

# INEQUALITY AND REDISTRIBUTION IN THE GREAT RECESSION: FACTS AND MACROECONOMIC CONSEQUENCES

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*Based on works with Jonathan Heathcote and Joe Steinberg*

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Social Cohesion and Public Policy*

# Questions and plan of the talk

- How has the great recession affected social cohesion (economic equality) in US?
- How has public policy (redistribution) responded?
- What are the macroeconomic consequences of such a response?

# Cyclical Dimensions of Inequality in US

- Sample
  - March Consumer Population Survey Data (about 60000 households each year, repeated cross section)
  - Select households with at least one member aged 22-65

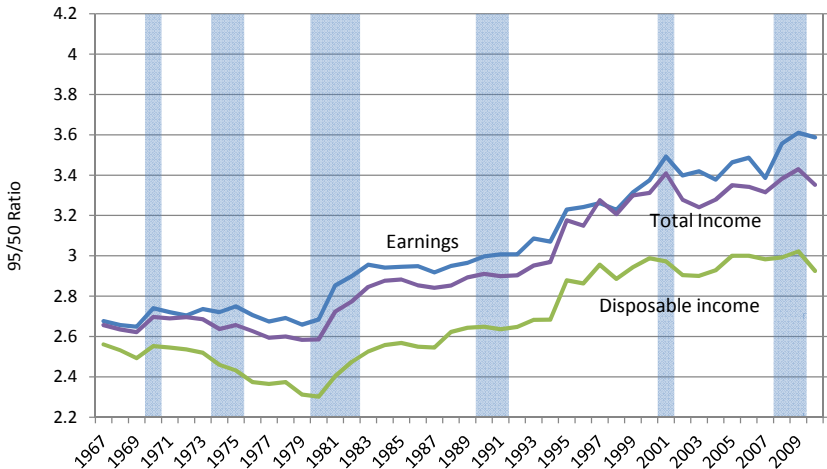
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  - Disposable Income=Total Income -Taxes

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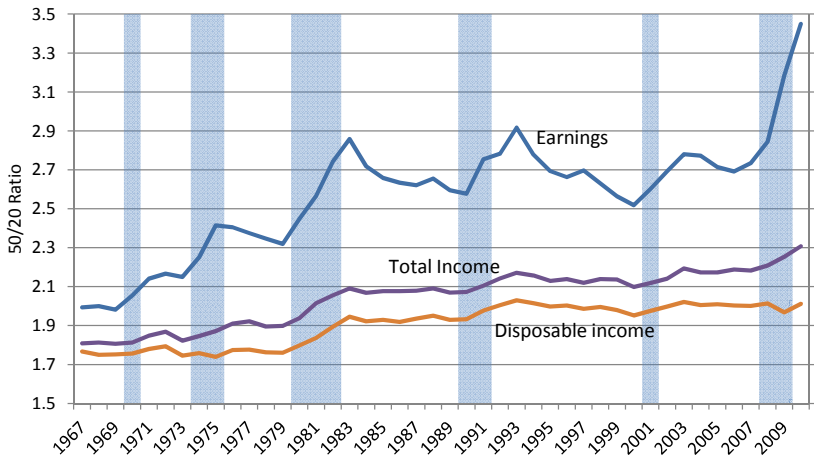
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- Inequality Measures
  - 95/50
  - 50/20

# Recessions and Inequality at the top



Note: Shaded areas represent years which contains at least a quarter classified as recession quarter by the NBER

# Recessions and Inequality at the bottom



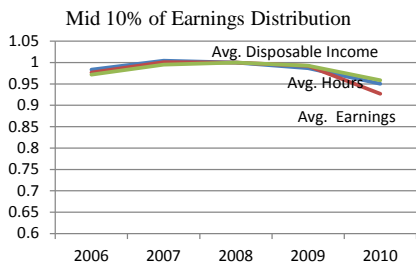
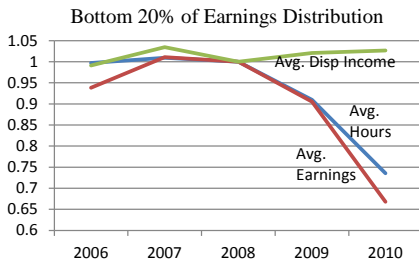
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# Special Features of the Great Recession

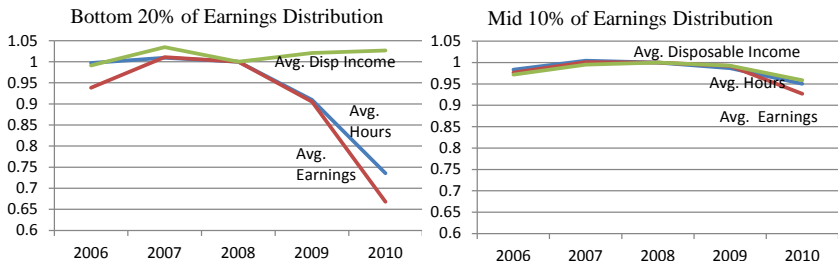
- Unprecedented collapse of bottom 20% of earnings distribution
- Despite collapse, unprecedented stability of the bottom 20% of disposable income distribution



# Constrasting the Middle and the Bottom



# Constrasting the Middle and the Bottom



- Collapse of bottom 20% of earnings is absolute (not relative)
- Main cause of collapse is collapse in hours worked

# Differences between earnings and disposable income

Income Category	Change in 50/20	Impact on change of earnings 50/20
Earnings	0.54	
Earnings – taxes	0.27	-0.27
Earnings + unemployment benefits	0.31	-0.23
Earnings + Social Security income	0.46	-0.08
Earnings + private retirement income	0.46	-0.08
Earnings + educational assistance	0.48	-0.06
Earnings + disability benefits	0.48	-0.06
Earnings + veteran's benefits	0.50	-0.04
Earnings + rental income	0.50	-0.04
Earnings + private assistance	0.50	-0.04
Earnings + survivor's benefits	0.50	-0.03
Earnings + worker's compensation	0.52	-0.02
Earnings + dividend income	0.53	-0.01
Earnings + alimony	0.53	-0.01
Earnings + other unspecified income	0.53	-0.01
Earnings + child support	0.54	0.00
Earnings + interest income	0.54	0.01

# Accounting for differences between earnings and disposable income

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## Beyond income

- Two reasons why earnings/disposable income not necessarily connected to welfare during GR
  - During GR wealth falls substantially and disposable income does not include unrealized capital losses
  - Government subsidy that support disposable income might be temporary, hence **permanent** disposable income might fall, despite stable **current** disposable income

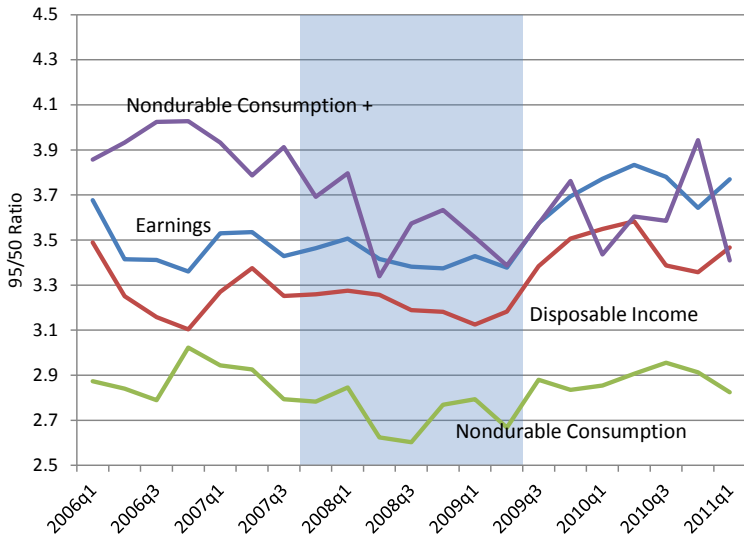
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- Inequality in Consumption reflects wealth changes and permanent income

# Consumer Expenditure Survey (CEX), 2006q1-2011q1

- Rotating short panel: Interview Survey covering 15,000+ households
- key strength: consumption data
- Sample and Inequality Measures: same as in CPS

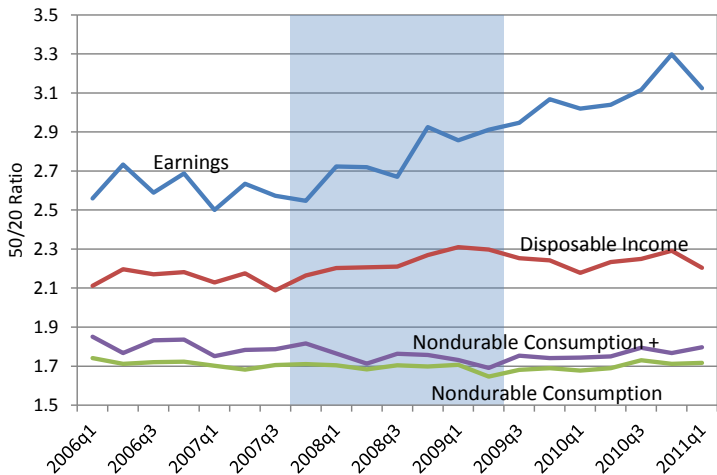
# Income/Consumption Inequality in the GR: top



Note: Shaded area represents the Great Recession.

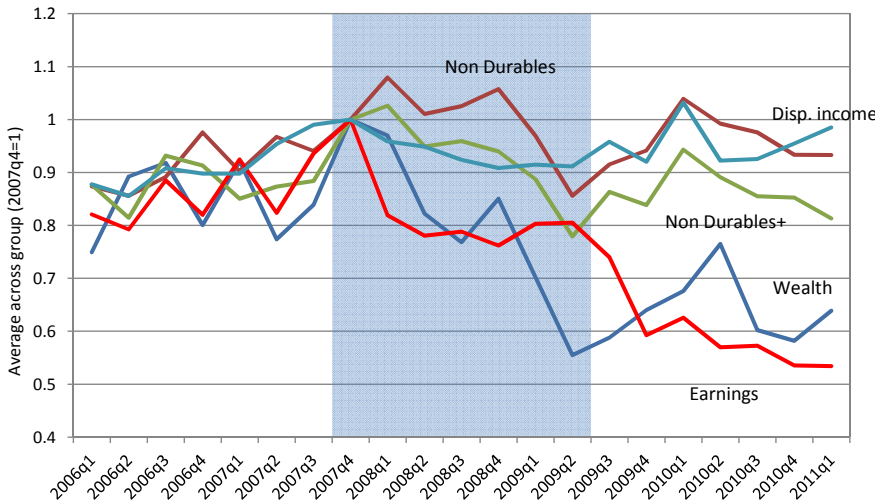


# Income/Consumption Inequality in the GR: bottom



Note: Shaded area represents the Great Recession.

# Tracking the bottom 20% of Earnings



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## Tracking the bottom 20% of Earnings

- Earnings Collapses (40%)
- Disposable Income Stable
- Non Durable Consumption Stable
- Wealth Falls (30%)
- Total Consumption (incl. Durables) Falls (20%)

## Digging Deeper

- Does stable disposable income of the bottom 20% of earning distribution means that households facing an income collapse are fully shielded?

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- Does stable disposable income of the bottom 20% of earning distribution means that households facing an income collapse are fully shielded?
- Not necessarily as households who are in the bottom 20% of earning distribution in a year are not the same households in the bottom 20% the next
- In order to assess effect of earning collapse on individual household, need panel data
- For US, PSID

## Dynamics of group statistics

- 

$$\Delta y_{B20} = \alpha_t \Delta y_{B20}^S + (1 - \alpha_t)(y_t^I - y_{t-1}^O)$$

- Key difference btwn earnings and disposable income is term

$$(y_t^I - y_{t-1}^O)$$

- Negative for earnings: entrants in bottom 20% have lower earnings than those who exit bottom 20%. In recessions low earners due to unemployment, say 0\$, push out from the bottom group low earners due to low wages, say 20000\$)
- Positive for disposable income: entrants in bottom 20% have higher disp. income than those who exit (expiring unemployment benefits)
- Composition affect group dynamics

# Tracking households in/out bottom 20%

Income (2006 \$)

Transfers and consumption (2006 \$)

Year	Unemp. rate (head of household)	Wealth (2006 \$)	Earnings	Disp. Income	Transfers	Unemp. insurance	Consumption nondurabl)
<i>(a) Bottom 20 percent of earnings</i>							
2006	14.6 %	20,498	4,868	8,463	2,963	424	8,373
2008	20.9%	-	4,928	8,691	3,092	733	9,354
Change	6.3%	-	1.2%	2.7%	4.3%	72.9%	11.7%
<i>(b) In-switchers</i>							
2006	12.4%	70,146	24,587	22,931	1,267	251	11,971
2008	19.3%	-	6,678	10,695	3,025	1,364	11,802
Change	6.9%	-	-72.8%	-53.4%	138.8%	443.1%	-1.4%
<i>(c) Out-switchers</i>							
2006	11.5%	29,137	7,115	9,317	1,665	538	9,443
2008	12.9%	-	20,200	19,596	1,568	320	11,813
Change	1.4%	-	183.9%	110.3%	-5.8%	-40.5%	25.1%
<i>(d) Stayers</i>							
2006	17.0%	14,791	4,128	8,113	3,276	386	7,282
2008	21.1%	-	4,254	7,954	3,137	534	7,553
Change	4.1%	-	3.0%	-2.0%	-4.3%	38.5%	3.7%

## Tracking households entering 20% of Earnings, 2006-2008

- Enter with high wealth (70000\$)
- Earnings Collapse (70%)
- Transfer increase
- Disposable Income Falls (50%)
- Non Durable Consumption Stable (-1.5%)



# Summarizing

- Gap between earnings and disposable income inequality is at its historical high, suggesting public policy
- Yet households facing significant earning loss face loss of disposable income and, in the long run, loss of consumption and welfare
- Can macro models help us evaluate whether we have "too little" or "too much" public policy?

## A model of sunspot-driven fluctuations

- Rise in expected unemployment
  - consumers reduce demand
  - firms reduce hiring
  - higher unemployment
- For a wave of self-fulfilling pessimism to get started need **high sensitivity of demand** to expected unemployment
- High wealth/cheap credit/strong public policy:
  - demand less sensitive to expectations
  - no sunspot-driven fluctuations
- Low wealth/costly credit/weak public policy:
  - demand more sensitive to expectations
  - sunspot-driven fluctuations

# A Stylized Model

- Related to *Farmer* 2010, *Chamley* 2011, *Guerrieri and Lorenzoni* 2009

## A Stylized Model

- Related to *Farmer* 2010, *Chamley* 2011, *Guerrieri and Lorenzoni* 2009
- Non-durable consumption good
- Produced by competitive firms using labor

$$c + g = y = n$$

where  $n$  is mass of workers employed

- Durable housing  $h$ , in fixed supply with relative price  $p$
- Each representative household contains continuum of potential workers

# Household Problem

$$\max_{\{c_t, h_{t+1}\}} E \sum_{t=0}^{\infty} \beta^t (\log c_t + \phi h_t)$$

s.t.

$$p_t h_{t+1} - p_t h_t = (1 - u_t)(w_t - c_t) - u_t \left( \frac{\psi}{2} \min \{p_t h_t - d - c_t, 0\}^2 + c_t \right) + T_t$$

$\phi$  : preference weight on housing

$\psi$  : cost of credit

$d$  : part of home value that cannot be used as collateral

$u_t$  : fraction of household workers unemployed

$T_t$  : lump-sum rebate of credit costs

Note: no disutility from work, so unemployment inefficient

## Timing

1. Households co-ordinate expectations on current unemployment, distributions of future unemployment rates
2. Representative household sends out workers with consumption order  $c_t$ , assets  $p_t h_t$ , reservation wage  $w_t^*$
3. Representative firm randomly meets potential workers sequentially, decides whether to hire them
4. Firms pay wages  $w_t = w_t^*$ , workers pay for consumption - must borrow if unemployed and  $c_t > p_t h_t - d$
5. Household regroups, net resources determine  $h_{t+1}$ .

Optimal firm strategy: hire worker iff aggregate order  $c_t$  not yet filled and  $w_t^* \leq 1$

Optimal household strategy: set  $w_t^* = 1$

# Frictions

1. **Labor market friction:** No role for labor supply in determining allocations  $\Rightarrow$  equilibrium unemployment, multiplicity
  - Workers cannot affect probability of meeting a firm by asking a lower wage, and when meet ask for reservation wage (alternatively downward wage rigidity)

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1. **Labor market friction:** No role for labor supply in determining allocations  $\Rightarrow$  equilibrium unemployment, multiplicity
  - Workers cannot affect probability of meeting a firm by asking a lower wage, and when meet ask for reservation wage (alternatively downward wage rigidity)
2. **Credit friction:** Unemployed with low wealth must use expensive credit  $\Rightarrow$  precautionary motive
3. **Consumption commitment friction:** Consumption chosen before unemployment status known  $\Rightarrow$  precautionary motive sensitive to expected unemployment



# Equilibrium Conditions

- $w_t = w_t^* = 1$
- $h_t = 1$
- $T_t = \psi u_t \min \{(p_t - d - c_t), 0\}^2$
- $c_t = n_t = 1 - u_t$

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- 

$$p_t \frac{1}{c_t} \times \frac{1}{(1 - \psi u_t \min \{(p_t h_t - d - c_t), 0\})} = \beta E_t \left[ \phi + \frac{p_{t+1}}{c_{t+1}} \right]$$

## Strong Housing demand $\Rightarrow$ full employment

If

$$\phi \geq \bar{\phi} = (1 + d) \frac{1 - \beta}{\beta}$$

then the **only steady state is  $p = \underline{p}$  and  $u = 0$**

Logic:  $\phi \geq \bar{\phi} \Rightarrow \underline{p} - d \geq c_{max} = 1$

... so even the unemployed never needs credit

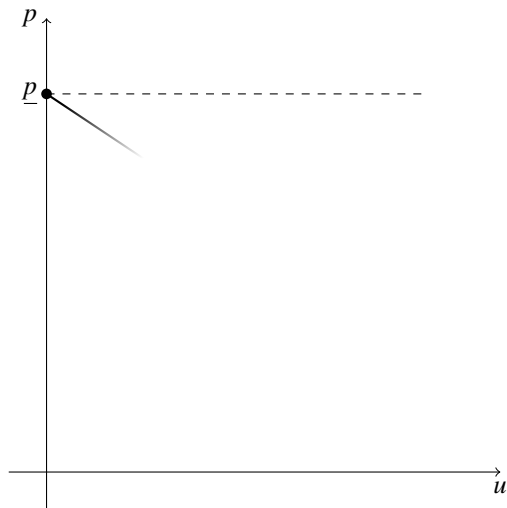
Absent credit constraints,

$$p = \frac{\beta(1 - u)}{1 - \beta} \phi \leq \underline{p} = \frac{\beta}{1 - \beta} \phi$$

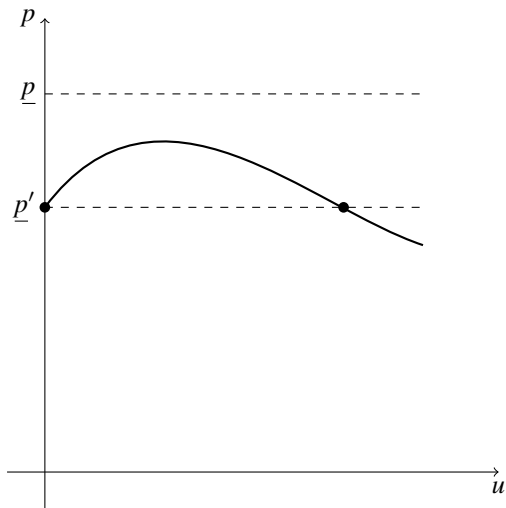
But marginal investor implies  $p \geq \underline{p}$ , so  $p = \underline{p}$ ,  $u = 0$

High wealth  $\Rightarrow$  High consumption demand  $\Rightarrow$  Full Employment

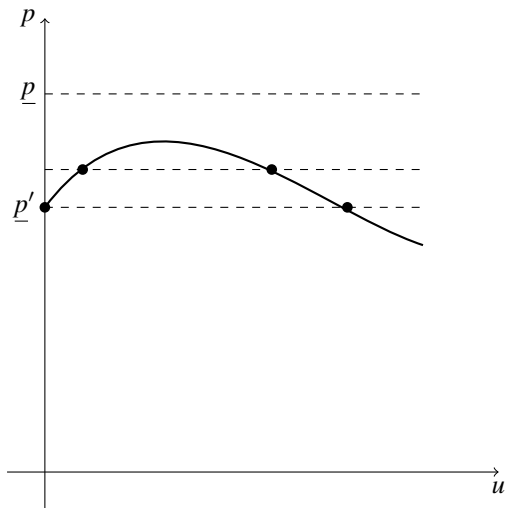
## Steady state: High housing prices



## Low housing prices: Multiple steady state $u$ , given $p$



## Low housing prices: Multiple steady state $p$



## Low Asset prices and Volatility

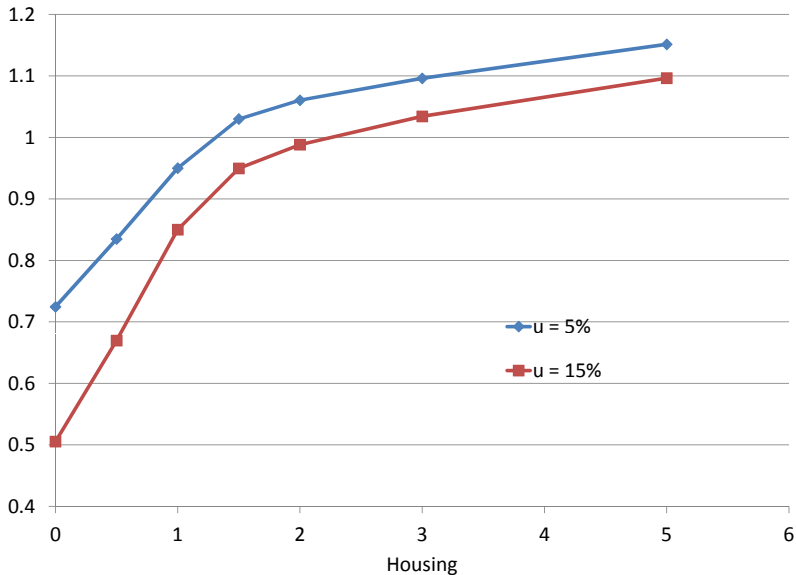
- When asset prices are (exogenously) low the model display many types of multiplicity: multiple steady states and sunspots.

## Micro Evidence for the Mechanism

- **Key mechanism:** Elasticity of demand wrt unemployment risk is larger when wealth is low
- **Natural test:** Did wealth-poor households reduce consumption more than rich households as unemployment rose during the Great Recession?



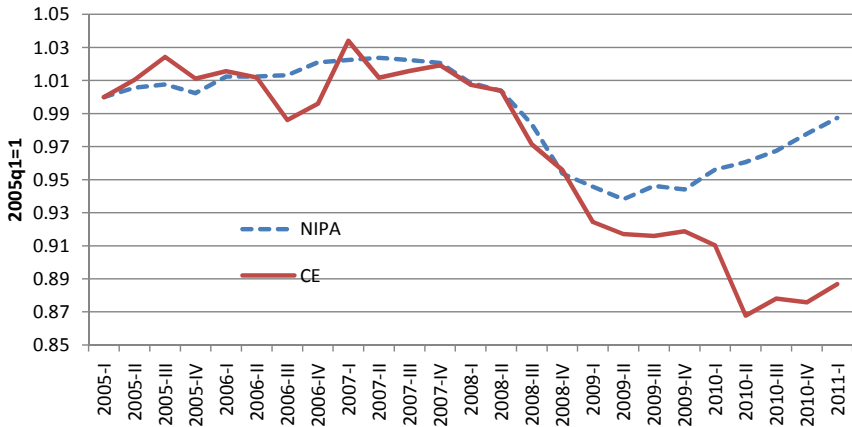
## Differential Sensitivity in the Model



# Consumer Expenditure Survey

- Households aged 25-60 with 4 quarters of consumption data
- Sort households by wealth (net financial wealth plus home equity) relative to consumption
- Compare consumption growth of top and bottom halves of wealth distribution

# CE Survey versus NIPA



## Characteristics of Rich versus Poor

	Wealth Group	
	0-50	50-100
Sample size	8,864	8,873
Average age of head	41.4	46.9
Heads with college	25.7%	40.5%
Average household size	2.9	2.8
Net wealth p.c. (2005\$)		
Mean	1,498	119,796
Median	238	63,162
Mean after-tax income p.c. (2005\$)	22,117	32,811
Mean consumption p.c. (2005\$)	9,353	11,252

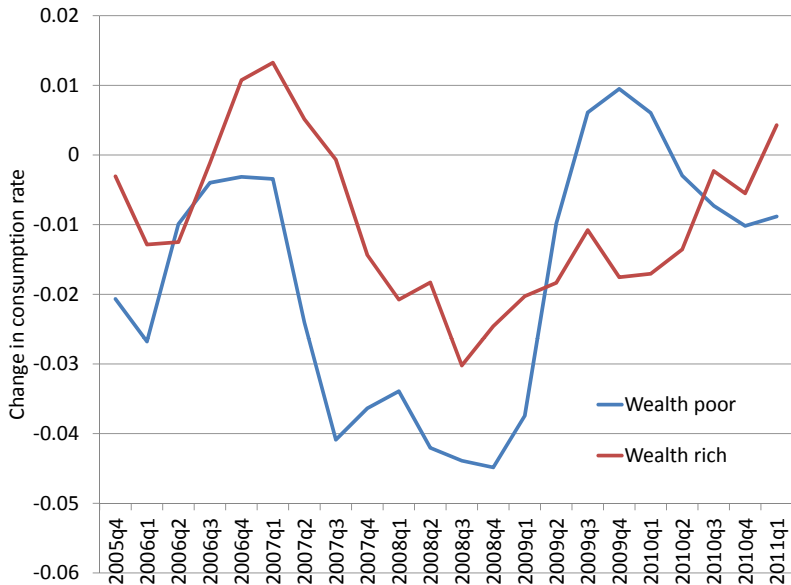
# Consumption Growth: Rich versus Poor



## Consumption vs. Income Growth

	Wealth Group	
	0-50	50-100
Mean growth income p.c.	-0.3%	-1.0%
Mean growth cons. p.c.	-5.6%	-3.1%

# Consumption Rates: Rich versus Poor

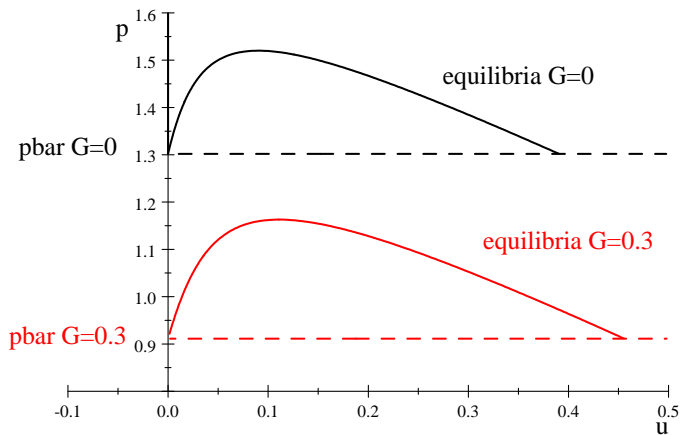


## Micro Evidence: summary

- Low wealth households reduce consumption much more during recession, despite facing similar increase in unemployment/income risk



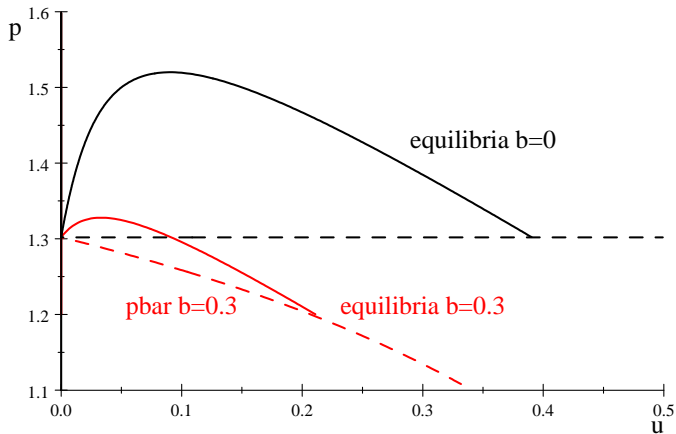
# Policy 1: Tax and Spend



## Policy 1: Review

- Reduces elasticity of aggregate demand to expectations
- Also reduces asset values (credit constraint more binding)
- Can narrow/expand range of equilibrium unemployment
- Welfare implications depend on utility from  $G$
- Not necessarily effective!

## Policy 2: Unemployment benefit $b$ financed by proportional tax $\tau$ on earnings



## Policy 2: Review

- Policy reduces need for costly credit  $\Rightarrow$  shrinks range of possible unemployment rates
- Unique full employment equilibrium if

$$b \geq \frac{\psi \left( (d + 1) + \frac{\beta}{(\beta - 1)} \phi \right) + (\beta - 1)}{(\beta - 1) + \psi}$$

- ... which implies  $b \geq 0.61$  in a numerical example

# Conclusions

- Individual unemployment risk can, through precautionary demand reduction, drive macroeconomic instability, especially in periods of low wealth
- Public policy geared toward reducing directly this risk, can be effective in reducing instability
- Micro policies more effective than macro ones, especially in time of low asset prices
- Can help understand the historically high use of public policy during GR