ECB Exchange Rate Communication

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Motivation and Research Question

- Communication is a key policy tool of central banks
- Monetary policy communication is heavily studied, exchange rate communication isn't
- **Examples of ECB exchange rate communication**
  - 21 July 2022: "We expect inflation to remain undesirably high for some time, owing to continued pressures from energy and food prices and pipeline pressures in the pricing chain. Higher inflationary pressures are also stemming from the depreciation of the euro exchange rate."
  - 13 January 2005: "As regards exchange rates, we confirm our position, expressed when the euro rose sharply, that such moves are unwelcome and undesirable for economic growth."

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- **Research questions**
  - When does the ECB mention the exchange rates? When do journalists ask about it?
  - Do statements move exchange rates at all? In the intended way?

⇒ **Two views**

- Skeptics
  - FX markets too large for communication to have any effect
  - ECB does not target the exchange rate

- Optimists
  - Communication is a powerful signal of future policy changes
  - Central banks talk a lot about the exchange rate!
  - Empirical evidence from the early 2000's

Outline

- Literature and contribution
- Data
- Determinants of mentions
- High-frequency effectiveness of verbal interventions
- Low-frequency effectiveness of verbal interventions
- Conclusions

- **High frequency identification and Central bank communication**
  - Cochrane & Piazzesi (2002), Gürkaynak et al. (2004), Blinder et al. (2008), Nakamura & Steinsson (2018), Blinder et al. (2024)
    ⇒ **This project:** Focus on exchange rate communication

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- **Effectiveness of exchange rate communication**
  - Fatum & M. Hutchison (2003), Jansen & De Haan (2005), Fratzscher (2006), Fratzscher (2008b), Fratzscher (2008a), Beine et al. (2009), Fratzscher (2009)
    ⇒ **This project:** Extended sample period; state-of-the-art methods

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- **Natural language processing of policy communication**
  - Hansen et al. (2018), Gholampour & van Wincoop (2019), Bianchi et al. (2023), Ferrari Minesso et al. (2022), Bertsch et al. (2024)
    ⇒ **This project:** Use these techniques for exchange rate communication

Description of the data

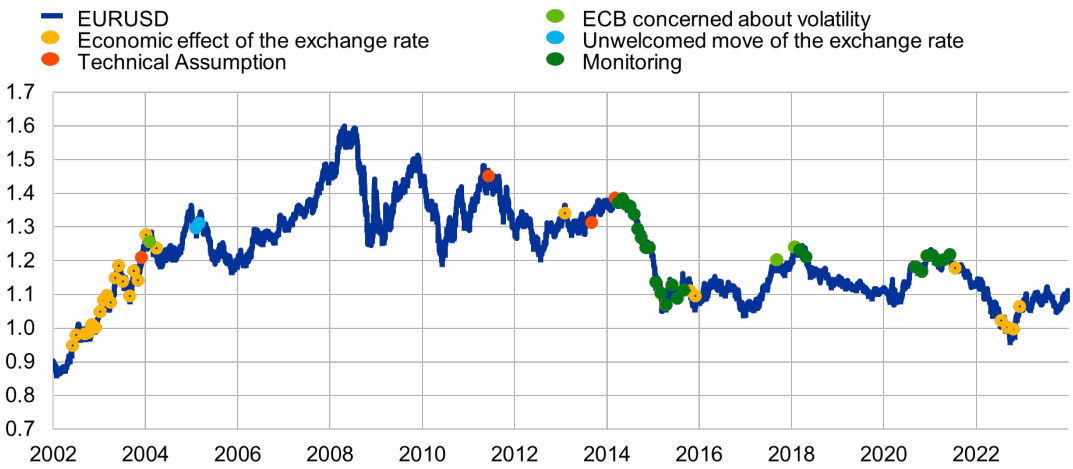
- Exchange rate communication:
  - ECB monetary policy statement and intermeeting speeches by the President
  - Contains keywords: “exchange rate”, “appreciat*”, “depreciat*”, “dollar”, “interven*”

- High-frequency data:
  - EURUSD and monetary policy surprises (OIS2Y) from Altavilla et al. (2019)
    Press conference window, 14:20-15:45
    Correlations

- Macroeconomic data releases:
  - Standardised US macroeconomic surprises based on Bloomberg survey
  - Initial Jobless Claims, Continuing Jobless Claims, Manufacturers’ New Orders Total, Trade Balance of Goods and Services, Durable Goods New Orders Industries, Producer Price Index

Summary statistics Categories

Mentions of the exchange rate in monetary policy statements: classification by type



