

Perceptions and Expectations of Mortgage Borrowers: New Evidence from the National Survey of Mortgage Originations

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Abstract

Research on house price expectations has been limited by a lack of data which have meaningful cross-sectional variation in home purchase and refinance experiences across respondents. The National Survey of Mortgage Originations (NSMO) fills this gap and allows for the exploration of whether members of different demographic groups exhibit different levels of knowledge of house price changes in their local areas and whether they have different levels of capacity to anticipate future price changes as a result. This study finds that first-time homebuyers, a demographic group considered potentially vulnerable during the origination process, are consistently more aware of recent and impending house price trends than repeat purchasers. This study also shows that borrowers with lower incomes have less awareness about price trends than borrowers with higher incomes, and less-educated borrowers have less awareness about price trends than borrowers with higher levels of education. Additionally, this article provides evidence that expectations of future house price changes in consumers' local markets have informational value for estimating future house prices beyond the value provided by local economic data. This study provides a basis for understanding whether consumers who are less knowledgeable about house prices in their area may make poorer decisions regarding their mortgage or home purchase and may require more support or protection as a result.

Introduction

Economists understand that consumer expectations of house prices can play a role in the real economy. Several studies have shown that expectations have predictive information in the aggregate. What is less understood is whether differences in cross-sectional house price expectations can help predict cross-sectional variations in outcomes and whether there is variation in the relationship across different demographic groups. That is, do members of different demographic groups exhibit more or less knowledge of house price changes in their local areas, and do they have more or less capacity to forecast future price changes as a result? This article addresses these two questions.

These questions are important not just for macroeconomic purposes, but for consumer well-being and policy formulation as well. Consumers who are less knowledgeable about house prices in their area may make poorer decisions regarding their mortgage or house purchase. Because housing is a significant portion of overall wealth for most households, the accuracy of perceptions and expectations regarding house price trends could have lasting effects on the lifecycle consumption decisions of households.

This article addresses the questions posed earlier using previously unavailable survey data from the newly released NSMO, which is based on the National Mortgage Database (NMDB®).¹ The survey database is large enough to provide meaningful cross-sectional variation in home purchase and refinance experiences across respondents. The survey offers a rich set of questions about house prices, including what respondents think has happened to prices in their local area (backcasting) and what respondents expect to happen (forecasting). Because time has passed since the responses reflected in the publicly released NSMO data were gathered, it is possible to compare both respondents' backcasts and forecasts with actual house price changes in their areas.

Another advantage of NSMO is that it surveys only borrowers who have just obtained a mortgage. These borrowers are likely the most motivated and informed consumers among the overall population of homeowners and their answers should be the most accurate since they experienced the mortgage process recently. This makes NSMO better for comparisons of the accuracy of backcasts and forecasts across groups than surveys of the whole population. House price expectation data from comprehensive national surveys suffer from the fact that many respondents may have little need to be informed since they are not active participants in the housing market. The emphasis on borrowers active in the mortgage market is also important because these are the consumers for whom consumer protection would have been most relevant. The identification of subgroups who turn out to be systematically less informed may be particularly important in designing consumer-focused policies.

The remainder of this article is organized as follows. The next section provides background information on the literature and data used for the analysis. The two sections after that provide results for backcasting and forecasting, respectively. The section following those examines differences across groups in how they form expectations. The final section concludes.

¹ NSMO and NMDB are described in the guest editors' introduction.

Background

Despite the importance of understanding borrowers' perceptions and expectations concerning local house prices, little economic literature compares them with the price changes that actually occurred in the relevant local areas. Case et al. (2015) evaluated survey responses regarding house price trend perceptions and expectations collected from recent homebuyers in four specific housing markets in the same season annually over the 2003-through-2014 period. The responses are compared to changes in the Case-Shiller Home Price Index over the same period for those four markets. Niu and van Soest (2014) used national survey responses from the RAND American Life Panel, conducted quarterly from 2009 through 2013, to compare state level responses concerning future price expectations with the Federal Housing Finance Agency (FHFA) House Price Index (HPI) state-level indices. The latter study does not focus on respondents most likely to be interested in house prices, and neither study uses a sample that is representative.

This article extends the existing literature using responses to NSMO, which was specifically designed to provide detailed information on borrower perceptions and expectations. In addition to questions concerning mortgage shopping behavior and mortgage closing experience, NSMO includes questions concerning borrowers' perceptions of recent house price trends in their neighborhood and their expectations of future house price trends. The survey also contains detailed information on borrower demographics and several questions which solicit the borrower's appetite for financial risk, concerns about loan qualification, and knowledge about mortgages.

