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How to Limit the Spillover from the 2021 Inflation Surge to Inflation Expectations?*

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Abstract

By providing numerical inflation projections. Many central banks currently face inflation well above their targets and with that the challenge to prevent spillovers on inflation expectations. We study the effect of different communication about the 2021 inflation surge on German consumers' inflation expectations using a randomized control trial. We show that information about rising inflation increases short- and long-term inflation expectations. This initial increase in expectations can be mitigated using information about inflation projections, where numerical information about professional forecasters' projections seems to reduce inflation expectations by more than policymaker's characterization of inflation as a temporary phenomenon.

Keywords: Short-run and long-run inflation expectations, inflation surge, randomized control trial, survey experiment, persistent or transitory inflation shock.

JEL classification: E31, E52, E58, D84.

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1 Introduction

After a decade of inflation rates mostly below 2 percent, many developed countries are currently experiencing an inflation surge. Inflation started to climb in developed countries at the beginning of 2021, after supply bottlenecks and capacity constraints severely limited the supply of goods, while demand was strong, as the economies recovered from the COVID-19 recession. The year-on-year inflation rate in Germany rose above 5 percent in November 2021.¹ Since Germany is among the most inflation-averse countries inside the Euro area and the public discussion includes many inflation hawks, the current inflation surge is an important topic both in the policy world and among the general public.

While at the onset of the inflation surge, many central banks characterized increasing inflation as temporary, concerns over more persistent inflation grew in the last months of 2021, when price increases started to spill over to sectors that have not been impacted by supply-chain disruptions and worries increased that this might lead to higher wage demands.² The European Central Bank (ECB) has argued that the inflation hike will be temporary (Lagarde, 2021). However, there is considerable uncertainty and disagreement about the persistence of the current shock, and to what degree supply and demand factors feed into it.³ Given this high level of uncertainty, one of the main fears of central banks is that the surge in inflation would spillover to inflation expectations resulting in a de-anchoring of (long-run) expectations, which would warrant a quick policy response. In fact, mean short-run inflation expectations by German consumers, measured in the Bundesbank Survey on Consumer Expectations, rose by about 1 percentage point in the second half of 2021, while long-run inflation expectations increased by about 0.5 percentage points.⁴

In such an environment it is imperative to understand how policymakers can use communication to steer inflation expectations of the general public. While there is broad consensus that central bank communication is effective in steering expectations of financial market participants, the influence central bank communication has on the general public is much less clear (Lamla and Vinogradov, 2019; Coibion et al., 2020b). Consequently, in this paper, we investigate how information about the current surge in inflation impacts both short- and long-run inflation expectations of consumers and

¹CPI inflation in Germany was 5.2 percent year-on-year in November 2021, see https://www.destatis.de/EN/Press/2021/12/PE21_564_611.html. In Germany, policy responses to the COVID-19 crisis such as the temporary VAT reduction in the second half of 2020 led to lower prices in 2020 and, consequently, additionally pushed inflation up by about 1.2 percentage points in the second half of 2021 when tax rates were adjusted back to previous levels (Bundesbank, 2020). A surge in energy prices pushed the current inflation rate further upwards.

²Even the ECB’s staff union demanded more pay to guard against inflation (Look, 2021).

³The Bank of England raised the policy rate in their December meeting, citing inflation as the main factor in this decision. In the December statement, the FOMC in the US acknowledges that “[s]upply and demand imbalances related to the pandemic and the reopening of the economy have continued to contribute to elevated levels of inflation.” (Federal Reserve, 2021). The FOMC has announced a faster tapering of asset purchases at the same meeting. In contrast, the ECB official have continued to claim that the inflation surge is temporary, expecting that inflation will return in 2023 to levels below 2 percent. Lagarde (2021), for example, emphasized that “[e]ven after the expected end of the pandemic emergency, it will still be important that monetary policy—including the appropriate calibration of asset purchases—supports the recovery throughout the euro area and the sustainable return of inflation to our target.”

