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IZA DP No. 15399

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ABSTRACT

COVID-19 Private Pension Withdrawals and Unemployment Tenures*

This is the first study to evaluate the effects of early pension withdrawal policies on tenures on unemployment payments in the COVID-19 context. We use a novel set of linked whole-of-population administrative records to examine more than half-a-million Australians who found themselves newly on an unemployment payment in the initial months of the COVID-19 pandemic. We estimate that receiving a lump sum of up to A$10,000 from superannuation accounts at the most acute phase of the pandemic, between April and June 2020, resulted in a 32 per cent lower exit rate from unemployment benefits inside the first six months of a spell on benefits, and 14 per cent inside a year of spell. Receiving a lump sum during the second window of opportunity – mostly in July and August 2020 and as a labour market recovery was underway – resulted in a 34 per cent lower exit from unemployment benefits inside the first nine months of spell, and 14 per cent inside fifteen months of spell. The jobseeking deterrence is ultimately temporary but it took close to eighteen months for an estimated convergence 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 A$580 million in additional pandemic fiscal expenditure.

JEL Classification: E24, H12, H30, H53, J32

Keywords: unemployment, crisis management, fiscal policy, government expenditure, unemployment benefits, welfare programs, private pensions

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1. INTRODUCTION

The COVID-19 pandemic prompted a range of previously untested major policy responses from governments. In Australia, the two largest fiscal measures were a A$38 billion (US$26 billion) release of funds from private pension accounts (equivalent to 2.1 per cent of Australian GDP in 2019-20), and an A$88 billion (US$62 billion) wage subsidy (approximately 4.8 per cent of 2019-20 Australian GDP). This paper evaluates the impacts of the first of these measures on those entering the unemployment benefits system in the initial months of COVID-19. Specifically, we ask: did people withdrawing large lump sums – up to A$20,000 (US$14,000) – from otherwise inaccessible private pension accounts spend longer on unemployment benefits?

We find that the lump sum withdrawals had a large labour market deterrence effect. For example, receiving a lump sum of up to A$10,000 from superannuation accounts at the most acute phase of the pandemic, between April and June 2020, resulted in a 32 per cent lower exit rate from the unemployment payment system inside the first six months of the unemployment spell, and 14 per cent inside a year of spell. Receiving a lump sum during a second window of opportunity – mostly in July and August 2020 and as a labour market recovery was underway – resulted in a 34 per cent lower exit from unemployment payments inside the first nine months of a spell on benefits, and 14 per cent inside fifteen months of spell. It took 18 months for the unemployment benefit exit rates of withdrawers to converge with those who didn't withdraw. 162,000 withdrawers with completed spells on average spent an additional 7 weeks on unemployment benefits, translating to 8 million additional days on unemployment benefits in aggregate and implying additional pandemic fiscal expenditure in the order of A$580 million ($US410 million).

Australia does not have a traditional unemployment insurance scheme. Rather, it has a universal welfare system that provides income to those with low income and assets. The main income support payments paid to working age individuals are JobSeeker (formerly Newstart Allowance) and Youth Allowance (Other). We include a small number of recipients of the Farm Household Allowance. These payments are targeted at those without employment but are also paid to individuals who are working but have very low incomes. While recognising that some recipients are employed, we will refer to recipients of these payments as being on "unemployment benefits" or "unemployment payments" in what follows and we analyse their spells on "unemployment"—that is we examine when they cease receipt of one of these payments.

Our analysis is based on a novel whole-of-population set of linked administrative records spanning Australian income tax, social security, private pension, demographic and COVID-19 program datasets. Using survival (time to event) analysis techniques, we compare unemployment tenures of more than 230,000 individuals who took advantage of the early release program with more than 300,000 individuals who did not. The individuals commenced spells during a three-month window from 23 January 2020, the week in which the first positive COVID-19 case was recorded in Australia, to 19 April 2020, when the superannuation early access program began.

The key empirical concern is that our estimates reflect systematic differences between withdrawing and non-withdrawing individuals, rather than the effects of the withdrawals. This possibility cannot be ruled out a priori. All the study population was eligible to withdraw, owing to their receipt of qualifying payments. Withdrawals were consequently not random. Individuals who chose to withdraw had higher pre-COVID-19 superannuation balances and earnings histories, and were more likely to be male and have children.

Controlling for observable characteristics leads to finding even stronger effects of the lump sum withdrawals on the length of unemployment spells. We argue that any remaining bias from unobservable characteristics such as motivation or ability is likely to further strengthen effects rather than eliminate them. We check our parametric estimates by comparing them to matching estimates and find very similar results. We undertake two further checks. Theory suggests that those who are more financially constrained should be more responsive to lump sum withdrawals than those who are not. We separately examine those who are more or less income constrained and those who are more or less asset constrained and show that their behaviour is consistent with the theory. Second, we present evidence that smaller withdrawals led to shorter spells on unemployment in the first few months of spells.

We conclude that it was the COVID-19-related access to lump sums from otherwise locked-away private pensions that drove delayed exit from unemployment payments. Because pension withdrawals were not linked to re-employment or job search behaviour, they allow us to identify the effect of extra liquidity on employment spells. The extra money leads to longer spells on unemployment and we find no evidence of higher wages for those who take longer to find employment.

Our findings contribute to literature on social insurance and unemployment. One of the most well founded results of empirical and labour 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)[1]. Chetty (2008) (building on Card et al. (2007) and Lalive (2007)) apply this logic to lump-sum severance payments, perhaps the closest approximation of lump sum superannuation withdrawals, and find longer unemployment spells, particularly for constrained households. Labour market effects are of particular 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) and the prospect of financing crisis support lump sums through reductions in future retirement balances rather than directly from the public purse.

Our paper is also the first to evaluate the effect of pension withdrawals on labour 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).[2] The Australian Bureau of Statistics (2021) estimates that close to 90 per cent of withdrawn funds were consumed or used to pay down credit card or personal debt over the course of 2020. Hamilton et al. (2021) 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 covers the policy context. Sections 3 and 4 detail the conceptual framework, data and empirical strategy. In Section 5 we introduce the results. In Section 6 we discuss policy implications and offer a brief conclusion.

[1] 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.

[2] 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.

2. POLICY CONTEXT

Australian COVID-19 early access to pensions stimulus policy

On Sunday 22 March 2020, the Commonwealth Australian Government announced the second of three packages of major measures that would form its substantive fiscal response to COVID-19. A key part of the suite 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 perhaps best characterised on the basis of being *impacted* during the early months of the pandemic by lost hours, employment or income. Specifically, eligible applicants had to be personally and financially impacted by Covid in one of the following ways: Be unemployed; made redundant in 2020; eligible to receive the JobSeeker or related unemployment payment[3]; a sole trader whose business was suspended; experience a reduction in working hours by at least 20 per cent; or be a sole trader with reduced turnover of at least 20 per cent 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). Moreover, receipt of other support measures (such as wage subsidies or welfare support payments) were not a factor for program eligibility. This meant that qualifying withdrawers were able to access other government programs and may have been largely, fully or even over-compensated for lost private income by other forms of public support.

A$38 billion in total was withdrawn (1 per cent of the A$3 trillion in aggregate superannuation balances) or 2.1 per cent 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[4]) 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 main reasons.[5]

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 to unprecedented (recent) levels immediately after the measure was announced. Two further spikes

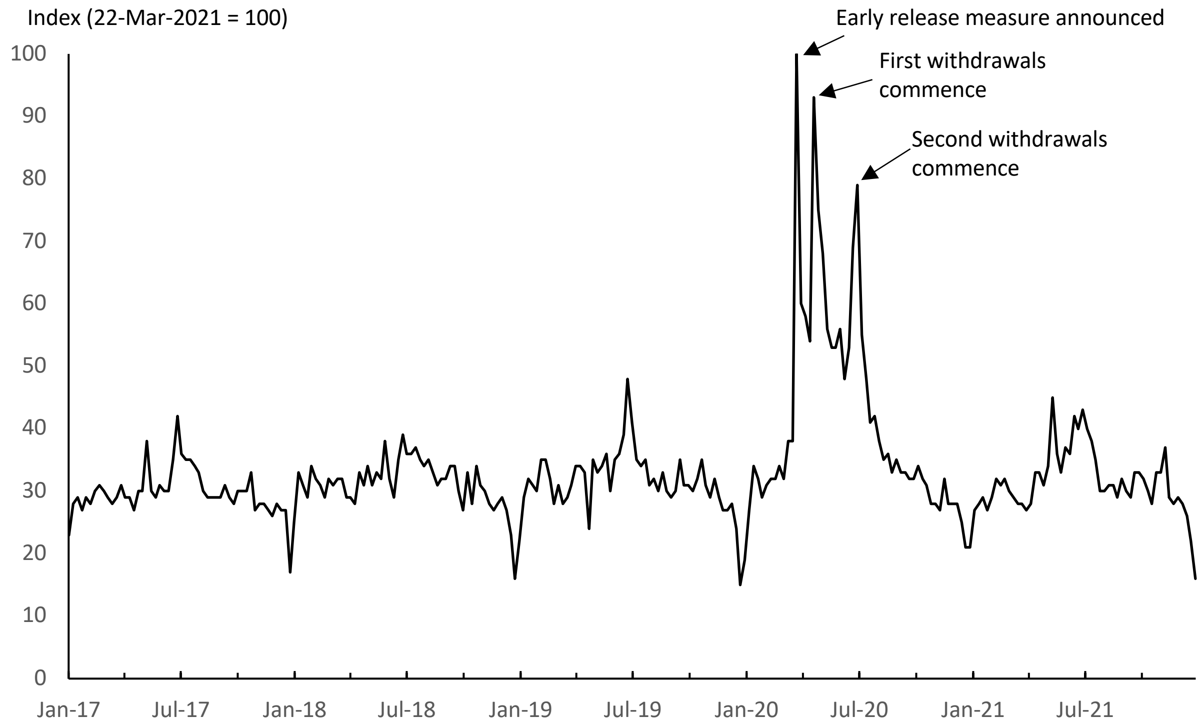
[3] JobSeeker is Australia's primary working-age unemployment payment. Basic details on eligibility rules, payment rates, mutual obligation tasks and activities necessary to secure the payment, and initial claim processing and management see Services Australia (2022).

[4] 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).

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

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 (Chart 1).

Chart 1. Frequency of weekly Google search trends for terms 'superannuation', 'super release', 'withdraw', and 'early access', Jan 2017-December 2021.

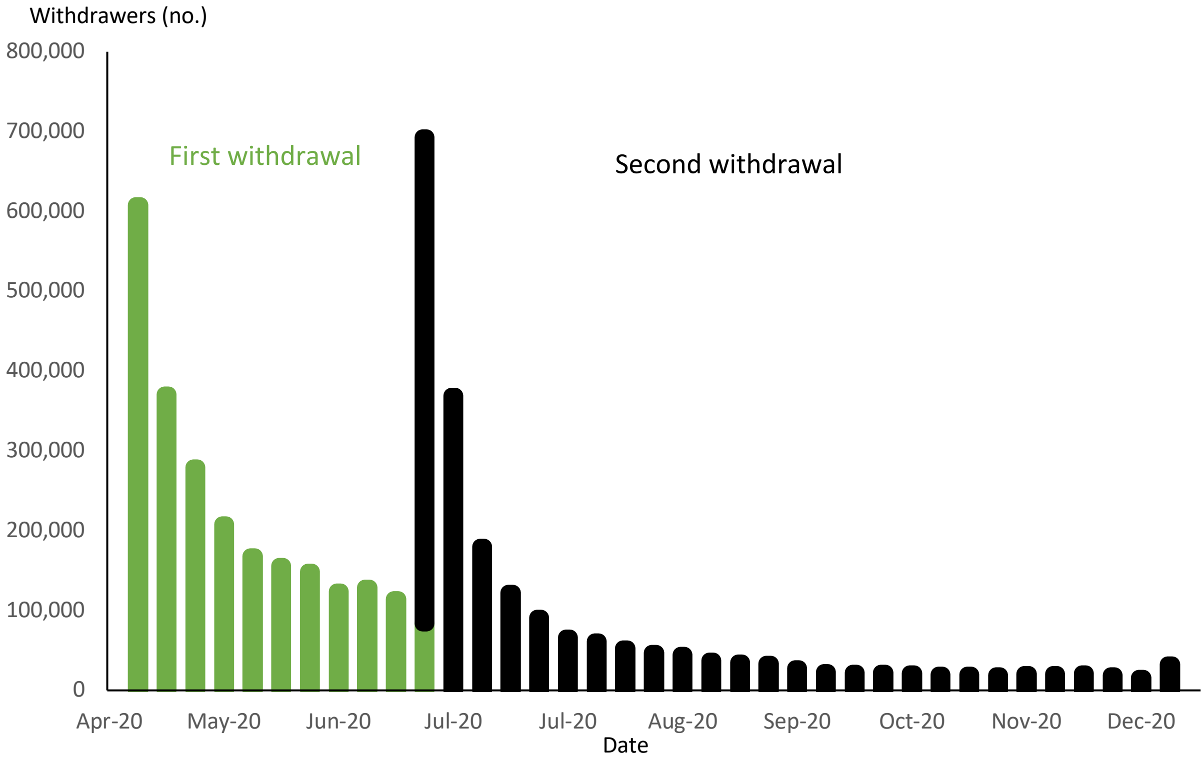


Source: [Google trends]

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 (Australian Prudential Regulatory Authority, 2021). Up to A$10,000 was transferred on average in 3 working days (ibid).[6] There was something of a 'rush to the door' with more than 50 per cent of applications for each withdrawal opportunity occurring within the first 20 days of its availability (Chart 2). In total, A$28 billion – three quarters of the released funds - was approved in the three months from 19 April to 18 July 2020.

[6] Such administrative arrangements, delivered for a new program and with a tax administrator also administering other major stimulus programs and business-as-usual arrangements while managing a transition to work from home arrangements itself, are a noteworthy achievement for the ATO and the Australian bureaucracy.

Chart 2. Weekly applications: an initial rush to withdraw in both windows of opportunity



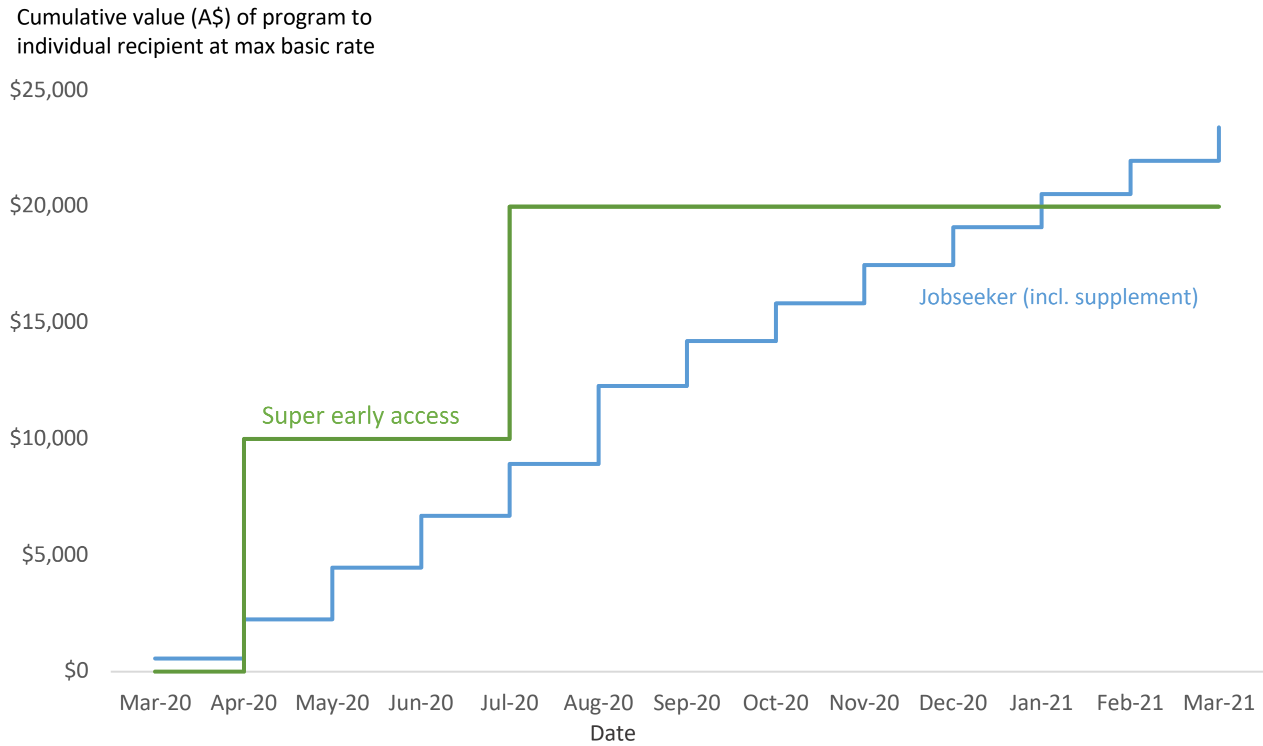
Source: Author calculations based on superannuation COVID-19 early release program records.

Fourth, the size of the lump sum was significant. The average program-wide A$12,400 ($US8,700) withdrawal amount was equivalent to approximately a fifth of average 2018-19 taxable income (ATO 2021a, ATO 2021b). It was also equivalent to 5 months of unemployment support (Chart 3) at the supplemented rates that were being paid to individuals during the COVID-19 pandemic. Individuals could access A$20,000 and couples A$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). Chart 3 demonstrates that access to superannuation provided an earlier and, at least initially, much larger stimulus than the fortnightly support delivered through unemployment 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.[7] The early access scheme represents the first Australian use of private pension savings as a social insurance mechanism against an economic shock.

[7] 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

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



Source: Author calculations.

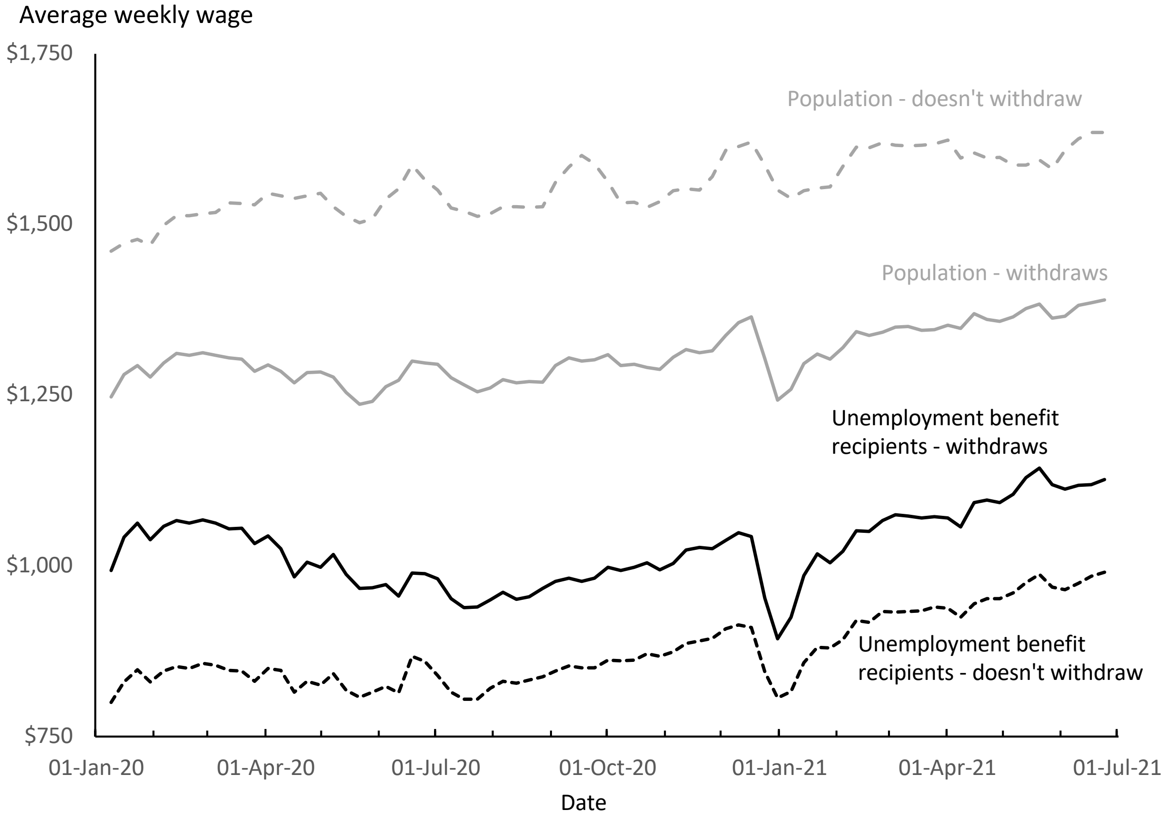
Australian unemployment payment recipients during COVID-19

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.[8] 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 Chart 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.

looking to buy a first home have been able to make voluntary contributions into superannuation 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.

[8] 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.

Chart 4. Unemployment payment recipients who withdrew from super had higher wages than those who didn't



Source: Authors' calculations based on Job Market Tracker and superannuation COVID-19 early release program records. Unemployment recipients are defined as recipients of the following payments targeted at those of working age who are unemployed: Jobseeker, Newstart, Youth Allowance (Other) and Farm Household Allowance. The unemployment benefit recipients lines include any individual who appears in the data as having received an unemployment payment at any point since January 2019.

