Online Appendix for

"Central Bank Communication and House Price Expectations"

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Table A.1: (Un)Predictability of treatment status - Wave 1

	Test against all other groups		Test against the control group	
	F-statistic	p-value	F-statistic	p-value
	(1)	(2)	(3)	(4)
C (control group)	0.59	0.9189		
T1 (current federal funds rate)	0.53	0.9499	0.36	0.9945
T2 (current and projection of federal funds rate)	1.02	0.4379	0.85	0.6450
T3 (current and projection of federal funds rate with mechanism)	0.79	0.7274	0.91	0.5675

Notes: the table reports results for estimating the following linear-probability regression for each treatment - $Treatment_i^j = X_i b^j + error$, where i indexes respondents, $Treatment_i^j$ is a dummy variable equal to one if household i is provided with treatment j and zero otherwise. X is a vector of demographic characteristics. Individual characteristics are gender, age, age squared, employed indicator and education (indicator variable for each group). Household characteristics are household income (binned; indicator variable for each bin), household size (indicator variable for each size), census region (indicator variable for each region). The table reports F-statistic for the joint statistical significance of b.

Table A.2: US Income-Marriage-Gender Joint Distribution, 2021 Current Population Survey

%	Monthly Household Income ($)	Less than $1,000	$1,000 - $1,999	$2,000 - $2,999	$3,000 - $3,999
Marriage-gender	Married-couple families	1.29	1.59	2.40	4.09
	Single/divorced male	2.90	2.43	2.16	3.06
	Single/divorced female	5.24	4.66	3.53	4.45

	Monthly Household Income	$4,000 - $4,999	$5,000 - $5,999	$6,000 - $7,499	$7,500 - $9,999
Marriage-gender	Married-couple families	3.00	2.67	5.56	7.24
	Single/divorced male	1.90	1.54	2.42	2.25
	Single/divorced female	2.31	2.00	2.81	2.52

	Monthly Household Income	$10,000 - $14,999	$15,000 - $19,999	$20,000 or more
Marriage-gender	Married-couple families	9.22	1.94	8.30
	Single/divorced male	2.08	0.29	1.09
	Single/divorced female	1.94	0.27	0.86

Table A.3: Correlates of house price change expectations - Wave 1

	Expected house price changes (pre-treatment)	
	(1)	+ controls (2)
Expected inflation	0.079*	0.076*
	(0.044)	(0.043)
Expected mortgage rate change	-0.505***	-0.514***
	(0.053)	(0.047)
Perceived current federal funds rate	0.125	-0.104
	(0.314)	(0.315)
Male		-0.653
		(0.832)
Employed		0.672
		(1.237)
Bachelor's degree or more		4.437***
		(1.446)
Age		0.266
		(0.219)
Age squared		-0.002
		(0.002)
Income $\geq$ \$75,000		-1.760**
		(0.828)
Total household size		-0.279
		(0.357)
Child presence		-1.228
		(0.886)
Married		0.731
		(0.931)
Homeowner		0.410
		(0.877)
Recent mortgage payer		-0.856
		(0.914)
Heard Federal Reserve news		0.720
		(1.380)
Certain about house price forecast		4.488***
		(1.219)
Understand inflation		0.639
		(1.146)
Treatment Group: T1		-1.604
		(1.082)
T2		-1.866
		(1.173)
T3		-1.493
		(1.169)
Region: Midwest		-1.488
		(1.550)
South		-0.390
		(1.400)
West		0.584
		(1.517)
Constant	4.751***	-3.086
	(0.523)	(4.952)
Observations	3,013	2,963
R-squared	0.32	0.36
Joint sig of covariates	0	0

Notes: The table reports results for correlation between other pre-treatment expectations (column (1)) and plus other demographic and prior informedness (heard of Federal Reserve news, certain about their pre-treatment house price forecasts, how well they think themselves understand inflation) controls (column (2)) Assignments of treatment groups are included to show the randomization. OLS estimates reported. Robust standard errors in parentheses. Significant at *, ** and *** denote significance at 10

Table A.4: Average treatment effects on real house price change expectations - Wave 1

| $(E_i^{post}Y - E_i^{pre}Y)$ | Real house price change expectations | | | |
| | Main wave | | Follow -up | |
	(1)	(2)	(3)	(4)
Controls	2.684***	2.886	-0.767	-2.125
	(0.610)	(4.266)	(0.520)	(4.190)
Treatment effects relative to control:				
T1 (current policy rate)	-1.434	-1.452	-0.451	-0.458
	(0.930)	(0.946)	(1.306)	(1.324)
T2 (current policy rate	-0.205	0.025	-0.340	-0.357
and rate hikes)	(0.934)	(0.950)	(0.807)	(0.804)
T3 (current policy rate,	-5.255***	-5.139***	-1.153*	-1.314*
rate hikes, and explaining	(0.963)	(0.984)	(0.687)	(0.719)
mortgage rate channel)				
Demographics		✓		✓
Observations	3,001	2,937	1,021	1,005
R-squared	0.02	0.03	0.01	0.03

Notes: regressions use sampling weights. Robust standard errors are in parentheses. ***, **, * denote statistical significance at 1, 5 and 10 percent levels.

Table A.5: Treatment effects on house price expectations by household groups, with demographic controls

Dependent variable:	Mortgage payer		Education ≥ Bachelor's degree	
(house price)	Yes (1)	No (2)	Yes (3)	No (4)
Control	0.700 (5.665)	0.325 (4.373)	0.288 (0.490)	0.761 (0.698)
Treatment effects relative to control:				
T1 (current funds rate)	0.432 (1.351)	0.362 (1.209)	-0.078 (1.082)	1.634 (1.410)
T2 (current funds rate and projections)	-3.522**** (1.107)	-0.512 (0.761)	-2.789*** (0.659)	5.290*** (1.535)
T3 (current funds rate, projections and explaining mortgage rate channel)	-7.260*** (1.247)	-6.754*** (0.798)	-7.058*** (0.719)	-5.604*** (1.307)
Demographic	✓	✓	✓	✓
Observations	863	2,074	2,468	521
R-squared	0.11	0.09	0.07	0.18

Notes: the table reports estimates of specification (1) using house price change expectations as the dependent variable. Columns (1) - (2), columns (3) - (4), report estimation results by respondents' prior knowledge of mortgage status and education level, respectively. Robust standard errors are in parentheses. ***, **, * denote statistical significance at 1, 5 and 10 percent levels.

Table A.6: Sample characteristics, descriptive statistics in Wave 3

	Full sample	Control	T1 - script	T2 - audio	T3 - video	P-value
	(1)	(2)	(3)	(4)	(5)	(6)
Observation	2,020	482	542	521	475	
Panel A: Personal background						
Female	55.0%	53.5	55.2	61.1	49.5	0.94
Age (in years)	41.2	39.8	41.0	41.9	42.0	0.56
	(13.6)	(13.1)	(13.5)	(13.8)	(14.0)	
Above Bachelor's degree	16.5%	15.3%	18.1%	17.3%	14.7%	0.87
Married	47.9%	45.2%	46.9%	51.8%	47.7%	0.99
Homeowner	56.6%	51.9%	53.9%	63.6%	56.8%	0.82
Employed	78.1%	75.1%	80.9%	79.4%	76.5%	0.36
HH Income < $60,000	55.4%	54.4%	55.6%	56.2%	55.6%	0.36
Paying mortgage	35.5%	33.2%	33.5%	38.1%	37.4%	0.85
Census region location:						
Northeast	18.5%	19.7%	19.1%	17.4%	17.6%	0.52
Midwest	19.5%	17.4%	21.0%	19.3%	20.4%	0.46
South	41.2%	42.5%	40.2%	41.1%	41.2%	0.99
West	20.8%	20.33%	19.6%	22.2%	20.8%	0.82

	Full sample	Control	T1	T2	T3	P-value
	(1)	(2)	(3)	(4)	(5)	(6)
Panel B: Perceptions & Expectations						
Expected national house price change,	2.09	2.40	2.09	1.78	2.12	0.41
over next 12 months	(9.5)	(9.06)	(9.76)	(9.54)	(9.47)	
Expected federal funds rate,	4.97	5.01	4.90	5.05	4.92	0.20
future 12 months	(2.04)	(1.98)	(2.16)	(2.00)	(2.02)	
Expected inflation, future 12 months	6.42	6.47	6.61	6.19	6.41	0.71
	(5.88)	(5.42)	(5.73)	(6.24)	(6.09)	
Perceived federal funds rate,	4.67	4.70	4.72	4.58	4.67	0.16
November	(1.60)	(1.52)	(1.64)	(1.57)	(1.67)	
Perceived *change* in federal funds rate,	2.21	2.27	2.07	2.29	2.23	0.48
December	(1.93)	(1.95)	(1.87)	(1.99)	(1.92)	

Notes: the mean value of continuous variables are reported. Standard deviations are in parentheses. Column (6) in both panels reports the p-value of one-way ANOVA test of equality of each row variable across the four groups.

Table A.7: Average FOMC speech treatment effects on house price expectations

| $(E_i^{post}Y - E_i^{pre}Y)$ | House price change expectations | | | |
| | Main wave | | Follow-up | |
	(1)	(2)	(3)	(4)
Control	-0.141	-3.212	-0.229	-3.258
	(0.140)	(2.786)	(0.198)	(2.845)
Treatment effects relative to control:				
T1 (FOMC speech **script**)	1.390***	1.285***	1.241***	1.163***
	(0.345)	(0.346)	(0.386)	(0.386)
T2 (FOMC speech **audio** clip)	3.101***	2.760***	2.502***	2.313***
	(0.383)	(0.384)	(0.408)	(0.406)
T3 (FOMC speech **video** clip)	4.937***	4.706***	3.893***	3.745***
	(0.419)	(0.419)	(0.430)	(0.432)
Demographics		✓		✓
Observations	2,020	2,000	1,494	1,494
R-squared	0.06	0.09	0.05	0.09

Notes: robust standard errors are in parentheses. ***, **, * denote statistical significance at 1, 5 and 10 percent levels.

Table A.8: Average FOMC speech treatment effects on inflation expectations

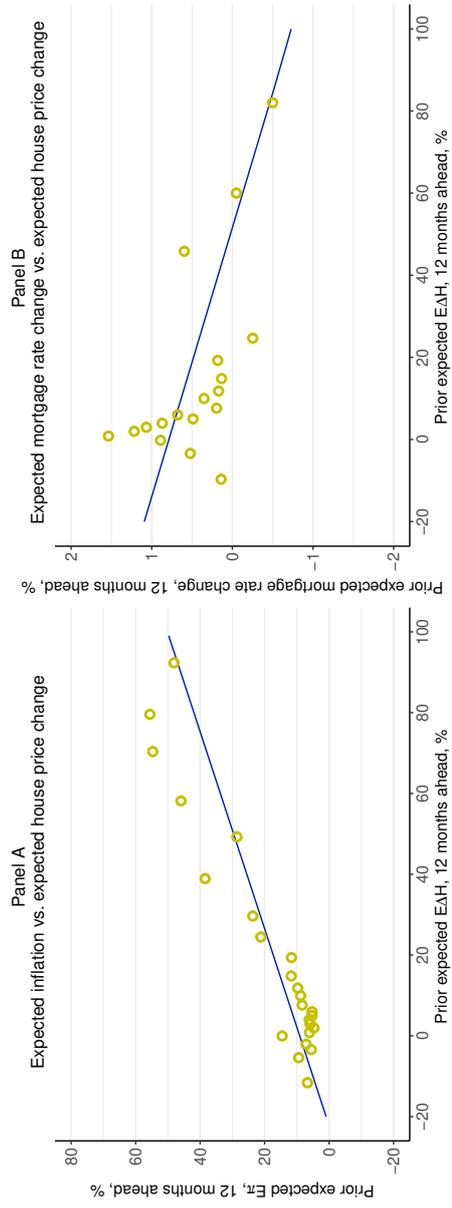| | Inflation expectations | | | |
| | Main wave | | Follow-up | |
$(E_i^{post}Y - E_i^{pre}Y)$	(1)	(2)	(3)	(4)
Control	-0.676	-3.042	-1.427	-1.380
	(0.130)	(3.150)	(0.150)	(3.596)
Treatment effects relative to control:				
T1 (FOMC speech **script**)	1.540***	1.346***	1.118***	1.037***
	(0.309)	(0.310)	(0.319)	(0.327)
T2 (FOMC speech **audio** clip)	3.135***	2.644***	2.809***	2.559***
	(0.338)	(0.341)	(0.340)	(0.343)
T3 (FOMC speech **video** clip)	4.510***	4.257***	3.785***	3.818***
	(0.370)	(0.362)	(0.356)	(0.363)
Demographics		✓		✓
Observations	2,020	2,000	1,494	1,494
R-squared	0.06	0.10	0.05	0.10

Notes: robust standard errors are in parentheses. ***, **, * denote statistical significance at 1, 5 and 10 percent levels.

Table A.9: Treatment effects of FOMC wording, voices and body language on inflation expectations

| | Inflation expectations | | | |
| | Main wave | | Follow-up | |
Revision	(1)	(2)	(3)	(4)
Treatment exposure				
Text	1.346***	0.815***	1.037***	0.752**
	(0.310)	(0.318)	(0.327)	(0.337)
Voice	1.299***	1.237***	1.521***	1.475***
	(0.413)	(0.409)	(0.418)	(0.416)
Body	1.612***	1.625***	1.259***	1.298***
	(0.447)	(0.446)	(0.439)	(0.439)
Shock		-0.336***		-0.184*
		(0.101)		(0.103)
Constant	-3.042	-3.216	-1.380	-1.495
	(3.150)	(3.183)	(3.596)	(3.628)
Prior expectations	✓	✓	✓	✓
Demographics	✓	✓	✓	✓
Observations	2,000	2,000	1,494	1,494
R-squared	0.10	0.11	0.10	0.11

Notes: robust standard errors are in parentheses. ***, **, * denote statistical significance at 1, 5 and 10 percent levels.

