

Scale in Housing Policy: A Case Study of the Potential of Small Area Fair Market Rents

Matthew Palm

University of Melbourne

Abstract

The U.S. Department of Housing and Urban Development (HUD) caps subsidies for Section 8 housing vouchers using limits known as the Fair Market Rents (FMRs). HUD recently implemented Small Area Fair Market Rents (SAFMRs), based on ZIP Code-level rents, to improve options for voucher recipients in high-opportunity areas. I use a proprietary dataset of for-rent listings to test the ways in which SAFMRs would change the number of listings below FMR across five California HUD metropolitan FMR areas—Oakland-Fremont, Sacramento--Roseville--Arden-Arcade, San Diego-Carlsbad, San Francisco, and San Jose-Sunnyvale, Santa Clara. I examine local housing authorities' concerns regarding the SAFMRs. I find the SAFMRs will increase the number of listings below FMR in high-opportunity neighborhoods across each area studied except San Francisco. I confirm Oakland housing authorities' concerns that the SAFMRs would reduce the number of units below FMR in areas with rapidly rising rents. I find that Sacramento and San Diego may benefit most from the SAFMRs among those studied. These findings validate HUD's criteria for identifying areas in which to implement the SAFMRs, as Sacramento and San Diego are also the only two areas among the case studies in this article that HUD initially approved for SAFMRs implementation. The SAFMRs highlight the importance of geographic scale in housing policy implementation.

Introduction

In select metropolitan areas, HUD recently implemented a new way of defining Fair Market Rent (FMR), the subsidy limits for Section 8 housing vouchers.¹ This change, called the Small Area

¹ "Establishing a More Effective Fair Market Rent System; Using Small Area Fair Market Rents in Housing Choice Voucher Program Instead of the Current 50th Percentile FMRs." Final Rule. 24 CFR Parts 888, 982, 983, and 985. *Federal Register* 81 (221) November 16, 2016.

Fair Market Rent (SAFMR), shrinks the geographic scale at which HUD calculates these voucher maximums from the metropolitan scale, known as the HUD metro FMR area, to the smaller ZIP Code-related geography. HUD implemented this rule to encourage voucher recipients to relocate into high-opportunity areas. Recent research finds that children who grow up in high-opportunity communities are more likely to experience upward social mobility (Chetty, Hendren, and Katz, 2016). The results of an SAFMR pilot program in Texas suggest that this policy scale change does improve voucher holders' locations (Collinson and Ganong, 2013). However, advocates and public housing authorities (PHAs) in some areas objected to the SAFMRs, arguing the American Community Survey (ACS) data used to define FMRs did not keep pace with rapidly rising rents. They also noted the SAFMRs did not consider the lack of vacancies in some markets, or the ways SAFMRs could reduce housing options for residents in gentrifying communities (Johnson, 2016b; Levin, 2016).

In this study, I examine two aspects of the SAFMRs. First, I test the ability of SAFMRs to increase the number of listings below the voucher payment limits (henceforth, "below FMR") in high-opportunity neighborhoods. Second, I test the concerns of some PHAs regarding the way in which SAFMRs may exacerbate the impacts of rising rents and reduce the number of below-FMR units in markets with tight vacancy rates. I utilize a proprietary database of for-rent listings covering five HUD metropolitan FMR areas in California—Oakland-Fremont (henceforth, Oakland), Sacramento--Roseville--Arden-Arcade (Sacramento), San Diego-Carlsbad (San Diego), San Francisco, and San Jose-Sunnyvale-Santa Clara (San Jose)—from 2012 and 2013 to model these potential impacts of the SAFMR. As some SAFMR critics' concerns involve rapidly rising rents, I also draw on data from the same proprietary source for 2011 and 2014–2015 to contextualize my results within each area's market trends. Because the use of web-based rental listings to study housing affordability is new, I also present a set of results comparing my analysis with those of the only other study to examine FMRs using web-based rental listings, conducted by Boeing and Waddell (Boeing and Waddell, 2016).

I find that the SAFMRs would increase the share of below-FMR listings in high-opportunity areas in four of the five HUD metropolitan FMR areas studied, the exception being San Francisco. I note that San Francisco's unique results are a function of rents increasing faster than the SAFMRs in that area's expensive ZIP Codes. I also identify a pattern unique to Oakland—the SAFMRs would exacerbate the loss of below-FMR units in lower rent ZIP Codes where rents are significantly increasing, reconfirming local PHAs' concerns (Johnson, 2016b). I fail to find a relationship between ZIP Code vacancy rates and the potential impact of the SAFMRs, suggesting the SAFMRs may not reduce the overall share of units below FMR.

This article contains five sections. I begin with a background to provide a more detailed explanation of FMRs, SAFMRs, and theoretical motivations behind the SAFMR approach. In the following section, a literature review examines the many obstacles facing voucher recipients, noting a lack of attention among scholars for the role that market rents play in limiting voucher holders' choices. I also highlight the data limitations of the few studies that do consider market constraints. I then detail local agencies' concerns with the SAFMRs and present several hypotheses based on this review. A data section and methods section follows in which I note the limitations of rental listings data. My results and conclusions highlight the implications of the SAFMRs for each of the metropolitan areas studied in this article.

Background

Vouchers enable participating households to pay only 30 percent of their income on rent, with the remaining rent subsidized by the federal government up to FMR limits (HUD, 2017a). HUD calculates FMRs for thousands of geographies known as HUD metropolitan FMR areas, geographies that can encompass between 50,000 and several million residents. HUD began using the ACS to measure FMRs after a report from the U.S. Government Accountability Office called for greater transparency and consistency in FMR implementation. The report detailed the need for a cost-effective approach to calculating FMRs that would be consistent across jurisdictions and over time and transparent enough that concerned local housing authorities could replicate and thus verify proposed FMRs (GAO, 2005). HUD responded to the report by adopting the ACS for its FMR calculations and by developing a completely open-access FMR documentation system available online (HUD, 2017a).

To calculate the FMRs, HUD starts by estimating the 40th percentile of the distribution of gross rents in each metropolitan FMR area, by number of bedrooms, using the latest available ACS data (HUD, 2017b). Gross rents include both the contracted rent for housing and the utilities paid by the household, meaning that HUD intends for FMRs to cover utilities and rent. HUD relies on the latest 5-year rolling sample of the ACS to produce these estimates (U.S. Census Bureau, 2016a). If recent movers in the ACS report significantly higher rents than the 40th percentile, then HUD adjusts the 40th percentile rent proportionally upward. HUD uses the latest 1-year sample of the ACS to make these recent mover adjustments, bringing the data inputs closer to the time of policy application.

HUD must publicly post FMRs for thousands of jurisdictions several months prior to the year of their implementation to provide time for PHAs and other stakeholders to comment on the proposed limits. HUD usually posts the FMRs in September of the prior year (NLIHC, 2016a). By that time, however, the latest ACS data available are usually 2 years old. To account for this lag, HUD applies trend and inflation factors to the initial ACS-derived limits. Although this method accounts for time factors, spatial challenges remain. The traditional FMRs are frequently insensitive to inter-neighborhood variations in rental market conditions. HUD's calculation of the FMRs covering large geographies creates a mismatch between local markets and regional statutory voucher limits.