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, a sum equivalent to 37 per cent of the A$753.80 weekly Australian minimum wage. The payment is subject to a complex range of income and asset thresholds, both for the individual and their partner. To continue receiving payments, recipients must also undertake what are termed 'mutual obligation' activities such as completing a minimum number of job applications within specified time limits. The rate of basic payment (which serves as a benchmark for all related working age unemployment payments) has remained essentially unchanged in real terms since the 1990s.

As part of the same package of stimulus measures in which the superannuation early release program was announced, the Australian Government announced a range of temporary changes to the terms of unemployment payments in order to increase the availability, adequacy and timeliness of support at the most acute phase of the pandemic (Commonwealth of Australia 2020b). In particular, all recipients of qualifying unemployment payments would automatically receive a temporary Coronavirus Supplement payment that was initially worth $550 per fortnight between 27 April 2020 and 25 September 2020.[9] Along with effectively doubling the rate of base payment, income and asset

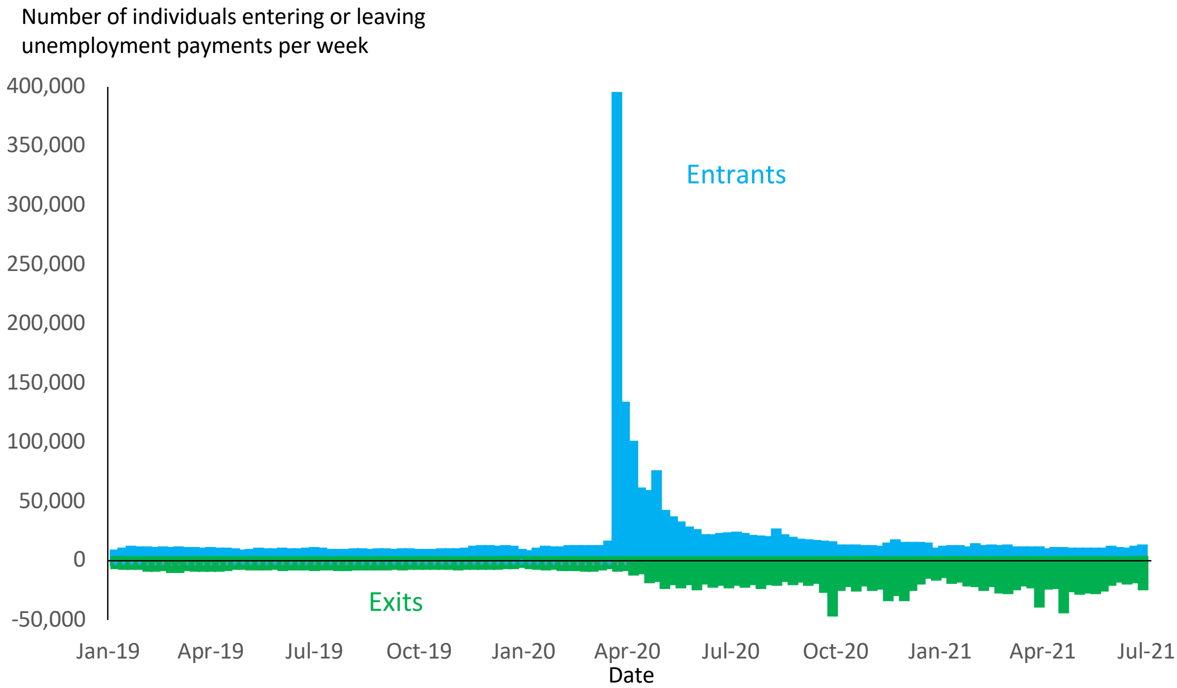
[9] Later the supplementary payment was extended at reduced rates of $250 per fortnight between 26 September 2020 and 31 December 2020, and $150 per fortnight from 1 January 2021 to 30 March 2021. Income and asset thresholds and eligibility conditions were also progressively tightened in this time.

thresholds and work search requirements were removed or relaxed considerably, and claims processes were accelerated (Commonwealth of Australia, 2020a).

Chart 5 highlights some important aggregate trends in flows onto and off unemployment payments. It reveals the rapid pace of change that took place in early 2020. In particular, there was a single week – the last week in March 2020 – in which close to 400,000 individuals started a spell on payments. Incidentally, this week has been well documented through Australian media reporting. 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 labour market recovery coincided with a strong net exit from unemployment payments, in the order of half-a-million individuals.

Chart 5. Weekly income support flows for unemployment payments, January 2019- June 2021



Source: Author calculations based on DOMINO records. Notes: Unemployment payment recipient is defined here to include JobSeeker, Newstart Allowance, Farm Household Allowance and Youth Allowance (Other).

3. CONCEPTUAL FRAMEWORK AND MODEL

This section draws heavily on two sources of analysis. The first is Freebairn (1998)'s conceptual framework for evaluating the opportunity cost of saving through superannuation against consuming or saving funds. Imposing current tax system parameters on this frame, along with some reasonable assumptions about future retirement circumstances, suggests that there was a tax system inducement to withdraw superannuation when people got the opportunity. The second is understanding the impact of the job search model outlined in general form by Card et al. (2007) and in a specific form 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 through the empirical specification.

The present value of lump sum pension withdrawals

The tax advantage is instructive. Equations specified in Freebairn (1998) for the after-tax (present) 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.

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

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

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

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

Freebairn (1998) also notes that before compulsory superannuation, people voluntarily chose superannuation savings levels to the point where the marginal payoffs (derived from the first order conditions of the equations) were equal. The rationale for compulsion in superannuation contributions implies that the first derivative of the return on superannuation is less than one, or both, of the marginal return on private savings or current consumption.

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 ($t_y = t_c = 0$). After replacing remuneration drawn from wages (W) with funds in super (F) that can either withdrawn (F_{with}) or held in super (F_{held}), the present value calculations are as follows:

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

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

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

Table 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[10] at retirement (t_r).

Table 1: Present value of $100 in superannuation: withdrawn tax free or held in superannuation

Year	Consumed	Saved for future consumption						
		$100 held in superannuation t_e = 15% during accumulation phase +		$100 withdrawn from superannuation and saved outside of super				
	$100 withdrawn for pandemic consumption [1]	t_r = 0% In future, will receive full age pension or no pension [2]	t_r = 50% In future, will receive part rate age pension [3]	t_i = 0% Earnings within personal tax free threshold; CGT on owner-occupied housing [4]	t_i = 7.5% Average effective tax rate on savings [5]	t_i = 10.5% Effective tax rate implied by CGT discount at low personal MTR [6]	t_i = 23.5% Effective tax rate implied by CGT discount at top personal MTR [7]	t_i = 47% Top personal MTR [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 per cent annual pre-tax return, and agents have a 3 per cent 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.

As a point of reference, the equivalent value of after-income-tax returns for consuming $100 of pre-tax wage income in the current period (Year 0) are given by headline marginal personal tax rates (including the base rate of Medicare Levy, but excluding other levies or offsets, as well as interactions with the corporate or capital gains tax regimes):

[10] 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 A$987.60 ($A25,678 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 A$180 per fortnight (A$4,680 annual) with a fortnightly income 'cut off point' for part pension payments at A$2,155 per fortnight (A$56,030 annual). Column 3 in Table 1 is constructed based on the income taper rate. There is also an asset test for maximum pension payments to single recipients at A$270,500 for those who own their home, and A$487,000 for those that don't. The age pension is then reduced by A$3 per fortnight per A$1000 in assets. A part pension can be paid if assets are worth up to A$599,750 for those who own their own home or A$816,250 otherwise.

- $100 if the earnings are within the personal tax free threshold;
- $79 for earnings between $18,201 and $37,000[11];
- $65.5 for earnings between $37,001 and $90,000;
- $61 for earnings between $90,001 and $180,000; and
- $53 if earnings are above $180,000.

A no-brainer for many to withdraw

The calculations underpinning Table 1 are simple and stylised 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. The incentive to withdraw is relevant to a wide range of the Australian population – and includes both those who consumed the withdrawn amounts during the pandemic, and those who chose to save outside the superannuation environment.

For those who intended to use withdrawals to supplement (smooth) their current year-consumption, the cash that went into pockets was equivalent to a tax-free pay rise with no withholding. The return is thus superior to the after tax-value of the vast majority of wages, including wages within the tax-free threshold that would be withheld and then refunded upon submission of a tax return. The maximum $10,000 withdrawal would represent approximately 13 weeks of (supplemented) unemployment payments, and approximately 8 weeks of the minimum wage.

Those seeking to optimise the after-tax return on their savings would generally need to find, for an investment option achieving the same return as superannuation and holding all else equal, a marginal tax rate less than the 15 per cent superannuation earnings tax rate.[12] A tax rate on capital income that is lower than 15 per cent is a widespread outcome, with Varela et al. (2020) estimating that the average marginal effective tax rate across all assets in Australia is around 7.5 per cent. A particularly notable and common low-tax investment is owner-occupied housing, which comprises more than 40 per cent of Australian household assets and faces an estimated marginal effective tax rate of 9 per cent (mainly reflecting stamp duties levied upon purchase, with no tax on capital gains, ibid).

The assessment of whether the present value of superannuation that is withdrawn and saved is higher than the value of keeping it in superannuation depends, in part, upon whether the individual will be subject to the withdrawal of benefits in retirement based upon the additional savings. If individuals believe they will generate sufficient income from their assets to be a part-rate pensioner in retirement – a prospectively large proportion of our population[13] – the present values in column [3] suggest that withdrawing superannuation is preferable at any tax rate. This includes those whose income on savings would be taxed at the top marginal personal tax rate. For those who expect to receive full age pension or no age pension (those with either very small or very large superannuation balances), withdrawn superannuation represents a higher present value than keeping it in superannuation at effective tax rates that apply to a wide range of savings (comparing columns [4] through [8] to column [2]).

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[11]Calculations exclude the Medicare levy low-income phase out region for simplicity.

[12] The tax discounted rate on capital gains on super of 10% could replace the 15% rate in table 1, with generally similar conclusions than those presented in Table 1.

[13] It would be reasonable for most working age Australians to expect to receive a part rate pension at some point in their retirement. The modelling that underpinned the 2020 Retirement Income Review projected that 63 per cent of retirees would be receiving part rate pensions when current 30 year olds reach retirement age in 2060, up from 38 per cent of existing retirees currently (Commonwealth of Australia 2020c). Although the impact that COVID-19 has on lifetime incomes is yet to be studied, it is intuitively likely that the cohort who received welfare benefits is more likely than the general population to be full- or part- rate pensioners in retirement.

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. Workers typically have limited (or no) input into the level of (compulsory) contributions made by their employers on their behalf. Financial planning also demands many complex and risky decisions, and it's not clear to savers how (or if) marginal superannuation savings will be used in retirement (Daley and Coates 2019, Deetlefs et al. 2019).

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 super, tax and transfer regime settings (along with broader economic, social and environmental conditions) by the time the current working age population retires.

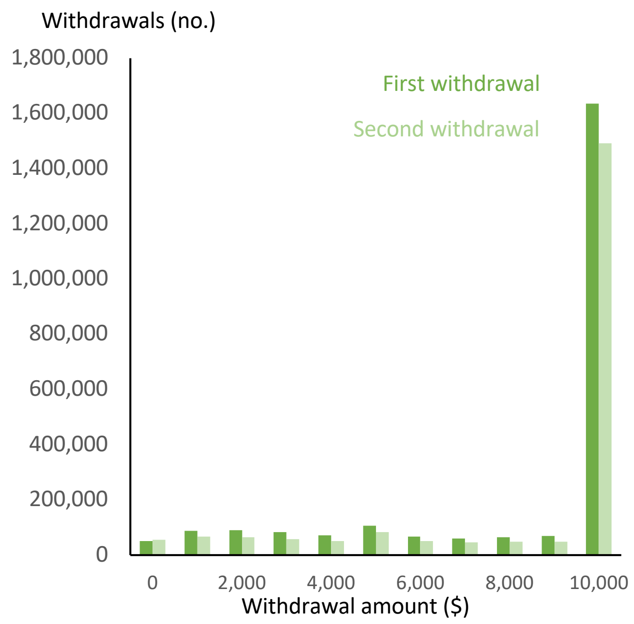
Against a backdrop of super containing uncertain and poorly understood value, individuals were, in effect, gifted an option with strong up-front value. A time-limited (and unexpected) opportunity to access otherwise 'stranded' assets, tax-free. Furthermore, it was offered during the most acute phase 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.

Withdrawal amounts were determined primarily by program conditions

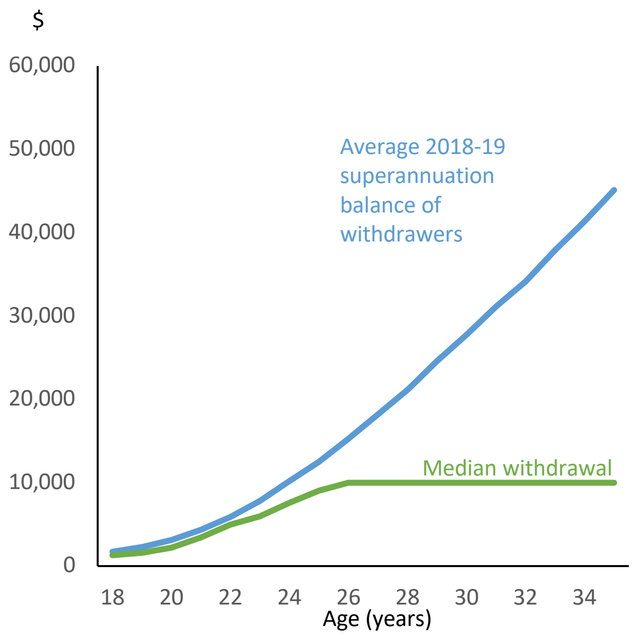
Chart 6 highlights the main constraint on sums withdrawn appears to have been the terms and conditions of the withdrawal program. Chart 6a confirms that the most common withdrawal outcome (chosen by more than 70 per cent of withdrawers in first withdrawal and 60 per cent in second withdrawal) was the $10,000 maximum amount. Chart 6b 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 per cent (or more) of their pre-Covid-19 balance at the first withdrawal opportunity alone.

Chart 6. Withdrawal amounts were determined primarily by program conditions

6a. The modal outcome was to withdraw $10,000 in both windows of opportunity



6b. 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.

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.

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

Model setup.

Start with a discrete time period of t = 0,1,2,…,T-1 weeks. Over a close-to-18-month window from 23 January 2020 to 30 June 2021, 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 $\psi\ (s_t)$.

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

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

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

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

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:

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

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,[14] 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:

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

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:

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

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[15]. Estimating if lump sum

[14] $V_t(A_t)$ 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).

[15] 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.

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 wage, and thereby reduces the incentive to search (through a substitution effect as their relative value of leisure increases).[16]

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.[17]

Conversely, the more tight 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.

[16] 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.

[17] 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.

4. DATA AND EMPIRICAL STRATEGY

Estimating the impact of superannuation withdrawal 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.[18] 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.

Data

The analysis relies on a wide range of linked comprehensive sets of confidentialised (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 (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. We observe for each of the full population of 3 million individual program applicants the reason for application, date of ATO approval (if approved), fund type and amount applied for. We supplement this program information with full-population superannuation balance information for the 2018-19 year (the last complete year pre-covid), also provided by the Australian Taxation Office[19].

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 do not extend to sole traders (Frydenberg and Birmingham 2021). For our purpose of looking at the effect of superannuation withdrawal on unemployment benefit tenure this is not relevant.

[18] It is important to recognise that this is a practical reality of real-world crisis support mechanisms. It's difficult to foresee a government withholding support in the height of an acute crisis from those in need who qualify for a program, purely due to a desire to insert some random variation that enables crisp causal identification.

[19] Of most interest: pre-covid superannuation balances are as reported through Member Account Attribute Service (MAAS) and Member Account Transaction Service (MATS) for the 2018-19 financial year. The

Sample selection

Constructing a comparable group of individuals, who differ in their take up of the superannuation early release program, requires sample selection decisions around the composition of the population on unemployment benefits. 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.[20] The inflows into our sample are individuals that began receiving one of these payments over the three-month period from 23 January 2020 (the week in which 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[21] 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.[22]

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

[20] The focus on the full population including both males and females is a distinction from Chetty (2008) which just focusses on working age males. The age range 16-65 is consistent with a focus on the working age population that is accessing superannuation before the age of eligibility for old age pension. Given retirements are often transitioned into over several years, and superannuation is increasingly accessed once people reach their mid-50s, in sensitivity analysis we evaluate a narrower age range of 22-58; an age range which is also the primary age range for JobSeeker receipt. The narrower age range does not have a material impact on estimates.

[21] 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.

[22] In Appendix D we demonstrate that our estimates are robust to these sample selection conditions. 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; sensitivity check 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 inference.

are commencing unemployment spells in order to withdraw superannuation (e.g. this rules out the possibility that our estimates are inadvertently reflecting reverse causality).[23]

One further restriction is needed to arrive at the population for our survival analysis. This is to remove those who have incomplete information on two key covariates: historical wage and salary information from personal income tax returns (from 2015-16 to 2018-19) and without recorded pre-COVID-19 superannuation balances. An absence of recorded information on what are two primary financial metrics can be anticipated to correlate with poorer labour 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 labour market experiences to those with these sources of information.

The differences in population characteristics raise questions about the viability of alternative approaches to missing values, such as through multiple imputation based on observed values. Our judgement is that complete case analysis is the preferred path here.[24] As a robustness check, Appendix D presents a comparison of the population differences and the associated estimated labour market effects in models without controls where we can include the individuals with missing covariates.

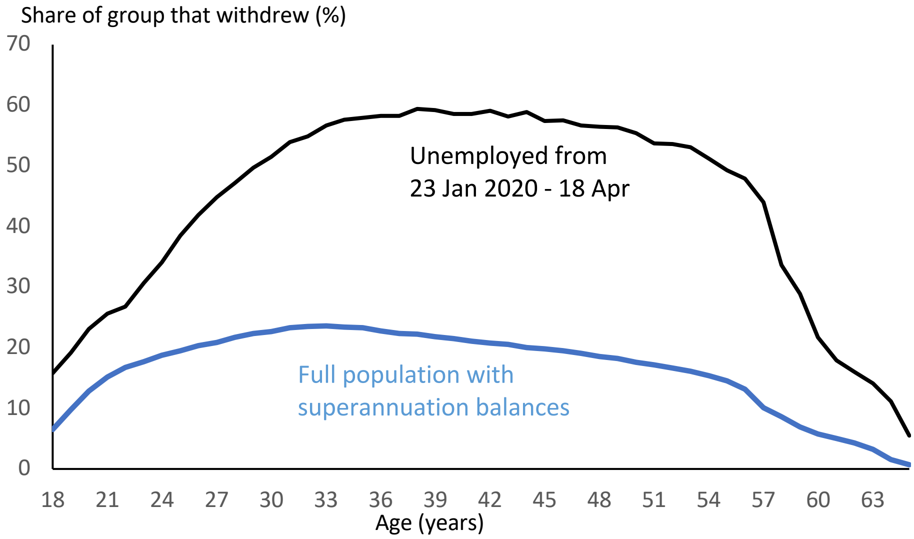
Population characteristics: comparing withdrawers and non-withdrawers.

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

Chart 7, Table 2 and Table 3 highlight how those who began unemployment spells in the initial months of COVID-19 are different in important respects from the broader population. Chart 7 shows that they were more likely to withdraw from superannuation. 236,380 (45 per cent) of the sample population participated in at least one of the two tranches of the early release program, compared to 18 per cent of those with superannuation balances. 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 unemployment recipient withdrawers (where the whole population qualified) was less skewed towards younger age cohorts in their 20s and 30s, than the population more generally (where not all the population qualified).

[23] 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 per cent reduction in hours means that choices to become unemployed are motivated predominantly by other considerations than eligibility to withdraw.
[24] 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 A.

Chart 7. 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.

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, 55,775 (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 per cent of withdrawers and 9 per cent of the early release program's total amount withdrawn.

Tables 2 and 3 reveal that there are systematic differences in population characteristics of those who withdrew and those who didn't, as well as between the population receiving unemployment benefits in the early months of COVID-19 and those 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 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 2) and those who withdraw at the second opportunity (Table 3).

Table 2. Population characteristics, first withdrawal

Characteristic	Don't withdraw first opportunity* (1)	First withdrawal (19 Apr-30 Jun 2020)			Pooled (5)	Began most recent spell in calendar year 2019 (6)
		All withdrawers (2)	*Of which: withdraw both times*** *(3)*	*Of which: withdraw first only* *(4)*		
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						
Per cent onunemployment 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
Per cent female	52.5	41.1	39.1	46.4	48.0	44.5
Per cent married	32.6	37.0	36.2	39.1	33.8	17.7
Per cent homeowner or mortgagee	27.8	23.6	24.1	22.4	26.1	17.5
Per cent with children	15.8	35.1	37.6	28.3	20.3	18.8
Education level: per cent 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

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.

Tables 2 and 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 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,[25] withdrawers were on benefits for an average of 5.3 weeks (37 calendar days) longer than nonwithdrawers.

[25] Those with incomplete spells are unsuprisingly almost identical in average tenures.

A similar story emerges when considering those who withdrew at the second opportunity (Table 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 (conditional on the full population still on their unemployment spell as at 1 July 2020) were on government support for an average of 3.3 weeks (23 calendar days) longer than non-withdrawers.

Table 3. Population characteristics, second withdrawal.