Table A.10: Signal evaluations of FOMC wording, voice tone and body languages on inflation expectations

| | Inflation expectations | | | |
| | Main wave | | Follow-up | |
Revision	(1)	(2)	(3)	(4)
Signal evaluation				
wording	-1.130***	-1.130***	-0.885***	-0.841***
	(0.182)	(0.182)	(0.169)	(0.165)
Voice tone	-2.103***	-2.103***	-1.802***	-1.775***
	(0.283)	(0.283)	(0.276)	(0.267)
Body language	-1.921***	-1.921***	-1.573***	-1.544***
	(0.414)	(0.414)	(0.377)	(0.367)
Shock		-0.624***		-0.503***
		(0.082)		(0.075)
Constant	2.311	2.311	3.582	2.959
	(2.648)	(2.648)	(2.442)	(2.491)
Prior expectations	✓	✓	✓	✓
Demographics	✓	✓	✓	✓
Observations	2,000	2,000	1,494	1,494
R-squared	0.34	0.37	0.44	0.46

Notes: robust standard errors are in parentheses. ***, **, * denote statistical significance at 1, 5 and 10 percent levels.

Figure A.1: Distributions of pre-treatment perceptions and 1-year-ahead expectations about inflation and federal funds rate - Wave 1
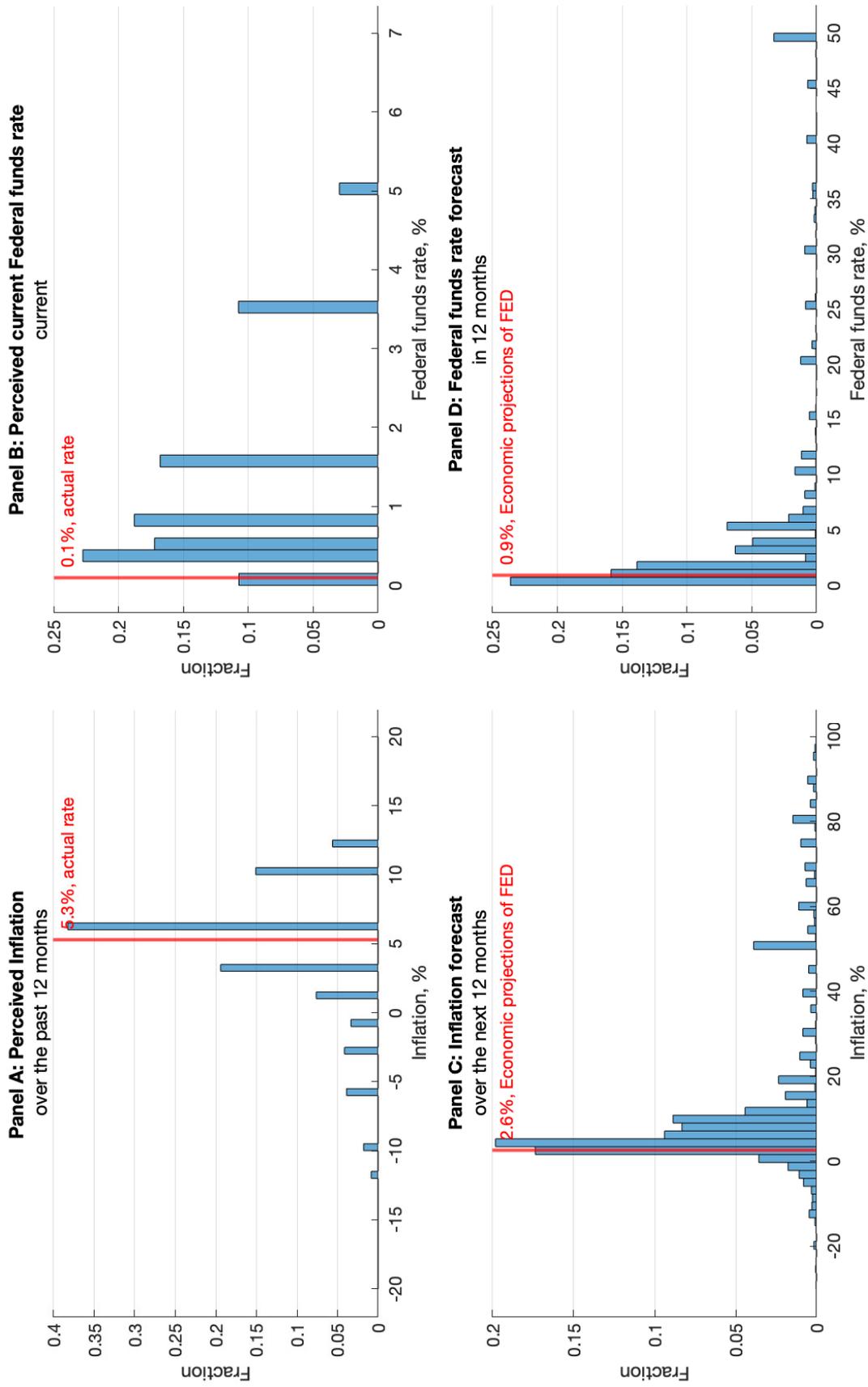
Notes: the Panels A and B show the distribution of perceived inflation rates over the past 12 months and the currect federla funds rate from the choice from a distribution. Mid-point values of each choice are plotted. The Panel C and D show the distribution of 1-year-ahead inflation and federal funds rate expectation from the point expectations. The vertical lines in each panel show the actual values or projected values from the latest Fed's economic projections, respectively.

Figure A.2: Pre-treatment correlations between house price change expectations and macroeconomic expectations - Wave 1

Notes: each panel presents a binscatter of expected house price change over the next 12 months vs. an outcome variable (expected inflation over the next 12 months and expected change in 30-year fixed-rate mortgage interest rate in 12 months).

Figure A.3: Distributions of house price forecasts under baseline and shock scenarios and forecast revisions - Wave 2
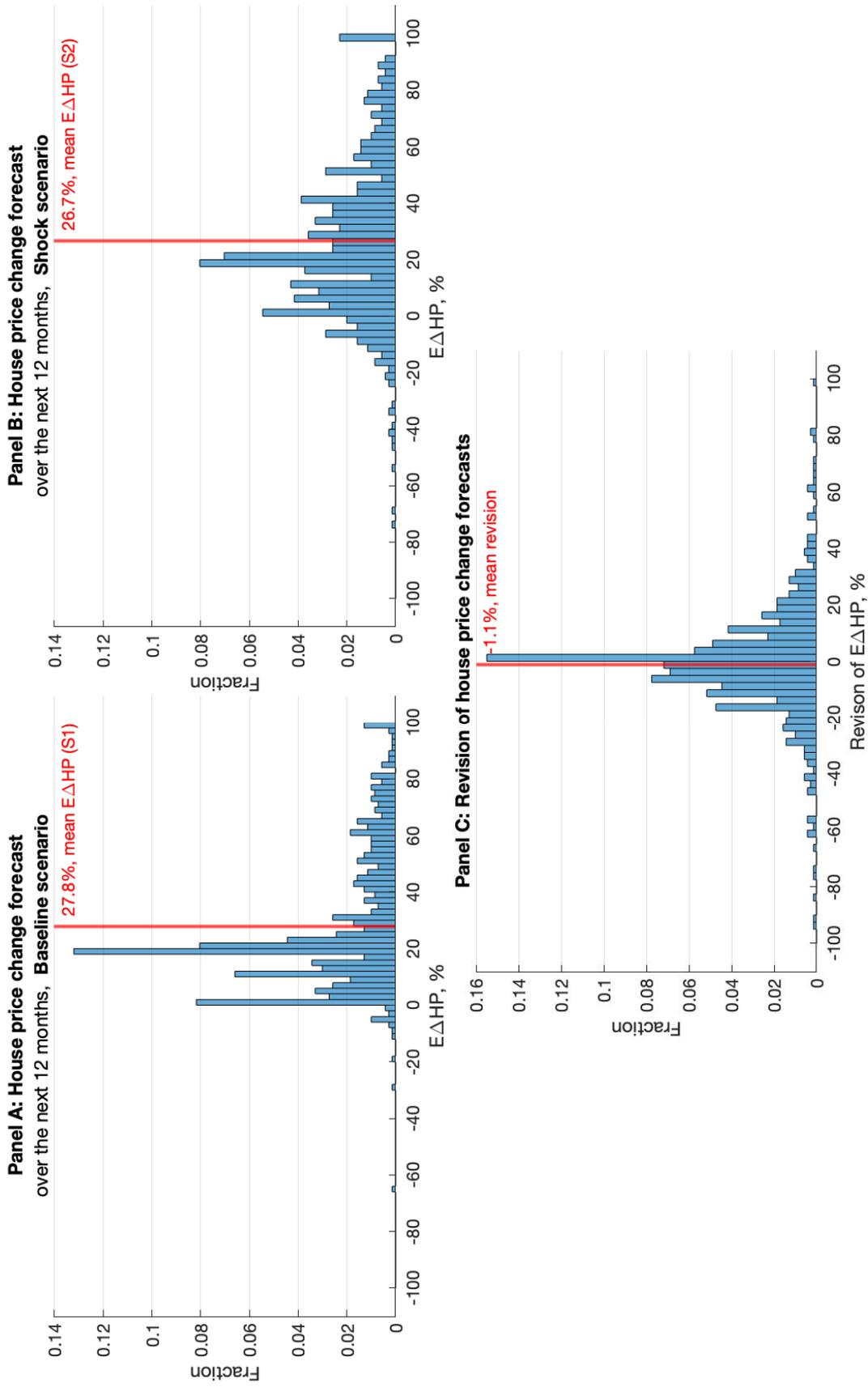
Notes: the subfigures in Panel A and Panel B show distributions of expected house price change in the baseline scenario (FOMC keeps interest rate unchanged) and the shock scenario (FOMC unexpected increases interest rate) in wave 2 survey, respectively. The subfigure in Panel C shows the distribution of revisions to house price change forecasts from the baseline to the shock scenario. The red vertical lines illustrate mean values of the distributions.

Figure A.4: Correlation between house price change forecasts in baseline and shock scenarios - Wave 2
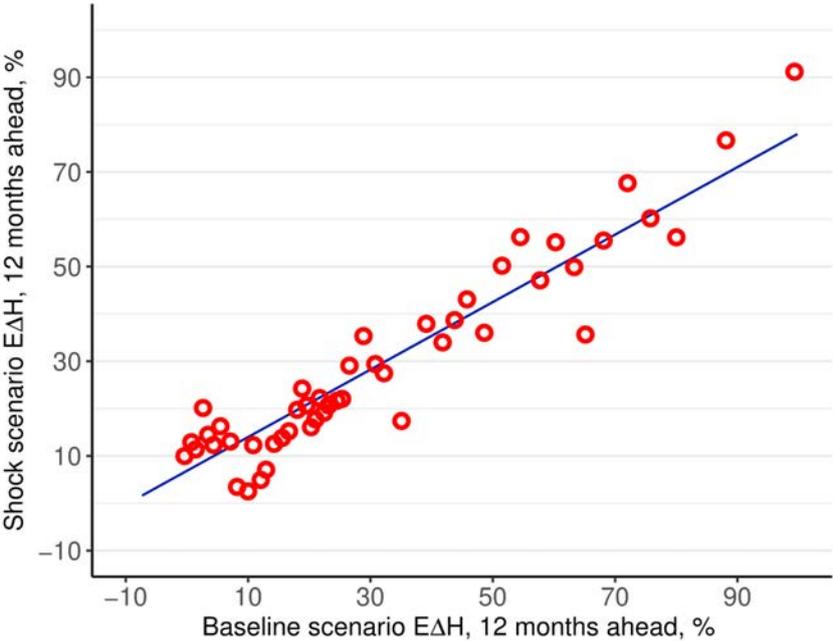
Notes: the figure presents a binscatter of expected house price changes over the next 12 months from the baseline scenario (S1) vs. the shock scenario (S2), using wave 2 data.

