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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. In our survey, we exogenously vary these expectations by providing households with different expert forecasts. Linking the survey data with rich home-scanner data, we document that homeowners' spending is inelastic to home price expectations. By contrast, renters reduce their spending when expecting higher home price growth. These findings reflect differences in the tendency to be a future net buyer of housing across the two groups. Our study highlights consequences of asset price growth for consumption inequality.

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

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1 Introduction

Asset valuations are central to wealth inequality. Over the last decades, increases in the valuation of stocks and housing have been a key driver of rising wealth inequality in many countries (Piketty and Zucman, 2014). Long-run changes in asset valuations are not merely "paper gains and losses" but can have substantial welfare effects, which differ between prospective net buyers and sellers of the asset (Fagereng, Gomez, Gouin-Bonenfant, Holm, Moll and Natvik, 2022). The anticipation of such price shifts should therefore entice households to update about their future economic situation. This raises the question of whether and how households' beliefs about the long-run growth rate of asset prices affect their economic decisions. Answering this question is key for understanding the behavioral and distributional consequences of asset price growth across net buyers and sellers of assets in modern economies.

In this paper, we study this question in the context of beliefs about changes in the valuation of homes – the most important asset on households' balance sheets – and households' consumption spending. Home price beliefs are key drivers of various housing-related decisions (Armona, Fuster and Zafar, 2019; Bailey, Dávila, Kuchler and Stroebel, 2019; Bailey, Cao, Kuchler and Stroebel, 2018; Kuchler, Piazzesi and Stroebel, 2023) and might affect consumption spending through their varying effects on the economic outlook of households. Specifically, higher anticipated home price growth makes a future home purchase more costly. Current renters – many of whom are prospective home buyers – should therefore negatively update about their future economic circumstances. Conversely, current owners should anticipate higher wealth, although homeowners may view this as a "paper gain" if they do not plan to move or anticipate the need to find a replacement home – which also has gone up in value – if they decide to sell. Home price beliefs might therefore differentially affect consumption decisions of current renters and homeowners, thereby exacerbating consumption inequality across these groups.

Identifying the causal effect of home price beliefs 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 variable bias 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. These households use scanners provided by NielsenIQ to track their expenditures, which substantially reduces noise compared to self-reported spending data. Our experiment relies on an information intervention embedded in a survey. We exogenously vary respondents' expected annual 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% (*high forecast*), while the other half of the respondents receive a forecast of an average annual home price growth of 1.5% (*low forecast*) over the next ten years. We then elicit posterior home price expectations both in the main survey and in a follow-up survey four weeks later. This setup allows us to link changes in home price expectations to actual spending behavior over the months following the intervention as measured in the scanner data. Due to the randomized nature of our intervention, the resulting evidence on the effect of home price beliefs on spending is immune to concerns related to omitted variable bias or classical measurement error.

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 1.5 p.p. across treatment arms corresponds to a learning rate from the forecasts of one-third, and implies a 22% 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, Cruces and Perez-Truglia, 2017; de Quidt, Haushofer and Roth, 2018).

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, allowing us to rule out effect sizes of more than 2.8 p.p. at a power of 80%. By contrast, renters reduce their spending by 7.6% 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 3.9 p.p. in response to a 1 p.p. higher expected annual home price growth. As the scanner dataset mainly covers spending on non-durable goods, we complement the scanner data 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.

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 supplements the provided expert forecasts with different narratives, allowing us to better control potential spillovers from the information to other beliefs, and elicits spending on a rich set of categories not contained in the scanner data. Despite these changes, the experiment confirms that homeowners' spending is inelastic to beliefs about home

price growth.

Having established how home price beliefs shape the consumption decisions of renters and owners, we explore the mechanisms behind our findings. We focus on three key channels: (i) planned future home purchases and sales, (ii) expected future rental prices, and (iii) expectations about future borrowing constraints.

To understand the role of planned asset purchases and sales, we split our original 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 expectations are entirely driven by likely future buyers of the asset: those who plan to move within the next ten years. 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 homeowners, 40% report not planning to move within the next ten years. Changes in housing wealth are likely to remain "paper gains or losses" for these households. Consistent with this notion, we find no average effect on consumption spending for this group of owners. Yet, even among owners who do plan to move – prospective sellers of the asset – consumption is inelastic to changes in home price expectations. One explanation for this pattern lies in the special nature of housing: all households require a place to live, which implies that many prospective sellers are at the same time prospective buyers of a replacement home. The demand for replacement homes effectively renders many owners neither net buyers nor net sellers of housing. The heterogeneity in spending responses therefore suggests that the transmission of expected asset price changes to consumption crucially depends on whether a household is a prospective net buyer or seller of the asset.[1]

We examine the role of beliefs about future rental prices and borrowing constraints in shaping households' spending responses to changes in home price beliefs using additional measures included in our survey. First, receiving a forecast of higher future home price growth could lead respondents to conclude that rental prices will also increase, raising the cost of housing services and thereby effectively reducing expected disposable economic resources for future renters. Indeed, both homeowners and renters upward adjust their expectations about rental prices when exposed to the high home price forecast. This may contribute to spending reductions among renters and to muted responses among owners, who face renting as an outside option in case they decide to realize wealth gains by selling their current home. Second, 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 appreciation, 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

[1] A back-of-the-envelope calculation confirms that the size of renters' spending reductions is sufficient to offset part of the increase in the expected down payment caused by our intervention, providing further support for this mechanism.

further contribute to the muted spending responses in this group.

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. 65% of renters 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 (41%), followed by mentions of higher rental prices (10%). Among owners, reported changes in the economic outlook are more balanced across expecting an improvement, a worsening, or no change. 25% 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 48% of owners mention increases in the valuation of their current home, 19% 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. Considerations about changes in future collateral constraints are very rare among homeowners (2%). Overall, these patterns in households' reasoning align with the evidence from our main experiment.

In the mechanism survey 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 planned reduction in spending is the most frequent response among renters, while a large majority of homeowners report that they would not change their spending. Reassuringly, respondents' considerations as measured in the open-ended question are highly correlated with their self-reported spending responses and explain up to 80% of the renter-homeowner difference in spending adjustments.

Lastly, we confirm the relevance of the potential key mechanisms behind our findings by reviewing the recommendations provided on popular financial advice websites. These websites encourage prospective future home buyers to save more when facing rising home prices. By contrast, owners are advised to consider the increased purchase price of the replacement home they require when realizing housing wealth gains.

Taken together, our study showcases how beliefs about long-run changes in the valuation of the most important asset on households' balance sheets – housing – shape spending behavior. Consumption responses to shifts in these beliefs crucially differ between renters and owners. Households thus seem to anticipate how asset price swings affect their economic situation, which contributes to consumption inequality across prospective buyers and sellers. Our findings are consistent with recent evidence that asset price movements are not purely "paper gains or losses"

but can substantially affect welfare for important groups of households (Fagereng, Gottlieb and Guiso, 2017). Conceptually, our study suggests that behavioral responses to anticipated asset price swings may depend on the asset class, as the dual nature of housing as an asset and consumption good mutes the spending response of owners.

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 (Aladangady, 2017; Andersen and Leth-Petersen, 2021; Aruoba, Elul and Kalemli-Özcan, 2022; Attanasio, Blow, Hamilton and Leicester, 2009; Browning, Gørtz and Leth-Petersen, 2013; Campbell and Cocco, 2007; Deng, Liao, Yu and Zhang, 2022; Disney, Gathergood and Henley, 2010; Guren, McKay, Nakamura and Steinsson, 2021; Kaplan, Mitman and Violante, 2020; Mian and Sufi, 2011; Mian, Rao and Sufi, 2013; Piazzesi and Schneider, 2016; Sodini, Van Nieuwerburgh, Vestman and von Lilienfeld-Toal, 2023; Stroebel and Vavra, 2019; Vestman, Bojeryd, Tyrefors and Kessel, 2023). Most of these studies document small positive effects of home price appreciations on the spending of homeowners, with a one dollar increase in home prices increasing homeowners' spending by between zero and ten cents (see Vestman et al. (2023) for an overview of effect sizes across studies). The effects are often concentrated among small groups of owners close to their collateral constraint (Aladangady, 2017; Aruoba et al., 2022; Browning et al., 2013; DeFusco, 2018; Vestman et al., 2023). Only few studies have examined spending responses to realized home price changes among renters. Aladangady (2017) documents an insignificant negative effect 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.

Our paper is the first to study the role 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 expected costs of home purchases and expected housing wealth gains, leading to muted spending effects among homeowners and negative effects among renters. If home price expectations are formed by extrapolating recent price changes – as suggested by empirical evidence (Armona et al., 2019) – this expectation channel will attenuate the aggregate consumption effects of realized home price swings.

Second, we contribute to a literature studying the formation and consequences of housing

[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. In work subsequent to ours, Binder, Kuang and Tang (2023) find that renters report lower non-durable spending in response to information reducing their expected house price growth, consistent with our findings.

market expectations (Kuchler and Zafar, 2019; Kuchler et al., 2023). Home price expectations have been shown to be central to households' choices regarding whether to rent or own (Adelino, Schoar and Severino, 2018; Bailey et al., 2018), housing investment (Armona et al., 2019), home selling (Bottan and Perez-Truglia, 2022), and mortgage leverage (Bailey et al., 2019). Our findings illustrate that expected home prices are also an important determinant of non-housing outcomes – the spending decisions of renters.

