

ECB FORUM ON CENTRAL BANKING

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Alena Wabitsch

University of Oxford

The Messenger Matters



EUROPEAN CENTRAL BANK

EUROSYSTEM

Overview

Motivation

- Successful policy communication must reach and influence the public
- How can this be achieved?

Does it matter who communicates?



- Context of central banks: Communication as a **monetary policy tool**

This Paper

How does the messenger impact central bank communication?

Empirical evidence using **national heterogeneity** in the Euro area:

- Motivating evidence from Twitter
- Causal evidence from inflation forecasting experiment

How should messengers be selected to optimally communicate to the public?

- Optimal communication: disclosure and **delegation**
- Generalized coordination model with strategic complementarity (on the social value of public information)

Main Findings

Messenger effects:

- Information **availability**
- Information **processing**

Individuals who match messenger's nationality (**the ingroup**)...

- ...are reached more: ~1/3 more likely
- ...use information more: inflation expectations use signal ~5pp more, halving gap to Bayesian

→ *Positive nationality-based ingroup effects make policy communication more effective*

Optimal communication through diverse messengers?

- Mostly desirable
- Sometimes harmful

→ *Strategic selection of messengers (delegation) is a powerful additional policy tool*

1. Motivating Evidence

Motivating Evidence

New Dataset:

- >8m tweets in 5 languages (DE, ES, FR, IT & EN)
- Language proxies nationality
- Contain "ECB", "European Central Bank" or translated equivalents
- 2016-2022: 3 years per president (Draghi and Lagarde), 48 press conferences
- Ingroup:** Messenger and receiver match nationalities

Figure 1. Focus on Policymakers Varies by Tweet Language

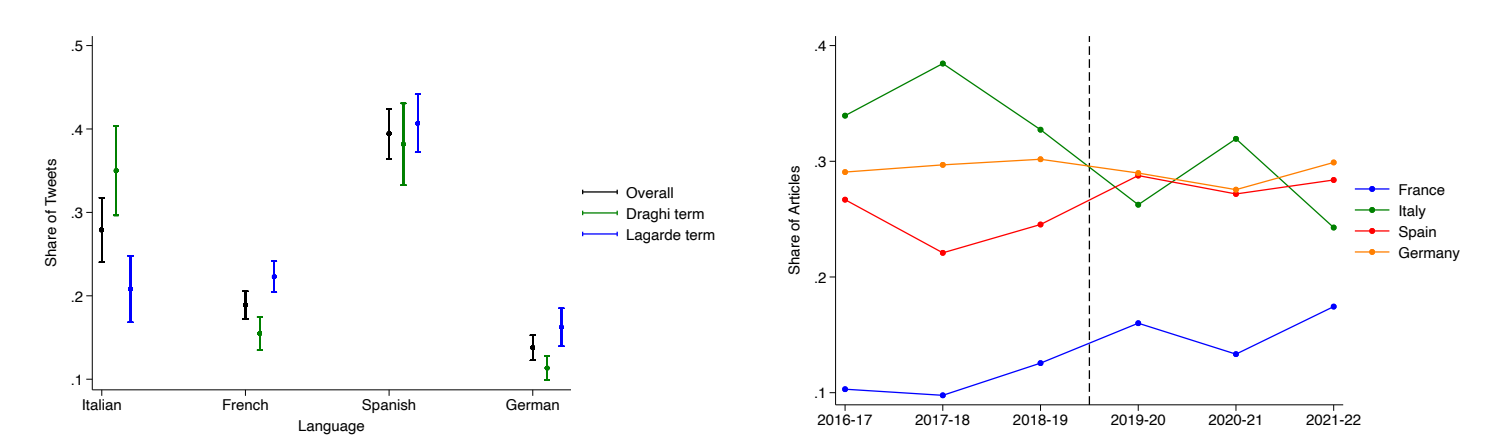


Insights: 2 Dimensions of Messenger Effects

- Higher information **availability** for the ingroup
- Stronger **belief updating** by the ingroup