Characteristic	Don't withdraw in second opportunity* (1)	Second withdrawal (1 July-31 Dec 2020)			Pooled (5)
		All withdrawers (2)	*Of which: withdraw both times (3)*	*Of which: withdraw second only (4)*	
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
Per cent female	51.3	40.1	*38.9*	*46.6*	47.0
Per cent married	32.9	33.1	*34.4*	*27.1*	33.0
Per cent homeowner or mortgagee	27.2	23.2	*23.7*	*20.5*	25.7
Per cent with children	15.8	27.7	*29.3*	*19.9*	20.4
Education level: per cent 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.

Two final short observations relating to pertinent differences in population characteristics are in order. The first is that the population of new unemployment payment recipients during COVID-19 (Column 5 in Table 2) were materially different from the population of recipients of those payments drawn from the more 'normal' times of 2019 (Column 6 in Table 2). In particular, they had stronger historical financial and socio-demographic outcomes and experienced shorter spans on unemployment. The second comes from comparing those who withdrew once (Column (4) in both Tables 2 and 3) compared with those that withdrew twice (Column (3) in both Tables 2 and 3). The single-withdrawing populations had much lower pre-Covid wage and superannuation balances than those who withdrew twice. Together the two populations suggest a mix of high 'motivation' (early withdraw and rapid exit from unemployment payments) and low 'motivation' (late withdrawal and prolonged unemployment tenure) populations among those with particular financial disadvantage.

Model specification

Setup

We deploy a Cox hazards model to estimate the effects of lump sums on tenures on unemployment benefits.[26]

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.[27]

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.

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));

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[26] 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.

[27] We note that fitting the *X* using partial likelihood is equivalent to estimating β_k using the survival data in the interval $[t_{k-1}, t_k)$, by excluding all those data points *i* such that $X_i < t_{k-1}$, and treating all those *i* such that $X_i \geq t_k$ as censored.

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).[28]

This produces an estimating equation:

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

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:

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

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* 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:

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

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 two specifications of each model. Initially with no controls (i.e. assuming γ'= ρ'= 0). Then with full covariate information.

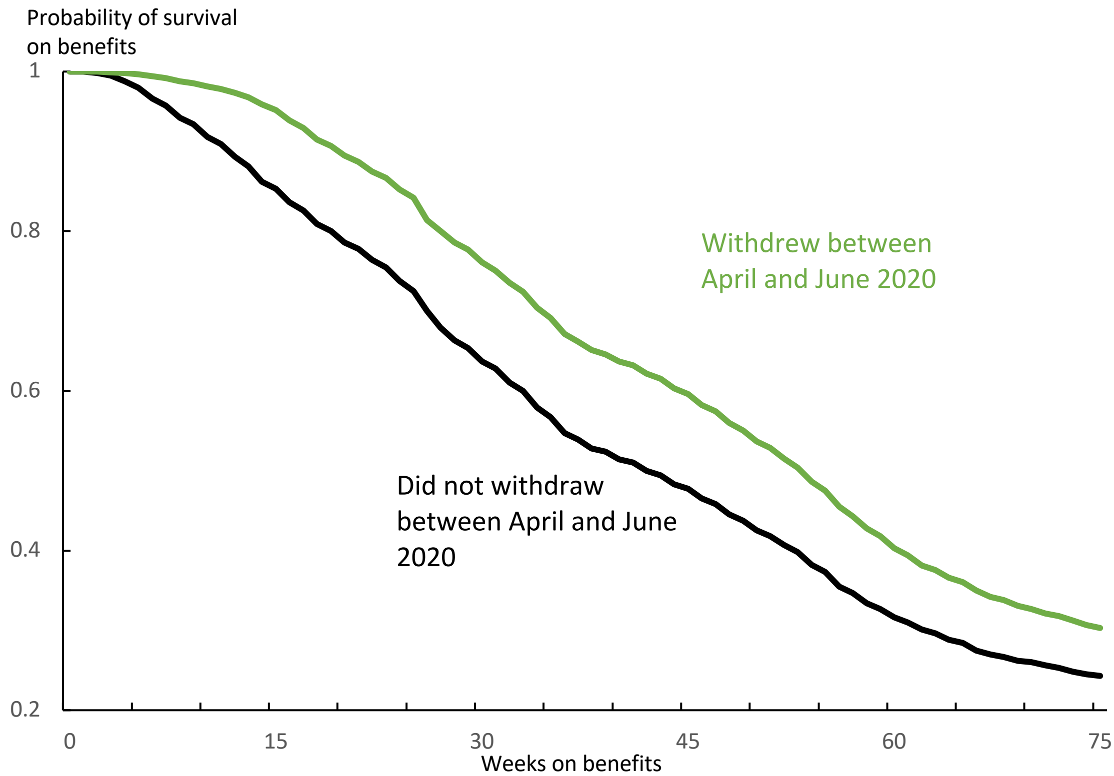
[28] A robustness check, involving a more complicated alternative model where all covariates enter with time-varying effects on a quarterly basis, reveals no material change in the estimated effect of superannuation on welfare spells.

5. RESULTS

Graphical evidence

We start by presenting the graphical evidence. Charts 8 and 9 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.

Chart 8. Probability of survival on unemployment payments, first tranche of withdrawals.

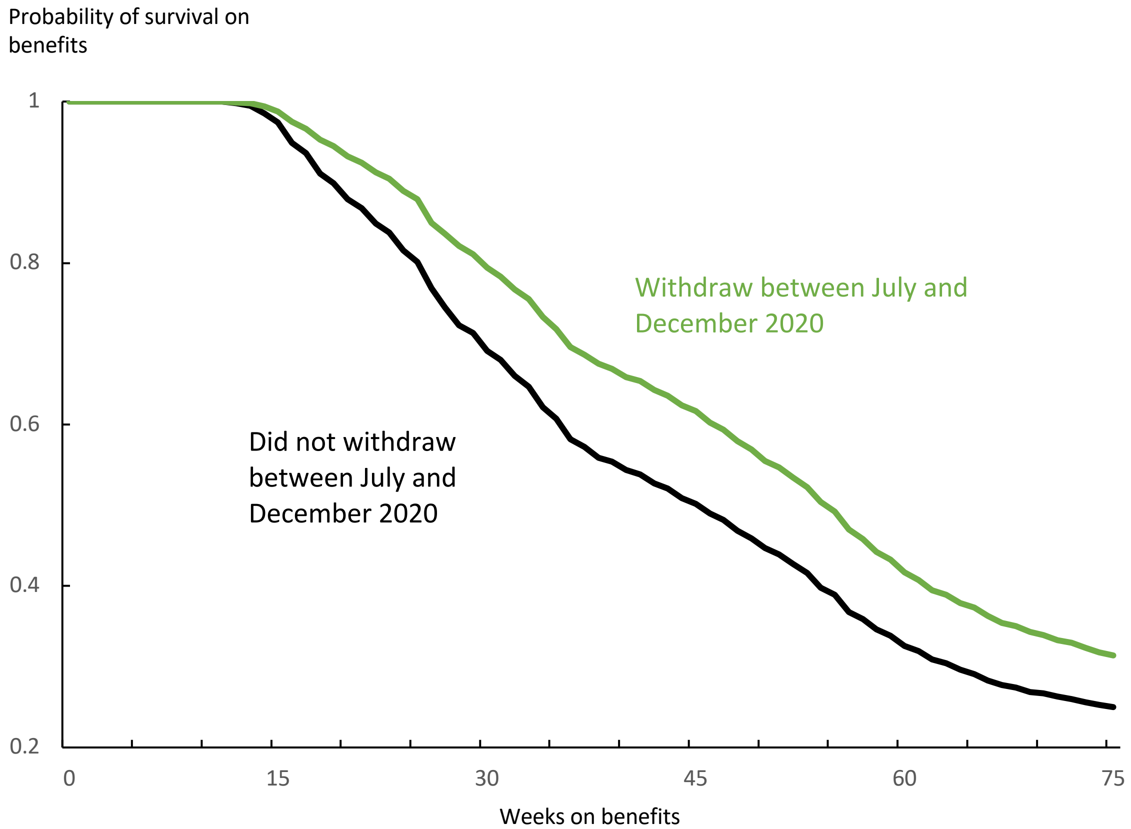


There is a substantial gap in survival rates between withdrawers and non-withdrawers, with those who withdrew more likely to remain on unemployment. The proportional difference in exit rates across the full sample suggests that the size of the gap is a constant 33 per cent (relative) difference. However, Chart 8 reveals that the difference in exit is time-varying. At 13 weeks of spell on benefits, approximately 18 per cent of non-withdrawers have exited compared to 5 per cent of withdrawers; a 13 percentage point difference. This gap increases to 15 percentage points after 26 weeks (37 per cent and 22 per cent exit rates respectively), before gradually converging to 12 percentage points (64 per cent and 52 per cent exit rates respectively) after 52 weeks and 6 percentage points (76 per cent and 70 per cent exit rates respectively) by 30 June 2021. The divergence, then convergence, between groups over time explains why we favour quarterly time interactions over a single (constant) point estimate of the unemployment payment exit rate.[29]

[29] A related way of is describing this situation is that it violates the proportional hazards assumption based on tests of Schoenfeld residuals from the Cox Proportional Hazards specification. We are reluctant to adopt such framing in this instance as our large sample size renders proportional hazard testing somewhat less useful than in studies with smaller samples. Even very small departures from proportionality will yield failed proportional hazards tests. For example, from a brief investigation, sample sizes of more than approximately 10,000 in our

Chart 9 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 that individual's survival on benefits to 1 July 2020. As Table 3 revealed, this includes a sizeable group of about 45,000 individuals who withdrew at the first opportunity as well. By construction, this population has survived on benefits for the first 11 weeks. Exit rates between withdrawing and non-withdrawing groups is consequently similar inside the first quarter of spell. After that, the general pattern of behaviour (initial divergence then 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 per cent exit rate for non-withdrawers and 15 per cent exit rate for withdrawers), which increases to 12 percentage points after 39 weeks (45 per cent and 33 per cent exit rates respectively) before gradually converging to 11 percentage points after 52 weeks (57 per cent and 47 per cent exit rates respectively) and 7 percentage points (72 per cent and 65 per cent exit rates respectively) by the end of the sample period.

Chart 9. Probability of survival on unemployment payments, second tranche of withdrawals.



As discussed above, those who withdrew superannuation are different to those who didn't, in ways that we can observe and ways that we can't. The former includes the characteristics presented in Tables 1 and 2, whereby those who withdraw are in general at a later stage of life and household development. The latter might include an 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 wages or 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

sample appear to violate proportional hazards tests, even when comprised entirely of smaller samples that each satisfy the test for proportionality. Appendix A presents a visual test of proportionality for each variable.

the differences in inherent individual characteristics between groups, instead of the true relationship between superannuation withdrawals and subsequent exit from unemployment support.

In a similar manner to Chetty (2008), we adopt a range of approaches to investigate whether the relationship between unemployment spells and superannuation withdrawal might be causal.

Importantly, the early access program was disproportionately accessed by a cohort of older and higher earning males that one might traditionally expect to have higher levels of workforce participation, as well as shorter tenures on unemployment. An estimate that does not control for demographic and social factors can therefore be anticipated to be biased *against* finding that withdrawals lead to longer tenures. We therefore compare our estimates with and without controls for population heterogeneity.

As a further sensitivity test, we balance withdrawing and non-withdrawing populations based on age, prior year wage, industry and superannuation balance using coarsened exact matching and nearest neighbour matching. Very similar results to the parametric specification with a rich set of controls provides more assurance of a causal interpretation.

Theory can provide further assurance. The basic premise, within a job search framework, is that lump sum withdrawals will extend unemployment tenures more among those who are more constrained in their capacity to smooth consumption, such as due to lower asset levels reducing people's ability to weather income shocks, or if individuals face a larger financing gap between pre-spell income and income during spells on (supplemented) unemployment benefits. The lump sums act to provide relief against such constraints. We examine this relationship in the data and find behaviour consistent with the theory.

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 are presented in Tables 4 and 5.

Table 4. Exit rates associated with participation in early release of superannuation program

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*** (0.005)	-0.777*** (0.005)	-0.553*** (0.032)	-0.624*** (0.030)
Weeks 14-26	-0.241*** (0.005)	-0.317*** (0.005)	-0.384*** (0.005)	-0.452*** (0.005)
Weeks 27-39	-0.186*** (0.006)	-0.257*** (0.005)	-0.275*** (0.005)	-0.343*** (0.005)
Weeks 40-52	-0.099*** (0.008)	-0.140*** (0.008)	-0.134*** (0.006)	-0.167*** (0.007)
Weeks 52-65	-0.012 (0.008)	-0.084*** (0.008)	-0.068*** (0.008)	-0.139*** (0.007)
Weeks 66-75	0.051 (0.028)	-0.047 (0.026)	0.024 (0.029)	-0.078*** (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	0.654	0.539	0.638
Wald test	19,480	88,042	6,948	56,440

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 per cent in the baseline (no control) setting (specification 1) and 78 per cent 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 32 per cent. Inside a year, withdrawal was estimated to have experienced a significant 14 per cent 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 per cent reduction in exit compared to those who didn't in the full controls specification. 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 per cent.

The rate of convergence is similar for those that withdrew in the second opportunity (specifications 3 and 4 in Table 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 per cent in the third quarter, 14 per cent in the fifth quarter and 8 per cent in the sixth quarter in the full control specification (specification 4).

We speculate that in an uninterrupted world, an additional three months of unemployment tenures (that is, spell records to end-September 2021) would have revealed a similar convergence in tenures between withdrawers and those withdrawing during the second tranche. That is, convergence in exit rates would be estimated to occur at the seventh quarter of spell. However, such data was not available at time of analysis, and the emergence of a major new national wave of virus associated with the Delta strain of COVID-19 in late-June 2021, and associated lockdowns, will confound interpretation in any case.

Effects per $1,000 withdrawn

In addition to exit rates based on someone's participation in particular tranches of the superannuation early release program, exit rates can be calculated on the dollar value of withdrawal across the period. That is, at up to $20,000 withdrawn per individual (Table 5) instead of participation in one of two tranches. Under the full control specification, each $1,000 withdrawn is estimated to reduce exit rates by 10.9 per cent inside the first quarter of spell, 1.6 per cent inside the first three quarters of spell, and 0.7 per cent inside a year. For those that withdrew the average of approximate $13,800, this translates to no expected attrition from benefits inside the first quarter, a 23 per cent reduction in exit rates in quarters 2 and 3, a 10 per cent reduction in the fourth quarter, and 7 per cent in the fifth quarter. As with the 'participation in program' model specifications, the estimated effect of withdrawal is no longer statistically significant by the 6th quarter of a spell.

The similar-but-lagged pattern of effect across the two tranches of program leads us to focus on examining withdrawals as two essentially distinct lump-sum payments.

Table 5. 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)	-0.005*** (0.001)
Weeks 66-75	0.006*** (0.002)	-0.002 (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	0.643
Wald test	19,480	75,305

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.

Matching

Tables 2 and 3 revealed systematic differences in observed characteristics between withdrawing and non-withdrawing populations. Tables 4 and 5 then revealed that one approach for handling these differences – controlling for population heterogeneity through covariate terms in the Cox model - results in stronger and more persistent estimated effects of withdrawals.

An alternative approach to addressing the potential bias associated with observable characteristics is to balance the population via an algorithmic matching method prior to estimation. We treat matching methods as a sensitivity check on the estimates produced via the 'full control' specification. 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 sector of employment 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 C).

Table 6 reveals that the three different techniques for managing population heterogeneity will produce similar estimated effects of withdrawal. 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.

Table 6. 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	206,435	NA	258,980	173,537
Matched Treated	NA	202,771	206,435	NA	170,602	173,537
Unmatched Control	323,268	17,051	116,833	276,551	17,571	103,014
Unmatched Treated	206,435	3,664	0	173,537	2,935	0
Estimated change in exit rate based on for quarterly epochs in spell:						
Weeks 1-13	-0.777*** (0.005)	-0.783*** (0.005)	-0.779*** (0.005)	-0.623*** (0.113)	-0.654*** (0.028)	-0.623*** (0.031)
Weeks 14-26	-0.317*** (0.005)	-0.273*** (0.005)	-0.303*** (0.005)	-0.448*** (0.005)	-0.451*** (0.005)	-0.449*** (0.005)
Weeks 27-39	-0.257*** (0.005)	-0.215*** (0.006)	-0.240*** (0.006)	-0.337*** (0.005)	-0.339*** (0.005)	-0.339*** (0.005)
Weeks 40-52	-0.140*** (0.008)	-0.146*** (0.007)	-0.145*** (0.008)	-0.165*** (0.008)	-0.201*** (0.007)	-0.183*** (0.008)
Weeks 52-65	-0.084*** (0.008)	-0.100*** (0.007)	-0.078*** (0.008)	-0.136*** (0.007)	-0.182*** (0.007)	-0.136*** (0.008)
Weeks 66-75	-0.047 (0.026)	-0.018 (0.027)	-0.009 (0.030)	-0.078*** (0.026)	-0.072** (0.026)	-0.070** (0.029)
Model fit						
Concordance	0.643	0.562	0.562	0.638 (se=0.0)	0.532 (se = 0)	0.532 (se = 0)
Wald test	75,305 (p < 2e-16)	12,030 (p<2e -16)	12,030 (p<2e -16)	56,440 (p < 2e-16)	8,742 (p < 2e-16)	8,742 (p < 2e-16)

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).

As a further sensitivity check, Table 7 shows that the central estimated effects of superannuation withdrawal are robust to the exclusion of individual covariates.

Table 7. Exit rate estimates when excluding selected covariates, first withdrawal

Length of spell	Full controls (1)	Full control estimates of withdrawal in first opportunity, adjusted by not controlling for:									
		Super balances (2)	Log of average pre-covid wages (3)	Week of spell fixed effect (4)	Sex (5)	Home (6)	Marital (7)	Child (8)	Education (9)	Location (10)	Sector (11)
Obs	2,232,730	2,232,730									
Events	381,042	381,042									
Weeks 1-13	-0.777*** (0.005)	-0.767*** (0.005)	-0.769*** (0.005)	-0.773*** (0.005)	-0.773*** (0.005)	-0.774*** (0.005)	-0.770*** (0.005)	-0.773*** (0.005)	-0.772*** (0.005)	-0.771*** (0.005)	-0.771*** (0.005)
Weeks 14-26	-0.317*** (0.005)	-0.291*** (0.005)	-0.293*** (0.005)	-0.309*** (0.005)	-0.308*** (0.005)	-0.314*** (0.005)	-0.301*** (0.005)	-0.310*** (0.005)	-0.311*** (0.005)	-0.305*** (0.005)	-0.305*** (0.005)
Weeks 27-39	-0.257*** (0.005)	-0.235*** (0.006)	-0.230*** (0.006)	-0.248*** (0.005)	-0.250*** (0.005)	-0.255*** (0.005)	-0.242*** (0.006)	-0.251*** (0.005)	-0.254*** (0.005)	-0.246*** (0.005)	-0.246*** (0.005)
Weeks 40-52	-0.140*** (0.008)	-0.121*** (0.008)	-0.128*** (0.008)	-0.138*** (0.007)	-0.149*** (0.007)	-0.149*** (0.007)	-0.134*** (0.008)	-0.144*** (0.008)	-0.156*** (0.008)	-0.139*** (0.008)	-0.138*** (0.008)
Weeks 52-65	-0.084*** (0.008)	-0.066*** (0.008)	-0.062*** (0.008)	-0.077*** (0.007)	-0.093*** (0.007)	-0.093*** (0.007)	-0.077*** (0.008)	-0.087*** (0.008)	-0.099*** (0.008)	-0.081*** (0.008)	-0.081*** (0.008)
Weeks 66-75	-0.047 (0.026)	-0.041 (0.026)	-0.019 (0.027)	-0.035 (0.026)	-0.052* (0.026)	-0.061* (0.026)	-0.045 (0.026)	-0.054* (0.026)	0.063 (0.026)	0.048 (0.026)	0.047 (0.026)

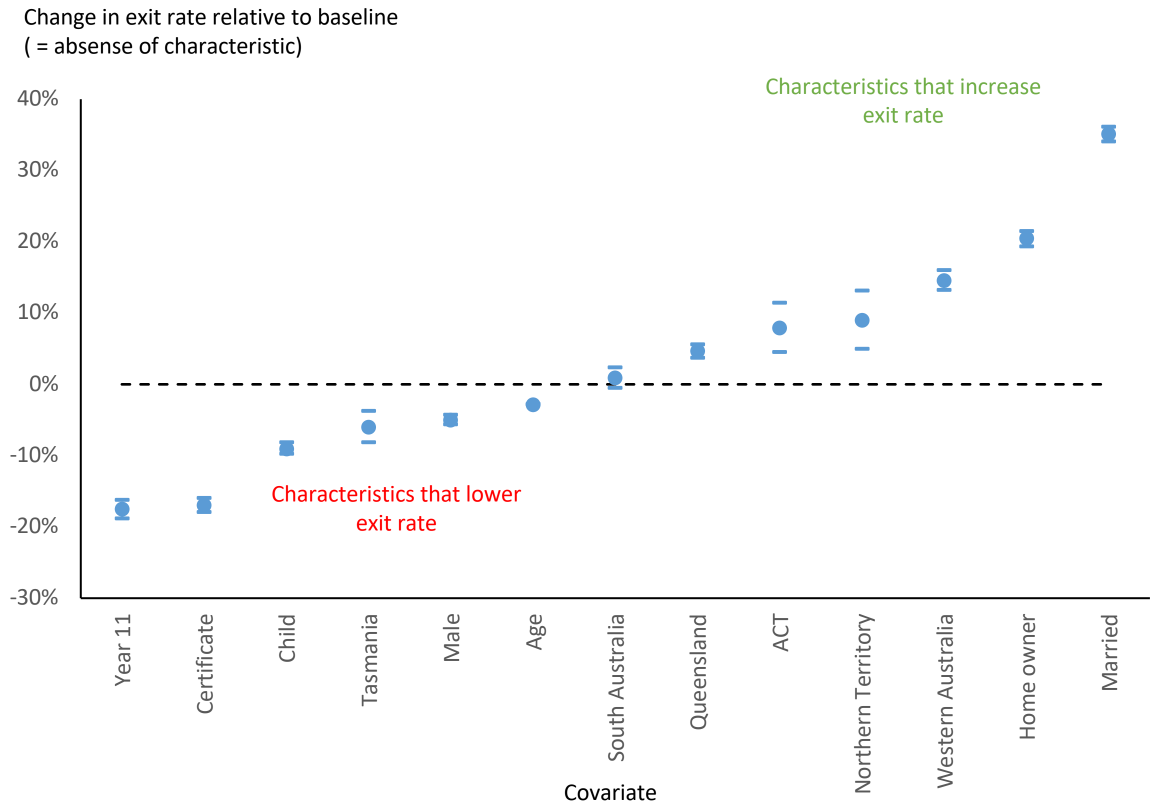
Notes: *** p < 0.01 ** p < 0.02 * p < 0.05. Coefficients can be interpreted as the change in the exit rate associate with the withdrawal from superannuation. Standard errors (transformed to account for log-linear model specification) are clustered at the individual level and are in parentheses. The study 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.