Figure A.5: The distribution of total number of mechanisms recalled by respondents
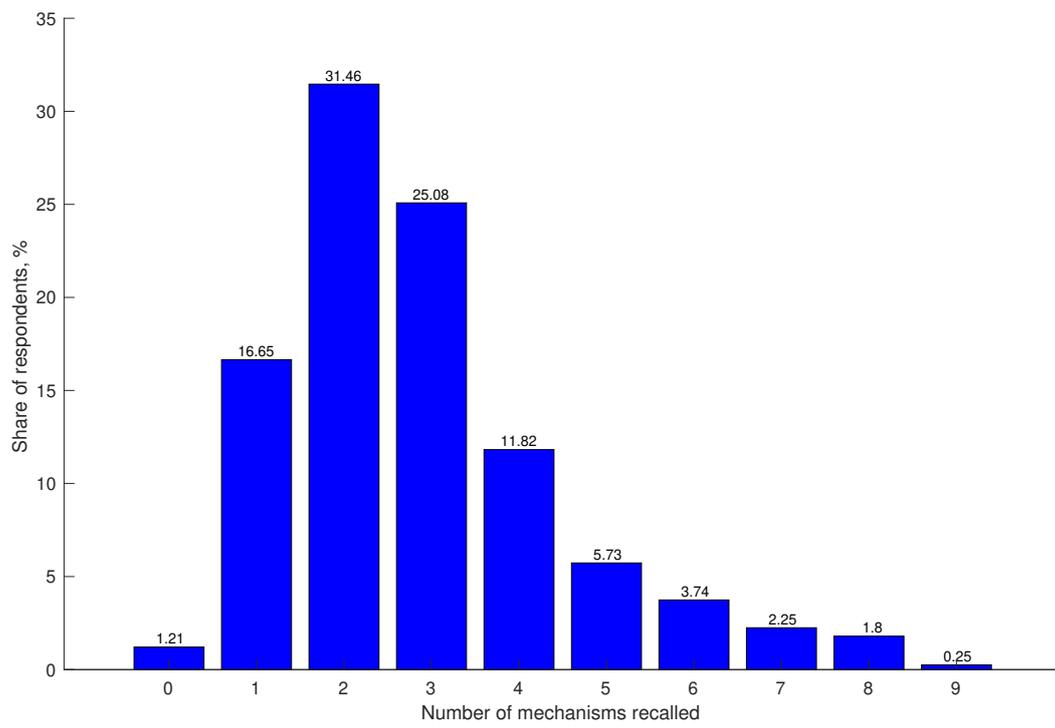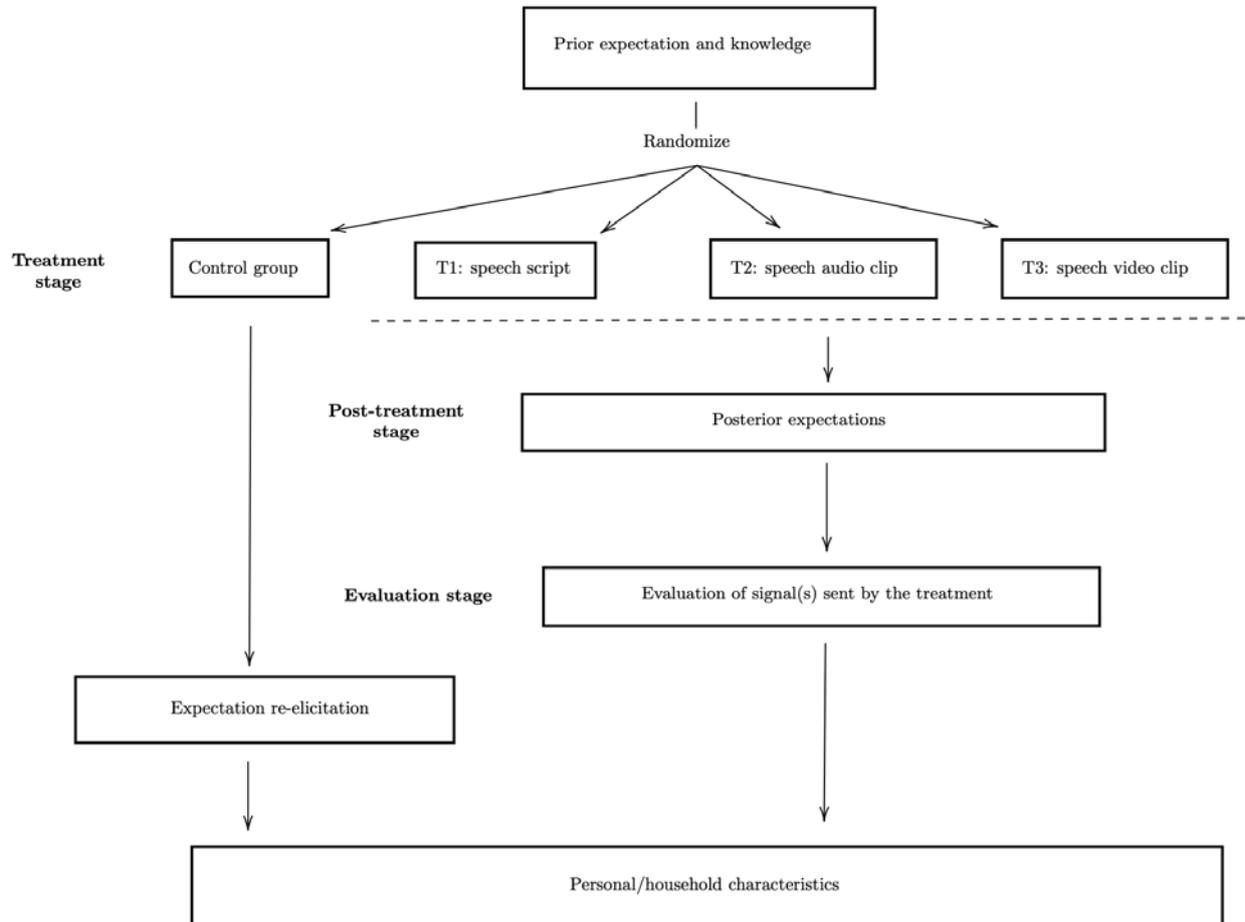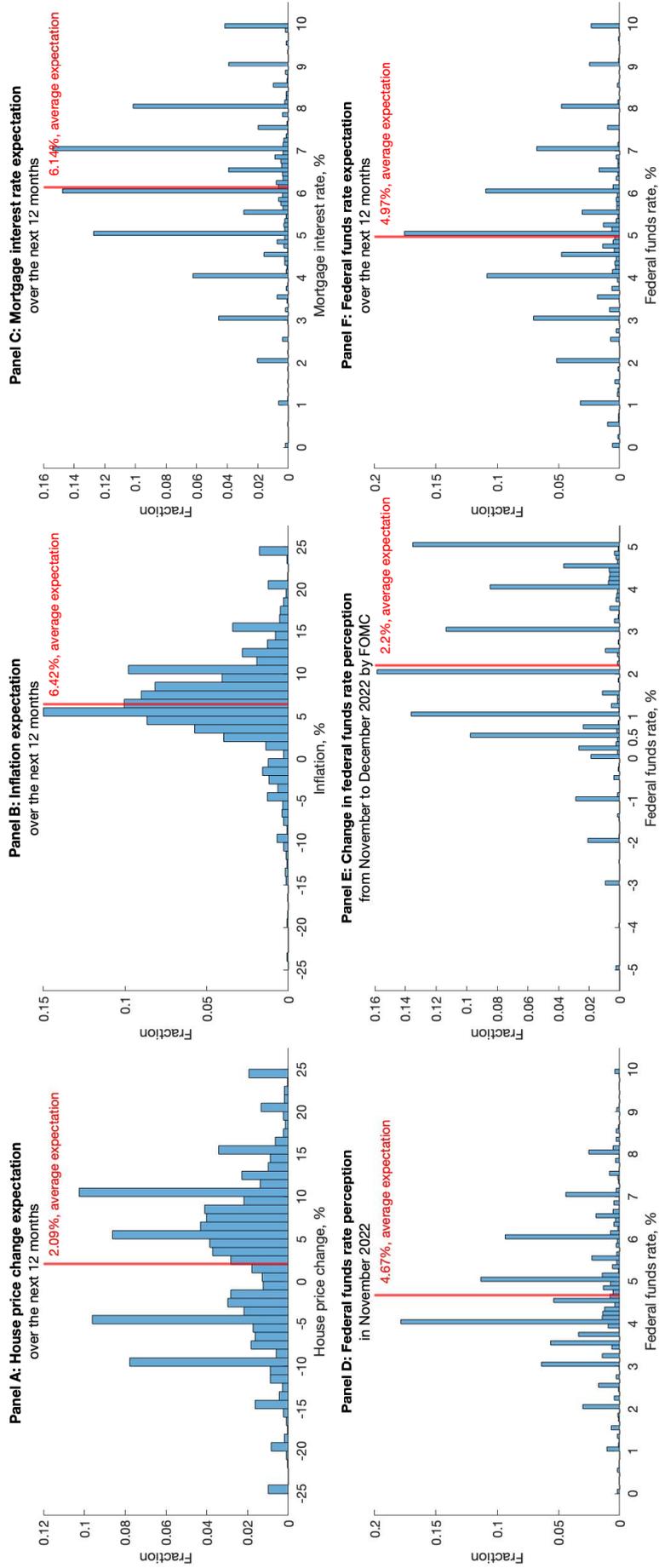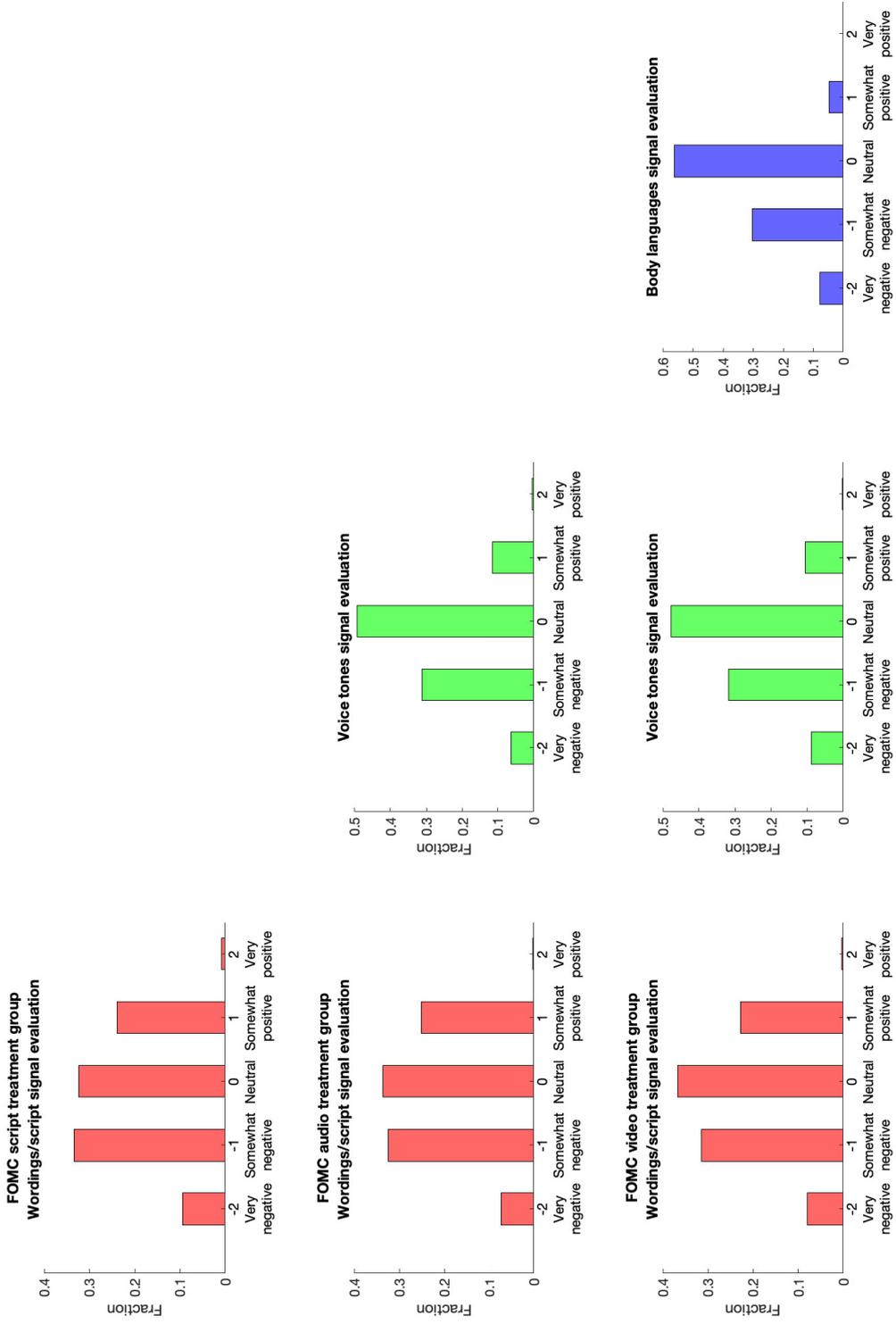
Figure A.6: Survey flow - Wave 3

Figure A.7: Distributions of expectations and perception of households - Wave 3

Notes: this figure plots distributions of households' expectations and perceptions. The red vertical lines illustrate mean values of the distributions.

Figure A.8: Distributions of signal evaluations – Wave 3

Notes: this figure plots distributions of households' evaluation of signals in speech treatments.

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A Alternative Specification

A critical step to quantify the causal effects of information treatments on variations of posterior house price expectations is isolating the impacts from endogenous prior house price beliefs. Thereby, in the second alternative specification, we follow **CGGW21**; **CGW22**; **CGKS20** and start by regressing households' posterior beliefs about house price change on corresponding prior beliefs, controlling for a series of personal attributes and allowing the intercepts and the average marginal effects (slope) of prior beliefs to vary across different treatment groups. Particularly, we assess the effects of different monetary policy treatments on expectations based on the regression of the following form:

$$
\begin{aligned}
E_i^{post}\Delta H \quad = \quad & \alpha_0 + \beta_0 E_i^{pre}\Delta H + \Sigma_{j=1}^3 \alpha_j \times \mathbb{1}\{i \in Treatment_j\} \\
& + \Sigma_{j=1}^3 \beta_j E_i^{pre}\Delta H \times \mathbb{1}\{i \in Treatment_j\} + C_i\Phi + \epsilon_i,
\end{aligned}
\tag{A.1}
$$

where i indexes respondents, j indexes treatments, $E\Delta H$ measures the expected house price change, pre denotes pre-treatment expectations measure, $post$ denotes post-treatment expectations measure and $\mathbb{1}\{i \in Treatment_j\}$ is an indicator function which equals one if respondent i receives treatment j. The omitted category is the control group, so that regression coefficients α_j (intercept) and β_j (slope), $j = 1, 2, 3$, capture relative effect to the control group. C_i is a vector of individual and household characteristic control variables. After controlling demographic attributes, the estimated coefficients remain roughly unchanged for both wave 1 and wave 3 samples. The alternative specification (A.1) has Bayesian updating interpretation to assess whether households put more or less weight on their prior beliefs in forming their posteriors depending on whether they are provided with new information or not. Particularly, slope, β_j, should be more negative for more informative/credible treatments, i.e., the weight on the prior is smaller.

A.1 Wave 1

Note given the randomization of treatments provision, controls Φ only marginally help the precision but of no material effect on the estimates, we report results with and without controlling demographic attributes in Table A.11.

Table A.11: Treatment effects on house price expectations - Wave 1

| | Posterior house price change expectations | | | |
| | Main wave | | Follow-up | |
	(1)	(2)	(3)	(4)
Intercept				
Control	2.845***	-1.654	0.335	-3.874
	(0.706)	(5.955)	(0.668)	(3.348)
Relative to control:				
T1 (current funds rate)	0.884	0.585	-0.880	-1.029
	(2.374)	(2.386)	(1.584)	(1.533)
T2 (current funds rate	0.166	0.066	0.630	0.649
and projections)	(1.234)	(1.241)	(0.899)	(0.880)
T3 (current funds rate,	-3.174**	-2.946**	1.214	1.134
projections and explaining	(1.296)	(1.307)	(0.764)	(0.747)
mortgage rate channel)				
Slope				
Control	0.784***	0.755***	0.633***	0.652***
	(0.047)	(0.049)	(0.114)	(0.107)
Relative to control:				
T1 (current funds rate)	0.204	0.224	0.132	0.118
	(0.137)	(0.142)	(0.223)	(.219)
T2 (current funds rate	-0.042	-0.023	-0.118	-0.120
and projections)	(0.078)	(0.079)	(0.144)	(0.140)
T3 (current funds rate,	-0.391***	-0.390***	-0.234*	-0.257*
projections and explaining	(0.088)	(0.094)	(0.121)	(0.114)
mortgage rate channel)				
Demographics		✓		✓
Observations	3,039	2,989	1,012	1,001
R-squared	0.40	0.40	0.32	0.36

Notes: the table reports estimates of specification (2) for nominal house price expectations (column (1)), real house price expectations (column (2)), inflation expectations (column (3)) and mortgage interest rate expectation (column (4)). Coefficients for groups other than the control group are relative to the coefficient for the control group. Regressions use sampling weights. Robust standard errors are in parentheses. ***, **, * denote statistical significance at 1, 5 and 10 percent levels.

