

RESEARCH REPORT

# Housing Affordability

Local and National Perspectives

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March 2018

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# Acknowledgments

The Housing Finance Policy Center (HFPC) was launched with generous support at the leadership level from the Citi Foundation and John D. and Catherine T. MacArthur Foundation. Additional support was provided by The Ford Foundation and The Open Society Foundations.

Ongoing support for HFPC is also provided by the Housing Finance Innovation Forum, a group of organizations and individuals that support high-quality independent research that informs evidence-based policy development. Funds raised through the Forum provide flexible resources, allowing HFPC to anticipate and respond to emerging policy issues with timely analysis. This funding supports HFPC's research, outreach and engagement, and general operating activities.

This report was funded by these combined sources, as well as funds provided by the Alfred P. Sloan Foundation through the Urban Institute Sloan Administrative Data Research Facility database project. We are grateful to them and to all our funders, who make it possible for Urban to advance its mission.

The views expressed are those of the authors and should not be attributed to the Federal Deposit Insurance Corporation or the Urban Institute, its trustees, or its funders. Funders do not determine research findings or the insights and recommendations of Urban experts. Further information on the Urban Institute's funding principles is available at [urban.org/fundingprinciples](https://urban.org/fundingprinciples).

# Executive Summary

This report presents a new approach to measuring affordable homeownership. Future changes in the homeownership rate will depend on the ability of today's renters to become homeowners. Our proposed housing affordability for renters index (HARI) focuses on how affordable homeownership is for current renters. We compare the share of renters who reported the same or more income than those who recently purchased a home using a mortgage, in effect measuring how many renters have enough income to purchase a house. For each metropolitan statistical area (MSA), we construct a local area index that compares renters and borrowers in the same MSA and a national index that compares renters nationwide with homeowners in a specific MSA. The new indexes reveal that slightly more than a quarter of current US renters have incomes higher than those who recently became homeowners using a mortgage. The indexes also reveal how housing affordability differs over time, by location, and across racial and ethnic groups. We demonstrate the value of our new indexes by showing that they are predictive of homeownership rates: MSAs that are deemed more affordable by our index have higher homeownership rates.



# Housing Affordability: Local and National Perspectives

Rising entry-level pricing has put homeownership out of reach for more and more families, and high interest rates have made matters worse. There are many affordability measures in the literature (Fannie Mae 2015; Haurin 2016), but they are primarily variations on a comparison of median spending on housing costs and the area median household income. These measurements are incomplete because they ignore the full distribution of incomes, focusing only on the median, and because they look at the population as a whole instead of the renters who are best positioned to become first-time homebuyers. Moreover, they contain ad hoc assumptions on nonmortgage housing costs, including property taxes and insurance. Given the variability of property taxes, the implications can be misleading.

We thus offer a new affordability index that considers the entire distribution of recent mortgage borrowers and renters in assessing who can afford to buy a home. Our housing affordability for renters index (HARI) contains two MSA-level indexes: one measuring housing affordability for *local renters* and another measuring housing affordability for *nationwide renters* who may move to a region.

These indexes show variations in affordable homeownership across areas. A local index of 25 percent indicates that 25 percent of renters in a given area earn enough income to purchase a house in that area; the local index ranges from 5 percent to 37 percent. Meanwhile, the index covering all renters nationwide ranges from 3 percent to 42 percent, depending on the region into which the renter might move, assuming the renter keeps his or her current income in the move. (Incomes often fall or rise to reflect wage levels in the new area.)

For the nation as a whole, 27 percent of renters earned at least as much as households who recently purchased a home using a mortgage. We also found that the affordability index varies over time. For most MSAs, affordability in 2016 was higher than it was in 2005 but lower than it was in 2009. Indexes at the MSA level, which consider only local renters, can be different from indexes that consider area-specific home prices and the national renter population. In Washington, DC, for example, local renters' incomes are higher than the US average. DC is considered affordable to local renters but not affordable to nationwide renters. Evidence also shows that housing affordability differs by race and ethnicity. Non-Hispanic white (white) renters have higher affordability levels than Hispanic and black renters.

Finally, to demonstrate the value of our new indexes, we show that both the local and national indexes are predictive of homeownership rates. More affordable MSAs, as measured by our indexes, have higher homeownership rates.

These indexes have limitations. In particular, we consider the income of renters relative to new homeowners but do not consider down payments or credit scores. Renters often have misconceptions about how large a down payment is necessary or may have trouble saving for one. They also tend to have lower credit scores. Thus, our estimates may be considered upper bounds.

## Current Housing Affordability Indexes

Current affordability metrics measure household-level and market-level trends (Fannie Mae 2015). Household-level measures compare housing costs with income at the household level. For example, the US Department of Housing and Urban Development (HUD) defines a household as “cost burdened” whenever the household spends more than 30 percent of its gross annual income on total housing costs (Jewkes and Delgadillo 2010). Such rules of thumb are based on the fact that household wages need to cover not only housing costs but other expenditures. But any decision about what is a reasonable share of income that can safely be spent on housing is arbitrary because households who earn more can spend a higher share of their income on housing and because the share that households can spend on housing depends on home location and amenities. For example, a household could spend more on housing if the home was near a transportation hub and there was no need for a car (Pelletiere 2008; Schwartz and Wilson 2008). This measure is often aggregated to the MSA or national level and is an ex post measure, comparing actual spending and actual income.

The residual income calculation is another household-level metric. It captures a household’s ability to cover its debt service and still have enough money to cover day-to-day living expenses, such as food, clothing, and transportation. This calculation assumes a minimum level of nonhousing consumption. The US Department of Veterans Affairs (VA) uses the residual income calculation in its mortgage origination process. If the residual income left over after covering the monthly debt service is less than a certain threshold, the application for a VA mortgage would not be approved. The minimum level is determined by family size, loan amount, and census region.<sup>1</sup> Unlike cost burden, residual income is an ex ante measure used in underwriting.

Market-level affordability refers to housing affordability in a region. In most market-level affordability measures, a “typical” family is defined, and the index measures whether this family could qualify for a mortgage loan on a “typical” home.

According to the National Association of Realtors (NAR), a typical family earns the national median family income, and a typical home is a national median-priced single-family home, assuming a 20 percent down payment.<sup>2</sup> In its index calculation, the NAR assumes that the monthly principal and interest payment cannot exceed 25 percent of the median monthly family income. A similar measure is the California Housing Affordability Index, published by the California Association of Realtors. This index tracks the share of California and national households that can afford to purchase a median-priced house.<sup>3</sup>

An alternative measure is the National Association of Home Builders’ (NAHB) Housing Opportunity Index, which measures affordability as the share of home sales “in a metropolitan area for which the monthly income available for housing is at or above the monthly cost for that unit.”<sup>4</sup> A difference between the NAR and NAHB indexes is in the calculation of housing cost: the NAHB includes property taxes and insurance costs in addition to the principal and interest payments, while the NAR considers principal and interest only.

Bourassa and Haurin (2016) developed an affordability index with a structure similar to the NAR and NAHB that is meant to be forward looking. This index allows both the US income tax deductions for mortgage interest and property taxes and expected home price inflation to reduce housing costs for owner-occupants. As in the NAR index, this number is compared with 25 percent of the median family income.