Finally, from a methodological perspective, our paper adds to a growing literature that uses information provision experiments to study the formation and consequences of macroeconomic expectations (Armantier, Nelson, Topa, van der Klaauw and Zafar, 2016; Binder and Rodrigue, 2018; Cavallo et al., 2017; Coibion, Georgarakos, Gorodnichenko, Kenny and Weber, 2021b; Coibion, Gorodnichenko and Kumar, 2018; Coibion, Gorodnichenko and Ropele, 2020; Coibion, Gorodnichenko, Kumar and Ryngaert, 2021c; D'Acunto, Fuster and Weber, 2022; Haaland and Næss, 2023; Kumar, Gorodnichenko and Coibion, 2023; Laudenbach, Weber, Weber and Wohlfart, 2023; Roth and Wohlfart, 2020). Only few other studies have linked information experiments shifting expectations with non-survey-based data on spending decisions (Coibion, Georgarakos, Gorodnichenko and Weber, 2021a; Coibion, Gorodnichenko and Weber, 2022; Galashin, Kanz and Perez-Truglia, 2021; Hackethal, Schnorpfeil and Weber, 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. Moreover, building on the approach in Bailey et al. (2019), we demonstrate how one can use supplementary surveys with open-ended questions to better understand the behavioral mechanisms underlying findings obtained using field data.

2 Experimental design and data

2.1 Baseline survey

In the following we describe the core modules of our baseline survey. 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 an expert who regularly participates in the World Economic Survey (WES), an expert survey on macroeconomic forecasts.[3] We provide our respondents with one of two actual

[3]The WES used to be administered by the ifo Institute and covered experts from more than 110 countries, who made macroeconomic forecasts for their economies. We were allowed to include questions in the October 2019 wave. In 2022, the WES was replaced by the Economic Experts Survey (EES).

forecasts of different experts – a commonly used method to vary beliefs in a non-deceptive way (Haaland, Roth and Wohlfart, 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:

> *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 value of a $100,000 home in ten years from now aims to mitigate the potential effects of exponential growth bias on the perception of cumulative home price growth (Stango and Zinman, 2009).

A potential concern is that the treatment may not only shift expectations about home price growth, but also expectations about the overall rate of inflation. To reduce such side-effects, respondents in both groups subsequently receive an additional expert forecast that the average annual rate of inflation in the US over the next ten years will be 2.2%. In our analysis in Section 3.1 we provide evidence for a limited role of potential spillovers of our intervention to expectations about other macroeconomic and personal outcomes.

Post-treatment beliefs To study the effect of the different 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 rates, which are mutually exclusive and collectively exhaustive. For each respondent, we then derive the implied mean and standard deviation of their home price expectations using the midpoints of the bins.[4] Lastly, we elicit

[4]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,"

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 intervention and the follow-up survey, which allows us to examine treatment effects on a spending category for which the coverage in 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 In our experiment, all respondents are provided with one of two different expert forecasts about future home price growth. An alternative design would provide a treatment group with an expert 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 an expert forecast, such side-effects should be comparable across treatment arms in our design. Second, the identifying variation in the alternative design depends on the difference between the information and a respondent's prior belief. 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,

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.

the identifying variation in our design depends only on the difference in the signals across the two treatment arms, 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 households that are 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 that they are provided with by NielsenIQ. The data have been collected since 2004 and the sample is broadly nationally representative in terms of nine demographic characteristics, such as age, household income, race and ethnicity. The NielsenIQ panel is by now widely used in academic research to study households' spending behavior and belief formation (Chopra, 2021; Coibion et al., 2022; Stroebel and Vavra, 2019). We also conduct additional data collections, which we introduce throughout the paper when relevant. 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. 3,850 active panelists completed our survey, out of which 2,482 (64%) completed the follow-up survey four weeks later. We exclude respondents that drop out of the NielsenIQ Homescan panel within three months after our main survey to focus on respondents with high-quality spending records (Dubé, Hitsch and Rossi, 2018), thus mitigating concerns about attrition bias as households report a lower spending share before dropping out of the panel (Neiman and Vavra, 2023). A pervasive concern in online surveys is that some respondents may not take the survey seriously and just quickly click through the questions. To focus on attentive respondents, we therefore drop individuals who spend less than five seconds on the screen on which the treatment information is provided. Finally, we exclude respondents who indicate to neither own nor rent a home. These steps leave us with a final sample of 2,554 respondents for the baseline survey, out of which 1,702 form the follow-up sample.

Spending data Our key outcome variable is respondents' consumption expenditure as measured in 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, Brown and Mathiowetz, 2001; Browning, Crossley and Weber, 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 all kinds of groceries (food and non-food), personal care and health products, and general merchandise products. 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., 2020; Stroebel and Vavra, 2019), tax rebates (Broda and Parker, 2014), inflation expectations (Coibion et al., 2021a, 2022), unemployment experiences (Malmendier and Shen, 2019) 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.2 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 average age (55 in our sample vs 48 in the population) and household income ($79,046 in our sample vs $79,517 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, Malmendier, Ospina and Weber, 2021). Another difference is a higher share of individuals with a college degree (47% in our sample vs 31% in the population) – a common feature of online panels (Armantier, Topa, van der Klaauw and Zafar, 2017).

Integrity of randomization Appendix Table A.3 presents balance tests to assess the integrity of the randomization into the two treatment arms. To address slight imbalances across arms, we include a set of control variables in all specifications comparing levels of variables across treatment arms.[5] Appendix Figure A.2 presents the cumulative distribution of average monthly household spending in the quarter prior to our baseline survey as measured in the scanner data. The distribution of baseline monthly spending is virtually indistinguishable across treatment arms, both among homeowners (Panel A, Kolmogorov-Smirnov p-value = 0.779) and among renters (Panel B, Kolmogorov-Smirnov p-value = 0.486).

3 Main results

3.1 Home price expectations

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

[5]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.

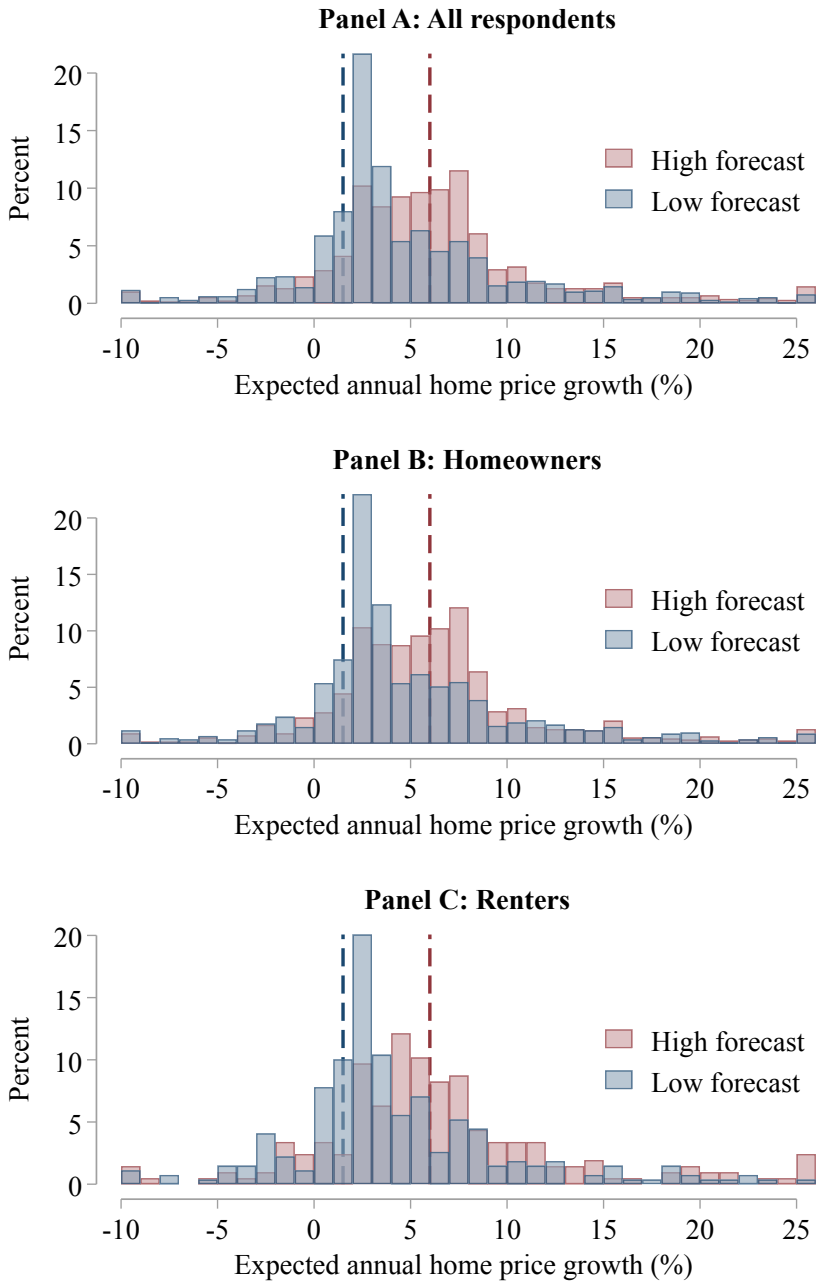
Pre-treatment beliefs Panel A of Appendix Figure A.1 displays the distribution of prior point expectations about average annual home price growth over the next ten years, winsorized at the 95th percentile. There is a substantial amount of disagreement across respondents and, on average, respondents expect home prices to increase by 9.6% 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.

