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Abstract

We use novel survey data to estimate how personal experiences affect household expectations about aggregate economic outcomes in housing and labor markets. We exploit variation in locally experienced house prices to show that individuals systematically extrapolate from recent locally experienced home prices when asked for their expectations about U.S. house price changes over the next year. In addition, higher volatility of locally experienced house prices causes respondents to report a wider distribution over expected future national house price movements. We find similar results for labor market expectations, where we exploit within-individual variation in labor market status to estimate the effect of own experience on national labor market expectations. Personally experiencing unemployment leads respondents to be significantly more pessimistic about future nationwide unemployment. The extent of extrapolation is unrelated to proxies for how informative personal experiences are, and is more pronounced for less sophisticated individuals.

Key words: expectation formation, extrapolation

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1 Introduction

Expectations play a key role in economic models of decision-making under uncertainty. The benchmark approach of assuming that individuals form expectations by accurately processing all available information and updating their beliefs accordingly has found little support in the data (see Manski [2004] for an overview). Recent work has turned to empirical measures of expectations to inform modeling assumptions that deviate from the rational expectations benchmark (see Barberis, Greenwood, Jin, and Shleifer [2015]). We contribute to this research effort by empirically analyzing how personal experiences affect expectations about aggregate economic outcomes, and as such provide guidance on modeling the expectation-formation process.

We focus on expectations about national house price movements and unemployment rates, both of which are crucial for understanding economic activity. House price expectations play an important role in understanding housing booms and busts, including the recent financial crisis (Piazzesi and Schneider [2009], Goetzmann et al. [2012], Glaeser et al. [2013], Burnside et al. [2014], Glaeser and Nathanson [2015]). Employment expectations matter for economic recovery after recessions, and can influence households' job search behavior (see, for instance, Carroll and Dunn [1997], Tortorice [2011]). In addition, house prices and unemployment offer a rich empirical setting to understand the effect of experience on expectations more generally.

For this purpose, we use data from the Survey of Consumer Expectations (SCE), a monthly online survey of approximately 1,200 US household heads, fielded by the Federal Reserve Bank of New York since 2012. It elicits consumer expectations on various economic outcomes, including house price changes and labor market outcomes, and collects rich data on respondents' personal backgrounds and economic and demographic situations.

We first exploit variation in locally experienced house prices to estimate the effect of past experience on expectations. Since house price development has differed substantially across the US (particularly, in the last decade), there is significant geographic variation in the house price development experienced by different individuals.[1] We use the entire history of such locally experienced past house price returns to proxy for each individual's experience. We find that past locally experienced house price development

[1]For instance, Arizona experienced large increases in house prices in the recent boom, with annual increases of up to 30% in 2005, followed by deep drops of over 25% in 2008. On the other hand, house prices in Indiana have been very stable over the same time horizon with average changes of less than 1% per year.

significantly affects expectations about future changes in US house prices.[2] For instance, respondents in ZIP codes with a 1 percentage point higher change in house prices in the previous year expect the one-year-ahead increase in US house prices to be .09 percentage points higher. Furthermore, consistent with Malmendier and Nagel [2013] in the case of inflation expectations, we find that more recently experienced house price changes have a substantially stronger effect than earlier ones. Specifically, house price changes over the past 3 years matter the most for house price expectations.

The SCE elicits both a respondent's point estimate of the expected change in house prices, as well as a distribution of expected house price changes. This allows us to estimate whether past experiences also affect the variance of expected future house price movements. Respondents who experience more volatile house prices locally do indeed report a wider distribution over expected future national house price movements. For instance, the standard deviation of one-year-ahead expected house price changes is 0.25 percentage points higher for respondents who experienced a 1 percentage point higher standard deviation in local house price changes in the past 5 years.

Next, we turn to the effect of personal unemployment experience on US unemployment expectations. During the 12 months that respondents stay in the survey, locally experienced house prices do not change enough to estimate how respondents update their expectations as their experiences change. Analyzing unemployment expectations, however, allows us to focus on individuals who experience job transitions (for example, individuals who were previously employed and lost their jobs, or who were unemployed and found a new job) during the panel, and to exploit this *within-individual* variation in experiences to estimate the effect on expectations. Within-individual variation allows us to estimate how a given respondent changes her expectations as her experiences change over time. This use of within-individual variation ensures that observed differences in expectations are directly driven by differences in experiences rather than potential differences between individuals. This is only possible because of the rich panel component of the survey, something that is absent from most other consumer surveys of expectations.[3] We find that experiencing unemployment leads respondents to be significantly more pessimistic about future US unemployment: when transitioning to unemployment,

[2]The literature has previously shown that aggregate home price changes are highly positively correlated, e.g. Case and Shiller [1989], and explored different explanations, e.g. Guren [2015].

[3]Previous studies, largely due to data limitations, have mostly overlooked the panel dimension of survey expectations (see Keane and Runkle [1990] and Madeira and Zafar [2015], for exceptions), and instead have studied the aggregate evolution of beliefs in repeated cross-sections. However, this complicates the interpretation of previous work on learning in expectation updating.

respondents believe the likelihood of increasing US unemployment over the next twelve months to be between 4 and 5 percentage points higher than when employed (on a base average likelihood of 39 percent).

We further explore which potential mechanisms are consistent with the observed extrapolation from personal experiences to aggregate outcomes and the resulting implications for understanding how individuals form expectations.

First, we analyze whether the extent of respondents' extrapolation from personal experiences is related to how informative these experiences are about the aggregate outcome. For house price expectations, we find that differences in how correlated local and national house price changes were in the past are not associated with differences in the extent of extrapolation from locally experienced house prices. In addition, to justify the 4 to 5 percentage points higher likelihood of US unemployment rate reported by unemployed respondents, a back-of-the-envelope exercise indicates that respondents would need to be about 19% more likely to lose their job if unemployment were truly going up than they would be if it were not - an arguably large gap.

Second, we study which respondents are more likely to extrapolate from their experiences when forming expectations. Respondents with lower numeracy skills, as measured by a battery of questions in the survey, extrapolate the most from personally experienced unemployment and house prices. Similarly, respondents with a college degree extrapolate less from past house prices. We also analyze whether the extent of extrapolation differs for homeowners and renters to assess whether our results are driven by a risk-adjustment of expectations. While past price increases are good for homeowners, they are bad for renters. Risk-adjustment by homeowners therefore amplifies any extrapolation from past experiences whereas it dampens the effect for renters. We find no difference in the extent of extrapolation between homeowners and renters, indicating that risk-adjustment is unlikely to drive our results.

Third, while experiencing unemployment significantly affects expectations about US unemployment, it does not affect expectations about other economic outcomes, such as stock prices, interest rates, or inflation. Therefore, respondents in general do not appear to become more pessimistic or optimistic due to changes in their employment situation. Similarly, past house prices are not related to expectations about these other outcomes.

Before turning to the implications of our findings, we also argue that the stated expectations in our survey data are predictive of actual outcomes and respondents' planned behavior. Respondents' beliefs about their own labor market prospects are associated with actual outcomes: respondents who believe they are more likely to lose

their job are indeed more likely to subsequently do so, both across as well as within individuals. In addition, expectations about future house price changes are related to whether respondents consider housing a good investment.

What do our findings imply about the expectation formation process? Extrapolation from local experiences in itself may not be inconsistent with standard models of optimal expectation formation, since they could be informative about aggregate changes. However, our finding that extrapolation is not related to the informativeness of the experiences, and that less sophisticated individuals are more likely to extrapolate cast doubt on this extrapolation being optimal. This naive extrapolation may be a result of respondents either not knowing other relevant information, or simply overweighting their personal experiences when incorporating them into expectations (biased information updating). Our results are therefore broadly consistent with models of adaptive and experience-based learning, as well as models of expectation formation in which individuals form expectations subject to information constraints [Coibion and Gorodnichenko, 2012a,b]. Such information constraints could arise because of rational inattention (as in Sims [2003], Gabaix [2014]) or costly information acquisition [Reis, 2006].

How individuals form expectations about aggregate outcomes has important implications for the conclusions drawn from models in economics and finance.[4] Heterogeneity in consumers' expectations can generate over-investment in real assets (Sims [2009]), cause financial speculative behavior (Nimark [2010]), and impact the economy's vulnerability to shocks (Badarinza and Buchmann [2011]). In housing markets, overoptimistic beliefs are often cited as major contributors to the run up in house prices prior to the recent financial crisis (see, for instance, Piazzesi and Schneider [2009], Goetzmann et al. [2012], Burnside et al. [2014] and Glaeser and Nathanson [2015]). Consistent with this literature, our findings suggest that increases in house prices in the early 2000s could have led consumers to extrapolate based on their recent experiences, which would have led them to become overly optimistic. Similarly, our finding that individuals extrapolate from local house prices to US-wide house prices suggests an explanation for why out-of-town buyers, especially those from areas with higher past price appreciation, may be overly optimistic about home prices, as is argued by Chinco and Mayer [2014]. Likewise, extrapolation from recent experiences can lead unemployment expectations to be systematically biased at the beginning and end of recessions, as argued by Tortorice [2011].

[4] Woodford [2013] provides an overview of the implications for macro models when deviating from the assumption of rational expectations, and notes that " behavior ... will depend (except in the most trivial cases) on expectations".

During an economic downturn, consumers who receive a bad labor market shock may become overly pessimistic about labor market conditions. This may lead them to invest less in job search or accept less suitable positions, thereby prolonging the effect of the initial shock.

Several papers have studied how past experiences affect consumers expectations of inflation and future returns in financial markets. Malmendier and Nagel [2013] show that individuals' inflation expectations are influenced by the inflation experienced during their lifetime.[5] Vissing-Jorgensen [2004] shows that young investors with little experience expected the highest stock returns during the stock market boom of the late 1990s;[6] and Amromin [2008] and Greenwood and Shleifer [2014] find that stock return expectations are highly correlated with past returns and the level of the stock market.

Compared to this previous body of work, our paper focuses on housing and unemployment expectations, which merit interest in and of themselves. We show that the level of past experiences affect the expected level of future price changes and that past experienced volatility affects the width of the distribution of expected future price changes. To our knowledge, this extrapolation of both the first and second moment has not been documented in the literature before. We also exploit different sources of variation in experiences. For housing market expectations, we exploit geographic variation in locally experienced house prices rather than variation due to age or over time. For unemployment, we can observe how the same individual changes her expectations as her labor market experiences change while in the sample. This individual-level variation in experiences – which, to our knowledge, has not been exploited in any application – allows us to filter out confounding factors which could lead to differences in expectations across individuals. It is reassuring to see that both within- and across- respondent variation in experiences in two different applications lead to similar qualitative conclusions. As a result, our empirical findings not only provide additional evidence for the growing literature exploring the implications of extrapolative expectations not just in the housing or labor market, but also in other asset markets and macroeconomic models [see Barberis et al., 2015, for a recent overview].

[5]While not studying expectations directly, several papers have shown how experiences affect subsequent investment decisions, possibly through expectations. For instance, Malmendier and Nagel [2011] show that bond and stock return experienced during an individual's life time affect risk taking and investment decisions. Kaustia and Knüpfer [2008] and Chiang et al. [2011] find that the returns investors experience in IPOs affect their decisions to invest in subsequent IPOs. Similarly, Koudijs and Voth [2014] find that having been exposed to potential losses leads lenders to lend more conservatively.

[6]Consistent with such expectations, Greenwood and Nagel [2009] show that younger mutual fund managers invested more heavily in technology stocks during this time.

2 Data

Our data are from the Survey of Consumer Expectations (SCE), a monthly survey fielded by the Federal Reserve Bank of New York since late 2012.[7] The SCE is an internet-based survey of a rotating panel of approximately 1,200 household heads.[8] Respondents participate in the panel for up to twelve months, with a roughly equal number rotating in and out of the panel each month. Each survey typically takes about fifteen to twenty minutes to complete and elicits consumer expectations on house price changes, inflation, labor market outcomes and several other economic indicators. When entering the survey, respondents answer additional background questions.

2.1 Information on Housing and House Price Expectations

Each month, the SCE elicits expectations about changes in nationwide house prices in the US. First, respondents are asked whether they believe US home prices will increase or decrease over the next 12 months and by what amount. Second, the survey elicits a distribution of expected house price changes over the same 12-month horizon. Specifically, respondents are asked to assign a probability to a range of possible house price changes such that the total of all probabilities adds up to 100 percent. Appendix A.1 shows the exact phrasing of the question.

We restrict our sample to respondents who answer questions about expected house price changes and basic demographic information. For each respondent, we focus on the module in the earliest month of the year in which this is the case. Our sample spans two years, from December 2012 to November 2014. For the analysis, we also exclude respondents who are under 25.

Our final sample consists of 4,221 respondents. Table 1 shows summary statistics of our sample. The average respondent in our sample is 51 years old. 87% of respondents are white and 7% black. 70% of respondents are married and 56% are men. 56% of respondents also went to college. The average yearly household income in our sample is $89,250. Our sample has respondents with higher income and higher educational attainment than the US population overall. While the SCE provides weights to obtain

[7] See www.newyorkfed.org/microeconomics/sce.html for additional information.

