Discussion of Guido Lorenzoni's "Optimal Monetary Policy with Uncertain Fundamentals and Dispersed Info"

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GUIDO LORENZONI'S PAPER
"Optimal Monetary Policy w/Uncertain Fundamentals and Dispersed Info."

Setting

- Dispersed knowledge of fundamentals
- Imperfect signal causes "noise cycles"
- Central bank has no special information

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Would more public information be helpful?

Yes, if policy is optimal

AGENDA
Lorenzoni (2009)

- **Actors and Information**
- **Policy**
- **Basic mechanism for stabilizing noise cycles**

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- Actors and Information
- Policy
- Basic mechanism for stabilizing noise cycles
- Welfare Effects of Public Information (Optional)

Households

- Consumer, worker, producer w/identical preferences
- Heterogeneous
  - Productivity
  - Information
  - "Sampling" shock to consumption basket

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$$y_{it} = a_{it} + n_{it}$$

$$a_{it} = a_t + \epsilon_{it}$$

$$a_t = \rho a_{t-1} + \theta_t$$

EVENTS AND INFORMATION

At each point in time, there are three sub-periods

Time $(t, 0)$: Monetary Policy

Time (t, I): Signals and Pricing

Time (t, II): Spending and Production

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- a_{t-1} observed by everybody
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Time (t, II): Spending and Production

- Consumers observe prices and choose consumption basket
- Production occurs, goods are exchanged

Price Setting at (t, I)

$$p_{it} = \kappa_p + E_{i(t,I)}(\text{nom. marginal cost})_{it} \quad (6)$$

Consumption choice at (t, II)

Intertemporal Profile:

$$c_{it} = \kappa_c + E_{i(t,II)} c_{it+1} - \gamma^{-1} \left(r_t - E_{i(t,II)} \bar{p}_{it+1} + \bar{p}_{it} \right) \quad (7)$$

Basket:

$$c_{ijt} = c_{it} - \sigma \left(p_{jt} - \bar{p}_{it} \right))$$

MONETARY POLICY

Policy Rule

$$r_t = \xi_0 + \xi_a a_{t-1} + \xi_p \left(p_{t-1} - \hat{p}_{t-1} \right) \tag{8}$$

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Price Level Target

$$\hat{p}_t = \mu_a a_{t-1} + \mu_\theta \theta_t + \mu_e e_t \tag{9}$$

- Targeted in retrospect
- Rule known ex-ante
- Time consistent

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Key parameters

- $\boldsymbol{\xi_p > 1}$ ensures $\boldsymbol{p_t = \hat{p}_t}$
- $\boldsymbol{\mu_a}$ pins down rest

Full information ($\sigma_e = 0$)

- No effects of policy
- Real allocation independent of μ_a

EFFECTS OF POLICY W/DISPERSED INFO

Suppose aggregate productivity, a_t, goes up and $\mu_a > 0$ ...

Policy

Higher price level target for next period / Lower real rate now

$$\hat{p}_{t+1} = \mu_a a_t + \dots$$

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Prices too low if true shock is a_t, too high if e_t

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Result 1: Some μ_a will offset noise shocks

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Result 1: Some μ_a will offset noise shocks

Result 2: Same policy yields full-info response to a_t

STABILIZATION OF NOISE CYCLES

Key mechanism

- Dispersed information during the period
- Better information after the period
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Crucial: Price rigidity between subperiods

- **Prices fixed before consumers post demands**
- **Better informed consumers**

Average producer expects . . .

$$\text{real wage} = \text{agg productivity}$$

$$\text{consumption} = \text{full info consumption}$$

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(Avg expectation is linear in agg. productivity and noise)

Average producer expects . . .

real wage = agg productivity

consumption = full info consumption

(Avg expectation is linear in agg. productivity and noise)

If consumption response to noise is zero . . . (Result 1)

. . . response to agg. productivity is identical to full info

(Result 2)

OPTIMAL ACCOMMODATION OF NOISE

Benchmark

Constrained efficiency of a social planner
having only public information

Baseline model

No heterogeneity in goods baskets
Full stabilization is optimal

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Extended model

Policy effects on cross-sectional distribution of goods,
trade-off against stabilization effects

BASELINE MODEL

Identical consumption baskets ($\chi = 0$)

Homogeneous allocations for any policy
Consumers see all prices

No strategic complementarity in pricing ($\eta = 0$)

No trade-off between aggregate stabilization and cross-sectional efficiency

- Independent pricing decisions
- Relative prices proportional to idiosyncratic productivity

Stabilization policy works already in baseline model!