1. Information Availability

Figure 2. Share of Tweets and Newspaper Articles by Language

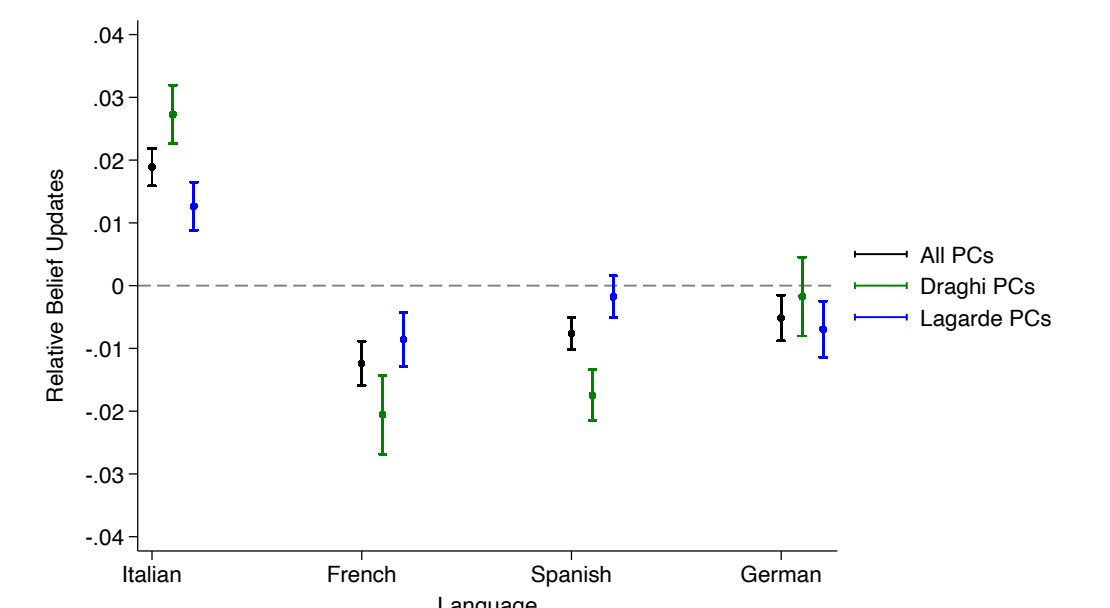


Information availability increases for the ingroup (by 10.5pp*** on Twitter and by 6.1pp*** for print media)

2. Information Processing: Belief Updates

- Beliefs:** Measured as tweet sentiment $\in (-1, 1)$, dictionary-approach
- Relative belief updates:**
 - Between last tweet during quiet period...and first tweet after press conference (within 24 hours)
 - Absolute change in sentiment (demeaned)

Figure 3. Belief Updates by Tweet Language



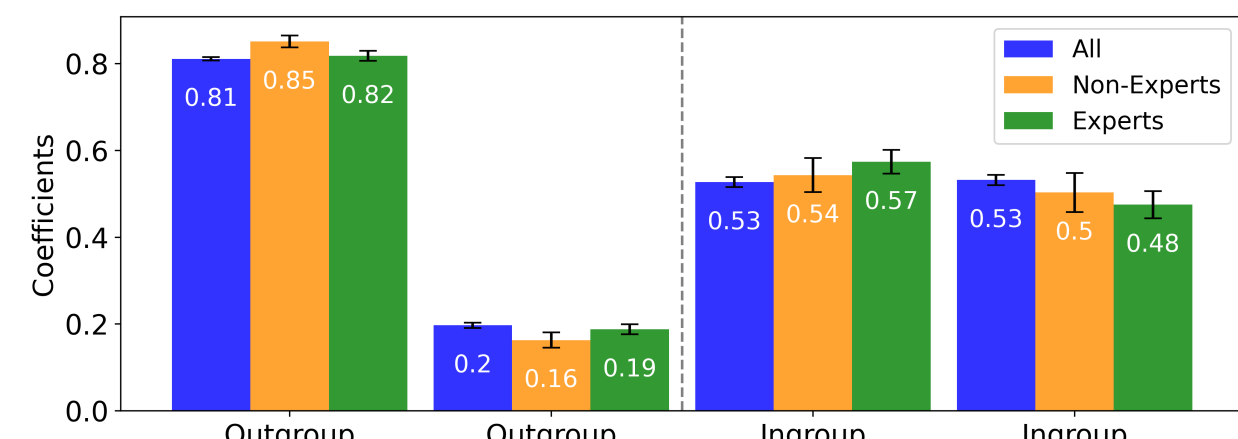
Information processing: Stronger belief updating by ingroup (0.014***)