[8] The monthly survey is conducted over the internet by the Demand Institute, a non-profit organization jointly operated by The Conference Board and Nielsen. The sampling frame for the SCE is based on that used for The Conference Board's Consumer Confidence Survey (CCS). Respondents to the CCS, which itself is based on a representative national sample drawn from mailing addresses, are invited to join the SCE internet panel. The response rate for first-time invitees is around 55%.

nationally representative averages, our sample is not weighted. In addition to basic demographic information, respondents were asked a series of five or six questions based on Lipkus et al. [2001] and Lusardi [2009], that provides an individual-specific measure of numeracy. Respondents, on average, answer 80% of the questions correctly and at least a quarter answer all of them correctly. 78% of respondents own their home. On average they have lived in their current ZIP code for 13 years and in their current state for 35 years. However, there is substantial heterogeneity in our sample, with a quarter of respondents having moved to their ZIP codes within the past five years.

Table 1 also shows that the average point estimate of our sample for next year's house price change is 5.4%. Figure 1, however, shows that respondents give a wide variety of answers around the mean point estimate, though 5% is the most common answer. We can also calculate the average expected house price change, as well as the expected standard deviation of price changes based on the probabilities respondents assign to the different ranges of possible house price changes.This exercise reveals that on average respondents expect an increase in house prices of 4.3% and a standard deviation around this expected mean of 15.3%.

Finally, past house prices in the respondents' ZIP codes, MSAs and states vary substantially. Prices have increased by 7% in the past year for the average respondent, though by only 2% for respondents in the 25$^{\text{th}}$ percentile and by over 11% for respondents in the 75$^{\text{th}}$ percentile.[9]

2.2 Information on Own Employment and Unemployment Expectations

Each month, respondents in the SCE are asked whether they expect the US unemployment rate a year later to be higher: The wording of the questions is: "*What do you think is the percent chance that 12 months from now the unemployment rate in the U.S. will be higher than it is now?*" Respondents also state their current employment situation, based on which we classify respondents into five categories: employed (either full or part-time), searching for work (the unemployed), retired, student or out of the labor force (e.g., homemaker, permanently disabled). Depending on their current employment status, respondents answer additional questions about their personal employment prospects. Appendix A.2 shows the exact phrasing of these questions.

[9] Appendix Table A2 shows additional summary statistics of the history and variability of past house price returns over different time horizons, confirming the substantial heterogeneity.

We restrict our sample for the analysis of unemployment expectations to respondents who state their employment status and answer the question about aggregate unemployment. We no longer require respondents to be at least 25 years old and to answer the house price question, allowing us to include 333 additional respondents. We include them in this part of the analysis to maximize sample size. Starting in December 2012, our sample contains 4,554 respondents who answer on average 6 survey modules, for a total of 28,615 respondent-month observations.[10]

Table 2 shows each respondent's current and previous employment status in each monthly module. 69% of respondents are employed when answering the survey, 5% are currently looking for work (unemployed). The remaining respondents are either students, retired, or out of the labor force for other reasons. While in the panel, several respondents experience changes in their employment status. Of special interest to us are the 148 instances in which respondents lose their previous employment and the 204 instances where respondents find a new job out of unemployment, since we can exploit these within-individual changes in employment experiences to estimate their effect on expectations.

3 Experiences and Expectation

3.1 Estimating Effect of Experiences on Expectations

To analyze the effect of personal experiences on an individual's expectation about aggregate outcomes, we estimate the following regression equation:

$$expectation_{it}^{d} = \alpha + \beta experience_{it}^{d} + \gamma X_{it} + \epsilon_{it} \tag{1}$$

where $expectation_{it}^{d}$ is respondent i's expectation about aggregate outcome d reported at time t and $experience_{it}^{d}$ is an individual's experience related to outcome d. X_{it} are control variables, including respondent demographics and time fixed effects.

To estimate the effect of experience on expectations about house prices, we estimate Equation 1 where $expectation_{it}^{d}$ is the expected one year-ahead change in average US house prices, as stated by respondent i at time t. We proxy for experienced house prices, $experience_{it}^{d}$, by the local house price development where the respondent currently lives.

[10] As Appendix Table A1 shows, this extended sample is very similar with respect to demographic characteristics to the subset of respondents who also answer the house price question.

We focus on zip code level house prices, but also show results using MSA or state level house prices throughout the paper. First, to filter out seasonal effects, we use year-on-year changes in home prices. Therefore, a respondent's house price experience does not vary during the year she spends in the panel and we focus on only one house price expectation per respondent. The effect of house price experience on expectations is therefore identified in the cross-section by differences in the local house price history.

To estimate the effect of one's own unemployment experience on her unemployment expectations we estimate Equation 1 where $expectation_{it}^{d}$ is the percentage chance that US unemployment will be higher a year later, as stated by respondent i in month t. $experience_{it}^{d}$ is an individual's own employment status in month t. Transitions in the respondent's employment situation during the panel, as shown in Table 2, enable us to include individual fixed effects. This allows us to exploit within-individual variation in employment experience to identify the effect of experience on expectations.

3.2 Prior Year Local House Prices and US House Price Expectations

Figure 2 provides a first look at the relationship between locally experienced past house prices and expectations. Panel A sorts respondents into deciles based on the change in local house prices in the year prior to respondents taking the survey. On average, respondents in ZIP codes with higher price changes expect one-year-ahead US house prices to increase more. Similarly, panel B shows that respondents in states with higher increases in house prices in the prior year on average expect US house prices to be higher in the coming year. These graphs suggest that respondents are influenced by local house price experiences when reporting expectations about nationwide home prices.

Table 3 presents regression estimates of the relationship between the locally experienced house prices in the prior year and expected future US house price changes, controlling for respondent characteristics. We estimate Equation 1 using the previous year's house price return in the ZIP code (column 1), MSA (column 2) and state (column 3) where the respondent lives as a measure of her past experience. We estimate the effect on respondents' expectations about one-year-ahead house price changes, as well as the one-year-ahead house price change in three years, i.e., the change in home prices between two and three years after respondent takes the survey.[11] The estimates confirm

[11]In January 2014, the survey question was "Now we would like you to think about home prices further into the future. Over the 12-month period between January 2016 and January 2017, what do

that past local experience significantly affects expectation about US house prices both in the coming year, as well as further in the future. The effect is of similar magnitude irrespective of whether ZIP code, MSA or state level house prices are used: a one percentage point increase in past local house prices increases expected house price changes by about .1 percentage points.

Note that the effect of past local house prices is of very similar magnitude irrespective of whether respondents are asked about US house prices in the coming year or three years ahead. Respondents appear to not only extrapolate from local to aggregate prices, but also from recent changes in house prices to price changes both in the coming year as well as three years in the future.

3.3 Volatility of Past Local House Prices and Expected US House Price Volatility

So far, we have focused on the effect of the *level* of experienced house price changes on the *level* of expected future house prices changes. In this section, we analyze whether the effect of past experiences on expectations extends to the second moment: we estimate whether respondents who have experienced more volatile house price returns locally, expect future house prices to be more volatile relative to respondents who live in areas with more stable house price returns in the past.

Table 4 presents the results. We measure expected volatility by the standard deviation of the distribution of expected house prices elicited in the survey.[12] Correspondingly, we measure experienced volatility by the standard deviation of house prices in the respondent's ZIP code (column 1), MSA (column 2) and state (column 3). The standard deviation of past house prices is calculated over different horizons: the past 5, 10 and 20 years, as well as since the beginning of our data on local house prices in 1976. For each horizon and house price measure, the various cells in Table 4 present the estimated coefficient and corresponding standard error on locally experienced volatility. In all specifications we include deciles of the previous year's change in house prices to control for different levels of house prices, as well as respondent demographics and survey date fixed effects.

Table 4 shows that respondents in areas which experienced more volatile house prices expect nationwide house prices to be more volatile. A one percentage point increase in

you expect will happen to the average home price nationwide?"

[12]See section 2.1 for a description of the data and appendix A for the exact wording of the question.

the experienced standard deviation in the respondent's ZIP code increases the expected standard deviation by 0.13 to 0.25 percentage points. Taking into account the extent of variation in past experience, a one standard deviation increase in the standard deviation of experienced house prices in the last 10 years (4.33 according to Appendix Table A2) increases the standard deviation of expected house prices by over half a percentage point (4.33*.133 = .58).[13] The estimated effects are very similar both in magnitude and significance when using MSA level measures. Using state level house price measures yields smaller estimates which are often not statistically significant.

3.4 History of Local House Prices and US House Price Expectations

So far, we have measured respondents' experience of past house prices by the house price change in the previous year only. However, respondents' experience of local house prices may also be shaped by house price developments in earlier years. In this section, we measure each respondent's experience by a weighted average of past house price changes instead of just using the previous year's change.

3.4.1 Weighted Average of Past House Prices as an Experience Measure

We follow the approach of Malmendier and Nagel [2011] to capture the history of all past prices in one experience variable. Each person's house price experience is calculated as the weighted average of all experienced house price returns, R_t. The weights are determined by the parameter λ which allows the weights to increase, decrease or be constant over time. Specifically, respondent i's house price experience in year t is measured by A_{it}, calculated as follows:

$$A_{it} = \sum_{k=1}^{horizon_{it}-1} w_{it}(k,\lambda) R_{t-k} \tag{2}$$

where

$$w_{it}(k,\lambda) = \frac{(horizon_{it}-k)^{\lambda}}{\sum_{k=0}^{horizon_{it}-1}(horizon_{it}-k)^{\lambda}}. \tag{3}$$

R_{t-k} is the change in local house prices in year $t-k$. The weights depend on the experience horizon of the individual, $horizon_{it}$, when the home price return was realized,

[13] A one standard deviation increase in the standard deviation of house prices since the beginning of our data increases the standard deviation of expected house prices by .48 (2.42*.198=.48).

k, and the parameter λ. Note that in the case where $\lambda = 0$, A_{it} is a simple average of past changes in home prices over the experience horizon. If $\lambda > 0$ ($\lambda < 0$), the weighting function gives more (less) weight to more recently experienced changes. We estimate λ later in the paper.

Finally, we need to determine when respondents start to experience local house prices, captured by the experience horizon, $horizon_{it}$. Our ZIP code level house price data are available only since 1976, so this is the earliest year respondents can start experiencing house prices. We consider two types of experience horizons. First, we consider a fixed number of past years, such as the past 3 or 5 years, and assume that respondents experience and recall past house prices over this time horizon. Second, we consider different *individual-specific* horizons (after 1976) for when a respondent starts experiencing local house prices: the year or year before she moves to her current ZIP code, the year she moves to her current state of residence, the year she turns 13, or her year of birth. Each of these horizons makes different assumptions about when and how respondents perceive local house prices. We show results for all of these possible horizons and let the estimates inform us which one yields the best fit in our data.

Figure 3 illustrates the geographic variation in house prices documented in Appendix Tables A2 and A3 and shows how it translates into the weighted experience variable depending on the weighting parameter λ. Panel A shows yearly changes in house prices in three states with different hours price development: Arizona experienced high increases in house prices in the early 2000s and a large decline after the onset of the financial crisis in 2008. New York experienced large increases in house prices in the 1980s. Prices also increased in the early 2000s and declined afterwards, though both the increase and subsequent decline of house prices were substantially smaller than in Arizona. House prices in Indiana have been relatively stable over the last decade. As a result, the weighted house price experience in Indiana is very similar for respondents of all experience horizons (irrespective of whether recent or earlier experiences are weighted more).

In Arizona and New York, however, weighted experience varies substantially with experience horizon and the weighting parameter λ. Respondents with a 5 or 10 year experience horizon who heavily overweight recent experiences (that is, $\lambda > 1$) tend to have large positive weighted home price experiences, since home price increases in the recovery after the crisis receive more weight. Weighted home price experiences also increase as early experiences are overweighted since for respondents with 10-year horizon experiences, these overweight the run-up in prices in the early 2000s. In New York, unlike in Arizona, respondents with a very long horizon also have high weighted house price

experiences when early experiences receive higher weights since these capture the 1980s when New York experienced large increases in house prices.

3.4.2 History of Past House Prices and Expectations

We consider values of the weighting parameter λ ranging from -2 to 20 in intervals of .1. For each λ on this grid, we calculate the weighted average of past house price changes and use it as our measure of past experiences to estimate Equation 1. We then compare the R^2 of these regressions to determine which values of λ and experience horizon yield the best fit for our data.

Figure 4 plots the fit of the regression, measured by the R^2, along the range of weighting parameters λ for each considered experience horizon. Local experience is captured by ZIP code level house prices. The top panel shows the results for horizons of a fixed number of years for each individual ranging from the last two years to the start of our data series in 1976. For comparison, the straight horizontal, dashed line also shows the fit of the regression when using only the previous year's house price return. Panel B shows results for horizons which depend on each individual's personal situation: the time the respondent has lived in her current ZIP code, her current state, the time since the respondents was 13 years old, and the time since her birth.

The overall best fit is achieved when experience is measured by the average of house price returns over the past three years. Including earlier house price returns in addition to only the most recent year's house price change therefore improves the fit of the regression. However, relatively short horizons of a few years yield a better fit compared to longer horizons, and using individual-specific horizons does not improve fit. Even for respondents who have lived longer in their current ZIP code or state, the most recent years appear to matter most for forming expectations.

