

# Negative Gearing and Welfare: A Quantitative Study of the Australian Housing Market

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*“We haven’t got any plans to review the policy (negative gearing) we took to the election. Can I just say to you that the issue of housing affordability is overwhelmingly a question of supply.”*

Malcolm Turnbull, PM of Australia

*“... deep down in the core of the Turnbull government, they know that if they want to resuscitate the Australian dream of owning your own home, they need to act on negative gearing.”*

Bill Shorten, Opposition Leader

# Negative gearing in Australian housing market

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Figures: Negative Gearing

# Negative gearing in Australian housing market

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- **Negative gearing:** Landlords deduct **housing investment losses** from **gross income** at their marginal rates
- Arguments **for**
  - facilitate construction of new houses
  - stimulate **supply of rental housing**
  - help renters with affordable shelter services
- Arguments **against**
  - most housing investment is to purchase **established properties**
  - possibly worsen **inequality**
  - additional **upward pressure** on house prices

Figures: Negative Gearing

## This paper

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  - endogenous house prices and rents
  - income tax code and negative gearing for housing investment

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- **Model:** General equilibrium OLG model with incomplete markets and heterogeneous agents
  - uninsurable idiosyncratic income shock
  - endogenous house prices and rents
  - income tax code and negative gearing for housing investment
- **Calibrate:** Match **life-cycle profiles** from micro-data and **moments** of Australian housing market
- **Simulate:** Compare **stationary equilibria** with and without negative gearing

# Main findings

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## Repealing negative gearing

- Improves housing affordability and increases homeownership rate
  - lower house prices and higher rents  $\Rightarrow$  lower price-to-rent ratio
- Reduces housing investment
  - aggregate rental supply and landlord rate fall
  - most of young landlords with high earning driven out of the market



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- Reduces housing investment
  - aggregate rental supply and landlord rate fall
  - most of young landlords with high earning driven out of the market
- Overall welfare gain of 1.5% and 76% of households better off
  - redistribution plays a key role for welfare gain
  - with redistribution, renters are winners and landlords are losers

# Model

# Demographics

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- Unit-mass of **finitely-lived** households
- Live and work for  $a = 1, 2, \dots, 14$  periods
  - the model period is 5 years
  - households enter the economy at age 21 and exit at age 90
- Age-dependent survival rate,  $\kappa_a$  with  $\kappa_{14} = 0$

## Preferences

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- Expected **life-time utility** of household

$$\mathbb{E}_0 \left[ \sum_{a=1}^{14} \beta^{a-1} \kappa_a u_a(c_a, \tilde{h}_a) \right], \quad \beta \in (0, 1)$$

$c$ : non-durable consumption;       $\tilde{h}$ : housing services

- Utility function

$$u_a(c, \tilde{h}) = \frac{[c^\alpha (\lambda \tilde{h})^{1-\alpha}]^{1-\sigma}}{1-\sigma}, \quad \alpha, \sigma \in [0, \infty)$$

$\lambda > 1$  for **homeowners**;       $\lambda = 1$  for **renters**

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- **Accidental bequest**: assets of deceased households equally distributed to surviving households

# Housing

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- Housing services  $\tilde{h}$  can be obtained by **purchasing** or **renting**
- Households can **buy** at price  $p$  or **rent** at  $p^r$  per unit
- Households become
  - **landlords** if  $h > \tilde{h} > 0$
  - **owner-occupiers** if  $h = \tilde{h} > 0$
  - **renters** if  $\tilde{h} > h = 0$
- Renters can live in houses that are smaller than the minimum housing size available to homeowners
- No renter-landlords

## Housing as risky asset

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- Sales of housing asset subject to **idiosyncratic house price shock**  $\omega \in \Omega$
- Ex-ante expected capital gain is zero  $\Rightarrow \mathbb{E}(\omega p) = p$
- $\omega$  not realized until house is sold
  - households know unconditional probability of the shock  $\pi_\omega$

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- $\omega$  not realized until house is sold
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- Competitive construction firm buys from **selling households** and sell old and new houses to **purchasing households** at price  $p$



## Maintenance and transaction costs

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- Homeowners bear maintenance expense at constant rate  $\delta$
- Landlords incur additional (fixed) expense  $\zeta$
- Linear transaction costs

$$TC(h_{-1}, h) = \begin{cases} 0 & \text{if } h_{-1} = h \\ \phi^b p h + \phi^s (\omega p) h_{-1} & \text{if } h_{-1} \neq h \end{cases}$$

