

TUPD-2025-001

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Evidence from a Randomized Control Trial**

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January 2025

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Inflation Expectations and Information Selection: Evidence from a Randomized Control Trial*

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January 23, 2025

Abstract

This study employs randomized control trial methods to explore how information selection and processing contribute to the heterogeneity in consumers' inflation expectations. We find that, first, respondents vary in their preferences for inflation forecasts from established institutions. Second, providing credible information about future inflation helps stabilize expectations, with follow-up surveys indicating that this effect persists for at least one month. Third, respondents revise their expectations more extensively when provided with additional information. Fourth, respondents incorporate information more fully when they can choose the information they view. Individuals with exposure to interest rate risk are more likely to focus on relevant signals.

JEL Classification: D12; D15; D84; E21; E52

Keywords: attention allocation; imperfect information; information processing;
information selection; monetary policy; rational inattention

*We thank Naohito Abe, Kazuki Hiraga, Munechika Katayama, Kazuhiro Teramoto, and other participants of the Association of Behavioral Economics, and Finance 2023, the Japanese Economic Association 2024 Spring Meeting, and DSGE Conference 2024 for their comments and suggestions. Tango was supported by JST SPRING, Japan Grant Number JP-MJSP2179. Kikuchi acknowledges financial support from JSPS KAKENHI Grant Numbers 22K20163 and 23K17553. Nakazono acknowledges financial support from Institute of Social and Economic Research, Osaka University, and JSPS KAKENHI Grant Numbers 21H04397, 22K01438, and 23K17553. The experiment conducted in this study was reviewed and approved by the Research Ethics Committee at Hitotsubashi University, with IBR number 2023D023.

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1 Introduction

Expectations play a central role in modern macroeconomics. An expanding body of literature examines survey data on expectations, revealing considerable heterogeneity among consumers (Mankiw et al., 2003; Coibion and Gorodnichenko, 2012; Weber et al., 2022). Consumer expectations deviate from full-information rational expectations (FIRE) due to factors such as sticky information (Mankiw and Reis, 2002), rational inattention (Sims, 2003), noisy information (Mackowiak and Wiederholt, 2009), differing priors (Patton and Timmermann, 2010), and strategic interactions (Morris and Shin, 2002). This heterogeneity in expectations carries important implications, including diminished effectiveness of policy announcements (Angeletos and Lian, 2018; Coibion et al., 2023, forthcoming), impacts on intertemporal consumption allocation (Crump et al., 2022), challenges to policymaking under dispersed information (Angeletos and Pavan, 2008), and considerations within HANK models (Kaplan et al., 2018). Policymakers are increasingly focused on understanding subjective expectations.

Heterogeneity in expectations develops across three stages of belief formation: information selection, information acquisition, and information processing (Fuster et al., 2022). In sticky information models, this heterogeneity arises because only a subset of agents acquire information within a given period. In noisy information models, it emerges when agents select or observe different pieces of information (Lucas, 1972). Furthermore, heterogeneity may appear during information processing, influenced by idiosyncratic noise in signals or variations in signal precision.

This study employs experimental methods to examine how each stage of belief formation contributes to heterogeneity in expectations. We conduct an experiment on a nationwide sample of consumers, broadly representative of the Japanese population, allowing respondents to select and process information. Additionally, by introducing exogenous variation in information selection, we assess how the quality and quantity of information influence heterogeneity in expectations.

The experimental design is inspired by recent literature on information-provision experiments. For instance, Coibion et al. (2023) investigate household inflation expectations, while Roth et al. (2020) apply similar methods to examine home price and GDP growth expectations. In these studies, a random subset of respondents is provided with specific information, and the resulting effects on expectations are measured. However, in real-world scenarios, individuals are seldom provided with curated information directly. Instead, they must seek information independently, choosing among multiple sources and processing what they acquire. Our experiment simulates a more realistic information acquisition environment, where participants select the information sources they wish to view. While our experimental framework follows Fuster et al. (2022), who examined information selection related to home price expectations in housing booms, our study focuses on how

consumers choose information and form inflation expectations.

The experimental design comprises three stages. In the first stage, respondents report their prior beliefs about inflation. We assess these beliefs by asking distributional questions regarding aggregate inflation over the next 12 months and the next 10 years. In the second stage, respondents indicate their information preferences. Half of the respondents are randomly assigned to an information treatment group, which we term “exogenous information treatment.” These participants receive inflation forecasts from one or more sophisticated institutions—the Government of Japan (GOJ), the Bank of Japan (BOJ), and the consensus forecasts of private institutions (ESP). Variation in the number of information sources is expected to introduce heterogeneity in signal precision.

The remaining respondents are randomly assigned to an “endogenous information selection” group, where they can choose to view inflation forecasts from GOJ, BOJ, or ESP. This choice-based variation is expected to create heterogeneity in the degree of attention allocated to different signals. Respondents may also choose not to view any information. In the third stage, the survey concludes with the re-elicitation of the posterior beliefs about inflation expectations of all respondents.

Our study contributes to the literature by revealing how information selection and processing contribute to heterogeneity in consumers’ inflation expectations. We report four key findings. First, respondents show diverse preferences in the information they choose to view. While 26.0% opt to see all available information from the GOJ, BOJ, and ESP, 16.2% prefer only the private sector’s consensus forecast, and 13.7% choose not to view any. Our findings suggest that older respondents and higher-income individuals are more likely to seek comprehensive information, while younger respondents and those with lower educational attainment often prefer to avoid it altogether. This pattern supports the conjecture that only individuals capable of processing a full set of information are inclined to demand sophisticated forecasts. Thus, information processing costs may shape the demand for information.

Second, providing credible information about future inflation helps to stabilize inflation expectations. Respondents who view one or more pieces of information tend to incorporate it and revise their beliefs accordingly. This finding aligns with the model’s prediction of Bayesian updating with endogenous information selection, as outlined in Section 5, that agents assign higher weights to information with a precise signal. Respondents who view information from established institutions place greater weight on that information. A follow-up survey tests the persistence of these effects and confirms that the impact of information provision lasts for at least one month. This suggests that credible information effectively and consistently stabilizes inflation expectations over time.

Third, respondents tend to revise their expectations more when presented with multiple pieces of information. They are more likely to incorporate several sources into their expectations than a

single source. This evidence suggests that respondents perceive information from multiple sources as containing more precise signals than information from a single source; therefore, it supports the model assumption outlined in Section 5.

Finally, respondents incorporate information more effectively when they choose which information they view. Our results indicate that respondents in the information-selection treatment revise their expectations by approximately 0.4% more than those in the information-provision treatment. Why do some respondents pay more attention to information than others? One explanation is that consumers with exposure to interest rate risk, such as those with mortgage loans, may demand information on inflation forecasts more actively. This exposure to risk likely motivates them to allocate more attention to signals, leading them to incorporate information more thoroughly into their expectations. Our findings support this view. We show that respondents exposed to interest rate risk are significantly more attentive to signals. This aligns with the model prediction in Section 5, which suggests that respondents more exposed to fundamental risks place a greater weight on relevant information.

The remaining paper proceeds as follows. Section 2 explains the experimental research design and Section 3 presents our econometric framework. Section 4 shows the estimation results. Section 5 presents a model that can match most of our empirical findings. Section 6 summarizes the findings and presents the conclusions.

2 Research design

This section describes the survey administration, presents our experimental design, and explains the structure of both the main survey and the follow-up survey. Full instructions are available in Appendices Appendix A and Appendix B.

2.1 Survey

We used an online panel maintained by MyVoice Communications, Inc. to collect a sample of 2,009 respondents, representing the Japanese population in gender and age. Data were collected from September 5 to 7, 2023. One month later, a follow-up survey (from October 5 to 20, 2023) was conducted to examine whether the consumers had anchored inflation expectations after viewing the sophisticated forecasts one month before.

Stage 1: Prior belief

In the first stage, we elicit respondents' prior beliefs about future inflation rates. The survey began with a question asking respondents to estimate the percentage change in consumer prices over the past 12 months.¹ The average forecast is 9.1%. This is higher than the actual rate of 3.3% but closely aligned with the percentage change in food prices (excluding fresh food), which was 8.8% (9.2%) in July 2023.²

Next, respondents were presented with distributional questions regarding aggregate inflation expectations over the next 12 months and 10 years. The weighted average forecast for the next 12 months was 6.8%, higher than the professional consensus forecast of 2.6% from ESP forecasts conducted by the Japan Center for Economic Research, but below the 10.5% average forecast made by consumers in the Bank of Japan's July 2023 Opinion Survey. The weighted average forecast over the next 10 years was 6.6%, which, while exceeding the professionals' consensus forecast of 1.23%, is close to the 7.5% average in the Opinion Survey.³

Stage 2: Information preferences

After reporting their perceived and expected inflation rates, respondents proceeded to the second stage. At this point, they were *randomly* assigned to one of the following groups.

- (C0) (100 respondents): No information provided
- (T1) (100 respondents): Population growth rates in Japan (−0.45% in July 2023).
- (T2) (100 respondents): Inflation forecasts by the Government of Japan (GOJ) (+2.6% in FY2023).
- (T3) (100 respondents): Inflation forecasts by Bank of Japan (BOJ) (+2.5% in FY2023).
- (T4) (100 respondents): Inflation forecasts by professionals in the private sector (ESP) (+2.6% in FY2023).
- (T5) (100 respondents): Inflation forecasts by both the GOJ and BOJ.
- (T6) (100 respondents): Inflation forecasts by both the GOJ and ESP.
- (T7) (100 respondents): Inflation forecasts by both the BOJ and ESP.
- (T8) (200 respondents): Inflation forecasts by GOJ, BOJ, and ESP.
- (ET) (1,000 respondents): Respondents can choose one option between (T2) and (T8).

Group (C0) received no additional information, while Group (T1) received *placebo* information about Japan's population growth rate. We labeled Groups (C0) through (T8) as the control group

¹Table 1 reports the summary statistics on perceptions of inflation rates.

²These figures are the most recent publicly available inflation rates at the time of the survey.

³The consensus forecast by professionals represents the average of inflation forecasts for the next 7–10 years. The Opinion Survey's average forecast reflects inflation expectations over the next five years.

and the exogenous information treatment groups, respectively. A key part of our research involves Group (ET), which we label as the endogenous information selection group. Respondents in Group (ET) are given the option to view inflation forecasts from established forecasters: GOJ, BOJ), or ESP (consensus forecasts of private institutions). Next, respondents in Group (ET) select one of the following options.

Which information about the price outlook do you want to see?

- (T9) Price outlook from the GOJ.
- (T10) Price outlook from the BOJ.
- (T11) Price outlook from the ESP.
- (T12) Price outlook from both the GOJ and BOJ.
- (T13) Price outlook from both the GOJ and ESP.
- (T14) Price outlook from both the BOJ and ESP.
- (T15) Price outlook by the GOJ, BOJ, and ESP.
- (T16) I do not want to see any information.

We label Groups (T9) through (T16) as *endogenous* information selection groups. Table 2 shows that approximately one-fourth of respondents select Option (T16), opting to view all available information about the price outlook.

Stage 3: Posterior belief

In the final stage, we gathered respondents' posterior beliefs about future inflation rates through a multiple-choice question. The reason for presenting prior beliefs in the form of a distribution question and posterior beliefs in a multiple-choice format is to avoid the effects of repeated questioning that could arise from using the same question twice.⁴ Respondents were asked to estimate the percentage change in consumer prices for the next 12 months and the next 10 years. The average forecasts for inflation over the next 12 months and 10 years were 6.8% and 6.5%, respectively.

⁴This approach has been widely adopted in numerous previous studies (e.g., Coibion et al. (2023) and Fuster et al. (2022)).

3 Econometric framework

Next, we examined the impact of information treatments on consumers’ beliefs. Following the methodology of Coibion et al. (2022) and Coibion et al. (2023), we used the following specification:

$$X_j^{post} = \alpha \times X_j^{pre} + \sum_{k=2}^{17} \beta_k \times Treatment_j^{(k)} + \sum_{k=2}^{17} \gamma_k Treatment_j^{(k)} \times X_j^{pre} + \mathbf{Z}_j \Psi + \varepsilon_j, \quad (1)$$

where j represents respondents, X a measure of inflation expectations, pre inflation expectations measured before treatment, $post$ inflation expectations measured after treatment, and $Treatment_j^{(k)}$ is an indicator variable equal to one if respondent j is assigned to treatment k . Z is a vector representing the respondent’s characteristics, used to control for heterogeneity such as gender, income, and education.