Figure A.9: Treatment effects on house price expectations, main-wave and follow-up samples - Wave 1
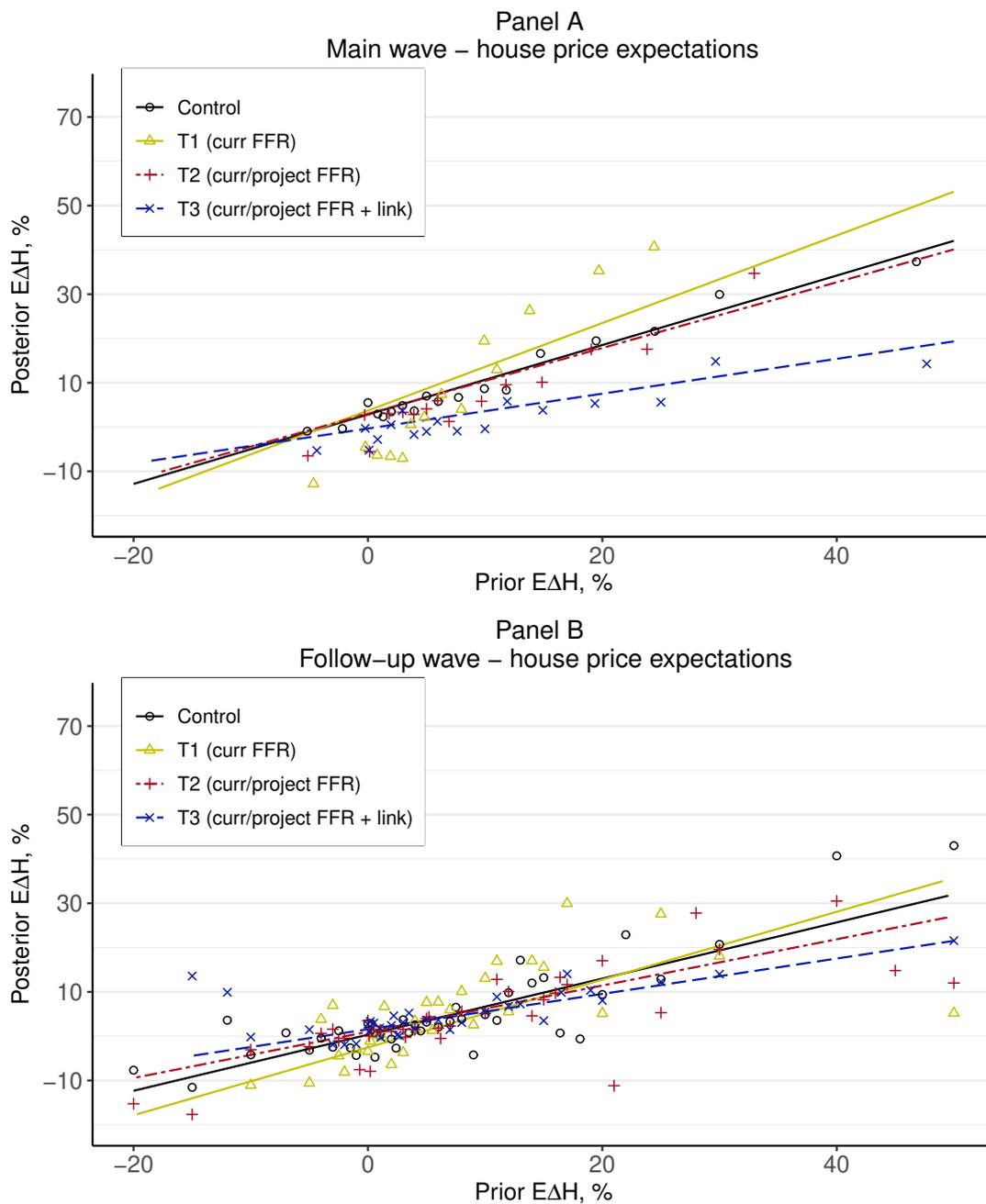
Panel A
Main wave – house price expectations

Panel B
Follow–up wave – house price expectations

Notes: the figure present binscatter plots for prior vs. posterior house price expectations by treatment group. Panel A shows main-wave house price change expectations and Panel B illustrates follow-up house price change expectation. Binscatters use sampling weights. Lines show fitted value of the linear regression.

Table A.12: Treatment effects on house price expectations by demographic group - Wave 1

	Education		Prior knowledge of link		Age		Mortgage payer	
	College or more	Less than college	Yes	No	50 years or more	Less than 50 years	Yes	No
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept								
Control	3.086***	1.025*	0.479	3.751***	1.361*	3.123***	1.936**	3.369**
	(0.811)	(0.586)	(0.790)	(0.953)	(0.737)	(0.825)	(0.746)	(1.668)
Relative to control:								
T1 (current funds rate)	0.781	1.520	4.648*	-0.300	1.072	0.795	1.922	0.211
	(2.675)	(1.978)	(3.838)	(2.926)	(4.078)	(2.701)	(2.423)	(3.188)
T2 (current funds rate and projections)	-3.024***	12.996***	-1.891	-0.242	-0.752	0.287	0.855	-0.686
	(1.053)	(3.234)	(3.113)	(1.273)	(2.188)	(1.381)	(2.241)	(1.395)
T3 (current funds rate, projections and transmission mechanism)	-3.240**	-2.704***	-2.824	-3.387***	-4.544***	-2.980**	-2.346	-3.683**
	(1.431)	(1.016)	(2.526)	(1.553)	(1.941)	(1.485)	(2.555)	(1.609)
Slope								
Control	0.771***	0.969***	0.833***	0.753***	0.834***	0.777***	0.805***	0.770***
	(0.050)	(0.049)	(0.156)	(0.068)	(0.084)	(0.051)	(0.063)	(0.064)
Relative to control:								
T1 (current funds rate)	0.198	0.242*	0.168	0.228	-0.022	0.238	-0.059	0.315*
	(0.148)	(0.115)	(0.156)	(0.184)	(0.295)	(0.152)	(0.234)	(0.168)
T2 (current funds rate and projections)	-0.002	-0.236	-0.237**	-0.073	-0.103	-0.078	-0.257**	0.059
	(0.0741)	(0.145)	(0.135)	(0.093)	(0.111)	(0.089)	(0.131)	(0.094)
T3 (current funds rate, projections and transmission mechanism)	-0.376***	-0.697***	-0.411***	-0.377***	-0.200**	-0.425***	-0.310**	-0.410***
	(0.091)	(0.212)	(0.135)	(0.114)	(0.103)	(0.101)	(0.156)	(0.107)
Observations	2,509	530	603	2,436	499	2,540	881	2,158
R-squared	0.39	0.53	0.51	0.37	0.51	0.39	0.38	0.42

Notes: the table reports estimates of specification (2) for nominal house price expectations, by different demographic attributes and prior knowledge. Coefficients for groups other than the control group are relative to the coefficient for the control group. Regressions use sampling weights. No other household/respondent controls are included. Robust standard errors are in parentheses. ***, **, * denote statistical significance at 1, 5 and 10 percent levels.

We visualize the results of this regression for house price change expectations in Figure A.9 and illustrate corresponding estimates for main-wave and follow-up responses in Table A.11, respectively. First to notice is that slopes of the relationship between pre-treatment and post-treatment expectations of nominal and real house prices for the control group are 0.784 and 0.516, respectively, implying a strong correlation between answers to prior and the posterior expectations, despite the different phrasings in the two questions. Consider first the effect of T3. This involves communicating current and projected path of hiking interest rate with respondents, with an explanation of the mortgage rate channel. As Figure A.9 illustrates, even for those with a high prior (nominal and real) house price change expectation initially, after the information treatment of T3, their posterior house price change expectation becomes the lowest, comparing with other treatment group. The weight placed on prior expectation for nominal house price change is significantly negative with both main-wave and follow-up responses, indicating that respondents are assigning a lot of weight on the information signal from the treatment T3 and the treatment effect is persistent. Comparatively, respondents receiving the information treatment of T2 generally place a larger weight on their prior house price change expectations than T3.

Table A.12 examines the heterogeneous treatment effect on nominal house price change expectation across different sub-samples. In general, all respondents receiving T3 place a meaningfully lower weight on their prior house price growth belief than the control group across different subsamples. In addition, there exists significant heterogeneity in updating their beliefs between respondents with and without a certain knowledge or experience after receiving the treatment. For example, after receiving T2, respondents with prior knowledge of the linkage between house price and interest rated also place a significantly lower weight on their prior belief than the control group, while there is no much difference between respondents without such knowledge and the control group. This is consistent with the analysis in the main text. Moreover, mortgage payers receiving T2 or T3 place a similarly lower weight on their prior than the control group, while no significant difference is found between non-mortgage payers receiving T2 and the control group.

A.2 Wave 3

We visualize the estimation results of this specification in Figure A.10 and illustrate corresponding estimates for main-wave and follow-up responses in Table A.11, respectively.

Figure A.10: FOMC speech treatment effects on house price expectations, main-wave and follow-up samples - Wave 3

Panel A
Main wave – house price expectations

Panel B
Follow–up wave – house price expectations
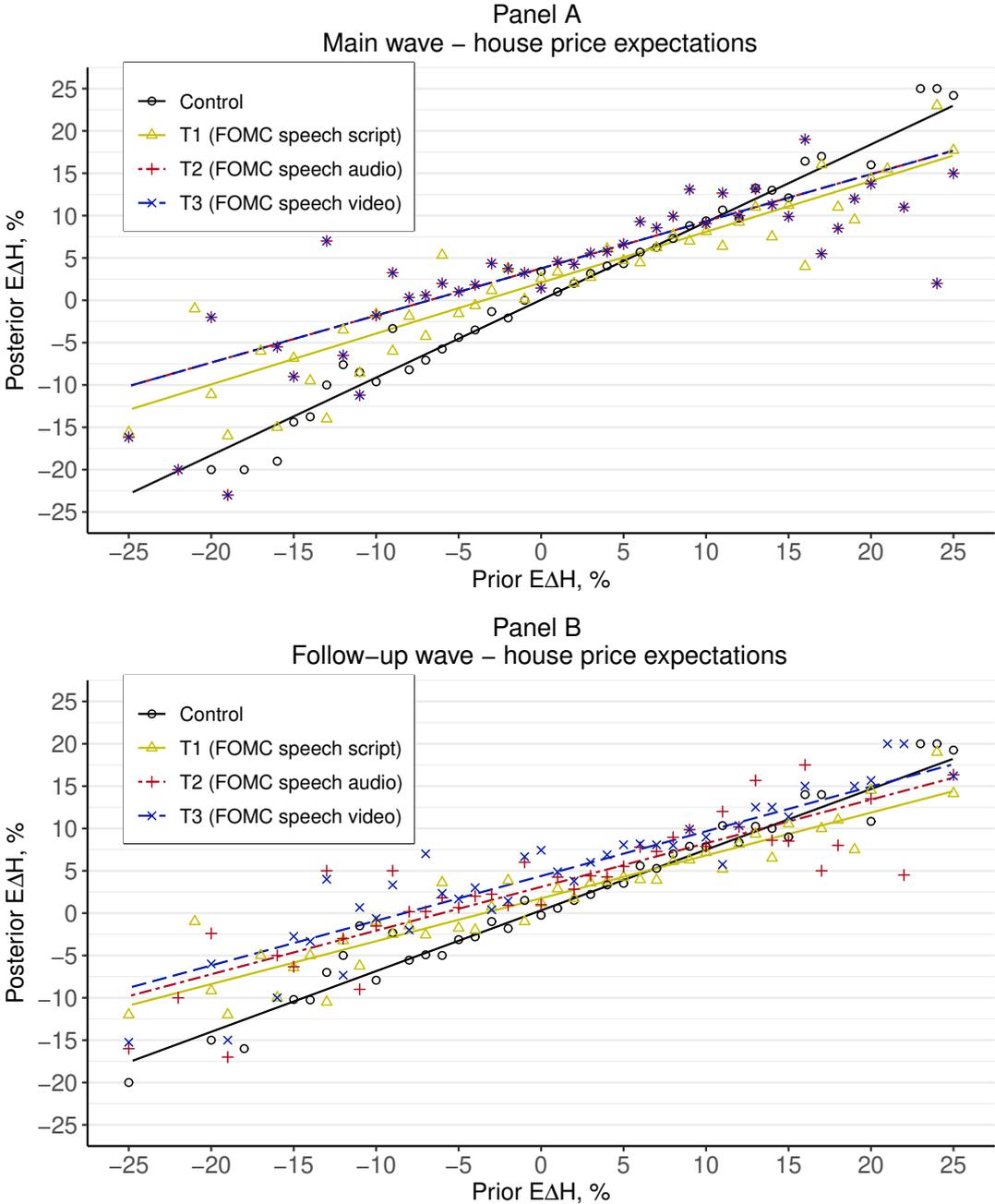
Notes: Binscatters are used. The figure present binscatter plots for prior vs. posterior house price expectations by treatment groups. Panel A shows main-wave house price change expectations and Panel B illustrates follow-up house price change expectation. Lines show fitted value of the linear regression.