Using NSMO responses from borrowers who originated mortgages from 2013 through 2016, this article compares respondents' perceptions of what happened to house prices in their local area with what actually occurred prior to the survey, and compares what they forecasted would happen with what actually did occur after the survey. The challenge in this exercise is to use a definition of area (neighborhood) comparable to that used by respondents and which also has available accurate summary information on house price changes. For this article, the county is used as the representation of "neighborhood," and actual house price changes are derived from newly available FHFA county-level house price indices. This is less than ideal, as it defines an area which is surely larger than that generally meant by respondents when they refer to a neighborhood. Indices, however, computed at more granular geographic levels (often based on very few observations) would include too much unexplained variation for a meaningful analysis of differences. In addition, the FHFA county indices are available at the quarterly level, which is generally not true for indices with more granular geography. This is important because of the relatively short window ("couple of years") used in the NSMO questionnaire for items regarding past and future house price change perceptions and expectations.

Another advantage in using a county-level definition of local area is that it allows for use of other aggregate measures of economic activity including population change, unemployment rates, per capita income changes, mortgage delinquency, and mortgage volumes. The metrics measuring mortgage delinquency and volume are new and are constructed from the NMDB. These aggregates serve as estimates of the "local economic fundamentals" driving county-level house price changes. This allows for comparisons of respondent perceptions and forecasts with actual changes at both the gross level and when controlling for these fundamentals.

The statistics for the specific county-level variables used in this analysis are presented in exhibit 1. NSMO data used in this analysis were solicited in 15 different waves of a quarterly survey. Thus, there is considerable variation in the timing of when respondents provided their answers (generally 6 to 9 months after origination). The county-level HPI estimates were available quarterly and thus could be aligned to when the survey was answered. Data regarding the county-level seriously delinquent rate and average mortgage loan amount were also available quarterly, both in terms of levels and changes.² Percent change in population, percent change in per capita income, and the level and change in the unemployment rate, however, were only available annually. Perforce, this implies alignment issues in their use, which is partially accounted for by using quarterly dummy variables for time of response in the analysis. Another consequence of the availability of data is a slight reduction in the number of observations that could be used for analysis. Population and unemployment data were not available for 72 observations in the full NSMO sample and thus those respondents were not used. An additional 2,928 observations were dropped for the forecasting section of the analysis since they were interviewed in the most recent waves of the survey considered for this study, and therefore, the 2 years of future price changes data were not available at the time of this analysis.

Exhibit 1

Summary Statistics for County HPI and Economic Data

Local Economic Fundamental Variable	N	25 th	50 th	75 th
Previous 2-Year County HPI Growth	24,775	4.46	9.34	17.29
Future 2-Year County HPI Growth*	21,847	6.73	10.97	16.10
Previous 2-Year County Population Growth	24,775	0.46	1.66	3.08
Previous 2-Year County Income Growth	24,775	4.55	6.38	8.61
Previous 2-Year County Mortgage Balance Growth	24,775	0.48	2.39	4.87
2-Year Lagged County Unemployment Rate	24,775	5.17	6.43	7.87
Change in 2-Year Lagged County Unemployment Rate	24,775	-1.17	-0.76	-0.41
2-Year Lagged County Serious Delinquency Rate	24,775	2.11	3.18	4.66
Change in 2-Year Lagged County Serious Delinquency Rate	24,775	-1.32	-0.70	-0.36

HPI = House Price Index.

Note: *2-year forward HPI comparison data is not yet available for surveys completed in 2017Q1 or 2017Q2.

² A mortgage is considered to be seriously delinquent if it has been delinquent for 90 days or more or has entered the bankruptcy or foreclosure process.

Borrower Backcasts of House Price Changes

Borrowers were asked, “In the last couple of years, how have house prices changed in the neighborhood where this property is located?”—a question referred to as a “backcast” in this study. The distribution of their responses is presented in exhibit 2. The distribution of actual percent change in county HPI over the 2 years prior to the quarter in which the borrower completed the survey is presented in exhibit 3. The exhibits demonstrate that both borrower backcasts and county-level HPIs skewed heavily toward price increases, though in both instances there is some evidence of price decreases.

The alignment between borrower backcasting of local house price trends and actual house price trends is examined in two ways: first, with a simple correlation of the percent change in respondents’ county HPI with their backcast of local house price trends for corresponding prior 2-year periods, and second, with a multivariate analysis examining the conditional correlation of actual changes with respondents’ backcasts, controlling for local economic fundamentals measured over the same 2-year period. In both the simple and multivariate backcast tests, backcast information is represented by two dummy variables for the responses “Significant Increase” and “Significant Decrease,” with “Little/No Change” treated as the base response.