Determinants of mentions

- Estimate probit regression:

$$M_t = \begin{cases} 1 & \text{if } M_t^* = \alpha + \beta X_t + \varepsilon_t > 0 \\ 0 & \text{otherwise} \end{cases}$$

  - M_t: dummy variable if exchange rate mentioned
  - X_t: vector of potential determinants, with a focus on:
    - Nominal exchange rate
    - REER deviations from equilibrium (Ca' Zorzi et al. (2022)) Charts
    - Exchange rate mentions in intermeeting communication by the President
  - Exchange rate mentions M_t on:
    - Monetary policy (introductory) statement
    - Questions by journalists
  - Heteroskedasticity-robust standard errors

Determinants of mentions: monetary policy (introductory) statement

	(1) MPS mention	(2) MPS mention	(3) MPS mention	(4) MPS mention
Δ REER deviation from equil. (abs.)	0.072**			
	(0.030)			
Δ REER from top/bottom 20 pctile		0.204***		
		(0.063)		
Δ REER deviation from equil. $\mid > 0$			0.092***	
			(0.032)	
Δ REER deviation from equil. $\mid < 0$			-0.047	
			(0.032)	
Δ REER towards REER equil.				0.060*
				(0.033)
Δ REER against REER equil.				0.078**
				(0.034)
Observations	217	217	217	217

- Mentions more likely when REER significantly diverges from equilibrium

More results

Determinants of mentions: questions by journalists

	(1) Q. mention	(2) Q. mention	(3) Q. mention	(4) Q. mention
Is mentioned, MPS	0.148**	0.139*	0.140*	0.170**
	(0.075)	(0.076)	(0.076)	(0.075)
Nominal exchange rate trend (abs. change)		0.071**		
		(0.036)		
Nominal exchange rate trend $\mid > 0$			0.114***	
			(0.043)	
Nominal exchange rate trend $\mid < 0$			-0.017	
			(0.039)	
President speeches				0.059**
				(0.024)
Observations	217	217	217	217

- Nominal exchange rate and mentions in speeches are key determinants of journalists' questions
- Journalists responsive to visible factors; ECB communication grounded in fundamentals

More results

High-frequency impact of mentions

- Specification with absolute changes:

$$|\Delta x_t| = \alpha + \beta M_t + \gamma_{OIS}|\Delta OIS_t| \times (1 - I_t) + \gamma_{Info}|\Delta OIS_t| \times I_t + \gamma_{News}|News_t| + \gamma_{Trend}|\Delta x_{t-1,t-5}| + \varepsilon_t$$

  - Δx_t: change in the (log) exchange rate over the press conference window
  - M_t: number of mentions
  - ΔOIS_t: change in the OIS rates
  - I: dummy equal to 1 if high-frequency changes in the OIS rate and Euro Stoxx50 have same sign
  - $News_t$: surprise component of macroeconomic announcements
  - $|\Delta x_{t-1,t-5}|$: control for trend over previous 5 days
  - Heteroskedasticity-robust standard errors

High-frequency results: Effects on absolute change of the EURUSD exchange rate

	(1)	(2)	(3)	(4)
| MP shock|	0.038***	0.041***	0.040***	0.039***
	(0.006)	(0.007)	(0.006)	(0.006)
| Info. shock|	0.008	0.013**	0.012**	0.013**
	(0.005)	(0.005)	(0.005)	(0.005)
Mentions, MPS		0.044**		
		(0.020)		
Mentions, questions			-0.008	
			(0.010)	
Mentions, answers				0.003
				(0.011)
Constant	0.264***	0.265***	0.296***	0.281***
	(0.021)	(0.034)	(0.036)	(0.039)
Observations	217	217	217	217
Macro and FX Contr.	YES	YES	YES	YES
Adj. R2	0.154	0.185	0.170	0.168

Dummy variable

- 1 bp MP shock:
  → 0.04pp change in EURUSD
- Mention in MPS:
  → 0.04pp change in EURUSD
- No effect of mentions in Q&A

Using AI to characterise sentiment expressed in exchange rate mentions

- To test for direction of exchange rate response, need to classify direction of mention
  1. **Sentiment detection**:
     - Use AI emotions detector (Hartmann (2022)) to classify mentions as *positive* (1), *negative* (-1), or *neutral* (0)
     - Positive if joy $>$ sample mean; negative if $\sum$ anger, disgust, fear, sadness $>$ sample mean

