



Do Vouchers Protect Low-Income Households from Rising Rents?

Ingrid Gould Ellen¹ · Gerard Torrats-Espinosa²

© EEA 2019

Abstract

Using restricted administrative data on the voucher program, we examine the experience of voucher holders in metropolitan areas with rising rents. While some of our models suggest that rising rents in metropolitan areas are associated with a slight increase in rent-to-income ratios among voucher holders, poor renters in general see significantly larger increases in rent-to-income ratios. We see little evidence that rising rents push voucher holders to worse neighborhoods, with voucher holders in central cities ending up in *lower* poverty neighborhoods as rents rise. It appears that vouchers may help low-income households remain in neighborhoods as they gentrify.

Keywords Housing vouchers · Rent · Rent burden · Neighborhood · Gentrification

JEL Classification R23 · R28

Over the last decade and a half, rents have risen throughout much of the country, with the median gross rent rising 17% nationally between 2000 and 2015, even after controlling for inflation. In many cities, the increases were far greater. In Washington, DC, for example, the median rent rose by 27% in real terms, just between 2006 and 2014 (NYU Furman Center 2016). As rents continue to climb in US cities, there is growing concern about rising rent burdens, especially those faced by low-income

The work that provided the basis for this publication was supported by funding from the U.S. Department of Housing and Urban Development, Office of Policy Development and Research and from the Annie E. Casey Foundation. The substance and findings of the work are dedicated to the public. The author and publisher are solely responsible for the accuracy of the statements and interpretations contained in this publication. Such interpretations do not necessarily reflect the views of the Government.

✉ Ingrid Gould Ellen
ingrid.ellen@nyu.edu

¹ New York University, New York, USA

² Columbia University, New York, USA



renters. By 2015, over 80% of renters in the bottom income quintile paid more than 30% of their income on rent, up from 72% in 2000.

Economists generally favor the Housing Choice Voucher (HCV) program as a tool to help low-income households manage these rising rents. Yet some question whether such a tenant-based subsidy can adequately protect low-income households and help them stay in their homes and neighborhoods as markets tighten, vacancy rates fall, and rents rise so rapidly. In theory, payment standards should rise together with metropolitan rents, but payment standard increases may lag actual increases in rent. Further, the increases are not even across space, and local rents in a neighborhood or city may rise more quickly than metropolitan area-wide voucher payment standards. Finally, when rents are rising, voucher holders may face more competition from other renters and have a more difficult time finding homes with affordable rents and landlords willing to rent to them.

Using restricted administrative data on the voucher program from the Department of Housing and Urban Development (HUD), we examine whether larger increases in median rents in a metropolitan area are associated with higher rent burdens and higher neighborhood poverty. Where possible, we compare the changes experienced by voucher holders to those experienced by the broader set of poor renters to learn if vouchers help to buffer the effects of rising rents. We focus on changes in metropolitan area-wide rents rather than neighborhood-level rents to avoid endogeneity concerns, as voucher holders select into neighborhoods depending on factors such as rents and trajectory in rents. Plus, our key question is how voucher holders fare in the face of changes in broader market rents.¹

In brief, we find that vouchers appear to protect low-income households from rising rents. While some of our models suggest that rising rents in metropolitan areas are associated with a slight increase in rent-to-income ratios among voucher holders in that metropolitan area, poor renters in general see significantly larger increases in rent-to-income ratios. Further, we see little evidence that rising rents push voucher holders to worse neighborhoods. Indeed, perhaps surprisingly, we find that voucher holders end up, if anything, in *lower* poverty neighborhoods as median rents rise in their metropolitan area. The magnitudes are small, however, and similar to those experienced by other poor families. The reduction in poverty exposure is experienced only by voucher holders living in central cities, and those who stay in their neighborhoods, suggesting it may be driven by gentrification of urban neighborhoods in metropolitan areas with rising rents. Vouchers, in other words, may help low-income households remain in neighborhoods as they gentrify.

¹ In addition, annual data on rents at the census tract level are not available, and even five-year estimates from ACS are noisy.



Housing Choice Voucher Program and Neighborhood Change

Congress created the Section 8 Existing Housing Certificate program (now the Housing Choice Voucher Program) in 1974, departing from the government's historic reliance on place-based housing subsidies. Today, this tenant-based subsidy program has become the largest federal rental housing program, with the federal government spending about 18 billion dollars annually to provide assistance to approximately 2.2 million low-income households (Center on Budget and Policy Priorities 2017). To receive a voucher, households apply to a local Public Housing Authority (PHA), which certifies that the household's income does not exceed the eligibility threshold of 50% of the area median income (AMI).² Most voucher holders have incomes well below this threshold, as PHAs are required to award 75% of their vouchers to households whose incomes do not exceed 30% of AMI. In 2013, 76% of voucher holders earned less than 30% of AMI, which is roughly equivalent to the poverty line in most areas (Collinson et al. 2016).

The voucher program allows low-income households to rent units on the private market, with the voucher paying the difference between 30% of a household's income and the rent, up to a specified local payment standard for a unit of that size. The local payment standard must fall between 90 and 110% of the area Fair Market Rent (FMR), which the Department of Housing and Urban Development (HUD) sets annually, targeted to the 40th or 50th percentile of rents for the metropolitan area.³ Voucher holders are allowed to rent units with rents above the local payment standard, but they must pay the full cost of any difference between the actual rent and the payment standard. Upon initial occupancy, the rent they pay cannot exceed 40% of their adjusted income. After initial occupancy, there is no limit on rent burden.

Voucher holders are shielded from rising rents to some degree by the structure of the program. As long as the rent of a unit remains below the local payment standard, then a voucher household living there will continue to pay 30% of their income on rent, even as the asking rent for the unit rises. HUD will simply pay the difference between the tenant's contribution and the higher asking rent. Landlords will earn market rents, and thus, there should be little risk of displacement. As long as payment standards respond quickly to changing rents, voucher holders might be uniquely positioned to reap the benefits of the renewed demand and investment occurring since 2000 in low-income, central city neighborhoods, while not suffering the rising rent burdens that often come along with that investment.

