Online Appendix for "Expectations with Endogenous Information Acquisition: An Experimental Investigation"

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A Additional Details

A.1 Survey Details and Respondent Characteristics

The Survey of Consumer Expectations (SCE) is conducted by the Demand Institute, a non-profit organization jointly operated by The Conference Board and Nielsen. The sampling frame for the SCE is based on that used for the Conference Board's Consumer Confidence Survey (CCS). Respondents to the CCS, itself based on a representative national sample drawn from mailing addresses, are invited to join the SCE panel. The response rate for first-time invitees hovers around 55%. Respondents receive $15 for completing each survey. See Armantier et al. (2016) for additional information.

Column (1) of Table A.1 shows characteristics of the sample for the baseline survey. Most dimensions in the sample align well with average U.S. demographic characteristics. For instance, the average age of our respondents is 50.8 years, and 47.4% are females, which is similar to the corresponding 45.5 years and 48.0% among U.S. household heads in the 2016 American Community Survey (ACS). Also, 74.8% of respondents in our sample are homeowners, somewhat higher than the national homeownership rate of 63.6% in the first quarter of 2017, according to the ACS. Our sample, however, has significantly higher education and income: 55.2% of our respondents have at least a bachelor's degree, compared to only 37% of U.S. household heads. Likewise, the median household income of respondents in the sample is $67,500, which is substantially higher than the U.S. 2016 median of $57,600. This may be partly due to differential internet access and computer literacy across income and education groups in the U.S. population.

Underscoring the fact that home prices are something that individuals actively think about, more than half of the sample – 56.3% – reports looking up home price information over the past

12 months. The average reported probability of moving and buying a different home over the next 3 years in the sample is 20 percent.

Columns (2) and (3) of the table show average characteristics for the subsamples assigned to the low- and high-reward treatments, respectively; in turn, columns (5) and (6) show the characteristics for the subsamples assigned to low and high realized prices of information. Columns (4) and (7) present p-values for the test of the null hypothesis that the mean characteristics are balanced across groups. The differences in pre-treatment characteristics are always small, and statistically insignificant in 31 out of the 34 tests. This is not surprising, because random assignment should preserve balance between the two groups.[1] Additionally, the last row of Table A.1 reports the response rate to the follow-up survey. There is no evidence for selective attrition: the response rate does not differ by reward or price treatments. Table A.2 provides additional information on how the follow-up sample compares with the initial sample. There is no evidence of selection in terms of who is invited to the follow-up, or that, conditional on being invited to the follow-up, the individuals who responded to this survey are significantly different from the ones who did not.

[1]We further note that for two of the three tests where the means are different at $p<0.1$, the distributions are not statistically significantly different according to a nonparametric Mann-Whitney-Wilcoxon test: for prior uncertainty and the high vs. low reward treatments, the test yields $p=0.25$; for median home values and the high vs. low price, the test yields $p=0.12$.

Table A.1: Descriptive Statistics and Randomization Balance by Reward Size

	All (1)	Low Reward (2)	High Reward (3)	F-Test P-value (4)	Low Price (5)	High Price (6)	F-Test P-value (7)
Prior Belief (1,000s)	198.1	198.2	197.9	0.374	198.1	198.2	0.662
	(5.969)	(6.095)	(5.843)		(6.022)	(5.986)	
Prior Belief (% change)	0.022	0.023	0.021	0.374	0.022	0.023	0.662
	(0.031)	(0.031)	(0.030)		(0.031)	(0.031)	
Income > 60,000 (0/1)	0.553	0.574	0.532	0.164	0.583	0.544	0.201
	(0.497)	(0.495)	(0.499)		(0.494)	(0.499)	
College Graduate (0/1)	0.552	0.550	0.554	0.877	0.577	0.543	0.275
	(0.498)	(0.498)	(0.497)		(0.495)	(0.499)	
Age	50.83	51.18	50.48	0.450	50.71	50.76	0.965
	(15.458)	(15.637)	(15.286)		(15.743)	(15.262)	
Female (0/1)	0.474	0.467	0.481	0.641	0.454	0.493	0.197
	(0.500)	(0.499)	(0.500)		(0.498)	(0.500)	
Married (0/1)	0.634	0.656	0.611	0.115	0.636	0.644	0.790
	(0.482)	(0.475)	(0.488)		(0.482)	(0.479)	
White (0/1)	0.813	0.788	0.837	0.039	0.806	0.826	0.383
	(0.390)	(0.409)	(0.370)		(0.396)	(0.379)	
Homeowner (0/1)	0.748	0.752	0.744	0.771	0.757	0.746	0.689
	(0.434)	(0.432)	(0.437)		(0.429)	(0.436)	
Numeracy (0-5)	4.013	4.005	4.020	0.824	4.069	4.000	0.278
	(1.062)	(1.096)	(1.029)		(1.034)	(1.053)	
Uncertainty in Prior Belief (Normalized)	0.041	0.044	0.038	0.065	0.042	0.041	0.881
	(0.049)	(0.051)	(0.045)		(0.048)	(0.049)	
Median House Value in State (1,000s)	225.235	226.613	223.872	0.674	233.383	218.550	0.026
	(108.080)	(107.852)	(108.384)		(114.023)	(102.627)	
House Value Volatility in State (Normalized)	0.037	0.037	0.036	0.316	0.037	0.037	0.699
	(0.015)	(0.015)	(0.015)		(0.015)	(0.015)	
Looked for Info in Past (0/1)	0.563	0.561	0.565	0.901	0.570	0.569	0.967
	(0.496)	(0.497)	(0.496)		(0.495)	(0.496)	
Conf. in Past Recall (1-5)	2.873	2.875	2.871	0.937	2.866	2.883	0.744
	(0.847)	(0.855)	(0.840)		(0.846)	(0.838)	
Probability Move and Buy in 3yr	0.200	0.196	0.205	0.572	0.204	0.204	0.967
	(0.280)	(0.275)	(0.285)		(0.278)	(0.287)	
Resp. Follow-Up Survey (0/1)	0.552	0.550	0.554	0.898	0.545	0.569	0.438
	(0.497)	(0.498)	(0.497)		(0.498)	(0.496)	
Observations	1,119	556	563		563	508	

Notes: Individual characteristics obtained from main survey. Column (1) corresponds to all respondents; columns (2) and (3) correspond to treatment groups for reward size treatment; columns (5) and (6) correspond to the price treatments (Low Price correspond to scenarios 1-4, while High Price corresponds to scenarios 5-11). Column (4) and (7) present p-values for the test of the null hypothesis that the mean characteristic is equal within the corresponding pair of treatment groups. All variables constructed from the survey data. Uncertainty is the standard deviation derived from the individual-level subjective density (this variable is winsorized above the 98.5th percentile), normalized by the home price level at the end of 2016. House price volatility in state is the standard deviation of median home prices in the state of residence over the last 2 years, ending in December 2016, normalized by the average home price over the past 2 years.

Table A.2: Descriptive Statistics by Follow-Up Invitation and Response

		Invited to Follow-Up			Responded Follow-Up invitation		
	All	No	Yes	F-test P-value	No	Yes	F-test P-value
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Prior Belief (1,000s)	198.1	197.9	198.2	0.534	198.7	198.1	0.331
	(5.969)	(5.714)	(6.098)		(7.367)	(5.821)	
Prior Belief (% change)	0.022	0.021	0.023	0.534	0.026	0.022	0.331
	(0.031)	(0.029)	(0.031)		(0.038)	(0.030)	
Income > 60,000 (0/1)	0.553	0.528	0.565	0.237	0.610	0.557	0.277
	(0.497)	(0.500)	(0.496)		(0.490)	(0.497)	
College Graduate (0/1)	0.552	0.543	0.556	0.679	0.580	0.552	0.571
	(0.498)	(0.499)	(0.497)		(0.496)	(0.498)	
Age	50.83	51.10	50.69	0.681	49.22	50.98	0.214
	(15.458)	(16.058)	(15.149)		(14.008)	(15.355)	
Female (0/1)	0.474	0.499	0.462	0.246	0.517	0.451	0.191
	(0.500)	(0.501)	(0.499)		(0.502)	(0.498)	
Married (0/1)	0.634	0.635	0.633	0.938	0.608	0.638	0.548
	(0.482)	(0.482)	(0.482)		(0.490)	(0.481)	
White (0/1)	0.813	0.816	0.811	0.826	0.831	0.807	0.539
	(0.390)	(0.388)	(0.392)		(0.377)	(0.395)	
Homeowner (0/1)	0.748	0.753	0.745	0.769	0.750	0.744	0.896
	(0.434)	(0.432)	(0.436)		(0.435)	(0.437)	
Numeracy (0-5)	4.013	3.995	4.022	0.688	4.075	4.011	0.535
	(1.062)	(1.061)	(1.064)		(1.022)	(1.072)	
Uncertainty in Prior Belief (Normalized)	0.041	0.041	0.041	0.961	0.047	0.040	0.132
	(0.049)	(0.051)	(0.047)		(0.047)	(0.048)	
Median House Value in State (1,000s)	225.235	224.432	225.645	0.861	239.850	222.878	0.137
	(108.080)	(108.782)	(107.792)		(115.701)	(106.063)	
House Value Volatility in State (Normalized)	0.037	0.037	0.037	0.938	0.039	0.036	0.076
	(0.015)	(0.016)	(0.015)		(0.014)	(0.015)	
Looked for Info in Past (0/1)	0.563	0.570	0.560	0.751	0.550	0.561	0.817
	(0.496)	(0.496)	(0.497)		(0.500)	(0.497)	
Conf. in Past Recall (1-5)	2.873	2.913	2.853	0.262	2.908	2.842	0.434
	(0.847)	(0.854)	(0.844)		(0.834)	(0.846)	
Probability Move and Buy in 3yr	0.200	0.191	0.205	0.424	0.230	0.200	0.310
	(0.280)	(0.277)	(0.282)		(0.295)	(0.279)	
High Reward (0/1)	0.503	0.486	0.512	0.399	0.550	0.505	0.364
	(0.500)	(0.500)	(0.500)		(0.500)	(0.500)	
Observations	1,119	381	738		120	618	

Notes: Individual characteristics obtained from main survey. Column (1) corresponds to all respondents, column (2) corresponds to individuals who were not invited to the follow-up survey, and column (3) corresponds to individuals who where invited to the follow-up survey. Column (4) presents p-value for the test of the null hypothesis that the mean characteristic is equal across (2) and (3). Column (5) corresponds to individuals who were invited to the follow-up survey but did not respond. Column (6) corresponds to individuals who were invited to the follow-up survey and responded. Finally, column (7) presents p-value for the test of the null hypothesis that the mean characteristic is equal across (5) and (6). All variables constructed from the survey data.