Table A.13: FOMC speech treatment effects on house price expectations - Wave 3

| | Posterior house price change expectations | | | |
| | Main wave | | Follow-up | |
	(1)	(2)	(3)	(4)
Intercept				
Control	0.569	-0.201	0.321*	0.610
	(0.142)	(2.377)	(0.206)	(2.258)
Relative to control:				
T1 (FOMC speech script)	2.027***	2.013***	1.425***	1.526***
	(0.322)	(0.324)	(0.280)	(0.287)
T2 (FOMC speech audio clip)	3.695***	3.471***	2.771***	2.730***
	(0.349)	(0.345)	(0.322)	(0.323)
T3 (FOMC speech video clip)	5.666***	5.525***	4.060***	4.091***
	(0.428)	(0.428)	(0.370)	(0.373)
Slope				
Control	0.918***	0.924***	0.717***	0.724***
	(0.017)	(0.018)	(0.019)	(0.020)
Relative to control:				
T1 (FOMC speech script)	-0.317***	-0.320***	-0.211***	-0.210***
	(0.036)	(0.036)	(0.033)	(0.034)
T2 (FOMC speech audio clip)	-0.363***	-0.365***	-0.201***	-0.199***
	(0.045)	(0.045)	(0.043)	(0.042)
T3 (FOMC speech video clip)	-0.356***	-0.351***	-0.188***	-0.191***
	(0.049)	(0.048)	(0.044)	(0.044)
Demographics		✓		✓
Observations	2,020	2,000	1,494	1,494
R-squared	0.53	0.54	0.56	0.58

Notes: the table reports estimates of specification (2) for nominal house price expectations (column (1)), real house price expectations (column (2)), inflation expectations (column (3)) and mortgage interest rate expectation (column (4)). Coefficients for groups other than the control group are relative to the coefficient for the control group. Regressions use sampling weights. Robust standard errors are in parentheses. ***, **, * denote statistical significance at 1, 5 and 10 percent levels.

Figure A.10 shows that all three treatments significantly reduce the weight placed on the prior beliefs by respondents, relative to the control group. This effect is also persistent in the follow-up wave. It shows that even for respondents with relatively low house price growth (or high house price decline) expectations, speech treatments meaningfully reduce their weight placed on the prior. In general, respondents finds the speech treatment credible.

Table A.11 quantifies the treatment effect on weight on prior. The slope coefficients are all significantly negative, indicating households put less weight on their prior beliefs in forming their posteriors than the control group, on average.

B Treatment effects on investment decisions

This section investigates the link between respondents' house price expectations and investment behavior. As explained in Section 2.1, respondents are asked to allocate $1000 for one-year investment between a housing-index fund with an annual return which equals the growth rate of home prices and a savings account (with a 2% annual interest rate) in both pre-treatment and post-treatment sections. The share of investment in the housing fund is measured by the proportion of $1000 that is allocated to the housing fund (on a 0–100 scale).[1] Figure A.11 illustrates the relationship between investment allocation and house price change expectation in pre- and post-treatment sections.

Figure A.11: Correlations between house price change expectations and investment
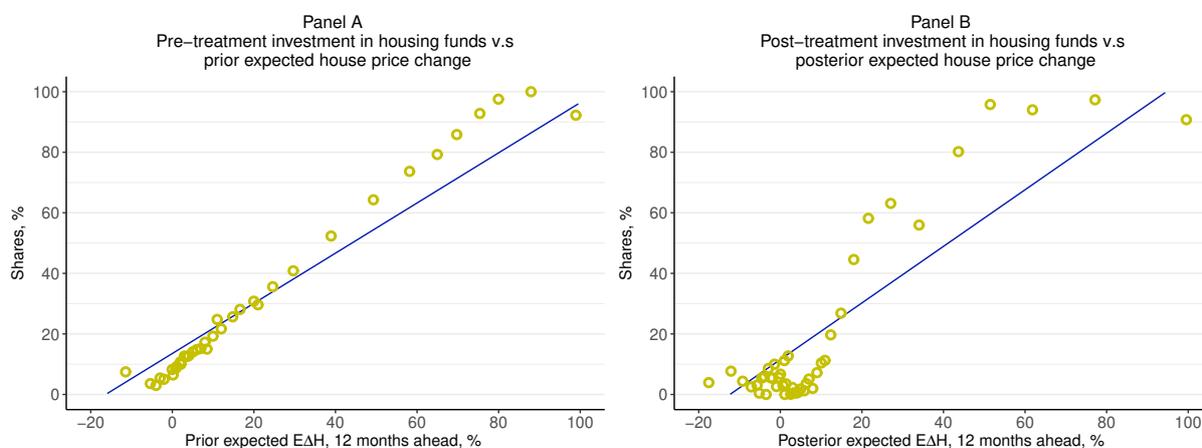
Columns (1) and (2) of Table A.14 illustrate estimates from an OLS regression of investment shares in the housing fund on house price change expectations with a set of controls for pre- and post-treatment data. A 1 p.p increase in 1-year ahead expected house price growth is significantly and positively correlated with 0.85% (or 0.48%) larger investment in the housing fund for the pre-treatment (or post-treatment) scenario. Column (3) reports the estimation result when the dependent variable is revisions to the investment share in the housing fund and the independent variable of interest is revisions to house price change expectations. The estimated coefficient on expectation revisions is statistically significant and close to the corresponding estimates in column (2): a 1 p.p increase in the revision to 1-year ahead expected house price growth is significantly and positively associated with 0.52% increase in housing fund investment. This result is comparable to related studies, e.g. **armona18** which finds a positive association of around 0.8 between expected house price change and housing fund investment. Moreover, respondents who are house owners significantly invest smaller shares of funds, consistent in pre-treatment and post-treatment settings and across different specifications. This might be due to the behavior of diversify-

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[1]Figure A.11 in Appendix demonstrates a positive correlation between shares of investment in housing index-based fund and house price change expectations for both pre- and post-treatment scenarios.

Table A.14: Relation between house price change expectations and investment decisions

Dependent variable: Shares invested in housing index-based funds	Pre-treatment housing fund shares	Post-treatment housing fund shares	Revisions to housing fund shares	Revisions to housing fund shares (IV)
(on a 0–100 scale)	(1)	(2)	(3)	(4)
Pre-treatment 1-year HP change expectation ($E_i^{pre}\Delta H$)	0.848*** (0.042)			
Post-treatment 1-year HP change expectation ($E_i^{post}\Delta H$)		0.484*** (0.047)		
HP change expectation revision ($E_i^{post}\Delta H - E_i^{pre}\Delta H$)			0.523*** (0.077)	0.658*** (0.200)
HP change expect. revision * control			0.250 (0.231)	
Pre-treatment shares in housing funds		0.797*** (0.046)	0.171*** (0.027)	0.164*** (0.025)
T1	0.516 (0.756)	-2.021 (1.620)	-0.773 (1.654)	
T2	0.938 (0.821)	2.112 (1.549)	2.151 (1.617)	
T3	0.855 (0.899)	-0.758 (1.445)	-0.955 (1.608)	
Homeownership	-1.199** (0.585)	-3.717*** (1.307)	-4.241*** (1.351)	-4.194*** (1.351)
Certainty about pre-treatment HP expect.	1.245* (0.721)	-1.221 (1.213)	-1.441 (1.273)	-1.485 (1.358)
Paying mortgage	2.767** (1.22)	-0.492 (1.280)	-1.886 (1.433)	-1.632 (1.535)
Constant	10.715*** (4.100)	-3.519 (7.579)	-5.791 (7.730)	-4.615 (7.746)
Demographics	✓	✓	✓	✓
Observations	2,989	2,989	2,989	2,989
R-squared	0.68	0.63	0.16	
Joint sig of covariates	0	0	0	0
First-stage χ^2 statistics (IV only)				40.19
Mean of dep. variable: Full sample	23.84	23.03	-1.28	-1.28
Control	23.79	22.17	-0.76	-0.76
T1 (curr FFR)	23.63	24.77	-1.46	-1.46
T2 (curr & proj. of FFR)	23.76	23.42	1.01	1.01
T3 (curr & proj. of FFR + mechanism)	23.95	18.93	-4.03	-4.03

Notes: Column (1) reports the relationship between pre-treatment house price change expectations and investment shares, using the specification $S_i^{pre} = a_0 + a_1 E_i^{pre}\Delta H + \Sigma_{j=1}^3 \beta_j \times \mathbb{1}\{i \in Treatment_j\} + C_i\phi + \epsilon_i$, where S_i^{pre} denotes the pre-treatment shares of investment in housing index-based funds and $E_i^{pre}\Delta H$ denotes the pre-treatment house price change expectations. Column (2) reports the same results as column (1) except using post-treatment data. Column (3) reports the relationship between revisions to house price change expectations and revisions to housing investment shares, using the specification $(S_i^{post} - S_i^{pre}) = a_0 + a_1(E_i^{post}\Delta H - E_i^{pre}\Delta H) + a_2 S_i^{pre} + a_3 Control_i(E_i^{post}\Delta H - E_i^{pre}\Delta H) + \Sigma_{j=1}^3 \beta_j \times \mathbb{1}\{i \in Treatment_j\} + C_i\phi + \epsilon_i$, where $Control_i$ is an indicator if respondent i is assigned into the control group. The remaining notations are same as before. OLS estimates reported for columns (1) to (3). IV regression are reported in column (4), with specification (3) - (4). Robust standard errors in parentheses. Significant at *p<0.10, **p<0.05, ***p<0.01. Joint siginificance of covariates shows p-values of F-test on equality of all covariates to zero.

ing portfolio choices, as house owners already put relatively larger amounts of investment in houses.

To illustrate the causal effect of house price expectations and tackle concerns about unobserved differences across individuals confounding the analysis, we use the exogenously random assignment of treatment as the instrument for revisions to house price change expectations. The first stage is identical to specification (1) in Section 2.3, except we include a more extensive set of control variables in C_i^*.[2] The full model, including the first stage, is as follows:

$$\text{First Stage:} \quad (E_i^{post}\Delta H - E_i^{pre}\Delta H) = a_0 + \Sigma_{j=1}^3 a_j \times \mathbb{1}\{i \in Treatment_j\} + \Phi'C_i^* + \epsilon_i, \quad \text{(A.2)}$$

$$\text{Second Stage:} \quad (S_i^{post} - S_i^{pre}) = \beta_0 + \beta_1(E_i^{post}\Delta H - E_i^{pre}\Delta H) + \Phi'C_i^* + e_i, \quad \text{(A.3)}$$

where S_i^{pre} and S_i^{post} are the pre- and post-treatment shares of investment in housing funds, respectively. The remaining notations are the same as in the previous sections. Column (4) reports the corresponding results using the instrumental variable (IV) estimation. Under the IV specification, a 1 p.p upward revision to 1-year ahead expected house price growth is significantly and positively associated with 0.66% increase in housing funds investment. The estimated coefficient is somewhat larger than the OLS estimate in column (3), illustrating a causal effect of house price expectations on the investment behavior. Overall, the significance of the estimated coefficients in columns (1) - (4) suggests a strong relationship between house price expectations and financial behavior.
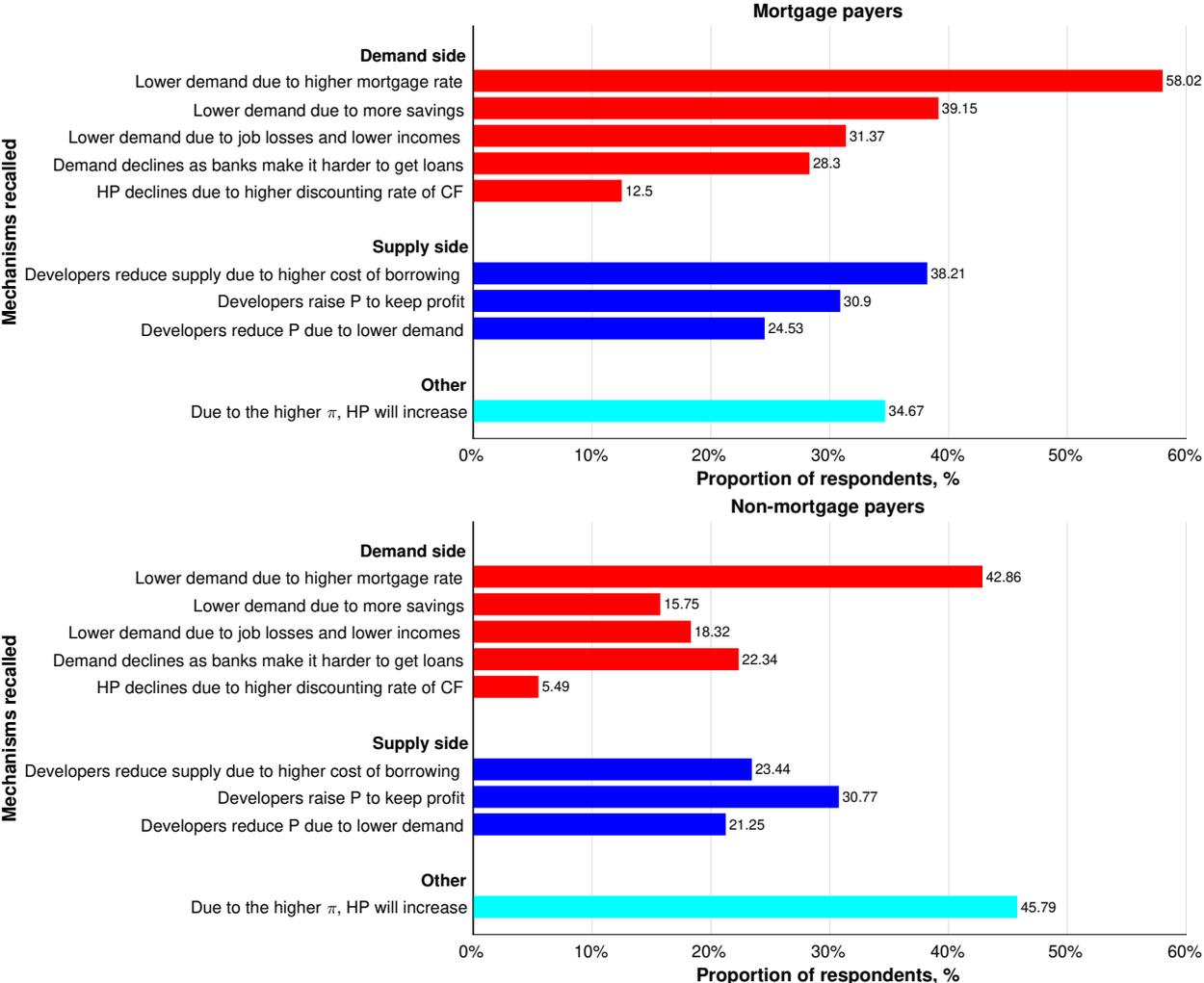
C   The role of personal experience

This section shows that respondents with different personal experience or background demonstrate substantial heterogeneity in recalling mechanisms in the shock scenario when the Federal Reserve unexpectedly raises interest rate.