Updates to a Signal

- The Signals:**
 - Novel information (surprise) from 48 press conferences
 - OIS-2Y monetary surprise indicator from Euro Area Monetary Policy Event-Study Database (**EA-MPD**) by Altavilla et al. (2019)

$$Posterior_{i,t} = \beta_1 Prior_{i,t} + \beta_2 Prior_{i,t} * Ingroup_{i,t} + \beta_3 Ingroup_{i,t} + \beta_4 Signal_t + \beta_5 Signal_t * Ingroup_{i,t} + \epsilon_{i,t}$$

Figure 4. Linear combination of coefficients with 95% CI



Expert classification follows Ehrmann and Wabitsch (2022)

Ingroup updates beliefs closer to signals (across expertise)

Why Twitter

- Real-world evidence
- Reduced concerns about: Extrapolation, Hawthorne or experimenter demand effects
- Modern information supply
- High-frequency panel insights

Limitations

- Specific policymakers
- Other co-occurring events and platform trends
- Crude beliefs

Experiment

- Addresses limitations

2. Inflation Forecasting Experiment (cont.)

Experimental Design

Two key decisions per inflation forecasting task:

- Inflation forecasts**
- Attention to information**

- Prior and Posterior (with precision): **Incentivized** to minimize forecast error
- Treatments:** Messengers of signals
 - Experts of in- and outgroup nationality
 - ECB Experts of in- and outgroup nationality
 - ECB and NCB (national central bank) experts
- 6 inflation scenarios
- Randomization:** Messenger-inflation match, messenger order

'Now imagine an expert from France who represents the European Central Bank (ECB) provides a forecast of 1.2% for inflation in period 11. You find this forecast, as well as the expert's corresponding forecast history, displayed in the graph.'

Updating Inflation Expectations: Estimation

Standard Bayesian belief updating:

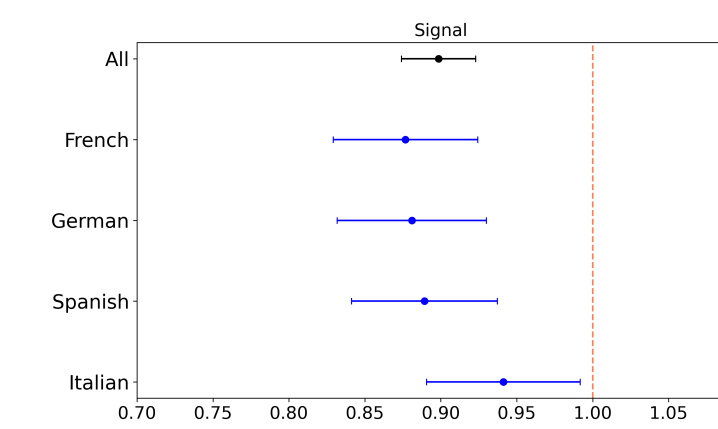
- Prior about $x \sim \mathcal{N}(A_i, \sigma_i^{-1})$
- Signal $B_j = x + e$, where $e \sim \mathcal{N}(0, \beta_j^{-1})$
- Posterior $E_i[x|B_j] = \frac{\alpha A_i + \beta_j B_j}{\alpha + \beta_j}$

$$Posterior_{ij} = \gamma \left(\frac{\alpha_i}{\alpha_i + \beta_j} A_i \right) + \delta \left(\frac{\beta_j}{\alpha_i + \beta_j} B_j \right) + \epsilon_{ij}$$

Following e.g., Benjamin (2019):

- If $\gamma = \delta = 1$: Bayesian Updating
- If $\gamma > 1$: prior over-/under-use
- If $\delta > 1$: signal over-/under-use

Figure 5. Signal Use (δ)



All treatments: $\delta = 0.90$

Findings

Hypothesis 1: The Pure Causal Ingroup Effect

Signals of **ingroup messengers** are used more to update inflation expectations (**0.052*****)

Treatment	Hypotheses	Messenger
1	H1	Expert from France
2	H1	Expert from France
3	H1	Expert from Germany
4	H1	Expert from Spain

$$Posterior_{ij} = \gamma \left(\frac{\alpha_i}{\alpha_i + \beta_j} A_i \right) + \sum_{j=1}^{2+2} \delta_j T_j \left(\frac{\beta_j}{\alpha_i + \beta_j} B_j \right) + \epsilon_{ij}$$