The SAFMRs address this problem. To calculate the SAFMRs, HUD first calculates a ratio—the median rent of a ZIP Code more than the median rent of its respective metropolitan statistical area (MSA). Suppose this ratio equals 110 percent for a given ZIP Code, because this ZIP Code is 10 percent more expensive than its overall MSA. HUD multiplies this ratio to the existing FMRs to calculate the SAFMR for that specific ZIP Code. This SAFMR now better reflects the rental market in this more expensive ZIP Code. Voucher recipients in that ZIP Code can now rent units 10 percent more expensive than those they could previously rent. HUD caps SAFMRs at 150 percent of their respective FMRs.

Geographic theory suggests this change should improve the ability of housing voucher recipients to disperse evenly across metropolitan areas. Tobler's First Law of Geography holds that near things are more related than far things (Miller, 2004). Housing is no exception. Rental and land markets are highly autocorrelated across space, with spatially oriented approaches like geographic fixed

effects and geographically weighted regression often better predicting rents and home prices than nonspatial statistical techniques in multiple studies (Löchl and Axhausen, 2010; McCord et al., 2014; Tu, Sun, and Yu, 2007). This spatial autocorrelation suggests that the rents of a unit's neighbors can more easily predict that unit's rent than similar units much farther away. The SAFMRs embodies this principle.

HUD recently rescinded the mandatory implementation of the SAFMRs in response to mounting uncertainty about its programmatic costs (NLIHC, 2017). Advocates successfully challenged that decision in court, and it appears the SAFMRs will take effect (Cohen, 2018).² Some critics argued that the SAFMRs would reduce the number of households supported by vouchers, because it would raise the cost of the program without providing additional revenue to offset those costs (NAHB, 2017). When considering the FMR, HUD must also contend with the fact that "flat rents" for public housing tenants are also derived from the FMR (HUD, 2015). Flat rents are alternative affordable rents for public housing tenants that are higher than income-based rents but do not rise if the tenants' income rises. Some jurisdictions have implemented flat rents as an incentive for public housing tenants to find employment (SAMHSA, 2016). The link between the flat rent and FMRs creates a separate set of stakeholders, public housing tenants in flat rent jurisdictions who would be adversely impacted by rising FMRs.

Unfortunately, rental prices and FMRs are only one of many factors constraining voucher holder's location choices. The following literature review details these challenges.

Literature Review

Researchers first identified the failure of housing vouchers to induce recipients to move into high-opportunity neighborhoods early in the life of the program (Newman and Schnare, 1997). More recent work confirms that this pattern continues in voucher location outcomes (Galvez, 2011), with one study suggesting voucher holders actually began reconcentrating in low-opportunity areas in the past decade (Metzger, 2014).

The literature identifies several causes of these patterns. One recent review of the evidence finds voucher holders lack support in the process of searching for housing, face lawful landlord discrimination against the use of vouchers as a source of income, and have limited social networks that constrain their capacity to relocate (Galvez, 2010). Perhaps as a result of these factors, voucher recipients who move involuntarily generally move to within 3 miles of their prior homes (Goetz and Chapple, 2010; Kleit and Galvez, 2011). The factors identified by Galvez (2010) may also help explain the reasons voucher holders who do relocate to the suburbs sometimes do so by renting in affordable housing sites built by the country's supply-side housing programs, such as the Low-Income Housing Tax Credit Program (Wang and Varady, 2005). If social networks are linked to one's race and class, the social network factor may explain the persistently unequal locational outcomes between White and non-White voucher recipients, although these trends appear to have improved slightly (McClure, Schwartz, and Taghavi, 2014). Reliance on public transportation may also limit the relocation options of voucher recipients who lack vehicles (Ruel et al., 2013).

² As of January 30, 2018.

The culmination of these challenges is so severe that even offering voucher recipients additional financial support if they agree to “move to opportunity” often fails to induce relocations into areas of higher opportunity (Schwartz, Mihaly, and Gala, 2016).

This body of literature largely ignores the role of market forces, or the role of the FMRs, in curtailing voucher recipients’ ability to penetrate higher opportunity neighborhoods. This literature offers no obvious insight into the ramifications of the SAFMRs, except to suggest it does not directly address many of the challenges voucher recipients face. However, the literature does demonstrate that even if the SAFMRs make voucher use in high-opportunity neighborhoods a financial possibility for participating families, they may not make it more likely to happen. This pattern will be particularly evident in states where source-of-income discrimination is legal, and landlords can lawfully refuse to rent to voucher holders (Tighe, Hatch, and Mead, 2016). As I discuss in the next section, the thin body of work that tackles market constraints relies on data that may be insufficient for properly assessing the role of market constraints.

Data Challenges in Unpacking Market Constraints

Researchers studying FMRs consistently find units renting below FMRs exist in nearly every census block group across the United States (McClure, 2014; McClure, Schwartz, and Taghavi, 2014). McClure also finds, however, that units below statutory FMRs are disproportionately in higher poverty neighborhoods. HUD references this finding in its rationale for the SAFMRs.³

Studies relying on the ACS, or long-form census, must contend with the challenge of data lag. How relevant and representative can years-old data be to voucher recipients who face rental markets in constant flux? Little research considers the means by which vacancies, seasonal factors, and rapidly changing market conditions might bias ACS-reliant analysis. Rapidly changing markets matter greatly in areas with rent control. For example, a unit captured in the ACS data or long-form census by McClure (2014) may be voucher accessible, simply because rent control applies and the rent observed is far lower than it would be if the unit returned to the market. Some researchers have attempted to measure the impact of market restraints on voucher relocation decisions with ACS median rents (Kleit and Galvez, 2011). This approach includes an additional drawback. The ACS tract-level median must represent market forces for units of all sizes, when in fact the FMRs vary based on the number of bedrooms, and these variations can fluctuate by metropolitan area.

Several papers have addressed the challenge of estimating the effect of the FMR by selecting a unit size with an FMR threshold that closely mirrors an ACS cross tabulation. For example, in a case study area where the FMR for a two-bedroom was \$979, researchers used ACS tabulations that count the number of units in a tract renting up to \$999 a month as a proxy for below-FMR counts (Cunningham and Droesch, 2005; Horn, Ellen, and Schwartz, 2014). This improvement comes with the trade-off of smaller ACS samples representing market conditions in these tracts. This method relies not on the small ACS tract samples but on even smaller sub-samples within them. Unfortunately, the switch from a long-form census to the 5-year ACS wave complicates this approach for the future, as 5-year wave estimates are highly unstable and potentially biased across space at the tract scale (Bazuin and Fraser, 2013; Folch et al., 2014).

³ Final rule.

One recent study offers insights by examining the FMR eligibility of rental listings posted on Craigslist (Boeing and Waddell, 2016). Compared with previous studies and HUD expectations, Boeing and Waddell found fewer below-FMR units in many of the country's most expensive markets. This significant difference suggests the need for further analysis of market constraints utilizing different kinds of data. Market studies conducted in Oakland, for example, led to significant upward revisions in FMRs there (Johnson, 2016a). Those findings, placed alongside Boeing and Waddell's estimates, imply that Craigslist may be more accurate than the ACS in capturing present market conditions.

Another recent study by Geyer (2017) also models the role of the market in explaining vouchers recipients' locational patterns. Geyer relies on listings of below-FMR units to build a model of voucher holders' residential location choices. She uses this model to predict the way various policy changes will affect the locations of voucher recipients. She finds that neighborhood-scaled housing voucher limits would be "both more effective at moving households to neighborhoods with lower poverty rates, and less expensive to implement, than a policy that increases the maximum voucher amount by 20 percent" (Geyer, 2017: 58).