Equation (1) allows us to evaluate whether consumers place greater or lesser weight on their prior beliefs when new information is provided. According to Coibion et al. (2018), Bayesian updating suggests that γ_k should be negative, as respondents’ posterior beliefs are a weighted average of their prior beliefs and the provided signal. Therefore, our primary focus is on the value of γ_k ; it should become more negative when treatments provide more precise signals, indicating a reduced weight on prior beliefs. Following Coibion et al. (forthcoming), we apply Huber robust regressions to minimize the effects of influential observations and outliers.

4 Effects of randomized and endogenous information treatments

4.1 Which information respondents choose to view?

We began by examining which information was chosen for viewing. Tables 2 and 3 illustrate the heterogeneity in information preferences. Respondents vary in their choices: 26.0% opted to view all information from the GOJ, BOJ, and ESP; 16.2% selected only the private sector’s consensus forecast; and 13.7% preferred no information at all. On one hand, the fact that over a quarter of respondents choose to view all available information suggests that, in the real world, consumers may select any accessible information if it is provided free of cost. On the other hand, the fact that 13.7% of them preferred no information at all indicates a reluctance to process information from multiple sources.

First, we examined the kind of information chosen by various respondents. Tables 2 and 3

highlight the heterogeneity in information preferences. Respondents differ in their preferred pieces of information: 26.0% chose to see all available information from the GOJ, BOJ, and ESP, 16.2% opted to see only the private sector’s consensus forecast, and 13.7% preferred no information at all. On one hand, the fact that more than a quarter of respondents demanded all available information suggests that, in the real world, consumers tend to select any information they can access without cost. On the other hand, the fact that 13.7% preferred no information at all indicates a reluctance to process information from multiple sources.

We conducted a probit analysis to identify factors associated with ‘preferring to view all available information’ or ‘opting to view none’. Table 4 presents the estimation results. The first, Specification (1), indicates that older respondents and higher-income earners were more likely to view all information, while the second, Specification (2), shows that younger respondents and those with higher educational attainment tended to avoid viewing any information. These findings support the conjecture that individuals who can process a full set of information are more inclined to seek sophisticated forecasts. The results suggest that the cost of information processing may influence information demand, contributing to heterogeneity in consumers’ inflation expectations.

Why did more than half of the respondents choose not to view all available information? As Tables 2 and 3 show, around 70% of households accessed only part of the information, even though it was freely available. Several factors may explain this behavior. First, respondents may have had limited capacity to process information (Mondria and Quintana-Domeque, 2013; Sims, 2003). The rational inattention model, as discussed by Sims (2003), suggests that agents face constraints on their information-processing ability. As a result, they selectively focus on certain pieces of information rather than trying to process everything. There may also be differences in information-processing capacity across households, which could explain the variations observed in Table 4. Second, respondents may prefer information aligned with their pre-existing beliefs and preferences (Chopra et al., 2022, 2024; Faia et al., 2023). Chopra et al. (2022) conducted an experiment with American voters to determine whether their demand for news was driven more by accuracy or by alignment with their beliefs. They found that individuals preferred information consistent with their beliefs, even if it was compromised. This finding aligns with our results, suggesting that personal preferences—such as distrust in the GOJ or BOJ or similar sources—may influence information demand, causing respondents to selectively choose only some information.

4.2 Do consumers update their beliefs?

Do consumers update their beliefs when they receive information from sophisticated institutions? To address this question, we estimated Equation (1). Table 5 presents the estimation results. Spec-

ification (1) examines the differences between the information treatment and information selection effects, while Specification (2) compares variations among the endogenous information selection groups. Specification (3) includes both the exogenous information treatment groups (T1–T8) and the endogenous information selection groups (T9–T16) for robustness. Figures 2 to 4 display the values of the coefficients γ from Specifications (1) to (3), respectively.

The tables and figures indicate that credible information prompts respondents to update their beliefs. Specifications (1) to (3) in Table 5 show that nearly all coefficients are significantly negative. Group (T1) serves as the control group. Respondents assigned to Group (T16) opted not to view any information, suggesting that randomized information treatments and selection processes influence respondents’ beliefs. Figure 1 further supports this finding. The left panel of the figure shows that placebo information has little impact on posterior beliefs, as indicated by the similar slopes of the black and red lines, implying that the treatment is uninformative. By contrast, the right panel shows that the blue line has a gentler slope than the black line, indicating that respondents revise their beliefs when presented with established forecasts. This graphical evidence suggests that respondents who receive sophisticated forecasts significantly adjust their posterior beliefs.

4.3 Effects of the quantity of information

Next, we ask whether consumers revise their forecasts to a greater extent when more information is provided. The three types of information provided in the survey come from different sources, but the predicted values provided are nearly the same. This characteristic allows us to assume that gaining more information means an increase in the perceived reliability of the provided predictions by the respondents. Figure 5 illustrates the values of the coefficients γ s of the group with information from a single source (T2–T4), that with information from two sources (T5–T7), and that with information from all sources (T8). The figure shows a monotonic decline in the coefficient γ s. Respondents further revise their forecasts when they see more information.⁵ Figure 4 illustrates this by showing that the red and blue bars get bigger except for (T3), (T4), and (T10).⁶ The evidence suggests that the more information are received, the more revisions are induced.

The next question is whether consumers revise their forecasts more substantially when they receive additional information. Figure 5 illustrates the values of the coefficients γ for groups receiving information from a single source (T2–T4), two sources (T5–T7), and all sources (T8). The figure shows a monotonic decline in the coefficients γ , indicating that respondents revise their forecasts more extensively as the amount of information increases. This pattern is also evident in Figure

⁵Table D.1 shows that these results exhibit statistically significant differences.

⁶Note that group (T16) respondents prefer not to see any information at all.

4, where the red and blue bars generally increase, except for groups (T3), (T4), and (T10).⁷ This evidence suggests that greater information availability leads to more significant forecast revisions.

4.4 Exogenous vs. endogenous information selection

This subsection addresses the question: Which is more effective, exogenous or endogenous information provision? We investigate whether endogenous information selection prompts respondents to revise their beliefs more than exogenous information treatment. Table 6 reports the estimation results. Specification (1) in Table 6 suggests that endogenous information selection is more effective than exogenous information treatment. Respondents in Group (ET) revised their posterior beliefs by approximately 0.4% more than those in the exogenous information treatment groups.

Figure 6 is intuitive. It illustrates the values of the coefficients γ_s of the *placebo* group (T1), the exogenous information treatment groups (T2–T8), and the endogenous information treatment groups (ET). The figure shows a monotonic decline in the coefficient γ_s . Respondents further revise their forecasts when they choose which information they can see. Figure 4 illustrates that the red bars are basically larger than the blue bars when we compare the corresponding treatments; for example, respondents assigned to (T8) and (T16) see the same forecasts by the GOJ, BOJ, and ESP.⁸ The evidence suggests that respondents believe information from several sources contains more precise signals than information from a single source.

Figure 6 provides an intuitive overview of the results. It displays the coefficients γ for the placebo group (T1), the exogenous information treatment groups (T2–T8), and the endogenous information treatment group (ET). It shows a monotonic decline in the coefficients, indicating that respondents revise their forecasts more substantially when they can choose the information they view. This trend is also observed in Figure 4, where the red bars, representing endogenous selection, are generally larger than the blue bars for comparable treatments. For example, respondents in Groups (T8) and (T16) received the same forecasts from the GOJ, BOJ, and ESP.⁹ This evidence suggests that respondents perceive information from multiple sources as offering more precise signals than information from a single source.

⁷Note that Group (T16) represents respondents who prefer not to view any information.

⁸The above four results are robust for long-run inflation expectations. Table 7 in Appendix Appendix C shows the estimation results from the elicited beliefs about inflation expectations over the next 10 years. Figures 2 to C.3 in Appendix Appendix C illustrate the values of the coefficients γ_s from Specifications (1) to (3) in Tables 5 and 7, respectively. The table and figures suggest that our benchmark results are robust for long-run as well as short-run expectations.

⁹These findings are robust for long-term inflation expectations as well. Table 7 in Appendix Appendix C reports estimation results for inflation expectations over the next 10 years. Figures 2 to C.3 in Appendix Appendix C display the γ coefficients from Specifications (1) to (3) in Tables 5 and 7, respectively, indicating that our results hold for both long- and short-term expectations.

4.5 Who pays more attention to acquired information?

Who pays more attention to acquired information? This is the next question we explore. One might expect that consumers with exposure to interest rate risk are more likely to seek information on inflation forecasts. Consumers face interest rate risk if they have a mortgage loan, and this exposure may be a key factor explaining heterogeneity in expectations. When respondents are exposed to inflation risk, they are likely to allocate more attention to informational signals than those without such exposure. As a result, they incorporate the information into their expectations to a greater extent than those who are less affected by inflation risk.

To identify respondents with exposure to interest rate risk, we asked in the follow-up survey whether they have a loan.¹⁰ Figure 7 illustrates the values of the coefficients γ for groups with and without loans. The figure shows clear evidence that the respondents with a loan revised their forecasts to a greater extent. This suggests that consumers are more attentive to inflation forecasts when exposed to interest rate risk¹¹.

4.6 Are the effects of information treatment persistent?

The final question is whether consumers keep their forecasts anchored after receiving credible information. While one might expect these effects to be temporary, we conduct a follow-up survey one year after the initial survey to assess their persistence. The analysis suggests that the effects are indeed persistent.

We use the following specification:

$$X_j^{followup} = \alpha \times X_j^{pre} + \sum_k \beta_k \times Treatment_j^{(k)} + \sum_k \gamma_k Treatment_j^{(k)} \times X_j^{pre} + \mathbf{Z}_j \Psi + \varepsilon_j, \quad (2)$$

where $X_j^{followup}$ represents inflation expectations measured in the follow-up survey. Equation (2) allows us to evaluate whether the effects of the information provision are persistent. Our focus is on γ_k , which will have a larger negative value if consumers remember the figures they saw in the first wave and incorporate this information into their forecasts.

Figure 8 illustrates the values of the coefficients γ for the placebo group (T1), the exogenous information treatment group (T2–T8), and the endogenous information selection group (ET). The figure provides clear evidence that respondents significantly revised their forecasts after viewing inflation projections from established institutions. A similar trend appears in Figure 9, which shows

¹⁰Table 8 provides basic statistics on inflation forecasts for the next 12 months from the follow-up survey.

¹¹This results are consistent with previous studies such as Coibion et al. (2018) and Roth et al. (2022).

the γ for groups with information from a single source (T2–T4), two sources (T5–T7), and all sources (T8). The figure indicates that consumers revised their forecasts to a greater extent when they view information from multiple sources.¹² These results imply that the quantity of information matters: the effects of information provision are larger and more persistent when multiple sources are provided.

5 Model setup

Following Fuster et al. (2022), this section presents a model designed to replicate most of the experimental results from the previous section. Agents in the model choose among different pieces of information.

The model’s timing is as follows.

1. Respondents select information about inflation forecasts from one or more of three established institutions or opt for no information (“information selection”).
2. Information is provided, and respondents decide how much attention to allocate to it (“information processing”).
3. Respondents report their posterior beliefs about the fundamental.

Respondent j has the prior belief that the fundamental θ is normally distributed with mean $\mu_\theta(j)$ and variance $\sigma_\theta^2(j)$. In the experiment, the fundamental represents inflation expectations over the next year or the next 10 years. The index j indicates that the model accounts for heterogeneity, allowing prior beliefs about the fundamental to vary across respondents.

