Communication as policy and firm uncertainty: evidence from randomised control trial

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Abstract

This paper uses a randomised controlled trial (RCT) to investigate whether central bank communication – the delivery of publicly available signals – affects firms' perceptions of uncertainty regarding inflation expectations, the economic outlook and forecast difficulty. The RCT assigns firms to one of four information treatments: professional 12-month CPI forecasts, the Central Bank of the Republic of Türkiye's (CBRT) current-year projection, the next-year projection, or the medium-term inflation target, or to a control group. We first show that higher uncertainty is strongly associated with weaker sales and employment plans, tighter anticipated financial conditions, and higher wage and cost expectations. Second, using a compact three-point elicitation (minimum-mode-maximum) mapped to a triangular posterior, we measure both the level and dispersion of inflation expectations and show that the communication treatments significantly compress dispersion in inflation expectations. Finally, we show that information treatments reduce within-firm subjective uncertainty regarding the future economic outlook and mitigate firms' perceived forecasting difficulty, with effects persisting for up to two months before attenuating. Taken together, the results indicate that central bank communication can meaningfully anchor firms' beliefs and improve sentiment, but the effects decay without reinforcement. Effective communication therefore requires periodic, state-contingent updates coordinated across reports, speeches and data releases.

Keywords: expectations, uncertainty, high inflation, randomised controlled trial, macroeconomics

JEL classifications: E12; E24; E31; E52

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1. Introduction

How firms form and update their expectations is central to the transmission of monetary policy and the dynamics of inflation. Uncertainty about the future path of inflation is a key friction in economic decision-making, as beliefs about future prices and costs move current decisions on wage setting, investment and pricing. When firms are unsure about future prices and costs, they may delay investment, hesitate to hire and adopt precautionary pricing strategies, weakening the transmission of monetary policy (Bloom (2009)). While central banks devote considerable resources to anchoring the level of inflation expectations, a distinct and equally critical challenge is managing the uncertainty surrounding those beliefs. This paper uses a randomised controlled trial (RCT) experiment to investigate whether the delivery of publicly available signals affects firms' perception of uncertainty regarding inflation expectations, economic outlook and forecast difficulty. Credible public signals can shape firms' beliefs and near-term outlooks. As expectations are heterogeneous, subject to persistent disagreement, and shaped by limited attention and noisy signals,[1] these frictions can amplify macroeconomic shocks and weaken policy pass-through. Consequently, central bank communication strategies aim not only to anchor the level of expectations but also to reduce the uncertainty surrounding them.

Beyond mean beliefs, the *second moment* of expectations has first-order implications for behaviour. A foundational insight from the real options tradition is that uncertainty induces firms to delay irreversible choices, such as investment and hiring (Bernanke (1983)). This "wait-and-see" mechanism has been shown to account for sharp, synchronised downturns during uncertainty spikes (Bloom (2009, 2014)). A large literature documents multiple sources of uncertainty: firm-specific uncertainty about future business conditions (Bloom et al (2007); Bachmann et al (2013); Bachmann et al (2017); Fiori and Scoccianti (2023)); aggregate macroeconomic uncertainty (Bloom (2009); Popescu and Smets (2010); Bachmann and Bayer (2014); Jurado et al (2015); Cesa-Bianchi et al (2020); Altig et al (2020)); financial market volatility (Gilchrist et al (2014); Christiano et al (2014); Caggiano et al (2021)); policy uncertainty (Fernández-Villaverde et al (2011); Kang et al (2014); Baker et al (2016); Gulen and Ion (2016); Binding and Dibiasi (2017); Brogaard et al (2020)); and demand uncertainty and consumer confidence (Arellano et al (2010); Barsky and Sims (2012)). Our paper bridges two core areas of this literature: (i) expectation formation under information frictions; and (ii) the pricing consequences of uncertainty for firms.

Building on Akarsu et al (2025), which used an experimental design to show that information treatments can shift the level of inflation expectations and influence firms' decisions, this paper asks a distinct question: can central bank communication also compress belief dispersion and reduce various measures of perceived uncertainty? To investigate the second moment of inflation expectations, we employ a three-point elicitation (minimum-mode-maximum) for 12-month-ahead inflation. Interpreting this triplet as a triangular posterior allows us to derive a firm-specific measure of subjective uncertainty in inflation expectations. We complement this primary measure with two survey-based indicators of economic uncertainty to provide a comprehensive picture of firms' perceived uncertainty: (i) a firm-level uncertainty index constructed from forward-looking business tendency survey (BTS)

[1] See Mankiw and Reis (2002); Sims (2003); Coibion and Gorodnichenko (2012) for the literature on information frictions.

items (Bachmann et al (2013)); and (ii) a direct self-assessment of forecasting difficulty.

We have several findings. Before making causal use of the RCT, we highlight the strong association between high inflation expectations and weaker sales and employment plans, tighter anticipated financial conditions, and higher wage and cost expectations. This pattern can be interpreted as evidence of an expectations channel through which information frictions transmit to real and pricing decisions (Bloom (2009); Gilchrist et al (2014)). Second, we examine the second moment of expectations. Using a compact three-point elicitation (minimum-mode-maximum) mapped to a triangular posterior, we measure the dispersion of inflation expectations and show that the communication treatments significantly compress this dispersion. We also find that information treatments reduce (i) the within-firm disagreement index regarding the future economic outlook, constructed from forward-looking BTS items (Bachmann et al (2013)); and (ii) firms' direct self-assessment of forecasting difficulty. Exploiting the panel dimension of the data, we finally show that the impact persists for up to two months before attenuating. This temporal profile is consistent with sticky information and rational inattention frameworks, in which salient, low-cost signals trigger sharp updates that gradually decay as attention reallocates and new shocks arrive (Mankiw and Reis (2002); Sims (2003)).