Data and Local Pushback Against the SAFMR

When HUD proposed the SAFMR, numerous local PHAs and advocacy organizations opposed the proposal, often citing data concerns in their criticisms.

A coalition of the PHAs in Oakland, one of my case study areas, commented that the existing evidence on the SAFMRs is limited to one HUD metropolitan FMR area, Dallas, TX, where vacancy rates are significantly higher when compared with rates in California (Johnson, 2016b). The letter argues that the SAFMRs would limit the purchasing power of vouchers in less expensive neighborhoods and thus reduce the overall number of units listed below FMRs. In a separate comment submitted to HUD, the Oakland Housing Authority also argued that the inadequacies of the ACS would worsen the situation for voucher recipients in rapidly gentrifying neighborhoods (Johnson, 2016a). A coalition of East Bay Housing Organizations, also in Oakland, emphasized their concerns about the lagging nature of the ACS preventing FMRs from keeping pace with the market (Levin, 2016). Lastly, the Santa Clara County Housing Authority also questioned the accuracy and relevance of ZIP Code-scaled FMRs. They argued it would harm voucher recipients who found housing in some high-income census tracts that are sandwiched inside lower rent ZIP Codes (Harsasz, 2016).

HUD responded to these and other concerns by allowing the SAFMRs to apply only in areas that met two conditions.

1. The metropolitan FMR area has a vacancy rate above 4 percent.
2. The metropolitan FMR area has at least 20 percent of its below-FMR stock in ZIP Codes with SAFMRs above 110 percent of their respective metropolitan FMRs.⁴

⁴ Final rule.

These stipulations might ensure a sufficient supply of below-FMR stock in these high-end ZIP Codes can offset the loss of below-FMR units in less expensive ZIP Codes. These changes address concerns related to overall vacancies and availability issues. They do not eliminate the possibility that lower vacancies in expensive ZIP Codes might mean the SAFMRs will reduce the total number of below-FMRs vacancies across areas. They also do not address the underlying issue of HUD's reliance on time-lagged ACS data and its potential impacts to voucher users in gentrifying communities. These criticisms and HUD's response inform the hypotheses presented in the following section. No prior empirical work with rental listings data explores these challenges with FMR formulation and their implications for enabling voucher recipients to penetrate the market.

Hypotheses

The primary purpose of this article is to test the potential for the SAFMRs to increase the number of units below FMRs in high-opportunity areas. The article utilizes a proprietary dataset of for-rent listings derived from online sources that do not face the drawbacks of the ACS at small geographies. To that end, the first hypothesis is—

1. The SAFMRs will increase the percentage of listings that are below FMR in high-opportunity areas.

Critics of the SAFMRs suggest the policy will not increase the number of below-FMR units in markets with tight vacancy rates. They argue it could reduce the overall share of units below FMR. Critics also note the SAFMRs may exacerbate the impacts of gentrification on voucher recipients due to the time lag between data collection and policy implementation. To assist in clarifying the ways these issues interact with the SAFMRs, I test three additional hypotheses.

2. A switch to the SAFMRs will reduce the overall share of listings below FMR in each HUD metropolitan FMR area.
3. At the ZIP Code level, vacancy rates will correlate positively and significantly with SAFMR-induced increases in listings below FMR.
4. Areas that lose below-FMR listings under the SAFMRs are also those experiencing the most rapid loss in below-FMR units under the existing FMR system (presumably, from gentrification).

The fourth hypothesis tests the idea that areas that saw below-FMR units vanishing due to gentrification were also those which would see a reduction of below-FMR listings under the SAFMRs, as suggested by several comments to HUD (Johnson, 2016a; Levin, 2016).

I selected proprietary rental listings data for this study in light of the many pitfalls of relying on ACS data noted in the literature review. Concerns do exist about the value of rental listings for policy analysis, however. The only study utilizing listings to measure FMRs in the market found strikingly different results than ACS-based estimates in the areas studied in this article (Boeing and Waddell, 2016). To further our understanding of this emerging source of data, I compare my data's findings in these areas with both Boeing and Waddell's and the ACS to test a final hypothesis.

5. Proprietary rental listings data will more closely reflect Boeing and Waddell's (2016) Craigslist findings on the share of units below FMR than findings derived from the ACS.

Data and Methods

I use a rental database prepared by Rent Jungle. The database contains information on rental listings gathered from internet sources such as Craigslist, as well as the web-listings provided by newspapers, other proprietary gatherers, property management companies, and community web pages. Rent Jungle uses a web-based tool to extract the data from each of these sources once a week on an automated basis and compiles them into a database on a central server. The dataset thus provides a weekly snapshot of all rental listings posted online or in print in each market. This snapshot also provides the location, number of bedrooms, and number of bathrooms for each of these listings. In total, this comprehensive for-rent database has more than 150,000 listings across the five HUD metropolitan FMR areas for 2012 and 2013.

Limitations

The potential statistical power of such a large sample does not make this dataset immune from criticism. This dataset faces several limitations. First, it measures contract rent, although HUD sets FMRs using gross rent, which includes utilities. The Rent Jungle data do not specify which listings include utilities and which do not. Second, the data do not capture the vacancy rate of listings in multifamily buildings. This missing information means the dataset may underestimate rental availability on very large multifamily properties. For example, the data might show a large apartment complex listing a single, two-bedroom unit every week from June through October. This listing will appear in the dataset as one consistently listed two-bedroom unit. In reality, however, the building may have three or four different two-bedroom units becoming available throughout that time. Reflected in the data, however, is only that one consistent listing at the same address with the same number of bedrooms during that time span. This example illustrates the third and final drawback, which is that the dataset does not uniquely identify each available unit. Because of this disadvantage, this study can only comment on the general impacts of the SAFMRs across each area studied but not the precise magnitudes of such impacts.

These limitations also illustrate why these data, although still helpful for academic research and this particular study, may be inappropriate for use by HUD in setting FMRs. Beyond these technical limitations, proprietary data may not fit the criteria set by GAO (2005) that the FMR documentation system be transparent, reproducible, and consistent across geographies.

Identifying Unique Listings

Boeing and Waddell (2016) take advantage of Craigslist's use of a unique identifier to pinpoint and track individual listings, thereby removing duplications of the same listing in their dataset. My proprietary listings do not offer such an easy solution. However, my interest in the rental market is relatively straightforward—I need the inventory of available rentals from which aspiring voucher tenants could choose in a given year. Toward this goal, I set up a series of heuristics to identify unique listings. First, I assigned a unique observation identification number for every listing with a unique combination of the following—an address, number of bedrooms, and year of listing (2012 versus 2013). If the data listed one of these unique observations twice within a minimum 6-month time span, I split it into two unique listings, 6 months apart, to account for the extended

availability and the possibility of multiple listings therein. In those cases in which a unit was listed in both 2012 and 2013, with its availability consistent but shifting from 2012 into 2013, I allowed for the unit to count once in each year if the total span of its availability was greater than 6 months (for example, if it was available from September 2012 through April 2013). These heuristics reduced the total sample from 150,000 to 95,868 units. The final culled listings dataset provides an average of 240 observations per ZIP Code, still far higher than the number of new renters most likely provided by the ACS, roughly an average of 44 observations per census tract.⁵

Addressing hypotheses four and five requires contextualizing the 2012–2013 analysis within broader trends of rental market change. To identify these trends, I drew on the same Rent Jungle database to procure listings from 2011 through 2015 and applied the same heuristics to these data to ensure consistency.

