Homeownership and Liquid Wealth Accumulation

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Contents

Introduction

Motivation

Effects of homeownership on the stock shares of financial portfolios are already documented in the literature (Cocco, 2005; Yao and Zhang, 2005; Chetty et al., 2017; Vestman, 2019)

Yao and Zhang (2005)'s finding:

- Given a level of total wealth, homeowners have a **lower propensity** to participate to the stock market
- Participating homeowners invest larger amount of liquid wealth into risky assets (**Diversification effect of real estate**)

$\Rightarrow$ Compounding effect of returns from higher stock holdings may be a driver of wealth inequality

Research question

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Over the life-cycle, does homeownership induce a greater accumulation of (liquid) wealth, also via higher stock holdings?

This paper

Theoretically, universal mechanisms. However, focus on Swiss setting.

- **Life-cycle simulation**, with consumption, homeownership and portfolio decision
- Two scenarios: **baseline** and **counterfactual**
- First analysis of **wealth accumulation** patterns
- Then analysis of **portfolio composition** since house purchase

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$\Rightarrow$ Additional capital gains do not contribute meaningfully to build-up of liquid wealth nor compensate for down payment

Model

Institutional setting

Why Switzerland?

- "Country of tenants", with less than 40% ownership rate
- *Imputed rental value* tax ensures stable housing costs even for homeowners
- Existence of two types of mortgages

Model setting

Starting point is two-goods life-cycle model à la Cocco (2005):

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- Agents enters the model as **working individuals** with stochastic income, retire after N periods and die after T periods
- Current utility drawn from **non-housing consumption** C_t and **housing size consumption** h_t
- Agents care about **bequest** (total net wealth)

Housing purchase

Before retirement, agents may purchase housing to live in

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- ▸ Housing costs

Assets allocation

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- Agents can start participating in the stock market at any time
- **Entry costs** for participating to the stock market, as well as **account fees** (as in Fagereng et al., 2017)

Value function (tenants and homebuyers before rent)

In each period, renting agents maximize the Bellman function

$$V_t^R(X_t^R) = \max_{\{C_t, h_t, \alpha_t, D_t\}} \left\{ \frac{(C_t^{1-\eta} h_t^{\eta})^{1-\gamma}}{1-\gamma} + \pi_t \beta \, \mathbb{E}_t[V_{t+1}(X_{t+1})] + (1-\pi_t)\beta\theta \, \mathbb{E}_t \left[\frac{(W_{t+1}+k)^{1-\gamma}}{1-\gamma} \right] \right\},$$
$$X_t^R = \{Y_t, L_t, A_{t-1}\}, \tag{1}$$

Value function (homeowners)

In each period, homeowners maximize the Bellman function

$$V_t^O(X_t^O) = \max_{\{C_t,\alpha_t\}} \left\{ \frac{(C_t^{1-\eta}\overline{h}^{\eta})^{1-\gamma}}{1-\gamma} + \pi_t \beta \, \mathbb{E}_t[V_{t+1}(X_{t+1})] + (1-\pi_t)\beta\theta \, \mathbb{E}_t \left[\frac{(W_{t+1}+k)^{1-\gamma}}{1-\gamma} \right] \right\},$$
$$X_t^O = \{Y_t, L_t, A_{t-1}, \overline{h}, \omega_t\}. \tag{2}$$

Generating life patterns

- Derive policy functions with chosen calibration via backward induction ▸ Parameters
- Agents start with no wealth, and random income which grows with a stochastic process
- Simulation of $10,000$ different agents
- Then: Simulation of **counterfactual homeowners**
  - Agents are **exogenously** and **unanticipatedly** excluded from the real estate market

