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FIRST-TIME HOMEBUYER SHARE AND HOUSE PRICE GROWTH

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Introduction

In 2013, the Federal Housing Finance Agency (FHFA) published *Mortgage Market Note 13-01, A Study of First-Time Homebuyers*, which provided estimates of first-time homebuyer shares for the last 20 years. Although the *Note* provided a detailed analysis of credit and borrower characteristics for first-time homebuyers, it did not study variations in first-time homebuyer shares for different geographic areas. While first-time homebuyer shares are undoubtedly affected by many factors, understanding geographic variation meaningfully expands the current body of knowledge on how first-time homebuyers are affected by economic and housing market conditions.

This *Brief* provides statistics from 1996 to 2013 using a large mortgage dataset assembled by FHFA and shows that first-time homebuyer shares differ a great deal across states. Also, the *Brief* discusses the relationship between trends in the share of first-time homebuyers and trends in house prices in various geographic areas. This exploratory analysis suggests that the first-time homebuyer share decreases as house price growth increases (or it increases when house price growth decreases). In other words, the first-time homebuyer share is negatively correlated with the change in house price growth.

First-Time Homebuyer Share by State and Year

In general, estimates of the share of first-time homebuyers in each state are not readily available. Statistics derived from the American Housing Survey (AHS)[2] and information from the National Association of Realtors (NAR) unfortunately rely on the data samples of relatively limited size. However, as discussed in *Mortgage Market Note 13-01*, FHFA has assembled a relatively large mortgage dataset comprised of loans that are guaranteed by either Fannie Mae or Freddie Mac ("the Enterprises") and loans that are endorsed by the Federal Housing Administration (FHA). This dataset has been used for calculating first-time homebuyer shares.

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[2] The AHS is a bi-annual survey of homeowner and home characteristics conducted by the U.S. Census Bureau and sponsored by the U.S. Department of Housing and Urban Development (HUD). Statistics derived from the AHS are a common information resource for housing researchers.

Mortgage Market Note 13-01 showed that, until 2007, the estimates from the Enterprise and FHA mortgage data tracked the aggregate U.S. estimates from the AHS and NAR very closely. It also showed that the overall market share of the Enterprises and FHA for purchase-money mortgages[3] has been 60 to 70 percent since 2008, which makes the combined mortgage dataset an excellent source for first-time homebuyer estimates over the past several years.

The aforementioned *Note* also showed that first-time homebuyer shares were relatively stable until 2000. For the U.S., the share declined modestly from 46 percent in 1996 to 44 percent in 2000.[4] The first-time homebuyer share declined after 2000 and fell to 37 percent in 2003, remained fairly flat over the next few years, then significantly increased between 2006 and 2007, reaching 47 percent in 2007, 54 percent in 2008 and 63 percent in 2009, when a federal first-time homebuyer tax credit program was active. During the period of decline and flatness in the first-time homebuyer share (2001-2006), the market shares of the Enterprises and FHA were also declining. The gentle decline in first-time homebuyer share during this period is also evident in the NAR and AHS estimates, which suggest that the decline is not entirely driven by the decreasing Enterprise and FHA market shares. After spiking in 2009-2010 as a result of tax credit programs, the first-time homebuyer share again drifted downward, reaching 56 percent by 2013.

Exhibit 1 presents the share of first-time homebuyers in each state, computed from the loan-level data of Enterprise-FHA mortgages. The share is calculated as the number of purchase-money mortgages taken out by first-time homebuyers divided by the total number of purchase-money mortgages for primary homes. The vertical axis categorizes states by Census Division starting from the Pacific on the top to New England on the bottom. The horizontal axis shows the year of purchase from 1996 on the left to 2013 on the right. The table shows the first-time homebuyer shares for each state by year both as values and as a heat map, with larger shares shown in darker shades of green.

States with the highest first-time homebuyer shares in recent years are: California, Nevada, the District of Columbia, Maryland, New York, New Jersey, Connecticut, Massachusetts and Rhode Island. These states are generally associated with high-cost metropolitan areas where job growth and worker mobility are likely to be higher and the share of first-time homebuyers in each of these states has exceeded 60 percent since 2011. In contrast, states with the lowest first-time homebuyer shares in recent years include: Montana, Wyoming, Iowa, Kansas, Wisconsin, Oklahoma, Arkansas, Kentucky, North Carolina, South Carolina, Vermont and Maine. Since 2011, shares in these states have been either at or below 50 percent, which is lower than the national share of about 56 percent. These states are generally associated with more non-urban areas. The share of first-time homebuyers in the remaining states has hovered around 50 to 60 percent in recent years.

