Trust in the Central Bank and Inflation Expectations: Experimental Evidence†

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Abstract

Exploiting an exogenous variation in trust in the central bank driven by randomized information treatment, this paper examines the extent to which the trust in the central bank affects the inflation expectations in Japan. The findings are twofold. First, information provision about inappropriate statement made by the Governor of the Bank of Japan (BOJ) reduced respondents’ trust in the BOJ by about 1.11 points on a 10-point scale. Second, a one-point decrease in trust in the BOJ raised inflation expectations by 0.63 percentage points while having no significant effect on inflation expectations uncertainty.

Keywords: trust in the central bank, inflation expectations, randomized control trial

JEL Classification: E02, E31, E52, E58

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1. **Introduction**

Trust in the central bank plays an important role in unconventional policy tools that work with the inflation expectations of households (and firms). Without sufficient trust in the central bank, policies such as forward guidance would not work well due to time inconsistency problem. Moreover, in the recent inflationary environment, a lack of trust in the central bank may further induce inflation.

Nevertheless, there are only a handful of studies empirically analyzing the impact of trust in the central bank on households’ inflation expectations, and all of them are about Europe. Using multiple regression analysis, Rumler and Valderrama (2020) report that as trust in the European Central Bank (ECB) declines, the inflation expectations of Austrian households increase. Christelis et al. (2020) and Mellina and Schmidt (2018) employ trust in others and other public institutions as instrumental variables (IV) for trust in the central bank and conclude that a decline in trust in the central bank leads to an increase in households’ inflation expectations in Netherlands and Germany, respectively.

Against this background, this study aims to contribute to the literature in the following aspects. First, this study analyzing in Japan is the first study outside of Europe. Second, and more importantly, it provides complementary evidence by taking a completely different identification strategy (i.e. randomized control trial) compared to previous studies. On June 6, 2022, Bank of Japan (BOJ) Governor Haruhiko Kuroda said in a speech, “Japanese households’ tolerance of price rises has been increasing.” Since this was at a time when many households were suffering from inflation, he was subsequently subjected to much criticism and eventually retracted his statement and apologized. In this study, Kuroda’s inappropriate statement made on June 6, 2022, was provided as information only to a randomly selected treatment group, and the resulting variation in trust in the BOJ was used to address omitted variable bias and/or reverse causality.

The remainder of the study is organized as follows. The next section provides a description of the data and experimental design. Sections 3 and 4 present the estimation results. Finally, Section 5 concludes.

2. **Data and Experimental Design**

Utilizing the pool of approximately 4.5 million individuals across Japan who were preregistered by iBRIDGE Corporation, a research firm in Japan, two internet-based surveys were conducted for this analysis. The first survey was conducted on June 16, 2022, followed by a second survey on June 21-22, following the same respondents. In the first survey, 3,000 individuals were randomly selected from the pool to match the Census distribution of gender and age and asked the following one question: “How much do you trust the Bank of Japan? Please answer on a scale of 1 to 10, with 10 being very much and 0 being not at all.” In the follow-up (second) survey, only a randomly selected treatment group was provided information on Kuroda’s inappropriate statement, while the control group received no information. Both groups were then asked again about their level of trust in the BOJ, inflation
expectations, uncertainty about inflation expectations, and the expected duration of monetary easing policy (see Appendix for exact wording). The number of respondents who answered all questions in the first and second surveys was 1,252, which is the sample used for the current analysis.

Table 1 summarizes the descriptive statistics. In the first survey, the means of all observable variables (including the pre-treatment trust level) are not significantly different between the two groups. In contrast, in the follow-up survey, the post-treatment trust level of the treatment group is 1.35 points lower than the control group (on a 10-point scale). In addition, the (post-treatment) expected inflations of the treatment group are 0.66 percentage points higher than the control group. These observations imply that the decline in trust in the BOJ leads to higher inflation expectations, but a more elaborate examination will be provided in Sections 3 and 4. Finally, the respondents are asked to subjectively evaluate the degree of uncertainty about inflation expectations on a 10-point scale (10 being very uncertain and zero being very certain), and there is no significant difference in mean values between the two groups.

