



RESEARCH INSTITUTE FOR HOUSING AMERICA **SPECIAL REPORT**

The Location of Affordable and Subsidized Rental Housing Across and Within the Largest Cities in the United States

Michael D. Eriksen
West Shell Associate Professor of Real Estate
Lindner College of Business
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Dr. Eriksen's research focuses on low-income housing markets, and he has worked on projects concerning the Low-Income Housing Tax Credit program, housing vouchers, home safety modifications, and disparities in home ownership. That research has appeared in the *Journal of Public Economics*, *American Economic Journal: Economic Policy*, *Journal of Urban Economics*, and *Real Estate Economics*. His work on fall prevention among the elderly won the 2014 best paper on senior housing award sponsored by the National Investment Center for Senior Housing.

Michael is currently on the Board of Directors of the American Real Estate and Urban Economics Association (AREUEA) and editorial board of the *Journal of Housing Economics*. He has received financial support for his research from the John D. and Catherine T. MacArthur Foundation, the National Institutes of Health, and the U.S. Department of Housing and Urban Development. His research has also been featured in the *Wall Street Journal*, *Frontline*, National Public Radio's *All Things Considered*, *USA Today*, *Money Magazine*, *Atlanta Journal-Constitution*, *Moneywatch*, and U.S. Congressional Testimony. He has also presented his research at the Congressional Budget Office, Department of Housing and Urban Development, Government Accountability Office, Urban Institute, American Enterprise Institute, AARP Foundation, and Fannie Mae.

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Executive Summary

Low and moderate income (LMI) households are an important part of the population served by the housing and mortgage industries. Over the last two decades, house prices and rent appreciation have exceeded growth in earnings for many Americans creating economic obstacles both for renters and prospective first-time homebuyers. Moreover, these changes in purchasing power have varied substantially across metropolitan areas. Cities with recent employment and income growth in areas with significant housing supply constraints have seen the greatest challenges in this regard, especially in the rental market.

Against this backdrop, this report provides evidence on changes in rent levels and the availability of subsidized rental housing for LMI households over the last two decades in the nation's 50 largest metropolitan areas. The estimates used in the analysis are primarily based on annual projections made by the U.S. Department of Housing and Urban Development (HUD) each fall to determine subsidy eligibility and generosity for the housing programs they administer for the upcoming fiscal year. These projections give a novel perspective of rents and resulting affordability as determined by HUD for the upcoming year and can be used to detect and address housing crises faster than using household survey data alone.

There are three parts of this report. The first part focuses on the evolution of housing rents and underlying affordability in the 50 largest metropolitan areas in the United States, including projections for 2021 made by HUD in fall 2020 after the emergence of the COVID-19 pandemic. The principal findings of the first part of the report are:

- The population-weighted median rent of a 2-bedroom housing unit across the 50 largest cities is projected to be \$1,629 per month in 2021. This is a 4.3% increase from 2020, which is higher than the 2.0% average increase in projected rents between 2001–2020. This is the seventh consecutive year rents were projected to increase faster than inflation.
- The highest rents were in cities with also the highest median household incomes. Annual median rents were on average \$324 higher for every \$1,000 increase in household median incomes across the 50 cities in 2020.

Recent increases in rent since 2001 were also correlated with additional employment and earnings growth, and in cities with geographical and regulatory supply constraints.

- Household median incomes appreciated on average 0.8% per year net of inflation in these cities between 2001 and 2020. On average, rents appreciated 175% faster than median incomes with the largest differential in growth rates estimated to occur in Seattle, WA at 376%.
- The average LMI household earning 60% of their metropolitan area's median income in 2020 needed an additional \$3,228 per year to rent a median housing unit and spend less than 30% of their household income. In 2001, an LMI household could spend less than 30% of their household income to rent the median rental unit in 38 of the 50 largest cities. This decreased to only 17 of the largest cities by 2020 suggesting a greater share of cities have become unaffordable to such households over the last 20 years.

The second part of the report focuses on the location of subsidized housing across and within the 50 largest metropolitan areas. The federal government spent an estimated \$52 billion subsidizing the rent of LMI households in 2019. The Low-income Housing Tax Credit (LIHTC) and Housing Choice Vouchers (HCV) are the largest rental subsidy programs, although there are still a significant number of public housing units in some large cities. The LIHTC provides a tax subsidy to private developers who construct rent-restricted units for at least 30 years, whereas the HCV program provides a voucher to individual households that caps their contribution towards rent at 30% of their gross income for privately supplied rental units up to an approved maximum.

The maximum income to receive a rental subsidy from the LIHTC program is 60% of their area median income, although the majority of HCV subsidies are targeted to much lower income households.

- An estimated 11.2 million renter households in the 50 largest cities had an income less than 60% of their metropolitan area median income in 2019 according to the American Community Survey. This represents 43% of all renter households in those cities, with the highest percent (51%) in Cincinnati, OH.
- There were an additional 1.4 million renter households earning less than 60% AMI between 2005 and 2019 in the 50 largest cities, representing a growth rate of 14.8%. The number of households earning between 60% and 80% AMI increased 22.2% over that same period.
- There was less than one rental subsidy available for every three otherwise income eligible renter households in 2020. New Orleans, LA had both the highest percentage of rental subsidies per capita and as a percentage of renter households earning less 60% of their local median income. The fewest number of rental subsidies per capita was in Phoenix, AZ.
- Almost 40% of subsidized renters under the LIHTC and HCV programs live in a neighborhood with a poverty rate greater than 20% in 2019, which is almost double the percentage of all renter households. 67% of occupied public housing units remain in high-poverty neighborhoods.

The third and final part of the report focuses on how the mandatory adoption of Small Area Fair Market Rents (SAFMRs) in 24 metropolitan areas in 2018 affected the surrounding neighborhood poverty rates of HCV recipients. Maximum rents of HCV recipients have traditionally been constant across metropolitan areas, but starting in 2011 HUD first allowed maximum rents to vary at the ZIP code level called SAFMRs in Dallas, TX in an effort to promote voucher households to move to higher-opportunity and more racially diverse communities. HUD allowed all public housing authorities that administer the HCV program locally to adopt SAFMRs in 2017, but required their adoption in 24 metropolitan areas starting in 2018. The principal results of the analysis of surrounding poverty rates after indicated:

- There was an immediate reduction in the percent of HCV recipients in high-poverty ($\geq 20\%$) Census tracts in metropolitan areas with mandatory SAFMRs. An estimated 2.7% fewer recipients lived in such areas within one year of SAFMRs becoming mandatory relative to metropolitan areas where SAFMRs were optional.
- There was a 3% increase in the relative likelihood of at least one voucher being used in a low-poverty ($< 10\%$) Census tract in metropolitan areas with mandatory SAFMRs. On average, there was a 15.6% increase in the number of voucher recipients in low-poverty tracts. These effects should be expected to increase after 2019 as voucher rental contracts of existing recipients are renewed.
- Significant heterogeneity in effects existed across metropolitan areas with mandatory SAFMRs. Additional research is needed to better understand those differences and how to mitigate the negative impact of reduced voucher payment standards on recipients remaining in high-poverty neighborhoods.

Introduction

Low and moderate income (LMI) households are an important part of the population served by the housing and mortgage industries. Over the last two decades, house prices and rent appreciation have exceeded growth in earnings for many Americans creating economic obstacles both for renters and prospective first-time homebuyers. Moreover, these changes in purchasing power have varied substantially across metropolitan areas. Recent employment and income growth in cities with significant geographic (e.g., mountains, coasts) or local regulatory constraints have seen the greatest affordability challenges, especially in the rental market.

Against this backdrop, this report provides evidence on changes in rent levels and housing affordability for LMI households over the last two decades in the nation's 50 largest metropolitan areas. In an important empirical innovation, this analysis uses publicly available data from the U.S. Department of Housing and Urban Development (HUD) on projected rents and income at the metropolitan level for both unsubsidized and subsidized rental units. These data provide a more up-to-date snapshot of markets and allow for a clearer description of emerging regional trends than other sources relying on household survey data. This report includes rental projections up through 2021 released by HUD in October 2020 after the emergence of COVID-19. The report will be of interest to those tracking affordability trends in the housing and mortgage industries, policy makers, advocates, and the media.

There are several principal findings. The first part of the report focuses on how the median rent of a 2-bedroom apartment in each metropolitan area has evolved since 2001 relative to that area's median 3-person household income. Between 2001 and 2020, median housing rents increased on average 2.0% faster annually than inflation in the 50 largest metropolitan areas and are projected to grow an additional 4.3% in 2021. Over this same period, median household incomes only increased 0.8% per year on average. The fastest increases in rental prices occurred in areas with higher income and employment growth paired with limited housing due to regulatory and geographic constraints. The greatest decrease in affordability occurred in Seattle, WA with median rents increasing 4.8% annually net of inflation between 2001–2020, while median incomes increased less

than 1% per year. As a potential result of COVID-19, the fastest appreciating rental markets between 2001–2020 are projected to have below average rental growth in 2021.

The report next focuses on how low- and moderate-income households have been affected by the general decrease in affordability. HUD defines a low-income household as earning less than 60% of the household-adjusted metropolitan area median income (AMI), which also determines the maximum income a household could earn to reside in a property subsidized under the Low-Income Housing Tax Credit (LIHTC) program. In 2001, a 3-person household earning 60% of their local AMI standard could rent the median 2-bedroom housing unit and spend less than 30% of their household income in 38 of the 50 largest metropolitan areas. The average low-income household earning exactly 60% AMI in the 50 largest cities in the U.S. could spend less than 30% of their income to rent a median unit in 2001, although this was not true 19 years later. The number of cities where a low-income household could spend less than 30% of their income to rent a median unit decreased to only 17 of the 50 metropolitan areas in 2020. It is estimated a low-income household would have to spend an additional 7.6% of their income to rent a median rental unit in 2020 as compared to 2001.

The second part of the report focuses on the location of subsidized housing across and within the 50 largest metropolitan areas. The federal government spent \$52 billion subsidizing the rent of over 7 million households in 2019, although significant variability exists where those units are located relative to need. There were an estimated

OVERVIEW OF FEDERAL RENTAL HOUSING SUBSIDY PROGRAMS

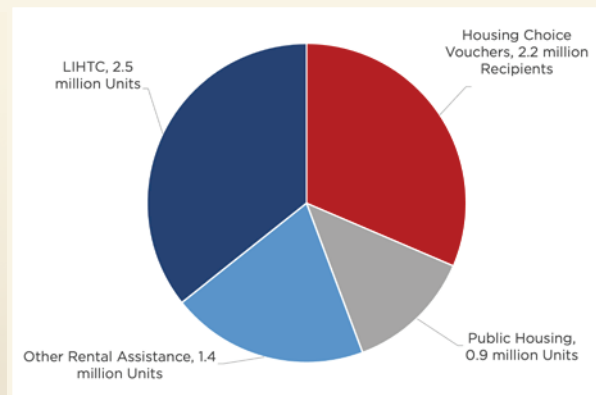
There are 3 main rental subsidy programs sponsored by the US federal government. The Low-Income Housing Tax Credit (LIHTC) is the largest program on a per-unit basis with over 2.5 million units subsidized under the program since its creation in 1986. The LIHTC provides a tax subsidy to developers of rent- and income-restricted housing units lasting 30 years. The maximum rent of an LIHTC-subsidized unit is 18 percent of the metropolitan area's median income adjusted by family size. The Joint Committee on Taxation of the U.S. Congress estimates the LIHTC program resulted in \$9.4 billion in lost tax revenue in 2019.

The LIHTC program largely replaced what is commonly referred to as public housing, with only a limited number of new public housing projects since the early 1980's and widespread demolitions starting in the 1990s. There is a legacy of rapidly deteriorating public housing across the nation with almost 1 million units still existing. The federal government provided \$7.4 billion in subsidies to local public housing authorities who administer the public units in 2019 because rent collected from tenants is insufficient to operate and maintain the aging structures.

Traditional public housing and the LIHTC are examples of place-based rental housing subsidy programs since the subsidy is tied to specific units and not individuals. The Housing Choice Voucher (HCV) program instead provides a subsidy directly to recipients equal to the difference between 30% of their gross income and the market rent of a privately-supplied unit traditionally capped by a metropolitan-wide maximum. There were 2.2 million HCV recipients in 2019 costing an estimated \$22.6 billion per year and there are growing

policy concerns about the number of HCV recipients using the subsidy to live in high-poverty areas. HUD allowed public housing authorities to increase the maximum HCV unit rent in high-rent ZIP codes starting in 2017 to encourage more households to move to lower-poverty neighborhoods.

