

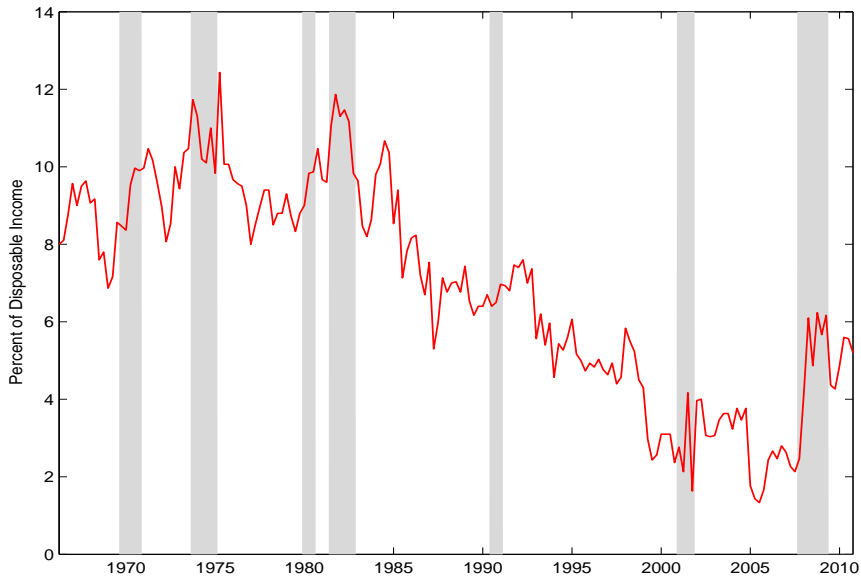
Labor Income Uncertainty and the Macroeconomy

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US Personal Saving Rate (s), 1966–2011



Theory

$$v(m_t) = \max_{\{c_t, x_t\}} u(c_t) + \beta \mathbb{E}_t [v(m_{t+1})]$$

s.t.

$$\mathcal{R}_{t+1} = \zeta \mathbf{R}_{t+1} + (1 - \zeta)R$$

$$m_{t+1} = (m_t - x_t - c_t)\mathcal{R}_{t+1} + \theta_{t+1}$$

- ▶ Labor Income Uncertainty
 - ▶ Unemployment Is Biggest Shock
 - ▶ Lots of Micro Evidence that Precautionary Saving Is Big
 - ▶ Basically, people facing greater σ :
 - ▶ Don't buy a house/car ($x = 0$)
 - ▶ Hold larger net worth
- ▶ Rate-Of-Return Uncertainty
 - ▶ Theoretical effects on C ambiguous
 - ▶ For plausible parameter values, $\sigma \uparrow \Rightarrow C \uparrow$
 - ▶ Portfolio share in risky asset is reduced