[3] "Purchase-money" mortgages are used for financing the purchase of homes. By contrast, refinance loans (which are not addressed in this paper) replace existing mortgages for borrowers who already own the collateral property.
[4] *Mortgage Market Note 13-01* addresses how these shares were calculated. As detailed in that paper, alternative metrics use different data sources and methodologies.

Exhibit 1. First-Time Homebuyer Share by State and Year

Census Division	State	Year																	
		96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13
Pacific	HI	55	59	56	55	52	44	42	36	36	34	38	46	48	60	60	58	56	55
	AK	40	45	46	45	48	43	41	41	44	43	40	45	50	52	58	50	50	52
	OR	39	39	35	38	39	36	35	31	34	29	31	38	47	59	57	54	54	50
	WA	40	42	38	39	40	37	39	35	38	35	37	43	50	60	58	56	57	56
	CA	57	60	53	53	52	46	42	35	35	32	37	49	61	71	71	67	66	63
Mountain	NV	44	44	43	46	45	41	38	32	32	31	33	45	60	71	71	67	65	62
	UT	48	48	45	47	51	50	47	41	44	41	43	45	54	64	61	60	59	55
	AZ	39	40	38	40	42	39	37	33	34	27	31	43	55	64	60	55	55	54
	NM	43	44	44	47	47	45	44	39	41	40	40	42	52	60	59	57	57	57
	CO	37	44	40	42	41	39	42	40	41	37	38	41	49	59	55	52	50	49
	WY	44	46	40	41	39	34	35	33	34	37	37	40	47	53	51	48	47	49
	ID	38	44	41	42	43	42	43	39	39	36	38	40	52	65	59	54	52	49
	MT	41	46	42	41	43	40	41	39	40	41	40	41	46	54	51	48	47	46
West North Central	ND	53	55	50	51	51	46	46	43	46	47	49	49	52	56	49	47	49	47
	SD	48	51	45	45	43	41	41	39	40	38	36	36	45	52	49	45	46	46
	NE	50	53	47	48	44	42	42	41	44	45	49	52	54	62	54	51	51	50
	KS	40	42	42	43	43	41	41	38	42	43	47	50	52	56	53	49	48	48
	MO	44	45	40	43	43	39	38	35	39	40	44	47	52	60	54	52	52	51
	IA	41	44	39	40	41	36	39	39	43	43	48	50	51	55	49	45	45	45
	MN	45	48	43	43	42	39	38	36	37	37	42	46	54	62	56	54	53	52
East North Central	WI	41	42	36	35	34	31	31	29	34	34	40	44	48	54	52	50	49	49
	IL	48	50	42	43	41	36	36	34	39	39	43	48	54	61	59	57	58	58
	IN	43	46	41	43	44	43	43	42	42	43	46	49	54	60	55	53	53	53
	MI	41	43	37	37	37	35	37	36	41	41	46	49	57	62	60	56	54	54
	OH	40	43	38	39	40	39	39	37	39	38	44	47	54	63	59	57	56	56
West South Central	TX	44	47	46	47	46	44	45	42	46	44	44	48	54	60	59	53	54	53
	LA	49	52	50	52	50	45	45	42	47	43	43	49	49	57	56	52	53	55
	OK	44	48	45	45	44	40	43	39	39	40	43	45	49	56	52	48	49	47
	AR	45	51	43	44	47	44	44	40	42	42	42	47	50	57	52	49	47	47
East South Central	KY	40	40	37	39	39	37	38	36	37	38	41	44	49	56	52	48	47	47
	TN	46	48	44	45	44	41	41	38	39	38	38	43	50	59	56	51	51	50
	MS	48	50	45	44	46	43	44	41	43	41	43	50	50	57	56	52	51	54
	AL	40	39	37	39	42	37	39	35	37	37	41	47	51	58	56	49	49	51
South Atlantic	FL	44	46	41	42	41	36	34	32	33	31	36	46	55	65	64	60	58	56
	GA	43	46	42	45	45	42	42	40	43	39	40	46	56	64	63	59	59	56
	SC	40	39	33	32	32	30	30	30	34	32	34	39	46	56	53	49	49	49
	NC	40	42	38	38	38	36	36	36	37	35	35	38	47	55	52	49	49	48
	WV	42	39	38	39	36	34	35	33	37	36	39	40	47	55	55	51	52	52
	VA	52	52	47	49	49	43	40	37	37	34	37	43	54	61	59	56	57	57
	DC	70	70	65	67	67	57	51	48	54	52	56	63	66	70	70	67	66	68
	MD	62	63	58	59	58	51	48	43	43	39	41	48	57	65	64	62	63	63
	DE	50	49	46	46	47	43	40	35	37	38	43	48	55	61	59	58	58	58
Mid Atlantic	PA	52	53	47	46	47	44	42	39	43	45	48	51	56	63	61	60	59	59
	NJ	51	55	50	49	48	42	41	38	47	45	47	53	58	66	66	64	63	63
	NY	55	56	51	50	49	45	41	39	47	50	53	57	61	69	68	66	65	65
New England	CT	62	59	51	50	48	43	43	40	44	42	45	50	56	64	63	61	61	61
	RI	51	55	49	50	49	43	40	34	37	35	38	42	57	68	65	64	65	67
	MA	53	51	43	42	43	40	39	35	41	40	46	51	57	62	61	59	59	61
	VT	37	35	31	31	29	26	27	27	30	32	36	40	43	52	49	47	41	40
	NH	46	45	38	37	36	31	31	28	32	34	39	42	50	59	55	55	54	53
	ME	50	47	42	41	39	35	34	31	36	35	39	46	50	56	52	47	48	47