Respondents have the common prior belief that each piece of information $k \in \{1, 2, 3\}$ is a noisy signal about the fundamental:

$$x_k = \theta + \varepsilon_k,$$

where x_k is the information provided and ε_k represents noise that is normally distributed with mean zero. The model allows for heterogeneous priors on the precision of each information source: $\tau_1(j) \equiv (1/\sigma_{\varepsilon,1}(j))$, $\tau_2(j) \equiv (1/\sigma_{\varepsilon,2}(j))$, and $\tau_3(j) \equiv (1/\sigma_{\varepsilon,3}(j))$. We assume that respondents who prefer information from multiple sources believe that a combination of sources $k \in \{(1, 2), (2, 3), (3, 1), (1, 2, 3)\}$ provide a noisy signal about the fundamental but perceive in-

¹²Figure C.4 in Appendix C displays the γ for respondents with and without loans, supporting our findings. The effects are more persistent among those exposed to interest rate risk.

formation from multiple sources as more precise than from a single source. For example,

$$\sigma_{\varepsilon,1}(j) > \sigma_{\varepsilon,(1,2)}(j) > \sigma_{\varepsilon,(1,2,3)}(j).$$

Following Sims (2003), the allocation of attention to the provided information is modeled as a noisy signal reflecting the information.

$$s(j) = x_k + \psi(j),$$

where $s(j)$ represents the signal about the provided information, k refers to the source of information selected by the respondent, and $\psi(j)$ is noise that arises due to limited attention to the provided information. In this setting, limited attention creates a noisy perception of the provided information. The noise, $\psi(j)$, is assumed to be normally distributed with mean zero and variance $\sigma_{\psi}^2(j)$. Allocating more attention to the information is represented by a lower noise variance, $\sigma_{\psi}^2(j)$. Respondents choose the level of attention to pay to the provided information, effectively selecting their preferred $\sigma_{\psi}^2(j)$.

Posterior beliefs are derived through Bayesian updating. If respondent j selects information source $k \in \{1, 2, 3, (1, 2), (2, 3), (3, 1), (1, 2, 3)\}$ and chooses the variance of the noise $\sigma_{\psi}^2(j)$, the respondent's posterior belief is obtained by combining prior belief with the received signal:

$$s(j) = \theta + \varepsilon_k + \psi(j).$$

The posterior mean of the fundamental is

$$E[\theta|s(j)] = \mu_{\theta}(j) + \frac{\sigma_{\theta}^2(j)}{\sigma_{\theta}^2(j) + \sigma_{\varepsilon,k}^2(j) + \sigma_{\psi}^2(j)} \times (\theta + \varepsilon_k + \psi(j) - \mu_{\theta}(j)). \quad (3)$$

The weight given to the provided information increases with both the perceived precision of the selected information source and the attention allocated to it. The posterior variance of the fundamental is

$$\sigma_{\theta|s}^2(j) = \frac{1}{\frac{1}{\sigma_{\theta}^2(j)} + \frac{1}{\sigma_{\varepsilon,k}^2(j) + \sigma_{\psi}^2(j)}}.$$

Equation (3) predicts how respondents process the provided information. First, respondents who preferred getting information from multiple sources were expected to place more weight on this information than those who prefer a single source, if they believed that multiple sources reduce the variance of noise, $\sigma_{\varepsilon,k}^2(j)$. This prediction aligns with empirical data. Tables 2 and 3 show that 261 out of 1,004 respondents opted to view all three sophisticated forecasts. Figures 2 to 4 indicate that

respondents placed more weight on information when they chose to view forecasts from multiple sources. Second, Equation (3) suggests that respondents with exposure to the fundamental pay closer attention to the provided information. Roth et al. (2022) support this, showing that respondents who learn about a higher personal exposure to unemployment risk during recessions increase their demand for expert forecasts on recession likelihood.

6 Conclusion

The study of subjective expectations has garnered increasing attention from policymakers. Heterogeneity in expectations arises during three stages of belief formation: information selection, acquisition, and processing (Fuster et al., 2022). This study uses experimental methods to analyze how each stage contributes to heterogeneity in expectations. We conduct an experiment with a nationwide sample of consumers representative of the Japanese population, allowing respondents to select and process information. Additionally, we introduce exogenous variation in information selection to measure the effects of information quality and quantity on expectation heterogeneity.

The experimental design comprises three stages. In the first stage, respondents report their prior beliefs about inflation expectations, which are elicited by presenting distributional questions about aggregate inflation over the next 1 and 10 years. In the second stage, respondents indicate their information preferences. Half of them are randomly assigned to information treatment groups, with variations in the number of information sources intended to generate heterogeneity in signal precision. The remaining half are randomly assigned to information selection groups, where variations in information choice are expected to create differences in the amount of attention they allocate to the signals. Respondents also had the option to opt out of viewing any information. In the third stage, the survey concludes with a re-evaluation of all respondents' posterior beliefs about inflation expectations.

We present four main findings. First, respondents show differing preferences for information sources. Our results indicate that older respondents and higher-income earners tend to view all available information, while younger respondents and those with lower educational attainment are more likely to opt out of viewing any information. These findings align with the idea that individuals who can process a set of information are more inclined to seek sophisticated forecasts. The cost of processing information may also influence information demand. Second, respondents incorporate the information they receive into their expectations. Our results show that respondents who view one or more pieces of information revise their beliefs accordingly, with the effects of information provision being not just transitory but persistent. This suggests that providing credible

information about future inflation can help stabilize inflation expectations over time, which may be especially valuable in a high-inflation environment. Third, respondents tend to incorporate multiple pieces of information into their expectations more readily than a single source. This indicates that respondents perceive information from multiple sources as providing more precise signals than information from a single source. Finally, the endogenous information-selection treatment leads respondents to incorporate the information into their expectations more than the exogenous information-provision treatment does. This suggests that individuals exposed to inflation risk, particularly through interest rate risk, are likely to pay closer attention to information signals than those who are not.

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Table 1: Basic statistics on perceptions about inflation rates

	Mean	S.D.	Observations
All	9.11%	3.30	2,009
Female	9.16%	3.35	1,006
Male	9.09%	3.24	994
Non-college grad	9.25%	3.40	1,024
College grad	9.04%	3.12	959
Annual income (< 2million yen)	9.21%	3.77	250
Annual income (> 7.5million yen)	9.15%	3.06	419
Age under 50	8.30%	3.71	966
Age over 50	9.87%	2.66	1,043

Note: Perceptions about inflation rates are the percentage change in consumer prices in the last 12 months.

Table 2: Basic statistics on inflation expectations: First wave

Treatment	Provided information	Prior		Posterior		Observations
		Mean	S.D.	Mean	S.D.	
All	(Entire sample)	6.76%	3.28	6.79%	3.82	2,009
C0	No information provided	6.53%	3.25	7.41%	4.42	100
T1	Population growth	7.15%	3.17	8.00%	3.80	100
T2	Price outlook by the GOJ	6.18%	3.15	7.22%	3.60	101
T3	Price outlook by BOJ	6.79%	2.95	6.40%	3.77	100
T4	Price outlook by ESP	6.09%	3.44	7.17%	3.65	100
T5	Price outlook by both the GOJ and BOJ	6.88%	3.46	6.89%	3.92	101
T6	Price outlook by both the GOJ and ESP	6.81%	3.23	7.35%	3.37	101
T7	Price outlook by both the BOJ and ESP	7.01%	3.16	6.83%	3.51	100
T8	Price outlook by the GOJ, BOJ, and ESP	6.90%	3.26	6.77%	3.45	202
ET	Choose one of the options below:					(1,004)
T9	Price outlook by the GOJ	6.72%	3.69	7.33%	4.15	108
T10	Price outlook by BOJ	7.23%	3.19	6.93%	3.46	59
T11	Price outlook by ESP	7.18%	3.27	7.41%	3.30	163
T12	Price outlook by both the GOJ and BOJ	6.62%	3.02	6.72%	3.42	96
T13	Price outlook by both the GOJ and ESP	6.82%	3.01	5.92%	3.28	102
T14	Price outlook by both the BOJ and ESP	6.70%	2.62	5.94%	3.15	77
T15	Price outlook by the GOJ, BOJ, and ESP	7.07%	2.89	6.12%	3.41	261
T16	Do not want to see any information at all	5.90%	4.37	5.96%	5.89	138

Note: Prior and posterior beliefs are inflation expectations over the next 12 months. GOJ, BOJ, and EPS represent the Government of Japan, Bank of Japan, and professional forecasts in the private sector, respectively.

Table 3: Basic statistics on consumer's inflation expectations for the next 10 years

Treatment	Provided information	Prior		Posterior		Observations
		Mean	S.D.	Mean	S.D.	
All	(Entire sample)	6.55%	3.59	6.51%	3.98	2,009
C0	No information provided	6.32%	3.88	6.88%	3.84	100
T1	Population growth	6.96%	3.81	7.62%	4.25	100
T2	Price outlook by the GOJ	5.53%	3.84	6.32%	4.12	101
T3	Price outlook by BOJ	6.47%	3.68	5.88%	4.01	100
T4	Price outlook by ESP	6.29%	3.77	7.07%	4.22	100
T5	Price outlook by both the GOJ and BOJ	6.77%	3.73	6.39%	3.81	101
T6	Price outlook by both the GOJ and ESP	6.60%	3.46	6.84%	3.72	101
T7	Price outlook by both the BOJ and ESP	6.56%	3.67	6.68%	3.94	100
T8	Price outlook by the GOJ, BOJ, and ESP	6.43%	3.53	6.30%	3.71	202
ET	Choose one of the options below:					(1,004)
T9	Price outlook by the GOJ	6.78%	4.10	7.25%	4.21	108
T10	Price outlook by BOJ	7.48%	3.35	7.14%	3.73	59
T11	Price outlook by ESP	6.94%	3.45	6.91%	3.78	163
T12	Price outlook by both the GOJ and BOJ	6.62%	3.17	6.35%	3.58	96
T13	Price outlook by both the GOJ and ESP	6.50%	3.07	5.70%	3.50	102
T14	Price outlook by both the BOJ and ESP	6.39%	3.23	5.75%	3.61	77
T15	Price outlook by the GOJ, BOJ, and ESP	6.54%	3.26	5.94%	3.69	261
T16	Do not want to see any information at all	6.45%	4.06	6.51%	5.31	138

Note: Prior and posterior beliefs are inflation expectations for the next 10 years. GOJ, BOJ, and EPS represent the Government of Japan, Bank of Japan, and professional forecasts in the private sector, respectively.

Table 4: Information preferences: Probit analysis

	(1) Prefer to see all information	(2) Prefer not to see any information
Female	0.131* (0.073)	0.061 (0.089)
Age	0.011*** (0.002)	-0.016*** (0.003)
Income	0.057*** (0.019)	-0.007 (0.024)
Education	0.013 (0.021)	-0.092*** (0.024)
Constant	-2.035 (0.188)	-0.329 (0.195)
Observations	2,000	2,000

Note: Dependent variables are (1) a dummy variable that takes one if respondents choose to see all pieces of information from the GOV, BOJ, and ESP, and zero otherwise, and (2) a dummy variable that takes one if respondents choose not to see any pieces of information at all, and zero otherwise. GOJ, BOJ, and EPS represent the Government of Japan, Bank of Japan, and professional forecasts in the private sector, respectively. ***, **, and * indicate 1%, 5%, and 10% significance, respectively.

Table 5: How does the acquired information influence posterior beliefs over the next 12 months?

Variables	(1)	(2)	(3)
(T1): Population growth	-0.272 (0.442)		-0.267 (0.438)
(T2): Price outlook by the GOJ	-0.431 (0.441)		-0.440 (0.437)
(T3): Price outlook by BOJ	-1.392*** (0.442)		-1.382*** (0.438)
(T4): Price outlook by ESP	-0.143 (0.442)		-0.137 (0.438)
(T5): Price outlook by both the GOJ and BOJ	-0.951** (0.441)		-0.936** (0.437)
(T6): Price outlook by both the GOJ and ESP	-0.970** (0.441)		-0.976** (0.437)
(T7): Price outlook by both the BOJ and ESP	-1.345*** (0.442)		-1.340*** (0.438)
(T8): Price outlook by the GOC, BOJ, and ESP	-1.324*** (0.382)		-1.319*** (0.379)
(ET): Choose one of the options below:	-1.381*** (0.328)		
(T9): Price outlook by the GOJ		-0.557 (0.414)	-0.549 (0.430)
(T10): Price outlook by BOJ		-1.316** (0.489)	-1.330** (0.509)
(T11): Price outlook by ESP		-0.900** (0.378)	-0.909** (0.394)
(T12): Price outlook by both the GOJ and BOJ		-1.102** (0.426)	-1.105** (0.443)
(T13): Price outlook by both the GOJ and ESP		-1.988*** (0.419)	-1.997*** (0.436)
(T14): Price outlook by both the BOJ and ESP		-2.011*** (0.452)	-2.014*** (0.470)
(T15): Price outlook by the GOJ, and BOJ, ESP		-2.066*** (0.350)	-2.073*** (0.364)
(T16): Do not want to see any information at all		-0.562 (0.391)	-0.564 (0.407)
Constant	1.145*** (0.313)	1.134*** (0.298)	1.140*** (0.310)
Observations	2,009	1,104	2,009

Note: Prior and posterior beliefs are inflation expectations over the next 12 months. GOJ, BOJ, and EPS represent the Government of Japan, Bank of Japan, and professional forecasts in the private sector, respectively. The estimated specification is $X_j^{post} - X_j^{pre} = c + \sum_{k=2}^{17} \gamma_k Treatment_j^{(k)} + error_j$. Coefficients for groups are relative to the coefficient for the control group (C0). All estimates are based on Huber-robust regressions. No respondent controls are included. Robust standard errors are in parentheses, and ***, **, and * indicate 1%, 5%, and 10% significance, respectively.

