

Anchors aweigh?

The effect of communicating forecast uncertainty

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Usual disclaimers apply: Views are ours alone

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Communicating Monetary Policy Uncertainty

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- **Benefit Tomorrow:** **protect reputation** → manage **expectations** (?) Spiegelhalter ‘24, van der Bles ‘19 on **trust**

A communication challenge for the Bank of England (and others)

Challenge 2

Bernanke Review Recommendation 11: *Despite their distinguished history, the fan charts as published in the MPR have weak conceptual foundations, convey little useful information over and above what could be communicated in other, more direct ways, and receive little attention from the public. **They should be eliminated.** However, it remains important to communicate the degree of forecast uncertainty and the balance of risks.*

This paper: two part exercise

Part A: What do different media communicate?

- Test interpretation of uncertainty across mediums: Fan charts, Dot Plots, etc...
 - e.g., central expectations, distributions, probabilities.
- Both UK general public and UK technical audiences.

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Part B: Dynamic Information Experiment: Effect of communicating uncertainty

- Sample: 1,600 observations from representative UK general public participants.
- Four Stages:
 - A. Priors elicited on inflation and confidence ranges.
 - B. Randomised forecast treatments (point vs. uncertainty).
 - C. Forecast error revealed (randomly assigned, varies)
 - D. Updated forecast treatment provided.
- Participants incentivised to forecast accurately and have 'sensible' confidence ranges

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Uncertainty

4. Public under-estimate uncertainty: 'over-confident'. Fans 'teach' more realistic perceptions.

A: What Communication of Uncertainty Works?

The Part A Exercise

- Two samples of participants:
 1. 300 person representative sample of UK participants
 2. 75 person expert sample (PhD Economics students, Financial Market Participants, Financial Journalists, Central Bank staff and people working for international organisations.)

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 - Point forecast only, fan chart, range, box & whisker, dot plot, speedometer

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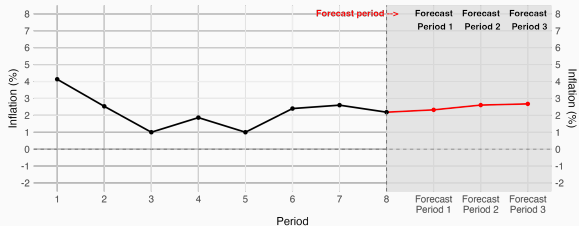
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 - Subjective questions:
 - How much do you understand?
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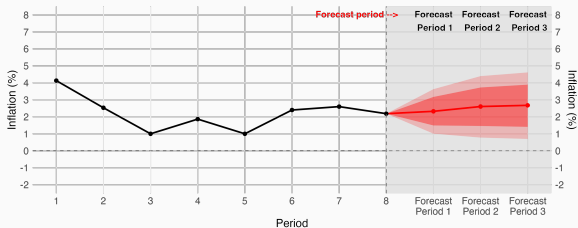
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 - Objective questions:
 - What is the most likely outcome?
 - Qs capturing understanding of distribution, probability ranges etc.

Unconditional Media

“Only Point Forecast”

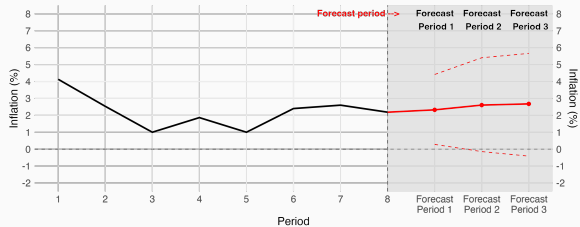


“Fan Chart”

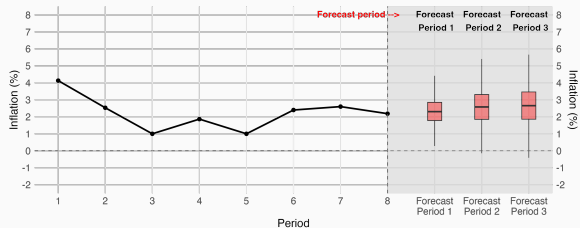


Unconditional Media

“Range”

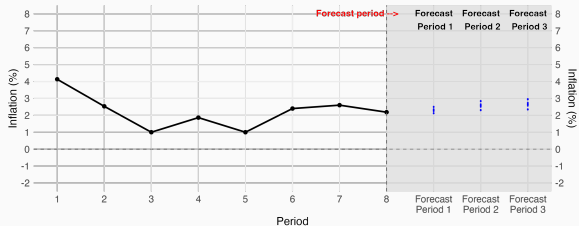


“Box and Whisker”

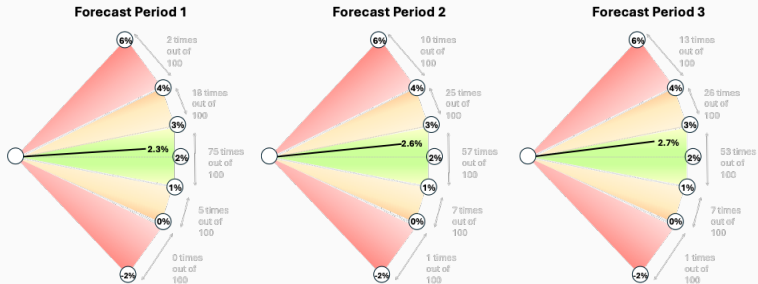


Unconditional Media

“Dots”



“Speedometer”



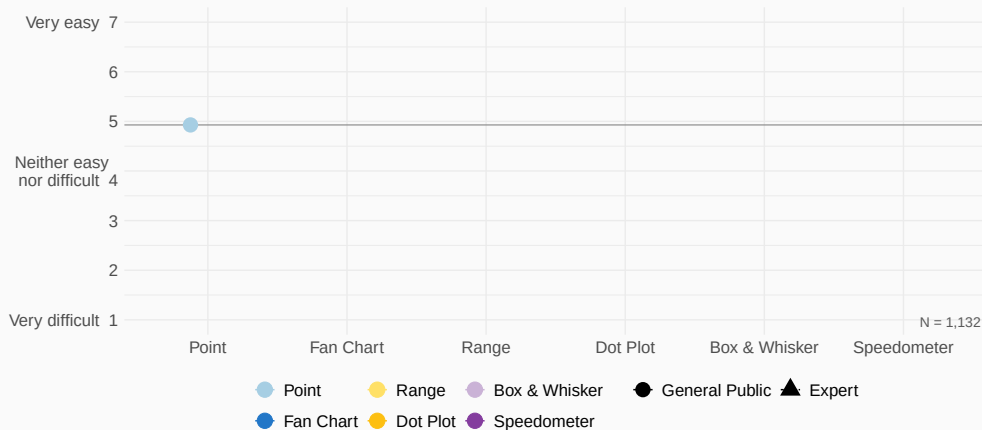
Part A Results: what does each medium communicate?

1. Is the medium 'understood'? (Liked?)

Subjective: How easy is this chart to understand?

► Distributions

$$y_{i,r} = \beta_1 \text{Treatment}_{i,r} + \beta_2 \text{Expert}_i + \beta_3 \text{Treatment}_{i,r} \times \text{Expert}_i + \delta' X_{i,r} + \gamma_i + \epsilon_{i,r}$$

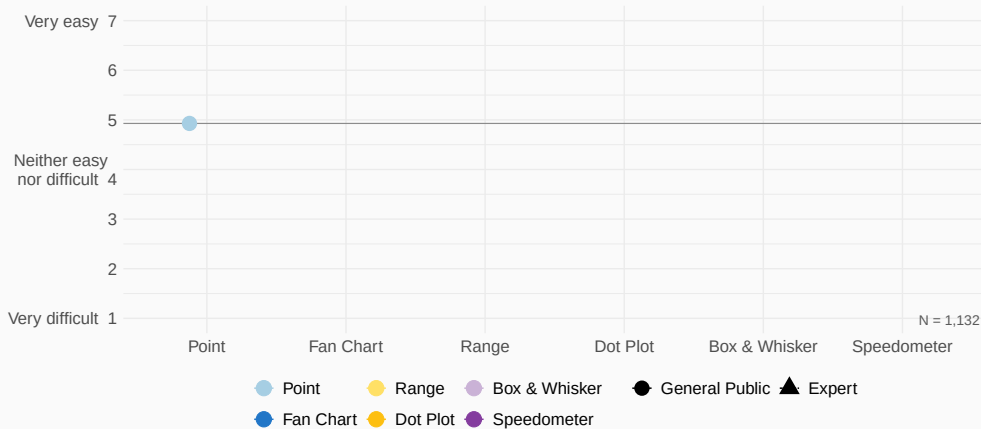


90% CIs on the treatment effect, cluster-robust by participant. Reference lines = the Point baseline (solid: public, dashed: experts).

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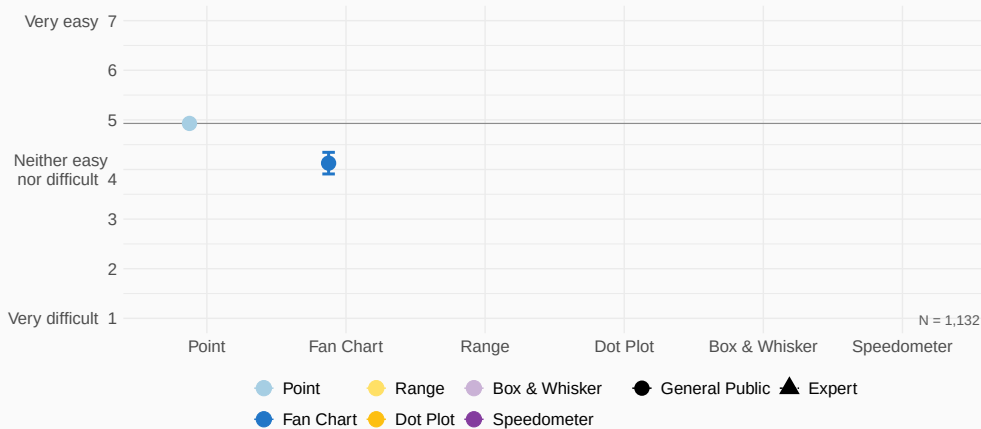


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PUBLIC LIKE POINT BEST. THEN FAN

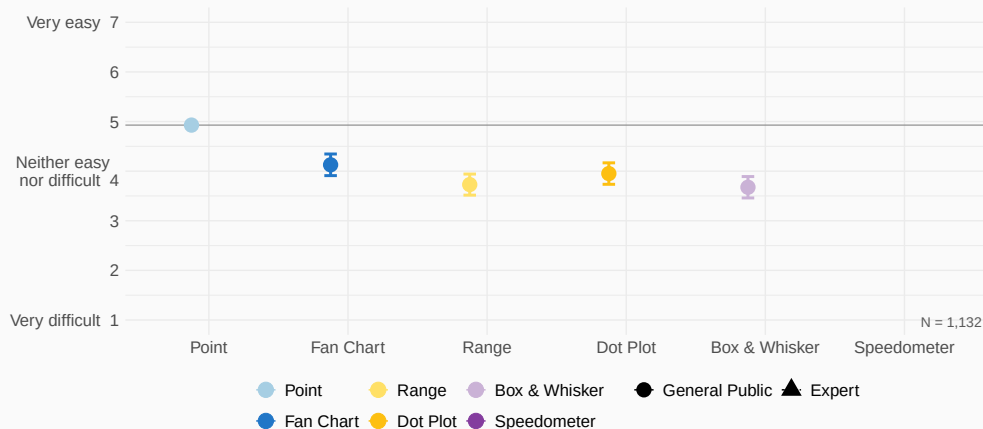


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PUBLIC LIKE POINT BEST. THEN FAN, DOT, RANGE, B&W.

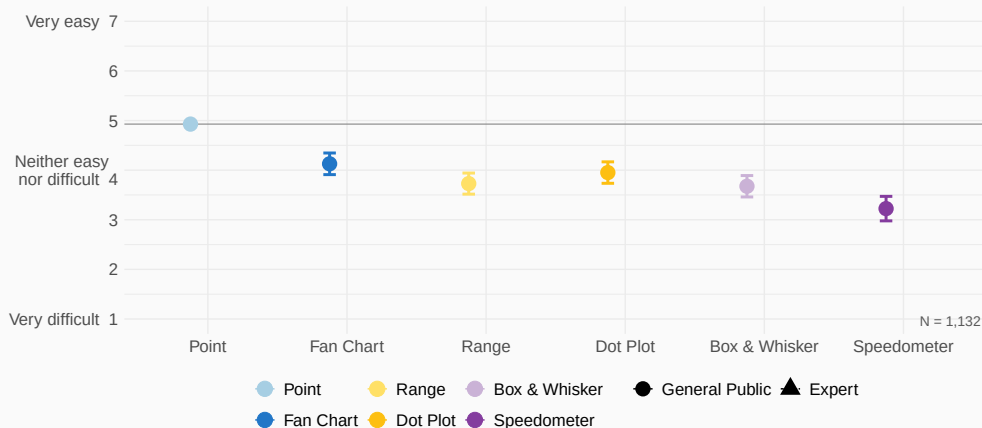


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PUBLIC LIKE POINT BEST. THEN FAN, DOT, RANGE, B&W. SPEEDOMETER LAST.

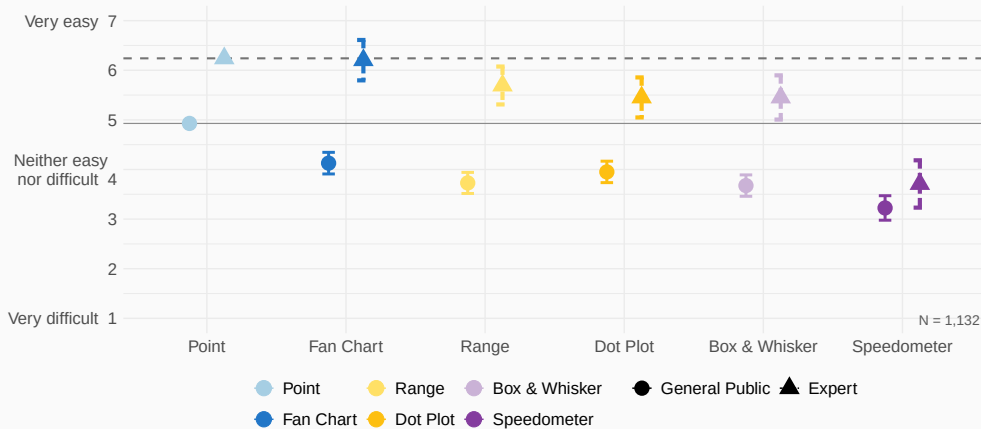


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EXPERTS 'UNDERSTAND' BETTER. SIMILAR RANKING. HATE SPEEDOMETER.



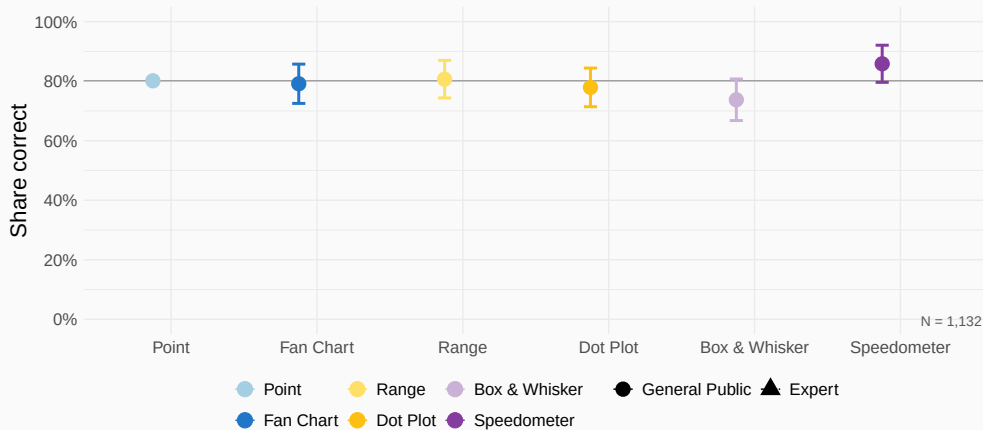
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2. Does the medium communicate expectation?