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2. **From sentiment to direction**:
   - If mention discusses effects on inflation, and:
     inflation is "high" ($> 2\%$) $\rightarrow$ *appreciation* desired;
     inflation is "low" ($< 2\%$) $\rightarrow$ *depreciation* desired.
   - Other mentions discussing direction of exchange rate moves: 4 cases
     appreciation: use sentiment;
     deprectiation: reverse sign of sentiment.
   - Remaining mentions: use sentiment

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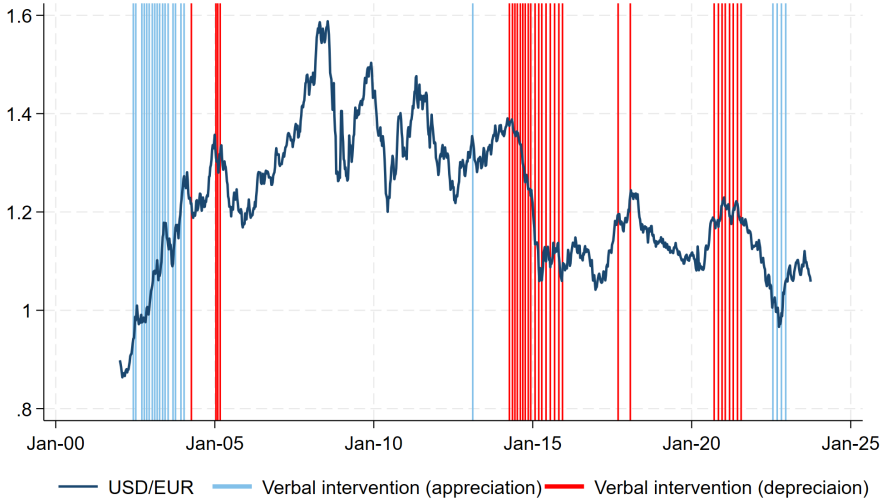
     deprectiation: reverse sign of sentiment.
   - Remaining mentions: use sentiment
3. **Aggregation**: Sum across all mentions in Monetary Policy Statement

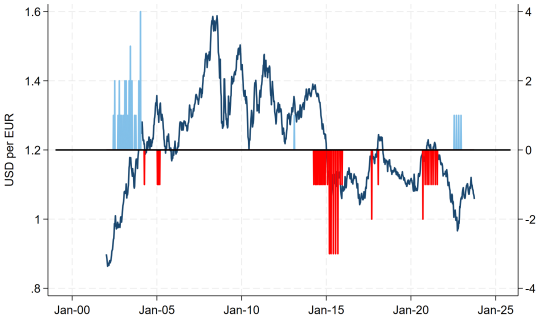
Examples of classification;

Using AI to characterise sentiment expressed in exchange rate mentions

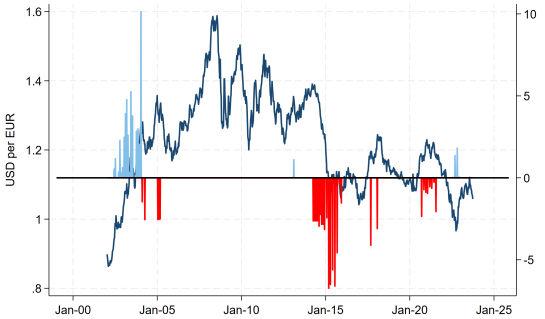
- Computing a directional sentiment index



Using AI to characterise sentiment expressed in exchange rate mentions



Discrete index



Continuous index

- Directional, high-frequency specification:

$$\Delta x_t = \alpha + \beta S_t + \gamma_{OIS}\Delta OIS_t \times (1 - I_t) + \gamma_{Info}\Delta OIS_t \times I_t + \gamma_{News} News_t + \gamma_{Trend}\Delta x_{t-1,t-5} + \varepsilon_t$$

  - Δx_t: change in EURUSD exchange rate over the press conference window
  - S_t: directional index
  - $News_t$: surprise component of macroeconomic announcements
  - γ_{OIS} and γ_{Info} control for pure MP and Information shocks, respectively
  - $\Delta x_{t-1,t-5}$: control for trend over previous 5 days
  - Heteroskedasticity-robust standard errors

High-frequency results: Effect on the EURUSD exchange rate

	(1)	(2)	(3)
MP shock	0.071***	0.070***	0.070***
	(0.011)	(0.011)	(0.011)
Info. shock	0.023***	0.024***	0.025***
	(0.007)	(0.007)	(0.007)
DS (discrete robust), positive			0.108**
			(0.046)
DS (discrete robust), negative			-0.028
			(0.063)
Directional sentiment (discrete robust)		0.036	
		(0.043)	
Constant	-0.020	-0.017	-0.040
	(0.025)	(0.025)	(0.027)
Observations	217	217	217
Macro and FX controls	YES	YES	YES
Adj. R2	0.309	0.310	0.320

