Anchoring Households' Inflation Expectations when Inflation is High

Giang Nghiem* Lena Dräger† Ami Dalloul ‡

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Abstract

This paper explores communication strategies for anchoring households' medium-term inflation expectations in a high inflation environment. We conducted a survey experiment with a representative sample of 4,000 German households at the height of the recent inflation surge in early 2023, with information treatments including a qualitative statement by the ECB president and quantitative information about the ECB's inflation target or projected inflation. Inflation projections are most effective, but combining information about the target with a qualitative statement also significantly improves anchoring. The treatment effects are particularly pronounced among respondents with high financial literacy and high trust in the central bank.

Keywords: Anchoring of inflation expectations, central bank communication, survey experiment, randomized controlled trial (RCT).

JEL classification: E52, E31, D84.

*Leibniz University Hannover and Centre for Applied Macroeconomic Analysis (ANU), Email: nghiem@gif.uni-hannover.de

†Leibniz University Hannover, Kiel Institute for the World Economy and CESifo, Email: draeger@gif.uni-hannover.de

‡Leibniz University Hannover, Email: dalloul@gif.uni-hannover.de

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"Fighting inflation is our mantra, our mission, our mandate. We know that the current situation is tough for many people across the euro area - that is why we have to raise interest rates to tame inflation." Christine Lagarde, President of the ECB, October 31, 2022[1]

1 Introduction

Many advanced economies experienced persistently high inflation following the COVID-19 pandemic and the Russian attack on Ukraine. This led to concerns about the de-anchoring of inflation expectations in the population. With de-anchored medium-term inflation expectations, the inflation surge might become more persistent, thus further challenging central banks' efforts to return to the inflation target. To manage and anchor inflation expectations, central banks increasingly communicate with the general public, for instance by providing information about inflation targets, policy rates, inflation projections as well as explanations for monetary policy decisions (Blinder et al., 2024; Dräger, 2023). In this paper, we thus ask which communication strategies are most effective in anchoring households' inflation expectations in times of high inflation.

To address this question, we conducted a randomized controlled trial (RCT) with a representative sample of about 4,000 German households in February, 2023, where we randomly allocated survey respondents into five different treatment groups and a control group. At the time of the RCT, the last available information on current inflation was from January, 2023, where inflation was measured at 8.7%, very close to the peak rates of 8.8% in October and November, 2022. The RCT was thus conducted at the height of the inflation surge in Germany, following a prolonged period of rising inflation rates that started around July, 2021. In this environment of high inflation, we test the effectiveness of different types of ECB communication on the anchoring of respondents' medium-term inflation expectations.

The first treatment (T1 – *ECB inflation projections*) provides survey respondents with the average inflation rate in the euro area for 2022 and with the ECB's projections for euro area inflation in 2023, 2024 and 2025. The second treatment (T2 – *ECB target*) informs respondents about the ECB's inflation target. Treatments T1 and T2 are thus quantitative in nature and are regularly communicated by the central bank with the aim of anchoring inflation expectations. The third treatment (T3 – *ECB president's statement*) gives a recent quote by ECB president Christine Lagarde, where she stresses the ECB's commitment to fight inflation, acknowledging that the current situation is difficult for many people and explaining that the ECB has to raise interest rates in order to tame inflation. This is thus a qualitative type of information. The last two treatments

[1]This text originates from Christine Lagarde's Twitter post on October 31, 2022. For more information, see https://twitter.com/Lagarde/status/1587083611677003777.

combine the two quantitative treatments in T1 and T2 with the qualitative statement in T3 in order to measure whether qualitative treatments may strengthen the impact of quantitative information on the degree of anchoring. The control group receives no information.

While the concept of anchored inflation expectations is undisputed in theory, there exists no unified empirical measure of anchored expectations (Afrouzi et al., 2015; Dräger and Lamla, 2018). We thus analyze two different measures. Under the first—admittedly strong—definition, fully anchored medium-term expectations should stay equal to the target of two percent even in the face of (transitory) shocks (Afrouzi et al., 2015). Since this is likely not fully the case in reality, we evaluate whether the information treatments reduce the absolute distance of posterior expectations from the target.

Second, we analyze whether the treatments reduce the individual forecast uncertainty of medium-term inflation expectations three and five years ahead. This aspect of anchored expectations argues that individuals with anchored expectations should exhibit low uncertainty around their medium-term inflation forecasts and also low cross-sectional disagreement (Afrouzi et al., 2015). Since we only evaluate one cross-section in our study, we focus on the former aspect regarding individual forecast uncertainty.

Our results show that in the full sample, treatment T1 showing ECB inflation projections with a downward trend until 2025 significantly reduces the absolute deviation in posterior expectations from target as well as the individual forecast uncertainty for both expectations three and five years ahead compared to the control group. The other treatments T2 and T3 are not effective by themselves in improving the anchoring of respondents' expectations in the full sample. However, combining quantitative treatments with the qualitative statement can strengthen the effect: while the projections do not become significantly more effective in anchoring expectations when the statement is added, combining the information about the inflation target and the statement leads to a significant improvement in the degree of anchoring. Since actual inflation was far from target at the time of our survey, this suggests that the qualitative statement helped to improve the credibility of the ECB's commitment to the target. Taking into account the interaction of treatments with respondents' prior inflation expectations shows that all five treatments were informative in the sense that they reduced respondents' reliance on their priors. However, the treatments containing the ECB projections reduce the reliance on priors significantly more in comparison to the other treatments.

Checking for potential heterogeneity in treatment effects, we find that the effectiveness of the information treatments differs across both levels of financial literacy and levels of trust in the ECB. All information treatments significantly improve the anchoring of medium-term inflation expectations in the sample with high financial literacy, while we find no treatment effects for those with low financial literacy. This implies that a certain level of financial knowledge is necessary in order for the information provided to affect

posterior expectations in the desired way.[2] Moreover, we find that the treatments not containing projections only significantly improve the anchoring of posterior expectations for those with high trust in the ECB, suggesting that a certain degree of trust in the institution is necessary for this type of information to be effective when inflation is far from target.[3]

In order to evaluate the transmission channels of the information treatments, we use survey questions asking respondents whether they found the information new and whether it was informative. Overall, treatment T1 including inflation projections is ranked as new and informative by a significantly higher share of respondents compared to the other treatments. Evaluating transmission channels across levels of financial literacy and trust shows that respondents with high literacy are more likely to view T1 as informative, thus reiterating that literacy is important for the effectiveness of this type of information. Importantly, respondents with higher trust rank all treatments significantly higher in terms of their informativeness. This implies that trust in the central bank is an important ingredient for the effectiveness of both quantitative and qualitative information to affect the anchoring of expectations.

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Our work closely relates and contributes to the growing and rich body of literature that studies the impact of of central bank communication on the formation of inflation expectations using RCT interventions within surveys (Coibion et al., 2018; Binder and Rodrigue, 2018; Coibion et al., 2022; Brouwer and de Haan, 2022a; Dräger et al., 2024). Specifically, our study adds to the findings of other works that evaluate the impact of information treatments on inflation expectations in a more dynamic inflation environment.

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For instance, Weber et al. (2024) find that as inflation rates rise, both individuals and firms start to pay more attention to information related to inflation. McMahon and Rholes (2023) demonstrate that in an environment of poor inflation forecasting performance, the credibility of central banks suffers, however, this detrimental effect can be mitigated with narrative communication. Dräger et al. (2024) show that under rising inflation rates information on inflation projections can dampen the spillovers to short- and long-run inflation expectations, but this effect can backfire if inflation subsequently rises more than previously projected. Finally, Knotek et al. (2024) find that informing households about the latest interest rate hike on average reduces their expectations for inflation over the next five years.

Our experiment design tests quantitative and qualitative statements on their own as well as treatments that combine both types of information. We thus add to the literature on the effectiveness of different types of quantitative information, such as the works of Coibion et al. (2018); Binder (2017); Binder and Rodrigue (2018); Coibion et al. (2022), which focus on the effect of inflation targets, forecasts and paths. We further contribute to works that investigate the effect of combining narrative (qualitative) and quantitative information treatments. Some studies find that the combination of the two types of information increases trust in the central bank (Dräger and Nghiem, 2023) and brings consumers closer to the target (Brouwer and de Haan, 2022a). By contrast, the experiment by D'Acunto et al. (2020), who investigate whether central banks should talk about solely their objectives or the instruments they have in their tool kits to achieve them, find evidence that points in favor of better managed expectations using exclusively information about objectives. Our results suggest that in terms of anchoring expectations, quantitative information about inflation projections stands out as the most effective type of information, while the qualitative information is useful to enhance the credibility of the quantitative inflation target when inflation is far from it.

We further contribute to the literature examining the importance of financial literacy and trust in the central bank in shaping inflation expectations (Afrouzi et al., 2015; Brouwer and de Haan, 2022b; Christelis et al., 2020; Coleman and Nautz, 2023; Dräger and Nghiem, 2023; Haldane et al., 2020; Hayo and Neuenkirch, 2014; Hoffmann et al., 2022; Mellina and Schmidt, 2018; Rumler and Valderrama, 2020; Stanislawska and Paloviita, 2021; van der Cruijsen et al., 2015). While existing studies predominantly focus on the direct impact of financial literacy and trust on consumers' inflation expectations, our research explores the role played by these factors in the degree of effectiveness of the information treatments for the anchoring of medium-term expectations.

Finally, our study relates to the broad literature on the anchoring of both experts' and consumers' inflation expectations. Where previous work evaluates repeated cross-sections of survey data (Beechey et al., 2011; Afrouzi et al., 2015; Dräger and Lamla, 2018) or expectations derived from financial markets (Gürkaynak et al., 2010; Jochmann et al.,

2010; Ehrmann et al., 2011; Strohsal et al., 2016), we estimate causal effects information treatments on the individual degree of anchoring in consumers' inflation expectations.

The rest of our paper is organized as follows. Section 2 discusses the set-up of the survey and the RCT experiment as well as some initial summary statistics. Section 3 presents the results of the empirical analysis of the treatment effects and section 4 concludes.

2 Survey experimental design and data

We conducted our survey using an internet-based panel provided by *Bilendi & respondi*, consisting of 4,000 German consumers during February 3-20, 2023. This sample is representative of the German population in terms of age, gender, income, and region.[6] Following Binder (2020), respondents were eligible to participate in the survey only if they responded affirmatively to the following question:

> We care about the quality of our data. In order for us to get the most accurate measures of your knowledge and opinions, it is important that you thoughtfully provide your best answers to each question in this survey. Do you commit to thoughtfully provide your best answers to each question in this survey?

Our survey starts with a set of questions designed to elicit consumers' demographic characteristics.[7] We then ask three questions about financial literacy, including questions about (1) inflation and real consumption, (2) interest rate compounding, and (3) risk diversification. These questions are taken and slightly modified from Burke and Manz (2014) and Lusardi and Mitchell (2011). We then construct an index of financial literacy counting the number of correct answers to these three questions. Individuals who answer fewer than two financial literacy questions correctly are categorized as having low financial literacy. Conversely, those who answered all three financial literacy questions correctly are classified as having high financial literacy.

Before providing information treatments, we ask all respondents about their (prior) inflation expectations, measured as point forecast for average inflation in Germany in the years 2023, 2025, and 2027, respectively. For our analysis, we focus on medium-term expectations for the years 2025 and 2027. Since the survey was conducted in early 2023, we term these expectations three and five years ahead.

Additionally, before the treatments, we measure respondents' trust, economic preferences as well as behavioral traits such as patience and optimism using qualitative scales between 0 and 10. For instance, we ask respondents to indicate their trust in the ECB on

[6] Note that the sample size for our analysis is significantly lower at about 2,300-2,500 observations. This is because many respondents chose not to report any prior inflation expectations.

[7] The full questionnaire is available in the online appendix A.3.

a scale ranging from 0 to 10, where 0 means no trust at all, while 10 means they fully trust in the ECB. We categorize individuals with low trust in the ECB as those who expressed their trust within the range of 0 to 3. Conversely, individuals were classified as having high trust in the ECB if they indicated their trust within the range of 7 to 10.[8]

We then divide the sample randomly into six groups, including one control group that did not receive any information, while the other five groups each received one of the following pieces of information:

1. **T1** (ECB inflation projections)[9]: Average inflation in the euro zone in 2022 was 8.4%. The European Central Bank (ECB) expects average inflation in the euro zone to be 6.3% in 2023, 3.4% in 2024 and 2.3% in 2025.

2. **T2** (ECB target)[10]: The European Central Bank (ECB) is committed to setting its monetary policy to ensure that inflation stabilizes at its 2% target in the medium term.

3. **T3** (ECB president's statement)[11]: The chairwoman of the European Central Bank (ECB) said "Fighting inflation is our mantra, our mission, our mandate. We know that the current situation is tough for many people across the euro area - that is why we have to raise interest rates to tame inflation."

4. **T4**: (T1 +T3) Average inflation in the euro zone in 2022 was 8.4%. The European Central Bank (ECB) expects average inflation in the euro zone to be 6.3% in 2023, 3.4% in 2024 and 2.3% in 2025.

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5. **T5**: (T2 + T3) The European Central Bank (ECB) is committed to setting its monetary policy to ensure that inflation stabilizes at its 2% target in the medium term.

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[8] The median trust expressed in our sample is at the middle range value of 5.

[9] This text originates from the ECB's monetary policy decisions, press released on December 15, 2022. For more information, see https://www.ecb.europa.eu/press/pr/date/2022/html/ecb.mp221215 f3461d7b6e.en.html.

[10] This text originates from the ECB's monetary policy strategy statement released on July 8, 2021 (paragraph 8). For more information, see https://www.ecb.europa.eu/home/search/review/html/ecb.strategyreview_monpol_strategy_statement.en.html.

[11] This text originates from Christine Lagarde's Twitter post on October 31, 2022. For more information, see https://twitter.com/Lagarde/status/1587083611677003777.

