of tax-transfer system interactions (typically displacing high rates to a different income level).

However, this comes at a high fiscal and economic cost. Tax-free thresholds that aren't targeted (and in the extreme case of owner-occupied housing, uncapped and not linked with pension assets tests) result in significant revenue leakage, as a large population of adults – combining those with high and low capacity to pay tax – all benefit. They impose economic costs from the higher statutory tax rates (and associated deadweight loss) that must be imposed on the taxpaying population in order for tax authorities to be able to 'make up' for the foregone revenue. Tax is also a material consideration into decision making. A relatively extensive literature (which is also growing as administrative taxation data becomes more accessible) points to taxpayers' propensity to respond to tax incentives. International studies such as Feldstein (1999), Saez (2010) and Kleven (2016) and Australian-focussed studies such as Breunig and Johnson (2016) observe that the bigger the difference in marginal rates, the greater the tendency for taxpayers to structure their affairs, and that those with more flexible forms of income have a higher

[105] The core idea behind dividend imputation, that individuals should pay tax at their marginal rate, may be sound but when combined with the tax free status of so much other income and wealth it is corrosive to fairness.

propensity to respond to incentives. Wages are a less flexible form of income and opportunities to reduce marginal rates are less for wage earners.

The mix of investment choices within Australia suggests that Australians have in aggregate responded to the tax-free status of key investment choices. In 2017-18, more than 70% of Australians' net worth was invested into housing and superannuation (ABS 2019). Noteworthy is that housing has remained relatively steady since 2000, while the share of assets housed within superannuation has grown significantly

Such an asset mix is suggestive that Australia's tax settings are a prominent part of a broader public policy landscape that is biasing people's – and firm's – lifetime decisions towards investing in particular domestic asset classes. In the process, the tax system is detracting from the efficient allocation of economic resources. In the media and around the world, there have been many calls for reduced globalisation in response to COVID-19. Some have suggested that production which has been offshored should be moved back onshore and that less trade and movement of people might be desirable. While we disagree with these sentiments, they are gaining traction. If a post-COVID-19 world triggers a prolonged decline in international capital mobility, such a shortcoming of the system will take on greater importance.

Imposing a broad-based and neutral tax regime that takes place from the first dollar of income (with appropriate compensation for low-income earners and retirees with low-asset levels) would carry the prospect of generating much more revenue with fewer distortions and could facilitate low economy-wide tax rates. Varela, Breunig and Sobeck (2020), for example, find that a flat capital tax rate of 6-7% would raise a similar amount of revenue to what is currently being collected through capital, if it were to be applied uniformly on all sources of capital including housing, superannuation, equities and bonds. Such a change would actually produce a more progressive tax system compared to the current regime (which is regressive in practice).

5.5.3 More complex

The Individual 1 and Individual 2 scenario above is an exhibit of Australia's highly complex tax system. It shows how tax outcomes depend on specific individual and family circumstances, such as age, type of employment relationship, marital status, or the presence of adult children in the household. This is part of the reason approximately three quarters of Australian taxpayers engage tax agents to manage their tax affairs (ATO 2019b). An increasing number of artificial arrangements and legal fictions are also being established to deal with increasingly complex tax laws.

The different tax rates, vehicles, and variety of opportunities also add up to a tax code that is a nightmare to administer, particularly for a tax administrator trying to direct finite resources to ensure effective compliance. The system requires constant adjustment and legislative change.

Yet as the 2020 decision measure to allow the early release of up to $20,000 in superannuation has revealed, incremental changes to specific parts of the tax system are now fraught with risk.

The early withdrawal measure was designed to allow eligible individuals affected by COVID-19 access to up to $10,000 of their superannuation in the last three months of the 2019-20 income year, and if eligible, to apply for another $10,000 in the first three months of the 2020-21 income year (Commonwealth of Australia 2020b). Notably, eligibility was defined by the level of financial impact from the coronavirus: being unemployed; being eligible to receive one of a small number of unemployment assistance payments; or a) being made redundant, b) having hours reduced by 20% or more, or c) being a sole trader whose business was suspended or there was a reduction in turnover of 20% or more.

With eligibility defined by financial impact, no constraints were placed upon an individual's capacity to absorb the financial impact and no constraints were placed on their ability to contribute back to superannuation through salary sacrifice arrangements in the same financial year that they withdrew from superannuation. As a result, a tax arbitrage opportunity was created (Breunig and Sainsbury 2020).

The application process involved only limited checks to substantiate claims, and the ATO waited until June 2020 to issue comprehensive guidance around the conditions for access for the new program (ATO 2020c). Given these preconditions, it was unsurprising that a survey of withdrawal behaviour suggested that up to 40% of those withdrawing superannuation had either no decrease in income or had received government benefits to cover any loss (Ryan 2020). A succession of media reports since the scheme was announced, documenting that a substantial number of ineligible applicants were withdrawing from superannuation and a significant number of younger people withdrawing the entire balance of their superannuation funds, have been similarly unsurprising (e.g. Jolly 2020).

