

# Individual Investors' Housing Income and Interest Rates Fluctuations

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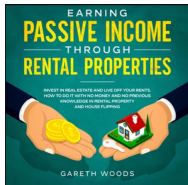
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## Motivation: Understanding Individuals' Housing Income

- Growing literature on investors in residential housing markets:
  - Speculators, house flippers (for example: *Bayer et. al. 2020 AER*)
  - Institutional investors in home rentals (for example: *Gurun et. al. 2022 RFS*)
  - Evidence that “small investors” in rentals are important (*Garriga et. al. 2023 REE*)

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  - Evidence that “small investors” in rentals are important (*Garriga et. al. 2023 REE*)
- **Limited evidence on individuals and their motivations for becoming landlords**
  - Rental properties are anecdotally a common investment for households
  - Popular Narrative: great “income-producing” asset



## Motivation: Interest Rates and Income

- When risk-free is low → investors' preferences for risky assets change
- Retirement-age investors shift to high-dividend stocks: **“Reaching for Income”**  
(Daniel et al. 2021, JF; Jiang and Zheng 2019, JME; Graham and Kumar 2006, JF; Di Maggio et. al 2020, JF)
  - They prefer using income (rather than capital gains) for consumption spending
    - Money is fungible, they should be indifferent between investment income and capital gains
    - But because of frictions and behavioral biases they prefer income-paying assets
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- **Rental properties might be attractive when reaching for income**
  - ▶ **Advantages**
    - ★ Income (rental yield) component is large share of returns (Demers and Eisfeldt 2022)
    - ★ Frequent (monthly) income payments
  - ▶ **Disadvantages**
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- **If retirees reach for rental income, there are important implications**
  - ▶ Housing Market effects: homeownership, prices, rents, affordability, risk, ...
  - ▶ Investing in a rental has major effects on income composition and portfolio allocation

## Our Paper

### 1 Stylized facts on ownership of rental properties (2003 to 2019):

- Based on confidential data on individual tax filings from the Australian Tax Office
- Share of landlords among middle-income retirees ↑ 80% (relative) since 2006-2007
- Increase in share of landlords is associated with interest rate cuts

### 2 Evidence that reaching for income is channel driving ↑ retiree landlords:

- Test reaching for income against alternative explanations
- Using observational data and two surveys we administered to small landlords

### 3 Implications of reaching for income:

- **Housing Market:** Reduction in homeownership rate
- **Household Income:** Higher exposure of retirees' income to local shocks

### 4 Quantitative Portfolio Model:

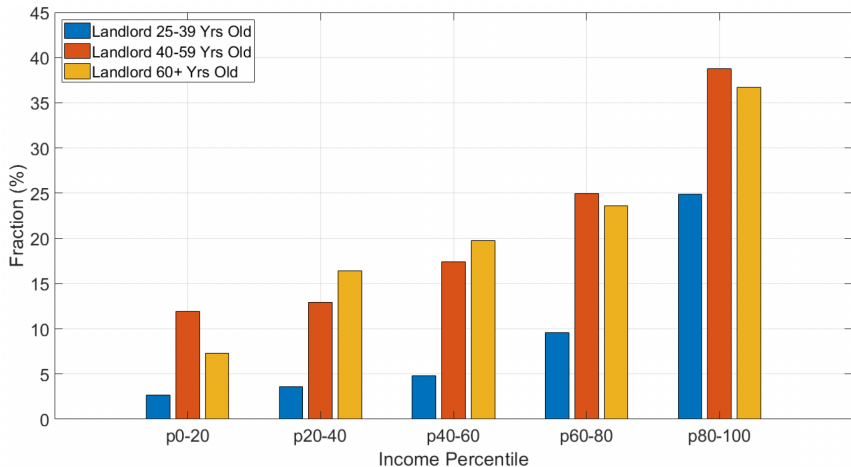
- Incorporate preference for consuming income
- Formally study trade-offs faced by middle-income retiree landlords
- House lumpiness and trading costs vs higher investment income