Figure C1. Rental Housing Subsidies in 2019, by Program.





11.2 million LMI households earning less than 60% of their metropolitan average in 2019 according to the American Community Survey in the nation's 50 largest metropolitan areas. This represents 43% of all renter households in those areas, and a 1.4 million increase since 2005. There were on average 7,758 rental housing subsidies for every 100,000 households with 32.5 additional subsidies per every \$100 in housing affordability gap. Metropolitan areas experiencing recent population growth had the fewest housing subsidies independent of affordability.

Almost 40% of subsidized renters under the LIHTC and HCV program lived in a neighborhood with a poverty rate greater than 20% in 2019, which is almost double the percentage of all renter households. 67% of occupied public housing units also remain in these high-poverty neighborhoods. A continual struggle of federal housing policy has been to encourage subsidized households to move to lower poverty neighborhoods that enable greater economic opportunity. Housing voucher recipients have the freedom to choose where to live, but were still 123% more likely to live in a Census tract with a poverty rate exceeding 20% than all renter households. Housing advocates have argued a single-metropolitan wide maximum voucher payment standard has prevented recipients to move to areas of the greatest opportunity. Starting in 2017, housing authorities in metropolitan areas were able to adopt a previous standard that varies across ZIP codes with a higher maximum payment in low-poverty areas called Small Area Fair Market Rents (SAFMRs). HUD further mandated adoption of SAFMRs to determine voucher payment standards in 24 metropolitan areas starting 2018.

The final part of the report discusses how mandatory adoption of SAFMRs affected the percent of voucher recipients living in high poverty Census tracts relative to areas where they were optional. An increasing percentage of voucher recipients were living in high poverty Census tracts between 2012–2016, although this trend was reversed in metropolitan areas with mandatory SAFMRs. An estimated 2.8% fewer recipients lived in high-poverty areas within one year of SAFMRs becoming mandatory relative to metropolitan areas where SAFMRs were optional. There was also a 3% increase in the relative likelihood of at least one voucher being used in a low-poverty (< 10%) Census tract in metropolitan areas with mandatory SAFMRs, with an 15.6% increase in total voucher usage. These effects should be expected to grow in the future, although budget uncertainty and the potential harm of increasing voucher recipients' rental contribution in low-rent ZIP codes suggests future research is needed before nationwide mandatory adoption.

The report is organized as follows. The next section provides background on previous relevant studies on affordability and subsidized housing and introduces the data sources used in the current analysis. The following two sections document rent levels in 2020 and rent growth from 2001 through 2020, respectively. Following that we discuss the measurement of housing affordability gaps. The final three sections examine the location of subsidized housing across and within metropolitan areas. There is a brief conclusion.

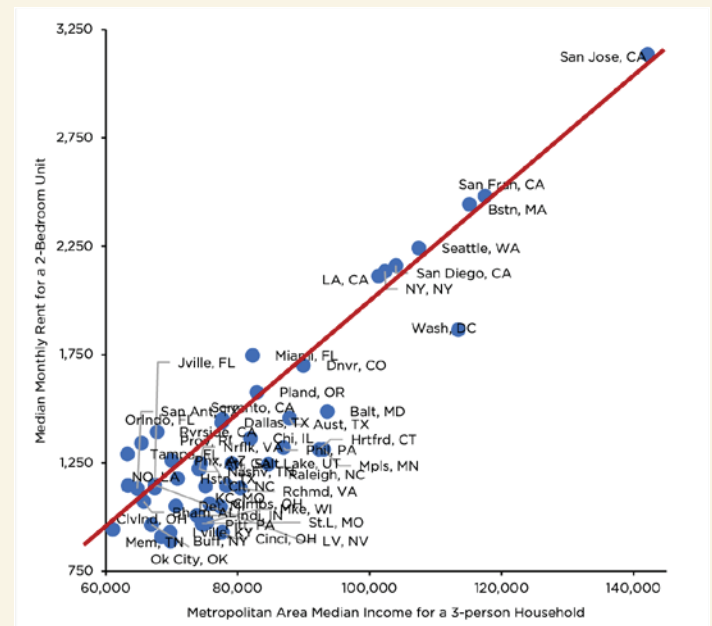
Rent Levels in 2020

It is accepted that rental housing is unaffordable for most low-income households in the largest metropolitan areas. Less is known about affordability in moderate sized cities and how the distribution of rents relative to incomes have shifted over time. This knowledge deficit occurs for multiple reasons, with often the best evidence coming from survey data with a significant lag between when the survey was conducted and the data released. Furthermore, survey evidence is usually based on repeated cross-sections with often only limited housing attributes and statistical power to isolate real trends from sampling errors.

The primary data series used in this analysis originates from HUD and are generated to help administer the housing programs HUD oversees. The first data series tracks the median, or 50th percentile of, rents for each metropolitan area by number of bedrooms.¹ These data were first generated in 2001, and used to determine the maximum housing voucher subsidy, or Fair Market Rent (FMR), in some metropolitan areas. The rent estimates are released in October and a variety of methods and sources have been used by HUD to calculate median rents since 2001, which by law are supposed to represent the “most recent data available.” In recent years, these are based on the most recent vintage of contract gross rent (including major utilities) paid by recent movers in the American Community Survey conducted by the U.S. Census Bureau, inflated using HUD’s forecasted growth in gross rent trends factor for the metropolitan area.

This report focuses on median rents of 2-bedroom units from 2001-2020 in the 50 largest metropolitan areas based on 2019 population estimates by the U.S. Census Bureau. The y-axis in Figure 1 illustrates the distribution of 2-bedroom rents across each of the 50 metropolitan areas in 2020. The population of these 50 metropolitan areas represent 179,844,653 individuals, or 54.5% of the U.S. population. The most populous metropolitan area was New York, NY with 19,216,182 inhabitants and the least populous was Buffalo, NY with a population of 1,127,983. It is important to recognize these estimates do not account for differences in square footage or other unit attributes besides the number of bedrooms on rents.

Figure 1. Comparison of median rents of 2-bedroom housing units and median incomes of a 3-person household in 2020.



Notes: Source: HUD. Solid line is the fit of a population-weighted linear regression with an R-squared of 82.6%. A \$1,000 increase in median income was associated with an additional \$324 per month in annual rent.

The most expensive median 2-bedroom rents in 2020 were in San Jose, CA at \$3,137 per month and the least expensive were in Buffalo, NY at \$891 per month. The median rent in San Jose is a significant outlier as compared to the other cities, with a \$655 gap between itself and the next highest city. A clustering of six cities occurs with median rents between

1. The underlying data used to create the tables and figures in this report is available to download at <http://www.cba.uc.edu/faculty/eriksemi/>



\$2,113 and \$2,482. Those six cities and associated median monthly rents were San Francisco, CA (\$2,482), Boston, MA (\$2,443), Seattle, WA (\$2,243), San Diego, CA (\$2,161), New York, NY (\$2,134), and Los Angeles, CA (\$2,113). The population weighted average of median rents for 2-bedroom units across the 50 metropolitan areas in 2020 was estimated to be \$1,564 per month, or \$18,768 annually.

Variability in household incomes is the most widely acknowledged factor explaining differences in rents across cities. Companies in high rent areas must increase salaries to attract and retain employees, although differences in amenities and housing supply constraints are also important factors in determining local rents. HUD annually publishes the median gross household income for each metropolitan area used to determine eligibility for its mean-tested subsidy programs in April of each year. The x-axis in Figure 1 represents this area median income (AMI) for a 3-person family in each of the 50 cities.²

As anticipated, there is a significant correlation between AMI and median rents with almost a perfect mapping in rank order of the top eight cities in both categories. The solid line in the figure represents the fit of a population-weighted linear

regression with R-squared of 82.6% and a slope of 0.027.³ This estimated slope means median rents were \$27 higher per month, or \$324 annually, for every \$1,000 increase in median incomes. The population weighted average of AMI in 2020 for 3-person household was estimated by HUD to be \$86,337.

Similar to rents, median incomes for a 3-person household in San Jose, CA (\$142,131) were significantly higher than other metropolitan areas with an almost \$25,000 gap to the next highest metropolitan area in nearby San Francisco. Of the 8 cities with the highest median incomes, Washington, DC is an outlier with relatively lower median rents (\$1,866 per month) as a percentage of median income (\$113,417). Of the 50 largest cities in 2020, the median incomes of 3-person households were the lowest in Memphis, TN (\$61,119), Tampa, FL (\$63,279), and New Orleans, LA (\$63,369). While Memphis also had the 46th ranked median rents, rents were relatively higher in Tampa (22nd) and New Orleans (32nd). Based on rank orderings, the largest differences in rankings occurred for Orlando, FL (18th highest rent, 46th highest income) and Cincinnati, OH (47th highest rent, 23rd highest income).

2. The 3-person AMI is used throughout the paper because this is the targeted occupancy of a 2-bedroom subsidized unit under the Low-Income Housing Tax Credit Program.

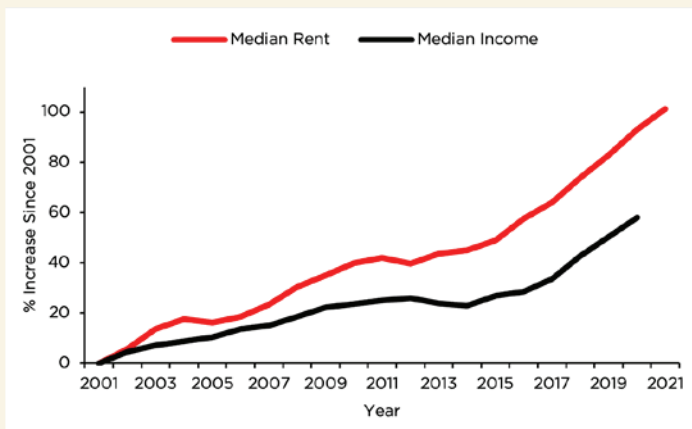
3. R-squared is a statistical measure that explains the strength of the relationship between the dependent variable represented on the y-axis and the independent variable on the x-axis plus an intercept. An R-squared of 82.6% means that percent of the variation in the dependent variable is explained by the independent variable and intercept, with a higher percentage indicating a superior fit.

Rental Growth (2001–2021)

This section is devoted to understanding regional trends in median rents and incomes over the last 20 years. While it is evident that substantial disparities in rental affordability exist across metropolitan areas, the trends over the last 20 years are less clear. It is also unknown whether the same set of areas were always unaffordable, or whether they are converging or diverging in affordability. The section concludes with rental projections for 2021 released by HUD in October 2020 for each metropolitan area.

Figure 2 compares growth in median rent and income in the 50 largest metropolitan areas since 2001. These estimates are nominal, or not adjusted for inflation. Median rents of a 2-bedroom housing unit increased 93% since 2001, whereas median incomes increased 58%. HUD forecasts rents to increase another 4.3% in 2021 meaning that median rents will have more than doubled over the last 20 years.

Figure 2. Percent increase in the nominal median 2-bedroom rent and area median income of a 3-person household since 2001.

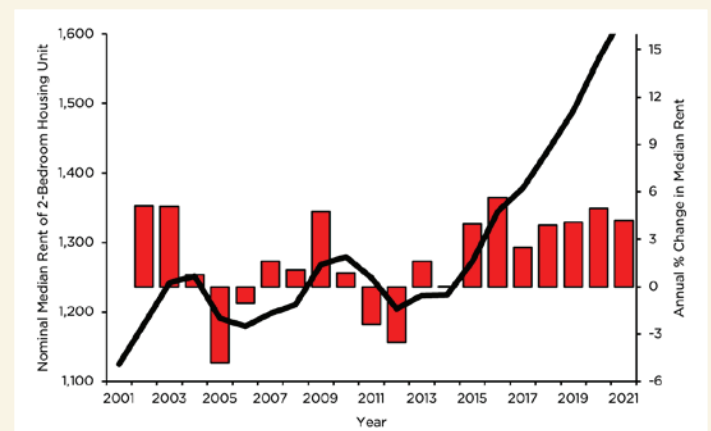


Notes: Data weighted by population of 50 largest metropolitan areas. Median rents increased 93% between 2001 and 2020 while median incomes increased by 58%. Median rents are projected to increase an additional 4.3% in 2021.