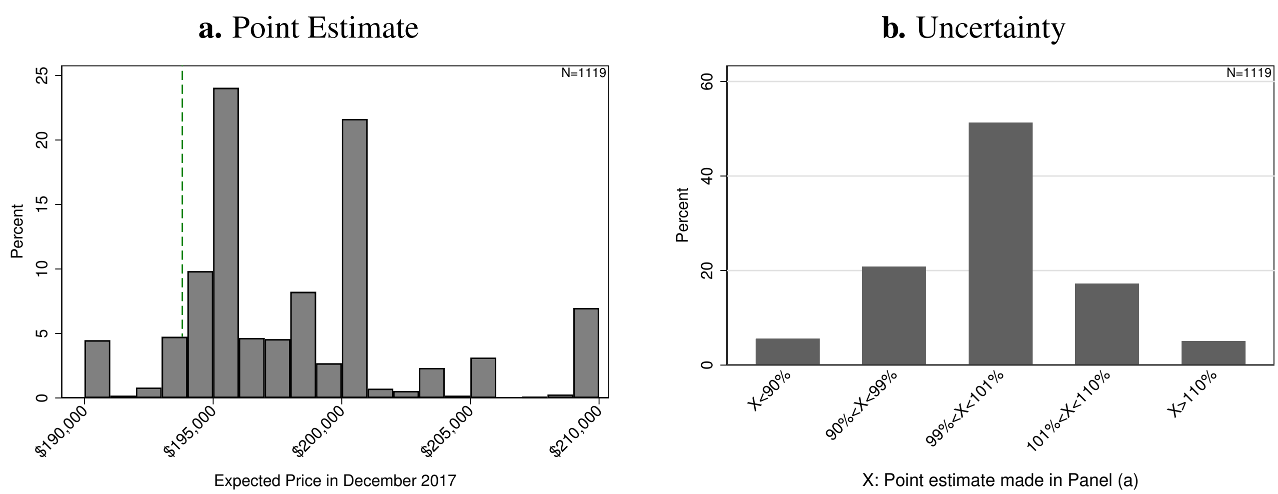
A.2 Prior Beliefs and Uncertainty

Figure A.1.a shows a histogram of the point estimates provided by respondents in the initial stage of the survey module, that is, prior to the information acquisition stages. In terms of the implied annual growth rates, the mean (median) value is 2.2% (1.7%), with substantial dispersion across respondents: the cross-sectional standard deviation of prior beliefs is 3.1%. To assess if individuals felt confident about their expectations, Figure A.1.b shows the probability distribution of beliefs around the individual's own point estimate, averaged over all individuals. On average, individuals thought there was a 51 percent chance that the true price would fall within 1% of their guesses. However, there was high dispersion in the degree of certainty. For example, 13% of the sample thought that there was a 90 percent chance or higher of year-end home prices being within 1% of their guess, and 16% of the sample thought that there was a 20 percent chance or lower. Ex-post, only 3.5% of respondents had a prior forecast within 1% of the realized ZHVI price as of December 2017, which was $206,300 (according to Zillow in January 2018), corresponding to realized growth over 2017 of 6.5%. For the posterior forecast, this fraction increased to 11.5%.

We use the responses to the probability bins to measure prior uncertainty at the individual level. We fit the binned responses to a normal distribution for each individual and use the estimated standard deviation of the fitted distribution as a measure of individual-level uncertainty, with higher values corresponding to higher uncertainty. For instance, consider an individual with a 2% house price growth point forecast who has an uncertainty (i.e., fitted standard deviation) of 1 percentage point. It means that the individual's 95% confidence interval for house price growth is [0.04%, 3.96%] ($= [2 - (1 * 1.96), 2 + (1 * 1.96)]$). In cases where the respondent puts all mass in one bin or equal mass in two adjacent bins, a uniform distribution is fitted. We are unable to fit a density for 4 individuals because of missing data. We winsorize prior uncertainty at the 98.5th percentile. As shown in Table A.1, the average uncertainty across respondents is 0.041, i.e. 4.1%; the median (not shown in table) is 1.6%.

We have checked the robustness of our findings to using alternate measures of uncertainty. For example, we obtain similar patters as in Figure 3.e if, instead of using the fitted standard deviation, we split individuals by the probability they assign to the middle bin (that includes their point forecast), classifying those assigning a probability of more than 50% as those who have low uncertainty. In addition, the results in the figure are robust to dropping individuals who put all the probability in a single bin (and for whom a uniform distribution is fitted). Also, note that a concern with elicitation of beliefs through bins is that some respondents may simply use a 1/N heuristic (put equal probability in each bin); this did not occur for any respondent in our survey, presumably because the bins were centered around each respondent's point forecast.

Figure A.1: Prior Beliefs: Expectations about Median House Price



Notes: Panel (a) shows the distribution of the expected value of the typical home in the U.S. at the end of 2017 (as of February 2017, when the survey took place). The vertical dotted line corresponds to the median house value in U.S. in December 2016 according to the Zillow Home Value Index (this value was shown to respondents). The histogram is censored at $190,000 and $210,000. Panel (b) corresponds to the distribution of the confidence about the forecast made in Panel (a) by individuals.

A.3 Numeracy Questions

In the first survey that SCE panelists take, they are asked a battery of 5 questions that measure the respondent's numeracy. taken from Lipkus, Samsa, and Rimer (2001) and Lusardi (2008):

1. In a sale, a shop is selling all items at half price. Before the sale, a sofa costs \$300. How much will it cost in the sale?

2. Let's say you have \$200 in a savings account. The account earns ten per cent interest per year. Interest accrues at each anniversary of the account. If you never withdraw money or interest payments, how much will you have in the account at the end of two years?

3. In the BIG BUCKS LOTTERY, the chances of winning a \$10.00 prize are 1%. What is your best guess about how many people would win a \$10.00 prize if 1,000 people each buy a single ticket from BIG BUCKS?

4. If the chance of getting a disease is 10 percent, how many people out of 1,000 would be expected to get the disease?

5. The chance of getting a viral infection is 0.0005. Out of 10,000 people, about how many of them are expected to get infected?

On average, respondents answered 4 questions correctly; the rank correlation between education and numeracy in the sample is +0.31.

A.4 Factors Associated with Information Choice, Willigness to Pay, and Response Times – Multivariate Results

Table A.3: Factors Associated with Information Choice – Multivariate Results

	Indicator: chose...				
	Forecast (1)	1yr (2)	10yr (3)	None (4)	Forecast or 1yr (5)
High Reward (0/1)	0.011	0.008	-0.015	-0.005	0.020
	(0.030)	(0.027)	(0.025)	(0.012)	(0.027)
Income > 60,000 (0/1)	0.034	0.002	-0.009	-0.027**	0.036
	(0.036)	(0.033)	(0.030)	(0.014)	(0.032)
College Graduate (0/1)	0.066**	-0.023	-0.027	-0.016	0.043
	(0.032)	(0.029)	(0.028)	(0.012)	(0.029)
Age	0.000	0.002**	-0.002***	0.000	0.002**
	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)
Female (0/1)	0.037	-0.014	-0.017	-0.006	0.023
	(0.032)	(0.028)	(0.027)	(0.013)	(0.029)
Married (0/1)	-0.035	0.001	0.039	-0.005	-0.034
	(0.036)	(0.032)	(0.029)	(0.015)	(0.031)
White (0/1)	0.060	-0.031	-0.019	-0.009	0.028
	(0.040)	(0.037)	(0.035)	(0.019)	(0.037)
Numeracy (0-5)	0.058***	-0.043***	0.000	-0.015*	0.015
	(0.015)	(0.014)	(0.013)	(0.008)	(0.015)
Uncertainty in Prior Belief (Std)	0.014	0.002	-0.001	-0.015**	0.016
	(0.016)	(0.015)	(0.012)	(0.007)	(0.013)
Median House Value in State (Std)	0.027*	-0.009	-0.010	-0.008	0.018
	(0.016)	(0.014)	(0.013)	(0.005)	(0.013)
House Value Volatility in State (Std)	-0.007	-0.007	0.010	0.003	-0.013
	(0.016)	(0.014)	(0.014)	(0.006)	(0.014)
Looked for Info in Past (0/1)	-0.014	0.035	-0.010	-0.010	0.021
	(0.031)	(0.028)	(0.027)	(0.013)	(0.028)
Homeowner (0/1)	-0.049	0.070**	0.004	-0.025	0.021
	(0.040)	(0.033)	(0.033)	(0.018)	(0.036)
Conf. in Past Recall (1-5)	-0.019	0.011	0.006	0.001	-0.007
	(0.018)	(0.017)	(0.015)	(0.009)	(0.016)
Prob Move and Buy in 3 Years	0.129**	-0.038	-0.051	-0.040**	0.091*
	(0.057)	(0.050)	(0.048)	(0.020)	(0.050)
Mean	0.45	0.28	0.22	0.04	0.74
Observations	1119	1119	1119	1119	1119
R2	0.05	0.04	0.02	0.05	0.03

Notes: Heteroskedasticity-robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Each column corresponds to a separate multivariate OLS regression. Unlike in Table 1, here we do not include the dummy variable "Look at Info During Survey", given its potential endogeneity with respect to the information source a respondent chose.

Table A.4: Factors Associated with Willingness to Pay and Response Times - Multivariate Results

	Willingness To Pay	Willingness To Pay	Log Min Posterior Belief	Log Min Posterior Belief	Log Min Posterior Belief | See Info	Log Min Posterior Belief | See Info
	(1)	(2)	(3)	(4)	(5)	(6)
High Reward (0/1)	0.843***	0.834***	0.096**	0.060	0.120**	0.106**
	(0.246)	(0.228)	(0.042)	(0.040)	(0.048)	(0.047)
Income > 60,000 (0/1)	0.719**	0.503*	-0.092*	-0.145***	-0.142**	-0.145***
	(0.298)	(0.273)	(0.049)	(0.048)	(0.057)	(0.056)
College Graduate (0/1)	0.184	0.104	0.009	-0.023	-0.005	-0.016
	(0.273)	(0.254)	(0.046)	(0.043)	(0.052)	(0.051)
Age	0.037***	0.039***	0.008***	0.007***	0.008***	0.008***
	(0.009)	(0.008)	(0.002)	(0.002)	(0.002)	(0.002)
Female (0/1)	0.135	0.058	0.056	0.031	0.076	0.057
	(0.269)	(0.251)	(0.045)	(0.043)	(0.052)	(0.052)
Married (0/1)	-0.012	-0.074	-0.008	-0.019	-0.045	-0.050
	(0.298)	(0.276)	(0.050)	(0.048)	(0.058)	(0.057)
White (0/1)	-0.103	-0.263	-0.134**	-0.139**	-0.105	-0.103
	(0.361)	(0.334)	(0.060)	(0.056)	(0.066)	(0.065)
Numeracy (0-5)	0.066	-0.085	0.035	0.018	0.024	0.019
	(0.137)	(0.129)	(0.023)	(0.022)	(0.027)	(0.026)
Uncertainty in Prior Belief (Std)	-0.128	-0.249*	-0.078***	-0.079***	-0.080***	-0.076***
	(0.136)	(0.130)	(0.021)	(0.019)	(0.024)	(0.024)
Median House Value in State (Std)	0.166	0.096	-0.014	-0.023	-0.023	-0.024
	(0.134)	(0.126)	(0.021)	(0.020)	(0.024)	(0.024)
House Value Volatility in State (Std)	0.203	0.214*	0.010	-0.003	-0.010	-0.017
	(0.127)	(0.117)	(0.022)	(0.021)	(0.025)	(0.025)
Looked for Info in Past (0/1)	0.481*	0.464*	0.051	-0.005	0.015	-0.010
	(0.267)	(0.250)	(0.045)	(0.043)	(0.052)	(0.052)
Homeowner (0/1)	0.284	0.111	0.056	0.057	0.027	0.034
	(0.331)	(0.308)	(0.058)	(0.054)	(0.067)	(0.066)
Conf. in Past Recall (1-5)	0.087	0.094	-0.044	-0.035	-0.056*	-0.054*
	(0.160)	(0.150)	(0.028)	(0.025)	(0.034)	(0.033)
Prob Move and Buy in 3 Years	0.606	0.317	0.115	0.085	0.098	0.095
	(0.476)	(0.439)	(0.080)	(0.074)	(0.093)	(0.090)
Look at Info During Survey (0/1)		-0.118		0.350***		0.297***
		(0.327)		(0.064)		(0.078)
Choose 1yr. (0/1)		-0.412		-0.053		0.013
		(0.275)		(0.048)		(0.057)
Choose 10yr. (0/1)		0.530*		0.078		0.149**
		(0.285)		(0.052)		(0.059)
Choose None (0/1)		-21.954***		-0.449***		
		(0.703)		(0.106)		
WTP				0.081***		0.033*
				(0.011)		(0.018)
Mean	4.16	4.16	0.65	0.65	0.77	0.77
Observations	1061	1061	1119	1119	806	806
R2	.	.	0.06	0.17	0.08	0.11

Notes: Heteroskedasticity-robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Interval regression is estimated in columns (1) and (2), using willingness to pay as the dependent variable. In columns (3) through (6), OLS regressions are estimated using the log of the time spent on reporting the posterior belief.

