RESEARCH BRIEF

IMPROVING
AMERICA'S HOUSING

Investigating Metro-Area Home Improvement Spending Cycles

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JCHS
JOINT CENTER FOR
HOUSING STUDIES
OF HARVARD UNIVERSITY

Over the past two decades, home improvement spending patterns among some of the largest metropolitan areas in the country have shown considerable variation in pace, timing and volatility. Differences in the remodeling cycles in Chicago, Detroit, Los Angeles, New York, and Philadelphia appear to be influenced by the relative strength or weakness of local economic and housing market conditions. In particular, change in home values stands out as a strong indicator of metropolitan remodeling activity. Ultimately, local home price cycles may be reliably good proxies for remodeling spending cycles in metro areas for which historical home improvement data is unavailable.

Background and Markets Overview

In 2017, homeowners in the U.S. spent over $250 billion on home renovations—such as kitchen and bath remodels, room additions, and replacements of roofing, flooring, and HVAC systems—according to estimates from the Joint Center for Housing Studies' Remodeling Futures Program. National home improvement spending in 2017 was 6.9 percent higher than 2016 levels and marked the fifth consecutive year of annual nominal growth at or above the market's long-term average of 5 percent (measured between 1994 and 2017). Yet the robust gains in the national remodeling market in recent years surely mask significant variation in spending trends at the local level. And while understanding historical and current trends in the national remodeling market may be very useful for large-scale contracting businesses and building material manufacturers and dealers, national conditions are much less meaningful for the typical small-scale remodeling contractor that might serve only a single geographic market.

This research examining metro-level home improvement spending cycles uses data from the 1995–2015 national American Housing Surveys (AHS), which are conducted every other year and sponsored by the U.S. Department of Housing and Urban Development (HUD). The main goal of the investigation is to understand if and how the magnitude and timing of remodeling spending booms, busts and recoveries have differed among major metro areas over the past twenty years, and how these cycles relate to local economic and housing market conditions.[1] Although consistent historical data are available for only five major metropolitan areas, the research findings shed light for understanding the likely pace, timing, and volatility of historical home remodeling spending cycles for many more metropolitan areas around the country.[2]

The metropolitan areas of Chicago, Detroit, Los Angeles, New York, and Philadelphia include some of the largest populations and markets in the nation, and their economies and housing markets have followed different trajectories over the past two decades. In 2015, the most recent survey year available for this research, these five metropolitan areas collectively accounted for 10.5 million of the nation's 74.1 million homeowners, or over 14 percent. In total, owners in these metros spent over $41 billion on home improvements in 2015, which was about 19 percent of market spending nationally. That year, the absolute size of local remodeling markets varied among these metros from $3.4 billion in Detroit to $19.5 billion in New York (Figure 1). Between 1994 and 2015, average annual inflation-adjusted spending on remodeling projects was $2,600 per homeowner for the nation as a whole, but homeowners in four of the five metro areas spent between 20 and 45 percent more: $3,800 per owner per year on average in Los Angeles, $3,700 in New York, $3,200 in Chicago, and $3,200 in Philadelphia. In contrast, the typical homeowner in the Detroit metro area spent $2,500 annually, slightly less than the typical homeowner in the U.S.

FIGURE 1

LOS ANGELES AND NEW YORK STAND OUT AS STRONGEST MARKETS FOR REMODELING, SUPPORTED BY HIGH HOME VALUES AND INCOMES

	Los Angeles	New York	Philadelphia	Chicago	Detroit	US
Remodeling Activity						
Total improvement expenditure, 2015 (Billions of dollars)	6.8	19.5	5.1	6.3	3.4	**220.1**
Average annual real per owner improvement spending, 1994-2015 (2015 dollars)	3,800	3,700	3,200	3,100	2,500	**2,600**
Incomes & Home Values						
Median owner income, 2015 (Thousands of dollars)	83	87	75	74	60	**63**
Median home value, 2015 (Thousands of dollars)	525	380	220	200	150	**180**
Change in real median home value, 1997-2015 (Percent)	109	50	28	-7	-24	**15**

Source: JCHS tabulations of HUD, American Housing Surveys; US Census Bureau, Retail Sales of Building Materials; Zillow Home Value Index; and National Association of Realtors: Real Estate Outlook; CoreLogic, Inc.: Home Sales; Moody's Analytics Estimated.

The especially strong remodeling spending levels in the Los Angeles and New York metros over the past two decades have been supported by relatively high household incomes and home values, while weaker improvement activity in Detroit reflects relatively lower incomes and home values. In 2015, median household incomes for homeowners in Los Angeles ($82,600) and New York ($87,000) were 27 percent and 33 percent higher, respectively, than the median income for the typical U.S. homeowner household, which was $65,250. Between 1995 and 2015, median homeowner incomes in Los Angeles and New York were consistently 20–40 percent higher than the median homeowner income in the U.S., compared to about 14 percent higher in Philadelphia. During the mid- to late 1990s, owner incomes in Detroit and Chicago were about 20–30 percent more than the national median, but by 2015 the typical income for homeowners in Chicago was only 13 percent above, and in Detroit 8 percent below, the national median.