For each horizon considered, Table 5 lists the highest R^2 and the associated weighting parameter λ, the coefficient on the weighted average of past experiences, its standard error and the effect of a one standard deviation increase in the experience variable. While the overall best fit is achieved by a three year fixed horizon, weighted past experiences have a significant effect on expectations for all horizons and the estimated effect is similar in magnitude: a one standard deviation increase in the experience variable increases expectations by .81 to .97 percentage points for fixed year horizons.

Table 5 also shows that the best-fit weighting parameter λ is higher the longer the horizon over which experiences are calculated. This suggests that as more early years

are included to the horizon, the optimal weighting parameter adapts and increases the relative weights on the most recent house price changes. For each horizon and its associated best fit weighting parameter λ, Figure 5 shows the weights assigned to the house price changes in each of the 10 most recent years. Irrespective of the experience horizon, the weight assigned to each year's house price by the optimal weighting parameter λ is very similar. Specifically, only house price changes in the previous three years receive substantial weight, whereas returns in earlier years receive very low weights. As the horizon increases and earlier years are included, the optimal weighting parameter λ increases such that the effective weights assigned to each year's house price are very similar. Therefore, no matter the length of the horizon, at the optimal weighting parameter only house price returns in the most recent years affect expectations about house prices.

Appendix D replicates the analysis of this section using state and MSA level house price changes instead of ZIP level changes. The results are very similar. Specifically, the optimal weighting parameters and estimated effects obtained for each horizon are very similar to the ones presented in Table 5.

3.5 Own Employment Experience and US Unemployment Expectation

So far, we have focused on the effect of locally experienced house prices on expectations in the cross-section. Locally experienced house prices do not change enough during the year to estimate how respondents update their expectations as their experiences change. We therefore now turn to unemployment expectations, which allows us to focus on individuals who experience job transitions during the panel and to estimate the effect of this *within-individual* variation in experiences on expectations.

Figure 6 shows average national unemployment expectations for employed and unemployed respondents over our sample period. Both the employed and unemployed adapt their expectations to changes in economic conditions. In December 2013, employed respondents believed unemployment would be higher 12 months from now with probability of just under 50%, though the estimate dropped to well below 40% in late 2014. At every point in time, however, respondents looking for work on average consider an increase in unemployment to be on average more than 7 percentage points more likely than than their employed counterparts.

Table 6 formally estimates this difference in nationwide unemployment expectations between employed and unemployed respondents. The estimation includes time fixed

effects to absorb changes in economic conditions over time and isolate the effect of employment status. The first two columns confirm the findings of Figure 6: In the cross-section, those searching for work are 8 percentage points more pessimistic about nationwide unemployment compared to their employed counterparts. Retired respondents are more optimistic than others, and those out of the labor force are slightly more pessimistic. Controlling for demographics and local unemployment rates in the second column, reduces the difference between employed and unemployed respondents to 6.6 percentage points, indicating that differences in characteristics could partially explain differences in expectations.

To address the concern that differences in characteristics between respondents with different experiences are driving the results, the last two columns of Table 6 include individual fixed effects which absorb any potential differences in characteristics between individuals. The resulting estimates capture how much a given respondent's expectation changes as her own employment status changes. The estimates suggest that individuals, on average, become 4 to 5 percentage points more pessimistic (optimistic) after becoming unemployed (finding a new job out of unemployment).[14] Therefore, as respondents' experience changes over time, their expectations change accordingly.

Finally, Table 7 explores whether the effect of unemployment differs when respondents lose their job relative to when respondents find a job out of unemployment. In the cross section, reported in the first column, we see that expectations of respondents who recently found a new job do not differ significantly from those of respondents who have been employed throughout the sample period. Respondents who lost their job or entered the sample looking for a job are substantially more pessimistic. When including individual fixed effects in column (2) of Table 7, however, we find no significant difference between recent job losers and employed respondents. Respondents who find a new job out of unemployment, however, are 4 percentage points more optimistic than those who are employed throughout the sample period.

[14] In unreported results we investigate whether the effect of job loss or finding a job out of unemployment varies by the length of unemployment and find no evidence for a systematic effect of unemployment length.

4 Potential Mechanisms

4.1 Understanding the Effect of Personal Experience on Expectation

What does extrapolation from local experiences to aggregate outcomes imply about expectation formation? For example, momentum in home price changes has been well documented (see Case and Shiller [1989] or, more recently, Guren [2015]). Some reliance on recent changes in home prices to predict next year's home price change might therefore be sensible. Similarly, relying on local experiences to predict national outcomes may be optimal if, similar to recent *national* price changes, recent *local* price changes are informative about national aggregates. In rational updating models, the weight assigned to such a signal depends on its informativeness. That would imply that extrapolation from personal or local experiences should be greater in cases where these experiences are more informative about national aggregates (for example, in cases where local home prices co-move more strongly with national home prices).

Likewise, systematic demographic differences in extrapolation would be inconsistent with models which assume that individuals 1) know all publicly available information and 2) fully and correctly incorporate this information when forming expectations. Excessive extrapolation from personal experiences can result from a deviation from either assumption: Respondents may rely heavily on their own experience because they do not know other relevant information, for instance because of rational inattention or costly information acquisition. Alternatively, they may overweight their personal experiences when forming expectations, for instance because of biases.

In the literature, models have explored both types of deviations, but differ widely in their specific assumptions and hence their implications for expectation formation. Whether or not a particular model in each class is consistent with our findings depends on its specifics. Rather than evaluating our findings in light of a few select models, we focus on outlining the general properties of models that our empirical findings are consistent with. For instance, consider the case of average extrapolation by individuals' education levels (a component of X_{it}). Differential extrapolation by education level would not be consistent with rational updating if both groups (that is, low- and high-education individuals) have equally precise information sets. On the other hand, if lower-education individuals have a higher level of heterogeneity in their non-local information, say, because of less accurate information (Madeira and Zafar [2015]), then they should

in fact be more responsive to their own experiences.

4.2 Informativeness of Own Experience

In this section, we assess whether reliance on personal experiences is justified based on how informative they are about the aggregate. We first analyze whether the effect of local house prices on expectations depends on how informative local house prices are for national house prices. In areas where changes in local and national house prices have been closely aligned in the past, which we capture by past correlation,[15] locally experienced house price movements are plausibly more informative about national house price changes. If respondents extrapolated from recent local to aggregate house prices because of the informativeness of local movements for aggregate prices, we would expect respondents' US house expectations to be more strongly influenced by locally experienced house prices in areas where their past correlation is higher.

Table 8 shows that there is no effect of past correlation on the extent of extrapolation from past prices. The effect of past local housing market movements on US house price expectations is almost identical, irrespective of the extent to which local house price changes were correlated with aggregate house price changes in the past.

We next assess whether respondents' updating of their expectations when they experience unemployment is consistent with its informational content. To do so, we calculate what our estimates imply about how informative individual job loss is about aggregate unemployment. Assume that all respondents are Bayesian updaters and agree that the unconditional probability of national unemployment increasing is 40% (the average expectation of all respondents in our sample), and that the probability of job loss if unemployment was not going to increase is 7% (roughly the average unemployment rate in the US over our sample period). Let $P(high)$ be the (unconditional) probability of unemployment being higher a year from now based on publicly available information. Let $P(high|unemployed)$ and $P(high|employed)$ be the probability of unemployment being higher for respondents who have experienced a job loss and those who are still employed, respectively. Assume that the likelihood of job loss if unemployment was not going to increase is $P(jobloss|nothigher)$ and that the probability of job loss is higher by x percent if unemployment was going to increase, that is, $P(jobloss|higher) = x * P(jobloss|nothigher)$. Then the differences in expectations by

[15] We compute the correlation between national and ZIP code level house price annual changes since 1976, when the data on house prices is first available.

employed and unemployed respondents should be:

$$P(high|unemployed) - P(high|employed) =$$
$$\frac{P(jobloss|nothigher) * x * P(high)}{P(jobloss|nothigher) * x * P(high) + P(jobloss|nothigher)(1 - P(high))}$$
$$- \frac{(1 - P(jobloss|nothigher)x)P(high)}{(1 - P(jobloss|nothigher)x)P(high) + (1 - P(jobloss|nothigher))(1 - P(high))}$$

Substituting in $P(high) = 40\%$, $P(jobloss|nothigher) = 7\%$ and $P(high|unemployed) - P(high|employed) = .045$ yields $x = 19\%$. That is, respondents would need to be about 19% more likely to lose their job if unemployment were truly going up than they would be if unemployment were not going to increase to justify the estimated difference in posterior beliefs of between 4 and 5 percentage points.[16]

4.3 Effect by Respondent Characteristics

Next, we explore which respondent characteristics affect the influence of past experiences on expectations about nationwide outcomes. We estimate whether the effect of local house prices varies by whether respondents own their home (top panel of Table 9) to assess whether reporting of risk-adjusted probabilities could explain our results. Next, we estimate whether proxies for sophistication, such as a college degree or the respondent's numeracy score affects the extent to which past experiences impact aggregate expectations.

A potential concern about our results is that instead of actual probabilities, respondents report risk-adjusted probabilities in the survey and that past experiences systematically affect the extent of risk adjustment. Specifically, past increases in house prices make homeowners better off and, hence, potentially less risk averse. Therefore, higher increases in past house prices would increase risk-adjusted expectations of future house price changes by decreasing the risk adjustment even if there was no effect on expectations of the actual likelihood of price changes. However, the effect of past experiences on the extent of risk adjustment should be the opposite for renters. Unlike for homeowners, higher increases in past house prices are detrimental for renters,[17] making them more risk averse and increasing the risk adjustment contained in risk-adjusted expectations. While risk-adjustment should amplify any extrapolation from past experiences

[16] For job loss rates, $P(jobloss|nothigher)$, between 1 and 20 percent and different unconditional probabilities the estimates vary but are of similar economic magnitude.

[17] See Stroebel and Vavra [2014].

for homeowners, it should dampen extrapolation from past prices for renters.

However, the top panel of Table 9 shows that there is no evidence of a stronger effect of past house prices for homeowners (compared to renters). If anything, the point estimates suggest a slightly lower effect for homeowners, though the estimate is not significantly different from that of renters. Risk adjustment therefore does not appear to be an important driver of our results.

A college degree and higher numeracy can be viewed as proxies for the respondent's sophistication. If respondents extrapolated from own experiences to aggregate outcomes because they were uninformed or because of cognitive biases, we would expect sophisticated individuals to be less prone to rely on their own experience (either locally experienced house prices or own employment status) when reporting expectations for nationwide outcomes. This is investigated in the lower panel of Table 9. It shows that a one percentage point increase in last year's ZIP level house price change increases expected national house price changes by 0.14 percentage points for non-college graduates, but only by 0.05 for college graduates and the difference of 0.09 is statistically significant. Similarly, in Table 10 the effect of past house prices for respondents with low numeracy is 0.17 and statistically significantly different from the estimate of 0.05 for respondents with high numeracy. Note, however, that while the effect is smaller, past experiences still significantly affect expectations for college graduates and high numeracy respondents.

Likewise, Table 11 shows that personal unemployment has the largest effect, an increase of 7.3 percentage points, on expectations for respondents with numeracy in the lowest tercile. Respondents with higher numeracy are significantly less influenced by their own employment status when forming expectations about national unemployment. We do not find significant differences in the effect of experiencing unemployment by college graduation status.

Overall, our results show a stronger effect of past experiences for less sophisticated individuals. That would be broadly consistent with models of expectation formation subject to either behavioral biases or costly information processing.

4.4 Expectations of Other Outcomes

Table 12 explores whether experiences in one domain, the labor or the housing market, also influence expectations regarding other economic variables. The first two columns of Table 12 show that unemployed respondents feel they are worse off than they were a

year ago and also expect to be worse off a year later.[18] The remaining columns estimate the effect of experiencing unemployment (top panel) and of past house prices (lower panel) on expectations about other outcomes. We do not find an effect of employment status on expectations for interest rates, US stock prices, inflation, government debt and house price development. Unemployment therefore does not make respondents more or less pessimistic about economic conditions in general. Rather, respondents appear to consider their own employment experience to be informative only of aggregate unemployment. Similarly, local house price changes are not systematically related to expectations about interest rates, stock prices, inflation or unemployment. We do find a statistically significant effect (at the 10% level) on respondents' expectations about government debt. However, given the substantial number of outcome variables considered, this could be by chance. Taken together, there is little evidence that other factors affecting expectations, such as general optimism or pessimism, are correlated with past house price returns and hence driving our results.

5 Robustness

5.1 Local Versus National House Prices and Recall of Past House Price Changes

Our analysis on home price expectations is based on two implicit assumptions. First, respondents understand that they are being asked for their national home price expectations and not local price changes. Second, respondents are aware of changes in the local housing market. The interpretation of our findings would be unclear if respondents were not aware of local house price conditions or did not realize that they were being asked for expectations regarding aggregate home price changes. In this section, we provide evidence for both of these assumptions, by analyzing data from a subset of respondents who answered additional questions on local house price expectations and recall of past prices.