- 1 bp MP shock:
  $\rightarrow$ 0.07pp appreciation in EURUSD
- Directional sentiment index only significant when supports appreciation

Continuous index

High-frequency results: Effect on the EURUSD exchange rate (2)

	(1)
MP shock	0.058***
	(0.008)
Info. shock	0.021***
	(0.007)
MP shock x ELB	0.131***
	(0.043)
Info shock x ELB	0.052*
	(0.031)
Directional sentiment (discrete robust)	0.090**
	(0.042)
Directional (discrete robust) x ELB	-0.180**
	(0.086)
ELB	-0.135**
	(0.067)
Constant	-0.013
	(0.025)
Observations	217
Macro and FX controls	YES
Adj. R2	0.412

- Reconciling with the earlier literature: differentiate ELB period (June 2014 to August 2022)
- MP pass-through stronger when rates are low/ELB (Ferrari Minesso et al. 2021)
- Exchange rate communication more effective when rates are higher

More results Continuous index (1) Continuous index (2)

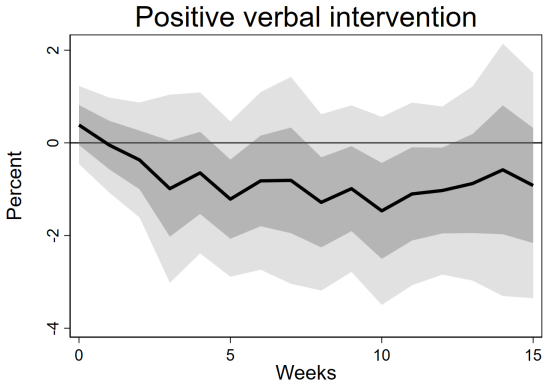
Low-frequency impact of mentions

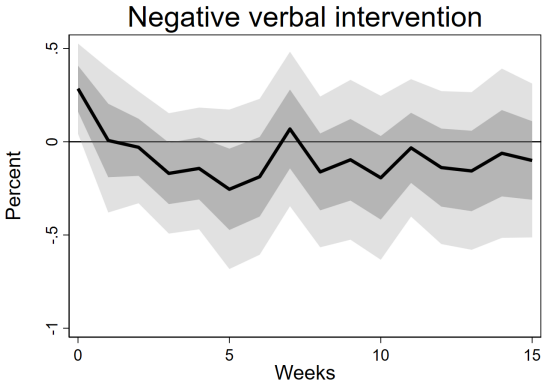
- Weekly local projections:

$$y_{t+k} = \alpha + \beta^k S_t + \sum_{j=1}^{p} \gamma_{j,h} y_{t-j} + \Gamma' X_t + \epsilon_t$$

  - y_{t+k}: log of the exchange rate
  - S_t: directional index
  - X_t: controls: EA and US 2-year OIS rates; EA and US stock market indices; EA and US term spreads; and 4 lags of all; contemporary monetary policy shock and information shocks;
  - $p = 4$: lags of dependent variable

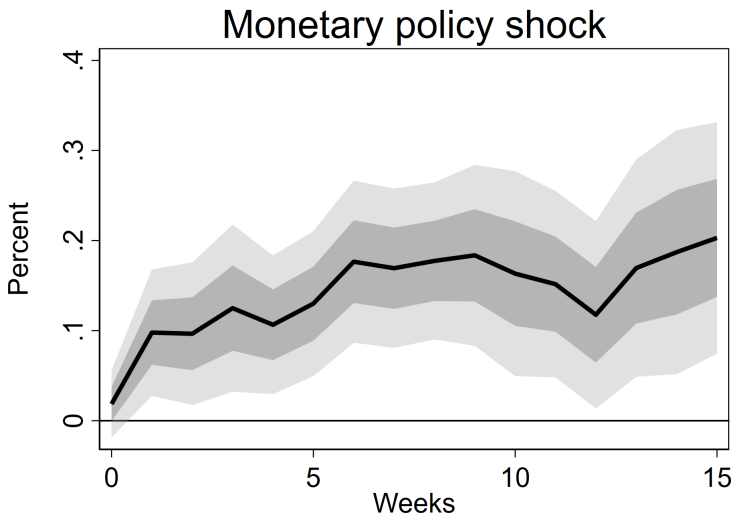
Estimated effect of exchange rate communication on the EURUSD exchange rate