That said, when market rents in a neighborhood rise above the voucher payment standard in the metropolitan area, voucher holders have to cover the marginal cost of any additional increases and will face higher rent burdens as a result. For example, if the payment standard is \$1000 for a two-bedroom unit, and the rent on a voucher

² In certain circumstances, households earning up to 80% of the area median income can receive a voucher.

³ During this time period, HUD allowed FMRs to be set at median rent in selected metropolitan areas where voucher holders were concentrated in a limited number of census tracts. Collinson and Ganong (2018) find this shift had no effect on voucher holder location.



holder's unit increases to \$1100, then the voucher holder will have to pay 30% of its adjusted income plus \$100 each month. A concern is that voucher holders may be forced to leave their homes to seek out a more affordable unit, potentially in a lower rent neighborhood.

Past Literature

Few researchers have analyzed how the residential patterns of voucher holders change in the face of rapidly rising rents, but we build on past analyses of the mobility rates of voucher holders and the characteristics of the neighborhoods they reach.

Voucher Rent Burdens

Although the Housing Choice Voucher program is designed so that participants pay 30% of their incomes on rent, many participants pay over 30% because they live in housing units with rents above the local payment standard. (The maximum allowable subsidy is the difference between the payment standard and 30% of a tenant's income.) McClure (2005) reports that in 2002, 38% of voucher holders paid more than 31% of their incomes on rent and 16.6% paid more than 40%.⁴ By 2015, Dawkins and Jeon (2017) report that the share of voucher holders paying more than 31% of their income on rent had risen to 46%. While one would expect tenants to face higher rent burdens in tighter housing markets, where it is more difficult to find willing landlords with housing units that meet program requirements (Finkel and Buron 2001), existing research finds little association between voucher rent burdens and county vacancy rates (McClure 2005; Dawkins and Jeon 2017). However, we know of no research that explores how rent burdens change over time with shifting market conditions.

Voucher Neighborhoods

The best evidence on the voucher program suggests that without additional incentives, it has a modest effect on the neighborhoods that households reach. For example, in their analysis of HUD's welfare to work voucher experiment, Mills et al. (2006) found that vouchers resulted in small but statistically significant improvements in neighborhood quality. As for the quality of local schools, in a reanalysis of data from HUD's welfare to work study, Ellen et al. (2016) find that the families randomly assigned vouchers reached neighborhoods with schools that had the same proficiency rates as the schools near to control group families. Similarly, Jacob and Ludwig (2012) find families receiving housing vouchers in the late 1990s in Chicago reached neighborhoods with poverty rates that were just 1% lower than other households who also applied for vouchers but did not initially receive them.

⁴ He limits sample to households with nonzero income.



A few papers have examined whether metropolitan area housing conditions appear to shape neighborhood outcomes for voucher families. Galvez (2011), for example, finds that in metropolitan areas with higher vacancy rates and a larger rental housing stock, voucher households are less concentrated in poor neighborhoods. Ellen et al. (2016) find that in metropolitan areas with higher vacancy rates, voucher holders with children reach relatively high-performing schools. Both of these studies suggest that when housing markets are weaker, voucher holders are more able to reach low-poverty neighborhoods and higher ranked schools.

Data and Methods

Our primary data source is HUD's Housing Choice Voucher Family Report, which includes all voucher households participating in the program from 2006 to 2014. These data contain information on race, ethnicity, presence of children, sources of income, and rent payments of all voucher holders in each year that they received a voucher. In addition, the dataset indicates the addresses where voucher holders live in each year. We geocode these addresses to determine the census tract and metropolitan area of residence of each voucher holder in each year. Although some addresses are missing or incomplete, we are able to geocode 91.2% of all addresses in the original HUD dataset.

We restrict our analyses to voucher holders living in the 48 contiguous states plus District of Columbia,⁵ and further limit our sample to voucher holders in the 196 large Core Based Statistical Areas⁶ (CBSAs) for which the American Community Survey provides estimates for the demographic characteristics that we include as controls. We further restrict the sample to voucher holders that appear in at least one pair of consecutive years, and we exclude the small number of households (less than 3%) who move across CBSAs. Our final sample of geocoded voucher holders is an unbalanced panel that includes 1,924,782 households in 2006, 1,916,791 in 2007, 1,942,922 in 2008, 1,950,109 in 2009, 1,936,982 in 2010, 1,908,206 in 2011, 1,843,293 in 2012, 1,835,001 in 2013, and 1,835,004 in 2014.

We merge the HUD data on voucher households to census data describing rents and other conditions in their metropolitan area drawn from the American Community Survey (ACS).

⁵ Alaska, Hawaii, Puerto Rico, and the other unincorporated territories are excluded from our sample.

⁶ We use the Core Based Statistical Area (CBSA) delineations based on the 2010 standards that were announced by the Office of Management and Budget in 2013. Although we have 238 unique CBSAs, not each of them is observed in all years. Some small CBSAs have missing information on racial composition and/or share of high-school dropouts. Among the 238 CBSAs that we consider, 118 have complete demographic information for the 9 years (2006–2014), 16 have demographic information for 8 years, 7 have demographic information for 7 years, 13 have demographic information for 6 years, 8 have demographic information for 5 years, 11 have demographic information for 4 years, 21 have demographic information for 3 years, 19 have demographic information for 2 years, and 25 have demographic information for only one year.