Source: FHFA calculations from the Enterprise and FHA mortgage data of purchase-money mortgages for primary homes.

Since 1996, some states have seen a significant increase in the share of first-time homebuyers, with more than one-third experiencing an increase of over ten percentage points between 1996 and 2013. The following five states have witnessed an increase of over fifteen percentage points: Nevada, Rhode Island, Washington, Ohio, and Arizona. In sharp contrast to those areas, North Dakota, South Dakota, and the District of Columbia experienced declines in first-time homebuyer shares over the same period. Interestingly, Exhibit 1 reveals that some of the states that had the highest first-time homebuyer shares in 1996 (for example, California and Maryland) saw relatively little change over the 1996-2013 period.

First-Time Homebuyer Share and House Price Growth

On the surface, it is not clear whether the share of first-time homebuyers should be either directly or inversely related to changes in home values. Economic intuition suggests that either could be true. On the one hand, increases in home values could motivate potential first-time buyers to "get off the sidelines" and pursue the positive financial returns that can be derived from homeownership. On the other hand, increasing house prices clearly leads to decreases in affordability—a critical issue for first-time homebuyers who often are just getting started professionally and are still trying to save for a down payment. When prices are rising too quickly, potential first-time homebuyers may be priced out of the market until either their income rises, or house prices decrease to more affordable levels, or some combination of the two.

This *Brief* examines whether the data support either one or the other of these two hypotheses using the simplest form of statistical analysis. To do so, two calculations were made for each state and each year since 1997. First, the change in the first-time homebuyer share was calculated for each state. Second, the FHFA House Price Index (HPI) was used to calculate year over year fourth-quarter house price growth for every state.[5]

Exhibit 2 shows the scatterplot of the two variables and a simple linear model of change in first-time homebuyer share (in the y-axis) and the house price growth (in the x-axis). The change in the first-time homebuyer share is negatively correlated with the change in house price growth. A simple regression model fitted to the data[6] suggests that a one percent increase in house prices tends to decrease the first-time homebuyer share by roughly one-quarter percent.[7]

To further clarify the source of the negative correlation between the change in first-time homebuyer share and house price growth, correlations were calculated for each state. Exhibit 3 presents the simple correlation coefficient between the annual change in first-time homebuyer share and annual house price growth for each state. The results are sorted from the largest negative correlation to the largest positive correlation.