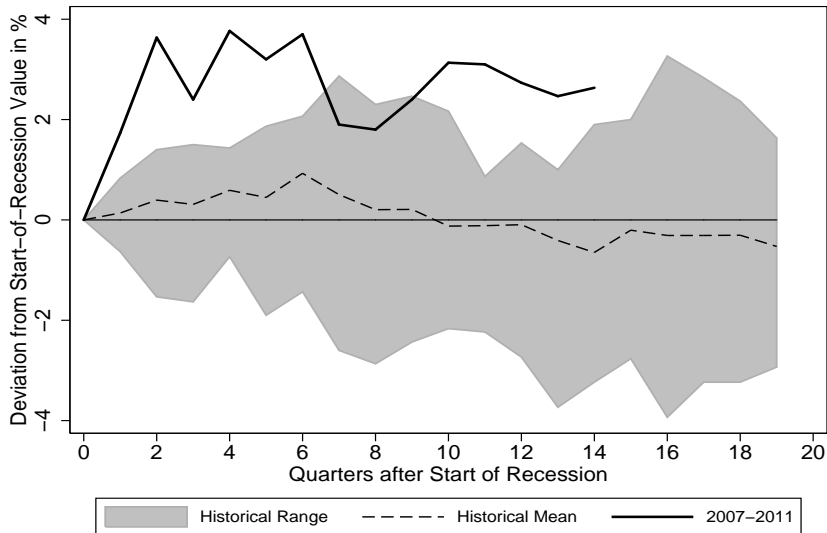
Literature on C

- ▶ “Wealth Effects”
 - ▶ Modigliani, Klein, MPS model, ...
 - ▶ $s_t = -0.05m_t + \text{other stuff}$
- ▶ “Precautionary”
 - ▶ Carroll (1992)
 - ▶ Saving rate rises in recessions
 - ▶ $\Delta \log C_{t+1}$ strongly related to $\mathbb{E}_t(u_{t+1} - u_t)$
- ▶ “Credit Availability”
 - ▶ Secular Trend:
 - ▶ Parker (2000), Dynan and Kohn (2007), Muellbauer (many papers)
 - ▶ Cyclical Dynamics:
 - ▶ Guerrieri and Lorenzoni (2011), Eggertsson and Krugman (2011), Hall (2011)

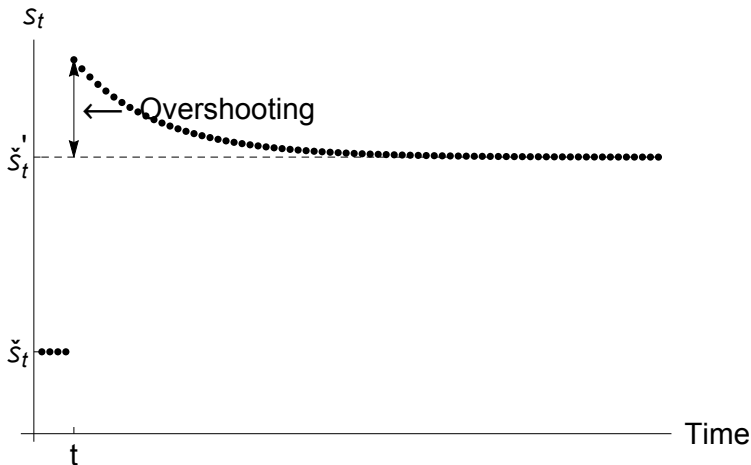
Great Recession 2007–2009

- ▶ s rises by ~ 4 pp
- ▶ Bigger & more persistent increase than any postwar recession
- ▶ But all three indicators also move a lot:
 - ▶ Credit conditions tighten
 - ▶ Unemployment Expectations rise
 - ▶ Wealth falls

