

Temptation, Commitment, and the Wealthy Hand to Mouth

Agnes Kovacs ¹ Patrick Moran ²

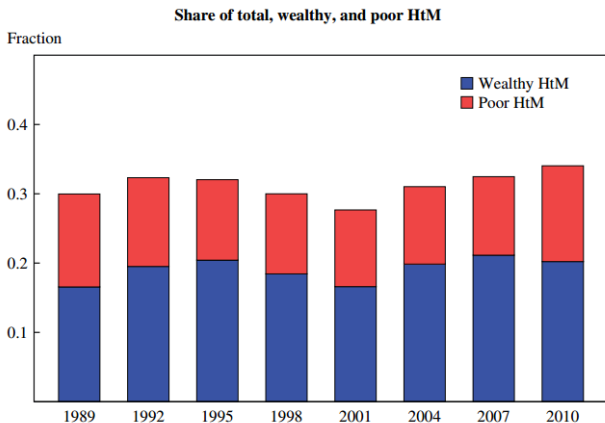
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Motivation

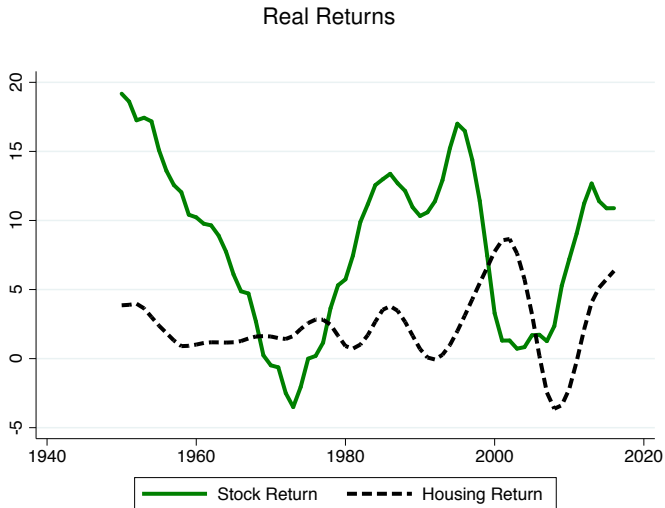
FACT 1: 20% of households are wealthy hand to mouth



Kaplan, Violante, and Weidner (2014). SCF Data.

Motivation

FACT 2: Housing has lower returns than stocks



10-year Moving Average, two sided. Annual Data

Motivation

FACT 2: Housing has lower risk-adjusted returns than stocks

	Mean	St.Dev.	Risk-adj. Return	Sharpe Ratio
Stock	8.24	16.82	5.40	0.45
Housing	2.34	5.06	2.10	0.30

Real Asset Returns

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Real Asset Returns

"It would be perhaps smarter, if wealth accumulation is your goal, to rent and put money in the stock market, which has historically shown much higher returns than the housing market." - Robert Shiller

Question

Why do households choose to be wealthy hand to mouth?

- ▶ It prevents consumption smoothing over income shocks
- ▶ There exists a liquid asset with higher returns than housing

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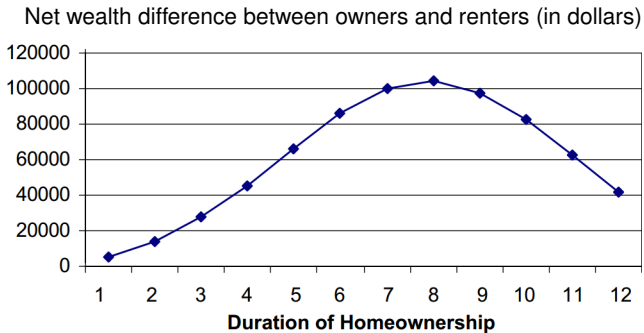
- ▶ It prevents consumption smoothing over income shocks
- ▶ There exists a liquid asset with higher returns than housing

Our goal: develop a new model of the wealthy hand to mouth

- ▶ Kaplan and Violante show the importance of these households
- ▶ But in their model, if stock were available, wealthy HtM would disappear

Motivation

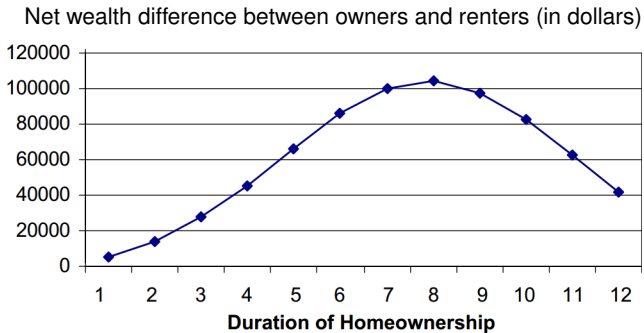
FACT 3: Homeowners save more on average than renters



Di, Belsky and Liu (2007). PSID Data.