<table>
<thead>
<tr>
<th></th>
<th>Treatment</th>
<th>Control</th>
<th>Difference in means (P-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First survey (Before treatment, June 17, 2022)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trust (Pre-treatment)</td>
<td>5.47</td>
<td>5.68</td>
<td>0.134</td>
</tr>
<tr>
<td>Male dummy</td>
<td>0.58</td>
<td>0.61</td>
<td>0.280</td>
</tr>
<tr>
<td>Age</td>
<td>47.60</td>
<td>47.02</td>
<td>0.438</td>
</tr>
<tr>
<td>Child dummy</td>
<td>0.53</td>
<td>0.51</td>
<td>0.659</td>
</tr>
<tr>
<td>Marrital dummy</td>
<td>0.62</td>
<td>0.61</td>
<td>0.759</td>
</tr>
<tr>
<td>Homeowner dummy</td>
<td>0.67</td>
<td>0.66</td>
<td>0.659</td>
</tr>
<tr>
<td>Household pretax annual income (10,000 yen)</td>
<td>628</td>
<td>654</td>
<td>0.276</td>
</tr>
<tr>
<td><strong>Second survey (After treatment, June 21-22, 2022)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trust (Post-treatment)</td>
<td>4.25</td>
<td>5.60</td>
<td>0.000 ***</td>
</tr>
<tr>
<td>Inflation expectations (%)</td>
<td>4.95</td>
<td>4.29</td>
<td>0.008 ***</td>
</tr>
<tr>
<td>Uncertainty about inflation expectations (0-10)</td>
<td>5.43</td>
<td>5.62</td>
<td>0.162</td>
</tr>
<tr>
<td>Expected duration of monetary easing policy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Will end soon</td>
<td>0.12</td>
<td>0.13</td>
<td>0.539</td>
</tr>
<tr>
<td>Will last another year or two</td>
<td>0.33</td>
<td>0.35</td>
<td>0.383</td>
</tr>
<tr>
<td>Will last another three to four years</td>
<td>0.33</td>
<td>0.29</td>
<td>0.156</td>
</tr>
<tr>
<td>Will last another five to nine years</td>
<td>0.12</td>
<td>0.10</td>
<td>0.196</td>
</tr>
<tr>
<td>Will last another 10 years or more</td>
<td>0.11</td>
<td>0.13</td>
<td>0.165</td>
</tr>
<tr>
<td>Number of respondents</td>
<td>655</td>
<td>597</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Descriptive statistics

*Notes*: *** indicates statistical significance level at 1%.

3. **Effect of information treatment on trust in the BOJ**

Figure 1 depicts the distribution of changes in trust in the BOJ by group. As expected, changes in trust in the control group are concentrated at zero, with a mean of about 0.09. In contrast, the distribution of the treatment group is skewed to the right, visually indicating that households’ trust in the BOJ has decreased after receiving information about Kuroda’s statement.
To quantitatively analyze the impact of information provision on trust in the BOJ, I estimate the following equation in accordance with Coibion et al. (2022).

\[
Trust_{it}^{post} - Trust_{it}^{prior} = \beta_0 + \beta_1 Treat_i + \beta_2 X_i + \varepsilon_i,  \tag{1}
\]

where \( i \) is the index for respondents, \( Trust_{it}^{post} \) is the posterior trust level, \( Trust_{it}^{prior} \) is the prior trust level, \( Treat_i \) is the treatment group dummy taking a value of one if respondent \( i \) is assigned to the treatment group, and zero if assigned to the control group, \( X_i \) is a vector of individual characteristics (the male dummy, age, child dummy, marital dummy, homeowner dummy, and household pretax annual income), and \( \varepsilon_i \) is an error term. \( \beta_1 \) captures to what extent the treatment group revised the trust level compared to the control group.

Table 2 provides the regression results. Columns (1) and (2) show that the estimates are largely unaffected by the presence or absence of control variables, with estimates ranging from –1.13 to –1.11. This means that the randomization worked well and that the respondent attributes \( (X_i) \) and the error term \( (\varepsilon_i) \) are nearly uncorrelated in Equation (1). Based on the estimate in column (2), the trust in the BOJ dropped 1.11 points (on a 10-point scale) or 0.44 standard deviation (given that the standard deviation of pre-treatment trust is 2.55) as a result of the information provision. As a robustness check, column (3) shows the estimation results when posterior trust is placed on the dependent variable and prior trust on the independent variable. The estimate is –1.18, which is not much different from the results in columns (1) and (2).
Table 2: Effect of information treatment on trust in the BOJ

Notes: Robust standard errors are indicated in parentheses. *** indicates statistical significance level at 1%.