Post-treatment beliefs Figure 1 displays the distributions of post-treatment beliefs about average annual home price growth rates over the next ten years, as measured by the means of respondents' subjective probability 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* treatment arm first-order stochastically dominates the distribution of posteriors in the *low forecast* treatment 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 control variables. Panel A focuses on the full sample. Being exposed to the high home price growth forecast increases respondents' posterior expectations about average annual home price growth over the next ten years by 1.5 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 ($6\% - 1.5\% = 4.5\%$). 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 1.5 p.p. across the two treatment arms implies a 22% difference in expected home prices at the end of the ten-year horizon.

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 32% 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.

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.

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,

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	1.480***	0.160	0.322***
	(0.238)	(0.221)	(0.036)
N	2,554	2,554	2,554
R^2	0.030	0.127	0.071
Mean in low forecast arm	4.676	7.822	0.000
Controls	Yes	Yes	Yes
Panel B: Homeowners			
High forecast	1.327***	0.105	0.314***
	(0.257)	(0.241)	(0.040)
N	2,079	2,079	2,079
R^2	0.026	0.133	0.069
Mean in low forecast arm	4.805	7.628	-0.026
Controls	Yes	Yes	Yes
Panel C: Renters			
High forecast	2.168***	0.428	0.388***
	(0.618)	(0.555)	(0.085)
N	475	475	475
R^2	0.060	0.112	0.091
Mean in low forecast arm	4.193	8.543	0.099
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 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 follow-up survey conducted four weeks after the intervention. 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 survey (Cavallo et al., 2017; de Quidt et al., 2018). 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.4, Column 1, $p < 0.01$).

We also use the follow-up survey to shed light on cross-learning, i.e., the possibility that respondents update beliefs about other macroeconomic or personal economic outcomes in response to the expert forecasts about home price growth. Cross-learning is a mechanism that generally operates in information provision experiments (Haaland et al., 2023) and could also matter in the real world when respondents learn about future home prices. Nevertheless, cross-learning complicates the interpretation of treatment effects on spending behavior.

We find some updating of expectations about future inflation in response to the treatment (Appendix Table A.4, Column 3, $p < 0.01$), but the effect is substantially smaller than the effect on expected home price growth. Similarly, respondents somewhat update about future real GDP growth (Column 4, $p = 0.016$), but this does not lead to changes in respondents' beliefs about their own labor income (Column 5, $p = 0.547$). Our treatment also has no strong effects on beliefs about interest rates or stock market returns (Columns 6 and 7). Overall, spillovers to beliefs about other economic variables seem to be of limited quantitative importance. In Section 3.2.3 we demonstrate the robustness of our results in an additional experiment that allows us to reduce concerns about cross-learning.[6]

3.2 Spending behavior

We next turn to the effects of our intervention on respondents' spending behavior, covering both non-durable spending measured in the scanner data and durable good spending measured in self-reports in the follow-up survey.

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:

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

[6]Open-ended data on reasoning about home price changes, which we collect using an additional mechanism survey, suggest that considerations about non-housing variables do not play an important role in shaping spending responses to changes in home price expectations. We discuss this evidence in Section 5.1.

where Log expenditures$_{i,t}$ indicates the log of respondent i's total household expenditure measured in the scanner data 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 respondents' expenditures as measured in the scanner data. Being exposed to the *high forecast* causes an insignificant reduction in expenditures by 1.5% when focusing on the full sample (Column 1, $p = 0.251$). When focusing on homeowners, the estimated treatment effects are very close to zero (Column 2, $p = 0.951$) and relatively precisely estimated, allowing us to rule out effect sizes of more than 2.8 p.p. at a power of 80%. However, receiving the *high forecast* significantly reduces spending among renters by 7.6% (Column 3, $p = 0.020$). The difference in treatment effects between homeowners and renters is statistically significant ($p = 0.035$). Putting the estimate among renters in relation to the corresponding first-stage estimate shown in Panel C of Table 1 (Column 1), renters reduce their spending by 3.9% for a one p.p. increase in expected average annual home price growth over the next ten years. Reassuringly, we obtain similar estimates of the elasticity of spending to home price expectations using a two-stage least-squares approach, as shown in Appendix Table A.5. The two-stage least-squares estimates suggest that renters decrease their spending by 2.8% in response to a one p.p. increase in expected home price growth (Column 3, $p = 0.067$). 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.

Robustness Our results are robust to a variety of checks. Appendix Table A.6 shows that we obtain similar estimates when performing the above analysis at the household-month-product category level. Appendix Table A.7 demonstrates robustness to focusing on households with 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. Lastly, Appendix Table A.8 shows that spending adjustments among renters are driven by a reduction in non-food expenditures.

3.2.2 Durable good purchases

We now turn to adjustments in respondents' purchases of durable goods over the four weeks following the intervention, as measured in self-reports in the follow-up survey. In Table 3 we regress a dummy for whether the respondent purchased any durable goods on a dummy variable

Table 2: Treatment effects on monthly scanner expenditures

	Dependent variable: Log expenditures		
	(1) All respondents	(2) Homeowners	(3) Renters
High forecast x Post	-0.015	-0.001	-0.076**
	(0.013)	(0.014)	(0.033)
	[0.251]	[0.951]	[0.020]
N	17,877	14,552	3,325
Households	2,554	2,079	475
R^2	0.727	0.724	0.725
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.

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

indicating whether a respondent received the high home price forecast as well as the standard set of control variables. 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 11 p.p. less likely to report any durable good purchase when exposed to the *high forecast* (Column 3, $p = 0.038$). This effect is sizable, given that 37% of renters in the *low forecast* arm made at least one durable good purchase. The patterns for purchases of durable goods thus resemble the results for non-durable spending: renters reduce their spending when expecting higher home price growth, while homeowners' 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, cross-learning about inflation but not nominal income – 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. Compared to our main experiment, we elicit spending on a richer set of categories and supplement the provided expert

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	0.036	-0.108**
	(0.024)	(0.026)	(0.052)
	[0.734]	[0.174]	[0.038]
N	1,702	1,374	328
R^2	0.024	0.019	0.058
Mean in low forecast arm	0.378	0.381	0.365
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.

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

forecasts with specific narratives, thus reducing the potential 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, David, Andrew, Zak and Ekaterina, 2021). The design proceeds in three waves. In an initial screener survey, we recruit 10,043 respondents to measure whether they are homeowners or renters. We re-invite the 4,917 homeowners identified in the screener survey to participate in the baseline survey, which is completed by 3,415 of them. In the follow-up survey, which takes place four weeks after the baseline survey, we re-invite all respondents from the baseline survey. 2,804 respondents complete the follow-up survey, corresponding to a relatively high re-contact rate of 81%.[7] Appendix Table A.11 provides summary statistics for the sample that completed the baseline survey. The key instructions for the three waves can be found 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

[7]There is no differential attrition between the two surveys across treatment arms ($p = 0.857$).

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. 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 in the housing market and should make it less likely that respondents attribute changes in home price growth to changes in the general level of 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 the main experiment, 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 that are 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.

Results Appendix Table A.12 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* does cause an increase in respondents' expected labor income growth (Column 5, $p < 0.01$). Panel B illustrates that whether respondents receive a supply-side narrative 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 in the follow-up survey, four weeks after the intervention. Taken together, a design attributing home price forecasts to developments in housing demand or supply substantially changes the nature of 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.13 presents results on spending decisions as measured in the follow-up survey, 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 consumed 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 decisions remain 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 focus on three key channels: (i) planned purchases and sales of homes, (ii) expected rental prices, and (iii) expected borrowing constraints.

4.1 Planned home purchases and sales

Whether asset price changes have real implications for a household depends on whether the household is a prospective buyer or seller of the asset (Fagereng et al., 2022). For prospective buyers, higher home price growth increases the cost of a future home purchase, which may entice them to save more. Since housing needs partially reflect hard constraints such as family size (Bailey et al., 2019), buying a smaller home when home prices are higher may not be an option for many households, making the saving margin central. For prospective sellers, higher home price growth implies higher proceeds from a future home sale, which may lead them to increase current consumption. Lastly, households that neither plan to buy nor plan to sell may view home price changes as irrelevant to their economic situation and not adjust their spending.

Heterogeneity in spending adjustments As a first step to understanding the role of this mechanism, we 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. We then analyze treatment effects on non-durable spending estimating specification 1 for each subsample. As shown in Table 4, spending reductions among renters are fully driven by those who intend to move in the next ten years (Column 4, $p < 0.01$) – that is, by likely future home buyers. 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

Table 4: Treatment effects on monthly scanner expenditures: Heterogeneity by moving intentions

	Dependent variable: Log scanner expenditures			
	Homeowners		Renters	
	(1) No plans to move	(2) Plans to move	(3) No plans to move	(4) Plans to move
High forecast x Post	0.014	-0.011	0.024	-0.089***
	(0.023)	(0.018)	(0.115)	(0.034)
N	5,788	8,764	343	2,982
Households	827	1,252	49	426
R^2	0.728	0.721	0.747	0.723
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 homeowners, while Columns 3–4 are restricted to renters. 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.