⁴See <https://www.bundesbank.de/en/bundesbank/research/survey-on-consumer-expectations/inflation-expectations-848334>.

which type of communication about future inflation developments may mitigate the spillover from observed current inflation dynamics onto short- and long-term expectations.

We test the influence of different information treatments about the future inflation development in light of the inflation surge in Germany on consumers' inflation expectations using a randomized control trial (RCT). The RCT was incorporated in the September 2021 wave of the Survey on Consumer Expectations in the Bundesbank Online Panel of Households (BOP-HH), which is representative of the German population. We randomly allocate respondents to five different information treatments. The main motivation is, first to observe the reaction of inflation expectations to the information about the current inflation rate (and past inflation from one year ago). Second, we assess whether complementary information about inflation projections can offset the reaction of the short- and long-run inflation expectations to the information about currently observed inflation dynamics.

Respondents in all treatment arms are informed about the recent inflation in August 2021 (3.9 percent) and last year's inflation rate in August 2020 (0 percent). Thus, all respondents have the same information on the current inflation rate, and they are aware that inflation in 2021 is significantly higher than a year ago. Coibion et al. (2020c) and Coibion et al. (2022) show that informing consumers or firm managers of the current inflation rate has significant effects on expectations.⁵ As we intend to analyze whether information about inflation projections affects the transmission of current inflation dynamics on expectations, we deem it important to inform all respondents about current inflation. Hence, the *basic* treatment, which serves as our control group, does not offer any additional information. The other treatments couple the information about the current inflation dynamic with additional information about the inflation outlook. The *long-lasting* treatment additionally cites Prof. Dr. Volker Wieland from the German Council of Economic Advisers ('Sachverständigenrat') who states that in his view inflation is likely to remain elevated between 2-3 percent in the next years. The *temporary* treatment additionally cites ECB president Christine Lagarde's view that the inflation increase will be temporary. The *SPF* treatment additionally provides the average forecasts of the Survey of Professional Forecasters (SPF) conducted by the ECB for the Euro area inflation for 2022-2025, i.e., inflation is expected to be between 1.5-1.8 percent over the next years. Finally, in line with Coibion et al. (2022), we add a *placebo* treatment that provides expected population growth as an additional information. The population growth should be viewed as irrelevant—at least to the first order—for forecasting inflation. The RCT design enables us to study the effects of the information treatments on changes in respondents' short- and long-run inflation expectations after the information treatment.

We observe that on average 25 percent of all consumers adjust their expectations after receiving an information treatment. Information about current inflation dynamics only (*basic* treatment) raises inflation expectations, both for the next 12 months as well as 5-10 years ahead. It is not

⁵Notably, they do not inform them of the *change* in inflation.

surprising that observing higher inflation increases inflation expectations.⁶ In our case, long-run inflation expectations increase by 0.37 percentage points across all consumers receiving this information. In all other treatments, except the placebo treatment, expectations decrease compared to the *basic* treatment, which indicates that providing inflation projections is effective in limiting the spillover from observing rising inflation to expectations. However, conditional on an update in expectations after treatment, only the *SPF* treatment significantly reduces short-run expectations, while both the *long-lasting* and the *SPF* treatments cause a downward adjustment of long-run expectations relative to the *basic* treatment.⁷ Both treatment effects are sizable, reducing long-run inflation expectations by 1.5 percentage points (*long-lasting*) and 1.9 percentage points (*SPF*), respectively.