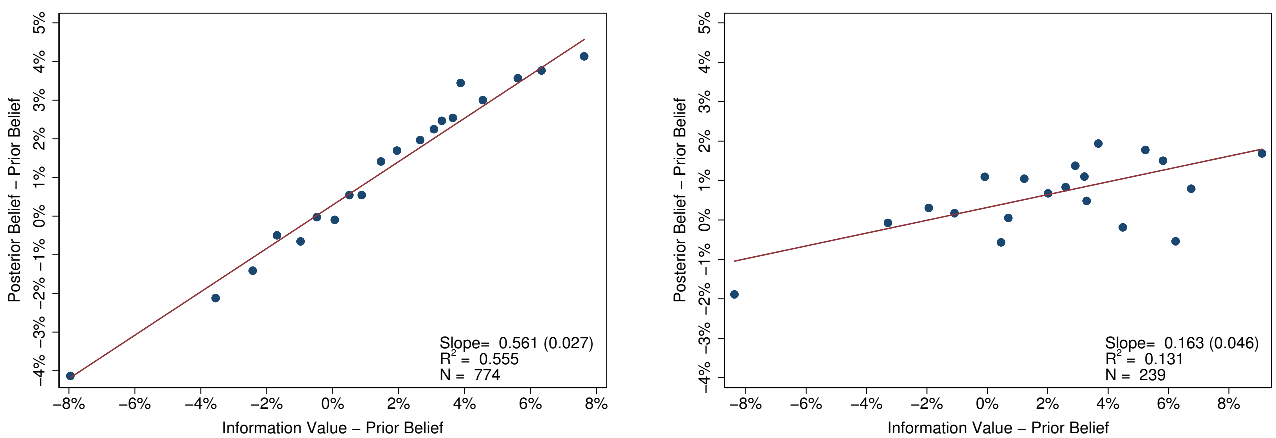
A.5 Decomposition of Learning Rates

In this section, we provide more details about the identification of the learning rates in Section 3.3.2. Figure A.2.a shows how the beliefs evolved after the information was provided. The y-axis indicates the revision in national home price beliefs, i.e., posterior belief *minus* prior belief. The x-axis shows the "gap" between the signal and the prior belief. For instance, if the respondent had a prior belief of 1% and was shown the forecast of experts (which was 3.6%), the x-axis would take the value of 2.6%. Intuitively, the x-axis shows how much potential for revision there is, and the y-axis shows the actual revision. If individuals fully reacted to the signal shown, we would expect all dots to lie on the 45-degree line. If individuals did not react to the information, we would expect the dots to lie in a horizontal line. The slope of the line is 0.561 and highly statistically significant (p-value<0.001). It is thus closer to the case where individuals fully react to the information (slope of 1) than the case where individuals fully ignore the information (slope of 0).

Figure A.2.b is identical to Figure A.2.a, except that instead of corresponding to individuals who were shown the signal, it corresponds to individuals who were not shown the signal. Consistent with the discussion in the main text that typos and/or more careful consideration can lead to updating that looks like learning from a signal, there is reversion to the signal when the signal was not shown. However, the magnitude of this reversion to the signal is substantially lower than the corresponding magnitude of the reversion when information is actually shown (0.163 versus 0.561). The estimated learning rate $\hat{\alpha}$ shown in Figure 3.a of the main text roughly corresponds to the difference between the slopes in Figure A.2.a and A.2.b (i.e., the incremental convergence towards the signal due to the signal provision).

Figure A.2: Changes from Prior to Posterior Beliefs

a. Revisions if Signal Shown **b.** Revisions if Signal not Shown



Notes: This sample does not include respondents who chose "None" as their favorite information source and respondents with non-monotonic choices across the BDM scenarios. The figures measure how individuals revise their beliefs of the expected value of a typical home one-year forward, conditional on whether information is shown. Panel a. presents the results for the subsample that received information and panel b. presents the results for the subsample that did not receive information. The dots correspond to the binned-scatterplot based on 20 bins. Slopes, robust standard errors (in parentheses) and R^2 are based on a linear regression of the belief update (i.e., posterior belief minus the prior belief) on the signal gap (i.e., signal value minus the prior belief), controlling for willingness to pay dummies.

B Supplementary Study

To shed further light on the findings from our main study, we fielded a supplementary module one year later in the February 2018 SCE Housing Survey. The sample that takes this module has no overlap with the sample from the main study, since respondents are phased out of the SCE panel after 12 months. The main purpose of the module was to investigate whether our result that the cross-sectional dispersion fails to go down in the group that is exogenously exposed to information (relative to the group that does not see information) is an artifact of the fact that respondents could not choose to buy multiple information sources.

In the supplementary survey, respondents were randomized into seeing no, one, or two pieces of information. Snapshots of this survey can be found in Appendix F. We next briefly summarize the study design:

1. **Stage 1 - Prior Belief** : This stage is identical to that in the main survey. Respondents report their year-end 2018 home price expectation as well as their subjective uncertainty.

2. **Stage 2 - Information Preferences:** This stage is also quite similar to that in the main survey. As in the main survey, respondents were randomized into a "high reward" or "low reward" group, and told that their home price expectation would be re-elicited. They were next informed that they may have the opportunity to see some information before the re-elicitation. They were then asked: *"If you had the choice of seeing one of the following two pieces of information, which one would you prefer to see?*

   (a) *The change in the value of a typical home in the US over the last one year (2017).*

   (b) *The change in the value of a typical home in the US over the last ten years (2008-2017).*

   (c) *Neither of the above -- I would not like to see any information"*

   In addition, conditional on choosing option a (option b), they were also asked if they would like to *additionally* see the information of option b (option a).

3. **Stage 3 - Posterior Belief:** Depending on the stated preference for the information source in stage 2, respondents possibly saw additional information in this stage. Of those who said they preferred to see option a (that is, past one year home price change), a third were given no information, a third were given information about home price change in the past year, and the remaining third were given information on both the past one and ten year change in home prices.[2] For example, those who got to see both pieces of information were shown:

[2]Those who chose option b were similarly randomly allocated to a no-info group, a group that saw only the past 10 year home price change, or a group that saw both changes. Those who chose option c did not see any information.

"We will next inform you about the change in the value of a typical home in the US over the last one year, and over the last ten years.

*According to the Zillow Home Value Index, the value of a typical home in the US increased by 6.5% over the last one year (December 2016 - December 2017) and by 0.7% per year on average over the last ten years (December 2007 - December 2017). That means a typical home in the US that currently has a value of **206,300** dollars would have had a value of **193,700** dollars in December 2016 and **191,700** dollars in December 2007.*

*If home values were to increase at a pace of 6.5% next year (that is, last year's pace), that would mean that the value of a typical home would be **219,710** dollars in December 2018.*

*If home values were to increase at a pace of 0.7% next year (that is, the average annual pace over the last 10 years), that would mean that the value of a typical home would be **207,744** dollars in December 2018.*

*Earlier in the survey, you reported that you thought the value of the typical home in the US at the end of this year (in December 2018) would be 222,222 dollars. We would now like to ask you again about the future value of a typical home in the US **at the end of this year**. What do you think the value of the typical home in the US will be at the end of this year (in December 2018)?"*

Home price expectations were then re-elicited from everyone.

At the very end of the survey, all respondents were asked whether they would have opted to see the forecast of housing experts for year-end home prices instead of their preferred information source. In addition, respondents were asked to report their belief (on a 5-point scale) about (1) the ability of experts to forecast house price growth accurately, and (2) the credibility of experts in general.

B.1 Empirical Analysis

A total of 1,144 respondents took the module. After applying the same sample selection criteria as in the main survey, we are left with 1,091 respondents. The sample is remarkably (and unsurprisingly) similar in observable characteristics to the main survey sample (shown in Table 1): 56.2% have household income of more than $60,000, 55.9% have a college degree or more, the mean age is 51.0 years, 45.6% are female, 64.6% are married, 84.6% are white, and 75.3% are homeowners. We next discuss the main results.

B.1.1 Cross-Sectional Dispersion

Table B.1 describes the prior and posterior beliefs for the three groups: the group that saw both pieces of information, the group that saw one piece of information, and the control group that saw no information. Recall that, conditional on one's reported preference for information, assignment to the three groups was random. Therefore, we can see how information – and more specifically being able to see multiple pieces of information – impacts the evolution of beliefs.

Information leads to a noticeable shift in mean beliefs, with the posterior belief significantly different from the prior. However, beliefs shift even in the control group. Relative to the no-info group, the average posterior uncertainty declines quite a bit in the two groups that saw information, indicating that information led respondents to become more certain. However, dispersion – as measured by the mean absolute deviation of beliefs across individuals – does not decline for the groups that saw information. In fact, the MAD goes up more for the information groups than for the control group: the MAD increases by 0.15 percentage points for the control group and by 0.44 (0.37) percentage points for the one- (two-) information group. We further see that our other measure of disagreement, based on whether a pair's constructed confidence interval overlaps or not, also increases a lot more for the information groups. For example, while a similar proportion of pairs disagreed at the prior stage in the two-information group and the control group (13.5% and 13.1%, respectively), at the posterior stage, a substantially higher proportion of pairs disagreed in the two-information group (22.9% versus 16.1% in the control group). This corroborates the finding in the main survey that information does not lead to a convergence in beliefs. Here we see that randomly providing two signals at the same time has effects similar to providing just one signal.

B.1.2 Other Results

Table B.2 shows other interesting patterns in the data. Column (1) shows that 92 percent of the respondents, when presented with the choice of seeing information in Stage 2, opted for some information (opposed to choosing the "Neither" option). We see that higher-education respondents and those with higher numeracy are significantly more likely to opt to see some information.

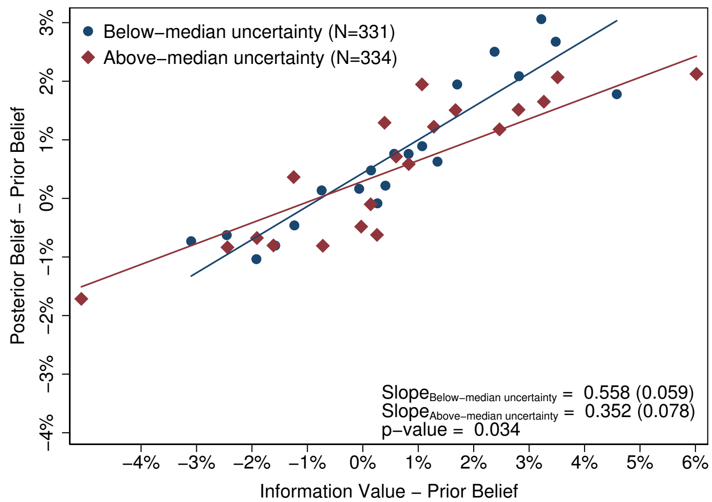
Conditional on wanting to see information, column (2) shows that 46 percent of the respondents preferred the past one year home price change, with the remaining 54 percent preferring the past ten year home price change. Given the serial dependence in home price movements, as discussed in the paper, the past one year home price change is arguably a more useful resource. Column (3) shows that the vast majority of respondents – 85 percent – reported wanting to see both sources of information if that were an option. In both columns (2) and (3), we see a clear difference by education and numeracy along the lines that one would expect.

Finally column (4) validates the finding in the main experiment that lower-numeracy and less-educated respondents are significantly less likely to prefer the forecast of experts over these alternative sources. Note, however, that here the vast majority – 68 percent – of respondents reported that they would have preferred experts' forecast over information about past home price changes, a substantially higher fraction than in the main experiment. This could be because the two studies differ in their specific setup.

Experts' forecast, as we discuss in the paper, should be the optimal information source. To dig deeper into why respondents may not choose the experts' forecast, the module included two questions about the perceived ability of experts to give accurate forecasts, and their credibility. The last two columns of the table show statistics for these two variables. 49 percent of the respondents agreed or somewhat agreed (answered 4 or 5 on a 5-point scale) with the statement *"Housing* *market experts can forecast future house price growth with high accuracy."* Likewise, 49 percent of the respondents agreed or somewhat agreed with the statement "*In general, I trust the credibility of people referred to as experts*." The last column shows that lower-educated respondents in fact have a lower level of trust in experts (44 percent of them trusting experts versus 53 percent of higher-educated respondents); they are also less likely to believe in the ability of experts to forecast accurately. In regression analysis (not presented here), we see that the 12 percentage point education gap in preferring experts (in column 4) declines by 2.5 points once we control for the perceived ability and trust in experts. This suggests that at least some of the differences by education in preferring experts are driven by perceptions about experts' credibility and ability.