Objective: What is the most likely value next year? ($\pm 0.3pp$) ► Distributions

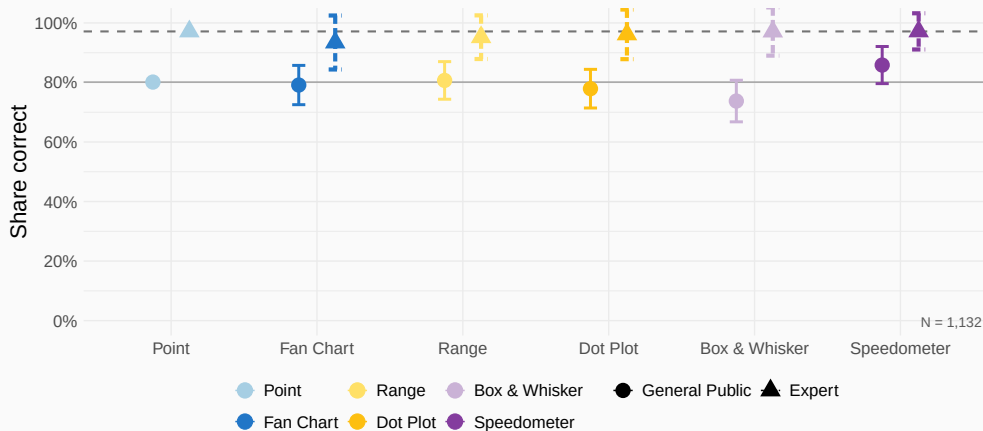
PUBLIC PRETTY GOOD AT EXTRACTING CENTRAL FORECAST.



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EXPERTS (THANKFULLY) VERY GOOD



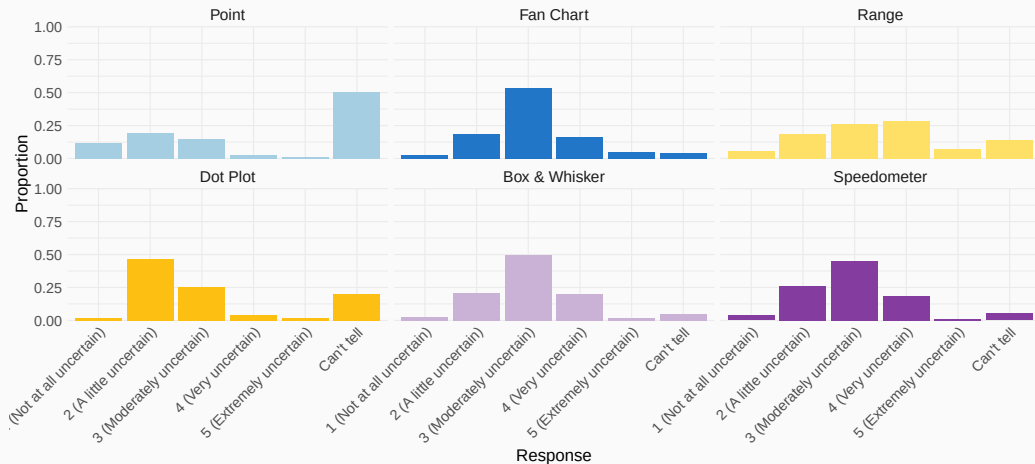
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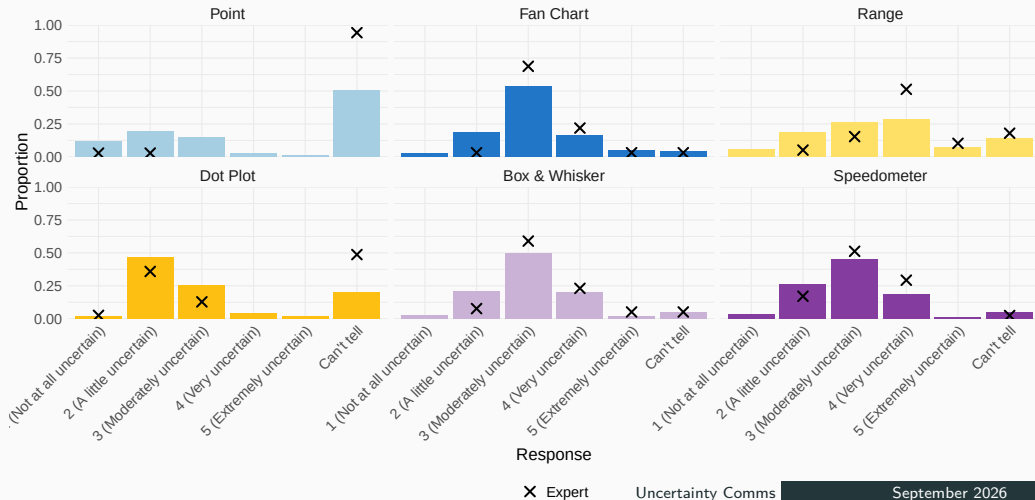
Subjective: How much uncertainty in this chart? (1-5 scale)

FANS, SPEEDOMETER, BOX & WHISKER 'NORMAL'. POINT AND DOTS CONFUSE.



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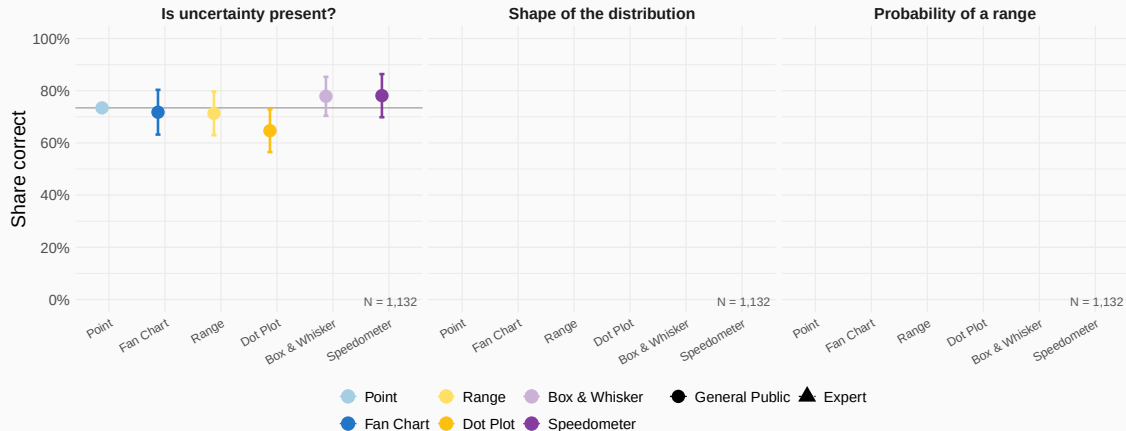
EXPERTS NOT 'MISLED' BY POINT. BUT DOTS STILL CONFUSE.



Obj: Is the direction certain, or only 'most likely'?

► Distributions

PUBLIC GOOD AT UNDERSTANDING DIRECTION NOT CERTAIN.

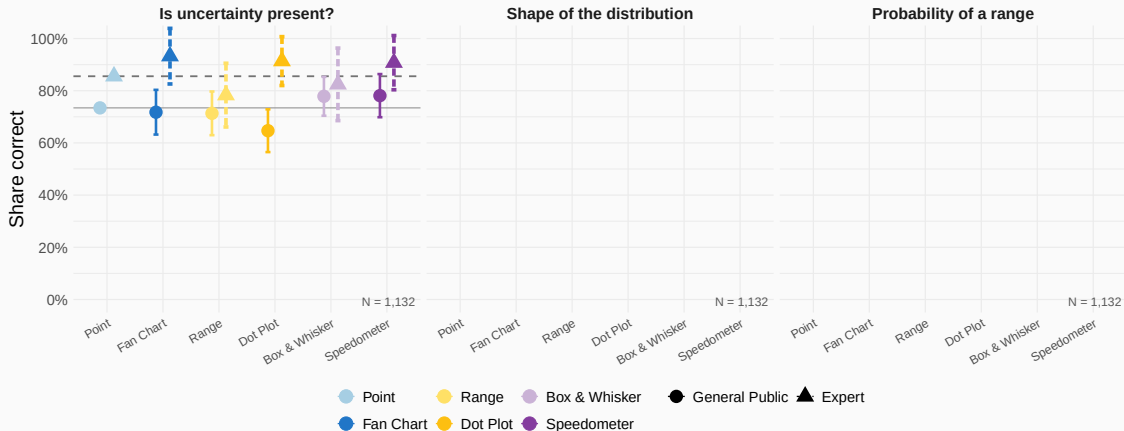


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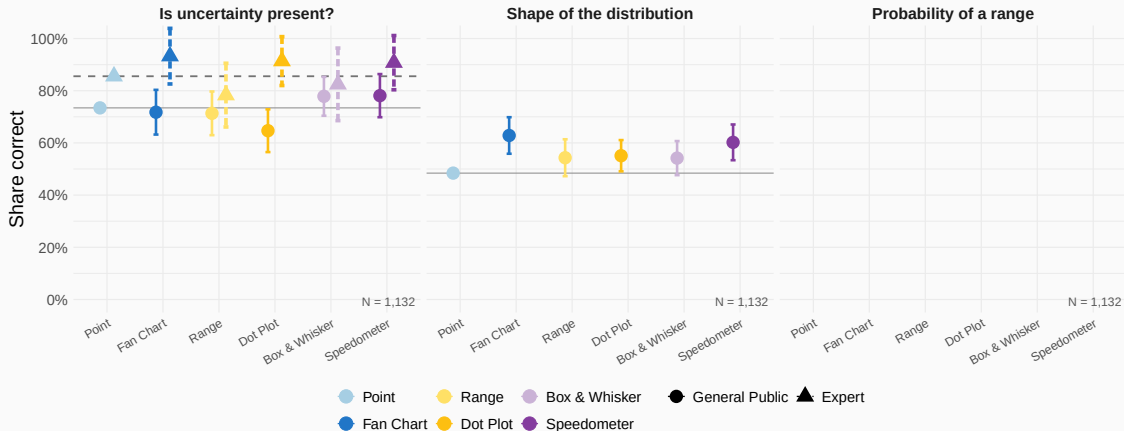
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Obj: Are outcomes near the centre more likely? ► Distributions

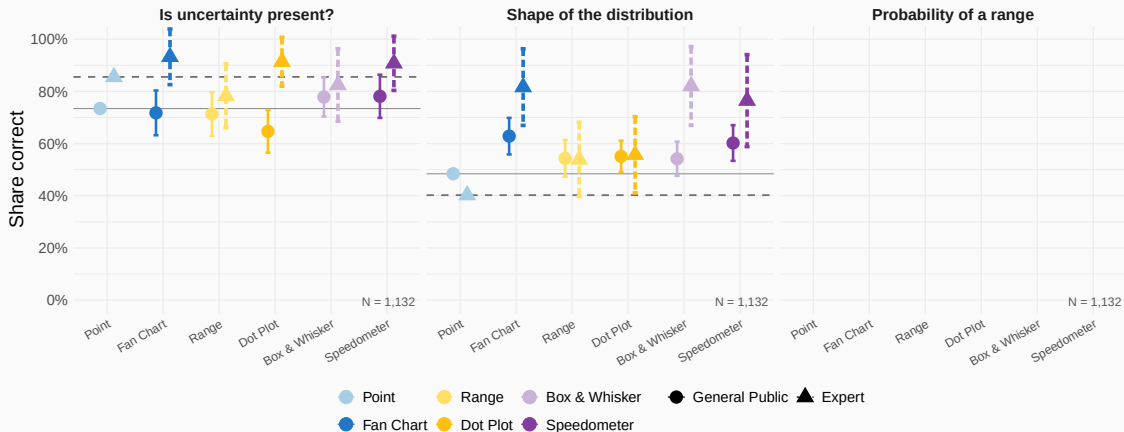
FANS AND SPEEDOMETER BEST EXPRESS 'NORMALITY' OF DIST.



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FANS, SPEEDOMETER, *and* B&W FOR EXPERTS.

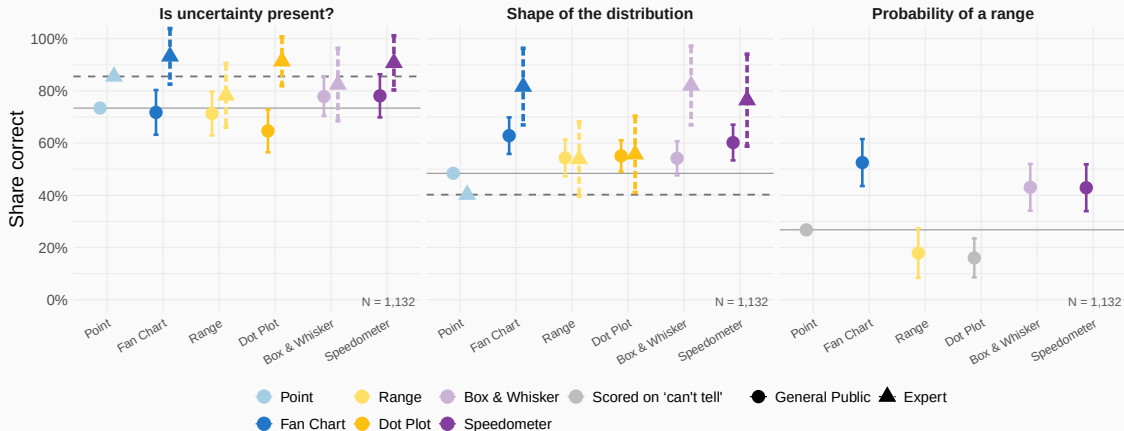


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Obj: How likely is inflation to land in a given range?

► Distributions

HARD QUESTION. FANS DO BEST.

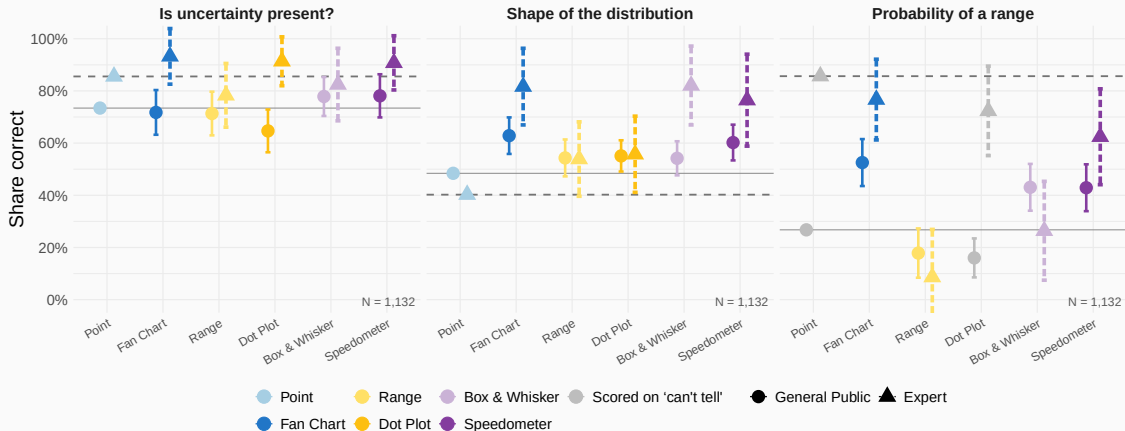


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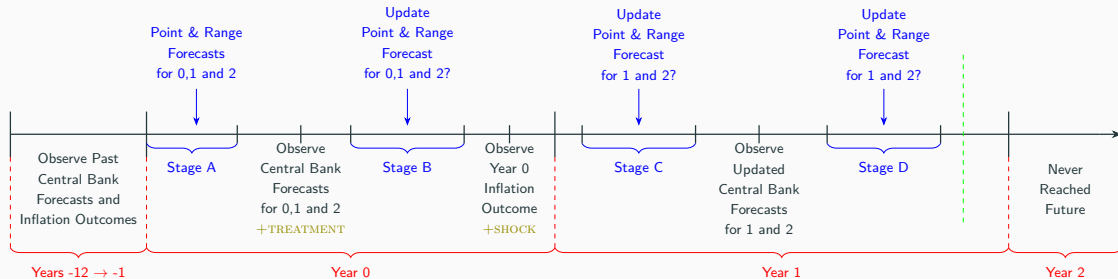
- Public – Fans, Box-and-Whisker and Speedometer do well.
- Experts – Understand uncertainty better, but relative ranking similar.

THE FAN IS LIKED, AND 'ACCURATELY' CONVEYS INFORMATION.

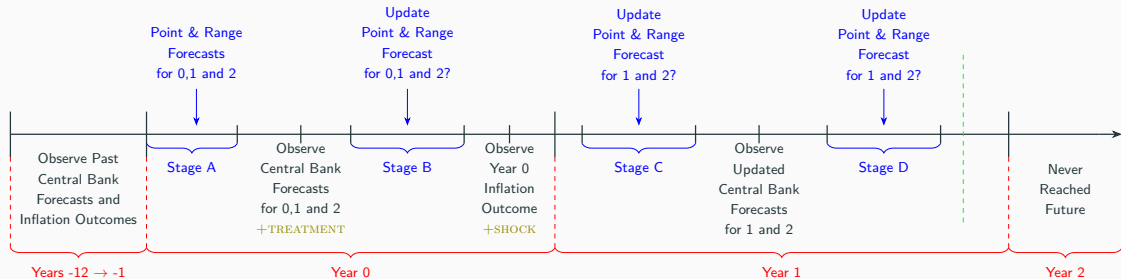
∴ WE NEXT COMPARE THE POINT AND THE FAN.