Since 2006, the ACS has released one-year estimates for CBSAs with at least 65,000 residents. As stated before, we limit our analyses to the large CBSAs with available estimates for the set of covariates that we include in our models. We construct a panel that includes yearly estimates of rents and other metropolitan area attributes for 196 CBSAs from years 2006 to 2014.⁷

We also link voucher holders to their neighborhood (as proxied by their census tract). We obtain census tract data from the ACS five-year estimates, which describe average neighborhood conditions during a five-year window. These data provide information on demographic and socioeconomic characteristics for every census tract in the country.⁸ We use the six waves of five-year estimates (from 2005–2009 to 2010–2014). For our annual models, we link each wave to voucher data that correspond to the last year in the 5-year window. For example, we link our 2009 voucher holder data with tract-level measures of neighborhood composition from the 2005–2009 5-year ACS estimates. Similarly, we link the 2014 voucher holder data with data on neighborhood composition from the 2010–2014 5-year ACS estimates.⁹

Our baseline model takes the following form:

$$Y_{imt+1} = \delta \text{Rent}_{mt} + \mathbf{X}'_{mt} \boldsymbol{\beta} + \mathbf{Z}'_{imt} \boldsymbol{\gamma} + \mathbf{V}'_m \boldsymbol{\varphi} + \mathbf{W}'_t \boldsymbol{\theta} + e_{imt} \quad (1)$$

In Eq. (1), Y_{imt+1} is a household-level outcome that measures rent burden, geographic mobility, or neighborhood characteristics. To capture rent burden, we calculate the log of the share in income spent in gross rent. We also test if, as expected, the rent burdens of voucher households whose rent was above the payment standard in the prior year are more sensitive to rising rents. For geographic mobility, we create a dummy variable that takes on value 1 if the household moved to a different census tract between year t and year $t+1$, and 0 otherwise. As for neighborhood outcomes, we examine the poverty rate of the neighborhood where a household resides. For example, Y_{imt+1} is the poverty rate in the census tract where household i in metropolitan area m lived in year $t+1$. Because we use year-to-year variation in tract characteristics starting in 2009 (ACS 2005–09), we restrict the analyses of neighborhood outcomes to the years 2009–2014.¹⁰

Rent_{mt} is the median gross rent in metropolitan area m in year t ; \mathbf{X}'_{mt} is a vector of controls for demographic and labor market characteristics in metropolitan area m in year t that includes the poverty rate, total population, share non-Hispanic

⁷ When we estimate CBSA-level models that compare the HCV and the IPUMS samples, the sample of CBSAs falls to 156 because the CBSA of residence is missing for some households in the IPUMS sample.

⁸ Census tracts are defined according to the boundaries from the 2010 delineations. The ACS waves for years 2006–2010, 2007–2011, 2008–2012, 2009–2013, and 2010–2015 are in 2010 boundaries. We crosswalk estimates from 2005–2009, which are in 2000 boundaries, to 2010 boundaries.

⁹ We find qualitatively the same results when we link voucher data from 2005 through 2009 to neighborhood conditions as reported in 2005–09 five-year ACS data and link voucher data from 2010 through 2014 to neighborhood conditions as reported in 2010–14 five-year ACS data.

¹⁰ We also run opportunity models using years 2007–2014 and obtain similar results. In this set of models, tract attributes for years 2007 and 2008 are obtained from the 2000 Census.



black, share non-Hispanic Asian, share Hispanic, share younger than 18, share older than 65, share college-educated, share of adults with less than a high-school degree, unemployment rate, and share of occupied housing units that are rented. Z'_{imt} is a vector of household-level attributes for household i in metropolitan area m in year t that control for the race, gender, age and age squared of the household head, presence of any dependents, building type, and number of bedrooms in the unit. We include both metropolitan area fixed effects, V'_m , and year fixed effects, W'_t , and e_{imt} is an idiosyncratic error term for household i in metropolitan area m in year t . The parameter of interest is δ , which provides an estimate of the association between changes in rents (because we include metropolitan area fixed effects) and changes in the corresponding household outcome. We cluster the standard errors at the metropolitan area level. While we are not making strong causal claims, we experiment with adding leads, or metropolitan area rents in year $t+2$ to our models to test whether coefficients on lagged rents remain statistically significant.

As for mechanisms, we undertake several tests to learn whether the patterns we see can be explained by gentrification of central city, low-income neighborhoods in CBSAs with rising rents. First, we examine whether voucher holders in central cities are more vulnerable than those in the suburbs to rising CBSA rents. Second, we test how *relative* increases in rent in the low-income neighborhoods of a CBSA affect voucher holder outcomes.¹¹ To do so, for each CBSA in the sample, we identify the set of tracts that were at or below the 40th percentile of the CBSA median household distribution in 2006, which we refer to as low-income tracts. For each CBSA and year, we then compute a weighted mean of the average rent in those tracts, with weights equal to the number of renters in each census tract. We use this weighted mean to characterize rents in low-income census tracts in the CBSA, as distinct from overall rent levels in the CBSA. Finally, we also estimate models of upward mobility, or whether or not a voucher holder moved to a census tract with a lower poverty rate across years, to examine whether any association between rents and neighborhood poverty exposure is driven by voucher holders who move to new neighborhoods or by those who stay in place as their neighborhood changes around them.

To provide a comparison to other poor renters, we use household-level data from the American Community Survey (IPUMS 1% samples) from years 2005–2014 and estimate Eq. (1) among metropolitan respondents who rented their homes and whose income was at or below the poverty threshold. The models include the same set of CBSA controls as the voucher models, a similar set of household-level controls,¹² CBSA fixed effects, and year fixed effects. We restrict the sample to poor renters who lived in the same CBSA one year ago. Estimates from these models show the association between changes in CBSA rents and the outcomes of poor renters as a

¹¹ While the gross rents charged to voucher holders rise with CBSA median rents, they should be more strongly associated with rents in the submarkets where voucher holders tend to rent (though these two rent measures are highly correlated).

¹² IPUMS models include the same set of household controls than the HCV models except for dummies for building type.