Controls for observed heterogeneity

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 (also see Appendix B).

Chart 10 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 (the week commencing 5 March 2020). The estimates have predictable effects. 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 (with linear estimated effect across the 16-65 age group), having children in the household, and being educated at a school leaver or certificate level (which is disproportionately correlated with age) are estimated to reduce exit.

Chart 10. Change in exit rate due to assorted covariates, first withdrawal



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.

Covariates with significant time-varying effects are in line with our a priori expectations (Chart 11). 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.

Chart 11a. Change in exit rate, assorted covariates with time-varying effects, first withdrawal

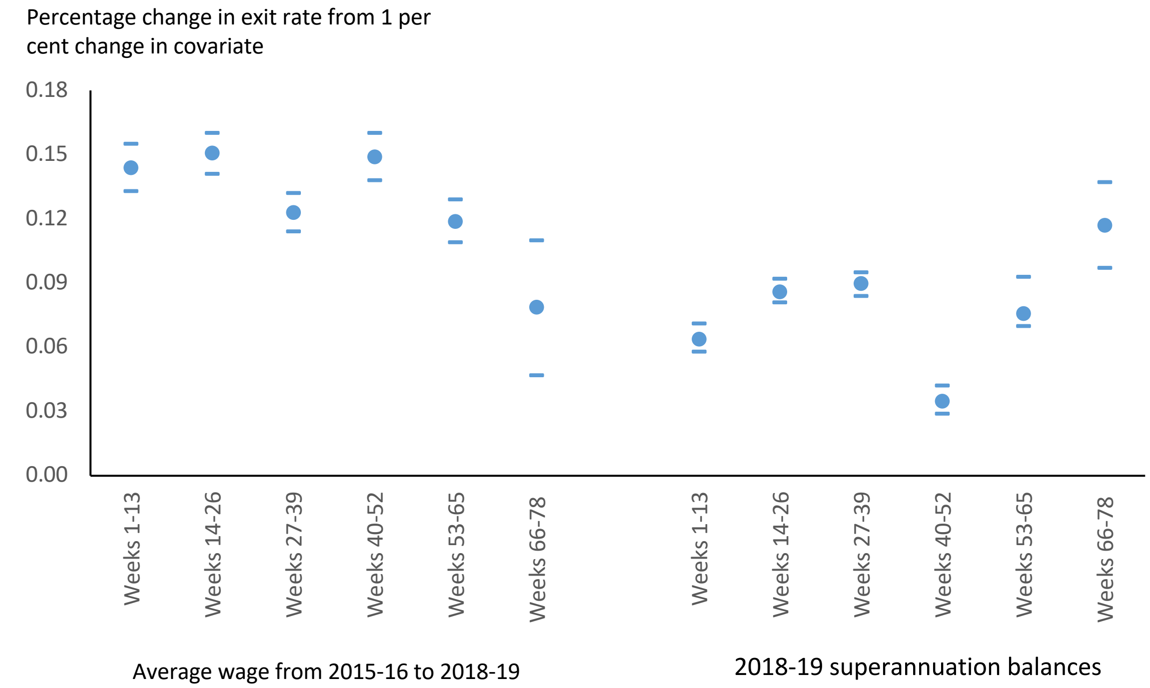
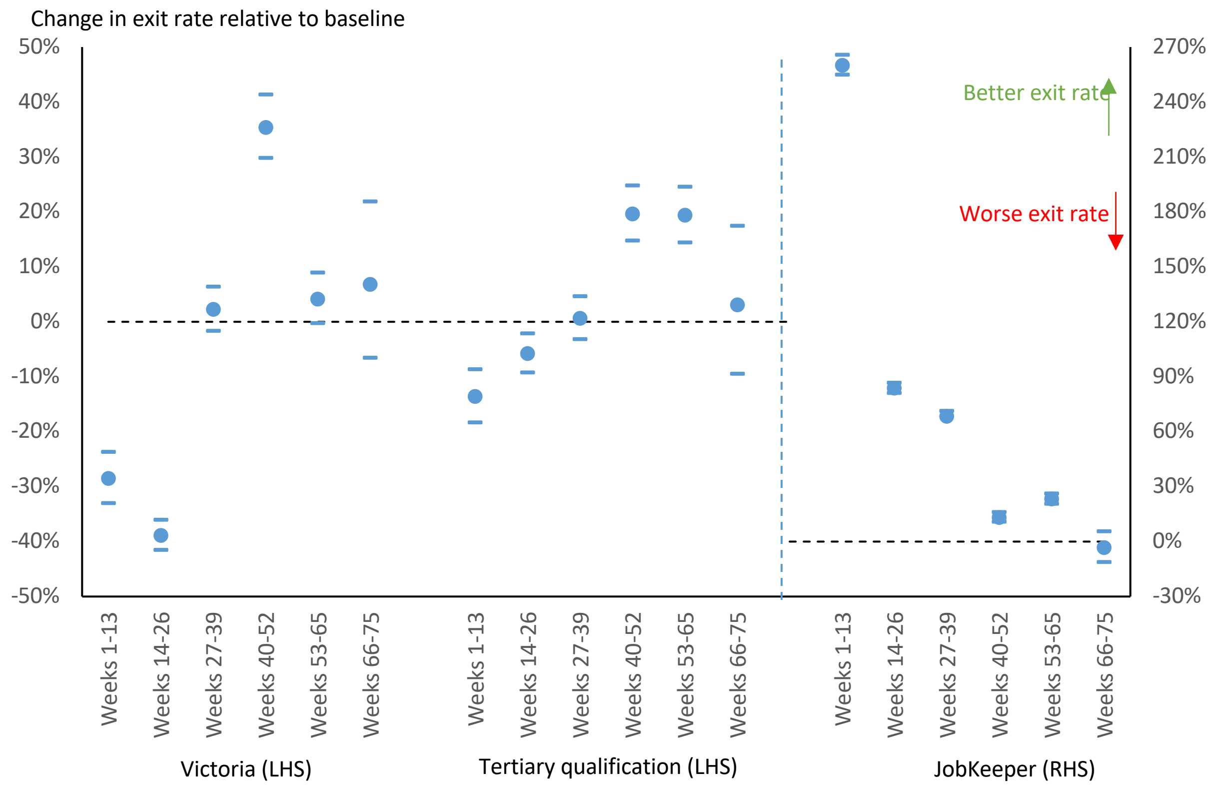


Chart 11b. Change in exit rate, covariates with time-varying effects, first withdrawal

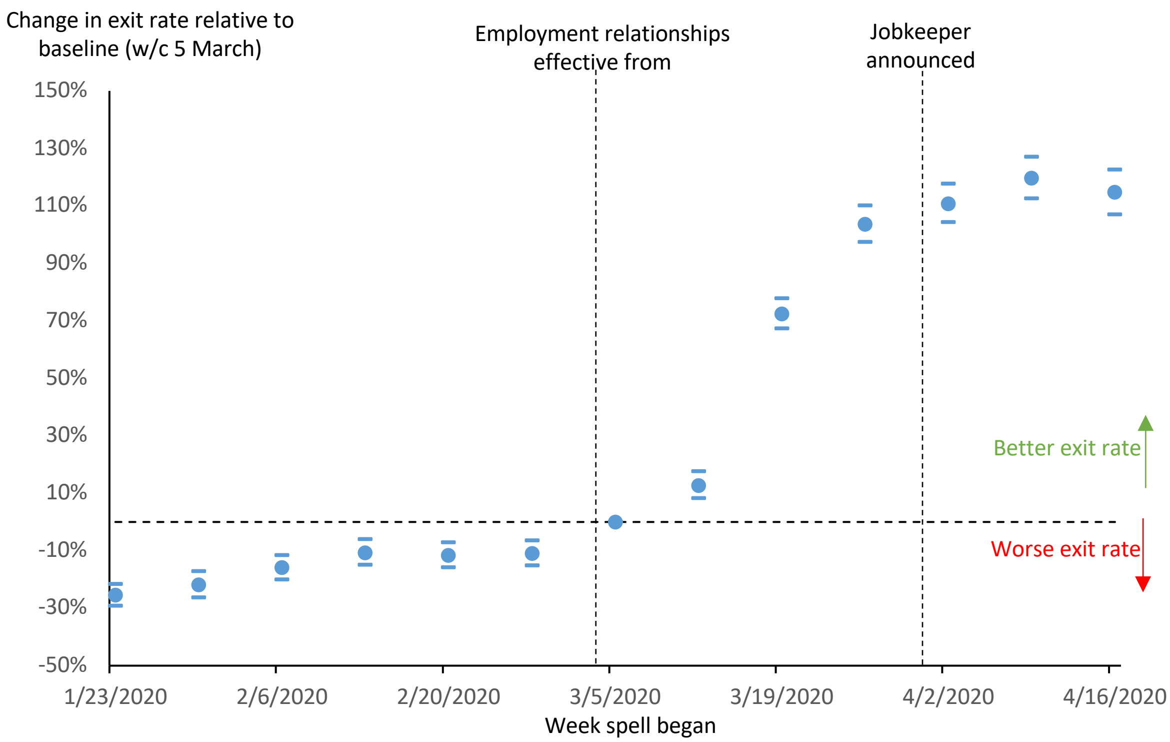


Notes. Presents coefficient estimates of the covariates from the Cox estimation generated alongside the estimates produced in specification 2 in Table 4. Upper and lower bounds calculated based on a 95% confidence interval have also been presented for each estimate. See Appendix B for values.

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. Chart 12 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 30. There is an important shift that takes place over the month of March.

The most obvious explanation for this change stems from the introduction of the JobKeeper program[31]. JobKeeper affected the population in two major ways. It directly subsidised the (re-)employment of a sizeable number of the unemployed (Chart 11b). In addition, the wage subsidy substantially altered the population of potential recipients – from the full population 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.

Chart 12. Exit rate by week unemployment payment spell began, first withdrawal



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.

[30] This observed trend continues with a wider 9-month sample begins in October 2019 and ends in June 2020.
[31] 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.

It is less clear that there is any associative link that the measures facilitated "better paying jobs". To illustrate, Charts 13a and 13b compare the average wage in the four weeks prior to an unemployment spell commencing, and the four weeks after payments ceased, by week that spell commenced.[32]

Those starting a spell in April (and later) received higher average wages upon re-employment than those who commenced spells in February (and earlier), with March again a transition month (Chart 13a). However, those who commenced spells after the introduction of JobKeeper also earned on average significantly more pre-spell. The resulting 'wage boost' associated with finding a job dropped from 50 per cent + in February to 0-10 per cent from April onwards (Chart 13b).

Chart 13b also reveals that withdrawals from superannuation were correlated with a lower wage boost at the end of their spells. This is notwithstanding that withdrawers experienced an additional month of average tenure on unemployment benefits. The observation holds irrespective of the week in which an spell commenced. It is a suggestive indicator (albeit a quite limited one) that withdrawals may not have been associated with better paying job matches.

Chart 13a. Average wages in 4 weeks pre- and post-unemployment payment spell

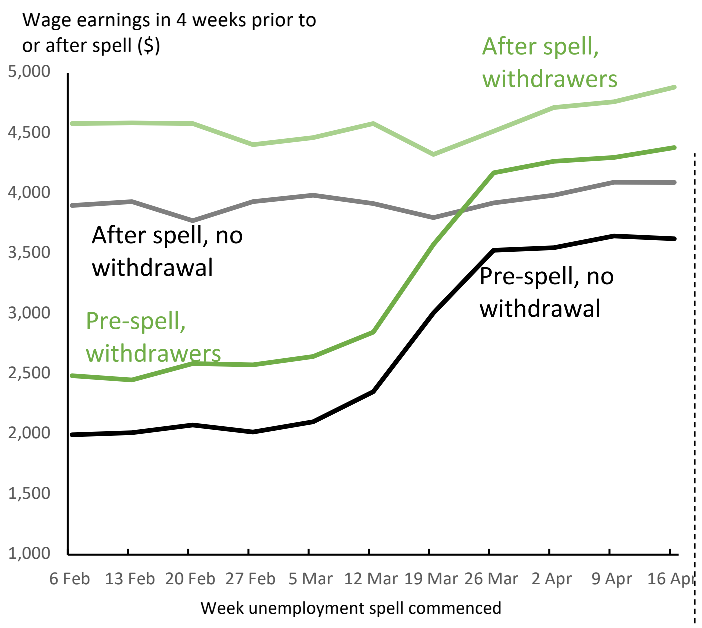
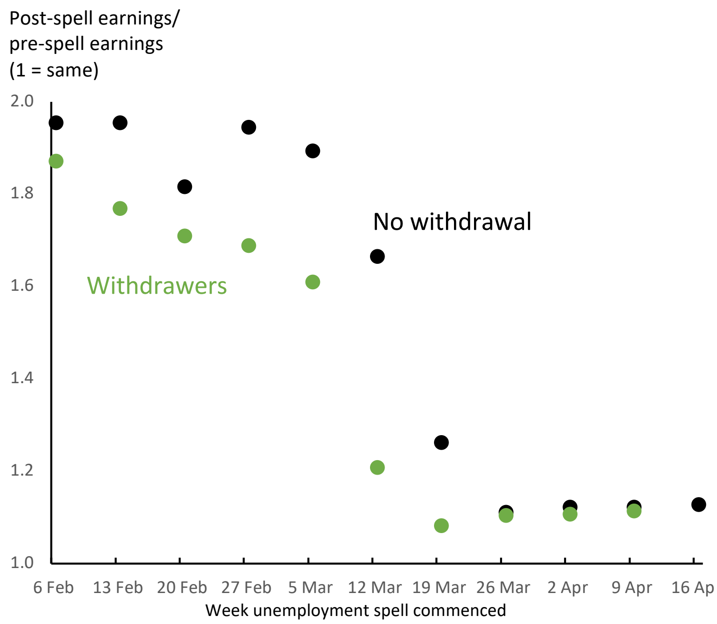


Chart 13b. Ratio of pre- and post-unemployment wages

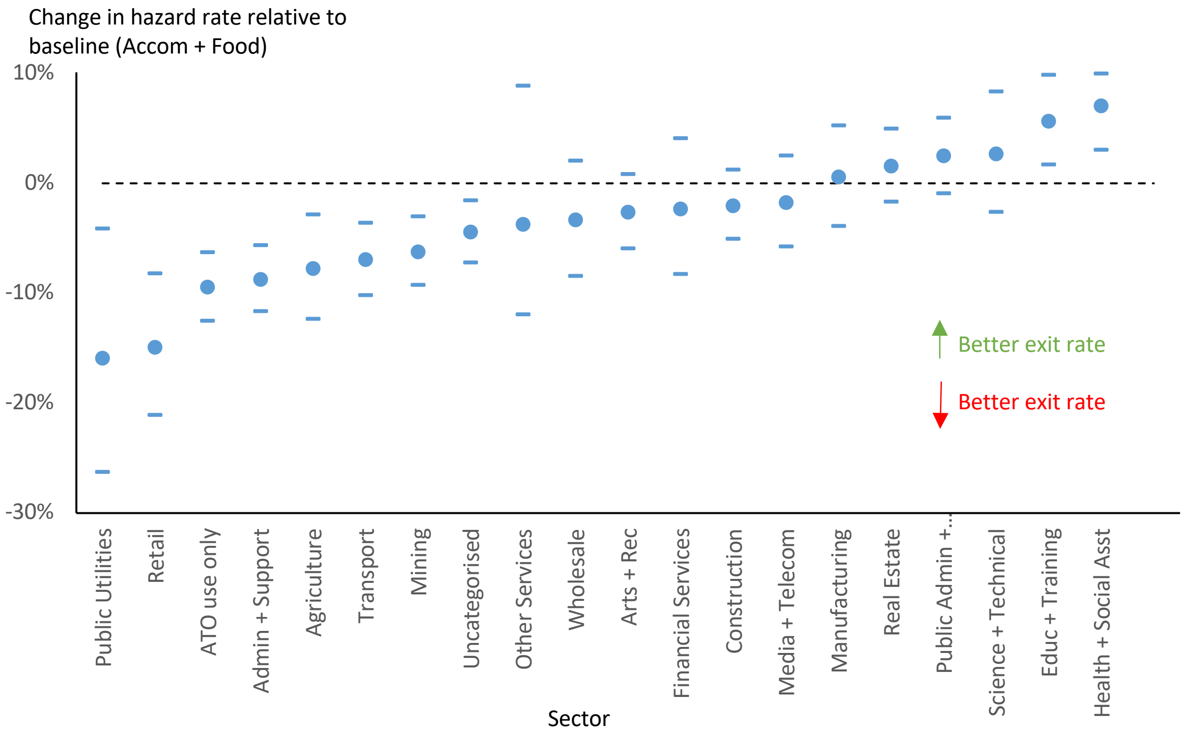


Notes: Calculations for week ending 30 January and earlier have been excluded due to only having 3 weeks of historical wage data.

Finally, re-employment prospects also varied by sector of (pre-spell) employment (Chart 14). Individuals made employed in Electricity, Gas, Water and Waste Services (labelled 'public utilities' as shorthand in the chart), 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.

[32] Average weekly wages have been calculated based on the weekly wage data reported in Single Touch Payroll (STP). Approx. 61 per cent of the sample received wages that were reported in STP in the 4 weeks prior to their spell. Approximately 51 per cent of the sample that received wages that were reported in the STP system the 4 weeks after their spell ceased.

Chart 13. Change in exit rate by industry of 2019-20 employment, first withdrawal



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.

Bringing together the location, wage, sector and temporal effects suggests that those losing jobs in the beginning of the pandemic were more likely to be a low productivity employee, working in a declining industry or business or having lower-paying skills. Once the pandemic began, and particularly once measures were announced that would support a range of employer-employee relationships, it was more likely that that job loss reflected aggregate factors outside of individual productivity.

Role of unobserved variables

Notwithstanding an extensive set of controls, it's important to recognise that our estimates are not sufficient to establish strict exogeneity. In particular, there remains a potential for unobserved variables to bias the estimated effects.

Within the population of unemployment benefit recipients, there will be some of 'low ability'. As an anecdote, an individual that expects to face a long spell on unemployment payments may be more likely to withdraw to better smooth current consumption. There will also be some of 'high ability'. As an anecdote, an individual who withdraws with full confidence of a short spell and an ability to recover foregone retirement balances. Such an individual might also be confident about their ability to contribute back to superannuation once the period of uncertainty has passed. The population characteristics tables are suggestive that there is a mix of populations. With those who withdrew in a generally stronger financial position (particularly regarding historical incomes and superannuation balances), the balance of probabilities would point to a greater propensity for high ability individuals to withdraw. This would, all else equal, lead us to underestimate the true causal link between withdrawal and unemployment tenures.

We do not have ready access to proxy variables that could substitute for unobserved ability such as IQ, or a survey of withdrawer job-seeking intent (and such proxies are limited in any case). That noted, these unobserved variables are also likely correlated with things that we have already controlled for such as an individual's wage history and superannuation balance. Our estimates which include covariates should already remove some bias associated with unobserved characteristics. Also, in as much as these would be positively correlated with the observed traits for which we have controlled, any remaining bias is likely to inflate our estimates rather than attenuate them.

Income and asset constraints

Our second approach to examining the causality of lump sum super withdrawals involves assessing the sensitivity of the effect of withdrawing across more and less financially constrained groups. As Chetty (2008) argues, withdrawals will affect unemployment durations more strongly among those who have less ability to smooth their consumption.

We cannot observe income and asset constraints directly in the program administrative datasets. We instead make use of two proxies for an individual's financial constraints.

The first is based on pre-COVID-19 wages. We divide the sample on the basis of pre-COVID-19 wages below $1115 a fortnight (the rate of supplemented JobSeeker payment) and above that level. We then estimate the effect of withdrawal on both groups. Table 8 (specifications 1-2 and 5-6) reveals that those with lower wages have longer spells on unemployment if they withdraw. Such individuals are likely to be more sensitive to cash payments generally (as they are more likely to be constrained) which supports a claim that liquidity effects are important in explaining the link between withdrawals and unemployment tenures.