Our paper is closely related to RCT studies on inflation expectations and central bank communication, in particular Coibion et al. (2022). Similarly to Coibion et al. (2022), we test how different forms of communication affect expectations, but focus specifically on how communication can reduce spillover effects from inflation spells on short- and long-run inflation expectations. Coibion et al. (2020c) use an information treatment showing current inflation, which leads to an increase in inflation expectations for firms in Italy, that consequently feed into firm decisions. In addition, Coibion et al. (2020a) also utilize a RCT design to study the effect of different forms of forward guidance on several macroeconomic forecasts. Haldane and McMahon (2018) use randomized information treatments to test the relevance of layered communication adopted at the Bank of England. Using the Survey on Consumer Expectations at the Bundesbank, Hoffmann et al. (2021) run a RCT with information treatments to analyze the effects of a hypothetical move to flexible average inflation targeting on inflation expectations in Germany. Furthermore, our work relates to the paper by Andre et al. (2021), who study the inflation narratives that experts, households and managers have in mind to explain the recent inflation surge. They show that narratives differ strongly between experts, on the one hand, and households or managers, on the other hand.

The remainder of the paper is organized as follows: Section 2 explains the data we use and the survey experiment, while Section 3 discusses our empirical results. Section 4 concludes.

2 Data and RCT Experiment

The randomized control trial in this study was conducted on respondents in the September 2021 wave of the Bundesbank Online Panel of Households (BOP-HH). The BOP-HH core questionnaire elicits a large range of both qualitative and quantitative macroeconomic expectations. For our study, we focus on point estimates of expected inflation 12 months ahead (short-run expectations)

⁶Coibion et al. (2020c) find similar evidence based on a RCT for firms in Italy. In contrast, Coibion et al. (2022) show that information about the current level of inflation decreases inflation expectations, and thus makes them more accurate. However, one has to keep in mind that in this study the level of inflation was inferred in an environment where inflation was subdued and a positive bias in inflation expectation among consumers was reported. By contrast, we study the behavior of expectations in a rising inflation environment.

⁷Note that the *long-lasting* treatment also mentions the expert’s inflation expectations in the range of 2-3 percent over the next years, which is lower than the August 2021 inflation rate of 3.9 percent shared with respondents in all treatments.

and expectations either 5 or 10 years ahead (long-run expectations).⁸ We elicit expectations before and after the information treatment.

The September 2021 wave consisted of 3,724 participants who were randomly selected into our five treatment arms, each consisting of about 650 respondents. In the *basic* treatment, participants were given the following information about current inflation:

“We now show you some information on the inflation rate. The inflation rate in Germany was measured by the Federal Statistical Office at 3.9% in August 2021, one year ago in August 2020 the inflation rate was 0%.”

This treatment serves as our control group. In all other treatments, respondents were provided with some information in addition to the basic information about current inflation. The *long-lasting* treatment cites a member of the German Council of Economic Advisers (‘Sachverständigenrat’) who thinks that inflation will be elevated beyond 2022:

“We now show you some information on the inflation rate. The inflation rate in Germany was measured by the Federal Statistical Office at 3.9% in August 2021, one year ago in August 2020 the inflation rate was 0%.

Volker Wieland, member of the ‘Sachverständigenrat’, was cited in the ‘Wirtschaftswoche’ [a weekly German newspaper focusing on economics and business topics] already on March 12, 2021, as saying: “I also expect inflation rates to be around 2% on average over the year, and in some months towards the end of the year even around 3%. [...] But I think that it is possible that we’ll have similar inflation rates also in 2022 and the years after, that is between 2 and 3% annually.”

The *temporary* treatment cites a different view by ECB president Christine Lagarde, stressing that the inflation increase will be temporary:

“We now show you some information on the inflation rate. The inflation rate in Germany was measured by the Federal Statistical Office at 3.9% in August 2021, one year ago in August 2020 the inflation rate was 0%.

The Handelsblatt [a daily German newspaper focusing on economics and business topics] wrote about this already on May 31, 2021: “The ECB president has so far stressed that she thinks the increased inflation will be a temporary phenomenon. According to her view, the price increase is mainly driven by special factors due to the pandemic, as shown also in the German inflation rate in May.”