Respondents in the SCE answer the same questions every month. However, an additional module about a specific topic is added every three months. In February 2015, a subset of the respondents to the monthly module took an additional survey module

[18] It is interesting to note that the estimate on "out of labor force" is qualitatively similar to that of the unemployed respondents. This would suggest that, the transition to out of the labor force, is partly driven in our sample by the same factors that lead respondents to become unemployed.

asking explicitly about ZIP code level house price expectations and past house prices changes.

5.1.1 Distinguishing between Local and National House Prices

A potential concern about our results is that respondents do not fully understand that the survey asks about expectations of national house prices and may incorrectly believe that they are being asked about local house prices. This could lead to a correlation between local past house prices and elicited expectations of nationwide house prices in the data even if true expectations about national house prices were independent of locally experienced prices.

First, the wording of the survey question, as fully outlined in Appendix A, explicitly states that the question is about nationwide home prices ("Next we would like you to think about home prices nationwide"), so it seems unlikely that many respondents misunderstand this.

Second, we evaluate a respondent's consistency across survey questions. In Table 13, we compare a respondent's expectation of national house prices as stated in the monthly module to her expectation of ZIP code level house prices as stated in the add-on module. If respondents incorrectly believed the question about national house prices to be about local house prices, we would expect them to give the same answer to both questions. On average, respondents' expectations about ZIP code level house prices are neither systematically higher nor lower than their nationwide price expectations, as reflected in the average difference of less than one percentage point. However, there are substantial differences in each individual's expected price change, as indicated by the standard deviation of the difference between the two point estimates of 6.8 percentage points, as well as the average absolute difference between both estimates of 4 percentage points. Similarly, only 20% of respondents state the exact same number for ZIP code and national level house price appreciation. 22% and 37% of the respondents state numbers that are within a half or one percentage point of each other, respecitvely. Importantly, in unreported regressions, we find no relationship between respondent characteristics and the likelihood of similar or identical answer to both questions. This suggests that most respondents understand what they are being asked about, since otherwise low numeracy and less educated respondents should have arguably been more likely to give similar responses to the two questions.

Finally, we turn to expectations about unemployment for further evidence of whether

respondents understand the difference between being asked about nationwide outcomes and local or, in the case of unemployment, personal outcomes. Appendix Table A1 shows that respondents indeed seem to understand the distinction between these two variables: Employed respondents, on average, assign a 23 percentage point higher likelihood to higher unemployment nationwide than to losing their own job. While it is reassuring that respondents understand they are being asked different questions, we would expect the average probability of job loss to be similar in magnitude to the average expected increase in unemployment. The large average difference between the two, however, indicates that most respondents are much more optimistic regarding their own employment prospects than they are about nationwide outcomes. This is consistent with prior evidence that respondents tend to overestimate their own ability,[19] and therefore their own employment prospects.

5.1.2 Recall of Past House Prices

For respondents to be able to extrapolate from past local house prices when forming expectations about nationwide home prices, they need to have at least some sense of what house prices were in their local area in the past. The February 2015 add-on module also asked respondents about changes in house prices in their ZIP code in the previous year, as well as over the previous five years.

Table 14 shows the relationship between recalled and actual house price changes, controlling for respondent demographics. A one percentage point increase in actual house price returns increases recalled house price changes in the previous year by .15 percentage points. The increase for perceived returns over the previous five years is around .2. If respondents perfectly recalled past house price returns, we would expect a coefficient of 1. The results indicate that recall is better over the five year horizon than for the previous year. This is consistent with our earlier finding that proxying for local house price experience by several years of recent house price changes yields a higher R^2 than just including the most recent year's house price return. Finally, unreported results suggest that respondents who went to college and have higher numeracy scores are more accurate in their recall of the past year's house price changes. However, the estimated effects of these characteristics are lower and no longer significant when evaluating the recall of house price changes in the last 5 years. Overall, the results suggest that respondents know the change in house prices in their local area to some extent. However, respondents'

[19] For instance, Weinstein [1980] documents that college students systematically underestimate the likelihood that something bad, such as loosing their job, will happen to them.

recalls are far from perfect, as indicated by the low R^2 of the regression and the estimated coefficient on actual house price changes of well below 1.

When estimating the effect of local house price experience on expectations, we measure respondents' past experience by actual house price changes. However, when forming expectations, respondents have to rely on what they believe prior house price changes to be.[20] Table 15 therefore estimates the effect of recalled local house price changes on expected US house price changes. Indeed, the estimated coefficient on recalled changes is highly statistically significant and larger than the corresponding coefficient on actual house price changes as shown in Table 3.[21] In addition, reducing the influence of outliers in recalled house price changes by winsorizing at 1% or 5% further increases the estimated effect.

5.2 Effects of Expectations

The results so far show that recent personal and local experiences significantly affect individuals' expectations of future economic outcomes. Our interest in these expectations stems from the belief that they influence individuals' current and planned economic activity and economic outcomes. In this section, we assess to what extent expectations elicited in our survey data are associated with actual future outcomes and intended actions.

5.2.1 Labor Market Expectations and Realized Outcomes

In addition to respondents' expectations about nationwide unemployment, respondents in the SCE also assess their own employment prospects. Specifically, employed respondents state how likely they think they are to lose their job. Tables 16 analyzes to what extent these self-assessed employment prospects are indicative of actual future employment outcomes both in the cross-section, as well as within-respondent over time.[22] The

[20] Cavallo et al. [2014] find in a field experiment that past recalled price changes are more predictive of expected inflation rates than actual past price changes.

[21] In unreported results we estimate the effect of both, recalled and actual price changes, for the same sample of respondents. This reduces our sample size further since we require both recalled price changes, as well as ZIP code level house price indices to be available. The effect of recalled price changes is similar to the effect in Table 15, both in magnitude and significance. The effect of actual house price changes for this sample is smaller compared to the estimate in Table 3. Therefore, the results confirm that respondents rely on what they remember past local house prices to be, which is better captured by recalled than by actual house price changes.

[22] Stephens Jr [2004] and Dickerson and Green [2012] also find that expectations of unemployment are predictive of future employment outcomes.

dependent variable in the table is a dummy for whether the respondent actually loses her job over the specified horizon. Respondents who think they are more likely to lose their job when they first enter the panel are in fact more likely to do so in the following months: Panel A of the table, which exploits cross-sectional variation, shows that an increase of 10 percentage points in the reported likelihood of losing a job over the next 12 months is associated with a 0.15 increase (on a 0-1 scale) in the actual likelihood of losing a job over the next six months. Moreover, the lower panel of Table 16 shows that as respondents become more pessimistic about losing their job they are indeed at an increased risk of being laid off, in particular over a 1-month horizon. Respondents' expectations about future job loss are therefore strongly related to actual job loss, indicating that respondents' expectations are predictive of actual, real life outcomes.

5.2.2 House Price Expectations and Intended Behavior

While a substantial number of respondents experience a job loss during their time in the survey for us to relate prior job loss expectations to actual outcomes, this is not the case for housing market outcomes, such as buying a new home. We therefore turn again to the subset of respondents who answered additional questions on house prices expectations in February 2015. These respondents were also asked whether they considered buying a home in their zip code today a good investment. This allows us to evaluate whether respondents who are more optimistic about future house prices are more likely to consider buying a home a good investment.[23] Table 17 shows that respondents who expect house prices to increase more, either nationally or in their current ZIP code, indeed rate investing in real estate in their current ZIP code as more attractive.

6 Conclusion

This paper documents that recent personal experience affects expectations about aggregate unemployment and house price development. Experiencing unemployment leads respondents to be significantly more pessimistic about nationwide unemployment. Likewise, house price development in the prior year significantly affects expectations of US house prices. Notably, labor and housing market experiences do not affect expectations about other economic outcomes, such as interest rates, stock prices, government debt

[23] Prior evidence indeed suggests that expectations are related to actual, as well as intended future investment decisions. See Shleifer [2015] for the effect of expectations on actual investment and D'Acunto et al. [2015] for intended purchases.

or inflation. The results therefore suggest that respondents extrapolate from their own recent experience in the given domain when forming expectations about aggregates.

Our findings that extrapolation from past experiences is not correlated with how informative local experiences are about national aggregates and that less sophisticated individuals are more likely to extrapolate are suggestive of naive extrapolation on part of consumers. They indicate that individuals either heavily weight personal experiences, or do not fully incorporate all publicly available information in their forecasts. Overall, our results lend support to models where individuals form expectations subject to information processing constraints.

Our results also have important implications for understanding aggregate fluctuations in labor and housing markets. For instance, our results illustrate how house price increases can lead households to expect high house price returns to persist in the future. Such expectations have been argued to play an important role in understanding housing booms and busts, including the recent financial crisis.[Piazzesi and Schneider, 2009, Burnside et al., 2014, Goetzmann et al., 2012].

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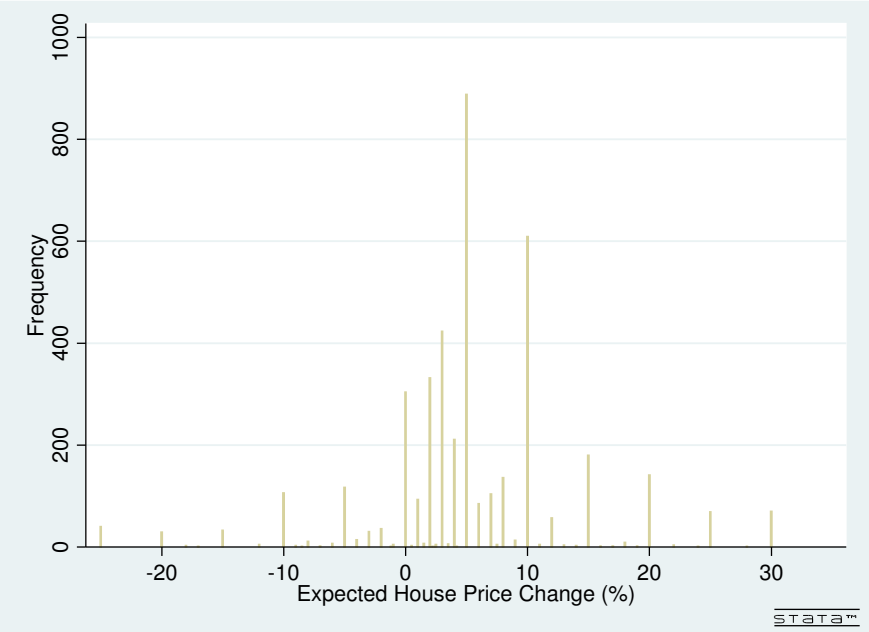
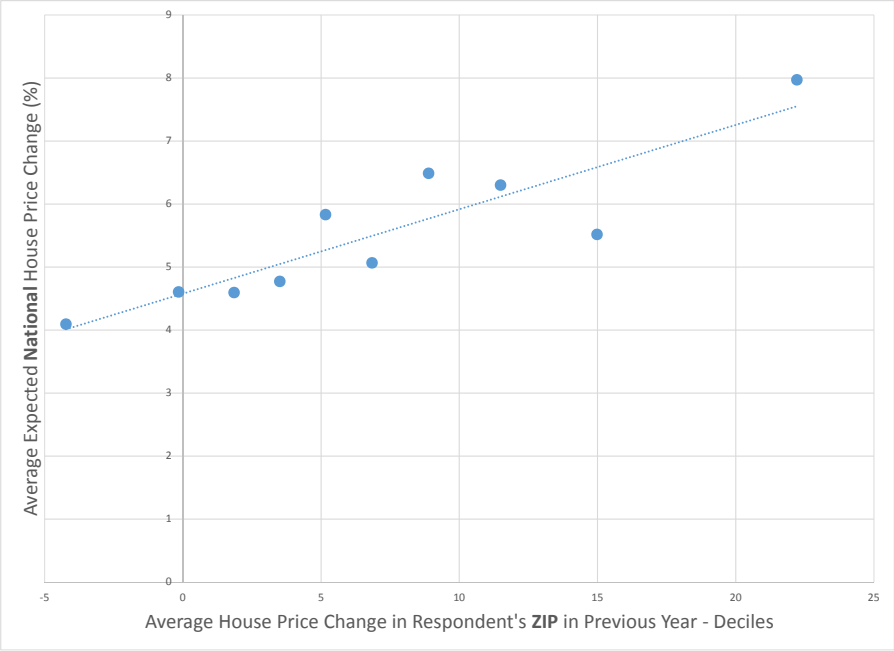
Figure 1: Distribution of Expected National House Price Changes

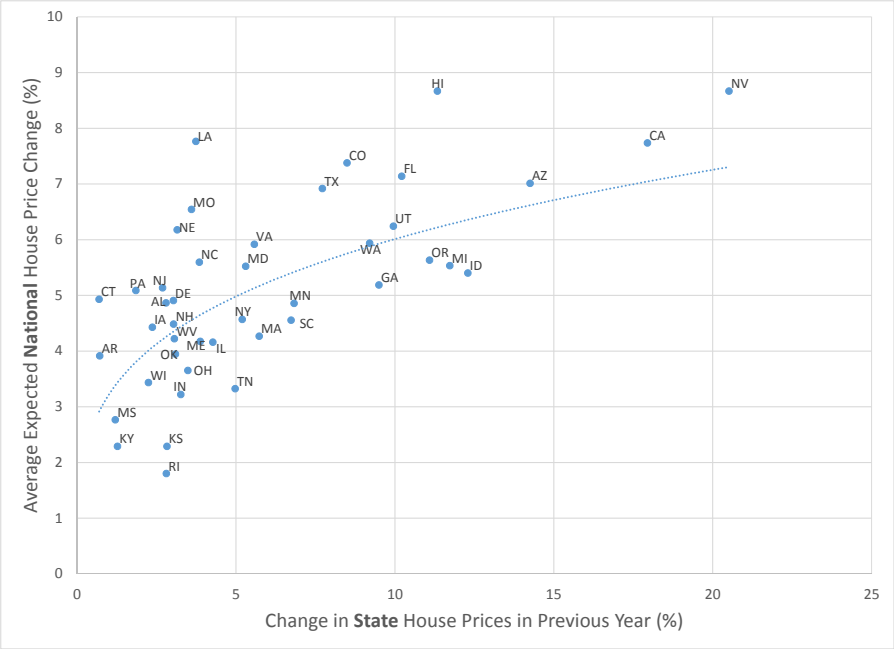


The figure shows the distribution of expected house prices changes for the coming year in percentage points as stated by the respondents in our sample.

