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Home Price Expectations and Spending: Evidence from a Field Experiment

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Abstract

We conduct a field experiment with US households to study how expectations about long-run home price growth shape spending decisions. We exogenously vary survey respondents' expectations by providing different expert forecasts. Homeowners' spending, measured using rich home-scanner data, is inelastic to home price expectations. By contrast, renters reduce their spending when expecting higher home price growth. These patterns reflect positive endowment effects for owners from higher future wealth and negative income effects for both groups due to higher future housing costs. Our study highlights consequences of asset price growth and long-term expectations about the economy for household behavior.

Keywords: Consumption, Home prices, Expectations, Information, Homeowner, Renter
JEL codes: C93, D14, D83, D84, G51

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1 Introduction

Many countries have experienced large increases in home prices over the last decades, which contributed to rising wealth inequality (Fagereng et al., 2022; Piketty and Zucman, 2014). For instance, US home prices have increased by an average of 4.2% per year since 1990 (U.S. Federal Housing Finance Agency, 2024). Housing is the most important asset on households' balance sheet, and *realized* changes in its valuation have been shown to trigger spending responses (Aladangady, 2017; Sodini et al., 2023; Stroebel and Vavra, 2019). But how do households' expectations about *future* longer-run home price growth affect their consumption decisions? Answering this question is critical for understanding individual consumption behavior, the consequences of asset price growth, and the business cycle implications of swings in longer-term expectations about the economy.

Home price expectations might affect consumption spending through different channels (Berger et al., 2018): for owners, higher anticipated house price growth increases expected future wealth and lowers the likelihood of becoming collateral constrained, which may increase their current consumption. However, higher house prices also come with increases in purchasing prices of homes and rental costs. Anticipation of these higher costs may reduce current spending among renters and counteract potential increases in spending among owners – who will have to pay these costs too in case they decide to sell and realize their wealth gains. Lastly, changes in home price expectations could affect households' desired home size and the timing of home purchases and sales, which may affect consumption responses.

Identifying the causal effect of home price expectations on households' spending behavior is challenging for several reasons. First, home price expectations are often unobserved in datasets that contain information on spending. Second, when information on both variables is available, spending is typically self-reported and therefore measured with substantial error. Third, correlations between spending and expectations may not accurately capture underlying causal relationships due to omitted variables or measurement error in expectations.

To address these challenges, we conduct a field experiment with about 2,500 US households from the NielsenIQ Homescan panel in November 2019. These households use scanners provided by NielsenIQ to track their expenditures, which substantially reduces noise compared to self-reported measures. Our experiment relies on an information intervention embedded in a survey. We exogenously vary respondents' expected home price growth over the next ten years by randomly providing them with one of two forecasts. The information is based on actual forecasts made by different participants in a separate survey of economic experts from the US. Half of the respondents in our NielsenIQ sample receive a forecast predicting an average annual home price growth of 6% over the next ten years (*high forecast*), while the other half of the respondents receive a forecast of an average annual home price growth of 1.5% (*low forecast*). We then elicit posterior home price expectations both in the main survey and in a follow-up survey conducted

four weeks later. This setup allows us to link changes in home price beliefs to actual spending behavior over the months following the intervention as measured in the scanner data. Because the expert forecasts are randomized, the resulting evidence on the effect of home price expectations on spending is immune to concerns related to omitted variable bias or classical measurement error in expectations data.

We first confirm that the treatment has a significant effect on respondents' post-treatment home price expectations. Respondents in the *high forecast* treatment arm expect an average annual home price growth of 6.1%, while respondents in the *low forecast* treatment arm think that home prices will grow only by 4.7% per year. The wedge of 1.4 p.p. across treatment arms corresponds to a learning rate from the forecasts of one-third, and implies a 15% difference in expected home prices at the end of the ten-year horizon across the two groups. These changes in home price expectations persist in the four-week follow-up survey, mitigating concerns related to numerical anchoring or experimenter demand effects (Cavallo et al., 2017).

Next, we analyze households' spending responses to the exogenous shift in beliefs about long-run home price growth. Homeowners do not adjust their spending in the three months after the survey as measured in the scanner data in response to the treatment. The effects are statistically insignificant, small in size, and relatively precisely estimated. By contrast, renters reduce their spending by 7.1% when exposed to the high home price growth forecast instead of the low home price growth forecast. Scaling this effect by the first-stage effect on renters' home price expectations reveals that renters decrease their spending by 3.6% in response to a 1 p.p. higher expected annual home price growth. As the scanner data mainly cover spending on non-durables, we complement it with self-reported durable spending elicited in the follow-up survey. Renters that received the *high forecast* are less likely to purchase durable goods between the main and the follow-up survey, while homeowners do not adjust their durable spending. This suggests that the spending of renters, both on durable and nondurable goods, is elastic to beliefs about long-run home price growth, while homeowners' spending is inelastic on average.

We use a robustness experiment with about 3,400 US homeowners to rule out that owners' muted spending response is due to specific features of our original setting. The experiment is similar to our initial survey, but elicits spending on a richer set of categories not covered in the scanner data. The experiment shows that homeowners' spending on these categories is also inelastic to beliefs about home price growth.

Having established how home price expectations shape the consumption decisions of renters and owners, we explore the mechanisms behind our findings. We focus on the following key channels: (i) endowment effects from expected changes in the value of owned housing, (ii) income effects from changes in future rental prices and purchasing costs of homes, (iii) collateral effects from a relaxation of future collateral constraints, and (iv) endogenous adjustments to (planned) housing consumption in response to changes in home price expectations, including plans regarding the size of the future home or the timing of home sales and purchases.

We examine the role of endowment, income and collateral effects using additional post-treatment beliefs elicited in our main experiment. First, higher expected home price growth leads owners to expect higher wealth in the future, consistent with positive endowment effects. Second, both owners and renters increase their expectations about rental prices when exposed to the high home price forecast. Higher expected rental costs reflect a negative income effect – directly for renters, and indirectly for owners, who face renting as an outside option in case they decide to realize wealth gains by selling their current home. Thus, negative income effects from future housing costs could contribute to spending reductions among renters and to muted responses among owners. Third, we detect no adjustments in expected future borrowing constraints among homeowners in response to the change in their home price expectations. Thus, homeowners do not anticipate the empirically documented relaxation of collateral constraints in response to *realized* home price appreciations, which has been identified as a key mechanism linking realized home price changes to spending behavior (Aladangady, 2017). This lack of updating suggests that there is no change in homeowners' precautionary savings motives in response to changes in home price expectations, which may further contribute to owners' muted spending responses.

The relative importance of endowment and income effects should depend on households' plans regarding future home purchases and sales. We thus split our scanner sample according to a proxy for plans to purchase or sell a home in the future. Spending reductions among renters in response to higher home price beliefs are entirely driven by likely future home buyers – those who plan to move within the next ten years –, for which expected income effects should be the strongest. As these prospective buyers expect a higher purchase price of homes, they may face an increased need to save to be able to make the required down payment. Among owners, we find suggestive evidence that spending responses vary depending on plans to upscale or downscale housing in the future. Overall, the heterogeneity in spending responses is broadly consistent with differences in the relative strength of endowment and income effects across groups.

Using an additional data collection, we study channels that involve endogenous adjustments to housing in response to changes in home price expectations, which could be reflected in consumption responses. However, neither homeowners nor renters significantly change their expectations about the likelihood and timing of future home purchases and sales in response to exogenously higher home price expectations. Moreover, while homeowners do not change their expectations about home size, renters somewhat increase their expectations about the size of their next home when expecting higher long-run home price growth. This finding is consistent with an investment motive, which may lead renters to plan to purchase larger homes to benefit from the higher long-run return on housing. This would increase the required down payment renters need to save up for and could contribute to their negative consumption responses. The data from our additional experiment are less supportive of classical substitution effects away from housing towards non-housing consumption due to a change in relative prices, or of future home purchases being brought forward to secure lower prices.

We then conduct a back-of-the-envelope exercise to show that the size of renters' spending reductions in our field experiment is consistent with the channel for which we find most support: negative income effects from higher rental costs and higher costs of planned home purchases.

As an alternative way to shed light on the mechanisms, we directly measure households' reasoning about the consequences of future home price growth. In a tailored mechanism survey with an additional household sample from the US, we confront respondents with a hypothetical situation in which their beliefs about the long-run growth rate of home prices increase. We then ask them how this revision of their beliefs would affect the expected future economic situation of their household, and elicit the considerations underlying their response using an open-ended question. Among renters, two thirds report a worsening of their future economic situation in response to higher expected home price growth. Renters predominantly explain their response by referring to the increased cost of a planned future home purchase, followed by mentions of higher rental prices, both consistent with negative income effects. Among owners, reported changes in the economic outlook are more balanced across expecting an improvement, a worsening, or no change. A quarter of owners explain that changes in home price expectations do not matter for them, as they do not plan to move. This group of owners seems to perceive changes in their own housing wealth merely as "paper gains". Moreover, while many owners mention increases in the valuation of their current home, they often also refer to increased costs of purchasing a new home in the future. Thus, owners seem to be aware of the difficulty of realizing housing wealth gains when there is a need to find a replacement home, pointing to offsetting positive endowment and negative income effects. Considerations about changes in future collateral constraints are very rare among owners, suggesting no important role for collateral effects. We also find only a limited role for considerations involving endogenous adjustments to housing. Overall, these patterns in households' reasoning align with the evidence from our main experiment.

In the mechanism survey on households' reasoning we also directly elicit how households would adjust their current spending in response to the hypothetical increase in expected home price growth. Despite the different methodology, we confirm the results from our main experiment: a reduction in spending is the most frequent response among renters, while a large majority of homeowners report that they would not change their spending.

Our study builds on and contributes to several strands of the literature. First, a large literature has studied households' spending responses to realized home price changes (Aruoba et al., 2022; Campbell and Cocco, 2007; Deng et al., 2022; Mian and Sufi, 2011; Piazzesi and Schneider, 2016; Sodini et al., 2023). The estimated effects of realized home price changes on the spending of homeowners vary in size. While some studies document small positive elasticities (Aladangady, 2017; Andersen and Leth-Petersen, 2021; Attanasio et al., 2009; Browning et al., 2013; Guren et al., 2021; Paiella and Pistaferri, 2017), other studies detect larger and sometimes substantial responses (Disney et al., 2010; Kaplan et al., 2020a,b; Mian et al., 2013; Stroebel and Vavra,

2019; Vestman et al., 2023).[1] The effects are often concentrated among owners close to their collateral constraint (Aladangady, 2017; Aruoba et al., 2022; Browning et al., 2013; Christelis et al., 2021; DeFusco, 2018; Vestman et al., 2023). Relatedly, Ganong and Noel (2020) use mortgage modifications to show that liquidity rather than wealth is central to spending decisions. A related literature has documented small positive spending responses to realized changes in stock market wealth (Andersen et al., 2024; Chodorow-Reich et al., 2021; Di Maggio et al., 2020) – which differs from housing as this asset has no consumption aspect.

Only few studies have examined spending responses to realized home price changes among renters. Aladangady (2017) and Guiso et al. (2006) document insignificant negative effects of higher home prices on renters' spending, while Campbell and Cocco (2007) find a muted relationship for this group. Disney et al. (2010) document that young renters in the UK report somewhat higher active saving in response to home price appreciations. Deng et al. (2022) find negative effects of home price changes on automobile purchases by Chinese households that are likely renters. Stroebel and Vavra (2019) show that increases in local home prices are associated with increases in renters' spending, reflecting higher local retail prices.

Our paper is the first to directly isolate the causal effect of expected *future* home price developments on households' current spending decisions.[2] In contrast to realized home price changes, expected future home price appreciations have no detectable effect on owners' spending decisions. A potential reason behind this divergence is that households' expectations about future home prices do not directly affect their current collateral constraints. Instead, expected home price changes seem to matter largely through income effects from the expected future costs of home purchases and renting and endowment effects from expected housing wealth changes, leading to muted spending responses among homeowners and negative ones among renters. Compared to realized home price changes, expected future home price growth features additional channels operating through endogenous adjustments to the timing and size of future home purchases, e.g., due to changes in the attractiveness of housing as an investment vehicle or a desire to purchase while prices are still low. We find some evidence that renters expect to purchase larger homes when expecting higher long-run house price growth, consistent with an investment motive. Otherwise, our data suggest that these channels offset each other or are muted, e.g., by optimization frictions. Consistent with our findings, Binder et al. (2023) find that renters report lower non-durable spending in response to information about the future path of interest rates, which spills over and increases respondents' home price expectations.

Second, we contribute to a literature studying the formation and consequences of housing market expectations (Kuchler and Zafar, 2019; Kuchler et al., 2023; Li et al., 2023). Home price expectations affect households' choices regarding whether to rent or own (Adelino et al., 2018; Bailey et al., 2018), housing investment (Armona et al., 2019), home selling (Bottan and

[1] See Vestman et al. (2023) for an overview of effect sizes across studies.

[2] Qian (2023a,b) studies how subjective expectations about future home price growth are related to households' expected future spending growth, but does not look at effects on current spending.

Perez-Truglia, 2024), and mortgage leverage (Bailey et al., 2019). Our findings illustrate that expected home prices also shape non-housing outcomes: the spending decisions of renters.

Finally, our paper adds to a broader literature that uses information provision experiments to study the formation and consequences of macroeconomic expectations (Armantier et al., 2016; Binder and Rodrigue, 2018; Cavallo et al., 2017; Coibion et al., 2024, 2018, 2020, 2021c; D'Acunto et al., 2022; Haaland and Næss, 2023; Kumar et al., 2023; Laudenbach et al., 2023; Roth and Wohlfart, 2020). Only few studies have linked information experiments shifting beliefs with non-survey-based data on spending decisions (Coibion et al., 2021a, 2022; Galashin et al., 2021; Schnorpfeil et al., 2023), and these papers focus on inflation expectations. Our study is unique in that it investigates the effects of information about future home prices on spending as measured in high-quality scanner data.[3] Moreover, we demonstrate how one can use supplementary surveys with open-ended questions to better understand the behavioral mechanisms underlying findings obtained from information experiments and linked field data.

2 Experimental design and data

2.1 Baseline survey

In the following, we describe the baseline survey from our main experiment. The main survey instructions can be found in Appendix Section D.1.

Prior beliefs and information treatment We start by eliciting respondents' prior beliefs about the average annual growth rate of the value of a typical home in the US over the next ten years. Subsequently, we inform all respondents that they will receive a forecast of future home price growth from a US expert who regularly participates in the World Economic Survey (WES), an expert survey on macroeconomic forecasts.[4] We provide our respondents with one of two actual forecasts of different experts – a commonly used method to vary beliefs in a non-deceptive way (Haaland et al., 2023). A random half of the respondents are assigned to the *high forecast* treatment and receive the following message:

> *According to this expert forecast, the average annual growth rate of home prices in the US over the next ten years will be 6 percent. In the case where home prices increase by 6 percent in each of the next ten years, this would mean that a home worth $100,000 today will be worth about $179,085 in ten years from now.*

The other half of the respondents are assigned to the *low forecast* treatment and receive the following alternative message:

[3] An open question in these studies is why individuals are ex-ante misinformed about decision-relevant variables and therefore respond to information. This finding also holds outside macroeconomic contexts, such as the returns to different college majors (Wiswall and Zafar, 2015) or outside options in the labor market (Jäger et al., 2024).

[4] The WES was administered by the ifo Institute and gathered macroeconomic forecasts from experts worldwide. We included questions in its October 2019 wave. In 2022, the Economic Experts Survey (EES) replaced the WES.

According to this expert forecast, the average annual growth rate of home prices in the US over the next ten years will be 1.5 percent. In the case where home prices increase by 1.5 percent in each of the next ten years, this would mean that a home worth $100,000 today will be worth about $116,054 in ten years from now.

The additional information on the implied home value in ten years aims to shut down exponential growth bias in the perception of cumulative home price growth (Stango and Zinman, 2009).

A potential concern is that the treatment may not only shift beliefs about home price growth, but also beliefs about overall inflation. To reduce such side-effects, respondents in both arms subsequently receive an additional expert forecast (taken from the Philadelphia Fed's Survey of Professional Forecasters) that the average annual rate of inflation in the US over the next ten years will be 2.2%. In Section 3.1 we show that spillovers of the home prices forecasts to beliefs about other macroeconomic and personal outcomes seem to be of limited economic importance.

Post-treatment beliefs To study the effect of receiving the expert forecasts on respondents' beliefs, we subsequently elicit respondents' agreement with the statement "US home prices will increase strongly over the next ten years" on a five-point categorical response scale. We also include qualitative measures of respondents' beliefs about the development of rental prices as well as their own net wealth over the next ten years. To gauge quantitative differences in post-treatment home price expectations across treatment arms, we measure respondents' subjective probability distribution over different potential realizations of the average growth rate of a typical home in the US over the next ten years (Manski, 2004). Respondents assign probabilities to different bins of potential future home price growth, which are mutually exclusive and collectively exhaustive. For each respondent, we then derive the implied mean and standard deviation of their subjective distribution using the midpoints of the bins.[5] Appendix C.2 shows that our results are robust to constructing the moments in alternative ways, such as by fitting generalized beta distributions (Armantier et al., 2017), and to increasing the number of bins. Lastly, we elicit additional beliefs, such as beliefs about current and future borrowing constraints, as well as background characteristics, such as current homeownership status.

2.2 Follow-up survey

Four weeks after the baseline survey, we conduct a follow-up survey that neither repeats the treatment information nor provides any new information. We ask respondents about their households' purchases of durable goods during the time between the main and the follow-up survey, which allows us to examine treatment effects on a spending category for which the coverage in

[5]The eight bins are: "less than -20 percent," "between -20 and -10 percent," "between -10 and -5 percent," "between -5 and 0 percent," "between 0 and 5 percent," "between 5 and 10 percent," "between 10 and 20 percent," and "more than 20 percent." For the bins of "less than -20 percent" and "more than 20 percent" we use the values -30% and 30% when calculating the mean and standard deviation, respectively. We winsorize the implied moments at the 5^{th} and 95^{th} percentile.

the NielsenIQ Homescan data is less comprehensive. We also re-elicit respondents' home price expectations, which enables us to test for persistence of treatment effects on respondents' beliefs. The key instructions for the follow-up survey can be found in Appendix D.2.

2.3 Discussion of the experimental design

Long-run expectations In our experiment we focus on beliefs about the average growth of home prices over the next ten years – a horizon that should be relevant for most households planning to buy or sell a home in the future. On top of this, the ten-year horizon allows us to abstract from the empirically occurring pattern of mean reversion in home prices over horizons of two to five years, which some but not all respondents may anticipate (Armona et al., 2019). Formulating the belief elicitation and the information around a shorter horizon (e.g., 12 months) would thus complicate the interpretation of heterogeneous treatment effects across groups.

Active control design We use an active control group design, in which all respondents are provided with one of two different forecasts about future home price growth. An alternative, passive control group design would provide a treatment group with a forecast, while a control group receives no information. Compared to this alternative design, our design has two key advantages. First, receiving information may not only shift the level of respondents' beliefs but could also have side-effects, such as reducing respondents' subjective uncertainty or priming respondents on economic forecasts of experts. By providing all respondents with a forecast, such side-effects should be comparable across conditions in our design. Second, the identifying variation in the alternative design depends on the difference between the information and a respondent's prior. However, prior beliefs are not randomly assigned, which complicates the interpretation of heterogeneous treatment effects across groups. Moreover, given that priors are measured with error, treatment effects – which have to be estimated as a function of respondents' priors – will be attenuated. By contrast, the identifying variation in our design depends only on the difference in the signals across the two conditions, which is orthogonal to respondents' priors. A more detailed discussion of active control designs can be found in Haaland et al. (2023).

2.4 Data

We conduct our survey among members of the NielsenIQ Homescan (HMS) panel. The HMS panel consists of about 100,000 US household respondents who record their shopping expenditures using a scanner provided by NielsenIQ. We conduct additional data collections, which we introduce throughout the paper when relevant. Appendix Table A.1 provides an overview.

Sample The baseline survey was administered in November 2019. We exclusively recruited members of the NielsenIQ panel that indicated to be head of their household. 3,556 active panelists with any post-treatment spending records completed our survey, out of which 2,304

(65%) completed the four-week follow-up.[6] We apply a set of standard filters from previous literature to mitigate noise and focus on respondents with high-quality spending records. First, we exclude 566 respondents that drop out of the panel within three months after our main survey or have any missing spending records during our study period from August 2019 to February 2020 (Dubé et al., 2018). This mitigates concerns about attrition bias as households report a lower spending share before dropping out of the panel (Neiman and Vavra, 2023). We next exclude 70 respondents who indicate to neither own nor rent. Following Coibion et al. (2022), we drop respondents with low levels of pre-treatment spending, excluding another 57 respondents who spend less than $60 a month on food on average in the three months before the treatment. Finally, a pervasive concern in online surveys is that some respondents may not take the survey seriously and just quickly click through the questions. We therefore drop 347 individuals who spend not more than five seconds on the treatment screen. These steps leave a final sample of 2,516 respondents for the baseline survey, out of which 1,678 form the follow-up sample.

Spending data Our key outcome variable is respondents' consumption expenditure as measured using the scanner data. Compared to self-reported spending data, the core advantage of scanner data is that it is immune to biases in households' recall of their own expenditures (Bound et al., 2001; Browning et al., 2003). The dataset includes high-frequency data on monthly purchases at the Universal Product Code (UPC) level, indicating the price, quantity, and date of purchase. The products recorded in the dataset include food and non-food groceries, personal care and health products, and general merchandise products from different retail channels (see Appendix Table A.3). The consumption measure that can be constructed from the scanner data therefore consists primarily of retail spending on nondurable goods. Previous literature has documented that the types of spending covered in the scanner data are elastic to realized home price changes (Kaplan et al., 2020b; Stroebel and Vavra, 2019), tax rebates (Broda and Parker, 2014), inflation expectations (Coibion et al., 2021a, 2022), unemployment experiences (Malmendier and Shen, 2024) and media exposure (Chopra, 2021), suggesting that the data are well-suited to study our research question. Nevertheless, we complement the scanner data with self-reported data on durable goods purchases collected in the follow-up survey.

Summary statistics Appendix Table A.4 provides summary statistics of our final sample, including population benchmarks from the 2019 American Community Survey (ACS). Our sample closely resembles the population in terms of household income ($79,058 in our sample vs. $81,918 in the population) but is somewhat more likely to be employed (72% of our sample are employed vs. 62% in the population). The most important difference is a 16 p.p. higher share of women, reflecting the allocation of grocery shopping within many households (D'Acunto et al., 2021). Another difference is a higher share with a college degree (47% in our sample vs. 31% in the population) – a common feature of online panels (Armantier et al., 2017). Our respondents are on average older than the general population, in particular the renters (51 in our

[6] In both baseline and follow-up survey, attrition does not differ across treatments (Appendix Table A.2).

sample vs. 42 in the general population), which likely contributes to the lower share of renters in our sample (18%) than in the population (32%). The composition of our sample reflects commonly known features of the NielsenIQ data. Discrepancies with the general population have to be weighed against the unique advantages associated with having precisely measured, non-self-reported spending data. The fact that NielsenIQ panel members respond similarly to income shocks or belief changes (Broda and Parker, 2014; Coibion et al., 2022) and exhibit overall similar spending patterns (Coibion et al., 2021b) as respondents in more representative surveys mitigates concerns regarding the sample composition.

Integrity of randomization Appendix Table A.5 presents balance tests to assess the integrity of the randomization into the two treatments. Baseline expenditures as measured in the scanner data are balanced in levels (and in logs) in the pooled sample ($p = 0.730$) and among homeowners ($p = 0.986$) and renters ($p = 0.862$), respectively. A joint F-test cannot reject balance across a broad set of covariates ($p = 0.926$). To improve statistical precision, we include a set of control variables in all specifications comparing levels of variables across treatment arms.[7] Appendix Figure A.1 presents the cumulative distribution of average monthly expenditures in the quarter prior to our baseline survey. The distribution is virtually indistinguishable across treatment arms, both among owners (Panel A) and among renters (Panel B).

3 Main results

3.1 Home price expectations

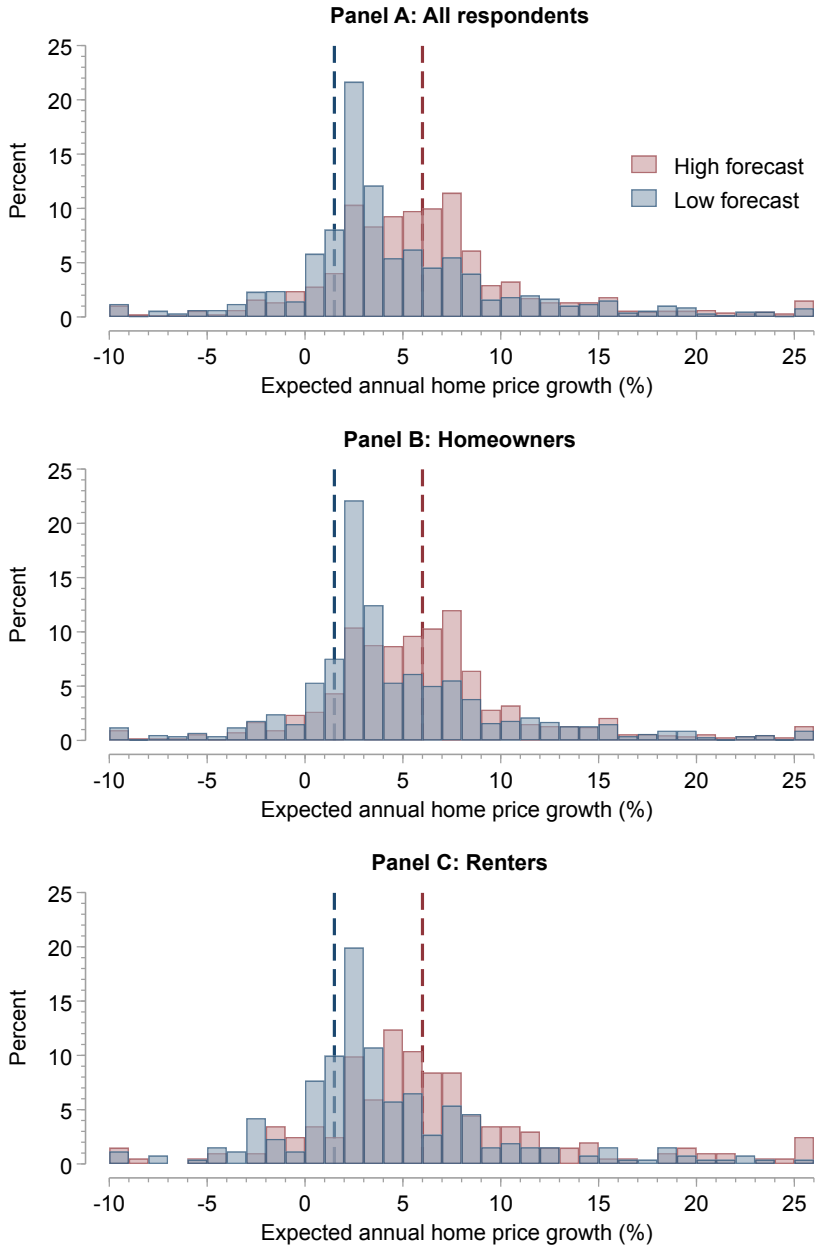
We start by analyzing the first-stage effects of our treatment on respondents' home price beliefs.