Finally, Figure B.1 replicates the finding in the main survey that individuals who are more certain (that is, those with below-median uncertainty) are in fact more responsive to the information. The set-up here is different from the main experiment. Thus, to make this comparison as similar to that in the main study, we restrict the sample to individuals who received one piece of information or no information (that is, we exclude individuals who received two pieces of information).

Figure B.1: Learning Rate By Uncertainty in Prior Beliefs



Notes: Same as in Panel d of Figure 3.e in the main paper, except that this uses the supplementary survey. The figure shows the updating slope by uncertainty in prior beliefs (i.e., above and below the median uncertainty).

Table B.1: Effect of Information-Acquisition on the Distribution of Expectations (Analogue of Table 4 in main text)

		Prior	Posterior
Both Pieces of Info			
	Mean	2.42 (0.176)	3.86 (0.200)
N=338	MAD	2.17 (0.130)	2.54 (0.145)
	Uncertainty	3.68 (0.154)	2.72 (0.136)
	Disagreem. (%)	12.09 (1.31)	22.32 (1.66)
One Piece of Info			
	Mean	2.35 (0.190)	3.28 (0.194)
N=327	MAD	2.11 (0.150)	2.55 (0.133)
	Uncertainty	3.91 (0.156)	2.83 (0.144)
	Disagreem. (%)	10.32 (1.20)	22.97 (1.65)
Control			
	Mean	2.58 (0.210)	3.00 (0.216)
N=338	MAD	2.39 (0.165)	2.54 (0.166)
	Uncertainty	3.66 (0.155)	3.28 (0.148)
	Disagreem. (%)	12.68 (1.40)	16.61 (1.57)

Notes: Table excludes respondents who report a preference for no information. The average level, the dispersion, the uncertainty, and the fraction of disagreements within group is presented for the prior, and posterior belief for the three groups (those who see two pieces of information, those who see one piece of information, and those who see neither (control).. The prior belief refers to the expected change for home prices to the end of the year before the information, that may help with forecasting, was presented to individuals. Posterior belief refers to the expected change after the information was shown to individuals. See notes to Table 3 for additional notes on definitions of various measures. Numbers in parentheses in each cell are standard errors.

Table B.2: Information Preferences and Beliefs

		Information Preferences				Perceptions	
	Obs	Prefer Any Info	Prefer 1yr | Info	Prefer Both | Info	Prefer Expert	Find Experts Accurate	Trust Experts
		(1)	(2)	(3)	(4)	(5)	(6)
All	1091	0.92	0.46	0.85	0.68	0.49	0.49
High Reward	546	0.92	0.47	0.86	0.68	0.51	0.49
Low Reward	545	0.92	0.45	0.85	0.67	0.47	0.49
P-value		0.993	0.589	0.585	0.683	0.155	0.785
College Graduate	610	0.94	0.44	0.89	0.73	0.52	0.53
Not College Grad	481	0.89	0.49	0.81	0.61	0.46	0.44
P-value		0.001	0.128	0.001	0.000	0.064	0.005
High Numeracy	469	0.96	0.50	0.87	0.71	0.48	0.48
Low Numeracy	622	0.89	0.43	0.84	0.65	0.51	0.50
P-value		0.000	0.017	0.140	0.023	0.312	0.393

Notes: High reward corresponds to 100 dollar prize. High numeracy corresponds to no incorrect answers. Column variable definitions are as follows: *Prefer Any Info*: Equals one if the respondent selected either 1 or 10 year info (opposed to no info); *Prefer 1 year* | *Info*: Conditional on selecting an information source, indicator that equals 1 if the respondent selected past 1 year info (those who selected no info are dropped here); *Prefer Both Info*: Indicator that equals 1 if respondent reported she would like to see both pieces of info (those who selected no info are dropped); *Prefer Expert*: Indicator that equals 1 if respondent reports that she would have chosen expert forecast, if it had been a choice; *Find Experts Accurate*: Indicator for reporting a belief of expert accuracy of 4 or 5 on a 5-point scale; *Trust Experts*: Indicator for reporting a belief of expert credibility of 4 or 5 on a 5-point scale.

C Proof of Proposition 1

The net benefit of acquiring access to information source j at cost c and receiving a signal of precision $1/\sigma_\psi^2(i)$ on the displayed information equals

$$\phi\left(\sigma_\theta^2(i)-\sigma_{\theta|s}^2(i)\right)-c-\mu\frac{1}{2}\ln\left(1+\frac{\sigma_\theta^2(i)+\sigma_{\varepsilon,j}^2(i)}{\sigma_\psi^2(i)}\right), \tag{C.1}$$

where

$$\sigma_{\theta|s}^2(i)=\begin{cases}\frac{1}{\frac{1}{\sigma_\theta^2(i)}+\frac{1}{\sigma_{\varepsilon,j}^2(i)+\sigma_\psi^2(i)}} & \text{if } \frac{1}{\sigma_\psi^2(i)}>0\\ \sigma_\theta^2(i) & \text{if } \frac{1}{\sigma_\psi^2(i)}=0\end{cases}.$$

The net benefit equals ϕ times the difference between prior and posterior variance of the fundamental minus the cost of information acquisition, c, minus the marginal cost of information processing, μ, times the uncertainty reduction about the displayed information.

To find the optimal signal precision, $1/\sigma_\psi^2(i)$, that maximizes objective (C.1) for a given information source j, it is useful to rewrite the maximization problem in terms of a different choice variable. Let α denote the weight on the signal implied by Bayesian updating

$$E[\theta|s(i)]=\mu_\theta(i)+\alpha\left[\theta+\varepsilon_j+\psi(i)-\mu_\theta(i)\right],$$

where

$$\alpha\equiv\begin{cases}\frac{\sigma_\theta^2(i)}{\sigma_\theta^2(i)+\sigma_{\varepsilon,j}^2(i)+\sigma_\psi^2(i)} & \text{if } \frac{1}{\sigma_\psi^2(i)}>0\\ 0 & \text{if } \frac{1}{\sigma_\psi^2(i)}=0\end{cases}.$$

Rewriting the objective (C.1) in terms of α instead of $1/\sigma_\psi^2(i)$ yields the expression

$$\phi\alpha\sigma_\theta^2(i)-c-\mu\frac{1}{2}\ln\left(\frac{1}{1-\frac{\sigma_\theta^2(i)+\sigma_{\varepsilon,j}^2(i)}{\sigma_\theta^2(i)}\alpha}\right).$$

Writing the maximization problem in terms of α instead of $1/\sigma_\psi^2(i)$ yields

$$\max_{\alpha\in\left[0,\frac{\sigma_\theta^2(i)}{\sigma_\theta^2(i)+\sigma_{\varepsilon,j}^2(i)}\right)}\left\{\phi\alpha\sigma_\theta^2(i)-c-\mu\frac{1}{2}\ln\left(\frac{1}{1-\frac{\sigma_\theta^2(i)+\sigma_{\varepsilon,j}^2(i)}{\sigma_\theta^2(i)}\alpha}\right)\right\}.$$

The unique solution is

$$\alpha^*=\max\left\{0,\frac{\sigma_\theta^2(i)}{\sigma_\theta^2(i)+\sigma_{\varepsilon,j}^2(i)}-\frac{\mu}{2\phi\sigma_\theta^2(i)}\right\}. \tag{C.2}$$

It follows from the definition of α that the signal precision that yields the optimal α is

$$\left(\frac{1}{\sigma_{\psi}^{2}\left(i\right)}\right)^{*}=\max\left\{0,\left[2\frac{\phi}{\mu}\frac{\sigma_{\theta}^{4}\left(i\right)}{\sigma_{\theta}^{2}\left(i\right)+\sigma_{\varepsilon,j}^{2}\left(i\right)}-1\right]\frac{1}{\sigma_{\theta}^{2}\left(i\right)+\sigma_{\varepsilon,j}^{2}\left(i\right)}\right\}. \tag{C.3}$$

Substituting the optimal α back into the objective yields the net benefit of acquiring access to information source j at the solution

$$\max\left\{-c,\phi\frac{\sigma_{\theta}^{4}\left(i\right)}{\sigma_{\theta}^{2}\left(i\right)+\sigma_{\varepsilon,j}^{2}\left(i\right)}-\frac{\mu}{2}-c-\frac{\mu}{2}\ln\left(2\frac{\phi}{\mu}\frac{\sigma_{\theta}^{4}\left(i\right)}{\sigma_{\theta}^{2}\left(i\right)+\sigma_{\varepsilon,j}^{2}\left(i\right)}\right)\right\}. \tag{C.4}$$

Equations (C.2)-(C.4) complete the characterization of individual i's optimal amount of attention to the displayed information for information source j (equation (C.3)), optimal weight on the displayed information for information source j (equation (C.2)), and net benefit of acquiring access to information source j (equation (C.4)). The max operators in equations (C.2)-(C.4) simply reflect the fact that, in the case of $\frac{\sigma_{\theta}^{2}(i)}{\sigma_{\theta}^{2}(i)+\sigma_{\varepsilon,j}^{2}(i)}\leq\frac{\mu}{2\phi\sigma_{\theta}^{2}(i)}$, the optimal amount of attention to displayed information equals zero and the net benefit of acquiring access to information source j equals $-c$. Finally, in the case of an interior solution ($\frac{\sigma_{\theta}^{2}(i)}{\sigma_{\theta}^{2}(i)+\sigma_{\varepsilon,j}^{2}(i)}>\frac{\mu}{2\phi\sigma_{\theta}^{2}(i)}$), the partial derivative of expression (C.4) with respect to $\sigma_{\varepsilon,j}^{2}\left(i\right)$ is strictly negative, implying that the net benefit of acquiring access to an information source is strictly increasing in its perceived precision, $\sigma_{\varepsilon,j}^{-2}\left(i\right)$.

Comparing any two information sources for which the optimal amount of attention is strictly positive (i.e., comparing any two information sources for which expression (C.3) is strictly positive and thus expression (C.2) is strictly positive), individual i strictly prefers the information source with the higher perceived precision, $\sigma_{\varepsilon,j}^{-2}\left(i\right)$, because the net benefit of acquiring access to an information source is strictly increasing in its perceived precision, $\sigma_{\varepsilon,j}^{-2}\left(i\right)$.

Finally, an individual's willingness to pay for access to information source j equals the net benefit of access to information source j plus the cost of information acquisition, c. Hence, individual i's willingness to pay for access to information source j equals

$$WTP(i,j)=\max\left\{0,\phi\frac{\sigma_{\theta}^{4}\left(i\right)}{\sigma_{\theta}^{2}\left(i\right)+\sigma_{\varepsilon,j}^{2}\left(i\right)}-\frac{\mu}{2}-\frac{\mu}{2}\ln\left(2\frac{\phi}{\mu}\frac{\sigma_{\theta}^{4}\left(i\right)}{\sigma_{\theta}^{2}\left(i\right)+\sigma_{\varepsilon,j}^{2}\left(i\right)}\right)\right\}. \tag{C.5}$$

D Alternative Model with Common Prior over Signal Precisions

In the model in the paper, individual i has the prior belief that the precision of information source $j \in \{1,2,3\}$ equals $\tau_j(i) \equiv \frac{1}{\sigma^2_{\varepsilon,j}(i)}$. τ_j being a function of i means that the prior belief about the precision of information source j may differ across individuals. In the model in this appendix, all individuals instead share the same prior belief about the precision of the information sources. Cross-sectional heterogeneity in beliefs over precisions arises ex post.

Common prior over precisions. Individuals have the prior belief that each information source j is a noisy signal about the fundamental:

$$x_j = \theta + \varepsilon_j,$$

where x_j is the displayed information, θ and ε_j are mutually independent, and the noise ε_j is normally distributed with mean zero. Individuals have the prior belief that one information source has high precision, $\tau_H = \frac{1}{\sigma^2_\varepsilon}$, and two information sources have low precision, $\tau_L = \frac{1}{\delta\sigma^2_\varepsilon}$, with $\delta > 1$.[3] The three information sources are homogenous *a priori*, that is, for any information source $j \in \{1,2,3\}$, individuals assign probability $1/3$ to information source j being the one with the high precision.