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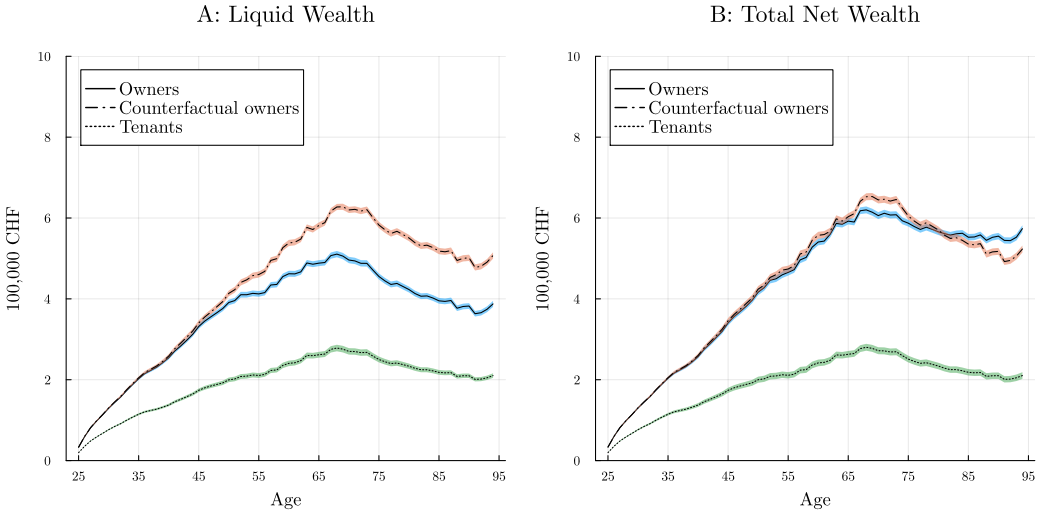
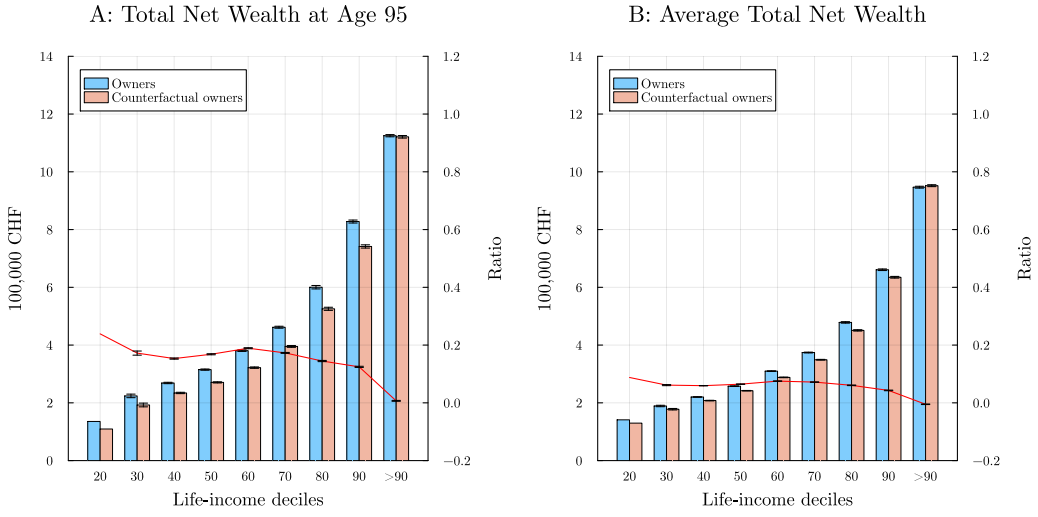
  $\Rightarrow$ Perfect copies of life patterns until purchase

