The Impact of Housing Vouchers on Crime in US Cities and Suburbs

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Abstract

This paper tests the common belief that subsidised housing contributes to higher crime rates. To do this, panel data on over 200 US cities are used and fixed effects models are estimated to control for unobserved differences between cities that may affect both voucher use and crime. Additionally, models are estimated that focus on the suburbs, to see if the steady increase in vouchers there has had any effect on crime. In cities, it is found that vouchers have a weak, negative relationship with violent crime rates, although these estimates are not particularly robust. In suburban areas, there is no observed relationship between vouchers and crime, suggesting that controversies in those communities blaming voucher households for elevated crime rates are misguided.

Introduction

Over the past two decades in the US, there has been a shift by federal and local housing policy-makers away from large, centralised public housing developments via a number of programmes, including the Housing Choice Voucher (voucher), Low-Income Housing Tax Credit (LIHTC) and HOPE VI programmes. Two goals of the voucher programme in particular are to increase access to less distressed neighbourhoods and to break up clusters of poverty and the co-occurring social problems that accompany concentrated poverty, including crime.

However, attempts to disperse voucher households to neighbourhoods and localities with higher opportunity are often met with resistance, explicitly on the grounds that incoming voucher households will bring with them increased crime. In exurban Los Angeles, the cities of Lancaster and Palmdale have been sued by civil rights groups for engaging in harassment and surveillance of Latino and Black voucher recipients (Medina, 2011). The mayor of Lancaster defends these efforts as vital for crime control due to the growing voucher

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population in his city. In Memphis, journalist Hanna Rosin presented correlational evidence that diffusing subsidised housing via HOPE VI and vouchers in Memphis not only changed the spatial location of crime, but led to crime increases citywide—perhaps due to the police's reduced inability to target crime hotspots, the difficulty of providing social services to a dispersed impoverished population and disrupted social networks. She suggests that this is a growing concern among police chiefs and criminologists nation-wide.

This paper attempts to identify whether crime rates in cities and suburbs are related to subsidised housing policies, focusing primarily on the Housing Choice Voucher Program. Using city and county-level crime data from the FBI's Uniform Crime Reports and voucher, HOPE VI, and public housing data from the US Department of Housing and Urban Development (HUD), I estimate the extent to which the prevalence of voucher households affects crime in US cities. My dataset covers 215 cities from 1997 to 2008, allowing me to estimate fixed effects models that control for unobservable differences between cities. Additionally, I use lagged specifications to further identify causal linkages between vouchers and crime, and estimate models on a sample of suburban areas to identify whether the growth in voucher populations in the suburbs has affected crime rates in those jurisdictions.

My findings suggest that there is virtually no relationship between voucher household prevalence and crime rates at the city level. Although cities and suburban areas with more vouchers per capita also have higher crime rates, this relationship disappears when controls are added. These findings suggest that controversies surrounding vouchers in city and suburban jurisdictions are being fuelled by misinformation. Although communities with a higher prevalence of voucher households appear to be higher in crime, there is no evidence that this is due to voucher households *increasing* crime.

Recent Trends in Crime and Rental Housing Subsidies

US cities have seen a wealth of change in the past 25 years in crime and rental housing subsidies. In the mid 1990s, as crime rates were levelling off and dropping across the country, US cities also underwent a substantial shift in how they invest in subsidised housing. These shifts were led by HUD and feature a number of programmes to encourage the spatial diffusion of households receiving housing subsidies, including HOPE VI, the LIHTC and vouchers. On the supply side, HOPE VI has been responsible for demolishing and revitalising tens of thousands of public housing units and the LIHTC is now the primary funding vehicle through which affordable rental housing is constructed in the United States. On the demand side, the voucher programme is the largest rental housing subsidy in the country, supporting over two million households nation-wide. Whereas public housing was virtually the only housing subsidy through the early 1970s, by 2004 the LIHTC and voucher programmes had a role in nearly 60 per cent of the nearly seven million subsidised units for low-income households (Schwartz, 2006). Figure 1 displays the substantial growth in the voucher and LIHTC programmes and the slow but steady decline in the number of public housing units nationwide during the data period (1997 to 2008), alongside the trend in crime, which has steadily declined since 1991.