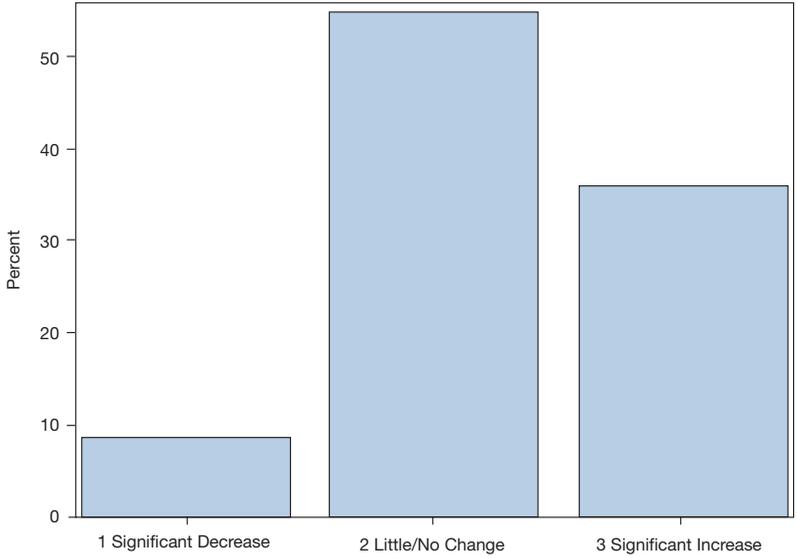
The two analyses test different hypotheses. The simple analysis tests how aware borrowers are of general changes in house prices. The multivariate analysis tests a more subtle question: do the borrowers possess information on actual local house price changes over and above that which could be explained by the other economic variables? Additionally, both analyses test how this information varies across groups.

Exhibit 4 presents estimates from the simple and multivariate backcast tests. The highly significant coefficients on the two dummy variables in the simple test have appropriate signs but are unbalanced in their effects. The coefficient on “Significant Increase” is nearly seven times larger than the coefficient on “Significant Decrease” in absolute value, illustrating that borrowers classify relatively smaller declines in prices as significant.

In the multivariate regression, all control variables are significant, providing evidence that the selected fundamentals are good indicators of actual house price growth. Importantly, the coefficients on the response dummy variables are still significant, albeit with somewhat smaller magnitude for “Significant Increase.” This indicates that borrowers have additional knowledge, beyond that gained from local economic conditions, that shapes their backcast of recent local house price trends. One possible explanation is that a borrower may be aware of a more recent appraisal or sale price of one of their neighbor’s homes that provides them with an information advantage over just the macroeconomic variables.

Exhibit 2

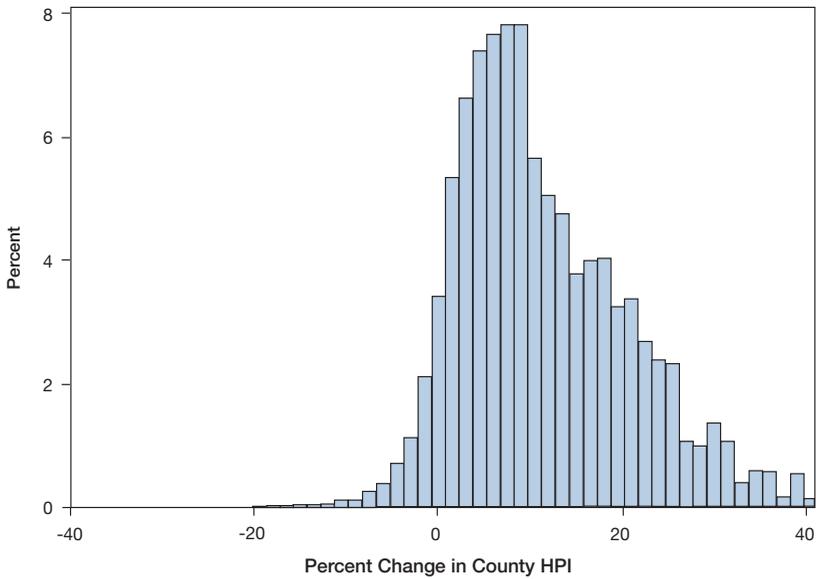
Perception of Recent Trends in Neighborhood House Prices



Note: Distribution of responses to the question, "In the last couple of years, how have house prices changed in the neighborhood where this property is located?".
Source: NSMO

Exhibit 3

Distribution of Actual Recent Trends in County House Prices



HPI = House Price Index.
Note: Distribution of actual change in county house prices in the 2 years prior to the quarter of survey completion.
Source: FHFA HPI

Exhibit 4

Parameter Estimates for Simple and Multivariate Backcast Regressions

Backcast Alignment with Actual House Price Trends		
Parameter	Simple	Multivariate
N	24,775	24,775
R²	0.0908	0.4838
Intercept	9.34 (0.08)	- 1.27* (0.53)
“Significant Increase”	5.86*** (0.12)	3.16*** (0.10)
“Significant Decrease”	- 0.84*** (0.21)	- 0.74*** (0.16)
Population Growth	-	1.82*** (0.02)
Income Growth	-	0.33*** (0.01)
Unemployment Level	-	0.77*** (0.03)
Change in Unemployment	-	- 3.56*** (0.11)
Average Mortgage Balance	-	0.10*** (0.01)
Delinquency Rate	-	- 0.74*** (0.03)
Change in Delinquency Rate	-	- 3.38*** (0.06)
Survey Quarter Fixed Effects	No	Yes

* = $p < 0.05$; ** = $p < 0.01$; *** = $p < 0.001$.
Note: Standard errors are given in parentheses.