## Why Australia?

- 1 Data:** Individuals directly own properties and report rental income and expenses
  - ▶ In U.S. even individuals frequently use legal entities (LLC) for investments
  - ▶ Australia has no joint filing, we can observe demographics of owners
  - ▶ Complemented with housing market data on buy-to-let activity
- 2 Setting:** Low-interest rate regime not triggered by housing crisis (unlike U.S.)
  - ▶ Period of steady house price growth
  - ▶ Similar to Germany, Canada, and Chile

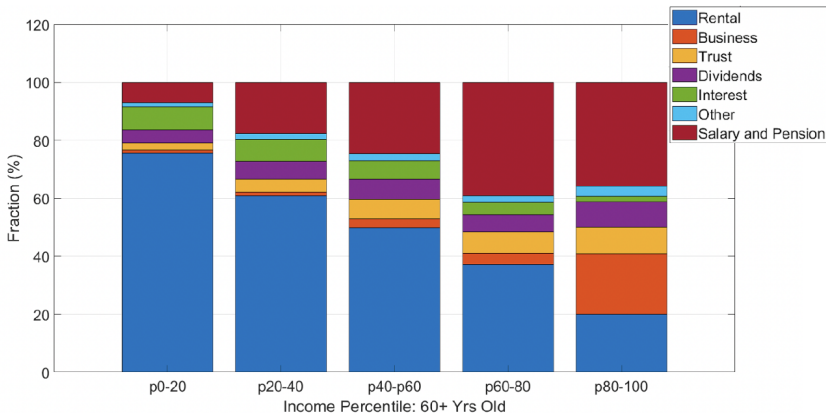


## Share of Landlords is Large Among Retirees (2017-2019)



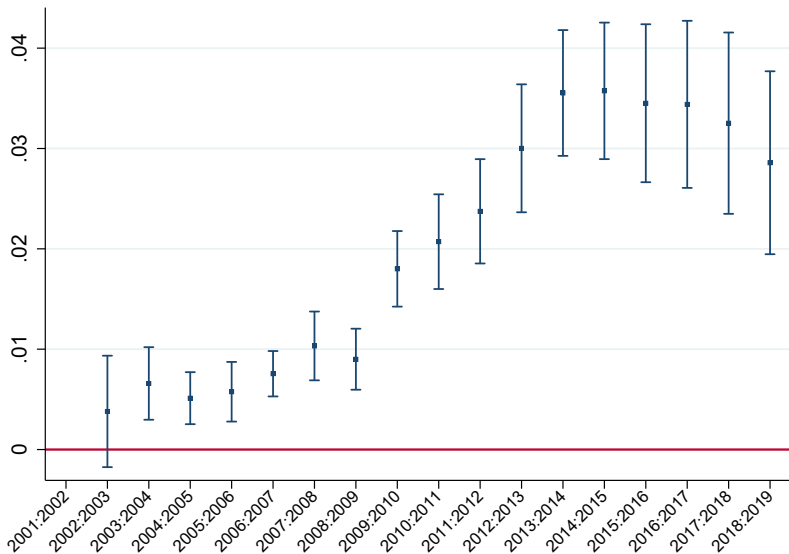
- Landlords are common also among middle-income groups

## Income Composition for Retiree Landlords (2017-2019)

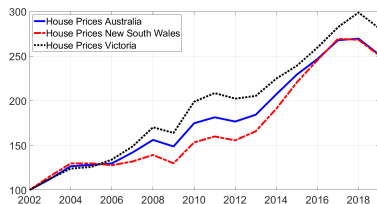
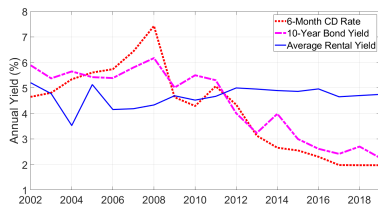


- Rental income 50% of total income for the median-income group
- 80% for the bottom quintile, 20% for top quintile

## Change Over Time in Landlord Share (2001-2002 Baseline is 13%)



## Interest Rates, Rental Yields, and Housing



- Substantial drop in interest rates, led by central bank policy and macro-trends
- Little change in rental yields (rent/price), and no housing crisis

## Share of Landlords and Interest Rates

We use tax filings data at the level of postcode  $i$  and year  $t$  to estimate:

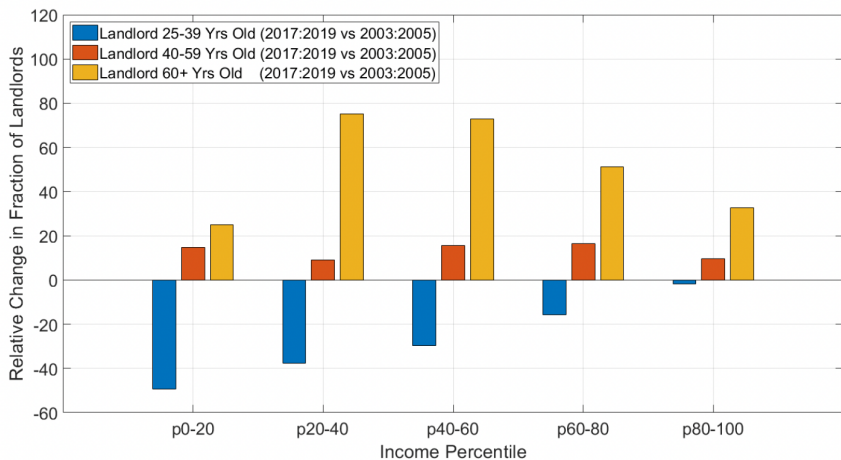
$$FracLL_{i,t} = \gamma y_t + \beta X_{i,t} + \alpha_i + e_{i,t}$$

- $FracLL_{i,t}$  share of local residents who are landlords
- $y_t$  is money market rate (6m CDs) or government bond yield
- $X_{i,t}$  vector of time varying (macro and postcode-level) controls,  $\alpha_i$  postcode FE

CD <sub>6m</sub>	-0.614*** (-10.30)		
Bond <sub>2yr</sub>		-0.705*** (-10.26)	
Bond <sub>10yr</sub>			-0.894*** (-6.80)
Postcode HP	-0.006*** (-3.21)	-0.006*** (-3.23)	-0.008*** (-3.42)
Mtg Credit Spread	0.428*** (3.71)	0.158 (1.15)	-0.164 (-0.67)
Postcode FE	YES	YES	YES
Macro-Controls	YES	YES	YES
$R^2_{adj}$	0.907	0.907	0.901
N	30,690	30,690	30,690

- Effect of rates: 1% drop in rates increases landlord fraction by 0.6-0.9%

## Relative Change (2003 → 2019) in Share of Landlords by Age and Income



- **Largest for retirement-age, median-income: share goes from 12% to 21%**
  - This is >80% relative change

## Stylized Facts Line-up with Predictions of Reaching-for-Income

- Substantial drop in interest rates, led by central bank policy and macro-trends
- Little change in rental yields (rent/price), and no housing crisis
- In 2009-2016, investors with “income preference” will find rentals ↑ attractive
- In 2009-2016, the share of retiree landlords (especially middle-income) increases
- Middle-income retirees most reliant on investment income for consumption
  - \* For younger groups wages/salaries > investment income
  - \* High-income retirees have income from Trusts and Businesses

## Reaching for Income vs Competing Mechanisms

### (1) Price Growth: Beliefs and Wealth

- 1 Extrapolation of future price growth (*Armona et al. 2018*)
  - 2 Relaxation of constraints or risk-taking induced by higher wealth
- Results not consistent with these channels:
    - Local (postcode) price growth is negatively correlated with share of landlords
    - We find no effects for speculative (flipping) investment
    - Survey evidence: retirees rank rental income higher than capital gains



## Reaching for Income vs Competing Mechanisms

### (2) Cost of Debt and/or Underwriting standards

- Drop in cost of debt, and/or relaxation of lending standards
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### (3) Reaching for Yield (Higher Total Returns)