These concurrent trends in crime and housing subsidy policies suggest that we should be sceptical when people blame voucher households for elevated crime rates in their communities. On the contrary, as vouchers have eclipsed public housing units as the primary way to provide housing subsidies,

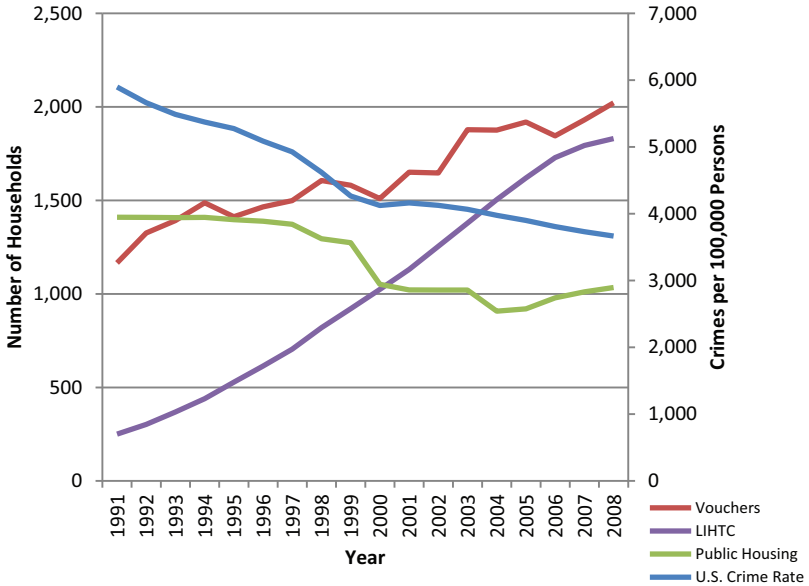

Figure 1. Voucher, LIHTC and public housing units by year, 1990–2008.
Sources: Author's calculations of HUD data; Schwartz, 2006; FBI Uniform Crime Reports.

crime has decreased. Researchers and policymakers have examined several reasons for the crime decline, focusing most commonly on economic and demographic factors, in addition to policing and incarceration (Barker, 2010). It is likely that many of these factors heavily outweigh the role of vouchers and other housing policies in the crime decline. However, these trends contradict the conventional wisdom represented by Rosin (2008) who suggests that, if not for the deconcentration of subsidised housing through the voucher programme, crime would have decreased even more. Furthermore, given the increased presence of voucher households in suburban communities, it is time we examine how such mobility patterns are affecting crime in those areas.

Theory and Empirical Evidence

There are a number of reasons why subsidised housing may affect crime in cities. First, the poor are disproportionately victims and perpetrators of crime, and occupy subsidised housing by definition. Subsidised households are also disproportionately members of minority groups, as are victims and perpetrators of crime. However, those receiving housing subsidies are also more likely to be females and their children, and the elderly are also overrepresented. These are populations that are less likely to be involved in crime, rendering population-based assumptions less conclusive. Crime may also be linked to subsidised housing if the presence of this housing leads to urban decline. Additionally, the physical design and environment of high-rise public housing has been shown to contribute to crime (National Commission on Severely Distressed Housing, 1992; Popkin *et al.*, 2000; Schneider and Kitchen, 2002).

On the other hand, it is important to note that housing subsidies are a form of public investment. Vouchers provide additional purchasing power for households, not just on housing but potentially on all other goods. Ellen and Horn (2012) estimate that

the median voucher household with children earns $13,000 annually, pays $1000 per month in rent and the post-tax benefit of the voucher is equivalent to $8000 per year—a 60 per cent increase in income. At the household level, these subsidies may make it less necessary to engage in criminal activity for financial benefit. For cities and neighbourhoods, housing vouchers are a substantial investment that can have important positive impacts on a number of social outcomes, potentially including reduced crime.

It is also important to discuss what drives the growth in the number of voucher households because this is the intervention and change that I am testing in this paper. First, voucher numbers may increase due to HOPE VI and other public housing demolitions, given that many jurisdictions replace some of these demolished units with vouchers to displaced households. However, according to HUD's data, a city's voucher population has a strong, positive relationship with the number of public housing households in a city (controlling for population), so it does not appear to be the case that vouchers are merely replacing public housing units. On the other hand, voucher growth does appear to be strongly related to HOPE VI spending—those cities that received HOPE VI grants from HUD to demolish public housing also have higher voucher numbers (again, controlling for population).