Overall, the results indicate that central bank communication can function as a policy instrument for managing uncertainty. Guidance that is concrete and state-contingent compresses disagreement and improves the near-term tone, but the effects decay quickly. Hence, one-off announcements are insufficient for durable anchoring. Communication must be refreshed at a frequency consistent with the observed attenuation of effects, coordinated across reports, speeches and data releases, and supported by simple monitoring of key indicators such as disagreement and forecasting difficulty to guide reinforcements. The remainder of the paper proceeds as follows. Section 2 sets out the institutional background and recent inflation dynamics. Section 3 describes the sample, timing, randomised information treatments (post-May 2024 BTS), and belief-elicitation and uncertainty measures. Section 4 presents the experimental results and their persistence, showing sharp uncertainty reductions that fade within two months, interpreted through sticky information and rational inattention frameworks. Section 5 concludes with policy implications for cadence-aware, state-contingent communication.

2. Inflation dynamics in Türkiye

Graph 1 illustrates the evolution of monthly firm inflation expectations alongside the realised annual change in the Consumer Price Index (CPI) in Türkiye. Beginning in 2017, the economy entered a sustained phase of high inflation. Although the monetary tightening cycle in mid-2018 temporarily reduced demand-driven pressures, subsequent shocks pushed inflation dynamics onto a more volatile path. The outbreak of the Covid-19 pandemic in 2020, followed by a series of interest rate cuts starting in September 2021, culminated in an unprecedented inflation peak by October 2022. In the summer of 2023, the Central Bank of the Republic of Türkiye (CBRT) initiated a decisive tightening cycle, raising the policy rate from 8.5% to 50% by March 2024. Coupled with fiscal consolidation, these measures contributed to exchange rate stabilisation and a gradual cooling of domestic demand. As a result,

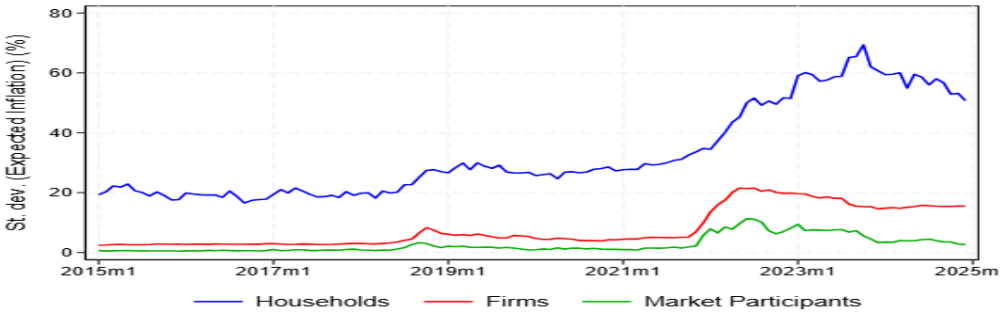
Türkiye entered a disinflationary period beginning in mid-2024 (Akarsu and Aktuğ (2025)).

One-year-ahead inflation expectations of households, firms and professionals

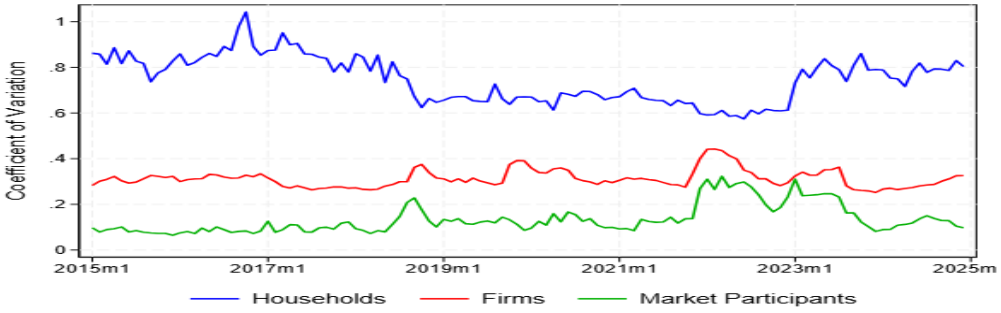
Graph 1

A. Mean expected inflation

B. Disagreement in expected inflation



C. Coefficient of variation of expected inflation



Source: CBRT.

The expectations data across economic agents, presented in Graph 1, reveal that the surge and subsequent decline in inflation were mirrored by substantial shifts in the level, dispersion and relative uncertainty of inflation beliefs. Graph 1.A shows that households consistently reported much higher expected inflation than both firms and market participants, with the divergence widening during the 2021–22 inflation surge. Firms' expectations rose as well, though they remained closer to realised CPI dynamics, while market participants' forecasts stayed the most anchored to actual outcomes. Graphs 1.B and 1.C highlight that disagreement and relative uncertainty, proxied by the cross-sectional standard deviation and the coefficient of variation, were persistently higher for households, moderate for firms and lowest for market participants.

Anchored inflation expectations – stable, target-aligned and resilient to shocks – are typically observed in low-inflation environments (Bernanke (2007); Draghi (2014); Dovern et al (2012)). However, as inflation accelerates, anchors weaken and heterogeneity across agents emerges. Consistent with international evidence, firms in Türkiye revised their expectations heterogeneously during the high-inflation phase: some re-anchored at elevated levels, while others struggled to adjust under heightened uncertainty. As the disinflation episode began in mid-2024, both uncertainty and disagreement declined. This re-anchoring process underscores the importance of credible and consistent monetary policy communication, particularly during volatile periods when inflationary shocks threaten to unmoor expectations.

3. Survey design and information treatments

This section describes the sampling frame, the information-provision experiment and our belief measures. Importantly, we use the very same randomised information experiment in Akarsu et al (2025). Our contribution is to extend the analysis to additional outcomes and mechanisms.