As indicated earlier, the simple and multivariate analyses are repeated for different subsets of respondents. An evaluation of the relative “accuracy” of the collective backcasts of each group is based on the relative R² statistics of the estimated equations, with a higher R² indicating more accuracy. The following demographic and behavioral groups are examined:

Age³:	Less than 30, 30 to 54, 55 or more
Purchaser status⁴:	First-time homebuyer, repeat purchaser
Refinance status:	Purchaser, refinancer
Education⁵:	Four-year college degree or higher, less than four-year college degree
Household income:	Less than \$50,000, \$50,000 to \$149,999, \$150,000 or more
Number of borrowers:	Single borrower, borrower with spouse/partner
Property use:	Primary residence, second or investment home
Credit score⁶:	Below 720, 720 to 799, 800 or more
Financial riskiness:	Above average, average, no risk
Qualification concern:	Very, somewhat, not at all

Results for both the simple and multivariate analyses for the subgroups are presented in exhibit 5. Like the overall analysis, both the simple and multivariate subset analyses produce similar results. With a few exceptions, those subgroups which were more accurate with the simple analysis were also more accurate when control factors were added. Refinancers were collectively more accurate than purchasers, perhaps because they lived in the area during the measurement period. Within the purchaser group, first-time homebuyers appeared to be more accurate, perhaps because homeownership is a bigger decision for them and they put more energy into the shopping process as a result.

Other groups that were collectively more accurate than comparison groups are borrowers aged 30 to 54 (relative to borrowers younger than 30 or aged 55 or older), college graduates (relative to borrowers with less formal education), higher-income households (relative to lower-income households), owner-occupants (relative to investors/second-home borrowers), borrowers who identified that they were willing to take above average financial risk (relative to those with less appetite for risk), and borrowers who indicated that they were either somewhat or not concerned about mortgage qualification (relative to those who were very concerned). This analysis also showed that neither credit score nor the number of borrowers on a mortgage was consistent in ranking accuracy when comparing the simple and multivariate analyses.

³ Age is defined as the older of the respondent and spouse age if the spouse is a borrower on the loan.

⁴ The purchaser demographic excludes refinancers, while all other demographics capture all respondents.

⁵ Household education level is defined as the highest level indicated between the respondent and spouse. The four-year college degree group includes respondents who indicated they were a "college graduate" or had completed "postgraduate studies."

⁶ Credit score uses VantageScore[®] 3.0, which ranges from 300 to 850, with higher scores implying less risk. The score used is the higher of the respondent and spouse at origination if the spouse is a borrower on the loan.

Exhibit 5

Relative Accuracy of House Price Trend Backcast Within Demographic Subsets

Demographic Category	Subset	N	R ² Simple	R ² Multivariate	Mean HPI Change (%) Within Response Category		
					Significant Increase	Little/No Change	Significant Decrease
Age	<30	1,870	.0981	.4659	13.8	8.1	5.6
	30–54	13,499	.1027	.4945	15.4	9.5	7.9
	55+	9,406	.0696	.4801	15.3	9.7	9.7
Purchase Status	First-Time	3,290	.0830	.4978	14.5	8.9	8.4
	Repeat	8,231	.0711	.4569	14.9	9.8	8.6
Refinance Status	Purchase	11,521	.0756	.4689	14.8	9.5	8.6
	Refinance	13,254	.1029	.5031	15.5	9.2	8.5
Education	4–Year Degree	17,562	.1028	.4900	15.4	9.4	8.3
	<4–Year Degree	7,213	.0616	.4765	14.5	9.2	8.9
	\$150K+	3,941	.0866	.5438	16.0	10.7	8.7
Household Income	\$50K–\$149,999	15,428	.0924	.4859	15.3	9.4	8.6
	<\$50K	5,406	.0664	.4667	13.8	8.4	8.2
Number of Borrowers	2	18,910	.0938	.4835	15.2	9.3	8.4
	1	5,865	.0816	.4877	15.1	9.5	8.9
Property Use	Owner/Occupants	22,751	.0925	.4860	15.1	9.2	8.6
	Investment/Rental	2,024	.0825	.4719	16.0	10.5	7.9
Credit Score	800+	5,923	.0806	.5016	15.2	9.6	9.1
	720–799	11,057	.1006	.4982	15.6	9.4	8.6
Risk Appetite	<720	7,795	.0833	.4706	14.7	9.1	8.1
	Above Average	5,752	.1029	.5112	15.3	9.6	7.6
Qualifying Concern	Average	12,580	.0939	.4815	15.4	9.3	8.7
	No Risk	6,443	.0710	.4721	14.7	9.1	8.9
Benchmark	Very	3,485	.0722	.4749	15.0	9.7	8.5
	Somewhat	7,101	.0961	.4888	15.5	9.3	8.5
Benchmark	Not at All	14,189	.0938	.4883	15.1	9.3	8.5
	All	24,775	.0908	.4838	15.2	9.3	8.5

HPI = House Price Index.