Table 1 Household and CBSA Characteristics in 2006, HCV and IPUMS samples

	HCV Sample, 2006 (N = 1,623,563)					IPUMS Sample, 2006 (N = 228,955)				
	Mean	SD	p25	p50	p75	Mean	SD	p25	p50	p75
<i>Geographic mobility</i>										
Moved to different unit	0.146	0.353	0	0	0	0.349	0.477	0	0	1
<i>Income and rent</i>										
Monthly income (logged)	6.685	0.769	6.351	6.698	7.179	5.898	1.976	5.866	6.584	6.886
Monthly income (in 2014 USD)	1011.22	687.46	573.33	810.42	1312.00	1069.33	1220.63	479.92	811.27	1270.66
Rent-to-income ratio	0.352	0.167	0.300	0.300	0.301	0.747	0.318	0.505	0.963	1
Above payment standard	0.127	0.281	0	0	1					
<i>Demographics</i>										
White	0.314	0.464	0	0	1	0.444	0.497	0	0	1
Black	0.463	0.499	0	0	1	0.255	0.436	0	0	1
Hispanic	0.190	0.392	0	0	0	0.227	0.419	0	0	0
Other race	0.031	0.187	0	0	0	0.074	0.261	0	0	0
Female	0.828	0.377	1	1	1	0.663	0.473	0	1	1
Age	46.328	16.505	33	44	57	43.416	18.601	27	40	56
Any dependents	0.583	0.493	0	1	1	0.421	0.494	0	0	1
<i>Building type and bedroom size</i>										
Single family detached	0.258	0.438	0	0	1					
Semi-detached (incl. 2-family home)	0.147	0.354	0	0	0					
Low-rise apartment building	0.183	0.386	0	0	0					
High-rise apartment building	0.322	0.467	0	0	1					
Rowhouse/townhouse	0.079	0.269	0	0	0					
Manufactured and mobile home	0.011	0.102	0	0	0					



Table 1 (continued)

	HCV Sample, 2006 (N = 1,623,563)					IPUMS Sample, 2006 (N = 228,955)				
	Mean	SD	p25	p50	p75	Mean	SD	p25	p50	p75
<i>CBSA controls</i>										
Median gross rent (in 2014 USD)	996.16	204.03	820.00	975.00	1157.00					
Median gross rent (logged)	6.883	0.207	6.709	6.882	7.054					
Population (logged)	14.785	1.306	13.701	14.793	15.608					
Share younger than 18	0.249	0.022	0.236	0.246	0.261					
Share older than 65	0.118	0.021	0.103	0.119	0.127					
Share non-Hispanic white	0.609	0.170	0.512	0.593	0.771					
Share non-Hispanic black	0.128	0.084	0.064	0.116	0.168					
Share non-Hispanic Asian	0.059	0.051	0.021	0.041	0.091					
Share Hispanic	0.181	0.153	0.050	0.149	0.265					
Share below poverty line	0.093	0.028	0.080	0.094	0.100					
Share with less than high-school diploma	0.155	0.046	0.128	0.148	0.170					
Share with college degree or more	0.301	0.065	0.265	0.294	0.345					
High-school dropout rate	0.062	0.019	0.052	0.056	0.069					
Unemployment rate	0.042	0.008	0.037	0.042	0.044					
Share of renter-occupied units	0.357	0.068	0.310	0.337	0.416					

Demographic attributes correspond to the head of the household as listed in the HUD data



whole. (We cannot exclude voucher holders, but they represent a small share of poor renters.)

Summary Statistics

Table 1 shows descriptive statistics for households in the HCV and IPUMS samples in 2006, along with CBSA characteristics. The left side of the table shows that roughly half of voucher holders are African-American (46.3%), nearly all are female (82.8%), and most have at least one dependent in the household (58.3%). In addition, voucher holders are more likely to live in high-rise apartment buildings than any other building type (32.2%), but many live in low-rise apartments and 1–2 family homes. Between 2005 and 2006, 14.6% of voucher households had moved to a different census tract. The share of voucher holders facing rent burdens above 40% was approximately 10%. The median voucher household paid just over 35% of their income on rent in 2006. The share paying rents above the local payment standard was under 13%. The mean monthly income of voucher holders in 2006 was \$1011 (in 2014 USD).

The right side of Table 1 shows characteristics of poor renters in the IPUMS sample in 2006. The mean monthly income of poor renters in 2006 was \$1069 (in 2014 USD), just slightly higher than that for voucher holders. The racial composition of poor renters is quite different from that of voucher holders, however, with more white and fewer black households. Among poor renters, 44.4% are white, 25.5% are black, 22.7% are Hispanic, and 7.4% identify as other racial/ethnic groups. Roughly two-thirds of the heads of the household are female (66.3%), and 42.1% have at least one dependent in the household. Most notably, as compared to voucher holders, poor renters as a whole are more mobile and face higher rent burdens. Between 2005 and 2006, 32.2% of poor renters in the IPUMS sample moved to a different housing unit.¹³

Table 2 shows the distribution of mean neighborhood poverty rates for voucher holders and poor families and the proportion living in high-poverty census tracts across 196 CBSAs. We compute them separately for those living in central city and suburban tracts in the CBSA. In general, poverty concentration rose between 2009 and 2014, and it was higher in the central city than in the suburbs. The proportion of poor families living in high-poverty census tracts rose from 20.3% in 2009 to 28% in 2014. Voucher holders were slightly more likely to live in high-poverty census tracts, with 31% living in such neighborhoods in 2013. The average voucher household living in the central city was exposed to a neighborhood poverty rate of 23.5% in 2009 and 27.3% in 2014. The average voucher household living in a suburban area lived in a census tract with a poverty rate of 13.9 and 17.5% in 2009 and 2014, respectively. On average, voucher households and poor households experienced identical poverty exposure in suburban areas, and in central cities, voucher holders lived in neighborhoods with slightly lower poverty rates than poor families.