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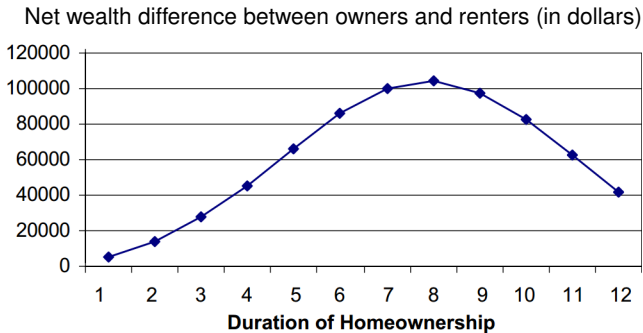


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Homeownership has a causal effect on savings (Le Blanc and Schmidt, 2017)

Motivation

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“One nice thing about investing in a house is that you’re committed to a mortgage payment.” - Robert Shiller

What we Do

- ▶ Develop a model of the “Committed Hand to Mouth”
 - ▶ Households face temptation, making it costly to hold liquid assets
 - ▶ Households can reduce temptation through illiquid assets
 - ▶ Housing provides a **commitment benefit** due to illiquidity

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- ▶ Use the model to match key aggregate moments
 - ▶ Macro moments: share of wealthy HtM, poor HtM, and liquid asset ratio
 - ▶ Micro evidence: half of down payment saved in year before purchase
 - ▶ Model is calibrated so that housing delivers lower returns than stock

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 - ▶ Model is calibrated so that housing delivers lower returns than stock
- ▶ Study the consumption response to winning the lottery
 - ▶ Can we match the empirical evidence on MPC heterogeneity?
 - ▶ Compare model to empirical results from Fagereng, Holm, and Natvik (2016)

Main Findings

1. Key model implications

- ▶ The **commitment benefit** generates additional demand for housing
- ▶ Homeownership leads to higher savings rates (commitment)
- ▶ It is difficult to accumulate a down payment gradually (temptation)

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3. Model generates realistic heterogeneity in MPCs

- ▶ Average MPC declines relatively slowly with **net wealth**
- ▶ Average MPC declines quickly with **liquid assets**

Model

Model

Life cycle model of consumption and savings

- ▶ Demographics: household works for \bar{T} years, then retired for $T - \bar{T}$
- ▶ Choices: consumption, housing (discrete)
- ▶ Assets: Liquid asset with return r , housing asset with return r^H

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Novel features

- ▶ Temptation preferences make it costly to hold liquid assets
- ▶ A commitment device (housing) can reduce temptation

Temptation and Commitment

Standard model

- ▶ Households are committed to their choices
- ▶ No need for commitment

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Temptation preferences (Gul and Pesendorfer, 2001 and 2004)

- ▶ Tempting, feasible alternative that is not chosen
- ▶ This tempting alternative impacts your utility
- ▶ Axiomatic, time consistent
- ▶ Commitment: reduce temptation by restricting choice set

Preferences

$$\max_{\{c_t, h_t\}_{t=0, \dots, T}} \mathbb{E}_0 \sum_{t=0}^T \beta^t U(c_t, h_t, \tilde{c}_t, \tilde{h}_t)$$

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$$U(c_t, h_t, \tilde{c}_t, \tilde{h}_t) = u(c_t, h_t) - \underbrace{\lambda [u(\tilde{c}_t, \tilde{h}_t) - u(c_t, h_t)]}_{\text{utility cost of self-control}}$$

- ▶ c_t : nondurable consumption
- ▶ h_t : housing status
- ▶ λ : degree of temptation

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Most tempting alternative: maximize current period utility

$$[\tilde{c}_t, \tilde{h}_t] = \arg \max_{c_t, h_t \in \mathcal{A}_t} u(c_t, h_t)$$

- ▶ \tilde{c}_t : most tempting consumption
- ▶ \tilde{h}_t : most tempting housing status
- ▶ \mathcal{A}_t : liquid budget set

Assets and Mortgages

1. Liquid asset (a_t)

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2. Illiquid housing asset (h_t)

- ▶ Three options: own a house, own a flat, rent
- ▶ House price: $p_t = p_{t-1}(1 + r^H)$
- ▶ Flat price: ηp_t
- ▶ Transaction costs: fraction f of the home price and utility cost χ
- ▶ Transaction costs generate **commitment benefit**

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3. Mortgages

- ▶ Buying a home automatically comes with a mortgage
- ▶ Downpayment: fraction ψ of the home price
- ▶ 30-year fixed-rate (r^M) mortgage
- ▶ Fixed repayment each period