Next, the *SPF* treatment gives the adjustment in the most recent short- and long-run inflation forecasts for the Euro area by professional forecasters surveyed in the ECB Survey of Professional Forecasters (SPF):

⁸Respondents are randomly selected to give long-run estimates with either a 5 or 10 year horizon in the core questionnaire. For our analysis, we make sure that the horizon for post-treatment forecasts matches that of pre-treatment forecasts, but otherwise regard both 5 or 10 year forecasts as long-run expectations.

“We now show you some information on the inflation rate. The inflation rate in Germany was measured by the Federal Statistical Office at 3.9% in August 2021, one year ago in August 2020 the inflation rate was 0%.

According to a survey by the European Central Bank (ECB) among experts in the Euro area, these have increased their expectations for inflation in the year 2021 for the whole Euro area (including Germany) from their previous forecast of 1.6% to 1.9%. The inflation expectations for the years 2022 and 2023 as well as for 2025 were adjusted to 1.5% and 1.8%.”

Finally, our last treatment provides a *placebo* test by adding information that is not relevant for forecasting neither short- nor long-run inflation:

“We now show you some information on the inflation rate. The inflation rate in Germany was measured by the Federal Statistical Office at 3.9% in August 2021, one year ago in August 2020 the inflation rate was 0%.

According to the Federal Statistical Office, the population in Germany which was 83 million in the year 2018 will likely increase until 2024 and start to shrink from 2040 onwards at the latest.”

After each treatment, we ask respondents whether they would like to adjust their short- and/or their long-run inflation forecasts. In order to make sure that individual updates are not due to inaccurate recall of previously given forecasts, we remind all respondents about their prior estimates. The post-treatment questions and answer categories are phrased as follows:

Q1: On the basis of this information, would you like to adjust your inflation expectations **for the next 12 months** given in the first part of the survey? If so, how would you adjust your expectations?

- Yes, from X [*inserted prior expectation*] percent to ... percent
- No
- Don't know
- No answer

Q2: And would you like to adjust your inflation expectations **for the next 5/10 years** given in the first part of the survey? If so, how would you adjust your expectations?

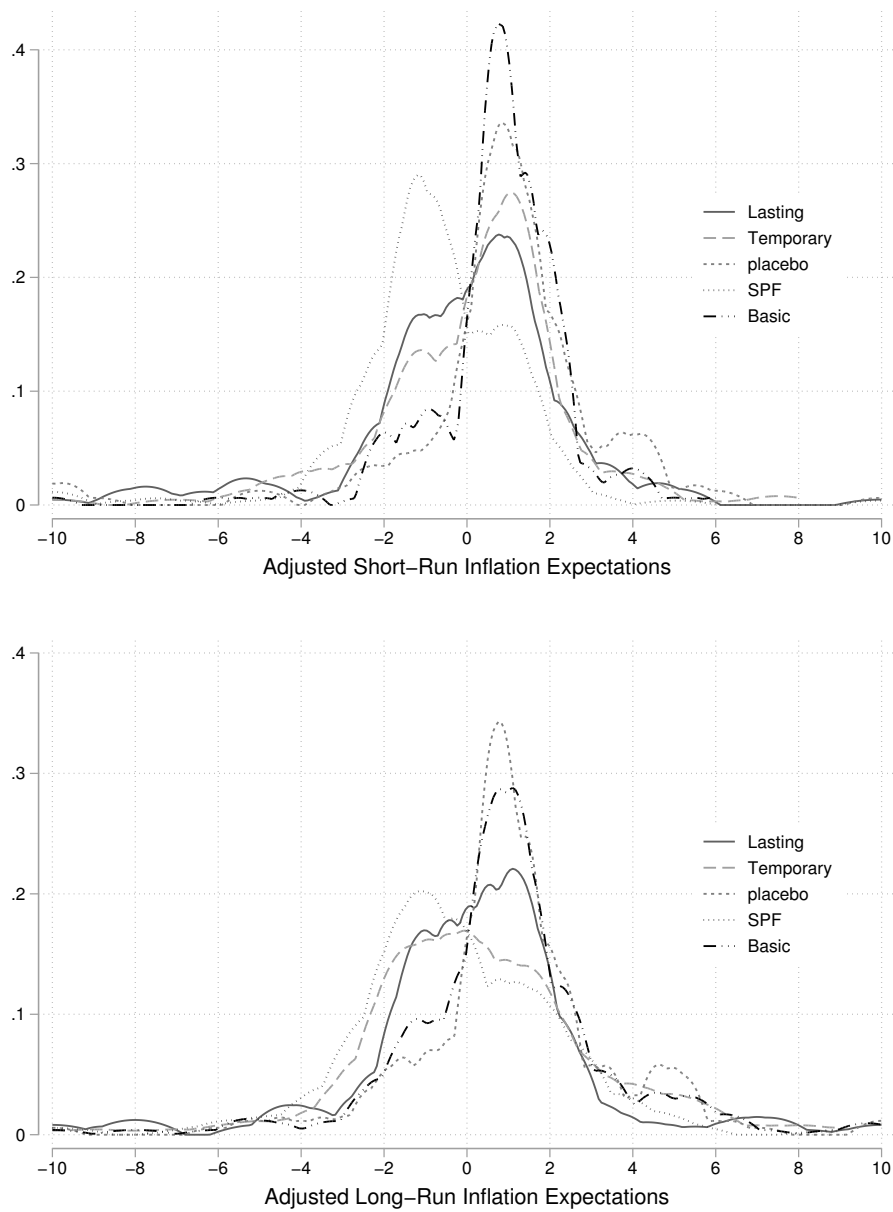
- Yes, from X [*inserted prior expectation*] percent to percent
- No
- Don't know
- No answer