¹³ We cannot distinguish between moves within and across Census tracts in the IPUMS sample.



Table 2 Exposure to poverty among voucher holders and poor families (N= 196 CBSAs)

	2009					2014								
	Mean	SD	p5	p25	p50	p75	p95	Mean	SD	p5	p25	p50	p75	p95
<i>Voucher households</i>														
Exposure to poverty in central city	0.235	0.079	0.120	0.180	0.228	0.283	0.387	0.273	0.068	0.161	0.226	0.275	0.318	0.384
Exposure to poverty in suburban areas	0.139	0.059	0.060	0.100	0.131	0.166	0.249	0.175	0.061	0.087	0.129	0.171	0.212	0.285
Share in high-poverty tracts	0.205	0.170	0.000	0.065	0.174	0.318	0.523	0.313	0.198	0.000	0.161	0.317	0.455	0.660
<i>All poor families</i>														
Exposure to poverty in central city	0.250	0.088	0.123	0.190	0.241	0.308	0.406	0.283	0.076	0.162	0.232	0.277	0.329	0.414
Exposure to poverty in suburban areas	0.141	0.051	0.067	0.104	0.135	0.167	0.233	0.175	0.057	0.095	0.139	0.172	0.204	0.274
Share in high-poverty tracts	0.203	0.152	0.000	0.081	0.191	0.304	0.479	0.280	0.166	0.000	0.156	0.282	0.385	0.563



Table 3 Regression results: Rent burden and residential mobility

	Log rent-to-income ratio				
	(1)		(2)		
	(1)	(2)	(3)	(4)	
	HCV households		IPUMS poor renters		
	(1)	(2)	(3)	(4)	
	HCV households		HCV households		
	(1)	(2)	(3)	(5)	
	HCV households		IPUMS poor renters		
	(1)	(2)	(3)	(5)	
Log CBSA median rent	0.037* (0.022)	0.010 (0.021)	0.174*** (0.040)	0.153*** (0.033)	0.092** (0.035)
Rent above payment standard		-0.829*** (0.182)			
(Log CBSA rent) × (Above PS)		0.140*** (0.027)			
CBSA % poor	0.174*** (0.065)	0.123** (0.049)	0.272** (0.130)	0.052 (0.082)	0.068 (0.106)
Log CBSA population	-0.031 (0.028)	-0.036 (0.024)	-0.002 (0.042)	-0.014 (0.024)	-0.096*** (0.033)
CBSA % below 18y	-0.787*** (0.273)	-0.499*** (0.181)	0.113 (0.308)	-0.050 (0.238)	-0.076 (0.313)
CBSA % above 65y	-0.887*** (0.297)	-0.599*** (0.254)	-0.972*** (0.361)	-0.042 (0.274)	0.488 (0.389)
CBSA % black	0.003 (0.147)	0.011 (0.131)	0.361 (0.341)	-0.363 (0.244)	-0.233 (0.238)
CBSA % Asian	0.114 (0.243)	-0.050 (0.203)	0.422 (0.435)	-0.401 (0.317)	0.365 (0.313)
CBSA % Hispanic	-0.033 (0.136)	0.141 (0.092)	0.081 (0.176)	-0.034 (0.156)	0.071 (0.183)
CBSA % less HS	-0.040 (0.087)	-0.007 (0.073)	-0.029 (0.168)	-0.029 (0.102)	-0.096 (0.149)



Table 3 (continued)

	Log rent-to-income ratio		Moved last year (0,1)	
	(1)	(2)	(3)	(4)
	HCV households		IPUMS poor renters	
	(1)	(2)	(3)	(4)
CBSA % college	-0.078 (0.066)	0.002 (0.057)	0.131 (0.138)	-0.013 (0.087)
CBSA % HS dropout	-0.052 (0.039)	-0.050 (0.039)	0.129* (0.076)	0.017 (0.047)
CBSA % unemployed	0.036 (0.094)	0.087 (0.082)	0.378** (0.184)	0.248* (0.137)
CBSA % renter	-0.094* (0.053)	-0.043 (0.046)	-0.218** (0.104)	-0.121* (0.069)
CBSA fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Household controls	Yes	Yes	Yes	Yes
Adjusted R-squared	0.090	0.122	0.199	0.037
Observations	13,828,013	13,828,013	430,889	13,828,013

Clustered standard errors by CBSA in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Households controls in HCV models include race and gender indicators, age, age squared, presence of dependents, household income, indicators for number of bedrooms, and indicators for building type. IPUMS models include the same household-level controls except for building type



Results

The results that follow show that the voucher program provides some protection for low-income renters in the face of rising rents, but it is not unqualified. The research design does not enable us to make causal claims; as such, all coefficients should be interpreted as associations.

Rent-to-Income Ratio

Column 1 in Table 3 shows that voucher holders pay a larger share of their incomes on rent as CBSA rents rise. That said, the association is modest. A 10% increase in median rents is associated with a 0.4% increase in the share of income that voucher holders spend in rent.¹⁴ As discussed earlier, the HCV program is designed so that participants can rent units in the private market without spending more than 30% of their incomes on rent, generally. But this is only true for voucher holders renting homes with rents below the payment standard (the maximum rent amount that HUD will provide in each metropolitan area). HCV participants can choose to rent a unit above the payment standard, but the subsidy will only pay for the difference between the payment standard and 30% of their income. Thus, we expect the association between higher rents and higher rent burdens to be largely restricted to voucher holders initially renting homes above the payment standard, who may opt to stay to place but pay higher shares of their income on rent.

To test whether this pattern holds, the regression in Column 2 in Table 3 interacts changes in median rents with an indicator for whether the household's rent in the prior year was above the local payment standard. We find, as expected, that the association between rising median rents and rent burdens is driven entirely by voucher households whose rents were above the payment standard. For households whose rent in year $t-1$ was below the payment standard, there is no association between changes in median rents and changes in the rent-to-income ratio. For households living in apartments where the rent was above the local payment standard in year $t-1$, a 10% increase in median rents is associated with a 1.4% increase in the rent-to-income ratio.