Representative Agent Model

Deterministic hump-shaped income

Housing provides no utility benefit and no financial benefit ($r^H = r$)

Model Insights

- ▶ Agent is tempted to maximize current period utility
- ▶ Resisting this temptation is costly in utility terms
- ▶ Agent can reduce the cost of temptation if they invest in housing

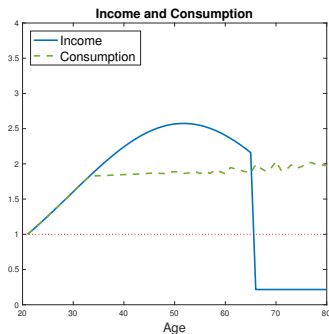
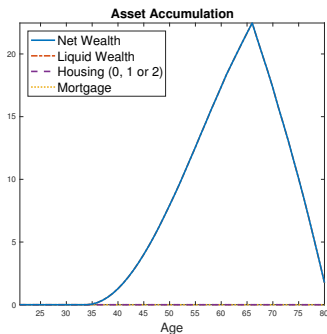
Model Insights

- ▶ Agent is tempted to maximize current period utility
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- ▶ Agent can reduce the cost of temptation if they invest in housing

- ▶ Two consequences:
 - ▶ Housing provides a **commitment benefit**, increasing housing demand
 - ▶ Homeownership increases savings rates

Model Insights

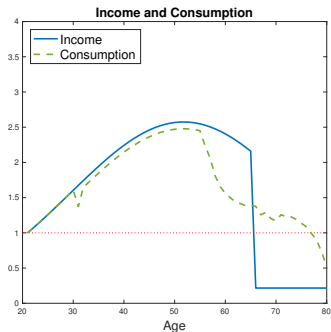
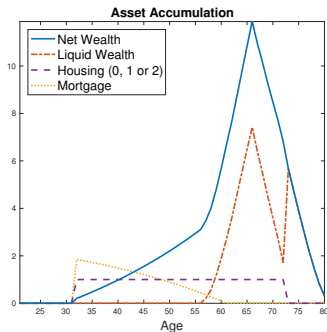
- ▶ When no temptation ($\lambda = 0$), representative agent does not buy a house



- ▶ Housing is inferior to liquid assets due to transaction costs

Model Insights

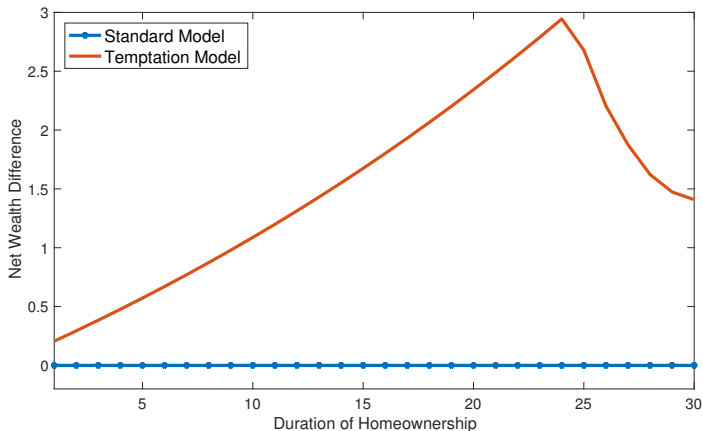
- ▶ With temptation ($\lambda = 0.7$), representative agent purchases housing



- ▶ Under temptation, it is difficult to save for retirement
- ▶ Agent buys housing due to **commitment benefit**

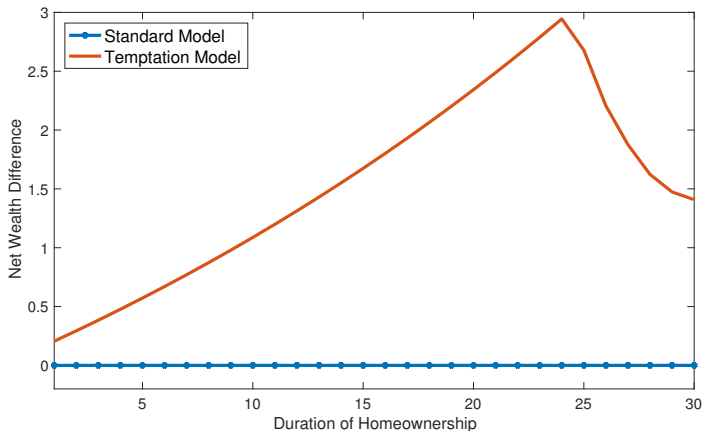
Model Insights: Housing increases savings

Net Wealth (when housing available) - Net Wealth (when housing unavailable)



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- ▶ Temptation, $\lambda > 0$: availability of housing increases savings
- ▶ No temptation, $\lambda = 0$: type of savings does not affect amount of savings