B: Effect of Uncertainty Communication Experiment

Experimental Timeline

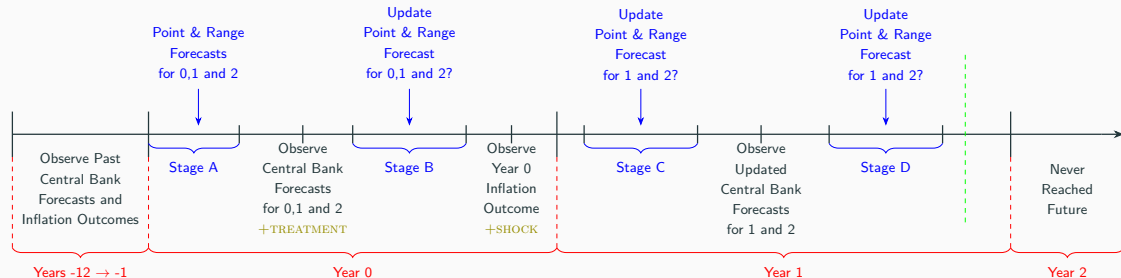


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 - Participant actions take place in Year 0 and 1.
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- A to D indicate the stages of our experiment:
 - In Stage A, the participant makes an initial set of forecasts for Year 0, 1 and 2. [*Priors*]
 - Then, as information is revealed they can update these forecasts. [*Posteriors*]

The environment and generating CB forecasts

- The environment (in the background) is a standard New Keynesian model
 1. Phillips curve: $\hat{\pi}_t = \beta \mathbb{E}_t \hat{\pi}_{t+1} + \kappa \hat{y}_t$
 2. IS curve: $\hat{y}_t = \mathbb{E}_t \hat{y}_{t+1} - \sigma(\hat{r}_t - \hat{\bar{r}}_t)$
 3. Monetary policy rule: $i_t = \chi_\pi \pi_t + \chi_y y_t + u_t$
- Backruns are model simulations (with specific shocks)
- The CB forecasts are all the optimal forecasts from the model
- CB uncertainty is derived from stochastic simulations of the model

Experiment Implementation

UK sample recruited via Prolific

- Sample are incentivised for accuracy of forecasts via:
 - proximity of point estimates
 - range forecasts containing outturn (decreasing in size of range)
- Stats:
 - Average time: 18:54.
 - Average base pay: £10.63 per hour.
 - Average bonus pay: £1.88

What participants see...

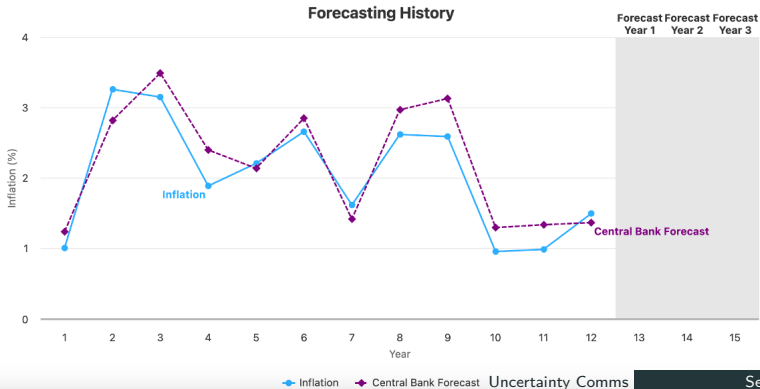
History and Point Forecast

Page 5 of 26

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We would like you to enter a **Point Forecast for inflation** for each of the next 3 Forecast Years (grey shaded region).

Input your point forecasts by clicking in the shaded section, or by typing your forecast into the input boxes below.



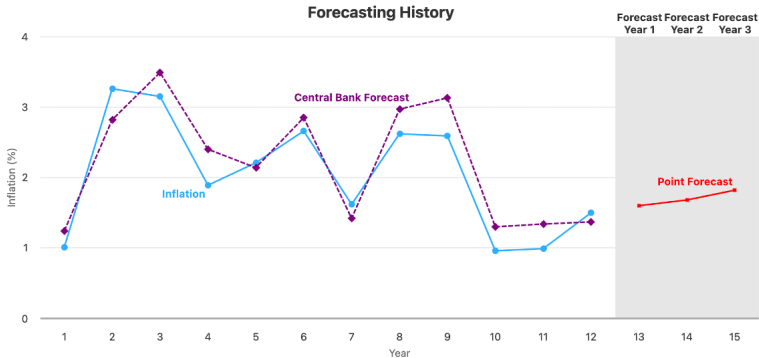
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— Inflation

— Central Bank Forecast

Uncertainty Comms

September 2026

19

What participants see...

Provide Your Forecast Range

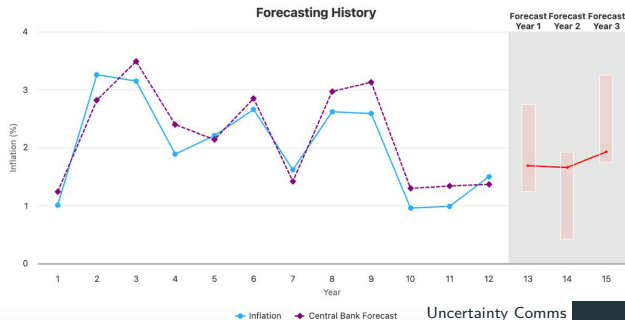
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We'd now like you to set a **range** around your **point forecasts** to express your uncertainty. Choose a lower and upper bound for inflation in each forecast year - pick bounds that you think will almost certainly include the true value.

Bonus: You earn a bonus if the outcome falls inside your forecast range. But remember, there's a trade-off: wider ranges earn less.

The ranges you first see are randomly generated placeholders. You can widen, narrow and move the ranges by dragging the boxes in the chart or entering values in the input boxes below.

Each range must include its corresponding point forecast.



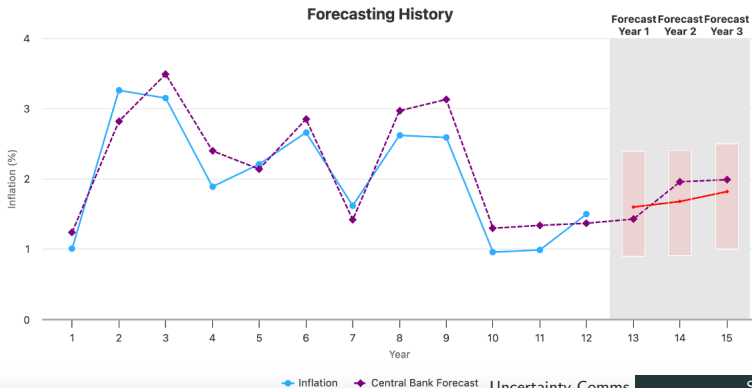
What participants see...

Central Bank's Forecast

Page 7 of 26

The central bank has now released its **inflation forecasts**. **Your forecasts** are shown for reference.

Note: You don't need to enter anything on this page or remember the values. We'll show these values again on the next pages.



Unlucky and lucky Outturns

Actual Inflation Outcome

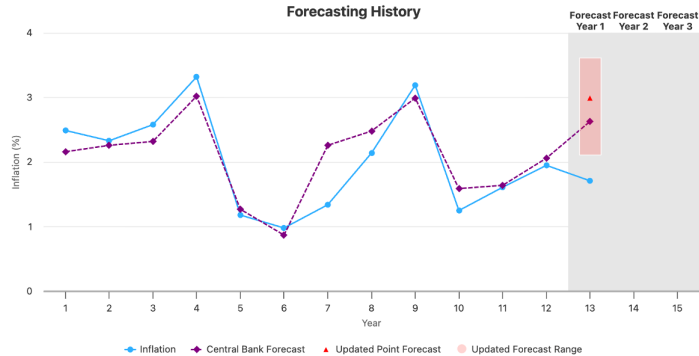
Page 10 of 26

The inflation outcome for Forecast Year 1 has now been revealed as 1.71%.

The central bank forecast was 2.63%.

Your updated Point Forecast was 2.99%.

Note: There is no forecast task on this page. Please review the outcome, then select Next.



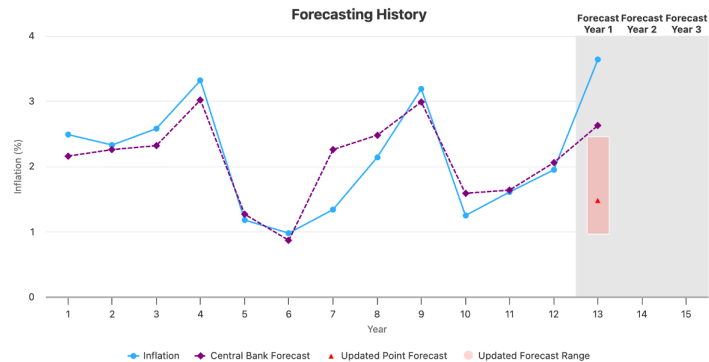
Unlucky and lucky Outturns

Actual Inflation Outcome

Page 10 of 26

The inflation outcome for Forecast Year 1 has now been revealed as 3.64%.
The central bank forecast was 2.63%.
Your updated Point Forecast was 1.48%.

Note: There is no forecast task on this page. Please review the outcome, then select Next.



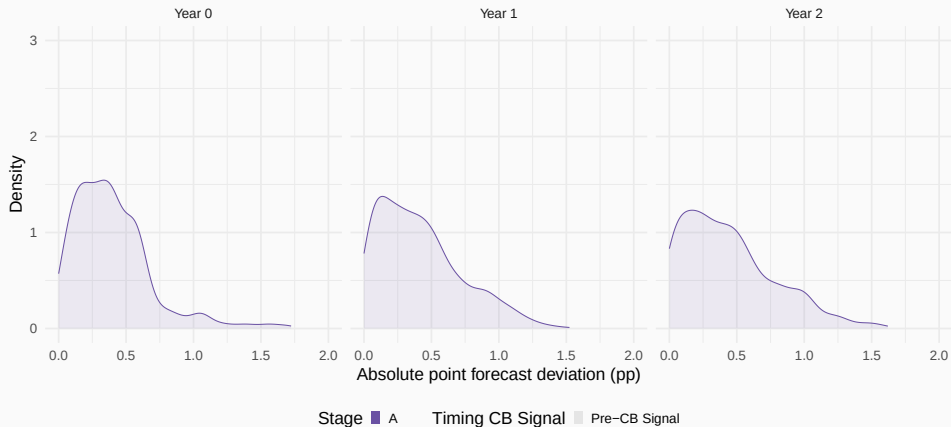
How Forecast Deviates from Optimal

How Forecast Deviates from Optimal

- We have 10 expected inflation measures
 - $\pi_{i,t}^A$ for $t \in \{0, 1, 2\}$
 - $\pi_{i,t}^B$ for $t \in \{0, 1, 2\}$
 - $\pi_{i,t}^C$ for $t \in \{1, 2\}$
 - $\pi_{i,t}^D$ for $t \in \{1, 2\}$
- But the expectation will depend on the backrun
- Use absolute deviation of expected inflation from the (optimal) central bank forecast:
 - $|\pi_{i,t}^A - \pi_{cb,t}^0|$ for $t \in \{0, 1, 2\}$
 - $|\pi_{i,t}^B - \pi_{cb,t}^0|$ for $t \in \{0, 1, 2\}$
 - $|\pi_{i,t}^C - \pi_{cb,t}^1|$ for $t \in \{1, 2\}$
 - $|\pi_{i,t}^D - \pi_{cb,t}^1|$ for $t \in \{1, 2\}$

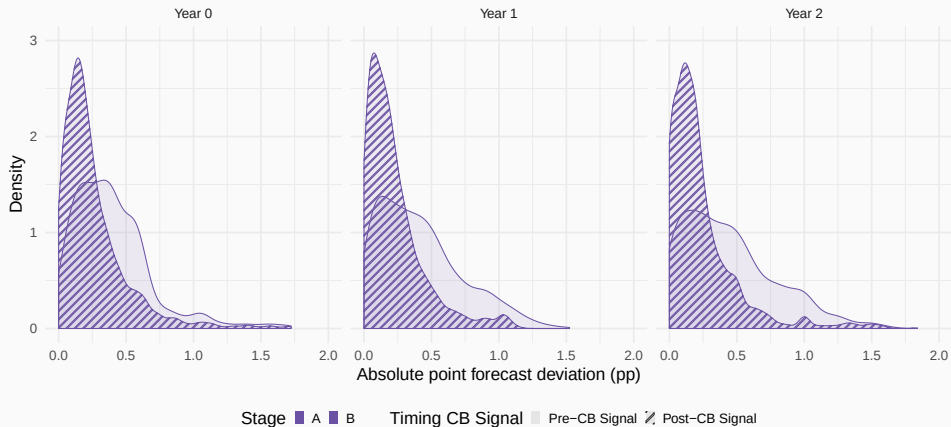
Absolute Forecast Deviations from Optimal

PRIORS ARE DISPERSED, PARTICULARLY AT LONGER HORIZONS



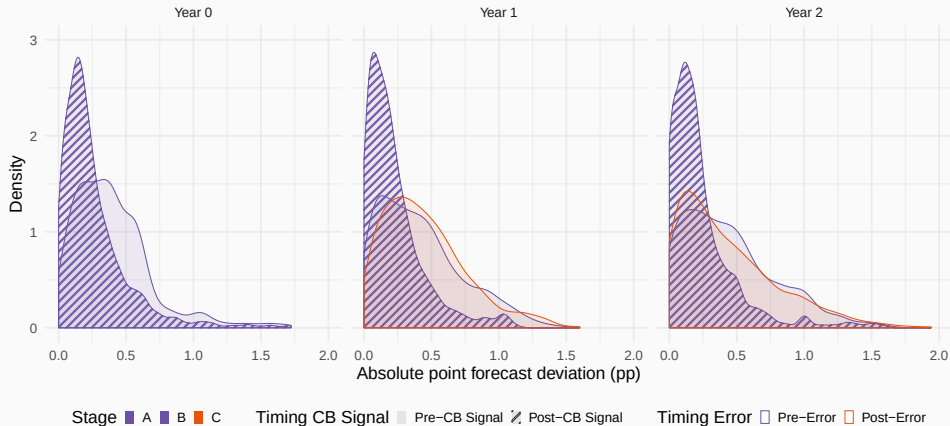
Absolute Forecast Deviations from Optimal

CB SIGNAL ANCHORS, ESPECIALLY AT LONGER HORIZONS



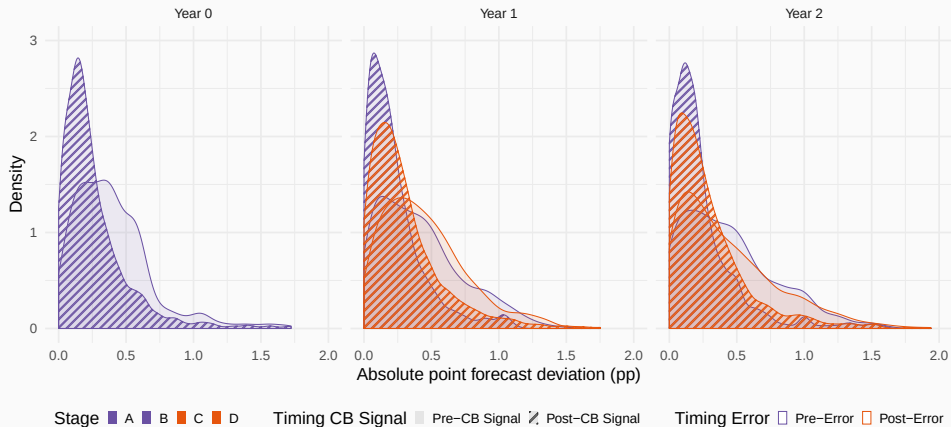
Absolute Forecast Deviations from Optimal