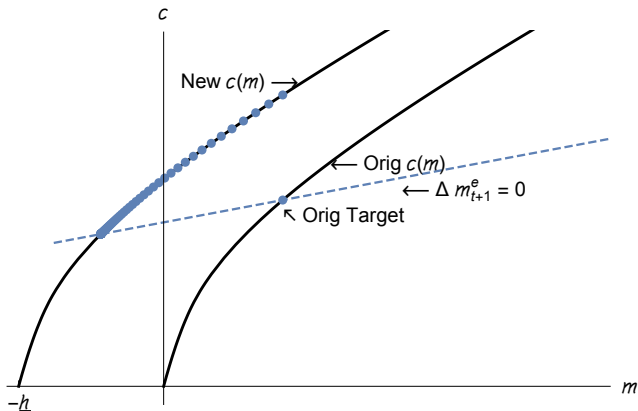
Personal Saving Rate 2007– ↑



Saving Rate After a Permanent Rise in \bar{U}

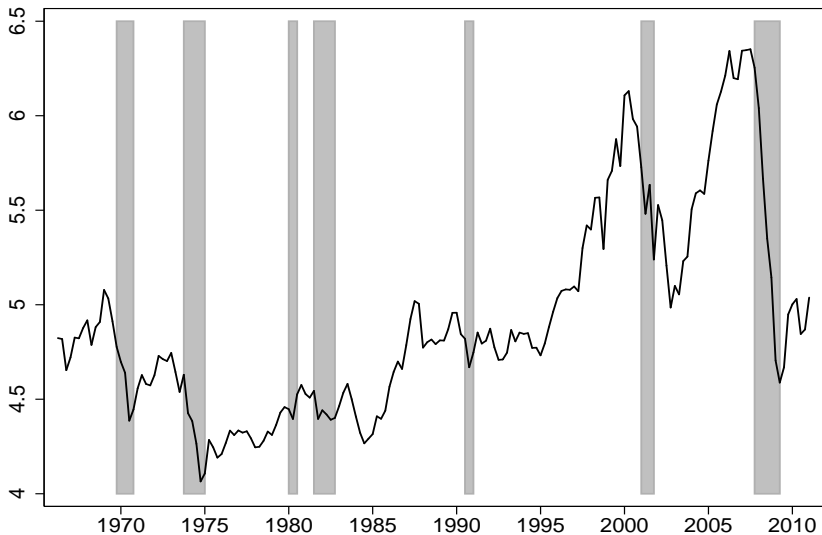


Credit Easing/Financial Innovation & Deregulation



\check{m} is close to linear in credit conditions

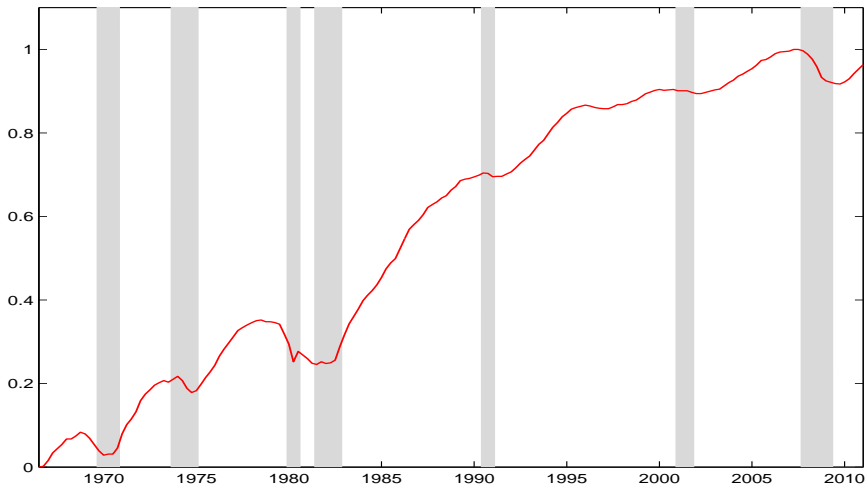
Net Worth (Ratio to Quarterly Disp Income)



Credit Easing Accumulated (CEA) (à la Muellbauer)

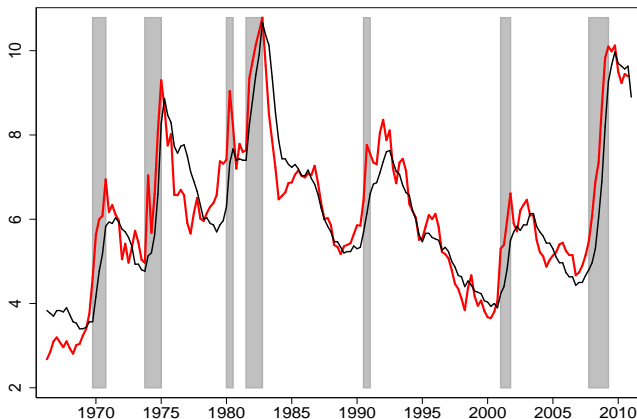
Accumulated responses, weighted with debt-income ratio, to:

“Please indicate your **bank's willingness to make consumer installment loans** now as opposed to three months ago.”



U_t Implied by Michigan U Expectations

U_{Exp} : “How about people out of work during the coming 12 months—do you think that there will be more unemployment than now, about the same, or less?”