In order to check for any potential heterogeneity across demographic groups, we additionally show results adding controls for gender, age and three income groups (*inc_low*—monthly net income below or equal 1.000 €, *inc_middle*—monthly net income between 1.000 € and 3.000 €, and *inc_high*—monthly net income above 3.000 €).

3 Results

3.1 Summary Statistics of Information Treatment Effects

Figure 1: Treatment Effects on the Overall Distribution of Inflation Expectations



To identify the causal effect of our treatments, in this subsection we look at how the distributions of short- and long-term inflation expectation change after each treatment. In the next subsection, we employ regression analysis to measure the treatment effects.⁹

In Figure 1, we plot the densities of changes in short- and long-term expectations for each treatment. The figure shows that observing the current inflation surge (*basic* treatment) increases both short- and long-run expectations, indicating a possibility for a de-anchoring of expectations in this environment. At the same time, we observe that the numerical forecast from the *SPF* has the strongest effect on both short- and long-run expectations in comparison to the distribution under the *basic* treatment: The increase of expectations of the *basic* treatment is reversed, leading to a mean reduction in both short- and long-run expectations. The distribution of expectations of the *placebo* treatment group has the same shape as the distribution of the basic treatment.

To test for statistical differences between the densities across treatments, we conduct Kolmogorov-Smirnov tests: We check whether the density of the *basic* treatment is statistically different from all other treatment densities. For changes in short- and long-term expectations, the Kolmogorov-Smirnov test shows that all treatment densities—except the density of the *placebo* treatment group—are statistically different from the density of the *basic* treatment.¹⁰ Thus, *long-lasting*, *temporary*, and *SPF* treatments affect expectations beyond the way the basic treatment does: The additional information about projected inflation importantly shapes inflation expectations, demonstrating that there is room for targeted communication about the current inflation outlook that could mitigate the spill-over from current inflation to consumers’ inflation expectations.

3.2 Treatment Effects on Short- and Long-Run Inflation Expectations

In this subsection, we evaluate the treatment effects on changes in individual short- and long-run inflation expectations in a regression framework. In all specifications, we take the *basic* treatment, which only informs respondents about the inflation rate in August 2021 in comparison to the rate in August 2020, as our control group.

