

# The Distribution of Wealth and the MPC: Implications of New European Data

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Based on joint work with  
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## Why Worry About the MPC ( $\equiv \kappa$ )?

Nobody who made a macro forecast in 2008–2012 would ask:

- In U.S. 2008–10, big 'stimulus' tax cuts
- In EZ, 2010–12, 'austerity'

In either case,  $\kappa$  should be central to analysis of effect

- Keynesian multipliers should be big in a liquidity trap (even Christiano, Eichenbaum, and Rebelo (2011)!)

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# Crude Keynesianism

Multiplier is  $1/(1 - \kappa) - 1$

- If  $\kappa = 0.75$  then multiplier is  $4 - 1 = 3$   
→ This is more micro estimates of what this might be
- If  $\kappa = 0.05$  then multiplier is only  $\approx 0.05$   
→ This is more macro than Agent models; as low as 0.05!
- IMF's *mea culpa*: Our multipliers were much too low  
→ This is a major underestimation of GDP effects of monetary  
policy (Christiano and Eichenbaum (2003))



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  - (this is max  $\kappa$  in Rep Agent models; as low as 0.02)
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  - $\Rightarrow$  serious underestimate of GDP effects of austerity
  - (Blanchard and Leigh (2013))

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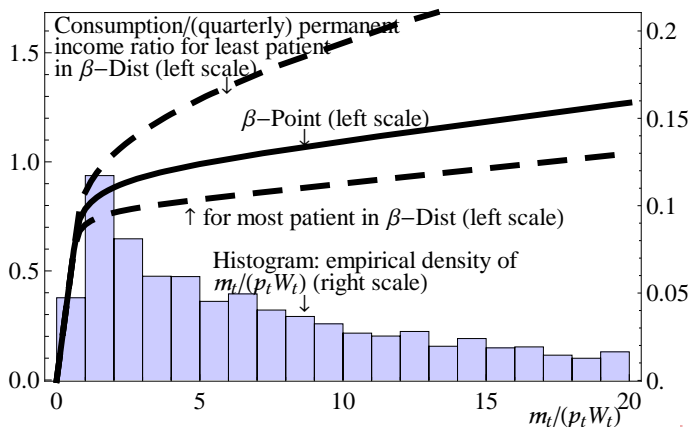
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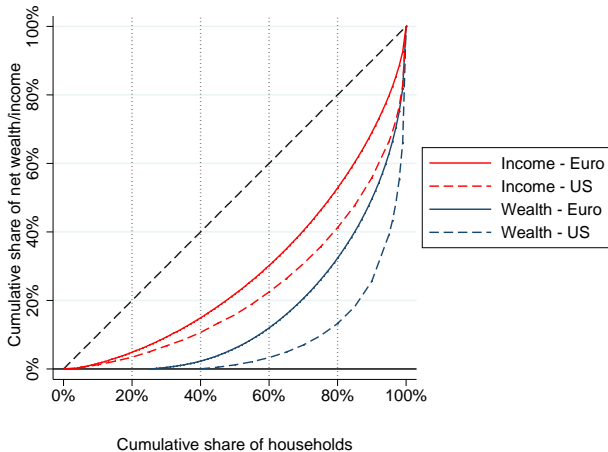
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# Wealth Distribution (U.S. Data) and Consumption Concavity (Theory)

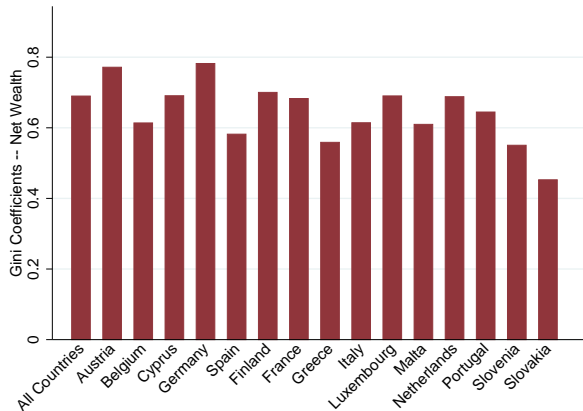




# Lorenz Curves for Income, Net Wealth; US vs Euro Area



# Substantial Differences in Inequality (Gini Coefficients)



## How Should Differences in Inequality Relate to the MPC?

For each country:

- Calibrate standard microeconomic consumption/saving model (with permanent/transitory income *a la* Carroll, Slacalek, and Tokuoka (2013b))
- Find best-fit preference parameters (e.g., impatience):
  - Parameters s.t. model wealth distribution best matches data
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## Bottom Line—Heterogeneity Is Crucial!