Borrower Forecasts of House Prices

Borrowers were asked, “What do you think will happen to the prices of homes in this neighborhood over the next couple of years?”—a question referred to as a “forecast” in this study. The distribution of their responses is presented in exhibit 6. The distribution of actual percent change in county HPI over the 2 years after the quarter in which the borrower completed the survey is presented in exhibit 7. Again, the figures demonstrate that both borrower forecasts and county-level HPIs skewed heavily toward price increases, though in both instances, there is some evidence of price decreases.

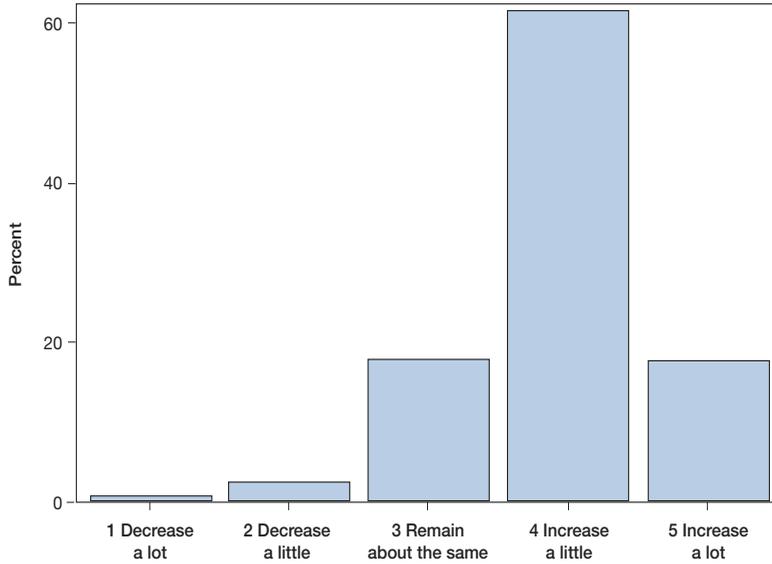
The alignment between borrower forecasting of local house price trends and actual house price trends is examined in the same two ways as studied for backcasting (simple and multivariate). A five-point scale was used, however, in soliciting respondents’ forecasts versus a three-point scale for backcasts. Thus, forecast information is represented by four dummy variables for “Increase a lot,” “Remain about the same,” “Decrease a little,” and “Decrease a lot,” with “Increase a little” treated as the base group since it was the modal response.

Exhibit 8 presents estimates from the simple and multivariate forecast tests. The highly significant coefficients on the four dummy variables in the simple test have appropriate signs but are unbalanced in their effects. The effects of coefficients on “Increase a lot” and “Remain about the same” have similar magnitude in absolute value. The coefficients on “Decrease a little” and “Decrease a lot,” while greater in magnitude than on “Remain about the same,” do not follow a linear pattern. This may just be a residual of the fact that house prices generally rose over the sample period. It may also mean that borrowers are more sensitive to the amount of a decline in prices than they are to a comparable increase.

In the multivariate regression, all local economic fundamental control variables except for the index of average loan balance and lagged 2-year delinquency rate are significant, providing evidence that the other selected fundamentals are good indicators of actual house price growth. The failure of the mortgage market variables to show predictive power suggests that these variables lag house price changes rather than lead them. The coefficients on the response dummy variables “Increase a lot” and “Remain about the same” are still significant, however the response dummy variables “Decrease a little” and “Decrease a lot” are no longer significant. This could be an indication that borrowers possess information on future house prices above what could be estimated when prices are trending upward.

Exhibit 6

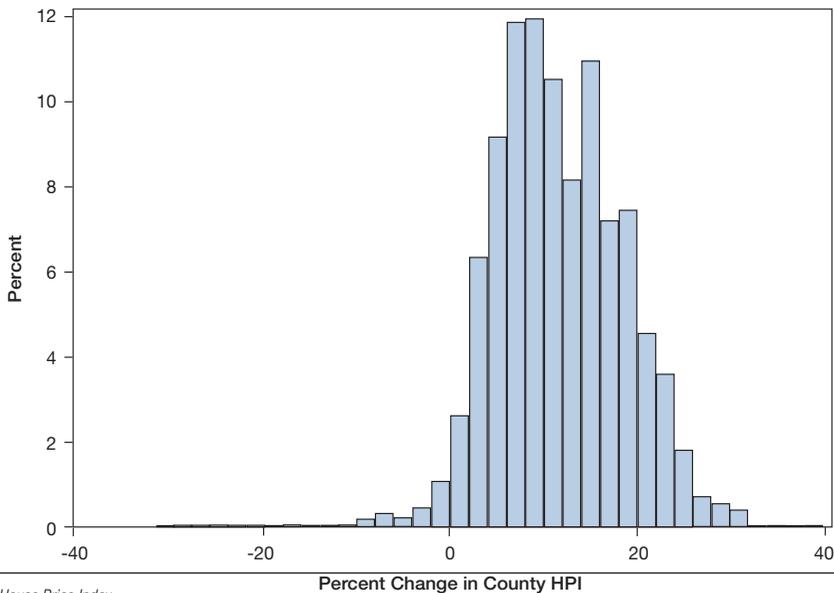
Expectation of Future Trends in Neighborhood House Prices