4. Effect of trust in the BOJ on inflation expectations

Figure 2 depicts the distribution of inflation expectations by group. More respondents in the treatment group answer 5% or 10%, visually indicating that inflation expectations in the treatment group are higher on average than in the control group.

![Figure 2: Distribution of inflation expectations by group](image)

Notes: Inflation expectations are a multiple-choice answer to the question, “What percentage change do you expect in the prices (including tax) of goods and services you purchase over the next 12 months?”

To examine the impact of changes in trust in the BOJ on inflation expectations in a rigorous
manner, I next instrument the revision of trust \((Trust_{t}^{post} - Trust_{t}^{prior})\) by a treatment dummy in accordance with Coibion et al. (2019, 2022). The identification assumptions are that being treated is strongly correlated with changes in trust, and that being treated affects inflation expectations only through changes in trust in the BOJ. More specifically, my second stage regression equation is as follows.

\[
\pi_i^e = b_0 + b_1(Trust_{t}^{post} - Trust_{t}^{prior}) + b_2X_i + u_i,
\]

(2)

where \(\pi_i^e\) is inflation expectations over the next 12 months and \(u_i\) is an error term. \(X_i\) contains a same set of control variables as in Equation (1). Column (1) of Table 3 shows IV estimate of the impact of trust in the BOJ on inflation expectations. The first-stage F-statistic is 92, which is high enough that there is no concern about weak IV. The estimated impact is \(-0.63\) and statistically significant at the 1\% level. It implies that a one-point decrease in trust in the BOJ (on a 10-point scale) would result in a 0.63 percentage point increase in inflation expectations. This IV estimate is much larger in absolute value than Christelis et al. (2020)’s IV estimate of \(-0.17\). One possible explanation is that there may be an asymmetry in the impact of trust in the central bank on inflation expectations. In this study, I focus on event in which trust in the central bank is lost. If the impact on inflation expectations is larger in the case of loss of trust, that may explain why my IV estimate is larger in absolute value.

<table>
<thead>
<tr>
<th>Dependent variable: Inflation expectations (%)</th>
<th>Uncertainty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trust (post) - Trust (prior)</td>
<td>0.17</td>
</tr>
<tr>
<td></td>
<td>(0.12)</td>
</tr>
</tbody>
</table>

Control variables | Yes | Yes
First-stage F-statistic | 92 | 92

Table 3: Effect of trust in the BOJ on inflation expectations

Notes: The first-stage F-statistic is the F-statistic testing the hypothesis that the coefficient on the treatment dummy equals zero in the first-stage of the two-stage least-squares. Robust standard errors are indicated in parentheses. *** indicates statistical significance level at 1\%.

As for the identification assumption, if factors other than trust in the BOJ are influenced by the information provision, then inflation expectations may just change through that factor (rather than trust in the BOJ). One such factor could be expectations about the duration of monetary easing policy. Kuroda’s statement that “Japanese households’ tolerance of price rises has been increasing” could be
taken as an indication that he intends to prioritize economic stimulus over inflation control. If so, households may believe that monetary easing policy will last longer than expected, which may have resulted in higher inflation expectations. The bottom part of Table 1 examines whether expected duration of monetary easing policy differ between the two groups, but there is no significant difference. This finding makes the identification assumption more plausible.\(^1\)

Column (2) shows that the impact of trust in the BOJ on uncertainty about inflation expectations is not statistically different from zero. This is a different result from Christelis et al. (2020), which report a statistically significant negative estimate. This may be due to an unorthodox way of asking about uncertainty about inflation expectations in this study.

5. Conclusion
This paper examined the impact of trust in the BOJ on households’ inflation expectations. To this end, I took advantage of changes in trust in the BOJ resulting from the information provision about inappropriate statement made by the Governor Kuroda and analyzed their impact on inflation expectations. The findings are as follows. Trust in the BOJ fell by 1.11 (on a 10-point scale) as a result of Governor Kuroda’s statement. In addition, a one-point decrease in trust in the BOJ was associated with 0.63 percentage points increase in inflation expectations. This result demonstrates the importance of maintaining trust in the central bank to control inflation during the recent stagflationary phase. Lastly, I found no evidence of an impact on the uncertainty of inflation expectations.

An interesting extension of this study would be an analysis of the long-run effects of Governor Kuroda’s statement and an analysis of the impact of elevated inflation expectations on households’ consumption behavior. These are left for future research.

\(^1\) For a more rigorous analysis, I applied an ordered probit estimation, but again found no significant effect on expected duration of monetary easing policy.
References