3.1. Measuring inflation uncertainty

We measure perceived inflation uncertainty using the CBRT's firm survey and randomised information design documented in Akarsu et al (2025). Following the May 2024 business tendency survey (BTS), the randomised controlled trial (RCT) began two days later with a seven-day completion window and voluntary participation. We obtained responses from 1,400 firms (a response rate of approximately 65%), and the realised sample is representative of national manufacturing. Firms were randomly assigned to four information sub-groups and a control group. Treatments consisted exclusively of publicly available information – forecasts from professionals and the CBRT – shown immediately before belief elicitation. This design induces exogenous variation in beliefs and permits causal analysis of the impact of communication on perceived uncertainty. Akarsu et al (2025) provides the survey platform, administration details and randomisation protocol that we follow here without modification.

Immediately following the information treatments (or, for the control group, after an equivalent screen), all respondents were presented with a compact three-point distributional elicitation that allows us to measure both the level and dispersion of their inflation expectations for the next twelve months. The precise wording and format presented to firms is shown below:

What is your expectation for the Consumer Price Index (CPI) inflation rate at the end of the next 12 months? In other words, how much do you think the general level of consumer prices will increase over the next 12 months? Additionally, what are your lowest (most optimistic) and highest (most pessimistic) inflation rate estimates at the end of the next 12 months?
At the end of the next 12 months, my annual (CPI) inflation estimate is: .....
My lowest (most optimistic) inflation (CPI) estimate is: .....
My highest (most pessimistic) inflation (CPI) estimate is: .....

These questions allow us to recover both the first moment of expectations and an internally consistent measure of dispersion. Following the literature on compact distributional elicitations, we treat the optimistic, best and pessimistic points as the *min* (a), *mode* (m) and *max* (b) of a triangular distribution and compute posterior moments accordingly. In particular, expected inflation is defined as the mean of the triangular distribution:

$$\pi_i^e = \frac{a_i + m_i + b_i}{3}$$

where π_i^e denotes the subjective distribution of firm i's twelve-month-ahead inflation belief. The associated perceived uncertainty is summarised by the variance of the triangular distribution, given by:

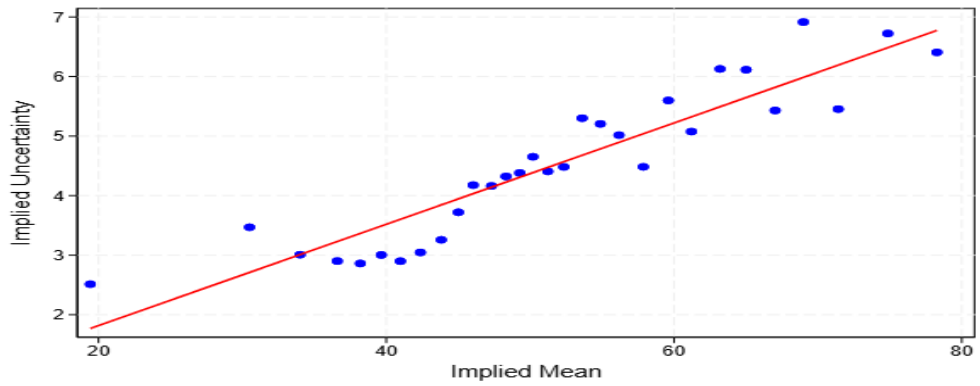
$$Var(\pi_i^e) = \frac{a_i^2 + m_i^2 + b_i^2 - a_i m_i - a_i b_i - m_i b_i}{18}$$

with the standard deviation $SD(\pi_i^e) = \sqrt{Var(\pi_i^e)}$ used as our baseline measure of posterior uncertainty. This formulation captures both the width of the subjective distribution and the degree of centrality of the mode, assigning lower dispersion when m_i lies closer to the centre of $[a_i, b_i]$.

Graph 2 illustrates the empirical relationship between the two measures: firms that report higher implied mean inflation also tend to exhibit systematically greater implied uncertainty, even after controlling for firm characteristics and fixed effects. We compute these measures for all respondents and estimate average treatment effects by comparing posterior uncertainty across randomised treatment groups.

Covariate-adjusted relationship between firms' implied mean inflation and implied uncertainty

Graph 2:



This figure plots the covariate-adjusted binscatter of implied uncertainty against implied mean inflation. The relationship is estimated using the approach of Cattaneo et al (2024), controlling for firm size (employment), firm age, exporter status and leverage, as well as sector and province fixed effects. The red line shows the fitted linear relationship after covariate adjustment.

Source: CBRT.

3.2. Measuring within-firm subjective uncertainty and forecasting difficulty

We use three different measures for firms' subjective uncertainty. Our primary outcome is a firm-month measure of subjective economic uncertainty constructed from the CBRT BTS in the spirit of Bachmann et al (2013). For each month *t*, firms

report the expected direction of change (increase, no change, decrease) for a set of forward-looking questions covering production, demand, prices, employment, orders and costs. Let f_{it}^{+} and f_{it}^{-} denote the shares of questions answered "increase" and "decrease," with $f_{it}^{0} = 1 - f_{it}^{+} - f_{it}^{-}$. We summarise within-firm disagreement across dimensions by

$$Uncertainty_{it} = \sqrt{f_{it}^{+} + f_{it}^{-} - (f_{it}^{+} - f_{it}^{-})^{2}}$$

which attains its maximum when responses are evenly split between "increase" and "decrease," and collapses to zero when all answers align. This BTS-based disagreement index is the uncertainty concept used in Table 2 and provides a transparent, model-free summary of how internally consistent a firm's directional expectations are across business margins.

Second, we consider a measure of economic sentiment derived from the BTS question on how the general trend in the firm's industry compares with the previous month, with responses one (optimism), two (neutrality) or three (pessimism). Unlike the two uncertainty constructs, this variable captures the directional tone of firms' assessments rather than the tightness of their beliefs. Information that reduces uncertainty should, under standard models of precautionary behaviour and sticky information, translate into more constructive assessments of near-term conditions, at least temporarily. This link from improved information to better sentiment is consistent with evidence that credible public signals and expert forecasts can anchor beliefs and lift business outlooks in the short run.