These conventional market-level measures of housing affordability present two common problems. First, they consider only median household income or median home price. The median value does not tell you anything about the distribution. Consider two housing markets with the same income distribution and the same median home price. One market has a broad home price distribution, and the other has a narrow distribution. Affordability is likely to be better in the market with the broader distribution, as low-income families can find homes they can afford. Moreover, in some markets, the median might not represent the market, as the distribution may be skewed. A better path forward is to consider the whole distribution of incomes and home prices instead of a median metric.

Second, these conventional market-level measures consider all households without distinguishing between owners and renters. But renters are making the tenure choices about renting or buying. Our new index focuses on renters’ ability to become homeowners. Moreover, it is misleading to use a typical

household to represent a typical renter because homeowners and renters have different incomes. Renters often have lower incomes, which makes them less able to afford a home than the median family. The 2016 Survey of Consumer Finances shows that homeowners have an average income of \$134,000, while renters have an average income of \$47,800 (Bricker et al. 2017). Explanations for this often mix cause and effect. For example, high-income families tend to buy homes, tend to be better educated, and tend to have more family wealth. Coulson and Fisher (2002) used data from the US Current Population Survey and Panel Study of Income Dynamics and found that homeowners have higher wages, shorter unemployment spells, and a lower probability of experiencing unemployment. Munch, Rosholm, and Svarer (2008) suggest that, all things equal, homeowners stay at their jobs longer than renters because of the higher costs of moving. Employers are willing to offer them higher wages, as the employer earns a higher return on their investment in human capital. For our purposes, we acknowledge a significant difference between renter and homeowner incomes.

To resolve the issues associated with the current housing affordability metrics, this report proposes a new measure of affordability for owner-occupied housing that compares renters' income distribution with recent homebuyers' income distribution.

## Data and Methodology

### Data

We rely on the Administrative Data Research Facility<sup>5</sup> to construct our index. This database, constructed by the Urban Institute, aggregates American Community Survey (ACS) variables and Home Mortgage Disclosure Act (HMDA) variables to different geographic levels. We obtained the income of those who purchased a home in any given year from the HMDA data, and we took renter income from the ACS data. We used HMDA for the former data source because although the ACS provides the income of homeowners with a mortgage, we cannot tell which year the home purchase was made. And we wanted to compare all renters with recent borrowers. For this analysis, we include renter income and mortgage borrower income at the core-based statistical area level from 2005 to 2016 to create the local and national indexes. We discuss the results for the 20 most-populous core-based statistical areas (also known as metropolitan statistical areas, or MSAs).

## Methodology

Our method is motivated by two considerations:  $R_i$ , the probability of a renter's household income falling in a specific income level (i), and  $O_i$ , the probability that the renter with income level i has enough income to get a mortgage and purchase a home. Our index is measured by equation 1.

$$(1) \text{ Local Index} = \sum_1^n R_i * O_i$$

To calculate  $O_i$ , imagine a renter earns \$50,000 annually. The renter can afford a house purchased, with a mortgage, by a homeowner who also earns \$50,000. We assume a renter can afford whatever a homeowner who earns the same can afford, because they have the same resources with which to cover the cost. Moreover, the renter can also afford all the houses purchased by homeowners who earn *less than* \$50,000. Thus,  $O_i$  measures the cumulative probability that a mortgage borrower's income is *less than or equal to* that of all recent mortgage borrowers. Equation 2 describes this calculation.

$$(2) \text{ Local Index} = \sum_{i=1}^n R_i * (\sum_{j=1}^i B_{ij})$$

where  $B_{ij}$  is the probability a borrower's income falls in a particular income level j and  $j \leq i$ .

In this case, we do not have an ad hoc assumption, nor do we look at median borrowers, renters, or households as other housing affordability indexes do. Instead, we rely on homeowners' income distribution and renters' income distribution in an MSA and calculate the share of renters who earn enough to purchase a home in the same area. Willis (2017) used a similar distributional approach to determine the share of New York City loans that banks should make to low- and moderate-income borrowers. He used the mortgage-to-income ratio of both borrowers and renters.

We do not consider the type of home or its location within an MSA because that information is embedded in the house price. Areas that have higher house prices have higher incomes (Capozza et al. 2002; Gallin 2006).

One significant limitation of our analysis is that we do not explicitly consider down payments or credit scores. Both these items can be major barriers to homeownership (Goodman et al. 2017). Several surveys show that renters believe they need to put down 20 percent to qualify for a mortgage. But even for those who know better, saving the 3.5 percent necessary for an FHA mortgage is a struggle, as renters are less apt to have inherited wealth with which to accumulate a down payment (Hilber and Liu 2008). Credit scores are also a constraint. The median US credit score is 676, but the median score among homeowners is 751, and the 25th percentile is 680 (Ginnie Mae 2018). Bai, Zhu, and Goodman (2015) compare the profiles of first-time homebuyers (renters) with repeat homebuyers (homeowners) and find that the average FICO score for first-time homebuyers is 716, while the average FICO score for

repeat homebuyers is 741. Because renters have difficulties saving for a down payment and have lower credit scores, our affordability indexes might be an upper bound of the housing affordability level.

We also consider that homeowners are more likely to have longer periods in residence than renters, and renters are more mobile than homeowners (Rohe and Stewart 1996). We create a second housing affordability index for each MSA to evaluate the ability of renters in other regions to move to that MSA. For our MSA-specific national indexes, we assume all US renters, not just renters in that MSA, face the tenure choice for that MSA. We also assume that renters' income levels remain unchanged in this move, an inaccurate but simplifying assumption. The calculation is presented by equation 3.

$$(3) \text{ National Index} = \sum_{i=1}^n RN_i * (\sum_{j=1}^i B_{ij})$$

where  $RN_i$  is the probability of a nationwide renter in an income level  $i$ . Other variables are the same as before.

## An Example

We use 2016 data for Washington, DC, to describe how we created the indexes (table 1). We first separate renters' incomes and the incomes of new mortgage borrowers into 22 intervals. The income difference for each interval is \$10,000.

TABLE 1

## Regional and National Housing Affordability Index Calculations for Washington, DC, in 2016

Income interval	Income range (\$ thousands)	DC renter probability (%)	Borrower probability (%)	Cumulative borrower probability (%)	Renters who can afford a house (%)	Local HARI (%)	National renter probability (%)	National HARI (%)
1	1-10	6.2	0.0	0.0	0.0	0.0	9.0	0.0
2	11-20	8.1	0.0	0.0	0.0	0.0	15.6	0.0
3	21-30	9.0	0.3	0.4	0.0	0.0	13.7	0.1
4	31-40	8.4	2.0	2.4	0.2	0.2	12.1	0.4
5	41-50	7.9	4.9	7.3	0.6	0.8	10.1	1.1
6	51-60	7.7	7.1	14.4	1.1	1.9	8.2	2.3
7	61-70	7.4	7.7	22.2	1.7	3.6	6.6	3.7
8	71-80	6.4	7.8	30.0	1.9	5.5	5.1	5.3
9	81-90	5.9	7.5	37.6	2.2	7.7	4.0	6.8
10	91-100	5.2	7.4	45.0	2.3	10.0	3.1	8.1
11	101-110	4.6	6.5	51.5	2.4	12.4	2.6	9.5
12	111-120	3.2	6.0	57.5	1.8	14.2	1.8	10.5
13	121-130	3.4	5.5	63.0	2.2	16.4	1.5	11.5
14	131-140	2.5	4.6	67.5	1.7	18.1	1.1	12.2
15	141-150	2.2	4.2	71.7	1.6	19.6	0.9	12.9
16	151-160	2.1	3.5	75.2	1.5	21.2	0.8	13.5
17	161-170	1.3	3.0	78.2	1.0	22.2	0.6	13.9
18	171-180	1.2	2.6	80.8	1.0	23.2	0.5	14.3
19	181-190	1.0	2.4	83.2	0.8	24.0	0.4	14.6
20	191-200	0.7	1.9	85.1	0.6	24.6	0.3	14.8
21	201-210	0.8	1.7	86.9	0.7	25.3	0.3	15.1
22	211-Max	4.4	13.1	100.0	4.4	<b>29.6</b>	2.0	<b>17.1</b>

Source: Administrative Data Research Facility.