FORECAST ERROR RE-DISPERSES BELIEFS TO SIMILAR DEGREE AS PRE-CB SIGNAL



Absolute Forecast Deviations from Optimal

CB UPDATED SIGNAL RE-ANCHORS, THOUGH TO LESS THAN PRE-MISS



Absolute Forecast Deviations from Optimal

Table 1: Share of forecasts close to optimal, by Stage and Year

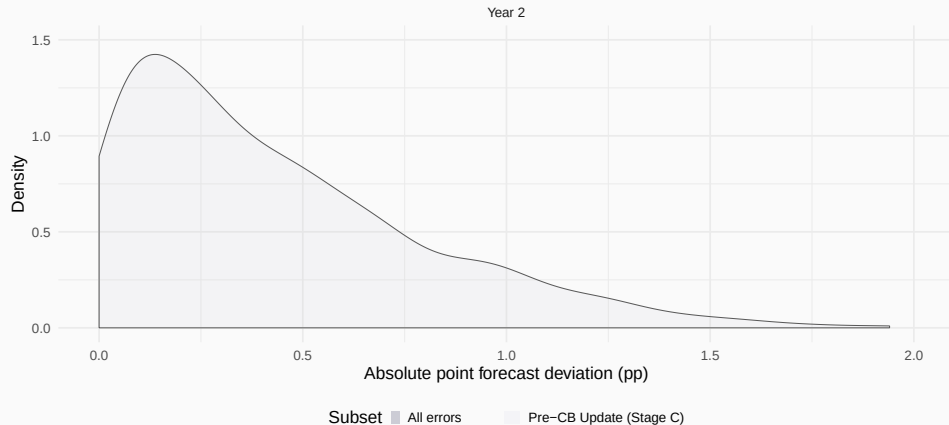
Stage	Year 0		Year 1		Year 2	
	$\leq 25\text{bp}$	$\leq 50\text{bp}$	$\leq 25\text{bp}$	$\leq 50\text{bp}$	$\leq 25\text{bp}$	$\leq 50\text{bp}$
<u>Pre-error</u>						
A	35%	71%	37%	67%	36%	65%
B	64%	88%	68%	90%	70%	90%
<u>Post-error</u>						
C	-	-	30%	64%	41%	65%
D	-	-	55%	84%	58%	84%

anchoring

de-anchoring

re-anchoring

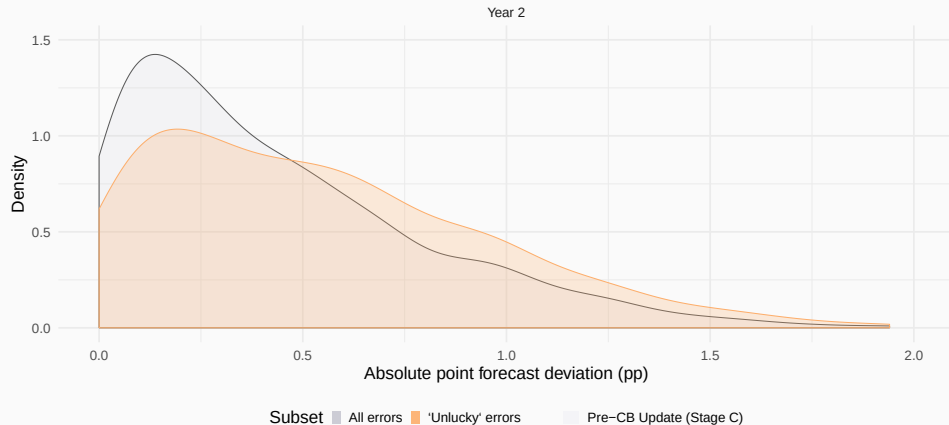
FORECASTS DISPERSED AFTER FORECAST ERROR



Stage C: 'De-anchoring' effect by error type

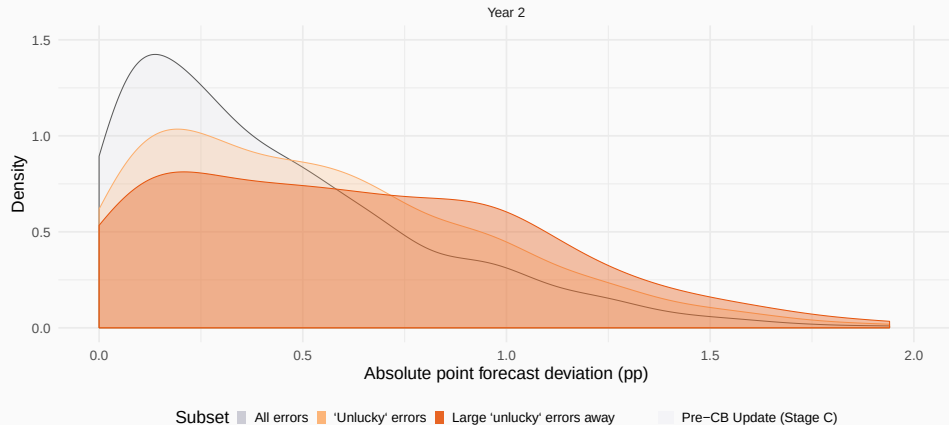
► 'Unlucky' errors

'UNLUCKY' ERRORS DE-ANCHOR MORE



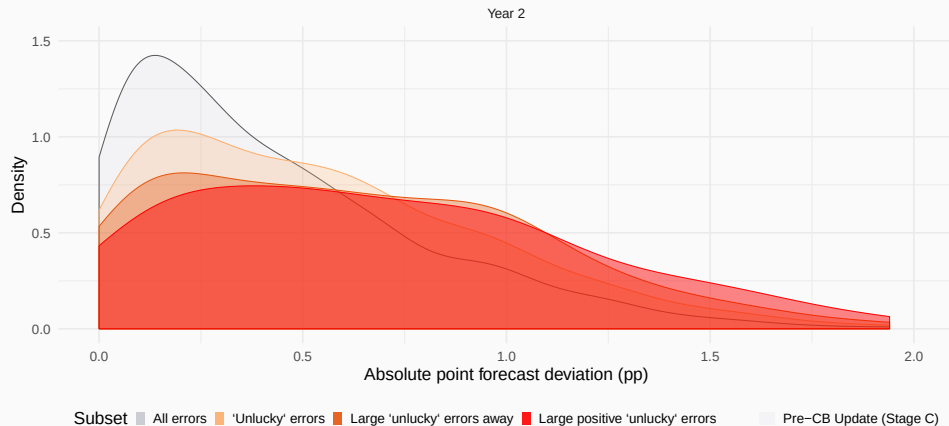
Stage C: 'De-anchoring' effect by error type ▸ 'Unlucky' errors

PARTICULARLY FOR LARGE UNLUCKY ERRORS



Stage C: 'De-anchoring' effect by error type ► 'Unlucky' errors

PARTICULARLY FOR LARGE AND POSITIVE UNLUCKY ERRORS

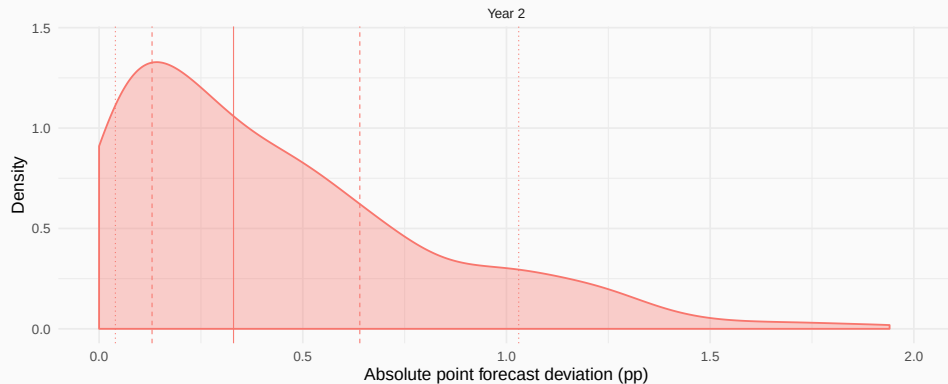


Share of forecasts close to optimal: Year 2 by Stage and Error (all treatments)

Stage	Subset	≤ 25 bps	≤ 50 bps
B	All errors	70%	90%
C	All errors	41%	66%
C	'Unlucky' errors	30%	52%
C	Large 'unlucky' errors	26%	44%
C	Large positive 'unlucky' errors	22%	40%
D	All errors	58%	84%
D	'Unlucky' errors	52%	81%
D	Large 'unlucky' errors	49%	77%
D	Large positive 'unlucky' errors	44%	74%

Stage C: Point vs Fan, all errors

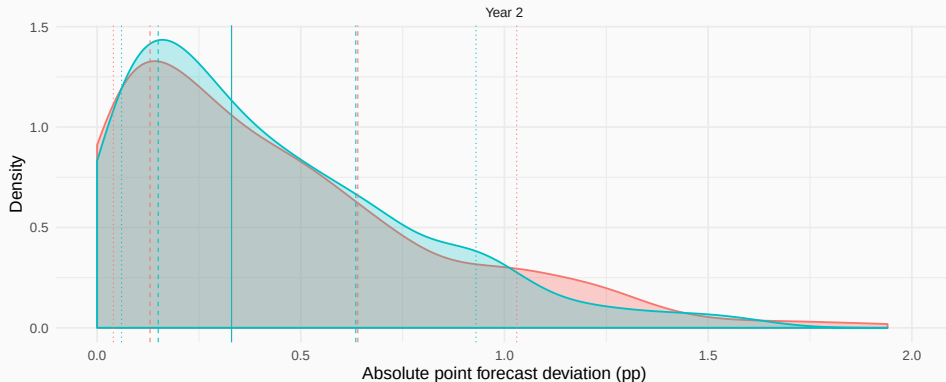
POINT FORECASTS ONLY



Treatment ■ Point Fan Statistic | Median | IQR (25th/75th) : P10/P90

Stage C: Point vs Fan, all errors

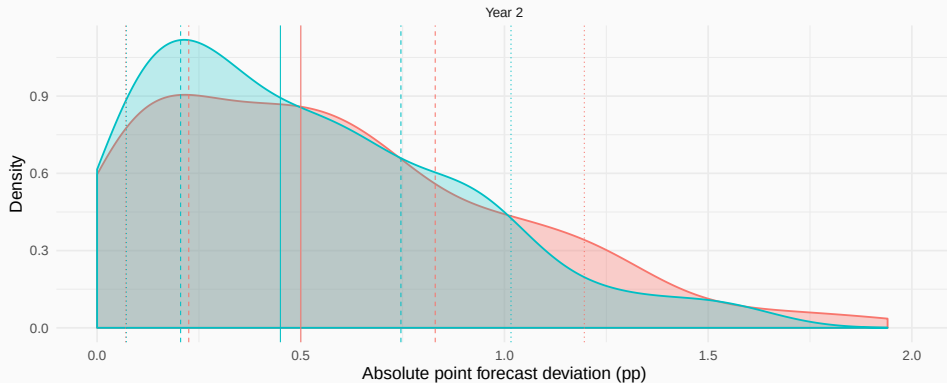
ALL ERRORS: SIMILAR DE-ANCHORING ACROSS BOTH



Treatment ■ Point ■ Fan Statistic | Median | IQR (25th/75th) : P10/P90

Stage C: Point vs Fan, 'unlucky' errors

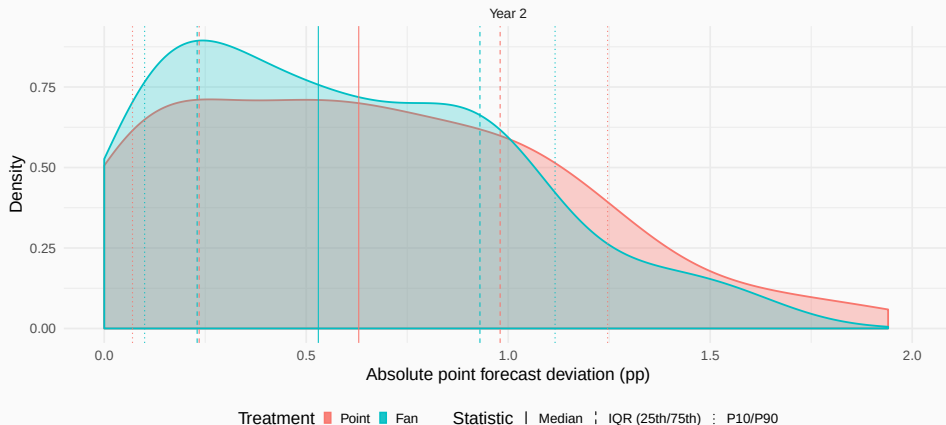
FANS DAMPEN DE-ANCHORING AFTER 'UNLUCKY' ERRORS



Treatment ■ Point ■ Fan Statistic | Median | IQR (25th/75th) : P10/P90

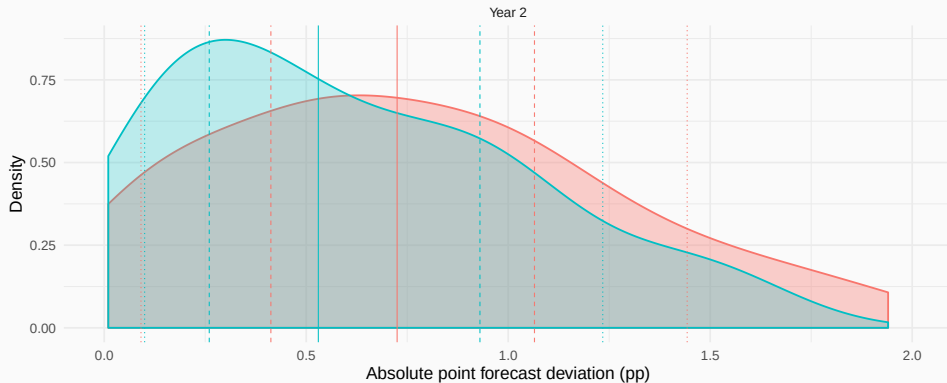
Stage C: Point vs Fan, 'unlucky' large errors

FANS DAMPEN DE-ANCHORING AFTER 'UNLUCKY' ERRORS, ESPECIALLY LARGE ONES



Stage C: Point vs Fan, 'unlucky' large positive errors

FANS GIVE MOST 'INSURANCE' EXACTLY WHERE IT IS NEEDED



Treatment ■ Point ■ Fan Statistic | Median | IQR (25th/75th) : P10/P90

Share of forecasts close to optimal: Year 2, by Stage, Error and Treatment

Stage	Subset	Point	Fan
B	All errors	92%	88%
B	Errors away from target	92%	87%
B	Large errors away from target	92%	86%
B	Large positive errors away from target	92%	87%
C	All errors	65%	66%
C	Errors away from target	50%	54%
C	Large errors away from target	42%	46%
C	Large positive errors away from target	35%	47%
D	All errors	84%	84%
D	Errors away from target	81%	82%
D	Large errors away from target	78%	78%
D	Large positive errors away from target	75%	74%

Regression Specification

$$|\pi_{i,t}^Z - \pi_{cb,t}| = \beta_1 \text{Treatment}_{i,r} + \beta_2 \text{Error Type}_{i,r} + \beta_3 \text{Treatment}_{i,r} \times \text{Error Type}_{i,r} + \delta' X_{i,r} + \gamma_i + \epsilon_{i,r} \quad (1)$$

Dependent variable: Absolute deviation of point forecast from optimal: Year 2									
	Stage B		Stage C			Stage D			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Intercept (no FE)									
β_1 Fan									
β_2 Unlucky Large Error									
Unlucky Large Positive Error									
β_3 Fan*Unlucky Error									
Fan*Unlucky Large Error									
Fan*Unlucky Large Positive Error									
$\beta_1 + \beta_3$ Fan + Fan*Error Type (linear comb.)									
Participant FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls: Experimental Variation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598
Adjusted R ²	0.271	0.299	0.304	0.308	0.318	0.317	0.316	0.315	0.316

Note: *p<0.1; **p<0.05; ***p<0.01. Cluster-robust standard errors in parentheses, clustered at participants' level

CB forecast with fans anchors relatively less initially (Stage B)

$$|\pi_{i,t}^Z - \pi_{cb,t}| = \beta_1 \text{Treatment}_{i,r} + \beta_2 \text{Error Type}_{i,r} + \beta_3 \text{Treatment}_{i,r} \times \text{Error Type}_{i,r} + \delta' X_{i,r} + \gamma_i + \epsilon_{i,r} \quad (1)$$

Dependent variable: Absolute deviation of point forecast from optimal: Year 2									
	Stage B	Stage C				Stage D			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Intercept (no FE)	0.278								
β_1 Fan	0.031*** (0.011)								
β_2 Unlucky Large Error									
Unlucky Large Positive Error									
β_3 Fan*Unlucky Error									
Fan*Unlucky Large Error									
Fan*Unlucky Large Positive Error									
$\beta_1 + \beta_3$ Fan + Fan*Error Type (linear comb.)									
Participant FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls: Experimental Variation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598
Adjusted R ²	0.271	0.299	0.304	0.308	0.318	0.317	0.316	0.315	0.316