Note: Distribution of responses to the question, "What do you think will happen to the prices of homes in this neighborhood over the next couple of years?".
Source: NSMO

Exhibit 7

Distribution of Actual Future Trends in County House Prices



HPI = House Price Index.
Note: Distribution of actual change in county house prices in the 2 years after the quarter of survey completion.
Source: FHFA HPI

Exhibit 8

Parameter Estimates for Simple and Multivariate Forecast Regressions

Forecast Alignment with Actual House Price Trends		
Parameter	Simple	Multivariate
N	21,847	21,847
R²	0.0407	0.5141
Intercept	11.87*** (0.06)	6.57*** (0.17)
“Increase a lot”	1.96*** (0.12)	0.29*** (0.09)
“Remain about the same”	- 2.27*** (0.12)	- 0.25** (0.09)
“Decrease a little”	- 2.49*** (0.29)	- 0.29 (0.21)
“Decrease a lot”	- 3.10*** (0.55)	- 0.12 (0.39)
Past HPI Growth	-	0.21*** (0.00)
Population Growth	-	1.16*** (0.02)
Income Growth	-	0.36*** (0.01)
Unemployment Level	-	- 0.07** (0.02)
Change in Unemployment	-	- 0.81*** (0.08)
Average Mortgage Balance	-	- 0.01 (0.01)
Delinquency Rate	-	0.14*** (0.02)
Change in Delinquency Rate	-	- 0.02 (0.05)
Survey Quarter Fixed Effects	No	Yes

HPI = House Price Index.
 * = $p < 0.05$; ** = $p < 0.01$; *** = $p < 0.001$.
 Note: Standard errors are given in parentheses.

Conversely, this could also be an indication that borrowers may not possess information of future prices over what could be estimated when there is a downturn in house price trends.

The simple and multivariate analyses of forecasting is repeated for the same subsets of respondents examined in the backcasting section. Results for both the simple and multivariate analyses for the subgroups are presented in exhibit 9. There is less consistency between the simple and multivariate analyses than in the backcasting section. In multiple cases, there were reversals among pairs or a complete reverse ordering among triples.

Groups that were collectively more accurate than comparison groups at forecasting are young borrowers (relative to borrowers 30 and older), first-time homebuyers (relative to repeat purchasers), single-borrower households (relative to two-borrower households), owner-occupants (relative to investors/second-home borrowers), and borrowers who indicated that they were very concerned about mortgage qualification (relative to those that were somewhat or not at all concerned).

Several groups reversed ordering between the simple and multivariate analyses. Based on the simple analyses, the forecasts of the following groups were better aligned with actual price trends: refinancers (relative to purchasers), less formally educated (relative to college graduates), lower-income households (relative to higher-income households), and borrowers who take no financial risks (relative to borrowers who accept financial risk). In the multivariate analyses, these categories had a complete reversal in ordering. In this case, purchasers, higher-educated borrowers, higher-income borrowers, and borrowers willing to take above average financial risks may provide some information on future house prices above what could be estimated from fundamentals. Again, the credit score comparison groups showed no consistency in patterns between the simple and multivariate analyses.

Finally, there was very little consistency in the demographics that were relatively better at both backcasting and forecasting. The only group that was consistent in simple and multivariate test results and relatively better at both backcasting and forecasting was the first-time homebuyer group (relative to repeat purchasers).

How Expectations of Future House Prices are Formed

In the previous section, borrower responses regarding their expectations for future prices changes in their neighborhood were compared with actual future changes to determine if the respondent data have forecasting value. This section examines how these expectations are formed. This question is important in improving the understanding of how consumers process house price information, particularly when the answers are found separately for different subsets.

Here, the responses to the question “What do you think will happen to the prices of homes in this neighborhood over the next couple of years?” are treated as the dependent variable. There is no reason to believe that the responses follow a cardinal ordering so they are treated as ordinal, and the process is modeled as an ordered logistic regression.⁷ Three sets of explanatory variables are

⁷ See Cameron and Trivedi (2005) for a detailed review of ordered logistic regression methodology.

