The Wealth Distribution and the MPC: Implications of the New EU Wealth Survey

Cross-Country Evidence

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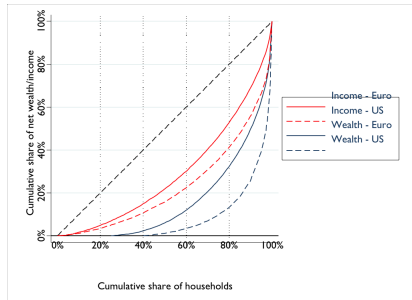
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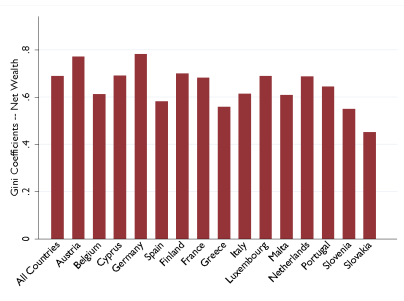jiri.slacalek@ecb.int

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Motivation

Wealth inequality: substantial and varying across countries

(a) Lorenz Curves for Income/Net Wealth, US/Euro Area

(b) Ginis for Net Wealth

How Should Differences in Wealth/Income Relate to the MPC?
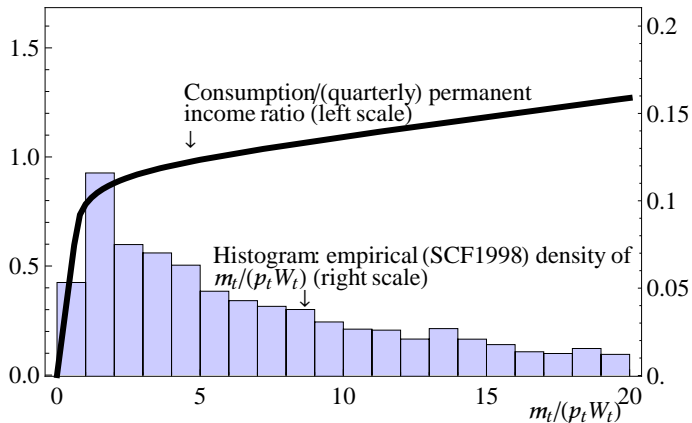
To-Do List

- Simulate a standard consumption/saving model

  (with permanent/transitory income a la Carroll, Slacalek, and Tokuoka (2013))

- Match model to each country's wealth distribution and income dynamics

- Back out implications for marginal propensity to consume, MPC

Findings—Heterogeneity Matters!

Model Implications

1. Important to match wealth distribution
2. High MPC out of transitory income shocks
   - Particularly high MPC when matching liquid assets
   - High MPC for low-wealth/low-income/unemployed households
   - Wealth inequality increases economy's MPC
     ⇒ MPC in US = 0.2–0.6 > MPC in Europe = 0.1–0.4
   - MPC higher under larger transitory income shocks
3. In line with empirical evidence on MPC
   but in stark contrast w/ repr-agent models (MPC $\sim$ 0.02–0.04)

Wealth Distribution and Concavity of Consumption Function

Consumption/(quarterly) permanent income ratio (left scale) ↓

Histogram: empirical (SCF1998) density of $m_t/(p_t W_t)$ (right scale) ↓

$m_t/(p_t W_t)$

The Model: Carroll, Slacalek, and Tokuoka (2013)

Key Ingredients

- Idiosyncratic income uncertainty
- Permanent and transitory income shocks
  - Permanent shocks boost wealth heterogeneity
  - Transitory shocks increase concavity of C function
- 'Blanchard' (1985) eternal youth
- Modest heterogeneity in impatience (to capture wealth distribution)

Household Problem

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

Variables normalized by permanent labor income ($p_t \mathrm{W}$)

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

'β-Dist' Model—Heterogenous Impatience

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

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

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

- Country-by-country estimation

Income Dynamics:
'Standard' Process with **Permanent** and Transitory Component

'Friedman/Buffer Stock' Income Process
Large literature on US data estimating process:

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

p_t = permanent income
ξ_t = transitory income
ψ_{t+1} = permanent shock

Income Parameters: US Estimates

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

Authors	Permanent σ_ψ^2	Transitory σ_ξ^2
Individual data		
MaCurdy (1982)[‡]	0.013	0.031
Topel (1991)	0.013	0.017
Topel and Ward (1992)	0.017	0.013
Meghir and Pistaferri (2004)°	0.031	0.032
Nielsen and Vissing-Jorgensen (2006)[¶]	0.005	0.015
Krebs, Krishna, and Maloney (2007)*	~ 0.01	~ 0.1
Jensen and Shore (2008)°	0.054	0.171
Guvenen (2009)	0.015	0.061
Heathcote, Perri, and Violante (2010)*	0.01–0.03	0.05–0.1
Hryshko (2010)°	0.038	0.118
Low, Meghir, and Pistaferri (2010)	0.011	–
Sabelhaus and Song (2010)[△]	0.03	0.08
Guvenen, Ozkan, and Song (2012)°	~ 0.05	~ 0.125
Karahan and Ozkan (2012)[•]	~ 0.013	~ 0.09
Blundell, Graber, and Mogstad (2013)[♣]	~ 0.015	~ 0.025
Household data		
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)°	0.010–0.030	0.029–0.055
Review of Economic Dynamics (2010)[◁]	0.02–0.05	0.02–0.1
Blundell, Low, and Preston (2013)°	~ 0.005	
DeBacker, Heim, Panousi, Ramnath, and Vidangos (2013)[§]	0.007–0.010	0.15–0.20

# Income Parameters: (Limited) Evidence from Europe

- Estimates comparable with US

	Variance of Income Shocks		
Country/Authors	Permanent σ_ψ^2	Transitory σ_ξ^2	Dataset
France			
Le Blanc and Georgarakos (2013)[*]	0.010	0.031	ECHP
Germany			
Le Blanc and Georgarakos (2013)[*]	0.006	0.030	ECHP
Fuchs-Schuendeln, Krueger, and Sommer (2010)[‡]	0.01–0.096	0.04–0.19	GSOEP
Italy			
Le Blanc and Georgarakos (2013)[*]	0.007	0.105	ECHP
Jappelli and Pistaferri (2010)[‡]	0.02	0.075	SHIW
Spain			
Le Blanc and Georgarakos (2013)[*]	0.001	0.113	ECHP
Albarran, Carrasco, and Martinez-Granado (2009)[°]	0.015–0.157	0.032–0.162	ECPF/ECHP
Pijoan-Mas and Sanchez-Marcos (2010)[‡]	0.01–0.15	~ 0.03	ECPF
United States			
Carroll, Slacalek, and Tokuoka (2013a)	0.010	0.010	Calibrated

Calibration

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C Function and Distribution of Wealth
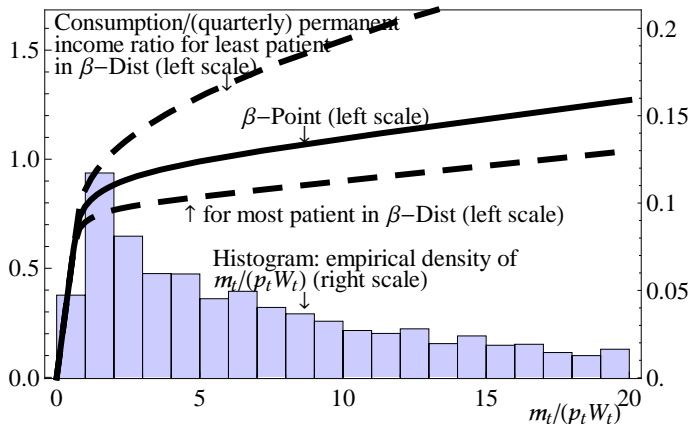
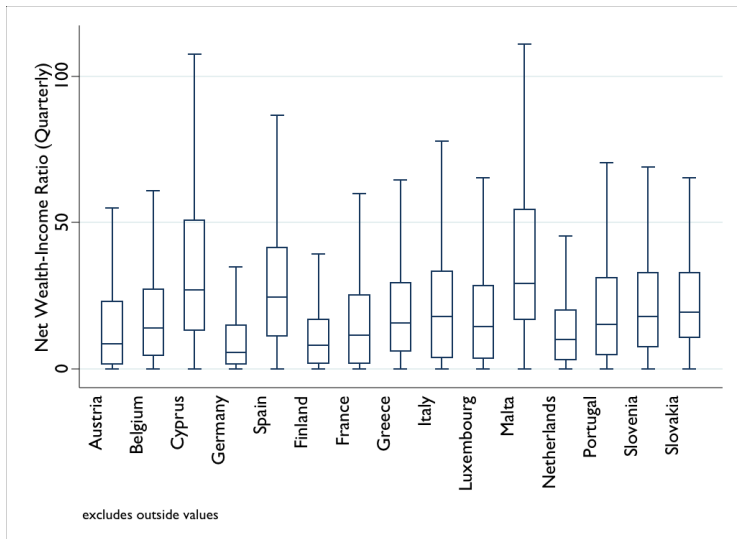# Empirical Wealth Distribution across Countries