Third, complementing this disagreement metric, we also analyse a directly coded BTS question that asks whether predicting future developments has become easier, unchanged or harder compared with the recent past, with responses recorded as one (easier), two (neutral) or three (harder). Conceptually, this variable is a self-assessment of forecasting difficulty. Whereas the Bachmann-style index infers uncertainty from dispersion across many items, the coded question captures managers' meta-perception of how predictable the environment is. A decline in this score after treatment indicates that professional forecasts or policy signals made the state of the world easier to read. The two measures therefore speak to distinct, complementary channels emphasised in the uncertainty literature: disagreement/ambiguity across decision margins and perceived difficulty in forming a reliable view (Bachmann et al (2013); Bloom (2014)).

3.3. Information treatments

The information RCT is designed to influence firms' inflation expectations by delivering targeted information. Each group in the sample is randomly given a publicly available piece of data regarding professional forecasts of inflation, the CBRT's forecasts for 2024 year-end and 2025 year-end, or the CBRT's inflation target.[2] Each group receives one of the following statements on the screen:[3]

[2] Each group consists of approximately 250 observations. Questions about price and wage changes over the past 12 months are asked before the treatment, while all other questions are asked post-treatment.

[3] The selection of firms into treatments is random. See Akarsu et al (2025) for further details and the list of questions.

Treatment 1 — professional forecasts (12-month CPI): "According to the results of the Market Participants Survey for May 2024, the participants' expectation for the Consumer Price Index (CPI) 12 months from now is 33.21%. In other words, professionals expect general prices to increase by 33.21% over the next 12 months."
Treatment 2 — CBRT forecast for 2024: "According to the Central Bank of the Republic of Türkiye's Inflation Report for May 2024, the central bank predicts that annual inflation will be 38% by the end of 2024. In other words, the central bank expects general prices to increase by 38% in 2024."
Treatment 3 — CBRT forecast for 2025: "According to the Central Bank of the Republic of Türkiye's Inflation Report for May 2024, the central bank predicts that annual inflation will be 14% by the end of 2025. In other words, the central bank expects general prices to increase by 14% in 2025."
Treatment 4 — CBRT medium-term inflation target: "Within the framework of the inflation targeting regime, the central bank's inflation target is 5%. In other words, the central bank aims for the general price level to rise by approximately 5% annually in the medium term."

After providing information to each treatment group (with the control group receiving none), respondents were asked several follow-up questions. These included their quantitative expectations for aggregate inflation, producer price inflation, salary growth, unit cost growth, employment changes, price growth of the firm's main product, and both domestic and export sales.

3.4. How inflation uncertainty correlates with firms' real, financial and pricing expectations

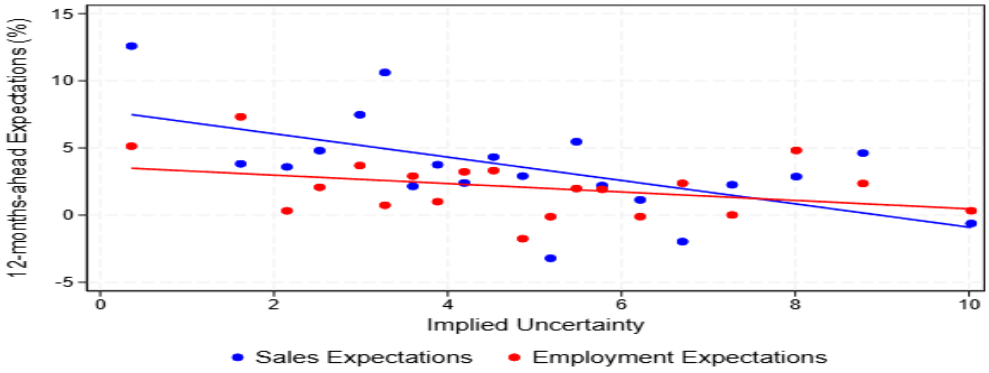
Graphs 3, 4 and 5 document a clear, internally consistent pattern linking firms' implied uncertainty to their forward-looking views about economic activity, financing and pricing. Across all panels we plot covariate-adjusted relationships – partialling out firm size (employment), firm age, exporter status, leverage, and sector- and province-fixed effects – so the slopes isolate how uncertainty co-moves with each outcome holding observables and location/industry heterogeneity constant. This analysis relies on cross-sectional correlations rather than causal inferences. Yet it also indicates the importance of reducing uncertainty in inflation expectations as the latter is strongly correlated with sentiments regarding economic activity and pricing behaviour.

Starting with real activity, Graph 3.A shows that higher uncertainty is associated with weaker 12-month-ahead expectations for sales and employment. This negative association is exactly what models of precautionary behaviour under uncertainty predict: when the outlook becomes noisier, firms trim hiring plans and scale back sales growth projections to preserve flexibility and cash (Bloom (2009); Bachmann and Christian (2013)). The pattern indicates that uncertainty acts like a drag on near-term real activity through the expectations channel, even before any realised shocks materialise. In addition, Graph 3.B turns to business and economic sentiment, coded such that optimism = one, neutral = two and pessimism = three. The upward slope means that higher uncertainty goes hand-in-hand with more pessimistic assessments of both the firm's own prospects and the broader economy. Survey evidence from other settings similarly finds that uncertainty tilts beliefs towards the downside and widens disagreement (Bachmann et al (2013); Coibion et al (2018)). In our data, micro-