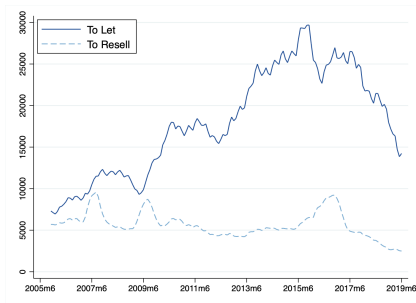
- Cuts in interest rates push investors towards high-risk/high-return assets
  - ▶ Lab evidence for financial assets (*Huau and Lai 2019 JFE and Lian et. al. 2018 RFS*)
  - ▶ Evidence for real estate vs bonds from the 1600s (*Korevaar 2022 JFE*)
- Results not consistent with this channel:
  - This mechanism does not predict stronger responses by retirees
  - Investment in rentals is higher in postcode with higher rental income
  - Retirees systematically extract higher taxable income than other groups
  - Survey evidence: retirees are motivated by rental income
  - Survey evidence: retirees use rental income for consumption
  - Survey evidence: retirees used saving accounts (↓ interest) to pay for rentals

## Investment Activity: Buy-to-let vs Buy-to-resell

- Construct measures of rental and speculative investment in the listings data:
  - ▶ **Buy-to-let:** house bought and re-listed as rental within 9 months
  - ▶ **Buy-to-resell (house flips):** house bought and re-listed for sale within 9 months

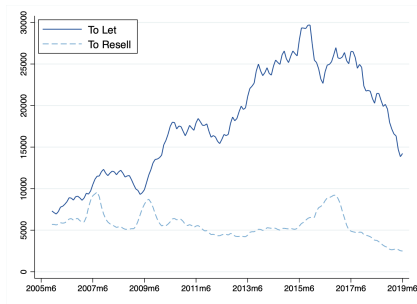
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- If favorable lending or price effects are stimulating investment:
  - ▶ We should observe also an increase in house flips (speculation)
  - ▶ **Instead, pattern is present only for buy-to-let ✓**



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- **Buy-to-Let volume also responds at high frequency to policy shocks on rates** ✓
  - Rate shocks:  $\Delta$  in bond yields around monetary policy announcements
  - Local projections approach (*Jorda 2005 AER, Moller and Wolf 2021 ECMA*)

## Heterogeneity Across Locations (Postcodes)

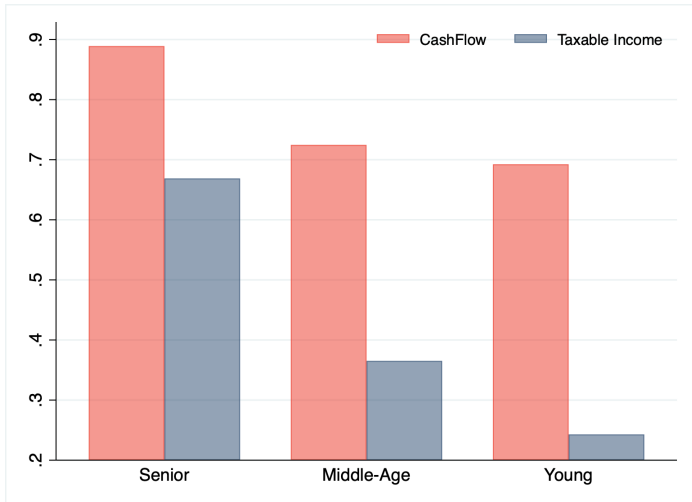
- Effects are heterogeneous across locations

$$Y_{i,t} = \gamma (y_t \times X_{2005,i}) + \beta_X X_{i,t} + \alpha_t + \alpha_i + u_{i,t}$$

	Share of Landlords			Share of Buy-to-Let		
$CD_{6m} \times Senior_{2005}$	-0.012*** (-5.60)					
$Bond_{2yr} \times Senior_{2005}$		-0.013*** (-6.27)				
$Bond_{10yr} \times Senior_{2005}$			-0.016*** (-7.02)			
$CD_{6m} \times RY_{2005}$				-0.535*** (-2.74)		
$Bond_{2yr} \times RY_{2005}$					-0.583*** (-2.85)	
$Bond_{10yr} \times RY_{2005}$						-0.748*** (-2.99)
Other Controls	YES	YES	YES	YES	YES	YES
$R^2_{adj}$	0.91	0.91	0.91	0.57	0.57	0.57
N	30507	30507	30507	17540	17540	17540