Kinds of heterogeneity:

- *ex ante*  
→ Heterogeneous responses (for the same reasons)
- *ex post*  
→ Even with identical responses (due to different shocks)

Key conclusions:

- 1 Both kinds of heterogeneity are necessary to match the data
- 2 Models that match  $\neq$  have much higher  $\kappa$  than Rep Agent
- 3 Less  $\neq$  in Europe implies somewhat lower MPCs than U.S.

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  - Newborn consumers differ (e.g., in impatience)
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# The Model: Carroll, Slacalek, and Tokuoka (2013b)

## Key Ingredients

- Uninsurable idiosyncratic income uncertainty
- Permanent and transitory income shocks
  - Permanent shocks boost wealth heterogeneity
  - Transitory shocks increase concavity of C function
- Blanchard (1985) finite lifetimes model
- Modest heterogeneity in impatience
  - Lets the model match wealth distribution
  - In U.S.:  $\beta_{\text{most patient}} - \beta_{\text{least impatient}} \approx 0.04$



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# Household Problem

$$\begin{aligned}
 v(m_t) &= \max_{\{c_t\}} u(c_t) + \beta \mathbb{E}_t \left[ \psi_{t+1}^{1-\rho} v(m_{t+1}) \right] \\
 &\text{s.t.} \\
 a_t &= m_t - c_t \\
 a_t &\geq 0 \\
 k_{t+1} &= a_t / (\delta \psi_{t+1}) \\
 m_{t+1} &= (\Gamma + r) k_{t+1} + \xi_{t+1} \\
 r &= \alpha a (K / \bar{\ell} L)^{\alpha-1}
 \end{aligned}$$

Variables normalized by permanent labor income ( $p_t W$ )



## Both Ex Post and (A Bit of) Ex Ante Heterogeneity

### Model of Heterogenous Impatience

- Assume uniformly distributed  $\beta$  across households
- Estimate the band  $[\hat{\beta} - \nabla, \hat{\beta} + \nabla]$  by **minimizing distance between model ( $w$ ) and data ( $\omega$ ) net worth** held by the top 20, 40, 60, 80%

$$\min_{\{\hat{\beta}, \nabla\}} \sum_{i=20,40,60,80} (w_i - \omega_i)^2,$$

s.t. aggregate net worth–output ratio matches the steady-state value from the perfect foresight model

- Country-by-country estimation

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## Income Dynamics:

### 'Standard' Process with **Permanent** and Transitory Component

#### 'Friedman/Buffer Stock' Income Process

Large literature on US data estimating process:

$$y_{t+1} = p_{t+1}\xi_{t+1}$$

$$p_{t+1} = \rho_t \psi_{t+1}$$

$p_t$  = permanent income

$\xi_t$  = transitory income

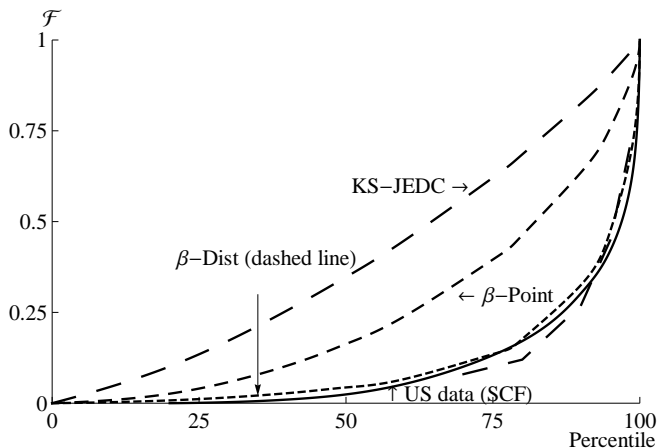
$\psi_{t+1}$  = permanent shock

# Income Parameters: US Estimates

- $\sigma_{\psi}^2 \approx 0.01+$ ,  $\sigma_{\xi}^2 \approx 0.01+$

Authors	Permanent $\sigma_{\psi}^2$	Transitory $\sigma_{\xi}^2$
<b>Individual data</b>		
MaCurdy (1982) <sup>†</sup>	0.013	0.031
Topel (1991)	0.013	0.017
Topel and Ward (1992)	0.017	0.013
Meghir and Pistaferri (2004) <sup>°</sup>	0.031	0.032
Nielsen and Vissing-Jorgensen (2006) <sup>‡</sup>	0.005	0.015
Krebs, Krishna, and Maloney (2007) <sup>*</sup>	~ 0.01	~ 0.1
Jensen and Shore (2008) <sup>°</sup>	0.054	0.171
Guvenen (2009)	0.015	0.061
Heathcote, Perri, and Violante (2010) <sup>*</sup>	0.01–0.03	0.05–0.1
Hryshko (2010) <sup>°</sup>	0.038	0.118
Low, Meghir, and Pistaferri (2010)	0.011	–
Sabelhaus and Song (2010) <sup>△</sup>	0.03	0.08
Guvenen, Ozkan, and Song (2012) <sup>°</sup>	~ 0.05	~ 0.125
Karahan and Ozkan (2012) <sup>*</sup>	~ 0.013	~ 0.09
Blundell, Graber, and Mogstad (2013) <sup>‡</sup>	~ 0.015	~ 0.025
<b>Household data</b>		
Carroll (1992)	0.016	0.027
Carroll and Samwick (1997)	0.022	0.044
Storesletten, Telmer, and Yaron (2004a)	0.017	0.063
Storesletten, Telmer, and Yaron (2004b)	0.008–0.026	0.316
Blundell, Pistaferri, and Preston (2008) <sup>°</sup>	0.010–0.030	0.029–0.055
Review of Economic Dynamics (2010) <sup>°</sup>	0.02–0.05	0.02–0.1
Blundell, Low, and Preston (2013) <sup>°</sup>	~ 0.005	–
DeBacker, Heim, Panousi, Ramnath, and Vidangos (2013) <sup>§</sup>	0.007–0.010	0.15–0.20

# Model Fits U.S. Wealth Distribution Data Remarkably Well



# Income Parameters: (Limited) Evidence from Europe

- Estimates comparable with US

Country/Authors	Variance of Income Shocks		Dataset
	Permanent $\sigma_{\psi}^2$	Transitory $\sigma_{\xi}^2$	
<b>France</b>			
Le Blanc and Georgarakos (2013)	0.010	0.031	ECHP
<b>Germany</b>			
Fuchs-Schuellndeln, Krueger, and Sommer (2010)	0.01–0.096	0.04–0.19	GSOEP
Le Blanc and Georgarakos (2013)	0.006	0.030	ECHP
Rostam-Afschar and Yao (2013)	0.030	0.054	GSOEP
Yao (2011) <sup>§</sup>	0.008–0.015	0.07–0.09	GSOEP
<b>Italy</b>			
Jappelli and Pistaferri (2010)	0.02	0.075	SHIW
Le Blanc and Georgarakos (2013)	0.007	0.105	ECHP
<b>Spain</b>			
Pi Joan-Mas and Sanchez-Marcos (2010)	0.01–0.15	~ 0.03	ECPF
Albarran, Carrasco, and Martinez-Granado (2009)	0.015–0.157	0.032–0.162	ECPF/ECHP
Le Blanc and Georgarakos (2013)	0.001	0.113	ECHP
<b>United States</b>			
Carroll, Slacalek, and Tokuda (2013a)	0.010	0.010	Calibrated