Figure 2: Local House Price Experience and National House Price Expectation



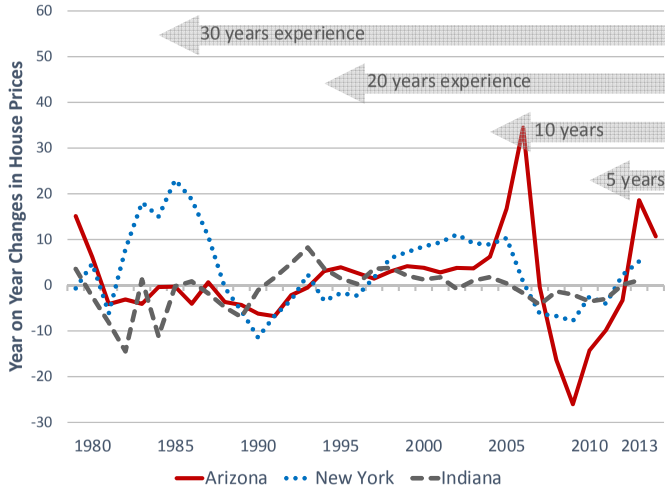
(a) ZIP Level House Price Change



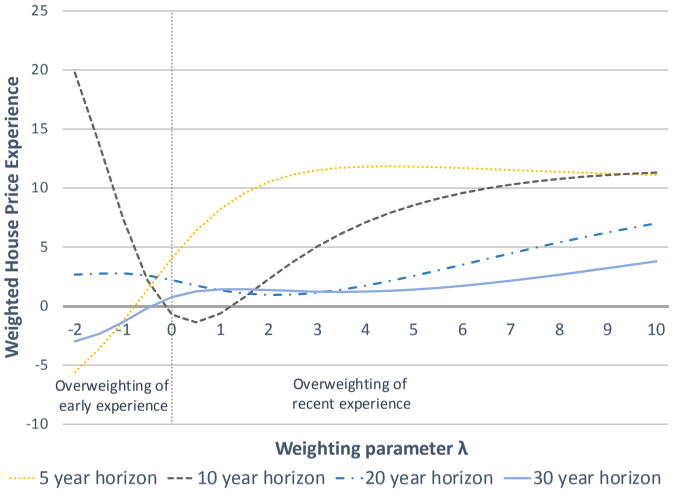
(b) State Level House Price Change

The figure shows the relationship between local house price changes in the past calendar year where the respondent lives and expected national house price changes in the next year. For each decile of past price changes in the respondent's ZIP code, Panel A shows the average past house price changes and the average expected national house price changes. Panel B shows the average past house price changes and the average expected national house price changes for each state.

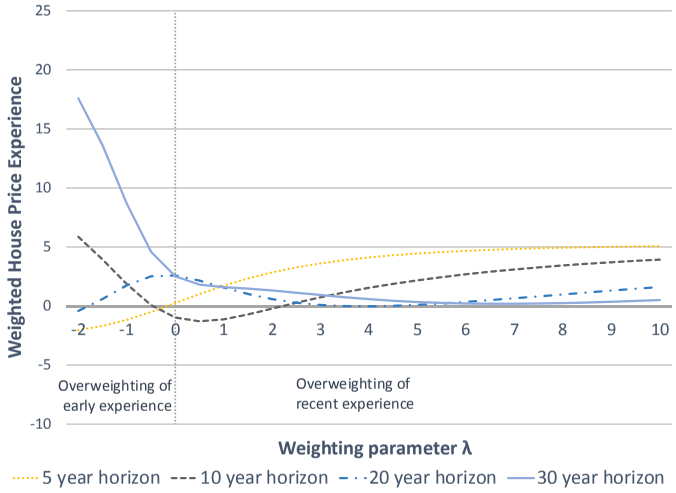
Figure 3: House Prices and Weighted Experience



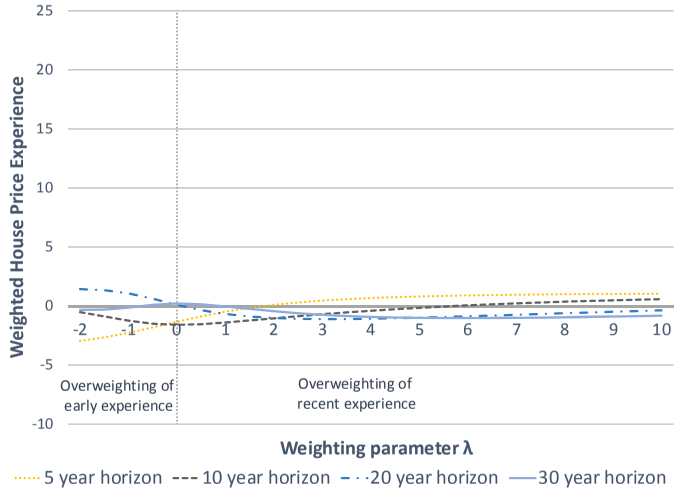
(a) House Price Changes Over Time



(b) Arizona - Weighted Experience



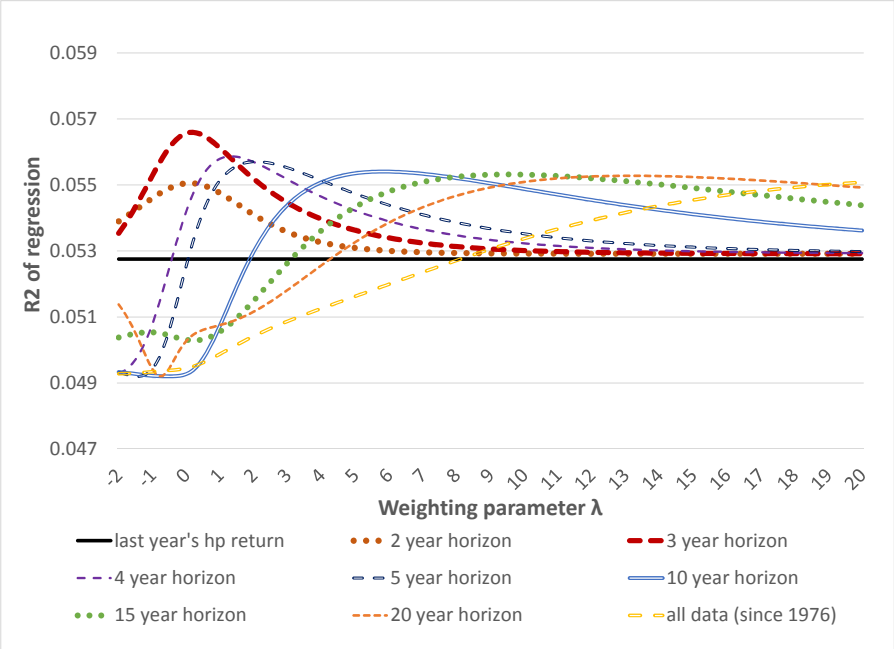
(c) New York - Weighted Experience



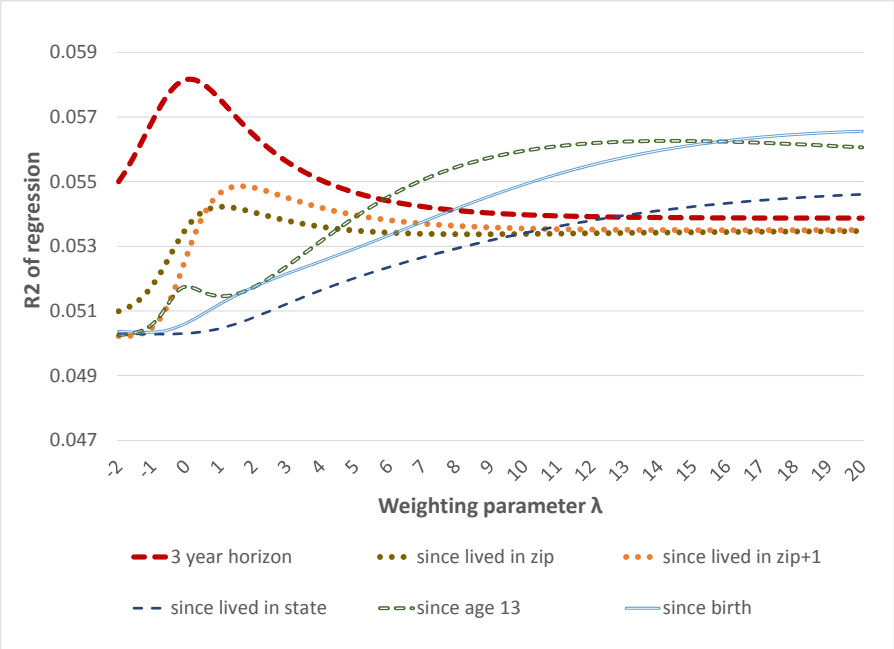
(d) Indiana - Weighted Experience

Panel A shows yearly changes in house prices in Arizona, Indiana and New York. The remaining panels show how the weighted house price experience of respondents with experience horizons of 5, 10, 20 and 30 years in Arizona (Panel B), New York (Panel C) and Indiana (Panel D) changes as the weighting parameter λ changes. The weighting parameter λ determines the weighting of past returns when past experience is measured by a weighted average of past house price changes according to Equation 2

Figure 4: Weighted Average of ZIP Code House Prices and Expectation



(a) Fixed Year Horizons (All Respondents)



(b) Individual Specific Horizons (Respondents with Years Lived in ZIP Available)

For each horizon, the figure shows how the R^2 of the regression estimates of Equation 1 changes as the weighting parameter λ changes. The weighting parameter λ determines the weighting of past returns when past experience is measured by a weighted average of past house price changes according to Equation 2.

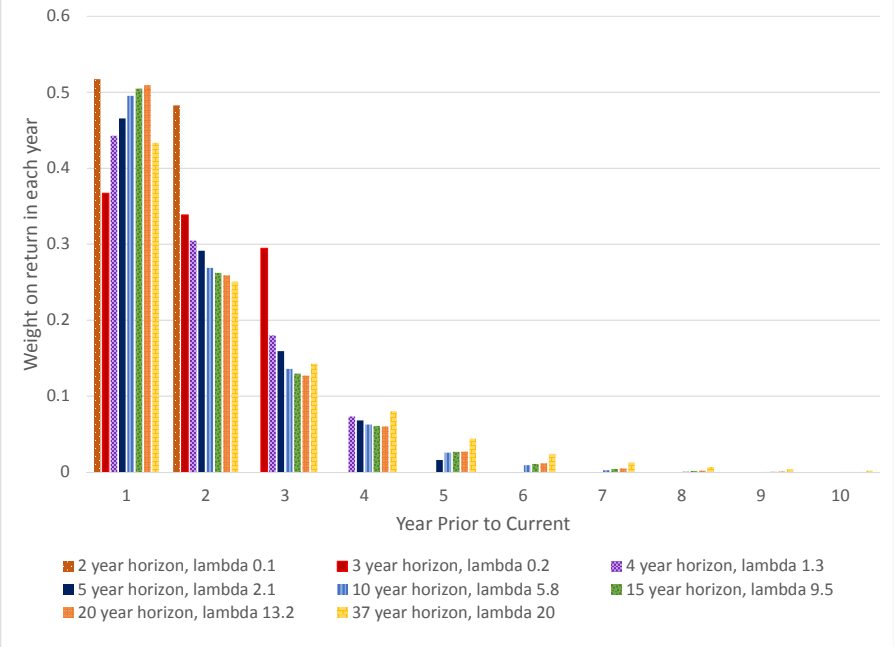


Figure 5: Weights Implied by Optimal Weighting Parameter - ZIP Code House Prices

The figure shows the weights on the house price returns in the past 10 years implied by the optimal weighting parameters corresponding to the specifications with the highest R^2 as shown in Table 5.