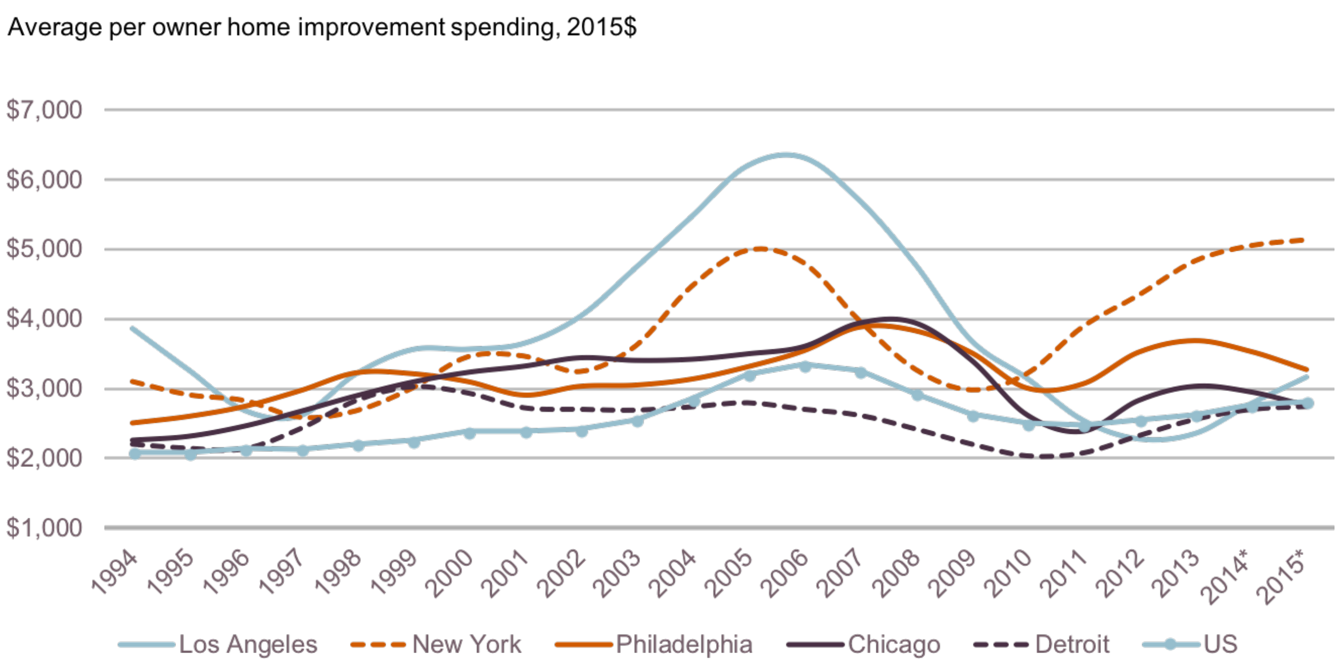
Similarly, in 2015 the median home values in the metropolitan New York ($380,000) and Los Angeles ($525,000) areas were roughly double and triple the national median home value of $180,000. Moreover, constant inflation-adjusted median home values increased 50 percent in New York between 1997 and 2015 and 109 percent in Los Angeles while rising only 15 percent for the nation as a whole, according to the Zillow Home Value Index. In the Chicago and Philadelphia metros, median home values were about 10–20 percent above the national median in 2015, but whereas real home prices rose 28 percent in Philadelphia between 1997 and 2015, they fell 7 percent in Chicago. In metro Detroit, median home values were 17 percent below the national average in 2015, having fallen in real terms by 24 percent between 1997 and 2015.

Pace, Timing, and Volatility of Metro Remodeling Cycles

In just the five metropolitan areas for which consistent historical data are available, there is surprising variety in the trajectory of home improvement spending over time, with some metros experiencing severe booms and busts and others exhibiting much more mild changes in spending (Figure 2). The Los Angeles and New York metros stand out as having unusually strong, or volatile, spending cycles. In comparison, remodeling activity in metropolitan Chicago, Detroit, and Philadelphia has been much steadier over the past two decades. At first glance, it may appear that the timing of upturns and downturns in average spending levels is fairly similar among this selection of major metro areas, but here too are meaningful differences in each metro's spending cycle. As a reference for the metropolitan cycles in average real per owner home improvement spending levels between 1994 and 2015, the national cycle is characterized by fairly steady annual increases in spending levels through 2002 followed by a rapid acceleration during the housing boom. Nationally, average remodeling spending peaked in 2006 at $3,350 per homeowner, but the ensuing mortgage market crisis and Great Recession sent spending tumbling by more than 25 percent through 2011. And although average owner expenditure recovered 13 percent from this cyclical bottom through 2015, it was still 16 percent lower than spending level at the peak and 4 percent below the historical trend line for spending between 1994 and 2015.

FIGURE 2

LARGE VARIETY OF REMODELING CYCLES AMONG MAJOR METROS

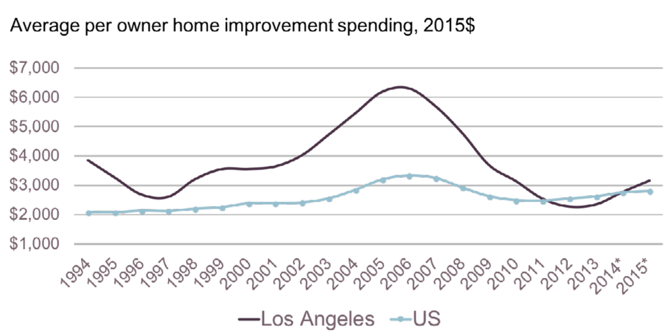


Notes: Estimates were produced by applying annual shares of metro-level retail sales of building materials to two-year improvement spending levels from the AHS, and smoothed using a three year moving average. *Metro boundaries were updated in the 2015 AHS.
Source: JCHS tabulations of HUD, American Housing Surveys and US Census Bureau, Retail Sales of Building Materials.

Compared to the national cycle, the historical remodeling cycle in Los Angeles has been characterized by an extreme boom followed by an equally dramatic bust and a relatively slow recovery through 2015 (Figure 2A). Between 1997 and 2006, average per owner home improvement spending in the Los Angeles metro grew more than 140 percent after adjusting for inflation, compared to less than 60 percent nationally. This phenomenal growth was then erased by the housing bust. From peak to trough, average remodeling spending fell 64 percent in L.A. to the lowest level on record for the metro and even below the national averages by 2012 and 2013. Indeed, of the five metros, L.A. experienced the most protracted downturn, with average remodeling expenditure declining for six years compared to five nationally and only three in Chicago and Philadelphia. Although spending in L.A. grew strongly from its 2012 bottom through 2015 (39 percent compared to 13 percent nationally), average real per owner improvement spending in Los Angeles was still fully 50 percent lower in 2015 than peak expenditure levels in 2006.

FIGURE 2A

EXTREME BOOM AND BUST WITH ONLY MILD RECOVERY THROUGH 2015 IN LOS ANGELES

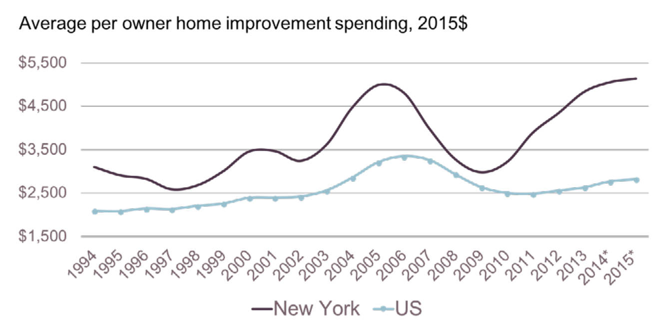


Notes: Estimates were produced by applying annual shares of metro-level retail sales of building materials to two-year improvement spending levels from the AHS, and smoothed using a three-year moving average. *Metro boundaries were updated in the 2015 AHS to include Orange County in addition to Los Angeles County.
Source: JCHS tabulations of HUD, American Housing Surveys and US Census Bureau, Retail Sales of Building Materials.