## Other Calibration

Matches the 2010 JEDC volume

# Empirical Wealth Distribution Across Countries

## Eurosystem Household Finance and Consumption Survey

- Detailed wealth data from 15 euro area countries
- Ex ante harmonized, country-representative
- 62,000 households
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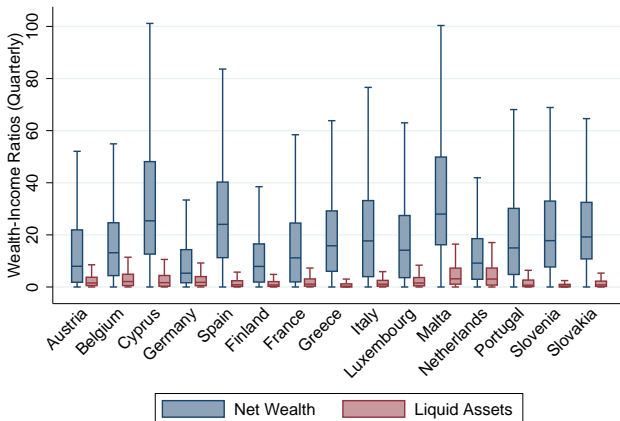
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# Memo: Inequality in Net Wealth Driven by Homeownership



## Stylized Facts

### Liquid Assets More Concentrated Near Zero—where C Function Step



excludes outside values



# Model-Implied $\kappa$ Matching Distribution of Net Wealth

- Aggregate MPC: 0.1–0.2
- Almost every country estimated to have less heterogeneity in impatience than in U.S. ( $\nabla$  small)

	All	AT	BE	CY	DE	ES	FI	FR	GR	IT	LU	MT	NL	PT	SI	SK
Overall Average	0.13	0.16	0.1	0.13	0.19	0.14	0.13	0.13	0.1	0.14	0.12	0.1	0.11	0.11	0.1	0.1
By wealth/permanent income ratio																
Top 1%	0.06	0.06	0.06	0.06	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Top 10%	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Top 20%	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Top 40%	0.06	0.06	0.06	0.06	0.06	0.07	0.06	0.06	0.06	0.07	0.06	0.06	0.06	0.06	0.06	0.06
Top 50%	0.07	0.06	0.06	0.07	0.07	0.08	0.07	0.07	0.07	0.05	0.07	0.06	0.06	0.07	0.07	0.07
Top 60%	0.07	0.07	0.07	0.07	0.08	0.07	0.07	0.07	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Bottom 50%	0.19	0.25	0.14	0.19	0.3	0.2	0.19	0.19	0.13	0.22	0.17	0.14	0.16	0.15	0.13	0.13
By income																
Top 1%	0.09	0.13	0.07	0.09	0.13	0.08	0.09	0.09	0.07	0.08	0.09	0.07	0.08	0.08	0.07	0.07
Top 10%	0.1	0.13	0.07	0.1	0.14	0.09	0.1	0.1	0.07	0.1	0.09	0.07	0.08	0.08	0.07	0.07
Top 20%	0.11	0.14	0.08	0.11	0.15	0.09	0.11	0.1	0.08	0.1	0.1	0.08	0.09	0.09	0.08	0.08
Top 40%	0.12	0.15	0.1	0.12	0.16	0.11	0.12	0.12	0.09	0.11	0.11	0.1	0.11	0.1	0.09	0.09
Top 50%	0.13	0.15	0.1	0.13	0.16	0.12	0.13	0.12	0.1	0.11	0.12	0.1	0.11	0.11	0.1	0.1
Top 60%	0.13	0.16	0.11	0.13	0.17	0.12	0.13	0.13	0.1	0.13	0.12	0.11	0.12	0.11	0.1	0.1
Bottom 50%	0.13	0.17	0.1	0.13	0.22	0.16	0.13	0.14	0.1	0.17	0.12	0.1	0.11	0.11	0.1	0.1
By employment status																
Employed	0.12	0.15	0.1	0.12	0.18	0.13	0.12	0.12	0.09	0.14	0.11	0.1	0.1	0.1	0.09	0.09
Unemployed	0.25	0.33	0.2	0.25	0.36	0.21	0.25	0.24	0.19	0.23	0.23	0.2	0.22	0.21	0.19	0.18
Time preference parameters <sup>†</sup>																
$\beta$	0.989	0.988	0.99	0.989	0.988	0.989	0.989	0.989	0.99	0.989	0.989	0.99	0.99	0.99	0.99	0.99
$\nabla$	0.003	0.005	0.002	0.003	0.005	0.002	0.003	0.003	0.001	0.003	0.003	0.002	0.002	0.002	0.001	0.