The solid line in Figure 3 illustrates the annual increase in median rents for 2-bedroom housing units weighted by metropolitan population between 2001 and 2021 adjusting for inflation. Historical estimates in the figure, and presented throughout the remainder of the paper, are in year 2020 constant dollars as they are adjusted for inflation using

the U.S. Bureau of Labor Statistics' Consumer Price Index (CPI) of a basket of consumer goods minus shelter costs. That inflation minus shelter costs was projected to increase 72.0% from 2001 until 2020.

Figure 3. Annual median rent of 2-bedroom housing units across the 50 largest metropolitan areas from 2001 to 2021 (in year 2020 constant dollars).



Notes: Rents adjusted for inflation using the Consumer Price Index of consumer goods minus shelter. The solid line represents the metropolitan area population-weighted average and the bars indicate the annual percent increase.

In year 2020 constant dollars, the median rent of a 2-bedroom unit weighted by population has increased from \$1,114 in 2001 to \$1,570 per month in 2020. This represents a 40.9% total increase over this period, or an annualized increase of 2.0% net of inflation. The solid bars in Figure 3 represent annual percentage change in rents based on the previous year. Positive rental growth occurred in 15 of the 19 years and has increased every year since 2014. The largest annual projected increases in median rents were observed

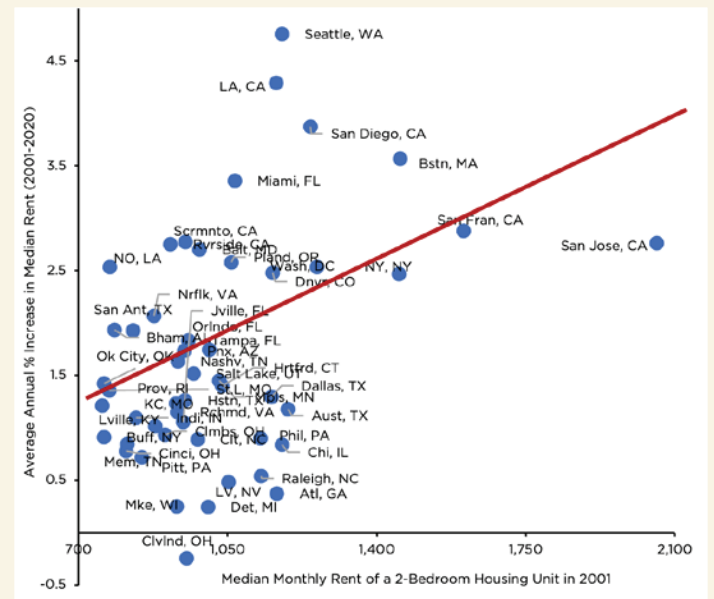


in 2003 (5.1%) and 2020 (5.6%).⁴ Weighted decreases in median rents were observed in 2005, 2006, 2011, and 2012, with the largest decreases occurring in 2005 (-4.7%) and 2012 (-3.5%).

Figure 4 illustrates annualized increases in 2-bedroom rents from 2001–2020 for the 50 metropolitan areas net of inflation. The x-axis of the figure represents median rents in 2001 and the solid red line indicates the slope of a population-weighted linear regression. Net of inflation, annualized percent changes in median rents ranged from -0.24% for Cleveland, OH to 4.76% in Seattle, WA. The population weighted average annual increase across the 50 cities was 2.0% between 2001–2020 net of inflation.

There is a weak, positive correlation between rents in 2001 and future appreciation. The slope of a linear regression is 0.002 and R-squared representing the fit is 15.1%. This means that rents appreciated an additional 0.2 percentage points between 2001–2020 for every \$100 difference in rents in 2001. The 3 cities with the highest rent in 2001 (San Jose, CA, San Francisco, CA, and Boston, MA) remained the top 3 cities in 2020, although they did not experience the highest rates of appreciation. In terms of rental market rankings, the largest increase in relative rents occurred for Riverside, CA with that area increasing 20 spots from the 35th to the 15th most expensive market. The largest decrease occurred for Cleveland, OH with that area decreasing 22 spots from the 26th to 2nd least expensive market. Seattle, WA increased from the 8th most expensive rental market in 2001 to the 4th most expensive in 2020.

Figure 4. Average annual percent increase in median 2-bedroom rents from 2001–2020 in the 50 largest metropolitan areas net of inflation.



Notes: The solid line is the slope of a population-weighted linear regression with an R-squared of 15.1%. Median rents increased on average 2.0% above inflation and a \$100 increase in monthly rent in 2001 was associated with an additional 0.2 percentage point average annual increase.

4. It is important to recognize this report primarily relies on projected increases in rent by HUD in October of the preceding year, and therefore actual increases in rent collected from tenants might be different. For example, the 5.6% projected increase in rent in 2020 does not take into account observed decreases in rent due to the emergence of COVID-19 in early 2020.

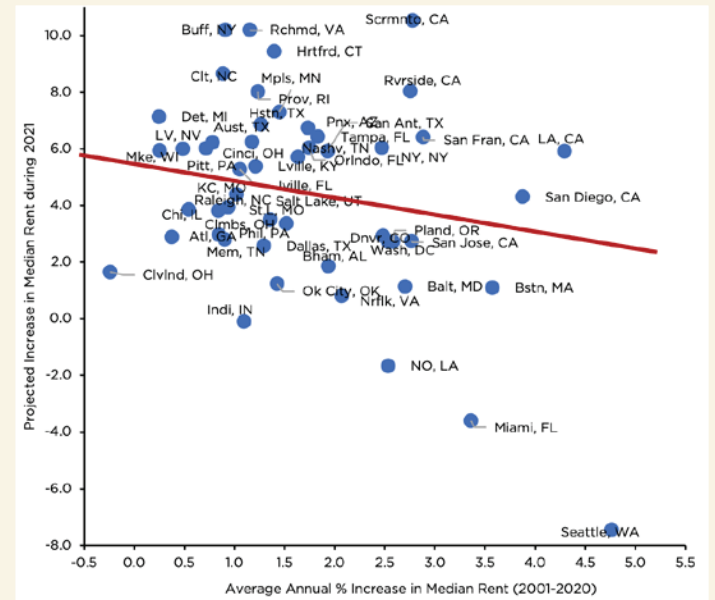
PROJECTED RENTAL GROWTH IN 2021

HUD releases their metropolitan-level rent projections for the upcoming year in October. In 2021, HUD projects median rents will increase on average of 4.3% across the 50 largest metropolitan areas. This is higher than the average annual increase of 2.0% between 2001 and 2020, although slightly lower than the 4.6% projected increase that occurred in 2020. It is important to note these projections were made after the nationwide emergence of COVID-19 in early Spring 2020.

There was a slight negative correlation between a metropolitan area's increase in median rent between 2001 and 2020, and projected rental growth in 2021. The y-axis of Figure 5 illustrates the projected increase in median 2-bedroom rents in 2021 for each city and the x-axis indicates the average annual percent increase in rents between 2001 and 2021. Projected growth of median rent ranged from a high of 10.5% in Sacramento, CA to a low of -7.4% in Seattle, WA. Seattle, WA experienced substantial rental growth in the previous 19 years, especially in the previous 5 years, so the projected decrease could be indicative of new supply resulting from recent growth. Price declines were also projected in Miami, FL (-3.6%), New Orleans, LA (-1.7%), and Indianapolis, IN (-0.1%). An additional 1 percentage point increase in annual average rent appreciation between 2001 and 2020 was associated with a 0.7 lower projected increase in 2021.

It is interesting to note that 8 of the 10 cities projected to experience the highest appreciation of median rents in 2021 were cities with below average rent levels and appreciation over the preceding 19 years. Median rents in Richmond, VA and Buffalo, NY were both projected to increase by 10.2% in 2021, followed by Hartford, CT (9.4%), Charlotte, NC (8.7%), and Riverside, CA (8.0%). Although these are projections and the exact parameters used by HUD to make them are unknown, these projected increases could be a direct result of flight from larger and more expensive cities because of COVID-19.

Figure 5. Projected increase in median rent of a 2-bedroom housing unit in the 50 largest U.S. metropolitan areas in 2021.



Notes: The solid line represents the slope of a population-weighted linear regression of projected increase with respect to the average annual increase in median rent between 2001 and 2020 with an R-squared of 6.8%. Rents are projected to increase on average 2.0% in 2021 and a 1 percentage point increase in the rent appreciation between 2001 and 2020 was associated with a 0.7 projected decrease in rent.

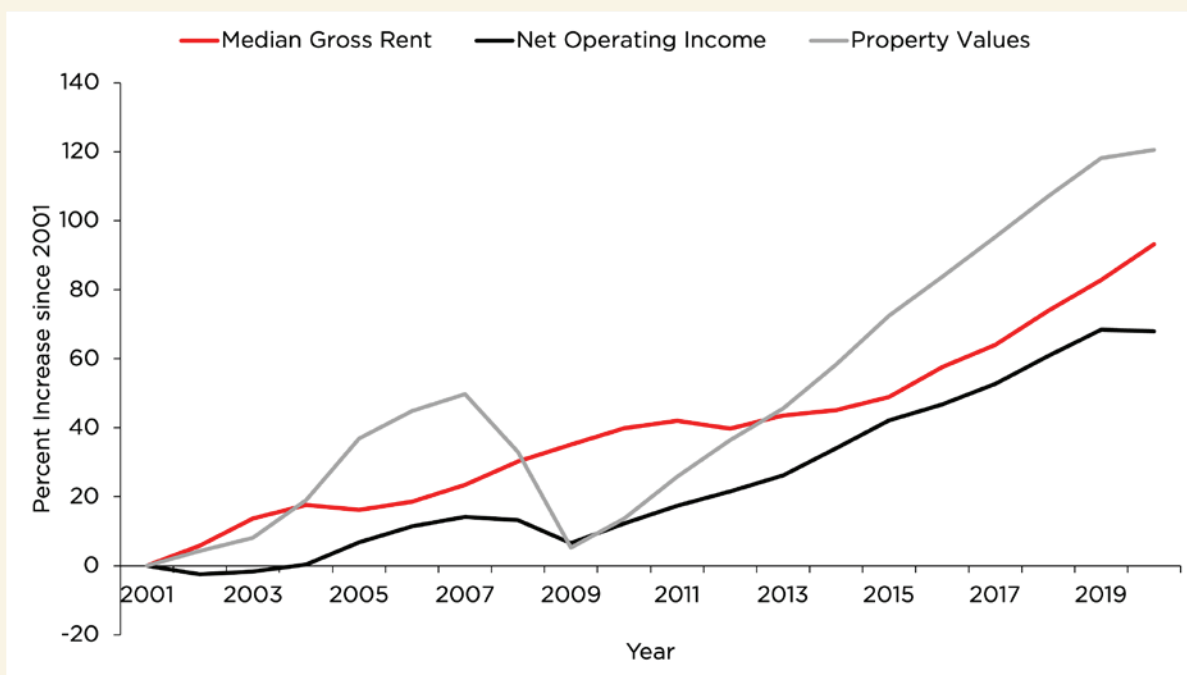
GROWTH IN MULTIFAMILY NOI AND PROPERTY VALUES

This reports primarily focuses on how gross rents paid by tenants have evolved since 2001 using data from the U.S. Department of Housing and Urban Development. These increases do not necessarily mean higher profits for property owners. The chart below compares growth rates of gross rents with net operating income (NOI) and values of multifamily family properties since 2001. The source of NOI data is Axiometrics and that on property values is from Real Capital Analytics. The data are not adjusted for inflation.

NOI has on average increased in 3.6% between 2001 and 2020, which is less than the 4.9% nominal increase in gross rents paid by tenants over the same period. The main difference between gross rents paid by tenants and NOI is lost revenue from vacant units and operating expenses. The black line in the figure below represents NOI growth since 2001 and the red line represents growth in gross rents paid by tenants. The two series track closely with the exception of decreases in NOI during 2002, the Great Recession in 2008 and 2009, and more recently in 2020 due to COVID-19. NOI is estimated to have increased on average 5.6% annually between 2010 and 2019, although estimated to have decreased by 0.2% in 2020.

Property values are largely determined by future projected NOI and the cost of capital as often represented by market capitalization or “Cap” Rates. With the exception of the Great Recession, trends in capital markets have been favorable to multifamily housing properties and resulted in a higher valuations per unit of NOI. The grey line in the figure below represents this growth in multifamily property valuations since 2001. Multifamily property values have increased on average 6.3% over this period, although were back to near 2001 levels in 2009 after a 30% decrease. Multifamily property values increased on average 10.7% annually between 2009 and 2019, with a 1.3% further appreciation in 2020 despite decreases in NOI associated with the COVID-19 pandemic.