Note: *p<0.1; **p<0.05; ***p<0.01. Cluster-robust standard errors in parentheses, clustered at participants' level

Error de-anchors. And 'unlucky' errors particularly so.

$$|\pi_{i,t}^Z - \pi_{cb,t}| = \beta_1 \text{Treatment}_{i,r} + \beta_2 \text{Error Type}_{i,r} + \beta_3 \text{Treatment}_{i,r} \times \text{Error Type}_{i,r} + \delta' X_{i,r} + \gamma_i + \epsilon_{i,r} \quad (1)$$

Dependent variable: Absolute deviation of point forecast from optimal: Year 2									
	Stage B		Stage C			Stage D			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Intercept (no FE)	0.278	0.522	0.375	0.365	0.406				
β_1									
Fan	0.031*** (0.011)	-0.012 (0.015)	0.027* (0.016)	0.027* (0.016)	0.029* (0.017)				
β_2									
Unlucky Large Error				0.148*** (0.042)					
Unlucky Large Positive Error					0.290*** (0.072)				
β_3									
Fan*Unlucky Error									
Fan*Unlucky Large Error									
Fan*Unlucky Large Positive Error									
$\beta_1 + \beta_3$									
Fan + Fan*Error Type (linear comb.)									
Participant FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls: Experimental Variation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598
Adjusted R ²	0.271	0.299	0.304	0.308	0.318	0.317	0.316	0.315	0.316

Note: *p<0.1; **p<0.05; ***p<0.01. Cluster-robust standard errors in parentheses, clustered at participant level

Fans materially mitigate the de-anchoring following 'unlucky' errors.

$$|\pi_{i,t}^Z - \pi_{cb,t}| = \beta_1 \text{Treatment}_{i,r} + \beta_2 \text{Error Type}_{i,r} + \beta_3 \text{Treatment}_{i,r} \times \text{Error Type}_{i,r} + \delta' X_{i,r} + \gamma_i + \epsilon_{i,r} \quad (1)$$

Dependent variable: Absolute deviation of point forecast from optimal: Year 2									
	Stage B		Stage C			Stage D			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Intercept (no FE)	0.278	0.522	0.375	0.365	0.406				
β_1 Fan	0.031*** (0.011)	-0.012 (0.015)	0.027* (0.016)	0.027* (0.016)	0.029* (0.017)				
β_2 Unlucky Large Error				0.148*** (0.042)					
Unlucky Large Positive Error					0.290*** (0.072)				
β_3 Fan*Unlucky Error			-0.076** (0.030)						
Fan*Unlucky Large Error				-0.146** (0.061)					
Fan*Unlucky Large Positive Error					-0.282*** (0.074)				
$\beta_1 + \beta_3$ Fan + Fan*Error Type (linear comb.)									
Participant FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls: Experimental Variation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598
Adjusted R ²	0.271	0.299	0.304	0.308	0.318	0.317	0.316	0.315	0.316

Note: *p<0.1; **p<0.05; ***p<0.01. Cluster-robust standard errors in parentheses, clustered at participant level

Fans materially mitigate the de-anchoring following 'unlucky' errors.

$$|\pi_{i,t}^Z - \pi_{cb,t}| = \beta_1 \text{Treatment}_{i,r} + \beta_2 \text{Error Type}_{i,r} + \beta_3 \text{Treatment}_{i,r} \times \text{Error Type}_{i,r} + \delta' X_{i,r} + \gamma_i + \epsilon_{i,r} \quad (1)$$

Dependent variable: Absolute deviation of point forecast from optimal: Year 2									
	Stage B		Stage C			Stage D			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Intercept (no FE)	0.278	0.522	0.375	0.365	0.406				
β_1 Fan	0.031*** (0.011)	-0.012 (0.015)	0.027* (0.016)	0.027* (0.016)	0.029* (0.017)				
β_2 Unlucky Large Error				0.148*** (0.042)					
Unlucky Large Positive Error					0.290*** (0.072)				
β_3 Fan*Unlucky Error			-0.076** (0.030)						
Fan*Unlucky Large Error				-0.146** (0.061)					
Fan*Unlucky Large Positive Error					-0.282*** (0.074)				
$\beta_1 + \beta_3$ Fan + Fan*Error Type (linear comb.)			-0.049** (0.022)	-0.120** (0.048)	-0.253*** (0.060)				
Participant FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls: Experimental Variation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598
Adjusted R ²	0.271	0.299	0.304	0.308	0.318	0.317	0.316	0.315	0.316

Note: *p<0.1; **p<0.05; ***p<0.01. Cluster-robust standard errors in parentheses, clustered at participant level.

CB able to (partly) re-anchor in our setting.

$$|\pi_{i,t}^Z - \pi_{cb,t}| = \beta_1 \text{Treatment}_{i,r} + \beta_2 \text{Error Type}_{i,r} + \beta_3 \text{Treatment}_{i,r} \times \text{Error Type}_{i,r} + \delta' X_{i,r} + \gamma_i + \epsilon_{i,r} \quad (1)$$

Dependent variable: Absolute deviation of point forecast from optimal: Year 2									
	Stage B		Stage C			Stage D			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Intercept (no FE)	0.278	0.522	0.375	0.365	0.406	0.366	0.326	0.329	0.342
β_1									
Fan	0.031*** (0.011)	-0.012 (0.015)	0.027* (0.016)	0.027* (0.016)	0.029* (0.017)	0.011 (0.012)	0.016 (0.014)	0.016 (0.014)	0.019 (0.013)
β_2									
Unlucky Large Error				0.148*** (0.042)				0.011 (0.033)	
Unlucky Large Positive Error					0.290*** (0.072)				0.030 (0.053)
β_3									
Fan*Unlucky Error			-0.076** (0.030)				-0.009 (0.023)		
Fan*Unlucky Large Error				-0.146** (0.061)				-0.019 (0.046)	
Fan*Unlucky Large Positive Error					-0.282*** (0.074)				-0.056 (0.056)
$\beta_1 + \beta_3$									
Fan + Fan*Error Type (linear comb.)			-0.049** (0.022)	-0.120** (0.048)	-0.253*** (0.060)		0.006 (0.016)	-0.003 (0.037)	-0.037 (0.046)
Participant FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls: Experimental Variation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598
Adjusted R ²	0.271	0.299	0.304	0.308	0.318	0.317	0.316	0.315	0.316

Note: *p<0.1; **p<0.05; ***p<0.01. Cluster-robust standard errors in parentheses, clustered at participants*year

No FE model

Stage D: Y1 and Y2

Run 2, Stage A

Uncertainty Effects

Measuring Uncertainty

- Uncertainty measured by the range that the participants provide:
 - “We’d now like you to set a range around your point forecasts to express your uncertainty. Choose a lower and upper bound for inflation in each forecast year - pick bounds that you think will **almost certainly** include the true value.”

Measuring Uncertainty

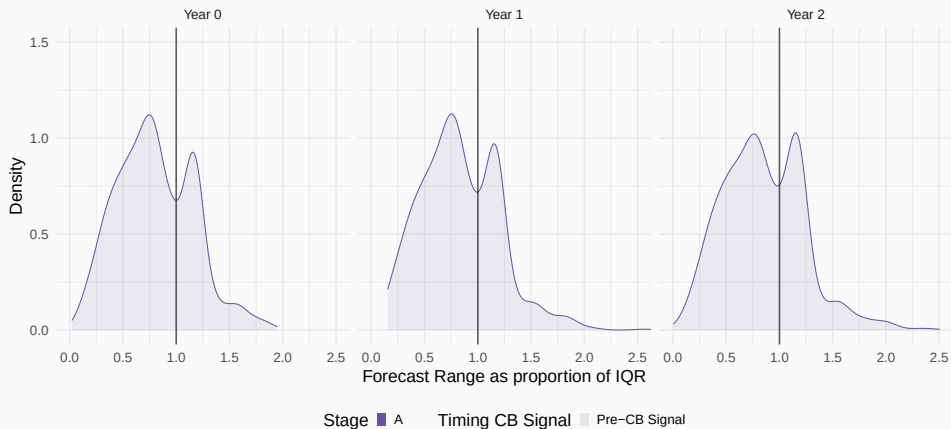
- Uncertainty measured by the range that the participants provide:
 - “We’d now like you to set a range around your point forecasts to express your uncertainty. Choose a lower and upper bound for inflation in each forecast year – pick bounds that you think will **almost certainly** include the true value.”
- We compare this with the back run Interquartile Range (IQR), as a ‘sensible’ ballpark
- In the back run data series (2), the IQRs are:
 - 1.2pp
 - 1.25pp

Measuring Uncertainty

- Uncertainty measured by the range that the participants provide:
 - “We’d now like you to set a range around your point forecasts to express your uncertainty. Choose a lower and upper bound for inflation in each forecast year - pick bounds that you think will **almost certainly** include the true value.”
- We compare this with the back run Interquartile Range (IQR), as a ‘sensible’ ballpark
- In the back run data series (2), the IQRs are:
 - 1.2pp
 - 1.25pp
- We measure the participant’s chosen range relative to this!

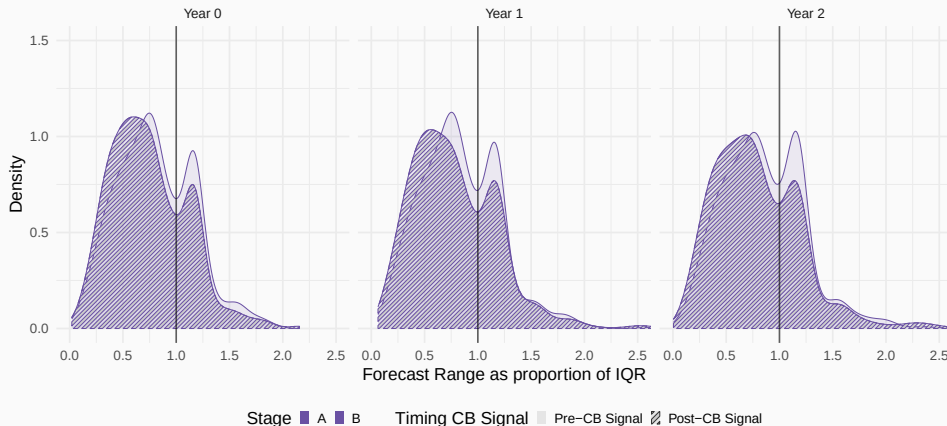
Range width deviations from backhistory IQR

MOST HAVE NARROW RANGES ('OVER-CONFIDENT') AND MANY KEEP DEFAULT



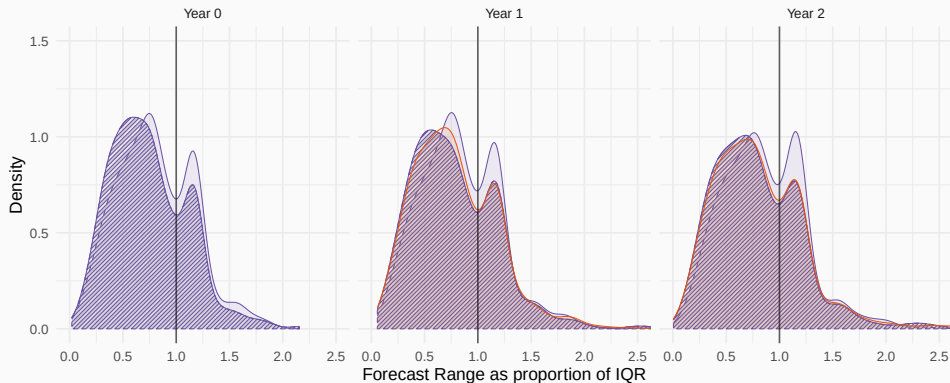
Range width deviations from backhistory IQR

CB SIGNAL $\Rightarrow$ CONFIDENCE $\uparrow$ & FEWER PEOPLE KEEP DEFAULT



Range width deviations from backhistory IQR

NO CHANGE AFTER ERROR



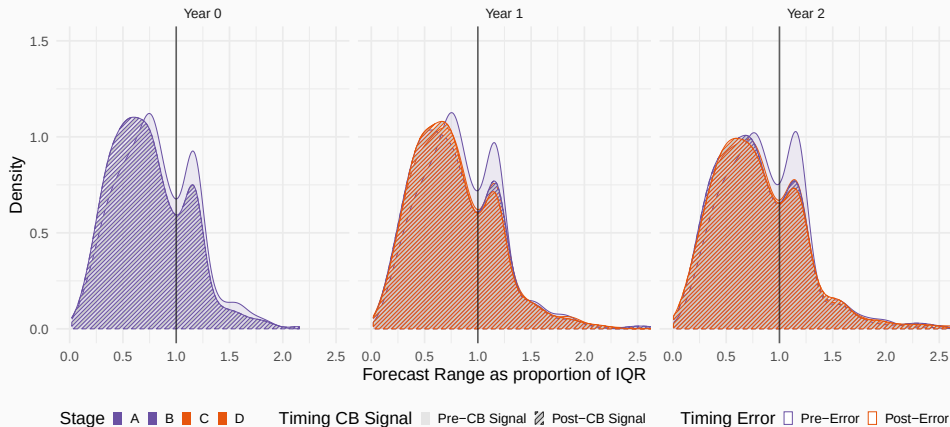
Stage ■ A ■ B ■ C

Timing CB Signal ■ Pre-CB Signal ■ Post-CB Signal

Timing Error ■ Pre-Error ■ Post-Error

Range width deviations from backhistory IQR

NO MATERIAL CHANGE IN RANGE WIDTH POST-UPDATED CB SIGNAL.



Regression specification

$$\frac{r_{i,t}^Z}{IQR_{-12:-1}} = \beta_1 \text{Treatment}_{i,r} + \beta_2 \text{Error Type}_{i,r} + \beta_3 \text{Treatment}_{i,r} \times \text{Error Type}_{i,r} + \delta' X_{i,r} + \gamma_i + \epsilon_{i,r} \quad (2)$$

Overconfidence.

$$\frac{r_{i,t}^Z}{IQR_{-12:-1}} = \beta_1 \text{Treatment}_{i,r} + \beta_2 \text{Error Type}_{i,r} + \beta_3 \text{Treatment}_{i,r} \times \text{Error Type}_{i,r} + \delta' X_{i,r} + \gamma_i + \epsilon_{i,r} \quad (2)$$

Dependent variable: Range as proportion of IQR by Stage, Horizon, and Error Type: Year 2									
	Stage B	Stage C				Stage D			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Intercept (no FE)	0.790	0.832	0.823	0.818	0.824	0.845	0.815	0.819	0.834
β_1									
Fan									
$\beta_1 + \beta_3$									
Fan + Fan*Error Type									
Error Type	All	All	Unlucky	Unlucky Big	Unlucky Big ↑	All	Unlucky	Unlucky Big	Unlucky Big ↑
Participant FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls: Experimental Variation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598
Adjusted R ²	0.553	0.640	0.635	0.640	0.639	0.655	0.654	0.654	0.654

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Cluster-robust standard errors in parentheses, clustered at participant level.

Fans ↑ range widths towards IQR.

$$\frac{r_{i,t}^Z}{IQR_{-12:-1}} = \beta_1 \text{Treatment}_{i,r} + \beta_2 \text{Error Type}_{i,r} + \beta_3 \text{Treatment}_{i,r} \times \text{Error Type}_{i,r} + \delta' X_{i,r} + \gamma_i + \epsilon_{i,r} \quad (2)$$

Dependent variable: Range as proportion of IQR by Stage, Horizon, and Error Type: Year 2									
	Stage B	Stage C				Stage D			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Intercept (no FE)	0.790	0.832	0.823	0.818	0.824	0.845	0.815	0.819	0.834
<u>β_1</u>									
Fan	0.055*** (0.014)	0.035*** (0.013)	0.024 (0.017)	0.023 (0.017)	0.029* (0.015)	0.041*** (0.013)	0.052*** (0.016)	0.052*** (0.016)	0.038*** (0.014)
<u>$\beta_1 + \beta_3$</u>									
Fan + Fan*Error Type									
Error Type	All	All	Unlucky	Unlucky Big	Unlucky Big ↑	All	Unlucky	Unlucky Big	Unlucky Big ↑
Participant FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls: Experimental Variation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598
Adjusted R ²	0.553	0.640	0.635	0.640	0.639	0.655	0.654	0.654	0.654

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Cluster-robust standard errors in parentheses, clustered at participant level.