Heterogeneous Agent Model

Earnings heterogeneity (Kaplan and Violante, 2014)

Housing in the utility function (Attanasio et al, 2012)

Calibration

- ▶ Set standard parameters based on existing literature
 - ▶ Downpayment requirement $\psi = 10\%$, transaction cost $F = 5\%$
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 - ▶ We set $r = 5.40\%$ and $r^H = 2.10\%$
 - ▶ KV set $r = -1.48\%$ and $r^H = 2.29\%$

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 - ▶ We set $r = 5.40\%$ and $r^H = 2.10\%$
 - ▶ KV set $r = -1.48\%$ and $r^H = 2.29\%$
- ▶ There remain five parameters to calibrate:
 - ▶ Temptation (λ)
 - ▶ Housing service flow (μ)
 - ▶ Housing's impact on MUC (θ)
 - ▶ Utility cost of moving (χ)
 - ▶ Initial house price (p_1)

Data versus Model

	Data	Temptation Model	Standard Model
Wealthy Hand-to-Mouth	20%		
Poor Hand-to-Mouth	10%		
Liquid over total assets	25%		
Homeowners	68%		
Down payment in advance	51%		

Model versus Data

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Model versus Data

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Wealthy Hand-to-Mouth	20%	21%	14%
Poor Hand-to-Mouth	10%	9%	0%
Liquid over total assets	25%	29%	33%
Homeowners	68%	68%	72%
Down payment in advance	51%	64%	76%

Model versus Data

MPC Heterogeneity

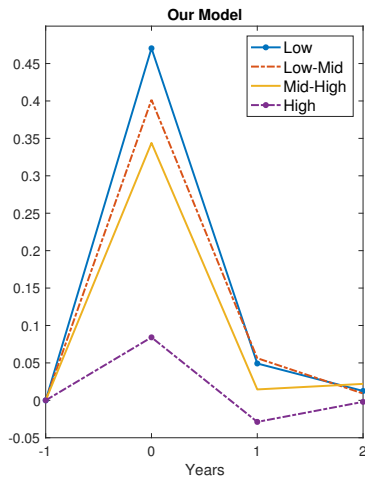
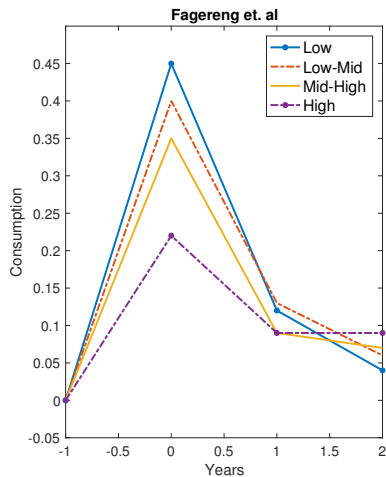
MPC Heterogeneity

- ▶ How do households respond to winning the lottery?
 - ▶ This represents an unexpected and transitory income shock
 - ▶ In our model, average MPC = 0.35
 - ▶ But can we match evidence on MPC heterogeneity?

MPC Heterogeneity

- ▶ How do households respond to winning the lottery?
 - ▶ This represents an unexpected and transitory income shock
 - ▶ In our model, average MPC = 0.35
 - ▶ But can we match evidence on MPC heterogeneity?
- ▶ Empirical evidence from Norway by Fagereng et al (2016)
 - ▶ Use administrative data on income and wealth
 - ▶ Liquid wealth is the most important determinant of MPC

MPC by Quartile of Liquid Wealth



Note: Transitory income shock = 1/3 annual income in model

- ▶ Consumption is more responsive for households with low liquid wealth

MPC Heterogeneity

X	Corr(MPC_t , X_{t-1})	
	Fagereng et al. (2016)	Our Model
Net wealth	-0.094	-0.057
Liquid wealth	-0.137	-0.110

Note: Each estimate is constructed by regressing $MPC_{i,t}$ on $X_{i,t-1}$ and age

- ▶ MPC declines more quickly with liquid assets than with net wealth

MPC Heterogeneity

	Marginal Propensity to Consume
All Households	0.35
Non Hand to Mouth	0.21
Poor Hand to Mouth	0.45
Wealthy Hand to Mouth	0.68

MPC Heterogeneity in the Model

- ▶ MPC of Non HtM is positive because of temptation

Conclusion: The “Committed” Hand to Mouth

How do we explain wealthy hand to mouth households?

- ▶ Temptation to consume liquid assets
- ▶ Desire for illiquidity due to commitment benefit
- ▶ This generates reasonable MPC heterogeneity

Why does homeownership lead to higher savings rates?

- ▶ Very difficult to explain this evidence with a standard model
- ▶ Can be explained by commitment benefit of housing

Thank you