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The ATO longitudinal information files (ALife): A new resource for retirement policy research*

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Cain Polidano[†x]
University of Melbourne

Andrew Carter[‡]
Australian Taxation Office

Marc Chan[fx]
University of Melbourne

Abraham Chigavazira[†]
University of Melbourne

Hang To[‡]
Australian Taxation Office

Justin Holland[‡]
Australian Taxation Office

Son Nguyen[‡]
Australian Taxation Office

Ha Vu[^x]
Deakin University

Roger Wilkins[†x]
University of Melbourne

Abstract

The Australian Taxation Office release of annual longitudinally linked individual tax and superannuation records, known as the ATO Longitudinal Information Files (ALife), opens-up opportunities for new research. In this study, we provide an overview of ALife, focusing on its use for retirement income research. To this end, we provide the first longitudinal estimates of superannuation outcomes for one-year birth cohorts. Results show marked increase in disparity of super balances in the lead-up to retirement as those in the top quartile ramp-up their contributions, possibly to take advantage of the favourable tax treatment of superannuation income in retirement years.

JEL Codes: H24, H55, J26
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*Corresponding author, cainp@unimelb.edu.au, +61 03 8344 2102. †Melbourne Institute of Applied Economic and Social Research, University of Melbourne. ˣTax and Transfer Policy Institute, Crawford School of Public Policy, Australian National University. ‡Australian Taxation Office. ᶠDepartment of Economics, University of Melbourne. ^Department of Economics, Deakin University.

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Tax and Transfer Policy Institute

Crawford School of Public Policy

College of Asia and the Pacific

+61 2 6125 9318

tax.policy@anu.edu.au

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The Australian National University

Canberra ACT 0200 Australia

www.anu.edu.au

1. Introduction

Governments around the world are seeking to improve the efficiency of programs and service delivery through the curation and release of large administrative datasets for research. In Australia, following the Australian government's 2015 Public Data Policy Statement[1] that committed the government to release non-sensitive public data, there has been a wave of activity to release administrative data for research. Consistent with this push, in 2019 the Australian Taxation Office has compiled and released a 10 percent sample of annual longitudinally linked individual tax and superannuation records (panel data), known as the ATO Longitudinal Information Files (ALife). ALife data are released annually around January each year, but due to late lodgements in tax returns, there is a two-year delay in data release. The current release, ALife2017, tracks individuals from 1990-91 in tax records and 1996-97 in superannuation records up to 2016-17.

The release of ALife opens-up opportunities for new research across many policy domains, including income distribution and dynamics and the labour market. Perhaps less obvious is that the data creates important new opportunities for research on retirement. Prior to ALife, retirement income analysis relied on the use of nationally representative annual survey data, especially individual panel data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey and repeated cross-sectional data from the Australian Bureau of Statistics' Household Income and Wealth Survey. There are several advantages of ALife over these surveys. First, the large number of observations in ALife provide new opportunities to conduct statistically robust analysis on sub-groups of interest that may be targeted by policy. For example, ALife allows for analysis of responses to the Low Income Superannuation Tax Offset (LISTO), introduced in 2012, that targets low-income earners. The longitudinal dimension of ALife means that it can be used to also examine differences in sub-group responses over time, which because of differences in their life circumstances and experiences, are often varied. Second, there is a well-established literature on survey non-response and response error and bias in relation to questions that have clear socially (un)desirable answers such as income (see Moore and Welniak (2000) for a review), that give analysis with administrative data an advantage. Third, ALife includes criteria for program eligibility which

[1] https://www.pmc.gov.au/sites/default/files/publications/aust_govt_public_data_policy_statement_1.pdf

allows for more precise estimation of program effects. For example, LISTO eligibility depends on taxable income from specific income sources and concessional superannuation contributions, which are not available in other datasets.[2] Finally, the new historical data in Alife2017 extends further back than existing survey data, which allows for new analysis of long-term trends and policy impacts.[3]

In this paper, we provide a brief overview of ALife for researchers and showcase its potential for superannuation and retirement income policy research in Australia using the initial ALife release — Alife2016, which was the version available at the time of analysis. To do this, we first describe briefly the retirement income system and policy landscape in Australia to better understand the utility of ALife data for retirement research (section 2). Following this, to better understand the underlying Alife population and the superannuation data, we compare the ALife sampling frame with population estimates from ABS Census (section 3), provide an overview of ALife content (section 4), compare ALife superannuation data with that from the HILDA Survey (section 5) and present longitudinal superannuation information for one-year cohorts (section 6). In concluding (section 7), we summarise ALife's strengths and areas for future development. Like other administrative datasets, ALife is constantly evolving and these developments, where possible, will be incorporated into future ALife releases.

2. Superannuation and retirement income policy in Australia

Retirement income policy in Australia is based on three pillars: the means tested and publicly funded Age Pension; superannuation, a compulsory employer-funded private retirement pension; and voluntary private savings, including voluntary private contributions to superannuation, that are supported through tax concessions and targeted government payments. A feature of the Australian system is the high interdependency of the three pillars, due mainly to the income and assets tests of the Age Pension, which means that Age Pension payments depend on the accumulation of private savings (whether in superannuation or not). This interdependency potentially incentivises people to trade-off higher savings from private sources for greater access to the publicly-funded Aged Pension, which has fiscal implications. As identified by the Productivity Commission (2015), the margins where this occurs and the fiscal implications of this are not well understood. The release of ALife is an important

[2] Taxable income up to $37,000, with at least 10% from business income or earnings.

[3] The first wave of HILDA is 2000 and 1995 in the Household Income and Wealth Survey.

development in efforts to understand superannuation accumulation and deaccumulation behaviour in response to tax, superannuation and pension reforms. Research by the authors is currently underway to examine some of these interrelationships and their fiscal implications.[4]

Below we provide a brief introduction to superannuation in Australia. For more detailed information about the superannuation system, including recent changes, see the Australian Taxation Office website (https://www.ato.gov.au/Individuals/Super/).

2.1. The superannuation system

Superannuation was first introduced in the 19th century for select white collar workers, including public servants, but was made compulsory for most employees from April 1992 (see Nielson and Harris (2010) for a chronology of superannuation in Australia). From 1992, employers were required to make minimum contributions to their employees' retirement, except for employees paid less than $450 in a calendar month; those aged under 18 who worked no more than 30 hours a week, and certain contractors.[5] The compulsory retirement payments, known as the Superannuation Guarantee (SG), started at 3 percent of employee pay and has been gradually increased over time to its current rate of 9.5%.[6] SG employer contributions are generally tax deductible to the employer and are excluded from taxable income for the employee, but are taxed at a rate of 15% on deposit into the superannuation fund (concessional contribution).

On top of SG contributions, concessional contributions can also be made by employees requesting that their employer salary sacrifice all or part of their pay. However, from July 2012 individuals whose aggregate income and concessional contributions are above a threshold

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[4] These issues are being addressed under ARC Linkage Grant LP170101045 between the University of Melbourne and the ATO.

[5] Such as freelancers or as self-employed. Other exemptions include domestic or private work not more than 30 hours per week; non-residents in Australia being paid by an employer from outside Australia and some foreign executives who hold certain visas or entry permits under migration regulations.

[6] The SG was supposed to increase to 10% on 1 July 2018; and then increase by 0.5% each year until it reached 12% on 1 July 2022. However, the 2014 federal budget deferred the proposed 2018 SG rate increases by 3 years, with the 9.5% rate remaining until 30 June 2021, and then the rate increasing by 0.5% each following year until the SG rate reaches 12%, on 1 July 2025.

became liable to pay an extra 15% on concessional contributions (known as Division 293 tax).[7] Concessional contributions are subject to an annual cap, which has been tightened over time.[8] Contributions made above the cap are taxed at a higher rate — at the highest marginal tax rate plus the medicare levy up to 2012-13, and at the individual's actual marginal tax rate plus the medicare levy thereafter. Employees can also make voluntary after-tax contributions, known as personal contributions, which can be claimed until the age of 75. Personal contributions are either deductible or non-deductible. Those that are deductible count towards the concessional cap and are taxed in the superannuation fund. Non-deductible personal contributions are not taxed in the superannuation fund and count towards a non-concessional (and not concessional) contribution cap. For low income earners, if they make personal contribution to a super fund, the government will also make a co-contribution, the amount depending on their income and the size of the non-deductible personal contribution.