Fans $\uparrow$ range widths towards IQR. Persistently.

$$\frac{r_{i,t}^Z}{IQR_{-12:-1}} = \beta_1 \text{Treatment}_{i,r} + \beta_2 \text{Error Type}_{i,r} + \beta_3 \text{Treatment}_{i,r} \times \text{Error Type}_{i,r} + \delta' X_{i,r} + \gamma_i + \epsilon_{i,r} \quad (2)$$

Dependent variable: Range as proportion of IQR by Stage, Horizon, and Error Type: Year 2									
	Stage B	Stage C				Stage D			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Intercept (no FE)	0.790	0.832	0.823	0.818	0.824	0.845	0.815	0.819	0.834
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<u>$\beta_1 + \beta_3$</u>									
Fan + Fan*Error Type									
Error Type	All	All	Unlucky	Unlucky Big	Unlucky Big $\uparrow$	All	Unlucky	Unlucky Big	Unlucky Big $\uparrow$
Participant FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls: Experimental Variation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598
Adjusted R ²	0.553	0.640	0.635	0.640	0.639	0.655	0.654	0.654	0.654

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Cluster-robust standard errors in parentheses, clustered at participant level.

Fans ↑ range widths towards IQR. Persistently. Particularly *Wide* fans.

$$\frac{r_{i,t}^Z}{IQR_{-12:-1}} = \beta_1 \text{Treatment}_{i,r} + \beta_2 \text{Error Type}_{i,r} + \beta_3 \text{Treatment}_{i,r} \times \text{Error Type}_{i,r} + \delta' X_{i,r} + \gamma_i + \epsilon_{i,r} \quad (2)$$

Dependent variable: Range as proportion of IQR by Stage, Horizon, and Error Type: Year 2									
	Stage B	Stage C				Stage D			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Intercept (no FE)	0.790	0.832	0.823	0.818	0.824	0.845	0.815	0.819	0.834
<u>β_1</u>									
Fan	0.055*** (0.014)	0.035*** (0.013)	0.024 (0.017)	0.023 (0.017)	0.029* (0.015)	0.041*** (0.013)	0.052*** (0.016)	0.052*** (0.016)	0.038*** (0.014)
<u>$\beta_1 + \beta_3$</u>									
Fan + Fan*Error Type			0.044** (0.018)	0.072* (0.040)	0.076 (0.051)		0.029 (0.018)	0.007 (0.040)	0.062 (0.050)
Error Type	All	All	Unlucky	Unlucky Big	Unlucky Big ↑	All	Unlucky	Unlucky Big	Unlucky Big ↑
Participant FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls: Experimental Variation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598
Adjusted R ²	0.553	0.640	0.635	0.640	0.639	0.655	0.654	0.654	0.654

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Cluster-robust standard errors in parentheses, clustered at participant level.

Fans ↑ range widths towards IQR. Persistently. Particularly *Wide* fans.

$$\frac{r_{i,t}^Z}{IQR_{-12:-1}} = \beta_1 \text{Treatment}_{i,r} + \beta_2 \text{Error Type}_{i,r} + \beta_3 \text{Treatment}_{i,r} \times \text{Error Type}_{i,r} + \delta' X_{i,r} + \gamma_i + \epsilon_{i,r} \quad (2)$$

	Dependent variable: Range as proportion of IQR by Stage, Horizon, and Error Type: Year 2								
	Stage B	Stage C				Stage D			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Intercept (no FE)	0.790	0.833	0.823	0.817	0.825	0.846	0.815	0.818	0.834
β_1^{Narrow}									
Fan Narrow	0.013 (0.020)	0.019 (0.017)	-0.001 (0.023)	0.018 (0.022)	0.019 (0.020)	0.025 (0.017)	0.038* (0.022)	0.048** (0.020)	0.029 (0.019)
$\beta_1^{\text{Narrow}} + \beta_3^{\text{Narrow}}$									
Fan Narrow + Fan Narrow*Error Type			0.040 (0.025)	0.025 (0.046)	0.025 (0.059)		0.011 (0.025)	-0.045 (0.046)	0.003 (0.059)
β_1^{Wide}									
Fan Wide	0.097*** (0.020)	0.051*** (0.019)	0.049** (0.025)	0.029 (0.023)	0.040* (0.020)	0.057*** (0.019)	0.067*** (0.025)	0.057** (0.023)	0.047** (0.020)
$\beta_1^{\text{Wide}} + \beta_3^{\text{Wide}}$									
Fan Wide + Fan Wide*Error Type			0.054** (0.025)	0.128*** (0.049)	0.142** (0.065)		0.047* (0.025)	0.069 (0.049)	0.138** (0.065)
Error Type	All	All	Unlucky	Unlucky Big	Unlucky Big ↑	All	Unlucky	Unlucky Big	Unlucky Big ↑
Participant FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls: Experimental Variation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598
Adjusted R ²	0.558	0.640	0.640	0.640	0.640	0.655	0.654	0.655	0.655

Notes: *p<0.1; **p<0.05; ***p<0.01. Cluster robust standard errors in parentheses, clustered at participant.

Conclusion

Part A: What do different media communicate?

- Fans 'understood' and jointly convey expectation and uncertainty best. For Public *and* Experts.

Part B: Dynamic Information Experiment: Effect of communicating uncertainty

Expectation

1. Point forecasts anchor expectations marginally more than fans initially (in line with prev. work).
2. Errors de-anchor expectations, particularly 'unlucky' errors
→ fans materially 'insure' against this
3. CB can (partly) re-anchor, albeit to a lower level than pre-error

Uncertainty

4. Public under-estimate uncertainty: 'over-confident'. Fans 'teach' more realistic perceptions.

Policy Implication: A moment of pushback

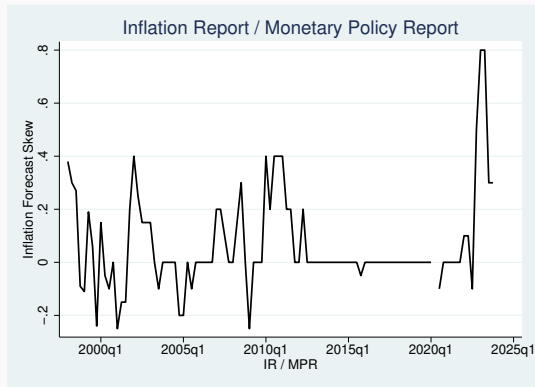
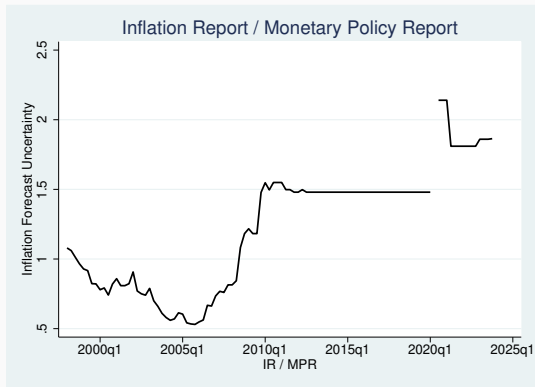
Opportunity 1

*Don't condemn the fan chart to the historical dustbin. **But definitely use it more carefully.** Narrative is key: IR text communicates risk beyond statistical measures (HMT, 2019).*

Policy Implication: A moment of pushback

Opportunity 1

*Don't condemn the fan chart to the historical dustbin. **But definitely use it more carefully.** Narrative is key: IR text communicates risk beyond statistical measures (HMT, 2019).*



**Next Steps: Effect of
Communicating *Conditional*
Uncertainty**

Questions

- So far we've focused only on *unconditional* uncertainty.
- But forecasters also face specific conjunctural risks - they may wish to communicate in advance.
 - either to reassure they are aware of them
 - or to emphasise that all roads nevertheless lead to target inflation
- Follow-up experiment focusing on communicating *conditional* uncertainty

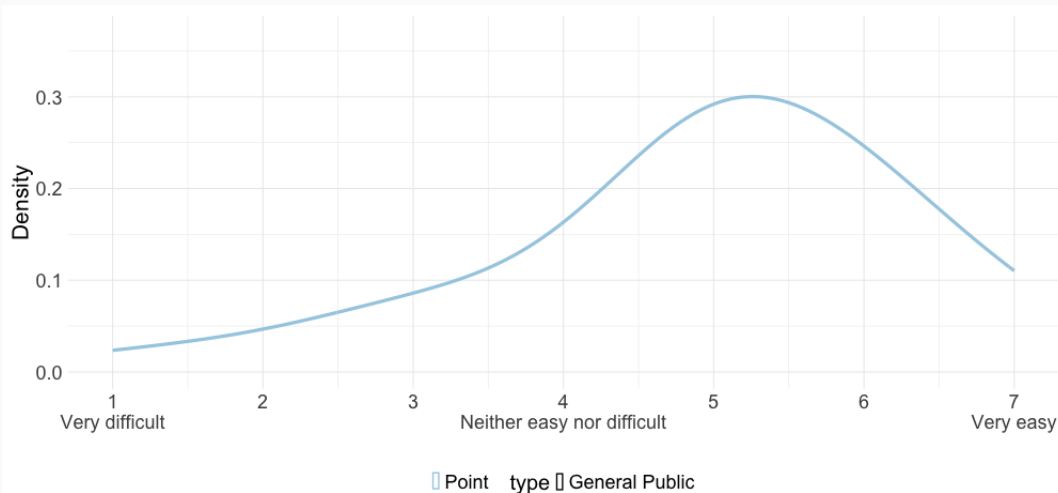
From Unconditional to Conditional Uncertainty

1. Can people understand conditionality?
2. Can people understand info about π and i jointly?
3. What is the effect of communicating conditional uncertainty?
 - Same Timeline as Part B
 - Treatments
 - Inflation: {Point, Fan, Scenario, Fan + Scenario}
 - Interest rate: {text, chart}
 - Outturns: {Towards Scenario, Baseline, Away from Scenario}
 - Questions
 - Do Scenarios protect against really bad misses? (Do people believe all roads lead to target?)
 - Do people understand *why*? (interest rates adjust)
 - Do people understand it's not *commitment*?
 - Fundamental (additional) trade-off:
 - Being clear that inflation will return to target no matter what, and why
 - Over-complicated info and /or risk of misinterpretation as commitment.

A: Unconditional descriptives and regression table

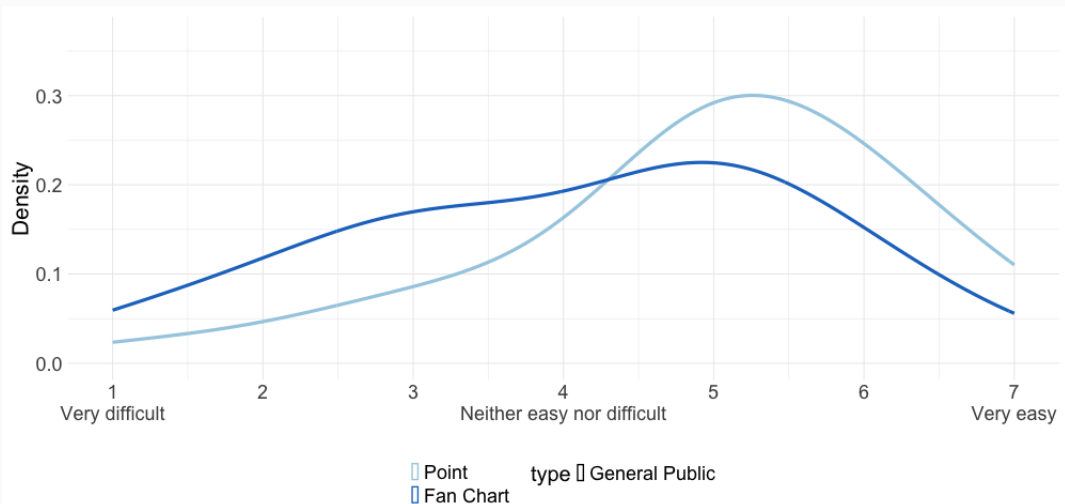
Subjective: To what extent do you think you understand this chart? (1-7 scale)

POINTS 'UNDERSTOOD' BEST.



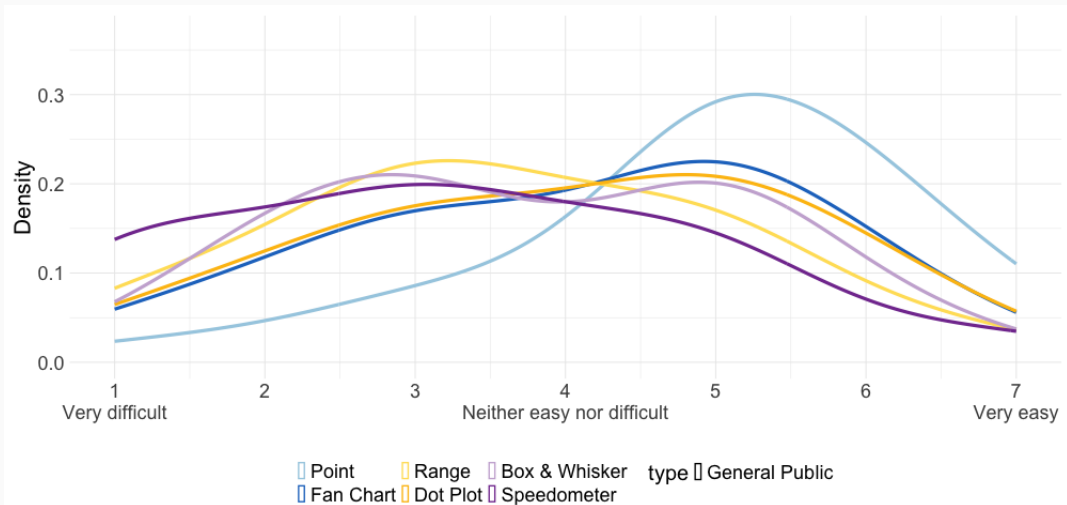
Subjective: To what extent do you think you understand this chart? (1-7 scale)

POINTS 'UNDERSTOOD' BEST. FANS DO OKAY.



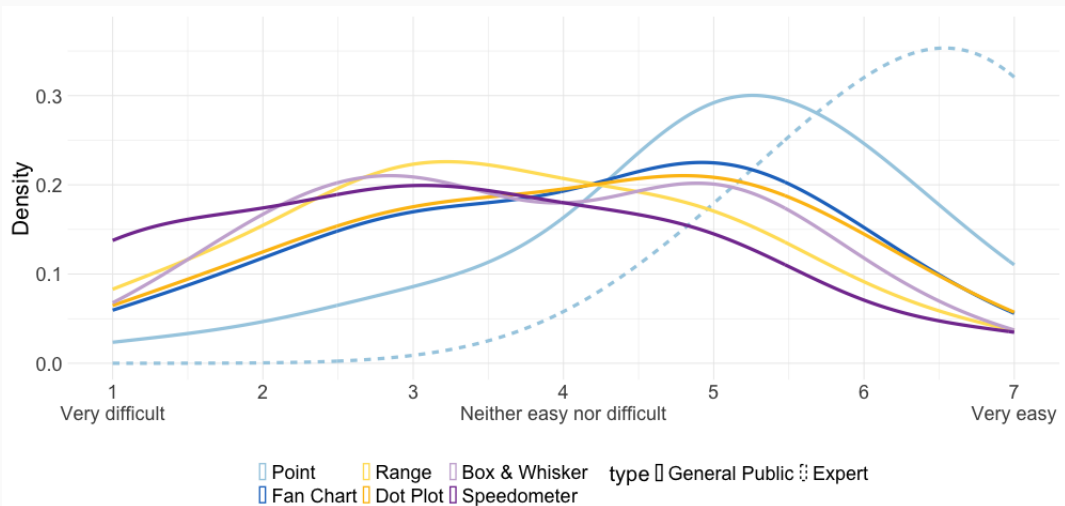
Subjective: To what extent do you think you understand this chart? (1-7 scale)

POINTS 'UNDERSTOOD' BEST. FANS, DOT PLOTS, BOX & WHISKER DO OKAY.