- Effect does not persist

Directional indices; Continuous index; ELB



Information shock;

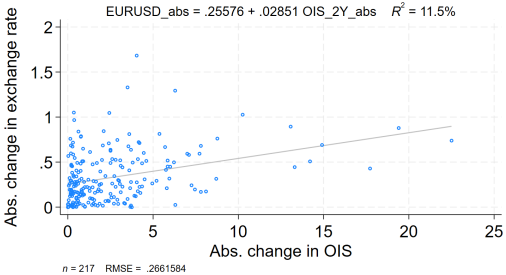
Conclusions and policy implications

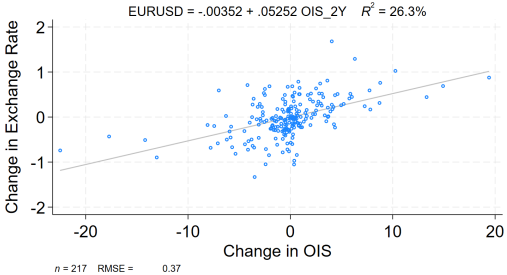
- **Conclusions**:
  - ECB mentions driven by disequilibria of real effective exchange rate; journalists' questions mainly responsive to the nominal exchange rate
  - Our findings support the skeptical view of the effectiveness of exchange rate communication:

    → Exchange rate communication has limited effects on exchange rate movements
    → Appears more effective in short run when rates are higher
    → Effect not persistent over time
  - Dominant role of monetary policy shocks in driving exchange rates ("it's all in there")
- **Implications**:
  - Main lever to affect the exchange rate is monetary policy, not exchange rate communication

Background slides

Correlation between monetary policy shocks the EURUSD exchange rate reaction





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Summary statistics of Exchange rate mentions

Table 1: Summary statistics on exchange rate mentions

	Total	MPS	Questions	Answers
Number of events with mentions	167	60	107	144
% of events with mentions	77%	28%	49%	66%
Total number of mentions	682	98	240	346
Avg. number of mentions, if mentioned	4.1	1.6	2.2	2.4
Max. number of mentions in event	19	3	9	11

Notes: MPS stands for Monetary Policy Statement.

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Summary statistics of Exchange rate mentions

Table 2: Exchange rate mentions by topic, and number of observations in the monetary policy statements

Topic	**Description**	**Count**
Technical assumptions	Exchange rate is mentioned as a technical assumption in staff forecast	7
Monitoring of the exchange rate	Statements regarding the need to monitor the exchange rate due to its impact on the economy and inflation	24
Economic effect of exchange rate	Statements regarding the exchange rate's impact on the economy and inflation	61
Concerns about exchange rate	Statements express concerns about volatility or direction/level of the exchange rate	6

Notes: The table classifies statements related to the exchange rate in the monetary policy statement into topics. Given the small number and repetitive nature of the mentions, a manual approach was most appropriate. To guide the classification, we first ran a hierarchical clustering on the textual similarity of the mentions, which offered a rough indication of possible groupings. The final classification, however, was based on manual revision, with each mention assigned to a topic according to the descriptions provided.

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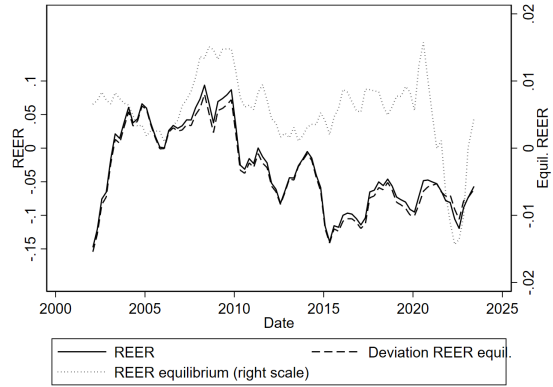
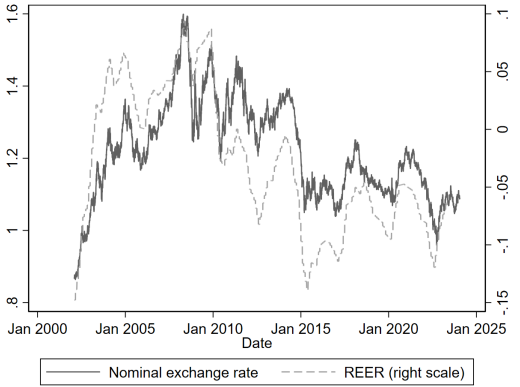
REER deviation from equilibrium





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Determinants of mentions: monetary policy (introductory) statement