What at face value is a relatively modest change to enable working-age individuals to access a limited sum of their retirement savings over a six-month period has, as at 21 June, seen in excess of 2 million applications withdrawing more than $17 billion (APRA 2020). It is having broader knock-on implications for the financial system, undermining personal income tax collections, and altering the dynamic between the private and public retirement income streams for a significant share of the Australian population. It is quickly becoming a cautionary tale that incremental, piecemeal change in the Australian tax system has significant unintended consequences. The only enduring way forward for the Australian tax system will be comprehensive reform based on common principles.

5.6 Discussion: is now different?

Slemrod and Bajika (2008) illustrate the challenging general task that tax reformers faced well when they invoked the plight of Hercules:

> *"who as penance for having killed his wife and children in a fit of madness, was given twelve tasks of immense difficulty. The fifth of these tasks was one of the most daunting of all – to clean, in one day, thirty years of accumulated manure left by thousands of cattle in the stables of Augeas. (The analogy to the tax system is, we fear, obvious). Hercules did not attempt to clean out the stables one shovelful at a time. Instead, Hercules diverted the rivers Alpheus and Peneus through the stables, ridding them of their filth at once."*

There is much to clean up in the Australian tax system, and the scale of change implied here does resemble a truly Herculean task.

That prospective task appears even more challenging considering that identifying and raising concerns around the efficiency, simplicity and fairness of the Australian tax system is not a particularly new practice. Such issues were neatly encapsulated by former Treasury Secretary Ken Henry, who, as part of 2018 remarks to the Australian Institute of Company Directors, noted that "tax reform is a decade overdue" (Henry 2018). Persuasive cases on the benefits of reform have fallen upon deaf political ears, notwithstanding the presence of a strong and detailed conceptual blueprint for tax reform in the form of the Henry Review.

Australia's increasing trend away from comprehensive change and towards incremental, piecemeal change in the past four decades does not inspire much confidence either. It is easy to become disillusioned at the prospect that future tax reform efforts, particularly ambitious and comprehensive reform, will ultimately prove dismal exercises.

There are two reasons to suspect that now might be a genuinely different context for tax reform. The first is that COVID-19 debt levels, combined with current structure of the Australian tax system, presents a strong rationale for change.

PwC (2020) and the Parliamentary Budget Office (2020) have outlined a scenario where, under reasonable assumptions, Commonwealth government public debt levels are expected to balloon, and where managing them presents as a generational challenge. What is particularly interesting is that these scenarios have been constructed partly based on an assumption that governments persist with the '2010s blueprint' of passive gradual fiscal repair through increased tax burdens on personal income taxpayers (through bracket creep) and companies.

The second stems from the uneven distribution of the consequences of COVID-19. The health and economic responses to COVID-19 were put in place to protect the entire population but they provide a disproportionate benefit to older populations that are more susceptible to the virus. At the same time, shutting down the economy has disproportionately affected working age Australians, and particularly the young in (or formerly in) casual employment. While much still needs to be analysed before a definitive statement can be made around the distributional consequences from a complex web of actions, it is likely that COVID-19 has already seen a significant intergenerational transfer from the current young and working age population towards current older Australians. The transfer becomes starker when considering that the younger generation will bear the heaviest burden of income taxation going forward.

These two reasons point to a potentially narrow window of political opportunity for comprehensive change. Comprehensive in the sense of the kinds of actions more akin to the diversion of rivers than to those that require a shovel. A well-articulated plan that places an increased tax burden on the holders of existing wealth, and a decreased tax burden on the working age taxpaying population may prove more socially acceptable now than it has been in recent decades. Crucially, this consideration also extends to the all-important debate about transitional arrangements that get from current to desired future systems, which can make or break tax reform efforts.

There are reasons to be cautious when expressing optimism, however. While there is a window of opportunity, there also needs to be the political willpower at multiple levels of government to proceed with what will invariably be politically challenging and sensitive reforms. Compromise will be essential. It remains to be seen how wide or enduring this window of opportunity will prove to be. It also remains to be seen whether the Australian political system will be able to consign the early 2010s as a temporary aberration of stalled tax reform, or whether the post-COVID-19 years will prove as gridlocked as those in recent history.

5.7 Conclusion

In this article, we explained that Australia's tax system is heavily reliant on income taxation, and that Commonwealth revenue raising has become more concentrated on a narrowing band of high income taxpayers paying high tax rates. At the same time, there is a path towards zero tax outcomes for a significant range of income and assets which are being used by some Australians.

We have also pointed out the types of structural trends that are suggestive of an increasing reliance on high-earning personal income taxpayers into the future. When all major Commonwealth revenue sources are being eroded by a powerful cocktail of longer-term forces – including globalisation, technological advance, changing consumption trends and taxpayer arbitrage – it is right to ask questions about how sound and sustainable the tax system is.

The COVID-19 shock and associated public response has revealed that the Australian tax system needs reform to ensure it will continue to have the capacity to meet future calls on government. The key questions of interest are whether tax reform will occur sooner rather than later, and whether it will be in the form of comprehensive, coordinated reform rather than ad hoc, incremental change that is beholden to lobbying by special interests.

In our view, a public policy and structural reform priority should be placed on coordinated actions to amend the tax system in ways that reduce fiscal vulnerabilities and improve societal wellbeing. And an important aspect of such reform should be eliminating or dramatically curtailing the amount of economic activity that attracts tax-free status.

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