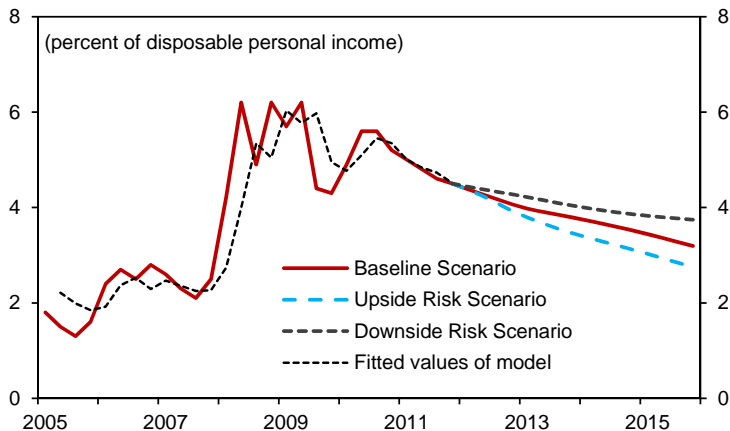
Reduced-Form Regressions

$$s_t = \gamma_0 + \gamma_m m_t + \gamma_{CEA} CEA_t + \gamma_{Eu} \mathbb{E}_t u_{t+4} + \gamma_t t + \gamma_{uC} (\mathbb{E}_t u_{t+4} \times CEA_t) + \varepsilon_t$$

Model	Time	Wealth	CEA	Un Risk	All 3	Baseline	Interact
γ_0	11.95*** (0.61)	25.20*** (1.73)	9.32*** (0.57)	8.24*** (0.42)	14.90*** (2.56)	15.23*** (2.16)	15.55*** (2.56)
γ_m		-2.61*** (0.32)			-1.12*** (0.42)	-1.18*** (0.35)	-1.37*** (0.46)
γ_{CEA}			-14.14*** (1.74)		-5.47*** (1.94)	-6.12*** (0.57)	-4.60*** (1.72)
γ_{Eu}				0.67*** (0.05)	0.32*** (0.12)	0.29*** (0.08)	0.38*** (0.11)
γ_t	-0.04*** (0.00)	-0.03*** (0.00)	0.04*** (0.01)	-0.05*** (0.00)	-0.00 (0.01)		0.00 (0.01)
γ_{uC}							-0.32** (0.16)
\bar{R}^2	0.70	0.85	0.82	0.88	0.89	0.90	0.90
F stat p val	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DW stat	0.30	0.69	0.50	0.86	0.94	0.93	0.98

PSR Forecasts—Out of Sample

2012–2015



Scenarios based on SPF and our judgement

Conclusions

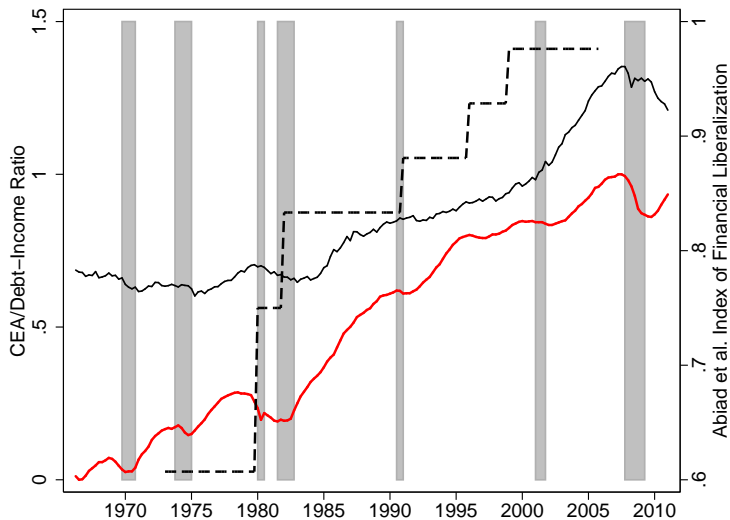
- ▶ All three effects present
- ▶ Easier borrowing largely explains secular decline s
- ▶ Order of importance in Great Recession:
 1. Wealth shock
 2. Labor income risk
 3. Credit tightening
 - ▶ \Rightarrow if credit has big cyclical effect, comes thru w and \bar{U}