Figure C2. Comparison of Growth in Median Rent with Net Operating Income (NOI) and Multifamily Property Values since 2001.



Notes: The NOI series is from Axiometrics and that on property values is from Real Capital Analytics.

Correlates of Rental Price Appreciation

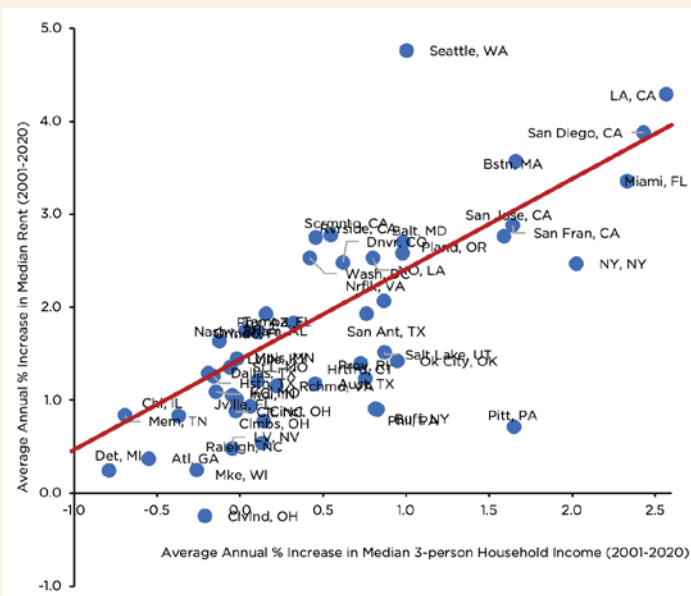
A large and growing literature in economics has attempted to decompose why housing rents have accelerated in recent years (Davis and Ortalo-Magné, 2011). While contributing to that causal literature is beyond the intended aim of this report, it is still possible to highlight metropolitan factors correlated with recent rental price increases.

Figure 6 compares the average annual percent increases in median incomes and rents, and shows the two were highly correlated between 2001 and 2020. The largest increases in median household incomes occurred in Los Angeles, CA (2.6%), San Diego, CA (2.4%), and Miami, FL (2.3%), which were also among the cities with the highest appreciation of

rent. Median incomes net of inflation decreased in 16 of the 50 cities between 2001 and 2020, with the largest decrease occurring in Detroit (-0.8%).

Median incomes increased 0.8% on average annually across the 50 cities over this period, although there was a slight convergence in (un)affordability. The solid line in Figure 6 is the fit of a linear regression of rental appreciation relative to income growth. The R-squared of the population weighted regression was 64.3% and the slope coefficient was estimated to be 0.96. This means each additional 1.0 percentage point annual increase in median incomes between 2001 and 2020 was associated with a 0.96 percentage point annual increase in median rent. This estimate implies housing affordability convergence over the last 20 years since it is less than one (and, on average the gap between the least and most affordable areas shrunk). This occurred only because rents increased faster in previously affordable/lower rent areas, although only because all areas became less affordable for median households. This corresponds to an increase in median rent \$3,522 associated with a \$13,700 increase in median income. Seattle, WA and Pittsburgh, PA were notable outliers based on increases in median rents relative to incomes. Annual appreciation of rents (0.7%) in Pittsburgh, PA was approximately half of income appreciation (1.7%), whereas increases of median rents (4.8%) in Seattle, WA were almost 5 times greater than growth in median incomes (1.0%).

Figure 6. Comparison of the average annual increase in median rents and incomes in the 50 largest U.S. metropolitan areas between 2001–2020 net of inflation.



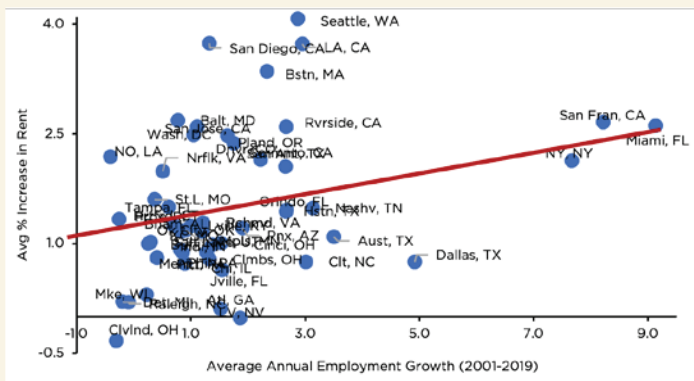
Notes: The solid line represents the slope of a population-weighted linear regression with an R-squared of 64.3%. A 1 percentage point increase in an average annual median income between 2001-2020 was associated with a 0.96 percentage point increase in average annual rent.

Figure 7 separately plots annualized percent increases in median rent with other potential correlates suggested in past research. These other correlates are employment and wage growth measured by the U.S. Bureau of Labor Statistics (BLS), and housing supply elasticity previously estimated by Saiz (2010). The y-axis in these figures is slightly different from before, and is now defined as the annualized percent increase in median 2-bedroom rents between 2001–2019,

which 2019 is the latest vintage of occupation wage data available from BLS. Panel C also omits Sacramento, CA as a housing supply elasticity was not previously estimated by Saiz (2010) for that geographic area. The estimates presented in the figures are not conditional upon each other, although the final paragraph of the sub-section discusses results holding the other factors constant.

Figure 7. Relationship of the average annual percent increases in median 2-bedroom rents from 2001–2019 net of inflation on employment, earnings and supply elasticity.

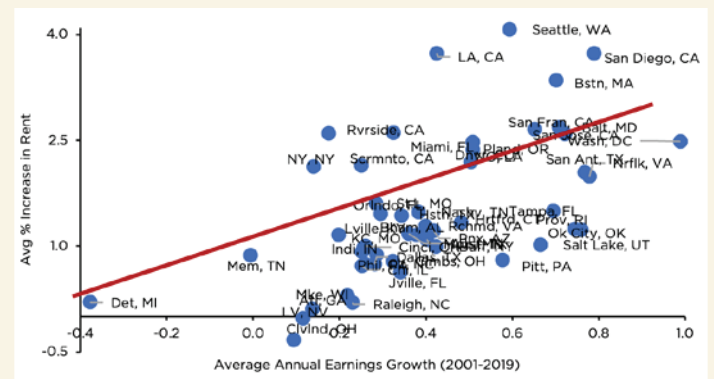
Panel A. Employment Growth (Slope 0.14; R² = 11%)



Notes: Employment and earnings growth from the Bureau of Labor Statistics. Supply elasticity estimates are from Saiz (2010). Solid lines represent the slope of population-weighted linear regressions.

Panel A of Figure 7 shows the association between median rent and employment growth across metropolitan areas. Annualized employment growth of all occupations across the 50 cities ranged from -0.4% for New Orleans, LA to 9.1% for Miami, FL. The population weighted average employment growth was 2.8%. A statistically significant correlation with employment and median rent growth exists with an estimated R-squared of 11%, although this relationship was not as strong as median household income growth. The slope of the linear regression implies a 1 percentage point increase in employment growth was associated with an additional 0.14 percentage point annualized increase in rents. Based on medians in 2001, this estimate implies an additional 9,365 employed workers in your metropolitan area between 2001 and 2019 was associated with an additional \$452 in annual rent in constant 2020 dollars. Omission of the three cities with the highest employment growth (Miami, San Francisco, and New York) would make the correlation even stronger.

Panel B. Median Earnings Growth of Individuals (Slope = 2.16; R² = 25%)

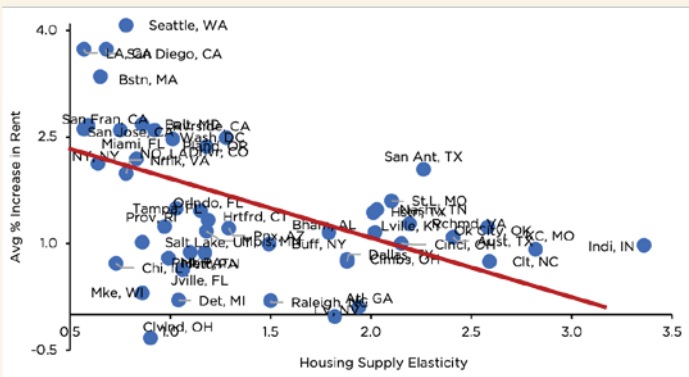


The BLS measures employment earnings of individual wage and salary workers and differs from household income due to households potentially having multiple wage earners and other sources of non-earnings-related income. This measure of earnings created by the BLS excludes income from entitlements, capital gains and self-employed persons, but includes overtime pay, commissions, and tips usually received. The population weighted median earnings across the 50 cities according to the BLS was 0.4% between 2001–2019, which is lower than the HUD-estimated increase in median household incomes over the same period.⁵ Annualized median earnings growth across all occupations ranged from -0.37% in Detroit, MI to 0.99% in Washington, DC between 2001–2019. Panel B of Figure 7 shows a relatively strong correlation between earnings growth with an R-squared of 25% and a slope coefficient of 2.16. It is interesting to note that while the fit of the regression of median earnings growth with respect to rental price appreciation is about one-third of that of median income growth, the coefficient slope with respect to earnings is much steeper, as would be expected from multiple wage earners within the same household. This estimate implies a 1.0 percentage point annual increase in median real earnings between 2001 and 2019 (approximately \$7,833) was associated with a \$8,221 increase in annual median rent.

5. The increase in median household incomes reported above was for 2001–2020. The population weighted annual average median increase in 3-person household incomes from 2001–2019 was estimated to be 0.54% by HUD.



Panel C. Housing Supply Elasticity
(Slope = -0.91; R² = 28%)



The last panel of Figure 7 plots annualized increases in median rents with housing supply elasticity estimated by Saiz (2010). Housing supply elasticity is a measure of how responsive the local market is providing new units in response to an increase in rents, where a higher elasticity means the market is more responsive. Housing supply elasticity can be affected both by natural (e.g., water and mountains) and artificial (zoning and building height restrictions) constraints. The intuition is that areas with a greater supply elasticity will have a superior supply response given an increased demand for housing in those areas, whereas a lower supply elasticity would be consistent with geographical and regulatory impediments. As expected, a negative

association exists with the greatest rental growth occurring in metropolitan areas with a supply elasticity less than 1 and only one metropolitan area (San Antonio, TX) with a supply elasticity greater than 1.5 having an annualized increased greater than 2%. The slope of the population-weighted linear regression is -0.91 with an R-squared of 28%. It is important to note that several cities with a supply elasticity greater than 1 (e.g., Austin, TX, Charlotte, NC, and Oklahoma City, OK) also experienced substantial employment and earnings growth despite below average rental price appreciation indicative of a supply response in those areas.

All three attributes from Figure 7 remain statistically significant when included together in a single regression. The R-squared of that multivariate regression was 57%. The estimated slope coefficients associated with median employment and earnings growth remain similar to the unconditional regression, with the slope of the coefficient on the housing supply elasticity measure decreasing from -0.91 to -0.68 when conditional on the other factors. Including median growth in household incomes eliminates the association with housing supply elasticity but increases the R-squared to 70%. The best fit (i.e., R-squared = 73%) was in regression models where housing supply elasticity was interacted with employment and wage growth reinforcing the dynamic relationships between each of the variables.

Housing Affordability Gaps

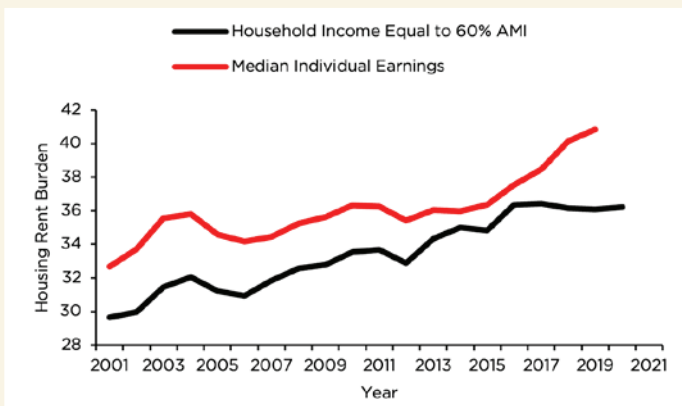
The previous section illustrated that rents have significantly increased over the last 19 years net of inflation, especially relative to income. In this section, the historical rent burden and the dollar amount needed for a low-income household to afford a median rental unit is calculated for each of the 50 largest metropolitan areas.