Table 6: Does the endogenous information selection influence the posterior beliefs more than the exogenous information treatment?

Variables	(1) Next 12 months	(2) Next 10 years
γ_2 : Placebo group (T1)	-0.266 (0.442)	0.013 (0.484)
γ_{3to9} : Exogenous information treatment groups (T2)–(T8)	-0.997*** (0.332)	-0.676* (0.363)
γ_{10} : Endogenous information selection group (ET)	-1.375*** (0.328)	-0.897* (0.359)
Constant	1.140 (0.313)	0.643 (0.342)
Observations	2,009	2,009
Wald statistics for $H_0: \gamma_{3to9} = \gamma_{10}$	6.53**	1.86*

Note: GOJ, BOJ, and EPS represent the Government of Japan, Bank of Japan, and professional forecasts in the private sector, respectively. The estimated specification is $X_j^{post} - X_j^{pre} = c + \sum_{k=2}^{17} \gamma_k Treatment_j^{(k)} + error_j$. Coefficients for groups are relative to the coefficient for the control group (C0). All estimates are based on Huber-robust regressions. No respondent controls are included. Robust standard errors are in parentheses, and ***, **, and * indicate 1%, 5%, and 10% significance, respectively.

Table 7: How does the acquired information influence posterior beliefs over the next 10 years?

Variables	(1)	(2)	(3)
(T1): Population growth	0.010 (0.484)		0.011 (0.482)
(T2): Price outlook by the GOJ	-0.200 (0.483)		-0.200 (0.481)
(T3): Price outlook by BOJ	-0.982** (0.484)		-0.978** (0.482)
(T4): Price outlook by ESP	0.011 (0.484)		0.011 (0.482)
(T5): Price outlook by both the GOJ and BOJ	-0.938* (0.483)		-0.935* (0.481)
(T6): Price outlook by both the GOJ and ESP	-0.886* (0.483)		-0.892* (0.481)
(T7): Price outlook by both the BOJ and ESP	-0.734 (0.484)		-0.737 (0.482)
(T8): Price outlook by the GOC, BOJ, and ESP	-0.807* (0.419)		-0.806* (0.417)
(ET): Choose one of the options below:	-0.899** (0.359)		
(T9): Price outlook by the GOJ		-0.264 (0.456)	-0.255 (0.473)
(T10): Price outlook by BOJ		-0.989* (0.539)	-0.993* (0.560)
(T11): Price outlook by ESP		-0.651 (0.417)	-0.658 (0.433)
(T12): Price outlook by both the GOJ and BOJ		-0.928* (0.469)	-0.932* (0.487)
(T13): Price outlook by both the GOJ and ESP		-1.436*** (0.462)	-1.442*** (0.480)
(T14): Price outlook by both the BOJ and ESP		-1.460*** (0.498)	-1.455*** (0.517)
(T15): Price outlook by the GOJ, and BOJ, ESP		-1.329*** (0.386)	-1.329*** (0.401)
(T16): Do not want to see any information at all		-0.044 (0.431)	-0.049 (0.448)
Constant	0.644* (0.342)	0.640* (0.329)	0.644* (0.341)
Observations	2,009	1,104	2,009

Note: Prior and posterior beliefs are inflation expectations over the next 10 years. GOJ, BOJ, and EPS represent the Government of Japan, Bank of Japan, and professional forecasts in the private sector, respectively. The estimated specification is $X_j^{post} - X_j^{pre} = c + \sum_{k=2}^{17} \gamma_k Treatment_j^{(k)} + error_j$. Coefficients for groups are relative to the coefficient for the control group (C0). All estimates are based on Huber-robust regressions. No respondent controls are included. Robust standard errors are in parentheses, and ***, **, and * indicate 1%, 5%, and 10% significance, respectively.

Table 8: Basic statistics on inflation expectations: Follow-up survey

Treatment	Provided information	Mean	S.D.	Observations
All	(Entire sample)	5.67%	3.29	1,426
C0	No information provided	6.47%	3.22	69
T1	Population growth	6.37%	3.21	68
T2	Price outlook by the GOJ	4.95%	2.90	71
T3	Price outlook by BOJ	4.48%	2.69	73
T4	Price outlook by ESP	6.18%	3.37	72
T5	Price outlook by both the GOJ and BOJ	5.32%	3.02	76
T6	Price outlook by both the GOJ and ESP	5.86%	3.35	66
T7	Price outlook by both the BOJ and ESP	5.73%	3.03	72
T8	Price outlook by the GOJ, BOJ, and ESP	5.52%	3.13	137
ET	Choose one of the options below:			(722)
T9	Price outlook by the GOJ	5.04%	4.50	68
T10	Price outlook by BOJ	6.22%	3.08	43
T11	Price outlook by ESP	6.44%	3.12	127
T12	Price outlook by both the GOJ and BOJ	4.91%	3.59	71
T13	Price outlook by both the GOJ and ESP	5.25%	2.92	71
T14	Price outlook by both the BOJ and ESP	6.13%	2.51	58
T15	Price outlook by the GOJ, BOJ, and ESP	5.88%	2.96	184
T16	Do not want to see any information at all	5.40%	4.24	100
	Household with loans	5.55 %	3.17	313
	Household without loans	5.71 %	3.32	1,113

Note: This table shows inflation expectations over the next 12 months in the follow-up survey. GOJ, BOJ, and EPS represent the Government of Japan, Bank of Japan, and professional forecasts in the private sector, respectively.

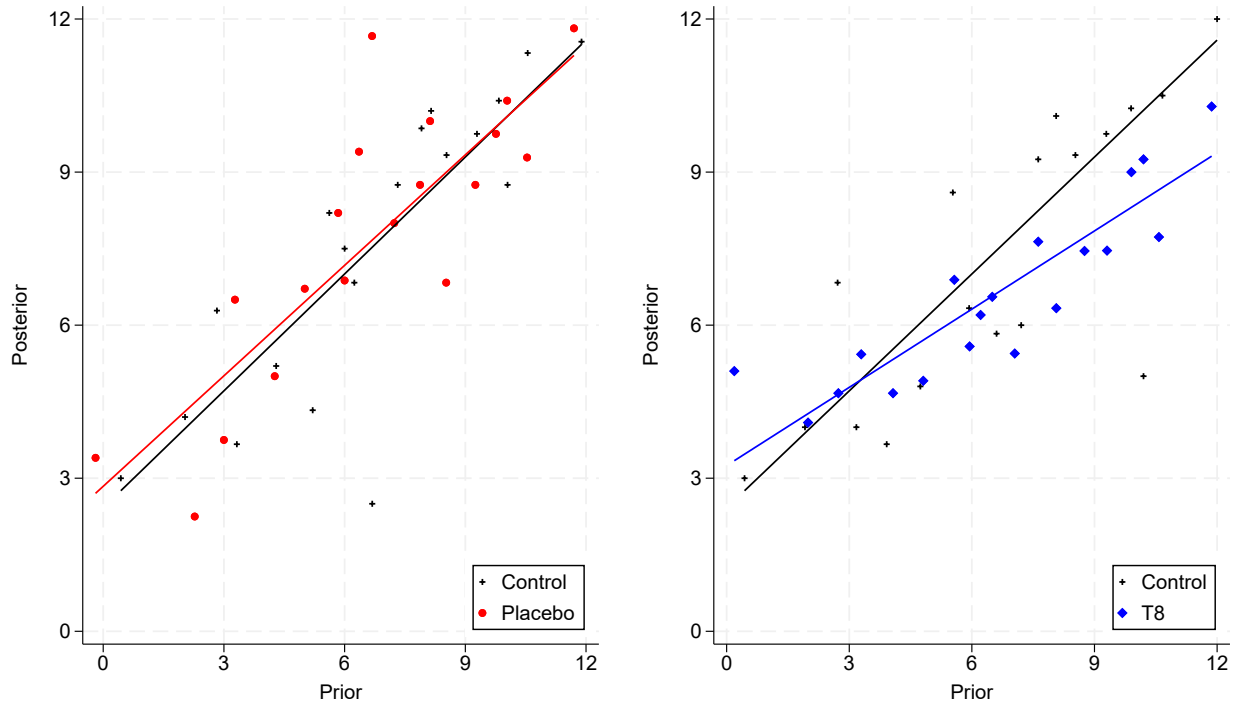


Figure 1: Binned scatterplot: Control group v.s. “placebo” in the left panel; Control group v.s. the group (T8) provided all of the established forecasts over the next 12 months in the right panel.

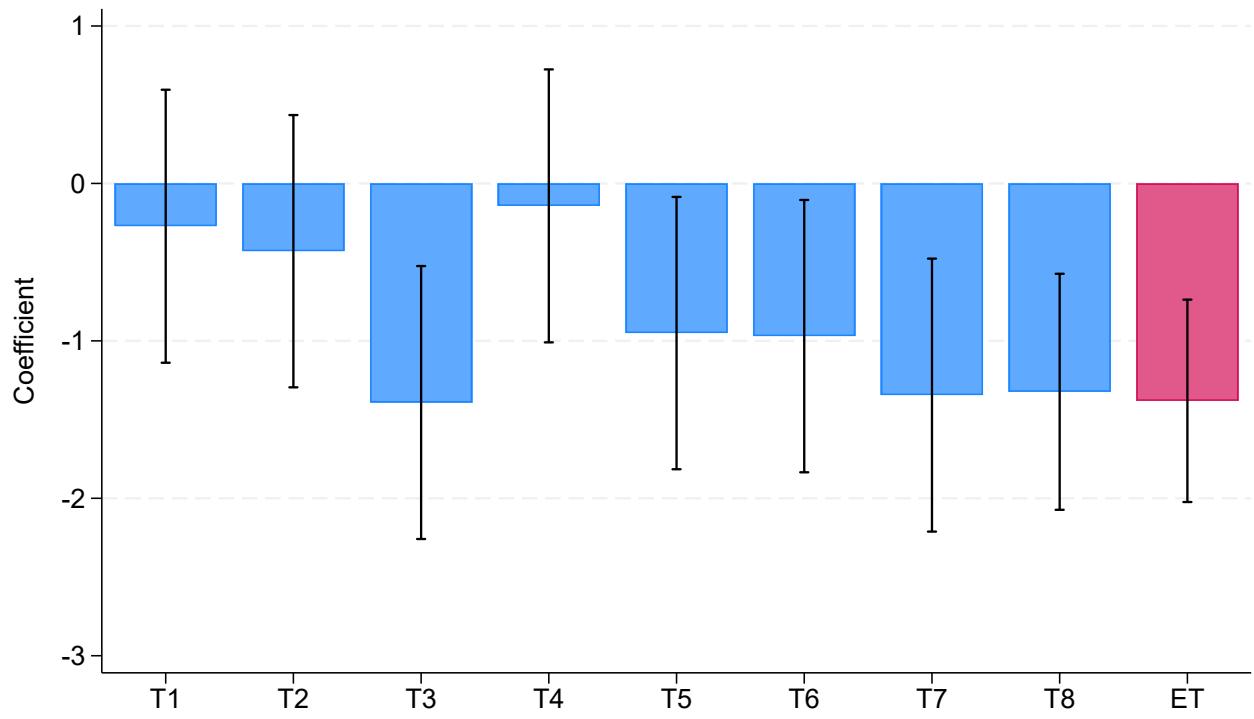


Figure 2: The acquired information influences the posterior beliefs over the next 12 months. Estimation results from the groups (T1) to (ET). The bar indicates the 90% confidence interval. The baseline is set to be (C0).