Data: Eurosystem Household Finance and Consumption Survey

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Stylized Facts

Substantial Variation in Wealth–Income Ratios Within & Across Countries

excludes outside values

Intermezzo
Inequality in Net Wealth Driven by Homeownership
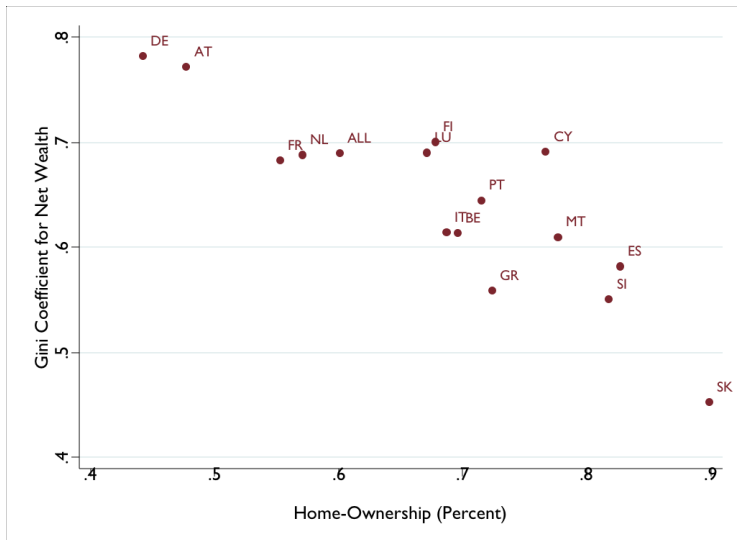
Stylized Facts
Liquid Assets Concentrated Near Zero—where C Function Steep

excludes outside values

Stylized Facts
Liquid Assets More Concentrated at Zero—where C Function Steep

excludes outside values
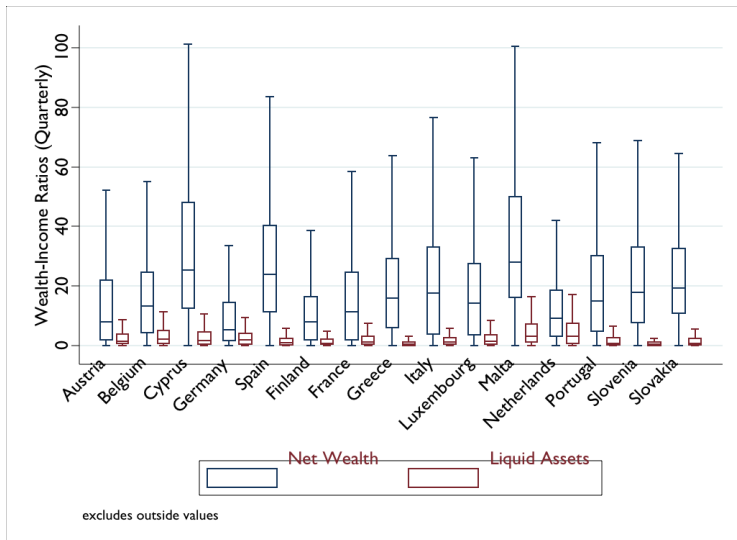
Gini Coefficients A Bit Higher for Liquid Assets