Table 8. Sensitivity of estimates to income and asset constraints

Length of spell	First withdrawal				Second withdrawal			
	Pre-spell wages		Predicted assets		Pre-spell wages		Predicted assets	
	Low (1)	High (2)	Low (3)	High (4)	Low (5)	High (6)	Low (7)	High (8)
Observations	2,232,730		1,652,932		2,212,274		1,605,848	
Events	381,042		298,257		308,425		241,412	
1-13 weeks	-0.797***	-0.742***	-0.727***	-0.784***	-0.798***	-0.498***	-0.524***	-0.593***
	(0.013)	(0.007)	(0.012)	(0.012)	(0.039)	(0.039)	(0.007)	(0.013)
14-26 weeks	-0.417***	-0.203***	-0.132***	-0.266***	-0.567***	-0.359***	-0.343***	-0.391***
	(0.011)	(0.07)	(0.012)	(0.01)	(0.007)	(0.007)	(0.011)	(0.011)
27-39 weeks	-0.336***	-0.135***	-0.231***	-0.273***	-0.433***	-0.228***	-0.320***	-0.361***
	(0.014)	(0.0148	(0.011)	(0.01)	(0.007)	(0.007)	(0.011)	(0.014)
40-52 weeks	-0.215***	-0.035***	-0.068***	-0.167***	-0.245***	-0.062***	-0.109***	-0.209***
	(0.014)	(0.011)	(-0.015)	(0.013)	(0.010)	(0.010)	(0.015)	(0.014)
53-65 weeks	-0.152***	0.008	-0.078***	-0.011	-0.199***	-0.053***	-0.032***	-0.074***
	(0.014)	0.011	(0.014)	(0.409)	(0.010)	(0.010)	(0.014)	(0.014)
66-75 weeks	-0.184***	0.01	0.088	0.195***	-0.206***	-0.038***	0.121**	0.140***
	(0.045)	(0.039)	(0.051)	(0.052)	(0.038)	(0.038)	(0.053)	(0.050)
Controls	X		X		X		X	
Model fit:								
Concordance	0.654		0.617		0.640		0.606	
Wald test	88,042		39,795		62,046		27,888	

Notes: Notes: *** p < 0.01 ** p < 0.02 * p < 0.05. Coefficients can be interpreted as the change in the unemployment exit rate associated with the withdrawal from superannuation. Standard errors are clustered at the individual level and are in parentheses. Estimates are all based on full control specifications.

The second proxy for constraints is based on predicted asset levels, using a similar process to the split sample instrumental variable process adopted in Angrist and Krueger (1995). Net assets are first predicted for each individual. The first step is an Ordinary Least Squares regression based on the nationally-representative Household Income and Labour Dynamics in Australia (HILDA) survey using the wealth module from 2018 (Wilkins et al., 2021). The prediction equation is a linear function of age, wage, education (measured in years) and marital status. We use this equation to divide the sample into a basic measure of above or below median predicted assets.[33]

Both the high and low predicted asset groups were responsive to withdrawals (Table 8, specifications 3-4 and 7-8). Focussing on the first withdrawal in particular (specifications 3-4) those with lower predicted assets were initially less responsive than those with higher predicted assets, but experience a longer time period before converging to the rate of exit from unemployment payments of non-withdrawers. Higher predicted assets may facilitate more flexibility in general around the exit from unemployment payments but the liquidity effect dominates in the longer term.

In both cases, we see a role for financial constraints consistent with the extra liquidity provided to people through superannuation withdrawals.

Intensive margin

The third robustness check is to evaluate whether larger withdrawals led to longer unemployment tenures. A causal interpretation is supported if larger withdrawals have a larger effect on tenures. Once their respective lump sums have been exhausted, tenures should converge between high-sum and low-sum withdrawers.

We implement the intensive margin 'test' by investigating whether the effect of withdrawal differs as pre-covid superannuation balance increases. As the withdrawal amount is an increasing function of balance, the indicator for receipt of a lump sum should have a larger effect on tenures among individuals with higher starting balance. 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.

Caution is warranted with interpretation. Examining the behaviour of those with low balances provides insight into a specific segment of the population. Balances of below $10,000 are correlated with other measures of disadvantage, limiting the strength of inference possible here.

A further complication is that it's not immediately apparent how quickly any convergence along the intensive margin should be. Recall that Hamilton (2021) presented suggestive evidence that the majority of lump sums are consumed within six weeks of arriving in bank accounts. The Australian Bureau of Statistics (2021) concluded that 90 per cent of withdrawn funds were consumed inside a 9-month window. The channel of consumption stimulus is therefore significantly more rapid than the convergence in unemployment benefit exit rates that we have estimated (at more than 15 months). The negative impact on unemployment duration is longer than the time taken to consume the stimulus. This is a novel and interesting result.

Chart 14 shows the probability of remaining on unemployment benefits for those who withdrew at the first opportunity, compared to those who did not withdraw, split by pre-covid balance and month of spell. There is no adjustment for covariates when presenting these probabilities of exit (which should be treated as suggestive).

In the first three months of spells, those who withdrew (green dots) and started with higher balances were less likely to exit than those who withdrew with lower balances. In comparison, for the non-withdrawing population (black dots) those with higher pre-covid super balances exit at a faster rate

[33] Our approach is consistent with Chetty (2008). We note, however, that this is a basic and limited approximation. For example, it will not capture the non-negligible population of wealthy 'hand-to-mouth' who are asset rich and income poor as identified by Kaplan and Violate (2014). Such individuals may have above-median assets but be income constrained.

than those with lower balances. This is true in each month of spell, with the difference becoming more pronounced as months increase.

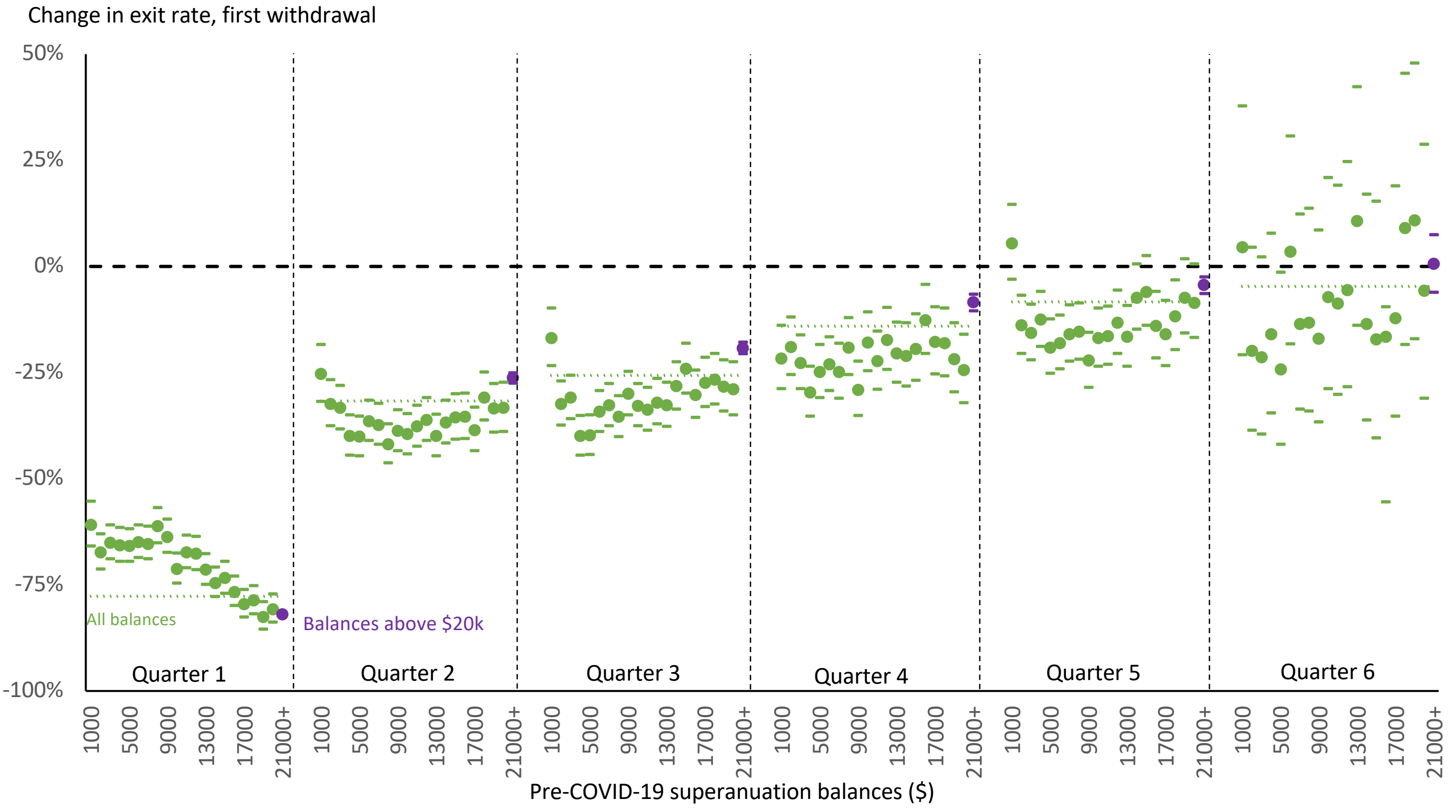
Chart 14 also reveals that when comparing the withdrawing and non-withdrawing groups, there are two separate effects to consider. A level difference (withdrawers as a group stay out of work longer than non-withdrawers) grows over the first six months of spells. In addition, there is a slope difference (those with higher balances finding jobs at a faster rate than those with lower) that initially increases, and then narrows from the third month of spell.

Chart 14. Individuals with higher superannuation balances who withdrew were initially more likely, then less likely, to remain on unemployment benefits as spell length increased.

The motivation for presenting probabilities at a monthly (rather than quarterly) granularity is revealed by Chart 15. Chart 15 presents quarterly estimates (and confidence intervals) from the Cox model estimations for the first withdrawal in which a binary variable for membership with each $1,000 superannuation balance grouping is interacted with the binary indicator of receipt of a lump sum.

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.

Chart 15. Change in exit rate associated with withdrawals, by pre-covid balance, first withdrawal



The inference from Charts 14 and 15 is that withdrawers with higher balances (and greater withdrawals) initially stay out of the labour 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 per cent 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 per cent. The corresponding estimate for those whose balances are 10 times larger (A$9,001-A$10,000) is 71 per cent, and those whose balances are 20 times larger ($19,001-$20,000) is 82 per cent.[34] The relative importance of the extensive margin in private pension savings is consistent with Chetty et. al (2014), who estimate that around 85 per cent of Danish individuals are passive savers, for whom participation in retirement savings via defaults has a more meaningful effect on retirement savings than changes in the price of retirement savings (such as via tax rates), and Sobeck and Breunig (2020) who find a similarly large role for passive savers in the Australian context.

And second, not much insight around the intensive margin can be gleaned through the second withdrawal. Charts 15 and 16 provide the monthly probabilities of survival on unemployment benefits and estimated quarterly exit rates associated with the second withdrawal. The exit prospects of this group begin to diverge from the third month; at which point withdrawers possessing higher starting superannuation balances were more likely to exit unemployment benefits than withdrawers possessing lower starting superannuation balances.

[34] We are happy to provide the results of these specifications on request.

Chart 16. Probability of survival on unemployment benefits by pre-covid balance, second withdrawal

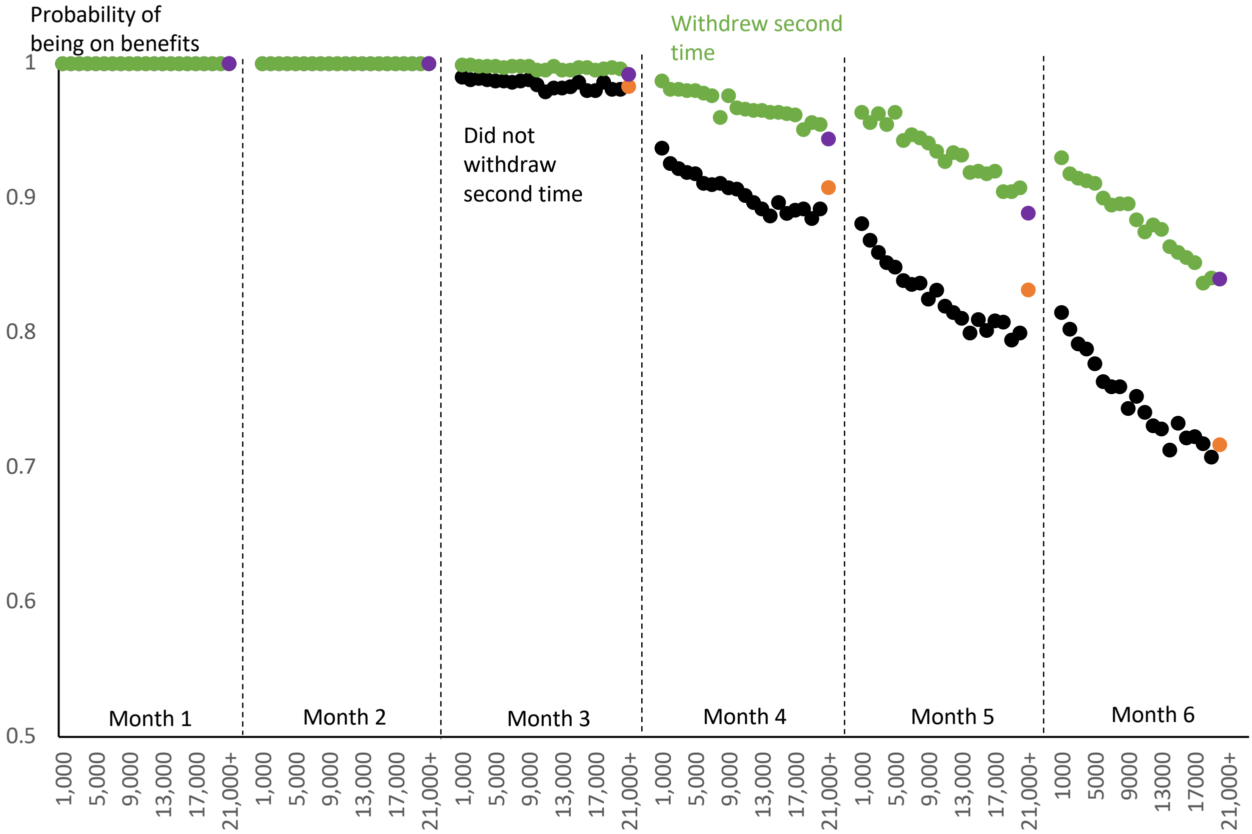
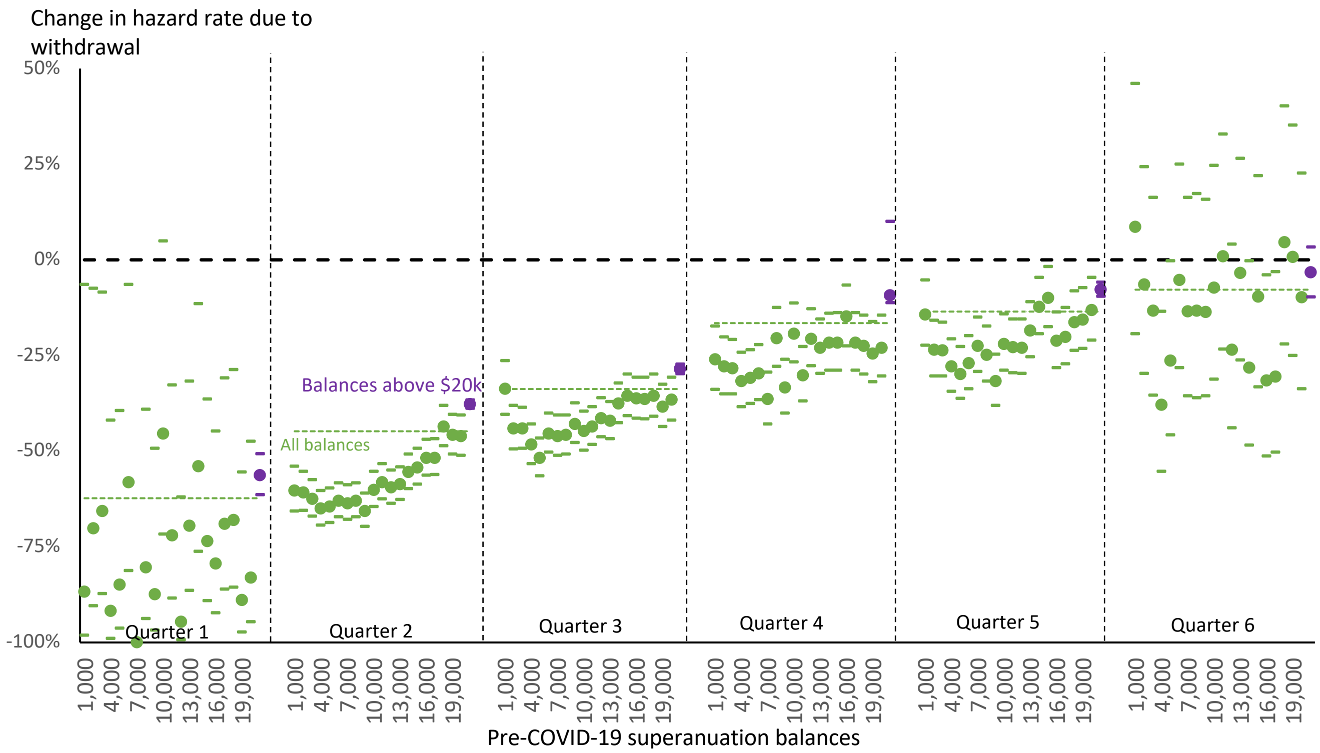


Chart 17. Change in exit rate due to withdrawals, by pre-covid balance, second withdrawal



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 but not in perpetuity. The direction of the intensive margin effect provides further evidence of a causal role for superannuation withdrawals on unemployment durations.

Average costs: An implied $580 million of pandemic fiscal expenditure

A large cohort of the population spending a significant amount of additional time on unemployment benefits has a direct, upfront and immediate fiscal cost. Table 9 highlights that this cost may well prove to be the largest near-term fiscal consideration for the measure.

Table 9. Fiscal outlays on unemployment benefit recipients due to superannuation withdrawals.

	Population counts	Average tenure (weeks)	Difference from no withdrawal (weeks)	Additional days on unemployment benefits	Implied expenditure on group @ $40 per day basic jobseeker payment ($m)	Implied expenditure on group @ $79 per day supplemented payment
Complete spells						
No withdrawal	228,962	28.4	-	-	-	-
First only	42,393	29.9	1.49	443,331	$17.9m	$35.3m
Second only	17,521	42.5	14.10	1,731,137	$69.9m	$137.9m
Both times	101,679	36.7	8.33	5,929,881	$239.3m	$472.3m
Ongoing spells						
No withdrawal	64,361	66.7	-	-	-	-
First only	13,380	66.7	0.02	1,957	$0.1m	$0.2m
Second only	12,424	66.8	0.08	277,589	$0.2m	$0.5m
Both times	48,983	66.6	-0.08	-1,086,208	-$1.1m	-$2.2m
Total	529,703			8,086,270	$326.3m	$644.0m

There were approximately 162,000 individuals who withdrew from superannuation (either the first opportunity only, the second opportunity only or both times) among the 391,000 individuals who had completed their unemployment spells. These withdrawers on average spent 7.2 weeks (approx. 50 days) longer on unemployment benefits than their counterparts who did not withdraw.

After extending a (strong) assumption that a sufficient number of jobs would have been available to absorb more workers, if such individuals chose to return to work at the same rates as non-withdrawers, the program resulted in an estimated 8.1 million additional days on unemployment benefits from completed spells. The basic full rate of payment pre-COVID-19 was $40 a day, and an implied fiscal cost if all unemployment benefit recipients were paid at this rate would be $326 million.[35] If the entire additional spells were paid at the supplemental rates of $79 a day available between April and end-September 2020, the implied cost would be $644 million. The latter would represent something of an upper bound. Given the front-ended profile of withdrawal's effect, and gradual reduction of surviving population over time, more spending will have occurred in the first six months of program. A back-of-the-envelope approximation attributing a majority of additional days to the April and September 2020 period (assuming that 4/5 of the additional time was at full supplemental rates and 1/5 at full basic rates) would imply fiscal outlays totalling $580m.

[35] We acknowledge that the average rate of daily support payment is, in practice, not going to be equal to the maximum base rate for singles. That noted, a detailed estimate for the average daily level of COVID-19 support provided to the unemployed is an involved exercise and beyond the scope of this analysis. The payments actually delivered to recipients are reduced for many recipients due to income and asset tests, at specified taper rates. Conversely, many payment recipients received the supplemental payments, allowances and one-off transfers, alongside in-kind and cost-relieving measures during COVID-19. The figures should be viewed as inexact but a useful guide to the order of magnitude of costs.

An argument could also be extended that the half a million population of unemployment benefit recipients is overly narrow. As a sensitivity check we repeated the population average calculations on a broader sweep of those commencing unemployment spells. Approximately 750,000 individuals in total commenced unemployment spells in the 9-month window from 18 October 2019 to 30 June 2020. Of these, 210,000 withdrew from superannuation and completed their spell. At an average of 53 additional days on unemployment support, an approximation of additional days on unemployment for the more comprehensive population sweep is 11.8 million, and implied outlays on benefits (based again on a 4/5 to 1/5 assumed split) would be $850 million (Table 10).