## Borrowing and saving

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- Households can save by holding a risk-free asset  $s' > 0$  that pays interest  $r$
- Households can borrow  $s' < 0$ , subject to a **collateral constraint**

$$s' \geq -(1 - \theta)ph$$

- Borrowing also requires
  - downpayment  $\theta$
  - interest payment at rate  $r + m$

## Taxation and transfers

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- Net rental income

$$NRI \equiv \left[ (p^r - p\delta)(h - \tilde{h}) - \zeta + (r + m)s \left( \frac{h - \tilde{h}}{h} \right) \mathbb{I}_{\{s < 0\}} \right] \mathbb{I}_{\{h > \tilde{h}\}}$$

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- Total taxable income

$$Y = y_a + rs\mathbb{I}_{\{s > 0\}} + NRI$$

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- If  $NRI < 0$ , **negative gearing** applies
- **Counter-factual policy** experiment by setting

$$Y = y_a + rs\mathbb{I}_{\{s > 0\}} + NRI\mathbb{I}_{\{NRI > 0\}}$$

- Progressive income tax system
- Receive lump-sum transfers  $F$

## Government and construction sector

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- **Government** collects tax  $T(Y)$ , sells assets of deceased households  $R$ , and distributes lump-sum transfers  $F$

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- Competitive **construction firm**
  - buys existing houses from selling households
  - develops unoccupied land  $L$  at constant price
  - sells old and new houses at market price  $p$
- Solves static problem

$$H^{\text{new}} = \max_L \{ p\psi_1 L^{\psi_2} - L \}$$

which gives the law of motion for the **aggregate housing supply**

$$H = H_{-1}(1 - \delta) + H^{\text{new}}$$

- Housing supply elasticity given by  $\varepsilon = \frac{\psi_2}{1-\psi_2} \in [0, \infty)$



## Parameterization overview

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- Earnings process **estimated** from the HILDA survey
  - gross income that includes **pensions** and other **social benefits** but excludes any **investment income**
- Tax function calibrated to the current Australian income tax system
- House price shock quantified from the SIH
- Discretize state space for housing

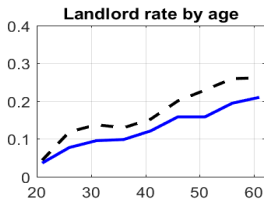
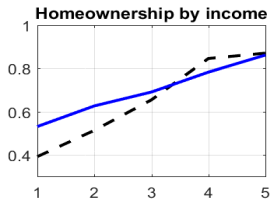
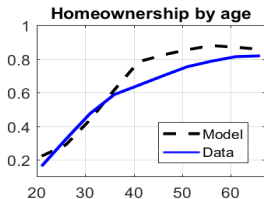
$$h \in \{h(1), \dots, h(K)\}$$

$$h^{\text{rent}} \in \{h^{\text{rent}}(1), \dots, h^{\text{rent}}(J), h(1), \dots, h(K)\}$$

- Preference parameters and landlord fixed cost calibrated internally

# Model fit

- Homeownership and landlord rates over life-cycle and income quintiles



# Simulation

## Steady state

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	Baseline	No NG $\varepsilon = 2$
Price	1.180	1.160
Rent	0.164	0.168
Price-rent ratio	7.209	6.907
Frac. of homeowners		
Frac. of owner-occupiers		
Frac. of landlords		
Frac. of renters		
Rental supply (relative to housing supply)		
Aggregate housing supply (normalized)		
Transfers		
Debt to income ratio		

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Price	1.180	1.160
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Price-rent ratio	7.209	6.907
Frac. of homeowners	0.667	0.722
Frac. of owner-occupiers	0.500	0.584
Frac. of landlords	0.167	0.138
Frac. of renters	0.333	0.278
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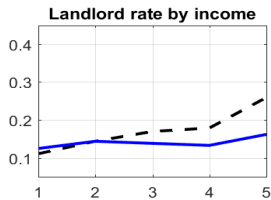
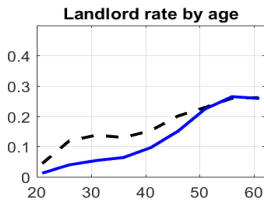
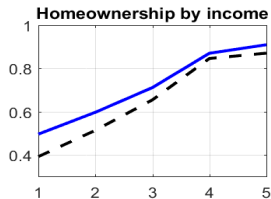
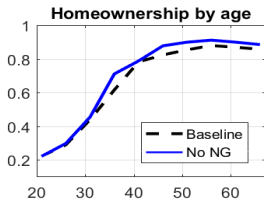
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Rental supply (relative to housing supply)	0.263	0.184
Aggregate housing supply (normalized)	1	0.987
Transfers		
Debt to income ratio		