The most common metric used to compare housing affordability across time and space are rent burdens. Rent burdens are calculated by dividing rent by income or earnings, where 30% is the common cutoff; a household contributing more than that amount is considered burdened. HUD's definition of a low-income household is earning less than 60% of their AMI adjusted by the number of household members, which is also the maximum 3-person household income to reside in a 2-bedroom unit subsidized under the Low-Income Housing Tax Credit (LIHTC) program. Figure 8 compares the rent burden of a median 2-bedroom unit relative to a 3-person household earning 60% of their metropolitan area median income (AMI), or median individual earnings according to the U.S. Bureau of Labor Statistics.

A 3-person household earning exactly 60% of their metropolitan area's household income could rent a median 2-bedroom unit in 2001 with less than 30% of their income but would be required to spend approximately 36% of their income by 2020. This burden as a fraction of individual earnings was steeper and increased from 33% in 2001 to almost 42% by 2019, which is the latest vintage of earnings data from the BLS. While the two series showed similar growth patterns until 2016, the rent burden as a fraction of household earnings has since been flat, whereas that of individual earnings has accelerated.

While rental cost burdens are the most used metric to measure affordability, it is often difficult to interpret the ratio across areas with difference incomes. Green (2011) alternatively proposed measuring the dollars needed for a low-income household to spend less than 30% of their income to rent a suitable unit, which he called the housing affordability gap (HAG). HUD annually defines the maximum housing voucher subsidy based on either the 40th or 50th percentile of asking rents depending on a variety of factors for each metropolitan area. For this study, the HAG is defined as the median rent of a 2-bedroom unit minus 18% of the AMI of a 3-person household, which is consistent with a household earning exactly 60% of the local AMI contributing 30% of their income towards housing. When the gap is greater than 0, this definition approximates the annual housing subsidy a household earning exactly the maximum allowable to reside in a LIHTC subsidized property would receive if they were alternatively allocated a housing voucher. A negative affordability gap would be indicative that LIHTC maximum rents exceed median rents

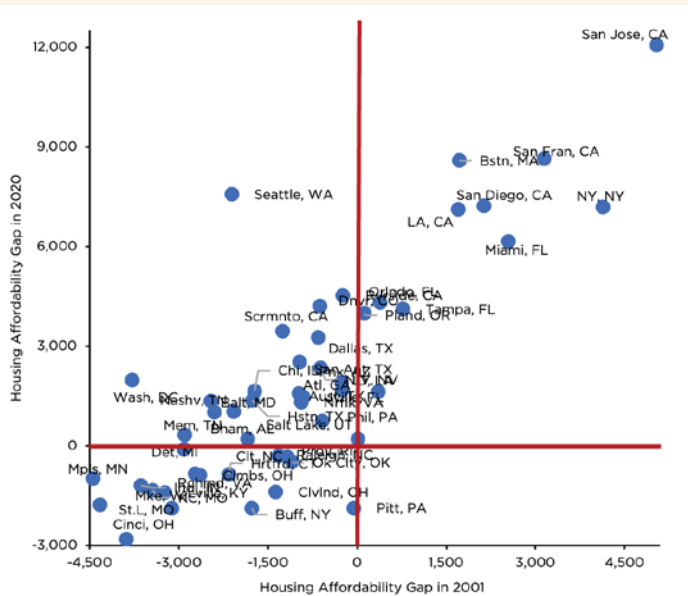
Figure 8. Comparison of historical rent burdens of median 2-bedroom housing units for a 3-person household with income equal to 60% of their metropolitan area's median income (AMI) or median individual earnings.



Notes: Median individual earnings according to the U.S. Bureau of Labor Statistics. The estimates are weighted by metropolitan area population.

in that city.⁶ As before, all historical estimates are adjusted for inflation and represented in year 2020 dollars based on the CPI minus shelter costs.

Figure 9. The dollar amount needed for a 3-person household earning 60% of their Metropolitan area's median income (AMI) to afford a median 2-bedroom rental unit in 2001 and 2020 such that they would pay 30% of their income.



Notes: Both estimates are in year 2020 constant dollars.

Figure 9 illustrates this affordability gap in 2001 and 2020 based on the 60% AMI standard. The horizontal and vertical lines represent the \$0 threshold for each year. In 2001, the population-weighted housing affordability gap was -\$155 with 38 of the 50 cities having a negative affordability gap. This means maximum LIHTC rents for a 3-person household, which are independent of tenant's actual income given they meet income eligibility requirements, were higher than the median rent of 2-bedroom market-rate units in these 38 cities with a negative affordability gap in 2001. For example, the median 3-person income in St. Louis, MO during 2001 was \$75,502 in 2020 dollars, which meant the maximum rent for a 2-bedroom LIHTC subsidized unit was \$13,590 per year, or \$1,133 per month. This resulted in an affordability gap of -\$4,323 given the median market-rate of a 2-bedroom rental unit in St. Louis was estimated to be \$9,267, or \$772 per month, in 2001. In other words, housing was relatively affordable in the majority of the largest cities

6. A variety of factors affect rents charged to tenants of LIHTC subsidized properties, and they are independent of the tenant's actual income unless the property or tenants receives additional subsidies. It is also not unusual for developers to voluntarily lower maximum rents in order to receive a competitive 9% LIHTC allocation, although this varies significantly across states. Several states also mandate that LIHTC maximum rents are at least 10% below market, although enforcement is unclear and presumably costly after the initial years of development.

in 2001 according to the definitions of the LIHTC program. The cities with the largest positive affordability gaps in 2001, and therefore least affordable, were San Jose, CA (\$5,041), New York, NY (\$4,136), and San Francisco, CA (\$3,140).

The population weighted average housing affordability gap increased by \$3,384 between 2001 and 2020 net of inflation across the 50 cities for low-income households. By 2020, the number of cities with a negative affordability gap decreased from 38 to 17, and the population-weighted affordability gap for all 50 cities was \$3,228. This decrease in affordability means a household earning exactly the 60% AMI standard in 2001 would have to devote an additional 7.6% of their income to continue to rent a median 2-bedroom housing unit in 2020.

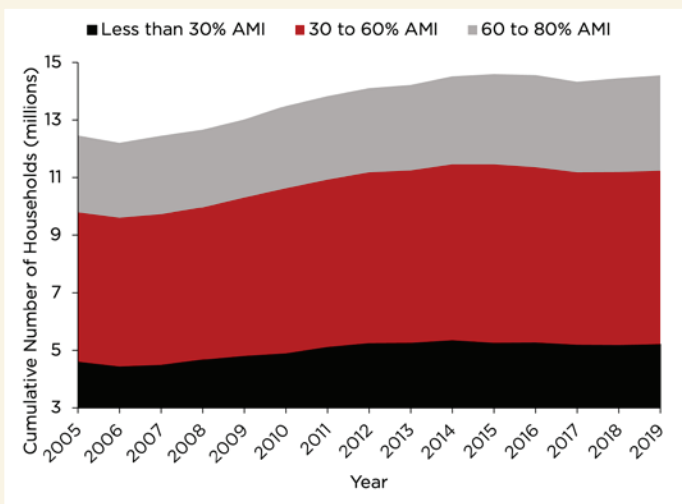
San Jose, CA remained as the least affordable city in 2020 for a household earning 60% AMI with estimated gap of \$12,064, although low-income households in Seattle, WA experienced the largest increase in the gap with \$9,689. This decrease in affordability in Seattle, WA means a household earning exactly 60% of the AMI standard in 2001 and 2020, would have to devote an additional 18.0% of their household income to continue to rent a median unit over this period. The housing affordability gap increased in 47 of the 50 cities, with only measured decreases in Cleveland, OH (-\$17), Buffalo, NY (-\$106) and Pittsburgh, PA (-\$1,824).

This section concludes with estimating how the number of low-income renter households earning 60% and below the AMI standard in each of the 50 largest metropolitan areas has changed over time. This was estimated by using the 1-year metropolitan microdata sample of the of the American Community Survey, which is available from 2005 until 2019. The percent of low-income renter households was determined in each metropolitan area by comparing a households' reported income to their local area's AMI adjusted by household size.

As mentioned above, the population of the 50 largest metropolitan areas has grown substantially over the last 20 years. The number of renters in these cities increased by 5 million households, or 23.7% between 2005 and 2019. Figure 10 illustrates the total of renter households earning less than 30%, 60%, and 80% AMI over this same time period. The bottom band in black indicates there were 4.6 million renter households earning less than 30% AMI in 2005, which increased to 5.2 million over the next 14 years which represents a 13.5% growth rate. The middle band in red illustrates the cumulative number of renter households earning less than 60% AMI. An estimated 5.2 million additional renter households earned between 30% and 60% AMI in 2005, which increased to 6 million in 2019. This results in a combined 11.2 million households earning less than 60% AMI in 2019, representing a growth rate of 14.8% since 2005.

The combined growth rate for households earning less than 60% AMI is substantially less than the 31.5% growth rate of renter households earning greater than 60% AMI. This implies the share of renter households earning less than 60% AMI has decreased across the 50 largest cities. When measured at the metropolitan level, the number of renter households earning less than 60% AMI increased in 48 of the 50 cities, with only decreases in New Orleans, LA and Memphis, TN. Eight cities had more than a 30% increase in the number in renter households earning less than 60% AMI, with the largest increase in Raleigh, NC at 54.5%.

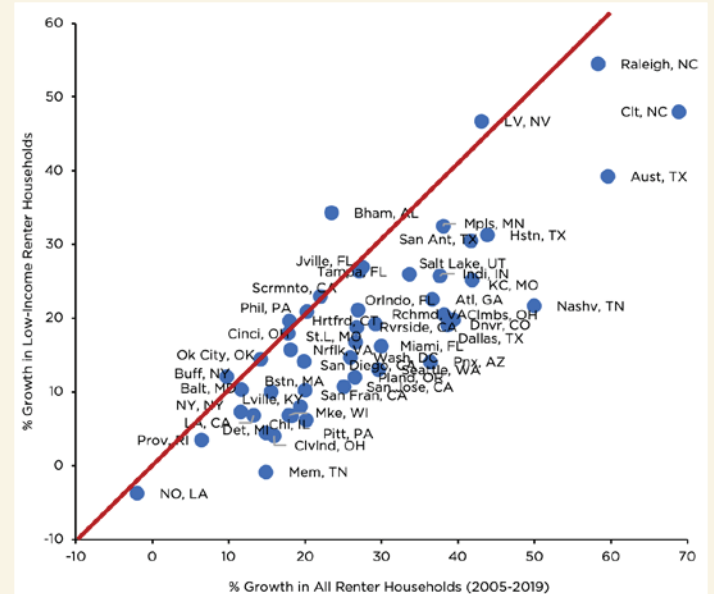
Figure 10. Total number of renter households in the 50 largest metropolitan areas who earned less than 30%, 60% and 80% AMI between 2005 and 2019.



Notes: The number of households earning less than 60% of their AMI increased 14.8% between 2005 and 2019.
Source: American Community Survey.

The top band of Figure 10 represents the number of renter households earning less than 80% AMI, with households earning between 60 and 80% AMI in grey. Housing targeted to these more moderate-income households are often referred to as “workforce” and often excluded from most rental housing subsidy programs despite growing affordability concerns as rents outpace incomes. The number of these “workforce” households increased from 2.7 million to 3.3 million between 2005 and 2019, a 22.2% growth rate.

Figure 11. Percentage growth in the number of renter households earning less than 60% of their area median income between 2005 and 2019.



Notes: The x-axis represents growth of all renter households in each of the 50 largest metropolitan areas. The solid red line represents the 45-degree angle with the x-axis where estimates above the line indicate low-income renter households have grown faster than all renter households.

Figure 11 compares the growth rate of low-income renter households earning less than 60% AMI between 2005 and 2019 with the growth rate of all renter households. The solid red line in the figure presents the 45-degree angle with the growth rate of all renter households. Estimates above that red line indicate the growth rate of low-income households was higher than the growth rate of all renter households in that metropolitan area. The growth rate of low-income households was lower than all renter households in 43 of the 50 metropolitan areas, although the majority of the differences were less than 2 percentage points. The largest differences in growth rates where low-income households outpaced all renter households were in Las Vegas, NV (3.6 percentage points) and Birmingham, AL (10.9 percentage points). Both New Orleans, LA (-3.7%) and Memphis, TN (-0.8%) experienced decreases in low-income renters, although New Orleans, LA experienced a similar decrease in all renter households (-2.0%). The greatest differential in growth rates (22.3%) was estimated to occur in Phoenix, AZ where the number of all renter households grew 36.4% while the percent of low renters grew 14.1%.

