Housing in the Bewley Model

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Question

- Does introducing **buy vs. rent** and a **mortgage** into the Bewley model change our findings on inequality and insurance?
  - Housing is an avenue for wealth accumulation (the "housing ladder").
  - However, home ownership may entail greater risk, especially around the time of purchase.

Reminder

- In Week 1, we solved a lifecycle Bewley model with one asset: risk-free bonds. We found:
  - Lifecycle wealth accumulation was hump-shaped and consumption inequality rose linearly with age.
  - Pass-through of persistent shocks into consumption was around 80% and transitory shocks was 25% (Zero Budget Constraint).

Question

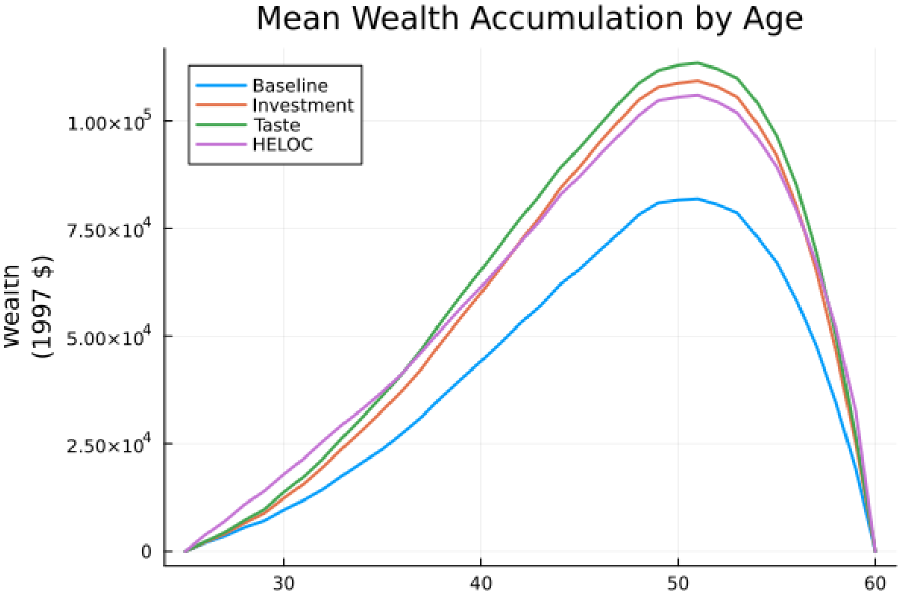
- In reality, American's single largest asset is their home [1].
- Compared to savings, housing is:
  1. Illiquid.
  2. Relatively indivisible.
  3. Usually financed via a mortgage with a down-payment constraint.

[1] Based on Survey of Consumer Finances waves 1989–2019. The median primary residence share is $\approx$ 40% of assets compared to 23% for all non-stock financial assets like CD's, bonds & savings.

My Approach

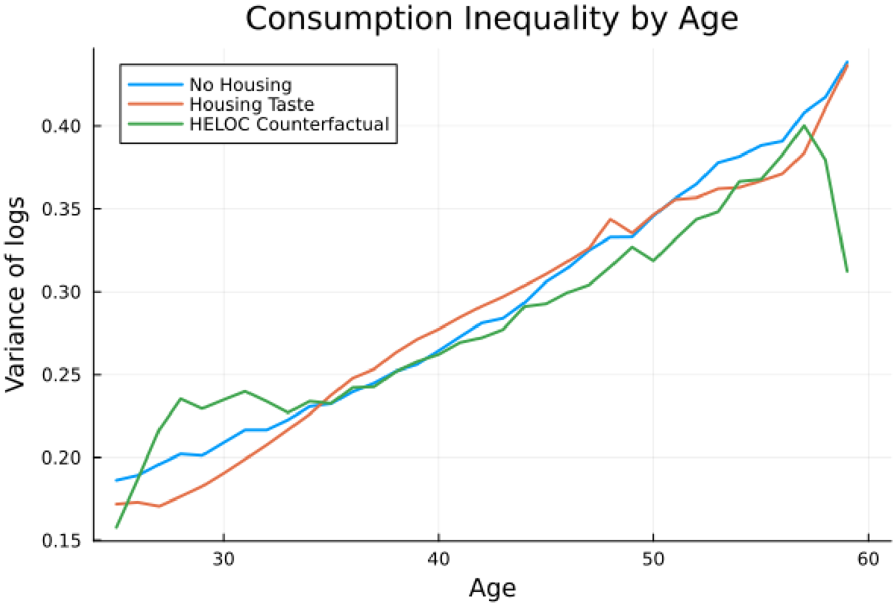
1. Incorporate an investment asset which matches these features into the Bewley model we used, while changing as little else as possible.
2. Then: add housing taste calibrated to match home owownership rates at 45.
3. Policy experiment: how does a home equity line of credit (HELOC) affect insurance and inequality?