Our regression set-up takes the following form:

$$\Delta\pi_i^{e,h} = a_0 + b_1 \cdot d_longlasting_i + b_2 \cdot d_temporary_i + b_3 \cdot d_spf_i + b_4 \cdot d_placebo_i + c' \cdot X_i^{controls} + u_i, \quad (1)$$

where $\Delta\pi_i^{e,h}$ denotes the consumer i 's update in inflation expectations at horizon h (short- or long-run expectations) after the treatment. The coefficients b_1 - b_4 measure the treatment effects in relation to the control group (*basic* information treatment). Some estimations additionally control for demographic characteristics $X_i^{controls}$, namely gender, age, and income groups. u_i represents the i.i.d. error term. All estimations use population weights and robust standard errors.

⁹Sample means for short- and long-run expectations, pre- and post-treatment for all treatment arms are provided in the appendix in table A.1

¹⁰The Kolmogorov-Smirnov test reports p-values of 0.000, 0.032, and 0.000 for the *long-lasting*, *temporary* and *SPF* treatment when comparing the densities to the *basic* treatment, respectively, and 0.348 for the comparison of the *placebo* treatment and *basic* treatment for short-run expectations and 0.002, 0.000, 0.000 and 0.991 analogously for long-run expectations.

Table 1 shows the estimated average treatment effect on changes in expectations of all participants: on changes in short-run inflation expectations in the first two columns, and on changes in long-run inflation expectations in the last two columns. In the *basic* treatment short-run inflation expectations are not affected, but long-run expectations increase on average by 0.37 percentage point. All significant treatment effects show a negative sign, implying that respondents lowered their inflation expectations in comparison to those respondents who were only informed about the inflation increase from August 2020 to August 2021. Note that there is no qualitative difference in the treatment effects between the models with or without demographic control variables. We find the strongest treatment effect for the *SPF* treatment, which causes a reduction in both short- and long-run expectations relative to the *basic* treatment. This suggests that providing numerical forecasts of experts, that lie significantly below the current inflation rate, has a strong impact on households' expectations and is efficient in taming fears of persistently higher inflation. In the case of long-run inflation expectations, reported in columns (3) and (4), we find additional negative treatment effects from both the *long-lasting* and the *temporary* treatments. This implies that both texts, emphasizing that the current inflation increase will either be temporary or could be persistent in the next few years, caused respondents to lower their long-run inflation expectations relative to those just informed about the current inflation rate. Respondents in both treatment arms interpret the additional information as relevant particularly for their long-run expectations.

Table 1: Overall Treatment Effects

	$\Delta\pi^{e,short}$		$\Delta\pi^{e,long}$	
<i>d_longlasting</i>	-0.2372 (0.2210)	-0.2195 (0.2262)	-0.4301* (0.2427)	-0.4478* (0.2406)
<i>d_temporary</i>	-0.3382 (0.2981)	-0.3441 (0.3078)	-0.3127* (0.1650)	-0.3175* (0.1718)
<i>d_spf</i>	-0.4477** (0.1989)	-0.4447** (0.2072)	-0.5851*** (0.1787)	-0.6150*** (0.1818)
<i>d_placebo</i>	0.2538 (0.1640)	0.2297 (0.1693)	-0.0173 (0.1780)	-0.0920 (0.1686)
<i>constant</i>	0.0138 (0.1440)	-0.2493 (0.4288)	0.3714*** (0.1195)	0.3283 (0.2886)
Demographic Controls	No	Yes	No	Yes
N	3158	3054	3116	3018
Adj. R ²	0.011	0.015	0.012	0.012

Note: Bundesbank Survey on Consumer Expectations, September 2021 wave. Inflation expectations prior to and post treatment are truncated to lie in the range $-5 \leq \pi^e \leq 25$. OLS estimations with population weights with robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