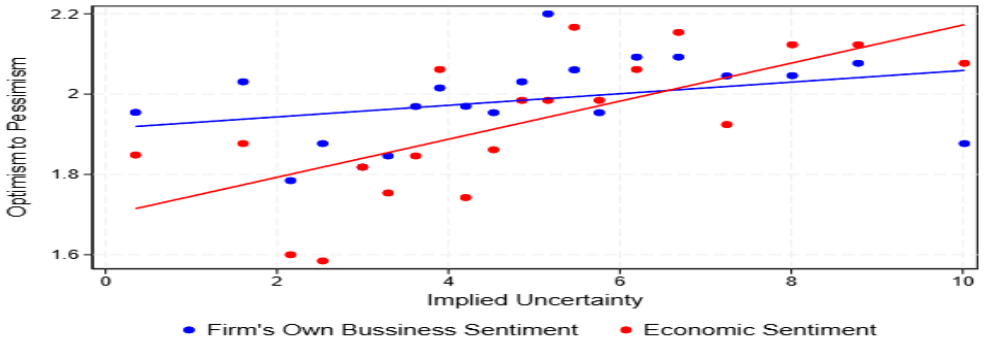
Relationship between firms' implied uncertainty and their expectations

Graph 3

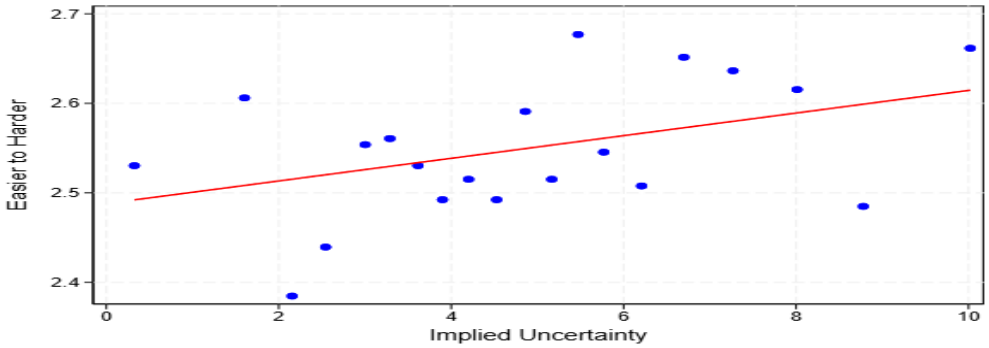
A. Uncertainty and firms' real expectations



B. Uncertainty and pessimism in business and economic sentiment



C. Uncertainty and financial constraint expectations



This figure shows the covariate-adjusted binscatters of firms' implied uncertainty against three sets of expectations. All outcomes and the regressor are residualised for firm size (employment), firm age, exporter status, leverage, and sector and province fixed effects. Graph 3.A relates uncertainty to real expectations (sales and employment). Graph 3.B measures business and economic sentiment, where optimism is coded as one, neutral as two and pessimism as three, so higher values indicate greater pessimism. Graph 3.C examines expected financial constraints, where easier conditions are coded as one, neutral as two and harder conditions as three, such that higher values correspond to tighter financial conditions.

Source: CBRT.

and macro-sentiment move together with uncertainty, suggesting that firms internalise not only their idiosyncratic risks but also a worsening macro backdrop. Finally, Graph 3.C examines expected financial conditions, with the scale coded as easier = one, neutral = two and harder = three. Again we see a positive relationship:

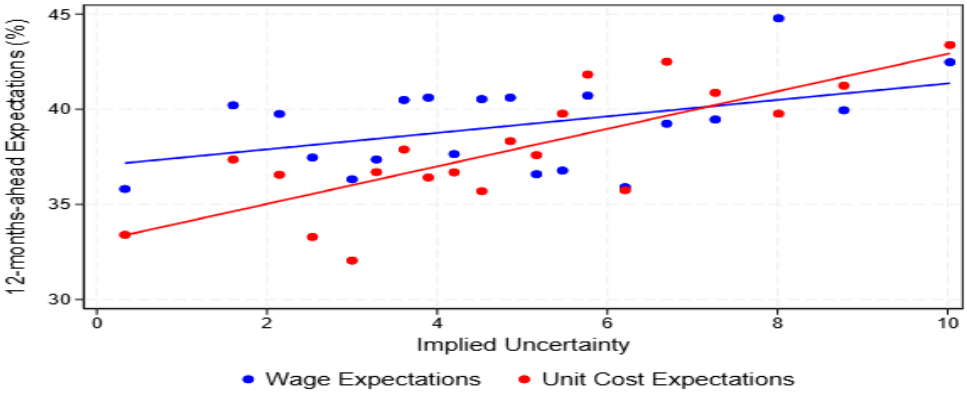
firms that report higher uncertainty also anticipate tighter financing ahead. This is consistent with the idea that uncertainty amplifies financial frictions – by eroding collateral values, widening risk premia or making lenders more selective – thereby restricting external finance just when firms might need it most (Gilchrist et al (2014)). The joint deterioration of sentiment and expected credit conditions helps explain why real plans weaken in Graph 3.A.

Graph 4 links uncertainty to cost pressures and pricing. Graph 4.A shows that wage and unit cost expectations rise with uncertainty. Graph 4.B shows a parallel increase in price expectations. These results point to a supply-side channel: when the environment is more uncertain, firms build in buffer margins – through higher expected wage growth, input costs or markups – to protect against adverse realisations and adjustment costs (Bloom et al (2018)). In high-inflation contexts like Türkiye, this precautionary pricing can become self-reinforcing as suppliers and workers negotiate under risk, pushing up cost expectations that translate into higher planned prices.