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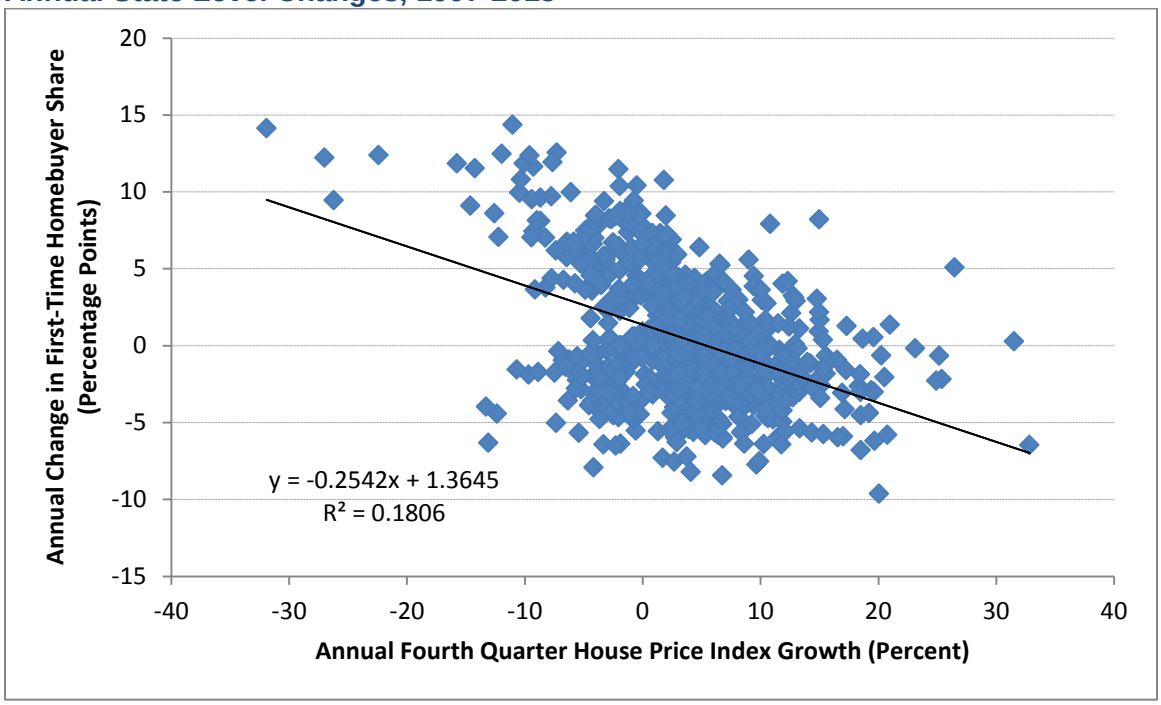
[5] The FHFA HPI has been published since 1996 and tracks house price appreciation throughout the US. The — newest data can be downloaded at: http://www.fhfa.gov/DataTools/Downloads/Pages/House-Price-Index.aspx.

[6] A regression model of this type is the simplest way of assessing the general relationship between two variables reflected in a scatterplot.

[7] A change in first-time homebuyer share does not necessarily indicate a change in the number of first-time homebuyers. First-time homebuyer share can change even when the number of first-time homebuyers remains constant but the number of repeat buyers changes. Repeat buyers are purchasers who are looking to move from their currently owned homes.

Exhibit 2. First-Time Homebuyer Share and Fourth Quarter House Price Index Annual State Level Changes, 1997-2013



Source: FHFA calculations.

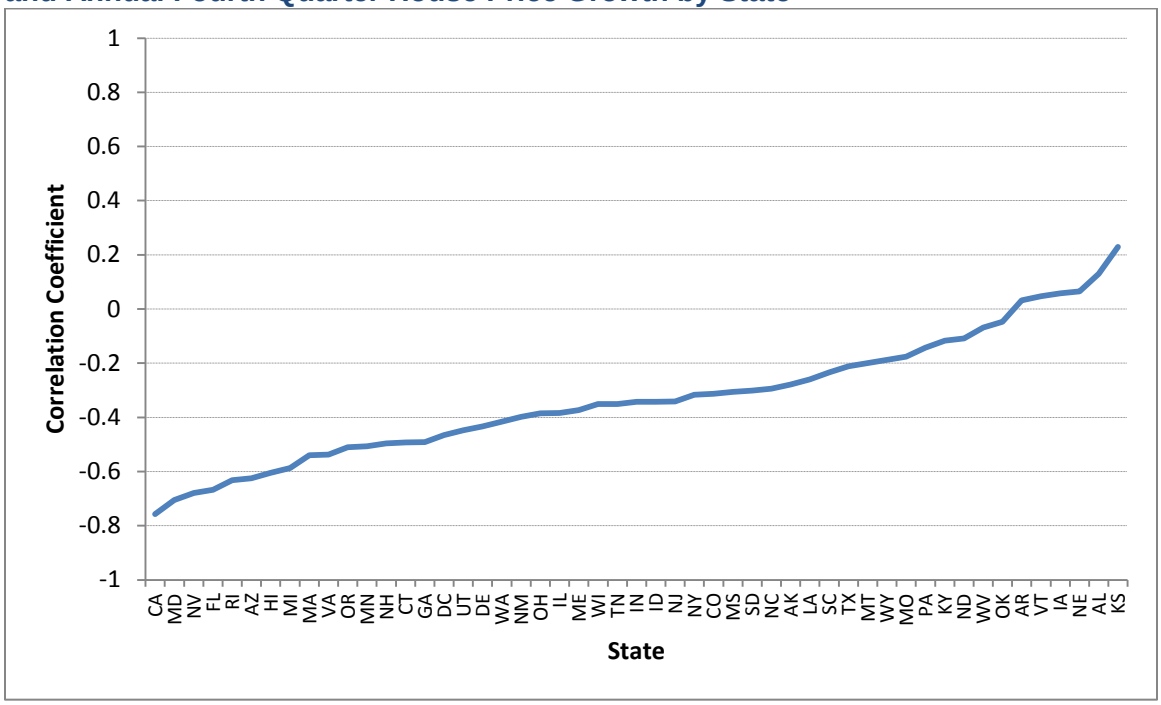
Almost 90 percent of states exhibit a negative correlation, suggesting that first-time homebuyer share decreases as house price growth increases. Comparing the results in Exhibit 3 to the level of the homebuyer shares in the respective states, one finds the correlation coefficient is the most negative in several states with the highest first-time homebuyer shares. These include: California, Maryland, Nevada, Rhode Island and Massachusetts. Only 11 percent of states have weak positive correlations. States with weak positive correlations of over 0.1 are Alabama and Kansas.