Model-Implied MPCs
Matching the Distribution of **Net Wealth**

- Aggregate MPC: 0.1–0.2
- Little heterogeneity in impatience—low ∇

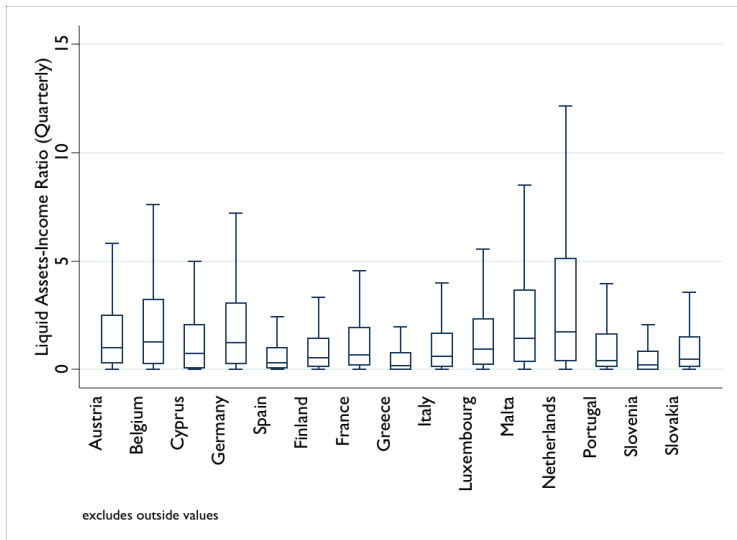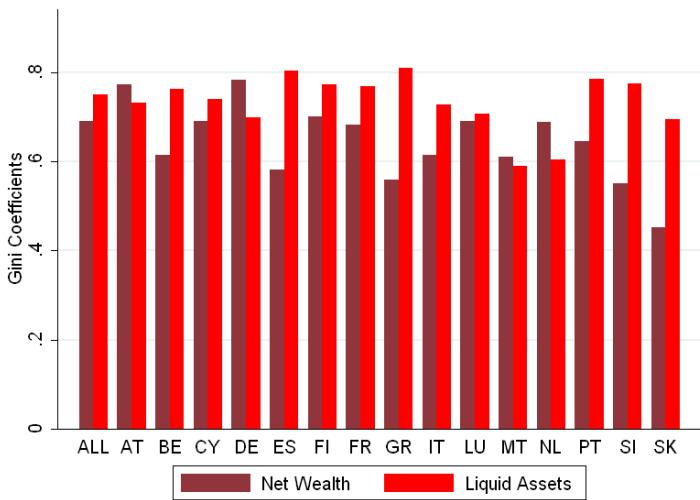|	All	AT	BE	CY	DE	ES	FI	FR	GR	IT	LU	MT	NL	PT	SI	SK
Overall Average	0.13	0.16	0.1	0.13	0.19	0.14	0.13	0.13	0.1	0.14	0.12	0.1	0.11	0.11	0.1	0.1
By wealth/permanent income ratio																
Top 1%	0.06	0.06	0.06	0.06	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Top 10%	0.06	0.06	0.06	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	0.06	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‡																
$\hat{\beta}$	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
∇	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 MPCs
Matching the Distribution of **Liquid Assets**

- Aggregate MPC: 0.2–0.4
- More impatient households (than for net wealth)