Much as in Los Angeles, average home improvement expenditure in metropolitan New York underwent a dramatic boom and bust over the past two decades (Figure 2B). Between 2002 and 2005, average spending levels increased over 50 percent in New York compared to 33 percent nationally, and during the bust spending declines measured 40 percent from peak to trough, compared to 26 percent nationally. But unlike in L.A., remodeling activity rebounded very quickly and strongly in New York since bottoming out in 2009, such that by 2015 average real per owner spending actually surpassed the metro's 2005 peak by 3 percent. In comparison, per owner improvement spending levels nationally were still down 16 percent in 2015 from market peak. Indeed, New York is the only one of the five metros to experience a full recovery in real per owner home improvement expenditure through 2015.

FIGURE 2B

ALSO EXTREME BOOM AND BUST, BUT WITH STRONG RECOVERY THROUGH 2015 IN NEW YORK

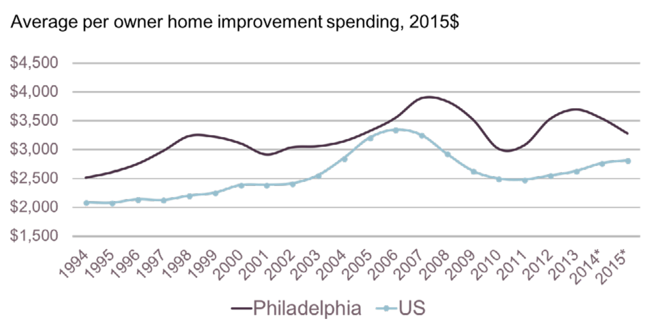


Notes: Estimates were produced by applying annual shares of metro-level retail sales of building materials to two-year improvement spending levels from the AHS, and smoothed using a three-year moving average. Data for 1994-2013 combine the New York and Northern New Jersey (including Newark, Edison and surrounding counties) metros to more closely match updated boundary definitions* utilized in the 2015 AHS for the New York-Newark-Jersey City, NY-NJ-PA metropolitan statistical area.
Source: JCHS tabulations of HUD, American Housing Surveys and US Census Bureau, Retail Sales of Building Materials.

In Philadelphia, the historical remodeling cycle is characterized by a much steadier rise and a later peak in average spending levels than in Los Angeles or New York (Figure 2C). Average spending levels increased 27 percent in both Philadelphia and nationally from 2003–2007, and peak-to-trough declines of 23 percent were likewise on par with the national downturn of 26 percent. Since 2010, the remodeling recovery has been somewhat uneven in Philadelphia: average spending levels rebounded strongly through 2013, but then softened in 2014 and 2015. With the uneven recovery, average real per owner improvement expenditure was still 16 percent lower in 2015 than peak spending levels in Philadelphia in 2007.

FIGURE 2C

LONG AND STEADY UPTURN WITH UNEVEN RECOVERY IN PHILADELPHIA THROUGH 2015

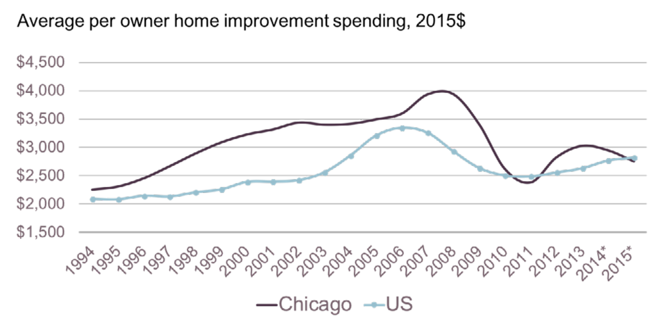


Notes: Estimates were produced by applying annual shares of metro-level retail sales of building materials to two-year improvement spending levels from the AHS, and smoothed using a three-year moving average. *Metro boundaries were updated in the 2015 AHS.
Source: JCHS tabulations of HUD, American Housing Surveys and US Census Bureau, Retail Sales of Building Materials.

The remodeling cycle in Chicago looks similar to Philadelphia's cycle, with a fairly long and gradual upturn in average spending levels during the housing boom years, a later peak in spending, and a somewhat uneven recovery from the downturn through 2015 (Figure 2D). Average real improvement spending rose just 13 percent at its steepest pace from 2005 to 2008, compared to 31 percent for the U.S. in the three years prior to peak. Whereas spending peaked nationally in 2006, homeowners in Chicago continued to increase their average remodeling expenditures through 2008. And the downturn hit metro Chicago faster and harder, with average spending declining 40 percent in just three years from its 2008 peak to its 2011 trough, compared to a 26 percent peak-to-trough decline nationally. Since 2011, remodeling expenditures bounced back quickly and sharply, increasing 27 percent through 2013, but then shrank back 9 percent through 2015.

FIGURE 2D

FAIRLY STEADY UPTURN, ALSO WITH UNEVEN RECOVERY IN CHICAGO

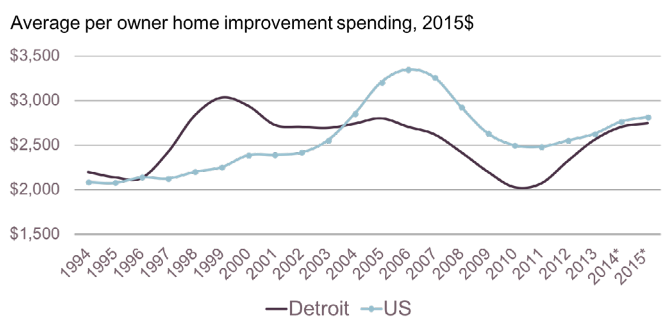


Notes: Estimates were produced by applying annual shares of metro-level retail sales of building materials to two-year improvement spending levels from the AHS, and smoothed using a three-year moving average. *Metro boundaries were updated in the 2015 AHS.
Source: JCHS tabulations of HUD, American Housing Surveys and US Census Bureau, Retail Sales of Building Materials.

Detroit is the only one of the five metros that did not experience a noticeably large run-up in average remodeling spending levels during the national housing boom of the early to mid-2000s, and in fact real median home values grew only modestly before declining in Detroit from 2001–2007, compared to 30 percent growth nationally (Figure 2E). Instead, average home improvement spending in Detroit rose sharply during the late 1990s, increasing over 40 percent from 1996 to 1999. This earlier boom was followed by a long period of lower, flat spending levels during a time when average spending nationally was climbing very quickly along with house prices. With the housing crash and Great Recession, however, the already weakened remodeling spending in Detroit contracted by 28 percent from 2005 to 2010, a decline similar to the peak-to-trough decline in national average spending levels of 26 percent. Yet the recovery in remodeling expenditure occurred fairly quickly in Detroit, rising near to national averages by 2013 and returning to pre-recession spending levels by 2015. Even so, average improvement spending in Detroit in 2015 was still more than 9 percent lower, in real terms, than the metro's historical peak spending level in 1999.