Column 3 in Table 3 shows that poor renters as a whole see larger increases in rent burdens as rents rise. For poor renters, a 10% increase in median rents is associated with an increase in the share of income spent on rent of 1.7%, slightly larger than the increase experienced by voucher holders whose rent in year $t-1$ was above the local payment standard. In short, vouchers appear to provide significant protection from the affordability burdens associated with rising rents, at least for those renting homes below the payment standard.

¹⁴ We obtain similar results when we aggregate to CBSA and estimate long-change regressions examining link between increases in CBSA rent and increases in rent burden between 2006 and 2014.



Table 4 Regression results: Neighborhood poverty

	HCV households		All poor families (ACS tract data)
	(1)	(2)	(3)
	Tract poverty	CBSA exposure to poverty	CBSA exposure to poverty
Log CBSA median rent	-0.071** (0.030)	-0.112*** (0.027)	-0.062** (0.025)
CBSA % poor	0.173*** (0.049)	0.190** (0.089)	0.079 (0.079)
Log CBSA population	0.016 (0.023)	0.071** (0.032)	0.059** (0.025)
CBSA % below 18y	-0.275 (0.262)	-0.374 (0.364)	-0.633 (0.471)
CBSA % above 65y	0.310 (0.359)	0.633 (0.403)	0.624 (0.418)
CBSA % black	-0.174 (0.255)	0.188 (0.248)	0.118 (0.228)
CBSA % Asian	-0.193 (0.358)	0.319 (0.394)	0.348 (0.321)
CBSA % Hispanic	0.306 (0.218)	0.689*** (0.262)	0.561** (0.218)
CBSA % less HS	-0.048 (0.083)	-0.015 (0.103)	-0.097 (0.087)
CBSA % college	-0.052 (0.051)	-0.043 (0.093)	-0.047 (0.091)
CBSA % HS dropout	-0.010 (0.043)	-0.034 (0.045)	-0.048 (0.040)
CBSA % unemployed	-0.293*** (0.101)	-0.240 (0.176)	-0.130 (0.138)
CBSA % renter	0.164*** (0.047)	0.126 (0.077)	0.162** (0.065)
CBSA fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Household controls	Yes	N/A	N/A
Adjusted R-squared	0.165	0.930	0.928
Observations	5,439,251	997	997

Clustered standard errors by CBSA in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Households controls in HCV models include race and gender indicators, age, age squared, presence of dependents, household income, indicators for number of bedrooms, and indicators for building type

Residential Mobility

Column 4 in Table 3 shows that voucher households are more likely to move to a different census tract when rents rise in the CBSA. Each 10% increase in median



rents in the metropolitan area is associated with a 1.5 percentage point increase in the probability of moving to a different census tract in the following year. Column 5 shows a similar, though somewhat smaller, change in the probability of relocation among poor renters in the IPUMS sample, a 0.9 percentage point increase for each 10% increase in median rents in the metropolitan area. Thus, vouchers do not appear to be helping low-income households remain in place when rents rise. The more relevant question may be where low-income households are able to move when given a voucher. We explore this question next.

Neighborhood Poverty

Consistent with past literature, we measure neighborhood quality by the poverty rate. Column 1 in Table 4 shows that each 10% increase in median rents in the metropolitan area is associated with a 0.7 percentage point decline in the poverty rate of the census tract where voucher holders live. We cannot estimate similar exposure to poverty models for the full set of poor renters as IPUMS data do not report the census tract where each household lives. However, we can compare regressions of average exposure to neighborhood poverty in each CBSA. Thus, Column 2 presents results from a CBSA-level model in which the dependent variable is the exposure to tract poverty for the average voucher holder in the CBSA. In line with results in Column 1, these estimates suggest that each 10% increase in median rents in the metropolitan area is associated with a 1.1 percentage point decline in the poverty rate in the census tract where the typical voucher holder lives.

Column 3 in Table 4 shows analogous results for poor families as a whole.¹⁵ Because the IPUMS data do not reveal the census tract of residence, the dependent variable in this model is the exposure to poverty for the average poor family in a given CBSA, or the weighted average poverty rate in the census tracts where poor families live. Regressing this CBSA-level outcome on median rents and the same set of CBSA controls included in other models, we find that a 10% increase in CBSA rents is associated with a 0.6 percentage point reduction in average neighborhood poverty rate, slightly smaller than the change experienced by voucher holders.

At first blush, these results regarding neighborhood characteristics are surprising and somewhat counter to expectations. With rising rents, we might expect both voucher holders and other poor renters to have fewer choices and to end up in neighborhoods with higher poverty rates and less educated neighbors. However, it is also true that in metropolitan areas with rising rents, higher income households are more likely to opt for lower-income central city neighborhoods—the very neighborhoods where voucher holders tend to live (Ellen et al. 2013). Thus, while voucher holders and poor renters may find fewer available units when rents rise, if they are able to stay in their neighborhoods as they change, they may see higher income and more educated neighbors moving in around them. Note that this effect is not just explained by an across-the-board reduction in poverty in cities where rents appreciated more

¹⁵ We compute exposure for all poor families because publicly available tract data from the American Community Survey do not report separate counts of poor renters.