	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	0.12	0.13	0.13	0.12	0.12
Top 10%	0.12	0.13	0.12	0.13	0.13	0.12	0.12	0.12	0.12	0.12	0.13	0.13	0.13	0.13	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	0.14	0.15	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[‡]																
$\grave{\beta}$	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
∇	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
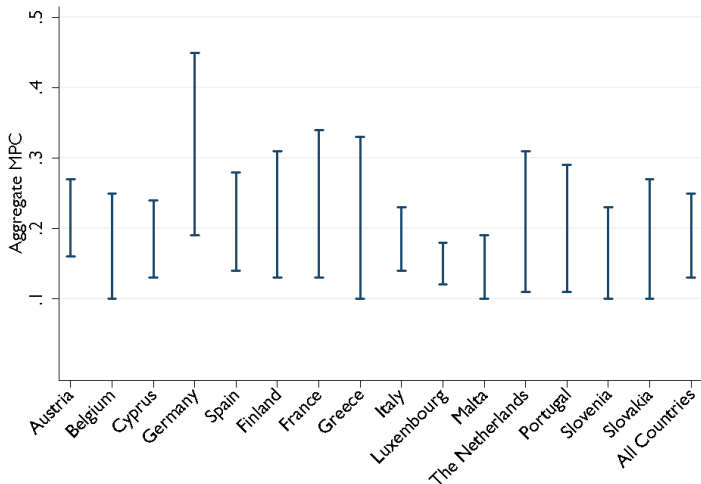
Notes: The figure shows the range of aggregate MPCs spanned by the estimates based on the distribution of net wealth (lower bound, Table **??**) and of liquid assets (upper bound, Table **??**).

Model Fits Upper Tail Surprisingly Well

- Share of top 10%: $\frac{\text{model}}{\text{data}}$ mostly ~ 1, especially for net wealth
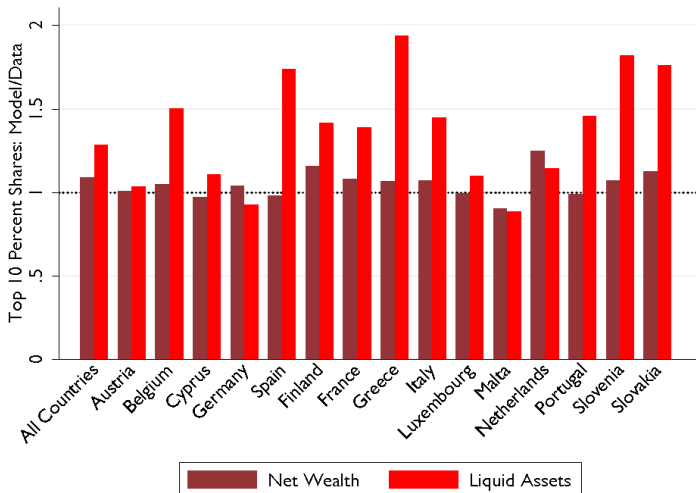
Empirical Evidence: **MPC ~0.2–0.6** (≫ 0.02–0.04)

- Mostly From US

| Authors	Consumption Measure			Horizon*	Event/Sample
	Nondurables	Durables	Total PCE		
Blundell, Pistaferri, and Preston (2008)[‡]	0.05				Estimation Sample: 1980–92
Browning and Collado (2001)			~ 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)[‡]	~ 0				CEX, 1980–2001
Jappelli and Pistaferri (2013)	0.48				Italy, 2010
Johnson, Parker, and Souleles (2009)	~ 0.25			3 Months	2003 Child Tax Credit
Lusardi (1996)[‡]	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)			~ 1/3	1 Year	2008 Economic Stimulus
Shapiro and Slemrod (1995)			substantial		1992 Bush Proposal
Shapiro and Slemrod (2009)			~ 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

- Model with modest impatience heterogeneity 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: $\sim 0.04 \nearrow \sim 0.1$–$0.4$
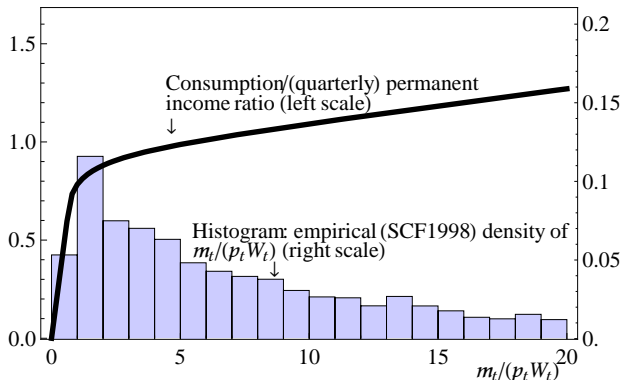
- **Heterogeneity matters!**