Pre-treatment beliefs Panel A of Appendix Figure A.2 displays the distribution of prior point expectations about average annual home price growth over the next ten years, winsorized at the 95$^{\text{th}}$ percentile. There is a substantial amount of disagreement across respondents and, on average, respondents expect home prices to increase by 8.4% per year (median: 5%). Thus, the signals from the expert forecasts provided in the two treatment arms (1.5% and 6%) both imply weaker home price growth than expected by the average respondent. Panel B shows that the distribution of prior expected home price growth is somewhat shifted to the right among renters compared to homeowners. Appendix C.3 examines correlates of how closely aligned a respondent's home price expectation is with the average expert forecast.

Post-treatment beliefs Figure 1 displays histograms of post-treatment beliefs about average annual home price growth as measured by the means of respondents' subjective probability

[7] The control variables are: gender, age, log household income, prior home price expectations, household size, and indicators for full-time employment, having a college degree or a higher level of education, race, ethnicity, region, presence of children and being a homeowner. The results are robust to not controlling for these variables.

Figure 1: Posterior beliefs about future home price growth



Note: This figure plots the distribution of respondents' beliefs about average annual home price growth over the next ten years as captured by the means of their subjective probability distributions, using data from the baseline survey of our main experiment. Panel A shows the distribution in the full sample, while Panels B and C are restricted to homeowners and renters, respectively. Each panel displays the distribution separately for respondents in the *high forecast* and the *low forecast* treatment arm. The mean of respondents' subjective probability distribution is winsorized at the 1st and 99th percentile of the full sample for ease of visualization. The dashed vertical lines indicate the low and the high home price forecast provided to respondents as part of the information treatment.

distributions. The figure highlights that, within each treatment arm, beliefs are shifted towards the provided expert forecast. As a result, the distribution of posteriors in the *high forecast* arm first-order stochastically dominates the distribution of posteriors in the *low forecast* arm.

Table 1 quantifies the first-stage effects of our treatment on respondents' beliefs about future home price growth. Specifically, we regress different measures of respondents' beliefs on a dummy variable taking value one if a respondent was randomly assigned to the *high forecast* arm, and zero otherwise, as well as our baseline set of controls. Panel A focuses on the full sample. Being exposed to the high forecast increases respondents' posterior expectations about average annual home price growth over the next ten years by 1.4 p.p. on average (Column 1, $p < 0.01$). Thus, our treatment generates a difference in posterior beliefs of one third of the difference in signals across the two arms ($6\% - 1.5\% = 4.5\%$).[8] This learning rate lies in the middle of the range of learning rates estimated in previous information provision experiments on macroeconomic expectations (Haaland et al., 2023). The wedge of 1.4 p.p. across treatments implies a 15% difference in expected home prices at the end of the ten-year horizon.[9]

Our treatment has no significant effects on respondents' perceived uncertainty of future home price growth as measured by the standard deviation of a respondent's subjective probability distribution (Column 2). This suggests that our active control group design, where every respondent receives a forecast, generates clean exogenous variation in beliefs about future home prices, holding constant potential side-effects of information provision such as a reduction in uncertainty. Our treatment variation also changes respondents' agreement with a qualitative statement that house prices will increase strongly over the next ten years by 33% of a standard deviation (Column 3, $p < 0.01$). Panels B and C present first-stage estimates separately for homeowners and for renters. While our treatment has somewhat larger effects on home price expectations among renters, differences across groups are not statistically significant.

Persistence and cross-learning There are two potential concerns with our first-stage evidence. First, respondents may unconsciously anchor on the provided numerical information. Second, respondents might guess the experimental hypothesis and try to conform with it. In both cases, changes in reported expectations would not reflect actual changes in beliefs. We address these concerns using data from the four-week follow-up. Since numerical anchoring is a short-lived phenomenon by definition, and since respondents are less likely to remember the exact details of the treatment information, concerns related to numerical anchoring or demand effects should be mitigated in the follow-up (Cavallo et al., 2017). Reassuringly, respondents in the *high forecast* arm still expect a 1.1 p.p. higher home price growth than those in the low forecast arm four weeks after the intervention (Appendix Table A.6, Column 1, $p < 0.01$).[10]

We also use the follow-up survey to shed light on cross-learning, i.e., the possibility that

[8] Appendix Section C.1 examines whether respondents' learning is consistent with Bayesian updating.

[9] Appendix A.3 illustrates learning from the expert forecasts with a binscatter plot of post-treatment against pre-treatment home price expectations by treatment arm. Treatment effects on posterior home price expectations seem to be driven by those with lower prior home price expectations.

[10] In the baseline survey we elicit probabilistic home price expectations, while the follow-up elicits point forecasts. This implies that the estimated magnitudes of treatment effects are not directly comparable across survey waves. In Section 3.2.3 we use a robustness experiment with identical measurement in both waves and show that treatment effects on expected home and rental price growth persist at about two-thirds of their original size.

Table 1: Treatment effects on beliefs about future home price growth

	Dependent variable: Expected home price growth		
	Quantitative measure		Qualitative measure
	(1)	(2)	(3)
	Mean of distribution (%)	Std. dev. of distribution (%)	House prices will increase strongly (z-scored)
Panel A: All respondents			
High forecast	1.383***	0.169	0.328***
	(0.190)	(0.216)	(0.036)
N	2,516	2,516	2,516
R^2	0.036	0.129	0.072
Mean in low forecast arm	4.682	7.707	-0.000
Controls	Yes	Yes	Yes
Panel B: Homeowners			
High forecast	1.263***	0.116	0.312***
	(0.209)	(0.236)	(0.040)
N	2,053	2,053	2,053
R^2	0.032	0.138	0.068
Mean in low forecast arm	4.782	7.535	-0.022
Controls	Yes	Yes	Yes
Panel C: Renters			
High forecast	1.966***	0.466	0.424***
	(0.468)	(0.542)	(0.086)
N	463	463	463
R^2	0.078	0.107	0.101
Mean in low forecast arm	4.302	8.360	0.084
Controls	Yes	Yes	Yes

Note: This table presents regression estimates of the treatment effect of receiving a *high forecast* (6%) rather than a low forecast (1.5%) about average annual home price growth over the next ten years on home price expectations, using data from the baseline survey of our main experiment. The dependent variables are the mean and standard deviation of a respondent's subjective probability distribution over average annual home price growth over the next ten years (Columns 1 and 2) and a respondent's z-scored agreement with the statement that "US home prices will increase strongly over the next ten years" (Column 3). Panel A uses the full sample, while Panels B and C are restricted to homeowners and renters, respectively. All regressions control for gender, age, log household income, prior home price expectations, household size and indicators for employment, having a college degree or above, race, ethnicity, region, and children. The regressions in Panel A also control for homeownership. Robust standard errors are shown in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

respondents update beliefs about other macroeconomic or personal economic outcomes in response to the house price forecasts. Cross-learning is a mechanism that can in principle operate in any information provision experiment (Haaland et al., 2023) and could also matter in real-world situations in which respondents learn about future home prices. Nevertheless, cross-learning can complicate the interpretation of treatment effects on spending behavior.

We find some updating of beliefs about future inflation in response to the treatment (Appendix

Table A.6, Column 3, $p < 0.01$), although the effect is substantially smaller than the effect on expected home price growth.[11] Expected inflation should influence consumption mainly through (opposing) real income effects and intertemporal substitution, so changes in inflation expectations have to be viewed in connection with updating about nominal income and interest rates. Receiving the high forecast insignificantly increases respondents' expected labor income growth (Column 4, $p = 0.401$) and expected interest rates on saving accounts (Column 5, $p = 0.096$), muting the reductions in expected real income and real interest rates from higher expected inflation. Our treatment has moderate effects on expected real GDP growth (Column 6, $p = 0.016$), and no strong effects on expected stock market returns (Column 7, $p = 0.150$). Thus, consumption changes due to spillovers to other expectations should be limited. Appendix Section C.4 discusses cross-learning in more detail and provides a subsample analysis for homeowners and renters.

3.2 Spending behavior

We next turn to the effects of the expert forecasts on respondents' spending behavior.

3.2.1 Non-durable spending

We start by analyzing treatment effects on non-durable spending as measured in the scanner data. For this analysis we focus on the period from August 2019 to February 2020, covering three months before and after the treatment was administered in November 2019. We estimate the following two-way fixed effects model on our monthly panel of NielsenIQ households:

$$\text{Log expenditures}_{i,t} = \beta\ \text{High forecast}_i \times \text{Post}_t + \tau_i + \mu_t + \varepsilon_{i,t}, \tag{1}$$

where $\text{Log expenditures}_{i,t}$ indicates the log of respondent i's total household expenditure in month t. High forecast_i is a dummy variable taking value one for respondents exposed to the high home price growth forecast, and zero otherwise. Post_t is a dummy variable taking value one for the month when the survey was administered – November 2019 – and all following months, and zero otherwise. τ_i and μ_t are respondent and month fixed effects. Robust standard errors clustered at the respondent level are reported and used for inference throughout the analysis.

Table 2 presents the treatment effects on expenditures measured in the scanner data.[12] Being exposed to the *high forecast* causes an insignificant reduction in expenditures by 1.4% in the full sample (Column 1, $p = 0.265$). Among homeowners, the treatment effects are very close to zero (Column 2, $p = 0.879$) and relatively precisely estimated. The upper 95%-confidence band for the effect on owners is a spending increase of 2.6%. However, receiving the *high forecast* significantly reduces renters' spending by 7.1% (Column 3, $p = 0.020$) – an effect corresponding to 11% of the cross-sectional variation of monthly household spending. The difference in

[11] This suggests that also spillovers to expected future moving costs are limited.

[12] Appendix Figure A.4 plots the distribution of post-treatment average monthly spending across treatment arms.

Table 2: Treatment effects on monthly scanner expenditures

	Dependent variable: Log expenditures		
	(1) All respondents	(2) Homeowners	(3) Renters
High forecast x Post	-0.014	-0.002	-0.071**
	(0.013)	(0.014)	(0.030)
	[0.265]	[0.879]	[0.020]
N	17,612	14,371	3,241
Households	2,516	2,053	463
R^2	0.717	0.712	0.726
Household FEs	Yes	Yes	Yes
Month FEs	Yes	Yes	Yes

Note: This table presents two-way fixed effects regression estimates of the treatment effect of receiving a *high forecast* (6%) rather than a low forecast (1.5%) about average annual home price growth over the next ten years on spending. The dependent variable is the log of monthly expenditures measured in the scanner data. "High forecast x Post" is the interaction between a binary indicator taking value one for respondents in the *high forecast* treatment arm and a binary indicator taking value one for the month a respondent participated in the baseline survey and for all following months. All regressions include household and month fixed effects and include observations from the three months before and the three months after a respondent participated in the baseline survey. Column 1 presents estimates for the full sample, while Columns 2 and 3 present estimates for homeowners and renters, respectively. Robust standard errors clustered at the respondent level are shown in round parentheses, while p-values are shown in square brackets.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

treatment effects between owners and renters is statistically significant ($p = 0.033$). Putting the estimate among renters in relation to the corresponding first-stage estimate shown in Column 1 of Panel C of Table 1, renters reduce their spending by 3.6% for a one p.p. increase in expected average annual home price growth over the next ten years. We obtain similar estimates using a two-stage least-squares approach, as shown in Column 3 of Appendix Table A.7 ($p = 0.042$). Taken together, renters' non-durable spending negatively responds to changes in expected home price growth, while owners' spending seems to be inelastic to these expectations.

In Appendix C.5 we discuss the magnitudes of our estimated effects against the backdrop of previous literature. First, the elasticity of renters' spending to home prices in ten years implied by our estimates is -0.34. This is a noticeable magnitude compared to elasticities of realized home price changes estimated in previous literature for both renters and owners. Second, we show that our estimates are comparable to estimated effects of beliefs about other macroeconomic variables on spending. In Section 4.3, we present a back-of-the-envelope calculation suggesting that our estimated effect size for renters is plausible after carefully accounting for the main mechanisms at play.

Robustness Our results are robust to a variety of checks. Appendix Table A.8 shows that we obtain similar estimates when performing the above analysis at the household-month-product category level. Appendix Table A.9 demonstrates robustness to using more restrictive criteria on regular spending records in the NielsenIQ panel, to excluding households with extreme levels of

baseline expenditure, to replacing month and individual fixed effects with a post and a treatment group dummy, and to restricting the sample period to one instead of three months before and after the treatment. Appendix Table A.10 shows that we obtain similar estimates if we extend the sample period. Lastly, Appendix Table A.11 shows that spending adjustments among renters are – if anything – stronger for non-food categories.

To shed light on the timing of treatment effects, Appendix Figure A.5 presents dynamic treatment effects on monthly scanner expenditures, derived from an event study with a balanced panel of households. The sample spans the period from three months before to six months after respondents participated in the main survey in November 2019. Reassuringly, there are no significant pre-treatment differences in levels or trends. Moreover, the event study corroborates that homeowners are unresponsive to changes in home price expectations. For renters, treatment effects gradually increase in size until the third month post-treatment, after which they gradually diminish to close to zero between the fourth and sixth months following the intervention. While the disaggregated nature of the event study reduces power, Appendix Table A.12 presents analogous dynamic treatment effects for two-month bins that increase the statistical precision of our estimates. This exercise confirms the patterns detected in the event study.

3.2.2 Durable good purchases

We now turn to adjustments in respondents' spending on durables over the four weeks following the intervention, as reported by respondents in the follow-up. In Table 3 we regress a dummy for whether the respondent purchased any durable goods on a dummy indicating whether the respondent received the high home price forecast and our baseline set of controls. We detect no significant adjustments in the tendency to purchase durable goods in the full sample (Column 1) or among homeowners (Column 2). However, renters are about 12 p.p. less likely to report any durable good purchase when exposed to the *high forecast* (Column 3, $p = 0.028$). This effect is sizable, given that 36% of renters in the *low forecast* arm purchased at least one durable good. The patterns for durables thus resemble the results for non-durables: renters reduce their spending when expecting higher home price growth, while owners' spending is unaffected.

3.2.3 Robustness experiment

Our result that homeowners do not adjust their spending in response to the treatment could reflect specific features of our setup rather than an actual inelasticity of their spending to home price expectations. First, it could be the case that the scanner data cover the wrong spending categories or that our self-reported measure of durable spending is too coarse. Second, moderate cross-learning about inflation but not nominal income – somewhat reducing expected real income – could offset owners' potential positive spending response to higher home price expectations. We address both of these concerns with an additional experiment on a sample of US homeowners.

Table 3: Treatment effects on durable good spending as self-reported in the follow-up survey

	Dependent variable: Any durable good purchase (binary)		
	(1) All respondents	(2) Homeowners	(3) Renters
High forecast	0.008	0.037	-0.115**
	(0.024)	(0.027)	(0.052)
	[0.749]	[0.170]	[0.028]
N	1,678	1,358	320
R^2	0.024	0.018	0.058
Mean in low forecast arm	0.379	0.383	0.364
Controls	Yes	Yes	Yes

Note: This table presents regression estimates of the treatment effect of receiving a high forecast (6%) rather than a low forecast (1.5%) about average annual home price growth over the next ten years on durable good spending self-reported in the follow-up survey of our main experiment. Column 1 presents estimates for the full sample, while Columns 2 and 3 present estimates for homeowners and renters, respectively. "High forecast" is a binary indicator taking value one for respondents assigned to the *high forecast* treatment arm. The dependent variable is a binary indicator for reporting to have made any durable good purchases in the past four weeks. All regressions include the set of controls described in detail in Table 1. Robust standard errors clustered at the respondent level are shown in round parentheses, while p-values are shown in square brackets.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Compared to our main experiment, we elicit spending on a richer set of categories and supplement the provided expert forecasts with specific narratives to reduce the scope for cross-learning.

Sample We conducted this experiment in the US in August and September 2023. We recruited respondents on Prolific, a provider widely used in social science research (Eyal et al., 2021). We proceed in three waves. In an initial screener survey, we recruit 10,043 respondents and measure their homeownership status. We re-invite the 4,917 owners identified in the screener survey to participate in the baseline survey, which is completed by 3,366 of them. All respondents from the baseline survey are re-invited to participate in a four-week follow-up. 2,804 respondents complete the follow-up, which implies a relatively high re-contact rate of 83%. There is no differential attrition between baseline and follow-up across treatment arms ($p = 0.790$). Appendix Table A.13 displays summary statistics for the sample that completed the baseline survey. The key instructions for the three waves are in Appendix Sections D.3, D.4 and D.5.

Design In the baseline survey, we provide respondents with different forecasts about the future development of home prices, closely following the main design presented in Section 2.1. A random half of the respondents are assigned to the *low forecast* arm and receive an expert forecast predicting an average annual home price growth over the next ten years of 2%. The other half are assigned to the *high forecast* arm and receive a forecast of an average home price growth of 6%. To increase control over potential cross-learning, we cross-randomize our respondents into receiving one of two different narratives associated with the provided expert forecast. In particular, half of the respondents learn that the expert cited demographic trends in the US (e.g., age structure or population growth) – a demand-side factor – as a main factor underlying

their forecast about home price growth. The other half of the respondents receive an expert forecast citing housing supply constraints (e.g., regulation or the current housing stock) as a main factor underlying their forecast. Both of these narratives attribute home price growth to developments inside the housing market and should make it less likely than in our main experiment that respondents attribute changes in home price growth to changes in the overall economy, such as changes in inflation. The expert forecasts and the associated narratives are based on actual expert responses to a tailored module included in the June 2023 wave of the ifo Institute's Economic Expert Survey. As in our main experiment, all respondents subsequently receive a forecast that average inflation over the next ten years will be 2%, which is taken from the Survey of Professional Forecasters. We then elicit a series of qualitative and quantitative expectations about home price growth and other variables.

In the follow-up survey, we elicit whether respondents purchased a rich set of major items not covered in the scanner data in the previous four weeks, specifically: houses and apartments; cars and other vehicles; major household appliances and furniture; electronic equipment; luxury items; machinery, tools, and sports equipment; as well as major vacations. We further measure households' spending on food consumed away from home (including restaurant visits). At the end of the survey, we also re-elicit the main expectations measured in the baseline survey. Different to our main experiment on the NielsenIQ sample, we use identical measurement of expectations in both waves, which allows us to quantify the persistence of belief changes.

Results Appendix Table A.14 presents results on the effects of the expert forecasts on respondents' expectations. Respondents in the *high forecast* arm expect 1.8 p.p. higher average annual home price growth over the next ten years (Column 1 of Panel A, $p < 0.01$), corresponding to a learning rate of $1.8/(6-2) = 0.45$. Receiving the *high forecast* also increases respondents' expectations about rental prices (Column 2, $p < 0.01$). As in our main experiment, we only observe minor effects on respondents' interest rate expectations (Column 3, $p = 0.090$). Unlike in our main experiment, we do not detect any changes in respondents' inflation expectations (Column 4, $p = 0.923$), suggesting that the narratives provided alongside the expert forecasts successfully prevent respondents from attributing higher home price growth to higher general levels of inflation. At the same time, receiving the *high forecast* somewhat increases respondents' expected labor income growth (Column 5, $p < 0.01$). Panel B illustrates that whether respondents receive a supply-side or a demand-side narrative does not directly affect their expectations and that the effects of the forecasts do not depend on which of the two narratives is provided. Panel C highlights that changes in expectations in response to the treatment persist at a reduced size (about two-thirds for expected home price growth and expected rental price growth) in the follow-up survey, four weeks after the intervention. Overall, our design attributing home price forecasts to developments in housing demand or supply appears to substantially alter cross-learning compared to our main experiment: instead of expecting lower real income (due to higher inflation), respondents in the *high forecast* arm now expect somewhat higher real income

(due to higher nominal income).

Appendix Table A.15 presents results on spending decisions as measured in the follow-up, focusing on the extensive margin for spending on major items and on log total expenditures for spending on food consumed outside the home. The treatment does not significantly change owners' tendency to exhibit non-zero combined spending across all major items included in our survey, nor their tendency to purchase any individual of the major items, or their spending on food away from home. Thus, despite focusing on a wide range of spending categories not covered in the scanner data and despite a substantially different nature of cross-learning about future real income, homeowners' spending remains inelastic to changes in home price expectations.

4 Mechanisms

In this section, we shed light on the mechanisms behind the heterogeneous effects of home price expectations on the spending decisions of homeowners and renters. We largely focus on the mechanisms that are at play in the incomplete markets model by Berger et al. (2018) and adopt their terminology.

4.1 Endowment effects, income effects, and collateral effects

A first component of households' spending responses to (expected) home price growth are endowment effects: owners increase their current spending to smooth anticipated future wealth gains. A second component are income effects: higher house prices are associated with higher purchasing prices of homes and higher rental costs. The anticipation of such changes in housing costs could increase households' prospective cost of living and lead to reductions in current consumption spending. This effect should operate among renters but also among owners, who would require a replacement home in case they decide to realize their housing wealth gains. In models without borrowing constraints and no endogenous upscaling or downscaling of housing, these would be the only effects operating (Buiter, 2010; Glaeser et al., 2000; Sinai and Souleles, 2005). They would result in a muted spending response to expected home price increases among owners and a negative one among renters, consistent with our evidence.

Richer models with income uncertainty and borrowing constraints include collateral effects as a third component: higher home prices relax collateral constraints among owners. These collateral effects seem to be the main channel through which *realized* home price changes affect spending (Aladangady, 2017; Christelis et al., 2021; Ganong and Noel, 2020). Unlike realized home price changes, changes in expected *future* home price growth generated by our treatments do not affect households' actual current borrowing constraints. However, homeowners (and those who expect to own in the future) may update their beliefs about future borrowing constraints.

Table 4: Channels behind the effects of home price expectations on spending: Theoretical predictions and empirical evidence

	Predicted effect on consumption		Channel supported in our data	
	(1) Homeowners	(2) Renters	(3) Homeowners	(4) Renters
Endowment effects	+	0	✓	✓
Income effects	–	–	✓	✓
Collateral effects	+	(+)		
Substitution effects	+	+		
Investment channel	–	–		(✓)
Purchase timing	0	–		

Note: This table presents an overview of different theoretical mechanisms that could be driving effects of expected home price changes on current spending. It displays theoretical predictions for the direction in which a given channel should affect the spending of owners (Column 1) and renters (Column 2), and whether we find evidence consistent with the channel in our data (Columns 3 and 4).

Similarly, if homeowners revise their beliefs about the current home price expectations of lenders, this may translate into lower perceived current borrowing constraints. These changes in beliefs about collateral constraints could reduce current precautionary savings motives. Columns 1 and 2 of Table 4 summarize the theoretical predictions of the different channels.

Updating about future wealth, rental prices, and collateral constraints We start by examining changes in beliefs about future wealth, future rental prices and collateral constraints by estimating treatment effects on a set of qualitative beliefs included in our baseline survey. These beliefs are measured on 5-point or 7-point categorical response scales and are z-scored using the sample mean and standard deviation in our analysis.

First, respondents exposed to the *high forecast* are 7.7% of a standard deviation more optimistic about the development of their households' net wealth over the next ten years (Table 5, Column 1, Panel A, $p = 0.042$). Although this mostly reflects updating among owners (Panel B, 8.7% of a standard deviation, $p = 0.035$), also renters slightly increase their expectations about future net wealth, though not significantly so (Panel C, 3.6% of a standard deviation, $p = 0.695$). For owners, these results suggest that respondents understand that higher home price growth increases the value of their assets. For renters, these results suggest that many renters plan to accumulate more wealth, potentially to be able to still afford a home despite higher home prices.

Second, respondents increase their expectations about future rental prices by 17.7% of a standard deviation in the full sample (Table 5, Column 2, Panel A, $p < 0.01$). The effect is almost twice as large among renters (Panel C, 31.3% of a standard deviation, $p < 0.01$) than among owners (Panel B, 15.8% of a standard deviation, $p < 0.01$), which may reflect a differential understanding of the link between home prices and rental prices (Kindermann et al., 2022).

Table 5: Treatment effects on expected rental prices, borrowing constraints, and net wealth

	Dependent variable:			
	(1) Expected change in net wealth	(2) Agree: Rental prices will increase strongly	(3) Perceived ease of borrowing now	(4) Expected ease of borrowing in ten years
Panel A: All respondents				
High forecast	0.077**	0.177***	0.006	0.008
	(0.038)	(0.039)	(0.035)	(0.036)
N	2,516	2,516	2,516	2,516
R^2	0.119	0.032	0.228	0.173
Controls	Yes	Yes	Yes	Yes
Panel B: Homeowners				
High forecast	0.087**	0.158***	-0.014	0.003
	(0.041)	(0.043)	(0.038)	(0.040)
N	2,053	2,053	2,053	2,053
R^2	0.120	0.030	0.186	0.167
Controls	Yes	Yes	Yes	Yes
Panel C: Renters				
High forecast	0.036	0.313***	0.055	-0.001
	(0.093)	(0.099)	(0.097)	(0.092)
N	463	463	463	463
R^2	0.118	0.054	0.185	0.200
Controls	Yes	Yes	Yes	Yes

Note: This table presents regression estimates of the treatment effect of receiving a high forecast (6%) rather than a low forecast (1.5%) about average annual home price growth over the next ten years on expectations about various outcomes, using data from the baseline survey of our main experiment. The dependent variable in Column 1 is respondents' expected change in their household's total net wealth over the next ten years measured on a 7-point Likert scale. The dependent variable in Column 2 is respondents' agreement with the statement that "rent on homes/apartments in the US will increase strongly over the next ten years" measured on a 5-point Likert scale. The dependent variables in Columns 3 and 4 are respondents' perceived ability to obtain a $1,000 loan either now or in 10 years from now, measured on 5-point Likert scales. All dependent variables are z-scored using the mean and standard deviation in the full sample. Panel A uses the full sample, while Panel B and C restrict to homeowners and renters, respectively. All regressions include the set of controls described in detail in Table 1. Robust standard errors are shown in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Third, in our baseline survey we elicit how difficult our respondents would find it to take out a $1,000 loan to finance a car repair (i) currently and (ii) in ten years from now. As shown in Columns 3 and 4 of Table 5, we detect virtually no changes in respondents' perceived current or future borrowing constraints in response to the treatment, neither in the full sample (Panel A), nor among homeowners (Panel B) or renters (Panel C).[13]

[13]Moreover, we would expect spending responses to changes in expected future home prices to be driven by currently unconstrained households. In unreported regressions we found no differences in treatment effects according to proxies for current constraints (income, financial assets, net wealth). Given that these variables contain many missings, as NielsenIQ does not allow to force participants to respond to survey questions, and given that

Heterogeneity in spending adjustments Endowment and income effects predict heterogeneity in spending responses. For prospective net buyers of housing, the negative income effects from higher purchasing prices of homes should outweigh any positive endowment effects from a higher value of owned housing. Conversely, for prospective net sellers of housing, the positive endowment effects should outweigh the negative income effects.