Typically, the minimum age at which one can draw down super (the preservation age) was 55 until July 2016, since then it has been increasing by one year every two years; it is scheduled to keep increasing up until July 2024, when it will reach 60. Generally, individuals can access their superannuation after they have reached their preservation age and are retired. Once a person reaches the Age Pension age, which has been slowly increasing from 65 years in financial year 2016-17 to 67 years by July 2023, there is no requirement to be retired to access superannuation. Access to superannuation prior to preservation age is possible, but only under certain conditions — extreme financial hardship, terminal illness, temporary residency, a superannuation balance less than $200 or on compassionate grounds. For those beyond their preservation age, but less than 60, superannuation income received is taxed at the marginal tax rate, but there is a 15% tax offset,[9] whereas super paid from age 60 is generally tax free. The latter was introduced in July 2007 as part of the Government's *Simplified Superannuation* reforms. Prior to these reforms, superannuation income at the age of 60 and above was taxed at the same rate as at the age below 60 (marginal tax rate less a 15% tax offset). Benefits can be paid as either a lump-sum or as an income stream, but if the latter is taken, there are requirements for minimum payments to be made.

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[7] The threshold was $300,000 from 1 July 2012-30 June 2017, then it was reduced to $250,000.

[8] From July 2018, people with super balances of less than $500,000 can carry forward unused concessional caps.

[9] Tax offsets are available for superannuation income paid prior to age 60 depending on individual circumstances.

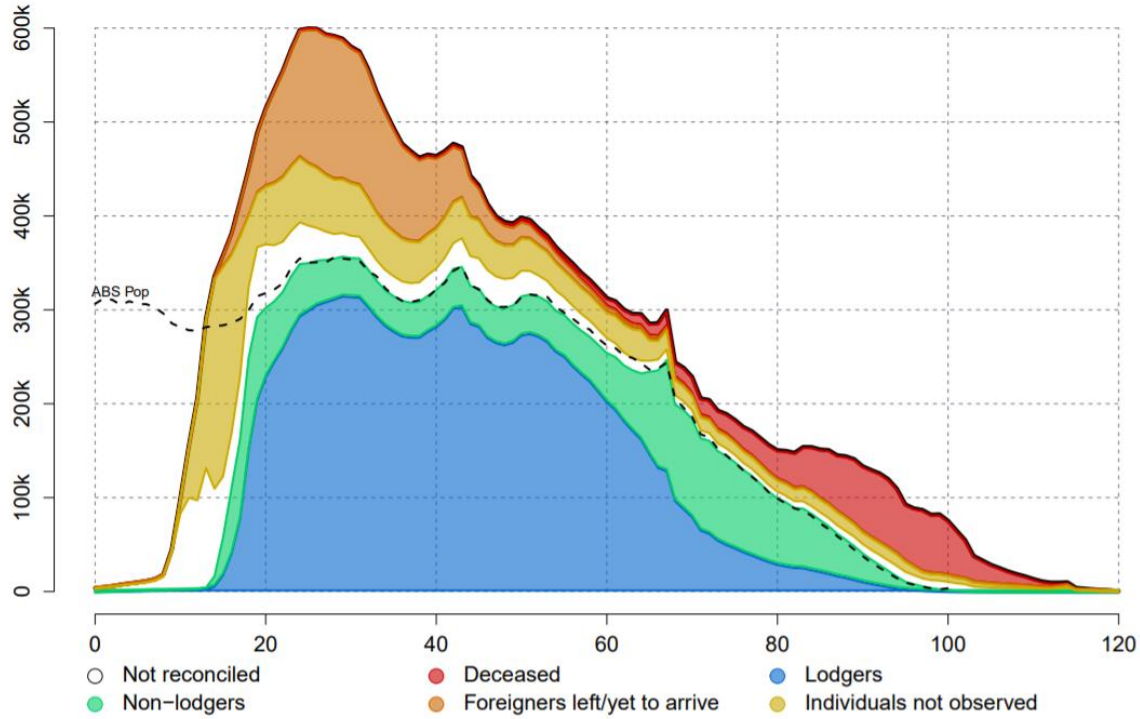
3. Sample design

The initial ALife2016 sample is a 10 percent random sample of the ATO's 2016 client register of tax filers regularly updated since 1980, including temporary visa holders and people who died prior to 2016.[10] The 10% random sample is called ALife's 'broad sample'. To draw the random sample from the client register, each client is given a unique permanent random number between 0 and 1 and clients with a number less than 0.1 are included in the sample. In effect this means that the selection of each client is an independent Bernoulli trial with a 10% chance of selection. Historical information is added retrospectively by tracking individuals of the broad sample back through time via their tax file number. In each release of ALife following initial sample, the broad sample is updated by a 10% random sample of people added to the client register since the previous annual release.

From the broad sample, ALife comprises individuals with at least one tax or superannuation record from 1990-91 with no blank rows in the dataset. This means that individuals from the broad sample may appear in one, both or none of the superannuation and tax records in ALife. A small number of individuals who face relatively high risk of re-identification (such as those aged 95 or more) are excluded from Alife.

[10] The ATO client register contains individuals (including sole traders) who are not tax lodgers, e.g. people who have a tax file number who have not lodged a tax return.

Figure 1: Comparison of the of the distribution of people by age in the ATO client register against the ABS's Estimated Resident population, 30 June 2014



To help users understand the client register, the ALife sample and their relationship to population measures, we compare the client register to the ABS Estimated Resident Population (ERP) in 2014 (Figure 1). ERP is the official measure of Australia's population, based on the concept of 'usual residence'.[11] For this exercise, we exclude around 1.8 million (out of 31.7 million) people from the client register who do not have date of birth. In Figure 1, the ERP estimates are shown by the dotted line and the client register is the solid black line at the top of the distribution. From Figure 1, the client register contains far more individuals overall — 31.7

[11] Usual residence are people, regardless of citizenship, who usually live in Australia, except for diplomats and their families and includes usual residents who are overseas for less than 12 months. It excludes overseas visitors who are in Australia for less than 12 months. The ERP is based on the results of the Census of Population and Housing, adjusted for net undercount and Australian usual residents temporarily overseas on census night. The ERP is compiled as at 30 June of each census year and updated quarterly between censuses for Australia, states and territories and annually for smaller areas. Population measures based on place of usual residence are also referred to as the de jure population. More details about the concept of ERP, as adopted by the ABS for official population estimates, are contained in Information Paper: Population Concepts, 2008 (cat. no. 3107.0.55.006) and Population Estimates: Concepts, Sources and Methods (cat. no. 3228.0.55.001).

million compared to 23.5 million for the ABS estimated resident population — with the difference most pronounced during working age. To reconcile the ERP and the client register, we link information from other administrative datasets including: personal income tax returns; superannuation contribution statements; social security payments summaries; pay as you go (PAYG) payment summaries; distributions from partnerships and trusts; divided distributions from companies; education data and temporary work visa departure dates.

The main observation to be made from Figure 1 is that tax lodgers and visible non-lodgers (social security recipients and others observed in the administrative data, such as those in PAYG payment summaries and students), or the blue and green sections, are a reasonable approximation of the ABS ERP in 2014. The Australian Taxation Office is currently conducting work to develop population measures that will more closely reflect ERP.

The difference between the client register and ERP estimates, the area between the hard-black line and the dotted black line can be mostly explained by three groups at 30 June 2014 —people in the client register who are deceased (red section) ; foreigners who have left/yet to arrive in Australia (orange section) and citizens who do not appear in any dataset since 2000 and who are likely to be overseas (yellow section).[12] The blank section reflects those who are not seen in any dataset in 2014 and cannot be reconciled.

