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The Messenger Matters

EUROPEAN CENTRAL BANK

EUROSYSTEM

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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:
1. Motivating evidence from Twitter
2. Causal evidence from inflation forecasting experiment

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

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

Messenger effects:
(i) Information **availability**
(ii) 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

æ Positive nationality-based ingroup effects make policy communication more effective

Optimal communication through diverse messengers?
- Mostly desirable
- Sometimes harmful

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

1. Motivating Evidence

Motivating Evidence

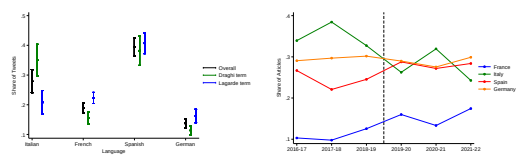
New Dataset:
- >8m tweets in 5 languages (DE, ES, FR, IT & EN)
- Language proxies nationality
- Contain "ECB", "European Central Bank" or translated equivalents
- 2016-2022: 3 years per president (Draghi and Lagarde), 48 press conferences
- **Ingroup:** Messenger and receiver match nationalities

Figure 1. Focus on Policymakers Varies by Tweet Language

1. Higher information **availability** for the ingroup
2. Stronger **belief updating** by the ingroup

1. Information Availability

Figure 2. Share of Tweets and Newspaper Articles by Language

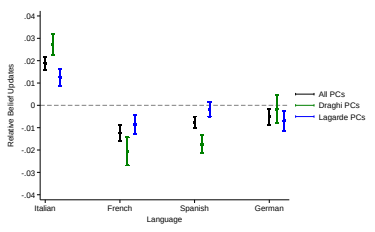


Information availability increases for the ingroup (by 10.5pp*úúú* on Twitter and by 6.1pp*úúú* for print media)

2. Belief Updates

- **Beliefs:** Measured as tweet sentiment *œ*(≠ 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



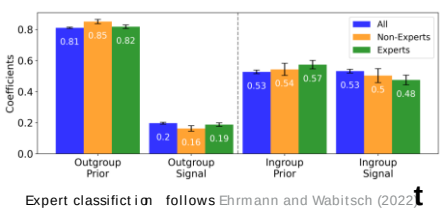
Stronger belief updates for the ingroup (by 0.014*úúú*)

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)

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

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

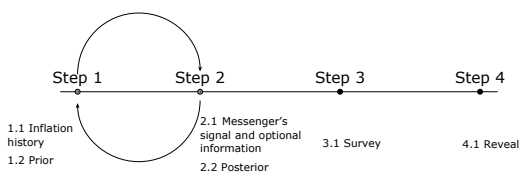
Limitations
- Specific policymakers
- Other co-occurring events and platform trends
- Crude beliefs

Experiment
- Addresses limitations

2. Inflation Forecasting Experiment

Inflation Forecasting Experiment

- Incentivized inflation forecasting tasks
- **Treatments**: Signals from varying messengers
- At core: *Is information used differently across messengers?*



- 6 forecasting tasks with different messenger treatments (within-subject)
- Survey:
  - Perceived messenger ability
  - Representative policymakers and institutions: trust and exposure
- Data:
  - 400 participants via Prolific, collected in fall of 2023
  - Participant nationality (+ residence): DE, ES, FR, IT

2. Inflation Forecasting Experiment (cont.)

Experimental Design

Two key decisions per inflation forecasting task:

1. **Inflation forecasts**:

2. **Attention to information**

- Prior and Posterior (with precision): Incentivized to minimize forecast error
- Treatments: **Messengers** of signals
  1. Experts of in- and outgroup nationality
  2. ECB Experts of in- and outgroup nationality
  3. 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.'*

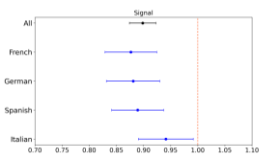
Updattng Inflaion Expectations: Estimation

Standard Bayesian belief updating:
- where Prior about $x \sim N(A_i, \tau_i^{-1})$
- and Signal $B_j = x + e$, where $e \sim N(0, \tau_j^{-1})$
- Posterior: $E_i[x|B_j] = \frac{\tau_i A_i + \tau_j B_j}{\tau_i + \tau_j}$

$$Posterior_{ij} = \underbrace{\frac{\tau_i}{\tau_i + \tau_j}}_{\text{weighted Prior}} A_i + \underbrace{\frac{\tau_j}{\tau_i + \tau_j}}_{\text{weighted Signal}} B_j + \varepsilon_{ij}$$