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

the treatment (Column 1, $p = 0.540$). Yet, even homeowners that do plan to move – who are likely future home sellers – do not adjust their spending in response to the treatment (Column 2, $p = 0.548$). A potential explanation for this pattern lies in the special nature of housing as an asset: given that every household requires a place to live, prospective sellers may realize that they are at the same time prospective buyers of a replacement home, leading to muted overall effects of home price expectations on current consumption (Aladangady, 2017; Sinai and Souleles, 2005).[8]

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 be planning to buy a home in the future. Similarly, owners above retirement age should be less likely to plan on upscaling their home and thereby becoming a net buyer of housing. Appendix Table A.10 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. Spending reductions of renters are fully concentrated among those below retirement age, who are likely future home buyers (Panel A, Column 3, $p = 0.012$). Although we find

[8] Appendix Table A.9 highlights 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.

no significant heterogeneity among owners of different age, the estimated effects are negative for those below and positive for those above retirement age, consistent with differences in the likelihood of being a prospective net buyer of housing.[9]

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.14, 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 ($p = 0.502$), 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, $p = 0.576$ and $p = 0.370$). 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 strongly support the idea that the effect of home price expectations on spending depends on whether a household is a prospective net buyer of housing.

Magnitude of renters' spending adjustments As a second step to understanding the role of planned home purchases and sales, we conduct a back-of-the-envelope calculation to interpret the magnitude of renters' spending responses in our main experiment. Specifically, we ask the following question: if renters expect to purchase a home in the future at a price consistent with their home price expectations, to what extent is the size of the treatment effect on spending in line with the idea that renters increase their saving to offset the higher expected purchase costs?

We make four 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 20% of the purchase price and use a mortgage to finance the remaining 80%. Third, respondents expect interest rates to permanently equal zero, reflecting the macroeconomic environment in the years preceding our survey. Fourth, 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 $35 more per month than respondents in the *low forecast* arm. The last 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.

Table 5 presents the details of the calculation. The average home value in the zip codes

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

Table 5: 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)	\$334,471	
Treatment effect on monthly scanner expenditures	-\$35	
	High forecast:	*Low forecast:*
Home price expectations (%)	4.2%	6.3%
Expected purchase price (assuming uniform purchase date within next 10 years)	\$474,484	\$422,110
Expected down payment (20% of home value)	\$94,897	\$84,420
Expected down payment difference across treatment arms	\$10,477	
Expected cumulative savings differences from changes in scanner expenditures until home purchase	\$2,314	
Cumulative savings differences relative to down payment difference	22.1%	

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 down payment required for purchasing a home in the next 10 years among renters. 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 in the zip codes of our respondents as of October 2019. We assume that renters target a down payment of 20% of the home value. We assume that initial spending adjustments, leading to renters in the *high forecast* treatment arm saving \$35 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.

where the renters in our sample reside was about \$334,000 according to data from Zillow when we conducted our baseline survey. Given our assumptions, the difference in average posterior home price expectations between renters in the *high forecast* (6.3%) and *low forecast* treatment arms (4.2%) would imply that renters in the *low forecast* treatment arm face an expected down payment of $\$474,484 \times 0.2 = \$94,897$, while renters in the *high forecast* treatment arm expect a down payment that is \$10,477 higher. At the same time, renters in the *high forecast* treatment arm are able to save \$35 more per month. This, in turn, translates into an expected cumulative savings difference of \$2,314 across treatment arms at the time of home purchase in the future. This savings difference is equivalent to 22.1% of the difference in the expected down payment across treatment arms.[10]

The observed spending responses among renters would thus be sufficient to offset about a

[10]When restricting to renters that plan to move to a different home in the next ten years, an analogous exercise yields a cumulative savings difference equivalent to 24.5% of the difference in the expected down payment across treatment arms.

quarter of the change in the required down payment given the exogenous change in home price expectations. Given that the scanner data cover only about a quarter of spending for the average household (Dubé et al., 2018), this likely constitutes a lower bound on the share of the change in down payment that renters would be able to cover by increased saving. Indeed, Section 3.2.2 shows that renters also reduce purchases of durable goods, which are not fully covered in the scanner data. Overall, the back-of-the-envelope calculation highlights that the size of renters' spending responses to our intervention is consistent with the idea that they increase their saving to compensate for the higher expected cost of buying a home in the future.

Taken together, the heterogeneity in spending responses and the magnitude of renters' spending adjustments underscore a key role for prospective purchases and sales of the asset in the transmission of asset price expectations to consumption.

4.2 Expected rental prices and borrowing constraints

We examine additional potential mechanisms behind households' spending responses by examining treatment effects on a set of qualitative beliefs included in our 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, higher expected home prices could make households conclude that future rental prices are higher. For households that expect to be renters in the future, this would increase the prospective cost of living and thus reduce disposable future income, which could lead them to reduce current spending. As shown in Column 1 of Table 6, respondents increase their expectations about future rental prices by 17.6% of a standard deviation in the full sample (Panel A, $p < 0.01$). The effect is almost twice as large among renters (Panel C, 31% 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, Le Blanc, Piazzesi and Schneider, 2022). Thus, higher expected rental prices may contribute to spending reductions among renters and muted spending responses among owners, who face renting as a potential future housing option in case they decide to realize wealth gains by selling their home.

Second, realized home price appreciations have been shown to relax homeowners' collateral constraints, leading to spending increases among constrained households (Aladangady, 2017). Unlike realized home price changes, changes in expected *future* home price growth generated by our intervention do not affect households' actual current borrowing constraints. However, homeowners may update their beliefs about future borrowing constraints, changing their current precautionary savings motives. Similarly, if homeowners revise their beliefs about the current home price expectations of lenders in response to our intervention, this may translate into lower perceived current borrowing constraints. In our baseline survey we elicit how difficult our

Table 6: Treatment effects on expected rental prices, borrowing constraints, and net wealth

	Dependent variable:			
	(1) Agree: Rental prices will increase strongly	(2) Perceived ease of borrowing now	(3) Expected ease of borrowing in ten years	(4) Expected change in net wealth
Panel A: All respondents				
High forecast	0.176***	0.006	0.006	0.078**
	(0.039)	(0.035)	(0.036)	(0.038)
N	2,554	2,554	2,554	2,554
R^2	0.031	0.226	0.173	0.119
Controls	Yes	Yes	Yes	Yes
Panel B: Homeowners				
High forecast	0.158***	-0.018	-0.003	0.089**
	(0.043)	(0.037)	(0.040)	(0.041)
N	2,079	2,079	2,079	2,079
R^2	0.029	0.184	0.165	0.119
Controls	Yes	Yes	Yes	Yes
Panel C: Renters				
High forecast	0.310***	0.083	0.018	0.042
	(0.098)	(0.096)	(0.091)	(0.091)
N	475	475	475	475
R^2	0.053	0.182	0.199	0.122
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' 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 2 and 3 are respondents' perceived ability to obtain a $1,000 loan either now or in 10 years from now, measured on 5-point Likert scales. The dependent variable in Column 4 is respondents' expected change in their household's total net wealth over the next ten years measured on a 7-point Likert scale. 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.

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

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 2 and 3 of Table 6, 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). The lack of updating about borrowing constraints may further contribute to the muted spending

responses among homeowners.[11]

Lastly, we examine effects on respondents' expectations about the development of their household's net wealth over the next ten years. As shown in Column 4 of Table 6, respondents exposed to the *high forecast* are 7.8% of a standard deviation more optimistic about their households' net wealth (Panel A, $p = 0.037$). Although this mostly reflects updating among owners (Panel B, 8.9% of a standard deviation, $p = 0.031$), also renters slightly increase their expectations about future net wealth, though not significantly so (Panel C, 4.2% of a standard deviation, $p = 0.645$). For owners, these results suggest that respondents realize that higher home price growth makes them more wealthy, even if many are not planning to realize these gains and thus treat them as "paper gains" only. For renters, these results suggest that spending reductions are not exclusively driven by a higher expected stream of future rental payments, which reduce future net wealth. Instead, many renters seem to plan to accumulate more wealth, potentially to be able to afford a home in an environment with higher home prices.

5 Reasoning about home price changes

5.1 Survey evidence

As an alternative approach to understanding the mechanisms behind our findings, we elicit households' reasoning about the consequences of future home price changes with an additional mechanism survey. On the one hand, this provides more direct mechanism evidence grounded in respondents' own words rather than the researcher's interpretation. On the other hand, this approach sheds light on households' explicit awareness of the key mechanisms shaping their economic decisions in this setting.

Sample The survey was conducted in November 2022 with 500 US respondents recruited on Prolific. Appendix Table A.15 presents summary statistics. 49.4% of our respondents are female, 69.5% have at least a college degree and the median household income of respondents in our sample is $62,500. 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.6 provides the key survey instructions.

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:

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

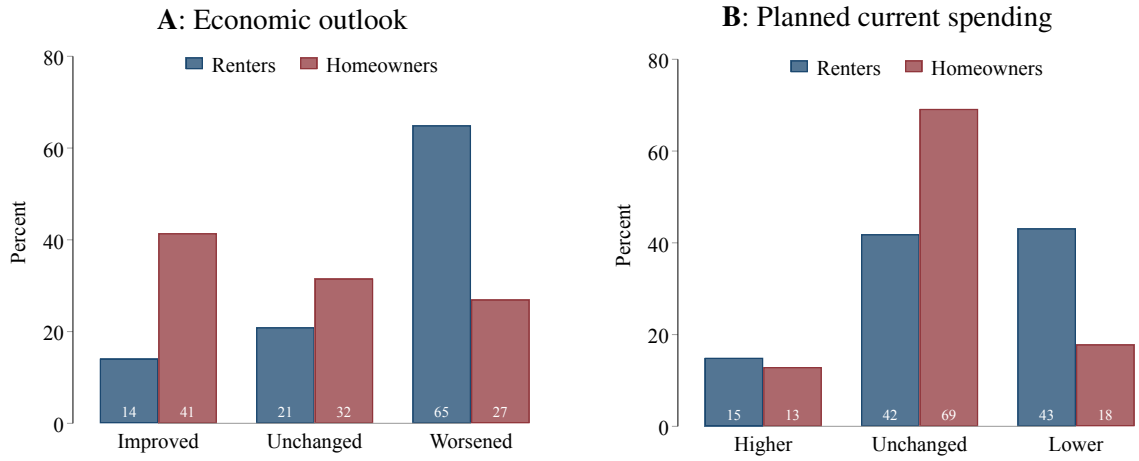
Imagine that you expect home prices to grow by 1.5% per year over the next 10 years. Now imagine that you increase your expectations about future home prices. You now expect home prices to increase by 6% per year over the next 10 years.