To examine heterogeneity in spending responses, we first split our samples of owners and renters into subgroups of likely future buyers and sellers of housing, using moving intentions elicited before the treatment as a proxy.[14] We then analyze treatment effects on non-durable spending estimating specification (1) for each subsample. Columns 1 and 2 of Table 6 display heterogeneous spending responses among renters. These estimates should be interpreted with caution because of the small number of renters not planning to move. The spending reductions among renters are fully driven by those who intend to move in the next ten years (Column 2, $p < 0.05$) – that is, by likely future home buyers, for which negative income effects should be the strongest. Among owners, a large fraction (40%) do not plan to move in the next ten years. These households are unlikely to be prospective sellers, and increases in their housing wealth are likely to remain "paper gains" for them. Consistent with this notion, spending of this group is unaffected by the treatment (Column 3, $p = 0.607$). On average, also homeowners that do plan to move do not adjust their spending in response to the treatment (Column 4, $p = 0.519$).[15] One explanation is that owners planning to move are both prospective sellers and buyers of housing. They are subject to both positive endowment effects as they expect to sell at a higher price and to negative income effects as they expect to pay more for the required replacement home.

We complement the above analysis using age as an alternative proxy for planned future home purchases and sales. Specifically, renters that have reached retirement age should be less likely to plan to buy a home in the future. Similarly, owners above retirement age should be less likely to plan to upscale their home and thereby become a net buyer of housing. Appendix Table A.16 presents treatment effects from estimating specification (1) separately for respondents aged below 65 and for those aged 65 or older – corresponding to the average retirement age in the US.[16] Spending reductions of renters are fully concentrated among those below retirement age, who are likely future home buyers (Panel A, Column 3, $p < 0.01$). Although the difference across homeowners of different age narrowly misses statistical significance ($p = 0.106$), the

these variables are only imperfect proxies for borrowing constraints, these results should be interpreted cautiously.

[14]Moving plans are an imperfect proxy for plans to buy a home. However, US households are typically first renters and then transition to owning over the course of their life-cycle. According to data from the ACS, the fraction of renters decreases from about 70% to less than 30% between age 30 and 50, dropping further below 20% by age 70. Transitioning back to renting is very uncommon. A significant fraction of renters planning to move therefore likely plan to purchase a home. Consistent with this, an additional mechanism survey discussed in Section 5 highlights that 68% of renters plan to buy a home in the next ten years and that 41% of renters write about a planned future home purchase when thinking about a hypothetical increase in expected future home price growth.

[15]Unreported regressions show that there is no significant heterogeneity in treatment effects on home price expectations across owners or renters with different moving intentions. This implies that differential spending adjustments across groups do not reflect differential first-stage effects on beliefs.

[16]Appendix Section C.7 presents additional heterogeneity analyses by income and parental status.

Table 6: Treatment effects on monthly scanner expenditures: Heterogeneity by moving intentions

	Dependent variable: Log scanner expenditures			
	Renters		Homeowners	
	(1) No plans to move	(2) Plans to move	(3) No plans to move	(4) Plans to move
High forecast x Post	-0.011	-0.078**	0.012	-0.012
	(0.100)	(0.032)	(0.024)	(0.018)
N	322	2,919	5,726	8,645
Households	46	417	818	1,235
R^2	0.751	0.723	0.716	0.709
Household FEs	Yes	Yes	Yes	Yes
Month FEs	Yes	Yes	Yes	Yes

Note: This table presents two-way fixed effects regression estimates of the treatment effect of receiving a high forecast (6%) rather than a low forecast (1.5%) about average annual home price growth over the next ten years on spending for different subgroups, using data from our main experiment. The dependent variable is the log of monthly expenditures measured in the scanner data. "High forecast x Post" is the interaction between a binary indicator taking value one for respondents in the *high forecast* treatment arm and a binary indicator taking value one for the month a respondent participated in the baseline survey and for all following months, and zero otherwise. All regressions include household and month fixed effects and include observations from the three months before and the three months after a respondent participated in the baseline survey. Columns 1–2 are restricted to renters, while Columns 3–4 are restricted to homeowners. Columns 1 and 3 are restricted to respondents who do not plan to move to a new home in the next ten years, while Columns 2 and 4 are restricted to those who plan to move. Robust standard errors clustered at the respondent level are shown in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

estimated effects are negative for those below (Column 2 of Panel B, $p = 0.366$) and positive for those above retirement age (Column 2 of Panel C, $p = 0.176$), consistent with differences in the likelihood of being a prospective net buyer of housing. These findings are in line with Christelis et al. (2021), who show that older households adjust their spending more strongly in response to increases in housing wealth.[17]

We use our robustness experiment with a sample of homeowners described in Section 3.2.3 to better understand the role of planned home sales and purchases among owners. In that experiment, we directly elicit respondents' plans to sell or buy within the next ten years, including whether they plan to upscale or downscale compared to their current home, before the intervention. As shown in Column 1 of Appendix Table A.17, homeowners not planning to sell do not adjust their tendency to purchase any of the major items included in the survey in response to the intervention ($p = 0.525$), consistent with them treating changes in housing wealth as "paper gains and losses". Among those who do plan to sell, the effects of the treatment strongly depend on whether they plan to upscale or downscale compared to their current home: for those who plan to buy a cheaper or equally expensive home, the treatment has small and insignificant positive effects on their inclination to purchase major items (Columns 2 and 3, $p = 0.741$ and

[17]Due to the composition of the NielsenIQ sample we are not powered to separately study effects on very young households.

$p = 0.858$). By contrast, the treatment strongly reduces this tendency among those who plan to buy a more expensive home by 11.6 p.p., compared to a fraction of 79% in the low forecast arm (Column 4, $p < 0.01$). These results are again consistent with differences in the relative strength of endowment and income effects across groups.

Summary Taken together, treatment effects on beliefs and the heterogeneity in spending responses suggest that anticipated endowment effects and income effects are central to households' spending adjustments, while expected future collateral effects are less important.

4.2 Endogenous adjustments to housing

Rich models of housing and consumption allow for endogenous adjustments in the amount of housing households consume or own in response to changes in (expected) home prices (Berger et al., 2018). This introduces additional effects operating on top of the endowment, income and collateral effects described in Section 4.1. Columns 1 and 2 of Table 4 display how these additional channels should affect the consumption responses to higher home price expectations.

A fourth component of the consumption response are classical substitution effects: when the consumption of housing services becomes relatively more expensive, households prefer living in smaller homes and increase their non-housing consumption. In our setting, renters planning to buy a home may decide to buy a home of smaller size or to buy later than originally planned in response to higher home price expectations, allowing for higher non-housing consumption. In the extreme, renters may give up on future plans to buy a home altogether. Similarly, substitution effects could make owners prefer living in smaller homes when home prices increase.[18]

A fifth component of the consumption response pushes into the opposite direction: with a higher expected long-run return on homes, housing becomes a more attractive investment vehicle. This may induce households to reduce non-housing consumption to invest more into housing. For instance, current renters may decide to transition to owning or to buy earlier and higher-quality homes than originally planned. Homeowners may decide to upgrade their housing.

A sixth component of the consumption response stems from timing considerations as in workhorse models of durable consumption (Eberly, 1994; Grossman and Laroque, 1990): with home prices rising more quickly, planned future home purchases may be brought forward to purchase while prices are still low or to avoid paying higher rents. Current renters planning to buy a home then have to come up more quickly with the required down payment, reducing their current non-housing consumption.

[18]The strength of this channel crucially depends on the elasticity of substitution between non-housing and housing consumption. In the case of Cobb-Douglas preferences, substitution effects perfectly offset income effects from higher housing costs and – if the model features income uncertainty and borrowing constraints – collateral effects (Berger et al., 2018). Other utility functions can feature a lower degree of substitutability between the two types of consumption.

To shed light on channels operating through endogenous adjustments to housing, we conduct an auxiliary moving plans experiment. In this experiment, we examine whether changes in home price expectations affect respondents' expectations about future home purchases and sales and about the quality and size of their future home.

Sample We conducted this experiment in September 2024 on Prolific.[19] 2,000 respondents completed our survey, out of which 1,072 are owners and 928 are renters. Appendix Table A.18 provides summary statistics. The key survey instructions are available in Appendix D.6.

Design Our design closely follows the baseline surveys of our main experiment (see Section 2.1) and the robustness experiment (see Section 3.2.3). Most importantly, a random half of the respondents are assigned to the *high forecast* arm and receive a forecast about average annual home price growth over the next 10 years of 6%, while the rest are assigned to the *low forecast* arm and receive a forecast of 2%.[20] Then, we elicit probabilistic expectations about the possibilities of moving into another rental home and of transitioning to owning (for renters) and about the possibilities of transitioning to renting and of selling and buying another home (for owners) over different future horizons. These measures enable us to assess the combined net effect of the three additional channels outlined above on the expected timing of a move and on the decision of whether to rent or own. On top of this, we elicit expectations about the size and quality of the next home in case of a move over the next five years. These outcomes capture the net effect of the investment channel and substitution effects, which push households' desired home size into opposite directions. We elicit two additional outcomes to capture these two mechanisms: expectations about the attractiveness of housing as an investment vehicle and about the relative value of spending money on housing rather than non-housing consumption.

Results We detect large differences in home price expectations across treatment arms. Column 1 of Appendix Table A.19 shows that homeowners and renters in the *high forecast* treatment arm hold 1.6 p.p. (Panel B, $p < 0.01$) and 1.7 p.p. (Panel C, $p < 0.01$) higher home price expectations, corresponding to a learning rate of about one third, as in our main experiment.

We next turn to the net effect of higher home price expectations on moving plans, which could be shifted through all of the three channels outlined above. Appendix Figure A.6 shows that receiving a more optimistic forecast about home price growth has no statistically or economically significant effects on respondents' moving plans. While the perceived likelihood of transitioning to owning increases with the time horizon for renters, these plans do not differ across treatment arms (Panel A, all $p > 0.100$). A similar pattern holds for renters' expectations about moving to a new rental home (Panel B, all $p > 0.100$). Among homeowners, the treatment has no statistically significant effects on the perceived likelihood of selling and then buying a new home (Panel C, all $p > 0.100$) or of transitioning to renting (Panel D, all $p > 0.100$). Thus, the three channels

[19] We pre-registered the experiment on AsPredicted (`https://aspredicted.org/6454-tp2n.pdf`).

[20] The forecasts are based on the expert forecasts collected for the robustness survey presented in Section 3.2.3.

through which home price expectations could shift the expected timing of a move or the decision of whether to rent or own are either muted or offset each other.

Finally, we examine expectations about the size and quality of the next home, which could be affected through substitution effects and the investment channel. The treatment does not change owners' expectations about the size and quality of their next home, nor their expectations about the value of spending money on housing rather than non-housing consumption or the attractiveness of housing as an investment vehicle (Appendix Table A.19, Panel B, Columns 3-7).[21] By contrast, receiving the *high forecast* increases renters' expectations about the size of their next home, in terms of both the number of rooms (Panel C, Column 3, $p = 0.019$) and square feet (Column 4, $p = 0.006$), though not their expectations about the overall quality of their next home (Column 5). Moreover, renters perceive housing as a more attractive investment vehicle when receiving the high forecast, although the effect is only marginally statistically significant (Column 6, 11.1% of a standard deviation, $p = 0.097$). Renters do not significantly change their expectations about the relative value of spending money on housing rather than non-housing consumption (Column 7, $p = 0.726$).

Summary Overall, our additional experiment provides some evidence of endogenous adjustments to housing in response to higher expected home price growth among renters, but not among owners. Specifically, renters increase their perceived attractiveness of housing as an investment vehicle and expect to buy larger homes, which increases the required down payment. This investment channel could add to the negative income effects from higher expected housing costs and contribute to renters' negative spending response to higher home price expectations. One caveat is that this evidence on endogenous adjustments to housing was collected in a different economic environment from that of our main field experiment.

Why are expectations about future housing consumption mostly inelastic to changes in home price expectations? One potential explanation are optimization frictions: first, adjustment costs – e.g., taxes or moving costs – will at least mitigate endogenous adjustments in housing. Second, the type, size and location of homes owned by households often reflect hard constraints such as family size or a desire to be close to amenities, schools or workplace. Indeed, empirical evidence suggests that such factors are key to decisions in the housing market (Bailey et al., 2019; Bergman et al., 2024). Third, home size cannot be fully flexibly adjusted due to the lumpiness and indivisibility of housing. Lastly, the timing of a move could be constrained by factors such as the start of a new work contract. In Appendix Section C.6 we provide evidence suggesting that such optimization frictions play a major role in housing decisions.

[21] Consistent with a muted investment channel, unreported regressions show that homeowners' plans to buy a second home within the next five years are unaffected by the treatment.

4.3 Magnitude of renters' spending adjustments

In the last two subsections we have provided evidence suggesting that endowment effects from increases in the value of owned housing and income effects from higher housing costs are the most important channels behind the effects of home price expectations on consumption spending (see Table 4, Columns 3 and 4). These two effects should roughly offset each other for homeowners, consistent with our evidence. For renters, endowment effects are zero, leaving the negative income effects as the main operating channel. On top of this, there could be some further negative effects on current spending as renters seem to increase the size of their desired future home due to an investment motive.

In this subsection, we present a back-of-the-envelope calculation to gauge whether renters' spending adjustments are consistent with the magnitude of the negative income effects of higher home price expectations. Specifically, we ask the following question: if renters expect to purchase a home in the future at a price in line with their home price expectations, is the spending response consistent with renters trying to increase their saving to compensate for (i) higher expected rental costs until the date of home purchase and (ii) the higher expected purchasing costs of their future home? Naturally, this exercise relies on strong assumptions and treatment effects estimated with statistical uncertainty, rendering this exercise more suggestive in nature.

We make six main assumptions for this exercise: first, all renters expect to buy a home in the next ten years, with an expected purchase date assigning equal probability to each point in this time period. Second, respondents require liquidity for a down payment that is equivalent to 12% of the purchase price and use a mortgage to finance the remaining 88%.[22] Third, respondents expect interest rates to permanently equal zero, reflecting the macroeconomic environment in the years preceding our survey. Fourth, respondents expect their rental costs to increase by half of the year-on-year home price growth rate until the time of purchase, consistent with the national-level evolution of rents and home prices (Gallin, 2008). Fifth, renters permanently change their spending in line with the initial adjustments during the first three months after the intervention, i.e., respondents in the *high forecast* arm permanently save $32 more per month than respondents in the *low forecast* arm. This assumption is necessary as renters' actual spending adjustments over longer horizons are affected by a declining first-stage effect of our treatment on respondents' beliefs. Sixth, renters do not change the expected size of the home they plan to buy. We make this last assumption as we have no quantitative evidence on increases in the size of the home renters intend to buy due to an investment motive.

[22] 12% corresponds to the average down payment made by homebuyers in 2019 (National Association of Realtors Research Group, 2020a). While down payments among first-time home buyers are on average somewhat smaller, the renters in our sample tend to be older than renters in the population (see Appendix Table A.4) and older homebuyers typically make larger down payments (National Association of Realtors Research Group, 2020a). Moreover, survey data suggest that prospective homebuyers expect to make even larger down payments of around 20% (National Association of Realtors Research Group, 2020b), which is also the down payment recommended in many popular financial advice blogs and books. On balance, we view the 12% as a reasonable approximation for the beliefs of the average respondent in our sample.

Table 7: Back-of-the-envelope calculation: Differences in cumulative savings and expected down payments across treatment arms among renters

	Renter	
Average home value (in zip code, Zillow HPI)	$336,082	
Average monthly rent (in zip code or county, Zillow)	$1,521	
Treatment effect on monthly scanner expenditures	-$32	
	Low forecast:	*High forecast:*
Home price expectations (%)	4.3%	6.3%
Expected purchase price (assuming uniform purchase date within next 10 years)	$426,756	$477,578
Expected down payment (12% of home value)	$51,211	$57,309
Expected rental payments (until move, 50% home price pass-through after one year)	$107,148	$119,497
Expected down payment difference across treatment arms	$6,099	
Expected rental cost difference across treatment arms	$3,349	
Expected cumulative savings differences from changes in scanner expenditures until home purchase	$2,140	
Cumulative savings differences relative to expected extra costs	22.6%	

Note: This table presents a back-of-the-envelope calculation that compares the implied cumulative savings from differences in scanner expenditures across treatment arms to the difference in the expected extra costs arising from the down payment required for purchasing a home in the next 10 years among renters and the additional rental costs until the move. The calculations assume that all renters plan to purchase a home within the next 10 years. The time of the purchase is drawn from a uniform distribution over $\{1,\ldots,10\}$. Based on the average posterior home price expectations among respondents in the *high forecast* and *low forecast* treatment arms, we obtain the expected purchase prices. We use data from Zillow on the average value of homes and the average rental prices in the zip codes of our respondents as of October 2019. For rental prices, we use county-level estimates if zip code data is unavailable. We assume that renters target a down payment of 12% of the average home value in their local area. We assume that renters expect 50% of the changes in home price to pass through to rental prices after 12 months. We assume that initial spending adjustments, leading to renters in the *high forecast* treatment arm saving $32 per month more than those in the *low forecast* treatment arm, are permanent. We then compare the difference in the expected down payment across treatments to the cumulative savings difference up until the moment of purchase.

Table 7 presents the details of the calculation. The average home value in the zip codes where the renters in our sample reside was about $336,000 when we conducted our baseline survey according to data from Zillow. Given our above assumptions, the difference in average posterior home price expectations would imply that renters in the *high forecast* treatment expect to pay a $6,099 higher down payment compared to renters in the *low forecast* condition. In addition, renters in the *high forecast* treatment should expect $3,349 more in total rental payments until they buy a home. Taken together, the higher expected down payments and rental costs amount to a negative income shock of $9,448. At the same time, renters in the *high forecast* treatment

arm are able to save $32 more per month. This, in turn, translates into an expected cumulative savings difference of $2,140 across treatment arms at the time of home purchase. The observed spending responses among renters would thus be sufficient to offset about a quarter (22.6%) of the income shock of $9,448 associated with the exogenous increase in home price expectations.

There are two important caveats to consider in interpreting this back-of-the-envelope exercise. On the one hand, the NielsenIQ data covers only about one quarter of overall household spending (Dubé et al., 2018), so reductions in spending categories not covered in the scanner data could help households pay for a higher fraction of the increase in housing costs.[23] On the other hand, our exercise ignores increases in the size of the home renters expect to buy due to an investment motive, as documented in Section 4.2, which might further increase the required down payment. Keeping these two caveats in mind, the size of renters' spending responses to our treatments is plausibly consistent with the idea that renters increase their saving mostly to compensate for the higher expected rental costs and the higher cost of buying a home in the future – i.e., that their consumption response largely reflects negative income effects.

5 Reasoning about home price changes

As a complementary approach to understanding the mechanisms behind our findings, we elicit households' reasoning about the consequences of future home price changes for themselves with an open-ended question included in an additional survey (Ferrario and Stantcheva, 2022). This exercise provides a direct lens into how individuals process information about home price growth without being primed on any particular potential mechanism. It agnostically captures the issues that come to individuals' minds when thinking about future home price growth, which are likely the ones that are most decision-relevant. Compared to the evidence in Section 4, this exercise provides evidence on mechanisms grounded in respondents' own words rather than the researcher's interpretation. For a discussion on the merits and limitations of such approaches, see Haaland et al. (2024).

5.1 Survey

Sample The additional mechanism survey was conducted in November 2022 with 500 US respondents recruited on Prolific. Appendix Table A.20 presents summary statistics. 53% of respondents own a home and, among those not owning a home, 68.4% intend to buy a home over the next ten years. Appendix D.8 provides the key survey instructions.

[23] Spending categories not covered in the NielsenIQ scanner data are overall likely less elastic, at least in the short run. For example, housing (33%) and transportation (17%) accounted for about half of people's consumption in 2019 according to data from the Consumer Expenditure Survey (U.S. Bureau of Labor Statistics, 2020). Moving into a cheaper home or buying a smaller car involves adjustment costs, leading to more inertia.

Design Our main object of interest are households' considerations when they think about changes in the long-run growth rate of home prices. To elicit these considerations we ask our respondents to imagine the following hypothetical scenario:

> *Imagine that you expect home prices to grow by 1.5% per year over the next 10 years. Now imagine that you increase your expectations about future home prices. You now expect home prices to increase by 6% per year over the next 10 years.*

The home price growth expectations appearing in this hypothetical scenario are the same as the expert forecasts provided to respondents in the two treatment arms of our main experiment. After viewing the scenario, respondents are asked whether their expectations about their own economic situation would improve, remain unchanged, or worsen as a result of the change in home price expectations. On the same survey screen, we elicit respondents' explanations for their response using an open-text box. This open-ended elicitation provides a unique lens into respondents' spontaneous reasoning about the mechanisms through which home price growth affects their economic circumstances. On a subsequent survey page, we ask our respondents to consider the same hypothetical scenario as before and to indicate whether their consumption spending would increase, remain unchanged or decrease as a result of the change in home price expectations. Given that the scenario mimics the key features of our field experiment as closely as possible, it allows us to check whether our results are robust to a completely different methodology.

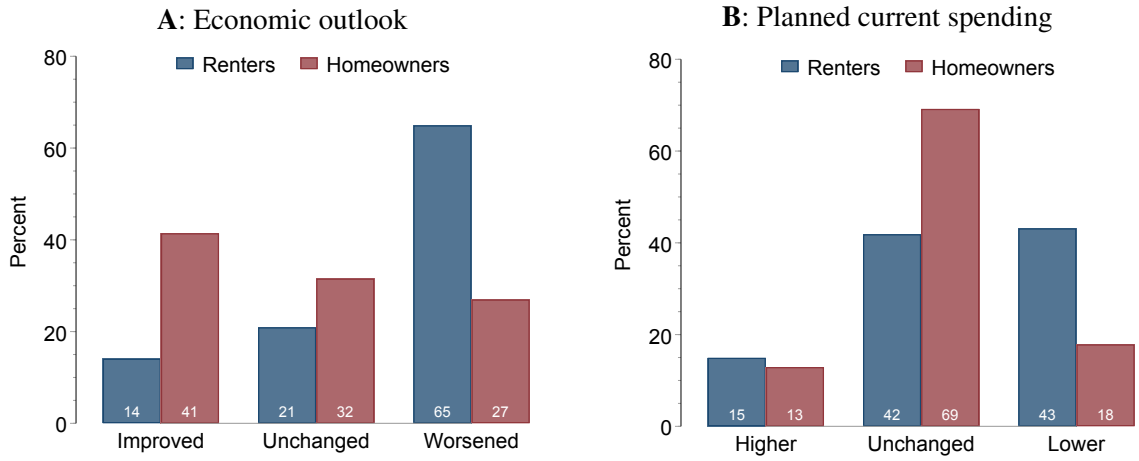
5.2 Results

Changes in the economic outlook and spending responses We start by describing the effects of the increase in home price expectations on respondents' expected future economic situation and their planned current spending. As shown in Panel A of Figure 2, a large majority of renters (65%) report that their expected future economic situation would worsen as a result of higher home price expectations. Among owners, changes in the economic outlook are more balanced between expecting an improvement (41%), no change (32%), and a worsening (27%). Panel B presents self-reported spending responses. Among renters, 43% would reduce their spending, 42% would leave it unchanged, and 15% would spend more when expecting higher home price growth. By contrast, the large majority of owners (69%) would not adjust their spending in response to higher home price expectations, while the remaining responses are roughly balanced between planning increases (13%) and reductions (18%) in spending.[24] In sum, despite the very different methodological approach, the reported spending responses closely align with the findings from the field experiment. This underscores the external validity of our findings.

Coding scheme We next turn to respondents' open-ended explanations for why a change in expected home price growth would affect their economic outlook in a specific way – our main

[24] Christelis et al. (2021) use hypothetical vignettes to elicit planned spending responses to a permanent increase in home values among Dutch homeowners, similarly finding that 90% do not plan to change their spending.

Figure 2: Mechanism survey: Effects of an increase in expected home price growth on respondents' economic outlook and planned current spending



Note: This figure displays respondents' assessments of how their expectations about their household's future economic situation (Panel A) and their planned current spending (Panel B) would change if their beliefs about average annual home price growth over the next ten years increased from 1.5% to 6%, based on data from the mechanism survey.

object of interest. Two research assistants independently review and manually code the responses using a scheme that was designed based on pilot studies. The scheme includes codes for different mechanisms, and each response can receive multiple codes. Adopting the terminology from Section 4, we include codes for (i) endowment effects from changes in the value of currently owned housing, (ii) income effects from changes in the cost of buying a home, (iii) income effects from changes in rental prices, (iv) collateral effects from changes in the ease of borrowing against home equity, (v) endogenous adjustments to housing[25], (vi) home price growth being irrelevant, e.g., because the household does not plan to move, (vii) overall inflation, (viii) household income growth, and (ix) interest rates. Conflicts are resolved through a third research assistant. If one coder assigns a given code, there is an 80% chance that the other coder does so as well, and 89% of the codes assigned by any of the two research assistants align with the final version. 79% of the text responses can be classified using our coding scheme. These points speak to the reliability of our coding scheme and underscore the high quality of the open-ended data.

Example responses We start by presenting example responses. Endowment and income effects play a key role in households' reasoning. Among homeowners, many respondents mention changes in the value of housing currently owned by their household, often in connection with the proceeds of a future home sale. This is illustrated by the following response:

We plan on selling our home in about 10 years when our mortgage would be

[25]This includes all up- or downsizing, buying or selling, or changes in the timing thereof happening endogenously in response to higher future house price growth, e.g., due to substitution effects, an investment channel or purchase timing considerations. This code was added during a revision by another research assistant revisiting the original data. We therefore exclude this code when calculating the inter-rater agreement.

completely paid off. We would be able to walk away with a higher profit, therefore more money in our pockets.

Another very common response among homeowners is that wealth increases are irrelevant as they are not planning to sell their home. Increases in housing wealth seem to be merely "paper gains" for these owners. The following response provides an example of such reasoning:

I don't intend to sell my home or purchase a new home in the future and am financially stable so this would have no effect on me.

Respondents – especially renters – also frequently express considerations about the costs of a future home purchase – i.e., income effects –, as illustrated by the following response:

It means I have to save more money in the future when I'm getting a house. I might have to get another job in order to afford a house and might not be able to have enough money for my and my family's other needs.

Renters also frequently refer to increasing rental prices:

I am a renter, when home prices increase, rents tend to increase as well.