After evaluating the overall treatment effect, we distinguish between the extensive and the intensive margin of treatment effects. The extensive margin is estimated as the likelihood of updating short- or long-run expectations after an information treatment using a probit model:

$$P(d_{-\pi_i^{e,h}} = 1|X) = \Phi \left(a_0 + b' \cdot Treatments_i (+c' \cdot X_i^{controls}) \right), \quad (2)$$

where $d_{-\pi_i^{e,h}}$ are dummy variables taking the value of 1 if consumer i updated her inflation expectations at horizon h (short- or long-run expectations) after the information treatment and $Treatments_i$ denotes the vector of treatment dummies. Table 2 reports the marginal effects evaluated at the mean in columns (1)-(4). The intensive margin of the treatments is estimated as the change in short- and long-run expectations (as in equation (1)) conditional on updating expectations after the treatment, shown in columns (5)-(8).

The results are presented in Table 2. Regarding the extensive margin, it shows that none of the additional information provided leads consumers to update their inflation expectations with a higher probability. In fact, except for the *SPF* treatment, all the other treatments lead to a *lower* likelihood of adjusting short-run inflation expectations compared to the *basic* treatment. In that sense, providing additional information about inflation projections can help to anchor expectations by mitigating the tendency to raise inflation expectations that we observe in the *basic* treatment. Interestingly, the *long-lasting* treatment reduces the likelihood of an update in short-run expectations, while the *temporary* treatment leads to a lower updating probability of both short- and long-run expectations.

The intensive margin is estimated on the smaller sample of respondents that update their short- and/or long-run expectations after the treatment. The *SPF* treatment has the strongest effect on lowering expectations relative to the *basic* treatment: Presented with additional evidence from experts' forecasts, respondents that update their expectations lower their short-run expectations by 1.4 percentage points and their long-run expectations by about 2 percentage points. For long-run inflation expectations, we find an additional significant treatment effect of the *long-lasting* treatment, where the additional information reduces long-run expectations by about 1.4 percentage points. These two treatments more than fully offset the increase in long-run expectations observed among respondents who update their expectations in the *basic* treatment. Notably, both of these treatments report inflation projections over the next years that lie significantly below the rate in August 2021. By contrast, the *temporary* treatment seems less effective compared to the *SPF* and the *long-lasting* treatments since it has no effect on the intensive margin.¹¹ Overall, we find that numerical information about inflation projections efficiently mitigates the effect of recent elevated inflation rates, while the effect of policymakers' characterization of the inflation surge as a "temporary phenomenon" is considerably smaller.¹²

¹¹Consumers who update their expectations in the *placebo* treatment on average increase their short-run expectations by about 1.1 percentage points relative to the *basic* treatment.

¹²To test for an asymmetric response to the information treatments, we split the sample of respondents into those who have prior inflation expectations below or above the current inflation rate of 3.9% in August 2021, which was given as an information in all treatments. These results are reported in Online Appendix Table A.2. Respondents who experience a negative inflation surprise via the information that current inflation lies above their short- or long-run forecast (first and third column) increase their expectations. By contrast, those with prior expectations above 3.9% on average reduce their short-run expectations.

Table 2: Treatment Effects: Extensive and Intensive Margin

	Extensive Margin		Intensive Margin	
	Prob. $\Delta\pi^{e,short} \neq 0$	Prob. $\Delta\pi^{e,long} \neq 0$	$\Delta\pi^{e,short}$	$\Delta\pi^{e,long}$
<i>d_longlasting</i>	-0.0724* (0.0408)	0.0004 (0.0448)	-0.9756 (0.8444)	-1.4239* (0.7968)
<i>d_temporary</i>	-0.0704* (0.0420)	-0.0854** (0.0435)	-1.3831 (1.1316)	-0.9624 (0.6240)
<i>d_spf</i>	-0.0108 (0.0408)	0.0281 (0.0423)	-1.3907** (0.6066)	-1.8638*** (0.5324)
<i>d_placebo</i>	-0.0949** (0.0389)	-0.0264 (0.0382)	1.1472** (0.5440)	0.0557 (0.5810)
Demographic Controls	No	Yes	No	Yes
N	3162	3053	775	809
χ^2	9.648	16.923		
Pseudo R^2	0.007	0.014	0.040	0.054
Adj. R^2			0.041	0.041