Table 10. Fiscal outlays on unemployment recipients associated with superannuation withdrawals, spells commencing between 18 April 2019 and 30 June 2020.

	Population counts	Average tenure (weeks)	Average difference in tenure from no withdrawal (weeks)	Additional days on unemployment benefits	Implied expenditure @ $40 per day full rate basic jobseeker payment ($m)	Implied expenditure @ $79 per day supplemented payment ($m)
Complete spells						
No withdrawal	332,954	27.9	-	-	-	-
First only	54,140	29.9	1.93	731,837	29.5m	58.3m
Second only	27,940	40.8	12.8	2,509,291	101.3m	199.8m
Both times	127,622	36.9	8.97	8,009,608	323.3m	637.9m
Ongoing spells						
No withdrawal	102,477	66.6	-	-	-	-
First only	18,445	67.9	0.02	164608	$6.6m	$13.1m
Second only	20,406	66.4	0.08	-22532	$-0.9m	$-1.8m
Both times	66,037	67.7	-0.08	489,398	19.8m	$39.0m
Total	750,021			11,882,211	$479.5m	$946.0m

A word of caution is advised when interpreting the estimates presented in Tables 9 and 10. They are basic approximations in pandemic years, intended as a reference point and guide. They should be interpreted more as guide to the order of magnitude of costs, rather than the sort of more involved effort required for a measure costing that could be published as part of a Commonwealth Budget. Moreover, there are important medium- and longer- term dimensions to policy – in the form of pension and part pension payments and life-course incomes of unemployment benefit recipients – that would need to be considered as part of a comprehensive accounting of fiscal costs of program. Finally, these are only an attempt to quantify expenses, not increased well-being or positive spillover effects on the macroeconomy of stabilisation policy.

6. DISCUSSION AND CONCLUSION

Three main observations extend directly from the results.

The first is that crisis support lump sums that went to unemployment benefit recipients led to longer tenures on unemployment payments. We contribute to what is a well-established literature on this matter by examining a new context at a distinct (and interesting) point in time. A novel contribution of this analysis stems from the size of lump sum payments at up to A$20,000 to eligible individuals, available at the most acute phase of the COVID-19 pandemic and financed out of private pension balances, operate in a similar manner to other payments of much lower value.[36] The consideration is relevant to payments both within and outside a pandemic context.

The second is that large lump sums have large labour market consequences that play out over an 18-month window. Those who withdrew were highly unlikely to return to the labour market in the first three months of their spell on unemployment payments. We estimate that receiving a lump sum of up to A$10,000 from superannuation accounts at the most acute phase of the pandemic, between April and June 2020, resulted in a 31 per cent lower exit from the unemployment benefit system inside the first six months of spells, and 14 per cent inside a year of spell. Receiving a second lump sum, mostly in July and August 2020 and as a labour market recovery was underway, resulted in a 33 per cent lower exit from the unemployment benefit system inside the first nine months of spells, and 14 per cent inside fifteen months of spell. The deterrence effect was ultimately temporary, insofar as an eighteen-month window of effect can be considered temporary, as would befit a finite payment that represents a fraction of a recipient's lifetime wealth.

These findings point towards a substantial liquidity effect and there is a range of evidence supporting a causal interpretation to these estimates. While our findings need to be considered in the light of the non-random selection of program participants, we have taken four steps to show that differences in population characteristics are not driving our findings. First, we adjusted our estimates by incorporating rich information on population heterogeneity, which results in the effects becoming larger and more persistent. Second, we re-estimated the model using matching methods and find similar results as in the parametric specification estimated on the full sample. Third, we investigated whether a larger withdrawal led to longer tenures, and found evidence among a sample of low-balance (and low-withdrawal) individuals that larger lump sums lead to longer tenures. Fourth, we confirmed that those in generally more financially constrained positions (whether in terms of incomes or assets) exited unemployment support more rapidly.

These four exercises together lead us to conclude that COVID-19-related access to lump sums from private pensions resulted in delayed exit from unemployment payments. Large lump sum withdrawals led to extended stays on unemployment benefits.

The dataset is rich, and we have adjusted our estimates to account for a wide range of life experience. Our estimates are consistent with job search theory and related studies, particularly Chetty (2008) and Card et al. (2007). Reassuringly, matching techniques suggest that the extent of any bias associated with the systematic observed differences in correlated-with-ability characteristics such as wage history and super balances is small. If anything, the estimated convergence in unemployment tenures of withdrawers and non-withdrawers is more gradual after balancing these covariates. Omitted variable bias related to unobserved productivity is only a minor concern, as we are able to control for pre-covid wages and superannuation balances which will be highly correlated with any

[36] A valuable avenue for further analysis rests on comparing the intensive margin of payments for singles and couples who withdrew, given qualifying couples could access up to $40,000.

remaining, unobserved productivity differences. There remains room for omitted variable bias – participants may have private knowledge about their re-empoyment prospects – that may affect our estimates. The fact that industry fixed-effects do not affect our estimates is reassuring on this point as is the fact that we find similar results across different sub-samples when we examine those who are more or less financially constrained.

There is a significant up-front fiscal cost associated with early release of pensions. Approximately 162,000 withdrawers with completed spells spent on average 7 weeks longer on benefits than comparable unemployment payment recipients who didn't withdraw. An estimated additional 8.1 million days on unemployment benefit receipt has an implied fiscal cost of around $580 million. The amount of additional outlays on less than 10 per cent of withdrawers is, by itself, more than the first two years of expected foregone tax revenue from an overall program of 3 million withdrawers.

A partial picture

It is important to recognise that impact on fiscal support payments is just one dimension of the full mix of benefits and costs associated with early release programs. In particular, the immediate private welfare gain to recipients and potential social gain from other channels of program effect must be weighed against whole-of-life consequences for withdrawers.

As a pure liquidity effect that aids in consumption smoothing, superannuation withdrawals should be viewed as a welfare-enhancing for program participants in the short term. Withdrawals served as a form of 'pandemic insurance' via access to an otherwise preserved and illiquid financial asset at a time of need. The liquidity provided individuals with greater choice and capacity to adjust to the circumstances of the pandemic without distorting the future financial trade-off associated with working or not working. The temporary overall nature of the employed consequence is symptomatic of that welfare improvement.

The prospective consumption stimulus and contributing role of fiscal supports for a health system in managing a peak case load are all broader considerations that will paint withdrawals in a more favourable light. For example, this analysis omits calculations of 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 (substantially) higher. Given the unusual role that Australia's enhanced safety net played in the context of pandemic support, we view estimating such benefits as a highly valuable avenue for future inquiry.

Broader lifetime considerations are likely to paint withdrawals in a less favourable light. For some participants, it is entirely possible that the program lowered their lifetime consumption opportunities. Lower superannuation balances may translate into lower retirement incomes. Lost earnings during longer spells on benefits may result in lower working life consumption opportunities. Their combined impact may translate into reductions in the (discounted present value of) lifetime income and wealth of program participants. The impact may be neither temporary, nor small, particularly if there is no wage boost upon re-employment or catch-up income growth relative to those who spend smaller amounts of time on benefits. As data availability improves, estimating lifetime impacts of withdrawals will be another highly valuable course of future inquiry.

Implications for future economic security measures

The most important new insight is that pension withdrawals should not be regarded as an 'off balance sheet' stimulus or economic security measure. A small share of the total population of withdrawers (less than 10 per cent of the 3 million individuals that participated in the program) required a sizeable additional amount of up-front government pandemic support due to their withdrawals. The up-front cost must also be considered alongside the long-term fiscal subsidisation of withdrawals among the (larger) withdrawing population, which may stem from larger pensions and part-pensions at the point of their retirement. Relatedly, the additional near-term outlays appear to have been omitted from consideration of the measure as it was rapidly designed and implemented. By way of reference, the 2020-21 Budget estimated that withdrawals would result in A$520 million in forgone tax revenue in 2019-20 and 2020-21 (Frydenberg and Cormann, 2020).

The findings also help inform more general decisions regarding the release of pensions to those of working age. There is a generality to findings given they have confirmed a well-established direction of policy effect. A heuristic that 'lump sum payments result in recipients choosing to spend more time outside of work' is relevant for crisis and non-crisis situations, and relevant when thinking about the employed (who have not been studied here) and unemployment recipients alike.

That said, the estimates should also be viewed as specific to the pandemic context. There are reasons, for example, to suspect that lump sum withdrawals would have more adverse labour market effects in other contexts. The unusual array of pandemic economic support measures underpinned an unprecedentedly rapid labour market recovery. Outside of a crisis, or in shocks with less fiscal stimulatory action and more traditional and protracted labour market recoveries, accessing lump sums carry a higher risk of program participants joining the ranks of the long-term unemployed.

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APPENDICES

Appendix A. 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. Charts A1, A2 and 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.

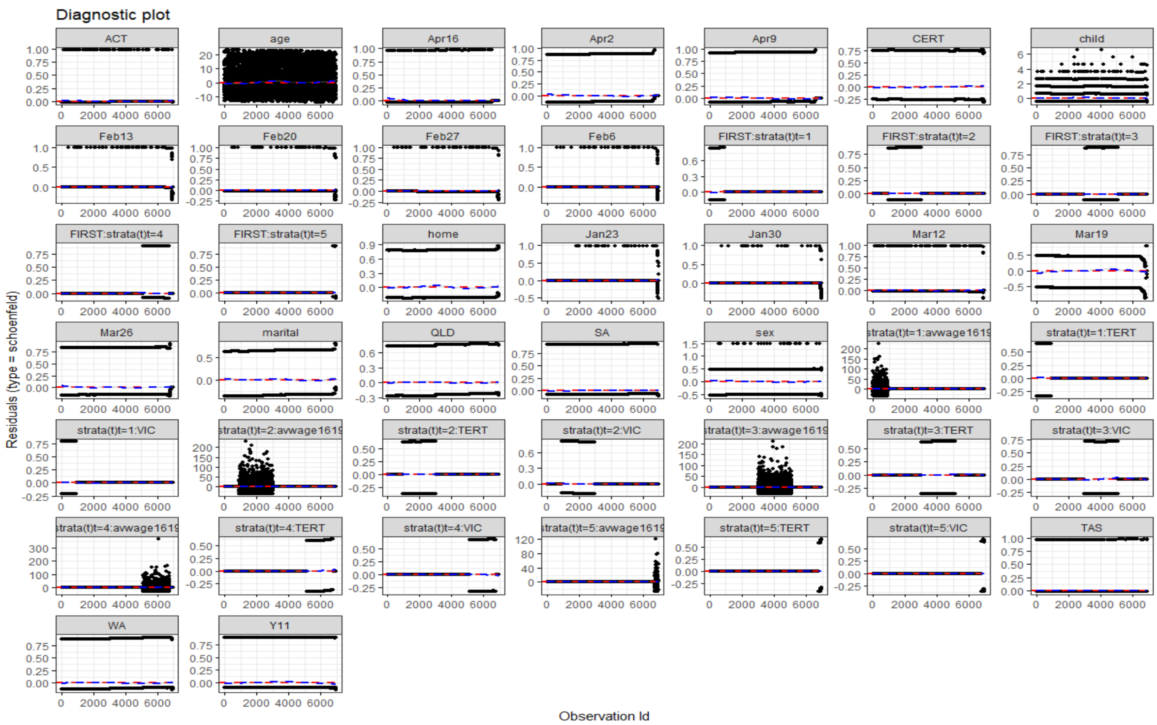
Diagnostic tests

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.

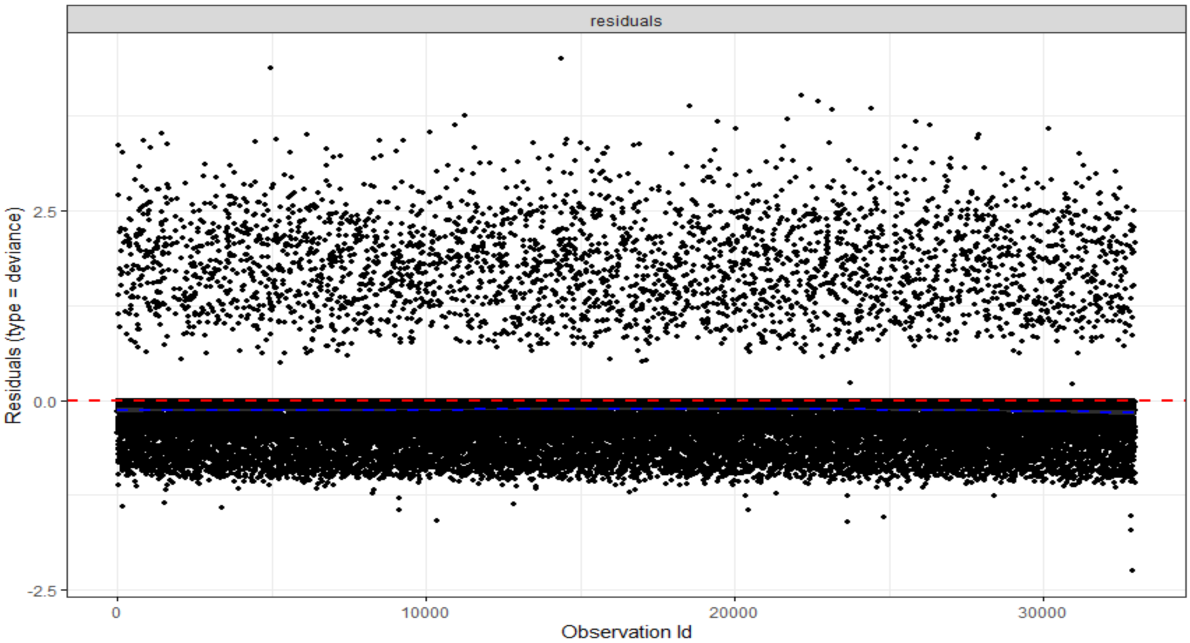
Instead of potentially spurious tests, we rely on graphical diagnostics plotting the scaled Schoenfeld residuals (Grambsch and Therneau, 1994). There is no discernible trend (Chart A1).

Chart A1. Visual test for proportionality of hazards



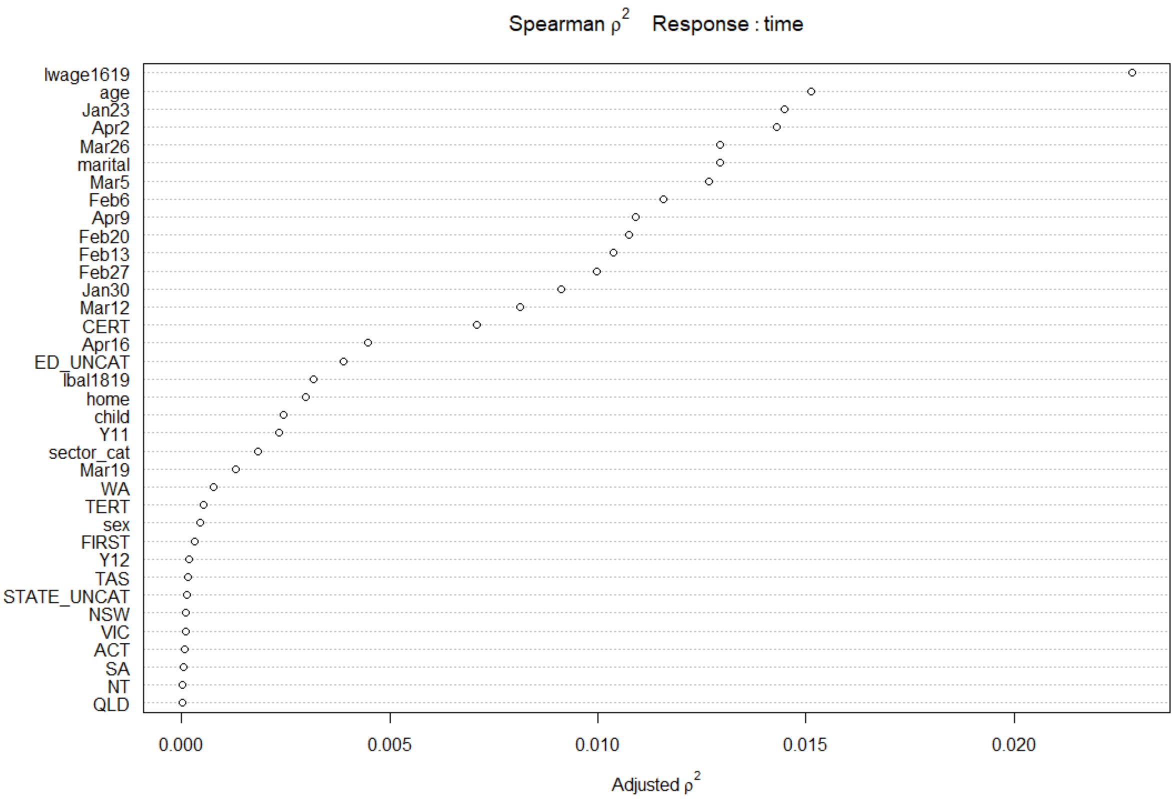
Regarding influencing observations, a plot of martingale residuals from the Cox regression for the first withdrawal (Chart A2) demonstrates no discernible trend or deviation from zero that would indicate that an influencing observation plays an outsized role on the regression output. The large sample size provides a sense-check that no single observation will play an outsized role on our estimates.

Chart A2. Test for influencing observations.



Regarding collinearity, all estimates of Spearman's correlation coefficient are close to 0 (Chart A3) suggesting that there are no material collinearity issues to be concerned with.

Chart A3. Test for collinearity.



Appendix B. Full set of covariate estimates based on the full controls specification, 1st withdrawal, 2nd withdrawal and marginal $1,000 withdrawn

In Tables 4-5 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 B1, B2, B3 and B4 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 B1-4 underpins the estimates presented in Charts 10-13.

Table B1. Covariates estimated with time-invariant effect

Variable	First withdrawal	Second withdrawal	Per $1000 withdrawn
Age	-0.028***	-0.027***	-0.028***
	(0.000)	(0.000)	(0.000)
Sex (baseline: female)			
Male	-0.050***	-0.037***	-0.056***
	(0.003)	(0.004)	(0.003)
Uncategorised	-0.022	-0.004	-0.027
	(0.024)	(0.028)	(0.024)
Home ownership (baseline: homeowner)			
Not homeowner	-0.170***	-0.144***	-0.179***
	(0.004)	(0.004)	(0.004)
Uncategorised	-0.053***	-0.028	-0.060***
	(0.024)	(0.027)	(0.023)
Marital status (baseline: married)			
Not married	-0.260***	-0.256***	-0.255***
	(0.003)	(0.003)	(0.003)
Uncategorised	-0.141***	-0.104***	-0.135***
	(0.008)	(0.009)	(0.008)
Children in household (baseline: no children)			
Child	-0.090***	-0.076***	0.088***
	(0.004)	(0.003)	(0.004)
Uncategorised	-0.060***	-0.052**	-0.059***
	(0.004)	(0.003)	(0.004)
Location (baseline: New South Wales			
Queensland	0.047***	0.067***	0.038***
	(0.005)	(0.006)	(0.005)
Western Australia	0.146***	0.147***	0.145***
	(0.007)	(0.008)	(0.007)
South Australia	0.009**	0.013	0.015**
	(0.007)	(0.008)	(0.007)
Tasmania	-0.060***	-0.043***	-0.057***
	(0.011)	(0.013)	(0.011)
Northern Territory	0.090***	0.057*	0.084***
	(0.021)	(0.023)	(0.021)
Australian Capital Territory	0.079***	0.054**	0.095***
	(0.017)	(0.02)	(0.017)
Uncategorised	0.025***	0.039***	0.027***
	(0.008)	(0.009)	(0.008)
Education (baseline: year 12)			
Year 11	-0.175***	-0.159***	-0.197***
	(0.007)	(0.008)	(0.007)
Certificate	-0.169***	-0.155***	-0.188***
	(0.005)	(0.006)	(0.005)
Uncategorised	0.110***	0.075***	0.117***
	(0.006)	(0.006)	(0.006)

Table B2. Covariates: industries

Covariate	First withdrawal	Second withdrawal	Per $1000 withdrawn
Administration and Support	-0.087***	-0.099***	-0.090***
	(0.015)	(0.017)	(0.015)
Agriculture	-0.077***	-0.096***	-0.071***
	(0.024)	(0.026)	(0.024)
Arts and Recreation	-0.026	-0.053***	-0.0071
	(0.017)	(0.019)	(0.024)
ATO use only	-0.094***	-0.102***	-0.091***
	(0.016)	(0.017)	(0.016)
Construction	-0.020***	-0.053***	-0.023
	(0.016)	(0.019)	(0.016)
Education and Training	0.057**	0.008	0.080***
	(0.021)	(0.022)	(0.021)
Electricity, Gas, Water and Waste Services	-0.159***	-0.170**	-0.167***
	(0.058)	(0.062)	(0.058)
Financial Services	-0.023	-0.024	-0.024
	(0.032)	(0.034)	(0.032)
Health Care and Social Assistance	0.071***	-0.011	0.077***
	(0.021)	(0.021)	(0.021)
Information Media and Telecommunications	0.006	-0.018	0.027
	(0.023)	(0.025)	(0.024)
Manufacturing	-0.017***	-0.025	-0.012
	(0.021)	(0.023)	(0.021)
Mining	-0.037	-0.075	-0.036
	(0.099)	(0.102)	(0.010)
Other services	0.025	-0.040	0.028
	(0.018)	(0.018)	(0.018)
Professional Scientific and Technical Services	-0.016	-0.019	0.028
	(0.017)	(0.018)	(0.017)
Public Administration and Safety	-0.149***	-0.147***	-0.164***
	(0.034)	(0.037)	(0.034)
Real Estate	0.027	0.027	0.032
	(0.027)	(0.030)	(0.027)
Retail Trade	-0.069***	-0.087***	-0.070***
	(0.017)	(0.018)	(0.017)
Transport, Postal and Warehousing	-0.062	-0.085***	-0.079***
	(0.016)	(0.017)	(0.016)
Uncategorised	-0.044***	-0.073***	-0.031**
	(0.015)	(0.015)	(0.015)
Wholesale Trade	-0.033**	-0.054	-0.028
	(0.027)	(0.029)	(0.027)