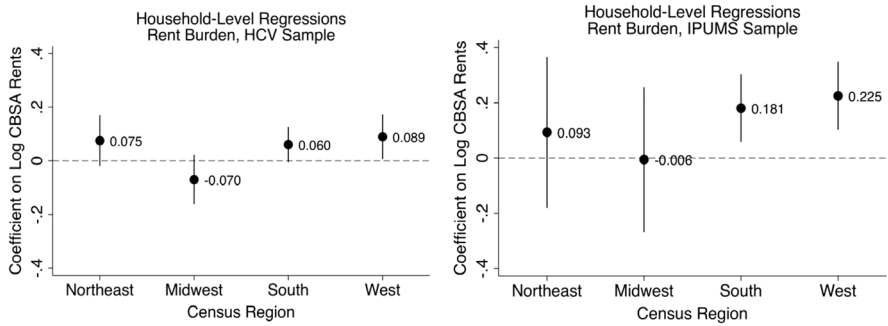


Fig. 1 Rent burden coefficients by region

rapidly. While changes in median rents are negatively correlated with changes in poverty, our models control for the poverty rate in the CBSA, which means that the decline in neighborhood poverty found in Table 4 is net of any CBSA-wide reduction in poverty.

Regional Variation

In Fig. 1, we explore heterogeneity in rent burden results across the four Census regions, both for the HCV and IPUMS samples. For voucher holders, we find rent burdens only significantly rise with rents in CBSAs in the West, though point estimates are similar in Northeast and South. By contrast, the association between rents and rent burdens for voucher holders in the Midwest is negative, and almost statistically significant. For poor renters, we see a similar regional pattern: Rent burdens rise with rents in the South as well as the West, and the estimated effect is essentially zero in the Midwest. Given that rental housing markets were generally tightest in the West and softest in the Midwest, these findings are expected. In tighter housing markets, rising rents may constrain the supply of homes available to voucher holders and low-income renters; in looser markets, there may be sufficient slack to allow voucher holders and other low-income renters to find affordable units even as rents rise.

Exploring Mechanisms

Table 5 begins to explore the mechanisms through which these patterns occur. We first separate voucher holders into two groups: those living in central cities and those living in suburbs. Column 1 in Table 5 shows that the association between changes in median rents and changes in neighborhood poverty is driven entirely by the changes in neighborhood conditions experienced by voucher holders living in central city tracts, suggesting the reduction in poverty associated with rising rents is linked to the gentrification of central city neighborhoods. Column 2 shows results of linear probability models of upward mobility, or moves to lower poverty tracts. As shown, we find no association between changes in median rents



Table 5 Regression results: Neighborhood poverty by central city status and upward mobility

	(1)	(2)
	Tract poverty	Upward mobility (0,1)
Log CBSA median rent	-0.022 (0.035)	-0.128 (0.172)
Central city tract	0.559*** (0.208)	
(Log CBSA rent)×(Central city)	-0.068** (0.031)	
CBSA fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
CBSA controls	Yes	Yes
Household controls	Yes	Yes
Adjusted R-squared	0.245	0.008
Observations	5,439,251	5,439,251

Clustered standard errors by CBSA in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Household-level controls include race and gender indicators, age, age squared, presence of dependents, household income, indicators for number of bedrooms, and indicators for building type. CBSA controls include poverty rate, total population, share non-Hispanic black, share non-Hispanic Asian, share Hispanic, share younger than 18, share older than 65, share college-educated, share of adults with less than a high-school degree, unemployment rate, and share of occupied housing units that are rented

in the metropolitan area and upwardly mobile moves, suggesting the reduction in exposure to poverty is driven by the voucher holders who stay in place as their neighborhoods experience reductions in poverty rates.

Finally, in Table 6, we examine whether voucher holders are more vulnerable to rising rents in the low-income submarkets where they tend to rent. When we include changes in CBSA-wide median rents and changes in mean rents in low-income tracts in our models, the estimated coefficients on rents in low-income tracts are larger than those for median rent, as expected. These coefficients, however, are imprecisely estimated due to the high correlation between changes in CBSA-wide median rents and changes in mean rents in low-income tracts. Column 3 shows that increases in mean rents in low-income tracts are associated with substantially larger decreases in poverty rates for voucher households. Indeed, we see a positive association between median rents and exposure to poverty when we include rents in the low-income submarket, perhaps reflecting that voucher holders are more restricted to high-poverty neighborhoods when rents in the metro area rise more than they do in low-income tracts.

For the overall population of poor renters, the point estimates suggest that rent burdens and mobility rates appear to be more determined by changes in median rents in the CBSA as a whole, as shown in Columns 4 and 5. If poor renters are more dispersed than voucher households, it makes sense that their outcomes change more with CBSA-wide changes in rent. Again, however, the coefficients are imprecisely estimated.



Table 6 Regressions accounting for rent changes in low-income tracts

	HCV sample		IPUMS sample	
	(1)	(2)	(3)	(5)
	Log rent-to-income ratio	Moved tracts (0,1)	Tract poverty	Log rent-to-income ratio
Log CBSA median rent	0.045 (0.029)	0.037 (0.047)	0.059** (0.025)	0.153 (0.105)
Log low-income tracts mean rent	0.071 (0.081)	0.138 (0.112)	-0.229*** (0.075)	-0.360 (0.252)
CBSA controls	Yes	Yes	Yes	Yes
CBSA fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Household controls	Yes	Yes	Yes	Yes
Adjusted R-squared	0.380	0.029	0.172	0.211
Observations	13,828,013	13,828,013	5,439,251	430,889

Clustered standard errors by CBSA in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. All models include the same CBSA-level controls than those shown in Table 4. Households controls in HCV models include race and gender indicators, age, age squared, presence of dependents, household income, indicators for number of bedrooms, and indicators for building type. IPUMS models include the same household-level controls except for building type



Table 7 Regressions with 2-year leads CBSA rents

	HCV sample		IPUMS sample			
	(1)	(2)	(3)	(4)	(5)	(6)
Log CBSA median rent	-0.035 (0.035)	0.123*** (0.058)	-0.036 (0.046)	0.219 (0.359)	0.151*** (0.048)	0.091*** (0.046)
Log CBSA median rent, 2-year lead	-0.007 (0.031)	0.052 (0.085)	-0.084*** (0.031)	0.068 (0.371)	-0.055 (0.053)	0.007 (0.050)
CBSA controls	Yes	Yes	Yes	Yes	Yes	Yes
CBSA fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Household controls	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.270	0.040	0.157	0.013	0.198	0.151
Observations	13,828,013	13,828,013	5,439,251	5,439,251	430,889	430,889