Cognitive effort and posterior over precisions. The state of nature is the identity of the information source with high precision. Let $j^* \in \{1,2,3\}$ denote this information source. Individuals have imperfect information about the state of nature. As explained before, individuals have a uniform prior over j^*. Before selecting an information source, individuals can expend cognitive effort on figuring out the state of nature, which is modeled as receiving a noisy signal on the state. The signal announces the identity of the information source with high precision and is correct with probability $\lambda \in [1/3, 1]$, where $\lambda = 1/3$ corresponds to a completely uninformative signal and $\lambda = 1$ corresponds to a perfectly informative signal. More cognitive effort corresponds to a higher λ but comes at a higher cost. If the signal is incorrect, it announces one of the two suboptimal information sources with equal probability. Let $z(i) \in \{1,2,3\}$ denote the signal received by indi-

[3] The assumption that two information sources have the same low precision is only for ease of exposition.

vidual i. For any two individuals i and i', the signals $z\left(i\right)$ and $z\left(i'\right)$ are conditionally independent given j^*, which captures the idea that cognitive mistakes arise on the level of the individual. It follows from Bayes' rule that for any individual i posterior beliefs are given by

$$\Pr\left(j = j^* | z\left(i\right) = j\right) = \frac{\lambda \frac{1}{3}}{\lambda \frac{1}{3} + \left(1-\lambda\right)\frac{1}{2}\frac{1}{3} + \left(1-\lambda\right)\frac{1}{2}\frac{1}{3}} = \lambda,$$

and

$$\Pr\left(j = j^* | z\left(i\right) \neq j\right) = \frac{\left(1-\lambda\right)\frac{1}{3}}{\left(1-\lambda\right)\frac{1}{3} + \left[\lambda + \left(1-\lambda\right)\frac{1}{2}\right]\frac{1}{3} + \left[\lambda + \left(1-\lambda\right)\frac{1}{2}\right]\frac{1}{3}} = \frac{1-\lambda}{2}.$$

The precise cost function for cognitive effort will be specified below and will have the property that a higher λ is more costly.

First Action: Selecting an information source. The optimal choice of the information source given the realization of the signal on precisions is to follow the recommendation of the signal. Formally, for any $\lambda > (1/3)$, we have $\lambda > \frac{1-\lambda}{2}$, and thus the optimal action is to select information source j if and only if $z\left(i\right) = j$. Intuitively, agents have a uniform prior and the signal is informative; hence the optimal action is to follow the recommendation of the signal. This has three implications. First, since there is idiosyncratic noise in the signal, individuals arrive at heterogeneous posteriors over precisions and take heterogeneous actions, even though individuals have a common prior over precisions. Second, for any sufficiently large group of individuals choosing to expend cognitive effort (i.e., for any sufficiently large group of individuals choosing $\lambda > (1/3)$), the information source with the high precision will be the modal choice with a high probability. Third, once λ becomes a choice variable (see the paragraph on rational inattention below) the probability of selecting the high-precision information source will depend on individual characteristics.

Prior beliefs and posterior beliefs over the fundamental. Individual i has the prior belief that the fundamental θ is normally distributed with mean $\mu_\theta\left(i\right)$ and variance $\sigma_\theta^2\left(i\right)$. Throughout this appendix, we set $\mu_\theta\left(i\right) = 0$ to simplify some of the equations and without affecting any of the qualitative results.

After selecting an information source and acquiring the information, the information is displayed. Paying attention to the displayed information is modeled as receiving a noisy signal on the displayed information

$$s(i) = x_j + \psi(i) = \theta + \varepsilon_j + \psi(i),$$

where j is the selected information source, x_j is the displayed information, and $\psi(i)$ is noise that arises due to limited attention to the displayed information. The noise $\psi(i)$ is assumed to be normally distributed with mean zero and variance $\sigma_\psi^2(i)$. Paying more attention to the displayed information is formalized as a smaller $\sigma_\psi^2(i)$. For the moment, we assume that this variance of noise is exogenous. For example, one could set $\sigma_\psi^2(i) = 0$ ("perfect attention to displayed information"). In an extension, we study the case where this variance of noise is endogenous, as in Section 4 of the paper.

Next, we derive the conditional density of the fundamental, θ, given the signal, $s(i)$. From the point of view of an individual, the signal on the fundamental is drawn from a mixture of two normal distributions. With probability λ the signal is drawn from a normal distribution with high precision. With probability $1-\lambda$ the signal is drawn from a normal distribution with low precision. The posterior density can be written as a mixture density

$$\begin{aligned} p(\theta|s(i)) &= p(\theta|s(i), j = j^*)\, p(j = j^*|s(i)) \\ &\quad + p(\theta|s(i), j \neq j^*)\, p(j \neq j^*|s(i)). \end{aligned}$$

The first term in each product is simple. The conditional distribution of θ given $s(i)$ and $j = j^*$ (high-precision information source) is a normal distribution with mean $\frac{\sigma_\theta^2(i)}{\sigma_\theta^2(i)+\sigma_\varepsilon^2+\sigma_\psi^2(i)} s(i)$ and variance $\frac{1}{\frac{1}{\sigma_\theta^2(i)}+\frac{1}{\sigma_\varepsilon^2+\sigma_\psi^2(i)}}$; and the conditional distribution of θ given $s(i)$ and $j \neq j^*$ (low-precision information source) is a normal distribution with mean $\frac{\sigma_\theta^2(i)}{\sigma_\theta^2(i)+\delta\sigma_\varepsilon^2+\sigma_\psi^2(i)} s(i)$ and variance $\frac{1}{\frac{1}{\sigma_\theta^2(i)}+\frac{1}{\delta\sigma_\varepsilon^2+\sigma_\psi^2(i)}}$. The second term in the first product is the posterior probability of having selected the high-precision information source given the realization of the signal $s(i)$. Using the fact that Bayes' rule implies that

$$p(j = j^*|s(i)) = \frac{p(s(i)|j = j^*)\, p(j = j^*)}{p(s(i))},$$

and that

$$p(j = j^*) = \lambda,$$

$$p\left(s(i)|j=j^{*}\right)=\frac{1}{\sqrt{2\pi\left(\sigma_{\theta}^{2}\left(i\right)+\sigma_{\varepsilon}^{2}+\sigma_{\psi}^{2}\left(i\right)\right)}}e^{-\frac{s(i)^{2}}{2\left(\sigma_{\theta}^{2}(i)+\sigma_{\varepsilon}^{2}+\sigma_{\psi}^{2}(i)\right)}},$$

$$\begin{aligned}p\left(s(i)\right)=&\frac{\lambda}{\sqrt{2\pi\left(\sigma_{\theta}^{2}\left(i\right)+\sigma_{\varepsilon}^{2}+\sigma_{\psi}^{2}\left(i\right)\right)}}e^{-\frac{s(i)^{2}}{2\left(\sigma_{\theta}^{2}(i)+\sigma_{\varepsilon}^{2}+\sigma_{\psi}^{2}(i)\right)}}\\&+\frac{1-\lambda}{\sqrt{2\pi\left(\sigma_{\theta}^{2}\left(i\right)+\delta\sigma_{\varepsilon}^{2}+\sigma_{\psi}^{2}\left(i\right)\right)}}e^{-\frac{s(i)^{2}}{2\left(\sigma_{\theta}^{2}(i)+\delta\sigma_{\varepsilon}^{2}+\sigma_{\psi}^{2}(i)\right)}},\end{aligned}$$

yields

$$p\left(j=j^{*}|s(i)\right)=\frac{\lambda}{\lambda+(1-\lambda)\sqrt{\frac{\sigma_{\theta}^{2}(i)+\sigma_{\varepsilon}^{2}+\sigma_{\psi}^{2}(i)}{\sigma_{\theta}^{2}(i)+\delta\sigma_{\varepsilon}^{2}+\sigma_{\psi}^{2}(i)}}e^{\left[\frac{1}{2\left(\sigma_{\theta}^{2}(i)+\sigma_{\varepsilon}^{2}+\sigma_{\psi}^{2}(i)\right)}-\frac{1}{2\left(\sigma_{\theta}^{2}(i)+\delta\sigma_{\varepsilon}^{2}+\sigma_{\psi}^{2}(i)\right)}\right]s(i)^{2}}}.$$

The posterior probability of having selected the high-precision information source depends on λ and depends on the signal realization $s(i)$, because extreme signal realizations indicate that the low-precision information source has been selected. Combining results yields the conditional density of the fundamental, θ, given the signal, $s(i)$.

It is now straightforward to compute the conditional mean and the conditional variance of the fundamental, θ, given the signal, $s(i)$. Standard results on mixture distributions yield

$$\begin{aligned}E\left[\theta|s(i)\right]=&E\left[\theta|s(i),j=j^{*}\right]p\left(j=j^{*}|s(i)\right)+E\left[\theta|s(i),j\neq j^{*}\right]p\left(j\neq j^{*}|s(i)\right)\\=&\frac{\sigma_{\theta}^{2}\left(i\right)}{\sigma_{\theta}^{2}\left(i\right)+\sigma_{\varepsilon}^{2}+\sigma_{\psi}^{2}\left(i\right)}s(i)\\&\times\frac{\lambda}{\lambda+(1-\lambda)\sqrt{\frac{\sigma_{\theta}^{2}(i)+\sigma_{\varepsilon}^{2}+\sigma_{\psi}^{2}(i)}{\sigma_{\theta}^{2}(i)+\delta\sigma_{\varepsilon}^{2}+\sigma_{\psi}^{2}(i)}}e^{\left[\frac{1}{2\left(\sigma_{\theta}^{2}(i)+\sigma_{\varepsilon}^{2}+\sigma_{\psi}^{2}(i)\right)}-\frac{1}{2\left(\sigma_{\theta}^{2}(i)+\delta\sigma_{\varepsilon}^{2}+\sigma_{\psi}^{2}(i)\right)}\right]s(i)^{2}}}\\&+\frac{\sigma_{\theta}^{2}\left(i\right)}{\sigma_{\theta}^{2}\left(i\right)+\delta\sigma_{\varepsilon}^{2}+\sigma_{\psi}^{2}\left(i\right)}s(i)\\&\times\left(1-\frac{\lambda}{\lambda+(1-\lambda)\sqrt{\frac{\sigma_{\theta}^{2}(i)+\sigma_{\varepsilon}^{2}+\sigma_{\psi}^{2}(i)}{\sigma_{\theta}^{2}(i)+\delta\sigma_{\varepsilon}^{2}+\sigma_{\psi}^{2}(i)}}e^{\left[\frac{1}{2\left(\sigma_{\theta}^{2}(i)+\sigma_{\varepsilon}^{2}+\sigma_{\psi}^{2}(i)\right)}-\frac{1}{2\left(\sigma_{\theta}^{2}(i)+\delta\sigma_{\varepsilon}^{2}+\sigma_{\psi}^{2}(i)\right)}\right]s(i)^{2}}}\right).\quad\text{(D.1)}\end{aligned}$$

For any signal realization $s(i)$ that differs from the prior mean of the fundamental, individuals respond more to the signal when λ is larger, because they can be more confident that they have selected the high-precision information source. Formally, the absolute difference between the posterior mean of the fundamental and the prior mean of the fundamental is strictly increasing in λ, because $p\left(j=j^{*}|s(i)\right)$ is strictly increasing in λ. In addition, standard results on mixture distributions yield

$$\begin{aligned} Var\left(\theta|s\left(i\right)\right) = & \left(\left(\frac{\sigma_{\theta}^{2}\left(i\right)}{\sigma_{\theta}^{2}\left(i\right)+\sigma_{\varepsilon}^{2}+\sigma_{\psi}^{2}\left(i\right)}\right)^{2} s(i)^{2}+\frac{1}{\frac{1}{\sigma_{\theta}^{2}(i)}+\frac{1}{\sigma_{\varepsilon}^{2}+\sigma_{\psi}^{2}(i)}}\right) p\left(j=j^{*}|s(i)\right) \\ & + \left(\left(\frac{\sigma_{\theta}^{2}\left(i\right)}{\sigma_{\theta}^{2}\left(i\right)+\delta\sigma_{\varepsilon}^{2}+\sigma_{\psi}^{2}\left(i\right)}\right)^{2} s(i)^{2}+\frac{1}{\frac{1}{\sigma_{\theta}^{2}(i)}+\frac{1}{\delta\sigma_{\varepsilon}^{2}+\sigma_{\psi}^{2}(i)}}\right) p\left(j\neq j^{*}|s(i)\right) \\ & - \left(E\left[\theta|s(i)\right]\right)^{2}. \end{aligned}$$

Second Action: Reporting a forecast of the fundamental. Each individual is assumed to report the forecast of the fundamental that minimizes

$$E\left[\left(\theta-y\right)^{2}|s\left(i\right)\right],$$

where θ is the fundamental and y denotes the reported forecast. The optimal action for any realization of the signal is then to report the conditional mean of the fundamental

$$y=E\left[\theta|s\left(i\right)\right].$$

A closed-form expression for this conditional mean of the fundamental is given in the previous paragraph.