The dataset covers five HUD metropolitan FMR areas in California—Oakland, Sacramento, San Diego, San Francisco, and San Jose—which are all consistently ranked among the most expensive rental markets in the United States (NLIHC, 2016b).

Applying FMRs and SAFMRs

I classified each rental listing as above or below established FMRs based on tables provided on HUD's website (HUD, 2017a). I then repeated the same step using the hypothetical SAFMRs HUD also posts online. I revised the hypothetical SAFMRs to be no less than 90 percent of the previous year's FMR, per HUD's implementation of the rule.⁶ This step required estimating the revised SAFMRs for 2012 to produce the final SAFMRs for the observations in 2013. Thus, the results of this study present an average impact of the SAFMRs during 2 years of consecutive implementation.

Defining High Opportunity

HUD's final rule issuing the SAFMRs refers specifically to increasing voucher holder presence in high-opportunity neighborhoods. HUD characterizes high-opportunity neighborhoods as those with low-poverty rates and access to good schools.⁷ I define opportunity in terms of neighborhood poverty rate, drawing on tract poverty rates from the 2010–2014 ACS. I define school quality using an average of the California Academic Performance Index (API) score of the three elementary schools nearest to each tract. I select this source as a previous study on the ability of voucher recipients to access high-performing schools also draws on the API (Basolo, 2014).

⁵ Although the ACS does not publish sample sizes for small scales, using state-level sample sizes, we can deduce that the 2014–2010 ACS contains roughly 390 responses per ZIP Code in California to represent the total housing stock (U.S. Census Bureau, 2016b). Because roughly one-half of California households rent, the ACS thus probably averages 195 rental units surveyed per ZIP Code. As roughly 12 percent of renters move annually (U.S. Census Bureau, 2015), then we can estimate the ACS contains around 24 new movers per ZIP Code in California compared with our sample of nearly 240 listings per ZIP Code.

⁶ Final rule.

⁷ Final rule.

Results

This section presents results by hypothesis, starting with the first—that the SAFMRs will increase the percentage of listings that are below FMRs in high-opportunity areas. Exhibit 1 presents the results with respect to tract-level poverty rates.

In tracts with poverty rates of less than 10 percent, the SAFMRs increase the percent of listings below FMR in every HUD metropolitan FMR area except San Francisco, where they decline slightly. Increases are the most dramatic in Sacramento, with a 34-percentage-point increase in below-FMR listings, and San Diego, with a 28.1-percentage-point increase in these low-poverty tracts. In tracts with poverty rates of more than 40 percent, in contrast, a sharp drop in below-FMR units occurs in the Oakland market of 18 percentage points. In the other four areas, however, the below-FMR share in high-poverty tracts declines between 0 and 11 percentage points. With the exception of San Francisco, these results suggest the SAFMRs will improve the number of listings below FMR in low-poverty neighborhoods. Exhibit 2 presents the results for the average API score of nearby schools.

In tracts near schools with the highest API scores, the percent of listings below FMR increases in every jurisdiction. These increases range from 1 percentage point in San Francisco to 38 percentage points in San Diego. In tracts near schools with the lowest API scores, the percent of listings below FMR decline modestly, from 0.6 percentage points in San Diego to 11 percentage points in San Jose.

Exhibit 1

Percent of Listings Below FMR by Area, Tract Poverty Rate, and FMR System

HUD Metropolitan FMR Area	Tract Poverty Rate (%)	Current FMR (%)	SAFMR (%)	Change (%)
Oakland-Fremont, CA	0–10	23.2	43.1	19.9
	10–20	37.3	49.5	12.2
	20–30	72.5	71.4	– 1.1
	30–40	77.6	68.0	– 9.6
	40 or more	64.2	45.3	– 18.9
Sacramento--Roseville--Arden-Arcade, CA	0–10	40.1	74.3	34.2
	10–20	73.4	82.5	9.1
	20–30	90.3	83.5	– 6.9
	30–40	93.1	86.0	– 7.0
	40 or more	89.0	82.1	– 6.9
San Diego-Carlsbad, CA	0–10	31.0	59.1	28.1
	10–20	56.6	64.8	8.2
	20–30	79.2	71.9	– 7.3
	30–40	68.5	74.2	5.7
	40 or more	82.7	71.6	– 11.2
San Francisco, CA	0–10	16.5	13.8	– 2.7
	10–20	17.7	10.6	– 7.2
	20–30	16.7	6.2	– 10.6
	30–40	16.2	10.0	– 6.2
	40 or more	38.8	35.9	– 2.9
San Jose-Sunnyvale-Santa Clara, CA	0–10	19.8	29.5	9.7
	10–20	40.8	34.8	– 6.0
	20–30	59.1	40.9	– 18.2
	30–40	68.3	46.2	– 22.1
	40 or more	75.0	75.0	0.0

FMR = Fair Market Rent. HUD = U.S. Department of Housing and Urban Development. SAFMR = Small Area Fair Market Rent.

Exhibit 2

Percent of Listings Below FMR by Area, School API Score, and FMR System

HUD Metropolitan FMR Area	School API Scores	Current FMR (%)	SAFMR (%)	Change (%)
Oakland-Fremont, CA	Less than 770	68.7	65.6	- 3.0
	770-820	50.4	60.9	10.5
	820-870	36.2	47.7	11.4
	870-915	14.6	36.9	22.4
	915 or more	12.5	40.8	28.3
Sacramento--Roseville-- Arden-Arcade, CA	Less than 770	87.6	79.4	- 8.2
	770-820	74.9	80.8	5.9
	820-870	68.2	83.7	15.5
	870-915	37.9	77.1	39.2
	915 or more	28.6	61.1	32.5
San Diego-Carlsbad, CA	Less than 770	71.3	70.8	- 0.6
	770-820	74.8	71.5	- 3.3
	820-870	62.0	67.1	5.1
	870-915	40.9	61.7	20.8
	915 or more	16.4	54.7	38.3
San Francisco, CA	Less than 770	15.0	9.2	- 5.8
	770-820	17.8	8.3	- 9.4
	820-870	16.6	11.8	- 4.8
	870-915	18.6	17.4	- 1.3
	915 or more	13.8	14.8	1.0
San Jose-Sunnyvale-Santa Clara, CA	Less than 770	38.4	27.2	- 11.2
	770-820	47.0	42.3	- 4.7
	820-870	22.0	28.2	6.2
	870-915	33.4	47.2	13.8
	915 or more	14.5	22.5	8.0

API = Academic Performance Index. FMR = Fair Market Rent. HUD = U.S. Department of Housing and Urban Development. SAFMR = Small Area Fair Market Rent.

The overall rate of declines in exhibit 2 are lower than in exhibit 1, as many neighborhoods with significant losses of below-FMR listings under SAFMRs were near schools that did not contain API scores in the dataset at the time of this analysis, a surprising finding. Taken together, however, the results on poverty rates and school quality demonstrate the SAFMRs will increase the percentage of listings that are below FMRs in high-opportunity areas, as expected, with the notable exception of San Francisco.