4. ALife content

The unit of analysis in ALife is the individual tax filer who is tracked over time using their unique client identification. Individual information available in Tax Return forms, Super Member Contribution Statements (MCS) forms and the Self Managed Superannuation Fund (SMSF) annual returns are included in ALife, including age, gender, residential address (ABS SA4 level category) and occupation. In the current standard release of ALife, there is no partner identifier. Generating a household identifier is in an experimental phase of development and will be made available in future ALife releases.

Below we provide an overview of the superannuation and tax information in ALife. For more detailed information, including how to access the data, refer to material on the ALife website (https://alife-research.app/).

[12] These are people who are observed in the data in the future or have been observed in the past.

4.1. Superannuation information

Superannuation data in ALife is annual financial-year curated superannuation balance and contribution information from all MCS and SMSF annual returns forms reported to the ATO. All providers are required to report details of each member's superannuation account in MCS or SMSF annual returns forms regardless of whether they are regulated by the Australian Prudential Regulation Authority (APRA). Details of what are collected in the MCS and SMSF annual returns forms are available on the ATO website.[13] Identifying information of the member in the MCS forms (e.g. name, date of birth, address) and provider (e.g. name, address, contact details) are excluded in the standard ALife release. While provider identifying information is omitted, ALife does distinguish balances and contributions by provider type — APRA regulated, self-managed and exempt public sector super schemes (not APRA regulated).

While all filed tax records are available in each year of ALife, the coverage of superannuation in ALife varies over time in accordance to legislative requirements for fund managers to report MCS forms to the ATO. Prior to 2013 (financial year 2012-13), fund managers were only required to lodge MCS forms to the ATO for accounts that received contributions during the financial year. This means that inactive accounts will be missing from ALife prior to 2013, which particularly affects data on retirees.[14] In 2013, it became a requirement for super funds to report all of their members' accounts (both active and inactive) to the ATO , which means that ALife only has full superannuation accounts coverage from here on.[15] For self-managed superannuation funds, which are not required to produce MCS, the ATO extracts all relevant information from their annual returns, which all fund managers are legally obliged to report.

A feature of the ALife superannuation data is the inclusion of rich information that is derived by the ATO for administering tax and superannuation regulations that are vital for policy evaluation. In summary, these include:

- each member's concessional and non-concessional cap and contributions;

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[13] https://www.ato.gov.au/Forms/Super-member-contribution-statement-for-2012-13-and-later-financial-years/

[14] Some superannuation fund managers voluntarily provided MCS for inactive accounts, possibly because it was administratively easier.

[15] Since 1 July 2012, obligations under Division 390 have been extended as a result of the *Stronger Super* reforms, which required MCS statement to be extended to all members, including those for whom no contributions were made. The main motivation for this was to reunite people with lost superannuation accounts.

- tax liability for excess contributions;
- super co-contributions; and
- member's Division 293 tax liability.

While there is comprehensive information in ALife about superannuation contributions and annual balance information from 2012-13, there is currently incomplete information available on draw-down and returns to superannuation. Superannuation payments, made to account holders, in MCS and SMSF forms are only available for lump-sum withdrawals. The ATO does hold superannuation payment summaries (for 2008-2018) that include *taxable* superannuation income streams, but not *untaxed* streams (for members aged 60 and over) and these are yet to be included in ALife. Members with zero balances are retained in ALife, which allows for the identification of complete draw-down.

4.2. Tax record information

Tax data in ALife consists of annual financial-year's incomes, deductions, tax rebates and offsets, medicare levy and surcharge and other tax information from the individual tax returns, including those of sole traders. In years where a tax return was not lodged, the individual's information for that year is missing in ALife. For information on the items collected in individual tax returns, visit the ATO website.[16] For reasons of confidentiality, tax payers identifying information is removed or generalized, for example, date of birth is generalized to age at 30 June (to integer level), and occupation is generalized to the 2-digit level of the Australian and New Zealand Standard Classification of Occupation codes. In addition to individual information from tax return forms, ALife includes the outcomes of tax assessment.

For more information on the components of individual income, deductions and other items from individual income tax returns, see Bond and Wright (2018).

5. Sample characteristics

In this section, we compare the superannuation balances and characteristics of superannuation members between ALife and HILDA. To showcase some of the advantages of ALife over past surveys, we also present superannuation statistics over time and across occupation categories.

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[16] https://www.ato.gov.au/Forms/Prior-years-individuals-tax-return-forms---schedules/.

The total value of superannuation balances in the ALife sample in 2016-17 is $208 billion (2017 values), which is somewhat lower than 10% of the total value of $2.5 trillion reported by the Australian Prudential Regulation Authority (APRA) (APRA 2017). The difference may be due to the exclusion of people from ALife who have a high risk of re-identification and the exclusion of unmatched superannuation accounts belonging to people who cannot be specified in the ATO database (due to missing identification information).

In Table 1 we compare the average superannuation membership rates and average balances for the ALife sample against those from HILDA, separately for males and females across birth cohorts in 2014. We choose 2014 as a comparison year because it is the latest year superannuation data is available in HILDA as part of its wealth module. The statistics in HILDA, but not ALife, are population weighted and both are deflated using the December 2014 CPI, with a base year of December 2017.

An interesting observation is differences in the superannuation gender gap estimated under the two datasets. Across all those born before 1998 (aged 17 and older) the average female superannuation balance in 2014 in HILDA is 41% lower than for men — $67,774 compared to $115,525 for men. In contrast, the comparable gender gap in 2014 in ALife is 26% — $63,751 compared to $93,687. As a point of comparison, the gap estimated for the Survey of Income and Wealth is 44% (Clare 2015).[17] The smaller gender gap in ALife can be explained by two factors. First, in Alife there is a greater proportion of women in Alife with non-zero superannuation balances than in HILDA. Second, among people with non-zero superannuation balances, the average difference between male and female balances is smaller in Alife.

A possible explanation is that in men in surveys may be more likely to over-inflate their wealth, and/or be too embarrassed to answer questions on wealth, because it is more socially desirable for them to be wealthy.[18] An alternative explanation is that there are differences in the base

[17] Average estimates from the Australian Bureau of Statistics' Survey of Income and Wealth, published by the Australian Superannuation Funds of Australia for all male members aged 15 and over (at June 2014) are $98,535 and $135,000 respectively. For females the relevant statistics are $54,916 and $83,000.

[18] Non-response is similar by gender, 17% for females and 15% for males in 2014. However, non-response appears more selective for males, with imputed values 25% lower than reported values. In contrast, imputed values for females are 2% higher than reported values on average.

population that skew the data, for example, ALife may capture working-age short-term residents who are more likely to be male (Australian Bureau of Statistics 2016).

In terms of characteristics of superannuation members with a non-zero balances that are common to ALife and HILDA (Table 2), we observe only minor differences in average statistics. As discussed above, the current version of ALife doesn't include a household identifier and around a quarter of all coupled superannuation members (16.7% out of 65.8%) have a missing partner identifier.