	(1) MPS mention	(2) MPS mention	(3) MPS mention	(4) MPS mention	(5) MPS mention
Nominal exchange rate trend (abs. change)	0.029				
	(0.029)				
Nominal exchange rate trend | > 0		0.030			
		(0.033)			
Nominal exchange rate trend | < 0		-0.026			
		(0.032)			
REER deviation from equil. (abs.)			0.028		
			(0.031)		
REER from top/bottom 20 pctile				0.102	
				(0.089)	
President speeches					-0.028
					(0.021)
Observations	217	217	217	217	217

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Determinants of mentions: questions by journalists

	(1) Q. mention	(2) Q. mention	(3) Q. mention	(4) Q. mention	(5) Q. mention	(6) Q. mention
Is mentioned, MPS	0.159**	0.140*	0.151**	0.141*	0.133*	0.156**
	(0.075)	(0.075)	(0.076)	(0.077)	(0.077)	(0.077)
REER deviation from equil. (abs.)	-0.061*					
	(0.036)					
REER from top/bottom 20 pctile		0.133				
		(0.111)				
Δ REER deviation from equil. (abs.)			-0.008			
			(0.034)			
Δ REER from top/bottom 20 pctile				0.036		
				(0.089)		
Δ REER deviation from equil. $\mid > 0$					0.057	
					(0.040)	
Δ REER deviation from equil. $\mid < 0$					0.061	
					(0.039)	
Δ REER towards REER equil.						0.008
						(0.038)
Δ REER against REER equil.						-0.031
						(0.037)
Observations	217	217	217	217	217	217

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High-frequency results: Absolute change of exchange rate communication on the EURUSD exchange rate

	(1)	(2)	(3)
| MP shock|	0.040***	0.039***	0.039***
	(0.007)	(0.006)	(0.006)
| Info. shock|	0.013**	0.012**	0.012**
	(0.005)	(0.005)	(0.005)
Is mentioned, MPS	0.076*		
	(0.042)		
Is mentioned, questions		-0.016	
		(0.035)	
Is mentioned, answers			0.019
			(0.039)
Constant	0.263***	0.295***	0.274***
	(0.035)	(0.038)	(0.043)
Observations	217	217	217
Macro and FX Controls	YES	YES	YES
Adj. R2	0.183	0.169	0.169

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Examples of mentions

- **Positive verbal intervention:**
  - 4 July 2002: "Overall, the strengthening of the euro exchange rate is a new factor suggesting a potential for lower inflation rates. However, other factors – in particular monetary developments and wage trends – do not indicate a moderation in price pressures."
- **Negative verbal intervention:**
  - 13 January 2005: "Downside risks to the economic outlook stemming from oil price developments have diminished somewhat over recent weeks. As regards exchange rates, we confirm our position, expressed when the euro rose sharply, that such moves are unwelcome and undesirable for economic growth."
- **Neutral statement:**
  - 5 September 2013: "According to Eurostat's flash estimate, as expected, euro area annual HICP inflation was 1.3% in August 2013, down from 1.6% in June and July. On the basis of current assumptions for energy and exchange rate developments, annual inflation rates are expected to remain low in the coming months, owing in particular to energy price developments. "

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When sentiment is expressed in the context of exchange rate developments:

	Appreciation	**Depreciation**
Positive sentiment	Keep sign	Reverse sign
Negative sentiment	Keep sign	Reverse sign

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Robustness test: High-frequency results: Effect on the EURUSD exchange rate - continuous directional index

	(1)	(2)	(3)
MP shock	0.071***	0.071***	0.071***
	(0.011)	(0.011)	(0.011)
Info. shock	0.023***	0.023***	0.024***
	(0.007)	(0.007)	(0.007)
DS (cont. robust), positive			0.055***
			(0.021)
DS (cont. robust), negative			-0.020
			(0.028)
Directional sentiment (cont. robust)		0.012	
		(0.022)	
Constant	-0.020	-0.017	-0.039
	(0.025)	(0.025)	(0.027)
Observations	217	217	217
Macro and FX controls	YES	YES	YES
Adj. R2	0.309	0.308	0.321

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High-frequency results: Effect on the EURUSD exchange rate (3)