Lastly, homeowners mention increases in the value of currently owned housing in conjunction with higher costs of the replacement home they would require if they were to realize these wealth gains – i.e., offsetting endowment and income effects:

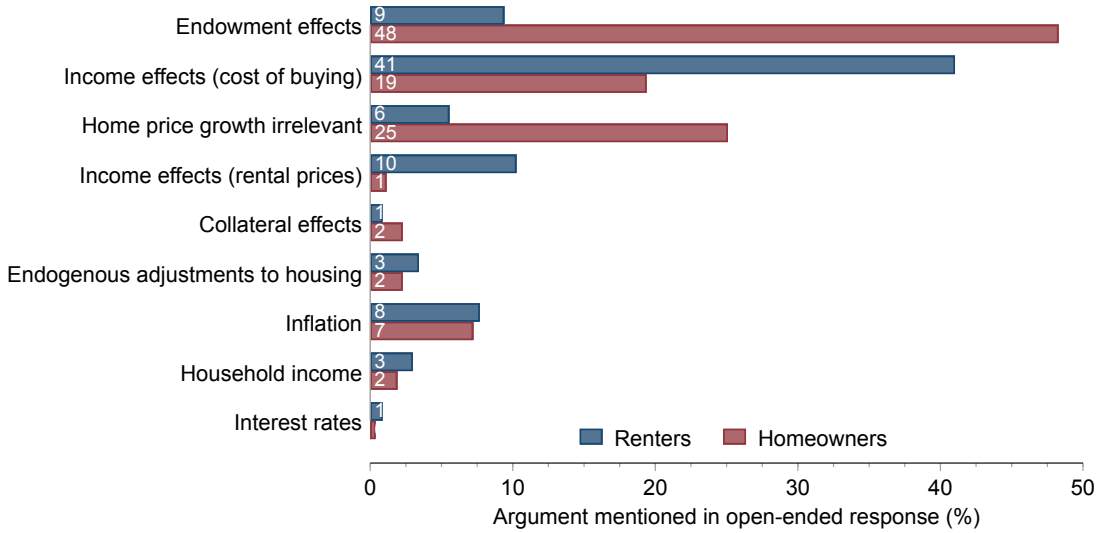
My house going up in value is always a positive, but it wouldn't necessarily affect how much financial freedom I have unless we sell the house. Selling the house would still require us to buy a new house however, which would also presumably have gone up in value.

Appendix Table A.21 provides more example responses for each code included in our scheme.

Frequency of different considerations Figure 3 displays the frequencies at which the different mechanisms through which higher expected home price growth affects respondents' economic outlook are mentioned in the text responses. Among renters, 41% mention increases in the cost of buying a home, highlighting that negative income effects from planned future home purchases play a central role for this group. Moreover, 10% write about increases in future rental prices – another component of negative income effects. 9% of renters mention changes in the value of currently owned housing, which may refer to owned housing that is not the main residence. Only 3% of renters in our sample refer to endogenous adjustments to housing, e.g., plans to buy a larger home or a future home purchase being brought forward. Our data on reasoning thus provides weaker evidence on endogenous adjustments to housing than our moving plans experiment presented in Section 4.2: there, some renters expect to buy larger homes when expecting a higher long-run return on housing, consistent with an investment motive.

Among homeowners, 48% mention changes in the value of currently owned housing, suggesting a key role for endowment effects for this group. More than half of these responses

Figure 3: Mechanism survey: Open-ended responses on how higher expected home price growth affects expectations about one's households' economic situation



Note: This figure displays the fractions of respondents invoking different arguments to explain why an increase in their beliefs about average annual home price growth over the next ten years from 1.5% to 6% would affect their economic outlook for their household in a specific way, based on data from the mechanism survey. Responses are classified by trained research assistants using a fixed coding scheme. Each response can be assigned multiple codes.

explicitly refer to a potential future home sale. 19% of owners write about the cost of future home purchases, consistent with owners being aware of the higher prices of the replacement home they would require in case they decided to realize housing wealth gains. Thus, income effects seem to be relevant for owners as well. A high fraction of owners – 25% – argue that higher house price growth would be irrelevant for their situation as they do not intend to sell. On the one hand, such responses could stem from owners being aware of the co-movement of their housing wealth with the prices of replacement homes, making a home sale unattractive. On the other hand, such responses could reflect owners not planning to move for other reasons, such as tight local housing markets, a preference for living in a certain area, or housing needs being driven by hard constraints such as family size (Bailey et al., 2019). In either case, an increase in housing wealth would remain a "paper gain" for such households. Strikingly, only 2% of owners cite collateral effects from changes in the ease of borrowing against home equity. This underscores the evidence from our field experiment, presented in Section 4.1, that owners do not anticipate a relaxation of borrowing constraints in response to higher home prices. Owners rarely refer to changes in rental prices. Only 2% of owners refer to endogenous adjustments to housing, e.g., downsizing, in line with the results in Section 4.2.

Taken together, the open-ended responses highlight that endowment effects from higher housing wealth and income effects from higher housing costs play a central role in households' reasoning regarding future home price growth.

Besides illustrating the mechanisms through which households believe home price changes to affect their own situation, the open-ended data highlight the extent to which respondents think about non-housing variables that may differ in a world with higher home price growth. Reassuringly, only few respondents refer to future inflation (7% of owners and 8% of renters) or household income (2% and 3%), while considerations about future interest rates are almost absent. These patterns support the evidence from the main field experiment (Section 3.1) and the robustness experiment (Section 3.2.3) that cross-learning about non-housing variables is of limited economic importance.

Validation We validate our open-ended data using a structured measure included later in the survey. In particular, respondents can select multiple factors from a list that contains the main economic mechanisms through which a change in home price expectations could plausibly affect their own situation. While this format mechanically primes respondents on various possible mechanisms, it mitigates some potential concerns about open-ended data, including measurement error due to respondents' reluctance to exert effort when describing their thoughts, the focus on top-of-mind responses, and researchers' degrees of freedom. Appendix Table A.22 shows that the hand-coded open-text measures and the structured measures correlate strongly with each other, corroborating the validity of the open-ended data.

In Appendix Section C.8 we show that the arguments respondents raise in the open-ended question are correlated with their self-reported spending responses in the expected directions. Moreover, we demonstrate that differences in considerations can account for up to 80% of the difference in planned spending responses between homeowners and renters. First, this provides another validation of the open-ended measurement. Second, this corroborates our previous evidence on the role of different mechanisms – in particular, endowment effects and income effects – in driving the effects of home price expectations on spending.

6 Conclusion

Over the last decades, industrialized countries have experienced substantial increases in home prices. We study how beliefs about long-run home price growth causally shape households' spending decisions. We use a field experiment that links an information intervention shifting beliefs about future home price growth to scanner data on consumption spending. While homeowners' spending is inelastic to home price expectations, renters reduce their spending when expecting higher home price growth. Using a variety of different approaches – examining updating of expectations about other outcomes, studying the heterogeneity of consumption responses across different groups, and collecting rich direct measures of households' reasoning regarding home price growth – we provide detailed evidence on the mechanisms underlying our findings: while renters seem to reduce current spending to be able to afford a home and to pay

for higher rental costs in the future, owners view expected increases in housing wealth as "paper gains", either because they do not plan to move or because they anticipate to pay more for the required replacement home. In other words, negative income effects from higher future housing costs seem to reduce renters' spending and to offset positive endowment effects among owners.

Our findings have several important implications. First, our study demonstrates that beliefs about the long-run evolution of the economy can affect households' decisions about current consumption spending and saving. Second, our results suggest that the anticipation of long-run swings in the valuation of homes contributes to consumption inequality across renters and owners, pointing to a new channel through which asset price growth affects economic outcomes. Third, our findings speak to a debate about the role of housing and home price expectations in business cycle dynamics (Akerlof and Shiller, 2010; Shiller, 2015). Our results highlight a channel through which home price expectations can have a dampening effect on aggregate consumption, which operates through the spending decisions of renters. The strength of this channel will crucially depend on the structure of the housing market in an economy, specifically the ratio of homeowners to renters. If home price expectations are formed by extrapolating recent price changes – as suggested by empirical evidence (Armona et al., 2019; Kuchler and Zafar, 2019) – this expectation channel will also dampen the aggregate consumption effects of *realized* swings in home prices: while homeowners might increase their spending in response to an increase in home prices (Aladangady, 2017; Andersen and Leth-Petersen, 2021), the associated increases in renters' expectations about future home price growth will reduce renters' spending.

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Home Price Expectations and Spending: Evidence from a Field Experiment

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Summary of the online appendix

Section A contains additional figures.

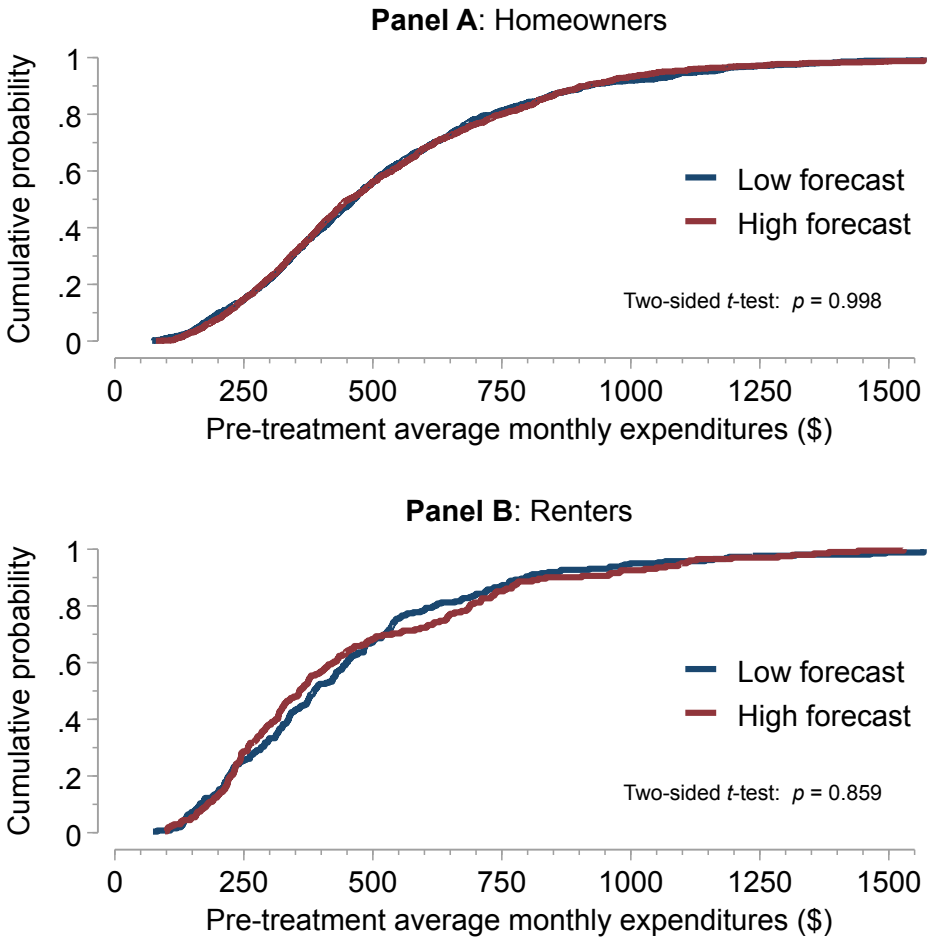
Section B contains additional tables.

Section C contains additional analyses.

Section D contains the key instructions for the survey modules.

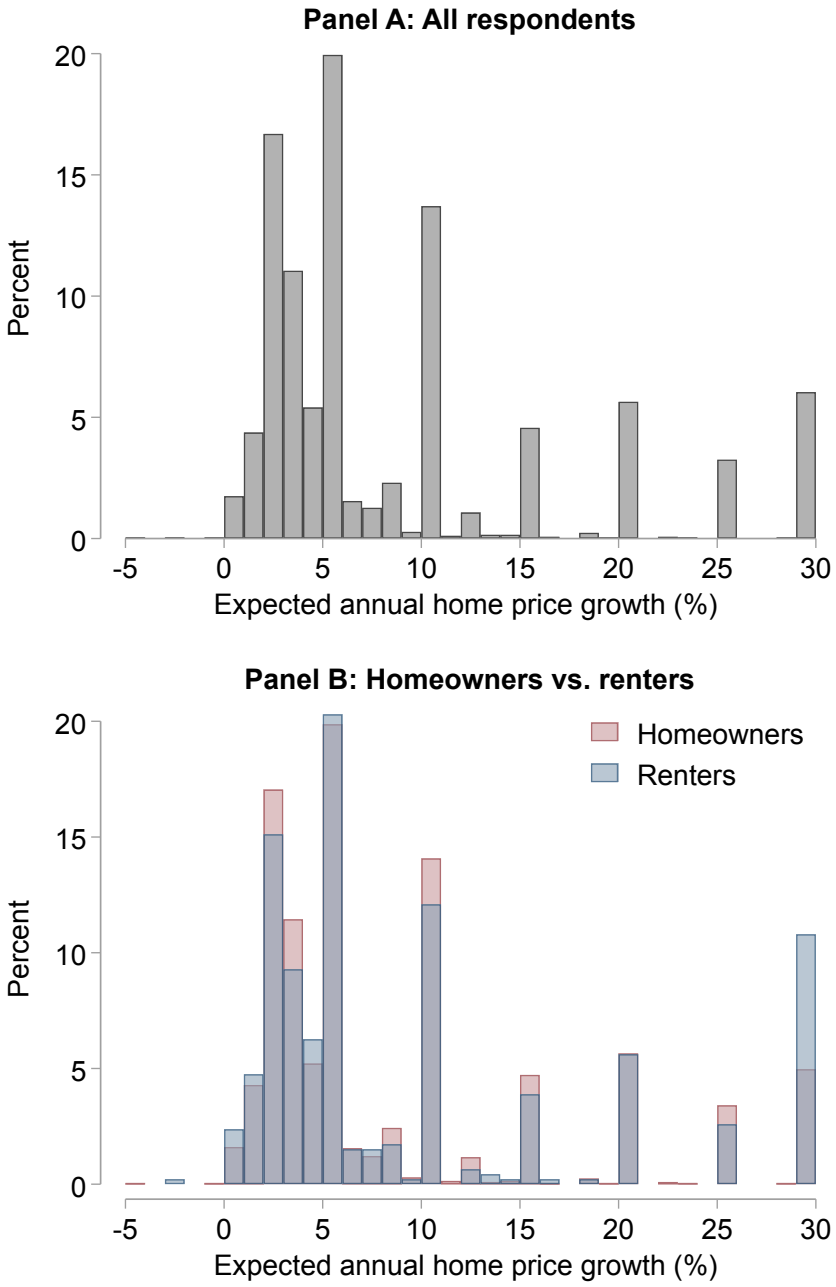
A Additional figures

Figure A.1: Test of balance: Pre-treatment monthly expenditures



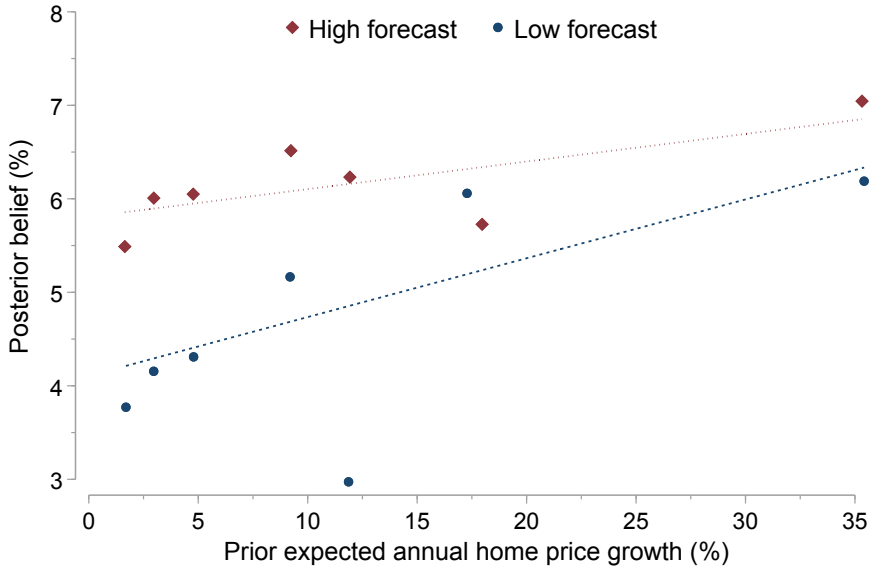
Note: This figure plots the distribution of pre-treatment average monthly expenditures measured in the scanner data in the three months before respondents participated in the baseline survey of our main experiment. Panel A and B plot the distribution for homeowners and for renters, respectively. Each panel displays the distribution separately for respondents assigned to the *high forecast* treatment arm and for respondents assigned to the *low forecast* treatment arm. p-values of a two-sided t-test for equality of means across treatment arms are shown in each panel.

Figure A.2: Prior beliefs about future home price growth



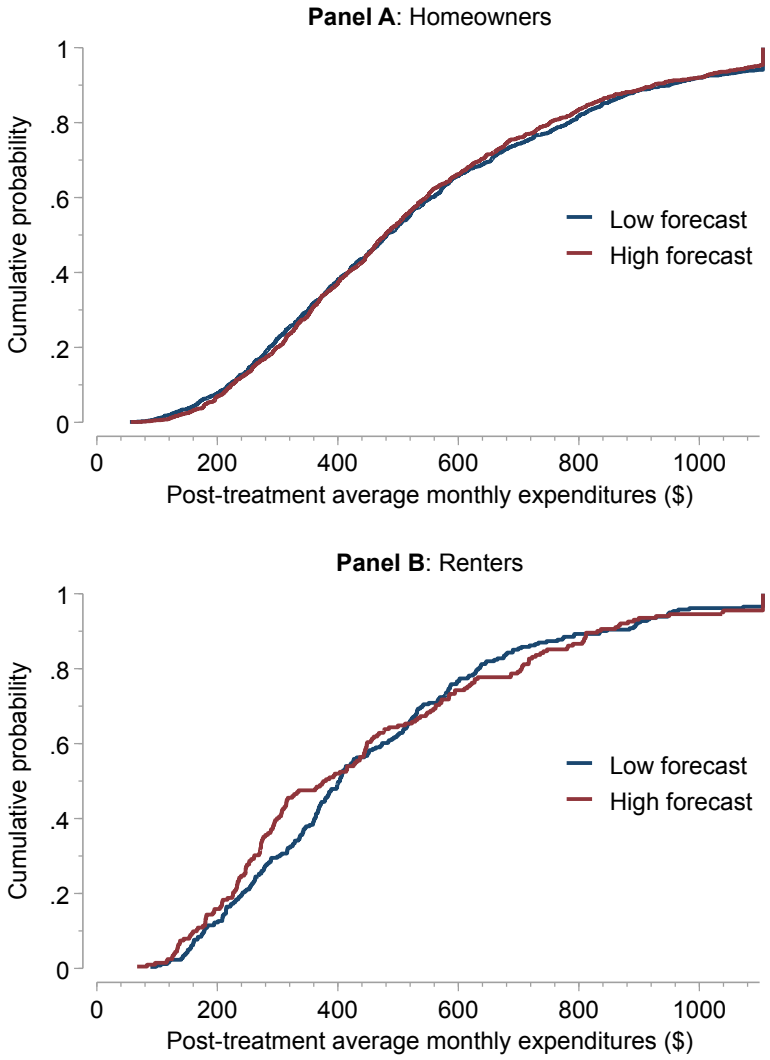
Note: This figure plots the distribution of respondents' prior point beliefs about average annual home price growth over the next ten years using data from the baseline survey of our main experiment. Panel A shows the distribution in the full sample, while Panel B shows the distribution separately for homeowners and for renters, respectively. Beliefs are winsorized at the 95th percentile for ease of visualization.

Figure A.3: Prior versus posterior annual home price growth expectations



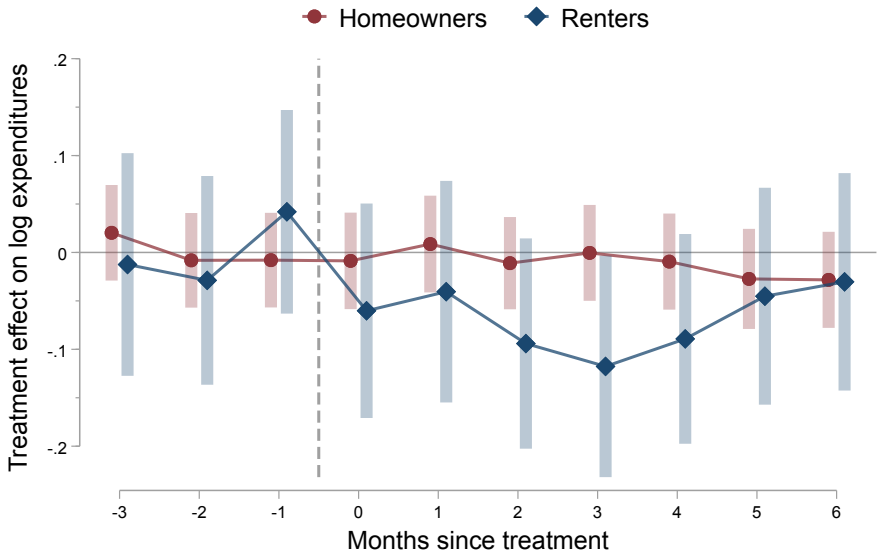
Note: This figure presents a binscatter plot of prior expected annual home price growth (%) against posterior expected annual home price growth (%) separately for respondents assigned to the *high forecast* and the *low forecast* treatment arms. Beliefs are trimmed at the 1st and 99th percentile. Prior beliefs are elicited as a point forecast, while posterior beliefs are measured probabilistically.

Figure A.4: Post-treatment average monthly expenditures



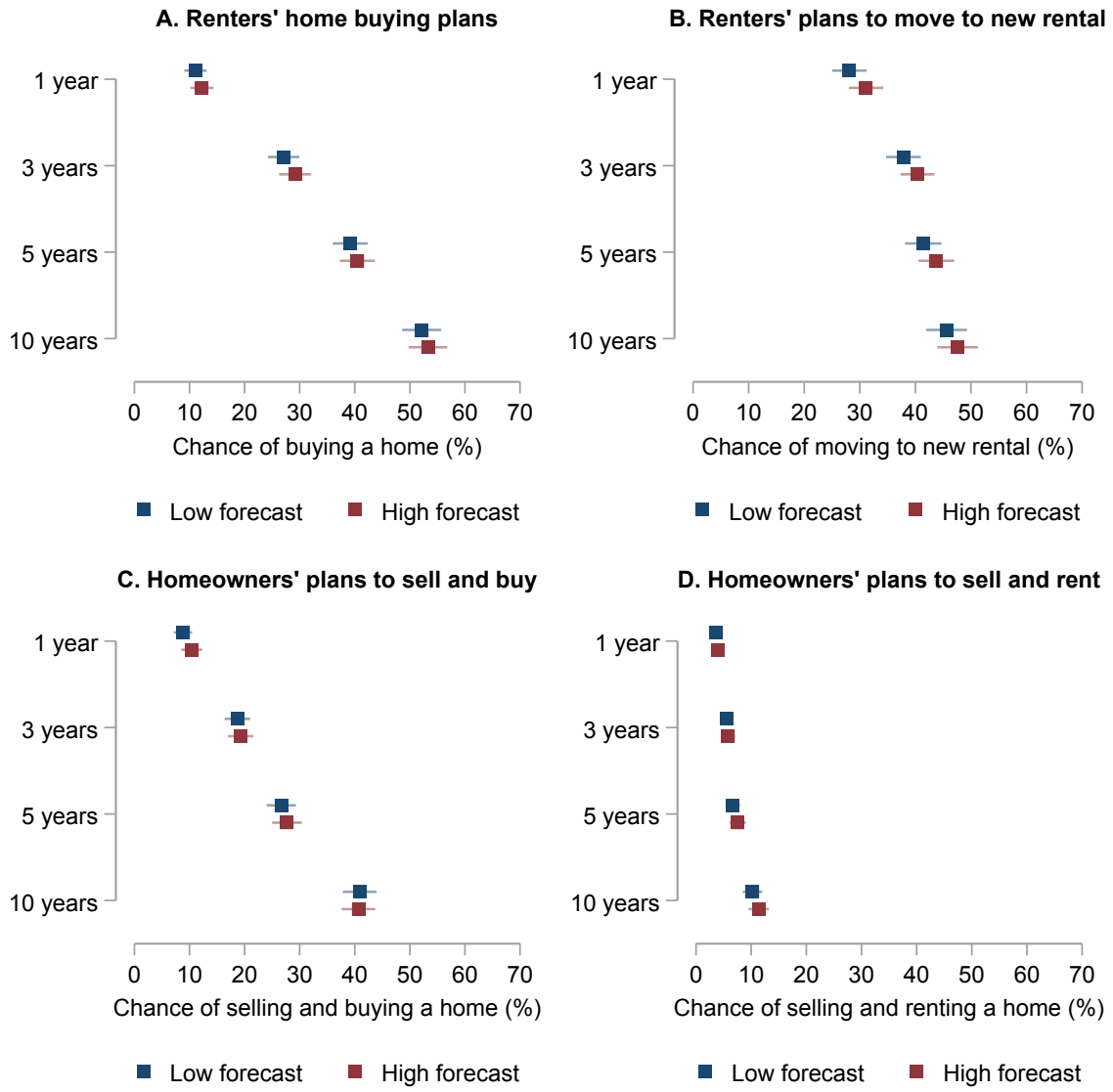
Note: This figure plots the distribution of post-treatment average monthly expenditures measured in the scanner data. Panel A and B plot the distribution for homeowners and for renters, respectively. Each panel displays the distribution separately for respondents assigned to the *high forecast* treatment arm and for respondents assigned to the *low forecast* treatment arm. Expenditures are winsorized at the 95th percentile.

Figure A.5: Dynamic treatment effects on monthly scanner expenditures



Note: This figure plots dynamic treatment effects on monthly scanner expenditures from an event study using a balanced panel of households from three months before and up to six months after respondents participated in the main survey in November 2019. Dynamic effects are derived using the *low forecast* treatment arm as the comparison group. We present estimates separately for homeowners and renters. 90% confidence intervals derived from standard errors clustered at the respondent level are shown as vertical bars.

Figure A.6: Treatment effects on moving plans



Note: This figure presents moving plans for renters (Panels A and B) and homeowners (Panels C and D) at different time horizons using data from the moving plans experiment (see Table A.1 for an overview of data collections). Each panel reports the mean percent chance of an event happening within a given time horizon (12 months, 3 years, 5 years and 10 years) separately for respondents who received a *high forecast* (6%) or a *low forecast* (2%) about the average growth rate of home prices over the next ten years. The outcome in Panel A is the percent chance of buying a new home. The outcome in Panel B is the chance of moving to a new rental home. The outcome in Panel C is the chance of selling your current home and buying a new home. The outcome in Panel D is the chance of selling your current home and moving to a rental home. 95% confidence intervals derived from robust standard errors are shown as horizontal lines.

B Additional tables

Table A.1: Overview of data collections

Data collection	*Sample*	*Treatment arms*	*Main outcomes*
Main experiment			
Baseline survey (November 2019)	NielsenIQ Homescan Panel, $n = 2,516$	*High forecast* vs. *low forecast*	Home price expectations and home scanner spending
Follow-up survey (December 2019)	NielsenIQ Homescan Panel, $n = 1,678$	None	Home price expectations and durable spending
Robustness experiment			
Baseline survey (August 2023)	Prolific, $n = 3,365$	*High forecast* vs. *low forecast*, *supply-side narrative* vs. *demand-side narrative* (2x2)	Home price expectations
Follow-up survey (September 2023)	Prolific, $n = 2,804$	None	Home price expectations and spending items
Mechanism survey			
(November 2022)	Prolific, $n = 498$	None	Reasoning about home price growth (open-ended)
Moving plans experiment			
(September 2024)	Prolific, $n = 2,000$	*High forecast* vs. *low forecast*	Home price expectations, moving plans and properties of next home
Optimization frictions survey			
(September 2024)	Prolific, $n = 500$	None	Optimization frictions in housing decisions

Note: This table provides an overview of all our data collections. The sample sizes refer to the number of respondents in our main specification for each data collection. We pre-registered the moving plans experiment (#192007, `https://aspredicted.org/6454-tp2n.pdf`) and the optimization frictions survey (#192013, `https://aspredicted.org/925x-r9h4.pdf`).