Clustered standard errors by CBSA in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. All models include the same CBSA-level controls than those shown in Table 4. Households controls in HCV models include race and gender indicators, age, age squared, presence of dependents, household income, indicators for number of bedrooms, and indicators for building type. IPUMS models include the same household-level controls except for building type

Robustness Checks

In Table 7, we explore the extent to which the size and direction of the coefficients on CBSA median rents remain significant when we add rent in year $t+2$ to our regression models. In the HCV sample, the coefficients on the leads are mostly insignificant, and the magnitudes of the coefficients on rent in year t remain largely the same. Still, the coefficients on rents in year t in the regressions of rent-to-income ratio and tract poverty rate lose significance, raising some questions about the robustness of these relationships. In the IPUMS sample, the coefficient on CBSA median rents in year t remains statistically significant in regressions of both rent burden and geographic mobility, suggesting the relationship between rents and rent burden is more robust for poor renters as a whole.

Conclusion

These analyses suggest that vouchers help to partially insulate low-income households from gentrification and the rising rents recently seen in many cities around the country. Voucher holders are not immune to the effects of increasing rents, however. As rents rise in a metropolitan area, voucher holders move more often and face slightly higher rent burdens, especially in the tight markets of the West coast. But the increases in rent-to-income ratios they experience with higher rents are significantly smaller than those felt by poor renters as a whole. Further, voucher holders whose initial rents fall below the local payment standard see no increase in rent burden as rents rise.

As for neighborhood outcomes, we see no evidence that voucher holders are getting pushed to less desirable neighborhoods within a metropolitan area. Indeed, we find a slight *reduction* in exposure to neighborhood poverty among voucher holders living in metropolitan areas where median rents increased more rapidly, even after controlling for the metropolitan area's poverty rate.

As for mechanisms, we find suggestive evidence that this reduction in poverty exposure is related to gentrification. First, the association between rising rents and reduced exposure to poverty is driven by voucher holders living in central city neighborhoods and by those who are able to remain in those neighborhoods. Second, we find the reduction in poverty exposure is particularly pronounced in CBSAs where rents rise in the low-income submarket relative to the broader market. Poor renters as a whole also see a reduction in exposure to neighborhood poverty in areas with increasing rents, though the association is somewhat more muted, suggesting that vouchers may help low-income households remain in communities as they see new investment and experience gentrification.

Importantly, our data only allow us to observe the residential patterns of the voucher holders who are able to successfully lease up with their voucher. In the most recent national study of voucher utilization, Finkel and Buron (2001) report that roughly one in five voucher holders nationally did not succeed in using their voucher to rent a home in 2000. It seems likely that rising rents make it more difficult for new



voucher holders to find acceptable, affordable homes in the 60–90 days that housing authorities typically allot them. Future work should explore how rising rents affect voucher take-up rates.

References

- Center on Budget and Policy Priorities. 2017. Housing Choice Voucher Fact Sheets. <https://www.cbpp.org/housing-choice-voucher-fact-sheets>.
- Collinson, Robert, Ingrid Gould Ellen, and Jens Ludwig. 2016. Low Income Housing. In *Economics of Means-Tested Transfer Programs in the United States*, vol. II, ed. Robert Moffit. Chicago, IL: University of Chicago Press.
- Collinson, Robert, and Peter Ganong. 2018. How Do Changes in Housing Voucher Design Affect Rent and Neighborhood Quality? *American Economic Journal: Economic Policy* 10(2): 62–89.
- Dawkins, Casey and Jae Sik Jeon. 2017. Rent Burden in the Housing Choice Voucher Program. Multidisciplinary Research Team Report. Washington, DC: Department of Housing and Urban Development.
- Ellen, Ingrid Gould, Keren Horn, and Katherine O'Regan. 2013. Why Do Higher Income Households Choose Low Income Neighborhoods? Pioneering or Thrift? *Urban Studies* 50(12): 2478–2495.
- Ellen, Ingrid Gould, Keren Horn, and Amy Ellen Schwartz. 2016. Why Don't Housing Choice Voucher Recipients Live Near Better Schools? Insights from Experimental and Big Data. *Journal of Policy Analysis and Management* 35: 884–905.
- Finkel, Meryl, and Larry Buron. 2001. *Study of Section 8 Voucher Success Rates Volume 1: Quantitative Study of Success Rates in Metropolitan Areas*. Washington, DC: U.S. Department of Housing and Urban Development, Office of Policy Development and Research.
- Galvez, Martha. 2011. Defining 'Choice' in the Housing Choice Voucher Program. Dissertation Manuscript, New York University.
- Jacob, Brian A., and Jens Ludwig. 2012. The Effects of Housing Assistance on Labor Supply: Evidence from a Voucher Lottery. *American Economic Review* 102(1): 272–304.
- McClure, Kirk. 2005. Rent Burdens in the Housing Choice Voucher Program. *Cityscape: A Journal of Policy Development and Research* 8(2): 5–20.
- Mills, Gregory, Daniel Gubits, Larry Orr, David Long, Judie Feins, Bulbul Kaul, Michelle Wood, Amy Jones & Associates, Cloudburst Consulting, and the QED group. 2006. *The Effects of Housing Vouchers on Welfare Families*. Washington, D.C.: U.S. Department of Housing and Urban Development, Office of Policy Development and Research.
- NYU Furman Center. 2016. National Affordable Rental Housing Landscape. 2016. https://furmancenter.org/files/NYU_Furman_Center_Capital_One_National_Affordable_Rental_Housing_Landscape_2016_9JUNE2016.pdf.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

