**Discussion of**

# "Optimal Fiscal and Monetary Policy under Rare Disasters: The Role of Government Debt and Monetary Conservatism"

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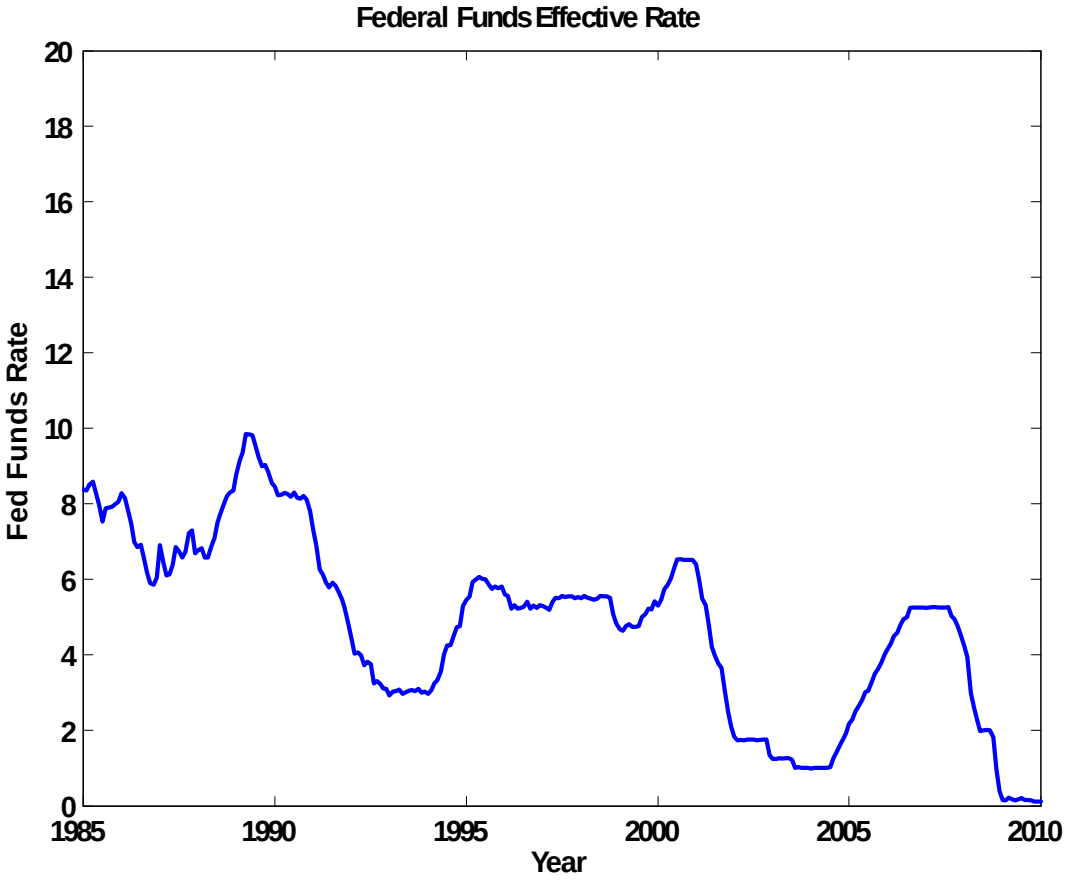
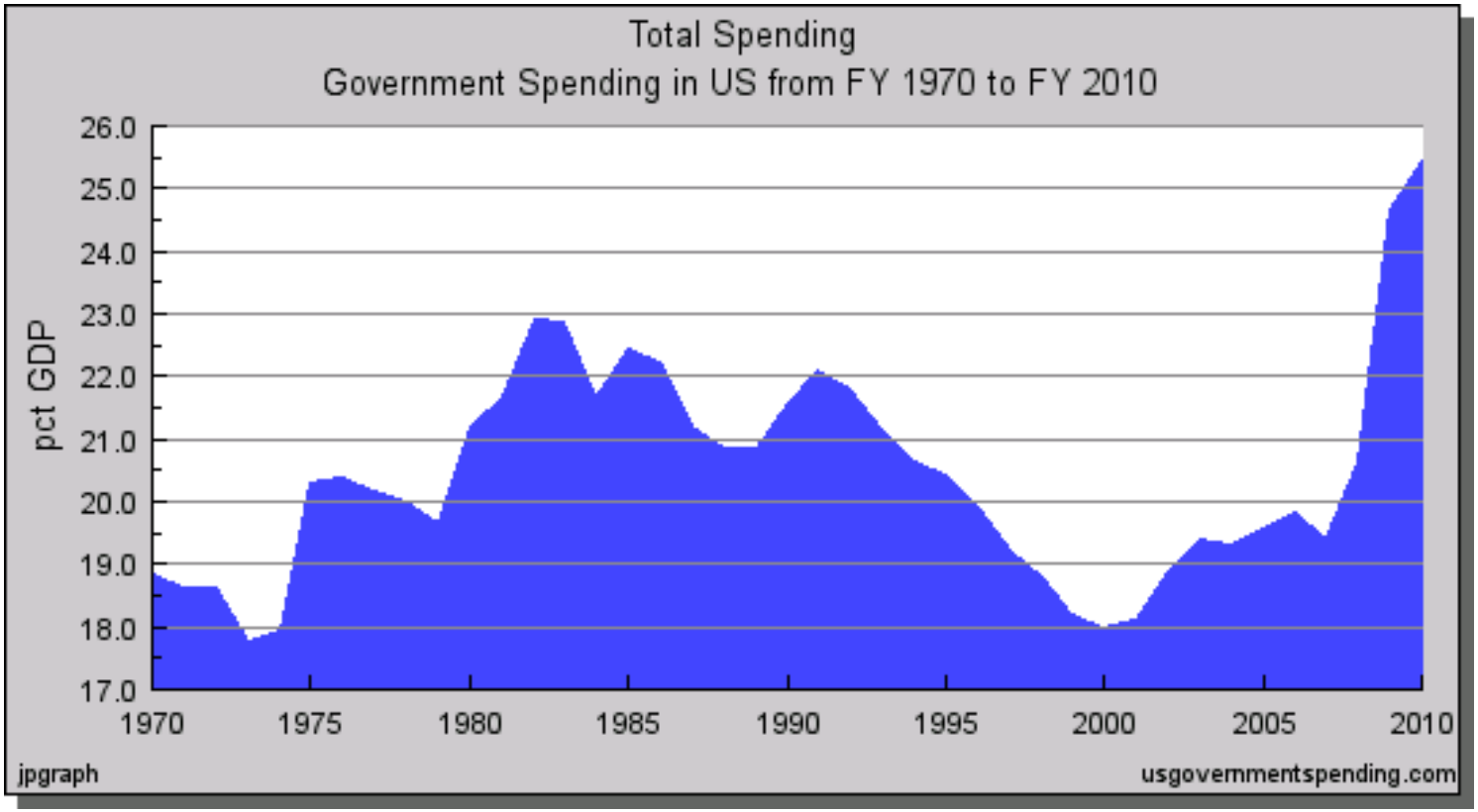
## Motivation