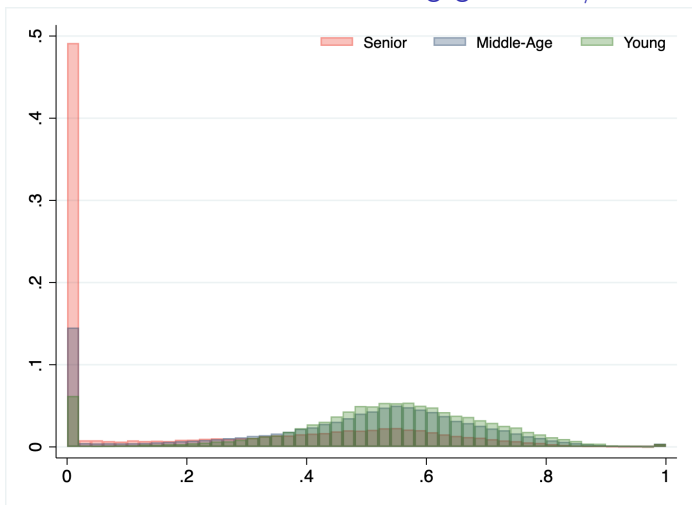
- Higher increase in share of landlords in areas with older residents ✓  
 $Senior_{2005}$  = Fraction (%) of Retirees in Residence postcodes (2005 demographics)
- Higher buy-to-let volume in areas with high rental-yield ✓  
 $RY_{2005}$  = Rental Yield (%) in Investment locations (yield over 2000-2005)

## Evidence from Individual Tax Records: Positive NET Rental Income



- Retirees are more likely to earn positive income after expenses ✓
- Other age groups have different behavior ✓

## Evidence from Individual Tax Records: Mortgage Interest/Total Expenses



- Retirees make limited use of leverage ✓
- Other age groups have different behavior ✓



## Samples and Structure

- Two surveys and two samples of landlords:
  - 1 Members of the Australian Landlords Association (ALA): small individual landlords
    - ★ Targeted 900 individuals: Response rate 32.89%, attrition rate 11%
  - 2 Qualtrics proprietary panel of Australian households
    - ★ Targeted retiree landlords; total of 240 respondents

## Samples and Structure

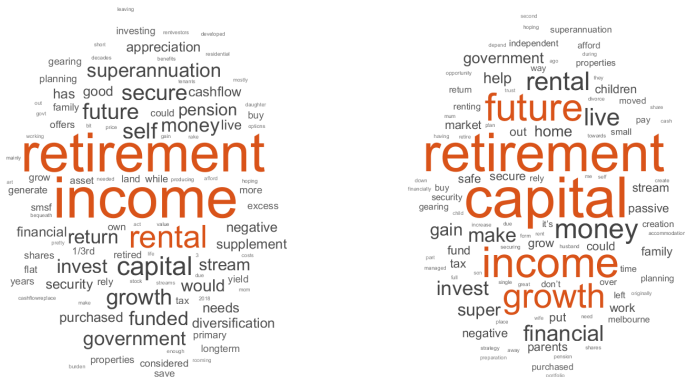
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- Structure of surveys:
  - ▶ Section 1A: Filter, ask if purchased rental in period 2006-2019
  - ▶ [Section 1B: Mechanism-Specific tests](#)
  - ▶ Sections 2 and 3: Risk-aversion, financial literacy, age, income, other characteristics

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- **Mechanism Tests in ALA Survey: Motivation for Purchasing a Rental Property**
  - ▶ Open-ended question and close-ended scoring questions
- **Mechanism Tests in Qualtrics Survey: Predictions of Reaching for Income**
  - 1 Preference for rental income (open and close-ended questions)
  - 2 How rental income is used
  - 3 Reallocation of wealth from interest saving accounts to real estate

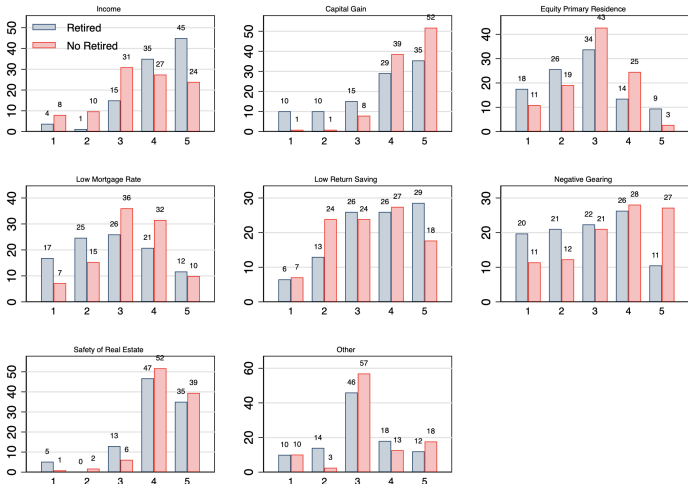
## ALA Survey: *Why did you buy?* Open-Ended Question