Table B3. Week unemployment spell began

Covariate	First withdrawal	Second withdrawal	Per $1000 withdrawn
Apr-16	1.146***	1.118***	1.204***
	(0.059)	(0.061)	(0.062)
Apr-09	1.196***	1.175***	1.254***
	(0.056)	(0.058)	(0.060)
Apr-02	1.108***	1.069***	1.152***
	(0.050)	(0.051)	(0.053)
Mar-26	1.035***	0.981***	1.066***
	(0.046)	(0.046)	(0.048)
Mar-19	0.724***	0.692***	0.737***
	(0.033)	(0.034)	(0.034)
Mar-12	0.127***	0.129***	0.129***
	(0.025)	(0.026)	(0.025)
Feb-27	-0.110***	-0.113***	-0.113***
	(0.023)	(0.025)	(0.023)
Feb-20	-0.117***	-0.139***	-0.123***
	(0.023)	(0.024)	(0.023)
Feb-13	-0.107***	-0.122***	-0.114***
	(0.024)	(0.025)	(0.024)
Feb-06	-0.160***	-0.185***	-0.171***
	(0.023)	(0.023)	(0.023)
Jan-30	-0.220***	-0.237***	-0.232***
	(0.025)	(0.026)	(0.024)
Jan-23	-0.255***	-0.274***	-0.267***
	(0.021)	(0.022)	(0.021)

Table B4. Time varying covariates

Covariate		First withdrawal	Second withdrawal	Per $1000 withdrawn
Log continuous variables (effect of 1 per cent change in variable on hazard rate)				
Average wage 2015-16 to 2018-19	1-13 weeks	0.144*** (0.006)	0.43*** (0.054)	0.128*** (0.006)
	14-26 weeks	0.151*** (0.005)	0.165*** (0.005)	0.147*** (0.005)
	27-39 weeks	0.123*** (0.005)	0.129*** (0.005)	0.124*** (0.005)
	40-52 weeks	0.149*** (0.006)	0.150*** (0.006)	0.149*** (0.006)
	53-65 weeks	0.119*** (0.005)	0.122*** (0.005)	0.120*** (0.005)
	66-75 weeks	0.079*** (0.017)	0.080*** (0.017)	0.078*** (0.017)
2018-19 superannuation balance	1-13 weeks	0.064*** (0.003)	0.076*** (0.021)	0.061*** (0.003)
	14-26 weeks	0.086*** (0.003)	0.112*** (0.003)	0.094*** (0.003)
	27-39 weeks	0.090*** (0.003)	0.102*** (0.003)	0.102*** (0.003)
	40-52 weeks	0.035*** (0.003)	0.040*** (0.003)	0.041*** (0.003)
	53-65 weeks	0.076*** (0.003)	0.081*** (0.003)	0.080*** (0.003)
	66-75 weeks	0.117*** (0.018)	0.119*** (0.011)	0.117*** (0.011)
Binary variables (effect of condition on hazards)				
JobKeeper	1-13 weeks	2.601*** (0.105)	0.228*** (0.071)	2.608*** (0.106)
	14-26 weeks	0.839*** (0.017)	0.778*** (0.017)	0.830*** (0.017)
	27-39 weeks	0.686*** (0.016)	0.687*** (0.016)	0.683*** (0.016)
	40-52 weeks	0.133*** (0.014)	-0.135*** (0.014)	0.132*** (0.014)
	53-65 weeks	-0.235*** (0.014)	0.239*** (0.014)	-0.235*** (0.014)
	66-75 weeks	-0.032 (0.043)	-0.028 (0.043)	-0.034 (0.043)
State: Victoria	1-13 weeks	-0.160*** (0.008)	-0.295*** (0.043)	-0.142*** (0.008)
	14-26 weeks	-0.343*** (0.006)	-0.346*** (0.006)	-0.341*** (0.006)
	27-39 weeks	-0.111*** (0.007)	-0.107*** (0.007)	-0.112*** (0.007)
	40-52 weeks	0.229*** (0.012)	0.240*** (0.012)	0.228*** (0.012)
	53-65 weeks	0.161*** (0.011)	0.170*** (0.011)	0.159*** (0.011)
	66-75 weeks	0.074** (0.034)	0.084*** (0.034)	0.072** (0.034)
Education: Tertiary	1-13 weeks	-0.178*** (0.010)	-0.094 (0.057)	-0.149*** (0.010)
	14-26 weeks	-0.069*** (0.009)	-0.089*** (0.030)	-0.063*** (0.009)
	27-39 weeks	-0.020** (0.010)	-0.039*** (0.018)	-0.020** (0.010)
	40-52 weeks	0.211*** (0.014)	0.197*** (0.017)	0.211*** (0.014)
	53-65 weeks	0.197*** (0.014)	0.181*** (0.015)	0.195*** (0.014)
	66-75 weeks	0.137** (0.043)	0.124*** (0.029)	0.134** (0.043)

Appendix C. 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 C1).

Table C1. Means before matching, first withdrawal

Covariate	Means Treated	Means Control	Std. Mean Diff.	Var. Ratio	eCDF mean	eCDF Max
Distance	0.43	0.37	0.52	0.96	0.14	0.20
Age (years)	37.40	36.64	0.07	0.90	0.07	0.15
Log wage 2016-19	11.52	11.16	0.36	0.78	0.11	0.16
Log pre-covid super balance	10.12	9.53	0.44	0.51	0.99	0.18
Sector						
Agriculture	0.01	0.01	0.00	.	0.00	0.00
Mining	0.00	0.00	0.00	.	0.00	0.00
Manufacturing	0.01	0.01	0.00	.	0.00	0.00
Electricity Gas Water and Waste Services	0.00	0.00	0.00	.	0.00	0.00
Construction	0.08	0.04	0.04	.	0.04	0.04
Wholesale trade	0.01	0.00	0.00	.	0.00	0.00
Retail Trade	0.03	0.02	0.01	.	0.01	0.01
Accommodation and Food Services	0.02	0.01	0.01	.	0.01	0.01
Transport Postal and Warehousing	0.06	0.03	0.03	.	0.03	0.03
Information Media and Telecommunications	0.01	0.01	0.00	.	0.00	0.00
Financial Services	0.00	0.00	0.00	.	0.00	0.00
Real Estate	0.01	0.01	0.00	.	0.00	0.00
Professional, Scientific and Technical Services	0.05	0.05	0.00	.	0.00	0.00
Administrative and Support Services	0.06	0.04	0.02	.	0.02	0.02
Public Administration and Safety	0.00	0.00	0.00	.	0.00	0.00
Education and Training	0.01	0.02	-0.01	.	0.01	0.01
Health Care and Social Assistance	0.02	0.02	0.00	.	0.00	0.00
Arts and Recreation Services	0.02	0.03	-0.01	.	0.01	0.01
Other Services	0.04	0.04	0.01	.	0.01	0.01
ATO Use Only	0.04	0.03	0.02	.	0.02	0.02
Uncategorised	0.53	0.64	-0.11	.	0.11	0.11

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 D).

The overall picture is similar for the second withdrawal (Table C2). 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 C2. Means before matching, second withdrawal

Covariate	Means treated	Means control	Std. Mean Diff	Var. Ratio	eCDF mean	eCDF max
Distance	0.44	0.35	0.70	0.79	0.18	0.27
Age (years)	37.36	36.81	0.14	0.59	0.08	0.18
Log wage 2016-19	11.57	11.09	0.48	0.72	0.14	0.22
Log pre-covid super balance	10.29	9.42	0.68	0.44	0.15	0.28
Sector						
Agriculture	0.01	0.01	0.03	.	0.00	0.00
Mining	0.00	0.00	0.01	.	0.00	0.00
Manufacturing	0.01	0.01	0.04	.	0.00	0.00
Electricity Gas Water and Waste Services	0.00	0.00	0.02	.	0.00	0.00
Construction	0.09	0.04	0.15	.	0.04	0.04
Wholesale trade	0.01	0.00	0.02	.	0.00	0.00
Retail Trade	0.03	0.02	0.04	.	0.01	0.01
Accommodation and Food Services	0.02	0.01	0.04	.	0.01	0.01
Transport Postal and Warehousing	0.05	0.03	0.09	.	0.02	0.02
Information Media and Telecommunications	0.01	0.01	-0.03	.	0.00	0.00
Financial Services	0.00	0.00	0.02	.	0.00	0.00
Real Estate	0.01	0.01	0.01	.	0.00	0.00
Professional, Scientific and Technical Services	0.05	0.05	-0.01	.	0.00	0.00
Administrative and Support Services	0.06	0.04	0.06	.	0.01	0.01
Public Administration and Safety	0.00	0.00	0.03	.	0.00	0.00
Education and Training	0.01	0.02	-0.06	.	0.01	0.01
Health Care and Social Assistance	0.02	0.02	-0.02	.	0.00	0.00
Arts and Recreation Services	0.02	0.03	-0.06	.	0.01	0.01
Other Services	0.04	0.03	0.04	.	0.01	0.01
ATO Use Only	0.05	0.03	0.09	.	0.02	0.02
Uncategorised	0.53	0.63	-0.21	.	0.10	0.10

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 6, 94% of control units (306,217 of the 323,268 in first withdrawal and 258,980 out of 276,551 in second withdrawal) and 98% of treated units (202,771 out of 206,435 in first withdrawal and 170,602 out of 172,537 in second withdrawal) remain after matching via coarsened exactly matching.

Charts C1 and C2 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, Charts C3 and C4 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

Chart C1. Love plots of covariate balance, coarsened exactly matching, first withdrawal

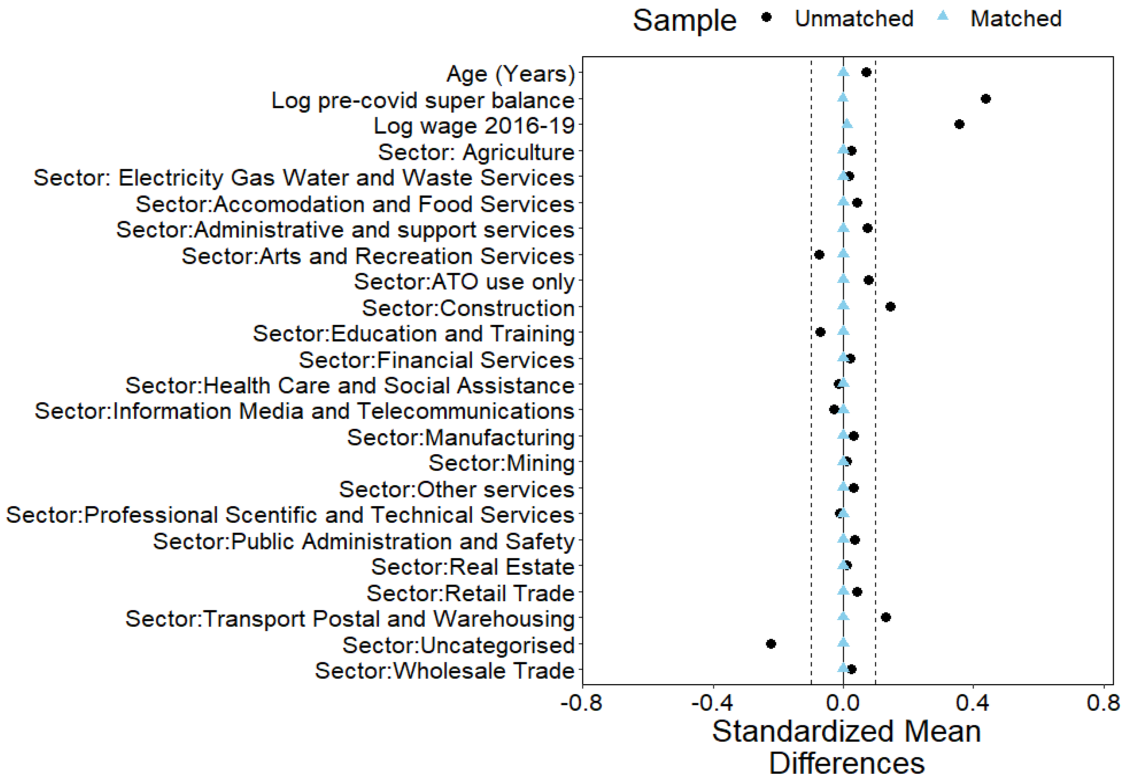


Chart C2. Love plots of covariate balance, coarsened exactly matching, second withdrawal

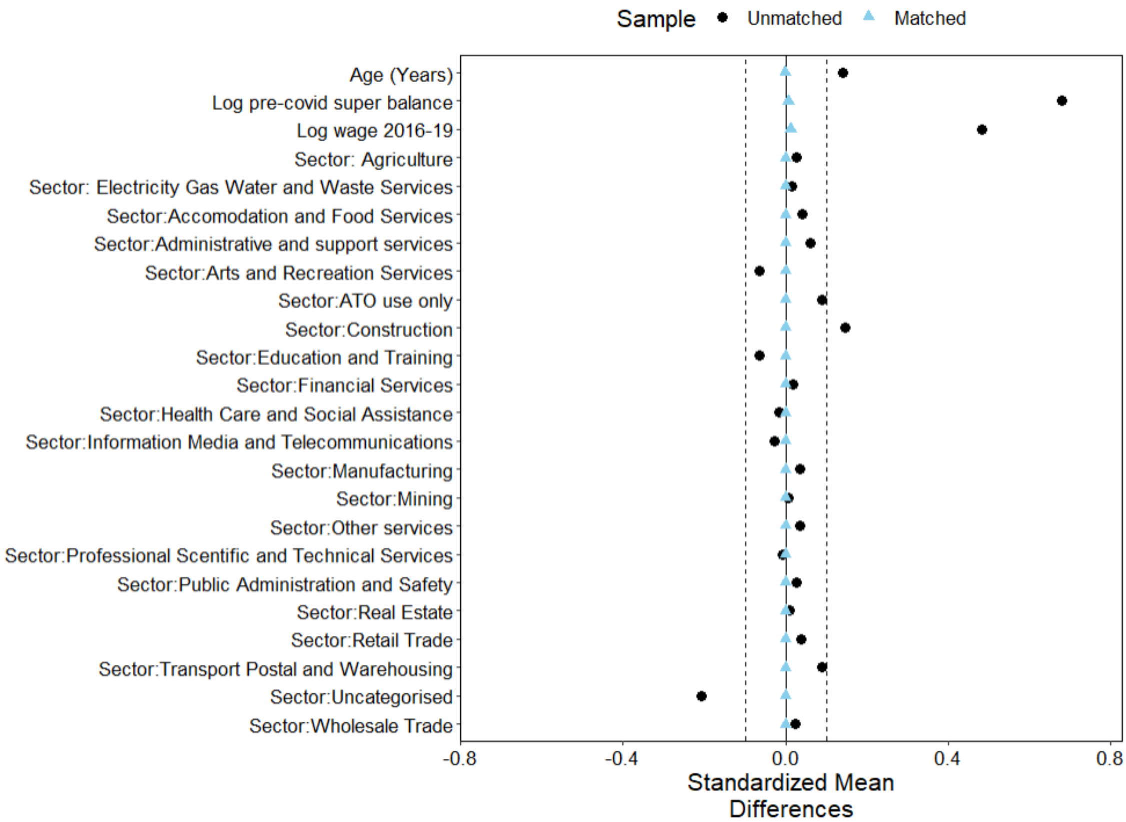


Chart C3. QQ plots, coarsened exact matching, first withdrawals

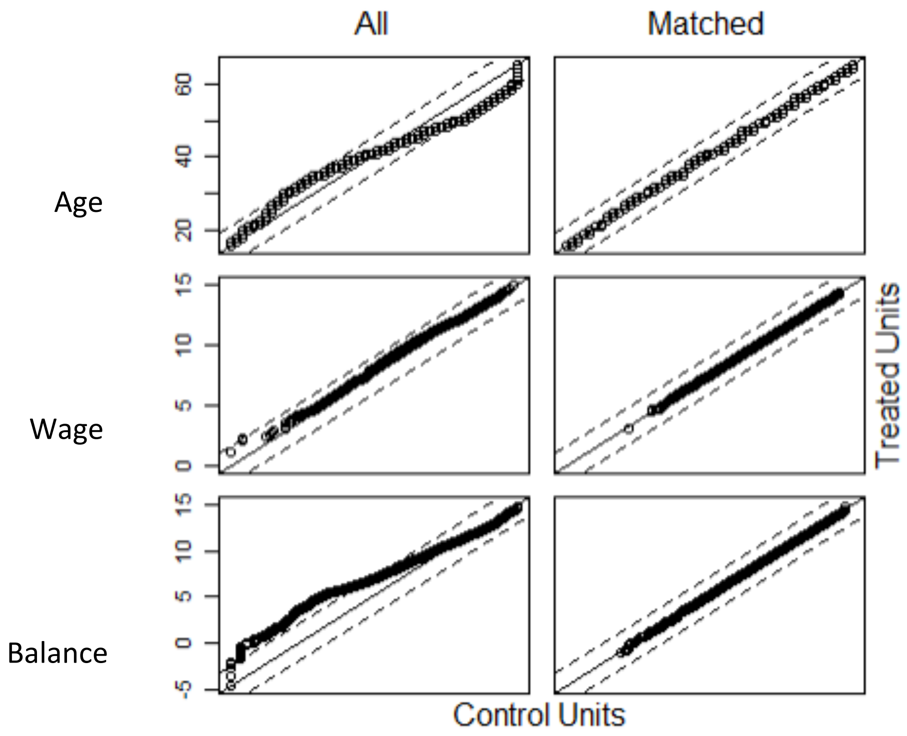
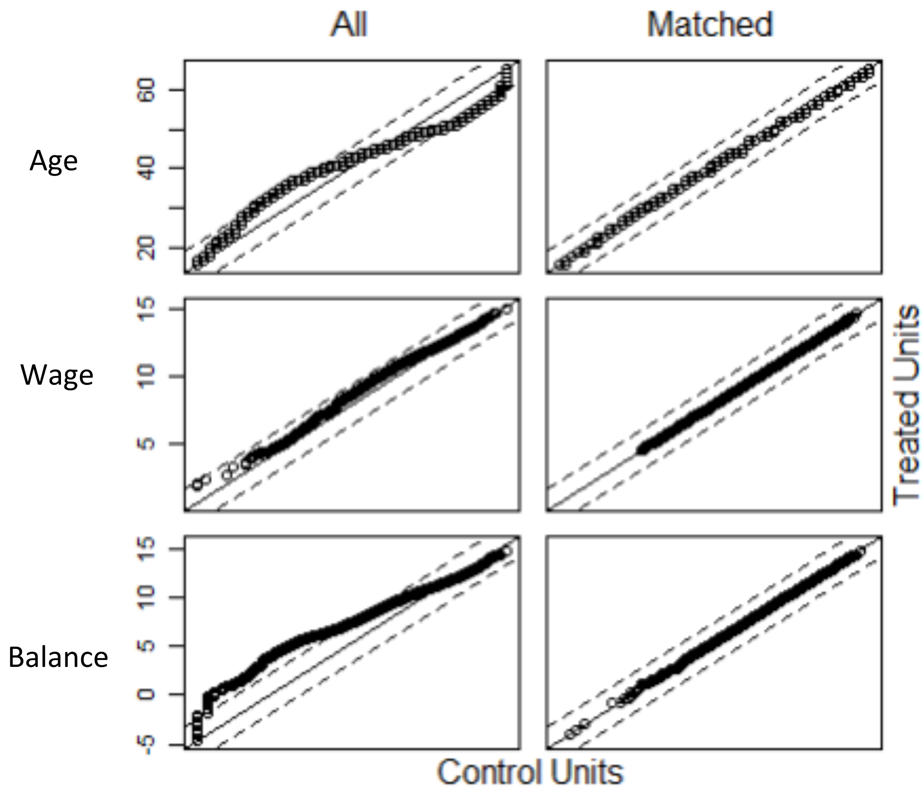


Chart C4. QQ plots, coarsened exact matching, second withdrawal



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 C2 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 (Charts C5 and C6). 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 C4 and C5, well matched across the majority of characteristics. The main differences are in wages and pre-existing superannuation balances.

We accompany this with two further visual tests. We first examine the balance of covariates using eQQ plots. Points far from the solid diagonal lines are areas of the covariate distributions that differ between treatment and control groups (Chart C2). In addition, the jitter plot provides a visualisation of the propensity scores of those who were matched (Chart C3).