References

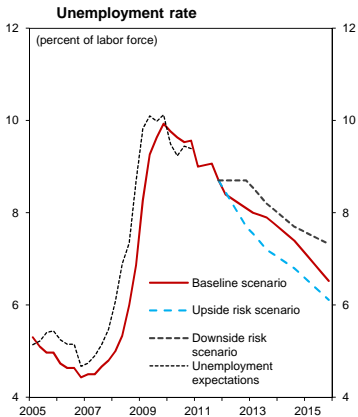
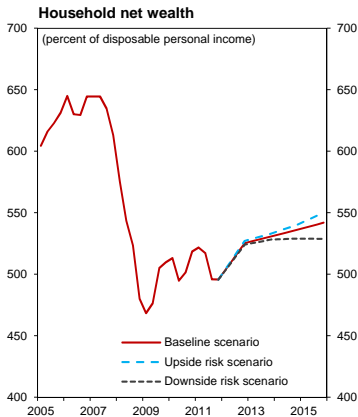
- CARROLL, CHRISTOPHER D. (1992): "The Buffer-Stock Theory of Saving: Some Macroeconomic Evidence," *Brookings Papers on Economic Activity*, 1992(2), 61–156, <http://econ.jhu.edu/people/ccarroll/BufferStockBPEA.pdf>.
- DYNAN, KAREN E., AND DONALD L. KOHN (2007): "The Rise in US Household Indebtedness: Causes and Consequences," in *The Structure and Resilience of the Financial System*, ed. by Christopher Kent, and Jeremy Lawson, pp. 84–113. Reserve Bank of Australia.
- EGGERTSSON, GAUTI B., AND PAUL KRUGMAN (2011): "Debt, Deleveraging, and the Liquidity Trap: A Fisher-Minsky-Koo Approach," *Manuscript, NBER Summer Institute*.
- GUERRIERI, VERONICA, AND GUIDO LORENZONI (2011): "Credit Crises, Precautionary Savings and the Liquidity Trap," *Manuscript, MIT Department of Economics*.
- HALL, ROBERT E. (2011): "The Long Slump," AEA Presidential Address, ASSA Meetings, Denver.
- PARKER, JONATHAN A. (2000): "Spendthrift in America? On Two Decades of Decline in the U.S. Saving Rate," in *NBER Macroeconomics Annual 1999*, ed. by Ben S. Bernanke, and Julio J. Rotemberg, vol. 14, pp. 317–387. NBER.