Table 1: Average superannuation balances for ALife2016 10% sample in 2014[a]

Birth cohort	Average balance, all		Average balance, non-zero balances		Proportion with non-zero balances (%)[c]	
	HILDA[b]	ALife	HILDA[b]	ALife	HILDA[b]	ALife
	$A2017	$A2017	$A2017	$A2017	%	%
			Females			
All	67,774	63,751	97,723	95,786	69	67
1930-1933	13,441	16,736	131,038	247,516	10	7
1934-1937	27,303	45,012	205,259	298,311	13	15
1938-1941	89,957	77,814	290,910	315,964	31	25
1942-1945	126,067	125,246	318,063	309,211	40	41
1946-1949	130,269	160,523	284,188	298,325	46	54
1950-1953	172,952	162,133	268,160	234,413	65	69
1954-1957	142,637	135,019	189,555	173,135	75	78
1958-1961	112,369	109,510	133,335	129,120	84	85
1962-1965	94,923	85,188	114,282	97,861	83	87
1966-1969	87,690	70,253	102,705	80,489	85	87
1970-1973	56,924	57,335	64,005	65,839	89	87
1974-1977	47,103	45,301	52,675	52,596	89	86
1978-1981	40,167	36,249	44,010	42,060	91	86
1982-1985	24,877	25,013	29,940	29,558	83	85
1986-1989	13,521	14,701	16,655	18,197	81	81
1990-1993	5,747	6,229	6,769	8,290	85	75
1994-1997	1,138	955	2,039	1,949	56	49
			Males			
All	115,525	93,687	151,942	130,042	76	72
1930-1933	29,416	40,351	138,845	262,030	21	15
1934-1937	98,049	82,766	315,307	322,735	31	26
1938-1941	185,279	131,844	441,747	370,707	42	36
1942-1945	154,127	182,571	351,682	365,634	44	50
1946-1949	281,953	213,130	438,639	345,992	64	62
1950-1953	296,200	224,303	378,274	291,493	78	77
1954-1957	231,816	207,950	289,474	249,042	80	84
1958-1961	201,067	168,685	221,595	192,203	91	88
1962-1965	168,388	131,443	183,073	146,841	92	90
1966-1969	138,943	103,769	154,468	115,666	90	90
1970-1973	106,002	82,680	115,274	92,023	92	90
1974-1977	83,248	62,876	88,677	70,314	94	89
1978-1981	50,805	45,967	54,334	51,496	94	89
1982-1985	34,488	31,549	37,202	35,945	93	88
1986-1989	18,397	18,269	20,403	21,739	90	84
1990-1993	8,201	7,666	9,545	10,008	86	77
1994-1997	1,453	1,351	2,496	2,807	58	48

[a]We do not report values for people born before 1930 because of small cell sizes. [b]Population weights are used to generate HILDA estimates.

Table 2: Characteristics of superannuation members with non-zero balances in ALife2016 and HILDA in 2014[a] (%)

	ALife	HILDA[b]
Place of residence		
Sydney	21	20.7
Rest of NSW	10.6	10.7
Melbourne	19	19.8
Rest of Victoria	5.8	5.4
Brisbane	9.8	10.5
Rest of Queensland	10.2	9.9
Adelaide	5.6	5.8
Rest of South Australia	1.4	1.3
Perth	8.8	9.3
Rest of Western Australia	2.1	1.8
Tasmania	2.1	2.1
Northern Territory	0.9	0.8
ACT	1.8	1.8
Missing location	0.9	0
Total	100.0	100.0
Sex		
Male	52.1	51.5
Female	47.9	48.5
Total	100.0	100.0
Age		
15-19	2.7	3.3
20-24	9.2	9.7
25-34	21.9	21.7
35-44	21.8	21.7
45-54	20.4	20
55-64	15.5	15.2
65-69	4.6	4.3
70-74	2.3	2.3
75-79	1.1	1.1
80-84	0.4	0.5
85 and older	0.1	0.1
Total	100.0	100.0
Partner status		
Married/defacto	49.1	66.1
Not partnered	34.1	33.9
Missing information	16.7	-
Total	100.0	100.0
Population count estimate	14,526,040[c]	13,391,909

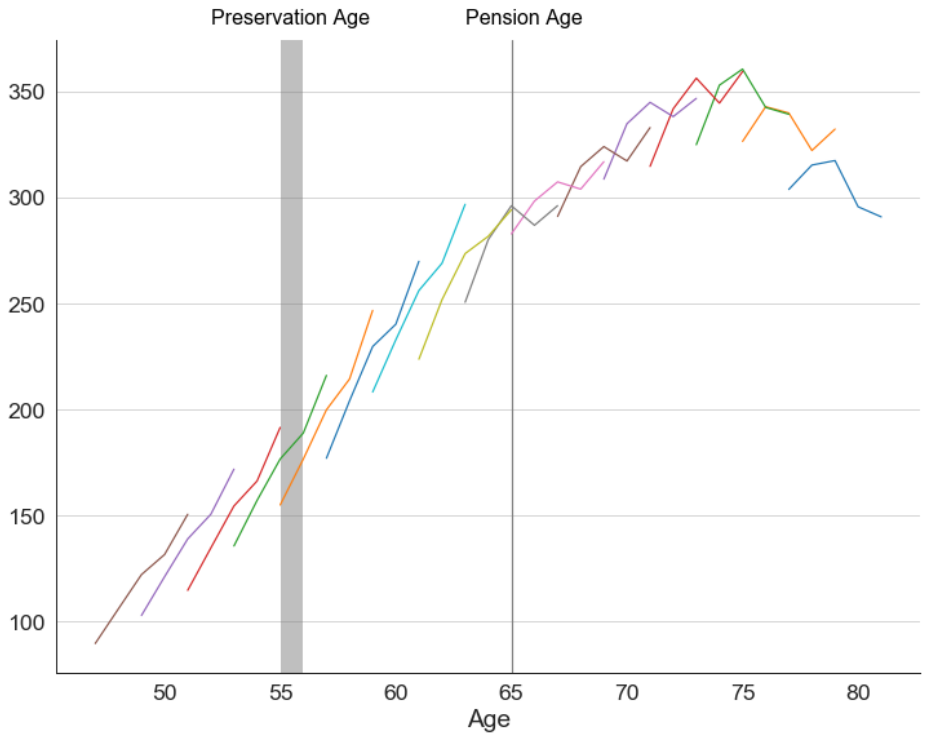
[a]Members are those with non-zero balances at the end of the financial year 2013-14. [b]Responding person population weights are used to generate HILDA estimates. [c]This is the population estimate generated by multiplying the actual numbers in ALife by 10 (because it is a 10% sample).

6. Super balances over time

A main advantage of ALife over survey data in retirement policy research are the large number of observations that allow for statistically robust estimates of sub-populations over time. In the figures below, we provide average superannuation member balances (Figure 2), rates of complete draw-down (Figure 3), rates of contribution (Figure 4) and average annual contributions (Figure 5) between 2012-13 and 2016-17 by one-year birth cohorts born 1936-1966. To save space, we only present averages for every second one-year birth cohort. The calculation of these averages is based on the same group of members with non-zero balances in ALife2016 at the end of the 2012-13 financial year. In all figures below, the preservation

age is marked by a vertical bar spanning the ages 55 and 56, which reflects the changes in the preservation age that occurred over this period (from 1 July 2015). The Age Pension age remained constant for both men and women, which is reflected by the vertical line at 65.

Figure 2: Average superannuation balances 2013-2017 among members with non-zero balances on 30 June 2013 ($A'000s 2017), every second one-year birth cohort born 1936-66



For the cohort of members born in 1948, who have just reached pension eligibility age in 2012-13, their average balance is $282,540 (Figure 2). Balances for 2012-13 members over time by quartile are also provided in Figure A.1 in appendix A.[19] What is apparent from Figure A.1 is the large discrepancy in average balances between those in the top quartile (or top 25%) and the rest. For example, for the 1948 cohort who just reached pension age in 2012-13, the average balance in each quartile is: $6,235 for the bottom quartile (bottom 25%); $63,912 for the 2nd quartile (2nd bottom 25%); $201,924 for the 3rd quartile (2nd top 25%) and $858,576 for the 4th quartile (top 25%). Comparing balances across quartiles, what is also apparent is that most of

[19] Members balances in 2012-13 are ranked from lowest to highest and are divided into four equal groups or quantiles.