Rational Inattention. So far we have derived the choice of the information source and the posterior beliefs over the fundamental for a given λ. Finally, we let individuals choose the probability with which they want to identify the high-precision information source. Individuals can choose how much cognitive effort they expend on identifying the high-precision information source.

The benefit of identifying the high-precision information source with a high probability is that it reduces the individual's mean square error:

$$E\left[\left(\theta-E\left[\theta|s(i)\right]\right)^{2}\right]=E\left[E\left[\left(\theta-E\left[\theta|s(i)\right]\right)^{2}|s(i)\right]\right]=E\left[Var\left(\theta|s\left(i\right)\right)\right].$$

It is straightforward to show that this mean square error is strictly decreasing in λ on $[1/3,1]$ and twice continuously differentiable in λ on $(1/3,1)$. In the following, let $MSE\left(i,\lambda\right)$ denote the mean square error of individual i, where the index i indicates that the mean square error depends on the variances $\sigma_\theta^2(i)$ and $\sigma_\psi^2(i)$, which may differ across individuals, and the argument λ indicates that the mean square error depends on λ.

The cognitive cost of identifying the high-precision information source with probability λ is assumed to equal $\mu I(\lambda)$, where $\mu > 0$ denotes the marginal cost of attention, as in Section 4 of the paper, and $I(\lambda)$ is the amount of attention that is required to identify the high-precision information source with probability λ. We assume that the function $I(\lambda)$ is strictly increasing on $[1/3, 1]$ and twice continuously differentiable on $(1/3, 1)$. In other words, attention is costly and identifying the best option among the three available options with a higher probability requires more attention.

We make no further assumptions about the function $I(\lambda)$, but it may be useful to give a concrete example. In the rational inattention literature following Sims (2003), it is common to quantify attention by uncertainty reduction, where uncertainty is measured by entropy. This is the modeling approach we took in Section 4 of the paper when we derived closed-form solutions. Applying the same modeling approach here yields

$$I(\lambda) = H(j^*) - H(j^*|z(i)),$$

where $H(j^*)$ denotes the entropy of the discrete state of nature j^* before receiving the signal $z(i)$ and $H(j^*|z(i))$ denotes the conditional entropy of the discrete state of nature j^* after receiving the signal $z(i)$. The right-hand side of the last equation quantifies the amount of information processed by the agent. The cost function $\mu I(\lambda)$ then says that for a higher μ the same uncertainty reduction requires a higher cognitive effort. Using the fact that the entropy of a discrete random variable with probability mass function p_i, $i \in \{1, 2, 3\}$, equals $-\sum_{i=1}^{3} p_i ln(p_i)$, with the convention $0 \ln(0) = 0$, (Cover and Thomas, 1991, Chapter 2) yields

$$I(\lambda) = \left[-3\frac{1}{3}\ln\left(\frac{1}{3}\right)\right] - \left[-\lambda\ln(\lambda) - 2\left(\frac{1-\lambda}{2}\right)\ln\left(\frac{1-\lambda}{2}\right)\right]. \tag{D.2}$$

The function $I(\lambda)$ given by the last equation is strictly increasing on $[1/3, 1]$ and twice continuously differentiable on $(1/3, 1)$.

The decision problem of the rationally inattentive individual reads

$$\max_{\lambda \in [1/3,1]} \left\{ \phi \left(MSE\left(i,1/3\right) - MSE\left(i,\lambda\right) \right) - \mu I\left(\lambda\right) \right\},$$

where $MSE\left(i,1/3\right) - MSE\left(i,\lambda\right)$ is the reduction in the mean square error that is achieved by identifying the high-precision information source with probability λ, $\mu I\left(\lambda\right)$ is the cognitive cost of identifying the high-precision information source with probability λ, and the parameter ϕ controls the incentive to have an accurate forecast of the fundamental.

Individuals with a higher ϕ/μ choose to identify the high-precision information source with a higher probability, i.e., they choose a higher λ. The proof is simple. Divide the objective in the decision problem by μ. The resulting transformed objective satisfies the strict single crossing property in $\left(\lambda; \frac{\phi}{\mu}\right)$. It follows from the Monotone Selection Theorem in Milgrom and Shannon (1994) that every selection from the set of solutions to the optimization problem is monotone non-decreasing in ϕ/μ. Furthermore, the partial derivative of the objective with respect to λ is strictly increasing in ϕ/μ, implying that interior solutions cannot remain unchanged as ϕ/μ changes.

Summary. Even though individuals share a common prior over precisions, individuals arrive at heterogeneous posteriors over precisions and select different information sources. The high-precision information source is the modal choice. Under the natural assumption that high-numeracy individuals need to expend less cognitive effort to identify the high-precision information source with a given probability (i.e., under the assumption that numeracy is negatively correlated with μ in the cross section), high-numeracy individuals choose to select the high-precision information source with a higher probability. As a result, they have a higher willingness to pay for their preferred piece of information and react more to the displayed information, because they can be more confident that they have selected the high-precision information source.

Comparison to standard discrete choice under rational inattention. It may be useful to compare the results in this appendix to well-known results in the literature on discrete choice under rational inattention (Matějka and McKay, 2015; Caplin and Dean, 2015). The first-order condition for λ when $I(\lambda)$ is given by equation (D.2) reads

$$\phi \frac{\partial \left[MSE\left(i,1/3\right) - MSE\left(i,\lambda\right) \right]}{\partial \lambda} - \mu \ln \left(\frac{\lambda}{\frac{1-\lambda}{2}} \right) = 0.$$

Rearranging yields

$$\frac{\lambda}{\frac{1-\lambda}{2}} = e^{\frac{\phi}{\mu} \frac{\partial \left[MSE\left(i,1/3\right) - MSE\left(i,\lambda\right) \right]}{\partial \lambda}}.$$

The probability of selecting the high-precision information source divided by the probability of selecting any other information source is related to the partial derivative of the benefit term with respect to λ divided by the marginal cost of information flow, μ. The difference between the last equation and standard results on discrete choice under rational inattention (Matějka and McKay, 2015; Caplin and Dean, 2015) is that the expression for the partial derivative of the benefit term with respect to λ is more complicated than in the existing literature on static discrete choice under rational inattention. The reason is that processing more information before selecting an option changes both the probability of *selecting* the best option and the subsequent *use* of the selected option (captured through the weight λ in equation (D.1)). This model feature arises naturally in the context of choice of an information source, but may also arise in other contexts.

Extensions. One can allow individuals to choose the amount of attention allocated to selecting an information source and the amount of attention devoted to the displayed information

$$\max_{\lambda \in [1/3,1], \sigma_{\psi}^{-2}(i) \geq 0} \left\{ \phi \left(MSE\left(i,1/3,0\right) - MSE\left(i,\lambda,\sigma_{\psi}^{-2}\left(i\right)\right) \right) - \mu I\left(\lambda,\sigma_{\psi}^{-2}\left(i\right)\right) \right\}.$$

In the benefit term, we now highlight the fact that the mean square error depends on λ and $\sigma_{\psi}^{-2}(i)$. In the cost term, we now measure the quantity of information processed about j^* and x_j. The total quantity of information processed depends on λ and $\sigma_{\psi}^{-2}(i)$.

One can also introduce the fixed cost of information acquisition. As pointed out in Section 4 of the paper, the willingness to pay for access to the selected information source equals the benefit of access to the information source, $\phi \left(MSE\left(i,1/3,0\right) - MSE\left(i,\lambda,\sigma_{\psi}^{-2}\left(i\right)\right) \right)$, net of the cost of processing the displayed information x_j at the optimal λ and $\sigma_{\psi}^{-2}(i)$. The individual acquires access to the information source if this willingness to pay exceeds the cost.

References

[1] Caplin, A., and Dean, M. (2015). "Revealed Preference, Rational Inattention, and Costly Information Acquisition," American Economic Review, Vol. 105(7), pp. 2183-2203.

[2] Cover, T. and H. Thomas (1991). "Elements of Information Theory," Wiley-Interscience, New York, NY, USA.

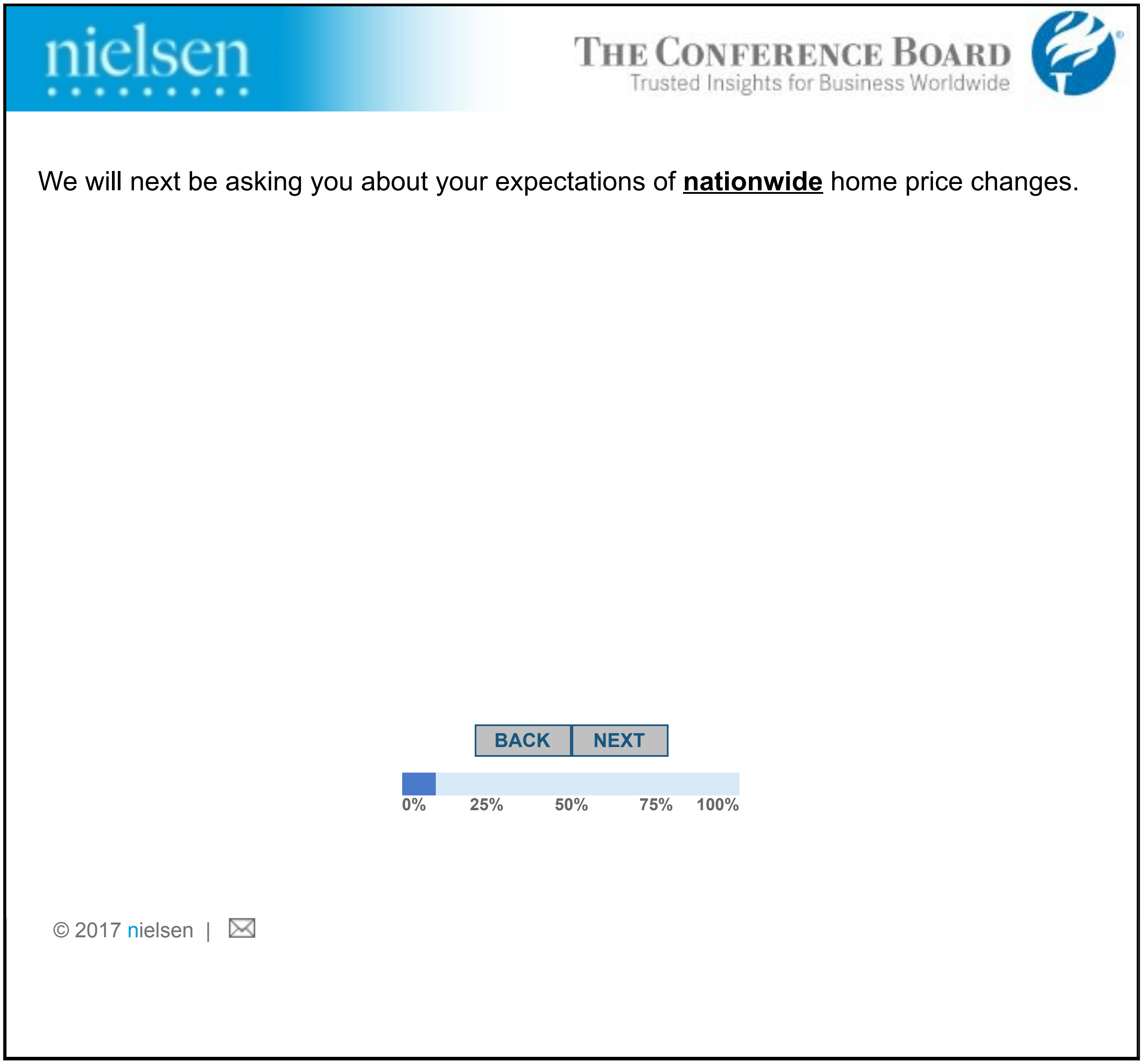
[3] Lipkus, I., Samsa, G., and Rimer, B. (2001). "General Performance on a Numeracy Scale among Highly Educated Samples," Medical Decision Making, Vol. 21, pp. 37–44.