	(1)	(2)	(3)
Pure Ingroup Effect (H1):	0.064***	0.047***	0.052***
	(0.029)	(0.017)	(0.017)
R-squared	0.960	0.986	0.994
N	795	795	795
Inflation Scenario		✓	✓
Treatment Order		✓	✓
Individual-FE		✓	✓

Hypothesis 2: Institutional Context

The ingroup effect diminishes yet persists within **institutional context**: Signals of ingroup messengers within ECB context are used more (**0.028***)

Treatment	Hypotheses	Messenger
5	H2, H3	Expert from France representing ECB
6	H2, H3	Expert from Italy representing ECB
7	H2, H3	Expert from Germany representing ECB
8	H2, H3	Expert from Spain representing ECB

Hypothesis 3: Homophily or Heterophobia?

Homophily drives ingroup effects within the ECB context

Potential causes of ingroup effect:

- Homophily:** liking for sameness
- Heterophobia:** dislike for difference

Comparing signal use between:

- Ingroup and neutral ECB expert (0.035**) → **Homophily**
- Outgroup and neutral ECB expert (0.013) → Not heterophobia

Hypothesis 4: Varying Institutions

We can change (perceived) nationality by **varying institutions**: Signals from national institutions are used more (**0.034****)

Treatment	Hypotheses	Messenger
9	H3, H4	Expert representing ECB
10	H4	Expert representing NCB

The Mechanism

Perceived Quality:

- ~**80%** of causal ingroup effect explained by perceived quality (i.e., perceived messenger ability)
- Remaining effect of (**0.010*****)
- Similar reduction of effects for other hypotheses

Trust:

- Fully explains the positive NCB effect
- Explains more than **half** of homophily effect, but some relative over-use remains (**0.021*****)

Information Reach & Attention

Ingroup policymakers **reach** audiences better:

'How well are you informed about the institutions or policymakers listed below?'

ECB Board Member	NCB Governor
France: Christine Lagarde	François Villeroi de Galhau
Italy: Fabio Panetta	Ignazio Visco
Germany: Isabel Schnabel	Joachim Nagel
Spain: Luis de Guindos	Pablo Hernández de Cos

- 27.1%** more likely to **know** representative ingroup policymakers
- 28.6%** more likely to **follow** news

What causes attention?

- Attention to information is **unaffected** by the messenger
- Attention is endogenous to the **inflationary environment**

Figure 6. Revealed Buttons (with 95%-CI)



Ingroup policymakers improve **reach** through information availability, **not attention**

3. Modeling Optimal Communication

Modeling Optimal Communication

- Social welfare evaluation of public information (Morris and Shin, 2002)
- Optimal transparency debate: public communication as a double-edged sword

What is optimal communication policy considering messenger effects?

A Generalized Coordination Model on the Social Value of Public Information ('Beauty Contest')

Environment:

- Agents $i \in [0, 1]$ choose action $a_i \in \mathbb{R}$ to maximize $u_i \in \mathbb{R}$
- Care about aligning actions with unknown $x \sim \mathcal{N}(\mu, \tau_x^{-1})$ and coordinating with others:

$$u_i = -(1-r)(a_i - x)^2 - r(a_i - \bar{a})^2$$

- Share α of ingroup agents and $(1-\alpha)$ outgroup agents
- Social Welfare:**

$$W(a, x) = \frac{1}{1-r} \int_0^1 u_i(a, x) di = - \int_0^1 (a_i - x)^2 di$$

Information Structure:

- Private signals: $y_i = x + \epsilon_{y,i}$, $\epsilon_{y,i} \sim \mathcal{N}(0, \tau_y^{-1})$
- Public signal: $Y = x + \epsilon_Y = x + \epsilon_2 + \epsilon_V$, $\epsilon_2 \sim \mathcal{N}(0, \tau_2^{-1})$, $\epsilon_V \sim \mathcal{N}(0, \tau_V^{-1})$

Central bank:

- Disclosure Policy:** Central bank controls precision of public signal τ_Y via τ_V
- Delegation Policy:** Choose messenger(s) to set ingroup-outgroup share α

Timeline:

- Decision on delegation and public information disclosure
- Agents receive signals and choose their actions to maximize expected utility