Location of Subsidized Housing Across Cities

The U.S. Federal Government spent at least \$52 billion subsidizing the rents of low-income households in 2019 (see Table 1). The three largest rental housing subsidy programs are housing choice vouchers (which was previously called Section 8 vouchers), the Low-Income Housing Tax Credit (LIHTC), and traditional public housing. This section is devoted to better understanding where subsidized housing is located across the largest cities.

Table 1. Summary of Subsidized Housing Expenditures and Units, by Program

	Expenditures		Units in 2019	
	2018	2019	Nationwide	50 Largest MSAs
Housing Choice Vouchers (HUD)	22.0	22.6	2.2	1.3
Public Housing (HUD)	7.3	7.4	0.9	0.4
Other Rental Assistance (HUD)	12.4	12.6	1.4	0.4
LIHTC (IRS)	9.0	9.4	2.5	1.6
Total	50.8	52.0	7.0	3.7

Notes: Expenditures are in billions and units are in millions. Housing Choice Voucher and Public Housing estimate from HUD fiscal year budget report based on the enacted amount. Public Housing expense includes the operation fund and capital fund. Other Rental Assistance programs from HUD include Project-Based Rental Assistance, Housing for the Elderly (Section 202), Housing for Persons with Disabilities (Section 811) and Rental Housing Assistance (Other). LIHTC expenditures estimates from IRS's "Credit for low-income housing" item with the combination of lost tax revenue from corporations and individuals claiming tax credits.

The federal government first subsidized housing in the 1930s by constructing and then operating subsidized units. It is estimated at least 1.3 million units were subsidized under 29 different public housing programs, although only a limited number of public housing units have been constructed since the 1980's with widespread demolition starting in the 1990's (Eriksen and Rosenthal, 2010). A public housing resident contributes 30% of their gross income as rent, with the government subsidizing the difference between that payment and the initial development, operation, and on-going capital expenditures of the building. There were an estimated 900,000 public housing units remaining nationwide as of 2019, and HUD spent \$7.4 billion operating

and maintaining those buildings. There were an estimated 446,652 occupied public housing units in the 50 largest metropolitan areas in 2019.

Housing vouchers that subsidize the rent of households living in privately supplied rental units were first permanently allocated under Section 8 of the Housing and Community Development Act of 1974. The basic motivation of using a housing voucher was that it is more cost effective for the government to subsidize rents of recipient households in existing units than building new units for that purpose. Housing vouchers have been allocated to recipients under several different programmatic names, although colloquially referred to as Section 8 vouchers (referencing the portion of the Act authorizing their first allocation). Similar to traditional public housing, voucher recipients contribute 30% of their gross income to their landlord, with the government subsidizing the difference between that payment and the unit's monthly rental cost, up to a maximum of the Fair Market Rent (FMR) as determined by HUD for a unit in that metropolitan area.⁷ Starting in 1998, the program was rebranded as Housing Choice Vouchers (HCV) and it is estimated there were 2.2 million such vouchers allocated nationwide in 2019 at an annual expenditure cost of \$22.6 billion. There were an estimated 1,295,156 housing vouchers allocated to recipients in the 50 largest metropolitan areas in 2019.

The LIHTC program originated through passage of the Tax Reform Act of 1986. The basic premise of the LIHTC program is to incentivize the development of housing units with

7. Public housing authorities (PHAs) are local entities that administer public housing and housing voucher programs. PHAs can establish voucher payment standards within 10% of the HUD-designated FMR in the metropolitan area where a voucher will be used.

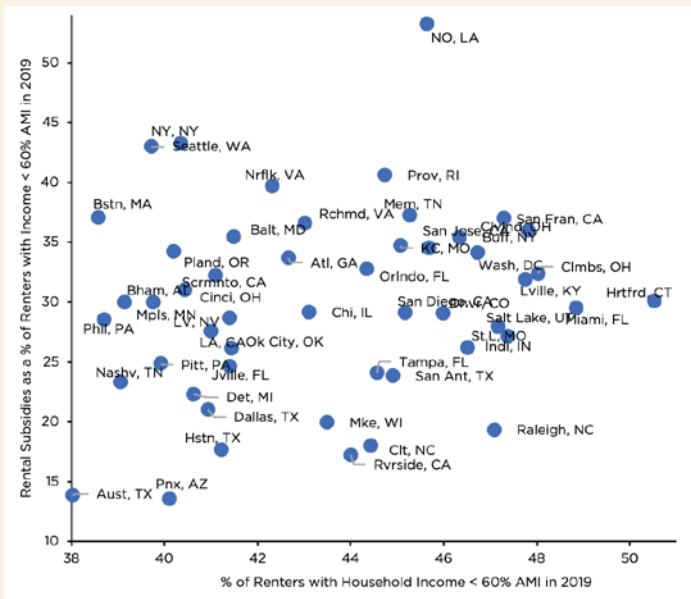


rental housing subsidies per 100,000 households in 2019 across the 50 largest cities. The three cities with the highest per capita share of rental housing subsidies were New Orleans, LA (14,905), New York, NY (13,078), and Seattle, WA (11,244). The three cities with fewest subsidies per capita were Phoenix, AZ (2,944), Austin, TX (4,007), and Riverside, CA (4,255). The solid line in the figure represents the slope of a population-weighted linear regression of the relationship of per capita subsidies relative to the housing affordability gap with an R-squared of 15.9%. That

regression indicates there were on average 32.5 additional subsidies associated with every additional \$100 in housing affordability gap, although the relatively low R-squared as compared to those earlier in the analysis indicate that current housing affordability alone is relatively a poor predictor of where rental subsidies are found.

Figure 13 alternatively presents the share of subsidized units as a percent of renter households earning less than 60% AMI in each of the 50 largest metropolitan areas in 2019. The x-axis in the figure is the percent of renter households with income less than 60% AMI in 2019. Weighted across the 50 cities based on metropolitan population, there were on average 29.1 subsidized units for every 100 renter households earning less than 60% AMI in 2019. This means there were less than 1 subsidized unit for almost every 3 otherwise income eligible renter households across the 50 cities in 2019. This measure most likely overstates the percent of available subsidies per low-income renter households considering housing vouchers recipients are eligible and often reside in units also subsidized under the LIHTC program.

Figure 13. Subsidized households as a percent of renter households with income less than 60% of their metropolitan area median income (AMI) in 2019.



Notes: For the 50 largest metropolitan areas. There were on average 29.1 rental subsidies for every 100 renter households with an income less than 60% AMI in 2019.

The percent of subsidized units per otherwise income eligible households range from a low of 13.6% in Austin, TX to a high of 53.3% in New Orleans, LA. Nine of the ten cities with the lowest number of subsidies per low-income renter household were located in the southern half of the U.S. and experienced significant population growth over the 20 prior years, with Milwaukee, WI (18.9%) as the exception. In addition to New Orleans, LA, the next three highest percent of subsidized were in Norfolk, VA (43.3%), Seattle, WA (43.0%), and Richmond, VA (40.6%).

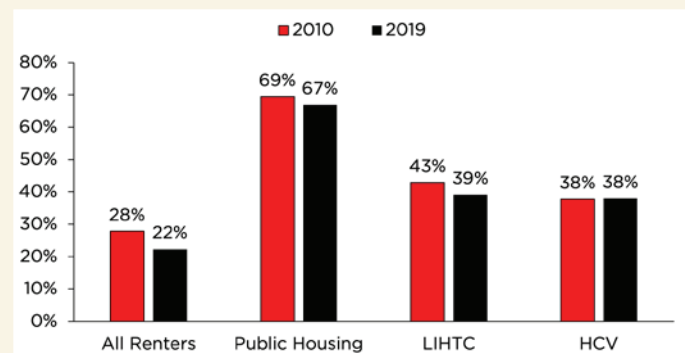
Location of Subsidized Households Within Cities

While recent evidence suggests there are substantial benefits for low-income children raised in low-poverty neighborhoods, it is less clear what percent of children living in a subsidized household actually reside in such areas (Chetty, Hendren, and Katz, 2016). This section is devoted to better understanding where subsidized housing is located within cities, especially relative to other renter-occupied housing.

Census tracts are created by the U.S. Census Bureau and approximate a neighborhood with on average 4,000 inhabitants. According to the 2019 American Community Survey (ACS) conducted by the U.S. Census Bureau, 69.8% of all households in the 50 largest metropolitan areas lived in a low-poverty Census tract with less than a 10% poverty rate; 11.0% lived in a high-poverty tract with a poverty rate exceeding 20%. Because lower-income households are more likely to rent than to own their own homes, renters, regardless of subsidy, were more than twice as likely to live in a high-poverty neighborhood (22.3%) and about 30% less likely to live in a low-poverty neighborhood (50.0%).

Figure 14 compares the percent of subsidized households living in a high-poverty Census tract in 2010 and 2019. Public housing residents were the most likely to live in high-poverty Census tracts, although the percent living in such areas has decreased over the last 10 years. Almost 70% of public housing residents lived in a high poverty-neighborhood from 2006–2010, although the share decreased to 66.9% between 2015–2019. The share of LIHTC subsidized housing units in high-poverty neighborhoods also decreased from 42.9% in 2006–2010 to 39.1% in 2015–2019, although the share of HCV recipients was virtually unchanged at 38% in the two periods.

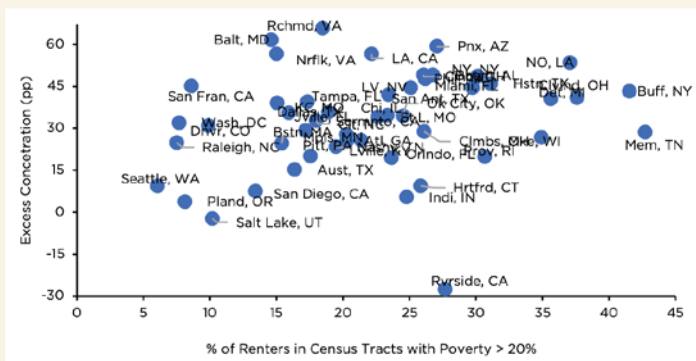
Figure 14. Percent of subsidized renters who live in a Census tract with a poverty rate higher than a 20% in the 2010 and 2019 5-year American Community Survey.



Significant heterogeneity exists across cities in the percent of subsidized housing located in a Census tract with a poverty rate exceeding 20%. Figure 15 illustrates this difference at the metropolitan level for each of the 3 main rental subsidy programs. The x-axis in the figure is the percent of renters living in a Census tract with a poverty rate exceeding 20% and the y-axis is the excess concentration of subsidy recipients in high-poverty neighborhoods relative to all renters in that metropolitan area. For example, 61.5% of public housing residents in Milwaukee, WI lived in neighborhood with a poverty rate exceeding 20% as compared to 34.9% of all renters regardless of subsidy, so the y-axis value in Figure 15 is the difference between those two estimates, or 26.6 percentage points. The percent of all renters regardless of subsidy living in a neighborhood with greater than 20% was the lowest in San Jose, CA at 1.1% and the highest in Memphis, TN at 42.7%.

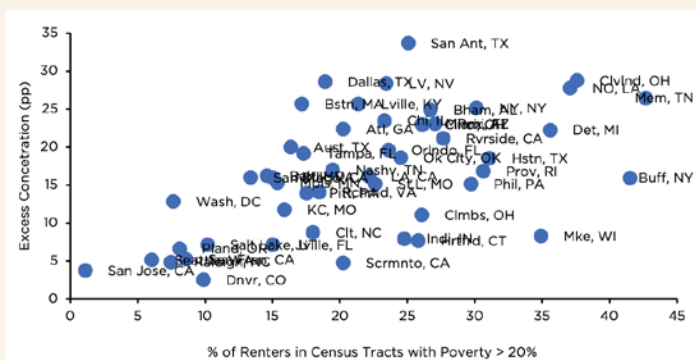
Figure 15. The difference in percentage points or excess concentration of subsidized housing in 2019 located in a Census tract with a poverty rate greater than or equal to 20% as compared to the percent of all rental housing in such neighborhoods.