Second, since the late 1990s, all vouchers are portable, meaning voucher holders are largely free to move across jurisdictions and use their vouchers in cities and suburbs other than those that issued the voucher. Thus, the voucher population (in either cities or suburbs) can grow because people used their vouchers to move across jurisdictional borders. Examining data on vouchers in suburban and city jurisdictions, I find that the voucher population has grown considerably faster in the suburbs echoing recent findings from Covington *et al.* (2011). In the empirical analysis, I test whether suburban voucher population growth affects crime in those areas.

It is also possible that voucher numbers grow through increases in the utilisation rate. There are a number of ways in which utilisation can increase—perhaps due to better targeting of the subsidies to populations that are more likely to use them, the implementation of Source of Income (SOI) laws that prohibit discrimination by landlords against using vouchers to pay for housing, a better job by local housing authorities of connecting voucher holders to housing, or more accessible rental markets. Voucher use can also increase and be captured in the data if local housing authorities project greater need (due to higher poverty rates or population growth) and are successful in obtaining additional funds from HUD. Empirically, SOI laws are strongly correlated with voucher growth (Freeman, 2012) and the strongest growth has occurred in larger cities on the coast, suggesting that more liberal and active housing authorities have been more proactive in recent years in bringing in additional voucher funding and/or connecting voucher households to housing opportunities. It is unlikely, however, that housing authorities are able to issue substantial vouchers in a timely fashion as economic conditions decline in a city. Thus, a limitation of this study is that changes in the voucher population may occur at different time lags relative to important dynamics (for example, poverty, unemployment, rents) that may affect crime.

Empirical Evidence

Much of what we know empirically about the relationship between crime and subsidised housing focuses on traditional public housing. There is mixed evidence on the effect that public housing has on

neighbourhood crime rates (Farley, 1982; McNulty and Holloway, 2000; Roncek *et al.*, 1981). More conclusive are the handful of case studies of public housing developments that paint a picture of particularly dangerous places to live (Kotlowitz, 1991; Popkin *et al.*, 2000). Looking at scattered-site public housing, Goetz *et al.* (1996) found in Minneapolis that police calls from areas surrounding scattered-site developments decreased after these developments were built. However, they found that as the developments aged, crime increased over time. Galster *et al.* (2003) found no impacts from dispersed public housing or supportive housing on crime rates in Denver.

Suresh and Vito (2009) focused on the voucher program and examined the spatial concentration of homicides before and after efforts in Louisville, KY, to deconcentrate public housing, primarily through HOPE VI and vouchers. They found that homicides moved to the parts of the city where public housing and voucher tenants moved, although their analyses were cross-sectional rather than longitudinal.

Van Zandt and Mhatre (2009) examined the relationship between clusters of housing voucher households and crime in Dallas, TX. They considered a cluster to be 10 or more voucher households during any month between October 2003 and July 2006, and examined crime data within a quarter-mile radius of the apartment complexes containing these voucher clusters. Unfortunately, the police only collected crime data in those areas if the number of voucher households was 10 or more, due to a consent decree resulting from a desegregation case. This not only led to gaps in coverage and limited the number and type of neighbourhoods examined, but the police may have deliberately focused crime control efforts on these areas, reducing the reliability of the data. Given those limitations, the authors found that clusters of voucher households are associated with higher rates of crime. However, they found no relationship between changes in crime and changes in the number of voucher households, suggesting that, while voucher households tend to live in high-crime areas, they are not necessarily the *cause* of higher crime rates. Thus, efforts to estimate the effect of vouchers on crime must account for the fact that voucher households disproportionately live in high-crime neighbourhoods and cities.

Ellen *et al.* (2012) and Popkin *et al.* (2012) also examine the relationship between vouchers and crime in neighbourhoods. Ellen *et al.* use longitudinal crime and voucher data from 10 US cities between 1997 and 2008. The authors find that crime is higher in neighbourhoods with housing vouchers, but their models suggest that reverse causality is the reason—voucher households move to higher crime neighbourhoods and do not necessarily cause the higher crime rates in those neighbourhoods.