FIGURE 2E

NO BOOM IN MID-2000S IN DETROIT AND QUICK REBOUND, THOUGH SPENDING STILL OFF HISTORICAL PEAK



Notes: Estimates were produced by applying annual shares of metro-level retail sales of building materials to two-year improvement spending levels from the AHS, and smoothed using a three-year moving average. *Metro boundaries were updated in the 2015 AHS.
Source: JCHS tabulations of HUD, American Housing Surveys and US Census Bureau, Retail Sales of Building Materials.

Comparing the pace and timing of each of the remodeling cycles in these five metro areas shows that while there are many elements in common, no two metros followed the same path during the twenty years from 1994–2015 (Figure 3). From 1994 to each metro's cyclical peak spending year, average real per owner home improvement spending levels increased the most in Chicago (75 percent through 2008) and least in Detroit (27 percent through 2005). During the past two decades, relative peaks in per owner spending occurred as early as 2005 in New York and as late as 2008 in Chicago. Yet New York also hit a cyclical bottom in spending levels much earlier in 2009 and fully three years before Los Angeles, which did not hit bottom until 2012. From cyclical peak to trough, average spending levels in both Los Angeles and Detroit shrank by exactly as much as they grew during their upturn years, though the magnitude of the growth and decline was very different between these metros (64 percent versus 27–28 percent). Recovery in average improvement expenditures since hitting a cyclical bottom has also varied considerably, from a low of only 9 percent in Philadelphia to 73 percent in New York through 2015. Compared to prior cyclical peak spending levels, by 2015 average remodeling expenditures in New York were 3 percent higher and in Detroit only 2 percent lower, whereas average spending levels were still 30 percent lower than peak in Chicago and fully 50 percent below peak in Los Angeles.

FIGURE 3

SUBSTANTIAL DIFFERENCES IN CYCLICALITY AND TIMING OF PEAK-TO-TROUGH SPENDING AMONG MAJOR METROS

Percent change in average real per owner home improvement spending

	Los Angeles	New York	Philadelphia	Chicago	Detroit	US
1994 to Peak	64	61	55	75	27	**60**
Peak to Trough	-64	-40	-23	-40	-28	**-26**
Trough to 2015	39	73	9	16	35	**13**
Peak to 2015	-50	3	-16	-30	-2	**-16**
Peak Year	*2006*	*2005*	*2007*	*2008*	*2005**	***2006***
Trough Year	*2012*	*2009*	*2010*	*2011*	*2010*	***2011***

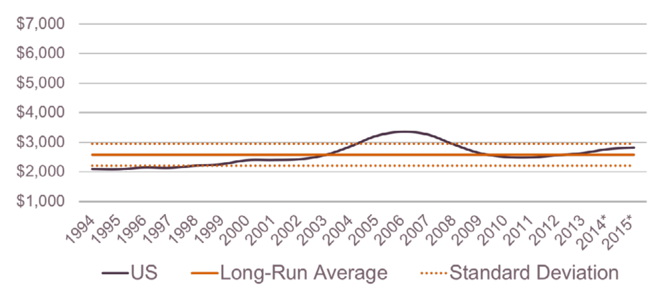
*Although peak spending in Detroit between 1994 and 2015 technically occurred in 1999, a relative peak in 2005 was chosen in order to make more consistent cyclical comparisons among metros.
Source: JCHS tabulations of HUD, American Housing Surveys and US Census Bureau, Retail Sales of Building Materials.

Even though the pace and timing of each of the remodeling cycles in these major metropolitan areas is unique, there is some commonality in describing the overall volatility of a metro area's remodeling cycle. One measure of cyclical volatility, or variability, is the standard deviation in any given year from the historical mean value across time, which in this case is the average of annual home improvement spending levels in each metro area from 1994–2015 (provided in Figure 1). A low standard deviation indicates that annual spending levels do not vary much from the historical average for the time period, while a high standard deviation indicates the annual data are highly dispersed from the long-run mean. For example, in the U.S. the average of annual real per owner improvement expenditures from 1994–2015 is $2,600; on average, annual spending in any given year during this twenty-year period was above or below this long-run average by $380, or about 15 percent (Figure 4). Even with the severity of the last boom and bust, the national remodeling cycle could be characterized as having relatively low to moderate levels of volatility in recent decades, especially in comparison to some of the metropolitan cycles, such as those in New York and Los Angeles.

FIGURE 4

US REMODELING CYCLE EXHIBITS LOW TO MODERATE VOLATILITY

Average per owner home improvement spending, 2015$

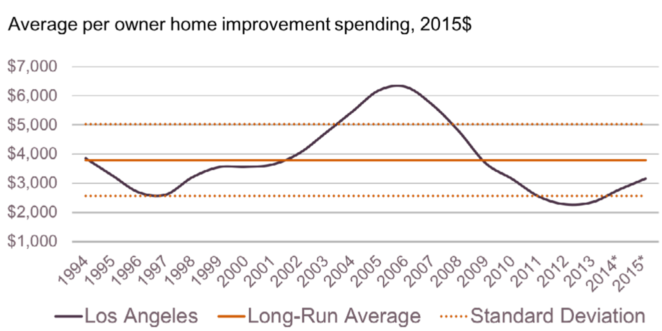


*Metro boundaries were updated in the 2015 AHS.
Source: JCHS tabulations of HUD, American Housing Surveys and US Census Bureau, Retail Sales of Building Materials.

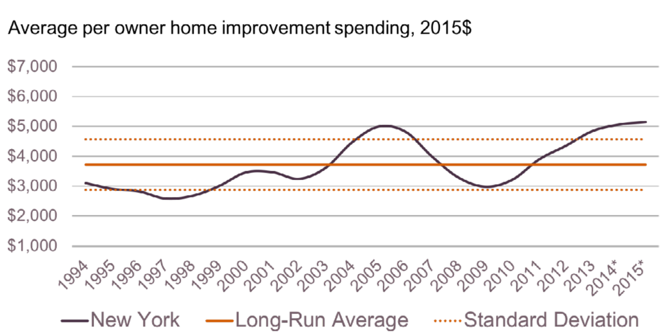
Volatility in major metropolitan remodeling cycles can be categorized as being low, moderate, or high relative to the volatility in the national remodeling spending cycle (Figures 4A-E). Home improvement spending cycles in the Detroit and Philadelphia metros exhibit somewhat less volatility than the national remodeling cycle, with standard deviations from their metro-wide long-run average spending levels of $300 and $370, respectively, or 12 percent of the metros' historical average spending levels. Conversely, both the New York and Los Angeles metros show substantial volatility in their remodeling cycles, with standard deviations in spending of $850 and $1,200, or 23 and 32 percent of each metro's respective historical long-run average spending level. Chicago, where the standard deviation in annual remodeling spending levels is $500, or 16 percent of long-run average spending, has a somewhat more volatile remodeling cycle than the nation as a whole, but certainly a much less volatile cycle than New York and Los Angeles.