Table A.2: No differential attrition across treatment arms

	Dependent variable: Attrition (binary)			
	Main survey	Follow-up survey		
	(1) All respondents	(2) All respondents	(3) Homeowners	(4) Renters
High forecast	0.006	0.002	0.015	-0.065
	(0.014)	(0.019)	(0.021)	(0.043)
Constant	0.194***	0.332***	0.331***	0.337***
	(0.010)	(0.013)	(0.015)	(0.029)
N	3,183	2,516	2,053	463
R^2	0.000	0.000	0.000	0.005

Note: This table presents an analysis of attrition. The dependent variable in Column 1 is an indicator for not completing the baseline survey in November 2019. The dependent variable in Columns 2–4 is a binary indicator for not having participated in the follow-up survey. "High forecast" is a binary indicator taking value one for respondents assigned to the *high forecast* treatment arm. Column 1 enriches the main sample with respondents that started the baseline survey but did not complete it. Information about homeownership status is missing for these respondents. Column 2 uses the main sample, while Columns 3 and 4 present estimates for the subset of homeowners and renters, respectively. Robust standard errors are shown in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.3: Overview of NielsenIQ product categories and retail channels

Product department (1)	**Example product modules** (2)
Health & Beauty Aids	baby care, cosmetics, cough/cold remedies, deodorant, hair care, oral hygiene, pain remedies, skin care, shaving
Dry Grocery	baby food, baking mixes, bottled water, candy, carbonated beverages, cereal, coffee, condiments, crackers, pet food, prepared foods, snacks, soup, canned vegetables
Frozen Foods	ice cream, frozen pizza, frozen vegetables
Dairy	cheese, eggs, yogurt
Deli	
Packaged meat	
Fresh produce	
Non-Food Grocery	detergent, diapers, fresheners/deodorizers, household cleaners, laundry supplies, pet care
Alcohol	beer, wine, liquor, coolers
General Merchandise	batteries/flashlights, candles, computer/electronic, cookware, film/cameras, insecticides, lawn/garden, motor vehicle, office supplies
Magnet products	

Retail channels:
All Other Stores, Department Store, News/Book Store, Apparel Stores, Discount Store, Office Supplies Store, Athletic Footwear, Dollar Store, Online Shopping, Automotive Store, Drug Store, Optical Store, Bakery, Electronics Store, Party Supply Store, Barber/Salon, Fish Market, Pet Store, Beauty Supply Store, Free Sample/Gift, Pizzeria, Beverage Store, Fruit Stand, Pro Shop, Bodega, Garden Stores, Quick Serve Restaurants, Butcher, Mini Mart, Music/CD Store, Camera Shop, Grocery, Restaurant, Candy Store, Hardware/Home Improvement, Service Station, Catalog Showroom, Health Food Store, Shoe Store, Cheese Stores, Home Delivery, Sporting Goods, Close Out Store, Home Furnishings, Stationery Store, Coffee Store/Gourmet Coffee, Home Inventory, Swap meet Flea Market, Computer Store, Hypermarket, TV/Home Shopping, Convenience Store, Kennel/Vet, Tobacco Store, Coop/Farm/Feed, Liquor Store, Toy Store, Craft Stores, Mail Order, Vending Machine, Dairy Store, Manufacturer Outlet, Video Store, Delicatessen, Military Store, Warehouse Club

Note: This table presents details about the NielsenIQ scanner data. The top part of the table presents an overview of the product categorization. Products are defined at the Universal Product Code (UPC) level. NielsenIQ assigns products to one of ten major product departments (Column 1). Each product department is then organized into a set of product modules within the product department. Column 2 provides examples of product groups that belong to the product departments. The lower part of the table provides a list of the retail channels that are distinguished in the NielsenIQ scanner data.

Table A.4: Summary statistics

	General population (ACS 2019)			Main experiment		
	All	Homeowners	Renters	All	Homeowners	Renters
Female	0.513	0.514	0.525	0.776	0.776	0.775
				(0.417)	(0.417)	(0.418)
Age	47.779	51.056	41.646	54.651	55.562	50.613
				(11.484)	(11.101)	(12.271)
Household income ('000 USD)	81.918	91.007	56.056	79.058	84.287	55.869
				(45.399)	(45.560)	(36.603)
College degree	0.306	0.344	0.250	0.469	0.475	0.443
				(0.499)	(0.499)	(0.497)
Employed	0.620	0.618	0.665	0.716	0.722	0.689
				(0.451)	(0.448)	(0.463)
Northeast	0.174	0.169	0.183	0.376	0.383	0.343
				(0.484)	(0.486)	(0.475)
Midwest	0.208	0.221	0.178	0.254	0.260	0.227
				(0.435)	(0.439)	(0.419)
South	0.380	0.388	0.366	0.263	0.263	0.261
				(0.440)	(0.440)	(0.440)
West	0.238	0.222	0.274	0.108	0.094	0.168
				(0.310)	(0.292)	(0.375)
Ethnicity: White	0.736	0.794	0.623	0.824	0.847	0.721
				(0.381)	(0.360)	(0.449)
Ethnicity: Black/African American	0.125	0.088	0.192	0.099	0.081	0.179
				(0.299)	(0.273)	(0.384)
Hispanic	0.164	0.130	0.237	0.059	0.055	0.080
				(0.236)	(0.227)	(0.271)
Household size	2.772	2.941	2.592	2.421	2.455	2.266
				(1.274)	(1.247)	(1.374)
Children in household (below 18)	0.356	0.377	0.346	0.236	0.227	0.274
				(0.425)	(0.419)	(0.447)
Prior: Home price growth (%)				9.322	8.944	11.001
				(11.122)	(10.405)	(13.751)
Baseline monthly expenditures				513.254	526.245	455.650
				(293.227)	(292.490)	(289.843)
Observations				2,516	2,053	463
Relative population share		67.8%	32.2%		81.6%	18.4%

Note: This table presents the mean and standard deviation (in brackets) of a range of background variables for the full sample and separately for homeowners and renters, respectively, in the main experiment. Columns 1–3 present the corresponding means in the general population based on data from the 2019 American Community Survey (ACS). "Female" is a binary indicator taking value one for female respondents. "Age" is the respondents' numerical age. "Household income" is the total pre-tax household income from all sources (in US dollars, top-coded at $150,000). "College degree" is a binary indicator for having completed a college degree. "Employed" is a binary indicator for being employed. "Northeast," "Midwest", "South" and "West" are binary region indicators. "Ethnicity: White" is a binary indicator for white respondents. "Ethnicity: Black/African American" is a binary indicator for Black/African American respondents. "Hispanic" is a binary indicator for respondents of Hispanic origin. "Household size" is the total number of individuals living in the respondent's household. "Children in household (below 18)" is a binary indicator for the presence of at least one child below the age of 18 in the household. "Prior: Home price growth (%)" is the prior point belief about average annual home price growth over the next ten years. "Baseline monthly expenditures" are the average monthly expenditures (in $) in the three months before our main study as recorded in the NielsenIQ data. The relative population share indicates the share of homeowners and renters in the respective sample (ACS or main experiment), excluding households that neither own nor rent their home.

Table A.5: Test of balance

	All respondents	Homeowners	Renters
	High vs low forecast	High vs low forecast	High vs low forecast
Female	0.005	0.022	-0.067*
	(0.742)	(0.242)	(0.087)
Age	0.042	-0.271	0.159
	(0.926)	(0.580)	(0.890)
Household income	-1,293.907	-2,656.281	-2,639.885
	(0.475)	(0.187)	(0.442)
College degree	-0.006	-0.001	-0.039
	(0.753)	(0.968)	(0.403)
Employed	-0.011	0.008	-0.107**
	(0.540)	(0.675)	(0.014)
Ethnicity: White	0.032**	0.035**	-0.015
	(0.038)	(0.029)	(0.720)
Ethnicity: Black/African American	-0.022*	-0.017	-0.019
	(0.067)	(0.166)	(0.590)
Hispanic	-0.007	-0.015	0.034
	(0.435)	(0.134)	(0.183)
Northeast	-0.010	-0.016	0.006
	(0.607)	(0.464)	(0.901)
Midwest	0.019	0.033*	-0.051
	(0.272)	(0.091)	(0.194)
South	-0.010	-0.010	-0.007
	(0.585)	(0.596)	(0.866)
Household size	-0.036	-0.047	-0.041
	(0.475)	(0.399)	(0.751)
Children in household (below 18)	-0.006	0.005	-0.039
	(0.745)	(0.806)	(0.356)
Prior: Home price growth (%)	-0.426	-0.243	-0.719
	(0.337)	(0.597)	(0.577)
Baseline monthly expenditures	4.030	-0.223	4.746
	(0.730)	(0.986)	(0.862)
Log baseline monthly expenditures	0.012	0.004	0.004
	(0.605)	(0.875)	(0.950)
p-value of joint F-test	0.926	0.579	0.560
Observations	2,516	2,053	463

Note: This table shows a test of balance for the main experiment. Columns 1–3 show differences in means between respondents assigned to the *high forecast* arm and respondents assigned to the *low forecast* arm with p-values of a t-test for differences in means in parentheses. "Female" is a binary indicator taking value one for female respondents. "Age" is the respondents' numerical age. "Household income" is the total pre-tax household income from all sources (in US dollars, top-coded at $150,000). "College degree of above" is a binary indicator for having completed a college degree. "Employed" is a binary indicator for being employed. "Northeast," "Midwest" and "South" are binary region indicators. "Ethnicity: White" is a binary indicator for white respondents. "Ethnicity: Black/African American" is a binary indicator for Black/African American respondents. "Hispanic" is a binary indicator for respondents of Hispanic origin. "Household size" is the total number of individuals living in the respondent's household. "Children in household (below 18)" is a binary indicator for the presence of at least one child below the age of 18 in the household. "Prior: Home price growth (%)" is the prior point belief about average annual home price growth over the next ten years. "Baseline monthly expenditures" are the average monthly expenditures (in $) in the three months before our main study as recorded in the NielsenIQ data. "Log baseline monthly expenditures" is the log of baseline monthly expenditures. The p-values of the joint F-test are determined by regressing the treatment indicator on the vector of covariates. The F-test tests the joint hypothesis that none of the covariates predicts treatment assignment.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.6: Treatment effects on beliefs: Follow-up survey

	Dependent variable: Expectation (in %)						
	(1) Home price growth	(2) Rental price growth	(3) Inflation rate	(4) Labor income growth	(5) Interest rate	(6) Real GDP growth	(7) Stock market return
High forecast	1.119***	0.467	0.449***	0.275	0.112*	0.422**	0.346
	(0.320)	(0.336)	(0.165)	(0.327)	(0.067)	(0.171)	(0.240)
N	1,678	1,678	1,678	1,678	1,678	1,678	1,678
R^2	0.098	0.079	0.158	0.066	0.106	0.109	0.048
Mean in low forecast arm	7.647	7.926	4.122	5.482	1.668	4.167	6.390
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table presents regression estimates of the treatment effect of receiving a high forecast (6%) rather than a low forecast (1.5%) about average annual home price growth over the next ten years on beliefs about various outcomes measured in the follow-up survey of our main experiment. "High forecast" is a binary indicator taking value one for respondents assigned to the *high forecast* treatment arm. The dependent variables in Columns 1–7 are a respondent's beliefs about the average annual home price growth, rental price growth, inflation, household labor income growth, savings account interest rate, real GDP growth and stock market return over the next ten years, respectively. Dependent variables in all specifications are winsorized at the 5^{th} and the 95^{th} percentiles, except for inflation and interest rate expectations, which are winsorized at the 95^{th} percentile only. All regressions include the set of controls described in detail in Table 1. Robust standard errors are shown in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.7: 2SLS estimates of the effect of home price expectations on monthly scanner expenditures

	Dependent variable: Log expenditures		
	(1) All respondents	(2) Homeowners	(3) Renters
Expected home price growth (%)	-0.010	-0.002	-0.036**
	(0.009)	(0.011)	(0.018)
	[0.283]	[0.889]	[0.042]
N	17,612	14,371	3,241
Households	2,516	2,053	463
Household FEs	Yes	Yes	Yes
Month FEs	Yes	Yes	Yes
Estimation	IV	IV	IV

Note: This table presents two-stage least squares estimates of the effect of home price expectations on spending based on a two-way fixed effects model using data from the main experiment. The dependent variable is the log of monthly expenditures measured in the scanner data. All regressions include household and month fixed effects and include observations from the three months before and after a respondent participated in the baseline survey of our main experiment. "Expected home price growth (%)" varies at the respondent-month level and is equal to prior home price expectations for all months before a respondent participated in the baseline survey and equal to the posterior home price expectation as measured in the baseline survey for all other months. We instrument "Expected home price growth (%)" with the excluded binary indicator "High forecast x Post", which is the interaction between a binary indicator taking value one for respondents in the *high forecast* treatment arm and a binary indicator taking value one in the month a respondent participated in the baseline survey of our main experiment and in all following months. We control for the interaction between prior home price expectations and a binary post-treatment indicator, which controls for differential time trends across individuals with different prior beliefs. Columns 1 uses all respondents, while Columns 2 and 3 focus on homeowners and renters, respectively. Robust standard errors clustered at the respondent level are shown in round parentheses, while p-values are shown in square brackets.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.8: Treatment effects on scanner expenditures: Product category level dataset

	Dependent variable: Log expenditures					
	All respondents		Homeowners		Renters	
	(1)	(2)	(3)	(4)	(5)	(6)
High forecast x Post	-0.017	-0.015	-0.007	0.000	-0.065**	-0.067**
	(0.012)	(0.012)	(0.013)	(0.013)	(0.028)	(0.030)
	[0.152]	[0.210]	[0.617]	[0.987]	[0.021]	[0.026]
N	145,483	145,483	119,315	119,315	26,168	26,168
Households	2,516	2,516	2,053	2,053	463	463
R^2	0.528	0.535	0.527	0.536	0.524	0.553
Household FEs	Yes	Yes	Yes	Yes	Yes	Yes
Month FEs	Yes	Yes	Yes	Yes	Yes	Yes
Product category x Month FEs	Yes	Yes	Yes	Yes	Yes	Yes
DMA x Month FEs		Yes		Yes		Yes

Note: This table presents two-way fixed effects regression estimates of the treatment effect of receiving a high forecast (6%) rather than a low forecast (1.5%) about average annual home price growth over the next ten years on spending. The unit of observation is a household-month-product category. There are 10 product categories defined by NielsenIQ. The dependent variable is the log of monthly expenditures in a specific product category measured in the scanner data. "High forecast x Post" is the interaction between a binary indicator taking value one for respondents in the *high forecast* treatment arm and a binary indicator taking value one for the month a respondent participated in the baseline survey of our main experiment and for all following months. All regressions include household and month fixed effects and include observations from the three months before and the three months after a respondent participated in the baseline survey. We also include product category-specific time trends in all specifications. Columns 2, 4 and 6 include flexible time trends at the Designated Market Area (DMA) level. Observations are weighted by the expenditure share of the product category in the household's total expenditure. Columns 1 and 2 present estimates on the full sample, Columns 3 and 4 present estimates for homeowners, and Columns 5 and 6 present estimates for renters. Robust standard errors clustered at the respondent level are shown in round parentheses, while p-values are shown in square brackets.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.9: Treatment effects on scanner expenditures: Robustness

	Dependent variable: Log expenditures					
	(1)	(2)	(3)	(4)	(5)	(6)
	Baseline	Winsorized	Trimmed	No missing spending data before exit	Without fixed effects	Two-period DiD
Panel A: All respondents						
High forecast x Post	-0.014	-0.016	-0.022	-0.014	-0.014	-0.009
	(0.013)	(0.013)	(0.014)	(0.013)	(0.013)	(0.022)
High forecast					0.012	
					(0.023)	
Post					0.030***	
					(0.009)	
N	17,612	17,612	16,219	16,905	17,612	5,032
Households	2,516	2,516	2,317	2,415	2,516	2,516
R^2	0.717	0.710	0.647	0.726	0.086	0.838
Household FEs	Yes	Yes	Yes	Yes		Yes
Month FEs	Yes	Yes	Yes	Yes		Yes
Controls					Yes	
Panel B: Homeowners						
High forecast x Post	-0.002	-0.003	-0.009	-0.002	-0.002	0.010
	(0.014)	(0.014)	(0.015)	(0.014)	(0.014)	(0.025)
High forecast					0.013	
					(0.025)	
Post					0.025**	
					(0.010)	
N	14,371	14,371	13,209	13,769	14,371	4,106
Households	2,053	2,053	1,887	1,967	2,053	2,053
R^2	0.712	0.704	0.638	0.720	0.080	0.829
Household FEs	Yes	Yes	Yes	Yes		Yes
Month FEs	Yes	Yes	Yes	Yes		Yes
Controls					Yes	
Panel C: Renters						
High forecast x Post	-0.071**	-0.072**	-0.078**	-0.069**	-0.071**	-0.099**
	(0.030)	(0.030)	(0.031)	(0.029)	(0.030)	(0.047)
High forecast					-0.006	
					(0.057)	
Post					0.051**	
					(0.020)	
N	3,241	3,241	3,010	3,136	3,241	926
Households	463	463	430	448	463	463
R^2	0.726	0.719	0.665	0.739	0.082	0.870
Household FEs	Yes	Yes	Yes	Yes		Yes
Month FEs	Yes	Yes	Yes	Yes		Yes
Controls					Yes	

Note: This table presents two-way fixed effects regression estimates of the treatment effect of receiving a high forecast (6%) rather than a low forecast (1.5%) about average annual home price growth over the next ten years on spending. Panel A, B, and C present estimates using all respondents, only homeowners, and only renters, respectively. The dependent variable is the log of monthly expenditures measured in the scanner data. "High forecast" is a binary indicator taking value one for respondents in the *high forecast* treatment arm, and zero otherwise. "Post" is a binary indicator taking value one in the month a respondent participated in the baseline survey and all following months, and zero otherwise. All regressions include observations from the three months before and the three months after a respondent participated in the baseline survey, except for Column 6, which uses data from October and November only. Column 2 presents estimates where the dependent variable is winsorized at the 95th percentile. Column 3 trims the sample at the 5th and 95th percentiles of the baseline distribution of monthly expenditures in the month before a respondent participated in the baseline survey of our main experiment. Columns 4 present estimates for the subset of respondents without any months of missing spending records (since 2019 and before dropping out of the panel), in addition to having non-missing spending data during our observation period. Column 5 presents estimates without household and month fixed effects, but instead includes the non-interacted "High forecast' and "Post" indicators as well as the set of controls described in detail in Table 1. Robust standard errors clustered at the respondent level are shown in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.10: Treatment effects on scanner expenditures: Robustness to time horizon

	Dependent variable: Log expenditures				
	(1)	(2)	(3)	(4)	(5)
Time horizon:	2 months	3 months	4 months	5 months	6 months
Panel A: All respondents					
High forecast x Post	-0.011	-0.014	-0.017	-0.022*	-0.024*
	(0.014)	(0.013)	(0.013)	(0.013)	(0.013)
N	15,096	17,612	20,064	22,347	24,810
Households	2,516	2,516	2,508	2,483	2,481
R^2	0.728	0.717	0.705	0.686	0.679
Household FEs	Yes	Yes	Yes	Yes	Yes
Month FEs	Yes	Yes	Yes	Yes	Yes
Panel B: Homeowners					
High forecast x Post	-0.002	-0.002	-0.005	-0.010	-0.012
	(0.015)	(0.014)	(0.014)	(0.014)	(0.014)
N	12,318	14,371	16,360	18,225	20,230
Households	2,053	2,053	2,045	2,025	2,023
R^2	0.720	0.712	0.700	0.681	0.674
Household FEs	Yes	Yes	Yes	Yes	Yes
Month FEs	Yes	Yes	Yes	Yes	Yes
Panel C: Renters					
High forecast x Post	-0.055*	-0.071**	-0.074**	-0.075**	-0.068**
	(0.031)	(0.030)	(0.030)	(0.030)	(0.029)
N	2,778	3,241	3,704	4,122	4,580
Households	463	463	463	458	458
R^2	0.742	0.726	0.712	0.695	0.689
Household FEs	Yes	Yes	Yes	Yes	Yes
Month FEs	Yes	Yes	Yes	Yes	Yes

Note: This table presents two-way fixed effects regression estimates of the treatment effect of receiving a high forecast (6%) rather than a low forecast (1.5%) about average annual home price growth over the next ten years on spending. Panel A, B, and C present estimates using all respondents, only homeowners, and only renters, respectively. The dependent variable is the log of monthly expenditures measured in the scanner data. "High forecast" is a binary indicator taking value one for respondents in the *high forecast* treatment arm, and zero otherwise. "Post" is a binary indicator taking value one in the month a respondent participated in the baseline survey and all following months, and zero otherwise. In Column k, we use observations up to k months after our invention was administered in November 2019. All specifications focus on a balanced panel of households and a fixed baseline period as in our main specification in Table 2. Robust standard errors clustered at the respondent level are shown in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.11: Treatment effect on scanner expenditures: Food vs. non-food items

	Dependent variable: Log expenditures					
	All respondents		Homeowners		Renters	
	(1) Food	(2) Non-food	(3) Food	(4) Non-food	(5) Food	(6) Non-food
High forecast x Post	-0.017	-0.006	-0.009	0.014	-0.060*	-0.098*
	(0.015)	(0.024)	(0.016)	(0.027)	(0.034)	(0.057)
N	17,612	17,612	14,371	14,371	3,241	3,241
Households	2,516	2,516	2,053	2,053	463	463
R^2	0.666	0.652	0.661	0.645	0.674	0.674
Household FEs	Yes	Yes	Yes	Yes	Yes	Yes
Month FEs	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table presents two-way fixed effects regression estimates of the treatment effect of receiving a high forecast (6%) rather than a low forecast (1.5%) about average annual home price growth over the next ten years on spending on food and non-food items. The dependent variable in Columns 1, 3 and 5 is the log of monthly food expenditures measured in the scanner data. We construct food expenditures by aggregating spending from the following NielsenIQ product departments: Dry Grocery, Frozen Foods, Dairy, Deli, Packaged Meat, Fresh Produce, Alcohol, Magnet products. The dependent variable in Columns 2, 4 and 6 is the log of monthly non-food expenditures measured in the scanner data. We construct non-food expenditures by aggregating spending from the following NielsenIQ product departments: Health and Beauty Aids, Non-Food Grocery, General Merchandise. Appendix Table A.3 provides an overview of all product departments and example products for each department. "High forecast x Post" is the interaction between a binary indicator taking value one for respondents in the *high forecast* treatment arm and a binary indicator taking value one for the month a respondent participated in the baseline survey and for all following months. All regressions include household and month fixed effects and include observations from the three months before and the three months after a respondent participated in the baseline survey of our main experiment. Columns 1 and 2 use all respondents, Columns 3–4 are restricted to homeowners, and Columns 5–6 are restricted to renters. Robust standard errors clustered at the respondent level are shown in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.12: Dynamic treatment effects on monthly scanner expenditures

	Dependent variable: Log expenditures		
	(1) All respondents	(2) Homeowners	(3) Renters
Time since treatment			
Month 0	-0.018	-0.010	-0.060
	(0.019)	(0.021)	(0.042)
Months 1-2	-0.013	-0.003	-0.067**
	(0.015)	(0.016)	(0.034)
Months 3-4	-0.026	-0.006	-0.104***
	(0.016)	(0.018)	(0.039)
Months 5-6	-0.035*	-0.029	-0.038
	(0.019)	(0.021)	(0.042)
N	24,810	20,230	4,580
Households	2,481	2,023	458
R^2	0.679	0.674	0.690
Household FEs	Yes	Yes	Yes
Month FEs	Yes	Yes	Yes

Note: This table presents dynamic treatment effect estimates for the treatment of receiving a *high forecast* (6%) rather than a low forecast (1.5%) about average annual home price growth over the next ten years on spending. The dependent variable is the log of monthly expenditures measured in the scanner data. "Month 0" is a binary indicator taking value one for respondents in the *high forecast* treatment arm in the month the treatment was administered. "Month 1-2" is a binary indicator taking value one for respondents in the *high forecast* treatment arm in the months 1 and 2 after the treatment was administered. "Month 3-4" and "Month 5-6" are defined analogously. All regressions include household and month fixed effects and include observations from the three months before and up to six months after a respondent participated in the baseline survey. Column 1 and 2 present estimates for homeowners and renters, respectively. Robust standard errors clustered at the respondent level are shown in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.13: Robustness experiment: Summary statistics and test of balance

	General population:	Survey sample	Test of balance	
	Homeowners (ACS 2019)	(Mean/std.dev.)	High vs low forecast	Supply vs demand narrative
Female	0.514	0.490	-0.019	-0.020
		(0.500)	(0.260)	(0.239)
Age	51.056	44.045	0.283	-0.047
		(13.806)	(0.552)	(0.921)
Log income	11.329	11.175	0.028	-0.024
		(0.748)	(0.279)	(0.346)
College degree	0.344	0.626	0.028*	0.013
		(0.484)	(0.094)	(0.438)
Employed	0.618	0.687	-0.014	-0.009
		(0.464)	(0.372)	(0.593)
Ethnicity: White	0.794	0.794	-0.004	0.010
		(0.405)	(0.753)	(0.466)
Ethnicity: Black/African American	0.088	0.086	-0.015	-0.003
		(0.281)	(0.128)	(0.768)
Hispanic	0.130	0.086	-0.002	-0.011
		(0.281)	(0.866)	(0.248)
Northeast	0.169	0.199	0.006	0.008
		(0.399)	(0.646)	(0.552)
Midwest	0.221	0.224	-0.005	0.012
		(0.417)	(0.736)	(0.405)
South	0.388	0.395	-0.014	-0.025
		(0.489)	(0.404)	(0.144)
West	0.222	0.182	0.013	0.004
		(0.386)	(0.344)	(0.736)
Prior: Home price growth (%)		11.798	0.110	-0.766*
		(13.007)	(0.807)	(0.088)
p-value of joint F-test			0.379	0.574
Observations		3,366	3,366	3,366

Note: This table presents the mean and the standard deviation and a test of balance for a range of background variables, in the robustness experiment. The first column presents the corresponding means in the general population of homeowners based on data from the 2019 American Community Survey (ACS). Column 2 presents the mean and standard deviation in the full sample (baseline survey). Columns 3 and 4 show differences in means between the groups indicated in the column header with p-values of a t-test for differences in means in parentheses. "Female" is a binary indicator taking value one for female respondents. "Age" is the respondents' numerical age. "Log income" is the log of the midpoint of the respondent's household income. "College degree" is a binary indicator for having completed a college degree. "Employed" is a binary indicator for being employed. "Ethnicity: White" is a binary indicator for white respondents. "Ethnicity: Black/African American" is a binary indicator for Black/African American respondents. "Hispanic" is a binary indicator for respondents of Hispanic origin. "Northeast," "Midwest" and "South" are binary region indicators. "Prior: House price growth, next 10 years" is the prior point belief about the average annual home price growth rate over the next ten years. The p-values of the joint F-test are determined by regressing the treatment indicator on the vector of covariates. The F-test tests the joint hypothesis that none of the covariates predict treatment assignment.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.14: Robustness experiment: Treatment effects on beliefs