Findings:



Mean Wealth Accumulation by Age
Baseline
Investment
Taste
HELOC
1.00×10^5
7.50×10^4
5.00×10^4
2.50×10^4
0
Wealth
(1997 $)
30
40
50
60

Findings:


Consumption Inequality by Age
No Housing
Housing Taste
HELOC Counterfactual
0.40
0.35
0.30
0.25
0.20
0.15
Variance of logs
30
40
50
60
Age

Findings:

Table: Insurance coefficients

Parameter	Baseline	Investment	Taste	HELOC
ϕ^{ε}	0.78	0.77	0.76	0.72
ϕ^{ζ}	0.23	0.26	0.26	0.26

What I did:

- To the baseline (ZBC) economy with persistent income process calibrated using the 1978-1997 PSID, I added:
  - A **deterministic** house price process: house prices start at $65K, the 1970 mean (in 1997 dollars) and grow at 1% per year. [2].
  - Renters pay 5% of that year's price (matching the data).
  - Trading housing incurs a 5% transaction cost.
  - Individuals can purchase a home using a **mortgage** - mortgages are non-portable and at least the interest must be paid each period.
  - The mortgage rate is 7% and the risk-free rate remains at 4%.
  - A **down-payment** of 20% is required for a home-purchase.
  - To focus on substitution effects and to ensure people don't default, I increased the income process I estimated in Week One by the amount of rent each period.

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[2] Growth matches (Cocco, 2005, JFE) who estimates 1.6% from the PSID over this period and subtracts .6% for quality increase

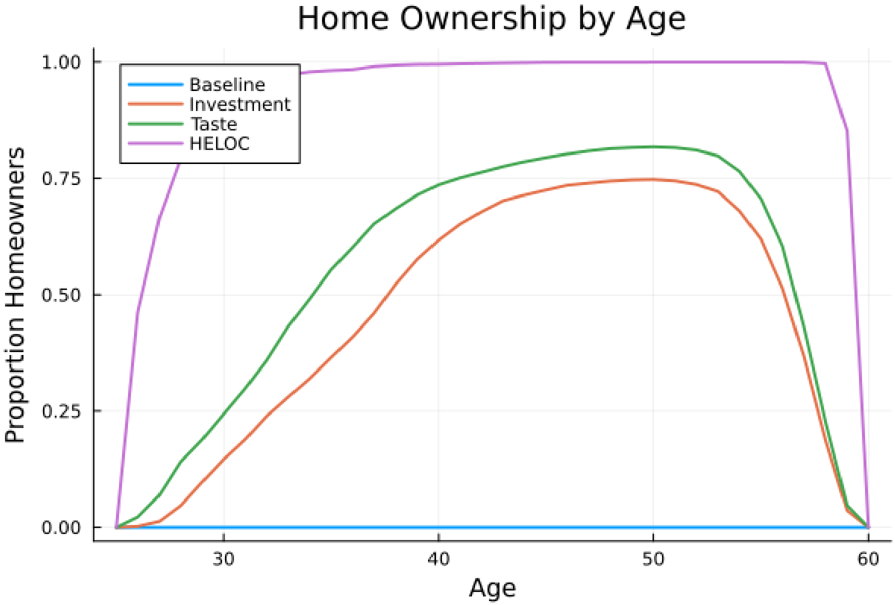
What I did:

- States are (Rent/Own, Transitory Shock, Persistent Shock, Mortgage Debt, Assets).
- Choices are: (Rent/Own tomorrow, Mortgage Debt tomorrow, Assets tomorrow, Consumption).
- Utility function is:

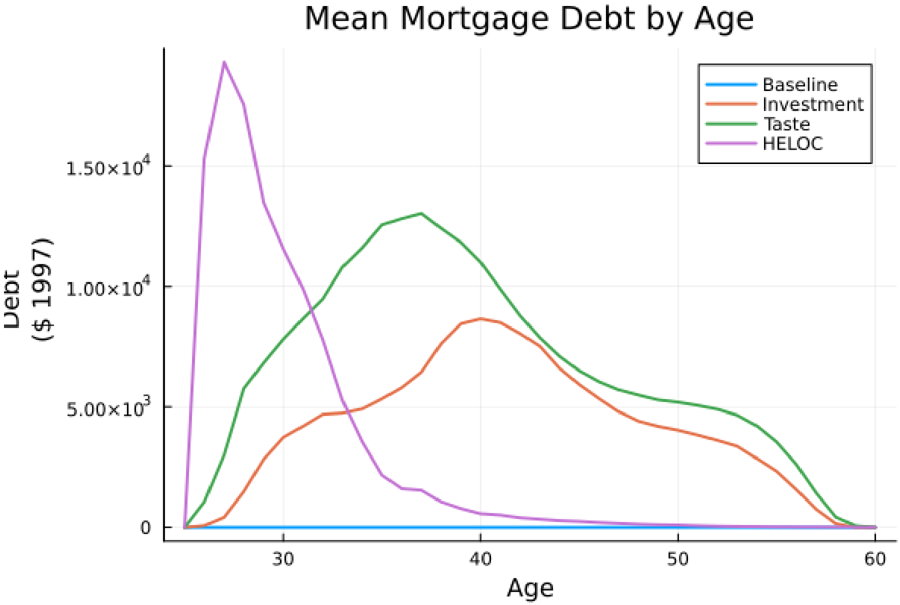
$$u(c, H) = \frac{\left(c^{1-\theta} s_H^{\theta}\right)^{1-\sigma}}{1-\sigma}, \qquad H \in \{0, 1\}.$$

- s_H represents the housing service flow from owning - capturing the relative increase in utility at every level of consumption from owning rather than renting.
- s_H calibrated to match the home ownership rate of 79.1% over the 1970 - 1998 SCF waves.
    - $s_H = 1.049$ relative to $s = 1$ for renters.