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Table 1: Summary Statistics: Control Group

Variable	Mean	Median	Std. Dev.	Min.	Max.	N
$\pi^{prior,3y}$	5.44	5	3.35	-5	20	457
$\pi^{posterior,3y}$	5.86	6	3.42	-2.8	23.5	428
$\lvert\pi^{posterior,3y} - 2\rvert$	4.02	4	2.92	0	19.25	421
$\pi^{prior,5y}$	4.78	5	3.78	-5	25	411
$\pi^{posterior,5y}$	5.05	5	3.29	-5	20.88	379
$\lvert\pi^{posterior,5y} - 2\rvert$	3.27	3.2	2.79	0	18.5	378

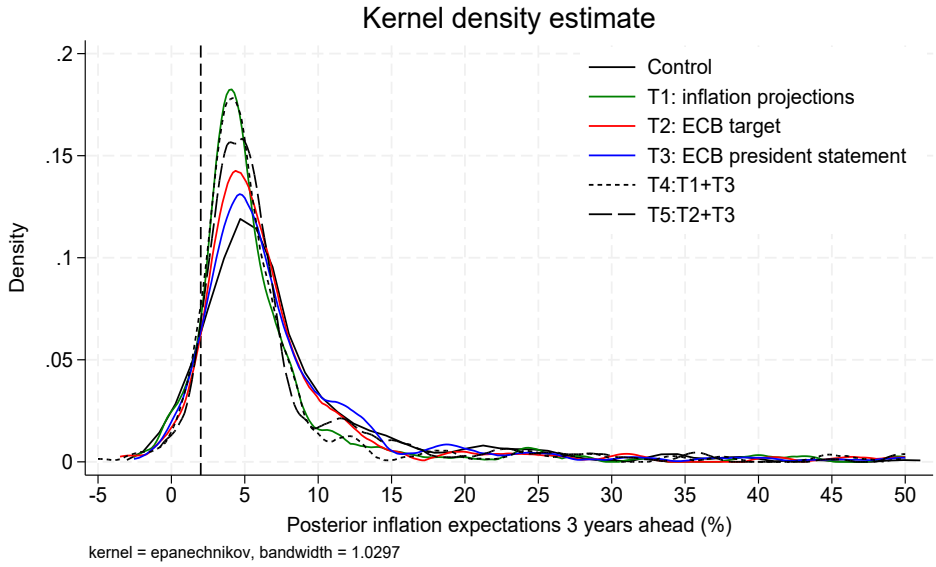
Note: Huber-robust mean, standard deviation, as well as minimum and maximum values are reported.

For those who receive an information treatment, respondents are asked to indicate whether the provided information was new to them (yes or no) and to rate its informativeness on a scale from 0 to 10, where 0 signifies "not informative at all", and 10 represents "very informative".

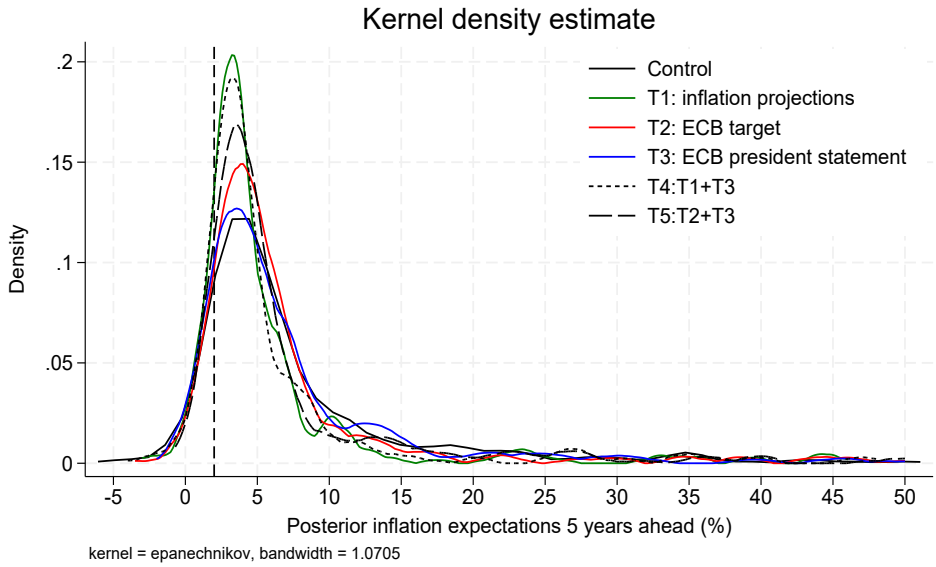
We then ask all respondents again about their (posterior) inflation expectations. To avoid inducing survey fatigue or confusion by asking the same questions twice (D'Acunto et al., 2023), we follow Christelis et al. (2020) and measure posterior expectations by asking about respondents' expected minimum and maximum values of average inflation in 2023, 2025 and 2027 and prompting them to provide the probability on the scale from 0% to 100% that their inflation expectations will be higher than the mid-point between the reported minimum and maximum. We use this information to calculate the weighted mean and the standard deviation of posterior inflation expectations. The level of anchoring of inflation expectations is measured by the absolute distance of medium-run expectations from the 2% target of the ECB and the uncertainty of their predictions, measured by the weighted standard deviations.

In order to test the randomization across treatment groups, we report balance tests in Table A2 in the online appendix. We conduct the tests with respect to all demographic characteristics used as controls in our regression analysis, namely age, gender, the log of household income, whether respondents currently live in East Germany, whether respondents hold at least a high school diploma, whether they are home owners and the number of persons living within the household. We generally find that the treatment groups do not significantly differ from the control group according to these characteristics. There are marginally significant differences in one treatment group with respect to gender, region and homeownership. Overall, we thus conclude that the randomization across these demographic characteristics worked well in all treatment groups. To mitigate the effect

Figure 1: Distributions of Posterior Inflation Expectations across Control and Treatment Groups



(a) *Inflation expectations 3 years ahead*



(b) *Inflation expectations 5 years ahead*

Note: These figures show the distributions of posterior inflation expectations three and five years ahead for both the control and treatment groups, using Kernel density estimates. Individuals with prior and posterior inflation expectations below -5% or above 50% are excluded.

of outliers, we first exclude individuals with inflation expectations below -5% or above 50% in our analysis. We further apply Huber (1964) weights in all regressions in order to endogenously weight outliers in expectations.

Table 1 shows summary statistics with the median as well as Huber robust mean and standard deviation for inflation expectations in the control group. Figure A2 in the online

appendix shows the distribution of inflation expectations measured as point forecast and weighted average for the control group. Both Table 1 and Figure A2 show that the prior and posterior measurement of inflation expectations for the control group yield comparable outcomes. This is as expected, since the control group did not receive any information treatment. Moreover, we observe that in February 2023, German consumers showed strong de-anchoring in inflation expectations. The mean of inflation expectations 3 and 5 years ahead hovers at about 5.5-5.9% and 4.8-5.1%, respectively. This corresponds with an absolute distance of medium-term inflation expectations from the 2% inflation target at about 4 and 3.3 percentage points.

Before delving into regression estimations, we visualize the distributions of posterior inflation expectations for 3 and 5 years ahead all treatment groups in Figure 1. Notably, all groups exhibit right-skewed distributions with a long right tail. However, we find that mean forecasts in the treatment groups tend to converge closer to the inflation target of 2%. This effect is particularly prominent for those who received the inflation projections treatment (T1) or the treatment combining projections with the qualitative statement (T4), while the effect is least pronounced for those who received the treatment including the qualitative statement from the ECB president (T3).

3 Results

3.1 Average Treatment Effects on the Distance from Target and Individual Forecast Uncertainty

In this section, we discuss the average treatment effects on our first two measures of anchored expectations, the absolute distance of posterior expectations from the target of 2 percent and the individual posterior inflation forecast uncertainty.

Equation (1) estimates the average treatment effects on the distance of posterior medium-term inflation expectations from target:

$$|\pi_{i,h}^{post} - 2| = \alpha + \beta|\pi_{i,h}^{prior} - 2| + \sum_{j=1}^{5} \eta_j Treatment_{j,i} + \zeta X_i + \epsilon_i \tag{1}$$

Similarly, equation (2) measures the treatment effects on the posterior uncertainty of medium-term inflation forecasts:

$$\sigma\pi_{i,h}^{post} = \alpha + \beta\pi_{i,h}^{prior} + \sum_{j=1}^{5} \eta_j Treatment_{j,i} + \zeta X_i + \epsilon_i, \tag{2}$$

where $|\pi_{i,h}^{prior} - 2|$ and $|\pi_{i,h}^{post} - 2|$ denote the absolute deviations from the target of 2 percent of individual i's prior and posterior expectations with horizon h, $\sigma\pi_{i,h}^{post}$ is the individual

standard deviation of posterior expectations (not available for prior expectations), $\pi_{i,h}^{prior}$ measures prior expectations, $Treatment_{j,i}$ are the five treatment dummies for T1-T5 and X_i is a vector of socio-demographic control variables, including age, gender, education, household income, homeownership status, household size, and region. We estimate both equations (1) and (2) using Huber (1964) robust regressions, in order to endogenously account for outliers in prior and posterior expectations.

Table 2 shows the results, where columns (1) and (2) present results for the level and the individual forecast uncertainty of posterior expectations three years ahead, and columns (3) and (4) show results for expectations five years, respectively. Figure 2 shows the treatment effects graphically. Controlling for prior expectations as well as a range of socio-demographic controls, we find that informing respondents about the ECB's inflation projections, which forecast a fall in inflation from the high rates in 2022 to rates close to target in 2025, has a signficant impact on both the distance from target and the uncertainty of posterior expectations. Relative to the control group, this treatment significantly reduces the average distance from target by about 70 (80) basis points for three-year-ahead (five-year-ahead) expectations, and reduces posterior forecast uncertainty by about 0.07-0.08 standard deviations. By contrast, neither the information about the ECB's inflation target (T2), nor the qualitative statement about the ECB's commitment to the target of price stability (T3) by themselves affect significantly the anchoring of posterior expectations in relation to the control group. This could imply that respondents realize that current inflation in early 2023 was far from target, so that this information by itself was not sufficient to affect the degree of anchoring in relation to the control group. Similarly, the qualitative commitment statement by ECB president Christine Lagarde seems not effective by itself in anchoring expectations. We also find that adding the statement of commitment to the ECB's projections (T4) does not change the results in comparison to T1, which provides only inflation projections. However, the combination of the information about the ECB's inflation target with the statement of commitment (T5) yields a significant improvement in anchoring relative to the control group, even though this effect remains below the improvements in anchoring generated by the inflation projections.

We further evaluate treatment effects in a Bayesian updating framework, where the results are discussed in online appendix A.1. We find that respondents in all treatment groups put significantly lower weight on their prior expectations compared to those in the control group. This suggests that when controlling for the weight on the prior, all treatments were informative. However, in line with the results shown in this section, adjustment towards the signal is significantly stronger in the treatments including inflation projections (T1 and T4) compared to the other treatments.

In the online appendix, we present additional results evaluating the robustness of our results in Table 2 concerning the time respondents spent reading the information treatments. We exclude participants who spent less than 7 seconds or less than 10 seconds

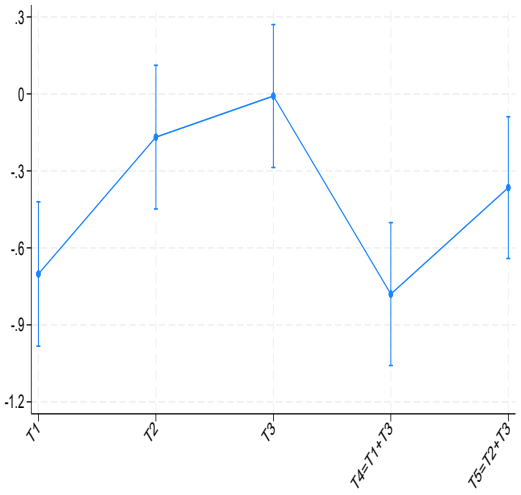
on the treatment text, which corresponds to dropping the 5% and 10% of the sample with the lowest time spent reading the treatments, respectively. Table A5 demonstrates that our average treatment effects remain unchanged for expectations 3 years ahead. However, for models predicting expectations 5 years ahead, Table A6 reveals that treatment T3 about the ECB president's statement becomes statistically significant once we exclude participants who spent very little time reading the treatment. Nevertheless, the magnitude of the estimated effect remains similar to the baseline models. These findings overall suggest that our baseline results are not driven by participants who spent little time reading the treatments.

Table 2: Average Treatment Effects on Posterior Inflation Expectations

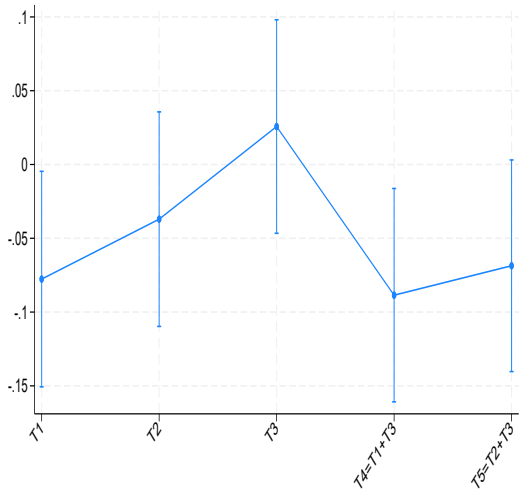
	(1)	(2)	(3)	(4)
	3 years ahead		5 years ahead	
	$\lvert\pi^{post,3y} - 2\rvert$	$\sigma\pi^{post,3y}$	$\lvert\pi^{post,5y} - 2\rvert$	$\sigma\pi^{post,5y}$
$\lvert\pi^{prior} - 2\rvert$	0.60***		0.68***	
	(0.01)		(0.01)	
π^{prior}		0.012***		0.018***
		(0.00)		(0.00)
T1: inflation projections	-0.70***	-0.078***	-0.82***	-0.070**
	(0.12)	(0.03)	(0.11)	(0.03)
T2: ECB target	-0.17	-0.037	-0.18*	-0.043
	(0.12)	(0.03)	(0.11)	(0.03)
T3: ECB president statement	-0.0082	0.026	-0.18	-0.0014
	(0.12)	(0.03)	(0.11)	(0.03)
T4: T1+T3	-0.78***	-0.089***	-0.77***	-0.067**
	(0.12)	(0.03)	(0.11)	(0.03)
T5: T2+T3	-0.37***	-0.069**	-0.50***	-0.032
	(0.12)	(0.03)	(0.11)	(0.03)
R^2	0.692	0.113	0.802	0.124
N observations	2318	2378	2054	2133
Demographic controls	Yes	Yes	Yes	Yes

Note: Demographic controls include age, gender, education, household income, homeownership status, household size, and region. This table reports estimated coefficients from OLS regressions with Huber (1964) weights. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

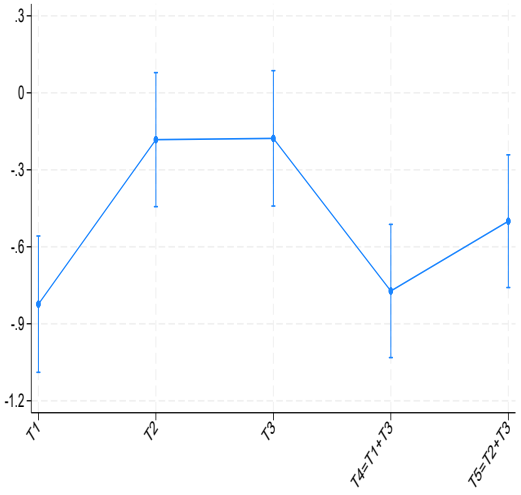
Figure 2: Average Treatment Effects on Posterior Inflation Expectations



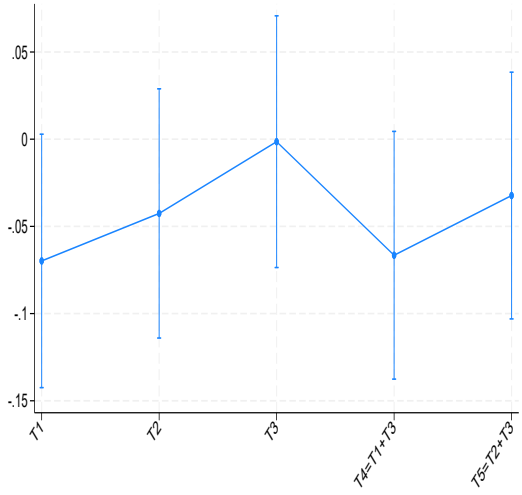
(a) *Inflation Expectations 3 years ahead*



(b) *Uncertainty of Inflation Expectations 3 years ahead*



(c) *Inflation Expectations 5 years ahead*



(d) *Uncertainty of Inflation Expectations 5 years ahead*

Note: All estimates are from Table 2, shown with 95% confidence intervals using Huber (1964) weights and robust standard errors.