- Word clouds for Retirees (left) and Non-Retirees (right)



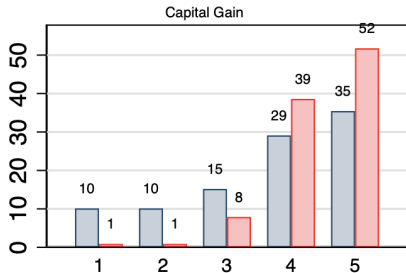
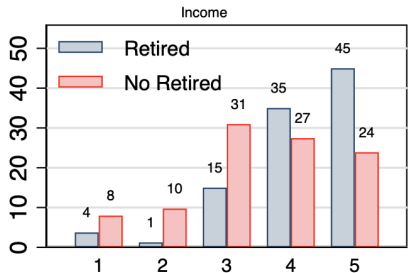
- Keyness scores (*Gabrielatos 2018*) and topic analysis confirm:
  - Income (or Income topic) is more frequent for Retirees
  - Capital (or Capital Gains topic) is more frequent for Non-Retirees

## ALA Survey: *Why did you buy?* Scoring Questions



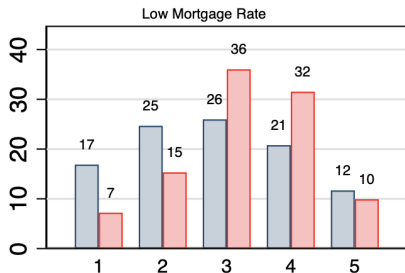
**X-axis:** Score Assigned to Motive (1 to 5); **Y-axis:** Number of Respondents

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## ALA Survey: Close-Ended Questions, Formal Tests

- If reaching for income drives retirees' behavior
  - Retirees should rank **"Income"** motive higher than non-retirees
- Test for difference in scores between groups (Wilcoxon rank-sum)

Motive	T-stat	
Income	<b>4.127***</b>	0.000
Low Return on Saving	<b>1.892*</b>	0.058
Capital Gains	<b>-3.653***</b>	0.000
Negative Gearing	<b>-3.116***</b>	0.002
Equity From Residence	<b>-1.429</b>	0.153
Low Mortgage Rate	<b>-2.169**</b>	0.030
Safety Real Estate	<b>-1.410</b>	0.158
Other	-0.907	0.364

- **"Income"** and **"Low Return on Savings"** have higher scores for retirees
- Other motives (*capital gains, taxation, mortgage rates, etc.*) are more important for non-retirees than for retirees



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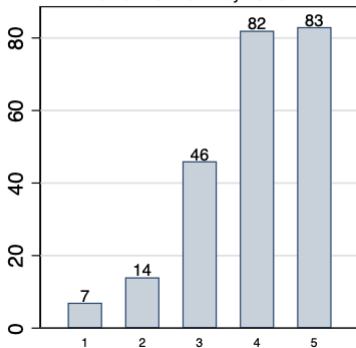
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- Test for difference in scores within groups (Wilcoxon signed-rank)

Motive	Non Retiree		Retiree	
	T-stat	P-value	T-stat	P-value
<b>Income</b>				
Capital Gains	<b>-6.146***</b>	0.000	<b>2.084**</b>	0.037
Negative Gearing	-0.215	0.830	<b>6.198***</b>	0.000
Equity From Residence	4.081***	0.000	<b>7.116***</b>	0.000
Low Mortgage Rate	1.877*	0.060	<b>6.416***</b>	0.000
Low Return on Saving	1.610	0.107	<b>3.21***</b>	0.001
Safety Real Estate	<b>-5.312***</b>	0.000	0.927	0.354
Other	1.699*	0.089	5.476***	0.000