[4] Lusardi, A. (2008). "Financial Literacy: An Essential Tool for Informed Consumer Choice?" NBER Working Paper No. 14084.

[5] Matějka, F., and McKay, A. (2015). "Rational Inattention to Discrete Choices: A New Foundation for the Multinomial Logit Model," American Economic Review, Vol. 105(1), pp. 272-298.

[6] Milgrom, P., and Shannon, C. (1994). "Monotone Comparative Statics," Econometrica, Vol. 62(1), pp. 157-180.

E Survey Instrument: Main Study



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As of December 2016, the value of the median or "typical" home in the US was **193,800** dollars (according to Zillow.com). Now, think about how the value of the typical home in the US has changed over time. (By value, we mean how much that typical home would approximately sell for.)

What do you think the value of such a home was

Please provide your best guess in each box below.

one year earlier (in December 2015)? [193000] dollars

ten years earlier (in December 2006)? [190000] dollars

How confident are you in your answers?

Please select only one.

Not at all confident		Somewhat confident		Very confident
1	2	3	4	5
○	○	○	○	○

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We would now like you to think about the **future** value of the typical home in the US. As mentioned earlier, according to Zillow.com, the value of the typical home in the US was **193,800** dollars as of December 2016.

What do you think the value of the typical home in the US will be **at the end of this year** (in December 2017)?

Please enter a number in the box below.

[ ] dollars

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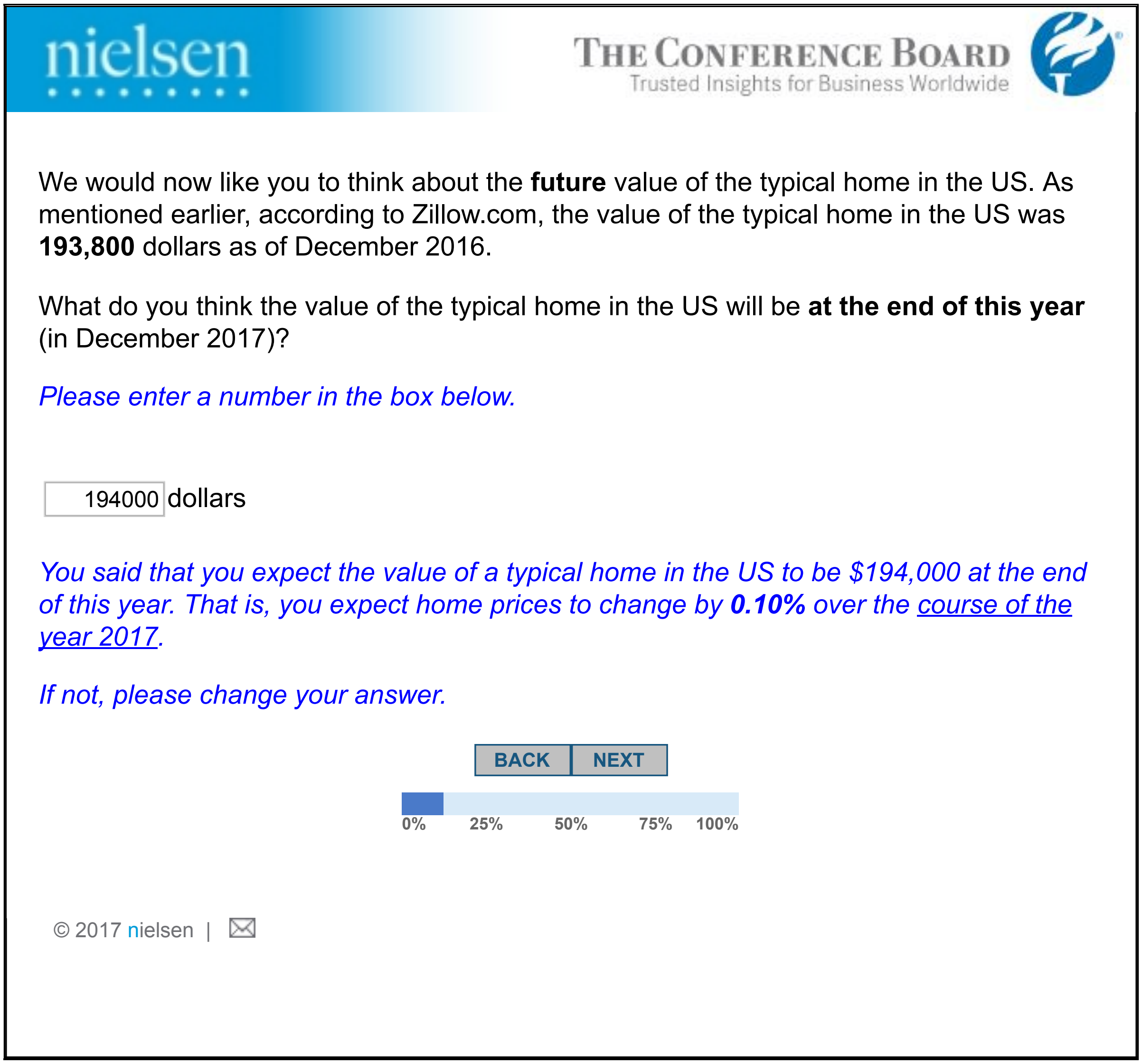
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We would now like you to think about the **future** value of the typical home in the US. As mentioned earlier, according to Zillow.com, the value of the typical home in the US was **193,800** dollars as of December 2016.
What do you think the value of the typical home in the US will be **at the end of this year** (in December 2017)?
Please enter a number in the box below.
194000 dollars
*You said that you expect the value of a typical home in the US to be $194,000 at the end of this year. That is, you expect home prices to change by **0.10%** over the course of the year 2017.*
If not, please change your answer.
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0% 25% 50% 75% 100%
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You estimated the value of the typical home in the US to be 194,000 dollars at the end of this year. Now we want to ask you about how confident you are about this forecast.

What do you think is the percent chance (or chances out of 100) that the value of such a home **at the end of this year (in December 2017)** will be...

(Please note: The numbers need to add up to ***100****.)*

Less than 174,600 dollars		percent chance
Between 174,600 and 192,100 dollars		percent chance
Between 192,100 and 195,900 dollars		percent chance
Between 195,900 and 213,400 dollars		percent chance
More than 213,400 dollars		percent chance
TOTAL	0	

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Earlier in the survey, we asked you to forecast the value of a typical home in the US at the end of this year. Later in this survey, we will ask you to do so again.

This time, we will reward the accuracy of your forecast: you will have a chance of receiving **$100**. There is roughly a 10% chance that you will be eligible to receive this prize: we will select at random 60 out of about 600 people answering this question. Then, those respondents whose forecast is within 1% of the actual value of a typical US home at the end of this year will receive $100.

Your payment will depend on your answer, so consider this question carefully. You will be informed at the end of the survey if you have been chosen for this potential prize.

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Before you report your forecast, you will have the opportunity to see only one of the following pieces of information that may help you with forecasting future year-ahead US home prices. Please rank the following pieces of information on a 1-4 scale, where 1 is "Highest ranked/Most Preferred" and 4 is the "Least Preferred".

Please click on each piece of information on the left, and drag it to the right hand side of the screen.

Change in the value of a typical home in the US over the last one year (2016).
Change in the value of a typical home in the US over the last ten years (2007-2016).
Forecasts of a panel of housing experts about the change in US home prices over this coming year (2017).
None of the above -- I would not like to see any information

1=Most preferred	
2	
3	
4=Least preferred	

BACK NEXT

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You said that you would most prefer seeing information on the change in the value of a typical home in the US over the last one year (2016). Now we want to assess how much you would value this information.

You will next be presented with 11 scenarios. In each scenario, you will be given the choice of either seeing information about the change in the value of a typical home in the US over the last one year (2016) OR receiving extra money with the check that you will be getting for completing this survey. The amount of money that you will be offered in these scenarios is pre-determined, and goes from $0.01 to $5. For instance, in *Scenario 1*, you will need to choose between seeing information or receiving $0.01; and in *Scenario 11*, you will need to choose between seeing information or receiving $5.

We will draw one of these 11 scenarios at random for you. Your choice in the randomly chosen scenario will then be implemented. That is, you will have to make 11 choices, but only one of those choices will be implemented.

Since one scenario will be picked at random, your choices will not affect which scenario will be chosen.

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You will now be asked to make a decision for each of the **11 scenarios**.

Scenario 1:
Would you like to see information about the change in the value of a typical home in the US over the last one year (2016) OR receive $0.01?

Note: if this scenario is chosen for you, your choice will be implemented. If you choose the information, you will see it on the next page. Instead if you choose the money, you will receive $0.01 in your check.

◉ see information ○ receive $0.01

Scenario 2:
Would you like to see information about the change in the value of a typical home in the US over the last one year (2016) OR receive $0.50?

◉ see information ○ receive $0.50

Scenario 3:
Would you like to see information about the change in the value of a typical home in the US over the last one year (2016) OR receive $1?

◉ see information ○ receive $1

Scenario 4:
Would you like to see information about the change in the value of a typical home in the US over the last one year (2016) OR receive $1.50?

◉ see information ○ receive $1.50

Scenario 5:
Would you like to see information about the change in the value of a typical home in the US over the last one year (2016) OR receive $2?

◉ see information ○ receive $2

Scenario 6:
Would you like to see information about the change in the value of a typical home in the US over the last one year (2016) OR receive $2.50?

◉ see information ○ receive $2.50

Scenario 7:
Would you like to see information about the change in the value of a typical home in the US over the last one year (2016) OR receive $3?

◉ see information ○ receive $3

Scenario 8:
Would you like to see information about the change in the value of a typical home in the US over the last one year (2016) OR receive $3.50?

◉ see information ○ receive $3.50

Scenario 9:
Would you like to see information about the change in the value of a typical home in the US over the last one year (2016) OR receive $4?

◉ see information ○ receive $4

Scenario 10:
Would you like to see information about the change in the value of a typical home in the US over the last one year (2016) OR receive $4.50?

◉ see information ○ receive $4.50

Scenario 11:
Would you like to see information about the change in the value of a typical home in the US over the last one year (2016) OR receive $5?

◉ see information ○ receive $5

BACK NEXT

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We would now like to ask you again about the future value of a typical home in the US **at the end of this year**.

Remember you will now have a chance of receiving **$100** for the accuracy of your forecast. There is roughly a 10% chance that you will be eligible to receive this prize. About 600 people are answering this question, of whom 60 will be randomly picked for this potential prize.

If you are picked, you will receive $100 if your forecast is within 1 percent of the actual median home value in the US in December 2017 (according to the Zillow Home Value Index).

Your payment will depend on your answer, so consider this question carefully. You will be informed at the end of the survey if you have been chosen for this potential prize.

NEXT

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Scenario 1 was picked at random for you.

You had chosen to receive information about the change in the value of a typical home in the US over the last one year (2016).

According to the Zillow Home Value Index, the value of a typical home in the US increased by 6.8% over the last one year (December 2015 - December 2016). That means a typical home in the US that currently has a value of **193,800** dollars would have had a value of **181,500** dollars in December 2015. If home values were to increase at a pace of 6.8% next year, that would mean that the value of a typical home would be **206,978** dollars in December 2017.

Earlier in the survey, you reported that you thought the value of the typical home in the US at the end of this year (in December 2017) would be 194,000 dollars.