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 lens into respondents' spontaneous reasoning about the mechanisms through which home price growth affects their economic circumstances. A key advantage compared to more structured question formats is that open-ended elicitations do not prime individuals on the available response options, which should make these elicitations more immune to concerns such as ex-post rationalization. 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.

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%), expecting no change (32%), and expecting a worsening (27%). Panel B presents self-reported spending responses. Among renters, 43% would reduce their spending, 42% would leave their spending unchanged, while the remaining 15% would increase their spending in response to higher expected 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. In sum, despite the very different methodological approach, the reported spending responses closely align with the findings from the field experiment.

Considerations 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 object of interest. Two research assistants independently review and manually code the responses using a coding scheme that was designed based on the results of pilot studies. The scheme includes codes for different mechanisms, and each response can receive multiple codes. Specifically, we include codes for (i) changes in the value of housing currently owned by the

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.

household, (ii) changes in the costs of buying a home, (iii) home price growth being irrelevant, e.g., because the household does not plan to move, (iv) changes in rental prices, (v) changes in the ease of borrowing money against home equity owned by the household, (vi) overall inflation, (vii) household income growth, and (viii) 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.

We start by presenting example responses. Future home purchases and sales 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 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, 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.*

Homeowners also 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:

> *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.*

Lastly, renters also frequently refer to increases in rental prices, as highlighted by the following response:

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

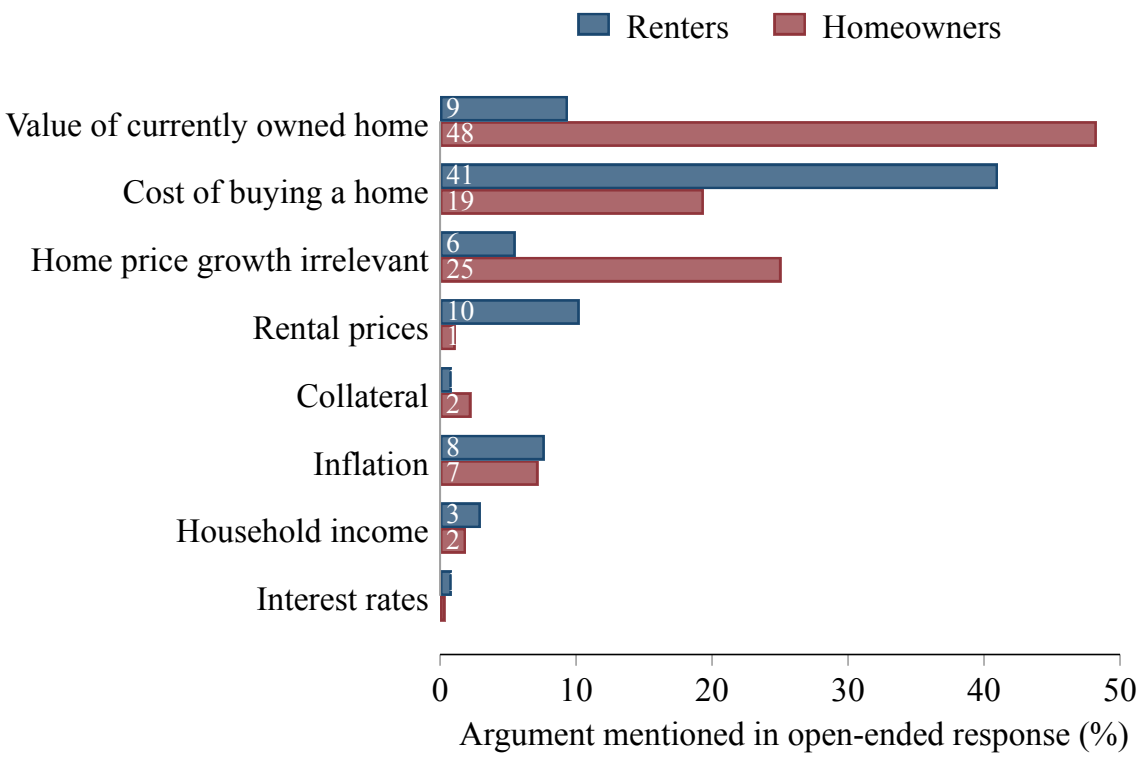
Appendix Table A.16 provides more example responses for each code included in our scheme.

Figure 3 displays the frequencies at which the different mechanisms through which an increase in 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 planned future home purchases play a central role for this group. Moreover, 19% write about increases in rental prices, which directly increase the cost of living for those who keep renting in the future. 9% of renters mention changes in the value of currently owned housing, which may refer to owned housing that is not the main residence.

Among homeowners, 48% mention changes in the value of currently owned housing. More than half of these responses contain explicit references to the proceeds of a potential future home sale.[12] 19% of owners write about the cost of future home purchases, consistent with owners being aware of the need to find a replacement home in case they decide to realize housing wealth gains. 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 their home. On the one hand, such responses could stem from owners being aware of the co-movement of their own housing wealth

[12] Our scheme does not contain a separate code for potential future home sales as there is a lot of variation in the extent to which owners are explicit about the fact that realizing wealth gains would require selling their home.

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.

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, changes in the ease of borrowing money against home equity – due to a loosening of collateral constraints – are only mentioned by 2% of homeowners. This underscores the evidence from the field experiment that homeowners do not anticipate a relaxation of borrowing constraints in response to higher home prices. Owners rarely refer to changes in rental prices.

Taken together, the open-ended responses highlight that planned home purchases and sales play a central role in households' reasoning regarding future home price growth, with an additional role for considerations about rental prices among renters.

Besides illustrating the mechanisms through which households believe home price changes

to affect their own situation, the open-ended data also illustrate 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% among owners and 8% among renters) or future 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 limited.[13]

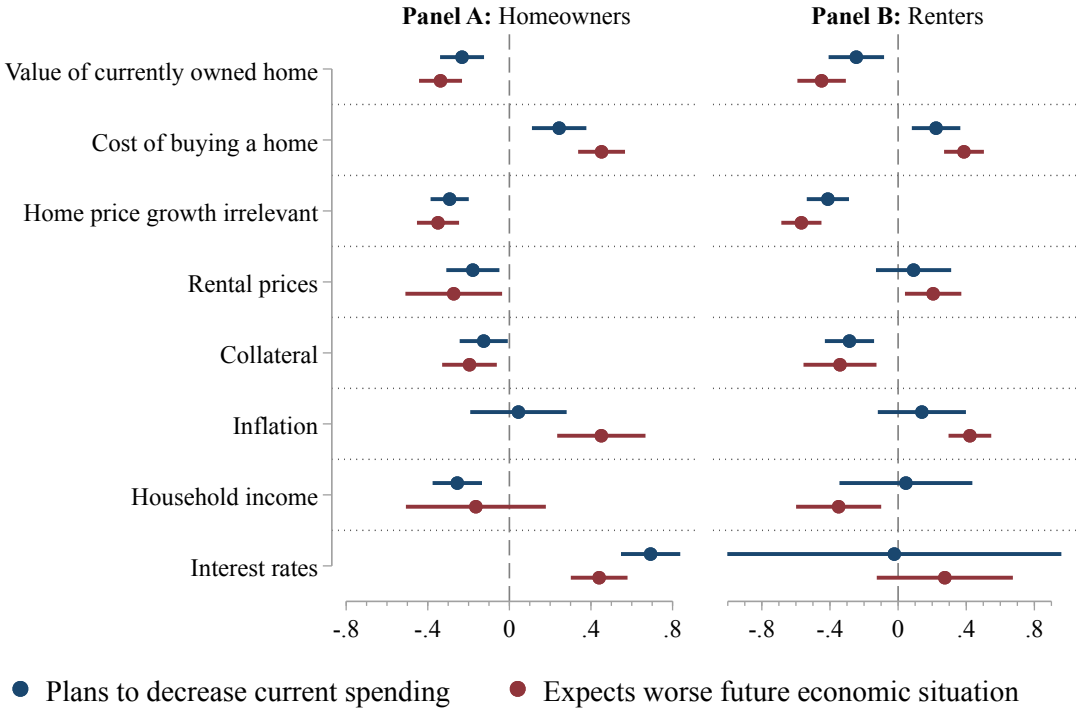
Considerations and spending responses Figure 4 provides evidence on the relationship between different considerations, elicited using the open-text box, and the tendency to report a worsening of the expected future economic situation of the household or to report a reduction in current spending. It displays 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 effects from higher expected own housing wealth and higher expected costs of replacement homes. 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 ($p = 0.357$). 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 homeowners and renters? We explore this by regressing a dummy variable indicating

[13] Open-ended elicitations are subject to some potential concerns. First, they could contain measurement error, as respondents may be reluctant to exert effort in describing their thoughts. Second, researchers have many degrees of freedom in how to code and analyze open-ended data. To address these concerns, we complement our open-ended elicitation with a structured question on a subsequent survey screen. 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 economic outlook. Appendix Table A.18 shows that the hand-coded open-text measures and the structured measures are strongly correlated with each other, corroborating the validity of the open-ended data.