We also show further results evaluating potential heterogeneity of treatment effects with respect to the level of prior inflation expectations relative to the inflation target of 2%. Specifically, we examine treatment effects for the samples with prior expectations below 2%, at 2%, or above 2%. Table A7 shows the results for inflation expectations 3 years ahead. Notably, we find no significant treatment effects of T1 among individuals with prior inflation expectations below 2%, nor for T4 and T5 among those with expectations at 2%. However, it is important to acknowledge the small sample size within these two groups, which could contribute to the lack of statistical significance. Consequently, these findings suggest that the results of the overall sample are driven by those predicting inflation 3 years ahead above 2%.

Moving to table A8, which presents the results for inflation expectations 5 years ahead, we observe a notably larger sample predicting inflation below or at 2%. Here, we find significant treatment effects in line with those in Table 2 across all three levels of prior inflation expectations. Interestingly, among those who previously predicted inflation exactly at 2% in the next 5 years, also the treatments T2 and T3 significantly reduce the deviation of posterior inflation expectations from the 2% inflation target. Furthermore, only within this group do the treatments significantly decrease the uncertainty of inflation expectations relative to the control group.

3.2 Heterogeneity in Treatment Effects

In this section, we study whether the treatment effects are heterogeneous across respondents' personal characteristics, focusing in particular on respondents' financial literacy and level of trust in the ECB, which were both measured before the treatments.[12]

The results in Table 3 suggest that the treatments are effective only for respondents with high financial literacy in improving the absolute deviation of posterior expectations from target as well as reducing individual forecast uncertainty. For this group, all treatments significantly reduce both the distance of five-years-ahead expectations from target as well as posterior forecast uncertainty. As before, the treatments including the ECB's inflation projections are the most successful in improving the anchoring of medium-term expectations. While the treatment effects' confidence bands overlap between the groups due to the large standard errors of estimates in the low literacy group, none of the treatment effects are significantly different from zero for this group, with the exception of T2, which shows marginal significance at the 10% level. For T5, we even find a significantly positive treatment effect on forecast uncertainty. Overall, these results suggest that some

[12]We generally split the sample at the median value for each personal characteristic within our sample. For reasons of space limitation, we focus on heterogeneity for the anchoring of expectations 5 years ahead in this section. The heterogeneity results for expectations 3 years ahead are qualitatively similar to those for 5 years ahead and are presented in Tables A3 and A4 in the online appendix.

basic knowledge regarding financial relationships is necessary for central bank information to be effective in anchoring expectations.

Moreover, Table 4 shows that the effectiveness of both quantitative and qualitative information for the degree of anchoring interacts with individuals' trust in the central bank: On the one hand, informing individuals about the ECB's inflation projections reduces the distance from target in their posterior expectations as well as forecast uncertainty for both individuals with high and low trust. This is good news insofar as it suggests a high degree of credibility of ECB predictions that does not depend on general trust in the ECB. On the other hand, the treatments showing the ECB inflation target (T2) or the qualitative statement (T3) are only significant in the high trust sample, suggesting that this information requires a certain degree of trust in the central bank to improve anchoring of expectations. This is plausible since actual inflation was far from target at the time of our RCT study.

Table 3: Heterogeneous Treatment Effects: Financial Literacy

	(1)	(2)	(3)	(4)
	Low Financial Literacy		High Financial Literacy	
	$\lvert\pi^{post,5y}-2\rvert$	$\sigma\pi^{post,5y}$	$\lvert\pi^{post,5y}-2\rvert$	$\sigma\pi^{post,5y}$
$\lvert\pi^{prior}-2\rvert$	0.62***		0.70***	
	(0.02)		(0.02)	
π^{prior}		0.024***		0.023***
		(0.00)		(0.00)
T1: inflation projections	-0.51	0.099	-1.03***	-0.18***
	(0.35)	(0.07)	(0.14)	(0.04)
T2: ECB target	-0.56*	0.021	-0.46***	-0.087*
	(0.33)	(0.06)	(0.14)	(0.05)
T3: ECB president statement	0.022	0.10	-0.46***	-0.15***
	(0.36)	(0.07)	(0.15)	(0.05)
T4: T1+T3	-0.53	0.067	-0.93***	-0.13***
	(0.33)	(0.06)	(0.14)	(0.04)
T5: T2+T3	0.067	0.23***	-0.69***	-0.14***
	(0.35)	(0.07)	(0.14)	(0.04)
R^2	0.729	0.194	0.780	0.198
N observations	563	589	766	761

Note: Demographic controls include age, gender, education, income, home owner, household size, and region. We categorize respondents with a level of financial literacy below the median of 2 in the low literacy group, and above 2 in the high literacy group. This table reports estimated coefficients from OLS regressions with Huber (1964) weights. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Can we relate the heterogeneity in treatment effects across levels of financial literacy and trust in the central bank to other types of literacy, behavioral traits or demographic characteristics? First, we evaluate whether heterogeneity with respect to financial literacy might be related to knowledge about monetary policy or to general education. Splitting

Table 4: Heterogeneous Treatment Effects: Trust in the Central Bank

	(1)	(2)	(3)	(4)
	Low Trust in the ECB		High Trust in the ECB	
	$\lvert\pi^{post,5y} - 2\rvert$	$\sigma\pi^{post,5y}$	$\lvert\pi^{post,5y} - 2\rvert$	$\sigma\pi^{post,5y}$
$\lvert\pi^{prior} - 2\rvert$	0.69***		0.64***	
	(0.02)		(0.02)	
π^{prior}		0.015***		0.015***
		(0.00)		(0.00)
T1: inflation projections	-1.02***	-0.18***	-1.13***	-0.12**
	(0.22)	(0.06)	(0.17)	(0.05)
T2: ECB target	0.037	-0.11*	-0.57***	-0.088*
	(0.22)	(0.06)	(0.17)	(0.05)
T3: ECB president statement	-0.39*	-0.10	-0.61***	-0.069
	(0.22)	(0.06)	(0.18)	(0.06)
T4: T1+T3	-0.64***	-0.15**	-1.10***	-0.11**
	(0.22)	(0.06)	(0.18)	(0.06)
T5: T2+T3	-0.43*	-0.080	-0.81***	-0.10*
	(0.23)	(0.06)	(0.18)	(0.05)
R^2	0.848	0.166	0.707	0.119
N observations	635	651	602	640

Note: Demographic controls include age, gender, education, income, home owner, household size, and region. We categorize individuals with low trust in the ECB as those who expressed their trust within the range of 0 to 3. Conversely, individuals were classified as having high trust in the ECB if they indicated their trust within the range of 7 to 10. This table reports estimated coefficients from OLS regressions with Huber (1964) weights. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

the sample between those without high school diploma ("Abitur") and those with a high school diploma or college degree (Table A9), we find no significant differences in the treatment effects across education levels. This suggests that it is not the general level of education, but specifically financial education, which is relevant for this type of information to affect the degree of anchoring. Moreover, Table A10 in the online appendix presents results for a sample split according to low and high monetary policy literacy, derived from an index constructed from two dummy variables measuring whether respondents correctly identified the ECB's inflation target and whether they correctly chose "stabilize prices for goods and services" as the main objective of the monetary policy by the ECB. We also find that the treatment effects do not differ statistically between those with low and high monetary policy literacy. If anything, the estimated treatment effects are larger for those with low knowledge about monetary policy (in line with the results in Dräger and Nghiem, 2023), and in the case of treatment T5, they are only significantly different from zero in the low monetary policy literacy group. Overall, the result in Table A1 thus can be explained by neither education in general, nor specific knowledge about the ECB's monetary policy. Rather, it seems to show that some basic understanding of financial relationships is important in order for specific information on monetary policy to affect respondents' posterior forecasts.

Second, we test whether heterogeneity with respect to trust in the central bank relates to behavioral traits, such as general trust in others, risk preferences, the level of patience or the level of optimism. The results are presented in Tables A11-A15 in the online appendix. Splitting the sample with respect to high and low levels of trust in other people, which may be regarded as a proxy for social trust, yields similar results to those in Table 3 (Table A11). This suggests that the effectiveness of information, particularly the one not including the projections, for the anchoring of inflation expectations relates to both social trust and trust in the institution. Interestingly, however, the heterogeneity with respect to risk preferences and patience seems to work in the other direction. Even though both trust and willingness to take risks as well as trust and patience are positively correlated in the sample[13], we find that more treatments are effective for the anchoring of posterior expectations in the risk-averse or impatient groups of the sample. In particular, treatment T3 showing the qualitative statement of commitment improves the anchoring only in the risk-averse sample (Tables A12-A13), and both treatments T2 and T3 improve the anchoring only in the impatient sample (Table A14). Finally, the treatment effects do not differ according to the level of pessimism or optimism (Table A15). Overall, the results for behavioral traits show that these matter for the effectiveness of the treatments, in particular those not including inflation projections. At the same time, the variation we

[13]Correlation coefficients in the full sample are 0.16 between trust in the ECB and the level of patience, 0.20 between general trust in others and the level of patience, 0.26 between trust in the ECB and willingness to take risks in general and 0.29 between trust in the ECB and willingness to take financial risks.

find according to trust in the ECB is not related to other behavioral traits except social trust.

Finally, Tables A9-A20 in the online appendix test for heterogeneity in the treatment effects with respect to demographic variation according to income, gender, age and region. The treatment effects on the distance of posterior expectations from the inflation target are not statistically different when we split the sample into either low ($< 2{,}500$ € monthly household income) and high ($\geq 4{,}000$ € monthly household income) income groups (Table A16) or according to gender (Table A17). However, the treatments T1, T2 and T4 significantly reduce forecast uncertainty of posterior medium-run expectations in the male sample, while the effects are not significant for the female sample. Table A19 shows treatment effects when splitting the sample into those below or above the age of 50. Here, we find that the treatment effects including inflation projections do not differ between the samples, while the treatment effects when informing about the ECB's inflation target (T2 and T5) in the overall sample seems to be driven by the younger respondents. Finally, Table A20 reports treatment effects when splitting the sample between regions. Respondents living in states that were part of the former German Democratic Republic (GDR) in East Germany are more responsive to the treatment informing about the ECB inflation target and the qualitative statement by Madame Lagarde (T2 and T3) compared to those living in states within West Germany. Again, the treatment effects including inflation projections do not differ across regions. Overall, the results show that the treatment effects of treatments including the inflation projections are independent of demographic characteristics, whereas there seems to be some variation in effectiveness of information about the inflation target and the qualitative statement according to respondents' age and region.

3.3 Transmission of Information

To assess the transmission channels of our information treatments, respondents were asked to indicate whether the provided information was new to them (yes or no) and to rate its informativeness on a scale from 0 to 10, where 0 signifies 'not informative at all' and 10 represents 'very informative'. We present the summary statistics of these variables graphically in Figure 3.

In line with the findings from the previous sections, we find that inflation projections are classified as new information by the largest share of respondents, with information about the target and the qualitative statement of commitment ordered after that. Still, about 55% of respondents in the full sample say the ECB's target was new information for them. Similarly, the ECB's projections are considered the most informative, with an informativeness mean rating of 7.1 on a scale from 0 to 10. This is followed by the ECB target at 6.4 and the qualitative statement of commitment at 5.5. Surprisingly, adding

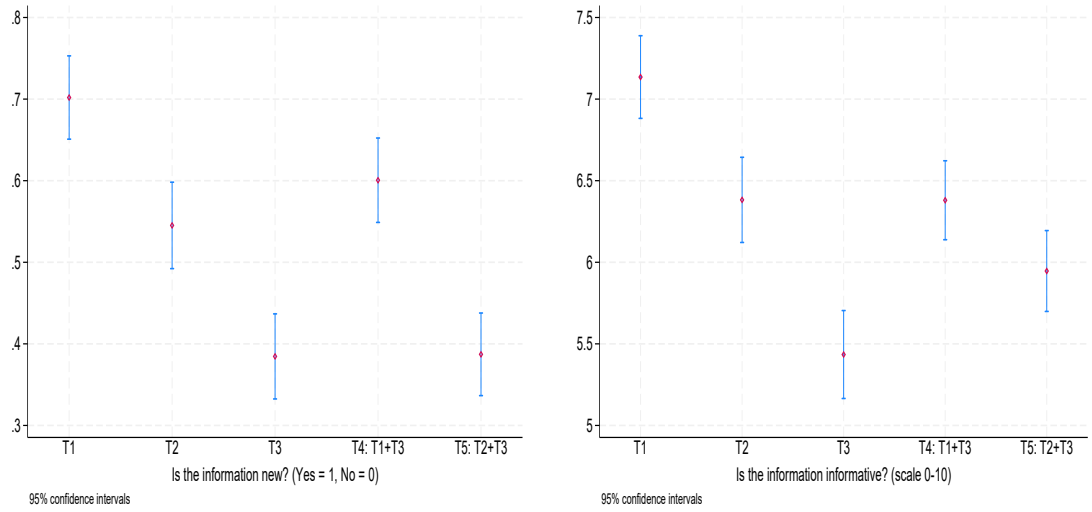
the statement of commitment to projections or the target makes this information less informative in the eyes of respondents.