	Dependent variable: Posterior beliefs (in %)				
	(1) Home price growth	(2) Rental price growth	(3) Interest rate	(4) Inflation	(5) Labor income growth
Panel A: Baseline survey					
High forecast	1.756***	1.639***	0.134*	0.011	0.809***
	(0.222)	(0.267)	(0.079)	(0.110)	(0.217)
N	3,365	3,365	3,363	3,363	3,362
Mean in low forecast arm	6.841	8.977	2.931	4.729	6.078
Controls	Yes	Yes	Yes	Yes	Yes
Panel B: Baseline survey					
High forecast	1.572***	1.518***	0.096	-0.159	0.794***
	(0.309)	(0.379)	(0.114)	(0.157)	(0.303)
Supply narrative	-0.037	-0.157	-0.067	-0.173	0.223
	(0.320)	(0.383)	(0.111)	(0.158)	(0.296)
High forecast x Supply narrative	0.375	0.243	0.075	0.340	0.035
	(0.441)	(0.533)	(0.157)	(0.220)	(0.435)
N	3,365	3,365	3,363	3,363	3,362
Mean in low forecast arm	6.841	8.977	2.931	4.729	6.078
Controls	Yes	Yes	Yes	Yes	Yes
Panel C: Follow-up					
High forecast	1.076**	1.177**	0.035	0.161	0.875**
	(0.460)	(0.488)	(0.104)	(0.164)	(0.342)
N	2,804	2,804	2,794	2,794	2,794
Mean in low forecast arm	13.528	14.868	3.248	5.979	8.322
Controls	Yes	Yes	Yes	Yes	Yes

Note: This table presents regression estimates of the treatment effects of receiving a high forecast (6%) rather than a low forecast (2%) about average annual home price growth over the next ten years on homeowners' beliefs in the robustness experiment. Panel A and B use data from the baseline survey of our robustness experiment, while Panel C uses data from the follow-up survey of our robustness experiment. "High forecast" is a binary indicator taking value one for respondents assigned to the *high forecast* treatment arm instead of the *low forecast* treatment arm. "Supply narrative" is a binary indicator taking value one for respondents assigned to the *supply narrative* treatment arm instead of the *demand narrative* treatment arm. The dependent variables are beliefs about the average annual home price growth, rental price growth, interest rate, inflation, and household labor income growth rate over the next ten years, respectively. The dependent variables in all specifications are winsorized at the 5^{th} and 95^{th} percentiles, except for inflation and interest rates, which are winsorized at the 95^{th} percentile only. All regressions include the standard set of control variables. Robust standard errors are shown in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.15: Robustness experiment: Treatment effects on spending

	Dependent variable:								
	Spending on major items (binary)								
	(1) Any category	(2) House or apartment	(3) Motor vehicle	(4) Household appliances	(5) Electronic equipment	(6) Luxury items	(7) Machinery & equipment	(8) Major vacation	(9) Log restaurant spending
High forecast	-0.019	0.001	0.006	-0.008	0.011	-0.005	0.004	-0.001	-0.038
	(-1.05)	(0.11)	(0.70)	(-0.58)	(0.67)	(-0.44)	(0.24)	(-0.12)	(-1.14)
N	2,811	2,811	2,811	2,811	2,811	2,811	2,811	2,811	2,811
R^2	0.093	0.014	0.013	0.028	0.083	0.067	0.041	0.037	0.233
Mean in low forecast arm	0.613	0.025	0.045	0.163	0.311	0.113	0.229	0.116	5.090
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table presents regression estimates of the treatment effects of receiving a high forecast (6%) rather than a low forecast (2%) about average annual home price growth over the next ten years on homeowners' spending as measured in the follow-up survey of the robustness experiment. "High forecast" is a binary indicator taking value one for respondents assigned to the *high forecast* treatment arm. The dependent variables in Columns 1–8 are binary indicators for whether the respondent had non-zero spending in the category indicated by the column header over the past four weeks. The dependent variable in Column 9 is the log of total spending on restaurants and food outside the home. All regressions include the standard set of control variables. Robust standard errors are shown in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.16: Treatment effects on monthly scanner expenditures: Heterogeneity by retirement age

	Dependent variable: Log expenditures		
	(1) All respondents	(2) Homeowners	(3) Renters
Panel A: Below retirement age			
High forecast x Post	-0.029**	-0.014	-0.089***
	(0.014)	(0.016)	(0.033)
N	14,189	11,382	2,807
Households	2,027	1,626	401
R^2	0.720	0.716	0.724
Household FEs	Yes	Yes	Yes
Month FEs	Yes	Yes	Yes
Panel B: At least retirement age			
High forecast x Post	0.046	0.044	0.053
	(0.030)	(0.032)	(0.066)
N	3,423	2,989	434
Households	489	427	62
R^2	0.704	0.697	0.741
Household FEs	Yes	Yes	Yes
Month FEs	Yes	Yes	Yes

Note: This table presents two-way fixed effects regression estimates of the treatment effect of receiving a high forecast (6%) rather than a low forecast (1.5%) about average annual home price growth over the next ten years on spending for different subgroups. The dependent variable is the log of monthly expenditures measured in the scanner data. "High forecast x Post" is the interaction between a binary indicator taking value one for respondents in the *high forecast* treatment arm and a binary indicator taking value one for the month a respondent participated in the baseline survey and for all following months, and zero otherwise. All regressions include household and month fixed effects and include observations from the three months before and the three months after a respondent participated in the baseline survey. Column 1 uses the full sample, while Columns 2 and 3 are restricted to homeowners and renters, respectively. Panel A focuses on the subset of respondents below age 65, while Panel B uses respondents aged 65 or older. Robust standard errors clustered at the respondent level are shown in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.17: Robustness experiment: Heterogeneity in treatment effects

	Dependent variable: Any spending on major items (binary)			
		Plans to sell and buy		
	(1) No plan to sell	(2) Cheaper home	(3) Equally expensive home	(4) More expensive home
High forecast	0.015	0.027	-0.010	-0.116***
	(0.023)	(0.082)	(0.055)	(0.039)
N	1,721	166	284	489
R^2	0.089	0.075	0.118	0.088
Mean in low forecast arm	0.561	0.539	0.697	0.787
Controls	Yes	Yes	Yes	Yes

Note: This table presents regression estimates of the treatment effects of receiving a high forecast (6%) rather than a low forecast (2%) about average annual home price growth over the next ten years on respondents' spending as measured in the follow-up survey of the robustness experiment for different subgroups of homeowners. The dependent variable is a dummy for whether a respondent bought any major items over the past four weeks. "High forecast" is a binary indicator taking value one for respondents assigned to the *high forecast* treatment arm. Column 1 is restricted to respondents who do not plan to sell, while Columns 2, 3 and 4 are restricted to respondents who plan to sell and plan to buy a cheaper, equally expensive, or more expensive home compared to their current home, respectively. All regressions include the standard set of control variables. Robust standard errors are shown in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.18: Moving plans experiment: Summary statistics and test of balance

	General population (ACS 2019)	Survey sample (Mean/std.dev.)	Test of balance (High vs low forecast)
Female	0.513	0.488	-0.023
		(0.500)	(0.303)
Age	47.779	41.478	0.265
		(13.076)	(0.651)
Log income	11.110	11.099	-0.007
		(0.765)	(0.847)
College degree	0.306	0.573	-0.060***
		(0.495)	(0.007)
Employed	0.620	0.684	0.010
		(0.465)	(0.618)
Northeast	0.174	0.156	-0.001
		(0.363)	(0.966)
Midwest	0.208	0.199	0.031*
		(0.399)	(0.078)
South	0.380	0.421	-0.003
		(0.494)	(0.886)
West	0.238	0.224	-0.028
		(0.417)	(0.140)
Household size	2.772	2.825	-0.033
		(1.466)	(0.611)
Homeowner	0.657	0.536	-0.001
		(0.499)	(0.967)
Prior home price growth (%)		10.929	0.070
		(11.196)	(0.889)
p-value of joint F-test			0.192
Observations		2,000	2,000

Note: This table presents summary statistics and a test of balance for the moving plans experiment from September 2024. The first column presents the corresponding means in the general population based on data from the 2019 American Community Survey (ACS). Column 2 presents the mean and standard deviation in the full sample. Column 3 shows differences in means across treatment arms with p-values of a t-test for differences in means in parentheses. "Female" is a binary indicator taking value one for female respondents. "Age" is the respondents' numerical age. "Log income" is the log of the midpoint of the respondent's household income. "College degree" is a binary indicator for having completed a college degree. "Employed" is a binary indicator for being employed. "Northeast," "Midwest", "South" and "West" are binary region indicators. "Homeowner" is a dummy for homeowners. "Prior: House price growth, next 10 years" is the prior point belief about the average annual home price growth rate over the next ten years. The p-values of the joint F-test are determined by regressing the treatment indicator on the vector of covariates. The F-test tests the joint hypothesis that none of the covariates predict treatment assignment.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.19: Moving plans experiment: Treatment effects on home price expectations and expectations about future housing

	Dependent variable:						
	Home price expectations		Properties of next home			Views on housing	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Mean (%)	Std. dev. (%)	Relative rooms	Relative sq. ft.	Relative quality	Housing attractive investment	Relative value of housing to non-housing
Panel A: All respondents							
High forecast	1.646***	0.143	0.052	0.070*	0.006	0.021	0.049
	(0.151)	(0.162)	(0.041)	(0.041)	(0.042)	(0.045)	(0.044)
N	2,000	2,000	2,000	2,000	2,000	2,000	2,000
R^2	0.107	0.102	0.097	0.102	0.056	0.023	0.023
Mean in low forecast arm	3.948	5.101	-0.000	0.000	0.000	0.000	0.000
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: Homeowners							
High forecast	1.618***	-0.113	-0.032	-0.014	-0.062	-0.056	0.071
	(0.207)	(0.224)	(0.055)	(0.055)	(0.054)	(0.061)	(0.057)
N	1,072	1,072	1,072	1,072	1,072	1,072	1,072
R^2	0.086	0.136	0.134	0.115	0.055	0.019	0.008
Mean in low forecast arm	3.850	5.309	-0.090	-0.105	-0.005	0.052	0.082
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel C: Renters							
High forecast	1.713***	0.406*	0.145**	0.169***	0.083	0.111*	0.024
	(0.219)	(0.233)	(0.062)	(0.062)	(0.064)	(0.067)	(0.068)
N	928	928	928	928	928	928	928
R^2	0.139	0.075	0.041	0.058	0.063	0.033	0.026
Mean in low forecast arm	4.061	4.859	0.104	0.122	0.006	-0.060	-0.095
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table presents regression estimates of the treatment effect of receiving a *high forecast* (6%) rather than a low forecast (2%) about average annual home price growth over the next ten years on home price expectations, using data from the moving plans experiment. The dependent variables in Columns 1 and 2 are the mean and standard deviation of a respondent's subjective probability distribution over average annual home price growth over the next ten years. The dependent variables in Columns 3–5 are the changes in the number of rooms, square feet and quality of the next (rental) home compared to the respondents' current home, elicited on a 5-point scale and z-scored using the mean and standard deviation in the *low forecast* arm. The dependent variable in Column 6 is the attractiveness of housing as an investment (5-point scale, z-scored). The dependent variable in Column 7 is the relative value of housing compared to the value of spending on non-housing goods and services (5-point scale, z-scored). The dependent variables are oriented such that higher values correspond to better housing properties (Columns 3–5) and more favorable views on housing (Columns 6–7). Panel A uses the full sample, while Panels B and C are restricted to homeowners and renters, respectively. All regressions control for gender, age, log household income, prior home price expectations, full-time employment indicators, having a college degree or above. The regressions in Panel A also control for homeownership. Robust standard errors are shown in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.20: Mechanism survey: Summary statistics

	General population	Mechanism survey		
	(ACS 2019)	All respondents	Homeowners	Renters
Age	47.779	38.488	42.605	33.821
		(13.431)	(13.157)	(12.195)
Female	0.513	0.495	0.479	0.513
		(0.500)	(0.501)	(0.501)
College degree	0.306	0.695	0.741	0.645
		(0.460)	(0.439)	(0.479)
Log income	11.110	11.000	11.227	10.737
		(0.797)	(0.678)	(0.846)
Plan to buy		0.499	0.335	0.684
		(0.501)	(0.473)	(0.466)
Plan to sell		0.217	0.335	0.085
		(0.413)	(0.473)	(0.280)
Observations		498	263	234

Note: This table presents the mean and standard deviation of a range of background variables for the full sample and separately for homeowners and renters, respectively, in the mechanism survey. The first column presents the corresponding means in the general population based on data from the 2019 American Community Survey (ACS). "Age" is the respondents' numerical age. "Female" is a binary indicator taking value one for female respondents. "College degree" is a binary indicator for having completed a college degree. "Log income" is the log of the midpoint of the respondent's household income bracket. "Plan to buy" is a binary indicator taking value one for respondents who plan to buy a home in the next ten years. "Plan to sell" is a binary indicator taking value one for respondents who plan to sell a home in the next ten years.

Table A.21: Mechanism survey: Coding scheme for open-ended responses with examples

Category	Explanation	Example
Endowment effects	Changes in the value of housing currently owned by the respondent's household	"If home prices increase by 6% per year over the next 10 years, then that would be a much bigger jump in my home value compared to if home prices were to increase only 1.5% per year over the next 10 years. Since my home is fully paid off, this larger rate of increase would result in much greater equity in my home. If I were to sell my home and move to a different location, I would net a much larger profit from the proceeds of the sale."
Income effects (cost of buying)	Changes in the cost of buying a home	"Buying a home will be significantly more expensive in the future. I would be negatively affected as buying a new home would cost a lot more in 10 years than it does now."; "This is because the predicted increase in home price will mean that more money would be needed to purchase a house. This same increase might not reflect on my household income."
Income effects (rental prices)	Changes in the rental prices of homes	"It would worsen for me because I do not yet own any form of real estate in my own name and rent would only continue rising."; "We live in a rented apartment. Landlord will surely increase the rent and this cause will hurt our economic situation."
Collateral effects	Changes in the ease of borrowing money against my home equity	"I own investment properties. Even though I plan to never sale them, I would be able to borrow more against them if I needed/wanted to."
Endogenous adjustments to housing	Endogenous up-/downsizing, buying/selling, or changes in timing, e.g., due to substitution effects, the investment channel, or purchase timing considerations.	"I would hope that my home's value would grow further over those 10 years at 6% rather than 1.5%. I could possibly sell if off and downsize."
Home price growth irrelevant	Home price growth irrelevant b/c not planning to buy or sell or to move	"For the time being, I plan on staying in my house for the remainder of my life. So what happens with home prices is not of much concern to me. And as long as I stay in my home, my economic situation will not be harshly affected."; "We do not plan to move out of the house we live in any time soon."; "I don't plan on moving so wouldn't really be affected. If I did sell, I would make more, but buying would cost more."
Inflation	Inflation and changes in the overall level of prices	"Typically, when the cost of housing is increasing, it is increasing in tandem with other goods and services. A jump from 1.5% to 6% could be due to demand, but it is also likely due to inflation."
Household income	Changes in my household's overall income	"Home prices have to be affordable to someone so if prices are increasing. I expect incomes to increase as well."
Interest rates	Changes in interest rates	"I predict that my situation would get worse because I currently do not own a home and am looking to buy when I can. This means it will be harder for me to buy because prices are increasing. This also means, interest rates could be getting higher, making it harder to pay off a new home when I do buy one."

Note: This table provides an overview of the different categories included in our coding scheme for the open-ended responses collected in the mechanism survey, along with example responses.

Table A.22: Mechanism survey: Open-ended responses predict considerations elicited with a structured question format

	Dependent variable: Selected the mechanism in in structured survey question (binary)						
	(1) Endowment effects	(2) Income effects (cost of buying)	(3) Income effects (rental prices)	(4) Collateral effects	(5) Inflation	(6) Household income	(7) Interest rates
Endowment effects	0.47***	-0.13***	-0.12***	0.13***	-0.25***	-0.25***	-0.25***
	(0.04)	(0.05)	(0.04)	(0.04)	(0.05)	(0.05)	(0.05)
Income effects (cost of buying)	-0.13***	0.38***	0.08*	0.08*	0.08	-0.07	0.08
	(0.05)	(0.03)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Income effects (rental prices)	-0.13	0.06	0.70***	-0.14***	-0.03	-0.17*	-0.06
	(0.08)	(0.08)	(0.03)	(0.04)	(0.11)	(0.10)	(0.10)
Collateral effects	-0.14	-0.26	0.19	0.76***	-0.12	-0.25*	-0.18
	(0.18)	(0.17)	(0.17)	(0.04)	(0.17)	(0.14)	(0.14)
Inflation	-0.14*	-0.14*	-0.03	-0.03	0.37***	0.16*	0.03
	(0.08)	(0.08)	(0.08)	(0.06)	(0.05)	(0.08)	(0.09)
Household income	-0.05	-0.12	0.10	0.08	0.01	0.50***	0.05
	(0.12)	(0.14)	(0.14)	(0.12)	(0.14)	(0.04)	(0.13)
Interest rates	-0.15	0.18*	0.04	0.10	0.14	0.24	0.53***
	(0.17)	(0.09)	(0.28)	(0.23)	(0.30)	(0.31)	(0.07)
N	467	467	467	467	467	467	467
R^2	0.256	0.215	0.166	0.101	0.123	0.102	0.086

Note: This table presents regression estimates of the (partial) correlations between indicating a specific mechanism in the structured question and mentioning different mechanisms in the open-ended question, based on data from the mechanism experiment. The dependent variables are binary indicators taking value one if a respondent selects a particular mechanism (indicated by the column header) in the structured question, and zero otherwise. "Endowment effects" is a binary indicator taking value one for respondents who mention changes in the value of their currently owned home in their responses to the open-ended question on how an increase in home price expectations would affect their household's economic outlook. "Income effects (cost of buying)", "Income effects (rental prices)", "Collateral effects", "Inflation", "Household income" and "Interest rates" are analogously defined binary indicators (see Table A.21 for details about these codes). Robust standard errors are shown in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

C Additional analyses

C.1 Learning rates

This appendix presents regression estimates of the learning rate in our main experiment and examines whether updating from the provided information is consistent with Bayesian learning.

In a first step, we provide formal estimates of the learning rate in our experiment, adapting the regression framework discussed in Haaland et al. (2023). Specifically, we construct a "Shock" variable as the difference between the expert forecast about home price growth that the respondent was assigned to and the respondent's prior expected home price growth:

$$\text{Shock}_i = \begin{cases} 6 - \text{prior}_i & \text{if High Forecast}_i = 1 \\ 1.5 - \text{prior}_i & \text{if High Forecast}_i = 0 \end{cases} \tag{2}$$

where High Forecast_i is an indicator taking value one for individuals who received a forecast suggesting high future home price growth, and value zero for respondents receiving the forecast suggesting low future home price growth. We next define an "Updating" variable that captures the difference between respondents' post-treatment and pre-treatment home price expectations.

To quantify the learning rate — the weight assigned to the expert forecast —, we estimate the following equation:

$$\text{Updating}_i = \alpha_0 + \alpha_1 \text{Shock}_i + \alpha_2 \text{Prior}_i + \Pi^T \mathbf{X}_i + \varepsilon_i \tag{3}$$

where ε_i is an idiosyncratic error term. We control for prior home price expectations to partial out the mechanical correlation between shock and updating that arises from their joint dependence on the prior belief. If respondents are Bayesian with normally distributed prior beliefs and a quadratic loss function, they should follow a linear learning rule that assigns a weight of α_1 to new information from the expert forecast (Cavallo et al., 2017), which lies between 0 and 1.

Table C.1 shows the results from this regression. Based on the posterior home price expectations in the baseline survey, we estimate an average learning rate of 0.308 (Column 1), meaning that respondents assign a weight of about one third to the new information and a weight of two thirds to their prior belief. If we instead construct the updating variable based on the post-treatment home price expectations elicited in the follow-up survey one month later, we estimate a slightly lower learning rate of 0.244 (Column 3). Our estimates are thus consistent with the first prediction of Bayesian updating that learning rates should lie between 0 and 1.

In a second step, we examine another prediction of Bayesian learning, namely that the learning rate should be higher among respondents that are less confident in their pre-treatment beliefs, as this likely reflects a more dispersed prior. In our baseline survey, we elicited respondents' confidence in their prior beliefs on a 5-point categorical response scale. We construct a "high confidence" variable that takes value one for respondents that report being "very" or

"extremely confident" in their prior beliefs, and zero otherwise. Columns 2 and 4 of Table C.1 show that there is no statistically significant difference in learning rates between respondents with high confidence and those with low confidence in their stated prior beliefs. The absence of a pronounced heterogeneity in learning rates by prior confidence is not unusual in information provision experiments. For example, Armona et al. (2019) similarly find no statistically significant heterogeneity by prior confidence in the updating of home price beliefs in response to information. Potential explanations for this lack of heterogeneity in learning rates include (i) measurement error in prior confidence, (ii) differential perceived precision of expert forecasts, or (iii) non-Bayesian learning rules.

Table C.1: Learning rates

	Dependent variable: Updating			
	Main experiment		Follow-up	
	(1)	(2)	(3)	(4)
Shock	0.308***	0.321***	0.244***	0.232**
	(0.042)	(0.057)	(0.071)	(0.093)
Prior	-0.617***	-0.605***	-0.539***	-0.573***
	(0.044)	(0.059)	(0.075)	(0.098)
High confidence		-0.181		-0.430
		(0.407)		(0.683)
Shock × High confidence		-0.030		0.029
		(0.084)		(0.143)
Prior x High confidence		-0.030		0.089
		(0.087)		(0.152)
N	2,516	2,516	1,678	1,678
R^2	0.720	0.721	0.474	0.474
Mean in low forecast arm	-3.900	-3.900	-0.641	-0.641
Controls	Yes	Yes	Yes	Yes

Note: This table presents OLS estimates of the learning rate from the professional forecasts shown to respondents in the main experiment. The dependent variable in columns 1–2 is updating in the main survey, while columns 3–4 use updating in the follow-up survey as the dependent variable. Updating is defined as the difference between the posterior expected annual home price growth and the prior expected annual home price growth as measured in the main survey. "Shock" is the difference between the professional forecast shown to respondents in the main experiment and the prior expected annual home price growth as measured in the main survey. "High confidence" is a dummy taking value one for respondents that are "very" or "extremely confident" in their prior estimate of the annual home price growth rate on a 5-point scale from 1 (not at all confident) to 5 (extremely confident). "Prior" is the prior expected annual home price growth as measured in the main survey. All regressions include the set of controls described in detail in Table 1. Robust standard errors clustered at the respondent level are shown in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

C.2 Measurement of expectations

In the baseline survey of our main experiment, we elicit respondents' subjective probability distribution over different potential realizations of the average growth rate of the price of a typical home in the US over the next ten years (Manski, 2004). Specifically, respondents assign probabilities to eight bins and we use a midpoint formula to derive the mean and standard deviation of the implied distribution. In this section, we (i) provide descriptive evidence that respondents exert high effort when reporting posterior beliefs, (ii) show that our treatment effects on home price expectations are robust to alternative methods of deriving moments of the belief distribution from the reported probability distribution, and (iii) demonstrate robustness to the number of bins used in the belief elicitation.

Descriptives The average and median respondents assign positive mass to five out of eight bins, with 91.1% of respondents assigning mass to at least two bins. At the 25^{th} percentile, respondents assign mass to three bins. At the 75^{th} percentile, respondents report a full prior using all the eight available bins. Moreover, only 13 respondents (0.5%) assign full mass to the bin "more than 20%" and nobody assigns full mass to the "less than -20%" bin. These descriptive statistics suggest that respondents are highly engaged and exert high effort when answering the post-treatment question about their home price expectations.

Construction of moments In our main analysis, we use a midpoint formula to construct the mean and standard deviation from respondents' stated post-treatment probability distribution. To examine the robustness of our results, we derive bins using the methodology of the Survey of Consumer Expectations (Armantier et al., 2017). Specifically, we fit a generalized beta distribution to respondents' stated beliefs and use the first two moments implied by the fitted distribution. The correlation between the moments derived from the midpoint formula and the moments derived from fitting generalized beta distributions is 0.95 for the first two moments. Columns 1 and 2 of Table C.2 present the first-stage effects of receiving the high forecast on the mean and standard deviation of respondents' posterior distribution over future home price growth, as recovered from fitting generalized beta distributions. The estimates are virtually identical to the ones reported in Table 1. We also probe the robustness of our null result on respondents' uncertainty about future home prices. Column 3 of Table C.2 shows that the treatment effects on uncertainty as constructed using the midpoint formula are unchanged if we exclude respondents with degenerate posterior beliefs. In Column 4, we assign degenerate posterior beliefs the maximum theoretical standard deviation based on the width of the bin that the respondent assigned 100% mass to (rather than assuming that the standard deviation is zero as done by the midpoint formula). We obtain identical results.

Number of bins We next show that the treatment effects on post-treatment home price expectations are robust to increasing the number of bins used in the elicitation of respondents' subjective probability distribution. In the moving plans experiment conducted in September 2024 with a

sample of Prolific respondents, we replicate the first part of our main experiment. Specifically, we elicit prior beliefs and provide expert forecasts using the instructions from the baseline survey of our main experiment. We subsequently elicit home price expectations using 14 bins instead of the 8 bins used in our main experiment, but keep the belief elicitation otherwise identical. Appendix D.6 provides the key instructions and the definition of each bin. The higher number of bins allows us to reduce the width of individual bins relative to the baseline experiment, providing a potentially more precise estimate of respondents' subjective probability distribution. In practice, there is a trade-off as it is cognitively more demanding to report a more fine-grained probability distribution, which may on net increase measurement error. Columns 1 and 2 of Appendix Table A.19 show treatment effects on the first two moments of respondents' subjective distribution, using a specification that is analogous to our main specification in Table 1. We find that both homeowners (Panel B) and renters (Panel C) hold home price expectations that are 1.6 to 1.7 percentage points higher in the *high forecast* compared to the *low forecast* treatment arm. The magnitude of the treatment effects implies a learning rate of about one third, which closely matches the weight respondents assign to the expert forecast in our main experiment. We also find little evidence that the treatments differentially shift respondents' uncertainty about future home price growth as measured by the standard deviation of their posterior subjective distribution (Column 2). While uncertainty is somewhat higher among renters in the high than among renters in the low forecast arm (Panel C), the effect is an order of magnitude smaller than the effect on the mean of the belief distribution and only marginally statistically significant at the 10% level ($p = 0.081$). Among homeowners, the estimated treatment effect on uncertainty is small and statistically insignificant ($p = 0.613$). Taken together, this robustness experiment shows that the first-stage treatment effects on renters' and homeowners' home price expectations are largely robust to the number of bins used to elicit home price expectations.