Figure 4: 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.

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: changes in the cost of purchasing a home, changes in own housing wealth, and reporting that home price changes would be irrelevant for one's economic situation. Considerations about these mechanisms have comparable effects on the spending responses of owners and renters, making a "horse race" between a homeowner dummy and considerations about these mechanisms straightforward to interpret. As shown in Appendix Table A.17, the coefficient estimate on the homeowner dummy shrinks in size by 80% and is no longer statistically significant once dummy variables for considerations about these three mechanisms 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 homeowners 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 role of prospective asset purchases and sales in the transmission of asset price expectations to current spending.

5.2 Evidence from financial advice websites

Using a similar approach as Bailey et al. (2019), we provide additional evidence from popular financial advice websites on the key mechanisms underlying the effects of expected home price appreciations on household spending. Since many individuals consult financial advice websites and blogs in matters related to their household's finances, the advice given on these websites is informative about the relevance of particular mechanisms in driving households' decisions (Choi, 2022; Chopra, 2021).

Advice for homeowners For homeowners, many websites emphasize that rising home values do not necessarily make them better off, as the prices of replacement homes rise in parallel with their own housing wealth. For instance, *Investopedia*[14] writes:

> *From a practical standpoint, even if your primary residence doubles in value, it probably just means that your real estate taxes have gone up. All of the gains you experience are on paper until you sell the property. Of course, for many homeowners, that's alright. A home that doubles in value is a nice asset to pass on to the kids and grandchildren.*
>
> *If you decide to sell and buy another home in the same area, remember that the prices of those other homes have probably risen, too. To truly book a gain from your sale, you will likely need to move to a smaller home in the same area, or move out of the area and find a less expensive place to live.*

A similar argument is made on the website *The Motely Fool*[15]:

[14] https://www.investopedia.com/articles/mortages-real-estate/11/the-truth-about-the-real-estate-market.asp

[15] https://www.fool.com/the-ascent/mortgages/articles/home-values-are-up-heres-how-to-use-that-to-your-advantage/

The problem with selling a home in today's market is that what you gain in the form of a higher sale price, you stand to lose when you buy a replacement home. You may have to pay a premium when you buy.

Advice for renters Many websites advise prospective homebuyers to start saving more when homes become less affordable. For instance, *realtor.com*[16] writes:

Continue to save. If you decide to hit the pause button on your search, keep saving. [...] So create a budget to help you increase your down payment. A budget will help you see where you spend your money each month and where you can save.

Home Bay[17] recommends the following to prospective buyers who are "priced out of the housing market":

Make a Plan to Save While Renting. We recognize that renting is often as much as (if not more than) a mortgage payment and that makes it hard to save while renting. However, you usually won't have to pay maintenance costs, property taxes, or the cost of replacing large appliances, so you might be able to put at least some of that money toward saving for a down payment. If you have the means, budget to save a goal amount each month.

These arguments from popular financial advice websites are consistent with the evidence from our field experiment and our additional mechanism survey: they highlight that changes in the affordability of homes have implications for both owners and renters. Appendix Section C provides further examples of arguments along these lines from financial advice websites.

6 Conclusion

Over the last decades, industrialized countries have experienced substantial increases in asset values, which redistribute economic resources from prospective buyers to prospective sellers of an asset. We study how beliefs about such long-run changes in asset prices causally shape households' consumption decisions, focusing on housing as the most important asset on households' balance sheets. We do so using 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 – studying

[16] `https://www.realtor.com/advice/buy/cant-afford-the-home-you-could-a-year-ago-heres-what-to-do/`

[17] `https://homebay.com/priced-out-housing-market/`

the heterogeneity of consumption responses across different groups, examining updating of expectations about other outcomes, 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 in the future, homeowners view expected increases in housing wealth as "paper gains", either because they do not plan to move or because they anticipate a higher price of the required replacement home if they do.

Our findings demonstrate that beliefs about the long-run growth rate of asset values contribute to consumption inequality across different groups of households. In this context, our study relates to recent work on the welfare effects of asset price appreciations (Fagereng et al., 2022). Similarly to these welfare effects, the consumption responses we document in our paper crucially depend on whether a household is a prospective net buyer or seller of the asset. Depending on their planned purchases or sales of the asset, households anticipate how they will be affected by future asset price growth and factor this into their spending decisions today.

Next to these implications for consumption inequality, our findings also speak to a debate about the role of 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. Our study builds on previous research documenting that realized home price appreciations can increase homeowners' consumption spending (Aladangady, 2017; Andersen and Leth-Petersen, 2021; Stroebel and Vavra, 2019). Given the extrapolative nature of home price expectations (Armona et al., 2019; Kuchler and Zafar, 2019), the channel we document likely dampens the aggregate consumption effects of realized swings in home prices.

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For online publication only:

Home Price Expectations and Spending: Evidence from a Field Experiment

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Summary of the online appendix

Section A contains additional figures.

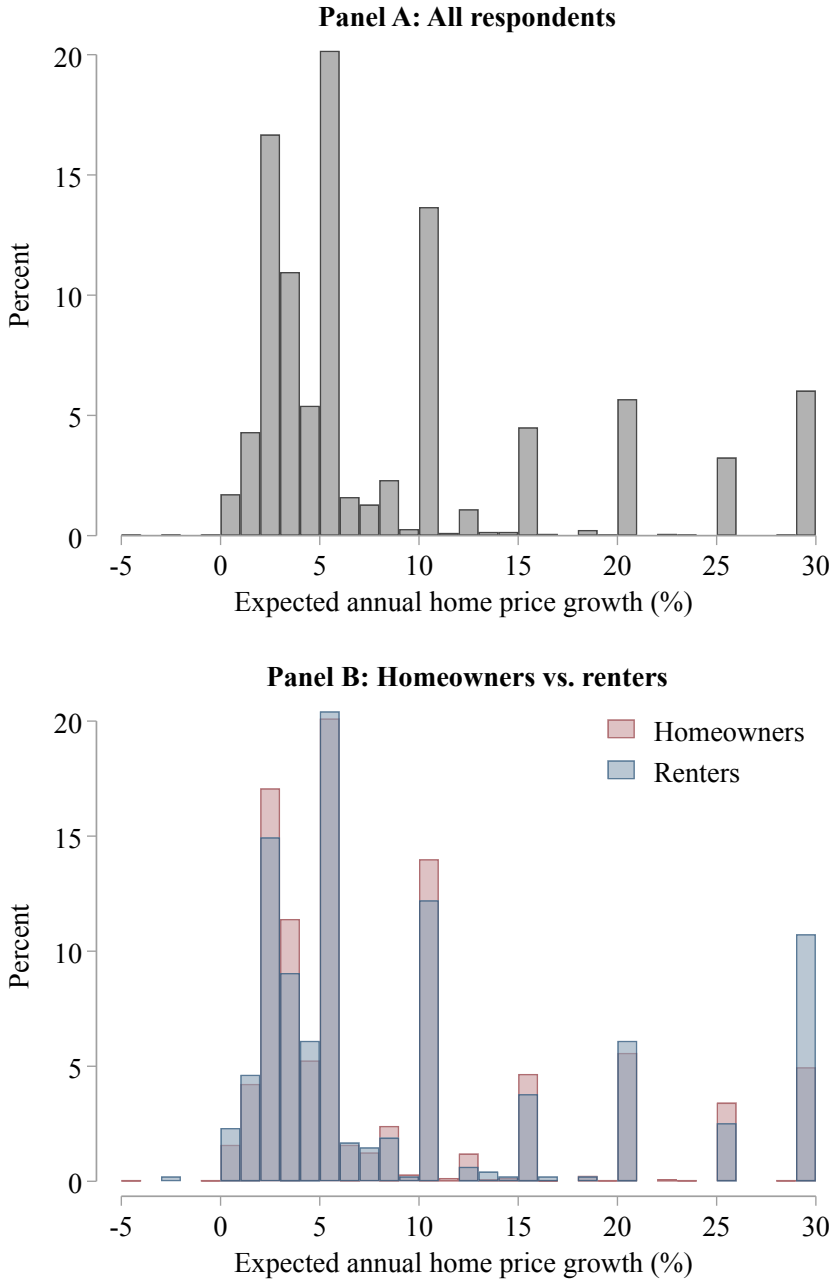
Section B contains additional tables.

Section C provides examples of advice given to renters and homeowners on popular financial advice websites and blogs.

Section D contains the key instructions for the survey modules.