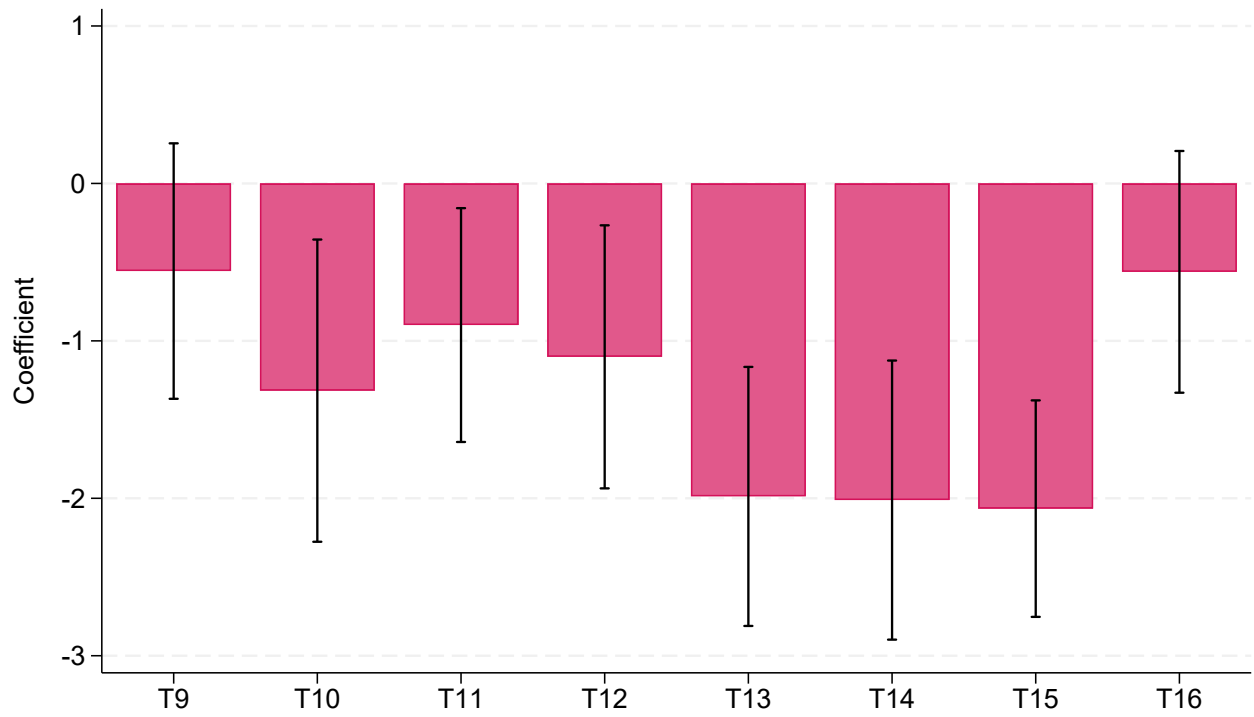


Figure 3: The information selection influences the posterior beliefs over the next 12 months. Estimation results from the groups (T9) to (T16). The bar indicates the 90% confidence interval. The baseline is set to be (C0).

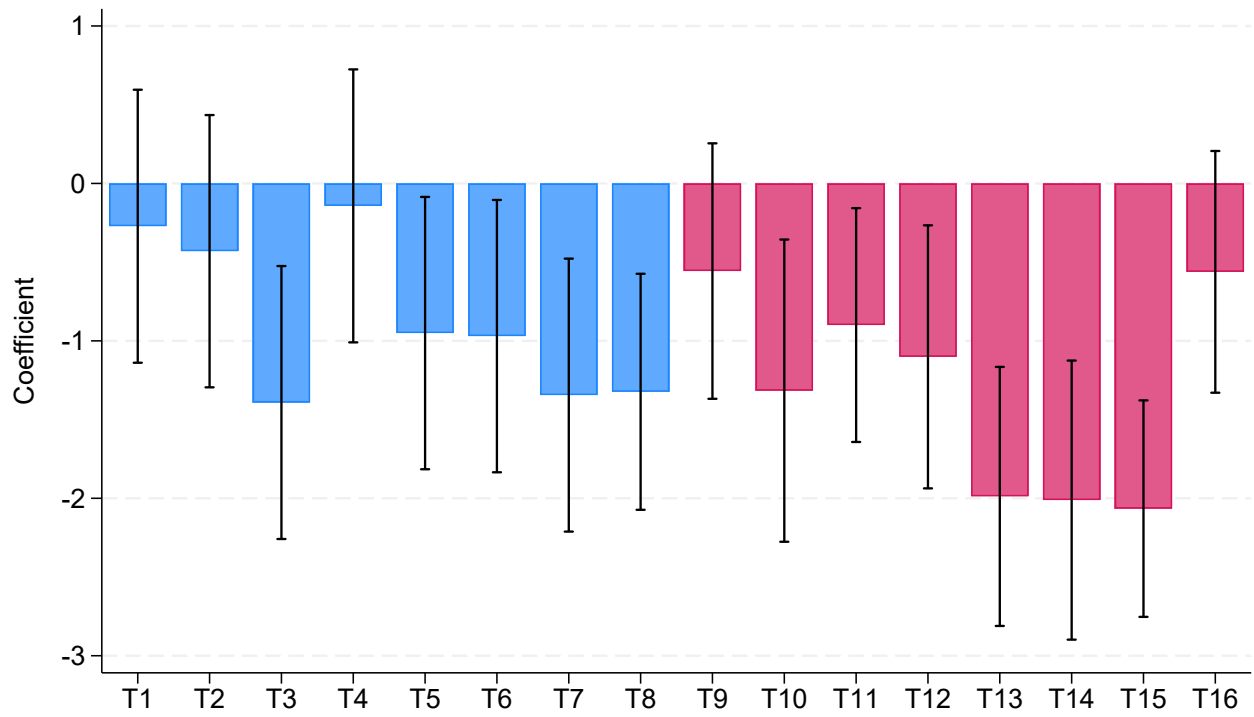


Figure 4: The acquired information influences the posterior beliefs over the next 12 months. Estimation results from the groups (T1) to (T16). The bar indicates the 90% confidence interval. The baseline is set to be (C0).

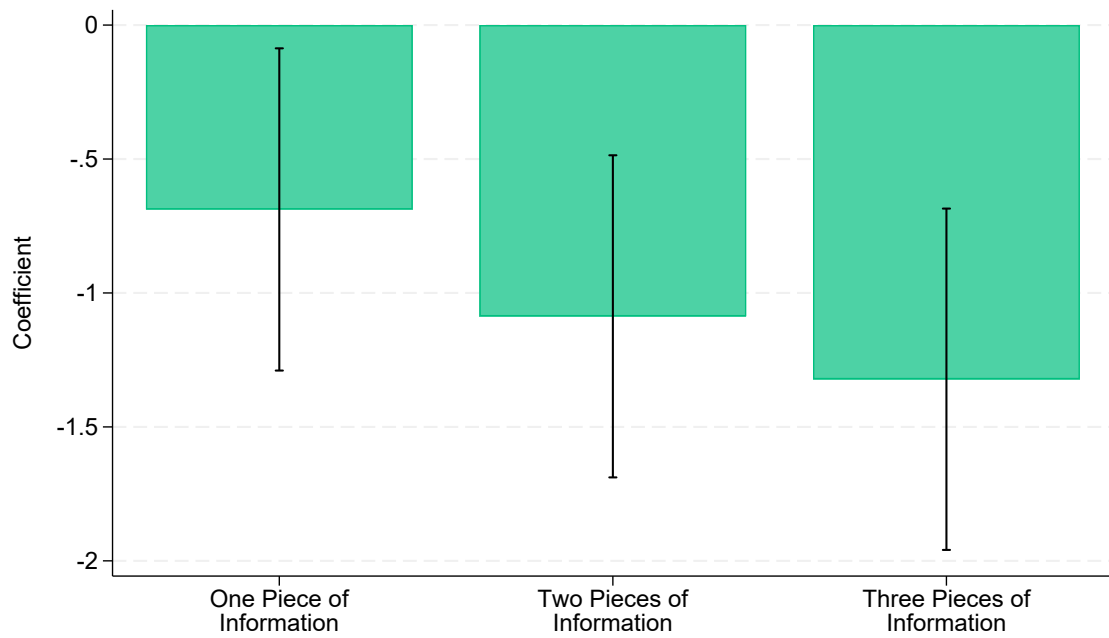


Figure 5: Effects of the quantity of information. The acquired information influences posterior beliefs over the next 12 months. The bar indicates the 90% confidence interval. The baseline is set to be (C0).

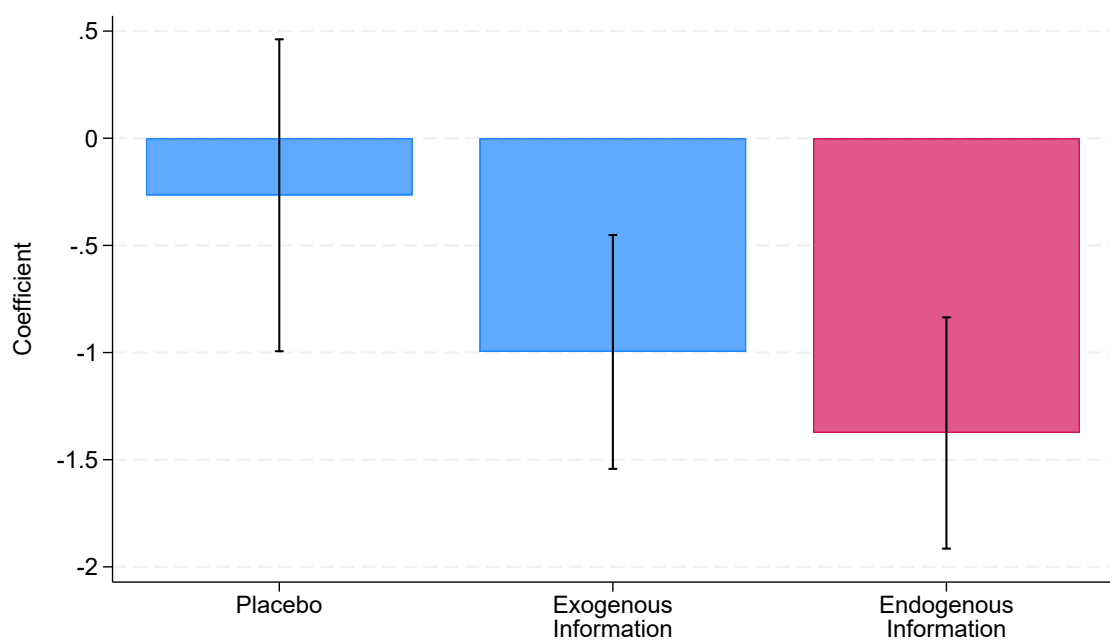


Figure 6: Exogenous vs. endogenous information selection. We compare the prior beliefs with the posterior beliefs over the next 12 months. The bar indicates the 90% confidence interval. The baseline is set to be (C0).