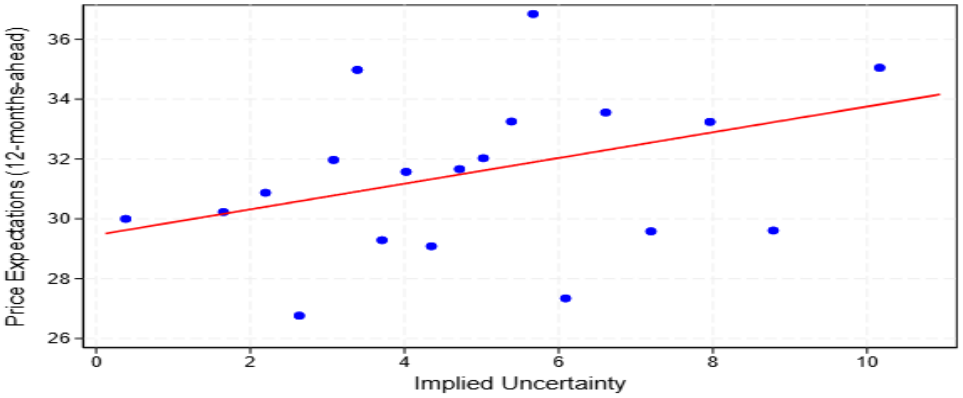
Relationship between firms' implied uncertainty and wage, unit cost and price expectations

Graph 4

A. Uncertainty and wage vs unit cost expectations



B. Uncertainty and price expectations



This figure presents the covariate-adjusted binscatter of firms' implied uncertainty against their cost and price expectations. All outcomes and the regressor are residualised for firm size (employment), firm age, exporter status, leverage, and sector and province fixed effects. Graph 4.A shows the relationship between implied uncertainty and firms' wage and unit cost expectations, and Graph 4.B shows the link between implied uncertainty and firms' price expectations.

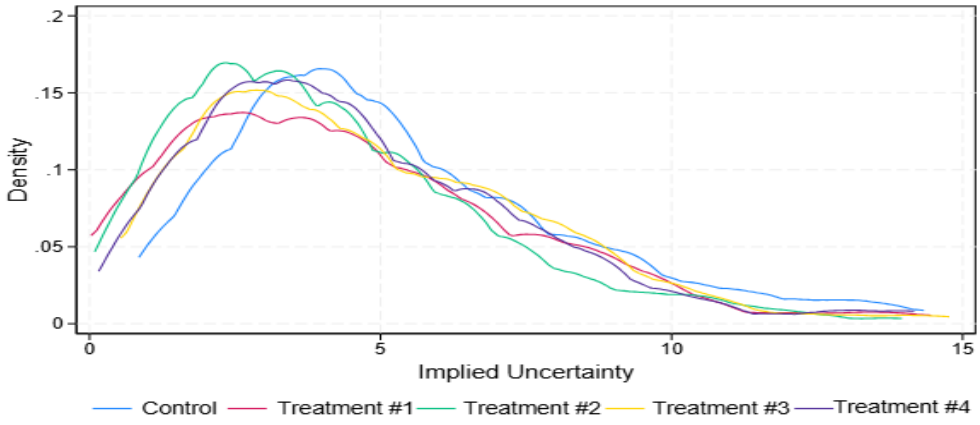
Source: CBRT.

4. Information treatments and the dynamics of uncertainty

4.1. Effect of information treatment on uncertainty

Graph 5 shows that firms assigned to treatment groups exhibit lower distributions of implied inflation uncertainty compared with the control group. This reduction in subjective uncertainty is consistent with a growing literature emphasising the role of targeted information in shaping economic agents' beliefs. For instance, Coibion et al (2022) document that survey-based information treatments can significantly narrow households' forecast dispersions, while Lamla and Vinogradov (2019) show that firms provided with clearer signals revise their expectations in a more anchored way. The intuition is straightforward: when firms receive credible, policy-relevant signals, they face less ambiguity about the macroeconomic environment, leading to tighter subjective distributions over future inflation outcomes. In contrast, untreated firms must rely more heavily on noisy private signals or backward-looking heuristics, which amplify forecast dispersion. Hence, the decline in implied uncertainty across treatment groups reflects an information-anchoring mechanism, whereby credible public signals reduce informational frictions and mitigate the noise inherent in firms' expectation formation.

Distribution of firms' inflation uncertainty by treatment type Graph 5:



This figure presents the densities of uncertainty in inflation expectations for each treatment group.

Source: CBRT.

We estimate how the information treatments affected firms' inflation beliefs and their subjective uncertainty using the same RCT and survey instrument as in our earlier study. Let i index respondents and $k \in \{1,2,3,4\}$ denote the treatment arms, with a contemporaneous control group. Our baseline specification is

$$y_i^{uncertainty} = \beta_0 + \sum_{k=1}^{4} \beta_k \boldsymbol{I}\{i \in Treat\ k\} + \delta_s + \phi_p + X_i'\gamma + \varepsilon_i, \quad (1)$$

where $\boldsymbol{I}\{\cdot\}$ are mutually exclusive treatment indicators, δ_s are sector fixed effects, ϕ_p are province fixed effects and X_i collects pre-treatment covariates that are included solely to improve precision, which are leverage, firm age and exporter

status.[4] Because assignment is randomised, each β_k identifies the average treatment effect on implied uncertainty relative to control, conditional on fixed effects and covariates.

The dependent variable varies by outcome, all measured immediately after the information screens within the same survey session. We first analyse the elicited bounds of beliefs: each respondent reports a minimum and a maximum plausible value for 12-month-ahead inflation, a_i and b_i (percent). We estimate equation (1) separately with $y_i^{min} = a_i$ and $y_i^{max} = b_i$ to trace how treatments shift the lower and upper tails of the subjective predictive distribution. Second, using the triplet (a_i, m_i, b_i) – where m_i is the respondent's most likely (modal) value elicited in the same module – we construct an operational measure of subjective uncertainty. Our primary uncertainty outcome sets $y_i^{uncertainty} = \sigma_i$ in equation (1), where σ_i denotes the implied standard deviation of beliefs (a_i, m_i, b_i) – under our maintained distributional assumption.