Panel A. Public Housing



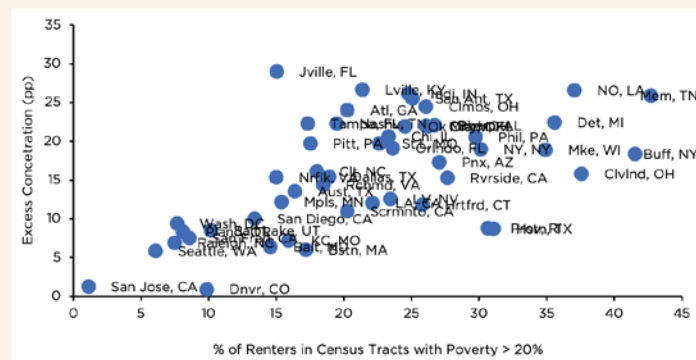
Panel A of Figure 15 illustrates this difference in poverty concentration for public housing residents in 2019. The greatest concentration of public housing residents in high poverty neighborhoods was in New Orleans, LA with over 90.6%, and the lowest was in Riverside, CA with 0% of public housing residents in such neighborhoods. The great excess concentration of public housing residents in high-poverty neighborhoods, however, was in Richmond, VA with 84.3% of public housing residents in high-poverty areas as compared to 18.5% of all renters, for a differential of 65.8 percentage points. Six cities had a difference greater than 50 percentage points, with Baltimore, MD (61.6 percentage points) joining Richmond as the only other city with a difference greater than 60 percentage points. In only two cities (Riverside, CA and Salt Lake City, UT) were public housing residents less likely to live in a high poverty neighborhood than renters in general. Although over 26% of renter households lived in a high poverty neighborhood in Riverside, CA, no public housing residents were found to live in such neighborhoods. San Jose, CA is omitted from the figure as no public housing was estimated to be in that metropolitan area.

Figure 15 Panel B. Low-Income Housing Tax Credit



Panel B of Figure 15 indicates the difference in poverty concentration for LIHTC residents. LIHTC projects are located by private developers with incentives to maximize occupancy, although the generosity of the subsidy increases for developers to locate projects in high-poverty neighborhoods in some metropolitan areas (Eriksen and Lang, 2017). Similar to public housing, the poverty rates of tenants in sufficiently large LIHTC subsidized projects may also directly affect the poverty rates of the neighborhoods where they reside. The percent of LIHTC rent-restricted units in high poverty areas ranged from 4.8% in San Jose, CA to 69.2% in Memphis, TN. The greatest difference between all renters and LIHTC units was estimated to occur in San Antonio, TX at 33.7 percentage points.

Figure 15 Panel C. Housing Choice Vouchers



Panel C of Figure 15 illustrates this differential for HCV recipients. Unlike residents in public housing and LIHTC projects, voucher recipients have at least some ability to rent units in lower poverty neighborhoods. More than 50% of HCV recipients live in high poverty neighborhoods in 10 metropolitan areas, with the highest percent in Memphis, TN at 68.6%, followed by New Orleans, LA (63.6%), Buffalo, NY (59.9%), and Detroit, MI (58.0%). The greatest differential between HCV recipients and all renters were in Jacksonville, FL (29.0%) with more than a 20 percentage point difference in 17 of the 50 metropolitan areas. 13 of the cities had less than a 10 percentage point difference though with the lowest difference (0.9 percentage points) estimated for HCV recipients was in Denver, CO.

Considering housing vouchers are portable between neighborhoods, it is often unclear to policymakers and researchers why such a high percentage of recipients continue live in such high poverty neighborhoods. The next section of the paper discusses potential explanations and a new initiative of HUD to vary the voucher payment standard across metropolitan areas to encourage recipients to live in lower poverty areas.

Implementation of Small Area Fair Market Rents (SAFMRs)

It has been well documented since at least Newman and Schnare (1997) that the overwhelming majority of public housing is located in high-poverty neighborhoods. The persistence of HCV recipients to live in such areas is somewhat of a mystery given recipients' ability to rent alternative units in lower-poverty areas with two main caveats.

First, the selected unit must meet minimum quality and safety guidelines established during an inspection. Second, the market rent of the unit must be below the maximum voucher payment standard as established by the allocating local public housing authority. This maximum voucher payment standard is traditionally the same across all neighborhoods within a metropolitan area and is approximately the 40th or 50th percentile of asking rents as determined by HUD.

Market studies on the purchasing power of voucher recipients have generally shown voucher units are often available in lower-poverty neighborhoods, although presumably tradeoffs exist for households relocating to those areas (Devine et al., 2003). The metropolitan-wide payment standard may also result in a subsidized household being able to afford a higher-quality or larger unit in high-poverty areas than they would be able to afford in other areas (Susin, 2002). Starting in 2011, HUD first allowed for payment standards to systematically vary across ZIP codes within a metropolitan area in Dallas, TX. This new payment standard was called Small Area Fair Market Rents (SAFMRs) and was the result of a lawsuit and resulting court settlement. The related lawsuit alleged a metropolitan-wide voucher payment standard resulted in segregated communities since predominantly African-American voucher recipients were effectively unable to use the subsidy in predominantly white neighborhoods with above median rents.¹¹

The settlement in Dallas was that the maximum housing voucher payment standard would instead be set at the ZIP code level, with an increased maximum payment in higher rent areas with recipients still contributing 30% of their

income.¹² HUD expanded the SAFMRs payment standard to a demonstration including 5 housing authorities in 2012 and made designations available for adoption by all housing authorities located in a metropolitan area starting in 2017. HUD also announced in late 2016 that housing authorities in 24 cities would be required to adopt SAFMRs to determine local voucher payment standards starting in 2018.

The section of the report is dedicated to better understanding how and where SAFMRs have been adopted. It will begin by summarizing existing research on SAFMRs, and then provide initial evidence of how their mandatory adoption has impacted the location of housing voucher recipients in those communities.

EXISTING RESEARCH ON SAFMRS

Collinson and Ganong (2018) provided the first evidence of SAFMRs adoption in Dallas, TX. They used administrative records from HUD through 2013 and found the establishment of ZIP code level payment standards resulted in landlords increasing rents in neighborhoods with a higher expected payment standard. Based on a comparison on voucher holders in Fort Worth, TX the authors find that implementation of SAFMRs in Dallas, TX resulted in voucher recipients, on average, moving to areas with lower violent crime and poverty. The authors conclude that the increased subsidies resulted in a cost-effective approach to promote voucher holder households to live in higher quality neighborhoods as compared to other policy interventions.

HUD selected housing authorities in 5 metropolitan areas to pilot implementation of SAFMRs starting in 2012. Those 5 cities were Chattanooga, TN, Chicago, IL, Laredo, TX, Long

11. See *Texas Department of Housing and Community Affairs et al., v. Inclusive Communities Project, Inc., et al.*

12. See the report by Dastrup et al. (2019) for more on the history and background of SAFMRs.

Beach, CA, and Mamaroneck, NY. In addition to raising the payment standard in relatively high rent neighborhoods, the implementation also lowered the maximum allowable rent in relatively low-rent areas. The diminished subsidies in low-rent areas will be reduced gradually to mitigate the impact on voucher holders living in those areas.

Dastrup et al. (2019) evaluated how implementation of SAFMRs in the 5 demonstration cities starting in 2012 impacted surrounding neighborhood attributes of HCV recipients. The key findings of that report were that voucher holders in metropolitan areas with SAFMRs were more likely to live in higher-rent ZIP codes as compared to voucher recipients in other cities, with the greatest effect for those with children. There was also a small increase in rental contributions made by voucher holders who remained in low-rent neighborhoods as unit rents did not decrease in proportion to the reduction in subsidy.

MANDATORY ADOPTION OF SAFMRs IN 2018

HUD announced in late 2016 that starting in 2017 housing authorities in all metropolitan areas would have the option to adopt housing voucher payments standards based on either the existing metropolitan wide FMR standard or based on the newly available SAFMRs available for individual ZIP Codes. HUD also indicated in that same announcement that adoption would be mandatory for public housing authorities located in 24 metropolitan areas starting in 2018. The new payment standard in mandatory adoption areas would be immediately required for new voucher recipients, and subsequently phased in during the annual review of existing voucher recipients. The 24 mandated metropolitan areas were selected based on the following criteria:¹³

- **Adequate Users:** At least 2,500 vouchers were in use in the metro area.
- **Low metropolitan FMRs:** At least 20 percent of the standard quality rental stock, within the metropolitan FMR area is in small areas (ZIP codes) where the small area FMR is more than 110 percent of the metropolitan FMR.
- **Vouchers concentrated in low-opportunity neighborhoods:** The percentage of voucher families living in concentrated low-income areas relative to all renters within the area must be at least 25 percent; The measure of the percentage of voucher holders living in concentrated low-income areas relative to all renters within these areas over the entire metropolitan area exceeds 155 percent (or 1.55).
- **High vacancy:** The vacancy rate for the metropolitan area is higher than 4 percent.

13. <https://www.huduser.gov/portal/datasets/fmr/fmr2016f/SAFMR-Key-Aspects-of-Final-Rule.pdf>

The metropolitan areas with newly mandated SAFMRs are indicated in Table 2. Those cities exclude Dallas, TX, and the 5 demonstration areas as SAFMRs were previously available prior to 2016. The first column of estimates in Table 2 presents the percent of housing voucher recipients in each of those metropolitan area living in a Census tract with a poverty rate greater than or equal to 20% in the 2012–2016 5-year American Community Survey. That percent ranged from a high of 87.1% in Gary, IN to a low of 18.6% in Honolulu, HI. The population weighted average in 2016 across metropolitan areas with eventually mandatory SAFMRs was 45.7%.

Table 2. Percent of Housing Voucher Choice (HCV) Recipients Living in High Poverty (> 20%) Census Tracts in Metropolitan Areas Before and After Mandatory Small Area Fair Market Rents (SAFMRs) start in 2018

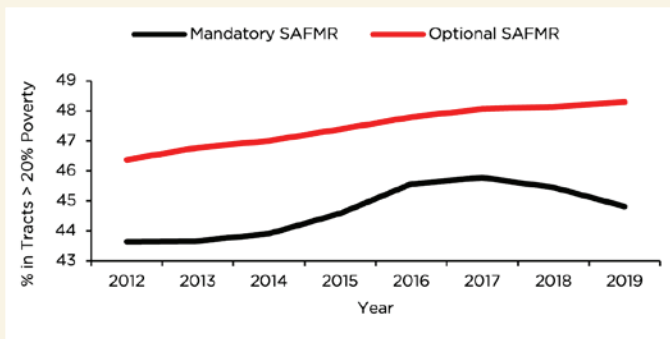
Metro Area (Alphabetically)	% of HCV Recipients in Census Tracts w/ Poverty Rates ≥ 20%		Change in % (2019– 2016)
	2016	2019	
Atlanta, GA	59.4	57.0	-2.4
Bergen, NJ	36.1	34.1	-2.0
Charlotte, NC	48.4	48.5	0.1
Colorado Springs, CO	25.4	26.7	1.3
Fort Lauderdale, FL	50.3	48.1	-2.2
Fort Worth, TX	43.6	41.3	-2.3
Gary, IN	87.1	87.0	-0.1
Hartford, CT	51.8	51.9	0.1
Honolulu, HI	18.6	20.1	1.5
Jackson, MS	76.9	74.3	-2.6
Jacksonville, FL	43.6	48.2	4.6
Melbourne, FL	51.1	49.7	-1.4
Monmouth, NJ	38.2	36.0	-2.2
Philadelphia, PA	51.9	51.8	-0.1
Pittsburgh, PA	48.7	48.7	0.0
Sacramento, CA	41.5	44.3	2.8
San Antonio, TX	56.0	53.5	-2.5
San Diego, CA	39.8	40.1	0.3
Sarasota, FL	43.8	37.7	-6.1
Tampa, FL	48.9	51.5	2.6
Washington, DC	27.9	25.2	-2.7
West Palm Beach, FL	47.0	49.7	2.7
Voucher Weighted Average Across 100 Largest Metropolitan Areas with:			
Mandatory SAFMRs	45.7	44.9	-0.8
Optional SAFMRs	47.9	48.4	0.5

Notes: Metropolitan areas with mandatory SAFMRs were announced in late 2016, made available for optional adoption in all metropolitan areas in 2017, and required in mandated areas starting in 2018. Census tract poverty rates determined using the (2012–2016) 5-year American Community Survey. Population-weighted averages exclude voucher recipients in Chicago (IL), Chattanooga (TN), Dallas (TX), Laredo (TX), and Long Beach (CA) as SAFMRs were available prior to 2016.

IMMEDIATE IMPACTS OF MANDATORY SAFMRS

The goal of this analysis is to test how mandatory adoption of SAFMRs affected the location of voucher recipients within one year of implementation. The first evidence of their effect is presented in Figure 16, which illustrates the annual percent of voucher recipients in high-poverty ($\geq 20\%$) neighborhoods between 2012 and 2016 in the 100 largest metropolitan areas.¹⁴ The bottom line represents this percent for voucher recipients in metropolitan areas with mandatory SAFMRs and the top line represents this percent for voucher holders in metropolitan areas where they were optional. Voucher holders in metropolitan areas where SAFMRs were available before 2016 are excluded from the figure.