# Model-Implied $\kappa$ Matching Distribution of Net Wealth

- Aggregate MPC: 0.1–0.2
- Almost every country estimated to have less heterogeneity in impatience than in U.S. ( $\nabla$  small)

	All	AT	BE	CY	DE	ES	FI	FR	GR	IT	LU	MT	NL	PT	SI	SK
Overall Average	0.13	0.16	0.1	0.13	0.19	0.14	0.13	0.13	0.1	0.14	0.12	0.1	0.11	0.11	0.1	0.1
By wealth/permanent income ratio																
Top 1%	0.06	0.06	0.06	0.06	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Top 10%	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Top 20%	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Top 40%	0.06	0.06	0.06	0.06	0.06	0.07	0.06	0.06	0.06	0.07	0.06	0.06	0.06	0.06	0.06	0.06
Top 50%	0.07	0.06	0.06	0.07	0.07	0.08	0.07	0.07	0.07	0.05	0.07	0.06	0.06	0.07	0.07	0.07
Top 60%	0.07	0.07	0.07	0.07	0.08	0.07	0.07	0.07	0.07	0.06	0.07	0.07	0.07	0.07	0.06	0.07
Bottom 50%	0.19	0.25	0.14	0.19	0.3	0.2	0.19	0.19	0.13	0.22	0.17	0.14	0.16	0.15	0.13	0.13
By income																
Top 1%	0.09	0.13	0.07	0.09	0.13	0.08	0.09	0.09	0.07	0.08	0.09	0.07	0.08	0.08	0.07	0.07
Top 10%	0.1	0.13	0.07	0.1	0.14	0.09	0.1	0.1	0.07	0.1	0.09	0.07	0.08	0.08	0.07	0.07
Top 20%	0.11	0.14	0.08	0.11	0.15	0.09	0.11	0.1	0.08	0.1	0.1	0.08	0.09	0.09	0.08	0.08
Top 40%	0.12	0.15	0.1	0.12	0.16	0.11	0.12	0.12	0.09	0.11	0.11	0.1	0.11	0.1	0.09	0.09
Top 50%	0.13	0.15	0.1	0.13	0.16	0.12	0.13	0.12	0.1	0.11	0.12	0.1	0.11	0.11	0.1	0.1
Top 60%	0.13	0.16	0.11	0.13	0.17	0.12	0.13	0.13	0.1	0.13	0.12	0.11	0.12	0.11	0.1	0.1
Bottom 50%	0.13	0.17	0.1	0.13	0.22	0.16	0.13	0.14	0.1	0.17	0.12	0.1	0.11	0.11	0.1	0.1
By employment status																
Employed	0.12	0.15	0.1	0.12	0.18	0.13	0.12	0.12	0.09	0.14	0.11	0.1	0.1	0.1	0.09	0.09
Unemployed	0.25	0.33	0.2	0.25	0.36	0.21	0.25	0.24	0.19	0.23	0.23	0.2	0.22	0.21	0.19	0.18
Time preference parameters <sup>†</sup>																
$\beta$	0.989	0.988	0.99	0.989	0.988	0.989	0.989	0.989	0.99	0.989	0.989	0.99	0.99	0.99	0.99	0.99
$\nabla$	0.003	0.005	0.002	0.003	0.005	0.002	0.003	0.003	0.001	0.003	0.003	0.002	0.002	0.002	0.001	0.

# Model-Implied $\kappa$ Matching Distribution of Liquid Assets

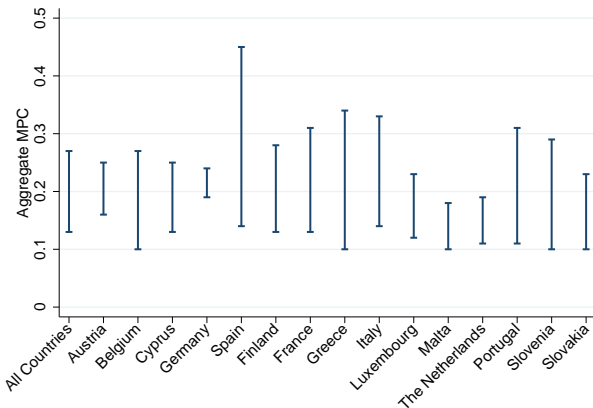
- Aggregate MPC: **0.2–0.4**
- Greater impatience (than for net worth); still less than in U.S.