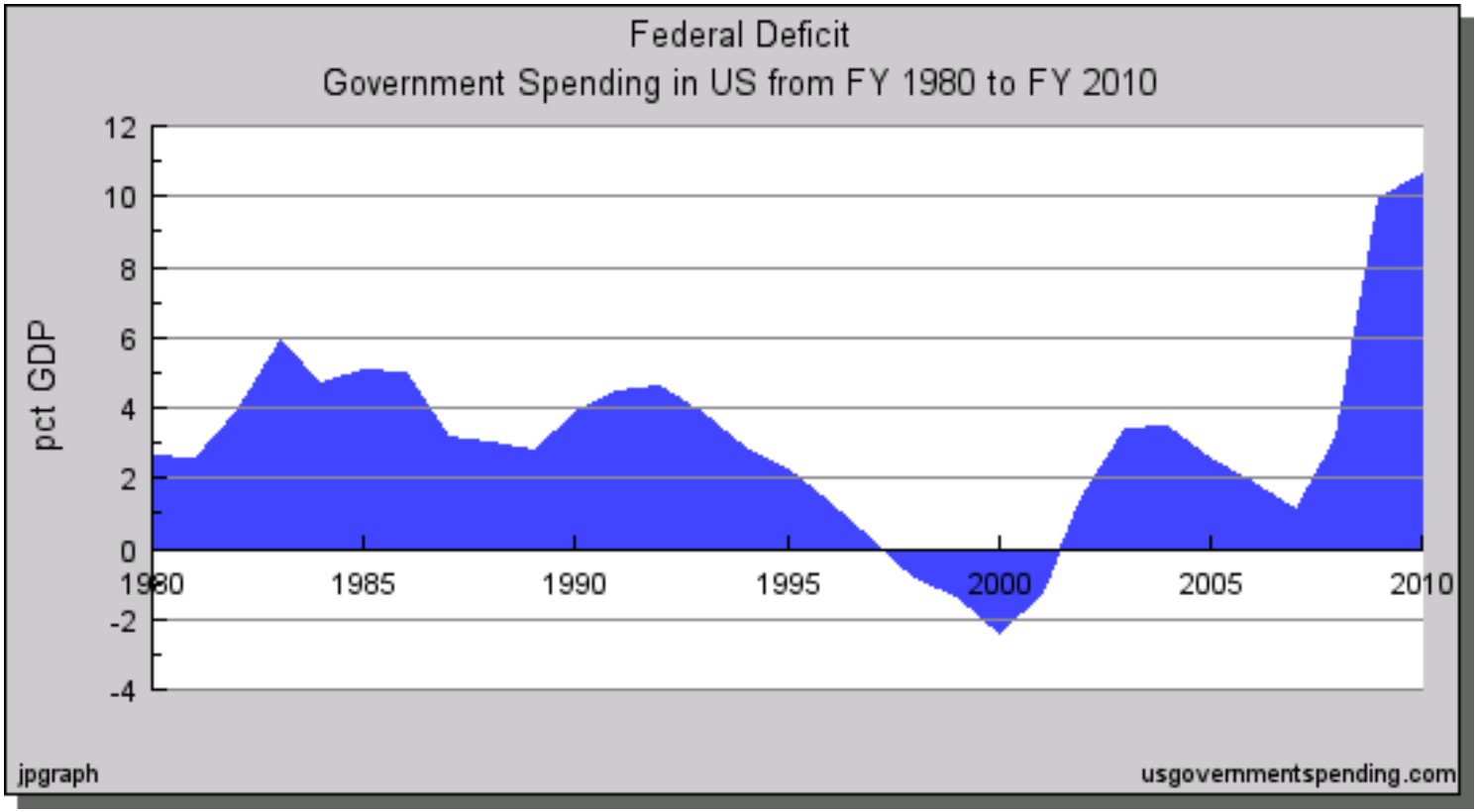
- Great Recession of 2008-20??: Massive decline in economic activity.

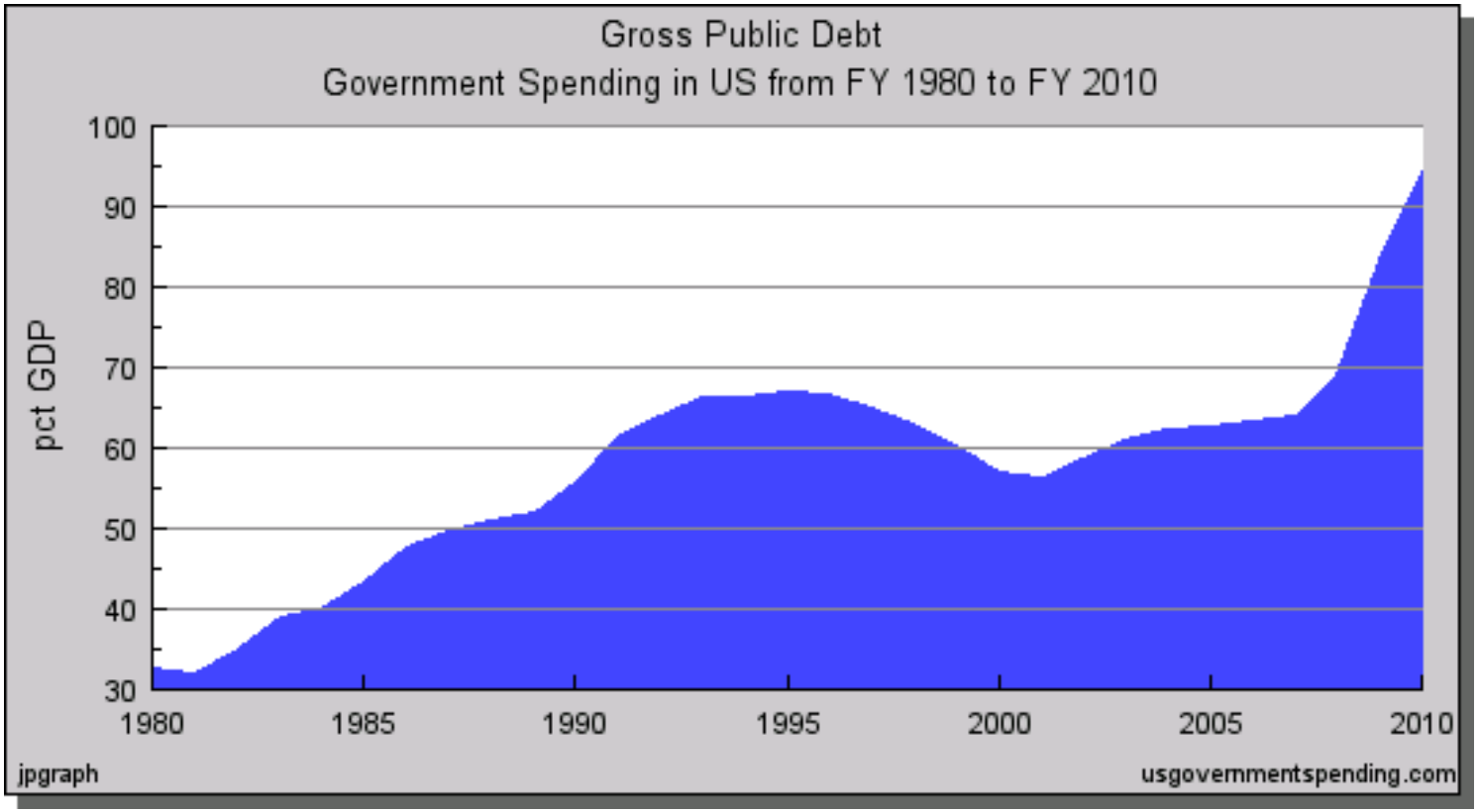
- Massive (discretionary?) response of monetary and fiscal policy
  - Monetary policy: reduction in $i$ (and more exotic measures)
  - Fiscal policy: expansion in $G$ and in $B$

[Add GDP Growth Plot]


Federal Funds Effective Rate
Fed Funds Rate
Year
20
18
16
14
12
10
8
6
4
2
0
1985
1990
1995
2000
2005
2010


Total Spending
Government Spending in US from FY 1970 to FY 2010
pct GDP
26.0
25.0
24.0
23.0
22.0
21.0
20.0
19.0
18.0
17.0
1970
1975
1980
1985
1990
1995
2000
2005
2010
jpgraph
usgovernmentspending.com


Federal Deficit
Government Spending in US from FY 1980 to FY 2010
pct GDP
12
10
8
6
4
2
0
-2
-4
1980
1985
1990
1995
2000
2005
2010
jpgraph
usgovernmentspending.com


Gross Public Debt
Government Spending in US from FY 1980 to FY 2010
pct GDP
100
90
80
70
60
50
40
30
1980
1985
1990
1995
2000
2005
2010
jpgraph
usgovernmentspending.com

## This Paper

- Determines numerically the optimal fiscal (tax and debt) and monetary (interest rate and money supply) policy in DSGE model with
  - Monopolistic competition
  - Price rigidity
  - Transaction costs that induce a money demand function

## This Paper

- Three Key model ingredients not present in classic Ramsey optimal policy literature (as in e.g. Schmitt-Grohe and Uribe, 2004).
  - Rare productivity and government spending "disasters"
  - Potentially non-benevolent objective of the government
  - Inability of government to commit to policies $\Rightarrow$ time consistency problem

## Model: Standard Elements (Households)

- Households are workers, consumers-savers and producers
- Preferences

$$E_0 \sum_{t=0}^{\infty} \beta^t \left( \frac{c_t^{1-\sigma}}{1-\sigma} - \alpha h_t \right)$$

- As worker, earn after tax wage $(1 - \tau_t) P_t w_t h_t$.

# Model: Standard Elements (Households)

- As consumer purchases final good, which is a CES aggregate of continuum of intermediate goods with elasticity of substitution $\theta$. Cost of purchasing $c_t$ is

$$\left[1 + s\left(\frac{c_t P_t}{M_t}\right)\right] P_t c_t$$

  which delivers money demand equation. Here $s$ is a time and policy-invariant function.

- As saver purchases cash $M_{t+1}$ and nominal government bonds $B_{t+1}$ at price $q_t = \frac{1}{1+i_t}$

# Model: Standard Elements (Households)

- As monopolistically competitive producer of intermediate good with linear technology and aggregate productivity $a_t$ faces demand

$$d(\tilde{P}_t, P_t, y_t) = y_t \left( \frac{\tilde{P}_t}{P_t} \right)^{-\theta}$$

- Price adjustment costs

$$\frac{\kappa}{2} \left( \frac{\tilde{P}_t}{\tilde{P}_{t-1}} - 1 \right)^2$$

# Model: Standard Elements (Government)

- Monetary policy $\bar{M}_{t+1}, q_t = \frac{1}{1+i_t}$
- Fiscal policy $\tau_t, \bar{B}_{t+1}$
- Budget constraint

$$\tau_t P_t w_t h_t + (\bar{M}_{t+1} - \bar{M}_t) + q_t \bar{B}_{t+1} = P_t g_t + \bar{B}_t$$

# Model: Nonstandard Elements

- Rare disasters

$$\begin{aligned}\log a_{t+1} &= \rho_a \log a_t + \varepsilon^a_{t+1} + \log(1-\kappa_t)\\ \log g_{t+1} &= (1-\rho_g)\bar{g} + \rho_g \log g_t + \varepsilon^g_{t+1} + \log(1+\eta_t)\end{aligned}$$

- Government objective: period return function

$$\frac{c_t^{1-\sigma}}{1-\sigma} - \alpha h_t - \delta\left(\frac{P_t}{P_{t-1}} - \pi^*\right)^2$$

  and intertemporal discount factor $\beta$.

# Model: Nonstandard Elements: Optimal Markov Policy without Commitment

- Government cannot commit to future policies (but can commit to not default outright on its debt).
- Individual state variables $S = (M, B, \tilde{P}_-)$. Aggregate state variables $\bar{S} = (\bar{M}, \bar{B}, P_{-1}; a, g)$.
- Government policy $\Psi$ maps $S$ into $(\bar{M}', \bar{B}', \tau, q)$.
- Given $\Psi$, household decision rule $D$ maps $(S, \bar{S})$ into $(M', B', \tilde{P}, c, h, )$.

# Time Line


| Current Government | Households | New Government |
|---|---|---|
| Takes as given $D(.),\Psi'(.)$ | Given $\Psi(.)= \Psi'(.)$ | Chooses $\Psi'(.)$ |
| Chooses $\Psi(.)$ | Choose $D(.)$ | |

Equilibrium: $D(.),\Psi'(.)$

Consistency: $\Psi(.)=\Psi'(.)$

## Comments: The Questions and the Model

- Ambitious model delivers convincing answers, but for what question?

- I take main questions to be (authors may disagree)
  - How should monetary and fiscal policy respond to a disaster?
  - Without government commitment, should there be monetary conservatism?

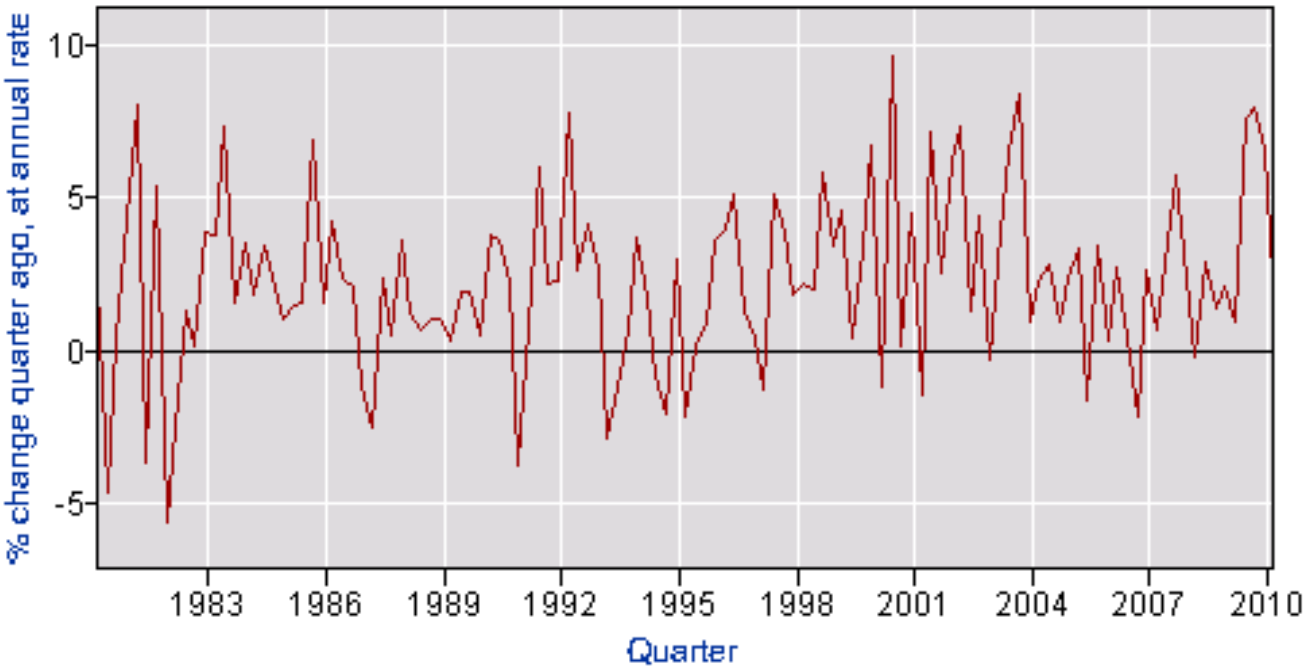
## Question 1: How should Policy respond to a Disaster?

Our main interest in studying stabilization policies under lack of commitment is in characterizing the optimal response to a simultaneous disaster in a and g. Although our model is tacit about its genesis, such event can be casually interpreted as a financial crisis [p. 24]

- How about the current financial crisis?

## Question 1: How should Policy respond to a Disaster?

- Collapse of 30% in TFP?
- (Exogenous) increase in $G$ by 50% a disaster? Certainly in the model! Welfare calculations!?
- Why do we need a model with $\delta > 0$ to answer this question? Turns out we don't.


% change quarter ago, at annual rate
10
5
0
-5
1983
1986
1989
1992
1995
1998
2001
2004
2007
2010
Quarter

[Add p. 26-27 Plot]

# Question 2: Why Monetary Conservatism

- Government has weird preferences $\frac{c^{1-\sigma}}{1-\sigma} - \alpha h - \delta \left( \frac{P}{P_{-1}} - \pi^* \right)^2$
- With commitment of government, no role for $\delta > 0$.
- But without commitment there might be inflation bias. Policies pursued with government objective $\delta > 0$ might be welfare enhancing even if they maximize the "wrong" objective.
- Results seem to confirm this.

# Question 2: Why Monetary Conservatism

- With $\delta = 0, 2$ model has different ergodic distributions. Not clear the figure gives conclusive answers about welfare.

- Would really like to see:
  - Interpret $\delta$ as a structural parameter and calibrate it.
  - Let government choose $\pi^*$ optimally, once and for all with full commitment. What would it be?

- Side remark: do we really need rare disasters to answer this question?

[Add p. 25 Plot]

## Comments: Computation

- Large shocks: local approximation might not be good enough. Paper uses global techniques. Good!
  - Show how good, relative to local approximations.
  - Show how nonlinear model is
- Approximation with polynomials efficient, but usually not good if policy functions have kinks. Doesn't the zero lower bound for $i$ cause kinks?

## To Conclude

- Very ambitious model, computed with methods at the frontier of what is feasible.
- Lots of answers. But question(s) could be sharpened.
- Model used should fit the question(s). Correct shocks? Reasonable propagation?