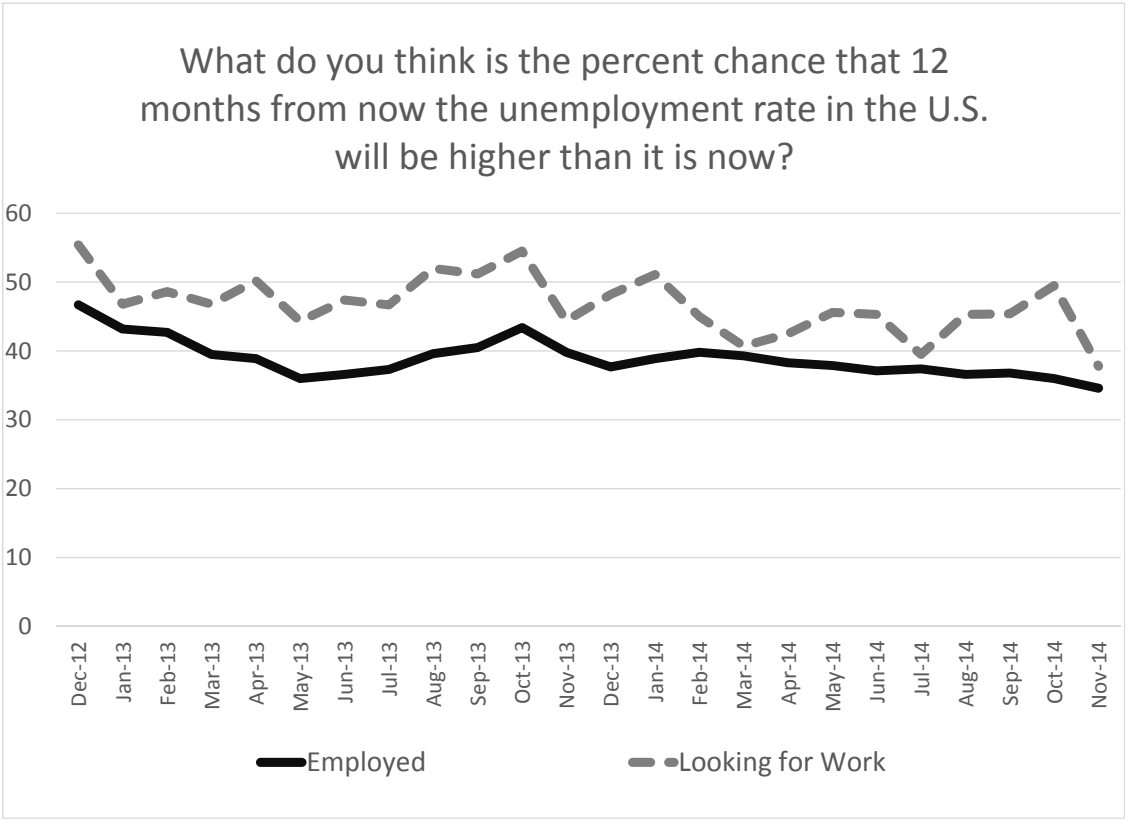


Figure 6: Employment Status and Unemployment Expectations Over Time

The figure shows the average percentage chance of US unemployment being higher a year later as reported by respondents of the Survey of Consumer Expectations (SCE) in each month, split by whether respondents are currently employed or searching for work.

	N	Mean	Std. Dev.	25th pctile	50th pctile	75th pctile
Respondent Characteristics						
Age	4,221	51.3	14.1	40	52	62
White	4,221	0.87	0.33	1	1	1
Black	4,221	0.07	0.26	0	0	0
Male	4,221	0.56	0.50	0	1	1
Married	4,221	0.70	0.46	0	1	1
College (at beginning of sample)	4,221	0.56	0.50	0	1	1
Income	4,221	89,253	53,204	45,000	87,500	125,000
Numeracy score	2,947	0.80	0.21	0.6	0.8	1.0
Homeowner	4,221	0.78	0.42	1	1	1
Years lived in current ZIP	4,218	12.9	10.9	4.5	9.5	18.0
Years lived in current state	4,217	34.7	19.9	18.0	34.0	50.0
Expected House Price Changes						
Expected house price change (point estimate)	4,221	5.4	9.3	2.0	5.0	10.0
Expected house price change (distribution)	4,221	4.3	4.6	1.6	4.1	6.8
Standard devation of expected price change	4,221	15.3	10.5	7.3	13.2	21.0
Expected probability of price change > 12%	4,221	11.8	23.3	0.0	0.0	10.0
Expected house price change - 3 year horizon	4,194	6.3	9.7	2.5	5.0	10.0
Past House Price Experience						
Prior year house price change in ZIP	3,001	7.1	7.5	1.9	6.0	11.6
Prior year house price change in state	4,221	7.0	5.4	3.3	5.8	9.8
Prior year house price change in MSA	3,580	6.6	6.1	2.1	5.2	10.5

Table 1: House Price Sample Summary Statistics

The table shows mean, standard deviation and the 25^{th}, 50^{th} and 75^{th} percentile for the characteristics, house price expectations and past house price experience of respondents of the Survey of Consumer Expectations (SCE) used throughout the paper. A respondent's numeracy score is the percentage of numeracy and financial literacy questions answered correctly.

			Current Employment Status					
			Employed	Looking for Work	Retired	Student	Out of Labor Force	Total
Previous Employment Status	New Entrant	N	3,133	269	834	41	277	4,554
		% row	69	6	18	1	6	100
	Employed	N	16,078	148	98	35	48	16,407
		% row	98	1	1	0	0	100
	Looking for Work	N	204	815	72	14	51	1,156
		% row	18	71	6	1	4	100
	Retired	N	105	62	4,654	4	62	4,887
		% row	2	1	95	0	1	100
	Student	N	32	12	3	143	7	197
		% row	16	6	2	73	4	100
	Out of Labor Force	N	57	43	75	7	1,232	1,414
		% row	4	3	5	1	87	100
	Total	N	19,609	1,349	5,736	244	1,677	28,615
		% row	69	5	20	1	6	100

Table 2: Employment Status Transitions from Month to Month

The table shows the number of observations for each combination of current and previous employment status reported by respondents in the Survey of Consumer Expectations (SCE). A respondent's previous employment status is unknown when she first enters the survey. In later modules, a respondent's previous employment status is the respondent's employment status in the previous survey module she participated in.

	I ZIP	II MSA	III State
	Expected Change in US House Prices - Next Year		
Past Local House Price Return	0.0880***	0.119***	0.125***
	(0.0222)	(0.0267)	(0.0369)
Time Fixed Effects	Y	Y	Y
Demographics	Y	Y	Y
Number of observations	3,001	3,580	4,221
R squared	0.0528	0.0465	0.0423
	Expected Change in US House Prices - 3 Year Horizon		
Past Local House Price Return	0.0938***	0.104***	0.0918*
	(0.0311)	(0.0327)	(0.0528)
Time Fixed Effects	Y	Y	Y
Demographics	Y	Y	Y
Number of observations	2,988	3,556	4,194
R squared	0.0563	0.0457	0.0374

Table 3: Previous Year's House Prices Change and House Price Expectations

The table shows regression estimates of Equation 1. The dependent variable is the expected change in house prices in percentage points as stated by the respondent. Past house price return is the return in the previous calendar year in the state (column 1), ZIP code (column 2) or MSA (column 3) where the respondent lives. Standard errors are clustered at the state level. Time fixed effects are included for each survey month. Demographics include indicators for each of the 11 possible categories eliciting household income in the survey, respondents' age and age squared and indicators for whether respondents own their home, are male, married, went to college and are white or black.

	Std of expected house price change		
	I	II	III
	ZIP	MSA	State
Std of returns since			
5 years ago	0.249***	0.272***	0.182**
	(0.0647)	(0.0856)	(0.0779)
10 years ago	0.133**	0.137***	0.0813
	(0.0521)	(0.0454)	(0.0510)
20 years ago	0.160**	0.156**	0.0695
	(0.0779)	(0.0587)	(0.0638)
1976 (all available data)	0.198*	0.174**	0.0727
	(0.103)	(0.0783)	(0.0677)
Last year's house price return	Y	Y	Y
Demographics	Y	Y	Y
Number of observations	3001	3580	4221

Table 4: Past Variation in House Price and Expected Variation

The table shows regression estimates of Equation 1. The dependent variable is the standard deviation of expected change in house prices in percentage points as stated by the respondent. For each horizon, the table shows the estimated coefficient on the standard deviation of experienced returns with standard errors clustered at the state level in parentheses. The standard deviation of past house price returns is based on house prices in the ZIP code (column 1), MSA (column 2) and state (column 3) where the respondent lives. Standard errors are clustered at the state level. Time fixed effects are included for each survey month. In all specifications, demographics include indicators for each of the 11 possible categories eliciting household income in the survey, respondents' age and age squared and indicators for whether respondents own their home, are male, married, went to college and are white or black.

	Best Fit Parameters for Weighted Past Experiences				
	R^2	λ	coefficient	standard error of coefficient	effect of 1 standard deviation
Fixed year horizons					
2 years	5.505%	0.1	0.146	0.031	0.816
3 years	5.659%	0.2	0.198	0.035	0.972
4 years	5.587%	1.3	0.192	0.036	0.883
5 years	5.571%	2.1	0.190	0.037	0.863
10 years	5.541%	5.8	0.186	0.038	0.833
15 years	5.532%	9.5	0.185	0.038	0.824
20 years	5.528%	13.2	0.184	0.038	0.820
all data (since 1976)	5.508%	20.0	0.203	0.044	0.810
Number of individuals			3,001		
Individual specific horizons					
3 years	5.817%	0.1	0.207	0.036	1.016
years lived in zip	5.422%	1.1	0.148	0.038	0.630
years lived in zip + 1	5.486%	1.6	0.174	0.041	0.694
years lived in state	5.461%	20.0	0.140	0.039	0.681
age	5.656%	20.0	0.208	0.043	0.842
years since age 13	5.626%	14.3	0.217	0.047	0.834
Number of individuals			2,942		

Table 5: Best Fit Parameters for Weighted ZIP Code Average as Measure of Experience

For each horizon, the table shows the parameters of the specifications with the highest R^2. The top panel shows results for fixed year horizons. The bottom panel considers individual specific horizons. Information on how long respondents have lived in their current area is not available for all respondents; as a result, we report a lower number of observations in the bottom panel.

	Percent Chance US Unemployment Higher in a Year			
	I	II	III	IV
Employment Status				
Employed		(omitted)		
Looking for Work	8.015***	6.619***	4.855***	4.019***
	(1.260)	(1.252)	(0.983)	(0.951)
Retired	-3.039***	-3.530***	1.268	1.123
	(0.718)	(0.923)	(1.073)	(1.049)
Student	0.457	0.421	1.660	1.390
	(2.357)	(2.224)	(2.141)	(2.050)
Out of the Labor Force	3.808***	1.939	1.500	1.121
	(1.264)	(1.300)	(1.471)	(1.410)
Local Unemployment Rate			3.171	
			(2.035)	
Local Unemployment (Decile Indicators)		Y		Y
Time Fixed Effects	Y	Y	Y	Y
Demographics		Y	Y	Y
Individual Fixed Effects			Y	Y
Average of dependent variable	38.82	38.82	38.82	38.82
Number of observations	28,615	28,615	28,615	28,615
Number of individuals	4,554	4,554	4,554	4,554

Table 6: Effect of Employment Status on Unemployment Expectations

The table shows regression estimates of Equation 1. Standard errors are clustered at the respondent level. The dependent variable is the percentage chance of US unemployment being higher a year later as stated by the respondent. Employment status is each respondent's self reported current employment status. Local unemployment is the unemployment rate in the ZIP code the respondent lives in. Time fixed effects are included for each survey month. In all specifications, demographics include indicators for each of the 11 possible categories eliciting household income in the survey. When no individual fixed effects are included, demographics also include respondents' age and age squared, indicators for whether respondents are male, married, went to college and are white or black.

	Percent Chance US Unemployment Higher in a Year	
	I	II
Employment Status		
Employed	(omitted)	
Looking for Work	6.908***	2.085
	(1.496)	(1.502)
Become Employed	0.139	-4.049***
	(1.609)	(1.533)
Became Unemployed	5.937***	1.136
	(2.105)	(1.556)
Retired	-3.552***	0.184
	(0.926)	(1.077)
Student	0.413	0.449
	(2.227)	(2.075)
Out of the Labor Force	1.927	0.000
	(1.301)	(1.423)
Local Unemployment (Indicators for Decile)	Y	Y
Demographics	Y	Y
Time Fixed Effects	Y	Y
Individual Fixed Effects		Y
Mean of dependent variable	38.82	38.82
Number of observations	28,615	28,615
Number of individuals	4,554	4,554

Table 7: Asymmetric Effect of Employment Status on Unemployment Expectations

The table shows regression estimates of Equation 1. Standard errors are clustered at the respondent level. The dependent variable is the percentage chance of US unemployment being higher a year later as stated by the respondent. Respondents who are employed and were not previously unemployed during the sample are classified as *Employed*. Respondents who are looking for work and were not previously employed are classified as *Looking for Work*. Respondents who are currently employed but were unemployed in any previous survey module are classified as *Become Employed*. Respondents who are currently looking for work but were employed in any previous survey module are classified as *Become Unemployed*. Local unemployment is the unemployment rate in the ZIP code the respondent lives in. Time fixed effects are included for each survey month. In all specifications, demographics include indicators for each of the 11 possible categories eliciting household income in the survey. When no individual fixed effects are included, demographics also include respondents' age and age squared, indicators for whether respondents are male, married, went to college and are white or black.