Notes: HARI = housing affordability for renters index. Income rounded to the nearest thousand.

In DC, local renters earn less than new mortgage borrowers. More than 40 percent of renters have incomes in intervals 1 to 6, compared with 15 percent of new mortgage borrowers. In interval 7 (incomes from \$61,000 to \$70,000), the share of renters versus new homeowners with a mortgage is similar. For intervals 8 and above, the share of renters is smaller than the share of new homeowners.

We aggregate borrower probability for each interval to get the cumulative mortgage borrower probability, which represents the share of houses affordable to renters with income in that interval. In interval 10, for example, the cumulative borrower probability is 45 percent. That is, 5.2 percent of DC local renters have incomes from \$91,000 to \$100,000, and these renters can afford roughly 45 percent of the DC homes that have recently sold.

We then aggregate the share of renters who can afford a house in each income interval to obtain our housing affordability index. The local index for Washington, DC, in 2016 was 29.6 percent. That is, 29.6 percent of renters in DC could afford a house in DC in 2016.

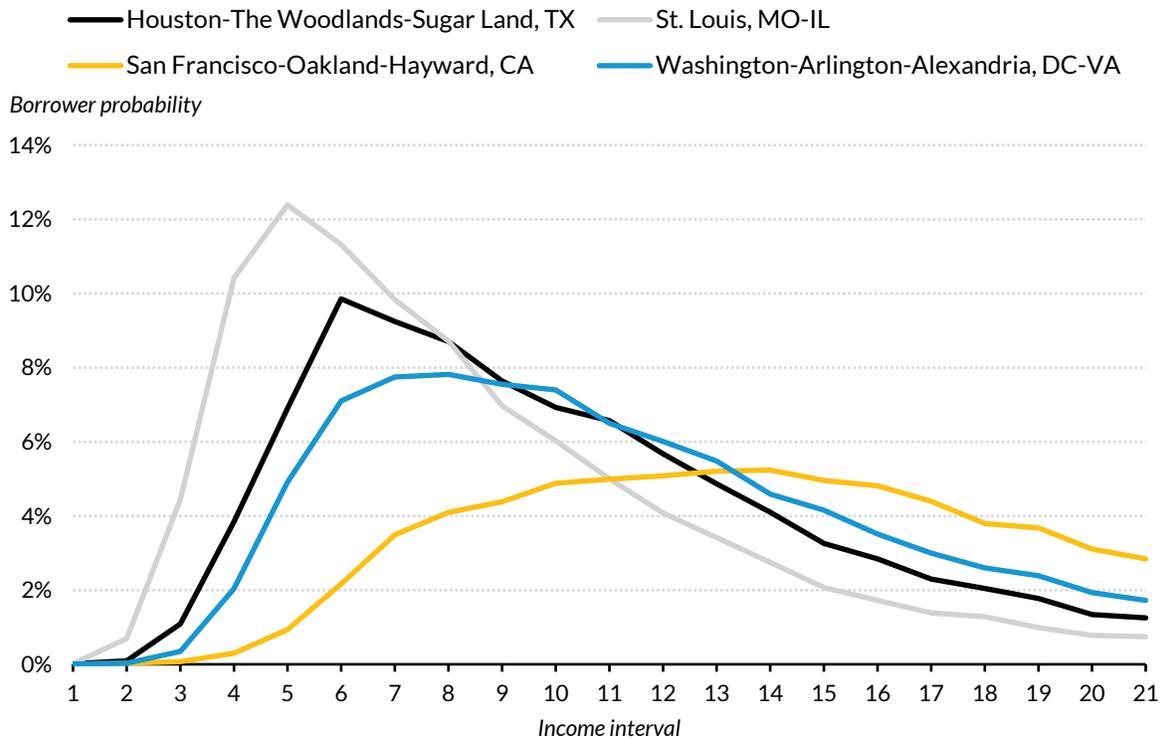
Now, let us compare nationwide renters with renters in the Washington, DC, MSA. DC renters have higher incomes than the national average: nearly 70 percent of renters nationally have incomes in intervals 1 through 6, compared with 40 percent of DC renters. DC renters are 1 to 2 percent more likely to have incomes in intervals 8 and above. Because of the income difference between DC renters and nationwide renters, the local index and national index look different. Even though the MSA index for DC is 29.6 percent, the national index for the DC is 17.1 percent. That is, only 17.1 percent of nationwide renters can afford a house in DC, based on income.

## Empirical Results

### **Mortgage Borrower and Renter Income Distributions**

We are interested in the relationship between the income distribution of new mortgage borrowers and the income distribution of all renters. In figures 1 and 2, we show examples of new mortgage borrower income distributions and all renter income distributions in Houston, St. Louis, San Francisco, and Washington, DC.

**FIGURE 1**  
**Mortgage Borrower Probability by Income Intervals**



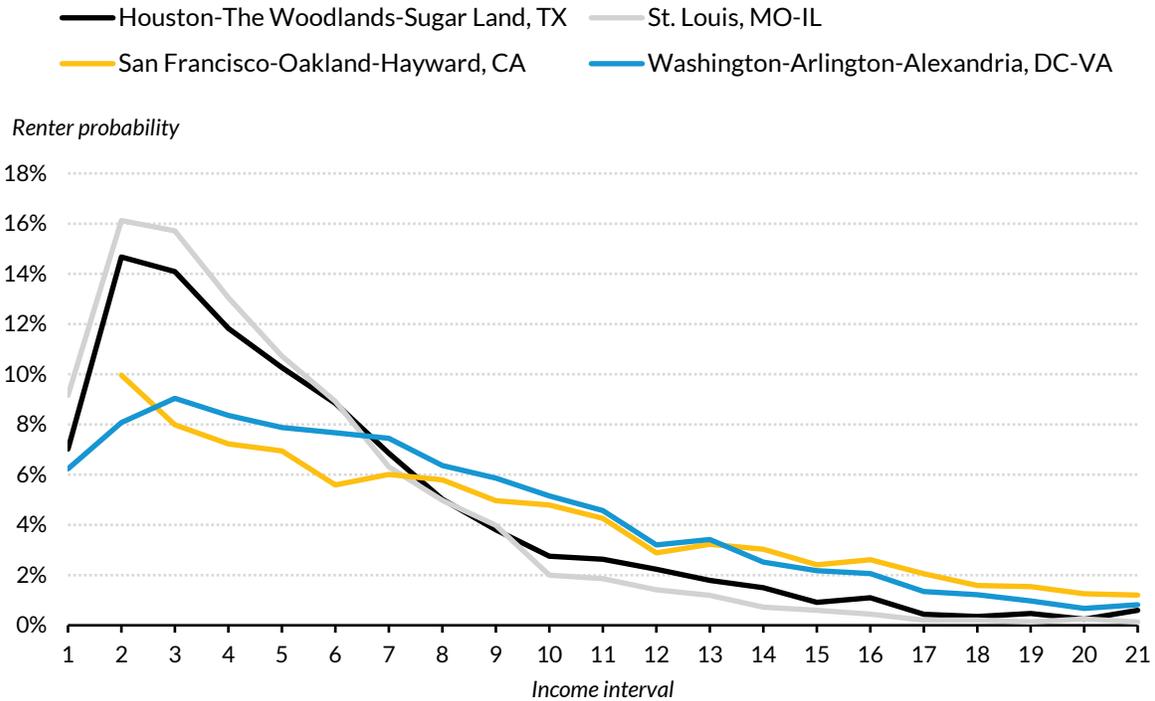
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Source: Administrative Data Research Facility.