Agent Types $h \in \{g, o\}$:

- Ingroup (g):**
 - Match messenger characteristics ($\theta_i = \theta_m$)
 - Receive all public signals Y
 - Form beliefs like Bayesians
- Outgroup (o):**
 - Do not match messenger characteristics ($\theta_i \neq \theta_m$)
 - Receive Y if $|Y| \geq d_o$, where $d_o \sim \mathcal{N}(0, 1)$
 - Fraction of informed outgroup agents: $A = 2\Phi(|Y|) - 1$.
 - Form beliefs with **Resonance Weight** (Malmendier and Veldkamp, 2022):
$$\rho_{im} = (2 - 2\Phi(|\chi|)|\theta_i - \theta_m|)$$

- All agents know A but are unaware of belief updating biases

Actions in the Unique Linear Equilibrium

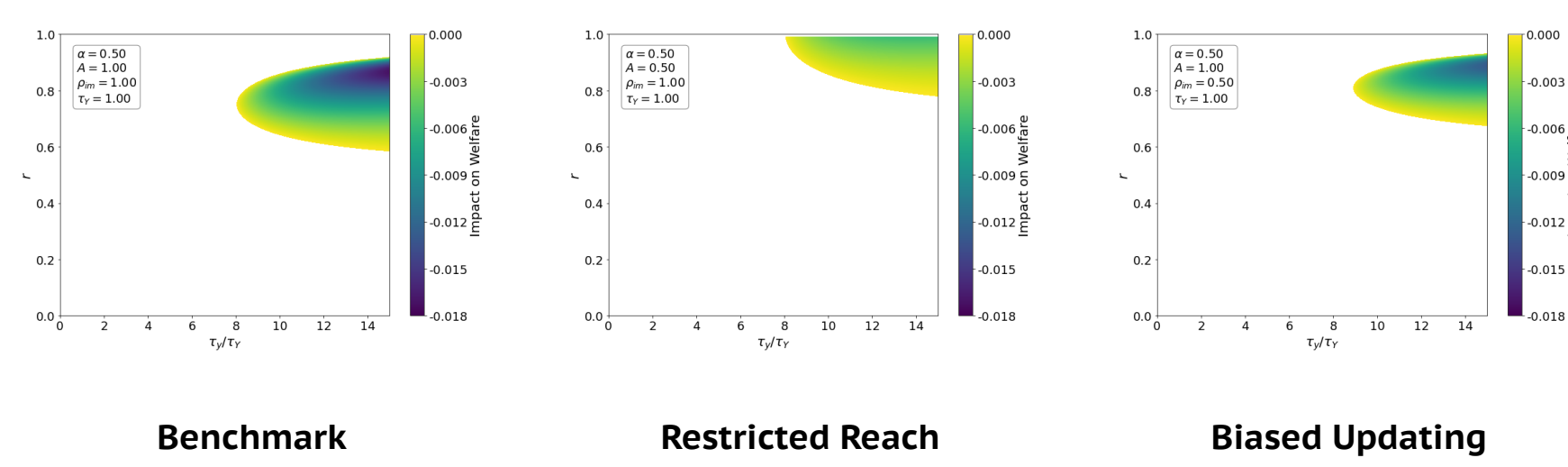
$$a_{ig}(y_i, Y) = \frac{\tau_Y Y + \tau_y q y_i}{\tau_Y + \tau_y q} \quad a_{io}(y_i, Y) = \frac{\rho_{im} \tau_Y Y + \tau_y q y_i}{\rho_{im} \tau_Y + \tau_y q} \quad a_{io}(y_i) = y_i$$