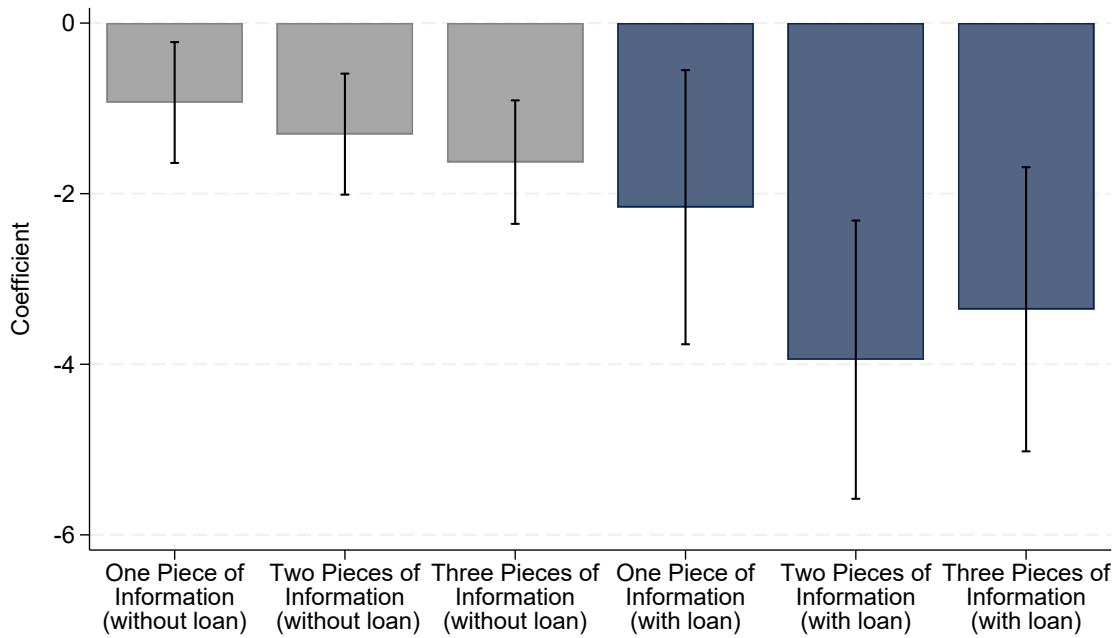


Figure 7: Who pays more attention to the information provided? The acquired information influences the posterior beliefs over the next 12 months. The bar indicates the 90% confidence interval. The baseline is set to be (C0).

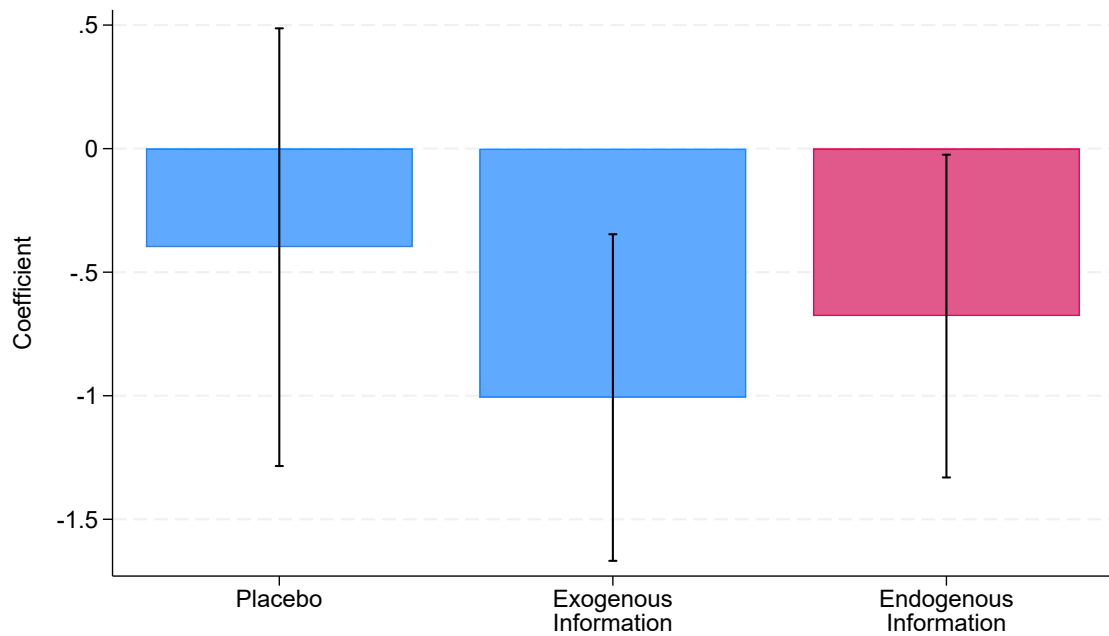


Figure 8: Are the effects of the information acquired persistent? The acquired information influences the posterior beliefs over the next 12 months. The bar indicates the 90% confidence interval. The baseline is set to be (C0).

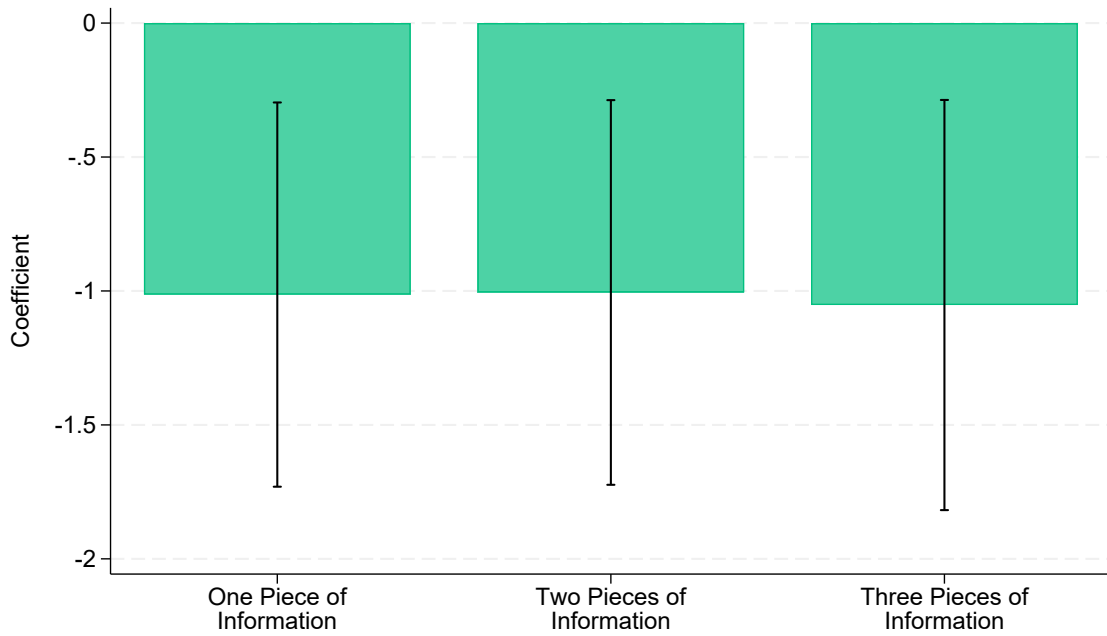


Figure 9: Are the effects of the information acquired more persistent when respondents choose information they see? The acquired information influences the posterior beliefs over the next 12 months. The bar indicates the 90% confidence interval. The baseline is set to be (C0).

Appendix A Questionnaire: 1st wave

Q.1. In your opinion, do you think prices have gone up or down compared to a year ago?

- (1) Have gone up significantly
- (2) Have gone up slightly
- (3) Have been unchanged
- (4) Have gone down slightly
- (5) Have gone down significantly

Q.2. In your opinion, how much do you think prices have changed year-on-year compared to a year ago?

- (1) Around +12% or higher (+11.5% or higher)
- (2) Around +11% (+10.5% ~ +11.4%)
- (3) Around +10% (+9.5% ~ +10.4%)
- (4) Around +9% (+8.5% ~ +9.4%)
- (5) Around +8% (+7.5% ~ +8.4%)
- (6) Around +7% (+6.5% ~ +7.4%)
- (7) Around +6% (+5.5% ~ +6.4%)
- (8) Around +5% (+4.5% ~ +5.4%)
- (9) Around +4% (+3.5% ~ +4.4%)
- (10) Around +3% (+2.5% ~ +3.4%)
- (11) Around +2% (+1.5% ~ +2.4%)
- (12) Around +1% (+0.5% ~ +1.4%)
- (13) Around +0% (-0.5% ~ +0.4%)
- (14) Around -1% (-1.5% ~ -0.6%)
- (15) Around -2% (-2.5% ~ -1.6%)
- (16) Around -3% (-3.5% ~ -2.6%)
- (17) Around -4% (-4.5% ~ -3.6%)
- (18) Around -5% (-5.5% ~ -4.6%)
- (19) Around -6% (-6.5% ~ -5.6%)
- (20) Around -7% (-7.5% ~ -6.6%)

- (21) Around -8% (-8.5% ~ -7.6%)
- (22) Around -9% (-9.5% ~ -8.6%)
- (23) Around -10% (-10.5% ~ -9.6%)
- (24) Around -11% (-11.5% ~ -10.6%)
- (25) Around -12% or lower (-11.6% or lower)

Q.3. Over the next year, do you think prices will go up or down?

- (1) Will go up significantly
- (2) Will go up slightly
- (3) Will be unchanged
- (4) Will go down slightly
- (5) Will go down significantly

Q.4. In some of the following questions, we will ask you to think about the percent chance of something happening in the future. Your answers can range from 0 to 100, where 0 means there is absolutely no chance, and 100 means that it is absolutely certain. For example, numbers like: 2 and 5 percent may indicate "almost no chance"; 18 percent or so may mean "not much chance"; 47 or 52 percent chance may be a "pretty even chance"; 83 percent or so may mean a "very good chance"; 95 or 98 percent chance may be "almost certain".

Over the next year, how likely do you think that the following changes (1)-(10) will occur in the annual inflation rate? (The number entered should total 100.)

- (1) increase by 12% or more _____ %
- (2) increase by 8% to 12% _____ %
- (3) increase by 4% to 8% _____ %
- (4) increase by 2% to 4% _____ %
- (5) increase by 0% to 2% _____ %
- (6) decrease by 0% to 2% _____ %
- (7) decrease by 2% to 4% _____ %
- (8) decrease by 4% to 8% _____ %
- (9) decrease by 8% to 12% _____ %

(10) decrease by 12% or more _____ %

Total XXX

Q.5. Over the next 10 years, how likely do you think that the following year-on-year changes (1)-(10) will occur in the annual inflation rate? (The number entered should total 100.)

(1) increase by 12% or more _____ %

(2) increase by 8% to 12% _____ %

(3) increase by 4% to 8% _____ %

(4) increase by 2% to 4% _____ %

(5) increase by 0% to 2% _____ %

(6) decrease by 0% to 2% _____ %

(7) decrease by 2% to 4% _____ %

(8) decrease by 4% to 8% _____ %

(9) decrease by 8% to 12% _____ %

(10) decrease by 12% or more _____ %

Total XXX

Q.6. If you could see the following information, which of the following would you want to see?

(1) Price Outlook by the Government

(2) Price Outlook by the BOJ

(3) Price Outlook by the Private Sector

(4) Price Outlook by the Government and the BOJ

(5) Price Outlook by the BOJ and the Private Sector

(6) Price Outlook by the Private Sector and the Government

(7) Price Outlook by the Government, the BOJ, and the Private Sector

(8) I do not want to see any information at all

You indicated in the previous question that you would like to see information on (answer to Q6). Below is the information about the price outlook.

- **Government Estimates of Population Growth**
According to the government's estimate released in July of this year, Japan's total population growth rate as of July 1 of this year is expected to be -0.45% compared to the same month last year.
- **Price Outlook by the Government**
According to the government's estimate released in July of this year, the consumer price index (an index that indicates how much the prices of goods and other items that consumers buy on a daily basis including taxes have changed) is expected to increase by $+2.6\%$ in FY2023 compared to the previous year.
- **Price Outlook by the Bank of Japan**
According to the Outlook for Economic Activity and Prices released by the Bank of Japan in July 2024, the rate of increase in the consumer price index excluding fresh food (an index that indicates how much the prices of goods that consumers buy on a daily basis, including taxes, have changed) for FY2023 is expected to be $+2.5\%$ compared to the previous year.
- **Price Outlook by the Private Sector**
According to the outlook released by private economists (professionals) in July 2024, the rate of increase in the consumer price index excluding fresh food (an index that indicates how much the prices including tax of goods that consumers buy on a daily basis have changed) for FY2023 is expected to be $+2.6\%$ compared to the previous year.

Q.7. I would like to ask again about the price outlook. Over the next year, how much do you think prices will change compared to the previous year?