From 1996-2013, almost one third of the states experienced significant house price growth[8] at or more than 100 percent. The states with the most significant house price growth over this period were the District of Columbia (324 percent growth in the HPI Index), California (140 percent), Hawaii (133 percent), and Massachusetts (121 percent). Indeed, of the 13 states which had negative correlations exceeding -0.5[9], seven of them had a percent change in the HPI either at or more than 100 percent between 1996 and 2013. Only two of the states with negative correlations exceeding -0.5 had changes in the HPI index of less than 80 percent: Michigan (25 percent) and Nevada (41 percent).

Several states with the most negative correlations had the most dramatic swings in house prices during the recent housing boom and bust. For example, Arizona saw prices rise by more than 150 percent between 1996 and 2006, and then saw prices recede by almost 50 percent in the early years of the housing bust. Nevada and California—two other states with large negative correlations reflected in Exhibit 3—also saw large swings in house prices.

[8] Measured by the percent change in the HPI Index.
[9] Negative correlations exceeding -0.5 as measured in absolute value.

Exhibit 3. Correlation of First-Time Homebuyer Share Change and Annual Fourth Quarter House Price Growth by State

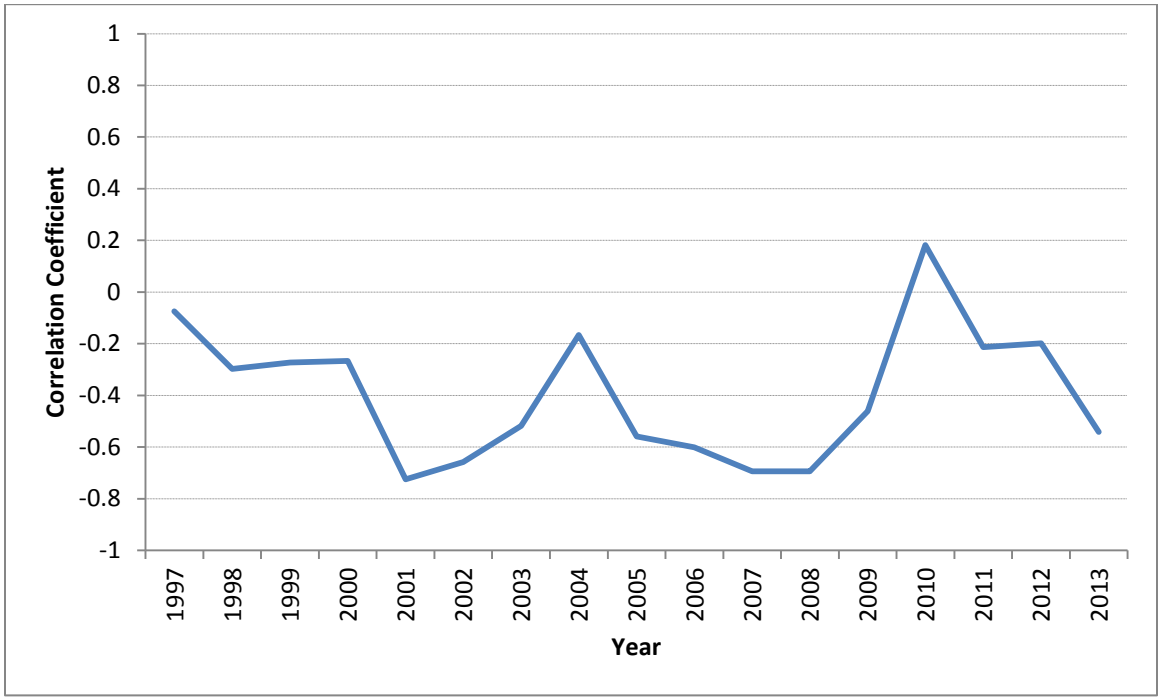


Source: FHFA calculations.

Given variations in the health of local labor markets, one might wonder whether the states with the strongest negative correlations had either significantly different unemployment or labor force participation rates of prime-aged home-buying adults (ages 25-44) compared to other states. Of the 13 states with negative correlations exceeding -0.5, only 5 of them had average prime-age unemployment rates during 1996-2013 exceeding 6 percent. Michigan had the highest average prime-age unemployment rate during this period (7.2 percent), while New Hampshire and Virginia had the lowest average prime-age unemployment rates (3.6 percent and 3.8 percent respectively). Moreover, about half of these states had a change in the prime-age unemployment rate of over three percentage points between 1996 and 2013, while half had a change in the prime-age unemployment rate of less than three percentage points. This suggests that high prime-age unemployment rates, and changes in the prime-age unemployment rates, were not necessarily the primary factors in the decline in first-time homebuyer shares as house price growth increased in some states. Prime-age labor force participation rates also did not show significant patterns among these states: over three quarters of the states had average prime-age youth labor force participation rates exceeding 83 percent. Nevertheless, further studies are needed on the interaction of labor markets and the relationship of first-time homebuyers and house price growth. [10]