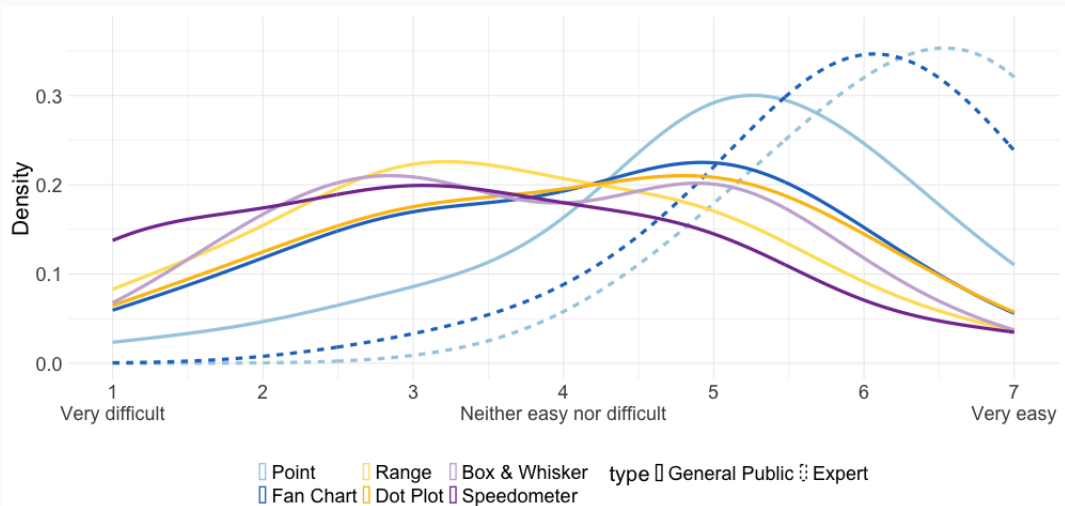
Subjective: To what extent do you think you understand this chart? (1-7 scale)

EXPERTS 'UNDERSTAND' BETTER.



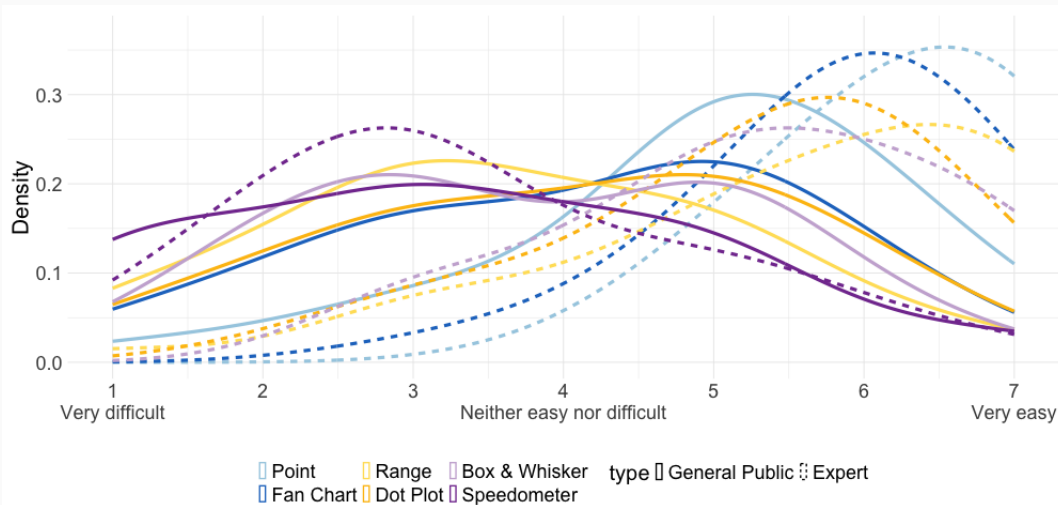
Subjective: To what extent do you think you understand this chart? (1-7 scale)

EXPERTS 'UNDERSTAND' BETTER. RELATIVE RANKING SIMILAR.



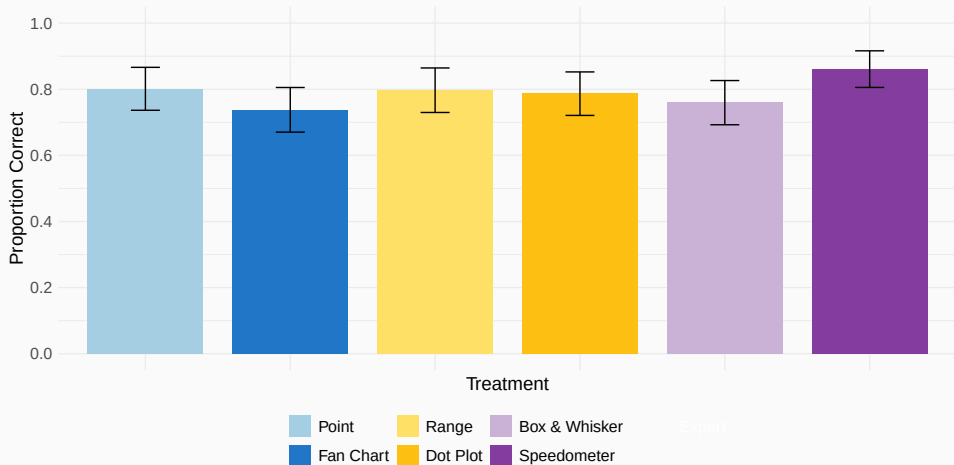
Subjective: To what extent do you think you understand this chart? (1-7 scale)

EXPERTS 'UNDERSTAND' BETTER. RELATIVE RANKING SIMILAR. HATE SPEEDOMETER



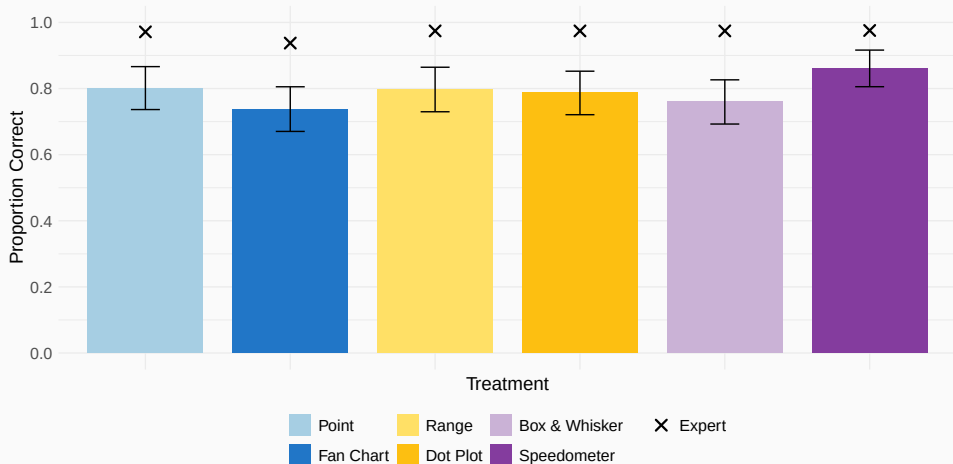
'Anchoring': Most likely value for the series in Forecast Period 1? ($\pm 0.3pp$)

BASIC INFORMATION CONVEYED FAIRLY WELL ACROSS ALL MEDIA



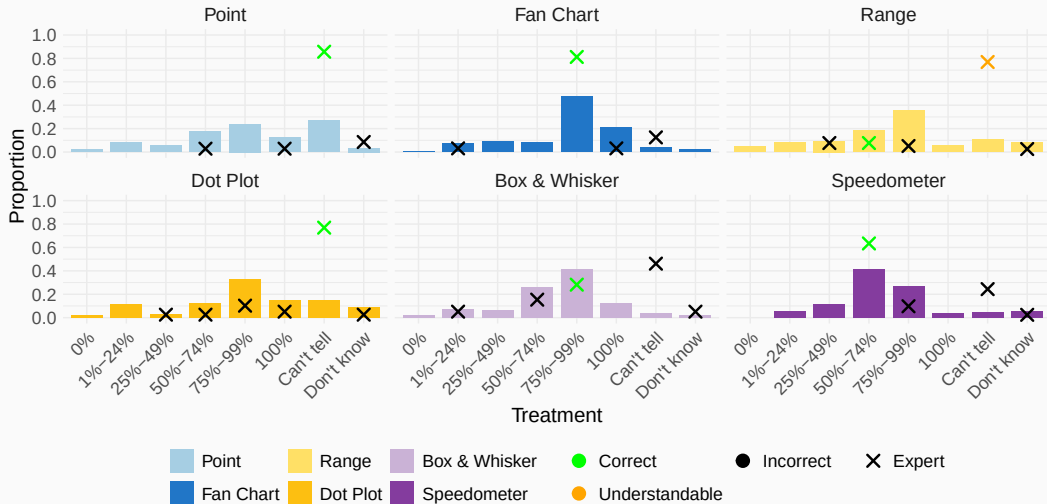
'Anchoring': Most likely value for the series in Forecast Period 1? (± 0.3 pp)

EXPERTS ARE (UNSURPRISINGLY) PRETTY GOOD ACROSS THE BOARD



Uncertainty: How likely is it that inflation will be between X% and Y% in Y3

POINTS AND DOTS CONFUSE PUBLIC. FANS, B & W, SPEEDOMETER DO WELL.



Regression Analysis: Includes Participant FE and Expert $\times$ Medium

$$y_{i,r} = \beta_1 \text{Treatment}_{i,r} + \beta_2 \text{Expert}_i + \beta_3 \text{Treatment}_{i,r} \times \text{Expert}_i + \delta' \mathbf{X}_{i,r} + \gamma_i + \epsilon_{i,r} \quad (3)$$

Regression Analysis: Includes Participant FE and Expert $\times$ Medium

Scores

$$y_{i,r} = \beta_1 \text{Treatment}_{i,r} + \beta_2 \text{Expert}_i + \beta_3 \text{Treatment}_{i,r} \times \text{Expert}_i + \delta' X_{i,r} + \gamma_i + \epsilon_{i,r} \quad (3)$$

	Dependent variable: Responses to Part I questions					
	Subjective		Anchoring	Uncertainty		
	Q1.Liked? (1-7) (1)	Q2.How uncertain? (1-5) (2)	Q3.Point estimate (3)	Q4.Presence (4)	Q5.Distribution (5)	Q6.Probabilities (6)
Intercept (from no FE model)	5.181***	2.190***	0.802***	0.699***	0.536***	0.255***
β_1 (Unconditional Treatments)						
Fan	-0.801*** (0.131)	0.533*** (0.131)	-0.010 (0.040)	-0.017 (0.051)	0.144*** (0.042)	0.258*** (0.055)
Range	-1.199*** (0.133)	0.516*** (0.142)	0.006 (0.041)	-0.021 (0.051)	0.059 (0.044)	-0.089 (0.058)
Dot Plots	-0.977*** (0.132)	0.018 (0.132)	-0.022 (0.040)	-0.087* (0.049)	0.067* (0.040)	-0.108** (0.051)
Box & Whisker	-1.253*** (0.131)	0.454*** (0.130)	-0.064 (0.041)	0.044 (0.046)	0.058 (0.041)	0.163*** (0.056)
Speedometer	-1.704*** (0.143)	0.340** (0.136)	0.057 (0.038)	0.047 (0.050)	0.118*** (0.042)	0.161*** (0.056)
Participant FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls: Experimental variation	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,132	951	1,132	1,132	1,132	1,132
Adjusted R ²	0.625	0.323	0.414	0.322	0.576	0.204

Regression Analysis: Includes Participant FE and Expert $\times$ Medium

Scores

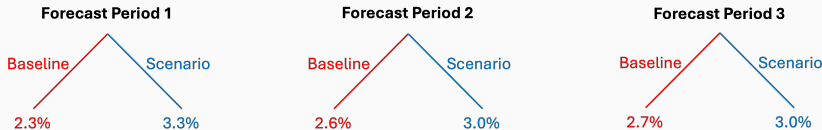
$$y_{i,r} = \beta_1 \text{Treatment}_{i,r} + \beta_2 \text{Expert}_i + \beta_3 \text{Treatment}_{i,r} \times \text{Expert}_i + \delta' X_{i,r} + \gamma_i + \epsilon_{i,r} \quad (3)$$

	Dependent variable: Responses to Part I questions					
	Subjective		Anchoring	Uncertainty		
	Q1.Liked? (1-7) (1)	Q2.How uncertain? (1-5) (2)	Q3.Point estimate (3)	Q4.Presence (4)	Q5.Distribution (5)	Q6.Probabilities (6)
Expert (from no FE model)	1.312***	-0.741*	0.170***	0.121*	-0.082	0.589***
β_3 (Treatment $\times$ Expert)						
Fan*Expert	0.764*** (0.284)	1.977** (0.851)	-0.027 (0.069)	0.094 (0.087)	0.270*** (0.101)	-0.348*** (0.122)
Range*Expert	0.652** (0.265)	2.482*** (0.835)	-0.025 (0.060)	-0.051 (0.088)	0.077 (0.098)	-0.681*** (0.124)
Dot Plots*Expert	0.189 (0.273)	1.181 (0.849)	0.012 (0.063)	0.146* (0.081)	0.088 (0.099)	-0.025 (0.117)
Box & Whisker*Expert	0.465 (0.293)	1.940** (0.848)	0.063 (0.065)	-0.075 (0.093)	0.361*** (0.099)	-0.756*** (0.126)
Speedometer*Expert	-0.829*** (0.314)	1.937** (0.845)	-0.057 (0.059)	0.005 (0.082)	0.244** (0.109)	-0.394*** (0.124)
Participant FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls: Experimental variation	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,132	951	1,132	1,132	1,132	1,132
Adjusted R ²	0.625	0.323	0.414	0.322	0.576	0.204

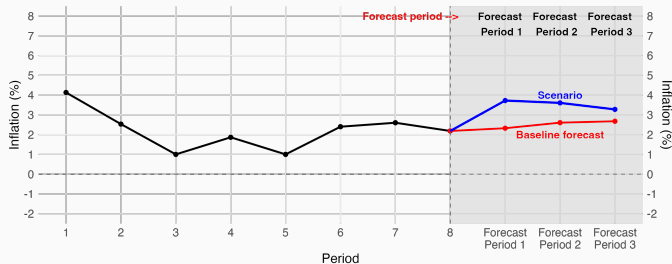
A: Conditional Media

Conditional Media

“Decision Tree”

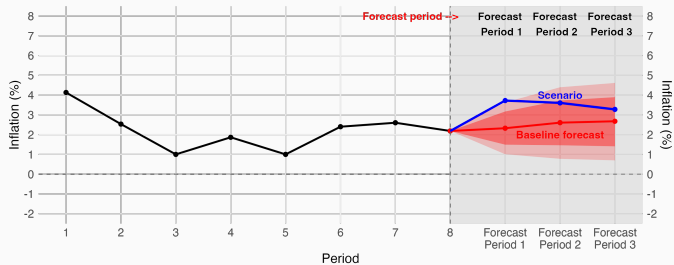


“Scenario”

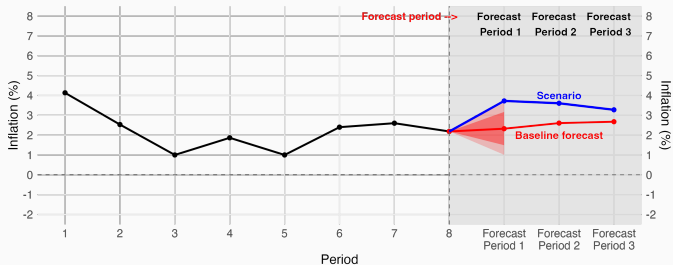


Conditional Media

“Scenario + 3yr Fan”



“Scenario + 1yr Fan”



Conditional communication is a bit different

	Dependent variable: Responses						
	Subjective		Objective				
	Understanding	Degree of Uncertainty	Point forecast	Forecast trend	Forecast range probability	Uncertainty info conveyed	Uncertainty distribution
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Constant (from no FE model)	4.938*** (0.113)	3.747*** (0.164)	0.801*** (0.033)	0.733*** (0.037)	−0.000	0.114*** (0.026)	0.486*** (0.042)
Conditional Uncertainty							
Tree Diagram	−1.225*** (0.138)	−0.304* (0.176)	−0.081* (0.042)	−0.096* (0.049)			
Scenario	−0.714*** (0.118)	−0.321* (0.179)	−0.142*** (0.042)	−0.029 (0.049)		0.008 (0.037)	
Scenario with Short fan	−1.500*** (0.124)	−0.611*** (0.160)	−0.069* (0.041)	0.005 (0.046)		0.023 (0.026)	
Scenario with Long fan	−1.402*** (0.128)	−0.632*** (0.162)	−0.202*** (0.045)	−0.082* (0.049)		0.045 (0.035)	
Participant FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,885	1,885	1,885	1,885	1,132	753	1,132
Adjusted R ²	0.614	0.317	0.412	0.297	0.278	0.634	0.574

Note:

*p<0.1; **p<0.05; ***p<0.01. Cluster-robust standard errors in parentheses, clustered at participant level.