	All	AT	BE	CY	DE	ES	FI	FR	GR	IT	LU	MT	NL	PT	SI	SK
Overall Average	0.27	0.25	0.27	0.25	0.24	0.45	0.28	0.31	0.34	0.33	0.23	0.18	0.19	0.31	0.29	0.23
By wealth/permanent income ratio																
Top 1%	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.13	0.13	0.12	0.12	0.12
Top 10%	0.12	0.13	0.12	0.13	0.13	0.12	0.12	0.12	0.12	0.13	0.13	0.13	0.13	0.12	0.12	0.13
Top 20%	0.13	0.13	0.13	0.13	0.13	0.14	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
Top 40%	0.13	0.13	0.13	0.13	0.13	0.19	0.14	0.14	0.14	0.15	0.13	0.13	0.13	0.14	0.14	0.13
Top 50%	0.15	0.14	0.15	0.14	0.13	0.23	0.14	0.16	0.16	0.16	0.14	0.13	0.14	0.16	0.14	0.14
Top 60%	0.15	0.15	0.15	0.15	0.15	0.25	0.16	0.17	0.19	0.18	0.14	0.13	0.14	0.17	0.16	0.14
Bottom 50%	0.38	0.35	0.38	0.35	0.34	0.62	0.4	0.44	0.49	0.47	0.31	0.23	0.24	0.44	0.42	0.31
By income																
Top 1%	0.23	0.21	0.22	0.21	0.19	0.31	0.24	0.25	0.29	0.23	0.19	0.15	0.15	0.26	0.25	0.19
Top 10%	0.23	0.21	0.23	0.21	0.19	0.32	0.24	0.25	0.29	0.24	0.19	0.15	0.15	0.26	0.25	0.19
Top 20%	0.24	0.22	0.24	0.22	0.2	0.32	0.25	0.26	0.3	0.24	0.2	0.16	0.17	0.27	0.26	0.2
Top 40%	0.25	0.24	0.25	0.24	0.21	0.36	0.27	0.27	0.31	0.27	0.22	0.18	0.18	0.29	0.27	0.22
Top 50%	0.26	0.24	0.26	0.24	0.21	0.38	0.26	0.28	0.32	0.28	0.23	0.18	0.19	0.3	0.27	0.23
Top 60%	0.26	0.25	0.26	0.25	0.23	0.39	0.28	0.29	0.32	0.29	0.23	0.19	0.19	0.3	0.28	0.23
Bottom 50%	0.28	0.26	0.28	0.26	0.27	0.51	0.3	0.34	0.36	0.38	0.23	0.18	0.19	0.32	0.31	0.23
By employment status																
Employed	0.25	0.23	0.25	0.23	0.23	0.43	0.26	0.29	0.32	0.32	0.21	0.17	0.18	0.29	0.27	0.21
Unemployed	0.47	0.44	0.47	0.44	0.4	0.63	0.5	0.52	0.61	0.49	0.39	0.29	0.3	0.55	0.52	0.38
Time preference parameters <sup>†</sup>																
$\beta$	0.969	0.969	0.969	0.969	0.97	0.959	0.969	0.967	0.967	0.966	0.97	0.971	0.971	0.968	0.968	0.97
$\nabla$	0.006	0.006	0.006	0.006	0.005	0.019	0.007	0.008	0.009	0.01	0.005	0.002	0.002	0.008	0.007	0.005

# Model-Implied $\kappa$ Matching Distribution of Liquid Assets

- Aggregate MPC: 0.2–0.4
- Greater impatience (than for net worth); still less than in U.S.