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[2]C_i^* includes C_i, pre-treatment housing fund shares, homeownership status, certainty about pre-treatment house price change expectations, and mortgage status.
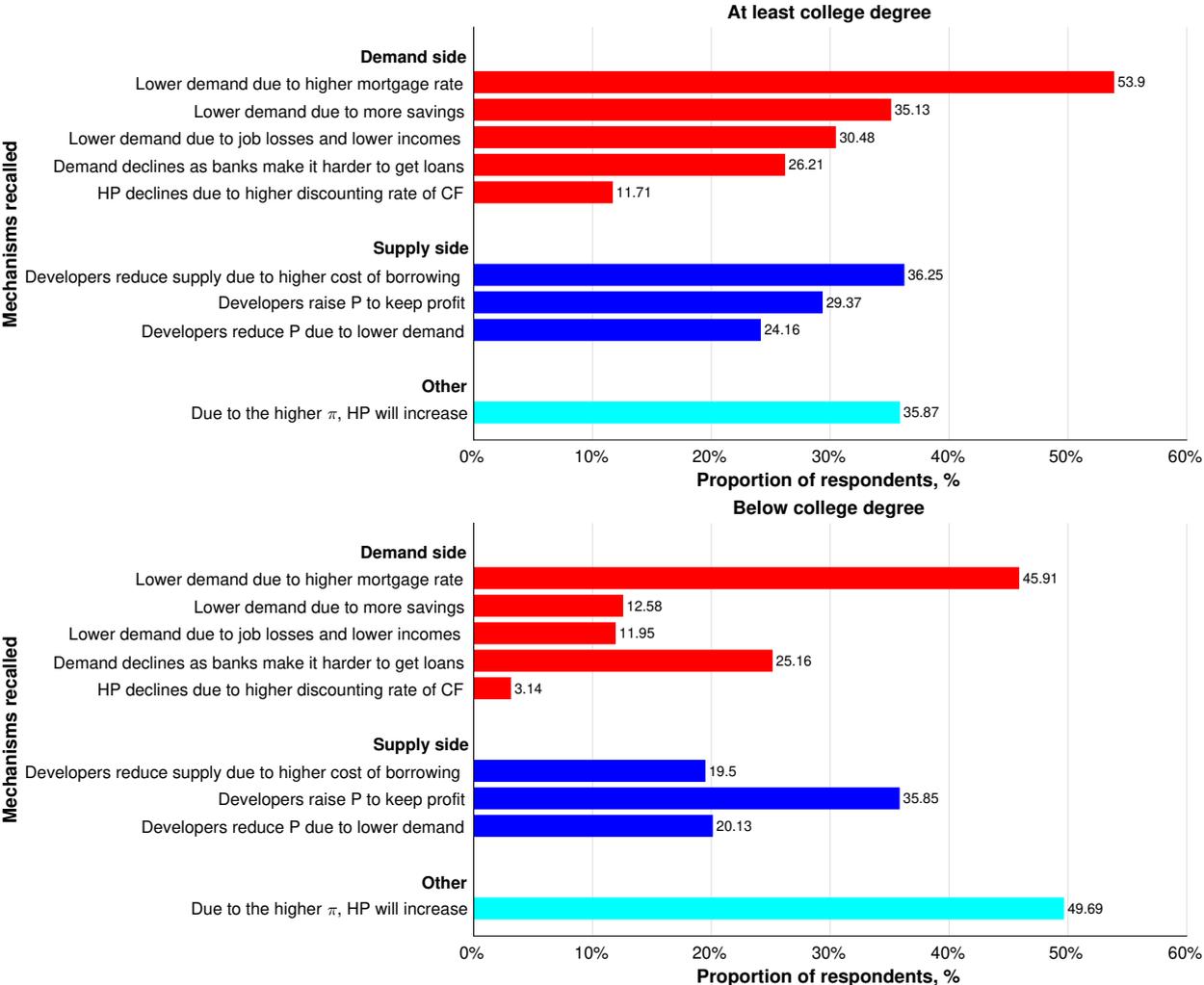
C.1 Heterogeneity in recalling mechanisms by mortgage status

Figure A.12: Recalled mechanisms when making house price change prediction in the shock scenario (federal funds rate unexpectedly raises), by mortgage status

Mortgage payers

Mechanisms recalled	Value
Demand side	
Lower demand due to higher mortgage rate	58.02
Lower demand due to more savings	39.15
Lower demand due to job losses and lower incomes	31.37
Demand declines as banks make it harder to get loans	28.3
HP declines due to higher discounting rate of CF	12.5
Supply side	
Developers reduce supply due to higher cost of borrowing	38.21
Developers raise P to keep profit	30.9
Developers reduce P due to lower demand	24.53
Other	
Due to the higher π, HP will increase	34.67

Proportion of respondents, %

Non-mortgage payers

Mechanisms recalled	Value
Demand side	
Lower demand due to higher mortgage rate	42.86
Lower demand due to more savings	15.75
Lower demand due to job losses and lower incomes	18.32
Demand declines as banks make it harder to get loans	22.34
HP declines due to higher discounting rate of CF	5.49
Supply side	
Developers reduce supply due to higher cost of borrowing	23.44
Developers raise P to keep profit	30.77
Developers reduce P due to lower demand	21.25
Other	
Due to the higher π, HP will increase	45.79

Proportion of respondents, %

Notes: this figure shows selected propagation channels on respondents' minds when they make their predictions, by respondents' experieence of paying mortgage, using Wave 2 data. Respondents can select multiple channels from a list. The figure reports the proportion of respondents selecting each of the 9 mechanisms. The full wording of the channels is available in Appendix.

Figure A.13: Recalled mechanisms when making house price change prediction in the shock scenario (federal funds rate unexpectedly raises), by education level

At least college degree

Demand side
- Lower demand due to higher mortgage rate: 53.9
- Lower demand due to more savings: 35.13
- Lower demand due to job losses and lower incomes: 30.48
- Demand declines as banks make it harder to get loans: 26.21
- HP declines due to higher discounting rate of CF: 11.71

Supply side
- Developers reduce supply due to higher cost of borrowing: 36.25
- Developers raise P to keep profit: 29.37
- Developers reduce P due to lower demand: 24.16

Other
- Due to the higher π, HP will increase: 35.87

Below college degree

Demand side
- Lower demand due to higher mortgage rate: 45.91
- Lower demand due to more savings: 12.58
- Lower demand due to job losses and lower incomes: 11.95
- Demand declines as banks make it harder to get loans: 25.16
- HP declines due to higher discounting rate of CF: 3.14

Supply side
- Developers reduce supply due to higher cost of borrowing: 19.5
- Developers raise P to keep profit: 35.85
- Developers reduce P due to lower demand: 20.13

Other
- Due to the higher π, HP will increase: 49.69

Notes: This figure shows selected propagation channels on respondents' minds when they make their predictions by respondents' education level (if they have at least a college degree), using Wave 2 data. Respondents can select multiple channels from a list. The figure reports the proportion of respondents selecting each of the 9 mechanisms. The full wording of the channels is available in Appendix.

Figure A.12 in Appendix summarizes the proportion of recent mortgage payers and non-mortgage payers who recalled each mechanism when predicting the impact of the interest rate hike on house prices. First, recent mortgage payers think of more channels than non-mortgage payers (2.8 versus 2.3 channels, on average). Second, the mortgage rate channel is the most commonly recalled channel by mortgage payers (58%), while the inflation channel is the most frequently recalled mechanism by non-mortgage payers (46%). This shows that the recent experience of paying a mortgage facilitates the respondents to associate the interest rate hike with economic mechanisms, particularly the mortgage rate channel. Figure A.13 in Appendix shows the proportion of respondents recalling each mechanism in the shock scenario by respondents' education level. A higher proportion of college graduates can recall most listed mechanisms than those without a college degree. College graduates recall around 2.8 channels on average, while non-college graduates recall 2.2 channels on average.

Moreover, the most-selected mechanism by college graduates is the mortgage rate channel; 54% of college graduates selected this channel. By contrast, the inflation channel is the most selected mechanism by non-college graduates (50%).

C.2 Association between personal experience and mechanism recall

After the elicitation of mechanisms coming up in respondents' mind when the Federal Reserve raises interest rate, we further ask respondents to report their level of personal (or family's/friends') experience with each of the 9 mechanisms. Five levels of experiences are given in an ascending order, from "no experiences" to "a lot of experiences". Elicitation of their personal experience facilitates us examining potential sources of recalling a particular mechanism.

First, we analyze the role for recent experience of paying mortgage by respondents in recalling the mortgage rate channel. Columns (1) and (2) of Table A.15 report the results from estimated ordered probit models. The dependent variable is the ordered ascending level of experience from "no experiences" to "a lot of experiences" elicited and the independent variable is an indicator that equals 1 if a respondent is recently paying mortgage and 0 otherwise. It is more likely for mortgage payers to report a higher level of experience, see column (1). The finding is robust to including demographic controls explained in Footnote 1 (see column (2)). This positive correlation not only indicates that recent mortgage payers are more likely to report a higher level of experience with the mortgage rate channel, but also suggests a significant consistency in the respondents' answers regarding the experience disclosure.

Second, we study how the recent personal experience of paying mortgage is associated with the effective recall of the mortgage rate channel in the shock scenario. We construct the dependent variable as a binary indicator which equals 1 if a respondent recalls and selects the mortgage rate channel and 0 otherwise. The independent variable remains the same as in previous columns. Based on column (4), mortgage payers are more likely to recall and select the mortgage rate channel and associate it with the shock scenario. This suggests that a potential reason why a respondent can recall the mortgage rate channel is their personal experience with this channel. Similar results are obtained and are reported in columns (1) and (2) of Table A.16 in Appendix, when we use linear probability models (instead of probit models).

Table A.15: Households' experience of paying mortgage correlates with recall of mortgage rate channel and revisions to house price change expectations

	Experience with mortgage rate channel		Recall mortgage rate channel		House price change expectation revisions	
	(1)	(2)	(3)	(4)	(5)	(6)
Recent experience of paying mortgage						
Yes	0.717***	0.590***	0.403***	0.417***	-4.210**	-5.004**
	(0.108)	(0.116)	(0.131)	(0.137)	(2.165)	(2.221)
Constant			-0.232**	0.237***	1.919	13.773
			(0.106)	(1.066)	(1.820)	(13.567)
Demographics		✓		✓		✓
Observations	697	689	697	689	697	689
Pseudo R-squared	0.03	0.12	0.02	0.09	0.01	0.06

Notes: the explanatory variable is an indicator variable that takes value 1 if respondents are recent mortgage payers and 0 otherwise. In columns (1) and (2), the dependent variable is the self-reported level of personal experience (from "no experiences" to "a lot of experiences") with the mortgage rate channel. In columns (3) and (4), the dependent variable is an indicator variable that takes a value of 1 if respondents recall the mortgage rate channel. In columns (5) and (6), the dependent variable is revisions to expected house price changes over the next 12 months. Regressions use sampling weights. Ordered probit model estimation results are reported in columns (1) and (2). Probit model estimation results are reported in columns (3) and (4). The linear probability model estimation results are reported in columns (5) and (6). Robust standard errors are in parentheses. ***, **, * denote statistical significance at 1, 5 and 10 percent levels.

Table A.16: Level of personal experience of paying mortgage, recall of mortgage rate channel and expectation revisions

	Recall mortgage rate channel		House price change expectation revisions		Direction of house price change expectation revisions	
	(1)	(2)	(3)	(4)	(5)	(6)
Level of experience (mortgage rate channel)	0.054***	0.058***				
	(0.016)	(0.018)				
Recall mortgage rate channel						
Yes			-6.602***	-7.896***	-0.641***	-0.729***
			(1.960)	(1.956)	(0.120)	(0.125)
Constant	0.358***	-0.401	2.411*	10.638		
	(0.050)	(0.266)	(1.434)	(13.642)		
Demographics		✓		✓		✓
Observations	697	689	697	689	697	689
R-squared	0.02	0.08	0.02	0.08	0.04	0.08

Notes: this table presents results from Wave 2. In columns (1) and (2), the dependent variable is an indicator variable that takes value 1 if respondents recalls the mortgage rate channel and 0 otherwise. The independent variable is the elicited level of personal experience by the respondents from "no experiences" to "a lot of experiences". Estimated linear probability model results are reported. In columns (3) and (4), the dependent variable is the revisions to expected house price changes over the next 12 months from the baseline to the shock scenario. The independent variable is an indicator that takes value 1 if respondents recalls the mortgage rate channel and 0 otherwise. In columns (5) and (6), the dependent variable is an indicator variable that takes value 1 if respondents revise their house price change expectation upward in the shock scenario, takes value 0 if they do not revise the expectation, and takes value -1 if they revise the expectation downward. The independent variable is the indicator which equals 1 if a respondent recalls the mortgage rate channel and 0 otherwise. Estimated ordered probit model results are reported. Regressions use sampling weights. Robust standard errors are in parentheses. ***, **, * denote statistical significance at 1, 5 and 10 percent levels.

Turning to the relation between respondents' recent experience of paying mortgage and revisions to their house price expectations following the interest rate hike, columns (5) and (6) of Table A.15 suggest that mortgage payers predict lower house price growth following the

Table A.17: Households' experience correlates with recalls of mechanism

Probability of recalling	Pooled		Demand side		Supply side		Inflation side	
a mechanism	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Related experience								
No	-0.580***	-0.561***	-0.615***	-0.583***	-0.563***	-0.550***	-0.351*	-0.420*
	(0.069)	(0.073)	(0.097)	(0.102)	(0.111)	(0.115)	(0.190)	(0.243)
Many ∼ a lot of	0.191***	0.176***	0.143**	0.113**	0.206**	0.177**	0.357***	0.393***
	(0.047)	(0.048)	(0.063)	(0.064)	(0.083)	(0.087)	(0.131)	(0.137)
Demographics		✓		✓		✓		✓
Observations	6,273	6,201	3,485	3,445	2,091	2,067	697	689
Pseudo R-squared	0.03	0.03	0.02	0.04	0.03	0.04	0.02	0.06
Pseudo R-squared (sum of all channels)	0.14	0.50	0.07	0.29	0.03	0.15	0.04	0.06

Notes: the table reports estimates of specification $y_i^j = a + \beta x_i^j + error_{i,j}$, where the dependent variable $y_i^j = 1$ if respondent i recalls mechanism j; otherwise $y_i^j = 0$. x_i^j denotes respondent i's level of personal experience with mechanism j. Probit model estimation results are reported in the table. Regressions use sampling weights. Robust standard errors are in parentheses. ***, **, * denote statistical significance at 1, 5 and 10 percent levels.

interest rate hike on average (see column (6)), relative to non-mortgage payers. Furthermore, to mitigate the noisy effect of extremely large revisions, we construct a measure of directional revision to expected house price change as the new dependent variable in columns (5) and (6) of Table A.16 in Appendix. A similar conclusion is reached. Respondents are more likely to revise their expected house price change downward if they have recent experience of paying mortgage, comparing with those who do not have the experience, based on column (6) of Table A.16.