	(1)	(2)
MP shock	0.125***	0.075***
	(0.015)	(0.017)
Info. shock	0.042***	-0.001
	(0.015)	(0.013)
DE10Y		0.062***
		(0.012)
Rate x DE10yshock		-0.034***
		(0.008)
MP shock x EA2y GovBond yield	-0.021***	-0.001
	(0.004)	(0.005)
Info shock x EA2y GovBond yield	-0.009	0.014*
	(0.008)	(0.007)
Directional sentiment (discrete robust)	-0.039	-0.027
	(0.053)	(0.044)
Directional (discrete robust) x rate	0.057**	0.053**
	(0.025)	(0.022)
EA2y GovBond yield	0.018	0.017
	(0.015)	(0.014)
Constant	-0.081**	-0.074**
	(0.036)	(0.033)
Observations	217	217
Macro and FX controls	YES	YES
Adj. R2	0.406	0.499

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High-frequency results: Effect on the EURUSD exchange rate (3)

	(1)	(2)
MP shock	0.059***	0.043***
	(0.008)	(0.012)
Info. shock	0.021***	0.003
	(0.007)	(0.014)
DE10Y		0.036*
		(0.022)
10y yield shock x ELB		0.016
		(0.031)
MP shock x ELB	0.129***	0.077
	(0.043)	(0.055)
Info shock x ELB	0.059**	0.003
	(0.025)	(0.044)
Directional sentiment (cont. robust)	0.044**	0.046**
	(0.019)	(0.020)
Directional (continuous robust) x ELB	-0.092**	-0.087**
	(0.036)	(0.034)
ELB	-0.141**	-0.112*
	(0.062)	(0.064)
Constant	-0.007	-0.014
	(0.025)	(0.025)
Observations	217	217
Macro and FX controls	YES	YES
Adj. R2	0.416	0.450

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High-frequency results: Effect on the EURUSD exchange rate (3)

	(1)	(2)
MP shock	0.126***	0.076***
	(0.015)	(0.017)
Info. shock	0.042***	-0.000
	(0.015)	(0.014)
DE10Y		0.061***
		(0.012)
Rate x DE10yshock		-0.034***
		(0.008)
MP shock x EA2y GovBond yield	-0.020***	-0.001
	(0.004)	(0.005)
Info shock x EA2y GovBond yield	-0.009	0.013*
	(0.008)	(0.007)
Directional sentiment (cont. robust)	-0.026	-0.020
	(0.026)	(0.021)
Directional (continuous robust) x rate	0.031**	0.028**
	(0.013)	(0.011)
EA2y GovBond yield	0.022	0.022
	(0.014)	(0.014)
Constant	-0.082**	-0.075**
	(0.035)	(0.032)
Observations	217	217
Macro and FX controls	YES	YES
Adj. R2	0.404	0.495

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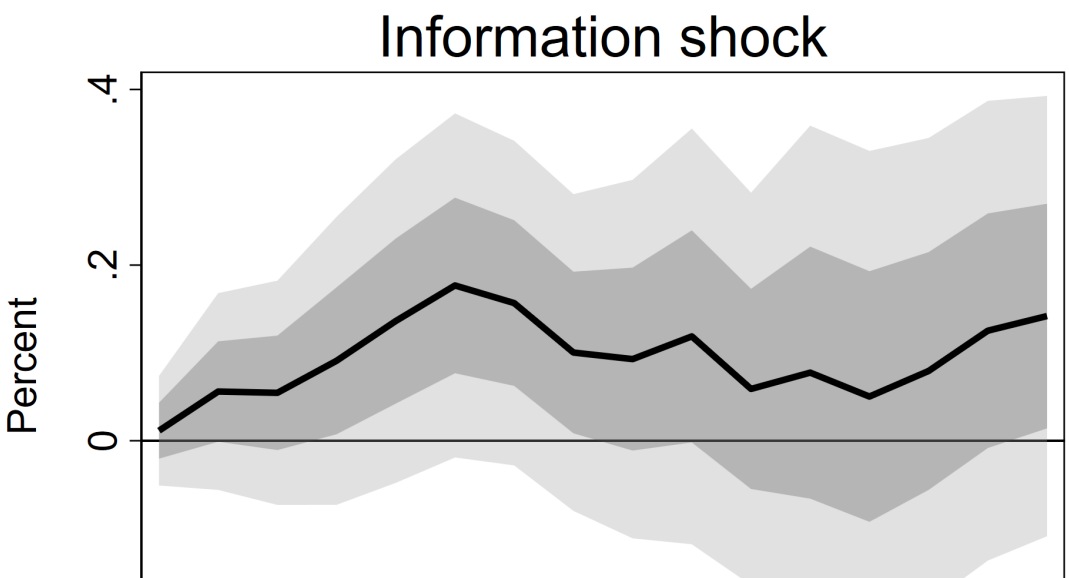
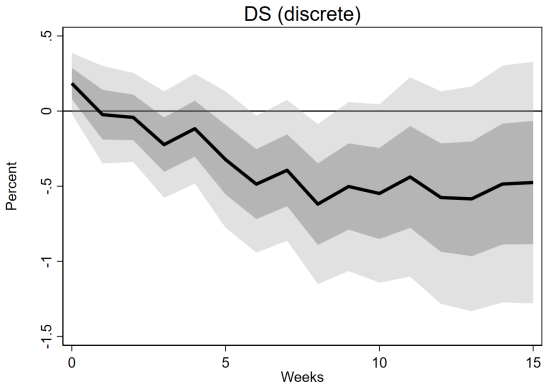
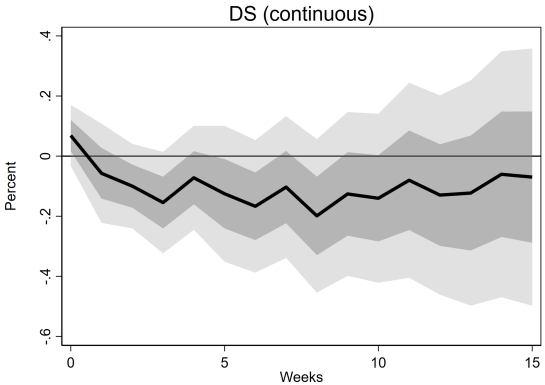