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Aggregate housing supply (normalized)	1	0.987
Transfers	0.229	0.236
Debt to income ratio	0.356	0.304

# $\Delta$ in homeownership and landlord rates





# Welfare Analysis

## Welfare criterion

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- Consumption equivalent variation (CEV)
  - percentage change in **current consumption of non-durables** that equates expected discount utility in **counterfactual vs. baseline**

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- Formally

$$V^{nong}(x) = \sum_{\omega \in \Omega} \left\{ \pi_{\omega} \left[ u \left( c_{\omega}^*(x) + cev, \tilde{h}_{\omega}^*(x) \right) + \beta \kappa_a \mathbb{E}_{z'|z} V^{ng}(x'_{\omega}^*(x)) \right] \right\}$$

for any  $x \equiv (a, s, h_{-1}, z)$

$c_{\omega}^*(x), \tilde{h}_{\omega}^*(x), x'_{\omega}^*(x)$ : optimal decision rules in **baseline economy**

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$c_{\omega}^*(x), \tilde{h}_{\omega}^*(x), x'_{\omega}^*(x)$ : optimal decision rules in **baseline economy**

- Positive CEV  $\Rightarrow$  the household **better off** in **counterfactual economy**

## Welfare: price vs. redistribution effects

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Simulate counterfactual economy under two scenarios:

1. No negative gearing **without** redistribution (*price effect*)
  - keep the **same transfer payment** to baseline economy
2. No negative gearing **with** redistribution (*redistribution effect*)
  - the government **distributes all its revenue**

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*Note:* There are no price and quantity differences across the steady states

## Redistribution key channel for welfare gain

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	Mean <i>CEV</i>	Median <i>CEV</i>	$P(CEV > 0)$
Price effect	-0.026	-0.007	0.325
Redistribution effect	0.015	0.047	0.756

## Welfare effects by housing tenure

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Initial Housing Tenure	Mean <i>CEV</i>	Median <i>CEV</i>	$P(CEV > 0)$
Renter	0.049	0.051	0.776
Owner-occupier	-0.015	0.036	0.776
Landlord	<b>-0.099</b>	<b>-0.018</b>	<b>0.455</b>



## Welfare effects by housing tenure and income

Initial Housing Tenure	Median <i>CEV</i> Income Quintile				
	<i>Q1</i>	<i>Q2</i>	<i>Q3</i>	<i>Q4</i>	<i>Q5</i>
Renter	0.059	0.057	0.051	0.049	0.053
Owner-occupier	0.025	0.036	0.036	0.037	0.039
Landlord	0.027	0.009	<b>-0.014</b>	<b>-0.072</b>	<b>-0.363</b>

Initial Housing Tenure	$P(CEV > 0)$ Income Quintile				
	<i>Q1</i>	<i>Q2</i>	<i>Q3</i>	<i>Q4</i>	<i>Q5</i>
Renter	0.812	0.782	0.732	0.915	0.944
Owner-occupier	0.672	0.704	0.782	0.788	0.858
Landlord	0.718	0.544	<b>0.475</b>	<b>0.374</b>	<b>0.106</b>

## Summary

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- Built a quantitative model to explore the effects of **negative gearing tax on welfare** of Australian households

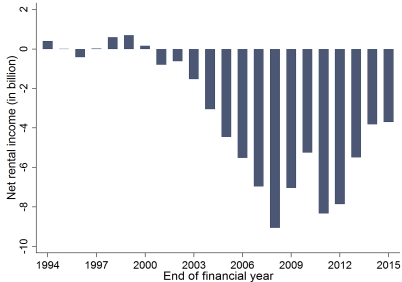
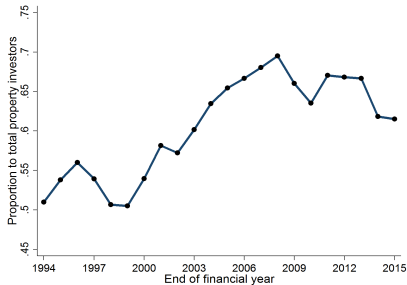
## Summary

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- Built a quantitative model to explore the effects of **negative gearing tax on welfare** of Australian households
- What have we learned from the model?

Removing negative gearing would

1. decrease house prices, (marginally) increase rents  $\Rightarrow$  **improve housing affordability**
2. increase homeownership rate  $\Rightarrow$  **shifting from renting to owning**
3. reduce housing investment
4. **welfare improves** and most households would be better off
5. **with redistribution**, renters are **winners**, landlords especially young with high earnings are **losers**



**Figure:** Negatively geared housing investors (left); Total rental income (right)

Source: Taxation Statistics, Australian Taxation Office

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