Figure 16. The percent of voucher recipients in Census tracts with a poverty rate greater than 20% in the 100 largest metropolitan areas by whether SAFMRS were mandatory



Notes: The areas with mandatory SAFMRs were announced in late 2016 and required to be adopted by 2018.

A higher percentage of voucher holders in metropolitan areas with optional SAFMRs lived in high-poverty Census tracts in 2016 as compared to where they would be eventually mandated. 46.4% of voucher holders in SAFMR optional areas lived in a high-poverty tract in 2012 and this increased in a near constant fashion to 48.4% in 2019. In 2016, voucher holders in eventual mandatory SAFMR areas were 2.5 percentage points, or 5.2%, less likely to live in a high-poverty Census tract. This difference increased to 3.5 percentage points, or 7.2%, in 2019 after SAFMRs were mandated.

The first column of estimates presented in Table 3 acts as a test whether the difference in the percent of voucher holders in high-poverty Census tracts in areas with mandatory SAFMRs is statistically significant. The dependent variable is an indicator variable equal to one if a voucher holder

14. The geographic metropolitan areas used in the report are defined according to consolidated business statistical areas (CBSA) as defined by the U.S. Census Bureau. HUD mandated SAFMRs adoption based on a public housing authorities fair market rent area, which approximates primary metropolitan statistical areas (PMSA).

is in a high-poverty area and the observations represent the 3,155,822 voucher recipients across 2016 and 2019. Estimates were obtained using a linear probability model. The coefficient in the first row corresponds to the base-line difference before SAFMRs were announced and the second row corresponds to the percentage point increase between 2016 and 2019 where SAFMRs were optional. The third row is an interaction of the first two variables and indicates that voucher recipients in areas where SAFMRs were mandatory were 1.3 percentage points less likely to reside in a high-poverty Census tract. This corresponds with a 2.7% average decrease and the asterisks indicates this result is statistically different from 0 at the 5% level of significance.

Table 3. Effect of Mandatory Small Area Fair Market Rents (SAFMRs) on the Percent of Housing Vouchers Recipients in Low- (<10%), Moderate- (10-to-20%), and High- (>20%) Poverty Census Tracts

	High-Poverty ($\geq 20\%$)	Moderate Poverty (10-to-20%)	Low-Poverty (< 10%)
Mandatory SAFMRs	-0.022 (0.045)	0.014 (0.016)	0.007 (0.041)
Year 2019	0.005* (0.003)	-0.008*** (0.001)	0.003 (0.002)
Year 2019 x Mandatory SAFMRs	-0.013** (0.006)	-0.000 (0.003)	0.013*** (0.004)
Observations	3,155,822	3,155,822	3,155,822

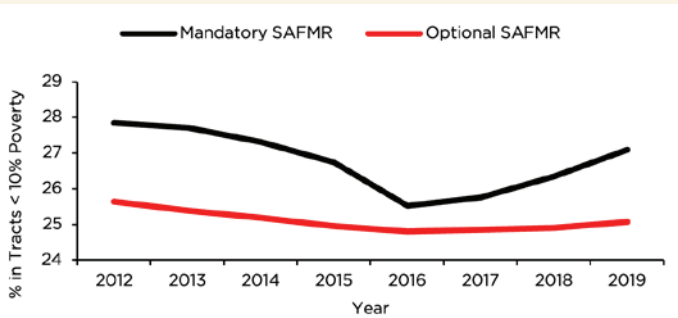
Notes: The dependent variable in each column is a (0,1) indicator for whether the Census tract where voucher recipient located had a poverty rate greater than or equal to 20%, between 10% and 20%, and less than 10% according to the 2016 5-year American Community Survey. The number of housing voucher recipients was determined using the 2016 and 2019 Picture of Subsidized Housing made available by the U.S. Department of Housing and Urban Development. Standard errors clustered at the 116 HUD-defined Fair Market Rental areas are indicated in parentheses. Asterisks indicate statistical significance at the following levels: * > 10%, ** > 5%, *** > 1%.

The last two columns of Table 2 indicate significant heterogeneity was observed across metropolitan areas with mandated SAFMRs. Decreases in the percent of households living in high-poverty Census tracts occurred in 12 of the 22 metropolitan areas after SAFMRs were mandated. The largest decrease was observed in Sarasota, FL at -6.1 percentage points and the largest increase was observed in Jacksonville, FL at 4.6 percentage points.

Results presented in the remaining columns of Table 3 indicate that there was virtually no change in the percent of voucher recipients in Census tracts with a moderate poverty rate between 10-to-20% as a result of mandatory SAFMRs, although there was 1.3 percentage point increase in the percent of voucher recipients in low-poverty

(< 10%) areas. Figure 17 illustrates this difference where each line now corresponds to the percent of voucher holders living in low-poverty areas based on whether SAFMRs were mandatory. Similar to Figure 16, there is a relatively smooth trend at approximately 25% before and after the SAFMR announcement by HUD in 2016 in places where they would be optional. In contrast, there is a break in trend and significant increase for voucher recipients in areas with mandatory SAFMRs starting in 2017. The change represents a 5% increase given the 2016 level and is also estimated to be different from no change occurring at the 1% level of statistical significance.

Figure 17. The percent of voucher recipients in Census tracts with poverty rate less than 10% in the 100 largest metropolitan areas based on whether SAFMRs were mandatory.



Notes: The areas with mandatory SAFMRs were announced in late 2016 and required to be adopted by 2018.

Table 4 presents how mandatory SAFMRs affected the number of housing vouchers used in low- and high-poverty Census tracts. There were on average 85 vouchers used in each of the 8,644 high-poverty tracts in 2016 as compared to on average 16 vouchers used in the 24,321 low-poverty tracts. 97% of high-poverty Census tracts had at least 1 voucher recipient in 2016 as compared to only 77% of low-poverty tracts. The first and third column of Table 4 present results testing how mandatory SAFMRs affected these averages using a traditional linear regression based on ordinary least squares (OLS), whereas the second and fourth columns adjust for the bunching of voucher counts at 0 using a tobit regression model.¹⁵

The regression specifications are similar to that in Table 3, although the estimates also now control for the number of voucher recipients in each Census tract 3 years prior, which were a very strong predictor of future voucher use. The first

15. The tobit regression model was developed by James Tobin and adjusts for potential attenuation bias due a censoring of estimates at 0. More specifically, it modifies the likelihood function to have different densities and cumulative distribute functions above and below the censored value of 0. Traditional linear regressions where the distribution of the dependent variable has a significant number of values at 0 will be understate the true effect without adjusting for the difference in likelihood.

two columns indicate that between 1.1-to-1.2 fewer vouchers were used in high-poverty Census tracts in metropolitan areas with mandatory SAFMRs. This estimate is relatively small as a percentage decrease (1.4%) used in high-poverty areas, and not estimated to be statistically different from 0 at conventional levels. In contrast, low-poverty Census tracts in metropolitan areas with mandatory SAFMRs had 1.8-to-2.5 additional vouchers, which corresponds to a 11.3-to-15.6% increase and was statistically different from no change at the 1% level. Although not indicated in the table, mandatory SAFMRs also increased the probability that at least 1 voucher was used in a low-poverty Census tract by 3.2%.

Table 4. Effect of Mandatory Small Area Fair Market Rents (SAFMRs) on the Number of Housing Voucher Choice Recipients in Low- (<10%) and High- (≥20%) Poverty Census Tracts

	High-Poverty Tracts		Low-Poverty Tracts	
	OLS	Tobit	OLS	Tobit
Voucher Recipients 3 Years Prior	1.011*** (0.006)	1.019*** (0.007)	0.968*** (0.023)	1.015*** (0.021)
Mandatory SAFMRs	0.860 (1.441)	1.012 (1.401)	-1.113** (0.467)	-1.522* (0.793)
Year 2019	0.148 (0.773)	-0.022 (0.744)	0.789*** (0.272)	0.753** (0.309)
Year 2019 x Mandatory SAFMRs	-1.204 (1.841)	-1.054 (1.840)	1.842*** (0.399)	2.514*** (0.480)
Observations	17,288	17,288	48,642	48,642
R-Squared	0.879	0.177	0.884	0.191
Left-Censored Observations	.	548	.	11,018

Notes: The dependent variable is the number of housing choice voucher recipients in a Census tract according to the 2016 and 2019 Picture of Subsidized Housing. The sample is stratified by Census tract poverty rates according to the 2016 5-year American Community Survey. Tobit regressions adjust estimates for censoring of observations at 0. Standard errors clustered at the 116 HUD-defined Fair Market Rental areas are indicated in parentheses. Asterisks indicate statistical significance at the following levels: * > 10%, ** > 5%, *** > 1%.

These results imply that imposing mandatory SAFMRs at least marginally changed the location of some voucher recipients. This report concludes with discussing caveats of those conclusions, potential barriers to making SAFMRs mandatory nationwide, and avenues for future research.

Summary and Policy Implications

This report has illustrated a significant and growing lack of affordable rental housing in the largest cities in the United States. While housing was already unaffordable for LMI households in a few of the largest cities located in geographically constrained areas in 2001, almost all cities became less affordable over the next two decades with median rents increasing annually at 2.0% above inflation while median incomes only increased 0.8%. Over this period, a median household needed to devote an additional 7.6% of their income to rent a median housing unit in 2020 as compared to 2001.

The federal government subsidizes the rent of approximately 7 million households annually, although the majority of low-income households do not receive a rental subsidy, with less than 1 subsidy for every 3 households with sufficiently low income in the 50 largest metropolitan areas. The number of low-income households increased by 1.4 million between 2001 and 2020, with the greatest need for additional subsidies in areas with recent population and income growth. While a LMI household earning exactly 60% of their metropolitan median income could spend less than 30% of their income to rent a median unit in 2001 in 38 of the largest 50 metropolitan areas in 2001, this has decreased to only 17 cities in 2020.

The ability of housing authorities to reimburse some landlords a higher payment standard through availability of Small Area Fair Market Rents (SAFMRs) has enabled some voucher recipients to move to lower-poverty neighborhoods. SAFMRs first become available nationwide in 2017 and HUD mandated housing authorities in 24 metropolitan areas adopt payment standards based on SAFMRs in 2018. Evidence first presented in this report shows that voucher recipients were almost 2.7% less likely to live in a high-poverty Census tract in metropolitan areas with mandated SAFMRs. More importantly, the number of recipients in low-poverty tracts increased by almost 16% within the first year. The movement of voucher recipients into low-poverty neighborhoods in metropolitan areas with mandatory SAFMRs should be expected to grow in the future as existing voucher rental contracts of previous recipients are renewed.

Additional research is needed before mandatory SAFMRs are deemed warranted nationwide. First, significant heterogeneity existed across metropolitan areas with mandated SAFMRs and it is unclear which strategies adopted by local public housing authorities to implement the new policy were most effective. Second, significant budget uncertainty exists surrounding adoption of SAFMRs. The basic premise of SAFMRs was that payment standards would be determined in the individual ZIP code level and that increases in high-rent neighborhoods would be offset by subsidy reductions in low-rent areas. Initial research suggested that implementation of SAFMRs nationwide would result in a 6% reduction in government expenditures associated with the program if households do not move neighborhoods as result of the policy change. Collinson and Ganong (2018) find, and this report confirms, that a behavioral response of households moving to higher-rent area with larger subsidies should be expected, and without such a response the policy would be viewed as a failure. Better understanding the implications and incidence of this response on already constrained budgets of local public housing authorities is important.

The last item that needs further study is how best to reduce the harm of voucher recipients continuing to reside in low-rent neighborhoods after SAFMRs are implemented. Das-trup et al. (2019) found that voucher recipients individual contributions towards rent increased for the majority of recipients after maximum subsidies decreased in low-rent neighborhoods in the 5 SAFMR demonstration cities. This result implies that total rents of the housing units voucher recipients lived in before SAFMRs were implemented did not decrease a proportional amount as the reduction in



government subsidy, making at least some households with already a limited disposable income harmed by the policy change. While enabling more low-income households to live in higher-opportunity neighborhoods is an important policy goal, it should also be recognized that some households have valid reasons to continue to live in their lower-rent neighborhoods due to proximity to social networks, public transportation, and in some instances stable learning environments for their children. Policies that minimize harm to these households, including the temporary freeze of government contribution towards rents of existing recipients, should be explored.

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