HETEROGENEITY AND POLICY TRADE-OFFS

Sampling shocks to consumption baskets

Scalable heterogeneity with two extremes

1. Homogenous baskets, each covering all goods $(\chi = 0)$
2. Complete heterogeneity, one good per basket $(\chi = 1)$

Policy Trade-offs $(\chi > 0)$

- Different baskets convey different price signals
- Different households anticipate different price targets

$\Rightarrow$ Policy affects aggregate and cross-section

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$\Rightarrow$ Policy affects aggregate and cross-section

But policy has only one lever (μ_a)

RELATED LITERATURE

Business Cycles and Dispersed Information

- Hellwig (2005)
- Angeletos and La'O (2008/09)
- Lorenzoni (AER, forth)

Welfare of Public Information

- Morris and Shin (2002, AER)
- Angeletos and Pavan (2007, Econometrica; 2009 JEEA)

Non-Fundamental Shocks and Policy Intervention

- Bernanke and Gertler (2001, AER)
- Cecchetti et al (2000, Geneva Report)
- Dupor (2005, JME)

WELFARE EFFECTS OF PUBLIC INFORMATION

What if policymaker could influence precision of signal?

Morris & Shin: Too much information can be bad . . .

Angeletos & Pavan: . . . but not when policy is optimal!

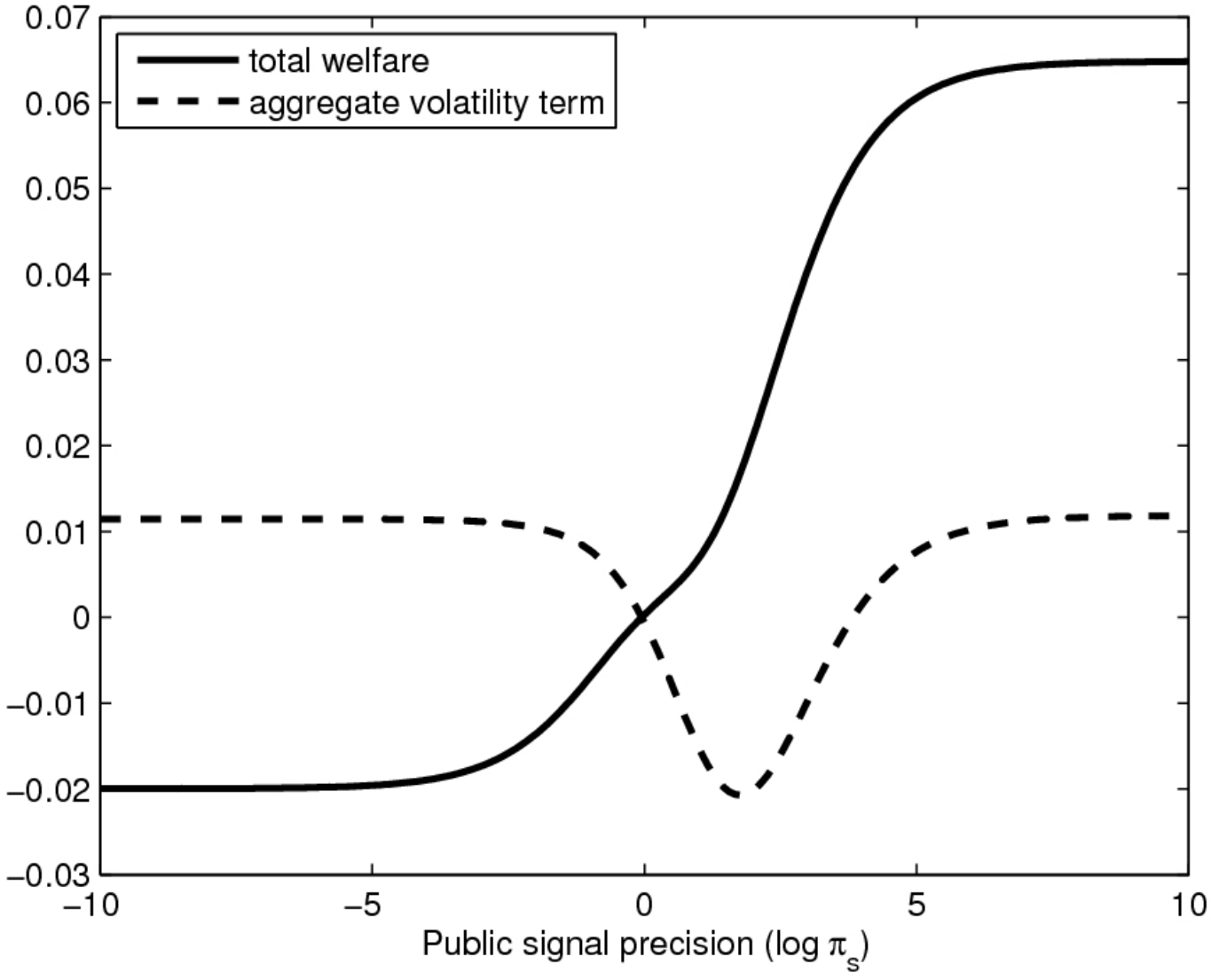
Lorenzoni

Under optimal policy,
more precision of public information
is always good!