FIGURES 4A-E

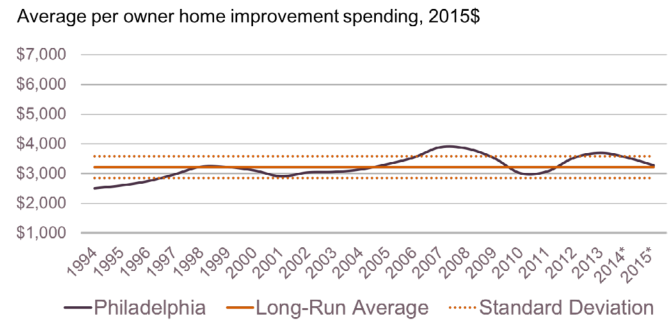
4A: LOS ANGELES REMODELING CYCLE EXHIBITS HIGH VOLATILITY



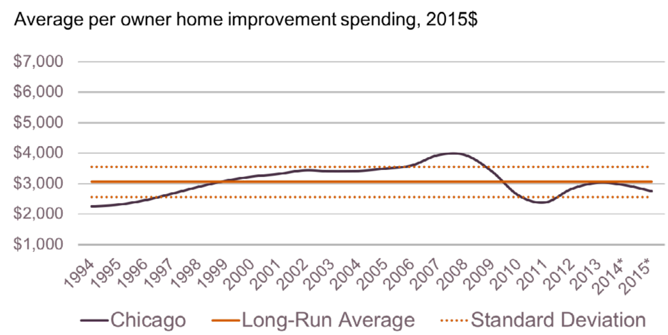
4B: NEW YORK REMODELING CYCLE ALSO EXHIBITS HIGH VOLATILITY



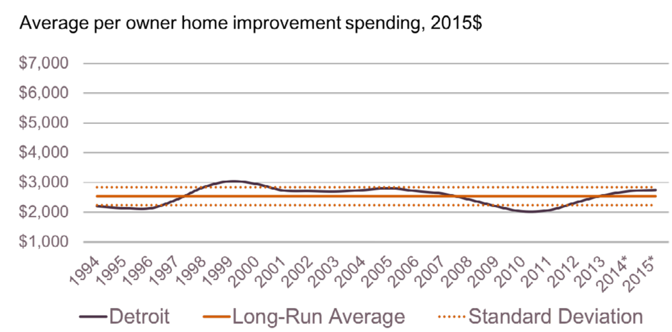
4C: PHILADELPHIA REMODELING CYCLE EXHIBITS LOW VOLATILITY



4D: CHICAGO REMODELING CYCLE EXHIBITS MODERATE VOLATILITY



4E: DETROIT REMODELING CYCLE EXHIBITS LOW VOLATILITY



*Metro boundaries were updated in the 2015 AHS.
Source: JCHS tabulations of HUD, American Housing Surveys and US Census Bureau, Retail Sales of Building Materials.

Housing Market Correlates of Metro Remodeling Cycles

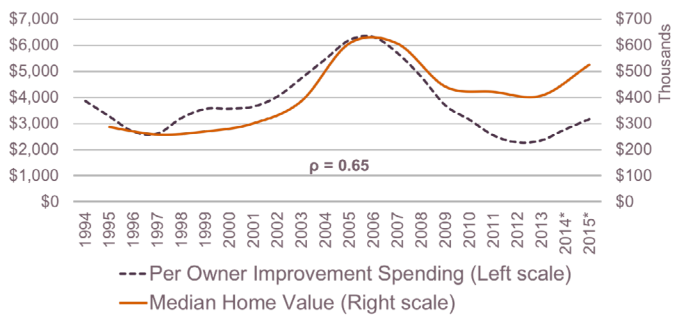
Prior Joint Center research on developing a leading indicator for the national remodeling cycle found that home prices and sales volumes are both highly correlated with spending on home remodeling projects and also tend to be leading indicators of upturns and downturns in remodeling spending.[3] Given this finding at the national level, it seems reasonable to expect that metropolitan-level changes in home prices and sales volumes would also be strongly correlated with the pace, timing, and variation of spending on remodeling projects in those areas.

Nationally, home prices and average annual home improvement spending levels are nearly perfectly positively correlated, which means that prices and remodeling activity almost always move in tandem over time. Correlation coefficients for annual data on national home prices and average improvement spending levels between 1994 and 2015 ranged from 0.83 to 0.92, depending on the specific measure of home values used in calculating the correlation coefficient.[4] This relationship also makes practical sense since home improvements, by definition, add value to a home. So when house prices (and therefore home equity levels) are rising, homeowners may be encouraged to make greater investments in their homes, and when prices are slowing or falling, homeowners may be more likely to postpone making any large, discretionary improvements to their homes.

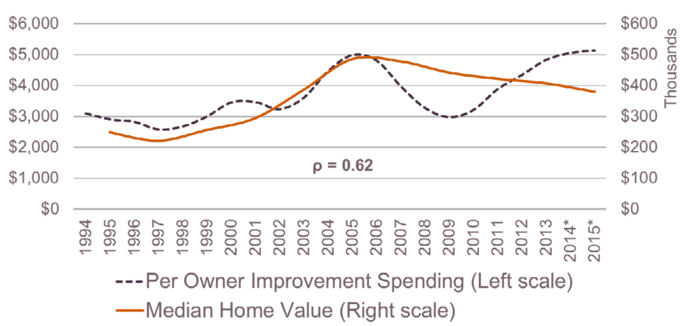
Although not quite as strong as the national correlation, metro-level median home values also correlate well with local home improvement spending levels over the past two decades in each of the major metros under consideration, with correlation coefficients ranging from 0.62 in New York to 0.76 in Chicago (Figures 5A-E). Just like the remodeling cycle, the home value cycle stands out as especially severe in metropolitan Los Angeles during the housing and economic boom and bust of the mid-2000s. In L.A., the real median home value increased 125 percent from $270,000 in 1999 to over $600,000 in 2007, compared to 45 percent nationally (from $142,000 to $206,000). After the housing bubble burst, home values in L.A. fell 30 percent to a median of $420,000 in 2011, compared to a decline of 18 percent nationally (to $169,000). The east coast markets of New York and Philadelphia had very similar magnitudes of home value booms and busts, with real home values in both metros increasing 83–84 percent during the boom (1999–2007) and shrinking 17 percent during the bust (2007–2011), though median values in the New York metro were around 70 percent higher than in Philadelphia during the boom and bust periods. Detroit and Chicago, on the other hand, did not experience the same run-ups in home values, with only 1 percent real growth from 1999–2007 in Detroit and 41 percent in Chicago, which was slightly below the growth in national median home value (45 percent). And yet, even without above-average house price booms, median home values in these Midwestern metros still suffered substantially outsized declines during the housing bust: -26 percent in Detroit and -36 percent in Chicago from 2007–2011, compared to -18 percent nationally. House price recoveries in these metros from 2011 through 2015 have also been mixed. Median home values in both Detroit and Los Angeles rebounded strongly, increasing 19 and 25 percent, respectively, over this time period. In contrast, Chicago home values grew only 5 percent, while prices in New York remained flat and continued to slide another 7 percent in Philadelphia. By 2015, all of the metros' real median home values were still well below peak levels, from -13 percent in L.A. (same as the national median) to -34 percent in Chicago.