Most new mortgage borrowers in St. Louis have lower incomes than in much of the rest of the country. About 70 percent of mortgage borrowers have incomes in the first 10 intervals. This is true for 60 percent of mortgage borrowers in Houston, 45 percent in DC, and 20 percent in San Francisco. San Francisco has the greatest share of high-income new homeowners, followed by DC. The housing affordability index is determined not only by the incomes of local new mortgage borrowers. We also need to look at the full distribution of local renters' incomes. If renters earn incomes comparable with the local mortgage borrowers, the local market would be considered affordable because renters have enough income to afford a house in that MSA.

FIGURE 2

Renter Probability by Income Intervals



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Source: Administrative Data Research Facility.

Figure 2 shows the renter income distributions for the same MSAs. In Houston and St. Louis, most renters' incomes fall in first 10 intervals. Renters in DC and San Francisco have higher incomes than renters in St. Louis and Houston. Only 2 percent of renters in St. Louis are in interval 10, compared with 5 percent of renters in DC or San Francisco. Cumulatively, 10 percent of renters are in intervals 10 and above in St. Louis, 17 percent in Houston, 32 percent in DC, and 40 percent in San Francisco. When we use this methodology to compare San Francisco and DC, we find that while mortgage borrowers in San Francisco have higher incomes than those in Washington DC, renters in these two MSAs have comparable incomes. Our index is consistent with the intuitive result that DC would be more affordable than San Francisco (figure 3).

FIGURE 3

**Local and National Housing Affordability Indexes in the 20 Most-Populous Metropolitan Statistical Areas in 2016**



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Source: Administrative Data Research Facility.

Note: The vertical yellow line indicates the US index, 27.3 percent.

**2016 Local Index Comparison**

In table 2, we show the 20 most-populous MSAs as measured by the number of households in 2016. The New York City MSA is the most populous. The second column shows the calculated local index. The next columns show the share of houses that renters with incomes in the 25th, 50th, 75th, and 90th percentiles could afford. For example, in Chicago, a renter with 25th percentile income can afford 0.2 percent of houses in Chicago, and a renter with 50th percentile income can afford about 9.1 percent.

The share increases to 47.6 percent for a renter with 75th percentile income and 71.2 percent for a renter with 90th percentile income. The overall housing affordability index for Chicago is 26.4 percent. That is, 26.4 percent of renters earn at least as much income as local mortgage borrowers who recently purchased a house.

TABLE 2

## Housing Affordability Index for the 20 Most-Populous Metropolitan Statistical Areas

Metropolitan statistical area	Local index (%)	Renters with incomes in the 25th percentile (%)	Renters with incomes in the 50th percentile (%)	Renters with incomes in the 75th percentile (%)	Renters with incomes in the 90th percentile (%)	National index (%)	Renters earning \$50,000 or more (%)	Homeownership rate (%)
New York-Newark-Jersey City, NY-NJ	22.1	0.0	5.0	34.4	68.4	15.4	5.0	51.1
Los Angeles-Long Beach-Anaheim, CA	18.0	0.0	3.6	29.1	55.3	13.6	3.6	47.7
Chicago-Naperville-Elgin, IL-IN-WI	26.4	0.2	9.1	47.6	71.2	25.0	28.9	63.5
Dallas-Fort Worth-Arlington, TX	23.8	1.6	13.0	39.8	61.8	21.7	22.4	59.1
<b>Houston-The Woodlands-Sugar Land, TX</b>	<b>22.4</b>	<b>0.1</b>	<b>5.0</b>	<b>31.0</b>	<b>66.6</b>	<b>21.2</b>	<b>21.8</b>	<b>59.4</b>
Philadelphia-Camden-Wilmington, PA	25.4	0.4	9.1	38.3	71.4	24.9	28.7	66.7
<b>Washington-Arlington-Alexandria, DC-VA</b>	<b>29.6</b>	<b>0.4</b>	<b>14.4</b>	<b>51.5</b>	<b>75.2</b>	<b>17.1</b>	<b>7.3</b>	<b>62.2</b>
Miami-Fort Lauderdale-West Palm Beach, FL	24.1	0.1	7.9	40.5	69.5	25.3	29.6	58.3
Atlanta-Sandy Springs-Roswell, GA	30.1	0.4	13.1	44.7	71.1	28.2	35.1	61.4
Boston-Cambridge-Newton, MA-NH	23.5	0.4	13.1	56.7	100.0	16.6	6.4	61.3
<b>San Francisco-Oakland-Hayward, CA</b>	<b>24.3</b>	<b>0.4</b>	<b>11.1</b>	<b>45.8</b>	<b>68.5</b>	<b>9.0</b>	<b>1.3</b>	<b>53.5</b>
Detroit-Warren-Dearborn, MI	26.0	0.6	15.4	37.9	70.7	30.3	37.9	67.7
Phoenix-Mesa-Scottsdale, AZ	31.2	0.4	12.9	48.0	76.4	29.6	37.1	61.8
Seattle-Tacoma-Bellevue, WA	25.7	0.5	8.1	40.7	71.4	18.1	8.1	59.5
Minneapolis-St. Paul-Bloomington, IL-MN	26.2	0.1	8.7	41.2	70.5	26.0	30.7	69.0
Riverside-San Bernardino-Ontario, CA	25.5	0.2	5.9	37.7	74.1	24.8	14.3	61.3
Tampa-St. Petersburg-Clearwater, FL	28.3	0.5	13.9	47.9	70.3	29.8	37.8	63.4
<b>St. Louis, MO-IL</b>	<b>26.6</b>	<b>0.7</b>	<b>15.6</b>	<b>39.3</b>	<b>70.8</b>	<b>30.6</b>	<b>39.3</b>	<b>68.2</b>
San Diego-Carlsbad, CA	20.2	0.1	6.9	38.9	76.9	14.0	2.8	52.2
Denver-Aurora-Lakewood, CO	25.6	1.0	11.9	41.1	68.8	21.5	21.6	63.9

Source: Administrative Data Research Facility.