Exhibit 9

Relative Accuracy of House Price Trend Backcast Within Demographic Subsets

Demographic Category	Subset	N	R ² Simple	R ² Multivariate	Increase "a lot"	Increase "a little"	Mean HPI Change (%) Within Response Category		
							Remain Same	Decrease "a little"	Decrease "a lot"
Age	<30	1,685	.0444	.5369	13.0	9.9	6.9	6.1	5.2
	30-54	11,898	.0405	.5280	14.9	11.9	8.0	7.6	7.0
	55+	8,264	.0407	.4860	15.1	11.9	7.5	8.4	6.0
Purchase Status	First-Time	2,943	.0481	.5532	13.5	10.8	7.7	6.2	8.1
	Repeat	7,321	.0296	.5036	14.3	11.6	8.0	8.3	8.2
Refinance Status	Purchase	10,264	.0366	.5192	14.0	11.4	7.9	7.3	8.2
	Refinance	11,583	.0443	.5116	15.4	11.9	7.6	7.7	6.0
Education	4-Year Degree	15,457	.0357	.5220	14.7	11.8	8.3	7.2	6.6
	<4-Year Degree	6,390	.0511	.4999	14.8	11.3	6.7	8.2	6.5
Household Income	\$150K+	3,419	.0295	.5252	16.2	13.0	10.3	7.5	10.1
	\$50K-\$149,999	13,586	.0398	.5183	14.8	11.7	7.9	7.9	8.0
	<\$50K	4,842	.0417	.4995	13.1	10.5	6.5	7.1	4.4
Number of Borrowers	2	16,649	.0395	.5084	14.7	11.6	7.8	7.8	7.8
	1	5,198	.0447	.5363	14.6	11.9	7.5	7.1	5.1
Property Use	Owner/Occupants	20,013	.0444	.5215	14.7	11.6	7.6	7.5	6.5
	Investment/Rental	1,834	.0150	.4729	15.0	12.3	9.3	9.0	7.2
Credit Score	800+	5,210	.0395	.5197	15.1	11.7	8.0	6.3	9.6
	720-799	9,737	.0354	.5170	15.1	11.9	8.3	7.7	5.7
Risk Appetite	<720	6,900	.0484	.5133	14.2	11.3	7.0	7.9	6.7
	Above Average	5,062	.0302	.5290	14.9	11.8	8.3	7.3	7.1
Qualifying Concern	Average	11,104	.0410	.5217	14.7	11.7	7.8	7.4	6.5
	No Risk	5,681	.0464	.4887	14.4	11.4	7.4	7.9	6.5
	Very	3,116	.0588	.5389	15.0	11.8	7.7	8.4	5.9
Benchmark	Somewhat	6,363	.0348	.5061	14.6	11.8	7.9	7.7	7.1
	Not at All	12,368	.0396	.5151	14.7	11.6	7.6	7.1	6.8
	All	21,847	.0407	.5141	14.6	11.6	7.9	7.9	6.7

HPI = House Price Index.

included in the analysis: (1) dummy variables representing the respondent's backcasts; (2) the set of county-level economic fundamentals variables; and (3) variables representing the demographic and other subgroups while controlling for backcasting and local economic fundamentals. Exhibit 10 presents results for the three different models. Column 1 uses only those variables in set (1) above; column 2 uses only the variables in (2); column 3 uses all three sets of variables. In each case, the columns present the log odds coefficients of the ordered logistic. Here, positive values should be interpreted as increasing the odds of a more optimistic response category and negative values as decreasing the same.

Exhibit 10

Three Models of House Price Expectation Formation (1 of 2)

Models of House Price Expectation Formation			
Parameter	Model 1 Past Perceptions (N=24,775)	Model 2 Local Fundamentals (N=24,775)	Model 3 Demographic Effects (N=24,775)
	<i>All ordered logistic regression coefficients are reported in log odds.</i>		
“Significant Increase”	1.35*** (0.03)	-	1.14*** (0.04)
“Significant Decrease”	- 0.69*** (0.05)	-	- 0.62*** (0.05)
Past HPI Growth	-	0.03*** (0.00)	0.02*** (0.00)
Population Growth	-	0.11*** (0.01)	0.09*** (0.01)
Income Growth	-	0.03*** (0.00)	0.02*** (0.00)
Unemployment Level	-	- 0.02 (0.01)	0.00 (0.01)
Change in Unemployment	-	- 0.01 (0.04)	0.01 (0.04)
Average Mortgage Balance	-	0.02*** (0.00)	0.00 (0.00)
Delinquency Rate	-	0.01 (0.01)	0.02* (0.01)
Change in Delinquency Rate	-	- 0.01 (0.02)	- 0.02 (0.02)

Exhibit 10

Three Models of House Price Expectation Formation (2 of 2)