We now analyze how households' experiences correlate with recalls of mechanisms on top of respondents' mind when making house price predictions in the shock scenario in a general sense. Recall that for each of the 9 mechanisms listed, respondents are asked to report their level of experience. We combine "some experiences" with "a few experiences" and "many experiences" with "a lot of experiences". Then we pair the mechanism recall with the corresponding level of experience reported. Therefore, each individual respondent has 9 pairs of recall and experience. Table A.17 shows the association between the level of experience and recalls of mechanisms using probit models. The combined group of "some experiences" with "a few experiences" is used as the base group.[3] Specifically, this table displays the estimated results when we consider all mechanisms (in column (1) and (2)), or mechanisms from demand side (in column (3) and (4)), or from supply side (in column (5) and (6)), or inflation channel (in column (7) and (8)). In general, respondents without any related experience with a mechanism are 56.1% less likely to recall it than the base group, while respondents with many to a lot of related experiences with a mechanism are more

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[3]Demographic controls are included but not reported in columns (2), (4), (6) and (8). Individual characteristics are gender, age, age squared, employed indicator and education (indicator variable for each group). Household characteristics are pre-tax household income (binned; indicator variable for each bin), household size (indicator variable for each size), census region (indicator variable for each region).

likely to recall it than the base group (see column (2)). Similar results are obtained when we divide the mechanisms into demand, supply and inflation channels (columns (3) – (8)).

Table A.18: Recalled mechanisms correlate with revisions to house price change expectations

Dependent variable:	**Directional expected HP change revision**			
	ordered probit		ordered logit	
	(1)	(2)	(3)	(4)
Standardized sum of mechanisms				
HP (+)	0.342***	0.324***	0.557***	0.525***
	(0.058)	(0.062)	(0.096)	(0.103)
HP (−)	-0.227***	-0.288***	-0.375***	-0.479***
	(0.058)	(0.064)	(0.092)	(0.109)
Demographics		✓		✓
Observations	697	689	697	689
R-squared	0.06	0.09	0.06	0.09

Notes: this table presents results from Wave 2. For independent variables, in wave 2, respondents are asked to select all mechanisms that come up on their mind when making house price change predictions under the shock scenario (S2). We construct two summary indices, namely the standardized sum of experiences with mechanisms implying an increase in house price (HP(+)) and a standardized version of experience with mechanisms implying a decrease in house price (HP(-)). The dependent variable is the directional change of respondents' expected house price change from the baseline (S1) to the shock scenario (S2). In columns (1) and (2), ordered probit model is used as the estimation model. In columns (3) and (4), ordered logit model is used as the estimation model. Robust standard errors are in parentheses. ***, **, * denote statistical significance at 1, 5 and 10 percent levels.

D   Wave 1 Survey Questionnaire

Background information

Q1A. Please tell us about yourself...

Gender

Highest education degree

Working status

B. What's your age?

C. Please tell us about your family...

Marital status

Have children

How many people in your household

D. *Over the last 12 months*, how much was your **household's total after-tax income** *per month*? (Household refers to people living in your main home, excluding non-relatives.)

Total **household after-tax income** per month:

Q2A. In which state is your primary residence?

State:

B. Are you renting or owning your main home?

○ Renting

○ Owning

C. Are you paying mortgage?

○ Yes

○ No

<- Previous

Survey Completion

0% ——————————— 100%

Next ->

Next, we would like to ask you and your perspective on current and future economic conditions. **These questions have no right or wrong answers**, and we are interested in your views and opinions.

Please provide *reasonable* answers.
Please be careful in what you choose and write, as **you will need to answer questions later based on them.**

<- Previous

Survey Completion
0% ———— 100%

Next ->

Inflation

Inflation is the percentage rise in overall prices in the economy. Deflation (the opposite of inflation) corresponds to when overall prices are falling.

Q5A. On a scale from 1 to 7, how well would you say you understand what "*inflation*" means?

○ 1 (I don't understand what "inflation" means)

○ 2

○ 3

○ 4

○ 5

○ 6

○ 7 (I know exactly what "inflation" means)

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Q5B. What do you think of the rate of **inflation/deflation** in the U.S. *in the **past** 12 months*? Please select one from the following.

○ the rate of **inflation** was **12%** or **higher**

○ the rate of **inflation** was between **8% - 12%**

○ the rate of **inflation** was between **4% - 8%**

○ the rate of **inflation** was between **2% - 4%**

○ the rate of **inflation** was between **0% - 2%**

○ the rate of **deflation** (the opposite of inflation) was between **0% - 2%**

○ the rate of **deflation** (the opposite of inflation) was between **2% - 4%**

○ the rate of **deflation** (the opposite of inflation) was between **4% - 8%**

○ the rate of **deflation** (the opposite of inflation) was between **8% - 12%**

○ the rate of **deflation** (the opposite of inflation) was **12%** or **higher**

Q5C. What do you think of **inflation/deflation** *in the **next 12 months***?

	Over the next 12 months	what percent? (enter a positive value)
There will be	[▲▼]	of [ ] %

Survey Completion
0% ▬▬▬▬▬▬ 100%

[← Previous] [Next →]

Federal funds rate

Federal Funds Rate is the interest rate set by the Federal Reserve.

Q6A. Have you ever heard of any news about the **Federal Reserve**?

○ Yes

○ No

Q6B. What do you think of the *current Federal Funds Rate*? Please select one from the following.

○ between **0% - 0.2%**

○ between **0.2% - 0.4%**

○ between **0.4% - 0.6%**

○ between **0.6% - 1%**

○ between **1% - 2%**

○ between **2% - 5%**

○ more than **5%**

Q6C. What do you think of this *Federal Funds Rate* in the *next* 12 months?

The Federal Funds Rate in the next 12 months will be [   ] %

QAC. Population, number of schools and government are important. To ensure the quality of our data, please select 'Agree' for each of them. This is just to screen out random clicking,

	Agree	Neither agree nor disagree	Disagree
Population	○	○	○
Number of schools	○	○	○
Government	○	○	○

<- Previous   Survey Completion   Next ->
0% ——————— 100%

Mortgage interest rate

Q7A. What do you think of the *current* annual (fixed-rate 30-year) *mortgage interest rate* for someone with a good credit score? Please select one from the follow.

○ between **0% - 2%**

○ between **2% - 2.5%**

○ between **2.5% - 3%**

○ between **3% - 3.5%**

○ between **3.5% - 4%**

○ between **4% - 6%**

○ between **6% - 10%**

○ more than **10%**

Q7B. What do you think of this *mortgage interest rate* in the *next* 12 months?

The mortgage interest rate in the next 12 months will be [   ] %

<- Previous

Survey Completion
0% ———— 100%

Next ->

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National house price

Q8. What do you think of the US nationwide *house price changes* would be *over the next 12 months*?

	increase, decrease or stay the same?	By what percent? (enter 0 if you select 'stay the same')
House price over the **next 12 months** will	[▲▼]	by [ ] %

Q9. How *certain* are you about your forecasts of house prices in the previous question?

	very uncertain	somewhat certain	very certain
House price over the **next 12 months**	◯	◯	◯

Q10. If the Federal Reserve starts to *increase Federal Funds Rate*, how would you anticipate national **house prices**?

◯ house prices will *increase*

◯ house prices will *decrease*

◯ house prices will *stay the same*

◯ Don't know

Investment decision

Q11. Consider a situation where you have to decide how to invest $1,000 for one year. You can choose between two possible investments. The first is a fund that invests in **US national housing market**, and pays an annual return equal to the growth in home prices. The second is a *savings account* that pays 2% of interest per year. What proportion of the $1,000 would you put into the two investments? Make sure both answers sum up to $1,000.

The housing market fund	$ [0]
The savings account	$ [0]
Total	$ [0]

You are almost done with this survey.

Below, we will provide you with the recent information taken from **a reliable US institution**. After reviewing the information, we will ask you to report your perspective on future price level, interest rate, mortgage rate and future house prices again.

Please provide *reasonable* answers.

NB: under each question, we will provide answer(s) you indicated in the previous section as reference(s).

Survey Completion
0% —————————— 100%

Next ->

Information treatment

Treatment 1: Current Federal Funds Rate

Before you give us your responses to the rest of the questions, **we would like you to know the following**. **Please read below carefully:**
_____

Current Federal Funds Rate

"The interest rate set by the Federal Reserve, known as the *Federal Funds rate*, is currently at **0.1%**."

_____

Treatment 2: Current and high projections of Federal Funds Rate

Before you give us your responses to the rest of the questions, **we would like you to know the following**. **Please read below carefully:**
_____

Current and projections of higher Federal Funds Rate

"The interest rate set by the Federal Reserve, known as the *Federal Funds Rate*, is currently at **0.1%**. One forecast from the Federal Reserve is that the *Federal Funds Rate* will *increase* to **1.1%** in 2022, **2.1%** in 2023, **3.1%** in 2024 and **3%** in the longer run."

_____

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Treatment 3: Current and high projections of Federal Funds Rate, with propagation mechanism

Before you give us your responses to the rest of the questions, **we would like you to know the following. Please read below carefully:**

_____

Current and projections of higher Federal Funds Rate with propagation mechanism

"The interest rate set by the Federal Reserve, known as the *Federal Funds Rate*, is currently at **0.1%**. One forecast from the Federal Reserve is that the **Federal Funds Rate** will *increase* to **1.1%** in 2022, **2.1%** in 2023, **3.1%** in 2024 and **3%** in the longer run.

An *increase* in the Federal Funds rate will **_increase the mortgage rate_**. *Higher mortgage payments* will *deter* prospective home-buyers and force some existing home-buyers to sell. This increase in sellers and decline in buyers will **_cause house prices to fall_**."

_____

Post-treatment questions

NB: under each question, we provide answer(s) you indicated in the previous section as reference(s).

Q12. *Given the new **information** at the top of this page* now, what is your best guess about the **Federal Funds Rate** in the *next* 12 months?
Note: Previously, you indicated that you think the *Federal Funds Rate* in the *next* 12 months would be **%**.

Federal Funds Rate in the next 12 months will be [   ] %

Q13. *Given the new **information** at the top of this page* now, what is your best guess about this **mortgage interest rate** in the *next* 12 months?
Note: Previously, you indicated that you think the *mortgage interest rate* would be **%** in the *next* 12 months.

Mortgage interest rate will be [   ] % in the next 12 months

Q14. *Given the new **information** at the top of this page* now, what are your best guesses about national **house price** **changes** *over the next 12 months*?
Note: You indicated that you think the nationwide house price will by .

	increase, decrease or stay the same	by what percent? (enter 0 if you select 'stay the same')
House price over the **next 12 months** will	[▲▼]	by [ ] %

Q15. *Given the new **information** at the top of this page* now, what is your best guess about **inflation/deflation** *over the* **next 12 months**?

Note: Previously, you indicated that you think *over the next 12 months*, there would be of **%**.

	Over the next 12 month	what percent? (enter a positive value)
There will be	[▲▼]	of [ ] %

Q16. *Given the new **information** at the top of this page* now, you have a chance to *reconsider* a situation where you have to decide how to invest $1,000 for one year. You can choose between two possible investments. The first is a fund that invests in **US national housing market**, and pays an annual return equal to the growth in home prices. The second is a *savings account* that pays 2% of interest per year. What proportion of the $1,000 would you put into the two investments? Make sure both answers sum up to $1,000.

Note: Previously you decided to invest $0 in the housing market fund and $0 in the savings account.

The housing market fund	$ 0
The savings account	$ 0
Total	$ 0

[End of Survey]

E Wave 2 Survey Questionnaire

Pre-treatment questions

Background information

Q1A. Please tell us about yourself...

Gender

Highest education degree

Working status

B. What's your age?

C. Please tell us about your family...

Marital status

Have children

How many people in your household

D. *Over the last 12 months*, how much was your **household's total after-tax income** *per month*? (Household refers to people living in your main home, excluding non-relatives.)

Total **household after-tax income** per month:

Q2A. In which state is your primary residence?

State:

B. Are you renting or owning your main home?

○ Renting

○ Owning

C. Are you paying mortgage?

○ Yes

○ No

Page break

Important!

The main part of the survey begins when you press on the 'next' bottom. Please try to **make your responses as accurate as possible**.

It is very important for the success of our research that you answer to the best of your knowledge and read the questions very carefully before answering.

<- Previous   Survey Completion   Next ->
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Page break

Definitions and information

The federal funds rate

The following two scenarios deal with federal funds rate. This is the **most important interest rate in the economy**. The value of the rate influences how 'costly' it is for banks to acquire money, thereby influencing interest rates on other important financial products, such as savings accounts, consumer loans, mortgages, or loans to firms.

The federal funds rate is the interest rate frequently discussed in the news. It is set by the Federal Open Market Committee (FOMC). **Currently, the federal funds rate is 0.1%.**

National house price change

The following two scenarios ask you to **predict** nationwide house price **change** over the next 12 months. **Over the past 12 months, the US national house price *increased* by 19.1%.**

<- Previous   Survey Completion   Next ->
0% ━━━━━━━ 100%

First, we would like you to think about the following hypothetical **Scenario 1**, where the federal funds rate stays constant.

_____

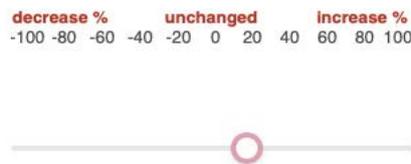## Scenario 1: Federal funds rate stays constant at 0.1%

Imagine that the **federal funds rate** stays **constant**. That is, in its next meeting, the Federal Open Market Committee announces that it will keep the interest rate **unchanged** at 0.1%.

The committee announces it does so with no changes in their assessment of the economic conditions.