Cross-sectional investigation shows that the MSA-level indexes vary less than many might expect. For the 20 most-populous MSAs, the least affordable is Los Angeles, where only 18 percent of renters can afford a house in the area. The second-least-affordable is San Diego (20 percent). The most affordable is Phoenix (31 percent). Eighteen of the 20 MSAs have a local affordability index between 20 and 31 percent.

This ordinal ranking may not be intuitive. For example, Washington, DC, has a higher MSA-level affordability index (29.6 percent) than Houston (22.4 percent). For traditionally high-cost areas, income is high for both homeowners and renters, so housing looks affordable doing this comparison. But even though Washington, DC, is affordable to local renters, it may not be affordable to renters in other areas. To get a broad picture, we also created a national index, which measures MSA affordability to renters nationwide.

## 2016 National Index and Local Index Comparison

Table 2 also shows the national index, which measures the housing affordability to nationwide renters, instead of local renters. In 9 of the 20 MSAs, the local index is more than 2 percentage points higher than the national index, and in 9 others, the national index and the local index are within 2 percentage points of each other. In 2 MSAs, the local index is lower than the national index.

The outliers make this analysis clear. Even though Washington, DC, is affordable to 29.6 percent of local renters, it is not affordable to renters from other places. Only 17 percent of nationwide renters can afford a house in DC. We see the same story in San Francisco. Twenty-four percent of local renters have enough income to afford a house, but only 9 percent of nationwide renters can afford a house in San Francisco.

Other MSAs are more affordable to nationwide renters than to local renters. In Detroit, 26 percent of local renters can afford to become homeowners. If we use the national index, 30 percent of nationwide renters can afford a house in Detroit. The St. Louis numbers are similar to Detroit's.

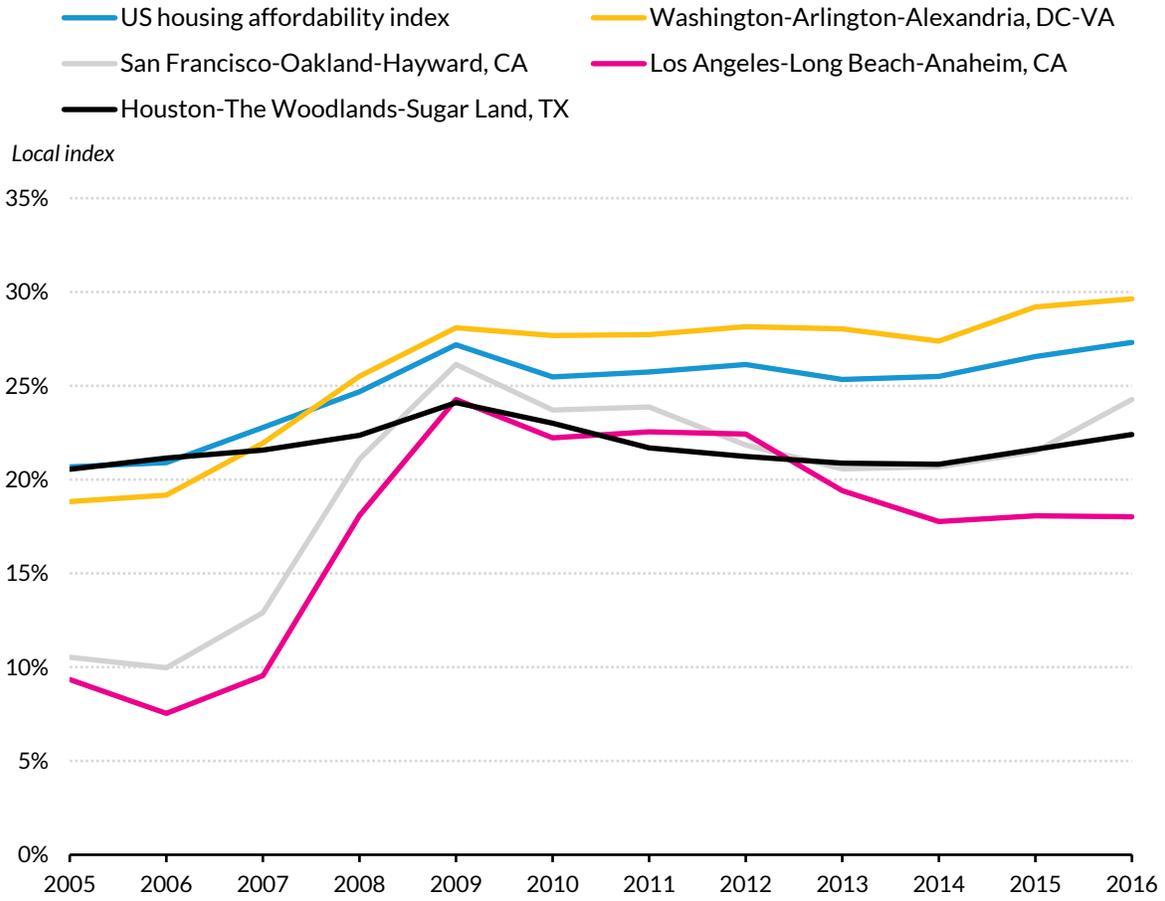
Figure 3 compares the local and national housing affordability indexes for the 20 most-populous MSAs in 2016. We also indicate the US average index (27 percent) with a line, but this US average index is not the average of local indexes. Instead, it compares the income distribution for nationwide mortgage borrowers and renters and shows that 27 percent of renters nationwide earned enough income to purchase a house somewhere in the nation, assuming their income was unchanged by a move. (We do not expect people who live in New York City to purchase homes in Houston, for example. It is

just intended to give readers an idea of orders of magnitude.) Metropolitan statistical areas above the line are more affordable than the US average, and MSAs below the line are less affordable. Among the 20 most-populous MSAs, only Atlanta, Phoenix, Tampa, and Washington, DC, are locally more affordable than the US average. The 16 other markets are less affordable than the US average.

## **Local and National Indexes over Time**

We looked at trends over time for the 20 most-populous markets. Figure 4 presents local index trends for Houston, Los Angeles, San Francisco, and Washington, DC. Figure 4a shows the local index, and figure 4b shows the national index. We also show trends over time for the US index. The MSAs followed a similar trend before 2009. In all 20 markets, the index was low (the areas were less affordable) in 2006 and increased through 2009. After that, the MSA-specific trends diverge, although the magnitude of the movement from 2009 to 2016 is smaller than from 2006 to 2009. For some MSAs, such as Los Angeles, the affordability index gradually decreased after 2009. For others, such as Houston and San Francisco, the affordability index decreased through 2014 and increased after. For MSAs like DC, affordability was stable after 2009.