Table C.2: Robustness: Treatment effects on beliefs about future home price growth

	Dependent variable: Expected home price growth			
	Generalized beta distribution		Non-parametric moment	
	(1)	(2)	(3)	(4)
	Mean of distribution (%)	Std. dev. of distribution (%)	Std. dev. excl. degenerate posterior (%)	Std. dev. with max. value for degenerate posterior (%)
Panel A: All respondents				
High forecast	1.514***	0.067	0.048	0.133
	(0.213)	(0.175)	(0.221)	(0.211)
N	2,512	2,512	2,292	2,516
R^2	0.038	0.140	0.145	0.136
Mean in low forecast arm	3.741	5.736	8.611	8.053
Controls	Yes	Yes	Yes	Yes
Panel B: Homeowners				
High forecast	1.371***	0.008	-0.001	0.080
	(0.230)	(0.190)	(0.241)	(0.230)
N	2,049	2,049	1,869	2,053
R^2	0.033	0.146	0.156	0.147
Mean in low forecast arm	3.852	5.599	8.417	7.881
Controls	Yes	Yes	Yes	Yes
Panel C: Renters				
High forecast	2.157***	0.381	0.305	0.434
	(0.547)	(0.441)	(0.552)	(0.533)
N	463	463	423	463
R^2	0.074	0.128	0.116	0.110
Mean in low forecast arm	3.321	6.255	9.353	8.707
Controls	Yes	Yes	Yes	Yes

Note: This table presents regression estimates of the treatment effect of receiving a *high forecast* (6%) rather than a low forecast (1.5%) about average annual home price growth over the next ten years on home price expectations, using data from the baseline survey of our main experiment. The dependent variables in Columns 1 and 2 are the mean and standard deviation of a generalized beta distribution fitted to respondent's subjective probability distribution over average annual home price growth over the next ten years. The dependent variable in Column 3 is the nonparametric estimate of the standard deviation (analogous to Table 1), excluding respondents who report a degenerate posterior with probability mass assigned only to one bin. The standard deviation in Column 4 is calculated as in Table 1, but setting the standard deviation to the theoretical maximum of $(b-a)/2$ for respondents with degenerate priors that assign mass only to a single bin $[a,b]$. Panel A uses the full sample, while Panels B and C are restricted to homeowners and renters, respectively. All regressions control for gender, age, log household income, prior home price expectations, household size and indicators for employment, having a college degree or above, race, ethnicity, region, and children. The regressions in Panel A also control for homeownership. Robust standard errors are shown in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

C.3 Distance of expectations to expert forecasts

This appendix presents additional evidence on how the prior home price expectations in the baseline survey of our main experiment compare to expert forecasts. This allows us to shed some light on the individual factors that correlate with more accurate home price expectation in the sense of being closer to the commonly-used benchmark of expert forecasts. In particular, we use the average forecast of the average annual home price growth rate over the next ten years made by the 51 experts who participated in our special module included in the October 2019 wave of the World Economic Survey (WES), an expert survey on macroeconomic forecasts. This average forecast was 3.83% at the time we conducted our baseline survey in 2019. We then use the absolute deviation of respondents' prior home price expectations from the average expert forecast as a measure of accuracy.

Table C.3 presents results from regressing absolute deviations on a set of demographic variables in the full sample (Column 1) and separately for homeowners (Column 2) and renters (Column 3). Older respondents hold less accurate home price expectations, while respondents with higher household income hold prior beliefs that are more aligned with expert forecasts. Higher educational attainment, as proxied by a college degree, is associated with expectations being closer to expert forecasts among homeowners, but not among renters. Homeownership status in itself does not play a significant role. These patterns on correlates of home price expectations are broadly consistent with previous literature (Kuchler et al., 2023).

Table C.3: Correlates of the distance of expectations to expert forecasts

	Dependent variable: Absolute deviation from expert forecasts		
	(1) All respondents	(2) Homeowners	(3) Renters
Age	0.058***	0.044***	0.119***
	(0.014)	(0.016)	(0.033)
Log income	-1.773***	-1.688***	-1.877***
	(0.248)	(0.269)	(0.632)
College degree or above	-0.673**	-0.964***	0.834
	(0.301)	(0.320)	(0.874)
Fulltime employment	0.207	0.241	-0.148
	(0.298)	(0.316)	(0.865)
Ethnicity: White	-1.035*	-0.802	-1.895
	(0.559)	(0.588)	(1.404)
Ethnicity: Black/African American	1.487*	1.775**	0.039
	(0.779)	(0.884)	(1.648)
Hispanic	2.575***	2.325***	3.419*
	(0.717)	(0.763)	(1.756)
Northeast	-0.376	-0.250	-0.247
	(0.498)	(0.540)	(1.169)
Midwest	-0.292	0.214	-2.375**
	(0.517)	(0.572)	(1.156)
South	0.588	0.817	-0.199
	(0.533)	(0.584)	(1.244)
Household size	0.246	0.129	0.573
	(0.165)	(0.172)	(0.455)
Children in household (below 18)	0.393	0.246	1.485
	(0.472)	(0.495)	(1.337)
Baseline monthly expenditures	-0.001	-0.001	-0.003
	(0.001)	(0.001)	(0.002)
Homeowner	-0.129		
	(0.431)		
N	2,516	2,053	463
R^2	0.063	0.058	0.097
Mean dep. var.	5.741	5.548	6.600

Note: This table presents regression estimates of the correlates of the distance of prior home price expectations to expert forecasts, using data from the baseline survey of our main experiment (see Table A.1 for an overview of data collections). The dependent variable in all specifications is the absolute distance between respondents' prior point forecasts of the average annual home price growth rate in the US over the next ten years and the average forecast of this quantity by 51 experts who regularly participates in the World Economic Survey (WES), an expert survey on macroeconomic forecasts. Column 1 uses the full sample, while Columns 2 and 3 present estimates for homeowners and renters, respectively. Robust standard errors are shown in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

C.4 Cross-learning

In this appendix, we provide further discussion of cross-learning, among others studying it separately for owners and renters.

Cross-learning is a potential mechanism that plausibly operates in any information provision experiment (Haaland et al., 2023). Specifically, receiving information about one variable might shift survey respondents' beliefs about other variables. For example, Coibion et al. (2024) find that information about inflation also leads to belief revisions about GDP growth. In our case, when receiving expert forecasts about home price growth, respondents might also update their beliefs about other macroeconomic or personal economic outcomes. On the one hand, cross-learning can be thought of as a natural by-product of belief changes about a given variable when respondents view different variables as being correlated with each other. On the other hand, cross-learning can complicate the interpretation of downstream effects of induced belief changes on other outcomes, such as spending decisions. We address cross-learning using two complementary strategies.

First, we deliberately design the baseline survey of our main experiment in a way that minimizes the scope for cross-learning, following best practices in the literature (Haaland et al., 2023). In particular, we use an active control group design, in which *all* respondents receive new information. Compared to an alternative design — where control group respondents do not receive any information —, our design has the advantage that cross-learning triggered by the mere *presence* of new information is ruled out by design. A second design feature aimed at mitigating cross-learning is that we provide all respondents with the same expert forecast about the future rate of inflation over the next ten years, thus fixing beliefs about an important other macroeconomic variable to the extent possible.

Second, we elicit a battery of relevant expectations about macroeconomic and personal outcomes in the follow-up of our main experiment. This approach allows us to get an impression of the potential degree of cross-learning for a select set of variables. As discussed in Section 3.1, we find some evidence of cross-learning, although its economic importance appears limited.

In Appendix Table C.4, we provide additional evidence on cross-learning, focusing separately on owners and renters. Given the reduced sample size in the follow-up and the noisy nature of the outcome measures, such subsample analyses are necessarily less reliable. We therefore present two versions of our regressions that reduce the influence of outliers in different ways: one through winsorization (odd-numbered columns, as in the rest of our paper), one through trimming (even-numbered columns). Panel A focuses on homeowners and Panel B on renters. As in our full sample, we observe some positive updating about future inflation when receiving the high home price growth forecast (Columns 5 and 6). Although these spillovers are statistically significant in three out of four cases, they are of much smaller size than the updating about future home prices. As discussed in Section 3.1, inflation expectations shape consumption decisions mainly

through two opposing channels: expected future real income (income effects) and expected future real interest rates (intertemporal substitution). Changes in inflation expectations thus have to be viewed in connection with changes in expectations about nominal income and nominal interest rates. We observe some positive updating about both of these variables, which in two out of eight cases reaches statistical significance (Columns 7-10). The net effects on expectations about real income and real interest rates are close to muted. This suggests that cross-learning about inflation, income, or interest rates does not have important implications for consumption responses to our treatment. Similarly, we detect only modest and mostly insignificant updating about real GDP growth (Columns 11 and 12) and stock returns (Columns 13 and 14).

Taken together, cross-learning is unlikely to affect the main conclusions of our analysis. This notion is further supported by our findings (i) that respondents in our mechanism survey (discussed in Section 5) rarely refer to non-housing variables when prompted to write about the implications of an increase in home price expectations for their economic outlook, and (ii) that our robustness experiment (presented in Section 3.2.3) yields similar results on the effects of home price expectations on homeowners' spending as our main experiment – despite a substantially different nature of cross-learning. In general, we view cross-learning and ways of dealing with it as a topic that deserves more attention in the literature using information provision experiments.

Table C.4: Subsample analysis of treatment effects on beliefs: Follow-up survey

	Dependent variable: Expectation (in %)													
	Home price growth		Rental price growth		Inflation rate		Labor income growth		Interest rate		Real GDP growth		Stock market return	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Panel A: Homeowners														
High forecast	1.007***	0.792**	0.437	0.661**	0.367**	0.250*	0.255	0.418	0.035	0.068	0.460**	0.266*	0.291	0.241
	(0.353)	(0.323)	(0.368)	(0.336)	(0.180)	(0.152)	(0.352)	(0.291)	(0.073)	(0.067)	(0.186)	(0.158)	(0.260)	(0.233)
N	1,358	1,263	1,358	1,305	1,358	1,308	1,358	1,262	1,358	1,302	1,358	1,254	1,358	1,253
R^2	0.099	0.091	0.074	0.062	0.143	0.115	0.042	0.049	0.091	0.053	0.099	0.070	0.041	0.033
Mean in low forecast arm	7.647	7.119	7.926	6.936	4.122	3.746	5.482	4.607	1.668	1.501	4.167	3.923	6.390	6.187
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Winsorizing	Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Trimming		Yes		Yes		Yes		Yes		Yes		Yes		Yes
Panel B: Renters														
High forecast	1.534*	2.008***	0.594	0.848	0.811**	0.466	0.395	1.320*	0.410**	0.266	0.381	0.173	0.643	-0.038
	(0.787)	(0.710)	(0.862)	(0.754)	(0.406)	(0.362)	(0.867)	(0.771)	(0.173)	(0.167)	(0.425)	(0.357)	(0.629)	(0.536)
N	320	288	320	293	320	302	320	297	320	295	320	277	320	278
R^2	0.142	0.146	0.135	0.079	0.272	0.154	0.153	0.166	0.201	0.128	0.192	0.190	0.106	0.118
Mean in low forecast arm	7.647	7.119	7.926	6.936	4.122	3.746	5.482	4.607	1.668	1.501	4.167	3.923	6.390	6.187
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Winsorizing	Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Trimming		Yes		Yes		Yes		Yes		Yes		Yes		Yes

Note: This table presents regression estimates of the treatment effect of receiving a high forecast (6%) rather than a low forecast (1.5%) about average annual home price growth over the next ten years on beliefs about various outcomes measured in the follow-up survey of our main experiment. "High forecast" is a binary indicator taking value one for respondents assigned to the *high forecast* treatment arm. The dependent variables are a respondent's beliefs about the average annual home price growth (Column 1 and 2), rental price growth (Column 3 and 4), inflation (Column 5 and 6), household labor income growth (Column 7 and 8), savings account interest rates (Column 9 and 10), real GDP growth (Column 11 and 12) and stock market return (Column 13 and 14) over the next ten years, respectively. We winsorize the dependent variables in odd columns and trimm the sample in even columns. We winsorize or trimm at the 5^{th} and the 95^{th} percentiles of the dependent variables in all specifications, except for inflation and interest rate expectations, where the sample is trimmed at the 95^{th} percentile only. All regressions include the set of controls described in detail in Table 1. Robust standard errors are shown in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

C.5 Comparison to related literature

We interpret the magnitude of our estimated effects of home price expectations on renters' spending in the context of previous literature.

Effects of realized home price growth We first compare the elasticity of renters' spending to future home prices implied by our estimates to the elasticity of spending to *realized* home prices measured in other studies. We shift respondents' beliefs about home price growth over the next ten years. We therefore calculate an elasticity by dividing the percent difference in spending across treatment arms by the percent difference in the implied expected home value in ten years.

Our estimated elasticity of renters' spending is -0.34, which we obtain by dividing the 7.1% difference in spending (Column 3 of Table 2) by the 21% difference in expected home prices in ten years implied by the posterior expected growth rates of 4.3% and 6.3% in the *high forecast* and the *low forecast* arm (Panel C of Table 1). Only few existing studies calculate an elasticity of renters' spending to realized home price changes. Attanasio et al. (2009) estimate a positive elasticity of 0.133 in survey data from the UK, while Stroebel and Vavra (2019) estimate a large elasticity of 0.408 using NielsenIQ data. The evidence in Stroebel and Vavra (2019) suggests that such changes mostly reflect a pass-through of local house prices to local retail prices. By contrast, our exercise isolates variation in expectations that is orthogonal to local conditions. Another benchmark are homeowners' responses to realized home price changes. Vestman et al. (2023) review estimated elasticities across 13 studies, ranging from 0 to 0.3. Smaller elasticities of homeowners' spending are plausible given that positive endowment effects and negative income effects from higher housing costs should partially offset each other for this group. Against the backdrop of these studies, our estimated elasticity for renters is relatively large. In Section 4.3, we present a back-of-the-envelope calculation suggesting that our estimated effect size for renters is plausible after carefully accounting for the main mechanisms at play.

Effects of other macroeconomic expectations Next, we compare our estimated effect for renters to the effects of other macroeconomic expectations on spending estimated in previous studies. We focus on two experimental studies, as estimates from correlational studies vary widely and are harder to interpret due to confounding factors. As highlighted in Section 3, renters reduce their spending by 3.6% for a one p.p increase in expected long-run home price growth. In a field experiment with NielsenIQ panelists, Coibion et al. (2022) find that a one p.p. increase in inflation expectations increases spending as measured in the scanner data by about 0.85% to 0.95%. In a similar setting, Coibion et al. (2021a) detect a short-run increase in expenditures measured in scanner data by 2.9% in response to an exogenous increase in the expected real interest rate by one p.p. Direct comparisons are challenging given differences in (i) the mechanisms operating for beliefs about different variables and (ii) reference horizons for expectations (ten years vs. one year). Keeping these caveats in mind, our estimates appear comparable to the effects of other macroeconomic expectations on spending.

C.6 Evidence on optimization frictions

We conduct another pre-registered auxiliary survey to provide evidence on optimization frictions in housing decisions.[1] Such frictions could attenuate endogenous adjustments to housing in response to changes in (expected) home prices operating through substitution effects, an investment motive, or purchase timing considerations, as studied in Section 4.2. We focus on current owners, as this allows us to ask retrospective questions on frictions they encountered when purchasing their current home.

Sample We conducted this survey with 500 homeowners recruited from Prolific in September 2024. Summary statistics are shown in Table C.5 and the main survey instructions are available in Appendix D.7.

Design We elicit homeowners' difficulty of finding a home, their flexibility of adjusting the move-in date, and the moving costs they incurred when they purchased their current home on 5-point categorical response scales. For each of these three types of optimization frictions, we elicit the main underlying drivers using multiple choice questions.

Results Figure C.1 provides an overview of the responses. Half of all homeowners faced difficulties in finding a suitable home (Panel A), mostly due to tight housing markets (41.2%, Panel B). Moreover, 50% of homeowners had no more than "some flexibility" regarding their move-in date (Panel C). They mostly cite the point in time when the new home became available as a factor constraining their move-in date (38.2%, Panel D). Lastly, 72.2% of homeowners report that it was at least "somewhat costly" in terms of time and money to move (Panel E), reflecting utility setup fees (36.2%, Panel F) or fees for real estate agents (23.8%). Thus, optimization frictions seem to play a major role in housing decisions, which could limit endogenous adjustments to housing in response to changes in (expected) home price growth.

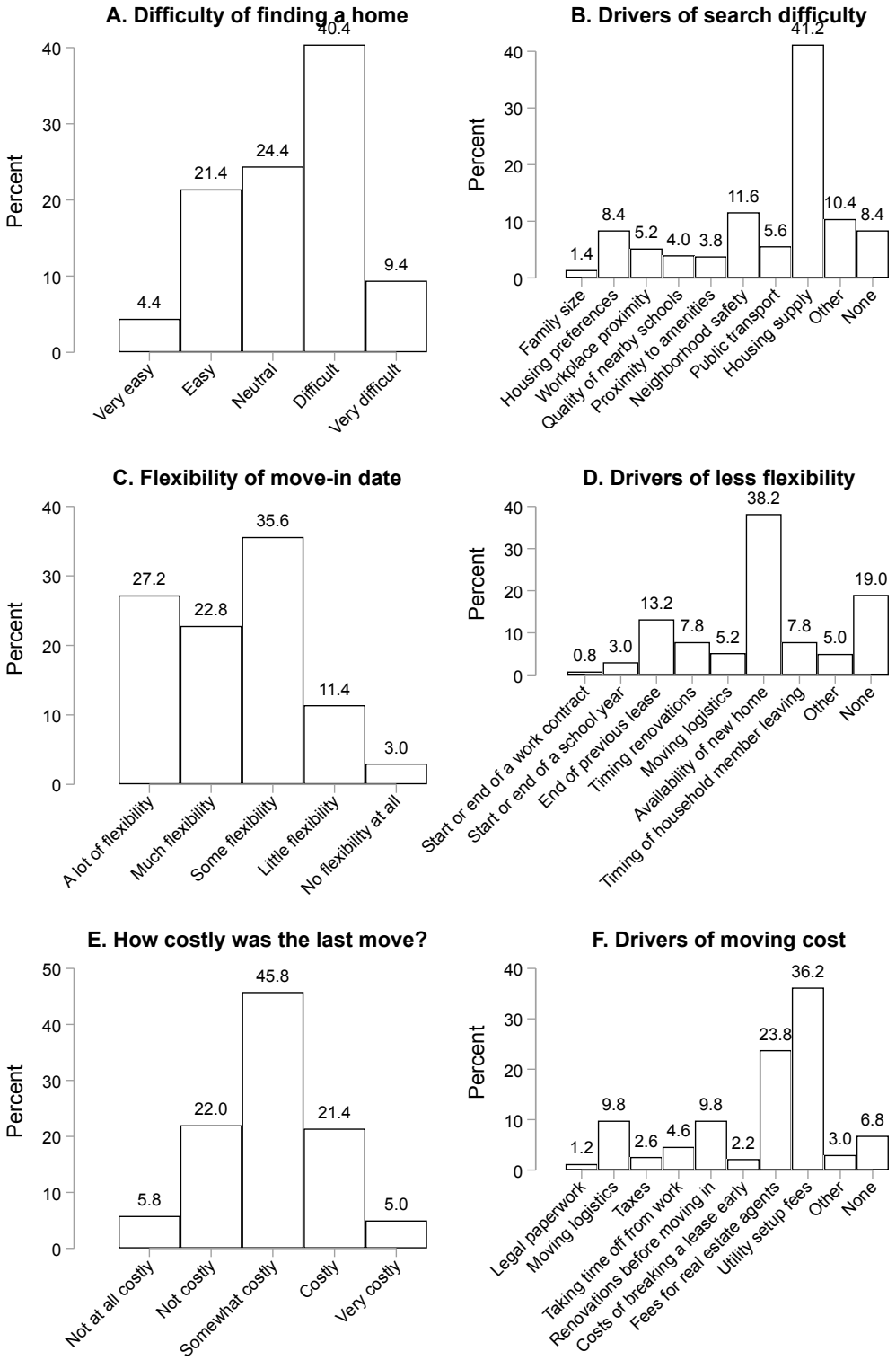
[1] The pre-registration is available here: `https://aspredicted.org/925x-r9h4.pdf`

Table C.5: Optimization frictions survey: Summary statistics

	General population: Homeowners (ACS 2019)	Survey sample (Mean/std.dev.)
Female	0.514	0.496
		(0.500)
Age	51.056	45.102
		(12.195)
Log income	11.329	11.341
		(0.706)
College degree	0.344	0.634
		(0.482)
Employed	0.618	0.684
		(0.465)
Northeast	0.169	0.198
		(0.399)
Midwest	0.221	0.212
		(0.409)
South	0.388	0.404
		(0.491)
West	0.222	0.186
		(0.389)
Household size	2.941	3.010
		(1.458)
Observations		500

Note: This table presents summary statistics for the optimization frictions survey from September 2024 with a sample of 500 homeowners. The first column presents the corresponding means for homeowners in the general population based on data from the 2019 American Community Survey (ACS). Column 2 presents the mean and standard deviation in the full sample. "Female" is a binary indicator taking value one for female respondents. "Age" is the respondents' numerical age. "Log income" is the log of the midpoint of the respondent's household income. "College degree" is a binary indicator for having completed a college degree. "Employed" is a binary indicator for being employed. "Northeast," "Midwest", "South" and "West" are binary region indicators.

Figure C.1: Optimization frictions in the housing market



Note: This figure presents evidence on optimization frictions among homeowners, using data from the optimization frictions survey ($n = 500$, see Table A.1 for an overview of data collections).

C.7 Additional heterogeneity analyses

In this appendix, we examine additional potential dimensions of heterogeneity in treatment effects.

We first examine heterogeneity by the presence of children. The NielsenIQ dataset tracks the number of children below the age of 18 that live in the same household as the respondent. We compare the spending response of households with some children (Panel A of Table C.6) with the spending response of households without any children (Panel B of Table C.6). We find no statistically significant heterogeneity in treatment effects on household spending. Next, we examine heterogeneity by household income. Panels C and D of Table C.6 show that we obtain very similar treatment effects on spending based on whether a household has above or below median income in our sample. The absence of heterogeneity in treatment effects could reflect that both dimensions – the presence of children and household income – may only be weakly related to households' plans of either upscaling or downscaling their housing.

Table C.6: Treatment effects on expenditures: Additional heterogeneity analyses

	Dependent variable: Log expenditures		
	(1) All respondents	(2) Homeowners	(3) Renters
Panel A: No children			
High forecast x Post	-0.012	-0.000	-0.069**
	(0.015)	(0.016)	(0.034)
N	13,454	11,102	2,352
Households	1,922	1,586	336
R^2	0.717	0.710	0.734
Household FEs	Yes	Yes	Yes
Month FEs	Yes	Yes	Yes
Panel B: Some children			
High forecast x Post	-0.022	-0.009	-0.076
	(0.027)	(0.030)	(0.066)
N	4,158	3,269	889
Households	594	467	127
R^2	0.702	0.704	0.688
Household FEs	Yes	Yes	Yes
Month FEs	Yes	Yes	Yes
Panel C: Below median income			
High forecast x Post	-0.017	0.004	-0.073**
	(0.018)	(0.021)	(0.036)
N	9,163	6,748	2,415
Households	1,309	964	345
R^2	0.710	0.709	0.706
Household FEs	Yes	Yes	Yes
Month FEs	Yes	Yes	Yes
Panel D: Above median income			
High forecast x Post	-0.012	-0.007	-0.070
	(0.018)	(0.019)	(0.056)
N	8,449	7,623	826
Households	1,207	1,089	118
R^2	0.716	0.707	0.766
Household FEs	Yes	Yes	Yes
Month FEs	Yes	Yes	Yes

Note: This table presents regression estimates of the treatment effect of receiving a high forecast (6%) rather than a low forecast (1.5%) about average annual home price growth over the next ten years on home price expectations for different subgroups in the baseline survey of our main experiment. The dependent variables are the mean and standard deviation of a respondent's subjective probability distribution over average annual home price growth over the next ten years (Columns 1 and 2) and a respondent's z-scored agreement with the statement that "US home prices will increase strongly over the next ten years" (Column 3). "High forecast" is a binary indicator taking value one for respondents assigned to the *high forecast* treatment arm. "Plans to move" is a binary indicator for those who plan to move to a different home. Panel A and Panel B are restricted to respondents without children and with children, respectively. Panel C and Panel D are restricted to respondents with below median and above median income, respectively. All regressions include the set of controls described in detail in Table 1. Robust standard errors are shown in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

C.8 Mechanism survey: Considerations and spending responses

In this appendix, we examine how different considerations raised in the open-ended question in our mechanism survey presented in Section 5 are related to respondents' reported spending responses to the hypothetical increase in home price expectations. Figure C.2 provides evidence on the relationship between different considerations and the tendency to report a worsening of the expected future economic situation of the household or to report a reduction in current spending. It displays coefficient estimates from multivariate regressions of spending and expectation responses on dummy variables indicating the different considerations as well as a set of control variables. We focus our discussion on the effects of considerations that frequently appear in the open-ended responses.

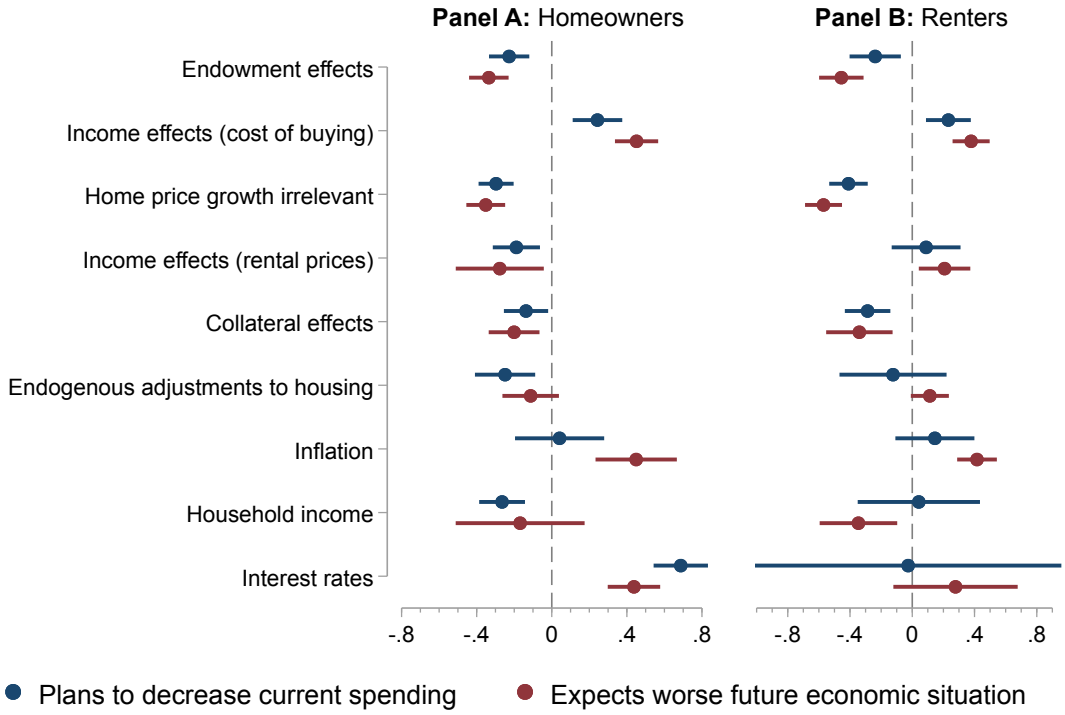
As shown in Panel A, among owners, considerations about changes in their own housing wealth are associated with a lower tendency to reduce spending ($p < 0.01$), while considerations about an increased cost of home purchases are associated with a higher tendency to reduce spending ($p < 0.01$). This is consistent with the idea that homeowners' muted spending responses to changes in home price expectations partially reflect offsetting endowment and income effects. Homeowners who mention that changes in home prices would be irrelevant to them are less likely to plan spending cuts ($p < 0.01$), suggesting that muted consumption responses are often due to homeowners viewing increases in their housing wealth as "paper gains". Panel B highlights that, among renters, especially those mentioning higher costs of purchasing a home tend to plan spending cuts ($p < 0.01$). Renters mentioning future rental prices are more likely to reduce spending, but the relationship is noisily measured ($p = 0.429$). Together, these patterns point to income effects as the key channel behind consumption responses among renters. Considerations about inflation are not significantly related to spending responses in either group, providing further evidence against an important role for cross-learning in driving spending responses in our main experiment. For both groups, the patterns for changes in respondents' economic outlook are broadly consistent with the patterns for spending.