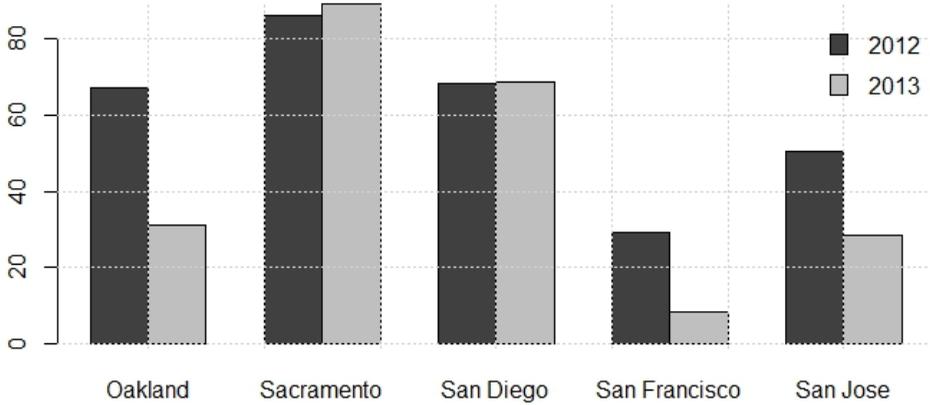
Expanding on Hypothesis One: Why Is San Francisco Different?

The SAFMRs fail to raise the share of below-FMR units in San Francisco in this time period, because the SAFMRs did not fully match stratospheric rents in that area's expensive ZIP Codes. To assess this failure properly, I limited the dataset to units in ZIP Codes with SAFMRs at 110 percent or above traditional FMRs. I then measured the percentage of listings in these high SAFMR ZIP Codes that were below their related SAFMRs and plotted the difference across HUD metropolitan FMR areas, shown in exhibit 3. Thus, the percentages in exhibit 3 represent the percent of listings a voucher recipient could afford under the SAFMRs in only the high-SAFMR ZIP Codes.

In San Francisco, 25 percent of listings in expensive ZIP Codes would have fallen below FMRs under the hypothetical SAFMRs in 2012. This decrease means that the SAFMRs would have enabled voucher holders to afford only 25 percent of listings in the ZIP Codes in which maximum

Exhibit 3

Percent of Listings in High-SAFMR ZIP Codes Below the SAFMRs, 2012 and 2013



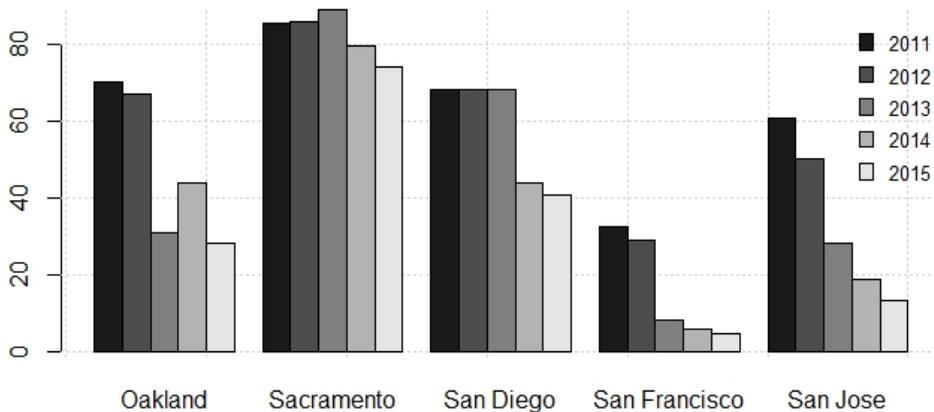
SAFMR = Small Area Fair Market Rent.

rents would have risen under SAFMR policy. Most listings in expensive ZIP Codes in Sacramento and San Diego, in contrast, would have fallen below FMRs under the same scenario, suggesting the SAFMRs would have significantly increased the number of listings affordable to voucher holders in expensive ZIP Codes in those cities. In all three Bay Area markets, a temporal pattern appears to emerge. These percentages would have declined by roughly one-half across the Bay Area from 2012 to 2013 under the SAFMRs, implying the SAFMRs would not have kept pace with rising rents in these ZIP Codes.

As the dataset acquired for this project spans 5 years, I use the same 5-year timeframe to plot the ways in which the statistics presented in exhibit 3 change across all five HUD metropolitan FMR areas during 5 years. Exhibit 4 shows the changes. During this period, the SAFMR system would

Exhibit 4

Percent of Listings in High-SAFMR ZIP Codes Below the SAFMRs, 2011–2015



SAFMR = Small Area Fair Market Rent.

not have kept pace with observed rents in the San Francisco Bay Area. Exhibit 4 illustrates the concerns of the East Bay PHAs that FMRs do not rise at the same pace as rents increases in that area (Johnson, 2016b). These findings could result from HUD's decision to limit SAFMRs to no more than 150 percent of traditional FMRs. I replicated this analysis under hypothetical SAFMRs that could rise above the 150 percent cap and found very similar results. Only 3 percent of listings in more expensive ZIP Codes saw their SAFMRs increase with the 150 percent cap removed.

The data suggest that the Bay Area is experiencing rapid rent increases that are particularly punitive to voucher recipients, regardless of the FMR system adopted. The failure of these higher-end SAFMRs to make a difference may explain the results for hypothesis two, discussed in the next subsection.

Hypothesis Two: SAFMRs Will Reduce the Overall Share of Listings Below FMR

Only in San Francisco do the SAFMRs reduce the overall share of listings below FMR, from 16.5 to 11.9 percent. In the other four areas, the share of listings below FMR increases, as shown in exhibit 5. In Oakland, Sacramento, and San Diego, a sufficient number of listings become below FMR in high-cost ZIP Codes to cancel out the loss of below-FMR units in less expensive ZIP Codes. In San Jose, the SAFMRs break even against the existing FMRs.

The increases range from only 2 percentage points in San Jose to nearly 15 percentage points in Oakland. These results suggest the SAFMRs as implemented in the HUD rule will not cause a cataclysmic loss of below-FMR units in its first 2 years of implementation. Given that HUD's ruling allows for annual stepwise reductions in SAFMRs in low-rent areas, however, these results do not offer insights on the long-term impact of the SAFMRs on the overall availability of below-FMR units.

A major potential drawback of the analysis thus far is the potential for real vacancy rates to bias the picture painted in this dataset. I address this problem in the next subsection.