**FIGURE 4A**  
**Local Index over Time**

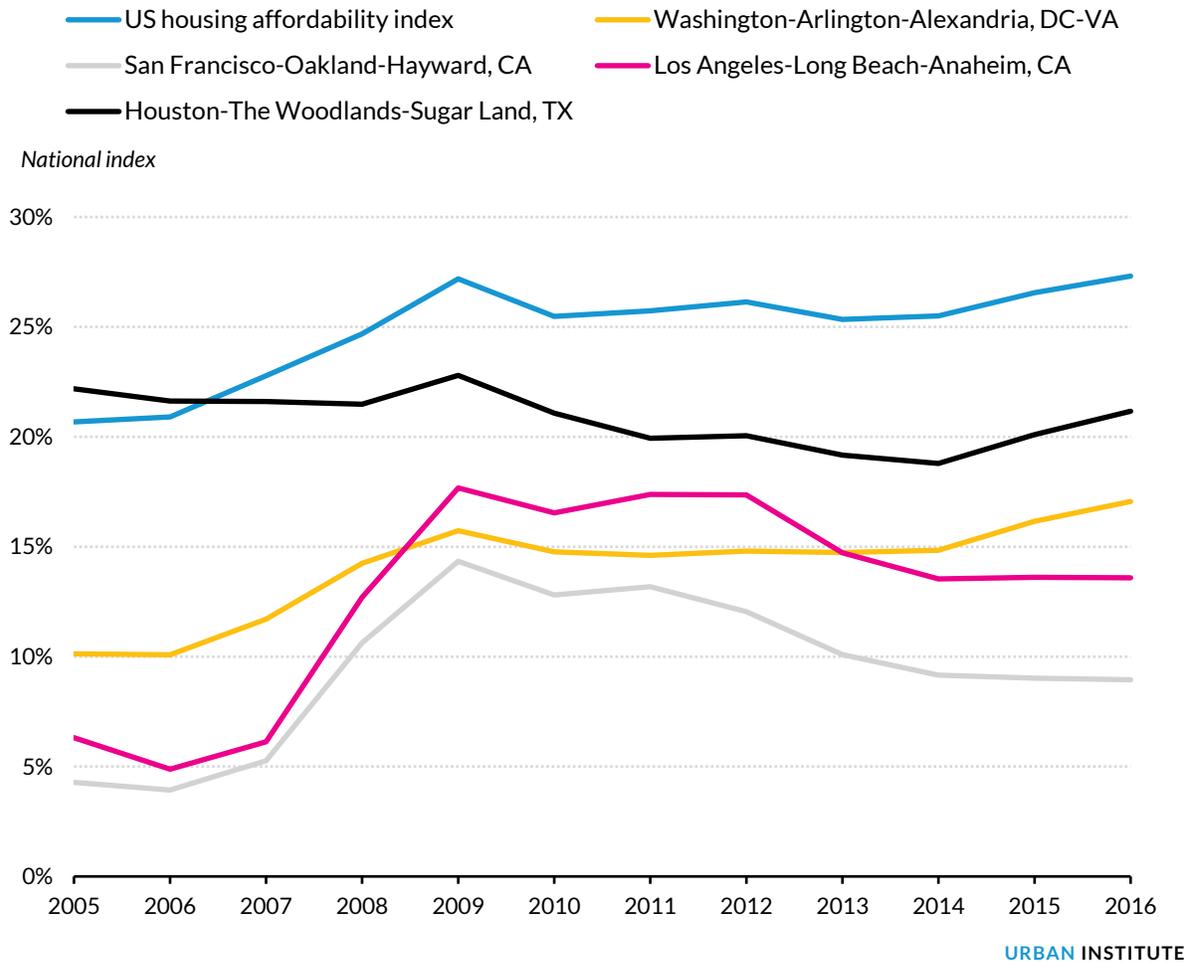


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Source: Administrative Data Research Facility.

FIGURE 4B

National Index over Time



Source: Administrative Data Research Facility.

Table 3 summarizes changes from 2005 to 2016. For the 20 most-populous MSAs, houses were more affordable to local renters in 2016 than they were in 2005. In 2005, fewer renters had the income to purchase a home at the height of the housing bubble. We observe a 7.4 percentage-point average increase between 2005 and 2016 in renters who had the income to purchase a house.

TABLE 3

## Index Change over Time for the 20 Most-Populous Metropolitan Statistical Areas

Metropolitan statistical area	2005 local index (%)	2016 local index (%)	Change (%)	2005 national index (%)	2016 national index (%)	Change (%)
New York-Newark-Jersey City, NY-NJ	15	22.1	7.1	9	15.4	6.0
Los Angeles-Long Beach-Anaheim, CA	9	18.0	8.7	6	13.6	7.3
Chicago-Naperville-Elgin, IL-IN-WI	19	26.4	7.2	18	25.0	6.9
Dallas-Fort Worth-Arlington, TX	22	23.8	2.0	22	21.7	0.2
Houston-The Woodlands-Sugar Land, TX	21	22.4	1.9	22	21.2	-1.0
Philadelphia-Camden-Wilmington, PA	20	25.4	5.4	19	24.9	5.6
Washington-Arlington-Alexandria, DC-VA	19	29.6	10.8	10	17.1	6.9
Miami-Fort Lauderdale-West Palm Beach, FL	15	24.1	9.3	15	25.3	9.9
Atlanta-Sandy Springs-Roswell, GA	25	30.1	4.8	23	28.2	5.4
Boston-Cambridge-Newton, MA-NH	17	23.5	6.2	12	16.6	4.4
San Francisco-Oakland-Hayward, CA	11	24.3	13.7	4	9.0	4.7
Detroit-Warren-Dearborn, MI	21	26.0	5.0	24	30.3	6.1
Phoenix-Mesa-Scottsdale, AZ	20	31.2	11.1	20	29.6	9.9
Seattle-Tacoma-Bellevue, WA	19	25.7	7.1	16	18.1	2.5
Minneapolis-St. Paul-Bloomington, IL-MN	20	26.2	6.3	20	26.0	6.2
Riverside-San Bernardino-Ontario, CA	11	25.5	14.3	11	24.8	14.3
Tampa-St. Petersburg-Clearwater, FL	21	28.3	7.6	22	29.8	8.1
St. Louis, MO-IL	23	26.6	4.0	27	30.6	3.4
San Diego-Carlsbad, CA	10	20.2	10.6	7	14.0	7.4
Denver-Aurora-Lakewood, CO	20	25.6	5.3	20	21.5	1.5