Background Slides

Alternative Measures of Credit Availability

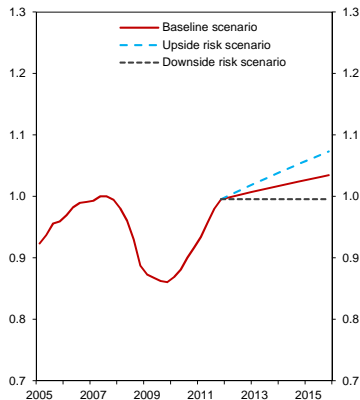


Assumptions/Scenarios for Out-of-Sample Forecasts

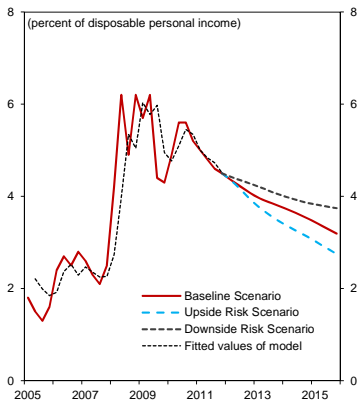


Assumptions/Scenarios for Out-of-Sample Forecasts

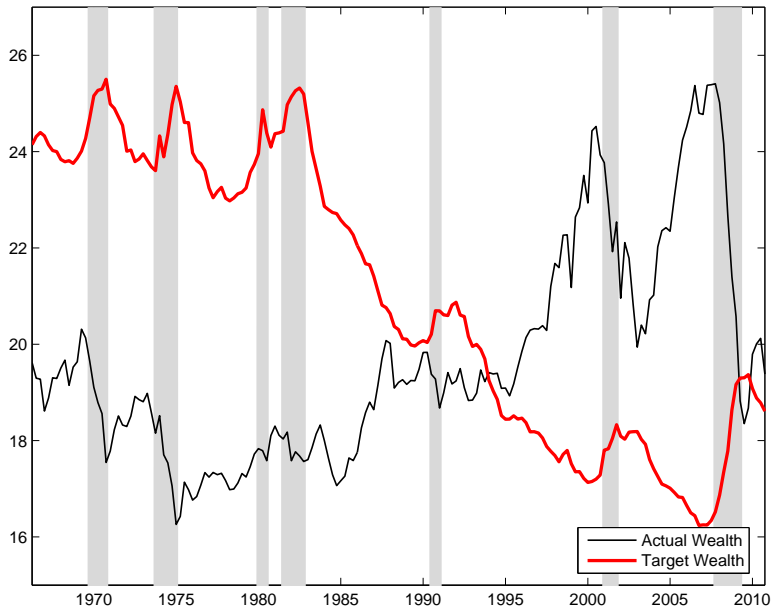
Credit conditions



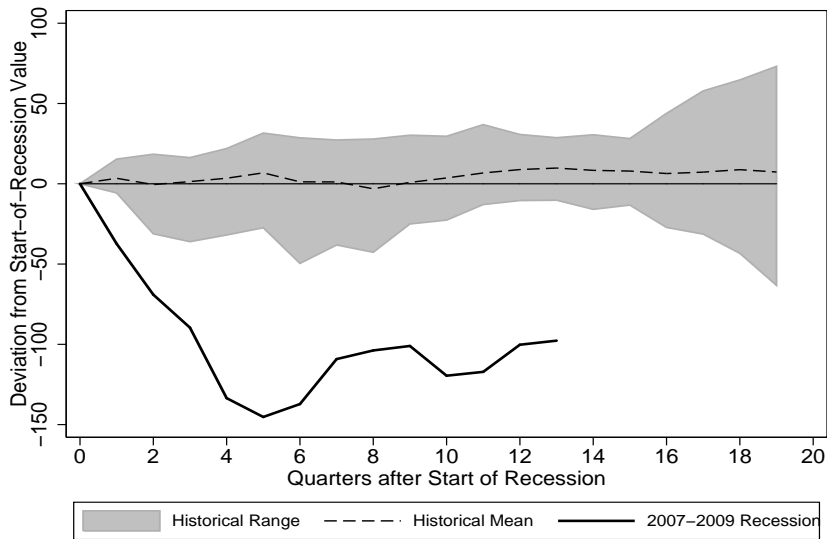
Household saving rate



Actual and Target Wealth

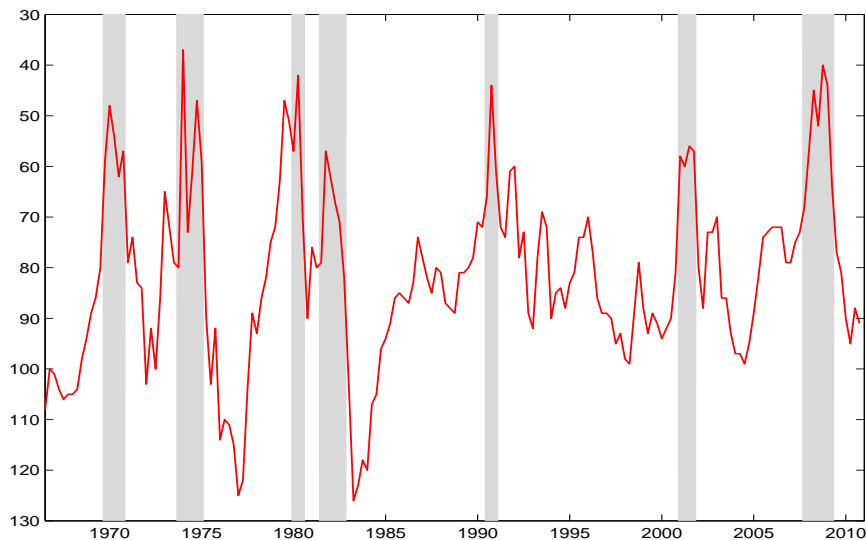


Household Wealth 2007– ↓ by 150% of Income

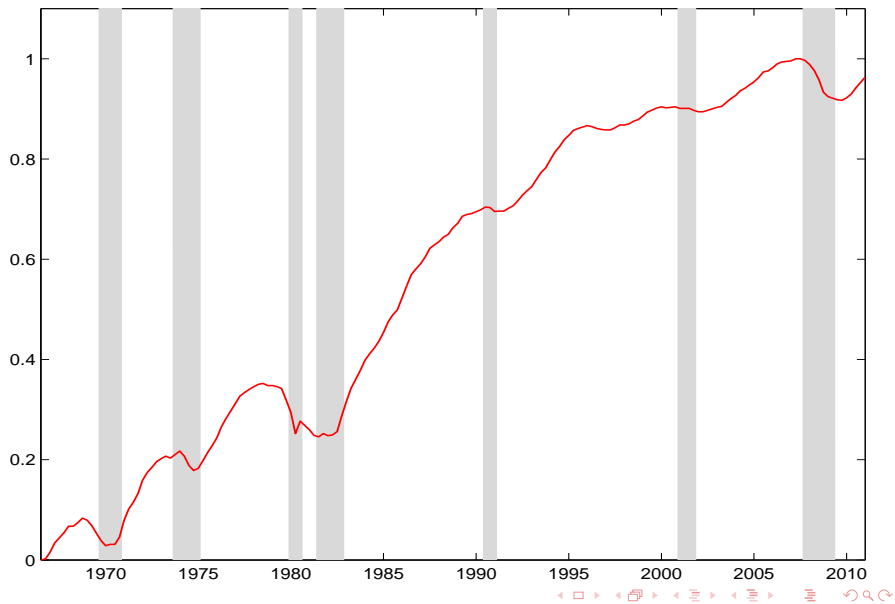


Sustained Expectations of Rising Unemp Risk

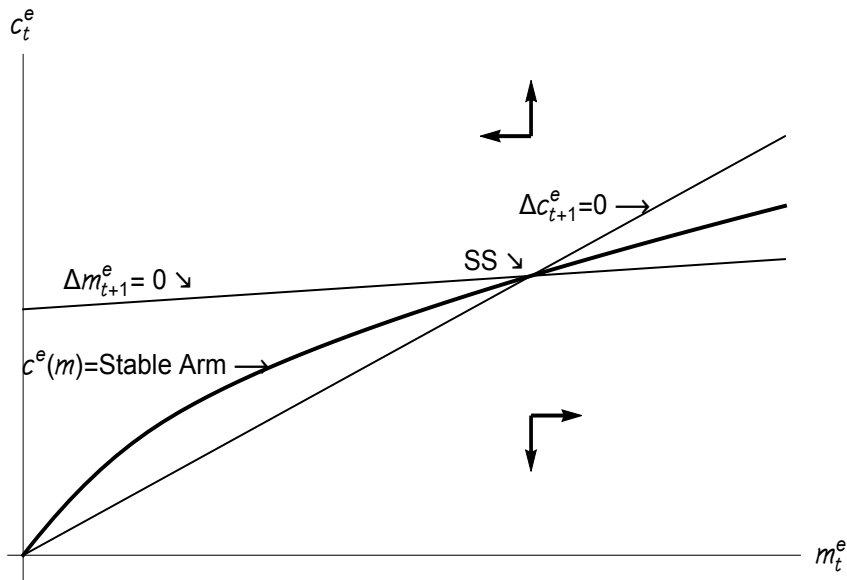
Thomson Reuters/University of Michigan $\mathbb{E}_t(u_{t+4} - u_t)$



Tighter HH Credit Supply (Based on Muellbauer)



Consumption Function



Overshooting and Fiscal Policy

DSGE models:

- ▶ Frictions, frictions everywhere; but missing here
- ▶ If Δc imposes 'external' costs
 - ▶ Sticky prices/wages
 - ▶ Capital (or Investment) adjustment costs
 - ▶ Other reasons for 'pecuniary externalities'
- ▶ \Rightarrow 'stimulus' payments, fiscal policy may reduce cost of cycle
- ▶ Justification for 'automatic stabilizers'?

Reduced-Form Regressions on Model Data

$$s_t^{\text{theor}} = \gamma_0 + \gamma_m m_t + \gamma_{\text{CEA}} \text{CEA}_t + \gamma_{Eu} \mathbb{E}_t u_{t+4} + \gamma_t t + \gamma_{uC} (\mathbb{E}_t u_{t+4} \times \text{CEA}_t) + \varepsilon_t$$

Model	Time	Wealth	CEA	Un Risk	All 3	Baseline	Interact
γ_0	11.96*** (0.50)	21.44*** (1.11)	9.35*** (0.41)	8.42*** (0.16)	12.24*** (0.60)	12.51*** (0.53)	12.49*** (0.55)
γ_m		-2.33*** (0.25)			-0.79*** (0.12)	-0.85*** (0.10)	-0.94*** (0.11)
γ_{CEA}			-13.82*** (1.12)		-5.85*** (0.59)	-6.49*** (0.14)	-5.33*** (0.47)
γ_{Eu}				0.63*** (0.02)	0.33*** (0.04)	0.30*** (0.02)	0.37*** (0.03)
γ_t	-0.04*** (0.00)	-0.03*** (0.00)	0.04*** (0.01)	-0.05*** (0.00)	-0.00 (0.00)		0.00 (0.00)
γ_{uC}							-0.19*** (0.04)
\bar{R}^2	0.80	0.93	0.93	0.98	0.99	0.99	0.99
F stat p val	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DW stat	0.05	0.22	0.09	0.39	0.72	0.71	0.99

Reduced-Form Regressions on Actual Data

$$s_t^{\text{meas}} = \gamma_0 + \gamma_m m_t + \gamma_{\text{CEA}} \text{CEA}_t + \gamma_{Eu} \mathbb{E}_t u_{t+4} + \gamma_t t + \gamma_{uC} (\mathbb{E}_t u_{t+4} \times \text{CEA}_t) + \varepsilon_t$$

Model	Time	Wealth	CEA	Un Risk	All 3	Baseline	Interact
γ_0	11.95*** (0.61)	25.20*** (1.73)	9.32*** (0.57)	8.24*** (0.42)	14.90*** (2.56)	15.23*** (2.16)	15.55*** (2.56)
γ_m		-2.61*** (0.32)			-1.12*** (0.42)	-1.18*** (0.35)	-1.37*** (0.46)
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γ_t	-0.04*** (0.00)	-0.03*** (0.00)	0.04*** (0.01)	-0.05*** (0.00)	-0.00 (0.01)		0.00 (0.01)
γ_{uC}							-0.32** (0.16)
\bar{R}^2	0.70	0.85	0.82	0.88	0.89	0.90	0.90
F stat p val	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DW stat	0.30	0.69	0.50	0.86	0.94	0.93	0.98