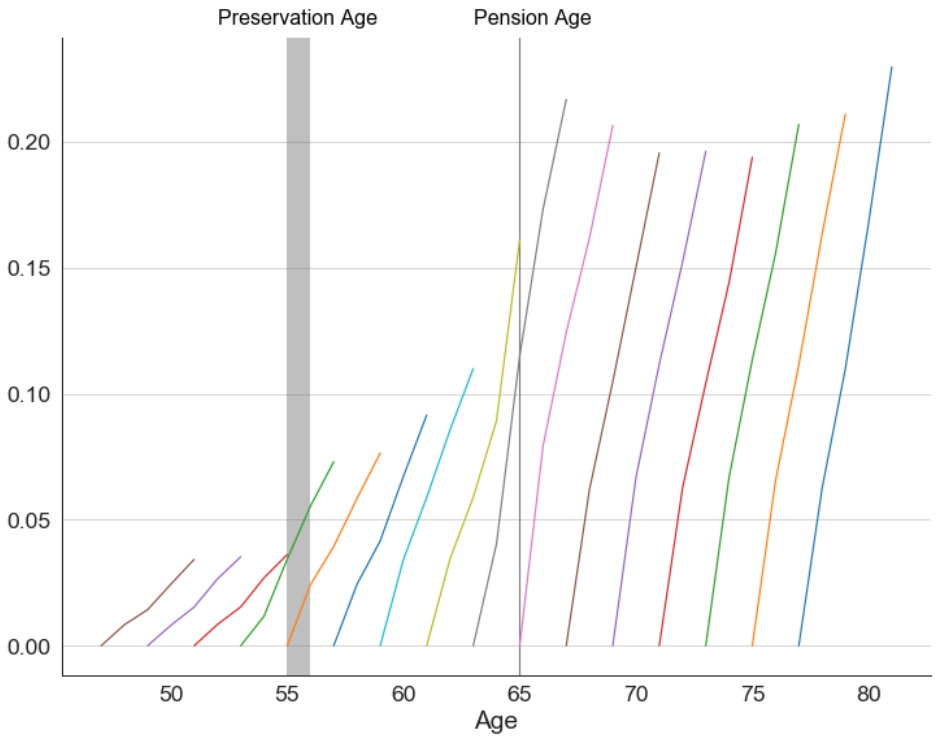
the disparity between the top quartile and the others is among cohorts approaching or in retirement years, which is likely to reflect differences in the use of superannuation in retirement.[20] For members with balances in the top half, these results suggest that superannuation is a liquid and tax-favourable place to park wealth in their retirement years, while for those in the bottom half, superannuation is more of a reservoir of wealth from which they can draw-on in retirement, for example, to pay-off debt, to re-invest and to fund retirement.

6.1. Superannuation draw-down over time

Over time we find little evidence that people, on average, run-down superannuation balances after reaching the preservation age (Figure 2), which is consistent with the findings of Reeson *et al.* (2016), who found similar results using a sample of 150,000 members of a large fund. Instead, across the cohorts born prior to 1960 who pass (or have passed) preservation age over the period, we find that superannuation balances have grown, which is due to superannuation returns and contributions outstripping the rate of superannuation draw-down, except for the oldest cohort in our analysis born in 1936 whose average balance falls. Growth in superannuation balances is also found across all member balance quartiles, although the greatest growth is for the top quartile (Figure A.1).

[20] The discrepancy in cohort mean balances between those in the top quartile and the rest is not driven by exceptionally high balances at the top, the discrepancy in cohort *median* balances between the top and the rest is of a similar magnitude. Figures for median balances are available upon request from the corresponding author.

Figure 3: Proportion of members with non-zero balances on 30 June 2013 who completely draw-down 2013-2017, every second one-year birth cohort born 1936-66



The rate of complete draw-down over time (Figure 3), reflected by the proportion of members in 2012-13 who completely withdraw their superannuation by 2016-17, doubles from around 3% for those who are just short of their preservation age (cohort born 1962) to around 6-7% for cohorts who pass their preservation age over the period (cohort born 1960).[21] The largest jump in complete drawn-down occurs for cohorts either side of the Age Pension eligibility age – 10% for those born 1954 who are just short of the pension age by 2016-17 to 22% for those born in 1950. For older cohorts who are well beyond pension age, the rate of draw-down over time is similar.

However, what is clear from Figure A.2 in appendix A, is that the rate of complete drawn-down depends heavily on the size of the initial balance. For members with balances in the bottom 50%, the rate of complete draw-down is much higher than for those with balances in the top half and the jump in draw-down around pension age much more pronounced. For example, for the cohort born in 1948 who have just reached pension age in 2012-13, 45% of those in the bottom quartile withdraw their super balance completely by 2016-17; 20% of those in the

[21] Gradual draw-down after age 60, for example annuities, cannot be observed in ALife.

second bottom quartile; 10% of those in the second top quartile and around 8% of those in the top quartile. The higher rates of complete draw-down among those with smaller initial balances, especially from pension age eligibility, does raise the likelihood that these people will be more reliant on the Age Pension to fund retirement. However, whether the complete draw-down of this group is a strategic decision to maximise pension income is unclear.

6.2. Superannuation contributions over time

The proportion of members in 2012-13 who make superannuation contributions declines over time, but as for the rate of complete draw-down, there is a more marked decline in the rate of contributions around pension age. For example, for cohort 1948 that has just reached retirement age in financial year 2012-13, the proportion of members who contribute declines by 40% over the time, whereas for cohort 1954 who are just short of the pension age (age 63 by 2016-17), the decline is 9%. As for drawn-down, there are marked differences in the proportion of members who are contributing over time by initial balance level, including prior to reaching preservation age. For members whose balances are in the bottom quartile (25%), only around a half are still contributing at age 50, compared to 81%, 91% and 93% in the second, third and top quartiles. The low contribution rate of members with balances in the bottom quartile is likely due to low rates of labour market participation among this group. Over time, cohorts across all quartiles reduce their rates of contribution, especially after the pension age, although this is less pronounced for members whose balances are in the bottom 25%. The contribution rate of this group may not be affected to the same extent by reaching retirement age because they may not have enough wealth to fund their retirement. Further, their future pension income (which is means tested) may be relatively unaffected from the accumulation of more superannuation past their pension age. It is those in the middle two groups whose contribution rate is most affected by reaching the pension age.

Figure 4: Proportion of members with non-zero balances on 30 June 2013 who make superannuation contributions 2013-2017, every second one-year birth cohort born 1936-66

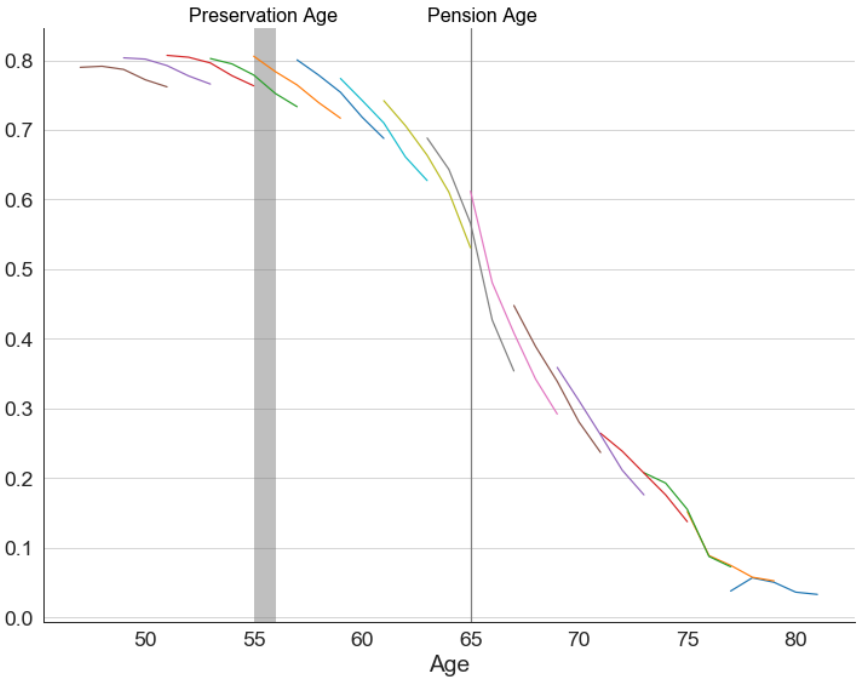
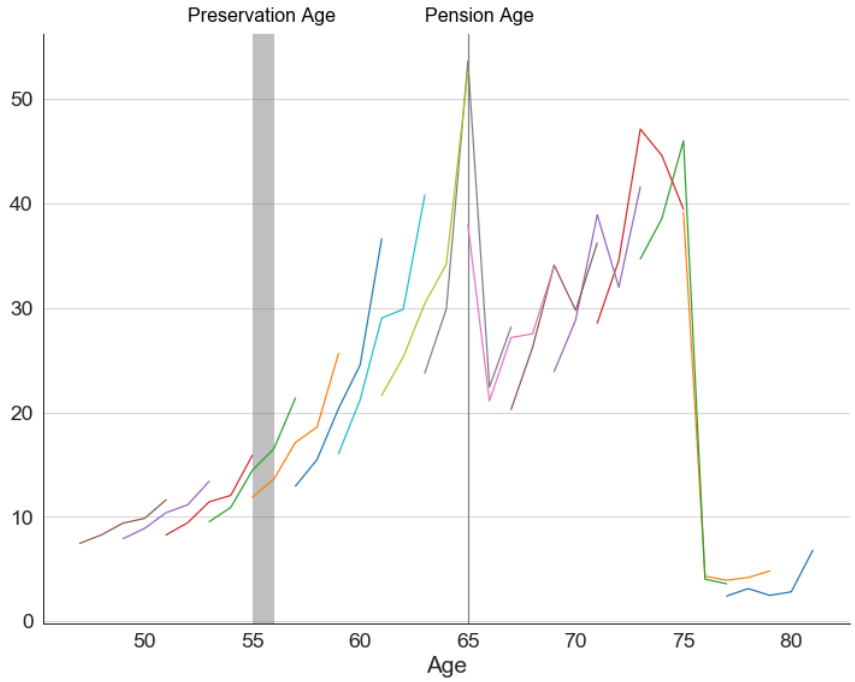