The empirical estimates in Table 1 point to a clear and robust decline in perceived uncertainty following exposure to the information treatments. Across both CPI- and PPI-based outcomes, every treatment group reduces the dispersion of firms' inflation beliefs, with effects that are statistically precise in most specifications. Among the arms, the Survey of Professional Forecasters (*SPF) information* (Treatment 1) and the *CBRT current release* (Treatment 2) consistently deliver the largest declines: SPF leads to CPI-based uncertainty, while the CBRT current-release treatment leads to PPI-based uncertainty. By contrast, the CBRT medium-term information (Treatment 3) produces smaller effects, and the CBRT long-term information (Treatment 4) yields moderate but robust reductions.

The treatments also shift the location of beliefs. For both price concepts, respondents revise the minimum and maximum of their expected inflation range downward relative to the control group, with the contraction at the upper bound typically exceeding that at the lower bound (Table 1). Jointly, these movements indicate that the posterior distribution not only shifts left but also tightens, consistent with a reduction in perceived right-tail risks. In short, the information screens do not merely re-centre beliefs; they compress the range within which firms consider future inflation plausible.

Taken together, the evidence in Table 1 aligns with a standard Bayesian mechanism: relative to the control group, information treatments discipline diffuse priors and align expectations more closely with the signal, thereby lowering subjective uncertainty. We therefore conclude that the RCT meaningfully reduces firms' uncertainty about future inflation and shifts beliefs towards lower and less dispersed values, with the strongest effects for the more informative treatments (SPF and the CBRT current release).

[4] Sector and province fixed effects are included to account for systematic heterogeneity in firms' inflation expectations and uncertainty that may arise from structural or regional factors. Sector fixed effects, δ_s, capture differences across industries in exposure to input costs, competitive pressures and demand conditions, which may shape how firms interpret and respond to macroeconomic signals. Province fixed effects, ϕ_p, control for regional variation in economic activity, labour markets and local demand shocks that could otherwise bias estimates of treatment effects.

Table 1: Treatment effect on firms' inflation uncertainty

	CPI			PPI		
	(1)	(2)	(3)	(4)	(5)	(6)
	Minimum	*Maximum*	*Uncertainty*	*Minimum*	*Maximum*	*Uncertainty*
T1 (SPF expectations)	-4.002***	-6.822***	-1.490***	-4.499**	-4.875*	-1.161***
	(1.348)	(2.303)	(0.348)	(1.951)	(2.745)	(0.419)
T2 (CBRT end of year)	-2.707**	-5.635**	-1.416***	-3.363*	-4.890*	-1.302***
	(1.312)	(2.205)	(0.339)	(1.795)	(2.522)	(0.393)
T3 (CBRT end of next year)	-6.529***	-7.452***	-0.815**	-5.920***	-5.984**	-0.731*
	(1.338)	(2.124)	(0.330)	(1.878)	(2.530)	(0.405)
T4 (inflation target)	-3.479**	-4.566**	-0.951***	-2.969	-4.463**	-0.967**
	(1.437)	(2.216)	(0.332)	(1.410)	(2.176)	(0.409)
Sector FE	✓	✓	✓	✓	✓	✓
Province FE	✓	✓	✓	✓	✓	✓
Firm controls	✓	✓	✓	✓	✓	✓
Control mean	58.79	72.97	5.71	55.70	68.79	5.53
R-squared	0.066	0.076	0.086	0.067	0.069	0.078
Observations	1,395	1,395	1,395	1,395	1,395	1,395

This table reports the estimated treatment effects of information interventions on firms' inflation expectations and their associated uncertainty. Columns (1)–(3) present results for CPI inflation, while columns (4)–(6) present results for PPI inflation. The dependent variables are the minimum and maximum bounds of firms' 12-month-ahead inflation forecasts as well as the implied subjective uncertainty, constructed from the elicited distribution of beliefs under a triangular distribution. All regressions are estimated using the Huber robust method to account for outliers and influential observations. Robust standard errors are reported in parentheses. ***p<0.01, **p<0.05, *p<0.1.

4.2. Persistence of information treatment effects in follow-up waves

Table 2 examines how the randomised information treatments propagate beyond the initial survey session by tracking outcomes one to four months after the intervention, denoted $y_{i,t+h}$ for $h \in \{1,2,3,4\}$. Throughout, we estimate average treatment effects with sector and province fixed effects and a small set of pre-treatment firm covariates included solely to improve precision. Because assignment is randomised, the treatment coefficients identify average causal effects relative to a contemporaneous control group at each horizon.

Table 2 documents that the information treatments sharply reduce firms' subjective economic uncertainty, which is defined as the uncertainty about possible economic developments and futures, in the immediate aftermath of the intervention, with effects persisting for one to two months before dissipating. Table 2, Panel A shows that both external benchmarks (professionals' forecast) and CBRT's current year-end and the following year-end forecasts, as well as the inflation target, lead to significant reductions in a within-firm disagreement index. The strongest effects appear within the first two months, after which the coefficients fade towards zero. Panel B confirms the same dynamic using a conceptually distinct measure of uncertainty – firms' direct self-assessment of "forecasting difficulty". The consistency across these two metrics indicates that the intervention genuinely clarified the informational environment, rather than simply altering how managers framed survey answers. In Bayesian terms, the treatments tightened priors, aligning firms' internal narratives across production, demand, costs and prices. This attenuation pattern

aligns closely with rational inattention theories (Mankiw and Reis (2002); Sims (2003)): firms initially update strongly when presented with a salient, low-cost signal, but as new shocks arrive and attention reallocates, belief dispersion returns.

In addition, Panel C highlights that uncertainty reductions are accompanied by temporary improvements in economic sentiment. Treatments based on SPF and the CBRT's year-end forecast generate statistically significant gains in optimism for up to two months, whereas the two-year forecast is weaker and the inflation target has a less consistent impact. This is consistent with precautionary behaviour models, which predict that when ambiguity about the near term shrinks, managers become more comfortable expressing a constructive industry outlook even before hard outcomes adjust (see Bachmann et al (2013); Coibion et al (2022)). Conceptually, the two uncertainty indicators capture distinct channels emphasised in the literature – cross-margin disagreement versus perceived predictability – yet they move together, and sentiment responds accordingly. Taken together, the evidence points to an informational mechanism: credible, near-term signals temporarily anchor beliefs and reduce perceived noise, thereby improving firms' tone and confidence, but the effect decays within a few months unless reinforced.