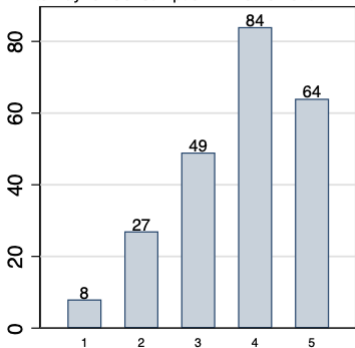
- For retirees, **"Income"** has higher ranking than all competing mechanisms
- For non-retirees, **"Income"** is dominated by **"Capital Gains"**

## Qualtrics Survey (Retirees Sample): Income Motive, and Income Use

How Important Was to Earn Investment Income, in the Form of Rent Payments?



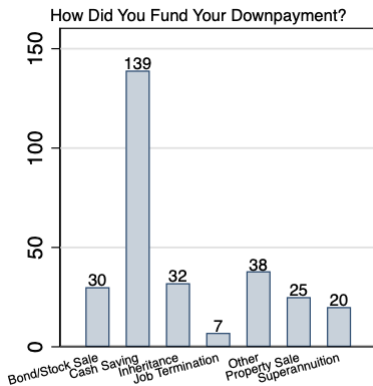
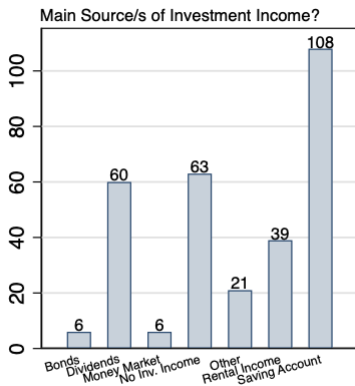
Rental Income Convenient Way to Pay for Consumption in Retirement?



**X-axis:** Score Assigned to Motive (1 to 5); **Y-axis:** Number of Respondents

- Retirees rate income motive as important (consistent with previous results) ✓
- Rental income is important as a way to pay for consumption needs ✓

## Qualtrics Survey (Retirees Sample): Wealth Reallocation



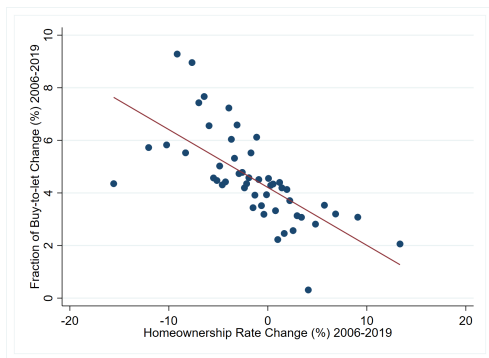
**X-axis:** Score Assigned to Motive (1 to 5); **Y-axis:** Number of Respondents

- Saving accounts were main source of investment income before purchasing rental ✓
- Rental property is purchased with cash from saving accounts ✓

## Reaching for Income and Homeownership

- Increase in landlords and rental investments may affect homeownership rates
  - Unless landlords purchase from other investors or from developers
- Empirical evidence: Rates  $\downarrow \rightarrow$  share of small landlords  $\uparrow \rightarrow$  homeownership  $\downarrow$ 
  - In buy-to-let, as rates  $\downarrow$  buyers increasingly purchase from owner-occupiers
  - In ALA/Qualtrics survey, purchase from owner-occupier is main source of rentals

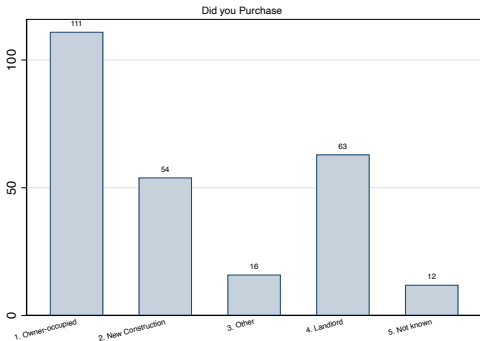
### Aggregate Effects: Postcode-Level $\Delta$ Buy-to-Let and $\Delta$ Homeownership



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Surveys: ALA (virtually identical results for Qualtrics)