where $q = 1 - r + r(1 - \alpha)(1 - A)$

Optimal Communication Policy

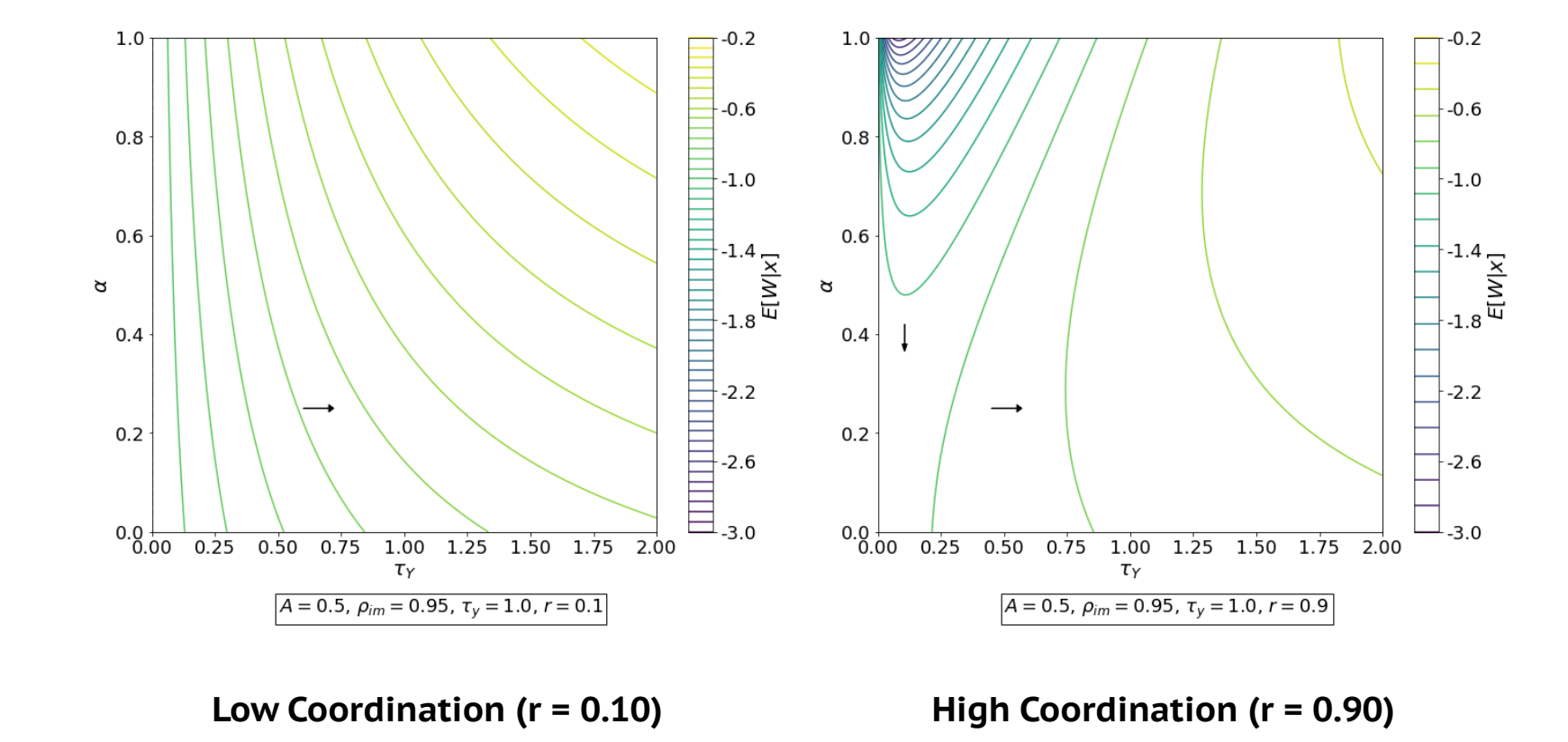
PROPOSITION. Increasing the precision of the public signal (τ_Y) improves welfare only if the public signal is sufficiently precise relative to private signals and if the coordination motive r is not too high.

Figure 7. Disclosure's Effect on Social Welfare



Outgroup agents **mitigate** welfare losses from disclosure

Figure 8. Social Welfare Contours: Disclosure and/or Delegation?



- Social welfare can benefit from strategic delegation (setting α)
- Choosing to delegate depends on coordination r :
 - Low r :** Maximizing α ($\alpha^* = 1$) is optimal (and so is full disclosure)
 - High r :** Reducing α can prevent over-reliance on noisy public signals → strategic delegation as alternative to limiting disclosure
- Two concrete examples of **delegation**: other board members or other institutions

Strategic selection of messengers (**delegation**) is a **powerful additional policy tool**

Conclusion

The Messenger Matters

- When characteristics of the messenger(s) align with those of receivers, central bank communication is more effective
- Two dimensions: reach and influence
- Delegation of communication can be a powerful policy tool
- Policy communication with the public beyond central bank context: fiscal, climate, health, education, etc.

Disclosures

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