- (1) Around $+12\%$ or higher ($+11.5\%$ or higher)
- (2) Around $+11\%$ ($+10.5\% \sim +11.4\%$)
- (3) Around $+10\%$ ($+9.5\% \sim +10.4\%$)
- (4) Around $+9\%$ ($+8.5\% \sim +9.4\%$)
- (5) Around $+8\%$ ($+7.5\% \sim +8.4\%$)
- (6) Around $+7\%$ ($+6.5\% \sim +7.4\%$)
- (7) Around $+6\%$ ($+5.5\% \sim +6.4\%$)
- (8) Around $+5\%$ ($+4.5\% \sim +5.4\%$)
- (9) Around $+4\%$ ($+3.5\% \sim +4.4\%$)

- (10) Around +3% (+2.5% ~ +3.4%)
- (11) Around +2% (+1.5% ~ +2.4%)
- (12) Around +1% (+0.5% ~ +1.4%)
- (13) Around +0% (-0.5% ~ +0.4%)
- (14) Around -1% (-1.5% ~ -0.6%)
- (15) Around -2% (-2.5% ~ -1.6%)
- (16) Around -3% (-3.5% ~ -2.6%)
- (17) Around -4% (-4.5% ~ -3.6%)
- (18) Around -5% (-5.5% ~ -4.6%)
- (19) Around -6% (-6.5% ~ -5.6%)
- (20) Around -7% (-7.5% ~ -6.6%)
- (21) Around -8% (-8.5% ~ -7.6%)
- (22) Around -9% (-9.5% ~ -8.6%)
- (23) Around -10% (-10.5% ~ -9.6%)
- (24) Around -11% (-11.5% ~ -10.6%)
- (25) Around -12% or lower (-11.6% or lower)

Q.8. Over the next 10 years, how much do you think the average year-on-year change in prices will be each year?

- (1) Around +12% or higher (+11.5% or higher)
- (2) Around +11% (+10.5% ~ +11.4%)
- (3) Around +10% (+9.5% ~ +10.4%)
- (4) Around +9% (+8.5% ~ +9.4%)
- (5) Around +8% (+7.5% ~ +8.4%)
- (6) Around +7% (+6.5% ~ +7.4%)
- (7) Around +6% (+5.5% ~ +6.4%)
- (8) Around +5% (+4.5% ~ +5.4%)
- (9) Around +4% (+3.5% ~ +4.4%)
- (10) Around +3% (+2.5% ~ +3.4%)
- (11) Around +2% (+1.5% ~ +2.4%)

- | | |
|---------------------------|-------------------|
| (12) Around +1% | (+0.5% ~ +1.4%) |
| (13) Around +0% | (-0.5% ~ +0.4%) |
| (14) Around -1% | (-1.5% ~ -0.6%) |
| (15) Around -2% | (-2.5% ~ -1.6%) |
| (16) Around -3% | (-3.5% ~ -2.6%) |
| (17) Around -4% | (-4.5% ~ -3.6%) |
| (18) Around -5% | (-5.5% ~ -4.6%) |
| (19) Around -6% | (-6.5% ~ -5.6%) |
| (20) Around -7% | (-7.5% ~ -6.6%) |
| (21) Around -8% | (-8.5% ~ -7.6%) |
| (22) Around -9% | (-9.5% ~ -8.6%) |
| (23) Around -10% | (-10.5% ~ -9.6%) |
| (24) Around -11% | (-11.5% ~ -10.6%) |
| (25) Around -12% or lower | (-11.6% or lower) |

Q.9. Please indicate your gender.

- (1) Male
- (2) Female
- (3) other

Q.10. Please enter your age.

Q.11. Please indicate where you live.

- (1) Hokkaido
- (2) Aomori
- ~
- (47) Okinawa
- (99) others

Q.12. Are you married?

- (1) Yes
- (2) No

Q.13. Please indicate your occupation.

- (1) Company employee / officer
- (2) Self-employed
- (3) Professionals (doctors, lawyers, hairdressers, designers, etc.)
- (4) Civil servant
- (5) Student
- (6) Housewife / househusband
- (7) Part-time workers and freelancers
- (8) Unemployed / retired
- (9) Others

Q.14. Please indicate your educational background.

- (1) Primary and secondary school graduates
- (2) High school graduate
- (3) Technical college graduate
- (4) Vocational school graduate
- (5) Junior college graduate
- (6) University graduate
- (7) Graduate-school graduate
- (8) Studying at or enrolled in school

Q.15. Please indicate your household's total annual take-home income (total income excluding taxes and social contributions from January to December of the previous year).

- (1) Less than 2 million

- (2) 2 million ~ less than 3 million yen
- (3) 3 million ~ less than 4 million yen
- (4) 4 million ~ less than 5.5 million yen
- (5) 5.5 million ~ less than 7.5 million yen
- (6) 7.5 million ~ less than 9.5 million yen
- (7) 9.5 million ~ less than 12 million yen
- (8) More than 12 million yen

Appendix B Questionnaire: Follow-up

Q.1. Over the next year, do you think prices will go up or down?

- (1) Will go up significantly
- (2) Will go up slightly
- (3) Will be unchanged
- (4) Will go down slightly
- (5) Will go down significantly

Q.2. In some of the following questions, we will ask you to think about the chance (in percent) of something happening in the future. Your answers can range from 0 to 100, where 0 means there is absolutely no chance, and 100 means it is absolutely certain. For example, numbers like 2 to 5 percent may indicate "almost no chance"; 18 percent or so may mean "not much chance"; 47 or 52 percent chance may be a "pretty even chance"; 83 percent or so may mean a "very good chance"; 95 or 98 percent chance may be "almost certain".

Over the next year, how likely do you think that the following changes (1)-(10) will occur in the annual inflation rate? (The numbers entered should total 100.)

- | | |
|------------------------------|---------|
| (1) Increase by 12% or more | _____ % |
| (2) Increase by 8% to 12% | _____ % |
| (3) Increase by 4% to 8% | _____ % |
| (4) Increase by 2% to 4% | _____ % |
| (5) Increase by 0% to 2% | _____ % |
| (6) Decrease by 0% to 2% | _____ % |
| (7) Decrease by 2% to 4% | _____ % |
| (8) Decrease by 4% to 8% | _____ % |
| (9) Decrease by 8% to 12% | _____ % |
| (10) Decrease by 12% or more | _____ % |

Total XXX

Q.3. Over the next year, how much do you think prices will change compared to the previous year?

- (1) Around +12% or higher (+11.5% or higher)

- (2) Around +11% (+10.5% ~ +11.4%)
- (3) Around +10% (+9.5% ~ +10.4%)
- (4) Around +9% (+8.5% ~ +9.4%)
- (5) Around +8% (+7.5% ~ +8.4%)
- (6) Around +7% (+6.5% ~ +7.4%)
- (7) Around +6% (+5.5% ~ +6.4%)
- (8) Around +5% (+4.5% ~ +5.4%)
- (9) Around +4% (+3.5% ~ +4.4%)
- (10) Around +3% (+2.5% ~ +3.4%)
- (11) Around +2% (+1.5% ~ +2.4%)
- (12) Around +1% (+0.5% ~ +1.4%)
- (13) Around +0% (-0.5% ~ +0.4%)
- (14) Around -1% (-1.5% ~ -0.6%)
- (15) Around -2% (-2.5% ~ -1.6%)
- (16) Around -3% (-3.5% ~ -2.6%)
- (17) Around -4% (-4.5% ~ -3.6%)
- (18) Around -5% (-5.5% ~ -4.6%)
- (19) Around -6% (-6.5% ~ -5.6%)
- (20) Around -7% (-7.5% ~ -6.6%)
- (21) Around -8% (-8.5% ~ -7.6%)
- (22) Around -9% (-9.5% ~ -8.6%)
- (23) Around -10% (-10.5% ~ -9.6%)
- (24) Around -11% (-11.5% ~ -10.6%)
- (25) Around -12% or lower (-11.6% or lower)

Q.4. Over the next 10 years, how likely do you think that the following year-on-year changes (1)-(10) will occur in the annual inflation rate? (The numbers entered should total 100.)

- (1) increase by 12% or more _____ %
- (2) increase by 8% to 12% _____ %
- (3) increase by 4% to 8% _____ %

- (4) increase by 2% to 4% _____ %
- (5) increase by 0% to 2% _____ %
- (6) decrease by 0% to 2% _____ %
- (7) decrease by 2% to 4% _____ %
- (8) decrease by 4% to 8% _____ %
- (9) decrease by 8% to 12% _____ %
- (10) decrease by 12% or more _____ %

Total XXX

Q.5. Over the next 10 years, how much do you think the average year-on-year change in prices will be each year?

- (1) Around +12% or higher (+11.5% or higher)
- (2) Around +11% (+10.5% ~ +11.4%)
- (3) Around +10% (+9.5% ~ +10.4%)
- (4) Around +9% (+8.5% ~ +9.4%)
- (5) Around +8% (+7.5% ~ +8.4%)
- (6) Around +7% (+6.5% ~ +7.4%)
- (7) Around +6% (+5.5% ~ +6.4%)
- (8) Around +5% (+4.5% ~ +5.4%)
- (9) Around +4% (+3.5% ~ +4.4%)
- (10) Around +3% (+2.5% ~ +3.4%)
- (11) Around +2% (+1.5% ~ +2.4%)
- (12) Around +1% (+0.5% ~ +1.4%)
- (13) Around +0% (-0.5% ~ +0.4%)
- (14) Around -1% (-1.5% ~ -0.6%)
- (15) Around -2% (-2.5% ~ -1.6%)
- (16) Around -3% (-3.5% ~ -2.6%)
- (17) Around -4% (-4.5% ~ -3.6%)
- (18) Around -5% (-5.5% ~ -4.6%)
- (19) Around -6% (-6.5% ~ -5.6%)

- (20) Around -7% (-7.5% ~ -6.6%)
- (21) Around -8% (-8.5% ~ -7.6%)
- (22) Around -9% (-9.5% ~ -8.6%)
- (23) Around -10% (-10.5% ~ -9.6%)
- (24) Around -11% (-11.5% ~ -10.6%)
- (25) Around -12% or lower (-11.6% or lower)

Q.6. In the previous survey (from September 4-7, 2023), which information did you see?

- (1) Price Outlook by the Government
- (2) Price Outlook by the BOJ
- (3) Price Outlook by the Private Sector
- (4) Price Outlook by the Government and the BOJ
- (5) Price Outlook by the BOJ and the Private Sector
- (6) Price Outlook by the Private Sector and the Government
- (7) Price Outlook by the Government, the BOJ, and the Private Sector
- (8) I do not see any information at all.

Q.7. Which of the following institutions do you trust regarding information regarding the outlook for the economy and prices? Please select all institutions you trust.

- (1) The Government
- (2) The Bank of Japan
- (3) The Private Sector
- (4) I do not trust any institution

Q.8. Does your household currently have a mortgage? Please select the type of interest rate and then write the total debt amount.

- (1) I have a fixed-rate mortgage. _____ yen
- (2) I have a variable-rate mortgage. _____ yen
- (3) I have a mortgage with a combination of fixed- and variable- interest rate. _____ yen
- (4) I do not have a mortgage.

Q.9. How much is your household's monthly mortgage payment?

_____ yen

Q.10. Please indicate which of the following financial assets you own. Please select all the financial assets you own.