_____

House price change - Scenario 1

Under this **Scenario 1** (constant federal funds rate), how do you think the nationwide **house price** will **change** over the next 12 months from now?

Note: the default position of the slider is the national house price change over the past year: 18.8%

decrease %	unchanged	increase %
-100 -80 -60 -40	-20 0 20 40	60 80 100

Second, we would like you to think about the following hypothetical **Scenario 2**, where the federal funds rate rises unexpectedly.

_____

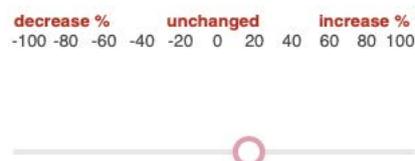## Scenario 2: Federal funds rate rises unexpectedly by 1%

Imagine that the **federal funds rate** is unexpectedly **1 percentage point higher**. That is, in its next meeting, the Federal Open Market Committee announces that it is raising the interest rate from 0.1% to 1.1%.

The committee announces it does so with no changes in their assessment of the economic conditions.

_____

House price change - Scenario 2

Under this **Scenario 2** (federal funds rate rises), how do you think the nationwide **house price** will **change** over the next 12 months from now?

Note: the default position of the slider is the national house price change over the past year: 18.8%

decrease %	unchanged	increase %
-100 -80 -60 -40	-20 0 20 40	60 80 100

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Your thoughts - Scenario 2

Above, you predicted the change of house price under **Scenario 2** (federal funds rate rises)**.**
Please tell us how you come up with your prediction.

**Why would house price change in this way when the interest rate (federal funds rate) increases?
What are your main considerations in making the prediction?**
Please respond in 2-3 sentences.

```


```

How did you come up with your house price change prediction for Scenario 2?

The following statements describe different thoughts you might have on your mind while making your predictions for **Scenario 2 (federal funds rate rises)**. **Did you have any of these thoughts in your mind?** Please tick all that you had on your mind.

☐ Due to the higher mortgage interest rate, the overall demand for houses declines.

☐ The higher savings account interest rate attracts more savings so that people cut back on their spending on houses.

☐ Due to the higher cost of borrowing, house developers reduce the house supply on the market.

☐ To make up for the higher cost of borrowing, house developers charge higher house prices.

☐ Higher interest rate leads to lower incomes and job losses. So people cut back on their spending on houses.

☐ Due to the higher inflation, house price will increase.

☐ Because there is less demand for houses, house developers reduce house prices.

☐ Banks make it harder to get loans, the overall demand for houses declines.

☐ The rate of discounting cash flows increases, so the value of house and house prices decline.

☐ *None of the above.*

Your *experience* with the economy

The economy is a complex system with many potential interacting economic mechanisms. You might have had a lot of **experiences** with some of the economic mechanisms, **either because you were directly part of them or because your friends, family or colleagues were part of them**.

Below, we list several economic mechanisms that could shape the economy. Please rate how much experience you or someone you know has with these economc mechanisms. You can choose between "no experiences", "a few experiences", "some experiences", "many experiences", and "a lot of experiences".

	No experiences	A few experiences	Some experiences	Many experiences	A lot of experiences
When mortgage interest rate increases, demand for houses declines.	○	○	○	○	○
When bank savings interest rate becomes higher, people cut back on their spending on houses.	○	○	○	○	○
Higher cost of borrowing forces house developers to reduce house supply on the market.	○	○	○	○	○
House developers charge higher house prices, to make up for the higher cost of borrowing.	○	○	○	○	○
Higher interest rate leads to lower incomes and job losses. So people cut back on their spending on houses.	○	○	○	○	○
Higher inflation increases house price.	○	○	○	○	○
Less demand for houses forces house developers to reduces house prices.	○	○	○	○	○
When banks make it harder to get loans, demand for houses declines.	○	○	○	○	○
The rate of discounting cash flows increases, so the value of house and house prices decline.	○	○	○	○	○

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F Wave 3 Speech Treatments and Survey Questionnaire

F.1 Speech script, audio and video clips

Speech script. The speech script treatment group are asked to read the following part of the speech made by Chair Powell in the press conference in December 2022:

"Today, the FOMC raised our policy interest rate by 1/2 percentage point. We continue to anticipate that ongoing increases will be appropriate in order to attain a stance of monetary policy that is sufficiently restrictive to return inflation to 2 percent over time. In addition, we are continuing the process of significantly reducing the size of our balance sheet. Restoring price stability will likely require maintaining a restrictive policy stance for some time. I will have more to say about today's monetary policy actions after briefly reviewing economic developments.

The U.S. economy has slowed significantly from last year's rapid pace. Although real GDP rose at a pace of 2.9 percent last quarter, it is roughly unchanged through the first three quarters of this year. Recent indicators point to modest growth of spending and production this quarter. Growth in consumer spending has slowed from last year's rapid pace, in part reflecting lower real disposable income and tighter financial conditions. Activity in the housing sector has weakened significantly, largely reflecting higher mortgage rates. Higher interest rates and slower output growth also appear to be weighing on business fixed investment. As shown in our Summary of Economic Projections, the median projection for real GDP growth stands at just 0.5 percent this year and next, well below the median estimate of the longer-run normal growth rate.

Despite the slowdown in growth, the labor market remains extremely tight, with the unemployment rate near a 50-year low, job vacancies still very high, and wage growth elevated. Job gains have been robust, with employment rising by an average of 272,000 jobs per month over the last three months. Although job vacancies have moved below their highs and the pace of job gains has slowed from earlier in the year, the labor market continues to be out of balance, with demand substantially exceeding the supply of available workers. The labor force participation rate is little changed since the beginning of the year. FOMC participants expect supply and demand conditions in the labor market to come into better balance over time, easing upward pressures on wages and prices. The median projection in the SEP for the unemployment rate rises to 4.6 percent at the end of next year.

Inflation remains well above our longer-run goal of 2 percent. Over the 12 months ending in October, total PCE prices rose 6 percent; excluding the volatile food and energy categories, core PCE prices rose 5 percent. In November, the 12-month change in the CPI was 7.1 percent, and the change in the core CPI was 6 percent. The inflation data received so far for October and November show a welcome reduction in the monthly pace of price increases. But it will take substantially more evidence to give confidence that inflation is on

a sustained downward path. Price pressures remain evident across a broad range of goods and services. Russia's war against Ukraine has boosted prices for energy and food and has contributed to upward pressure on inflation. The median projection in the SEP for total PCE inflation is 5.6 percent this year and falls to 3.1 percent next year, 2.5 percent in 2024, and 2.1 percent in 2025; participants continue to see risks to inflation as weighted to the upside."

Speech audio clip. The speech audio treatment group are asked to listen to the speech audio recording of the speech. The Youtube audio link is:

`https://youtu.be/HRvJdw6lzI8`.

Speech video clip. The speech audio treatment group are asked to watch to the speech video recording of the speech. The Youtube video link is:

`https://youtu.be/9vFDsCDdUzw`.

F.2   Survey Questionnaire

Pre-treatment questions

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

◯ Yes

◯ No

[Next]

Information

Before the main survey starts, we would like you to know the following information and statistics about the recent US economic conditions:

GDP growth

- The US economy (including consumer spending and housing activities) has **slowed down** from last year;

- Real GDP rose at a pace of **2.9 percent** last quarter and it is **roughly unchanged** through the first three quarters of this year;

- The median projection made by the Federal Reserve for real GDP growth stands at **0.5 percent** this year and next;

Unemployment

- The unemployment rate is at the level that is near 50-year **low**, and wage growth is **accelerated;**

- More demand than supply in the labor market;

- The median projection made by the Federal Reserve for the unemployment rate rises to **4.6 percent** at the end of next year;

Next, we would like to ask you about your perspective on current and future economic conditions. **These questions have no right or wrong answers**, and we are interested in your views and opinions.

Please be careful in what you choose and write, **as you will need to answer questions later based on them**.

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Inflation prediction

Inflation is the percentage rise in overall prices in the economy. Deflation (the opposite of inflation) corresponds to when overall prices are falling.

The recent rate of inflation remains well above the long-run target of 2%. Inflation indicators suggest the **12-month change in the price level** was ranged from **6% to 7.1% in November** and **5% to 6% in October.**

Q1. What do you think the **rate of inflation or deflation** over the *next* 12 months will be?
Note: **Positive values correspond to inflation; negative values to deflation**.
Rate of inflation or deflation over 12 months:

-25%	0%	25%

Federal funds rate perception and prediction

Federal funds rate is the policy interest rate set by the **Federal Reserve** (the US central bank).

Q2. What do you think the federal funds rate was in **November 2022**? (unit of measurement is percent, %)
Note: Please enter a value **between 0 and 10**. For example, if you think it will be 5.2%, just put 5.2 in the below box (same as questions below).

Federal funds rate in **November** (in %):

Q3. The Federal Reserve decided to change the federal funds rate in December 2022. What is your best guess about the *change* **in federal funds rate**? (unit of measurement is percent, %)
Note: Please enter a value **between -5 and 5**.

Change in federal funds rate in **December** (in %):

Q4. What do you think the **federal funds rate** in the *next* 12 months will be? (unit of measurement is percent, %)
Note: Please enter a value **between 0 and 10**.

Federal funds rate in **next 12 months** (in %):

Mortgage interest rate prediction

Q5. What do you think **(fixed-rate 30-year) mortgage interest rate** in the *next* 12 months will be? (unit of measurement is percent, %)
Please enter a value **between 0 and 10**.

Mortgage rate **in next 12 months** (in %):

House price change prediction

Q6. What do you think the **rate of national house price change** over the *next* 12 months will be? (Unit of measurement is percent, %)

-25%	25%

Q7. How **certain** are you about your house price growth prediction above?

	Very uncertain	somewhat uncertain	somewhat certain	very certain
How certain about house price growth prediction?	○	○	○	○

Q8. If the Federal Reserve **increases** federal funds rate, how would you anticipate **national house prices**?

○ House prices will **decrease**

○ House prices will **increase**

○ House prices will **remain unchanged**

○ Don't know

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In the next page, we will provide you with some materials related to the **Federal Reserve**.

After reviewing the information, you will be asked **three questions** about the **content of the material,** which you will be able to answer if you review the material carefully. **We will pay additional $1.00 if you can answer the three questions correctly. Please carefully evaluate the materials.**

Then, we will ask you to **reconsider the predictions you made** just now.

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Treatment - FOMC speech video clip treatment

This page provides the **video clip of the speech made by Chair Jerome Powell of the Federal Reserve** in the **latest** press conference **in December 2022** to announce their monetary policy decision.

Please watch the recording below carefully. You can watch **more than once**.

[once you click *next*, you cannot come back]

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Incentivizing questions

Regarding the content of the material...

Please answer the following three questions regarding the material you read in the previous page.

If you can correctly answer them, we will pay additional $1.00.

A. What was the **policy interest rate decision** made by the Federal Reserve (Fed) in December 2022?

○ Fed *raised* interest rate by *one* percentage point.

○ Fed *reduced* interest rate by *half* percentage point.

○ Fed *maintained* the interest rate.

○ Fed *reduced* interest rate by *one* percentage point.

○ Fed *raised* interest rate by *half* percentage point.

○ None of above is correct

B. According to the speech, **the U.S. economy** _____ comparing to last year, and **unemployment** remains 50-year _____.

○ accelerated; low

○ remains unchanged; high

○ slowed down; low

○ accelerated; high

○ remains unchanged; low

○ slowed down; high

C. Regarding the **price level**, which of the following is **true**?

○ The price level remain *unchanged* and the monthly pace of price growth is *accelerated*.

○ The price level keeps *decreasing* and the monthly pace of price growth is *reduced*.

○ The price level keeps *increasing* and the monthly pace of price growth is *accelerated*.

○ The price level keeps *increasing* but the monthly pace of price growth is *reduced*.

○ The price level remain *unchanged* and the monthly pace of price growth is *reduced*.

○ The price level keeps *decreasing* and the monthly pace of price growth is *accelerated*.

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Post-treatment questions - posterior expectations

Based on the press conference **video recording of Chair Jerome Powell's speech**, we would like you to **reconsider your economic predictions.**

Inflation prediction - reconsider

Q9. Now, what do you think the **rate of inflation or deflation** over the *next* 12 months will be?
Note: Your previous inflation/deflation prediction was **8 percent.**
Rate of inflation or deflation over 12 months:

-25%	0%	25%	

Federal funds rate prediction - reconsider

Q10. Now, what do you think the **federal funds rate** in the *next* 12 months will be? (unit of measurement is percent, %) Please enter a value **between 0 and 10**.
Note: Your previous prediction was **1.0 percent**.

Federal funds rate in 12 months (in %):

Mortgage interest rate prediction - reconsider

Q11. Now, what do you think **(fixed-rate 30-year) mortgage interest rate** in the *next* 12 months will be? (unit of measurement is percent, %) Please enter a value **between 0 and 10**.
Note: Your previous prediction was **1.0 percent**.

Mortgage interest rate in 12 months (in %):

House price change prediction - reconsider

Q12. Now, what do you think the **rate of national house price change** over the *next* 12 months will be? (Unit of measurement is percent, %)
Note: Your previous prediction was **6 percent**.

-25%		25%	

Q13. Now, how **certain** are you about your house price change prediction above?
Note: Previously, you answered **Very uncertain**.

	Very uncertain	somewhat uncertain	somewhat certain	very certain
How certain about house price change prediction?	○	○	○	○

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Post-treatment questions - signal evaluations

Regarding your **evaluation** of the press conference **video clip of Chair Jerome Powell's speech...**

Facial expression and body language

Q14. In your opinion, **what signal does his *facial expression or body language* send regarding the future US economy?**

	Very negative signal	Negative signal	Neutral signal	Positive signal	Very positive signal
Facial expression and body language send...	○	○	○	○	○

Voice tone

Q15. In your opinion, **what signal does his *voice tone* send regarding the future US economy?**

	Very negative signal	Negative signal	Neutral signal	Positive signal	Very positive signal
Voice tone sends...	○	○	○	○	○

Script and wording

Q16. In your opinion, **what signal does the *script* or *wording* of the speech** send regarding the **future US economy?**

	Very negative signal	Negative signal	Neutral signal	Positive signal	Very positive signal
Script and wording send...	○	○	○	○	○

If house price increases, would you (or your family) be better off, worse off or no change?

○ No change

○ Better off

○ Worse off