Wealth Inequality and MPC

- Inequality implies higher MPC, especially for liquid assets
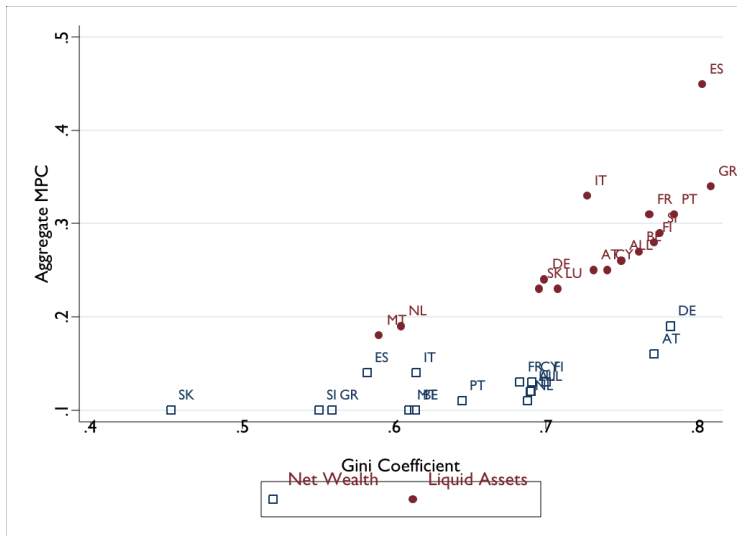
Wealth Inequality and MPC

- Inequality matters more at lower levels of wealth—for liquid assets—where C function is highly non-linear
- Inequality matters less at high levels of wealth

Consumption/(quarterly) permanent income ratio (left scale) ↓

Histogram: empirical (SCF1998) density of $m_t/(p_t W_t)$ (right scale) ↓

$m_t/(p_t W_t)$

Differences in Income Processes

- Larger transitory shocks $\Rightarrow$ C function more concave & larger MPC, in particular at low wealth

	Baseline $\sigma_\psi^2 = 0.01$ $\sigma_\theta^2 = 0.01$	Low σ_ψ^2 $\sigma_\psi^2 = 0.005$ $\sigma_\theta^2 = 0.01$	High σ_θ^2 $\sigma_\psi^2 = 0.01$ $\sigma_\theta^2 = 0.05$	Very High σ_θ^2 $\sigma_\psi^2 = 0.01$ $\sigma_\theta^2 = 0.10$
Overall Average	0.12	0.12	0.14	0.17
By wealth/permanent income ratio				
Top 1%	0.06	0.06	0.06	0.06
Top 10%	0.06	0.06	0.06	0.06
Top 20%	0.06	0.06	0.06	0.06
Top 40%	0.06	0.06	0.06	0.07
Top 50%	0.07	0.07	0.05	0.07
Top 60%	0.07	0.06	0.07	0.08
Bottom 50%	0.17	0.17	0.22	0.26
By income				
Top 1%	0.09	0.08	0.1	0.11
Top 10%	0.09	0.09	0.1	0.12
Top 20%	0.1	0.1	0.11	0.12
Top 40%	0.11	0.11	0.12	0.14
Top 50%	0.12	0.11	0.12	0.14
Top 60%	0.12	0.11	0.13	0.15
Bottom 50%	0.12	0.13	0.16	0.2
By employment status				
Employed	0.11	0.11	0.14	0.16
Unemployed	0.23	0.24	0.25	0.27

Summary

Take-aways

- Aggregate MPC for Net Wealth: 0.1–0.2
- Aggregate MPC for Liquid Assets 0.2–0.4
- MPC in Europe lower than in US [0.2–0.6; see Carroll, Slacalek, and Tokuoka (2013)]
- In Europe more equal wealth distribution $\Rightarrow$ less heterogeneity in impatience than in US
- MPC substantially higher for low-wealth/low-income/unemployed: 0.3–0.6 [vs 0.005–0.2]

MPC

- Higher for countries with more wealth inequality
- Higher for larger transitory income shocks
- **Interactions between wealth inequality and income uncertainty?**

References I

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