To what extent can differences in considerations account for differences in spending responses between owners and renters? We regress a dummy variable indicating whether a respondent reports spending cuts on a homeowner dummy, and step-by-step add dummy variables for mentioning different mechanisms. We focus on the three considerations that are most important in predicting spending responses: income effects from changes in the cost of purchasing a home, endowment effects from changes in own housing wealth, and reporting that home price changes would be irrelevant for one's economic situation. These considerations have comparable effects on the spending responses of owners and renters, making a "horse race" between a homeowner dummy and considerations straightforward to interpret. As shown in Table C.7, the coefficient estimate on the homeowner dummy shrinks by 80% and is no longer statistically significant once dummy variables for these three types of considerations are included (Columns 1 and 5). This exercise shows that differences in considerations can explain a sizable share of the difference in

spending responses between owners and renters.

Overall, the relationship between respondents' considerations and their planned consumption responses is consistent with the mechanism evidence from the field experiment: while renters reduce their spending due to higher expected costs of purchasing a home, homeowners do not respond, either because they do not plan to sell their home or because effects from higher proceeds of future home sales and higher costs of replacement homes offset each other. The evidence from our additional experiment therefore confirms the central roles of endowment and income effects in the spending response to home price expectations.

Figure C.2: Mechanism survey: Open-ended responses are correlated with planned behaviors and economic outlook



Note: This figure shows coefficient estimates from multivariate regressions of expectation and spending adjustments to an increase in beliefs about average annual home price growth over the next ten years from 1.5% to 6% on measures of reasoning, based on data from the mechanism survey. The dependent variables are binary indicators taking value one for respondents who report a worsened future economic outlook for their household and for respondents who would reduce their current household spending as a result of an increase in home price expectations. The independent variables are indicators for whether a respondent mentions specific mechanisms in their response to the open-ended question on how higher home prices would affect their economic outlook for their household in a specific way. Panel A shows results for homeowners, while Panel B presents estimates for renters. All regressions control for age, gender, college education, and log household income. 95% confidence intervals derived from robust standard errors are shown.

Table C.7: Mechanism survey: Considerations explain differences in planned spending responses to changes in home price expectations between homeowners and renters

	Dependent variable: Planned decrease in current spending (binary)				
	(1)	(2)	(3)	(4)	(5)
Homeowner	-0.253***	-0.175***	-0.194***	-0.135***	-0.051
	(0.040)	(0.044)	(0.041)	(0.043)	(0.045)
Endowment effects		-0.201***		-0.164***	-0.245***
		(0.040)		(0.039)	(0.042)
Income effects (cost of buying)			0.271***	0.249***	0.216***
			(0.048)	(0.048)	(0.047)
Home price growth irrelevant					-0.308***
					(0.038)
Constant	0.432***	0.451***	0.321***	0.345***	0.383***
	(0.032)	(0.032)	(0.036)	(0.037)	(0.037)
Explained homeowner effect:		31%	23%	47%	80%
N	497	497	497	497	497
R^2	0.076	0.109	0.145	0.167	0.217

Note: This table presents regression estimates of the effect of being a homeowner and of considerations on spending responses based on data from the mechanism survey. The dependent variable is a binary indicator taking value one for respondents who plan to decrease their current household spending in response to higher home price expectations, and zero otherwise. "Homeowner" is a binary indicator for respondents who own the home they are living in. "Endowment effects" is a binary indicator taking value one for respondents who mention changes in the value of their currently owned home in their responses to the open-ended question on how an increase in home price expectations would affect their household's economic outlook. "Income effects (cost of buying)" and "Home price growth irrelevant" are analogously defined binary indicators (see Table A.21 for details about these codes). Robust standard errors are shown in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

D Survey instructions

This section contains the key survey instructions for our different data collections. Appendix Table A.1 provides an overview and further details about the data collections.

D.1 Main experiment: Baseline survey (November 2019)

Moving intentions

What is the percent chance that your household will move to a different home within the next ten years? __ percent.

[Page break]

If your household moves to a different home within the next ten years, do you think it will move to a cheaper or to a more expensive home?

- My household would move to a cheaper home
- My household would move to an equally expensive home
- My household would move to a more expensive home

Prior beliefs

We would now like you to think about the value of a typical home in the US.
What do you expect the average annual growth rate of the value of a typical home in the US to be over the next ten years?
Note: This average annual growth rate of home prices is the change in value, in percent, that you expect each year on average over the next ten years.
____ percent per year, over the next ten years.

[Page break]

How confident are you about your answer to the question about home prices that you were just asked?

- Extremely confident
- Very confident
- Somewhat confident
- Not very confident
- Not at all confident

Information treatment

On the next slide, we will provide you with information on the view of a professional forecaster on the average growth rate of the value of a typical home in the US over the next ten years.
We would like to ask you to take a moment to review the information carefully.
Note: The information will be shown to you only once and you will not be able to come back to it.
[Respondents are randomly assigned in equal proportion to either the "high forecast" or the "low forecast" treatment arm at this stage in the survey.]

[Page break]

[Shown only to respondents in the "high forecast" treatment arm.]
We now would like to provide you with a forecast of home price growth from an expert who regularly participates in the World Economic Survey, an expert survey on macroeconomic forecasts.
According to this expert forecast, the average annual growth rate of home prices in the US over the next ten years will be 6 percent.
In the case where home prices increase by 6 percent in each of the next ten years, this would mean that a home worth $100,000 today will be worth about $179,085 in ten years from now.

[Page break]

[Shown only to respondents in the "low forecast" treatment arm.]
We now would like to provide you with a forecast of home price growth from an expert who regularly participates in the World Economic Survey, an expert survey on macroeconomic forecasts.
According to this expert forecast, the average annual growth rate of home prices in the US over the next ten years will be 1.5 percent.
In the case where home prices increase by 1.5 percent in each of the next ten years, this would mean that a home worth $100,000 today will be worth about $116,054 in ten years from now.

[Page break]

[Shown to all respondents. The instructions in the remainder of the survey are identical across treatment arms from now on.]
We now would like to provide you with a forecast of inflation from an expert who regularly participates in the Survey of Professional Forecasters. According to this expert forecast, the average annual rate of inflation in the US over the next ten years will be 2.2 percent.

Qualitative posterior

To what extent do you agree with the following statements?
Rent on homes/apartments in the US will increase strongly over the next ten years.

- Strongly agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree

US home prices will increase strongly over the next ten years.

- Strongly agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree

[Page break]

How do you think that the total net wealth of your household will change over the next ten years?

- Increase very strongly

- Increase strongly
- Increase somewhat
- Neither increase nor decrease
- Decrease somewhat
- Decrease strongly
- Decrease very strongly

Quantitative posterior: Home price expectations

In this question we present you with eight possible scenarios for the average annual growth rate of the value of a typical home in the US, over the next ten years.
Please let us know how likely you think it is that each scenario will occur.
Please type in the number to indicate the probability, in percent, that you attach to each scenario.
The probabilities of the eight scenarios have to sum up to 100 percent.
The average growth rate of the value of a typical home in the US over the next ten years will be...

- Scenario 1: ... more than 20 percent. ____ percent.
- Scenario 2: ... between 10 and 20 percent. ____ percent.
- Scenario 3: ... between 5 and 10 percent. ____ percent.
- Scenario 4: ... between 0 and 5 percent. ____ percent.
- Scenario 5: ... between -5 and 0 percent. ____ percent.
- Scenario 6: ... between -10 and -5 percent. ____ percent.
- Scenario 7: ... between -20 and -10 percent. ____ percent.
- Scenario 8: ... less than -20 percent. ____ percent.

Total: *[automatically calculated]* percent

Perceived constraints

Assume that your household wanted to increase its spending to finance a vacation that costs $1,000. How difficult would it be for your household to come up with money to finance this vacation...
... currently?

- Very difficult
- Somewhat difficult
- Neither easy nor difficult
- Somewhat easy
- Very easy

... in ten years from now?

- Very difficult
- Somewhat difficult
- Neither easy nor difficult
- Somewhat easy
- Very easy

[Page break]

Assume that your household's car broke down and the repair costs $1,000. How difficult would it be for your household to take out a loan to finance this repair...
...currently?

- Very difficult
- Somewhat difficult
- Neither easy nor difficult
- Somewhat easy
- Very easy

...in ten years from now?

- Very difficult
- Somewhat difficult
- Neither easy nor difficult
- Somewhat easy
- Very easy

Additional background characteristics

What is your year of birth? [Drop-down list]

[Page break]

Do you own or rent your current main residence?

- Owner
- Renter
- Other

D.2 Main experiment: Follow-up survey (December 2019)

Durable spending

What was your household's total spending on purchases of durable goods over the last four weeks?
Durable goods are goods that last in time, including for instance cars, electronics, kitchen appliances, furniture, house maintenance, jewelries, etc.
Please exclude purchases of houses, apartments, etc.
Please provide an answer in dollars.

- ☐ My household did not buy any durables over the last four weeks.
- ☐ $ __

Economic expectations

Now we would like to ask you about your views on the development of different economic indicators over the next ten years.
Over the next ten years, what do you think will be

☐ . . . the average annual interest rate on a savings account: __ percent.
☐ . . . the average annual inflation rate: __ percent.
☐ . . . the average annual change in home prices:__ percent.
☐ . . . the average annual change in your total household labor income: __ percent.
☐ . . . the average annual return of the US stock market: __ percent.
☐ . . . the average annual growth rate of US real (inflation-adjusted) GDP:__ percent.
☐ . . . the average annual change in rent on homes/apartments: __ percent.

Long-run plans

The next questions are about your expectations regarding your household's intended behavior over the next five years.

[Page break]

Over the next five years, does your household plan to search for a home to buy? Please include main and second homes, and any other real estate. [Yes/No]

[Page break]

Over the next five years, does your household plan to sell any home your household owns? Please include main and second homes, and any other real estate owned by your household. [Yes/No]

D.3 Robustness experiment: Screener survey (August 2023)

Do you own or rent your current main residence?

- Own
- Rent
- Other

Do you own any other homes or apartments that you are not living in yourself? [Yes / No]

Does your household plan to buy a home within the next ten years? [Yes / No]

Only for respondents who plan to buy a home:
Does your household plan to buy a home that is more expensive, equally expensive, or less expensive than your household's current main residence?

- We plan to buy a more expensive home
- We plan to buy an equally expensive home
- We plan to buy a less expensive home

Only for respondents who own their home:
Does your household plan to sell your current main residence over the next ten years? [Yes / No]

D.4 Robustness experiment: Baseline survey (August 2023)

Prior beliefs

We would now like you to think about the value of a typical home in the US.
What do you expect the average annual growth rate of the value of a typical home in the US to be over the next ten years?
Note: This average annual growth rate of home prices is the change in value, in percent, that you expect each year on average over the next ten years.
[Text entry box]

[Page break]

How confident are you about your answer to the question about home prices that you were just asked?

- Extremely confident
- Very confident
- Somewhat confident
- Not very confident
- Not at all confident

Information treatment

[Respondents are randomly assigned in equal proportion to the "high forecast" or the "low forecast" treatment arm, and the "supply rationale" or the "demand rationale" treatment arm at this stage in the survey.]

[Shown only to respondents in the "high forecast" and "supply narrative" treatment:]
We would like to provide you with a forecast of home price growth from an expert who regularly participates in the Economic Expert Survey, an expert survey on macroeconomic forecasts.
According to this expert forecast, the average annual growth rate of home prices in the US over the next ten years will be 6 percent. The expert cited housing supply constraints (e.g., regulation or the current housing stock) as a main factor underlying their forecast.
In the case where home prices increase by 6 percent in each of the next ten years, this would mean that a home worth $100,000 today will be worth about $179,085 in ten years from now.

[Shown only to respondents in the "high forecast" and "demand narrative" treatment:]
We would like to provide you with a forecast of home price growth from an expert who regularly participates in the Economic Expert Survey, an expert survey on macroeconomic forecasts.
According to this expert forecast, the average annual growth rate of home prices in the US over the next ten years will be 6 percent. The expert cited demographic trends in the US (e.g., age structure or population growth) as a main factor underlying their forecast.
In the case where home prices increase by 6 percent in each of the next ten years, this would mean that a home worth $100,000 today will be worth about $179,085 in ten years from now.

[Shown only to respondents in the "low forecast" and "supply narrative" treatment:]
We would like to provide you with a forecast of home price growth from an expert who regularly participates in the Economic Expert Survey, an expert survey on macroeconomic forecasts.
According to this expert forecast, the average annual growth rate of home prices in the US over the next ten years will be 2 percent. The expert cited housing supply constraints (e.g., regulation or the current housing stock) as a main factor underlying their forecast.

In the case where home prices increase by 2 percent in each of the next ten years, this would mean that a home worth $100,000 today will be worth about $121,899 in ten years from now.

[Shown only to respondents in the "low forecast" and "demand narrative" treatment:]
We would like to provide you with a forecast of home price growth from an expert who regularly participates in the Economic Expert Survey, an expert survey on macroeconomic forecasts.
According to this expert forecast, the average annual growth rate of home prices in the US over the next ten years will be 2 percent. The expert cited demographic trends in the US (e.g., age structure or population growth) as a main factor underlying their forecast.
In the case where home prices increase by 2 percent in each of the next ten years, this would mean that a home worth $100,000 today will be worth about $121,899 in ten years from now.

[Shown to all respondents. The instructions in the remainder of the survey are identical across treatment arms from now on.]
We now would like to provide you with a forecast of inflation from an expert who regularly participates in the Survey of Professional Forecasters. According to this expert forecast, the average annual rate of inflation in the US over the next ten years will be 2 percent.

Qualitative posterior

To what extent do you agree with the following statements?
Rent on homes/apartments in the US will increase strongly over the next ten years.

- Strongly agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree

US home prices will increase strongly over the next ten years.

- Strongly agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree

How do you think that the total net wealth of your household will change over the next ten years?

- Increase very strongly
- Increase strongly
- Increase somewhat
- Neither increase nor decrease
- Decrease somewhat
- Decrease strongly
- Decrease very strongly

Quantitative posterior: Home price expectations

In this question we present you with eight possible scenarios for the average annual growth rate of the value of a typical home in the US, over the next ten years.

Please let us know how likely you think it is that each scenario will occur. Please type in the number to indicate the probability, in percent, that you attach to each scenario. The probabilities of the eight scenarios have to sum up to 100 percent.
The average annual growth rate of the value of a typical home in the US over the next ten years will be...

- Scenario 1: ... more than 20 percent. ____ percent.
- Scenario 2: ... between 10 and 20 percent. ____ percent.
- Scenario 3: ... between 5 and 10 percent. ____ percent.
- Scenario 4: ... between 0 and 5 percent. ____ percent.
- Scenario 5: ... between -5 and 0 percent. ____ percent.
- Scenario 6: ... between -10 and -5 percent. ____ percent.
- Scenario 7: ... between -20 and -10 percent. ____ percent.
- Scenario 8: ... less than -20 percent. ____ percent.

Total: *[automatically calculated]* percent

[Page break]

Now we would like to ask you about your views on the development of different economic indicators in the US over the next ten years.
Over the next ten years, what do you think will be the average annual change in home prices: ____ percent.
Over the next ten years, what do you think will be the average annual change in rent on homes/apartments: ____ percent.

[Page break]

Over the next ten years, what do you think will be the average annual interest rate on a savings account: ____ percent.
Over the next ten years, what do you think will be the average annual inflation rate: ____ percent.
Over the next ten years, what do you think will be the average annual change in your total household labor income after taxes and deductions: ____ percent.

D.5 Robustness experiment: Follow-up survey (September 2023)

Durable spending

Over the last four weeks, did your household purchase any of the following goods? Please select all that apply.

- House or apartment:
- Car or other vehicle
- Major household appliances or furniture (e.g., refrigerator, sofa)
- Electronic equipment (e.g., smartphone, TV, laptop)
- Major vacation
- Luxury item (e.g., watch, jewelry)
- Machinery, tools, or sport equipment
- None of the above

[Page break]

Over the last four weeks, what was your household's total spending on each of the following categories of goods?

- House or apartment: $ ____
- Car or other vehicle: $ ____
- Major household appliances or furniture (e.g., refrigerator, sofa): $ ____
- Electronic equipment (e.g., smartphone, TV, laptop): $ ____
- Major vacation: $ ____
- Luxury item (e.g., watch, jewelry): $ ____
- Machinery, tools, or sport equipment: $ ____
- None of the above

[Note: Only durable goods categories that respondents selected on the previous survey page are presented in the above list.]

[Page break]

Over the last four weeks, did your household make any home improvements? [Yes/No]

[Page break]

Over the last four weeks, what was your household's total spending on restaurant visits and food consumed out of home? [Drop-down list]

[Page break]

Over the last four weeks, has your household taken out additional debt against your home equity? [Yes/No]

Over the next twelve months, does your household plan to take out additional debt against your home equity? [Yes/No]

Beliefs

Now we would like to ask you about your views on the development of different economic indicators in the US over the next ten years.
Over the next ten years, what do you think will be the average annual change in home prices: ____ percent.
Over the next ten years, what do you think will be the average annual change in rent on homes/apartments: ____ percent.

[Page break]

Over the next ten years, what do you think will be the average annual interest rate on a savings account: ____ percent.
Over the next ten years, what do you think will be the average annual inflation rate: ____ percent.
Over the next ten years, what do you think will be the average annual change in your total household labor income after taxes and deductions: ____ percent.

D.6 Moving plans experiment (September 2024)

Prior beliefs

We would now like you to think about the value of a typical home in the US.
What do you expect the average annual growth rate of the value of a typical home in the US to be over the next ten years?
Note: This average annual growth rate of home prices is the change in value, in percent, that you expect each year on average over the next ten years.
[Text entry box]

[Page break]

How confident are you about your answer to the question about home prices that you were just asked?

- Extremely confident
- Very confident
- Somewhat confident
- Not very confident
- Not at all confident

Information treatment

[Respondents are randomly assigned in equal proportion to the "high forecast" or the "low forecast" treatment arm.]

[Shown only to respondents in the "high forecast" treatment:]
We would like to provide you with a forecast of home price growth from an expert who regularly participates in the Economic Expert Survey, an expert survey on macroeconomic forecasts.
According to this expert forecast, the average annual growth rate of home prices in the US over the next ten years will be 6 percent.
In the case where home prices increase by 6 percent in each of the next ten years, this would mean that a home worth $100,000 today will be worth about $179,085 in ten years from now.

[Shown only to respondents in the "low forecast" treatment:]
We would like to provide you with a forecast of home price growth from an expert who regularly participates in the Economic Expert Survey, an expert survey on macroeconomic forecasts.
According to this expert forecast, the average annual growth rate of home prices in the US over the next ten years will be 2 percent.
In the case where home prices increase by 2 percent in each of the next ten years, this would mean that a home worth $100,000 today will be worth about $121,899 in ten years from now.

[Shown to all respondents. The instructions in the remainder of the survey are identical across treatment arms from now on.]
We now would like to provide you with a forecast of inflation from an expert who regularly participates in the Survey of Professional Forecasters. According to this expert forecast, the average annual rate of inflation in the US over the next ten years will be 2 percent.

Posterior home price expectations

In this question we present you with 14 possible scenarios for the average annual growth rate of the value of a typical home in the US, over the next ten years.

Please let us know how likely you think it is that each scenario will occur. Please type in the number to indicate the probability, in percent, that you attach to each scenario. The probabilities of the 14 scenarios have to sum up to 100 percent.
The average annual growth rate of the value of a typical home in the US over the next ten years will be...

- Scenario 1: ... more than 20 percent. ____ percent.
- Scenario 2: ... between 15 and 20 percent. ____ percent.
- Scenario 3: ... between 10 and 15 percent. ____ percent.
- Scenario 4: ... between 7.5 and 10 percent. ____ percent.
- Scenario 5: ... between 5 and 7.5 percent. ____ percent.
- Scenario 6: ... between 2.5 and 5 percent. ____ percent.
- Scenario 7: ... between 0 and 2.5 percent. ____ percent.
- Scenario 8: ... between 0 and -2.5 percent. ____ percent.
- Scenario 9: ... between -2.5 and -5 percent. ____ percent.
- Scenario 10: ... between -5 and -7.5 percent. ____ percent.
- Scenario 11: ... between -7.5 and -10 percent. ____ percent.
- Scenario 12: ... between -10 and -15 percent. ____ percent.
- Scenario 13: ... between -15 and -20 percent. ____ percent.
- Scenario 14: ... less than -20 percent. ____ percent.

Total: *[automatically calculated]* percent

Moving plans: Homeowners

[Questions below are shown only to homeowners. We ask separate questions for each time horizon shown in brackets.]

What is the likelihood (in percent) that you will sell your home and buy a new home within the next *[12 months, 3 years, 5 years, 10 years]*?
[Text entry box]
What is the likelihood (in percent) that you will sell your home and move to a rental home within the next *[12 months, 3 years, 5 years, 10 years]*?
[Text entry box]
What is the likelihood (in percent) that you will buy a second home or apartment as an investment within the next 5 years?
[Text entry box]

Moving plans: Renters

[Questions below are shown only to renters. We ask separate questions for each time horizon shown in brackets.]

What is the likelihood (in percent) that you will buy a home to live in within the next *[12 months, 3 years, 5 years, 10 years]*?
[Text entry box]

What is the likelihood (in percent) that you will move to a new rental home within the next *[12 months, 3 years, 5 years, 10 years]*?
[Text entry box]

Moving plans: All respondents

[Questions below are shown to all respondents.]

In case you move in the next 5 years, would you expect your new home to have fewer or more rooms than your current home?

- A lot fewer rooms
- Somewhat fewer rooms
- The same number of rooms
- Somewhat more rooms
- Many more rooms

In case you move in the next 5 years, would you expect your new home to have fewer or more square feet than your current home?

- A lot fewer square feet
- Somewhat fewer square feet
- The same number of square feet
- Somewhat more square feet
- Many more square feet

In case you move in the next 5 years, would you expect your new home to have higher or lower quality than your current home?

- A lot lower quality
- Somewhat lower quality
- Same quality
- Somewhat higher quality
- A lot higher quality

How attractive do you perceive housing to be as an investment?

- Not attractive at all
- Slightly attractive
- Neutral
- Moderately attractive
- Extremely attractive

In 5 years from now, do you expect spending on housing (e.g., rent, mortgages, home improvements) to provide more, the same, or less value compared to spending on non-housing goods and services (e.g., food, entertainment, travel)?

- Housing will provide significantly more value
- Housing will provide slightly more value
- Housing and non-housing consumption will provide about the same value
- Non-housing goods and services will provide slightly more value
- Non-housing goods and services will provide significantly more value

D.7 Optimization frictions survey (September 2024)

We will now ask you some questions about housing search. Think about the time when you moved into your current home.

How difficult was it to find a home that fits your size, location, and budget preferences?

- Very difficult
- Difficult
- Neutral
- Easy
- Very easy

Which of the following factors made it more difficult for you to find a suitable home? Please tick all that apply.

- The size of my family
- My specific housing preferences (e.g., garden, pool, home layout)
- Proximity to workplace
- Quality of nearby schools
- Proximity to amenities such as parks, stores and restaurants
- Neighborhood safety
- Availability of public transport
- Limited availability of homes
- Other: ___
- None of the above

[Page break]

How much flexibility did you have with your move-in date?

- A lot of flexibility
- Much flexibility
- Some flexibillity
- Little flexibility
- No flexibility at all

Which of the following factors made you less flexible regarding the move-in date? Please tick all that apply.

- Start or end of a work contract
- Start or end of a school year
- End of previous lease
- Timing of renovations
- Availability of movers or moving company
- Availability of the new home
- Timing of a household member leaving the home
- Other: ___
- None of the above

[Page break]

Think about the financial and time costs involved in your last move.

- Very costly
- Costly
- Somewhat costly
- Not costly
- Not at all costly

Which of the following factors made the process more costly in terms of time and money? Please tick all that apply.

- Legal paperwork
- Moving logistics
- Taxes
- Taking time off from work
- Renovations or repairs before moving in
- Costs associated with breaking a lease early
- Fees for real estate agents or brokers
- Utility setup fees (electricity, internet, etc.)
- Other: ___
- None of the above

D.8 Mechanism survey (November 2022)

Imagine you expect home prices to grow by 1.5% per year over the next 10 years. Now imagine that you increase your expectations about future home prices. You now expect home prices to increase by 6% per year over the next 10 years. How would this change in your expectations about future home prices affect your expectations about your household's future economic situation?

- My household's future economic situation would improve because of this change.
- My household's future economic situation would be unaffected by this change.
- My household's future economic situation would worsen because of this change.

Please explain why. Respond in full sentences. [Open-text box]

[Page break]

Which of the following factors did you consider when thinking about how the change in your expectations about future home prices would affect your expectations about your household's future economic situation? Please click on all factors that apply.

- Changes in the value of housing currently owned by my household
- Changes in the rent of homes
- Changes in the costs of buying a home
- Changes in the ease of borrowing money against my home equity
- Changes in my household's overall income
- Changes in interest rates
- Changes in inflation
- None of the above

[Note: Item order randomized, except for "None of the above"]

[Page break]

Please think again about the previous scenario. Imagine you expect home prices to grow by 1.5% per year over the next 10 years. Now imagine that you increase your expectations about future home prices. You now expect home prices to increase by 6% per year over the next 10 years. How would this change in your expectations about future home prices affect your household's current spending on consumption goods and services?

- My household would spend more because of this change.
- My household spending would be unaffected by this change.
- My household would spend less because of this change.

[Page break]

Do you own the place you are currently living in? [Yes/No]

Do you intend to buy a home in the next 10 years? [Yes/No]

Do you intend to sell a home in the next 10 years? [Yes/No]