We would now like to ask you again about the future value of a typical home in the US **at the end of this year**.

NEXT

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According to the Zillow Home Value Index, the value of a typical home in the US increased by 6.8% over the last one year (December 2015 - December 2016). That means a typical home in the US that currently has a value of **193,800** dollars would have had a value of **181,500** dollars in December 2015. If home values were to increase at a pace of 6.8% next year, that would mean that the value of a typical home would be **206,978** dollars in December 2017.

Earlier in the survey, you reported that you thought the value of the typical home in the US at the end of this year (in December 2017) would be 194,000 dollars.

We would now like to ask you again about the future value of a typical home in the US **at the end of this year**.

What do you think the value of the typical home in the US will be at the end of this year (in December 2017)?

Please enter a number in the box below.

[ ] dollars

NEXT

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According to the Zillow Home Value Index, the value of a typical home in the US increased by 6.8% over the last one year (December 2015 - December 2016). That means a typical home in the US that currently has a value of **193,800** dollars would have had a value of **181,500** dollars in December 2015. If home values were to increase at a pace of 6.8% next year, that would mean that the value of a typical home would be **206,978** dollars in December 2017.

Earlier in the survey, you reported that you thought the value of the typical home in the US at the end of this year (in December 2017) would be 194,000 dollars.

We would now like to ask you again about the future value of a typical home in the US **at the end of this year**.

What do you think the value of the typical home in the US will be at the end of this year (in December 2017)?

Please enter a number in the box below.

200000 dollars

*You said that you expect the value of a typical home in the US to be $200,000 at the end of this year. That is, you expect home prices to change by **3.20%** over the course of the year 2017.*

If not, please change your answer.

NEXT

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You estimated the value of the typical home in the US to be 200,000 at the end of this year (in December 2017). Now we want to ask you about how confident you are about this forecast.

What do you think is the percent chance (or chances out of 100) that the value of such a home **at the end of this year (in December 2017)** will be...

(Please note: The numbers need to add up to ***100****.)*

Less than 180,000 dollars		percent chance
Between 180,000 and 198,000 dollars		percent chance
Between 198,000 and 202,000 dollars		percent chance
Between 202,000 and 220,000 dollars		percent chance
More than 220,000 dollars		percent chance
TOTAL	0	

BACK NEXT

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It was ok to refer to other sources (such as Google, Zillow, etc.) when taking the survey. Did you use any such sources when answering any question in the survey?

Please select only one.

◯ Yes

◯ No

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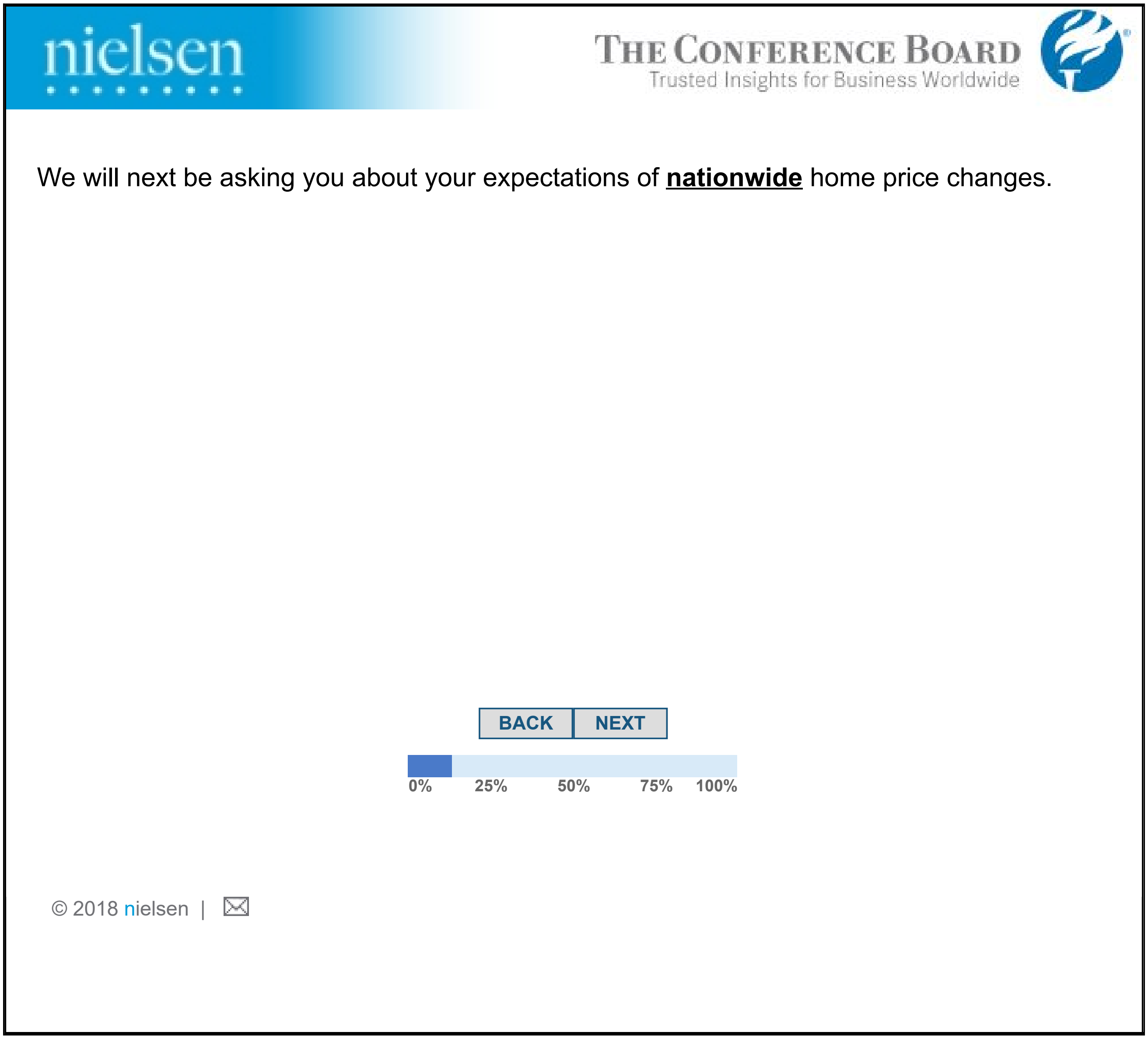
F Survey Instrument: Supplementary Study



As of December 2017, the value of the median or "typical" home in the US was **206,300** dollars (according to Zillow.com). Now, think about how the value of the typical home in the US has changed over time. (By value, we mean how much that typical home would approximately sell for.)

What do you think the value of such a home was

Please provide your best guess in each box below.

one year earlier (in December 2016)? ______ dollars

ten years earlier (in December 2006)? ______ dollars

How confident are you in your answers?

Please select only one.

Not at all confident		Somewhat confident		Very confident
1	2	3	4	5

BACK NEXT

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We would now like you to think about the **future** value of the typical home in the US. As mentioned earlier, according to Zillow.com, the value of the typical home in the US was **206,300** dollars as of December 2017.

What do you think the value of the typical home in the US will be **at the end of this year** (in December 2018)?

Please enter a number in the box below.

210000 dollars

*You said that you expect the value of a typical home in the US to be $210,000 at the end of this year. That is, you expect home prices to change by **1.79%** over the course of the year 2018.*

If not, please change your answer.

BACK NEXT

0% 25% 50% 75% 100%

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You estimated the value of the typical home in the US to be 210,000 dollars at the end of this year. Now we want to ask you about how confident you are about this forecast.

What do you think is the percent chance (or chances out of 100) that the value of such a home **at the end of this year (in December 2018)** will be...

*(Please note: The numbers need to add up to **100**.)*

Less than 189,000 dollars	0	percent chance
Between 189,000 and 207,900 dollars	10	percent chance
Between 207,900 and 212,100 dollars	80	percent chance
Between 212,100 and 231,000 dollars	10	percent chance
More than 231,000 dollars	0	percent chance
TOTAL	100	

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Earlier in the survey, we asked you to forecast the value of a typical home in the US at the end of this year. Later in this survey, we will ask you to do so again.

This time, we will reward the accuracy of your forecast: you will have a chance of receiving **$100**. There is roughly a 10% chance that you will be eligible to receive this prize: we will select at random 60 out of about 600 people answering this question. Then, those respondents whose forecast is within 1% of the actual value of a typical US home at the end of this year will receive $100.

Your payment will depend on your answer, so consider this question carefully. You will be informed at the end of the survey if you have been chosen for this potential prize.

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Before you report your forecast, you will possibly have the opportunity to see some information that may help you with forecasting future year-ahead US home prices.

If you had the choice of seeing one of the following two pieces of information, which one would you prefer to see?

I would prefer to see:

Please select only one.

- ○ The change in the value of a typical home in the US over the last one year (2017).
- ○ The change in the value of a typical home in the US over the last ten years (2008-2017).
- ○ Neither of the above -- I would not like to see any information

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You stated that your preferred information is about the change in home values over the last one year. If possible, would you additionally want to see information about the change in home values over the last ten years as well?

Please select only one.

- Yes, I would like to see this additional information.
- No, I would prefer not to see this additional information.

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We would now like to ask you again about the future value of a typical home in the US **at the end of this year**.

Remember you will now have a chance of receiving **$100** for the accuracy of your forecast. There is roughly a 10% chance that you will be eligible to receive this prize. About 600 people are answering this question, of whom 60 will be randomly picked for this potential prize.

If you are picked, you will receive $100 if your forecast is within 1 percent of the actual median home value in the US in December 2018 (according to the Zillow Home Value Index).

Your payment will depend on your answer, so consider this question carefully. You will be informed at the end of the survey if you have been chosen for this potential prize.

NEXT

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We will next inform you about the change in the value of a typical home in the US over the last one year.

According to the Zillow Home Value Index, the value of a typical home in the US increased by 6.5% over the last one year (December 2016 - December 2017). That means a typical home in the US that currently has a value of **206,300** dollars would have had a value of **193,700** dollars in December 2016. If home values were to increase at a pace of 6.5% next year, that would mean that the value of a typical home would be **219,710** dollars in December 2018.

Earlier in the survey, you reported that you thought the value of the typical home in the US at the end of this year (in December 2018) would be 210,000 dollars.

We would now like to ask you again about the future value of a typical home in the US **at the end of this year**.

What do you think the value of the typical home in the US will be at the end of this year (in December 2018)?

Please enter a number in the box below.

230000 dollars

Click here to view the official rules for the game.

*You said that you expect the value of a typical home in the US to be $230,000 at the end of this year. That is, you expect home prices to change by **11.49%** over the course of the year 2018.*

If not, please change your answer.

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You estimated the value of the typical home in the US to be 230,000 at the end of this year (in December 2018). Now we want to ask you about how confident you are about this forecast.

What do you think is the percent chance (or chances out of 100) that the value of such a home **at the end of this year (in December 2018)** will be...

*(Please note: The numbers need to add up to **100**.)*

Less than 207,000 dollars	0	percent chance
Between 207,000 and 227,700 dollars	5	percent chance
Between 227,700 and 232,300 dollars	90	percent chance
Between 232,300 and 253,000 dollars	5	percent chance
More than 253,000 dollars	0	percent chance
TOTAL	100	

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If you had been offered the opportunity to see the forecast of a panel of housing experts about year-end home prices before you reported your expectation, would you have chosen to do so (instead of seeing information about past home price changes)?

Please select only one.

- (•) Yes
- ( ) No

On a scale from 1 to 5, how strongly do you agree with the following statements:

Housing market experts can forecast future house price growth with high accuracy.

Please select only one.

- (•) 5 - Strongly agree: I think housing experts can definitely forecast prices with high accuracy.
- ( ) 4
- ( ) 3 - Neither agree nor disagree.
- ( ) 2
- ( ) 1 - Strongly disagree: I think housing experts can definitely NOT forecast prices with high accuracy.

In general, I trust the credibility of people referred to as experts.

Please select only one.

- (•) 5 -- Strongly agree: I generally trust the credibility of experts.
- ( ) 4
- ( ) 3 - Neither agree nor disagree.
- ( ) 2
- ( ) 1 -- Strongly disagree: I generally DON'T trust the credibility of experts.

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