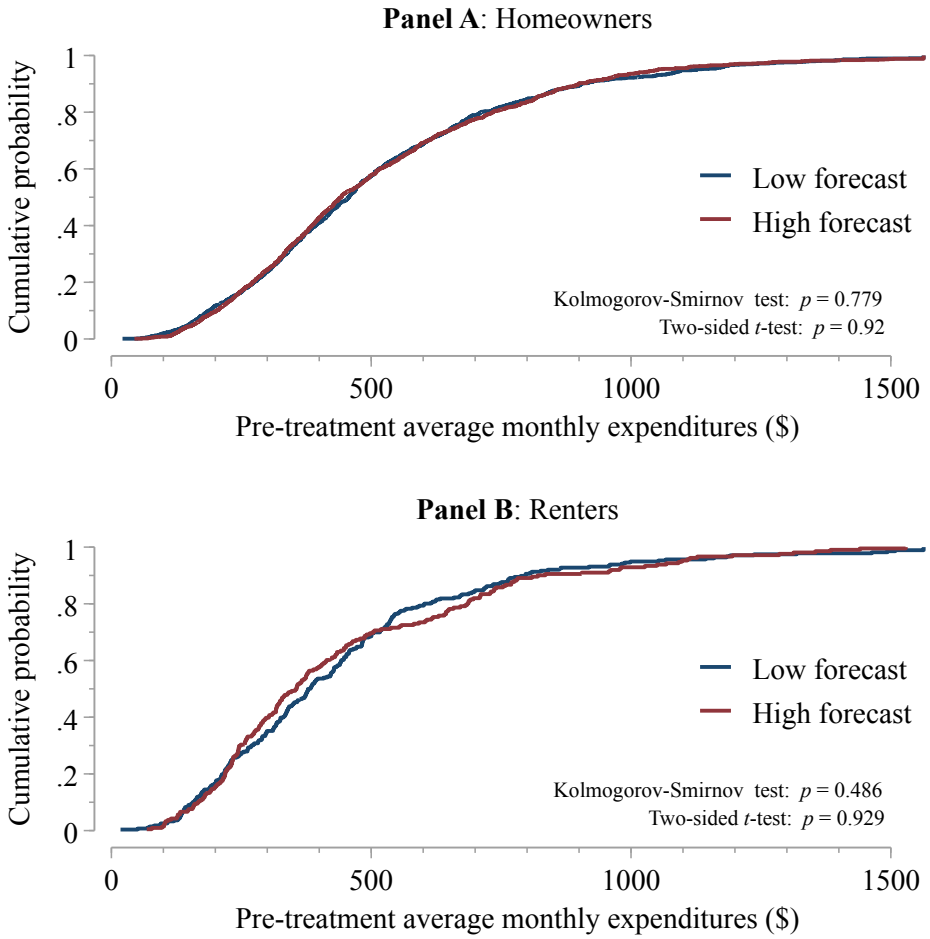
A Additional figures

Figure A.1: 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.2: 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. The p-value of a Kolmogorov-Smirnov test for equality of distribution across treatment arms and the p-value of a two-sided t-test for equality of means across treatment arms are shown in each panel.

B Additional tables

Table A.1: Overview of data collections

Experiment	**Sample**	**Treatment**	**Main outcomes**
Main experiment: Baseline survey (November 2019)	NielsenIQ Homescan Panel ($n = 2,554$)	*High forecast* vs. *low forecast*	Home price expectations and home scanner spending
Main experiment: Follow-up survey (December 2019)	NielsenIQ Homescan Panel ($n = 1,702$)	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
Robustness experiment: 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)

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.

Table A.2: Summary statistics

	General population	Main experiment		
	(ACS 2019)	All	Homeowners	Renters
Female	0.513	0.774	0.774	0.775
		(0.418)	(0.418)	(0.418)
Age	47.779	54.587	55.487	50.661
		(11.534)	(11.117)	(12.484)
Household income	79,517.289	79,046.977	84,362.438	55,781.051
		(45,406.293)	(45,561.762)	(36,634.145)
College degree	0.306	0.468	0.474	0.440
		(0.499)	(0.499)	(0.497)
Employed	0.620	0.715	0.720	0.693
		(0.451)	(0.449)	(0.462)
Northeast	0.174	0.374	0.381	0.343
		(0.484)	(0.486)	(0.475)
Midwest	0.208	0.256	0.262	0.227
		(0.436)	(0.440)	(0.420)
South	0.380	0.262	0.262	0.261
		(0.440)	(0.440)	(0.440)
West	0.238	0.108	0.094	0.168
		(0.310)	(0.292)	(0.375)
Ethnicity: White	0.736	0.823	0.846	0.722
		(0.382)	(0.361)	(0.448)
Ethnicity: Black/African American	0.125	0.101	0.083	0.179
		(0.301)	(0.276)	(0.384)
Hispanic	0.164	0.060	0.055	0.080
		(0.237)	(0.228)	(0.272)
Household size	2.772	2.414	2.452	2.248
		(1.273)	(1.248)	(1.368)
Children in household (below 18)	0.356	0.235	0.227	0.269
		(0.424)	(0.419)	(0.444)
Prior: Home price growth (%)		9.315	8.916	11.062
		(11.099)	(10.368)	(13.729)
Observations		2,555	2,079	475

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. The first column presents 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 working at least thirty hours per week. "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.

Table A.3: Test of balance

	All respondents	Homeowners	Renters
	High vs low forecast	High vs low forecast	High vs low forecast
Female	0.005	0.019	-0.057
	(0.747)	(0.293)	(0.144)
Age	-0.024	-0.283	-0.207
	(0.958)	(0.562)	(0.858)
Household income	-941.963	-2,327.132	-2,699.246
	(0.600)	(0.245)	(0.427)
College degree	0.001	0.008	-0.040
	(0.960)	(0.715)	(0.388)
Employed	-0.009	0.010	-0.100**
	(0.608)	(0.629)	(0.019)
Ethnicity: White	0.035**	0.037**	-0.006
	(0.021)	(0.021)	(0.877)
Ethnicity: Black/African American	-0.025**	-0.019	-0.025
	(0.036)	(0.113)	(0.490)
Hispanic	-0.010	-0.017*	0.030
	(0.297)	(0.085)	(0.231)
Northeast	-0.016	-0.021	-0.006
	(0.391)	(0.319)	(0.893)
Midwest	0.023	0.037*	-0.050
	(0.189)	(0.055)	(0.198)
South	-0.010	-0.011	-0.007
	(0.556)	(0.563)	(0.870)
Household size	-0.029	-0.042	-0.027
	(0.562)	(0.438)	(0.830)
Children in household (below 18)	-0.003	0.006	-0.030
	(0.856)	(0.758)	(0.465)
Prior: Home price growth (%)	-0.462	-0.238	-0.879
	(0.293)	(0.602)	(0.490)
p-value of joint F-test	0.710	0.316	0.439
Observations	2,554	2,079	475

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 working at least thirty hours per week. "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. 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.4: Treatment effects on beliefs: Follow-up survey

	Dependent variable: Expectation (in %)						
	(1) Home price growth	(2) Rental price growth	(3) Inflation rate	(4) Real GDP growth	(5) Labor income growth	(6) Interest rate	(7) Stock market return
High forecast	1.117***	0.495	0.448***	0.409**	0.196	0.111*	0.376
	(0.317)	(0.333)	(0.164)	(0.170)	(0.325)	(0.067)	(0.238)
N	1,702	1,702	1,702	1,702	1,702	1,702	1,702
R^2	0.102	0.079	0.162	0.113	0.068	0.108	0.049
Mean in low forecast arm	7.646	7.907	4.149	4.199	5.552	1.674	6.376
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, real GDP growth, household labor income growth, interest rate and stock market return over the next ten years, respectively. Dependent variables in all specifications are winsorized at the 5th and the 95th percentiles, except for inflation and interest rate expectations, which are winsorized at the 95th 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.5: 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 (%)	-0.009	-0.001	-0.028*
	(0.008)	(0.010)	(0.015)
	[0.262]	[0.951]	[0.067]
N	17,877	14,552	3,325
Households	2,554	2,079	475
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 a respondent's prior point belief about average annual home price growth over the next ten years for all months before a respondent participated in the baseline survey. It is equal to the mean of the respondent's subjective probability distribution over future home price growth for all the following 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. Columns 1 uses all respondents, while Columns 2 and 3 are restricted to 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.6: 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	-0.019	-0.017	-0.008	-0.003	-0.067**	-0.065**
	(0.012)	(0.012)	(0.013)	(0.013)	(0.029)	(0.031)
	[0.103]	[0.152]	[0.515]	[0.803]	[0.021]	[0.037]
N	146,784	146,784	120,177	120,177	26,607	26,607
Households	2,554	2,554	2,079	2,079	475	475
R^2	0.528	0.536	0.529	0.538	0.520	0.549
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.7: Treatment effects on scanner expenditures: Robustness