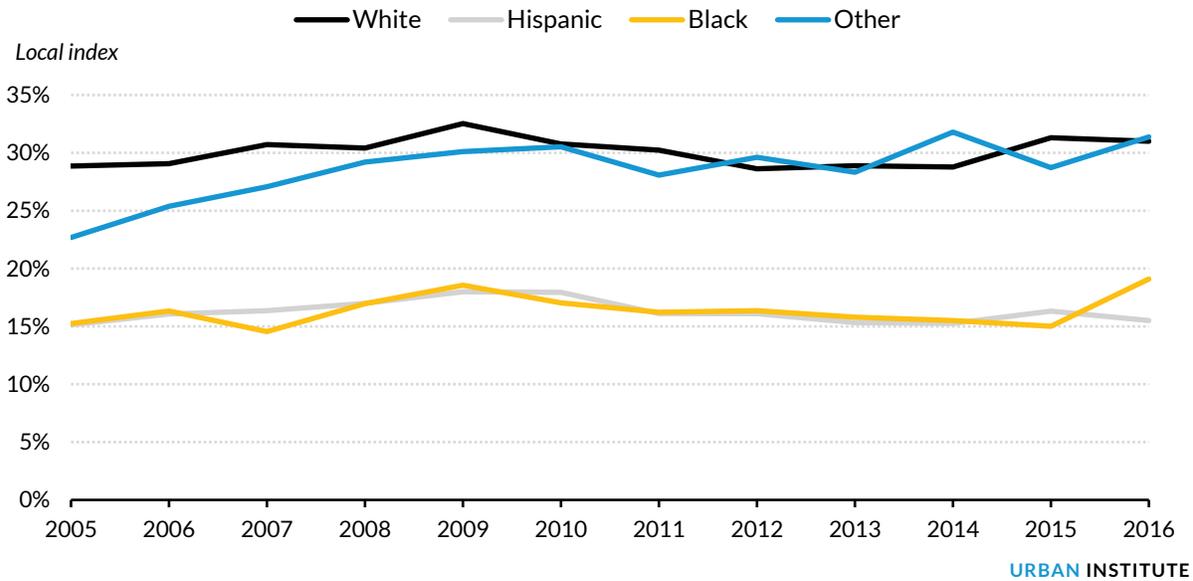
The story holds if we look at the national index. Houses were more affordable in 2016 than in 2005. For example, in New York City, only 9 percent of nationwide renters could afford a house in 2005. That share increased to 15.4 percent by 2016.

### Housing Affordability by Race and Ethnicity

Figure 5 shows the local index by race and ethnicity for Houston, Los Angeles, San Francisco, and Washington, DC, where housing affordability for black and Hispanic renters is lower than for white and “other” (most of whom are Asian) renters. In Houston, 15 to 18 percent of black and Hispanic renters earn enough income to become homeowners. Roughly 30 percent of white renters and renters of other races can afford a house, almost double the share of black or Hispanic renters.

FIGURE 5A

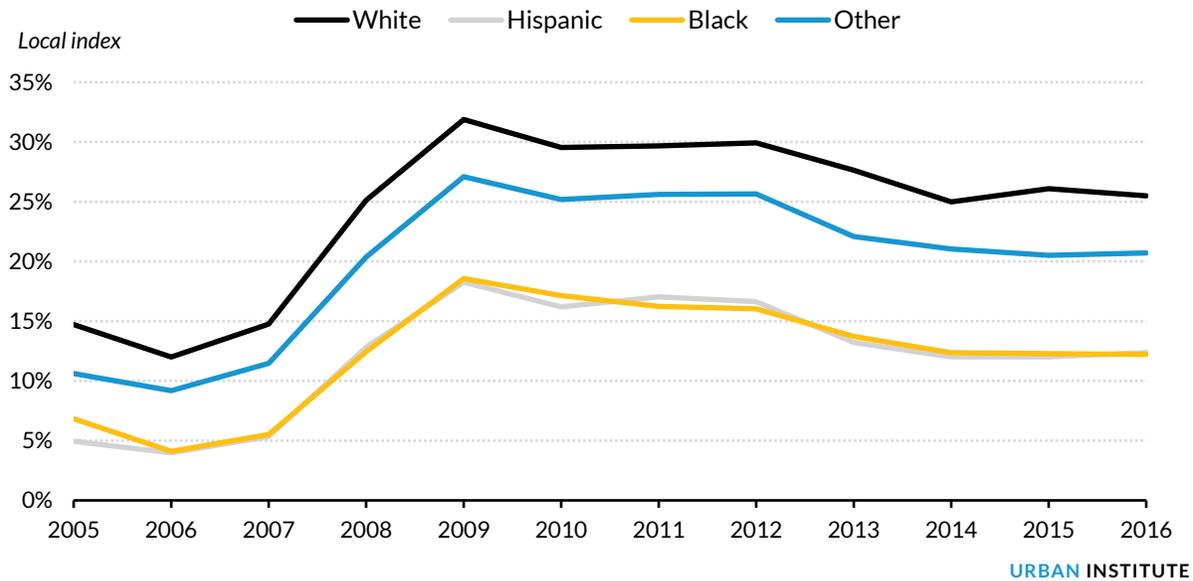
Home Affordability Index by Race or Ethnicity in Houston-The Woodlands-Sugar Land, Texas



Source: Administrative Data Research Facility.

FIGURE 5B

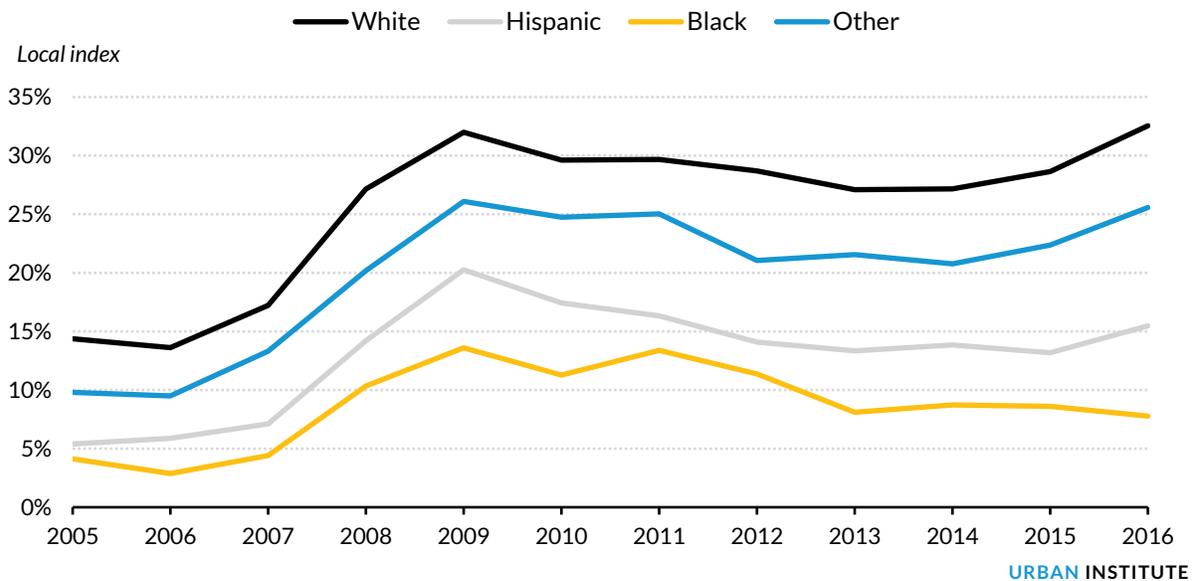
Home Affordability Index by Race or Ethnicity in Los Angeles-Long Beach-Anaheim, California



Source: Administrative Data Research Facility.