Results

Life-cycle analysis of wealth



Total net wealth by income deciles



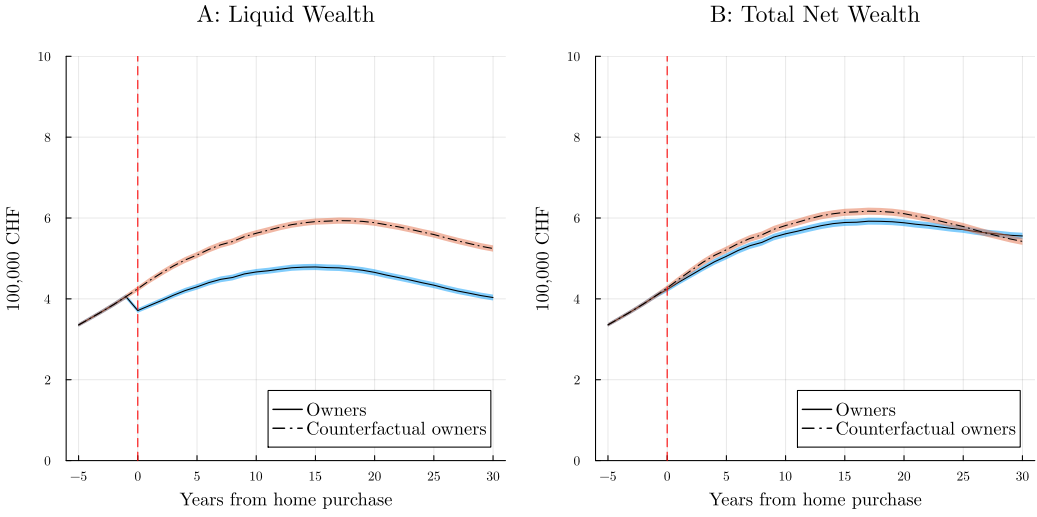
Determinants of late wealth

	Dependent Variable							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Indep. Variable	ln S_{65}	ln S_{65}	ln S_{65}	ln S_{95}	ln W_{65}	ln W_{65}	ln W_{65}	ln W_{95}
ln Y_1	1.223***	1.257***	1.210***	1.344***	1.273***	1.308***	1.217***	1.285***
	(0.012)	(0.010)	(0.015)	(0.015)	(0.013)	(0.010)	(0.015)	(0.015)
Counterfactual	0.104***	0.104***			0.000252	0.000252		
	(0.011)	(0.007)			(0.011)	(0.007)		
Cum. income growth		0.938***	0.907***	1.288***		0.965***	0.901***	1.182***
		(0.008)	(0.010)	(0.011)		(0.008)	(0.010)	(0.011)
D_{65}			-0.0545***	-0.377***			0.147***	0.196***
			(0.009)	(0.009)			(0.009)	(0.008)
Counterfactual			-2.48e-13	5.18e-14			-3.46e-13	-3.32e-13
			(0.013)	(0.010)			(0.013)	(0.011)
D_{65} x Counterfactual			0.154***	0.426***			-0.0309*	-0.0893***
			(0.015)	(0.013)			(0.015)	(0.013)
A_{age}			0.0737***	-0.136***			0.0735***	-0.0851***
			(0.010)	(0.011)			(0.010)	(0.011)
Const.	-0.477***	-1.159***	-0.638***	-1.691***	-0.897***	-1.599***	-0.716***	-1.133***
	(0.136)	(0.108)	(0.155)	(0.157)	(0.137)	(0.108)	(0.155)	(0.159)
R-sq	0.445	0.787	0.790	0.871	0.455	0.797	0.801	0.874
N	19758	19758	19758	19852	19758	19758	19758	19878

Note: Robust standard errors in parentheses. Monetary values are in terms of 2020 Swiss Francs and are winsorized at the top 5%.

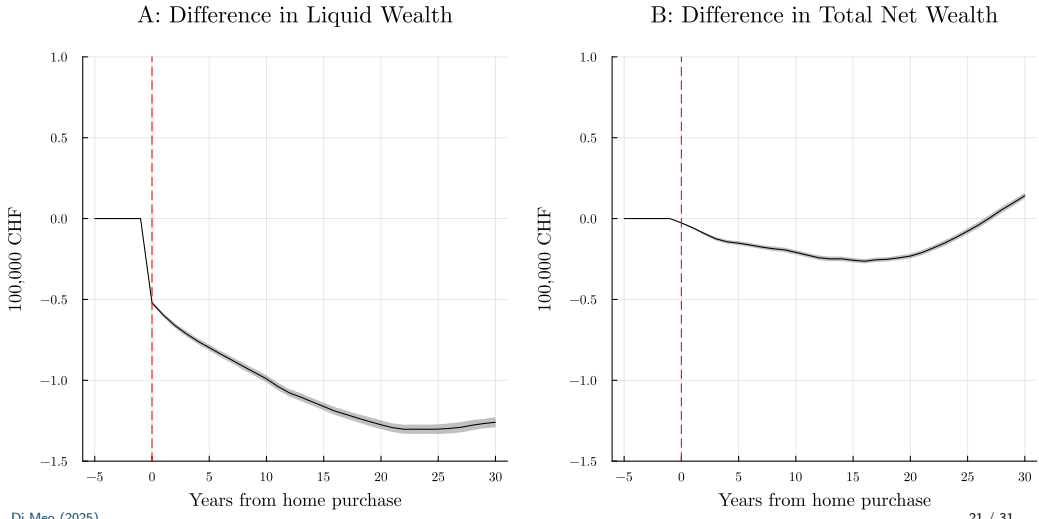
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Evolution of wealth



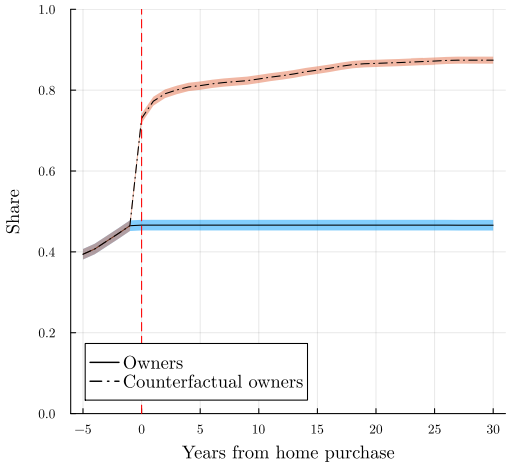
Evolution of differences (difference in differences)