FIGURES 5A-E

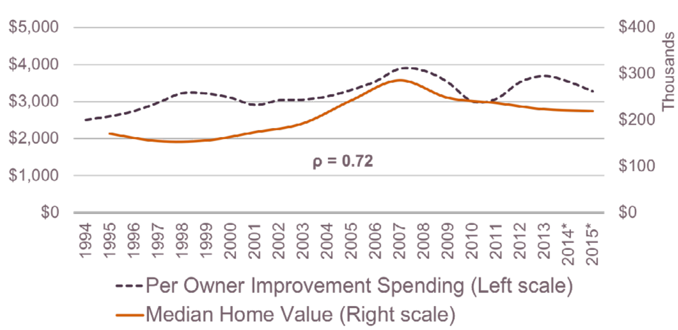
5A: HOME VALUES IN LOS ANGELES CORRELATE WELL WITH REMODELING; BOTH CYCLES ARE SIMILARLY VOLATILE



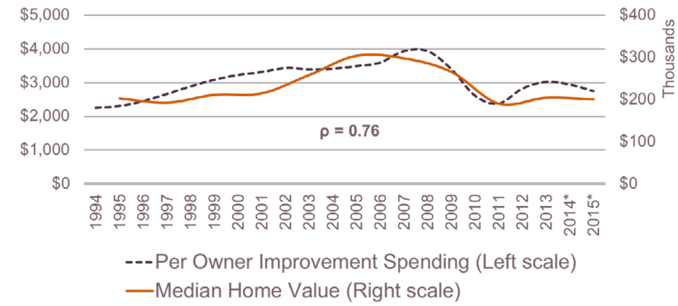
5B: HOME VALUES IN NEW YORK CORRELATE WELL WITH REMODELING; BOTH CYCLES ARE SIMILARLY VOLATILE



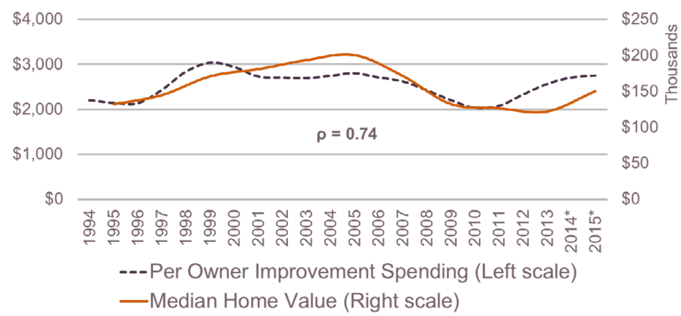
5C: HOME VALUES IN PHILADELPHIA CORRELATE WELL WITH REMODELING, BUT VALUE CYCLE IS MORE VOLATILE



5D: HOME VALUES IN CHICAGO CORRELATE WELL WITH REMODELING; BOTH CYCLES ARE SIMILARLY VOLATILE



5E: HOME VALUES IN DETROIT CORRELATE WELL WITH REMODELING, BUT VALUE CYCLE IS SOMEWHAT MORE VOLATILE



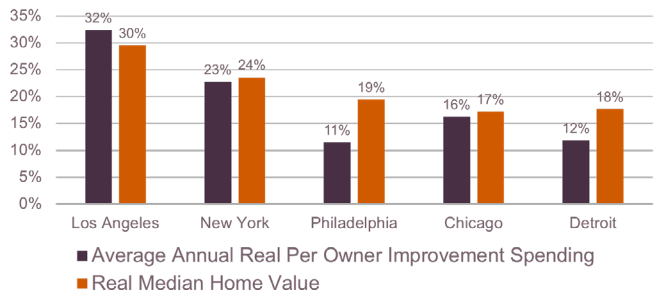
Notes: ρ is the correlation coefficient ranging from -1 to +1 where -1 indicates a perfectly negative correlation, +1 a perfectly positive correlation and 0 no correlation. Dollar values are adjusted for inflation. *Metro boundaries were updated in the 2015 AHS.
Source: JCHS tabulations of HUD, American Housing Surveys.

Not only are home values and home improvement spending levels strongly positively correlated in all of the metros, but the volatility in metro house price cycles also closely aligns with the amount of volatility in their home improvement spending cycles (Figure 6). In metropolitan New York, Chicago, and Los Angeles, the standard deviations from each metro's historical averages for home improvement spending and home values as a share of these long-term averages are nearly the same. This finding, along with the strong correlation coefficients for home prices and remodeling spending, suggests that metro-level home value cycles could be fairly good proxies for the local remodeling cycle in terms of pace and timing of upturns and downturns, as well as historical volatility levels. Yet the remodeling cycles in Detroit and Philadelphia have been somewhat less volatile than their home price cycles.

FIGURE 6

VOLATILITY IN METRO HOME VALUE CYCLES IS SIMILAR TO VOLATILITY IN REMODELING CYCLES

Standard deviation in long-run average home improvement spending and home values as share of long-run averages



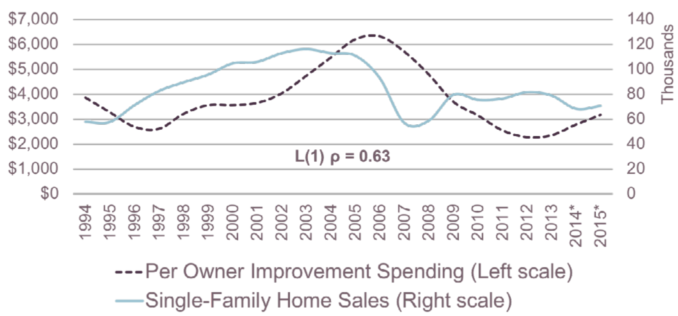
Note: Standard deviations and long-run averages calculated from 1994-2015.
Source: JCHS tabulations of HUD, American Housing Surveys; National Association of Realtors: Real Estate Outlook; CoreLogic, Inc.: Home Sales; Moody's Analytics Estimated.