	Expected Change in US House Prices		
	I	II	III
	ZIP	MSA	State
Past Return * Low Correlation	0.0969**	0.0930	0.129*
	(0.0444)	(0.0612)	(0.0656)
Past Return * Medium Correlation	0.0799***	0.152***	0.133***
	(0.0236)	(0.0477)	(0.0488)
Past Return * High Correlation	0.0865**	0.0877**	0.112**
	(0.0363)	(0.0423)	(0.0448)
Medium Correlation	0.460	-0.194	0.366
	(0.314)	(0.424)	(0.461)
High Correlation	0.0189	0.0334	0.0910
	(0.654)	(0.754)	(0.701)
Constant	3.411	1.969	3.286
	(2.829)	(2.885)	(2.769)
Time Fixed Effects	Y	Y	Y
Demographics	Y	Y	Y
Low vs. High Correlation	-0.0103	-0.00534	-0.0170
	(0.0567)	(0.0740)	(0.0650)
Number of observations	3001	2668	3001
R squared	0.0532	0.0540	0.0520

Table 8: House Prices Change and Expectations by Correlation with National House Prices

The table shows regression estimates of Equation 1. Standard errors are clustered at the state level. The dependent variable is the expected change in house prices in percentage points as stated by the respondent. Past house price return is the return in the previous calendar year in the state (column 1), ZIP code (column 2) or MSA (column 3) where the respondent lives. Time fixed effects are included for each survey month. In all specifications, demographics include indicators for each of the 11 possible categories eliciting household income in the survey, respondents' age and age squared and indicators for whether respondents own their home, are male, married, went to college and are white or black.

	Expected Change in US House Prices		
	I	II	III
	ZIP	MSA	State
		By ownership	
Past House Price Return * Non-Homeowner	0.115**	0.192**	0.160**
	(0.0433)	(0.0826)	(0.0741)
Past House Price Return * Homeowner	0.0956***	0.0939**	0.112***
	(0.0200)	(0.0404)	(0.0353)
Homeowner	-0.543	0.243	-0.222
	(0.658)	(0.869)	(0.859)
Time Fixed Effects	Y	Y	Y
Demographics	Y	Y	Y
Difference Non-Homeowner vs Homeowner	-0.0194	-0.0667	-0.0321
	(0.0450)	(0.0837)	(0.0623)
Number of observations	2,991	3,561	4,199
R squared	0.0511	0.0451	0.0394
		By college	
Past House Price Return * No College	0.138***	0.194***	0.184***
	(0.0330)	(0.0411)	(0.0476)
Past House Price Return * College	0.0463*	0.0531*	0.0767**
	(0.0253)	(0.0307)	(0.0363)
College	0.665	1.142**	1.043**
	(0.404)	(0.434)	(0.414)
Time Fixed Effects	Y	Y	Y
Demographics	Y	Y	Y
Difference No College vs College	-0.0917**	-0.141***	-0.108***
	(0.0386)	(0.0473)	(0.0387)
Number of observations	3,001	3,580	4,221
R squared	0.0542	0.0487	0.0433

Table 9: House Prices Change and Expectations by Homeownership and College

The table shows regression estimates of Equation 1. Standard errors are clustered at the state level. The dependent variable is the expected change in house prices in percentage points as stated by the respondent. Past house price return is the return in the previous calendar year in the ZIP code (column 1), MSA (column 2) or state (column 3) where the respondent lives. Time fixed effects are included for each survey month. In all specifications, demographics include indicators for each of the 11 possible categories eliciting household income in the survey, respondents' age and age squared and indicators for whether respondents own their home, are male, married, went to college and are white or black.

	Expected Change in US House Prices		
	I	II	III
	ZIP	MSA	State
Past Return * Low Numeracy	0.168***	0.177***	0.240***
	(0.0615)	(0.0502)	(0.0633)
Past Return * Medium Numeray	0.110***	0.181***	0.186***
	(0.0299)	(0.0387)	(0.0504)
Past Return * High Numeracy	0.0505**	0.0404	0.0880*
	(0.0236)	(0.0353)	(0.0473)
Medium Numeracy	-0.835	-0.934	-0.554
	(0.805)	(0.800)	(0.856)
High Numeracy	-0.465	-0.0110	-0.125
	(0.812)	(0.703)	(0.786)
Time Fixed Effects	Y	Y	Y
Demographics	Y	Y	Y
Low vs. High Numeracy	-0.118*	-0.136**	-0.152*
	(0.0608)	(0.0561)	(0.0801)
Number of observations	2104	2536	2947
R squared	0.0532	0.0476	0.0409

Table 10: House Prices Change and Expectations by Numeracy

The table shows regression estimates of Equation 1. Standard errors are clustered at the state level. The dependent variable is the expected change in house prices in percentage points as stated by the respondent. Past house price return is the return in the previous calendar year in the state (column 1), ZIP code (column 2) or MSA (column 3) where the respondent lives. Time fixed effects are included for each survey month. In all specifications, demographics include indicators for each of the 11 possible categories eliciting household income in the survey, respondents' age and age squared and indicators for whether respondents own their home, are male, married, went to college and are white or black.

	Percent Chance US Unemployment Higher in a Year	
Employed	(omitted)	
Looking for work * Low Numeracy	7.316***	
	(2.718)	
Looking for work * Medium Numeracy	2.153	
	(2.278)	
Looking for work * High Numeracy	1.699	
	(1.856)	
Looking for work * No College		4.870***
		(1.810)
Looking for work * College		3.954***
		(1.388)
Retired	1.580	3.164
	(2.785)	(2.802)
Student	3.991	4.653
	(5.895)	(6.013)
Out of the Labor Force	11.53**	15.36***
	(4.864)	(5.911)
Time Fixed Effects	Y	Y
Demographics	Y	Y
Individual Fixed Effects	Y	Y
Low vs. High Numeracy	-5.617*	
	(3.267)	
No College vs.College		-0.916
		(2.194)
Number of observations	1,461	1,717
Number of individuals	226	234

Table 11: Effect of Unemployment on Expectations by Respondent Characteristics

The table shows regression estimates of Equation 1 with the indicator for searching for work interacted with numeracy and college. Standard errors are clustered at the respondent level. The dependent variable is the percentage chance of US unemployment being higher a year later as stated by the respondent. Employment status is each respondent's self reported current employment status. Local unemployment is the unemployment rate in the ZIP code the respondent lives in. Time fixed effects are included for each survey month. In all specifications, demographics include indicators for each of the 11 possible categories eliciting household income in the survey.

			Chance that the following will be higher in a year						
	Will be better off in a year	*Are* better off than year ago	interest rates on savings	US stock prices	Inflation 1 year	Inflation 3 years	government debt	home prices	unemployment
Panel A									
Employment Status									
Employed	(omitted)					(omitted)			
Looking for Work	-0.100**	-0.504***	0.802	0.0542	0.206	0.0679	-0.885	-0.937	
	(0.0397)	(0.0533)	(1.022)	(0.938)	(0.199)	(0.196)	(1.045)	(0.629)	
Retired	-0.101**	-0.246***	0.773	-0.743	-0.179	-0.0333	0.193	-0.413	
	(0.0429)	(0.0435)	(1.225)	(1.112)	(0.213)	(0.212)	(1.011)	(0.579)	
Student	-0.130	-0.397***	-3.747	-3.213*	-0.343	-0.514	-0.454	2.075*	
	(0.103)	(0.0993)	(2.496)	(1.747)	(0.408)	(0.431)	(1.188)	(1.118)	
Out of Labor Force	-0.181***	-0.356***	0.0570	-0.680	-0.0560	-0.219	0.715	0.621	
	(0.0494)	(0.0555)	(1.593)	(1.281)	(0.274)	(0.327)	(1.270)	(1.207)	
Local Unemployment Indicators	Y	Y	Y	Y	Y	Y	Y	Y	
Demographics	Y	Y	Y	Y	Y	Y	Y	Y	
Time Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	
Individual Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	
Number of observations	28,602	28,606	28,594	28,062	25,398	25,631	24,151	20,310	
Number of individuals	4,554	4,554	4,554	4,554	4,392	4,388	4,389	3,242	
Panel B									
Prior Year's House Price Return			-0.0340	0.00174	0.0208	-0.0141	-0.105*		-0.0812
(ZIP code level)			(0.0638)	(0.0627)	(0.0324)	(0.0357)	(0.0600)		(0.0747)
Local Unemployment Indicators			Y	Y	Y	Y	Y		Y
Demographics			Y	Y	Y	Y	Y		Y
Time Fixed Effects			Y	Y	Y	Y	Y		Y
Number of observations / individuals			2,998	2,985	2,993	2,993	2,993		3,001

Table 12: Effect of Employment Status on Expectations about Other Economic Outcomes

The table shows regression estimates of Equation 1 with the following dependent variables: respondents' answer on a 5 point scale to whether they believe to be better off a year later (column 1) and whether they are better off than a year ago (column 2); the percentage chance that interest rates on saving accounts (column 3) and US stock prices (column 4) will be higher a year later; respondents best guess of the inflation rate in the next year (column 5) and between two and three years from now (column 6); the expected change in government debt (column 7), the expected change in US home prices (column 8) and the likelihood of unemployment increasing (column 9). Time fixed effects are included for each survey month. Local unemployment is the unemployment rate in the ZIP code the respondent lives in. In all specifications, demographics include indicators for each of the 11 possible categories eliciting household income in the survey. When no individual fixed effects are included, demographics also include respondents' age and age squared, indicators for whether respondents are male, married, went to college and are white or black. Standard errors are clustered at the individual level when including individual fixed effects in Panel A and at the state level in Panel B.

	N	Mean	Std. Dev.	25th pctile	50th pctile	75th pctile
Difference in expected house price change for the US and respondent ZIP code						
Difference (in percentage points)	543	0.99	6.83	0	1	3
Absolute difference (in percentage points)	543	4.06	5.57	1	2	5
Same for national and ZIP	543	0.20	0.40	0	0	0
Difference of .5 percentage points or less	543	0.22	0.41	0	0	0
Difference of 1 percentage point or less	543	0.37	0.48	0	0	1

Table 13: Difference between US and ZIP Code Level House Price Expectations

The table shows mean, standard deviation and the 25^{th}, 50^{th} and 75^{th} percentile for the difference between respondents' expectations of house price changes nationwide and in their current ZIP code.

	Perceived change in house prices over			
	I	II	III	IV
	Last year		Last 5 years	
Actual change in house prices	0.142**	0.150**	0.201***	0.186***
	(0.064)	(0.075)	(0.032)	(0.033)
Demographics	N	Y	N	Y
Number of observations	404	398	403	397
R squared	0.010	0.097	0.068	0.148

Table 14: Regression of Perceived Changes on Actual Changes in Past House Prices

The table shows the relationship between the actual house price change in a respondent's ZIP code and the house price changes as perceived by the respondent. A coefficient equal to 1 would indicate perfect recall of past prices by respondents. Demographics include indicators for each of the 11 possible categories eliciting household income in the survey, respondents' age and age squared and indicators for whether respondents own their home, are male, married, went to college and are white or black.

	Expected Change in US House Prices		
	I	II	III
Recalled Change in ZIP	0.192**		
	(0.002)		
Recalled Change in ZIP - Winsorized 1%		0.250***	
		(0.001)	
Recalled Change in ZIP - Winsorized 5%			0.342***
			(0.000)
Demographics	Y	Y	Y
Number of observations	535	535	535

Table 15: Extrapolation from Recalled House Prices

The table shows regression estimates of Equation 1 with recalled past price changes in the respondent's ZIP code instead of actual past prices changes as the explanatory variable. Column 1 shows the effect of the actual recalled price change. In columns 2 and 3, recalled price changes are winsorized at the 1% and 5% level respectively. The dependent variable is the expected change in house prices in percentage points as stated by the respondent. Demographics include indicators for each of the 11 possible categories eliciting household income in the survey, respondents' age and age squared and indicators for whether respondents own their home, are male, married, went to college and are white or black.