The evidence underscores that central bank communication can function as a powerful policy instrument: well designed information treatments materially compress firms' uncertainty and lift sentiment, but the effects fade within roughly two months. This temporal profile suggests that one-off signals are insufficient for durable anchoring; rather, guidance should be refreshed at a cadence that matches the observed decay. Coordination across speeches, reports and data releases is crucial to avoid dilution and to reinforce a consistent narrative. Fan charts, reiterating the policy horizon, and explicitly mapping implications for firms' planning cycles can further reduce interpretive ambiguity. Finally, the central bank should monitor simple, high-frequency key performance indicators, such as survey disagreement indices or self-reported forecasting difficulty, to track when uncertainty begins to increase. In short, credible and repeated communication buys valuable space for monetary policy to work through the expectations channel by sustaining lower uncertainty and more constructive sentiment.

Table 2: Persistence of information treatment effects: uncertainty and sentiment in follow-up waves

	(1) $y_{i,t+1}$	(2) $y_{i,t+2}$	(3) $y_{i,t+3}$	(4) $y_{i,t+4}$
	Panel A: Within-firm subjective uncertainty			
T1 (professionals' forecast)	-0.278***	-0.266***	-0.094**	-0.102**
	(0.078)	(0.041)	(0.045)	(0.046)
T2 (CBRT 1-y ahead forecast)	-0.207**	-0.219***	-0.038	-0.087*
	(0.087)	(0.041)	(0.044)	(0.045)
T3 (CBRT 2-y ahead forecast)	-0.278***	-0.153***	-0.011	-0.047
	(0.066)	(0.041)	(0.043)	(0.045)
T4 (inflation target)	-0.300***	-0.171***	-0.189***	0.030
	(0.065)	(0.042)	(0.043)	(0.045)
R-squared	0.227	0.084	0.080	0.056
	Panel B: Firms' self-assessment of forecasting difficulty			
T1 (professionals' forecast)	-0.037***	-0.034***	0.001	0.002
	(0.004)	(0.005)	(0.005)	(0.005)
T2 (CBRT 1-y ahead forecast)	-0.027***	-0.025***	0.002	0.000
	(0.005)	(0.005)	(0.005)	(0.006)
T3 (CBRT 2-y ahead forecast)	-0.024***	-0.025***	-0.003	-0.002
	(0.004)	(0.005)	(0.005)	(0.005)
T4 (inflation target)	-0.014***	-0.012**	0.001	0.002
	(0.004)	(0.005)	(0.005)	(0.005)
R-squared	0.101	0.086	0.042	0.054
	Panel C: Future economic sentiment/outlook			
T1 (professionals' forecast)	0.127***	0.067***	0.086***	0.054
	(0.046)	(0.025)	(0.031)	(0.038)
T2 (CBRT 1-y ahead forecast)	0.112***	0.071***	0.082***	0.055
	(0.043)	(0.024)	(0.030)	(0.040)
T3 (CBRT 2-y ahead forecast)	0.054*	0.017	0.009	0.009
	(0.029)	(0.023)	(0.031)	(0.038)
T4 (inflation target)	0.059**	0.013	0.048	0.072*
	(0.027)	(0.022)	(0.031)	(0.037)
R-squared	0.117	0.051	0.072	0.048
Sector FE	✓	✓	✓	✓
Province FE	✓	✓	✓	✓
Firm controls	✓	✓	✓	✓
Observations	1,395	1,395	1,395	1,395

Each column reports treatment effects estimated one to four months after the information intervention, denoted $y_{i,t+h}$ for $h = 1,2,3,4$. Panel A uses a firm-level subjective uncertainty index constructed from BTS responses in the spirit of Bachmann et al (2013), which captures disagreement across forward-looking questions on production, demand, prices, employment, orders and costs. Panel B relies on the directly coded BTS question on forecasting difficulty, where responses are scored as one = easier, two = unchanged and three = harder, with higher values indicating greater perceived uncertainty. Panel C measures firms' economic sentiment from the BTS question on the general trend in their industry relative to the previous month, coded as one = optimism, two = neutrality and three = pessimism. All regressions are estimated using the Huber robust method to account for outliers and influential observations. Robust standard errors are reported in parentheses. ***p<0.01, **p<0.05, *p<0.1.

5. Conclusion

This paper investigates how randomised information treatments shape firms' uncertainty in inflation expectations and economic sentiment in Türkiye. Leveraging a randomised controlled trial conducted immediately after the May 2024 BTS, we show that concise, policy-relevant information significantly compresses belief dispersion and temporarily anchors expectations. The treatments also reduce a within-firm multi-item disagreement index and lead to improvement in firms' own self-assessed forecasting difficulty. The effects last up to two months.

Beyond belief updating, our evidence highlights how uncertainty propagates into firms' sentiments regarding economic activity and financial conditions. Higher perceived uncertainty is associated with weaker sales and employment plans, more pessimistic industry assessments, tighter anticipated financial conditions, and higher cost and price expectations.

Taken together, our findings underscore the importance of credible and repeated central bank communication as a policy tool. Public signals can meaningfully reduce uncertainty and improve sentiment, but the effects decay quickly unless reinforced. In practice, this implies that central banks can work through expectations channels by delivering clear, state-contingent guidance in a cadence that matches the observed attenuation of information effects. More broadly, our results contribute to the literature on expectation formation and uncertainty by providing causal evidence from firms in an emerging market, demonstrating that communication policies matter not only for inflation forecasts but also for the broader economic environment in which firms operate.

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