To explore the reason for the heterogeneity of the information treatment effects across financial literacy and trust in the ECB, we estimate the correlation between these factors and respondents' assessment of the information treatment. Specifically, we use probit regressions to estimate the marginal effects of financial literacy and trust in the ECB on whether the provided information is new to them, while we use OLS regressions to estimate these effects on the informativeness of provided information, controlling for the full set of demographic variables. We show the results graphically in Figure 4 (with the corresponding Tables A22 - A25 in the online appendix). For financial literacy, we find that financially literate respondents are significantly less likely to view the provided information treatment as new, except for treatment T4 (Figure 4a and Table A22 in the online appendix). Importantly, respondents with high literacy view the ECB projections as more informative than those with low literacy, reiterating our earlier interpretation that basic knowledge is important in order for the information to be effective. However, the differences in informativeness across literacy groups is less pronounced for all other treatments (Figure 4b and Table A23 in the online appendix).

Regarding the trust in the ECB, Figure 4c (and Table A24 in the online appendix) show that the level of trust does not matter for whether respondents view the information treatments as new information. However, respondents with high trust give significantly higher ratings in terms of informativeness to all information treatments compared to those with low trust as shown in Figure 4d (and Table A25 in the online appendix). These results suggest that the response of consumers to provided information treatments in forming posterior inflation expectations depends on the informativeness of the information rather than on whether the information is new to them.[14]

[14]Table A21 in the online appendix additionally estimates the correlation between demographic characteristics, financial literacy, and trust in the ECB and the time spent reading the information treatments. We observe that individuals with higher financial literacy on average spent more time reading the treatments, while there is a negative correlation between the level of trust in the ECB and the time spent reading the treatment.

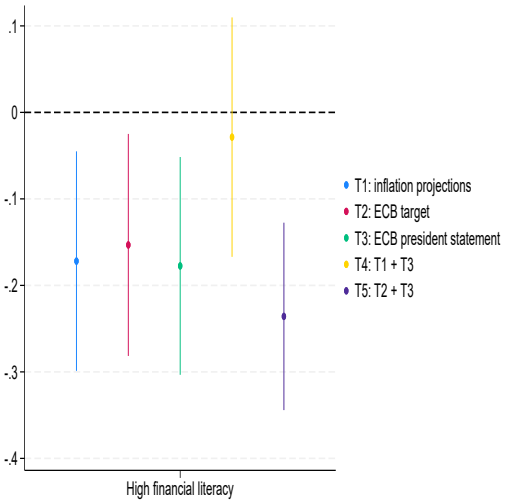
Figure 3: Households' Assessment of Information Treatments



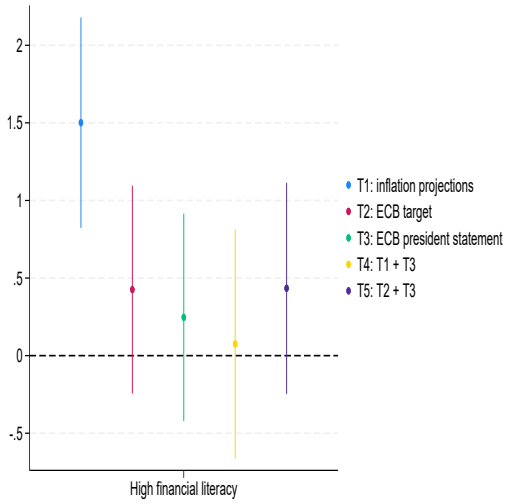
(a) *Is the information new? (Y/N)* (b) *Is the information informative? (scale 0-10)*

Note: This figure shows the average perception of the information treatments as new and informative, with 95% confidence intervals. The newness of the information is measured by a dummy variable, taking the value of one if respondents indicated the information was new, and zero otherwise. The degree of informativeness is rated on a scale from 0 to 10.

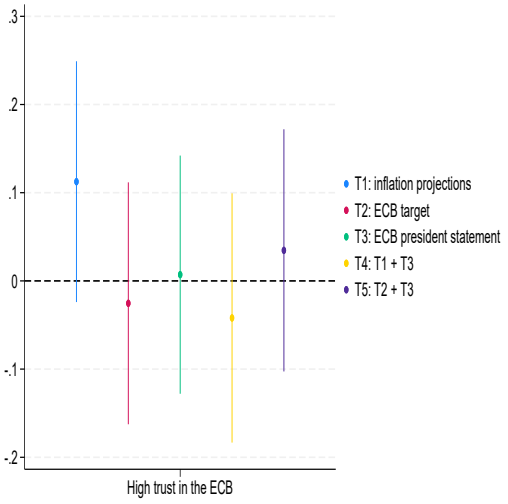
Figure 4: The Effect of Financial Literacy and Trust in the ECB on the Assessment of Information Treatments



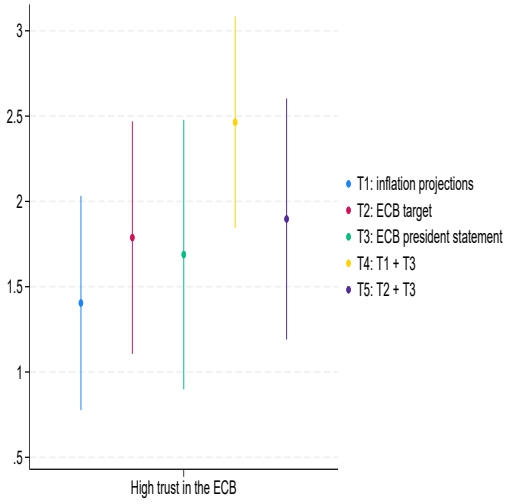
(a) *New information*



(b) *Informative information*



(c) *New information*



(d) *Informative information*

Note: These figures present the marginal effects of financial literacy and trust in the ECB on two aspects: whether the information treatment is new (using Probit regressions) and the informativeness of information treatment (using OLS regressions) with 95% confidence intervals using robust standard errors. Demographic controls include age, gender, education, household income, homeownership status, household size, and region. In the online appendix, Tables A22 - A25 show the corresponding regression results.

4 Conclusion

In this paper, we evaluate the effectiveness of both quantitative and qualitative information provided by the ECB on the anchoring of medium-term inflation expectations within a representative sample of about 4,000 German households. During the height of the recent inflationary period in February, 2023, we ran a randomized controlled trial (RCT) where survey respondents were randomly allocated into five treatment groups and a control group. The control group received no information, while the treatment groups received either quantitative information about ECB inflation projections or the ECB inflation target, a qualitative statement of commitment to the target by ECB President Christine Lagarde, or a combination of quantitative and qualitative information.

The results show that all information treatments are informative, as they reduce participants' reliance on their prior expectations. Among all five information treatments, the inflation projections predicting a downward trend in inflation until 2025 are most effective in improving the anchoring of medium-term expectations three and five years ahead. However, combining the information about the inflation target with the qualitative statement of commitment also significantly improves the degree of anchoring. This shows that even when current inflation is far from target, such a combination of information may still be valuable for a better anchoring of inflation expectations.

Analyzing the potential heterogeneity of treatment effects, we report that the treatment effects are more pronounced for respondents with high financial literacy or high trust in the ECB. The heterogeneity with respect to financial literacy cannot be explained with heterogeneity regarding either general education or knowledge about the monetary policy of the ECB. The heterogeneity with respect to trust in the ECB is similar to heterogeneity regarding respondents' social trust ('trust in others in general'), but not related to heterogeneity regarding risk preferences or patience. Similarly, the heterogeneity we find regarding either financial literacy or trust in the ECB cannot be explained by other personal or demographic characteristics like optimism, household income, gender, age or region.

How is the information in the treatments transmitted to respondents? Respondents with high financial literacy rate the informativeness of the treatment with inflation projections significantly higher than those with low literacy. This suggests that this particular type of knowledge is relevant to the understanding of information about current and projected inflation. Importantly, respondents with high trust in the central bank rate the informativeness of all information treatments more highly than those with low trust. In line with other work showing that trust is relevant for the formation of inflation expectations (e.g. Stanislawska and Paloviita, 2021; Brouwer and de Haan, 2022a,b; Christelis et al., 2020), these results imply that trust is also important for both quantitative and

qualitative information to be viewed as relevant, and this interacts with how effective this information is for the anchoring of inflation expectations.

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A ONLINE APPENDIX

A.1 Treatment Effects: Bayesian Updating Approach

Following Coibion et al. (2022, 2023) as well as Coibion et al. (2023), we study the interaction of treatment effects with prior expectations. This allows us to account for heterogeneity in treatment effects depending on the prior degree of anchoring, i.e. the absolute prior deviation from target. Moreover, this specification may be interpreted in terms of Bayesian belief formation, where posterior beliefs are formed as a weighted average between prior beliefs and the information signal:

$$belief^{post} = G \times information + (1 - G) \times belief^{prior} \tag{3}$$

In our study, prior and posterior beliefs are formed regarding the anchoring of expectations. In our specification, this refers to the absolute distance of expectations three and five years ahead from the target, respectively. The information treatments are the signals. For the control group, we would thus expect posterior beliefs to be equal to prior beliefs, since no information signal is provided. However, as discussed also in Coibion et al. (2022, 2023) as well as Coibion et al. (2023), since we measure prior and posterior beliefs with different questions in order to avoid survey fatigue, the correlation may be less than one. We estimate the relation in (3) for our set-up as follows:

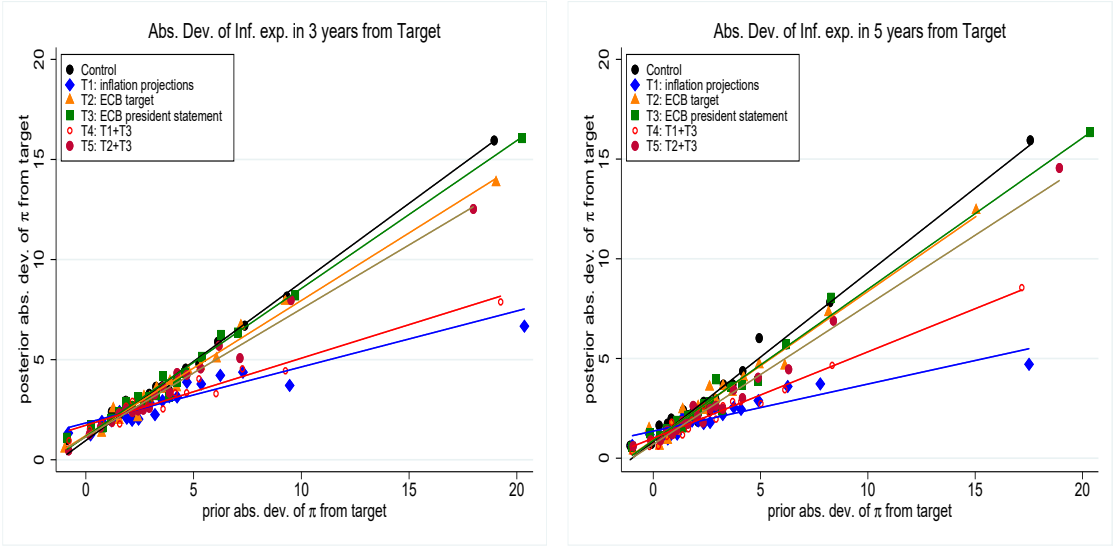
$$\begin{aligned} |\pi_i^{post} - 2| = \alpha + \beta|\pi_i^{prior} - 2| + \sum_{j=1}^{5} \eta_j Treatment_{j,i} \\ + \sum_{j=1}^{5} \lambda_j Treatment_{j,i} \times |\pi_i^{prior} - 2| + \zeta X_i + \epsilon_i \end{aligned} \tag{4}$$

The coefficient β estimates the persistence in expectations (measured as absolute distance from target) with respect to prior expectations within the control group. The sum of coefficients $\beta + \lambda_j$ then measures heterogeneity in the persistence relative to prior expectations across treatment groups. Thus, a negative λ_j coefficient for any treatment j implies that respondents in this treatment put a relatively lower weight on prior expectations compared to those in the control group. Thus, the treatment can be regarded as informative according to equation (3).

As before, we estimate (4) using Huber (1964) robust regressions. Figure A1 shows binscatter plots based on the Huber weights from (4). We also report the estimation results separately in Table A1. As expected, we observe a positive correlation between prior and posterior deviations in expectations from target with a correlation close to one. In line with our results from Table 2, the binscatter plots for expectations three and five years ahead are very similar. Also in line with the results above, we observe that respondents in T4 and T1 put significantly lower weight on the prior deviation

of expectations from target for any given level of prior anchoring. This reiterates our earlier finding that information about the downward trajectory in inflation projections by the ECB is particulary powerful in anchoring medium-term expectations. Interestingly, extending the signal of the projections with a qualitative statement of commitment reduces the dependence of respondents on the prior, particularly for expectations five years ahead. However, combining the qualitative statement with the information about the ECB's inflation target still yields a stronger impact on the anchoring, at least in the case of expectations three years ahead.

Figure A1: Updating of Inflation Beliefs by Information Treatments



(a) *Expectations 3 years ahead* (b) *Expectations 5 years ahead*

Note: Binscatter plots weighted with Huber weights from the regressions in Table A1.