Exhibit 5

Share of Listings Below FMR by Area and FMR System, 2012–2013

HUD Metropolitan FMR Area	Current FMR (%)	SAFMR (%)	Change (%)
Oakland-Fremont, CA	34.9	49.7	14.8
Sacramento--Roseville--Arden-Arcade, CA	69.6	80.6	10.9
San Diego-Carlsbad, CA	52.9	64.7	11.8
San Francisco, CA	16.5	11.9	- 4.6
San Jose-Sunnyvale-Santa Clara, CA	30.6	32.6	2.0

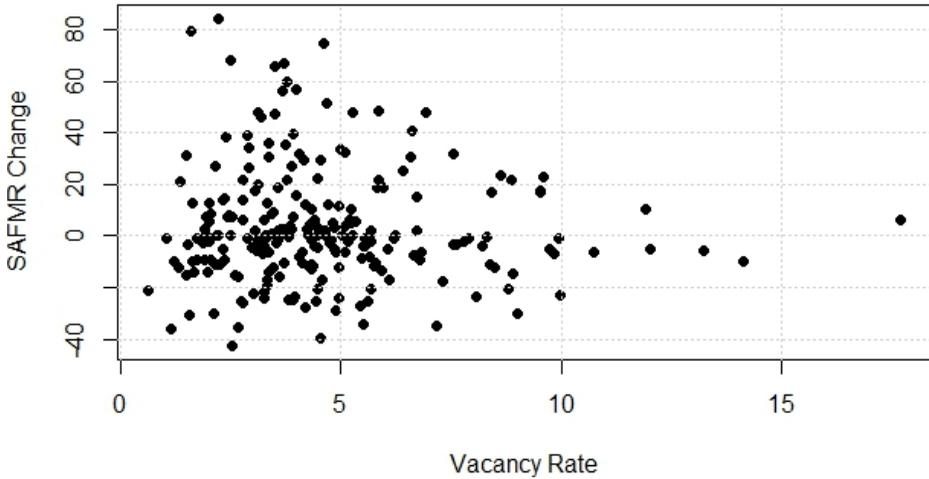
FMR = Fair Market Rent. HUD = U.S. Department of Housing and Urban Development. SAFMR = Small Area Fair Market Rent.

Hypothesis Three: Vacancy Rates Will Correlate Positively With the SAFMR's Effect

To test this hypothesis, I limited my analysis to only those ZIP Codes with rental vacancy rates significantly different from zero in the ACS, which reduced the data 50 percent. I also limited the analysis to ZIP Codes with more than 40 rental listings in my dataset, which did not further alter the sample size. With or without these adjustments, however, my results are the same. No apparent relationship exists between SAFMR shift and ZIP Code vacancy rates. I plot the relationship of these two variables across the 243 ZIP Codes with sufficient data in exhibit 6.

Exhibit 6

ZIP Code Vacancy Rates Plotted Against the Percent Change in Below-FMR Listings From the SAFMR



FMR = Fair Market Rent. SAFMR = Small Area Fair Market Rent.

Although regression analyses failed to specify a significant relationship, visual inspection of exhibit 6 offers some insights. All the ZIP Codes that had a 60–percentage-point increase or greater in below-FMR listings under the SAFMRs reported vacancy rates of less than 5 percent. ZIP Codes with vacancy rates of greater than 10 percent either saw a modest decline in below-FMR units under the SAFMRs or were unaffected.

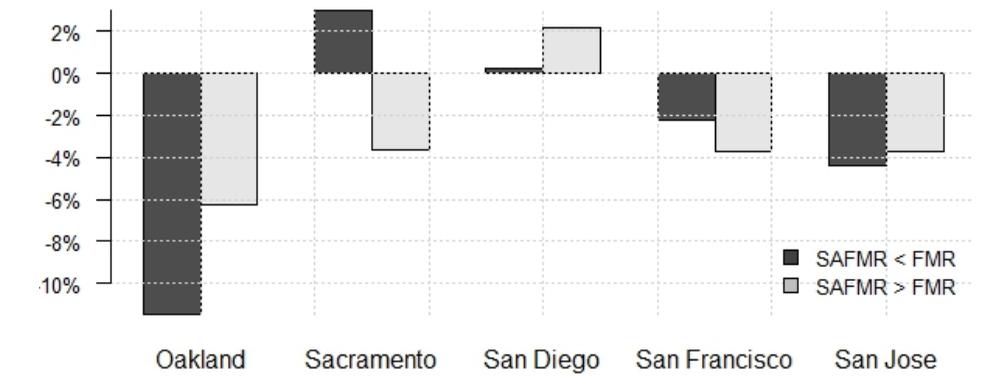
If a significant relationship exists between vacancy rates and the impact of the SAFMRs at these smaller geographies, the SAFMRs could severely restrict the number of units voucher recipients could afford. Fortunately, nothing in this study suggests this result is a major possibility, although vacancies from rigorous market studies could paint a different picture than the flawed ACS estimates used here. Regardless, HUD’s decision to limit implementation of the SAFMRs to areas with vacancy rates above 4 percent offers some assurance that vacancy rates may not be a major challenge for voucher recipients in areas using the SAFMRs.

Hypothesis Four: Areas That Will Lose Below-FMR Listings Under the SAFMRs Are Those Experiencing the Most Rapid Loss in Below-FMR Units

To test this hypothesis, I categorized all units into two geographic groups—those in ZIP Codes in which the SAFMRs were above the FMR, thus prospectively increasing voucher holders’ rental opportunities in that ZIP Code, and those in ZIP Codes in which the SAFMRs dropped below the FMR, and voucher holders would have fewer options. I then measured the actual loss of below-FMR listings under the existing statutory FMRs over time and bifurcated these results into these two geographic groups, producing exhibit 7.

Exhibit 7

Percentage-Point Shift in Share of Below-FMR Listings, 2011–2015, Under Existing FMRs, by Impact of SAFMRs



FMR = Fair Market Rent. SAFMR = Small Area Fair Market Rent.

Exhibit 7 shows that in Oakland, those ZIP Codes that would lose below-FMR listings under the SAFMRs were already experiencing an 11-percentage-point drop in below-FMR listings under existing policy. In contrast, ZIP Codes that would see uplift in below-FMR units under the SAFMRs witnessed only a 6-percentage-point drop in below-FMR listings. These results only reconfirm the concerns of activists and PHAs in Oakland (Johnson, 2016a, 2016b; Levin, 2016). Exhibit 7 suggests this dynamic of the SAFMRs aggravating existing market trends would not have occurred in San Diego, San Francisco, and San Jose.

The other remarkable finding presented in exhibit 7 concerns Sacramento. Between 2011 and 2015, the ZIP Codes in Sacramento in which SAFMRs would have increased below-FMR listings are also those that witnessed drops in the number of below-FMR listings under existing policy. This outcome suggests Sacramento will benefit from the SAFMRs if this trend continues past 2015.

Hypothesis Five: Proprietary Rental Listings Data Will More Closely Reflect Boeing and Waddell’s (2016) Estimation of the Share of Units Below FMR Than the ACS

As Boeing and Waddell utilized data in 2014, I use 2014 listings from my database to compare measurements of the share of units below FMR in exhibit 8. I disaggregate the results by number of bedrooms and the MSA designations that Boeing and Waddell used, which are different from the HUD metropolitan FMR area designations used elsewhere in this article.

In line with my hypothesis, Rent Jungle and Craigslist are more closely aligned to each other than the ACS in 8 of the 12 statistics examined here (66 percent). In all eight of these cases, these two datasets show fewer listings below FMR than the ACS. In 6 of the 12 comparisons, the Rent Jungle and Craigslist results are less than 5 percentage points apart.