Popkin *et al.* are specifically examining public housing transformation and what happens to crime in the neighbourhoods where former public housing residents move in Atlanta and Chicago. They find that crime declined substantially in the areas where public housing was demolished. However, in neighbourhoods in both cities where a relatively high concentration of residents relocated (often using vouchers), they observed significant increases in crime. In Chicago, the authors conclude, the increased property crime in destination neighbourhoods outweighed the decreased crime in origin neighbourhoods. The authors suggest that relocation should be targeted to avoid significant clustering of the relocated population.

All of the studies mentioned thus far look at these relationships at the neighbourhood level. Freedman and Owens (2011) is the only study that zooms out at a larger level of geography—the authors examined the effect

that the LIHTC has on crime in counties. They developed an instrumental variables strategy that took advantage of a discontinuity resulting from the designation of qualified census tracts (QCTs) where developers have added tax credit incentives for locating in such tracts, the authors found that LIHTC development in the poorest neighbourhoods results in lower violent crime at the county level.

Although there is a growing body of evidence on the relationship between subsidised housing and crime, there is still a limited understanding of how the voucher programme may affect crime and almost no knowledge of the aggregate impacts across cities. Although neighbourhood-level models may be identified with more precision, there are a number of reasons why a city-level analysis of these effects is essential. First, police budgets are commonly determined at the city level, as are major housing and land use decisions. Second, crime statistics are widely available at the city level, whereas tract-level crime rates are only available in select cities and years. Third, neighbourhood-level analyses are not able to capture crime spillovers to adjacent neighbourhoods. Criminals do not always commit crimes in their residential neighbourhoods, meaning that city-level analyses are more likely to capture crime effects in the aggregate. Relatedly, there may be non-linear relationships between subsidised housing and crime at the neighbourhood level that make aggregate crime effects unclear. Rosin (2008) suggested a number of reasons why the dispersion of subsidised households may affect crime: the increased challenge of policing multiple crime fronts, the difficulties in linking dispersed low-income populations to social services, and the loss in social networks that had thrived in concentrated housing projects. Galster (2005) suggests another—that decreases in the amount of high poverty tracts (which the voucher programme may contribute to through subsidised housing dispersion) are likely to be concurrent with increases in the proportion of the population living in mid-poverty census tracts. Those increases can have negative aggregate, city-wide effects along a number of social indicators, including crime.

Data and Methods

To estimate the extent that housing vouchers affect crime in US cities, I use data from 1997 to 2008 on vouchers, LIHTCs, public housing and HOPE VI from HUD, Uniform Crime Report data from the FBI and socioeconomic characteristics from the US census on the 215 US cities with population greater than 100,000 as of the 2000 census.[1] These data include annual counts of housing subsidies (LIHTC, public housing, vouchers and HOPE VI), violent and property crimes from the FBI Uniform Crime Report system, and race, poverty and income data that are linearly interpolated between census years using data from the 1990 and 2000 US censuses and the 2005–09 American Community Survey. I also include MSA-level unemployment rates from the US Bureau of Labor Statistics and state-level incarceration rates from the US Department of Justice, Bureau of Justice Statistics.

Descriptive statistics for the sample are provided in Table 1. The average city in the sample has just over 330,000 people, although the median city is much smaller, closer to 175,000. There are nearly 60 total (property plus violent) crimes per 1000 people over the entire data period—52 of those are property crimes. However, that masks considerable decreases over time. In 1997, that number was 68.7 and by 2008 the average crime rate had declined to 51.5 crimes per 1000 persons. The voucher programme is the most prevalent of the three

Table 1. Descriptive statistics: unweighted sample means ($N = 2399$)