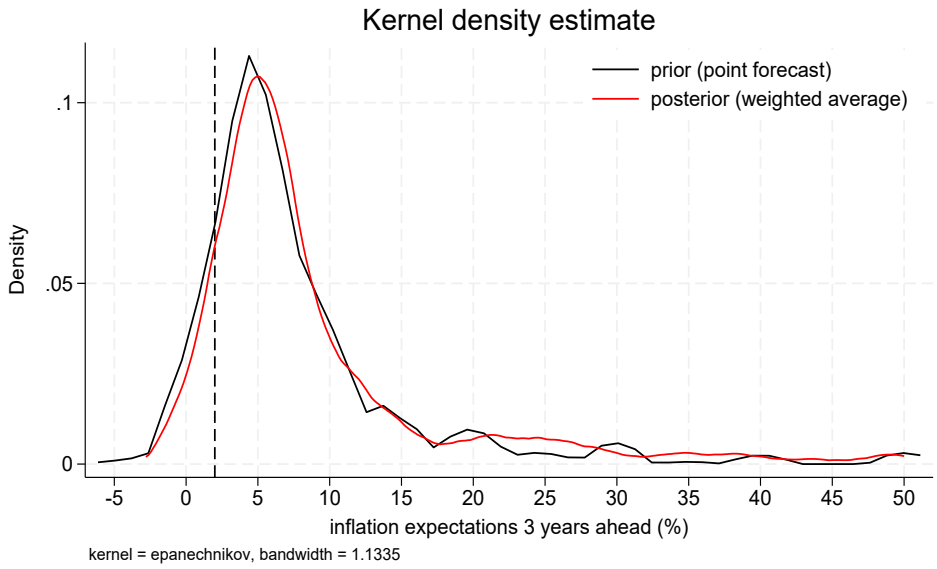
Table A1: Effect of Treatments on Posterior Expectations: Bayesian Updating Approach

	(1) $\lvert\pi^{post,3y} - 2\rvert$	(2) $\lvert\pi^{post,5y} - 2\rvert$
$\lvert\pi^{prior} - 2\rvert$	0.78***	0.85***
	(0.02)	(0.02)
T1: inflation projections	0.84***	0.49***
	(0.16)	(0.13)
T2: ECB target	0.21	0.057
	(0.15)	(0.13)
T3: ECB president statement	0.15	0.039
	(0.15)	(0.13)
T4: T1+T3	0.72***	0.18
	(0.15)	(0.13)
T5: T2+T3	0.16	-0.12
	(0.16)	(0.12)
T1: inflation projections $\times$ $\lvert\pi^{prior} - 2\rvert$	-0.50***	-0.60***
	(0.04)	(0.03)
T2: ECB target $\times$ $\lvert\pi^{prior} - 2\rvert$	-0.11***	-0.097***
	(0.03)	(0.03)
T3: ECB president statement $\times$ $\lvert\pi^{prior} - 2\rvert$	-0.045	-0.091***
	(0.03)	(0.03)
T4: T1+T3 $\times$ $\lvert\pi^{prior} - 2\rvert$	-0.45***	-0.42***
	(0.03)	(0.03)
T5: T2+T3 $\times$ $\lvert\pi^{prior} - 2\rvert$	-0.15***	-0.15***
	(0.04)	(0.03)
R^2	0.768	0.815
N observations	2312	2051
Demographic controls	Yes	Yes

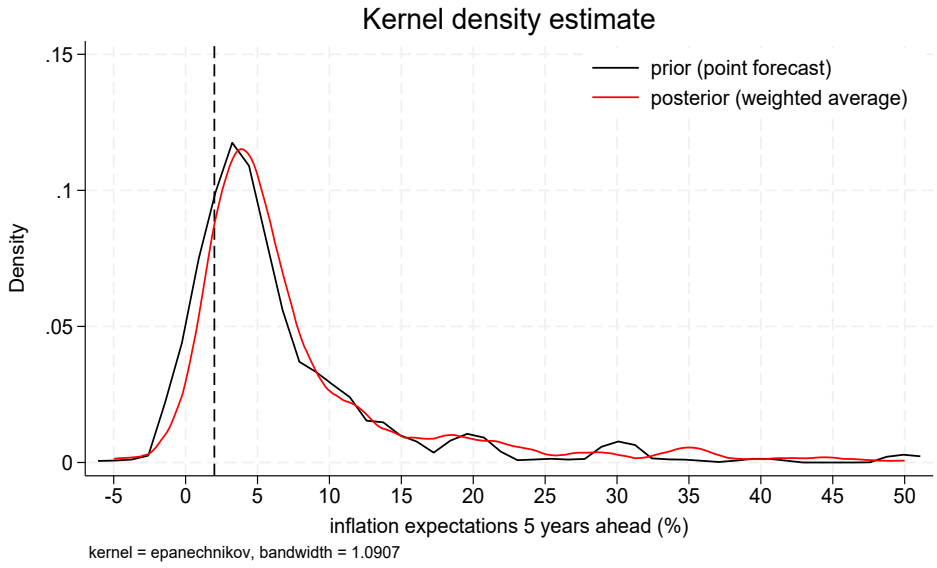
Note: Demographic controls include age, gender, education, household income, homeownership status, household size, and region. This table reports estimated coefficients from OLS regressions with Huber (1964) weights. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

A.2 Further Results

Figure A2: Inflation Expectations Distribution among the Control Group: Prior vs. Posterior



(a) *Inflation expectations 3 years ahead*



(b) *Inflation expectations 5 years ahead*

Note: These figures present the distributions of prior and posterior inflation expectations for three and five years ahead among the control group, using Kernel density estimates. Individuals with inflation expectations below -5% or above 50%, both prior and posterior, are excluded.

Table A2: Balance Tests for Demographic Characteristics: Control Group vs. Treatment Groups

	Groups						P-values from pairwise t-tests				
Variable	(1) Control	(2) T1 Inf. proj.	(3) T2 ECB tar.	(4) T3 ECB pres. stmt.	(5) T4 T1+T3	(6) T5 T2+T3	(2)-(1)	(3)-(1)	(4)-(1)	(5)-(1)	(6)-(1)
Age	48.251	47.340	47.625	47.514	48.516	47.498	0.309	0.486	0.411	0.766	0.404
	(16.518)	(16.171)	(16.470)	(16.264)	(16.044)	(16.311)					
Male	0.514	0.478	0.496	0.466	0.498	0.514	0.188	0.496	0.079*	0.549	0.988
	(0.500)	(0.500)	(0.500)	(0.499)	(0.500)	(0.500)					
Log of household income	2.716	2.669	2.751	2.699	2.749	2.755	0.406	0.546	0.767	0.565	0.496
	(1.041)	(1.022)	(1.059)	(1.048)	(1.040)	(1.014)					
Living in East Germany	0.163	0.131	0.144	0.149	0.152	0.142	0.090*	0.321	0.463	0.550	0.272
	(0.370)	(0.337)	(0.351)	(0.356)	(0.359)	(0.349)					
High school diploma	0.337	0.347	0.359	0.335	0.325	0.346	0.695	0.402	0.940	0.643	0.737
	(0.473)	(0.477)	(0.480)	(0.472)	(0.469)	(0.476)					
House owner	0.458	0.452	0.482	0.468	0.490	0.511	0.842	0.367	0.714	0.230	0.053*
	(0.499)	(0.498)	(0.500)	(0.499)	(0.500)	(0.500)					
Household size	2.434	2.354	2.438	2.445	2.358	2.370	0.207	0.953	0.862	0.229	0.320
	(1.172)	(1.152)	(1.221)	(1.185)	(1.137)	(1.153)					

Note: Columns (1)-(6) show mean values of demographic characteristics within treatment groups, with standard errors in brackets. Columns (7)-(11) present p-values from pairwise t-tests for the null hypothesis of equal means between treatment groups and the control group.

Table A3: Heterogeneous Treatment Effects: Financial Literacy

	(1)	(2)	(3)	(4)
	Low Financial Literacy		High Financial Literacy	
	$\lvert\pi^{post,3y} - 2\rvert$	$\sigma\pi^{post,3y}$	$\lvert\pi^{post,3y} - 2\rvert$	$\sigma\pi^{post,3y}$
$\lvert\pi^{prior} - 2\rvert$	0.70***		0.61***	
	(0.02)		(0.02)	
π^{prior}		0.013***		0.0084**
		(0.00)		(0.00)
T1: inflation projections	-0.57	0.068	-1.15***	-0.15***
	(0.35)	(0.07)	(0.16)	(0.04)
T2: ECB target	0.16	-0.0012	-0.77***	-0.067
	(0.32)	(0.07)	(0.15)	(0.05)
T3: ECB president statement	0.34	0.11	-0.41**	-0.051
	(0.33)	(0.07)	(0.16)	(0.05)
T4: T1+T3	-0.57*	0.0047	-0.86***	-0.13***
	(0.33)	(0.07)	(0.15)	(0.04)
T5: T2+T3	0.48	0.085	-0.83***	-0.20***
	(0.33)	(0.07)	(0.15)	(0.04)
R^2	0.772	0.098	0.660	0.191
N observations	655	668	842	846

Note: Demographic controls include age, gender, education, income, home owner, household size, and region. We categorize respondents with a level of financial literacy below the median of 2 in the low literacy group, and above 2 in the high literacy group. This table reports estimated coefficients from OLS regressions with Huber (1964) weights. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A4: Heterogeneous Treatment Effects: Trust in the Central Bank

	(1)	(2)	(3)	(4)
	Low Trust in the ECB		High Trust in the ECB	
	$\lvert\pi^{post,3y} - 2\rvert$	$\sigma\pi^{post,3y}$	$\lvert\pi^{post,3y} - 2\rvert$	$\sigma\pi^{post,3y}$
$\lvert\pi^{prior} - 2\rvert$	0.58***		0.61***	
	(0.02)		(0.03)	
π^{prior}		0.0099***		0.0053*
		(0.00)		(0.00)
T1: inflation projections	-0.81***	-0.19***	-0.70***	-0.10**
	(0.25)	(0.06)	(0.20)	(0.05)
T2: ECB target	0.019	-0.12*	-0.45**	-0.074
	(0.25)	(0.07)	(0.21)	(0.05)
T3: ECB president statement	-0.26	-0.077	-0.14	0.0066
	(0.25)	(0.07)	(0.21)	(0.05)
T4: T1+T3	-0.76***	-0.23***	-0.84***	-0.029
	(0.24)	(0.06)	(0.22)	(0.06)
T5: T2+T3	-0.42*	-0.092	-0.52**	-0.12**
	(0.24)	(0.07)	(0.21)	(0.05)
R^2	0.736	0.102	0.597	0.139
N observations	707	726	672	706

Note: Demographic controls include age, gender, education, income, home owner, household size, and region. We categorize individuals with low trust in the ECB as those who expressed their trust within the range of 0 to 3. Conversely, individuals were classified as having high trust in the ECB if they indicated their trust within the range of 7 to 10. This table reports estimated coefficients from OLS regressions with Huber (1964) weights. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A5: Average Treatment Effects on Posterior Expectations 3 Years Ahead across Time Spent Reading Treatment

	(1)	(2)	(3)	(4)	(5)	(6)
	Whole sample		Time on treatment > 6 seconds		Time on treatment > 9 seconds	
	$\lvert\pi^{post,3y} - 2\rvert$	$\sigma\pi^{post,3y}$	$\lvert\pi^{post,3y} - 2\rvert$	$\sigma\pi^{post,3y}$	$\lvert\pi^{post,3y} - 2\rvert$	$\sigma\pi^{post,3y}$
$\lvert\pi^{post,1y} - 2\rvert$	0.60***		0.60***		0.57***	
	(0.01)		(0.01)		(0.01)	
π^{prior}		0.012***		0.0093***		0.010***
		(0.00)		(0.00)		(0.00)
T1: inflation projections	-0.70***	-0.078***	-0.70***	-0.077***	-0.75***	-0.064**
	(0.12)	(0.03)	(0.12)	(0.03)	(0.12)	(0.03)
T2: ECB target	-0.17	-0.037	-0.18	-0.041	-0.19	-0.036
	(0.12)	(0.03)	(0.12)	(0.03)	(0.12)	(0.03)
T3: ECB president statement	-0.0082	0.026	-0.049	0.026	-0.075	0.029
	(0.12)	(0.03)	(0.12)	(0.03)	(0.12)	(0.03)
T4: T1+T3	-0.78***	-0.089***	-0.80***	-0.086***	-0.80***	-0.074**
	(0.12)	(0.03)	(0.12)	(0.03)	(0.12)	(0.03)
T5: T2+T3	-0.37***	-0.069**	-0.34***	-0.078***	-0.36***	-0.081***
	(0.12)	(0.03)	(0.12)	(0.03)	(0.12)	(0.03)
R^2	0.692	0.113	0.697	0.112	0.679	0.114
N observations	2318	2378	2278	2327	2217	2261

Note: Demographic controls include age, gender, household income, homeownership status, household size, and region. Columns (1) and (2) show the results for the entire sample as the baseline. Columns (3) and (4) show the results for those who spent more than 6 seconds reading the information treatment, corresponding to excluding 5% of sample size of the treated groups. Columns (5) and (6) show the results for those who spent more than 9 seconds reading the information treatment, corresponding to excluding 10% of sample size of the treated groups. This table reports estimated coefficients from OLS regressions with Huber (1964) weights. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A6: Average Treatment Effects on Posterior Expectations 5 Years Ahead across Time Spent Reading Treatment

	(1)	(2)	(3)	(4)	(5)	(6)
	Whole sample		Time on treatment > 6 seconds		Time on treatment > 9 seconds	
	$\lvert\pi^{post,5y} - 2\rvert$	$\sigma\pi^{post,5y}$	$\lvert\pi^{post,5y} - 2\rvert$	$\sigma\pi^{post,5y}$	$\lvert\pi^{post,5y} - 2\rvert$	$\sigma\pi^{post,5y}$
$\lvert\pi^{post,1y} - 2\rvert$	0.68***		0.67***		0.67***	
	(0.01)		(0.01)		(0.01)	
π^{prior}		0.018***		0.016***		0.017***
		(0.00)		(0.00)		(0.00)
T1: inflation projections	-0.82***	-0.070**	-0.84***	-0.070**	-0.85***	-0.060**
	(0.11)	(0.03)	(0.11)	(0.03)	(0.11)	(0.03)
T2: ECB target	-0.18*	-0.043	-0.19*	-0.045	-0.20*	-0.044
	(0.11)	(0.03)	(0.11)	(0.03)	(0.11)	(0.03)
T3: ECB president statement	-0.18	-0.0014	-0.22**	0.0032	-0.24**	0.0071
	(0.11)	(0.03)	(0.11)	(0.03)	(0.11)	(0.03)
T4: T1+T3	-0.77***	-0.067**	-0.80***	-0.065**	-0.80***	-0.059**
	(0.11)	(0.03)	(0.11)	(0.03)	(0.11)	(0.03)
T5: T2+T3	-0.50***	-0.032	-0.49***	-0.041	-0.50***	-0.044
	(0.11)	(0.03)	(0.11)	(0.03)	(0.11)	(0.03)
R^2	0.802	0.124	0.785	0.116	0.782	0.123
N observations	2054	2133	2014	2091	1963	2029