Callaway and Sant'Anna (2021) estimator for staggered treatment

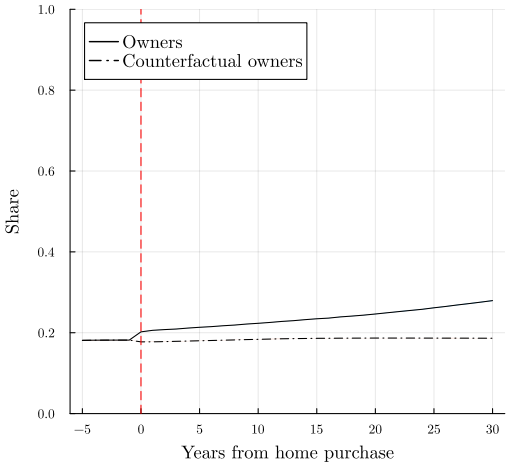


Participation to stock market

A: Participation to Stock Market

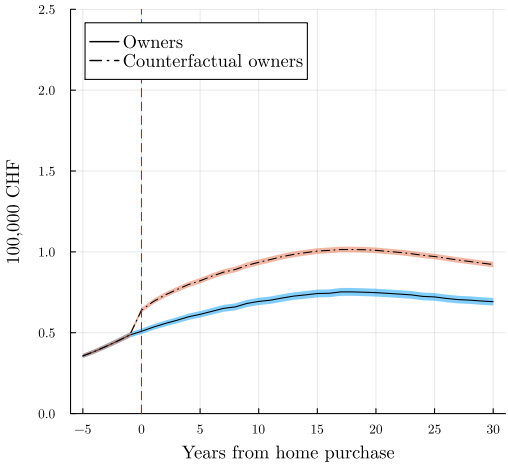


B: Conditional Stock Shares in Portfolio

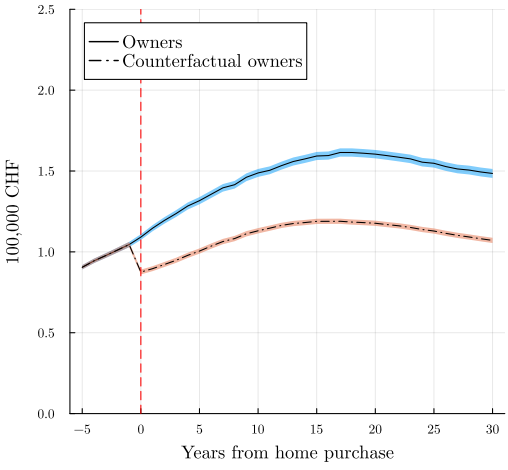


Stock volumes in portfolio

A: Unconditional Volume of Equities

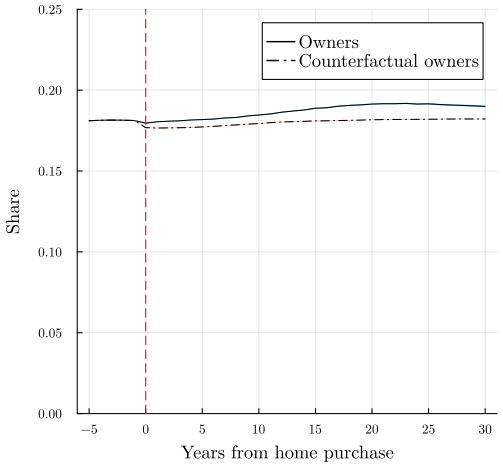


B: Conditional Volume of Equities

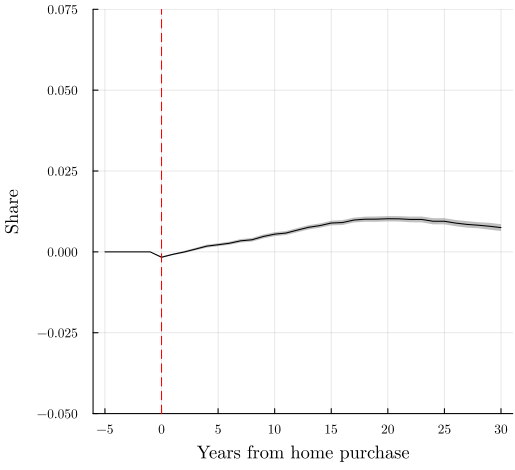


Conditional stock shares in total net wealth

A: Cond. Stock Shares in Total Net Wealth

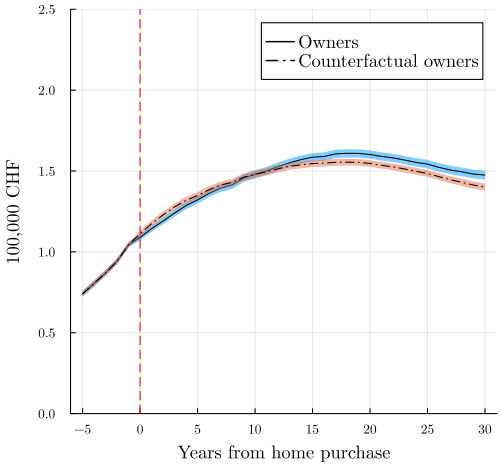


B: Panel A, Difference



Conditional stock shares in total net wealth

A: Volume of Stocks, Cond. on Early Part.



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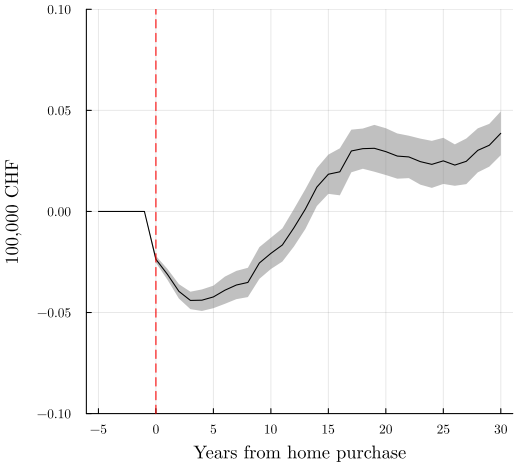

Conclusion

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- Aim of the project is to investigate a possible channel through which this wealth inequality between homeowners and tenants may be amplified.
- Increase in stock shares/volume unlikely to be a determining factor
- Implications for the possible future abolition of the imputed rental value tax

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Appendix

Housing costs

$$H_t = \begin{cases} \psi_r P_t h_t & D_t = 0 \\ [\delta + \psi_o(1-\delta)] P_t h_t & D_t = 1,\ D_{t-1} = 0,\ t \leq N,\ h_t \geq 30, \\ \psi_o(1-\omega_t) P_t \overline{h} & D_t = 1,\ D_{t-1} = 1, \end{cases} \tag{3}$$

with

$$\omega_t = \frac{P_t - (1-\omega_{t-1})P_{t-1}}{P_t}. \tag{4}$$

Back

Calibration