Figure 5: Average annual superannuation contributions 2016-17 among members with non-zero balances on 30 June 2013 ($A'000s 2017), every second one-year birth cohort born 1936-66



The amount that members contribute is estimated to ramp-up dramatically among cohorts that are close to the pension age. For example, among those born in 1952 who just meet the pension age by 30 June 2017, we estimate that their average contribution increases from around $21,626 per year to around $52,589 per year, which is around a 43% increase between 2012-13 to 2016-17. This is a dramatic increase that does not necessarily represent an increase in the savings rate, but possibly the diversion of wealth from other sources into superannuation to take advantage of concessional tax treatment of superannuation income in the draw-down phase. One way that wealth could be diverted is by liquidating assets to fund consumption, allowing a greater share of labour earnings to be diverted to superannuation. The ramp-up in contributions in the lead-up to retirement is apparent regardless of starting balances (Figure A.4), but is more pronounced for members whose balances are in the top 25%. For this group, although they may not be eligible for the pension, the pension age can still act as a psychological marker for a socially appropriate time to retire. The greater ramp-up in contributions among those in the top quartile suggests that those with greater superannuation balances to start with are more able to ramp-up contributions in the lead-up to retirement to take advantage of concessional tax treatment during the draw-down phase. Following the ramp-up in average contributions in the lead-up to pension age, there is an equally dramatic decline in average contributions after pension age, which coincides with increased rates of retirement.

Interesting, among those who remain attached to work after the retirement age, members again continue to increase their contributions over time in the lead-up to age 75, the maximum age at which people can legally contribute towards superannuation. Also of interest is the apparent kink in the increases in contributions over time, which coincides with the 2015-16 drop in superannuation returns. This kink is most noticeable amongst people who remain attached to work after the pension age, which again points to contributions at this time being driven more by expected returns from superannuation relative to other investments rather than members building their nest egg.

7. Super balances across occupations

As discussed above, a feature of ALife is being able to generate statistically robust estimates of population sub-groups. In Table 4, we present information on labour earnings (wages and salaries plus reportable employer superannuation contributions), contributions and superannuation balances by occupation subgroups for those who lodge a tax return in 2013-

14.[22] Despite the overall high coverage of superannuation among tax filers, an interesting result from Table 4 is that variation across occupations is highly related to skill level (and earnings). At one end of the spectrum, less than 5% of highly educated workers who are employed in professional jobs (excluding the occupational code "other professions") miss out on superannuation contributions. In contrast, around 15% of low skilled workers, such as labourers and food preparation assistants, miss out on superannuation contributions. The lower coverage among low-skilled workers is mostly likely because they are low paid and, when combined with casual intermittent employment, are more likely to earn less than $450 per month to qualify for the Superannuation Guarantee. Contributions as a share of earnings (excluding those with zero contributions) are relatively uniform across occupations at around the minimum, except for Protective Service Workers.

A point of note is that median contributions, as a share of labour earnings across most occupations, is close to the minimum Superannuation Guarantee (SG) in 2013-14 of 9.25%. However, it is important to stress that SG payment made by employers is calculated as a percent of Ordinary Time Earnings (OTE), not labour earnings. OTE is what employees are paid for their ordinary hours of work and excludes payments for overtime, which are part of labour earnings.[23] This is a likely reason why estimates of superannuation contributions as a share of labour earnings are less than employer responsibilities under the SG for some occupations.

The final column in Table 4 is the average balances of members who have non-zero balances by occupation. Given the relative consistency of the superannuation contribution rates as a share of labour earnings, the distributions across occupation groups appears closely linked to average labour earnings. However, it is worth keeping in mind that these are averages across all people with non-zero balances who filed a tax return in 2013-14. As shown in Figure A.1, discrepancies in super balances become much more pronounced as people approach retirement and these balances may not reflect differences in the size of the superannuation nest egg by occupation in retirement.

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[22] Information about occupation in ALife is captured via individual tax returns.

[23] Where there are no agreed hours of work and no pattern of customary, regular, normal or usual hours, all hours worked are treated as ordinary time hours.

Table 4: Average earnings, contributions and superannuation balances in ALife2016 by occupation for those who lodged a tax return in 2013-14[a]

ANZSCO classifications and codes	Average labour earnings[a]		Proportion with no contribution[b]		Median total contribution as a share of labour earnings[c]		Average balance of members with non-zero contributions	
	Female	Male	Female	Male	Female	Male	Female	Male
	$A2017	$A2017	%	%	%	%	$A2017	$A2017
Farm managers (12)	28,589	42,604	14.6	8.7	10.3	9.3	143,000	110,000
Hospitality managers (14)	44,468	62,092	4.1	5.0	9.4	9.3	64,764	108,000
Other managers (10,11,13)	70,190	101,000	4.9	6.3	10.0	9.9	153,000	240,000
Education professionals (24)	62,491	90,620	3.1	3.4	9.6	9.4	97,370	164,000
Health professionals (25)	59,084	94,150	2.8	2.2	9.4	9.5	83,433	176,000
ICT professionals (26)	53,965	65,275	1.6	1.6	9.8	10.3	124,000	182,000
Business professionals (22)	56,046	103,000	1.2	1.9	10.6	10.3	112,000	251,000
Legal professionals (27)	70,326	86,518	2.1	2.3	9.6	9.3	111,000	122,000
Design and engineering professionals (23)	57,407	72,860	2.5	4.9	10.4	10.9	102,000	168,000
Other professionals (20,21)	44,448	53,838	6.7	7.1	9.4	9.3	75,452	111,000
Auto & engineering trades (32)	46,806	75,861	1.8	2.3	9.8	9.3	70,333	130,000
Construction trades (33)	42,625	66,055	4.5	3.7	9.1	8.7	40,090	75,553
Electrotechnology trades (34)	30,442	47,782	10.3	9.7	9.2	8.9	30,303	48,727
Food trades (35)	57,250	72,500	2.6	3.5	9.5	9.0	79,689	96,888
Skilled animal and hort. Workers (36)	31,304	39,863	7.1	7.7	9.2	9.0	30,528	37,610
Engineering and ICT technicians (31)	29,132	38,917	5.8	5.3	9.3	9.2	36,511	61,066
Other trades and technicians (39)	30,854	57,176	7.4	5.0	9.3	9.1	36,590	92,285
Health and welfare support workers (41)	38,219	50,606	2.6	2.5	10.3	10.3	53,727	96,087
Carers and aides (42)	28,436	33,407	2.6	2.7	9.9	10.0	40,057	54,504
Hospitality workers (43)	20,922	25,267	10.3	8.7	9.1	9.1	16,073	21,844
Protective service workers (44)	61,163	65,643	2.8	3.3	12.9	12.3	96,803	131,000
Sports and personal service workers (45)	29,670	42,351	7.7	8.0	9.2	9.2	44,704	66,558
Clerks and administrative workers (50-59)	40,454	60,385	4.4	4.4	9.9	9.7	87,716	132,000
Sales and support workers (60-63)	25,833	39,938	7.7	7.5	9.4	9.2	33,148	54,520
Machine operators (70-72)	48,523	74,470	4.3	2.6	9.3	8.9	51,217	90,337
Road and rail drivers (73)	45,230	55,162	5.3	5.5	9.2	8.4	44,664	75,838
Storeperson (74)	33,289	41,243	3.8	2.8	9.2	9.1	35,291	55,209
Labourer (80)	25,365	25,762	16.3	8.6	8.8	8.4	14,129	27,203
Cleaners and laundary workers (81)	24,914	29,473	6.8	8.8	9.7	9.2	31,489	40,207
Construction and mining labourer (82)	50,247	59,577	8.3	6.3	9.1	8.4	43,917	56,021
Factory process worker (83)	31,647	42,918	5.3	4.3	9.1	8.8	36,917	54,274
Farm, Forestry and and garden worker (84)	23,018	31,387	12.2	9.9	9.2	9.2	29,845	46,162
Food preparation assistant (85)	20,625	17,062	13.2	19.1	9.4	8.8	20,959	9,124
Other labourer (89)	27,507	42,180	6.1	6.5	9.3	9.0	34,888	57,180
All	42,392	65,402	4.6	5.1	9.7	9.3	76,965[e]	114,731[d]