- (1) Bank savings (including cooperative banks, credit unions and other associations)
- (2) Corporate bonds
- (3) Life insurance
- (4) Stocks
- (5) Investment Trusts
- (6) Foreign currency deposits
- (7) Futures / Options
- (8) Japan Government bonds
- (9) Government bonds of foreign countries
- (10) Other bonds (public and corporate bonds, etc.)
- (11) Private individual pensions (from life insurance companies, etc.)
- (12) Company pensions
- (13) Cash
- (14) None

Appendix C Figures

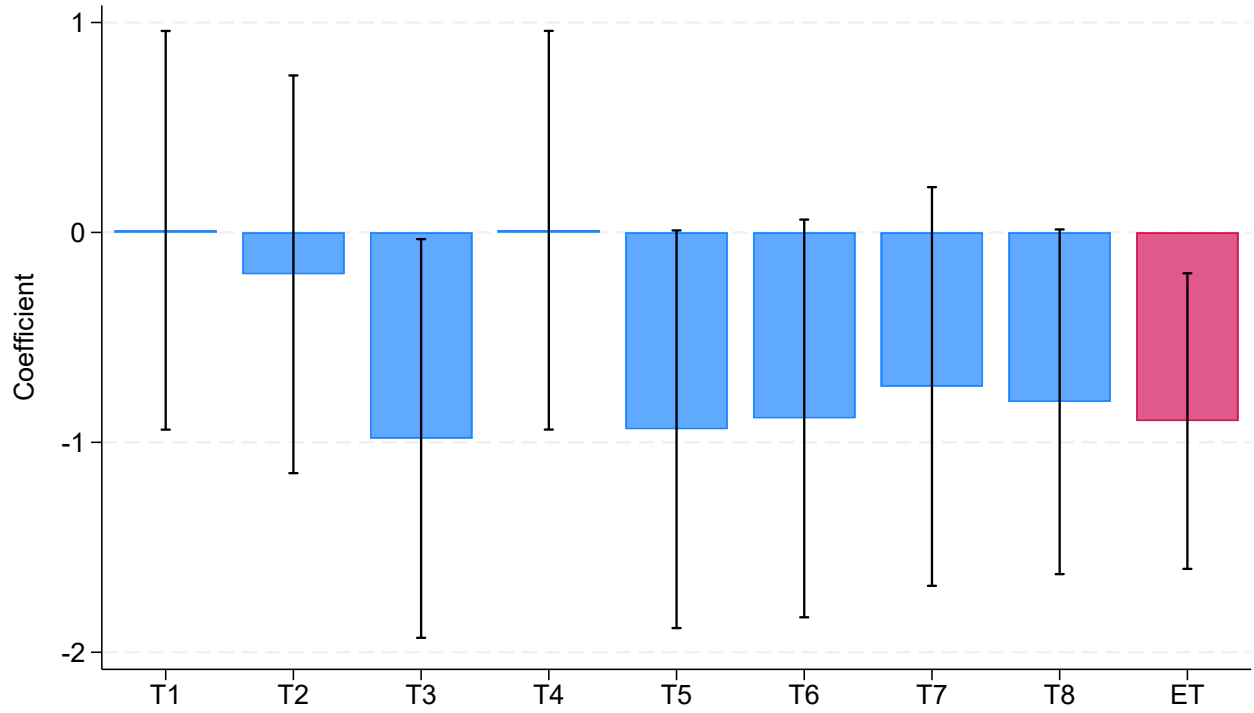


Figure C.1: Information provisions and selections influence posterior beliefs over the next 10 years. Estimation results from groups (T1) to (ET). The bar indicates the 90% confidence interval. The baseline is set at (C0).

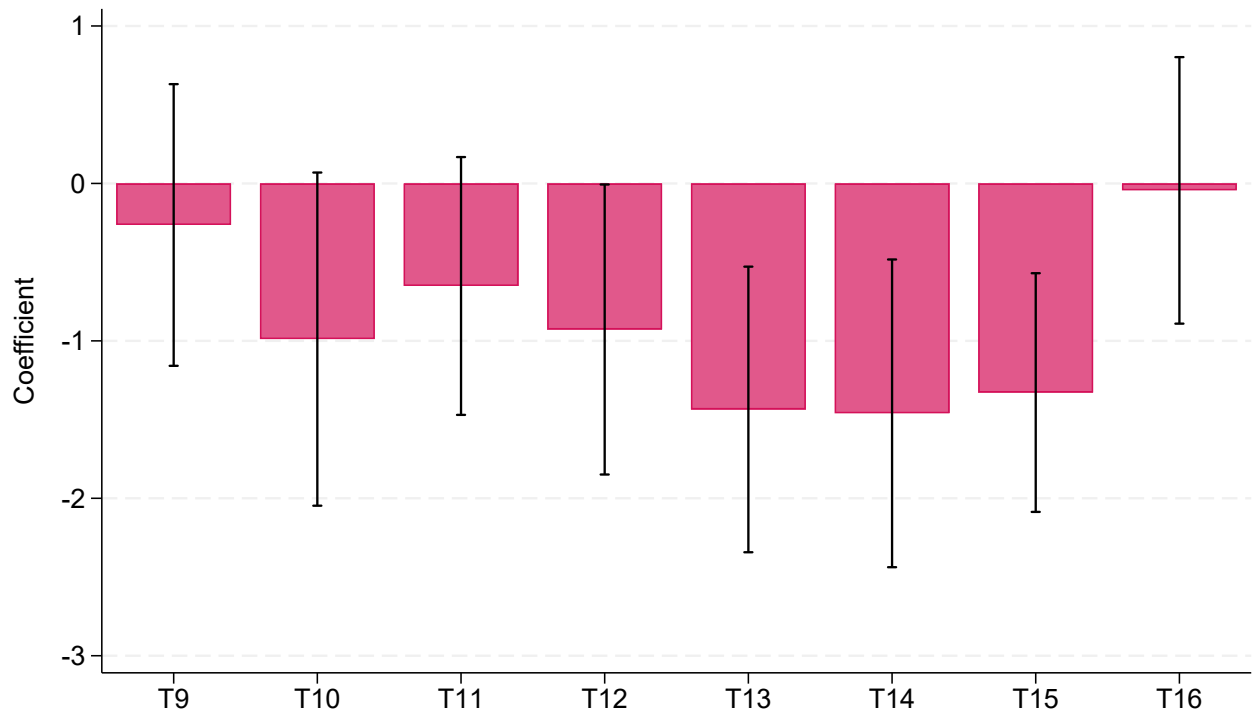


Figure C.2: Information provisions and selections influence posterior beliefs over the next 10 years. Estimation results from groups (T9) to (T16). The bar indicates the 90% confidence interval. The baseline is set at (C0).

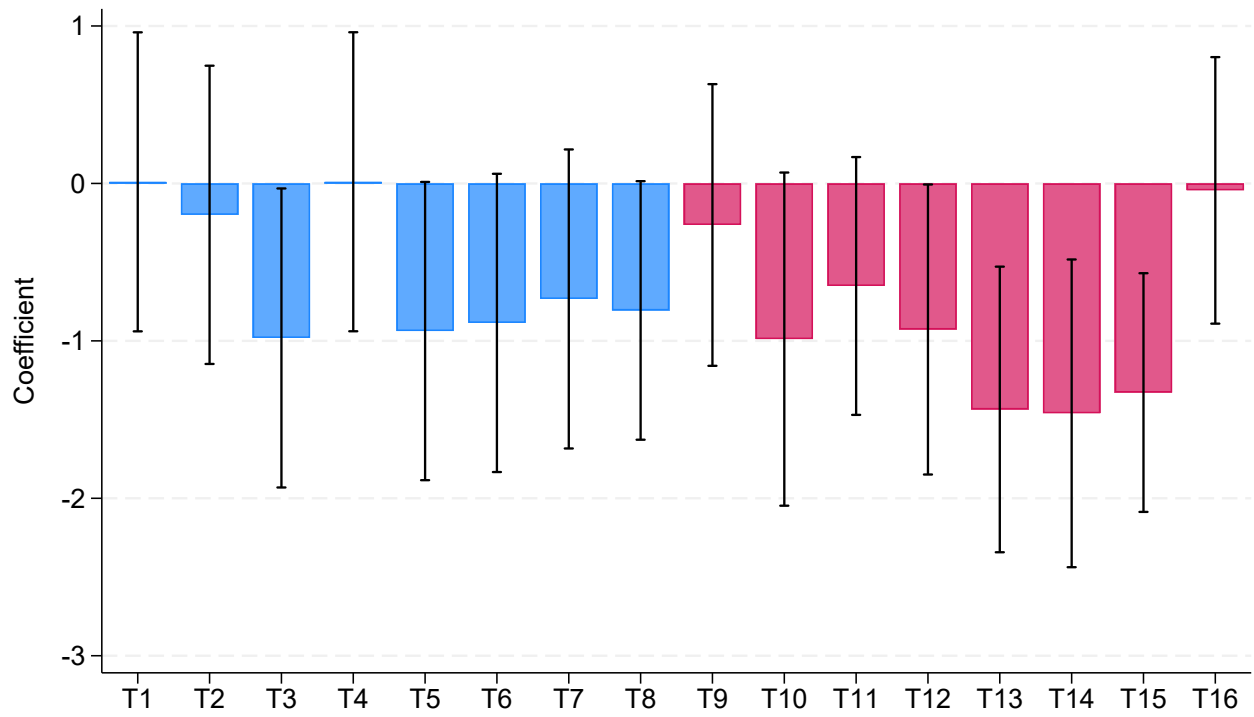


Figure C.3: Information provisions and selections influence posterior beliefs over the next 10 years. Estimation results from groups (T1) to (T16). The bar indicates the 90% confidence interval. The baseline is set at (C0).

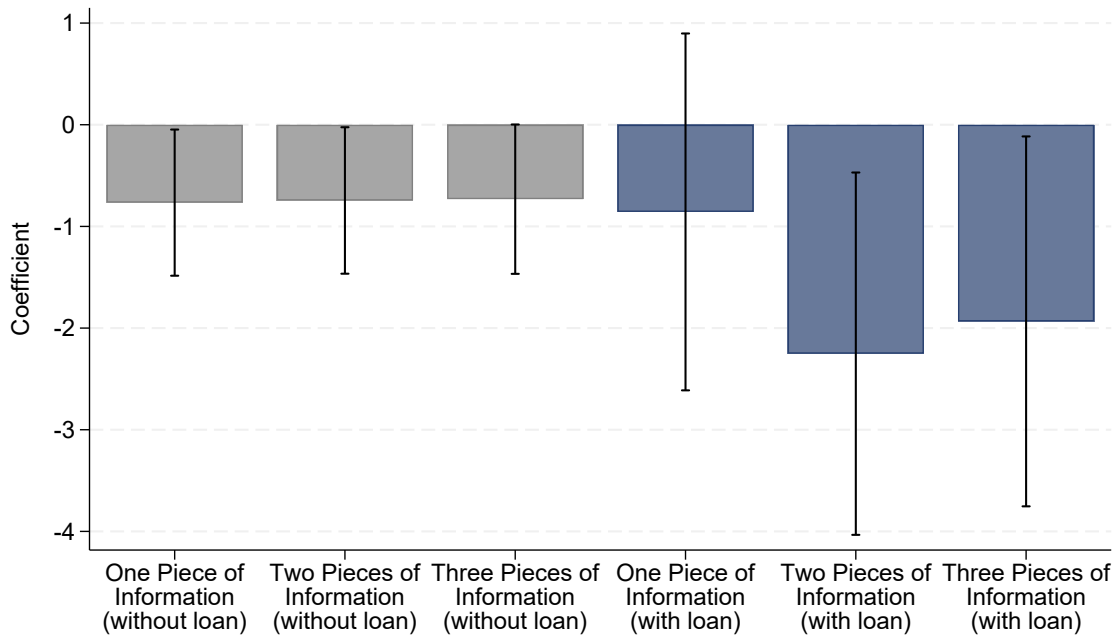


Figure C.4: Are the effects of the acquired information more persistent when respondents have a loan? We compare the prior inflation expectations over the next 12 months with the ones elicited in the follow-up survey. The bar indicates the 90% confidence interval. The baseline is set at (C0).

Appendix D Tables

Table D.1: Do multiple sources of information influence posterior beliefs more than a single source?

$$X_j^{post} - X_j^{pre} = c + \sum_{k=1}^3 \beta_k \text{Number of information Dummy}_j^{(k)} + error_j$$

β_0 : Placebo group	-0.272 (0.444)
β_1 : One piece of information	-0.800** (0.338)
β_2 : Two piece of information	-1.388*** (0.340)
β_3 : Three piece of information	-1.756*** (0.346)
Constant	1.145*** (0.314)
Observations	1,871

Wald statistics for H_0 : $\beta_1 = \beta_2$	10.56***
$\beta_2 = \beta_3$	3.53*
$\beta_1 = \beta_3$	24.73***

Note: Prior and posterior beliefs are inflation expectations over the next 12 months. Coefficients for groups are relative to the coefficient for the control group (C0). All estimates are based on Huber-robust regressions. No respondent controls are included. Robust standard errors are in parentheses, and ***, **, and * indicate 1%, 5%, and 10% significance, respectively.