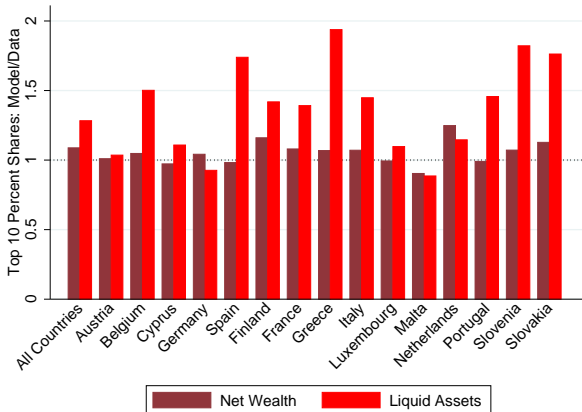
	All	AT	BE	CY	DE	ES	FI	FR	GR	IT	LU	MT	NL	PT	SI	SK
Overall Average	0.27	0.25	0.27	0.25	0.24	0.45	0.28	0.31	0.34	0.33	0.23	0.18	0.19	0.31	0.29	0.23
By wealth/permanent income ratio																
Top 1%	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.13	0.13	0.12	0.12	0.12
Top 10%	0.12	0.13	0.12	0.13	0.13	0.12	0.12	0.12	0.12	0.13	0.13	0.13	0.13	0.12	0.12	0.13
Top 20%	0.13	0.13	0.13	0.13	0.13	0.14	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
Top 40%	0.13	0.13	0.13	0.13	0.13	0.19	0.14	0.14	0.14	0.15	0.13	0.13	0.13	0.14	0.14	0.13
Top 50%	0.15	0.14	0.15	0.14	0.13	0.23	0.14	0.16	0.16	0.16	0.14	0.13	0.14	0.16	0.14	0.14
Top 60%	0.15	0.15	0.15	0.15	0.15	0.25	0.16	0.17	0.19	0.18	0.14	0.13	0.14	0.17	0.16	0.14
Bottom 50%	0.38	0.35	0.38	0.35	0.34	0.62	0.4	0.44	0.49	0.47	0.31	0.23	0.24	0.44	0.42	0.31
By income																
Top 1%	0.23	0.21	0.22	0.21	0.19	0.31	0.24	0.25	0.29	0.23	0.19	0.15	0.15	0.26	0.25	0.19
Top 10%	0.23	0.21	0.23	0.21	0.19	0.32	0.24	0.25	0.29	0.24	0.19	0.15	0.15	0.26	0.25	0.19
Top 20%	0.24	0.22	0.24	0.22	0.2	0.32	0.25	0.26	0.3	0.24	0.2	0.16	0.17	0.27	0.26	0.2
Top 40%	0.25	0.24	0.25	0.24	0.21	0.36	0.27	0.27	0.31	0.27	0.22	0.18	0.18	0.29	0.27	0.22
Top 50%	0.26	0.24	0.26	0.24	0.21	0.38	0.26	0.28	0.32	0.28	0.23	0.18	0.19	0.3	0.27	0.23
Top 60%	0.26	0.25	0.26	0.25	0.23	0.39	0.28	0.29	0.32	0.29	0.23	0.19	0.19	0.3	0.28	0.23
Bottom 50%	0.28	0.26	0.28	0.26	0.27	0.51	0.3	0.34	0.36	0.38	0.23	0.18	0.19	0.32	0.31	0.23
By employment status																
Employed	0.25	0.23	0.25	0.23	0.23	0.43	0.26	0.29	0.32	0.32	0.21	0.17	0.18	0.29	0.27	0.21
Unemployed	0.47	0.44	0.47	0.44	0.4	0.63	0.5	0.52	0.61	0.49	0.39	0.29	0.3	0.55	0.52	0.38
Time preference parameters <sup>†</sup>																
$\beta$	0.969	0.969	0.969	0.969	0.97	0.959	0.969	0.967	0.967	0.966	0.97	0.971	0.971	0.968	0.968	0.97
$\nabla$	0.006	0.006	0.006	0.006	0.005	0.019	0.007	0.008	0.009	0.01	0.005	0.002	0.002	0.008	0.007	0.005



Notes: Figure shows range of aggregate MPCs implied by the distribution of net wealth (lower bound) and of liquid assets (upper bound).