Chart C5. Love plot of covariate balance, nearest neighbour matching, first withdrawal

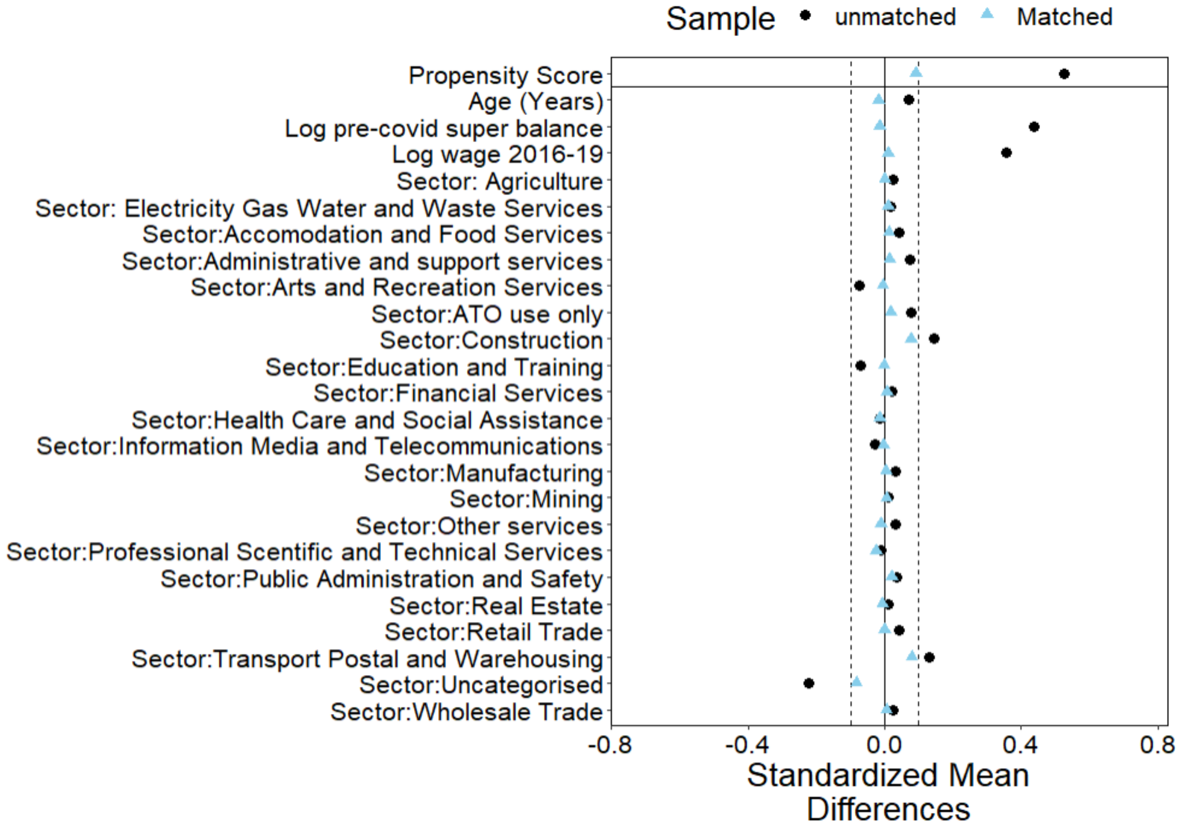


Chart C6. Love plot of covariate balance, nearest neighbour matching, second withdrawal

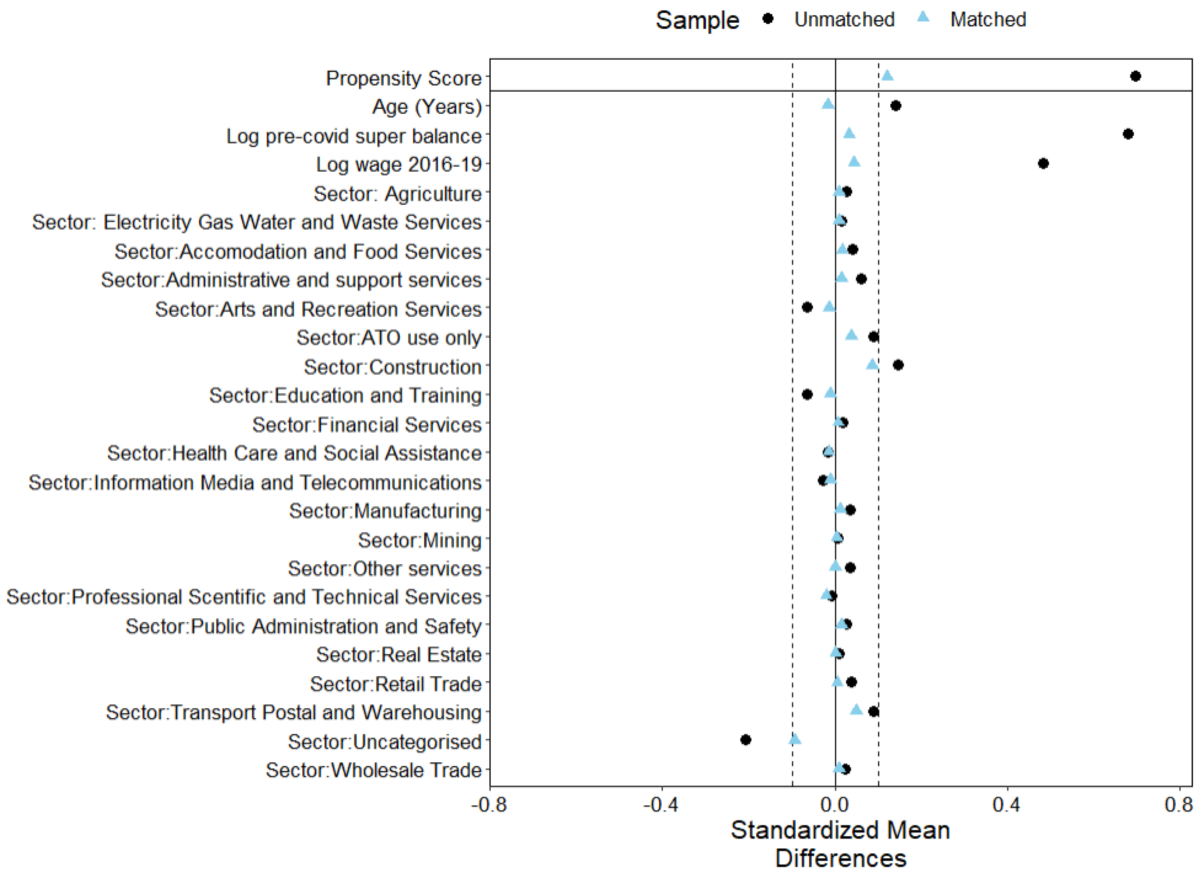


Chart C7. QQ plots, nearest neighbour matching, first withdrawal

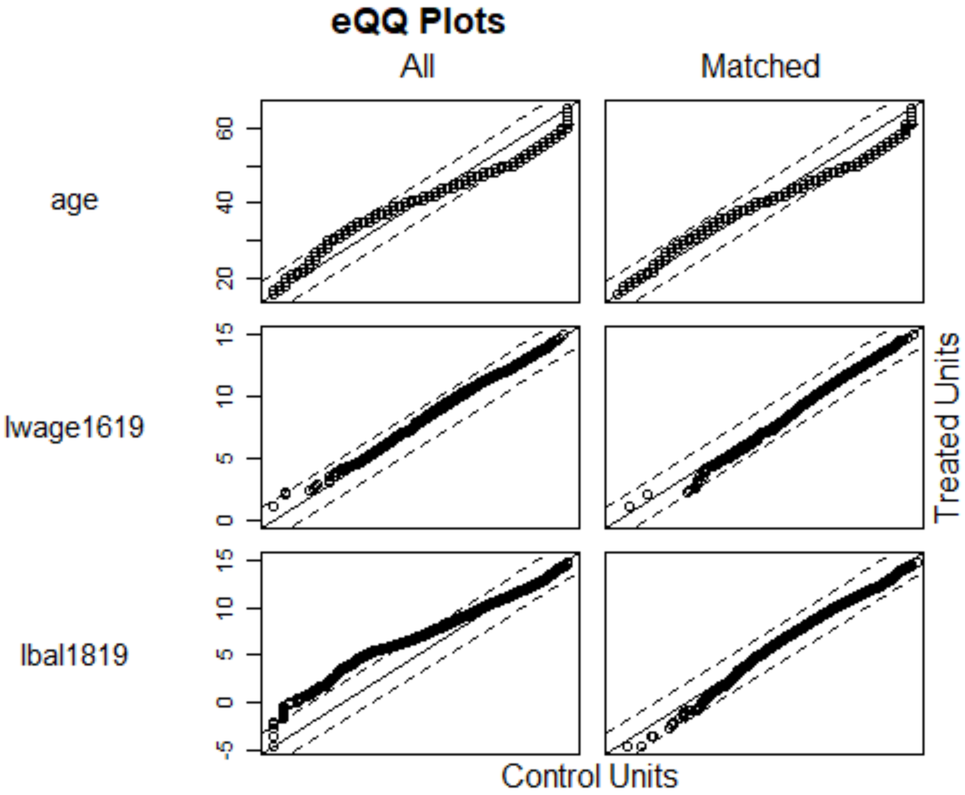


Chart C8. QQ plots, nearest neighbour matching, second withdrawal

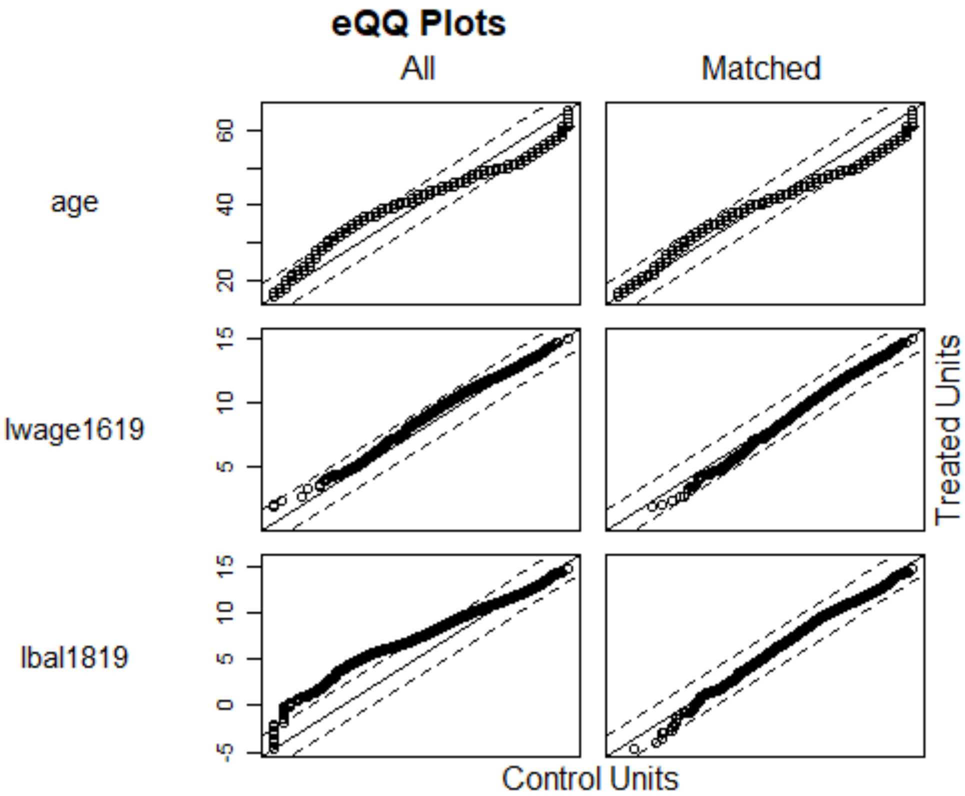


Chart C9. Jitter plots, nearest neighbour matching, first withdrawal

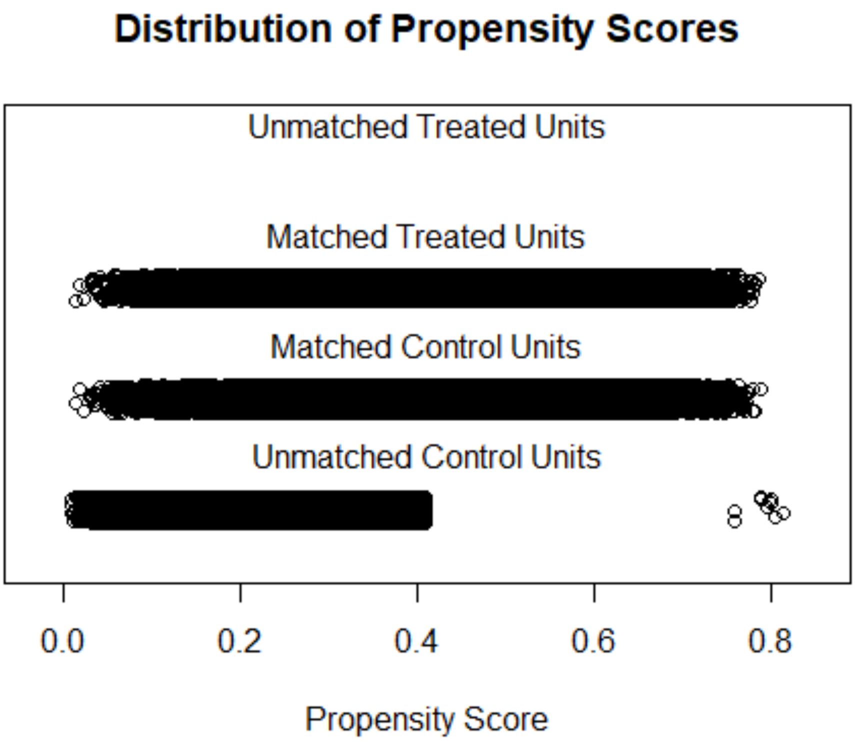
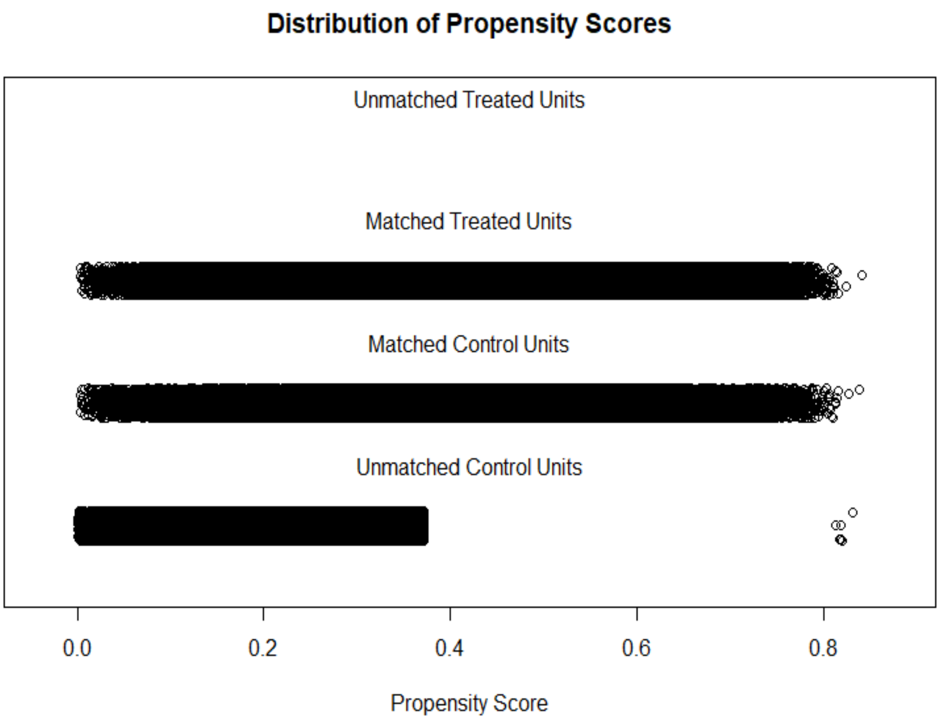


Chart C10. Jitter plots, nearest neighbour matching, second withdrawal



Appendix D. 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 D1). 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 per cent 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 D1 is that drawing from earlier (and later) weeks in the pandemic does not materially affect our results.

Table D1. Sensitivity of estimated effect of withdrawal to week that unemployment spell begins

Variable	Week that unemployment spell begins												
	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 D2 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 2 shows that the estimated effect of withdrawals 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 (presented in Table D1).).

Table D2. 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	-0.785***	-0.732***	-0.732***	-0.727***	-0.783***	-0.834***	-0.865***	-0.902***	-0.959***	-0.998***	N/A
	(0.009)	(0.018)	(0.022)	(0.026)	(0.031)	(0.035)	(0.041)	(0.051)	(0.080)	(0.369)	
Weeks 14-26	-0.313***	-0.335***	-0.273***	-0.294***	-0.352***	-0.293***	-0.318***	-0.304***	-0.282***	-0.314***	-0.356***
	(0.009)	(0.016)	(0.020)	(0.024)	(0.026)	(0.027)	(0.029)	(0.032)	(0.034)	(0.031)	(0.044)
Weeks 27-39	-0.307***	-0.281***	-0.262***	-0.265***	-0.249***	-0.291***	-0.271***	-0.253***	-0.253***	-0.274***	-0.213***
	(0.008)	(0.015)	(0.020)	(0.023)	(0.026)	(0.026)	(0.028)	(0.031)	(0.033)	(0.030)	(0.044)
Weeks 40-52	-0.161***	-0.180***	-0.123***	-0.208***	-0.152**	-0.115***	-0.118***	-0.150***	-0.158***	-0.143***	-0.143***
	(0.012)	(0.022)	(0.028)	(0.031)	(0.036)	(0.037)	(0.040)	(0.043)	(0.046)	(0.043)	(0.067)
Weeks 53-65	-0.098***	-0.103**	-0.063***	-0.127**	-0.131**	-0.076*	-0.064***	-0.038***	-0.016***	-0.136***	-0.148***
	(0.012)	(0.021)	(0.027)	(0.030)	(0.034)	(0.035)	(0.039)	(0.043)	(0.046)	(0.040)	(0.058)
Weeks 66-75	-0.108***	-0.079	-0.100	-0.126	0.078	-0.042	-0.211	0.272	-0.231	0.080	-0.008
	(0.039)	(0.070)	(0.088)	(0.099)	(0.124)	(0.120)	(0.120)	(0.171)	(0.140)	(0.147)	(0.204)
Concordance	0.618	0.639	0.623	0.627	0.621	0.621	0.621	0.635	0.667	0.667	0.654
Wald	58,252	54,000	53,665	53,626	53,546	53,553	53,553	53,467	53,414	53,299	184,451

Extending and constricting the sample selection window

Table D3. 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 (3)	Second (4)	First (5)	Second (6)	First (7)	Second (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	-0.772***	-0.625***	-0.730***	-0.723***	-0.781***	-0.632***
	(0.005)	(0.030)	(0.004)	(0.01)	(0.005)	(0.031)
14-26 weeks	-0.314***	-0.450***	-0.309***	-0.440***	-0.297***	-0.445***
	(0.005)	(0.005)	(0.004)	(0.004)	(0.005)	(0.005)
27-39 weeks	-0.252***	-0.341***	-0.196***	-0.286***	-0.238***	-0.338***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)
40-52 weeks	-0.141***	-0.171***	-0.167***	-0.169***	-0.144***	-0.178***
	(0.007)	(0.007)	(0.006)	(0.006)	(0.008)	(0.008)
53-65 weeks	-0.084***	-0.136***	-0.063***	-0.122***	-0.089***	-0.149***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)	(0.008)
66-78 weeks	-0.039*	-0.076***	-0.049*	-0.078***	-0.02	-0.063***
	(0.018)	(0.018)	(0.026)	(0.018)	(0.029)	(0.029)
Model fit:						
Concordance	0.673	0.662	0.651	0.643	0.659	0.642
Wald test	115,233	85,332	116,610	90.232	81,143	55,174

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 D5 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 D4. 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
Per cent female	56.6	48.0
Per cent married	29.3	33.8
Per cent homeowner or mortgagee	25.6	26.1
Per cent with children	18.7	20.3

Missing values associated with sample selection

Missing data poses a challenge to most empirical studies. Table D5 summarises the level of missingness that is associated with each main covariate.

Table D5. 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	569,308	116,206	16.0
Average prior year wage (2016-2019)	554,103	174,245	23.9
Children in household	468,330	260,018	35.7
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 D6. 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)	66.8	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
Per cent female	45.0	48.0
Per cent married	35.0	33.8
Per cent homeowner or mortgagee	25.0	26.1
Per cent with children	31.5	20.3

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

Tables D6 and D7 reveal 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 D5). 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 D7. 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 super withdrawal on hazard rate			
Weeks 1-13	-0.705***	-0.777***	-0.759***	-0.542***
	(0.008)	(0.005)	(0.005)	(0.019)
Weeks 14-26	-0.111***	-0.317***	-0.241***	-0.016
	(0.008)	(0.005)	(0.005)	(0.019)
Weeks 27-39	-0.050***	-0.257***	-0.186***	0.44
	(0.008)	(0.005)	(0.006)	(0.019)
Weeks 40-52	-0.025***	-0.140***	-0.099***	-0.017
	(0.008)	(0.008)	(0.008)	(0.021)
Weeks 53-65	0.144***	-0.084***	-0.012	0.171***
	(0.008)	(0.008)	(0.008)	(0.022)
Weeks 66-75	0.249***	0.047	-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 D6 and D7 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.