Variable	*Mean*	*S.D.*	*Minimum*	*Maximum*
Population	330,396	643,430	70,842	8,220,196
Log (population)	12.3	0.7	11.2	15.9
Crimes per 1000 persons	59.7	24.1	9.6	154.4
Property crimes per 1000 persons	52.1	20.8	9.0	130.4
Violent crimes per 1000 persons	7.6	4.8	0.0	33.5
Voucher households	2731.8	6328.8	0.0	115310.0
Public housing units	1705.7	8132.2	0.0	146449.0
LIHTC units	2140.6	4493.3	0.0	71232.0
HOPE VI ($)	15,600,000	35,700,000	0	258,000,000
Voucher rate	0.008	0.006	0.000	0.052
Public housing rate	0.004	0.005	0.000	0.026
LIHTC units per person	0.006	0.005	0.000	0.032
HOPE VI ($ per person)	38.4	78.7	0.0	521.1
Percentage non-Hispanic White	0.530	0.205	0.036	0.950
Percentage non-Hispanic Black	0.169	0.174	0.001	0.834
Percentage Hispanic	0.209	0.190	0.009	0.942
Percentage poverty	0.142	0.063	0.016	0.373
Median family income ($)	31,866	17,824	642	101,590
MSA unemployment rate	0.050	0.015	0.017	0.182
State incarceration rate	0.005	0.002	0.001	0.008

major housing subsidy programmes—there were an average of 2732 vouchers issued per city per year, compared with 2141 LIHTC units and 1706 public housing units. Housing subsidies also changed substantially over time—the number of vouchers per year more than doubled from 1997 to 2008; the number of LIHTC units nearly tripled; and the number of public housing units has barely changed.

Using these data, I estimate a set of fixed effects regression models to control for unobserved characteristics of cities that do not vary over time that may affect crime rates and voucher prevalence. Additionally, I use lagged and lead specifications—voucher variables lagged one year and one year into the future—to better isolate the causal relationship between vouchers and crime. This strategy controls for the fact that voucher households may move to cities with higher crime rates, due in part to the fact that rents are likely to be lower. This results in a two-way relationship between voucher household prevalence and crime. Similarly, they may be less likely to move to the suburbs if suburban crime rates are lower relative to the central city (and rents are relatively higher). As noted, Ellen *et al.* (2012) find that voucher households are frequently found in neighbourhoods where crime rates are rising. If that is the case in cities—voucher holders are less likely to migrate to lower crime suburbs and/or are more likely to move into higher crime central cities (or high-crime suburbs)—the observed relationship between voucher holders and crime would be biased upward by this association. Thus, the lag and lead specifications are designed to isolate the causal direction.

The baseline specification begins with the city-level crime rate on the left-hand side of the equation and vouchers per capita on the

right-hand side, along with per capita rates of LIHTCs, public housing units, HOPE VI revitalisation grant dollars awarded, MSA unemployment rates, state-level incarceration rates and a set of control variables reported by the US census in 1990, 2000 and the 2005–09 American Community Survey, interpolated linearly (percentage in poverty, median family income, percentage Hispanic and percentage non-Hispanic Black). All of the crime and housing variables are expressed as per capita rates in order to control for levels and changes in population. The equation can be expressed as

$$\begin{aligned} CrimeRate_{irt} &= \alpha + \beta_1 Voucher_{irt} \\ &+ \beta_2 LIHTC_{irt} + + \beta_3 PH_{irt} \\ &+ \beta_4 HOPE_{irt} + \beta_5 X'_{irt} + City_i + R_r * T_t + e_{irt} \end{aligned} \quad (1)$$

where, $CrimeRate_{irt}$ is the crime rate in city i region r, and year t, Voucher_{irt}, $LIHTC_{irt}$, PH_{irt} and $HOPE_{irt}$ denote the per capita voucher, LIHTC, public housing and HOPE VI totals in city i, region r, and year t respectively; X'_{irt} is the set of covariates described earlier. Again, in some models the voucher variables are lagged to limit endogeneity. $City_i$ and $T_t * R_r$ are city and year*region fixed effects respectively.

In all models, LIHTC units and HOPE VI dollars are measured as accumulating up through that year—the number of LIHTC units in 2000 (or HOPE VI dollars awarded) includes units that were built (or dollars awarded) from 1997 to 2000. The region–year interaction term uses the nine regions determined by the US census as an interaction term with the time trend. This modified time effect allows for the slope of the time trend to be conditional on the region of the country where a given city is located, because the nation-wide crime trend is much less relevant than the crime trend of cities in the sample that are in the nearby census region. Given that I am looking at variation across cities (over time), I cluster the standard errors at the city level.