Discrepancies between the two rental listings sources may be the results of my heuristics for identifying unique listings and my approach may need refinement. Alternatively, Rent Jungle’s

Exhibit 8

Percent of Units Below FMR According to Craigslist, Rent Jungle, and the ACS

MSA	Bedrooms	Craigslist (%)	Rent Jungle (%)	2014 PUMS 1-Year Recent Movers (%)
Sacramento--Roseville--Arden-Arcade, CA	1	58	67	70
San Diego-Carlsbad, CA	1	17	28	51
San Francisco-Oakland-Hayward, CA	1	18	16	41
Sacramento--Roseville--Arden-Arcade, CA	2	62	63	73
San Diego-Carlsbad, CA	2	24	27	36
San Francisco-Oakland-Hayward, CA	2	26	20	27
Sacramento--Roseville--Arden-Arcade, CA	3	69	73	62
San Diego-Carlsbad, CA	3	39	34	55
San Francisco-Oakland-Hayward, CA	3	37	30	62
Sacramento--Roseville--Arden-Arcade, CA	4	53	66	71
San Diego-Carlsbad, CA	4	36	36	51
San Francisco-Oakland-Hayward, CA	4	47	57	61

ACS = American Community Survey. FMR = Fair Market Rent. MSA = metropolitan statistical area. PUMS = Public Use Microdata Sample.

Sources: Craigslist data from Boeing and Waddell (2016); Rent Jungle data from author's calculation

proprietary listings might also include some higher-end rentals that property managers do not post to Craigslist, presenting a market that appears more expensive than the market viewed via Craigslist. The variation in findings among the two similarly organized listing sources demonstrates their limitations as suitable replacements to the ACS for FMR documentation. Proprietary providers may not be willing to make their assumptions, methods, and techniques publicly available, as HUD is required to do.

Conclusions

Switching to the SAFMRs increases the share of rental listings below FMR in low-poverty neighborhoods in the Oakland, Sacramento, San Diego, and San Jose HUD metropolitan FMR areas. It does the opposite in San Francisco. Across all five areas, shifting to the SAFMRs increases the share of rental listings below FMR in neighborhoods with high performing schools, although data limitations prevent conclusions about below-FMR shifts in less expensive areas. This article reveals that in San Francisco, the hypothetical SAFMRs in high-rent areas are simply not high enough to increase the below-FMR rate in these neighborhoods. Although it might seem appropriate to recommend even higher FMRs for these neighborhoods, the cost of providing vouchers in the most expensive parts of the nation's most expensive metropolitan areas may not be worth the trade-off of reducing the number of families the program could serve, as some critics of the SAFMRs point out

(NAHB, 2017). Regardless, this article finds the SAFMRs may increase voucher holders' options in high-opportunity neighborhoods, even in some of the most expensive metropolitan areas in the United States. This benefit does not guarantee voucher recipients will be able to use vouchers in these areas, however, as the SAFMRs do not address source of income discrimination.

I also explored several concerns expressed by local activists and PHAs in response to HUD's SAFMR ruling. San Francisco would see an overall drop in below-FMR listings, although the other four areas would see overall increases. However, given the trends tracked in exhibit 4, Oakland and San Jose might see a net drop in below-FMR listings if they adopted the SAFMRs at present.

The results also illustrate the way areas that would lose below-FMR listings under the SAFMRs experienced a faster drop in below-FMR rates under existing policy in Oakland. This outcome implies the SAFMRs might only worsen the challenges of voucher recipients in that area. These results are broadly consistent with concerns expressed by advocates and agencies in Oakland, who are concerned with unprecedented upward swings in the local rental market.

In contrast to Oakland, Sacramento may likely benefit from the SAFMR. This study finds that the SAFMRs may work most effectively in Sacramento and San Diego. That HUD only initially implemented the SAFMRs in these two markets among the five studied here inspires confidence in HUD's criteria for applying the SAFMRs to metropolitan areas.

This study also compared estimates of the share of units below FMRs across three sources of data, finding the ACS varied significantly from real-time listings data. Unfortunately, proprietary listings data do not meet the criteria established by GAO (2005) that the FMR system be entirely consistent, transparent, and replicable. Changes to the FMR system's use of the Consumer Price Index and trend-adjustment factors may be the most effective way to alleviate the challenges faced by voucher recipients in tight markets while maintaining methodological transparency.

Lastly, this study demonstrates the importance of scale when implementing housing policies and programs. Rents and land values are highly autocorrelated across space. The finer the scale at which market-oriented policy thresholds are determined, the more even policy outcomes are likely to be. This principle should be explored further, as it may have implications for other aspects of urban housing policy, from supply-side subsidy allocations to rent control.

Acknowledgments

The author thanks Deb Niemeier and Carolyn Whitzman for helpful feedback on this work. The author also thanks five anonymous reviewers and the Cityscape editorial team for helpful comments and review that enhanced this paper. This work was supported by California Department of Transportation (Caltrans) [Grant 65A0527 TO 017].

Author

Matthew Palm is a research fellow at the University of Melbourne.

References

- Basolo, Victoria. 2014. "Examining Mobility Outcomes in the Housing Choice Voucher Program: Neighborhood Poverty, Employment, and Public School Quality," *Cityscape* 15 (2): 135–153.
- Bazuin, Joshua T., and James C. Fraser. 2013. "How the ACS Gets It Wrong: The Story of the American Community Survey and a Small, Inner City Neighborhood," *Applied Geography* 45: 292–302. <https://doi.org/10.1016/j.apgeog.2013.08.013>.
- Boeing, Geoff, and Paul Waddell. 2016. "New Insights Into Rental Housing Markets Across the United States: Web Scraping and Analyzing Craigslist Rental Listings," *Journal of Planning Education and Research*. <https://doi.org/10.1177/0739456X16664789>.
- Chetty, Raj, Nathaniel Hendren, and Lawrence Katz. 2016. "The Effects of Exposure to Better Neighborhoods on Children: New Evidence From the Moving to Opportunity Experiment," *American Economic Review* 106 (4): 855–902. <https://doi.org/10.1257/aer.20150572>.
- Cohen, Rachel. 2018. "Court Forces Ben Carson To Be A Civil Rights Champion For A Day," *The Intercept*, January 2. <https://theintercept.com/2018/01/02/ben-carson-hud-housing-voucher/>.
- Collinson, Robert, and Peter Ganong. 2013. Incidence and Price Discrimination: Evidence From Housing Vouchers. Working paper. Cambridge, MA: Joint Center for Housing Studies of Harvard University.
- Cunningham, Mary K., and Audrey Droesch. 2005. "Neighborhood Quality and Racial Segregation." http://webarchive.urban.org/UploadedPDF/411248_neighborhood_quality.pdf.
- Folch, David C., Daniel Arribas-Bel, Julia Koschinsky, and Seth E. Spielman. 2014. Uncertain Uncertainty: Spatial Variation in the Quality of American Community Survey Estimates. Working paper 01. Tempe: Arizona State University, GeoDa Center for Geospatial Analysis and Computation.
- Galvez, Martha. 2011. Defining Choice in the Housing Choice Voucher Program. Unpublished.
- Galvez, Martha M. 2010. *What Do We Know About Housing Choice Voucher Program Location Outcomes? A Review of Recent Literature*. Washington, DC: Urban Institute.
- Geyer, Judy. 2017. "Housing Demand and Neighborhood Choice With Housing Vouchers," *Journal of Urban Economics* 99: 48–61. <https://doi.org/10.1016/j.jue.2016.12.002>.
- Goetz, Edward G., and Karen Chapple. 2010. "You Gotta Move: Advancing the Debate on the Record of Dispersal," *Housing Policy Debate* 20 (2): 209–236.
- Harsasz, Katherine. 2016. "Re: Docket No. FR-5855-P-02, Establishing a More Effective Fair Market Rent System: Using Small Area Fair Market Rents in Housing Choice Voucher Program Instead of the Current 50th Percentile FMRs." San Jose, CA: Housing Authority of Santa Clara.
- Horn, Keren M., Ingrid G. Ellen, and Amy E. Schwartz. 2014. "Do Housing Choice Voucher Holders Live Near Good Schools?" *Journal of Housing Economics* 23: 28–40. <https://doi.org/10.1016/j.jhe.2013.11.005>.