Like home prices, at the national level, existing home sales activity (as opposed to sales of newly constructed homes) also has been very highly correlated with home improvement expenditure. Moreover, the correlation increases considerably when home sales are given a lead time over remodeling activity of a full year or more, which means that trends in current home sales activity are more indicative of future remodeling spending than current spending. The correlation coefficient for remodeling spending and NAR's existing single-family home sales with a lead time of one year is 0.81. And in fact, a significant amount of remodeling tends to occur around the time of a home sale, both in preparation for a sale and especially by the new owners in the first few years after purchase. A 2014 survey from the Home Improvement Research Institute found that half of recent sellers (those who sold homes in the past three years) undertook one or more improvement projects to prepare their home for sale with expenditures averaging over $8,000. And the AHS estimates that in 2014–15, over 1.5 million homeowners were motivated to remodel in preparation for selling their homes. Historically, average annual per owner spending by recent buyers (those who purchased within the prior three years) is fully 27 percent higher than average improvement spending by homeowners who did not move recently, according to Joint Center tabulations of the AHS.

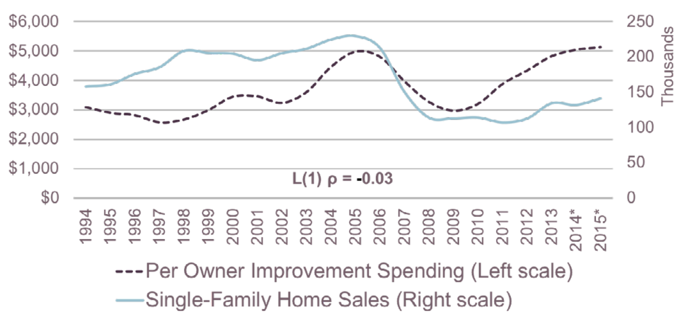
At the metropolitan level, sales of single-family homes with a one-year lead over remodeling spending correlate well with metro remodeling activity for most of the metros, though not as strongly as home prices (Figures 7A-E). The correlation coefficients for home sales and home improvement spending are moderately positive in Chicago (0.53), Detroit (0.62), and Los Angeles (0.63). In New York and Philadelphia, however, single family home sales show no correlation with lagged home improvement spending levels, with coefficients of -0.03 and -0.14, and these correlations do not improve if tested coincidentally or with varying lead or lag times. While each of the five metros saw home sales boom and bust over the past two decades, the severity of the booms and busts varied considerably. During the housing boom years, the volume of annual existing single-family home sales increased most in metropolitan Chicago and Philadelphia (25 percent) and least in Detroit (6 percent). Similarly, from peak to trough, home sales also fell most in Chicago (61 percent) and Philadelphia (57 percent) and least in Detroit (43 percent). Since hitting a cyclical bottom, home sales volumes rebounded 67 percent in Chicago through 2015, compared to 51 percent in Philadelphia and 40 percent in Detroit. Home sales activity in Los Angeles and New York over the past two decades was somewhat less extreme, growing 11–12 percent during the boom, contracting 51–53 percent during the bust, and rebounding more modestly at 24 percent in Los Angeles and 31 percent in New York through 2015. Yet by 2015, annual home sales volumes in most of the metros, while generally rising, were still about 35–40 percent below peak volumes during the housing boom, except in Detroit, where sales volumes were about 20 percent off prior peak.

FIGURES 7A-E

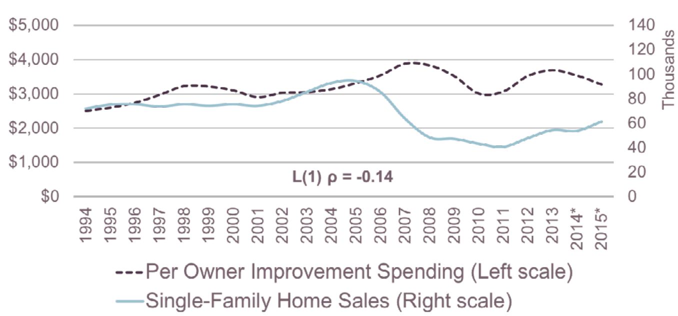
7A: HOME SALES IN LOS ANGELES CORRELATE WITH REMODELING, BUT SALES ARE LESS VOLATILE



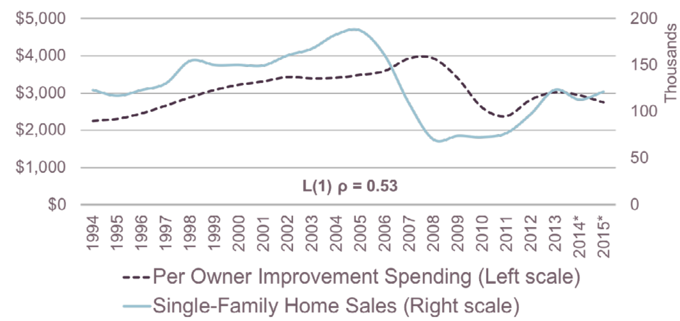
7B: HOME SALES IN NEW YORK DO NOT CORRELATE WITH REMODELING, THOUGH CYCLES ARE SIMILARLY VOLATILE



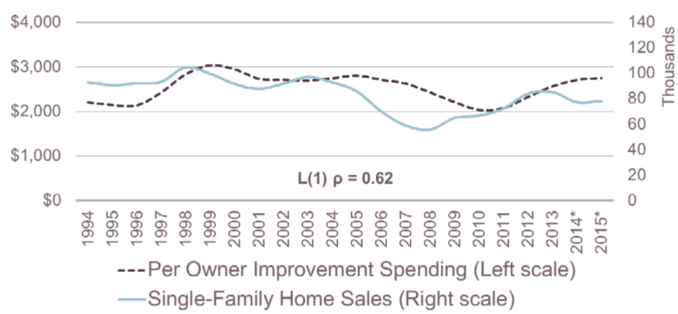
7C: HOME SALES IN PHILADELPHIA DO NOT CORRELATE WITH REMODELING AND ARE MUCH MORE VOLATILE



7D: HOME SALES IN CHICAGO CORRELATE WITH REMODELING, BUT SALES ARE MUCH MORE VOLATILE



7E: HOME SALES IN DETROIT CORRELATE WELL WITH REMODELING, BUT SALES ARE SOMEWHAT MORE VOLATILE

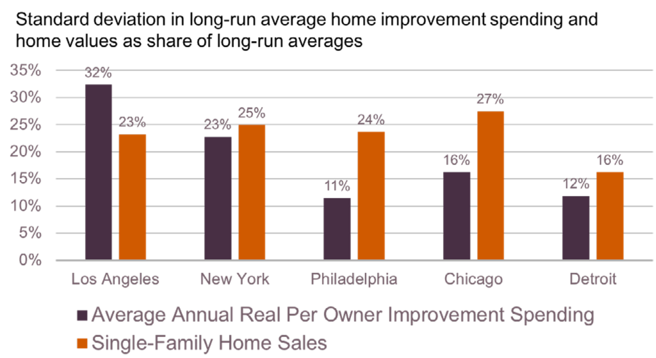


Notes: L(1) ρ is the correlation coefficient—ranging from -1 to +1 where -1 indicates a perfectly negative correlation, +1 a perfectly positive correlation and 0 no correlation—when home sales are given a one-year lead over remodeling spending. Dollar values are adjusted for inflation.
*Metro boundaries were updated in the 2015 AHS.
Source: JCHS tabulations of HUD, American Housing Surveys; National Association of Realtors: Real Estate Outlook; CoreLogic, Inc.: Home Sales; Moody's Analytics Estimated.