Additionally, households (with or without vouchers) may be aware of crime trends in their city (or potential destination cities) and use that information to help determine whether they should move in the near future. It may even be the case that they use these trends to anticipate future crime rates and use that information in moving decisions. To control for this, I estimate models with a linear city-specific time trend on the right-hand side of the equation, as a robustness check.

A key mechanism through which voucher numbers can change in a city is through mobility across place boundaries within an MSA. As voucher mobility has become a higher priority for HUD and local housing authorities, suburban voucher populations have grown faster than city ones. Covington *et al.* (2011) report that in 2008 nearly half of all housing voucher recipients lived in the suburbs, with steady growth in the proportion of vouchers in the suburbs occurring from 2000 to 2008. Using the data for this paper, I calculate that the suburban per capita voucher populations grew about 75 per cent faster than the city per capita voucher population from 2000 to 2006. Further, the controversies in suburban Los Angeles suggest that the most vocal opposition to voucher mobility exists in these areas.

To assess whether the growth of the suburban voucher population has affected crime in those areas, I estimate a set of models that focuses on the suburban portions of the MSAs that contain cities in the baseline sample. For these models, the estimation is the same, but the sample is restricted to suburban areas instead of cities greater than 100,000. I created this sample by gathering data for the 114 MSAs that contain cities in the original sample and then subtracted central-city housing subsidy, crime, population, and demographic

numbers from the MSA totals, leaving the suburban portions of the MSAs. In some cases, large cities from the original sample are more suburban (such as Overland Park, KS, and Plano, TX). In those cases, they are counted as suburbs for the suburban analysis. With the exception of the MSA unemployment and state-level incarceration rates, all of the variables in the model (including the population denominator) are identified at the suburb level.

Results

Table 2 displays the OLS results. The first two models present violent crimes per person as the dependent variable and the next two models use property crimes per person. The first and third results columns present models that control for the time trend using year fixed effects, and the second and fourth models control for the time trend using the more stringent region*year fixed effects. It is clear from these four models that there is not a strong relationship between crime and vouchers, or any of the subsidised housing variables. There is a small, negative association between vouchers and violent crime (10 per cent significance level). The magnitude of this relationship is also quite small—the coefficient of 0.058 suggests that a one standard deviation rise in the voucher rate is associated with 0.0003 fewer crimes per capita, which is quite small relative to the mean of 0.0075 crimes per capita (in other words, a 75 per cent increase in the voucher rate would lead to a 4 per cent decrease in the violent crime rate). There is no relationship at all, judging from these models, between vouchers per capita and property crime rates. There is a small positive association between public housing and property crime. LIHTC units and HOPE VI spending do not appear to have any relationship with crime. The demographic variables move in the hypothesised directions—the cities with higher percentages of non-Hispanic Blacks and households below the poverty line have higher crime rates. Unemployment and incarceration rates do not have strong effects on the crime rate, perhaps due to these variables being measured at the MSA and state levels respectively.

In Table 2, where vouchers and crimes were measured in the same year, it is possible that greater crime levels could be causing fewer vouchers to be used in the cities in the sample, rather than the other way around. To address reverse causality, I estimate models with lagged and future vouchers on the right-hand side. If lagged vouchers are highly correlated with crimes, then we can assume that vouchers are causing decreased crime and not vice versa, given that crime in the future cannot cause voucher numbers observed in the past. If future vouchers are related to crime in the past then we can assume that vouchers are moving to higher crime cities rather than causing the crime.

Table 3 displays the results from four models; in the first of two models for each crime type, the independent variable is lagged vouchers (t-1), the second includes lagged and future vouchers ($t+1$) in the same model. All models displayed include region*year fixed effects. We see here that the violent crime models (first two columns) suggest a slightly stronger relationship between lagged vouchers per capita and violent crime rates. The coefficient on lagged vouchers is nearly identical to the coefficient on vouchers in the current year, but the standard error is slightly smaller, making it significant at the 5 per cent level in the first model. Once I control for the future voucher rate, the coefficient is again only significant at the 10 per cent level. In the property crime models, the voucher–crime relationship remains non-existent. In all of the models, future vouchers do not relate to crime rates. