Managing Expectations

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How to Manage Expectations?

- Instruments: "will maintain 0% interest rates for τ quarters"
- Targets: "will bring unemployment down to Y%'

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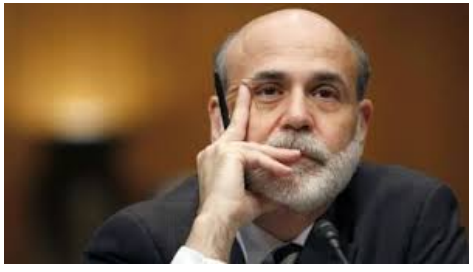

Instrument Communication

August 2011: "The Committee [FOMC] currently anticipates ... exceptionally low levels for the federal funds rate at least through mid 2013."

January 2012: horizon extended to " ... at least through late 2014."

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Target Communication (reserved?)

December 2012: "... as long as the unemployment rate remains above 6 1/2 percent, inflation between one and two years ahead is projected to be no more [than 2.5%], and longer-term inflation expectations continue to be well anchored.

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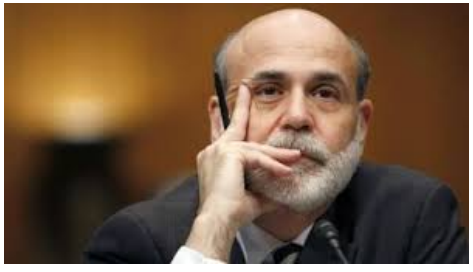

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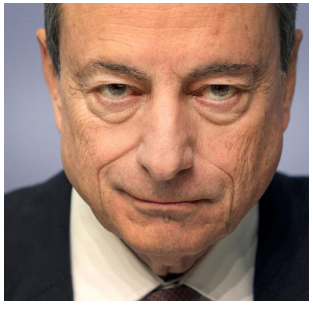

Target Communication (resolute?)

"do whatever it takes" (and perhaps won't bother to tell you *how*)

Instrument vs Target Communication

- Reason to prefer one over the other?

- **NO** in benchmark with
  (i) Full credibility
  (ii) No future shocks (or policy contingent on them)
  (iii) Rational Expectations + Common Knowledge

"Ramsey world"

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Our focus

Relax (iii) and explore role of bounded rationality

Main Lesson

Optimal Forward Guidance

- Instrument communication when GE feedback is weak
- Target communication when GE feedback is strong

Stop talking about R and start talking about u, Y when:

- ✓ long ZLB
- ✓ steep Keynesian cross
- ✓ strong financial accelerator

Rationale: help minimize

- ✓ agents' need to "reason about the economy"
- ✓ distortion due to bounded rationality
- ✓ lack of confidence

Model

$C = \int_i c_i \, \mathrm{d}i$ = average action today

Y = outcome (target) in the future

τ = instrument in the future

$$c_i = (1 - \gamma)\mathbb{E}_i[\tau] + \gamma \mathbb{E}_i[Y]$$

$\gamma \in (0, 1)$ parameterizes GE feedback

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Story (microfoundation in paper)

ZLB today, but not tomorrow

C = spending today; Y = income today plus tomorrow

τ = minus interest rate tomorrow (or for how long thereafter)

γ = Keynesian multiplier

Model

Final outcome depends on realized behavior and policy

$$Y = (1 - \alpha)\tau + \alpha C$$

$\alpha \in (0, 1)$ parameterizes direct policy effect

Story (microfoundation in paper)

Loose policy tomorrow $\rightarrow$ higher output tomorrow

The Model (just 2 equations!)

$$c_i = (1 - \gamma)\mathbb{E}_i[\tau] + \gamma\mathbb{E}_i[Y] \tag{1}$$

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The Model (just 2 equations!) and the Key Issue

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- No guidance: Agents have to forecast both τ and Y
- Instrument communication: know τ, have to think about Y
- **Target communication**: know Y, have to think about τ

Timing

$t = 0$ (FOMC meeting): PM sees θ (ideal point) and announces

either $\tau = \hat{\tau}$ (IC) or $Y = \hat{Y}$ (TC)

$t = 1$ (liquidity trap): Agents form beliefs and choose c_i

$t = 2$ (exit): C, τ and Y are realized

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The Policy Problem

$$\min_{\theta \mapsto \{\text{message}, (\tau, Y)\}} \mathbb{E}[(1-\chi)(\tau-\theta)^2 + \chi(Y-\theta)^2]$$

s.t. (τ, Y) is implementable in equil given

eq. (1)-(2) and message $\tau = \hat{\tau}$ or $Y = \hat{Y}$

Frictionless, REE Benchmark

Benchmark $\equiv$ representative, rational and attentive agent

(CK of both announcement and rationality)

$\Longrightarrow$ no error in predicting behavior of others:

$$\mathbb{E}_i[C] = C$$

$\Longrightarrow$ any equilibrium satisfies

$$c_i = C = Y = \tau$$

$\Longrightarrow$ irrelevant whether PM announces τ or Y

(equivalence of primal and dual problems)

Friction: Lack of CK / Anchored Beliefs

- Assumption: Lack of CK of announcement

  Let $X \in \{\tau, Y\}$ be the announcement. Agents are rational and attentive but think only fraction $\lambda \in [0, 1]$ of others is attentive:

$$\mathbb{E}_i[X] = X \qquad \mathbb{E}_i[\bar{\mathbb{E}}[X]] = \lambda \mathbb{E}_i[X]$$

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  - HOB in incomplete-info settings
  - Level-K Thinking: same essence, but a small "bug"
  - Cognitive discounting: same for GE, but adds PE distortion

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  - Level-K Thinking: same essence, but a small "bug"
  - Cognitive discounting: same for GE, but adds PE distortion
- Key shared implication: Anchored Beliefs

$$\bar{\mathbb{E}}[[C] = \lambda C$$

Preview of Arguement

1. Friction attenuates power of FG under IC

   Angeletos & Lian (AER2018), Farhi & Werning (2018), Gabaix (2018)

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4. Optimality: TC $\succ$ IC if and only if γ large enough

IC: Game after Announcing τ

$$C = (1-\gamma)\bar{\mathbb{E}}[\tau] + \gamma\bar{\mathbb{E}}[Y]$$

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(reasoned by agents)

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$$= \tau \text{ (fixed by FG)}$$

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$$C = (1-\delta_\tau)\tau + \delta_\tau\bar{\mathbb{E}}[C]$$

$$\alpha\gamma \in (0,1)$$

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- Game of **complements**

  "I expect less spending and income, so I spend less"

- Friction **reduces** effectiveness of FG

  Stylizes Angeletos & Lian (2018), Farhi & Werning (2018), Gabaix (2018), Garcia-Schmidt & Woodford (2018)

TC: Game after Announcing Y

$$C = (1-\gamma)\bar{\mathbb{E}}[\tau] + \gamma\bar{\mathbb{E}}[Y]$$

TC: Game after Announcing Y

$$C = (1-\gamma)\bar{\mathbb{E}}[\tau] + \gamma\bar{\mathbb{E}}[Y]$$

$\bar{\mathbb{E}}[\tau]$: (reasoned by agents) $= \frac{1}{1-\alpha}\bar{\mathbb{E}}[Y] - \frac{\alpha}{1-\alpha}\bar{\mathbb{E}}[C]$

$\bar{\mathbb{E}}[Y]$: $= Y$ (fixed by FG)

TC: Game after Announcing Y

(reasoned by agents)

$$= \frac{1}{1-\alpha}\bar{\mathbb{E}}[Y] - \frac{\alpha}{1-\alpha}\bar{\mathbb{E}}[C]$$

$$C = (1-\gamma)\bar{\mathbb{E}}[\tau] + \gamma\bar{\mathbb{E}}[Y]$$

$$= Y \text{ (fixed by FG)}$$

$$C = (1-\delta_Y)Y + \delta_Y\bar{\mathbb{E}}[C]$$

$$-\frac{(1-\gamma)\alpha}{1-\alpha} \leq 0$$

- Game of **substitutes**

  "I expect less spending, so I expect looser policy and spend *more*"

- Friction **increases** effectiveness of FG

  Turns FG literature upside down

Implementability

Proposition: implementable sets

$$\{(\tau, Y) : \tau = \mu_\tau(\gamma, \lambda) Y\} \qquad \{(\tau, Y) : \tau = \mu_Y(\gamma, \lambda) Y\}$$

Instrument communication | Target communication

attenuation $\mu_\tau(\gamma, \lambda) > 1 > \mu_Y(\gamma, \lambda)$ amplification

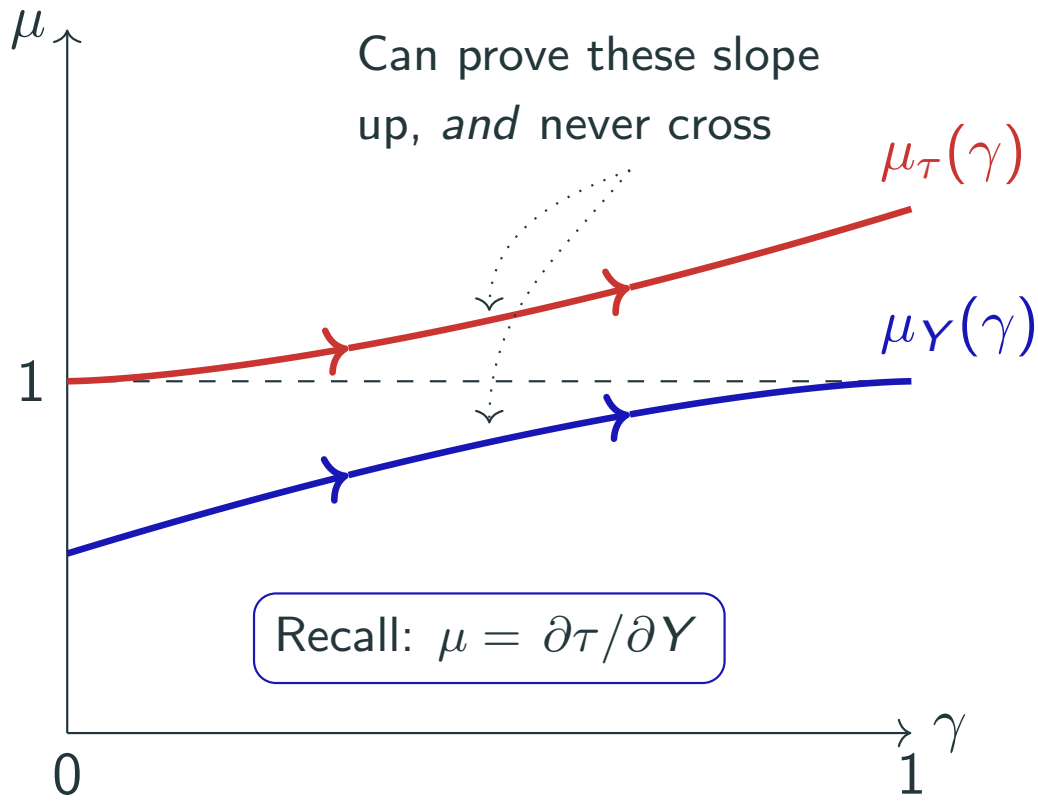
- Friction $\neq$ "everything is dampened"
- TC keeps powder dry

The Role of the GE Feedback

Proposition

$\partial \mu_\tau / \partial \gamma > 0$

$\partial \mu_Y / \partial \gamma > 0$



The Role of the GE Feedback

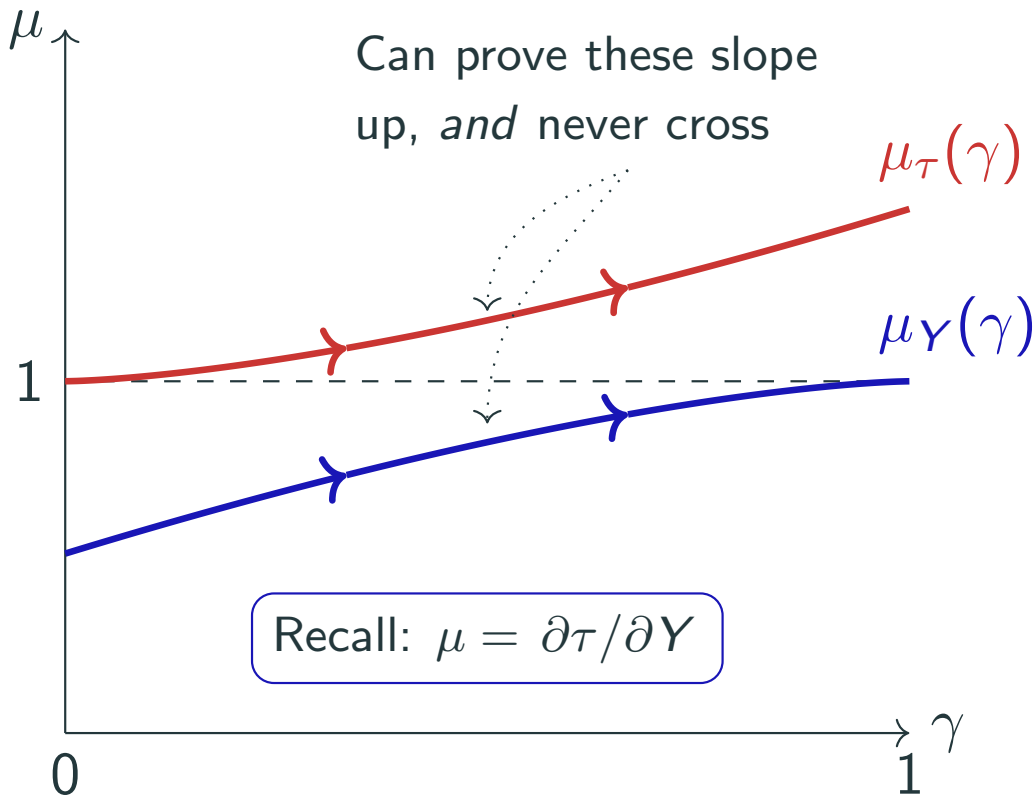
Proposition

$$\partial \mu_\tau / \partial \gamma > 0$$
$$\partial \mu_Y / \partial \gamma > 0$$

Quick intuition

Distortion from reasoning about what is not announced

High $\gamma \to$ very important to figure out Y, not so much τ



$$\text{as } \gamma \text{ (GE) increases} \Rightarrow \begin{cases} \text{distortion under IC increases} \\ \text{distortion under TC decreases} \end{cases}$$

Main Result

Theorem: optimal communication

There exists a $\hat{\gamma} \in (0, 1)$ ("critical GE feedback") such that

- $\gamma < \hat{\gamma}$: optimal to communicate instrument
- $\gamma \geq \hat{\gamma}$: optimal to communicate target

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Additional results in paper:

precise values of optimal message and attained (τ, Y)

variant with Level-k Thinking

Level-k

Generalized Departure from RE

- Misspecified beliefs:

$$\bar{\mathbb{E}}[C] = \lambda C + \sigma\epsilon$$

  where $\lambda, \sigma > 0$ and ϵ is orthogonal to θ

- Nests:
  - under-reaction ($\lambda < 1$): FG literature
  - over-reaction ($\lambda > 1$): Shleifer et al
  - noise or animal spirits ($\sigma > 0$)

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- Optimal policy result goes through
  - intuition: all about limiting the role of $\bar{\mathbb{E}}[C]$
  - i.e., "more thinking = more distortion" result extends

Take-Home Lessons

How to communicate / manage expectations?

- Tilt focus from R path to u, Y targets

  when feedback loops are strong

New perspective on Taylor rules

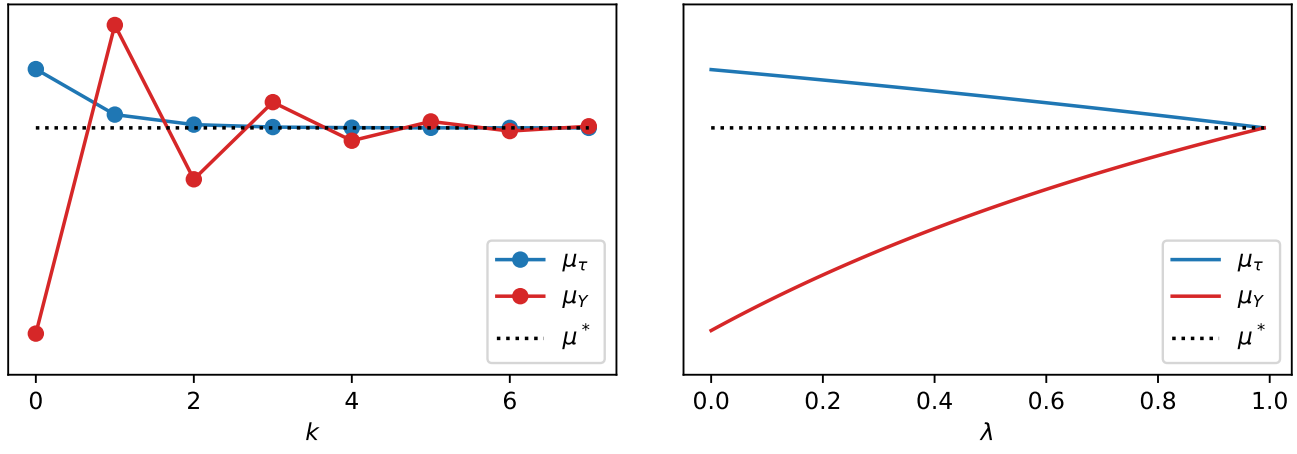
- Traditional: demand vs supply shocks
- Here: arrest bounded rationality or nearly self-fulfilling traps

Extend logic from multiple equil (Mario Draghi) to unique equil

- large multipliers $\rightarrow$ HOB critical $\rightarrow$ "nearly" self-fulfilling $\rightarrow$

Level-k: Similar but Less Sharp

- Instrument comm (games of complements): the same
  - others are less rational $\approx$ others are less attentive
- Target comm (games of substitutes): a bug
  - distortion changes sign between even and odd k



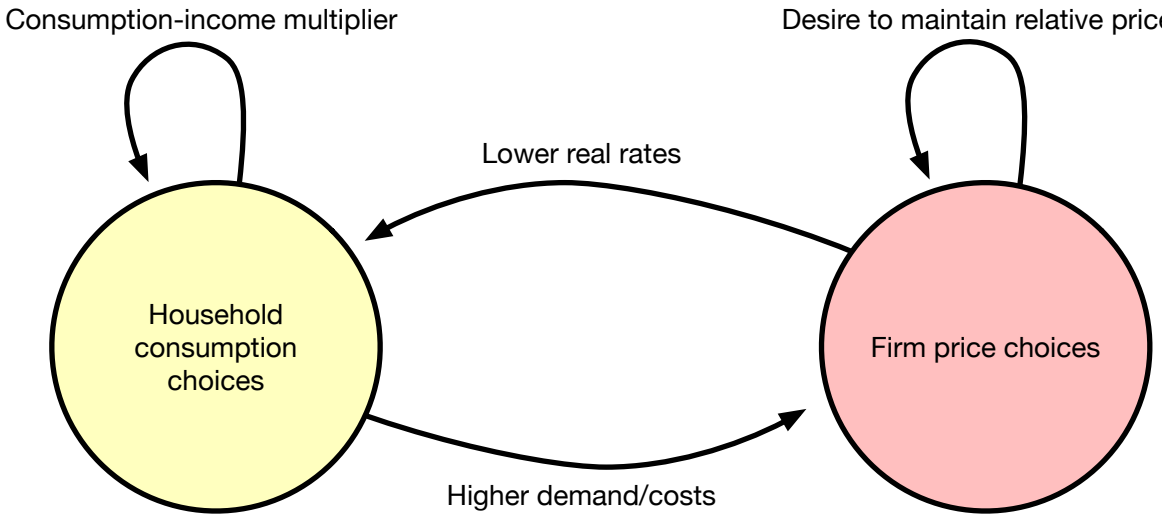
- Our preferred formulation avoids the bug

go back

- Cognitive discounting avoids it too (but confounds PE-GE)

FG: Three GE Feedbacks

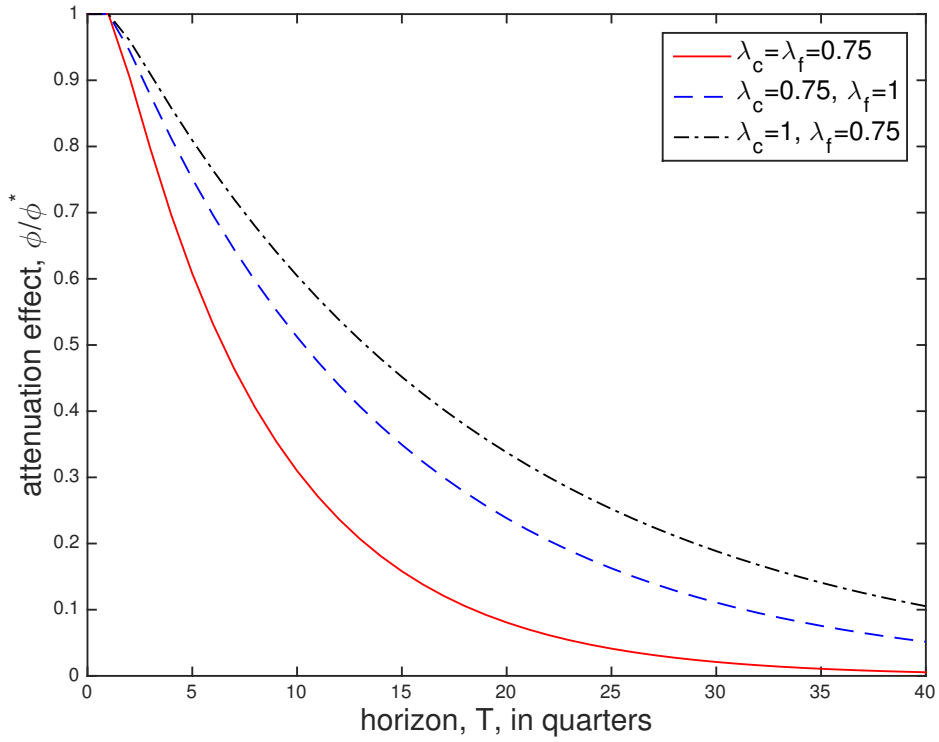
1. Within Dynamic IS: Keynesian cross
2. Within NKPC: dynamic pricing complementarity
3. Across: inflation-spending feedback



- All three: intensify with length of ZLB / horizon of FG

FG: Numerical Illustration

- Textbook NK model, with modest friction ($\lambda = .75$)



- Attenuation by 90% when ZLB last 5 years
- Plus, discontinuity at infinite horizons

◂ go back