Information shock
Percent
.4
.2
0

Robustness test (1): Estimated effect of exchange rate communication on the EURUSD exchange rate - 2 directional indices





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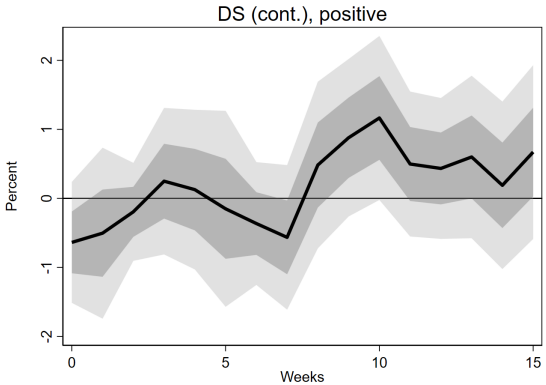
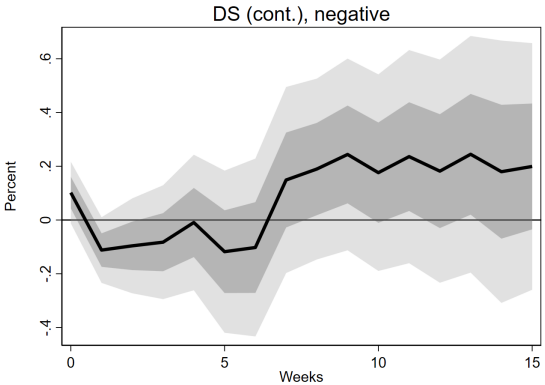
Robustness test (2): Estimated effect of exchange rate communication on the EURUSD exchange rate - continuous directional index





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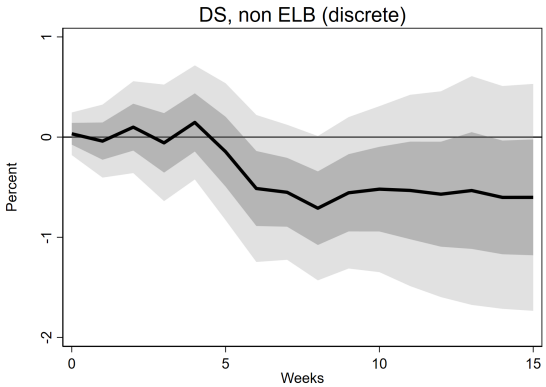
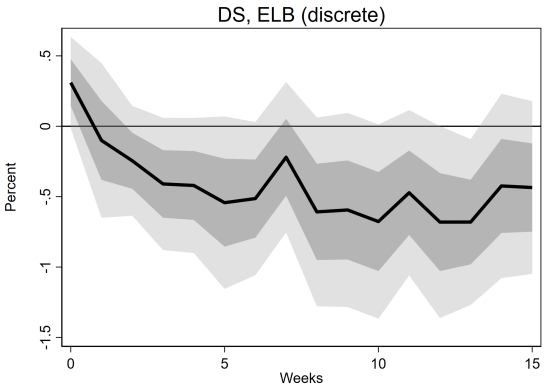
Robustness test (3): Estimated effect of exchange rate communication on the EURUSD exchange rate





- Effect does not appear to persist over time

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