Johnson, Eric. 2016a. "Re: Establishing a More Effective Fair Market Rent (FMR) System: Using Small Area Fair Market Rents (SAFMRs) in Housing Choice Voucher Program Instead of the Current 50th Percentile FMRs." Docket No. FR-5855-P-02. Oakland, CA: Oakland Housing Authority.

———. 2016b. "Re: Docket No. FR-5855-P-02 (Title: Establishing a More Effective Fair Market Rent System: Using Small Area Fair Market Rents in Housing Choice Voucher Program Instead of the Current 50th Percentile FMRs)." Oakland, CA: Oakland Housing Authority.

Kleit, Rachel G., and Martha Galvez. 2011. "The Location Choices of Public Housing Residents Displaced by Redevelopment: Market Constraints, Personal Preferences, or Social Information?" *Journal of Urban Affairs* 33 (4): 375–407. <https://doi.org/10.1111/j.1467-9906.2011.00557.x>.

Levin, Jeff. 2016. "Re: Docket No. FR 5855-P-02, (Title: Establishing a More Effective Fair Market Rent System: Using Small Area Fair Market Rents in Housing Choice Voucher Program Instead of the Current 50th Percentile FMRs)." Oakland, CA: East Bay Housing Organizations.

Löchl, Michael, and Kay W. Axhausen. 2010. "Modeling Hedonic Residential Rents for Land Use and Transport Simulation While Considering Spatial Effects," *The Journal of Transportation and Land Use* 3 (2): 39–63. <https://dx.doi.org/10.5198/jtlu.v3i2.117>.

McClure, Kirk. 2014. "The Prospects for Guiding Housing Choice Voucher Households to High-Opportunity Neighborhoods," *Cityscape* 12 (3): 101–122.

McClure, Kirk, Alex F. Schwartz, and Lydia B. Taghavi. 2014. "Housing Choice Voucher Location Patterns a Decade Later," *Housing Policy Debate* 25 (2): 37–41. <https://doi.org/10.1080/10511482.2014.921223>.

McCord, Michael, Peadar T. Davis, Martin Haran, David McIlhatton, and John McCord. 2014. "Understanding Rental Prices in the UK: A Comparative Application of Spatial Modelling Approaches," *International Journal of Housing Markets and Analysis* 7 (1): 98–128. <https://doi.org/10.1108/IJHMA-09-2012-0043>.

Metzger, Molly W. 2014. "The Reconcentration of Poverty: Patterns of Housing Voucher Use, 2000 to 2008," *Housing Policy Debate* 24 (3): 544–567. <https://doi.org/10.1080/10511482.2013.876437>.

Miller, Harvey J. 2004. "Tobler's First Law and Spatial Analysis," *Annals of the Association of American Geographers* 94 (2): 284–289. <https://doi.org/10.1111/j.1467-8306.2004.09402005.x>.

National Association of Home Builders (NAHB). 2017. "HUD Announces 2-Year Suspension of Small Area Fair Market Rents." <http://nahbnow.com/2017/08/hud-announces-2-year-suspension-of-small-area-fair-market-rents/>.

National Low Income Housing Coalition (NLIHC). 2017. "HUD Suspends Mandatory Small Area FMR Implementation." <http://nlihc.org/article/hud-suspends-mandatory-small-area-fmr-implementation>.

———. 2016a. "HUD Publishes FY17 Fair Market Rents." <http://nlihc.org/article/hud-publishes-fy17-fair-market-rents>.

———. 2016b. “Out of Reach 2016: No Refuge for Low Income Renters.” http://nlihc.org/sites/default/files/oor/OOR_2016.pdf.

Newman, Sandra, and Ann B. Schnare. 1997. “‘... And a Suitable Living Environment’: The Failure of Housing Programs To Deliver on Neighborhood Quality,” *Housing Policy Debate* 8 (4): 703–741.

Ruel, Erin, Deirdre A. Oakley, Chandra Ward, Reneé Alston, and Lesley W. Reid. 2013. “Public Housing Relocations in Atlanta: Documenting Residents’ Attitudes, Concerns and Experiences,” *Cities* 35: 349–358. <https://doi.org/10.1016/j.cities.2012.07.010>.

Schwartz, Heather L., Kata Mihaly, and Breann Gala. 2016. “Encouraging Residential Moves to Opportunity Neighborhoods: An Experiment Testing Incentives Offered to Housing Voucher Recipients,” *Housing Policy Debate* 27 (2): 230–260. <https://doi.org/10.1080/10511482.2016.1212247>.

Substance Abuse and Mental Health Services Administration (SAMHSA). 2016. “Impact of Increased Income on Housing Voucher Programs.” https://soarworks.prainc.com/sites/soarworks.prainc.com/files/Income_Housing_Vouchers_052616.pdf.

Tighe, J. Rosie, Megan E. Hatch, and Joseph Mead. 2016. “Source of Income Discrimination and Fair Housing Policy,” *Journal of Planning Literature* 32 (1): 3–15. <https://doi.org/10.1177/0885412216670603>.

Tu, Yong, Hua Sun, and Shi-Ming Yu. 2007. “Spatial Autocorrelations and Urban Housing Market Segmentation,” *The Journal of Real Estate Finance and Economics* 34 (3): 385–406. <https://doi.org/10.1007/s11146-007-9015-0>.

U.S. Census Bureau. 2016a. “American Community Survey (ACS).” <https://www.census.gov/programs-surveys/acs/technical-documentation/table-and-geography-changes.html>.

———. 2016b. “Sample Size.” <http://www.census.gov/acs/www/methodology/sample-size-and-data-quality/sample-size/index.php>.

———. 2015. “U.S. Mover Rate Remains Stable at About 12 Percent Since 2008, Census Bureau Reports.” <http://www.census.gov/newsroom/press-releases/2015/cb15-47.html>.

U.S. Department of Housing and Urban Development (HUD). 2017a. “Final FY 2016 Fair Market Rent Documentation System.” huduser.gov/portal/datasets/fmr.html#2016.

———. 2017b. “The Final FY 2016 San Diego–Carlsbad–San Marcos, CA MSA FMRs for All Bedroom Sizes.” huduser.gov/portal/datasets/fmr/fmrs/fy2013_code/2013summary.odn.

———. 2015. *Changes to Flat Rent Requirements—FY 2015 Appropriations Act* PIH-2015-1. <https://www.hud.gov/sites/documents/PIH201513FLATRENTNOTICE.PDF>.

U.S. Government Accountability Office (GAO). 2005. “Rental Housing: HUD Can Improve Its Process for Estimating Fair Market Rents.” <http://www.gao.gov/products/GAO-05-342>.

Wang, Xinhao, and David P. Varady. 2005. “Using Hot-Spot Analysis to Study the Clustering of Section 8 Housing Voucher Families,” *Housing Studies* 20 (1): 29–48. <https://doi.org/10.1080/0267303042000308714>.