	Dependent variable: Log expenditures					
	(1)	(2)	(3)	(4)	(5)	(6)
	Baseline	Winsorized	Trimmed	Households with regular spending records	Without fixed effects	Two-period DiD
Panel A: All respondents						
High forecast x Post	-0.015	-0.016	-0.019	-0.015	-0.015	-0.004
	(0.013)	(0.013)	(0.014)	(0.013)	(0.013)	(0.022)
High forecast					0.014	
					(0.024)	
Post					0.034***	
					(0.009)	
N	17,877	17,877	16,344	16,926	17,877	5,108
R^2	0.727	0.720	0.649	0.735	0.089	0.847
Household FEs	Yes	Yes	Yes	Yes		Yes
Month FEs	Yes	Yes	Yes	Yes		Yes
Controls					Yes	
Panel B: Homeowners						
High forecast x Post	-0.001	-0.002	-0.006	-0.001	-0.001	0.018
	(0.014)	(0.014)	(0.015)	(0.014)	(0.014)	(0.025)
High forecast					0.010	
					(0.026)	
Post					0.026***	
					(0.010)	
N	14,552	14,552	13,306	13,790	14,552	4,158
R^2	0.724	0.717	0.642	0.732	0.083	0.838
Household FEs	Yes	Yes	Yes	Yes		Yes
Month FEs	Yes	Yes	Yes	Yes		Yes
Controls					Yes	
Panel C: Renters						
High forecast x Post	-0.076**	-0.078**	-0.073**	-0.079**	-0.076**	-0.110**
	(0.033)	(0.033)	(0.034)	(0.033)	(0.033)	(0.048)
High forecast					0.010	
					(0.059)	
Post					0.066***	
					(0.022)	
N	3,325	3,325	3,038	3,136	3,325	950
R^2	0.725	0.718	0.657	0.734	0.082	0.876
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 who have at most one missing month of spending records within the sample period. Column 5 presents estimates without household and month fixed effects, but instead include 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.8: 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	-0.011	-0.016	-0.004	0.010	-0.047	-0.127**
	(0.016)	(0.024)	(0.017)	(0.027)	(0.040)	(0.058)
N	17,878	17,878	14,553	14,553	3,325	3,325
Households	2,554	2,554	2,079	2,079	475	475
R^2	0.687	0.654	0.679	0.649	0.698	0.669
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. The dependent variable in Columns 2, 4 and 6 is the log of monthly non-food 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 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.9: Treatment effects on beliefs: Heterogeneity by moving intentions

	Dependent variable: Expected home price growth		
	Quantitative measure		Qualitative measure
	(1)	(2)	(3)
	Mean of distribution (%)	Std. dev. of distribution (%)	Home prices will increase strongly (z-scored)
Panel A: Homeowners			
High forecast	1.164**	0.244	0.261***
	(0.460)	(0.414)	(0.069)
High forecast x Plans to move	0.267	-0.219	0.123
	(0.549)	(0.507)	(0.088)
N	2,079	2,079	2,079
R^2	0.027	0.136	0.070
Controls	Yes	Yes	Yes
Panel B: Renters			
High forecast	2.220	1.810	0.154
	(1.888)	(1.829)	(0.293)
High forecast x Plans to move	-0.023	-1.571	0.291
	(1.995)	(1.924)	(0.309)
N	475	475	475
R^2	0.068	0.120	0.093
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 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 homeowners and renters, respectively. All regressions include the set of controls described in detail in Table 1. Robust standard errors are shown in parentheses.

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

Table A.10: 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	-0.030**	-0.014	-0.091**
	(0.015)	(0.016)	(0.036)
N	14,440	11,563	2,877
R^2	0.731	0.730	0.723
Household FEs	Yes	Yes	Yes
Month FEs	Yes	Yes	Yes
Panel B: At least retirement age			
High forecast x Post	0.047	0.050	0.023
	(0.029)	(0.032)	(0.067)
N	3,437	2,989	448
R^2	0.709	0.701	0.740
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.11: Robustness experiment: Summary statistics and test of balance

	General population	Survey sample	Test of balance	
	(ACS 2019)	(Mean/std.dev.)	High vs low forecast	Supply vs demand narrative
Female	0.513	0.490	-0.019	-0.020
		(0.500)	(0.260)	(0.239)
Age	47.779	44.046	0.283	-0.047
		(13.804)	(0.552)	(0.921)
Log income	11.061	11.175	0.028	-0.024
		(0.748)	(0.279)	(0.346)
College degree	0.306	0.626	0.028*	0.013
		(0.484)	(0.094)	(0.438)
Employed	0.620	0.580	-0.017	0.019
		(0.494)	(0.319)	(0.262)
Ethnicity: White	0.736	0.794	-0.004	0.010
		(0.405)	(0.753)	(0.466)
Ethnicity: Black/African American	0.125	0.086	-0.015	-0.003
		(0.281)	(0.128)	(0.768)
Hispanic	0.164	0.086	-0.002	-0.011
		(0.281)	(0.866)	(0.248)
Northeast	0.174	0.199	0.006	0.008
		(0.399)	(0.646)	(0.552)
Midwest	0.208	0.224	-0.005	0.012
		(0.417)	(0.736)	(0.405)
South	0.380	0.395	-0.014	-0.025
		(0.489)	(0.404)	(0.144)
West	0.238	0.182	0.013	0.004
		(0.386)	(0.344)	(0.736)
Prior: Home price growth (%)		11.850	0.003	-0.701
		(13.076)	(0.995)	(0.117)
p-value of joint F-test			0.305	0.476
Observations		3,416	3,416	3,416

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 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 working at least thirty hours per week. "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.12: 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.13: 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.14: 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.15: 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	11.061	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.16: Mechanism survey: Coding scheme for open-ended responses with examples

Category	Explanation	Example
Value of currently owned home	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."
Cost of buying a home	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."
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."
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	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."
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.17: 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)
Value of currently owned home		-0.201***		-0.164***	-0.245***
		(0.040)		(0.039)	(0.042)
Cost of buying a home			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. "Value of currently owned home" 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. "Cost of buying a home" and "Home price growth irrelevant" are analogously defined binary indicators. Robust standard errors are shown in parentheses.

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

Table A.18: 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) Value of currently owned home	(2) Cost of buying a home	(3) Rental prices	(4) Collateral	(5) Inflation	(6) Household income	(7) Interest rates
Value of currently owned home	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)
Cost of buying a home	-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)
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	-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. "Value of currently owned home" 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. "Cost of buying a home", "Rental prices", "Collateral", "Inflation", "Household income" and "Interest rates" are analogously defined binary indicators. Robust standard errors are shown in parentheses.

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

C Financial advice websites

This section provides examples of advice from popular financial advice websites and blogs to homeowners and renters in the context of home price changes. It includes the cases presented in Section 5.2 as well as additional examples.

C.1 Advice for homeowners

Investopedia (https://www.investopedia.com/articles/mortages-real-estate/11/the-truth-about-the-real-estate-market.asp)

Because home prices tend to rise over time, buying a home has traditionally been viewed as a safe investment. Still, an important point to consider when looking at a home as an investment is that it won't ever pay off unless you sell it. From a practical standpoint, even if your primary residence doubles in value, it probably just means that your real estate taxes have gone up. All of the gains you experience are on paper until you sell the property. Of course, for many homeowners, that's alright. A home that doubles in value is a nice asset to pass on to the kids and grandchildren. If you decide to sell and buy another home in the same area, remember that the prices of those other homes have probably risen, too. To truly book a gain from your sale, you will likely need to move to a smaller home in the same area, or move out of the area and find a less expensive place to live.

Fool (https://www.fool.com/the-ascent/mortgages/articles/home-values-are-up-heres-how-to-use-that-to-your-advantage/)

The problem with selling a home in today's market is that what you gain in the form of a higher sale price, you stand to lose when you buy a replacement home. You may have to pay a premium when you buy. But if your home's value has spiked and you've been thinking of downsizing, now may be a good time to do so. Depending on how the numbers shake out, it's conceivable you could sell your home at a high enough price to buy a smaller property outright (meaning, without a mortgage).

C.2 Advice for renters

Realtor (https://www.realtor.com/advice/buy/cant-afford-the-home-you-could-a-year-ago-heres-what-to-do)

If you decide to hit the pause button on your search, keep saving. As frustrating as that is, patiently putting away money for a more significant down payment can be your best move in the long run. "If you can't afford a home now, then you shouldn't buy one," says Dan Belcher, founder and CEO of Mortgage Relief. "Sacrifice a little more and a little longer." Sure, you can put down as little as 3.5% with an FHA loan. But keep in mind that borrowers with less than the typical 20% down payment must pay for private mortgage insurance. So create a budget to help you increase your down payment. A budget will help you see where you spend your money each month and where you can save. You can also work on raising your credit score by paying off as much existing debt as possible.

Homebay (https://homebay.com/priced-out-housing-market/)

We recognize that renting is often as much as (if not more than) a mortgage payment and that makes it hard to save while renting. However, you usually won't have to pay maintenance costs, property taxes, or the cost of replacing large appliances, so you might be able to put at least some of that money toward saving for a down payment. If you have the means, budget to save a goal amount each month. If it's an option for you, it can be a good idea to live with family or get a roommate to lessen rent prices and further increase your savings.

Nerdwallet (`https://www.nerdwallet.com/article/mortgages/advice-for-renters-priced-out-of-homebuying`)

Nobody can truly predict interest rates nor inflation, nor the appreciation rate of homes in a relatively short period of time," Eric Lefkowitz, president and chief operating officer of Motto Mortgage Mint in San Diego, said via email. "But we can be certain that buyers should be saving for strong down payment options. This will ensure they can get the best available interest rate when the time comes."

Dave Ramsey (`https://www.ramseysolutions.com/real-estate/cant-afford-housing-market`)

Let's cut to the chase. If you don't have the money, you shouldn't buy a house. Period. That's just asking Murphy to show up and bring his three cousins—Broke, Desperate and Stupid! But you can start saving. Now, if you live in an unaffordable market, it'll probably take you longer to be financially ready to buy a home. Maybe you're still trying to pay off debt or save up a down payment. Maybe you live in an area where your home-buying budget can't support a mortgage just yet. That's okay. Renting helps you build up your savings—and patience. Plus, you get to call the landlord when something breaks instead of spending your hard-earned money to fix it! If you want to buy a home in an expensive market, waiting may be your smartest move. In the meantime, keep saving. Your area may seem more affordable three years from now when you have a hefty down payment saved!

D Survey instructions

This section contains the key survey instructions for our different surveys.

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 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]