Note: Demographic controls include age, gender, household income, homeownership status, household size, and region. Columns (1) and (2) show the results for the entire sample as the baseline. Columns (3) and (4) show the results for those who spent more than 6 seconds reading the information treatment, corresponding to excluding 5% of sample size of the treated groups. Columns (5) and (6) show the results for those who spent more than 9 seconds reading the information treatment, corresponding to excluding 10% of sample size of the treated groups. This table reports estimated coefficients from OLS regressions with Huber (1964) weights. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A7: Heterogeneous Treatment Effects: Prior Inflation Expectations 3 Years Ahead

	(1)	(2)	(3)	(4)	(5)	(6)
	$\pi^{prior} < 2$		$\pi^{prior} = 2$		$\pi^{prior} > 2$	
	$\lvert\pi^{post,3y} - 2\rvert$	$\sigma\pi^{post,3y}$	$\lvert\pi^{post,3y} - 2\rvert$	$\sigma\pi^{post,3y}$	$\lvert\pi^{post,3y} - 2\rvert$	$\sigma\pi^{post,3y}$
$\lvert\pi^{prior} - 2\rvert$	0.31***				0.61***	
	(0.06)				(0.01)	
π^{prior}		-0.041*				0.010***
		(0.02)				(0.00)
T1: inflation projections	-0.27	-0.091	-0.69**	-0.21**	-0.80***	-0.087***
	(0.29)	(0.11)	(0.34)	(0.11)	(0.13)	(0.03)
T2: ECB target	0.074	-0.19*	-0.69**	-0.099	-0.20	-0.034
	(0.32)	(0.11)	(0.32)	(0.12)	(0.13)	(0.03)
T3: ECB president statement	-0.080	-0.036	-0.62*	-0.22*	0.022	0.043
	(0.29)	(0.11)	(0.36)	(0.12)	(0.14)	(0.03)
T4: T1+T3	-0.57**	-0.065	-0.39	-0.055	-0.90***	-0.11***
	(0.28)	(0.11)	(0.33)	(0.11)	(0.13)	(0.03)
T5: T2+T3	-0.54**	0.19	-0.53	-0.14	-0.35***	-0.099***
	(0.27)	(0.13)	(0.34)	(0.11)	(0.13)	(0.03)
R^2	0.153	0.153	0.164	0.243	0.712	0.118
N observations	217	238	124	123	1966	2015

Note: Demographic controls include age, gender, education, household income, homeownership status, household size, and region. This table reports estimated coefficients from OLS regressions with Huber (1964) weights. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A8: Heterogeneous Treatment Effects: Prior Inflation Expectations 5 Years Ahead

	(1)	(2)	(3)	(4)	(5)	(6)
	$\pi^{prior} < 2$		$\pi^{prior} = 2$		$\pi^{prior} > 2$	
	$\lvert\pi^{post,5y} - 2\rvert$	$\sigma\pi^{post,5y}$	$\lvert\pi^{post,5y} - 2\rvert$	$\sigma\pi^{post,5y}$	$\lvert\pi^{post,5y} - 2\rvert$	$\sigma\pi^{post,5y}$
$\lvert\pi^{prior} - 2\rvert$	0.18***				0.69***	
	(0.05)				(0.01)	
π^{prior}		-0.033**				0.015***
		(0.01)				(0.00)
T1: inflation projections	-0.42*	-0.024	-0.35**	-0.13*	-0.95***	-0.072*
	(0.22)	(0.06)	(0.16)	(0.08)	(0.14)	(0.04)
T2: ECB target	-0.32	0.0039	-0.34**	-0.23***	-0.12	-0.024
	(0.21)	(0.06)	(0.16)	(0.07)	(0.14)	(0.04)
T3: ECB president statement	-0.32	-0.044	-0.54***	-0.23***	-0.10	0.050
	(0.22)	(0.06)	(0.14)	(0.07)	(0.15)	(0.04)
T4: T1+T3	-0.62***	-0.071	-0.42***	-0.18**	-0.88***	-0.033
	(0.21)	(0.06)	(0.15)	(0.07)	(0.14)	(0.04)
T5: T2+T3	-0.44**	0.096	-0.57***	-0.28***	-0.48***	-0.011
	(0.22)	(0.07)	(0.15)	(0.07)	(0.14)	(0.04)
R^2	0.138	0.116	0.108	0.248	0.810	0.107
N observations	315	321	231	239	1514	1574

Note: Demographic controls include age, gender, education, household income, homeownership status, household size, and region. This table reports estimated coefficients from OLS regressions with Huber (1964) weights. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A9: Heterogeneous Treatment Effects: Education

	(1)	(2)	(3)	(4)
	High Education		Low Education	
	$\lvert\pi^{post,5y} - 2\rvert$	$\sigma\pi^{post,5y}$	$\lvert\pi^{post,5y} - 2\rvert$	$\sigma\pi^{post,5y}$
$\lvert\pi^{prior} - 2\rvert$	0.68***		0.68***	
	(0.01)		(0.01)	
π^{prior}		0.029***		0.011***
		(0.00)		(0.00)
T1: inflation projections	-0.88***	-0.079	-0.77***	-0.050
	(0.15)	(0.05)	(0.16)	(0.04)
T2: ECB target	-0.24*	-0.053	-0.16	-0.029
	(0.14)	(0.05)	(0.16)	(0.04)
T3: ECB president statement	-0.093	0.059	-0.24	-0.031
	(0.16)	(0.06)	(0.16)	(0.04)
T4: T1+T3	-0.73***	-0.11**	-0.79***	-0.034
	(0.15)	(0.05)	(0.15)	(0.04)
T5: T2+T3	-0.55***	-0.059	-0.44***	-0.014
	(0.14)	(0.05)	(0.16)	(0.04)
R^2	0.793	0.136	0.810	0.072
N observations	880	919	1174	1224

Note: Demographic controls include age, gender, household income, homeownership status, household size, and region. We categorize individuals without high school diploma ("Abitur") into the low education group, and those with high school diploma ("Abitur") or college degree into the high education group. This table reports estimated coefficients from OLS regressions with Huber (1964) weights. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A10: Heterogeneous Treatment Effects: Monetary Policy Literacy

	(1)	(2)	(3)	(4)
	Low MPL		High MPL	
	$\lvert\pi^{post,5y}-2\rvert$	$\sigma\pi^{post,5y}$	$\lvert\pi^{post,5y}-2\rvert$	$\sigma\pi^{post,5y}$
$\lvert\pi^{prior}-2\rvert$	0.66***		0.78***	
	(0.01)		(0.02)	
π^{prior}		0.015***		0.012***
		(0.00)		(0.00)
T1: inflation projections	-1.02***	-0.078	-0.40**	-0.037
	(0.23)	(0.06)	(0.19)	(0.05)
T2: ECB target	-0.40*	-0.067	0.14	-0.082*
	(0.23)	(0.06)	(0.18)	(0.05)
T3: ECB president statement	-0.26	-0.039	-0.089	-0.036
	(0.24)	(0.07)	(0.18)	(0.05)
T4: T1+T3	-1.13***	-0.13**	-0.67***	-0.056
	(0.22)	(0.06)	(0.19)	(0.05)
T5: T2+T3	-0.63***	-0.032	-0.19	0.039
	(0.21)	(0.06)	(0.19)	(0.05)
R^2	0.805	0.119	0.853	0.087
N observations	652	691	779	799

Note: Demographic controls include age, gender, education, household income, homeownership status, household size, and region. We categorize respondents with a level of monetary policy literacy below the median of 1 in the low literacy group, and above 1 in the high literacy group. This table reports estimated coefficients from OLS regressions with Huber (1964) weights. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A11: Heterogeneous Treatment Effects: Trust in Others

	(1)	(2)	(3)	(4)
	Low trust		High trust	
	$\lvert\pi^{post,5y}-2\rvert$	$\sigma\pi^{post,5y}$	$\lvert\pi^{post,5y}-2\rvert$	$\sigma\pi^{post,5y}$
$\lvert\pi^{prior}-2\rvert$	0.65***		0.66***	
	(0.01)		(0.02)	
π^{prior}		0.0098***		0.013***
		(0.00)		(0.00)
T1: inflation projections	-0.83***	-0.058	-0.96***	-0.059
	(0.24)	(0.07)	(0.17)	(0.05)
T2: ECB target	-0.18	0.0037	-0.36**	0.0098
	(0.24)	(0.07)	(0.17)	(0.04)
T3: ECB president statement	-0.13	0.010	-0.57***	0.024
	(0.27)	(0.08)	(0.19)	(0.05)
T4: T1+T3	-0.52**	-0.12*	-0.83***	-0.038
	(0.23)	(0.07)	(0.18)	(0.05)
T5: T2+T3	-0.53**	-0.028	-0.58***	-0.0068
	(0.25)	(0.07)	(0.17)	(0.04)
R^2	0.844	0.086	0.710	0.162
N observations	529	549	558	587

Note: Demographic controls include age, gender, education, household income, homeownership status, household size, and region. We categorize individuals with low trust in others as those who expressed their trust within the range of 0 to 3. Conversely, individuals were classified as having high trust in others if they indicated their trust within the range of 7 to 10. This table reports estimated coefficients from OLS regressions with Huber (1964) weights. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A12: Heterogeneous Treatment Effects: Financial Risk Preference

	(1)	(2)	(3)	(4)
	Risk averse		Risk loving	
	$\lvert\pi^{post,5y}-2\rvert$	$\sigma\pi^{post,5y}$	$\lvert\pi^{post,5y}-2\rvert$	$\sigma\pi^{post,5y}$
$\lvert\pi^{prior}-2\rvert$	0.66***		0.71***	
	(0.01)		(0.01)	
π^{prior}		0.0100***		0.018***
		(0.00)		(0.00)
T1: inflation projections	-1.01***	-0.013	-0.70***	-0.13***
	(0.18)	(0.04)	(0.16)	(0.04)
T2: ECB target	-0.22	0.038	-0.15	-0.081*
	(0.17)	(0.04)	(0.15)	(0.04)
T3: ECB president statement	-0.41**	0.0094	0.22	0.061
	(0.18)	(0.04)	(0.16)	(0.05)
T4: T1+T3	-0.90***	-0.013	-0.61***	-0.082*
	(0.18)	(0.04)	(0.15)	(0.04)
T5: T2+T3	-0.53***	0.021	-0.43***	-0.041
	(0.18)	(0.04)	(0.14)	(0.04)
R^2	0.815	0.115	0.824	0.120
N observations	807	833	969	1019

Note: Demographic controls include age, gender, education, household income, homeownership status, household size, and region. We categorize respondents with a willingness to take financial risks below the median of 3 in the risk averse group, and above 3 in the risk loving group. This table reports estimated coefficients from OLS regressions with Huber (1964) weights. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A13: Heterogeneous Treatment Effects: General Risk Preference

	(1)	(2)	(3)	(4)
	Risk averse		Risk loving	
	$\lvert\pi^{post,5y}-2\rvert$	$\sigma\pi^{post,5y}$	$\lvert\pi^{post,5y}-2\rvert$	$\sigma\pi^{post,5y}$
$\lvert\pi^{prior}-2\rvert$	0.68***		0.70***	
	(0.01)		(0.01)	
π^{prior}		0.012***		0.018***
		(0.00)		(0.00)
T1: inflation projections	-1.08***	-0.080*	-0.43***	-0.0092
	(0.17)	(0.04)	(0.16)	(0.05)
T2: ECB target	-0.29*	0.019	0.025	-0.042
	(0.16)	(0.04)	(0.16)	(0.04)
T3: ECB president statement	-0.53***	0.039	0.30*	0.026
	(0.17)	(0.05)	(0.16)	(0.05)
T4: T1+T3	-1.09***	-0.072*	-0.55***	-0.0032
	(0.16)	(0.04)	(0.16)	(0.04)
T5: T2+T3	-0.69***	0.010	-0.10	0.026
	(0.16)	(0.04)	(0.16)	(0.04)
R^2	0.829	0.111	0.787	0.134
N observations	911	934	910	965

Note: Demographic controls include age, gender, education, household income, homeownership status, household size, and region. We categorize respondents with a willingness to take risks below the median of 4 in the risk averse group, and above 4 in the risk loving group. This table reports estimated coefficients from OLS regressions with Huber (1964) weights. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A14: Heterogeneous Treatment Effects: Patience

	(1)	(2)	(3)	(4)
	Impatient		Patient	
	$\lvert\pi^{post,5y}-2\rvert$	$\sigma\pi^{post,5y}$	$\lvert\pi^{post,5y}-2\rvert$	$\sigma\pi^{post,5y}$
$\lvert\pi^{prior}-2\rvert$	0.64***		0.72***	
	(0.01)		(0.01)	
π^{prior}		0.013***		0.026***
		(0.00)		(0.00)
T1: inflation projections	-0.83***	-0.083*	-0.79***	-0.056
	(0.18)	(0.05)	(0.16)	(0.04)
T2: ECB target	-0.48***	-0.031	0.14	-0.032
	(0.17)	(0.05)	(0.16)	(0.05)
T3: ECB president statement	-0.52***	-0.047	0.066	0.067
	(0.18)	(0.05)	(0.16)	(0.05)
T4: T1+T3	-0.89***	-0.061	-0.60***	-0.041
	(0.17)	(0.05)	(0.15)	(0.04)
T5: T2+T3	-0.85***	-0.043	-0.33**	-0.0079
	(0.18)	(0.05)	(0.15)	(0.04)
R^2	0.797	0.096	0.816	0.200
N observations	915	942	941	988

Note: Demographic controls include age, gender, education, household income, homeownership status, household size, and region. We categorize respondents with patience below the median of 6 in the impatient group, and above 6 in the patient group. This table reports estimated coefficients from OLS regressions with Huber (1964) weights. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A15: Heterogeneous Treatment Effects: Optimism