Model Features



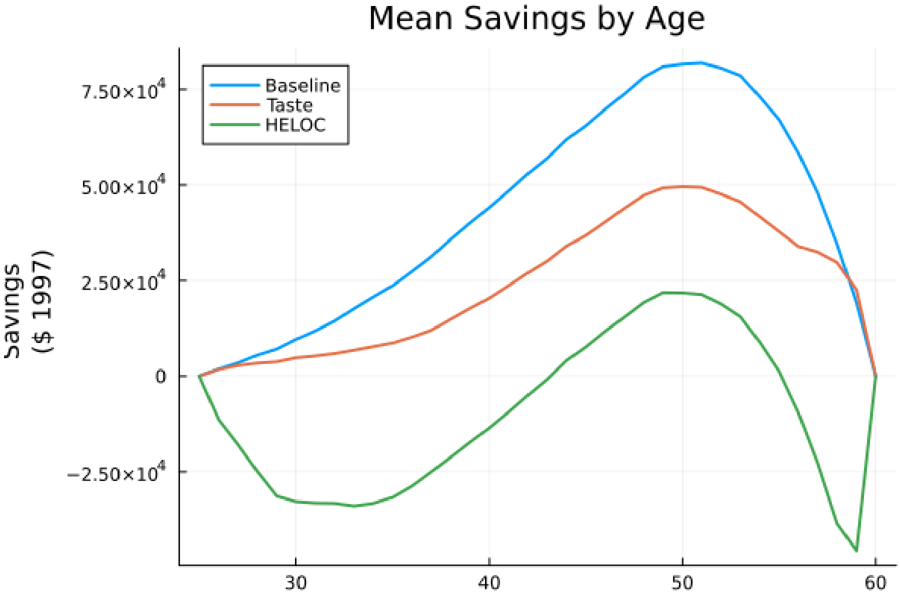
Model Features



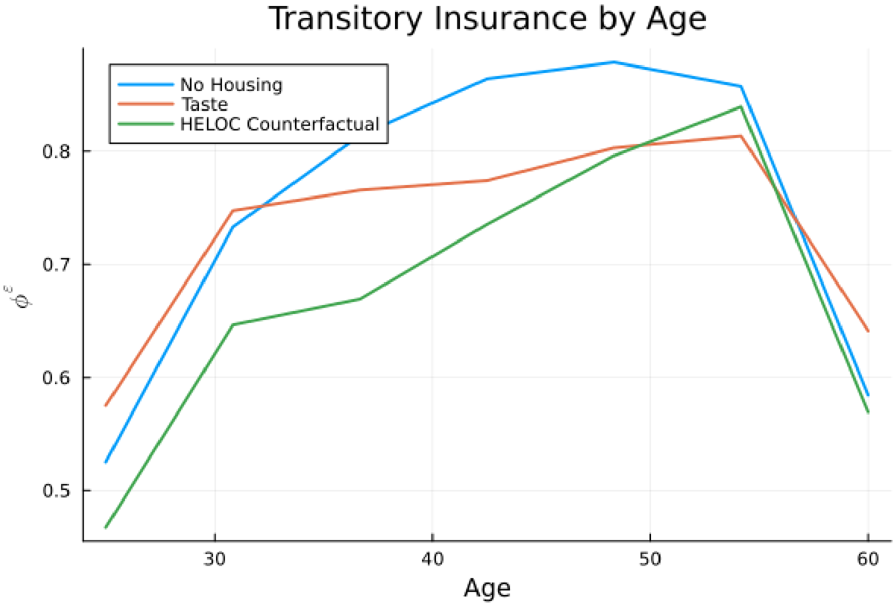
HELOC Counterfactual

- Modeled the introduction of a HELOC as a loosening of the zero borrowing constraint for homeowners in the housing taste economy:
  - Homeowners with at least 20% equity in their home can borrow up to 80% of their home equity, risk-free.
  - Must have zero HELOC debt and paid-off mortgage by end-of-life.

Savings patterns



Why is transitory insurance worse under a HELOC?



Why is transitory insurance worse under a HELOC?

- Under a HELOC, 20% of individuals who otherwise would not have become homeowners did so: this results in them accumulating less liquid wealth.
- HELOCs provide more insurance to those who need it the least.
- A thought: the presence of HELOCs may increase the need for outside, e.g. government, insurance.