[a]Wages and salaries and employer reportable superannuation contributions. [b]Proportion of members with positive reported wages and salaries, but with no contributions in 2013-14. [c]Includes concessional and post-tax contributions, excluding members who made non-zero contributions. [d]These are different to figures reported in Table 1because balances in this table are for those who report a tax return in 2013-14.

8. Conclusions

The generation, curation and release of ALife data to trusted users (consistent with the UK's 'Five Safes Framework' adopted by the ABS), provides researchers with new opportunities in several domains of research.[24] The key advantages of ALife over survey data are the large number of observations that allow for robust sub-group analysis; avoidance of bias in responses related to social desirability of income and wealth reporting and the inclusion of administrative information that allows for the identification of groups affected by policy changes.

This study has showcased some of these advantages. Specifically, we bring to light potential bias associated with the over-reporting of superannuation balances by males in survey data, possibly due to the social desirability of wealth. By tracking cohorts over time according to their initial superannuation balances, we show remarkable differences in accumulation and deaccumulation behaviours by initial balance levels. Most importantly, we show stark differences in average balances and draw-down behaviour between members whose balances are in the bottom quartile compared to those whose balances are in the top. Importantly, these differences are more exaggerated for cohorts at pension eligibility age. This appears to be more because those with high initial balances are more able to park their wealth in superannuation to take advantage of the concessional tax treatment of superannuation income, rather than increased savings for retirement. This is reflected by large increases in contributions in the lead-up to the pension age and low rates of complete withdraw around pension age.

Based on comparison of the ALife sampling frame with the ABS's Estimated Resident Population data, our conclusion is that the sampling frame is highly representative of the Australian Census population. Similarly, characteristics of superannuation members with non-zero balances from the 10% sample are also highly consistent with the nationally representative HILDA survey that is commonly used to report national statistics (see for example Wilkins *et al.* 2019).

ALife, like all early-life datasets, is in the process of development. Two of the key areas that will be made available in future releases are the inclusion of family identifiers and a module of PAYG non-lodgers. These will further expand the use of ALife as a tool for household and labour market analysis.

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[24] The 'Five Safes Framework' was devised by the UK's Office of National Statistics.

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Appendix A: Superannuation balances and flows over time by 30 June 2013 balance quartile

Figure A.1: Average superannuation balances 2013-2017 among members with non-zero balances on 30 June 2013 ($A'000s 2017), every second one-year birth cohort born 1936-66 by 30 June 2013 balance quartile

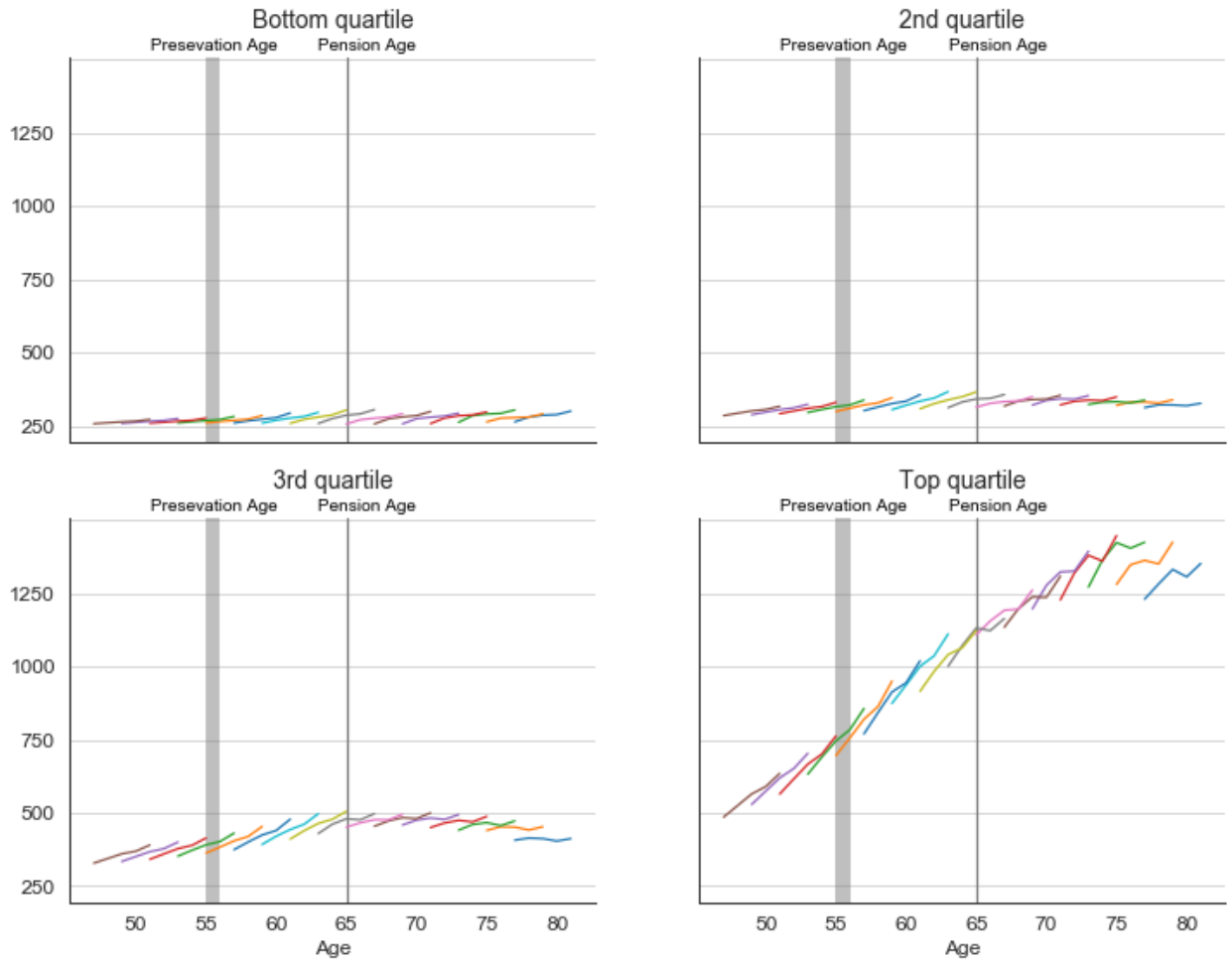

Figure A.2: Proportion of members with non-zero balances on 30 June 2013 who completely draw-down 2013-2017, every second one-year birth cohort born 1936-66 by 30 June2013 balance quartile