Parameter	Models of House Price Expectation Formation		
	Model 1 Past Perceptions (N=24,775)	Model 2 Local Fundamentals (N=24,775)	Model 3 Demographic Effects (N=24,775)
Age <30	-	-	0.04 (0.06)
Age ≥55	-	-	0.19*** (0.03)
Spouse/Partner	-	-	0.01 (0.04)
Income ≤\$50K	-	-	- 0.26*** (0.04)
Income ≥\$150K	-	-	0.01 (0.04)
College Graduate	-	-	0.06 (0.04)
Credit Score <720	-	-	0.12*** (0.04)
Credit Score ≥800	-	-	- 0.05 (0.04)
First-Time Homebuyer	-	-	0.01 (0.05)
Refinance	-	-	- 0.25*** (0.03)
Owner-Occupants	-	-	0.03 (0.05)
Very Concerned	-	-	- 0.02 (0.05)
No Concerns	-	-	- 0.07* (0.03)
Above Average Financial Risk	-	-	0.23*** (0.04)
No Financial Risk	-	-	- 0.18*** (0.04)
Survey Quarter Fixed Effects	No	Yes	Yes

HPI = House Price Index.

* = p<0.05; ** = p<0.01; *** = p<0.001.

Notes: Model 1 captures recent perceptions of borrowers through responses to the question: "In the last couple of years, how have house prices changed in the neighborhood where this property is located?" Model 2 includes local economic fundamentals as independent variables. Model 3 includes the perceptions from Model 1 and the fundamentals from Model 2 and adds demographic group dummy variables to capture differences relative to the base group which has the following characteristics: age 30 to 54, one-borrower household, income from \$50,000 to \$149,999, less than 4 years of college education, credit score from 720 to 799, repeat homebuyer, investor/second home owner, somewhat concerned about mortgage qualification, and takes average financial risks.

All ordered logistic regression coefficients are reported in log odds. Exponentiating the log odds coefficients returns the proportional odds ratio. Standard errors are given in parentheses.

It is not surprising that when regressing backcasts of recent house price changes on forecasts of future changes (column 1), the coefficients on the dummy variables are highly significant and properly signed. Holding all else constant, if the respondent selected “Significant Increase” as a backcast on recent prices, the odds of that respondent selecting a more optimistic categorical response as their forecast are nearly four times higher than selecting a less optimistic response. Conversely, if the respondent selected “Significant Decrease” as a backcast, the odds of selecting a more optimistic categorical response as their forecast are less than half as high as the odds of selecting a lower categorical response.

The results presented in column 2 indicate that more positive economic fundamentals including actual recent house price changes, population growth, income growth, and average mortgage balances slightly increase the odds of a respondent selecting a more optimistic categorical response as a forecast. Somewhat unexpectedly, unemployment indicators did not seem to be related to consumer forecasts.

The results presented in column 3 put these pieces together and measure the marginal, rather than gross, impact of both backcasts and economic fundamentals variables as well as the impact of variables representing demographic and other group factors. Somewhat surprisingly, the coefficients on the backcasting and economic fundamental variables are relatively similar to their gross effects shown in columns 1 and 2. This suggests that they have separate impacts on respondent forecasts. Coefficients on the group variables show that older borrowers, borrowers with low credit scores, and borrowers that take above average financial risk are significantly more likely to select a more optimistic response (conditioned on their backcast and fundamentals). Other groups were less optimistic. Borrowers with low income, refinancers, and borrowers that take no financial risk are more likely to select a more pessimistic response.

Conclusion

Assessing awareness of house price trends is an important part of consumer protection in the mortgage market. This article extends the literature by identifying variation across recent mortgage borrowers—those with the greatest incentive to be informed—in their awareness of changes in the house prices in their local markets. On a positive note, this study finds that first-time homebuyers, a demographic considered especially vulnerable during the origination process, are consistently more aware of recent and impending house price trends than repeat borrowers. On the other hand, this study finds that lower-income and less-educated borrowers have relatively less awareness about price trends.

This article also provides evidence that expectations of future house price changes in consumers’ local markets have informational value for forecasting beyond the value provided by local economic data. Why this is true, however, is not clear and needs to be further researched. This article finds that different demographic groups display varying degrees of optimism in forming their forecasts even when controlling for their backcasts and economic fundamentals. Borrowers willing to take above average risk stand out as the most optimistic forecasters, while lower income borrowers tend to be the least optimistic.

It is important to note that this study defined a relatively aggregated area—the county—as the “neighborhood” of the borrower. It is likely that there is neighborhood variation within counties that is not reflected in this definition, however, data at more local levels were unavailable for detailed exploration. Further, the results presented are in aggregate and may not reflect a particular locale.

Finally, this article should be treated as a “first stab” at the problem. NSMO contains a wealth of information on borrower behavior, expectations, and attitudes. While the article identifies the fact that consumers vary in the accuracy of their backcasts and forecasts, it does not address how this variation affects their behavior and, importantly, their outcomes in the mortgage market. These issues remain topics for future research.

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