(A) Employment Prospects When Entering Sample

	Lose job within			
	1 month	3 months	6 months	9 months
Pr(job loss within 12 months)	0.0321**	0.0767***	0.145***	0.151***
	(0.0137)	(0.0209)	(0.0292)	(0.0320)
Local Unemployment (Indicators for Decile)	Y	Y	Y	Y
Demographics	Y	Y	Y	Y
Time Fixed Effects	Y	Y	Y	Y
Individual Fixed Effects				
Number of observations	2,709	2,536	2,325	2,108

(B) Within Individual Changes in Employment Prospects

	Lose job within			
	1 month	3 months	6 months	9 months
Pr(job loss within 12 months)	0.0205**	0.0190	0.0134	0.00174
	(0.00954)	(0.0136)	(0.0117)	(0.0129)
Local Unemployment (Indicators for Decile)	Y	Y	Y	Y
Demographics	Y	Y	Y	Y
Time Fixed Effects	Y	Y	Y	Y
Individual Fixed Effects	Y	Y	Y	Y
Number of observations	15,711	14,379	12,461	10,576
Number of individuals	2,755	2,576	2,353	2,127

Table 16: Predictiveness of Own Employment Prospects

The table shows regression estimates for whether respondents' self reported probability of losing their job is indicative of future job loss. The dependent variable is whether respondents report having lost their job within the next 1, 3, 6 or 9 months of the survey module. *Pr(job loss within 12 months)* is the percentage chance that the respondent will loose her job within the next 12 months as stated by the respondent (on a 0-1 scale). Panel A includes only the first survey module for each respondent. Panel B includes all survey modules and respondent fixed effects. Local unemployment is the unemployment rate in the ZIP code the respondent lives in. Time fixed effects are included for each survey month. In all specifications, demographics include indicators for each of the 11 possible categories eliciting household income in the survey. When no individual fixed effects are included, demographics also include respondents' age and age squared, indicators for whether respondents are male, married, went to college and are white or black. Standard errors are clustered at the respondent level when applicable.

	Attractiveness of real estate investment in current ZIP code		
	I 1 year national expectations	II 1 year ZIP expectations	III 5 year ZIP expectations
Expectations - 1st tercile		(omitted)	
Expectations - 2nd tercile	0.424* (0.255)	0.763*** (0.212)	0.547** (0.245)
Expectations - 3rd tercile	0.432* (0.240)	0.687*** (0.206)	0.788*** (0.220)
Demographics	Y	Y	Y
Number of observations	538	536	538

Table 17: House Price Expectations and Housing Investment

The table shows ordered logit regression estimates of the effect of expected house price changes on how attractive respondents consider investing in a home in their current ZIP code. Respondents can choose whether they consider such an investment to be a bad or very bad investment, neither a bad nor good investment, a good investment, or a very good investment. Demographics include indicators for each of the 11 possible categories eliciting household income in the survey, respondents' age and age squared and indicators for whether respondents own their home, are male, married, went to college and are white or black.

A Survey Questions

A.1 Monthly Survey Questions on House Prices

Next we would like you to think about home prices nationwide. Over the next 12 months, what do you expect will happen to the average home price nationwide?
Over the next 12 months, I expect the average home price to...

- *increase by 0% or more*
- *decrease by 0% or more*

By about what percent do you expect the average home price to (increase/decrease as in previous question)? Please give your best guess.
Over the next 12 months, I expect the average home price to (increase/decrease as in previous question) by ____ % .
And in your view, what would you say is the percent chance that, over the next 12 months, the average home price nationwide will...

increase by 12% or more	____	*percent chance*
increase by 8% to 12%	____	*percent chance*
increase by 4% to 8%	____	*percent chance*
increase by 2% to 4%	____	*percent chance*
increase by 0% to 2%	____	*percent chance*
decrease by 0% to 2%	____	*percent chance*
decrease by 2% to 4%	____	*percent chance*
decrease by 4% to 8%	____	*percent chance*
decrease by 8% to 12%	____	*percent chance*
decrease by 12% or more	____	*percent chance*

The wording of the next question depends on the month of the survey. In January 2014, the question would have asked the following:
Now we would like you to think about home prices further into the future. Over the 12-month period between January 2016 and January 2017, what do you expect will happen to the average home price nationwide?
Over the 12-month period between January 2016 and January 2017, I expect the average home price to...

- *increase by 0% or more*

- *decrease by 0% or more*

By about what percent do you expect the average home price to (increase/decrease as in previous question) over that period?
Over the 12-month period between January 2016 and January 2017, I expect the average home price to (increase/decrease as in previous question) by ____ % .

A.2 Monthly Survey Questions on Employment

- *What do you think is the percent chance that 12 months from now the unemployment rate in the U.S. will be higher than it is now?*
- *What is your current employment situation?*
  - *Working full-time (for someone or self-employed)*
  - *Working part-time (for someone or self-employed)*
  - *Not working, but would like to work*
  - *Temporarily laid off*
  - *On sick or other leave*
  - *Permanently disabled or unable to work*
  - *Retiree or early retiree*
  - *Student, at school or in training*
  - *Homemaker*
  - *Other (please specify)*
- Question on own employment prospects for employed respondents
  - *What do you think is the percent chance that you will lose your main job during the next 12 months?*
  - *Suppose you were to lose your main job this month. What do you think is the percent chance that within the following 3 months, you will find a job that you will accept, considering the pay and type of work?*
- Question on own employment prospects for unemployed respondents
  - *What do you think is the percent chance that within the coming 12 months, you will find a job that you will accept, considering the pay and type of work?*

– *And looking at the more immediate future, what do you think is the percent chance that within the coming 3 months, you will find a job that you will accept, considering the pay and type of work?*

B Summary Statistics for Unemployment Expectation Sample

Table A1 shows summary statistics of the respondents included in the sample for analyzing employment expectations.

C Variation in House Prices and Weighted Experience

Table A2 shows additional summary statistics of the history and variability of past house price returns over different time horizons, confirming the substantial heterogeneity.

Table A3 shows summary statistics of past house price returns using MSA and state level house prices, instead of ZIP code level house prices as in Table A2.

D History of Local House Prices on US House Price Expectations - State and MSA Level House Prices

We replicate the analysis in section 3.4 using state and MSA level house prices instead of ZIP code level house prices to measure local house price experience. Table A4 shows the results. The first three columns replicate the information from Table 5 for comparison. The values of λ which yield the highest R^2 at each horizon are very similar when MSA or state level house prices are used. Similarly, the effect on expectations of a one standard deviation increase in the experience variable is similar across all horizons irrespective of which type of house prices are used.

	N	Mean	Std. Dev.	25th pctile	75th pctile
Respondent Characteristics					
Age (when entering sample)	4,554	50.66	14.42	39	62
White		0.86	0.34	1	1
Black		0.08	0.27	0	0
Male		0.55	0.50	0	1
Married		0.69	0.46	0	1
College (when entering sample)		0.55	0.50	0	1
Income		80,571	51,826	45,000	125,000
math score (% correctly answered)	2,900	0.80	0.22	0.6	1
Employment Status Switches	4,554	0.25	0.74	0	0
Observations Level					
Local Unemployment					
all	28,615	6.84	1.93	5.5	7.9
only employed	19,609	6.79	1.90	5.5	7.9
only unemployed respondents	1,349	7.23	1.80	6	8.3
Employment Expectations					
all	28,615	38.82	23.57	20	50
only employed	19,609	38.86	23.23	20	50
only unemployed respondents	1,349	47.06	25.70	30	60
Own Employment Prospects - Employed					
Loose job	17,007	15.67	20.67	1	20
find new job within 3 months		51.90	32.45	23	80
difference between own and US unemployment		23.10	28.10	5	41

Table A1: Employment Summary Statistics

The table shows mean, standard deviation and the 25^{th} and 75^{th} percentile for key characteristics of the sample of respondents of the Survey of Consumer Expectations (SCE) used throughout the paper. Included in the sample are respondents who state their employment status, their expectations about US unemployment, provide information about demographics and live in an area for which unemployment statistics are available. We do not require respondents to answer the numeracy questions or questions about their own employment prospects to be included in the sample.

	N	Mean	Std. Dev.	25th pctile	50th pctile	75th pctile
Past House Price Experience - Average Changes						
Mean change of **ZIP** level house prices						
past 3 years	3,001	0.10	0.16	-0.02	0.07	0.19
past 5 years	3,001	-0.01	0.21	-0.14	-0.02	0.12
past 10 years	3,001	0.49	2.01	-0.81	0.41	1.72
since respondent lived in ZIP	2,999	3.17	3.82	0.81	2.94	5.08
since respondent lived in state	2,998	3.95	2.45	2.86	4.02	5.33
since respondent was age 13	3,001	4.37	1.61	3.29	4.35	5.42
since 1976 (beginning of data series)	3,001	4.92	1.33	3.98	4.79	5.80
Past House Price Experience - Variation						
Standard devations of **ZIP** level house prices since						
past 10 years	3,001	9.18	4.32	5.98	8.01	11.60
respondent lived in ZIP	2,942	7.66	3.93	4.86	7.12	9.81
respondent lived in state	2,947	8.19	3.17	5.86	7.80	10.17
respondent was age 13	3,001	8.27	2.78	6.10	7.97	10.17
1976 (beginning of data series)	3,001	8.30	2.40	6.29	8.10	10.12

Table A2: House Price History Summary Statistics

The table shows mean, standard deviation and the 25^{th}, 50^{th} and 75^{th} percentile of house price expectations and past house price experience of respondents of the Survey of Consumer Expectations (SCE) used throughout the paper.

	N	Mean	Std. Dev.	25th pctile	50th pctile	75th pctile
Past House Price Experience - Average Changes						
Mean change of **state** level house prices						
past 10 years	4,221	0.65	1.17	-0.52	0.71	1.76
since respondent lived in ZIP	4,218	3.22	3.04	1.25	3.01	4.64
since respondent lived in state	4,217	4.09	2.08	3.09	4.13	5.31
since respondent was age 13	4,221	4.41	1.40	3.36	4.29	5.31
since 1976 (beginning of data series)	4,221	4.93	1.23	4.04	4.73	5.59
Mean change of **MSA** level house prices						
past 10 years	3,580	0.64	1.43	-0.38	0.56	1.85
since respondent lived in ZIP	3,578	3.07	3.24	1.00	2.89	4.53
since respondent lived in state	3,577	3.93	2.15	2.97	4.04	4.94
since respondent was age 13	3,580	4.26	1.39	3.29	4.23	5.07
since 1976 (beginning of data series)	3,580	4.78	1.16	4.04	4.71	5.61
Past House Price Experience - Variation						
Standard deviation of **state** level house prices since						
past 10 years	4,221	7.88	4.10	4.60	6.32	10.42
respondent lived in ZIP	4,151	6.21	3.71	3.66	5.43	8.17
respondent lived in state	4,146	6.98	3.04	4.62	6.28	8.55
respondent was age 13	4,221	7.10	2.67	4.90	6.85	8.75
1976 (beginning of data series)	4,221	7.19	2.37	4.90	7.13	8.52
Standard deviation of **MSA** level house prices since						
past 10 years	3,580	7.98	4.37	4.97	6.46	10.58
respondent lived in ZIP	3,519	6.41	3.83	3.78	5.58	8.39
respondent lived in state	3,515	7.14	3.16	4.76	6.40	8.98
respondent was age 13	3,580	7.22	2.84	4.93	6.56	9.04
1976 (beginning of data series)	3,580	7.33	2.46	5.29	6.69	9.04

Table A3: House Price History Summary Statistics

The table shows mean, standard deviation and the 25^{th}, 50^{th} and 75^{th} percentile of house price expectations and past house price experience of respondents of the Survey of Consumer Expectations (SCE) used throughout the paper.

	ZIP Code Level House Prices			MSA Level House Prices			State Level House Prices		
	R2	λ	effect of 1 standard deviation	R2	λ	effect of 1 standard deviation	R2	λ	effect of 1 standard deviation
Fixed year horizons									
2 years	5.505%	0.1	0.816	4.624%	-0.4	1.030	4.221%	-0.2	0.911
3 years	5.659%	0.2	0.972	4.600%	0.9	1.025	4.270%	0.6	0.956
4 years	5.587%	1.3	0.883	4.584%	1.6	1.014	4.250%	1.5	0.931
5 years	5.571%	2.1	0.863	4.573%	2.3	1.006	4.242%	2.3	0.922
10 years	5.541%	5.8	0.833	4.553%	5.9	0.994	4.228%	5.9	0.912
15 years	5.532%	9.5	0.824	4.547%	9.3	0.990	4.224%	9.4	0.909
20 years	5.528%	13.2	0.820	4.545%	12.6	0.989	4.223%	12.8	0.908
all data	5.508%	20.0	0.810	4.537%	20.0	0.991	4.217%	20.0	0.912
Number of individuals		3,001			3,580			4,221	
Individual specific horizons									
3 years	5.817%	0.1	1.016	4.750%	0.8	1.035	4.407%	0.6	0.959
lived in zip	5.422%	1.1	0.630	4.463%	5.7	0.881	4.078%	1.0	0.762
lived in zip + 1	5.486%	1.6	0.694	4.505%	3.6	0.914	4.147%	1.3	0.813
lived in state	5.461%	20.0	0.681	4.601%	18.4	0.951	4.279%	20.0	0.872
age	5.656%	20.0	0.842	4.704%	20.0	1.004	4.378%	19.4	0.927
since age 13	5.626%	14.3	0.834	4.714%	10.4	1.060	4.385%	7.9	0.995
Number of individuals		2,942			3,519			4,151	

Table A4: Best Fit Parameters for Weighted Past Prices as Experience Measure - ZIP Code, MSA and State Home Prices

For each horizon, the table shows the parameters of the specifications with the highest R^2. The first three columns use ZIP code level house prices, the three middle columns MSA level house prices and the last three state level house prices. The top panel shows results for fixed year horizons. The bottom panel considers individual specific horizons. Information on how long respondents have lived in their current area is not available for all respondents, hence the lower number of individuals in the bottom panel.