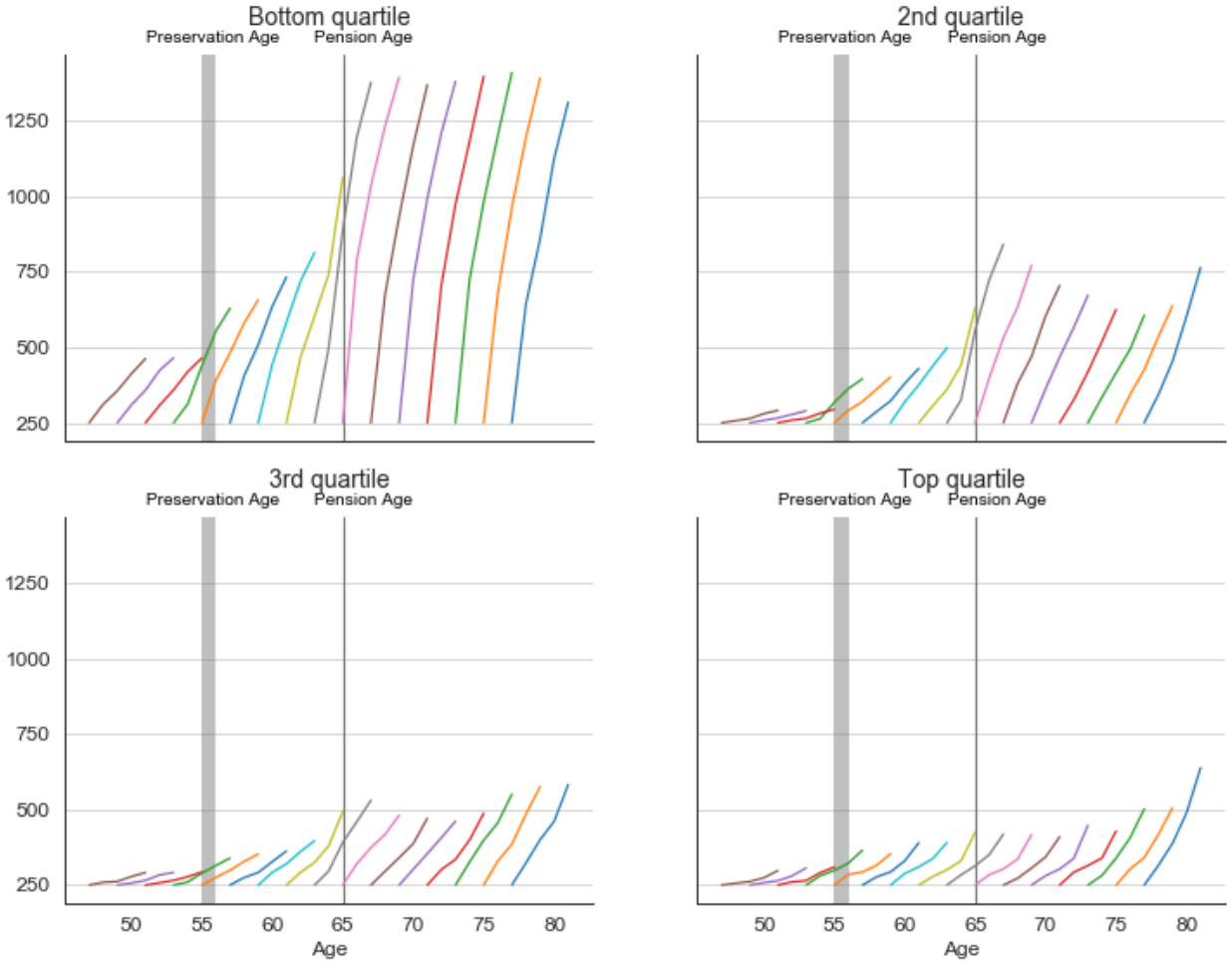

Figure A.3: Proportion of members with non-zero balances on 30 June 2013 who make superannuation contributions 2013-2017, every second one-year birth cohort born 1936-66 by 30 June 2013 balance quartile

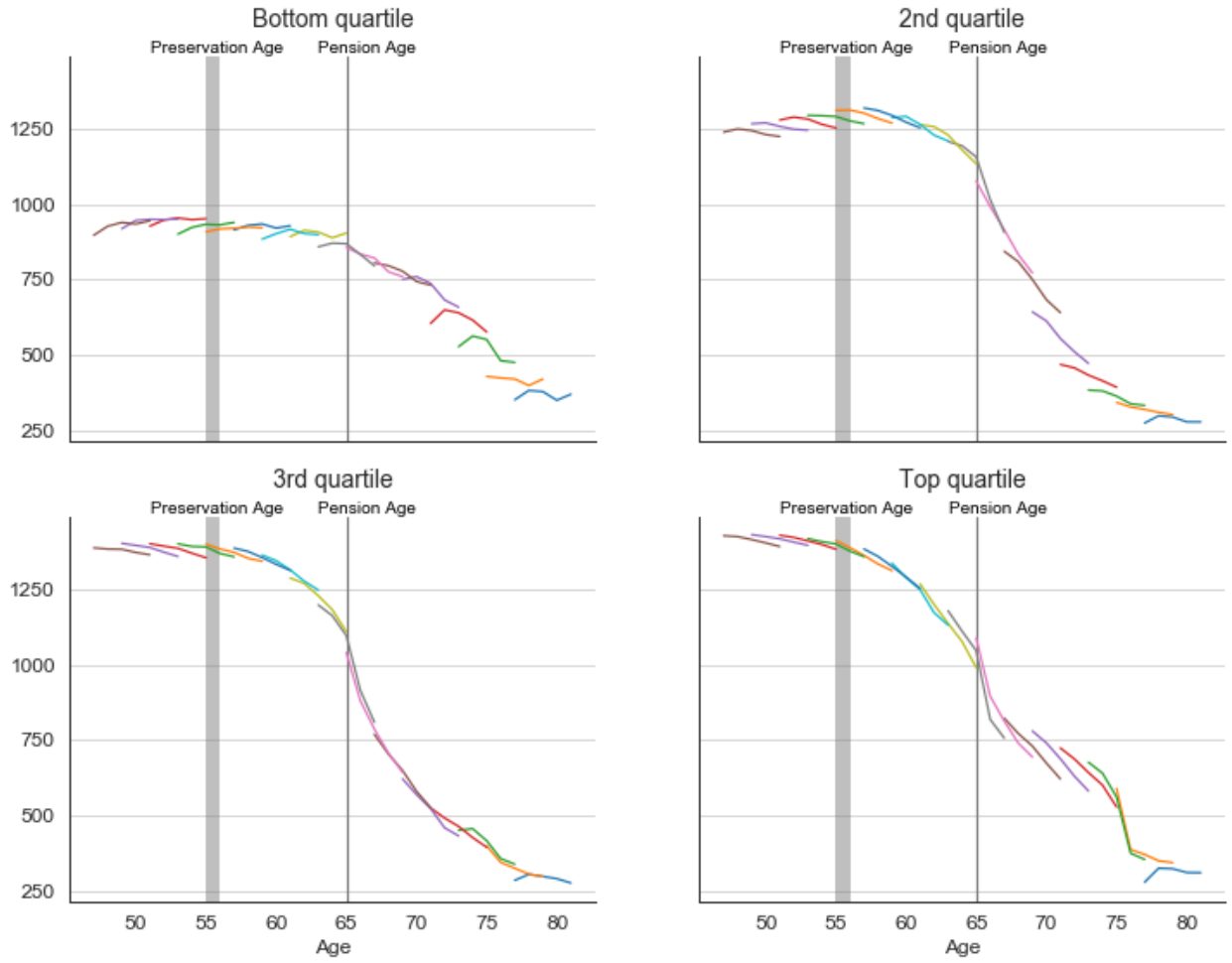

Figure A.4: Average annual superannuation contributions 2016-17 among members with non-zero balances on 30 June 2013 ($A'000s 2017), every second one-year birth cohort born 1936-66 by 30 June 2013 balance quartile