Parameter	Value	Source
Survival probabilities	π_t	Federal Statistical Office (2023)
Preferences		
Risk aversion	$\gamma = 5$	Standard value
Utility discount	$\beta = 0.97$	Standard value
Housing consumption	$\eta = 0.22$	Federal Statistical Office (2021)
Marginal propensity to bequest	MPB $= 0.88$	De Nardi et al. (2010); Bommier et al. (2020)
Bequest intensity	$\theta = 23481.5$	Based on MPB $= 0.88$
Bequest curvature	$k = 1$	Calibration on SHP
Risk-free asset and stock market		
Risk-free interest rate	$R_f = 1.018$	Swiss National Bank (2022a)
Entry fee	$I_t^{Entry} = 0.06\bar{Y}_t$	Target participation rate past age 50
Participation fee	$I_t^{Participation} = 0.01\bar{Y}_t$	Target participation rate past age 50
Mean return and std. of stocks	$\mu^R = 0.04,\ \sigma^R = 0.16$	Cocco et al. (2005); Yao and Zhang (2005) Chetty et al. (2017)
Real estate market		
Realized prices	P_t	Swiss National Bank (2022b); Wüest Partner (2023)
Down payment rate	$\delta = 0.2$	Standard in Switzerland
Relative rental price	$\psi_r = 0.0275$	Swiss National Bank (2022b); Wüest Partner (2023)
Relative mortgage interests price	$\psi_o = \psi_r$	Assumption
Mean and std. of real estate returns	$\mu^{P_t/P_{t-1}} = 0.03,\ \sigma^{P_t/P_{t-1}} = 0.04$	Swiss National Bank (2022b); Wüest Partner (2023)
Correlation between P_t/P_{t-1} and R_t	$\rho(P_t/P_{t-1}, R_t) = 0$	Cocco et al. (2005)
Income		
Realized income	Y_t	Federal Statistical Office (2022)
Mean and std. of income growth	$\mu^Y = 0.04,\ \sigma^Y = 0.035$	Historical Statistic of Switzerland (2012)
Replacement rate	$\phi = 0.8$	Calibration on SHP

Back