# Model Fits Upper Tail Surprisingly Well

- Share of top 10%:  $\frac{\text{model}}{\text{data}}$  mostly  $\sim 1$ , especially for net wealth



# Empirical Evidence: $MPC \sim 0.2-0.6 (\gg 0.02-0.04)$

## Mostly From US

Authors	Consumption Measure			Horizon*	Event/Sample
	Nondurables	Durables	Total PCE		
Blundell, Pistaferri, and Preston (2008) <sup>‡</sup>	0.05				Estimation Sample: 1980-92
Browning and Collado (2001)			$\sim 0$		Spanish ECPF Data, 1985-95
Coronado, Lupton, and Sheiner (2005)			0.36	1 Year	2003 Tax Cut
Hausman (2012)			0.6-0.75	1 Year	1936 Veterans' Bonus
Hsieh (2003) <sup>‡</sup>	$\sim 0$				CEX, 1980-2001
Jappelli and Pistaferri (2013)	0.48				Italy, 2010
Johnson, Parker, and Souleles (2009)	$\sim 0.25$			3 Months	2003 Child Tax Credit
Lusardi (1996) <sup>‡</sup>	0.2-0.5				Estimation Sample: 1980-87
Parker (1999)	0.2			3 Months	Estimation Sample: 1980-93
Parker, Souleles, Johnson, and McClelland (2011)	0.12-0.30		0.50-0.90	3 Months	2008 Economic Stimulus
Sahm, Shapiro, and Slemrod (2010)			$\sim 1/3$	1 Year	2008 Economic Stimulus
Shapiro and Slemrod (1995)			substantial		1992 Bush Proposal
Shapiro and Slemrod (2009)			$\sim 1/3$	1 Year	2008 Economic Stimulus
Souleles (2002)	0.6-0.9			1 Year	The Reagan Tax Cuts of the Early 1980s

## Quick Summary So Far

- Modest heterogeneity in impatience captures wealth distribution
- Essential to include low-wealth/high-MPC households in analysis (Rep Agent models can't do it)
- Models that match wealth distribution boost aggregate MPC:  
 $\sim 0.04 \nearrow \sim 0.1-0.4$  in European countries (cf. up to 0.6 in U.S.)
- **Heterogeneity matters!**



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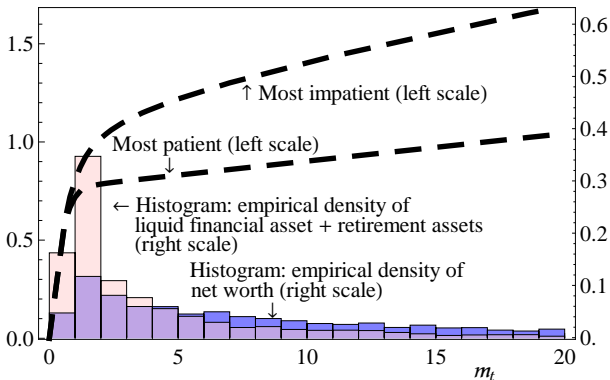
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# Empirical Distribution of Liquid Financial Assets vs Theoretical Consumption Functions (for U.S.)



# Larger transitory shocks $\Rightarrow$ Bigger $\kappa$

	Baseline $\sigma_{\psi}^2, \sigma_{\theta}^2 = 0.01$	High $\sigma_{\theta}^2$ $\sigma_{\theta}^2 = 0.05$	Very High $\sigma_{\theta}^2$ $\sigma_{\theta}^2 = 0.10$
Overall Average	0.13	0.14	0.17
By wealth/permanent income ratio			
Top 1%	0.06	0.06	0.06
Top 10%	0.06	0.06	0.06
Top 20%	0.06	0.06	0.06
Top 40%	0.06	0.06	0.07
Top 50%	0.07	0.05	0.07
Top 60%	0.07	0.07	0.08
Bottom 50%	0.19	0.22	0.26
By income			
Top 1%	0.09	0.1	0.11
Top 10%	0.1	0.1	0.12
Top 20%	0.11	0.11	0.12
Top 40%	0.12	0.12	0.14
Top 50%	0.13	0.12	0.14
Top 60%	0.13	0.13	0.15
Bottom 50%	0.13	0.16	0.2
By employment status			
Employed	0.12	0.14	0.16
Unemployed	0.25	0.25	0.27
Time preference parameters <sup>‡</sup>			
$\beta$	0.989	0.989	0.988
$\nabla$	0.003	0.004	0.005

# Summary

## Take-aways

- Aggregate MPC for **Net Wealth** : 0.1–0.2
- Aggregate MPC for **Liquid Assets** : 0.2–0.4
- MPC Higher for countries with more wealth inequality
  - MPC in Europe lower than in US (because less ≠)
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