Following e.g., Benjamin (2019):
- If " = " = 1: Bayesian Updating
- If " >< 1: prior over-/under-use
- If " >< 1: signal over-/under-use

Figure 5. Signal Use (")



All treatments: " = 0.90

Findings

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

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

$$Posterior_{ij} = \underbrace{\frac{\tau_i}{\tau_i + \tau_j}}_{\text{weighted Prior}} A_i + \sum_{j=1}^{K=2} \underbrace{\frac{\tau_j T_j}{\tau_i + \tau_j}}_{\text{weighted Signal}} B_j + \varepsilon_{ij}$$

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

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

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**

Homophily drives ingroup effects within the ECB context

Potential causes of ingroup effect:
(i) **Homophily:** liking for sameness
(ii) **Heterophobia**: dislike for difference

Comparing signal use between:
(i) Ingroup and neutral ECB expert (0.035*úú*) *æ* Homophily
(ii) Outgroup and neutral ECB expert (0.013) *æ* Not heterophobia

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

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 better **reach** audiences better:

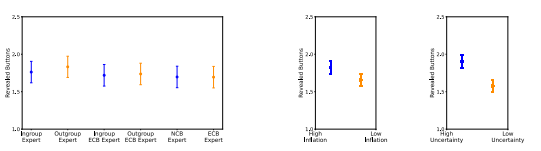
*'How well are you **informed** about the institutions or **policymakers** listed below?'*

	ECB Board Member	NCB Governor
France	Christine Lagarde	François Villeroy 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 $x \sim N(\mu, \tau_x^{-1})$ and coordinating with others:

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

- Share – of ingroup agents and $(1 - -)$ 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: $y_i = x + \varepsilon_{y,i}, \quad \varepsilon_{y,i} \sim N(0, \tau_y^{-1})$
- Public signal: $Y = x + \varepsilon_Y = x + \varepsilon_z + \varepsilon_V, \quad \varepsilon_z \sim N(0, \tau_z^{-1}), \quad \varepsilon_V \sim N(0, \tau_V^{-1})$

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 –

Timeline:
1. Decision on delegation and public information disclosure
2. 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 $d_o \sim N_+(0, 1)$
  - Fraction of informed outgroup agents: $A = 2\Phi(|Y|) - 1$.
  - Form beliefs with Resonance Weight (Malmendier and Veldkamp, 2022):

$$fl_{im} = (2 - 2\Phi(\%\%|\theta_i - \theta_m|))$$

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

Actions in the Unique Linear Equilibrium

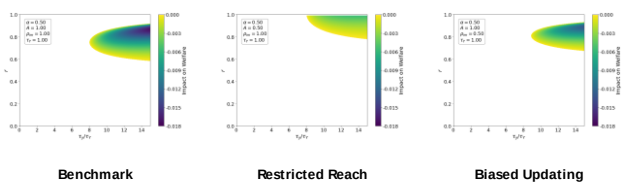
$$a_{ig}(y_i, Y) = \underbrace{\frac{\tau_Y Y + \tau_y q y_i}{\tau_Y + \tau_y q}}_{\text{Ingroup}} \qquad a_{io}(y_i, Y) = \underbrace{\frac{fl_{im}\tau_Y Y + \tau_y q y_i}{fl_{im}\tau_Y + \tau_y q}}_{\text{Informed Outgroup}} \qquad a_{io}(y_i) = \underbrace{y_i}_{\text{Uninformed Outgroup}}$$

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

Optimal Communication Policy

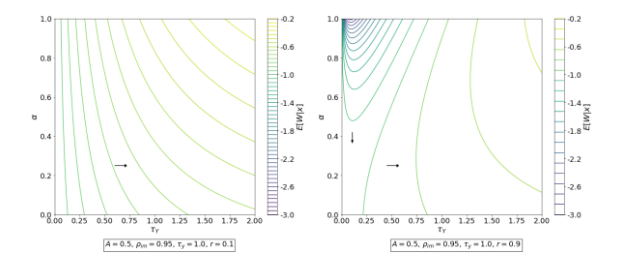
PROPOSITION. *Increasing the precision of the public signal (τ_Y) improves welfare only if the public signal is sufficiently precise relative to private signals and if the coordination motive r is not too high.*

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 –)
- Choosing to delegate depends on coordination r:
  - **Low** r: Maximizing – ($-^{\theta} = 1$) is optimal (and so is full disclosure)
  - **High** r: Reducing – can prevent over-reliance on noisy public signals *æ* 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 becomes 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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