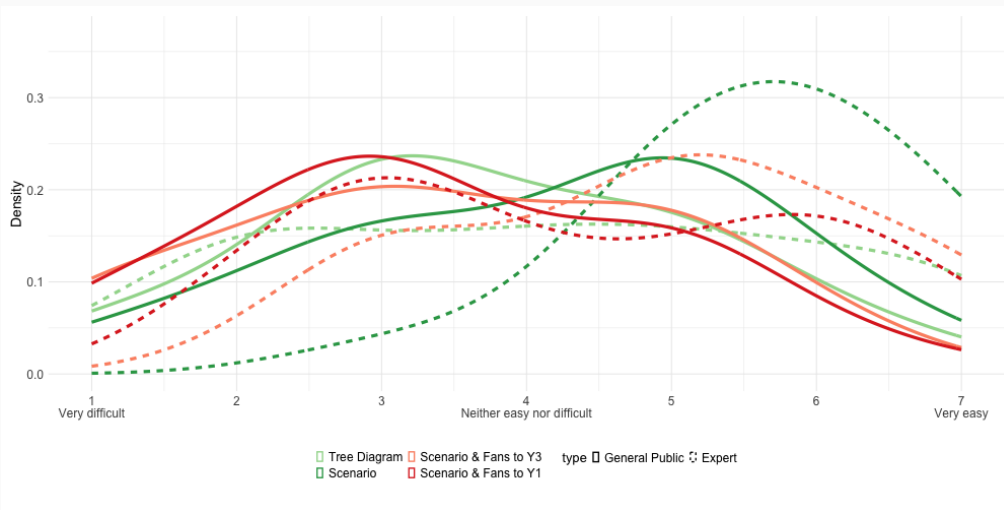
Conditional communication is a bit different

	Dependent variable: Responses						
	Subjective		Objective				
	Understanding	Degree of Uncertainty	Point forecast	Forecast trend	Forecast range probability	Uncertainty info conveyed	Uncertainty distribution
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Expert (from no FE model)	1.290*** (0.181)	1.996*** (0.243)	0.170*** (0.044)	0.124* (0.070)	0.000	0.303*** (0.087)	-0.086 (0.093)
Conditional Uncertainty							
Tree × Expert	-0.626* (0.337)	-0.655* (0.382)	0.091* (0.055)	0.059 (0.093)			
Scenario × Expert	0.355 (0.238)	0.034 (0.320)	0.137** (0.060)	-0.217** (0.092)		0.040 (0.110)	
Scenario with Short fan × Expert	-0.174 (0.327)	-1.609*** (0.290)	0.091* (0.055)	-0.157* (0.095)		0.256** (0.101)	
Scenario with Long fan × Expert	0.293 (0.261)	-1.616*** (0.301)	0.146** (0.069)	0.077 (0.085)		0.073 (0.090)	
Participant FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,885	1,885	1,885	1,885	1,885	753	1,132
Adjusted R ²	0.614	0.317	0.412	0.297	0.357	0.634	0.574

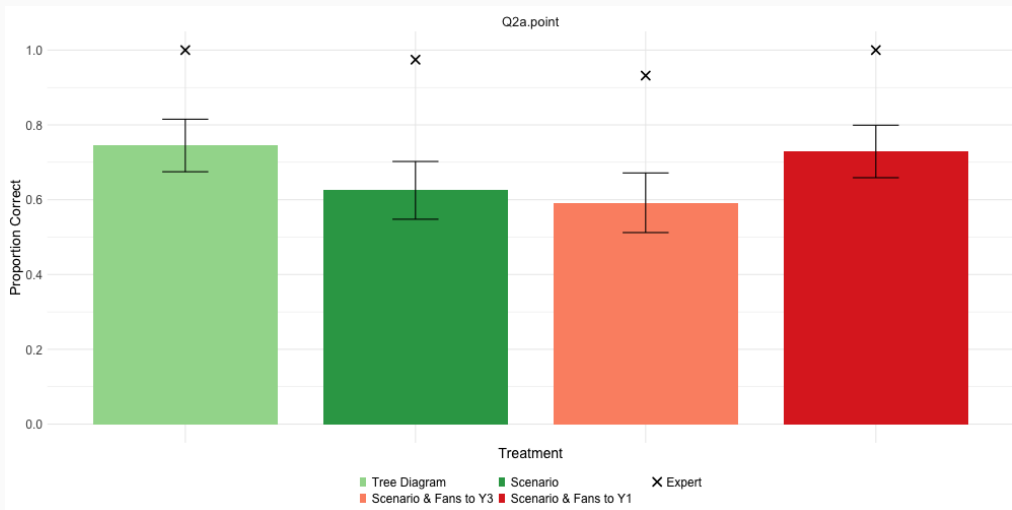
Note:

*p<0.1; **p<0.05; ***p<0.01. Cluster-robust standard errors in parentheses, clustered at participant level.

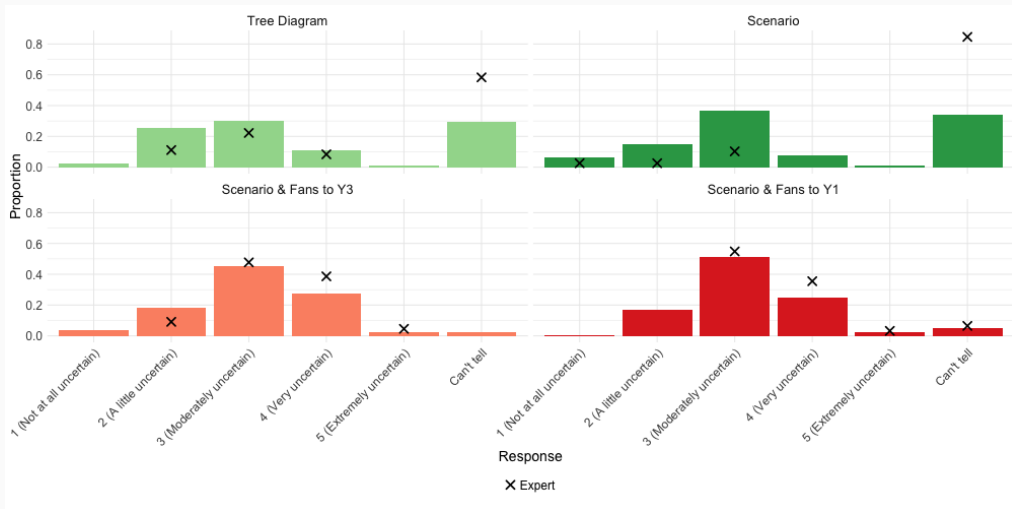
To what extent do you think you understand this chart? (1-7 scale)



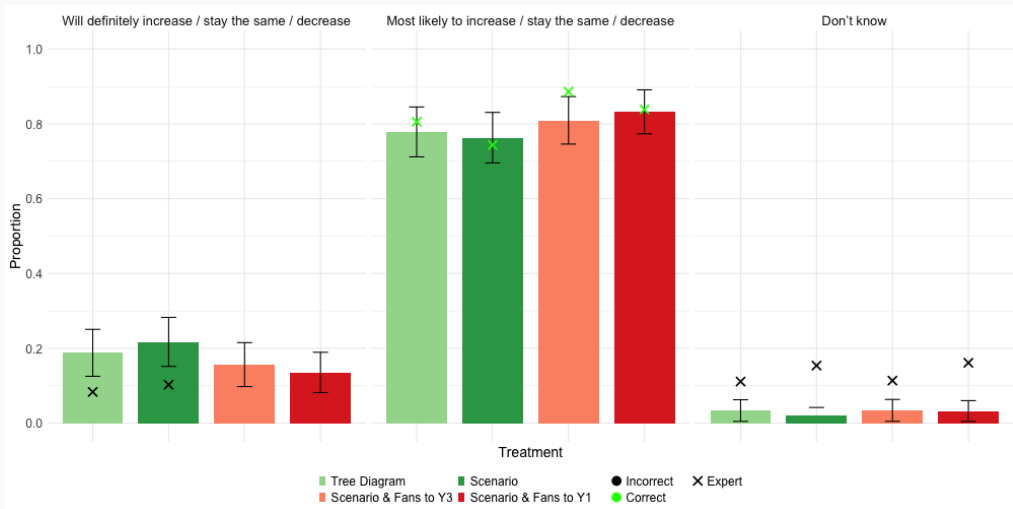
Conditional: Uncertainty blurs basic messages *somewhat* for the public



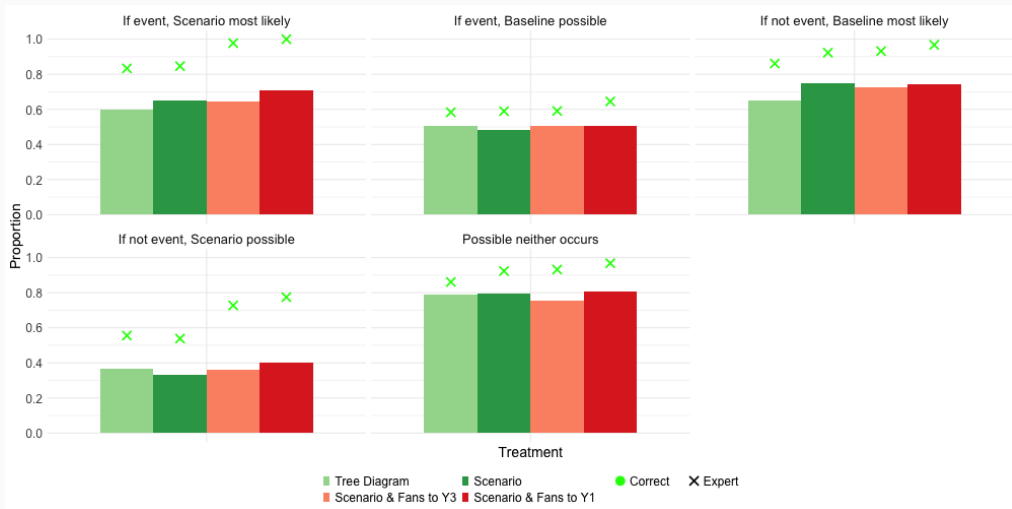
Uncertainty communication more mixed: How much uncertainty in this chart?



Uncertainty communication more mixed: Probability communicated?

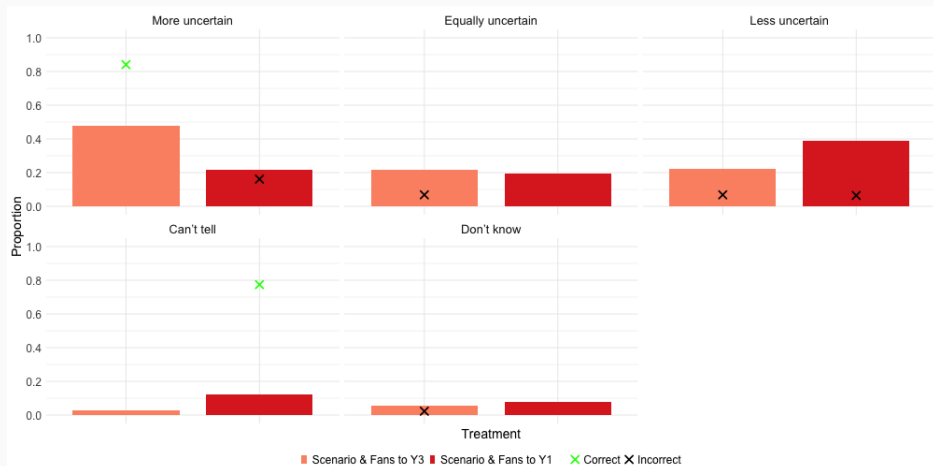


What do conditional charts convey?



Long fans don't deceive about longer-term probability - need to teach!

'Inflations outcomes in forecast year 3 are [XXXX] than those in forecast year 1'



Composite 'scores' across regression results (General Public)

Public	Subjective Scaled: $[-1, 1]$		Objective Unscaled: $\beta = \text{'proportion correct'}$						
			Anchoring	Uncertainty			Accuracy 'Score'		
	Q1.Liked? (1)	Q2.How uncertain? (2)	Q3.Point Estimate (3)	Q4.Presence (4)	Q5.Distribution (5)	Q6.Probabilities (6)	$\alpha = 0.25$ (7)	$\alpha = 0.5$ (8)	$\alpha = 0.75$ (9)
Point	0.39	-0.41	0.802	0.699	0.536	0.255	0.57	0.65	0.73
Fan	0.13	-0.11	0.792	0.682	0.680	0.513	0.67	0.71	0.75
Range	-0.01	-0.11	0.808	0.678	0.595	0.166	0.56	0.64	0.73
Dot Plots	0.07	-0.39	0.780	0.612	0.603	0.147	0.54	0.62	0.70
Box & Whisker	-0.02	-0.14	0.738	0.743	0.594	0.418	0.62	0.66	0.70
Speedometer	-0.17	-0.20	0.859	0.746	0.654	0.416	0.67	0.73	0.80

Scaling for 'Subjective' coefficients: $\left[\frac{\text{Intercept} + \beta_1 - 1}{\gamma - 1} - 0.5 \right] \times 2$ where $\gamma = [7, 5]$ for [Liked?, How uncertain?]

Accuracy 'Score' = $\alpha \times \beta^{\text{Anchoring}} + (1 - \alpha) \times \bar{\beta}^{\text{Uncertainty}}$

Greyed: on Q6 the correct answer for the Point and Dot Plot IS 'can't tell', so the cell is not a like-for-like test against the media that require reading a probability.

Composite 'scores' across regression results (Expert)

Experts	Subjective Scaled: $[-1, 1]$		Objective Unscaled: $\beta = \text{'proportion correct'}$						
			Anchoring		Uncertainty			Accuracy 'Score'	
	Q1.Liked? (1)	Q2.How uncertain? (2)	Q3.Point Estimate (3)	Q4.Presence (4)	Q5.Distribution (5)	Q6.Probabilities (6)	$\alpha = 0.25$ (7)	$\alpha = 0.5$ (8)	$\alpha = 0.75$ (9)
Point	0.83	'Can't tell'	0.97	0.82	0.45	0.84	0.77	0.84	0.90
Fan	0.82	-	0.94	0.90	0.87	0.75	0.87	0.89	0.92
Range	0.65	-	0.95	0.75	0.59	0.07	0.59	0.71	0.83
Dot Plots	0.57	-	0.96	0.88	0.61	0.71	0.79	0.85	0.90
Box & Whisker	0.57	-	0.97	0.79	0.87	0.25	0.72	0.80	0.89
Speedometer	-0.01	-	0.97	0.87	0.82	0.61	0.82	0.87	0.92

Scaling for 'Subjective' coefficients: $\left[\frac{\text{Intercept} + \beta_1 + \text{Expert} + \beta_2 - 1}{\gamma - 1} - 0.5 \right] \times 2$ where $\gamma = [7, 5]$ for [Liked?, How much uncertainty?]

Accuracy 'Score' = $\alpha \times \beta^{\text{Anchoring}} + (1 - \alpha) \times \tilde{\beta}^{\text{Uncertainty}}$

Greyed: on Q6 the correct answer for the Point and Dot Plot IS 'can't tell', so the cell is not a like-for-like test against the media that require reading a probability.

No FE Regressions

Dependent variable: Range as proportion of IQR by Stage, Horizon, and Error Type: Year 2									
	Stage B		Stage C			Stage D			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Constant	0.790*** (0.069)	0.832*** (0.065)	0.823*** (0.067)	0.818*** (0.069)	0.824*** (0.068)	0.845*** (0.064)	0.815*** (0.065)	0.819*** (0.066)	0.834*** (0.066)
Fan	0.055*** (0.021)	0.035* (0.021)	0.023 (0.027)	0.023 (0.023)	0.012 (0.022)	0.041* (0.021)	0.052* (0.027)	0.040* (0.023)	0.018 (0.022)
Fan*Unlucky Error			0.024 (0.041)				-0.023 (0.042)		
Fan*Unlucky Large Error				0.049 (0.051)				0.006 (0.054)	
Fan*Unlucky Large Positive Error					0.173*** (0.065)				0.166** (0.072)
Fan + Fan*Error Type (linear comb.)			0.047 (0.029)	0.072* (0.041)	0.185*** (0.056)		0.029 (0.030)	0.046 (0.042)	0.185*** (0.057)
Unlucky Error			0.015 (0.028)				0.053* (0.029)		
Unlucky Large Error				0.014 (0.036)				0.046 (0.039)	
Unlucky Large Positive Error					-0.020 (0.050)				-0.010 (0.053)
Participant FE	No	No	No	No	No	No	No	No	No
Controls: Experimental Variation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598
Adjusted R ²	0.028	0.037	0.037	0.038	0.042	0.041	0.042	0.041	0.046

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Cluster-robust standard errors in parentheses, clustered at participant level.