FIGURE 5C

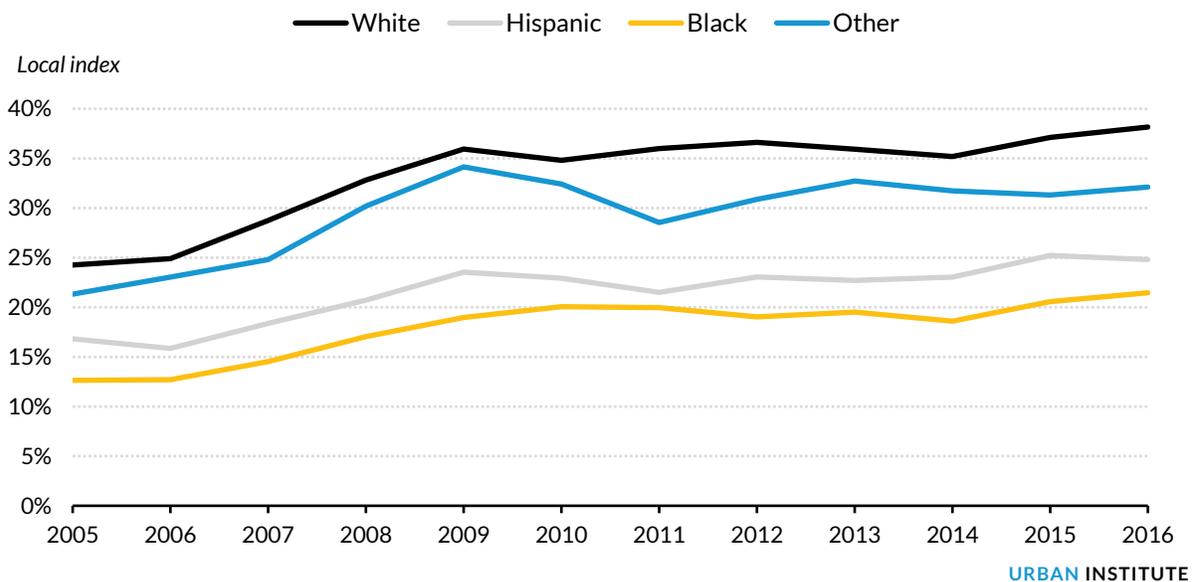
Home Affordability Index by Race or Ethnicity in San Francisco-Oakland-Hayward, California



Source: Administrative Data Research Facility.

FIGURE 5D

Home Affordability Index by Race or Ethnicity in Washington-Arlington-Alexandria, DC-Virginia



Source: Administrative Data Research Facility.

Los Angeles and Houston are similar. Black and Hispanic renters have similar housing affordability levels, while white renters and renters of other races have higher housing affordability levels.

In San Francisco and DC, racial and ethnic differences are greater. Black renters have a home affordability level 5 percent lower than that of Hispanic renters, Hispanic renters have a home affordability level 10 percent lower than that of renters of other races, and renters of other races have a home affordability level 10 percent lower than that of white renters. The home affordability gap between white renters (the group most able to afford to buy) and black renters (the group least able to afford to buy) has increased. From 2005 to 2016, the affordability gap between black renters and white renters has increased from 10 percent to 25 percent in San Francisco and from 12 percent to 17 percent in Washington, DC.

The persistent gap in home affordability levels between white renters and black and Hispanic renters in this analysis is caused by differences in income. The income of minority renters is skewed lower than that of white renters. Moreover, this analysis shows that the differences have increased in most MSAs.

## Housing Affordability and Homeownership

There is no optimal housing affordability index, but indexes should be evaluated based on their effectiveness (Haurin 2016). In this report, we use the homeownership rate to evaluate the predictive ability of both indexes. Theoretically, if a housing affordability index is higher, houses are more affordable for renters, so those areas should have higher homeownership rates.

To evaluate our measures, we use an ordinary least squares method. The dependent variable is each MSA’s 2016 homeownership rate, and the independent variable includes the local index in 2015, the national index in 2015, or both in one specification. Table 4 shows the results of these three specifications. For all regressions, affordability indexes are positively correlated with the homeownership rates. The coefficients are statistically significant.

**TABLE 4**  
**Homeownership Rate Regression Results on Affordability Index Specifications**

	Specification 1		Specification 2		Specification 3	
	Parameter	t value	Parameter	t value	Parameter	t value
Intercept	0.63	64.48	0.60	57.58	0.59	51.75
Local index	0.22	5.84			0.10	2.19
National index			0.27	7.74	0.23	5.45
R-squared	0.036		0.06		0.11	
Observations	918		918		918	

Source: Urban Institute calculations from the Administrative Data Research Facility.

The local index and the national index have different effects. In the first and second specifications, a 1 point increase in the local index implies a 0.22 point increase in the homeownership rate, and a 1 point increase in the national index implies a 0.27 point increase in the homeownership rate. Both coefficients are statistically significant. The third specification includes both indexes as independent variables. Both coefficients are positive and statistically significant. The national index has a larger impact on the homeownership rate than the local index. Even though homeownership rates are influenced by several factors, such as demographic trends and economic health, both our local and national indexes are statistically significantly correlated with homeownership rates. The variation in indexes in 2015 explain about 11 percent of the variation in the homeownership rate in 2016.

We believe both indexes are necessary to get a picture of renter affordability. The local index shows affordability for local renters, and the national index shows affordability for national renters. One can argue that as a renter moves from one location to another, wages do not stay constant and instead begin to mirror the wages in the new location. But a more affordable region provides a big incentive for renters to move in and become owners. Moreover, research has shown that workers do not capture all the gains (Hyslop and Maré 2009), suggesting the importance of the national indexes.

## Conclusion

In this report, we provide a new measure of housing affordability that addresses the weaknesses of current measures that do not account for income distributions or the renter-to-owner transition.

Our proposed measure, HARI, looks at whether renters can afford to buy a home. We compared the full income distribution of the renter population with that of borrowers who recently bought houses. We used this information to construct two relevant indexes: a local index that measures the affordability for local renters relative to the local housing market, and a national index that measures the affordability for nationwide renters relative to the local housing market.

Compared with the national indexes, local indexes show smaller variation across the metropolitan statistical areas, as areas with higher incomes generally have both renters and owners with higher incomes. In 2016, the US average index was 27 percent, indicating that 27 percent of renters nationwide earned enough income to purchase a house somewhere in the nation. The affordability index also varies over time. Affordability in 2016 was higher than in 2005, with most gains coming between 2005 and 2009. The results for the 2009–16 period are mixed across MSAs. Housing affordability also varies by race. White renters have a higher affordability level than Hispanic and black

renters. Lastly, both the local and the national indexes are predictive of the homeownership rate, with the national index showing a greater correlation to the homeownership rate.

These new indexes offer greater insight on how affordable homeownership is to renters in specific MSAs and where those renters will find the most affordable housing throughout the nation.

# Notes

1. See “Lenders Handbook–VA Pamphlet 26-7,” US Department of Veterans Affairs, accessed March 14, 2018, [https://www.benefits.va.gov/warms/pam26\\_7.asp](https://www.benefits.va.gov/warms/pam26_7.asp).
2. For a detailed description of the methodology, see “Methodology, About the Index,” National Association of Realtors, accessed March 14, 2018, <https://www.nar.realtor/research-and-statistics/housing-statistics/housing-affordability-index/methodology>.
3. The California Association of Realtors’ methodology is detailed at “Housing Affordability Index: Traditional Methodology,” California Association of Realtors, accessed March 14, 2018, <http://www.car.org/marketdata/data/haimethodology/>.
4. For more details, see “Housing Opportunity Index (HOI),” National Association of Home Builders, accessed March 14, 2018, <https://www.nahb.org/en/research/housing-economics/housing-indexes/housing-opportunity-index.aspx>.
5. “Urban Spark, About,” Urban Institute, accessed March 14, 2018, <https://adrf.urban.org/>.

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