[10] This analysis also examined whether either high unemployment rates or low labor force participation rates impacted first-time homebuyer shares. Though a positive correlation between the change in youth unemployment rate and the change in first-time homebuyer share was found, the correlation was very weak. There was no observable relationship between the change in youth labor force participation and the change in first-time homebuyer shares.

Exhibit 4. Correlation of First-Time Homebuyer Share Change and Annual Fourth Quarter House Price Growth by Year



Source: FHFA calculations.

Between 1997 and 2013, the share of Enterprise and FHA mortgages relative to each other, and also relative to private mortgages, changed from year to year. Exhibit 4 examines cross-sectional state data by year in order to investigate whether the changing composition of the Enterprise-FHA sample could explain much of the observed negative correlation between house prices and first-time homebuyer shares over time. For each year, it shows the cross-sectional correlation between the annual change in first-time homebuyer share and annual house price growth across the 50 states. If the sole reason for the negative relationship between first-time homebuyer shares and price appreciation was that the combined Enterprise-FHA data sample captured a larger share of such borrowers in the overall market, then the year-specific correlations would not be systematically negative.

Further, Exhibit 4 reveals that the negative correlations exist in nearly all years except 2010, the final year of the two-year federal first-time homebuyer tax credit program. Even during the height of the housing boom in either 2005 or 2006, the correlation coefficients are significantly negative: -0.56 and -0.60 respectively. In fact, in nearly all years in the 2001-2008 period[11] and also in 2013, the negative correlation coefficient was larger than -0.50 in absolute value.[12] This suggests that the negative relationship between the change in first-time homebuyer share and house price growth is robust and unaffected by the changing composition of the Enterprise-FHA sample over time.

[11] Except 2004.
[12] The strongest negative correlations were in 2001 (-0.72), 2002 (-0.65), and in 2007 and 2008 (-0.69 for both years).

Conclusion

The tendency of the first-time homebuyer share to decline as house price growth increases, as measured by the negative correlation between the change in first-time homebuyer share and house price growth, is evident in the aggregate correlation nationwide, as well as in the correlations across most states and in most years between 1996 and 2013. This provides evidence for the second hypothesis that increasing house prices may price some would-be first-time homebuyers out of the market. Periods of declining house prices (i.e., increases in affordability), by contrast, apparently tend to induce relatively robust home purchasing volume by first-time homebuyers.

Undoubtedly, additional research in this area is required. Future research could include further exploration of labor market outcomes such as employment and income, and household finance outcomes, such as student loan debt.