Note: Bundesbank Survey on Consumer Expectations, September 2021 wave. Inflation expectations prior to and post treatment are truncated to lie in the range $-5 \leq \pi^e \leq 25$. Average marginal effects from probit estimation in columns (1)-(4), OLS estimations in columns (5)-(8). All regressions are estimated with population weights with robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

4 Conclusion

In this paper, we study the effect of different communication about the current inflation surge on consumers' inflation expectations. We show that the information about the present inflation rate feeds into short- and long-term inflation expectations of German consumers. This result is in line with the observation that German consumers' long-run expectations have started to increase in 2021.¹³ This observed dynamic in inflation expectations could pose a concern and raises the question how central banks can tame the spillover from observed inflation on expectations. We are able to provide valuable insights to this matter. Our results from the survey experiment demonstrate that targeted communication using explicit numerical inflation projections is able to substantially limit the observed spillover effects from the current inflation surge to inflation expectations. We also find some evidence that text-based communication characterizing the inflation surge either as temporary or more long-lasting is capable of reducing the spillovers from current inflation to long-run inflation expectations, but to a lesser extent compared to an alternative with numerical inflation projections.

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¹³In fact, Bundesbank (2021) projects that the rate of headline HICP inflation will be slightly over 3.5% on average in 2022. In 2023 and 2024, it is projected to decrease to 2.25%, however, it will remain above the ECB's target. The report also cites that the main reason for projected elevated inflation over the medium term are expectations of sharply rising wages and a projected good general economic development, but also the costs of transitioning to a climate-neutral economy.

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5 Appendix

Table A.1: Short and Long-Run Inflation Expectations Pre- and Post-Treatment

Treatment	Short-run		Long-run	
	Pre	Post	Pre	Post
Basic	4.50	4.64	4.51	5.46
Lasting	5.10	4.49	5.04	4.96
Temporary	4.25	4.18	4.68	4.99
SPF	4.30	3.31	4.85	4.39
Placebo	4.36	5.21	4.40	5.40
Average	4.50	4.31	4.69	5.04

Notes: Sample means reported, not truncated data.

Table A.2: Overall Treatment Effects: Inflation Surprise

	$\Delta\pi^{e,short}$		$\Delta\pi^{e,long}$	
	prior $\pi^{e,short}$	prior $\pi^{e,short}$	prior $\pi^{e,long}$	prior $\pi^{e,long}$
	< 3.9%	> 3.9%	< 3.9%	> 3.9%
<i>d_infl_longlasting</i>	-0.3000** (0.1197)	0.0224 (0.4292)	-0.2304 (0.1526)	-0.5178 (0.4012)
<i>d_infl_temporary</i>	-0.2227 (0.1369)	-0.2356 (0.5294)	-0.2004 (0.1784)	-0.3954 (0.2990)
<i>d_infl_spf</i>	-0.5263*** (0.1204)	-0.3307 (0.3906)	-0.3386** (0.1461)	-0.8939*** (0.3378)
<i>d_infl_placebo</i>	-0.0448 (0.1650)	0.6367** (0.2990)	-0.0592 (0.1581)	-0.0441 (0.3057)
<i>constant</i>	0.8278* (0.4640)	-1.5671** (0.7680)	0.6559*** (0.2151)	-0.3209 (0.6724)
Demographic Controls	Yes	Yes	Yes	Yes
N	1538	1516	1693	1322
Adj. R ²	0.050	0.031	0.035	0.019

Note: Bundesbank Survey on Consumer Expectations, September 2021 wave. Inflation expectations prior to and post treatment are truncated to lie in the range $-5 \leq \pi^e \leq 25$. The current inflation rate for August 2021 was given as 3.9% in all treatment groups and the control group (basic treatment). OLS estimations with population weights with robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1