WELFARE EFFECTS OF PUBLIC INFORMATION

FIGURE 3

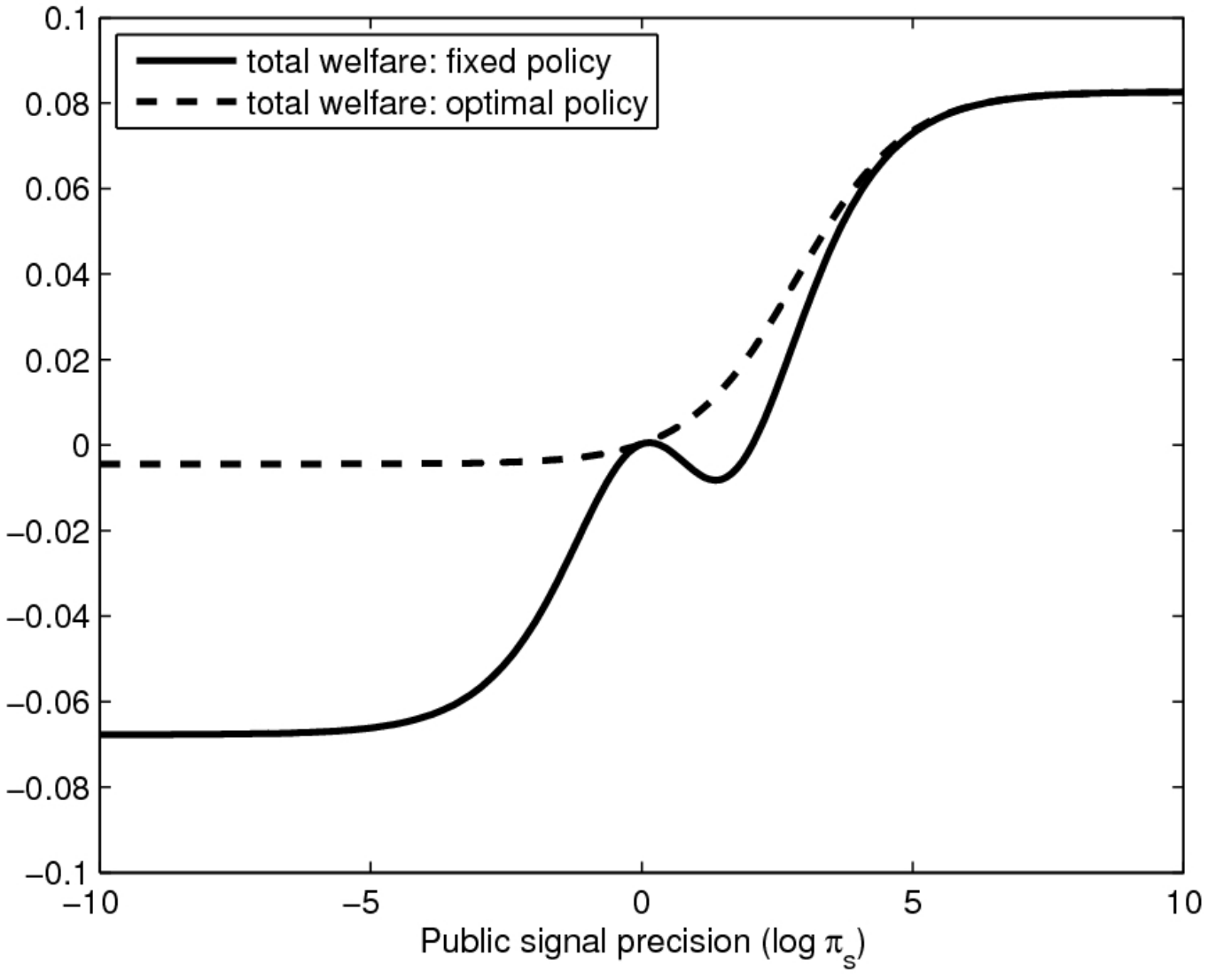
$\pi_s = 1/\sigma_e^2$



WELFARE EFFECTS OF PUBLIC INFORMATION

FIGURE 4

$\pi_s = 1/\sigma_e^2$



LORENZONI ON POLICY W/DISPERSED INFORMATION

Lessons Learned

- Backward-looking policy accommodates noise shocks
- Aggregate stabilization vs cross-sectional efficiency
- Main ingredients:
  - Information gets better as time passes
  - Different reactions to anticipated policies

Open questions

- How timely does information become better?
- Nominal rigidities: How to deal with time consistency?
- Stock market: How/when to identify a bubble ex-post?