In addition to the overall weaker correlation coefficients between metro-level home sales activity and home improvement spending levels, the volatility in metro area home sales volumes also does not appear to match metro remodeling cycle volatility as well as home prices (Figure 8). In metros like Chicago and Philadelphia, for example, the home sales cycles have been considerably *more* volatile than their remodeling spending cycles, while in Los Angeles, the home sales cycle has been much *less* volatile than its remodeling cycle over the past two decades. These findings suggest that a metro area's home sales cycle is likely not a very good proxy for its remodeling cycle, especially given the case of Philadelphia, where home sales have no correlation with remodeling and have been much more volatile than improvement expenditure over time.

FIGURE 8

VOLATILITY IN METRO HOME SALES CYCLES IS INCONSISTENT WITH VOLATILITY IN REMODELING



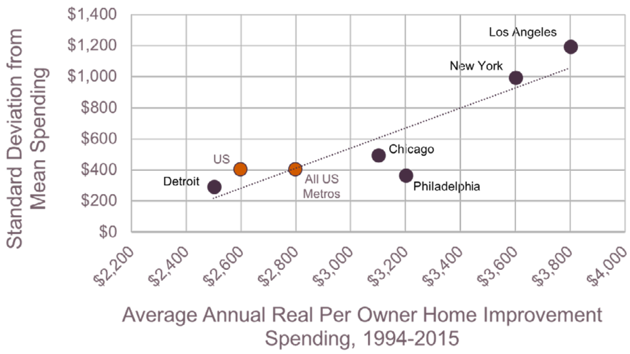
Note: Standard deviations and long-run averages calculated from 1994-2015.
Source: JCHS tabulations of HUD, American Housing Surveys; National Association of Realtors: Real Estate Outlook; CoreLogic, Inc.: Home Sales; Moody's Analytics Estimated.

Typologies of Metro Remodeling Cycle Volatility

Analysis of historical remodeling data for metropolitan Chicago, Detroit, Los Angeles, New York, and Philadelphia suggests a relationship between average levels of home improvement spending and the volatility of a metro area's remodeling cycle. Metros with higher levels of average annual per owner improvement spending tend to also experience larger swings in average spending over the course of their housing and remodeling cycles, as has been the case in New York and Los Angeles (Figure 9). In comparison, a metro like Detroit with relatively lower levels of average remodeling expenditure has had a much more stable remodeling cycle. Metropolitan Chicago also seems to fit the hypothesis with an historical average spending level about halfway between Detroit's and New York's and a standard deviation in mean spending suggesting a more volatile remodeling cycle than Detroit's, but not as volatile as New York's remodeling cycle. Of the five metros, Philadelphia is an outlier with relatively high historical improvement spending levels (similar to Chicago's), but a fairly stable remodeling cycle with volatility levels on par with Detroit's.

FIGURE 9

METRO REMODELING CYCLE VOLATILITY MAY INCREASE WITH LEVEL OF SPENDING



Source: JCHS tabulations of HUD, American Housing Surveys.

Given the limited sample size of this research, it is possible to say only that it appears markets with higher-spending homeowners might experience more volatile remodeling cycles over time, while markets with lower-spending owners might have more stable cycles. If historical data were available for more metro areas in more regions of the country, it is possible the data would show that this hypothesized linear relationship between level of spending and cyclical volatility is actually more complex. Certainly, if this relationship holds, however, it would have important implications for remodeling contracting businesses looking to expand into high-spending markets that are much more prone to periods of severe boom and bust. Remodelers in these markets would likely pursue very different business strategies for coping with drastically changing demand during large upturns and downturns than would remodelers operating in lower-spending but steadier markets.

Summary Findings and Future Applications

This first look at long-term remodeling cycles in some of the county's largest metropolitan areas finds significant variety among metro areas in terms of the timing of the peaks and troughs in average per owner spending levels, the volatility of spending levels over time, and the trajectories of remodeling spending recovery. Markets like New York and Los Angeles have experienced much more severe upturns and downturns in home remodeling activity, but New York bounced back very quickly from the recent downturn, whereas home improvement spending in Los Angeles was still far from peak levels through 2015. Differences in local housing market indicators—including home prices and sales—that have historically correlated well with remodeling activity at the national level are explaining some of the variation among major metro remodeling cycles. Given that metro-area home prices, in particular, are shown to have both a strong positive correlation with remodeling spending and also exhibit similar levels of volatility as a metro area's remodeling cycle, home price cycles may be reliably good proxies for the pace and timing of remodeling cycles in metro areas for which historical remodeling data is unavailable.

Endnotes

1. The term "cycle" refers to alternating periods of growth and decline in the remodeling industry. A complete economic cycle moves through periods of accelerating growth, decelerating growth, accelerating decline, and decelerating decline before repeating. Yet remodeling cycles are not regular or predictable, with periods of growth and decline typically varying widely in magnitude and length. For more information, see Abbe Will, "Understanding Remodeling Cycles," Harvard Joint Center for Housing Studies Working Paper, 2008.

2. The 1995–2013 national AHS used consistent county-level definitions of metropolitan geographies, but the 2015 AHS updated the definitions and is therefore somewhat inconsistent with the historical geography. With this update, boundaries changed the most for Los Angeles and Chicago, and the least for Detroit. For detail on the geographic boundaries before and after the 2015 update, see the following technical documentation from the U.S. Census Bureau: Summary of the Differences between the 2015 and 2013 AHS Metro Areas and Metropolitan Area Histories.

3. Abbe Will, "Re-Benchmarking the Leading Indicator of Remodeling Activity," Harvard Joint Center for Housing Studies Research Note, 2016.

4. Tested measures included owner-reported value from the AHS, the S&P CoreLogic Case-Shiller Home Price Index, National Association of Realtors® Median Sales Price of Existing Single Family Homes, Zillow's Home Value Index, among others.

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