## Reaching for Income and Homeownership

$$\mathbb{1}(\text{Owner-Occupied})_i = \beta y_t + \mathcal{B}_X X_{p,t} + \alpha_p + \tau_t + \epsilon_i$$

	(1)	(2)	(3)	(4)	(5)	(6)
	<b>Panel A: OLS</b>			<b>Panel B: Logit</b>		
<b>CD<sub>6m</sub></b>	-0.338* (-1.66)			-2.824*** (-3.49) [-0.702]		
<b>Bond<sub>2yr</sub></b>		-0.507** (-2.48)			-3.642*** (-4.66) [-0.906]	
<b>Bond<sub>10yr</sub></b>			-0.387* (-1.67)			-3.322*** (-3.73)
Controls	YES	YES	YES	YES	YES	YES
Postcode FE	YES	YES	YES	YES	YES	YES
Year-Month FE	YES	YES	YES	YES	YES	YES
R <sup>2</sup> <sub>adj</sub>	0.024	0.024	0.024	0.014	0.02	0.017
N	276163	276163	276163	276191	276191	276191

- As rates drop, likelihood that buy-to-let is purchased from owner-occupier increases

## Conclusions

- There is still limited evidence on individual investors in housing rentals
  - Popular form of investment
  - Small investors are main player in rental markets in most countries
- **We study how ↓ in interest rates affect the decision to become a landlord**
- Using unique data and setting from Australia, we find that:
  - 1 **Effects are large (share of landlords increases 13% → 17%)**
  - 2 **Driven by retirees (80% increase in share of middle-income retiree landlords)**
  - 3 **Reaching for Income is a key mechanism (based on observational data + surveys)**
- **Increase in the share of landlords has aggregate implications:**
  - **Decrease in the homeownership rate**
  - Increase in the riskiness of retiree's income
  - **New channel through which rates affect housing markets and retirees**

## Reaching for Income and Income Volatility

- Landlords typically own few rental properties, close to their residence
  - Evidence from *Australian Survey of Income and Housing*, and our own surveys
  - Landlords are undiversified and exposed to local shocks
- **Can we quantify retiree landlords' additional exposure to local shocks?**
- Use data from Western Australia: Local economy tied to Iron Ore Exports to China
- Fluctuations in Iron Ore price have
  - Low correlation with Stock market and Australian Economy
  - Strong effects on local growth and employment



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- Landlords typically own few rental properties, close to their residence
  - Evidence from *Australian Survey of Income and Housing*, and our own surveys
  - Landlords are undiversified and exposed to local shocks
- **Can we quantify retiree landlords' additional exposure to local shocks?**
- Use data from Western Australia: Local economy tied to Iron Ore Exports to China
- Fluctuations in Iron Ore price have
  - Low correlation with Stock market and Australian Economy
  - Strong effects on local growth and employment
- Effect of 10% iron price shock on income for **retirement-age non-landlords**:  
→ **0.01%; not-significantly different from 0**
- Effect of 10% iron price shock on income for **retirement-age landlords**:  
→ **1.7%; 2× the sensitivity of middle-age non-landlords to the same shock**

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- Formalize “preference for income” and how it affects decision to be a landlord
- Simple model; CRRA ( $\gamma = 5$ ,  $\beta = 0.98$ ) calibrated to 2017-2019 data
  - Retiree of age 65, who dies at age 83; chooses consumption and asset allocation
  - Risk-free rate = 2%, Yield on financial assets = 2%, (Net) Rental yield = 4.5%
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- **Model solved for landlord and non-landlord; rental property is:**
  - **Attractive because of diversification opportunity**
  - **Unattractive because of lumpiness + transaction costs**
  - **Attractive because for same invested wealth gives higher  $\text{TotIncome}$**

## Landlord and Non-Landlord Utility

**Discounted Utility Gap:** Normalized gap between  $V_{L,t0}$  and  $V_{NL,t0}$  (if  $>0$ ,  $L$  better off)

Age 65, Income = 40,000 AUD, Rental Property Price = 400,000 AUD

Blue Bars gap driven only by effect of rental on asset allocation; Red Bars also incorporate transaction cost



For median levels of wealth, being a landlord is optimal only if  $\phi > 0$