	(1)	(2)	(3)	(4)
	Pessimist		Optimist	
	$\lvert\pi^{post,5y}-2\rvert$	$\sigma\pi^{post,5y}$	$\lvert\pi^{post,5y}-2\rvert$	$\sigma\pi^{post,5y}$
$\lvert\pi^{prior}-2\rvert$	0.66***		0.69***	
	(0.01)		(0.01)	
π^{prior}		0.011***		0.019***
		(0.00)		(0.00)
T1: inflation projections	-0.90***	-0.085	-0.70***	-0.037
	(0.20)	(0.05)	(0.14)	(0.04)
T2: ECB target	-0.064	-0.0049	-0.18	-0.027
	(0.20)	(0.05)	(0.13)	(0.04)
T3: ECB president statement	-0.17	-0.024	-0.25*	0.044
	(0.20)	(0.06)	(0.15)	(0.04)
T4: T1+T3	-0.91***	-0.098**	-0.84***	-0.016
	(0.19)	(0.05)	(0.14)	(0.04)
T5: T2+T3	-0.79***	-0.029	-0.41***	-0.023
	(0.19)	(0.05)	(0.14)	(0.04)
R^2	0.838	0.129	0.762	0.127
N observations	811	837	1024	1067

Note: Demographic controls include age, gender, education, household income, homeownership status, household size, and region. We categorize respondents with optimism below the median of 6 in the pessimist group, and above 6 in the optimist group. This table reports estimated coefficients from OLS regressions with Huber (1964) weights. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A16: Heterogeneous Treatment Effects: Household Income

	(1)	(2)	(3)	(4)
	Low Income		High Income	
	$\lvert\pi^{post,5y} - 2\rvert$	$\sigma\pi^{post,5y}$	$\lvert\pi^{post,5y} - 2\rvert$	$\sigma\pi^{post,5y}$
$\lvert\pi^{prior} - 2\rvert$	0.71***		0.68***	
	(0.02)		(0.01)	
π^{prior}		0.019***		0.021***
		(0.00)		(0.00)
T1: inflation projections	-1.07***	-0.068	-0.75***	-0.071
	(0.24)	(0.05)	(0.16)	(0.06)
T2: ECB target	-0.36	-0.013	-0.19	-0.090
	(0.24)	(0.06)	(0.15)	(0.06)
T3: ECB president statement	-0.27	0.017	-0.15	-0.063
	(0.24)	(0.06)	(0.15)	(0.06)
T4: T1+T3	-1.04***	-0.080	-0.44***	-0.095*
	(0.25)	(0.06)	(0.16)	(0.06)
T5: T2+T3	-0.57**	0.0020	-0.45***	-0.12**
	(0.25)	(0.06)	(0.14)	(0.05)
R^2	0.825	0.160	0.828	0.106
N observations	645	681	693	712

Note: Demographic controls include age, gender, education, homeownership status, household size, and region. We categorize individuals with low income as those who indicated their monthly household income to lie below 2,500 €. Conversely, individuals were classified as high income if they indicated their monthly household income to be $\geq$ 4.000 €. This table reports estimated coefficients from OLS regressions with Huber (1964) weights. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A17: Heterogeneous Treatment Effects: Gender

	(1)	(2)	(3)	(4)
	Male		Female	
	$\lvert\pi^{post,5y} - 2\rvert$	$\sigma\pi^{post,5y}$	$\lvert\pi^{post,5y} - 2\rvert$	$\sigma\pi^{post,5y}$
$\lvert\pi^{prior} - 2\rvert$	0.74***		0.64***	
	(0.01)		(0.01)	
π^{prior}		0.032***		0.016***
		(0.00)		(0.00)
T1: inflation projections	-0.71***	-0.13***	-0.99***	0.048
	(0.13)	(0.04)	(0.21)	(0.05)
T2: ECB target	-0.13	-0.084**	-0.35*	0.019
	(0.12)	(0.04)	(0.21)	(0.05)
T3: ECB president statement	-0.12	-0.065*	-0.23	0.063
	(0.13)	(0.04)	(0.21)	(0.05)
T4: T1+T3	-0.54***	-0.091***	-1.03***	0.017
	(0.12)	(0.03)	(0.21)	(0.05)
T5: T2+T3	-0.42***	-0.062*	-0.63***	0.032
	(0.12)	(0.03)	(0.22)	(0.06)
R^2	0.830	0.200	0.754	0.107
N observations	1130	1178	926	958

Note: Demographic controls include age, education, household income, homeownership status, household size, and region. We split the sample into male and female individuals. This table reports estimated coefficients from OLS regressions with Huber (1964) weights. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A18: Heterogeneous Treatment Effects: Age

	(1)	(2)	(3)	(4)
	Age < 50		Age ≥ 50	
	$\lvert\pi^{post,5y} - 2\rvert$	$\sigma\pi^{post,5y}$	$\lvert\pi^{post,5y} - 2\rvert$	$\sigma\pi^{post,5y}$
$\lvert\pi^{prior} - 2\rvert$	0.68***		0.73***	
	(0.01)		(0.01)	
π^{prior}		0.024***		0.010***
		(0.00)		(0.00)
T1: inflation projections	-0.91***	-0.053	-0.74***	-0.067*
	(0.22)	(0.07)	(0.17)	(0.04)
T2: ECB target	-0.52**	-0.077	0.095	0.020
	(0.22)	(0.07)	(0.16)	(0.04)
T3: ECB president statement	-0.28	0.045	-0.067	0.0049
	(0.22)	(0.07)	(0.17)	(0.04)
T4: T1+T3	-1.05***	-0.070	-0.53***	-0.030
	(0.22)	(0.07)	(0.16)	(0.04)
T5: T2+T3	-0.84***	-0.069	-0.19	0.036
	(0.21)	(0.07)	(0.16)	(0.04)
R^2	0.878	0.102	0.874	0.059
N observations	1232	1232	1080	1080

Note: Estimates for wave 1. Demographic controls include gender, education, household income, homeownership status, household size, and region. We split the sample into individuals with age below 50 and 50 or older. This table reports estimated coefficients from OLS regressions with Huber (1964) weights. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A19: Heterogeneous Treatment Effects: Age

	(1)	(2)	(3)	(4)
	Age < 50		Age ≥ 50	
	$\lvert\pi^{post,5y} - 2\rvert$	$\sigma\pi^{post,5y}$	$\lvert\pi^{post,5y} - 2\rvert$	$\sigma\pi^{post,5y}$
$\lvert\pi^{prior} - 2\rvert$	0.68***		0.73***	
	(0.01)		(0.02)	
π^{prior}		0.024***		0.010***
		(0.00)		(0.00)
T1: inflation projections	-0.91***	-0.053	-0.74***	-0.067**
	(0.17)	(0.05)	(0.14)	(0.03)
T2: ECB target	-0.52***	-0.077	0.095	0.020
	(0.17)	(0.05)	(0.13)	(0.03)
T3: ECB president statement	-0.28	0.045	-0.067	0.0049
	(0.18)	(0.06)	(0.14)	(0.03)
T4: T1+T3	-1.05***	-0.070	-0.53***	-0.030
	(0.18)	(0.05)	(0.13)	(0.03)
T5: T2+T3	-0.84***	-0.069	-0.19	0.036
	(0.16)	(0.05)	(0.14)	(0.03)
R^2	0.821	0.096	0.755	0.070
N observations	1070	1129	989	1019

Note: Demographic controls include gender, education, household income, homeownership status, household size, and region. We split the sample into individuals with age below 50 and 50 or older. This table reports estimated coefficients from OLS regressions with Huber (1964) weights. Robust standard errors are in parentheses.* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A20: Heterogeneous Treatment Effects: East vs. West Germany

	(1)	(2)	(3)	(4)
	East Germany		West Germany	
	$\lvert\pi^{post,5y}-2\rvert$	$\sigma\pi^{post,5y}$	$\lvert\pi^{post,5y}-2\rvert$	$\sigma\pi^{post,5y}$
$\lvert\pi^{prior}-2\rvert$	0.73***		0.68***	
	(0.03)		(0.01)	
π^{prior}		0.021***		0.018***
		(0.01)		(0.00)
T1: inflation projections	-1.26***	0.070	-0.76***	-0.091***
	(0.26)	(0.09)	(0.12)	(0.03)
T2: ECB target	-0.80***	-0.025	-0.080	-0.041
	(0.23)	(0.07)	(0.12)	(0.03)
T3: ECB president statement	-0.57**	-0.0093	-0.13	-0.0017
	(0.23)	(0.08)	(0.13)	(0.03)
T4: T1+T3	-1.22***	-0.093	-0.68***	-0.066**
	(0.23)	(0.08)	(0.12)	(0.03)
T5: T2+T3	-1.05***	-0.0078	-0.40***	-0.034
	(0.22)	(0.08)	(0.12)	(0.03)
R^2	0.810	0.117	0.806	0.136
N observations	304	328	1742	1811

Note: Demographic controls include age, gender, education, household income, homeownership status, household size, and region. We split the sample according to the federal state where respondents currently live, grouping the states belonging to the former GDR into East Germany, and the remaining states into West Germany. This table reports estimated coefficients from OLS regressions with Huber (1964) weights. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A21: Determinants of the Time Spent Reading the Treatment

	(1) Time spent reading the treatment
Age 18 to 29 (reference group)	
Age 30 to 39	1.40**
	(0.64)
Age 40 to 49	2.57***
	(0.66)
Age 50 to 59	7.23***
	(0.65)
Age 60+	11.9***
	(0.68)
Male	-1.78***
	(0.41)
Log of household income	-0.76*
	(0.43)
Living in East Germany	1.57***
	(0.58)
High school diploma	-1.33**
	(0.53)
House owner	-1.31***
	(0.43)
Household size	0.51**
	(0.20)
Financial literacy	2.50***
	(0.22)
Trust in the ECB	-0.20**
	(0.08)
Constant	21.7***
	(3.08)
R^2	0.187
N observations	2774

Note: This table reports estimated coefficients from OLS regressions with Huber (1964) weights. Robust standard errors are in parentheses. The dependent variable is time spent reading the treatments in seconds. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A22: The Effect of Financial Literacy on the Newness of Information Treatment

	Dependent variable: Information treatment is new				
	(1) T1: inflation projections	(2) T2: ECB target	(3) T3: ECB president statement	(4) T4: T1+T3	(5) T5: T2+T3
High financial literacy	-0.66**	-0.42**	-0.53***	-0.084	-0.74***
	(0.26)	(0.19)	(0.20)	(0.21)	(0.19)
Pseudo-R^2	0.212	0.085	0.119	0.114	0.141
N observations	219	215	208	220	237

Note: This table presents the marginal effects of financial literacy on the likelihood that the information treatment is perceived as new, estimated using Probit regressions. Financial literacy is measured as a dummy variable, taking the value of one if respondents answer all three financial literacy questions correctly, and zero if they answer fewer than two correctly. Demographic controls include age, gender, education, household income, homeownership status, household size, and region. Standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A23: The Effect of Financial Literacy on the Informativeness of Information Treatment

	Dependent variable: Informativeness of Information treatment				
	(1) T1: inflation projections	(2) T2: ECB target	(3) T3: ECB president statement	(4) T4: T1+T3	(5) T5: T2+T3
High financial literacy	1.50***	0.43	0.25	0.075	0.43
	(0.34)	(0.34)	(0.34)	(0.37)	(0.35)
R^2	0.190	0.090	0.057	0.046	0.070
N observations	218	213	203	216	235

Note: This table presents the marginal effects of financial literacy on how informative the information treatment is perceived to be, on a scale from 0 to 10, estimated using OLS regressions. Financial literacy is measured as a dummy variable, taking the value of one if respondents answer all three financial literacy questions correctly, and zero if they answer fewer than two correctly. Demographic controls include age, gender, education, household income, homeownership status, household size, and region. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A24: The Effect of Trust in the ECB on the Newness of Information Treatment

	Dependent variable: Information treatment is new				
	(1) T1: inflation projections	(2) T2: ECB target	(3) T3: ECB president statement	(4) T4: T1+T3	(5) T5: T2+T3
High trust in the ECB	0.35	-0.069	0.022	-0.12	0.098
	(0.22)	(0.19)	(0.21)	(0.20)	(0.20)
Pseudo-R^2	0.099	0.072	0.120	0.080	0.058
N observations	185	202	193	185	195

Note: This table presents the marginal effects of trust in the ECB on the likelihood that the information treatment is perceived as new, estimated using Probit regressions. Trust in the ECB is measured as a dummy variable, taking the value of one if respondents stated their trust within the range of 7 to 10, and zero if they stated their trust within the range of 0 to 3. Demographic controls include age, gender, education, household income, homeownership status, household size, and region. Standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A25: The Effect of Trust in the ECB on the Informativeness of Information Treatment

	Dependent variable: Informativeness of Information treatment				
	(1) T1: inflation projections	(2) T2: ECB target	(3) T3: ECB president statement	(4) T4: T1+T3	(5) T5: T2+T3
High trust in the ECB	1.40***	1.79***	1.69***	2.46***	1.90***
	(0.32)	(0.35)	(0.40)	(0.31)	(0.36)
R^2	0.182	0.184	0.198	0.319	0.229
N observations	184	200	190	183	192

Note: This table presents the marginal effects of trust in the ECB on how informative the information treatment is perceived to be, on a scale from 0 to 10, estimated using OLS regressions. Trust in the ECB is measured as a dummy variable, taking the value of one if respondents stated their trust within the range of 7 to 10, and zero if they stated their trust within the range of 0 to 3. Demographic controls include age, gender, education, household income, homeownership status, household size, and region. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

A.3 Questionnaire

This survey deals with your views and expectations regarding inflation, monetary policy, and the economy in general. It is part of a scientific study at Leibniz University Hannover. Answering this survey takes approximately 15 minutes, and all responses are anonymous.

The quality of our data is crucial. To capture your knowledge and opinions as accurately as possible, it is essential that you answer each question to the best of your ability. Do you commit to answering each question in this survey carefully?

1. Yes
2. No

Respondi: Proceed to the rest of the questionnaire only if "Yes" is selected.

1. How old are you? _____ years (Numeric field between 18-100, no decimal numbers allowed)
2. Please specify your gender:
   (a) Male
   (b) Female
   (c) Diverse
3. In which German federal state do you live?
   (a) Baden-Württemberg
   (b) Bavaria
   (c) Berlin
   (d) Brandenburg
   (e) Bremen
   (f) Hamburg
   (g) Hesse
   (h) Mecklenburg-Vorpommern
   (i) Lower Saxony
   (j) North Rhine-Westphalia
   (k) Rhineland-Palatinate
   (l) Saarland
   (m) Saxony

(n) Saxony-Anhalt

(o) Schleswig-Holstein

(p) Thuringia

4. What was the average monthly net income of your household in the last twelve months? (Average over the last 12 months)

   (a) Under 500 Euro

   (b) 500 to 999 Euro

   (c) 1000 to 1499 Euro

   (d) 1500 to 1999 Euro

   (e) 2000 to 2499 Euro

   (f) 2500 to 2999 Euro

   (g) 3000 to 3499 Euro

   (h) 3500 to 3999 Euro

   (i) 4000 to 4999 Euro

   (j) 5000 to 5999 Euro

   (k) 6000 to 7999 Euro

   (l) 8000 to 9999 Euro

   (m) 10,000 Euro and more

   (n) 999 Don't know/No answer

5. What is your highest completed education level?

   (a) (Not yet) general school-leaving qualification, still a student in general education school or basic school leaving certificate without completed apprenticeship/vocational training or basic school leaving certificate with completed apprenticeship/vocational training

   (b) Further education without Abitur (secondary school leaving certificate/middle school/high school) or equivalent qualification

   (c) Abitur, (technical) university entrance qualification without studying or studying (university, college, technical college, polytechnic)

6. Imagine you have 100 € in your account with an annual interest rate of 10%. How much money would you have in your account after two years? (Randomize answer order)

   (a) Exactly 110 €

(b) Exactly 120€

(c) Exactly 200€

(d) Slightly more than 120€

(e) 999 Don't know/No answer

7. Imagine that your net income (income after taxes and deductions) in 2024 is twice as high, but also, the prices of all goods have doubled. How much can you buy with your income in 2024? (Randomize answer order)

   (a) More than today

   (b) Just as much as today

   (c) Less than today

   (d) Cannot be determined based on the given information

   (e) 999 Don't know/No answer

8. Do you agree with the following statement: "Investing in the stock of an individual company is less risky than investing in a fund of stocks from similar companies"? [Randomize answer order]

   (a) I agree

   (b) I disagree

   (c) 999 Don't know/No answer

9. Next, we would like to ask you about the current and expected inflation. We would like to inquire about the average inflation/deflation rate in Germany in the year 2022. What do you believe was the average inflation/deflation rate in 2022 in Germany? Please enter a number in the field below.

   Note: Inflation is the percentage increase in the general price level, usually measured by the Consumer Price Index. A decrease in the price level is commonly referred to as "deflation." If you believe that prices have not changed, enter "0." If you think there was deflation in 2022, enter a negative value. If you think there was inflation in 2022, enter a positive value.

   The average inflation/deflation rate in Germany in 2022 was __% (one decimal place possible) [Numeric values with one decimal place in the range of -100 to +100]

   (a) 999 Don't know/No answer

10. In your opinion, what will be the average inflation/deflation rate in Germany in the year 2023? Please enter a number in the field below.

If you believe that prices will not change, please enter "0." If you expect deflation, enter a negative value. If you anticipate inflation, enter a positive value.

I expect the average inflation/deflation rate in Germany in 2023 to be _% (one decimal place possible) [Numeric values with one decimal place in the range of -100 to +100]

(a) 999 Don't know/No answer

11. In your opinion, what will be the average inflation/deflation rate in Germany in the year 2025? Please enter a number in the field below.

    If you believe that prices will not change, please enter "0." If you expect deflation, enter a negative value. If you anticipate inflation, enter a positive value.

    I expect the average inflation/deflation rate in Germany in 2025 to be __% (one decimal place possible) [Numeric values with one decimal place in the range of -100 to +100]

    (a) 999 Don't know/No answer

12. In your opinion, what will be the average inflation/deflation rate in Germany in the year 2027? Please enter a number in the field below.

    If you believe that prices will not change, please enter "0." If you expect deflation, enter a negative value. If you anticipate inflation, enter a positive value.

    I expect the average inflation/deflation rate in Germany in 2027 to be __% (one decimal place possible) [Numeric values with one decimal place in the range of -100 to +100]

13. Next, we would like to ask you some questions about the European Central Bank (ECB):

    The main goal of the monetary policy of the European Central Bank (ECB) is to [Randomize the order of answers]

    (a) stabilize prices for goods and services

    (b) stabilize prices for corporate bonds

    (c) keep interest rates low and stable

    (d) reduce government debt

    (e) 999 Don't know/No answer

14. What is your estimate of the European Central Bank's (ECB) annual inflation target, which it aims to achieve on average in the medium term (approximately 3 years)?

__% (% annually) [Allow only whole numbers in the range of -100 to +100]

(a) 999 Don't know/No answer

15. To what extent do you trust the European Central Bank (ECB)? Please express your trust on a scale from 0 (no trust at all) to 10 (complete trust).

    [Insert number line between 0-10, with whole number increments] __

16. Now we would like to ask you some questions about your personal attitudes. In general, would you say that most people can be trusted, or that people cannot be trusted, and one should therefore be cautious in dealing with them? Please indicate your trust in other people on a scale from 0 to 10. 0 indicates the belief that people cannot be trusted/one must be cautious, and 10 indicates the belief that most people can be trusted.

    [Insert number line between 0-10, with whole number increments] __

17. Generally, are you a person who is willing to take risks, or do you tend to avoid risks? Please indicate your willingness on a scale from 0 (not willing at all to take risks) to 10 (very willing to take risks).

    [Insert number line between 0-10, with whole number increments] __

18. In the following question, we would like to ask for your assessment of your financial risk tolerance. Are you generally a person who is willing to take financial risks to potentially earn higher returns, or do you tend to avoid financial risks for a lower return? How would you rate yourself on a scale from 0 (very low financial risk with typically lower returns) to 10 (very high financial risk with typically higher returns)?

    [Insert number line between 0-10, with whole number increments]

    (a) 999 Don't know/No answer

19. Are you generally a patient or impatient person? Please indicate this on a scale from 0 (very impatient) to 10 (very patient).

    [Insert number line between 0-10, with whole number increments]

    (a) 999 Don't know/No answer

20. Are you generally a more optimistic or pessimistic person? Please indicate this on a scale from 0 (very pessimistic) to 10 (very optimistic).

    [Insert number line between 0-10, with whole number increments]

    (a) 999 Don't know/No answer

In the following, we would like to provide you with information on the monetary policy of the European Central Bank (ECB). Please read the information carefully.

[Respondi: Random allocation into 6 groups (equally sized): 1 Control Group and 5 Treatment Groups – Marked by variable 'random' with values from 1-6]

Treatment Group 1 (random=1): Average inflation in the euro zone in 2022 was 8.4%. The European Central Bank (ECB) expects average inflation in the euro zone to be 6.3% in 2023, 3.4% in 2024 and 2.3% in 2025.

Treatment Group 2 (random=2): The European Central Bank (ECB) is committed to setting its monetary policy to ensure that inflation stabilizes at its 2% target in the medium term.

Treatment Group 3 (random=3): The chairwoman of the European Central Bank (ECB) said "Fighting inflation is our mantra, our mission, our mandate. We know that the current situation is tough for many people across the euro area - that is why we have to raise interest rates to tame inflation."

Treatment Group 4 (random=4): Average inflation in the euro zone in 2022 was 8.4%. The European Central Bank (ECB) expects average inflation in the euro zone to be 6.3% in 2023, 3.4% in 2024 and 2.3% in 2025.

The chairwoman of the European Central Bank (ECB) said "Fighting inflation is our mantra, our mission, our mandate. We know that the current situation is tough for many people across the euro area - that is why we have to raise interest rates to tame inflation."

Treatment Group 5 (random=5): The European Central Bank (ECB) is committed to setting its monetary policy to ensure that inflation stabilizes at its 2% target in the medium term.

The chairwoman of the European Central Bank (ECB) said "Fighting inflation is our mantra, our mission, our mandate. We know that the current situation is tough for many people across the euro area - that is why we have to raise interest rates to tame inflation."

Control Group (random=6): Proceed to Question 23

21. How informative did you find the text? Please rate your response on a scale from 0 (not informative at all) to 10 (very informative). [Insert number line between 0-10, with whole number increments]

    (a) __ [Insert number line between 0-10, with whole number increments]

    (b) 999 I did not understand the text.

22. Was the information in the text new to you?

(a) Yes

(b) No

[Respondi: Show questions 21 and 22 on the same screen as the treatment texts (below the texts)]

23. What do you believe is the lowest and highest value that the average inflation or deflation rate in Germany could reach in 2023?

    (a) Please provide the minimum value: ....% (mm)

    (b) Please provide the maximum value: ....% (MM)

    What is the likelihood that the average price increase in 2023 will be greater than X%? (Respondi: Automatically calculate X as (mm+MM)/2 and display it on the respondents' screen)

    Please provide a response on a scale from 0 to 100, where 0 means "absolutely no chance" and 100 means "absolutely certain".

24. What do you believe is the lowest and highest value that the average inflation or deflation rate in Germany could reach in 2025?

    (a) Please provide the minimum value: ....% (mm)

    (b) Please provide the maximum value: ....% (MM)

    What is the likelihood that the average price increase in 2025 will be greater than X%? (Respondi: Automatically calculate X as (mm+MM)/2 and display it on the respondents' screen)

    Please provide a response on a scale from 0 to 100, where 0 means "absolutely no chance" and 100 means "absolutely certain".

25. What do you believe is the lowest and highest value that the average inflation or deflation rate in Germany could reach in 2027?

    (a) Please provide the minimum value: ....% (mm)

    (b) Please provide the maximum value: ....% (MM)

    What is the likelihood that the average price increase in 2027 will be greater than X%? (Respondi: Automatically calculate X as (mm+MM)/2 and display it on the respondents' screen)

    Please provide a response on a scale from 0 to 100, where 0 means "absolutely no chance" and 100 means "absolutely certain".

26. The European Central Bank (ECB) has committed to shaping its monetary policy to ensure a low and stable inflation rate in the medium term. How much do you trust that the European Central Bank (ECB) is capable of ensuring price stability in the medium term (within approximately 3 years)?

    Please provide your answer on a scale from 0 (no trust at all) to 10 (complete trust). [Number line from 0 to 10, with whole number increments]

    (a) 999 Don't know/No answer

27. Has the current financial situation of your household improved or worsened in the last 12 months?

    (a) Improved significantly
    (b) Improved somewhat
    (c) Stayed about the same
    (d) Worsened somewhat
    (e) Worsened significantly
    (f) 999 Don't know

28. How do you expect the financial situation of your household to evolve in the next 12 months?

    (a) Will improve significantly
    (b) Will improve somewhat
    (c) Will stay about the same
    (d) Will worsen somewhat
    (e) Will worsen significantly
    (f) 999 Don't know

29. How do you think the national economic situation will develop in the next 12 months?

    (a) Will improve significantly
    (b) Will improve somewhat
    (c) Will stay about the same
    (d) Will worsen somewhat
    (e) Will worsen significantly
    (f) 999 Don't know

30. How do you think the national economic situation will develop in the next 5 years?

    (a) Will improve significantly

    (b) Will improve somewhat

    (c) Will stay about the same

    (d) Will worsen somewhat

    (e) Will worsen significantly

    (f) 999 Don't know

31. Do you believe that now is a good or bad time to buy larger household items such as furniture, a refrigerator, a stove, a television, or similar?

    (a) Very good time

    (b) Good time

    (c) Neither good nor bad

    (d) Bad time

    (e) Very bad time

    (f) 999 Don't know

    In the following questions, we would like to ask for your assessment of inflation in the next 3 and 5 years under different scenarios. Please keep in mind that there are no right or wrong answers – we are interested in your views.

32. Consider the following scenario: What if the average inflation rate in 2023 were 1% lower than expected by you? What do you expect for the average inflation rate in 2025 and 2027 in this scenario?

    I would expect the average inflation rate in 2025 to be...

    (a) significantly higher

    (b) somewhat higher

    (c) roughly unchanged

    (d) somewhat lower

    (e) significantly lower

    (f) 999 don't know/no answer

    I would expect the average inflation rate in 2027 to be...

    (a) significantly higher

(b) somewhat higher

(c) roughly unchanged

(d) somewhat lower

(e) significantly lower

(f) 999 don't know/no answer

33. Consider the following scenario: What if the average inflation rate in 2023 were 1% higher than expected by you? What do you expect for the average inflation rate in 2025 and 2027 in this scenario?

    I would expect the average inflation rate in 2025 to be...

    (a) significantly higher

    (b) somewhat higher

    (c) roughly unchanged

    (d) somewhat lower

    (e) significantly lower

    (f) 999 don't know/no answer

    I would expect the average inflation rate in 2027 to be...

    (a) significantly higher

    (b) somewhat higher

    (c) roughly unchanged

    (d) somewhat lower

    (e) significantly lower

    (f) 999 don't know/no answer

Finally, we would like to ask you a few questions about yourself.

34. In which part of Germany did you live shortly before the fall of the Berlin Wall on November 9, 1989?

    (a) In the eastern part of Germany, in the former GDR

    (b) In the western part of Germany, in the Federal Republic of Germany

    (c) I moved to Germany after 1989

    (d) I was born after 1989

35. Does your household live in rented accommodation or in a property you own, such as a condominium or a house? Please choose the appropriate answer.

    (a) I live in rented accommodation and do not own any other residential property.

    (b) I live in rented accommodation but own other residential property.

    (c) I live in my own apartment.

    (d) I live in my own house.

36. How many people (including yourself) live in your household? __ people [Numeric field, do not allow decimal numbers, the number must be greater than zero (at least 1)]

37. Who is mainly responsible for the following in your household? [Matrix Question] a. Everyday purchases (e.g., groceries) b. Larger purchases (e.g., furniture, car) c. Meal planning and preparation d. Decisions about savings and financial investments

    (a) Me

    (b) Me together with my partner/another household member

    (c) My partner/another household member

38. Would you say that, on average over the last 12 months, the expenses of your household were higher than the household income, roughly equal to the household income, or lower than the household income?

    (a) Higher than the household income

    (b) Roughly equal to the household income

    (c) Lower than the household income

    (d) 999 I don't know/No answer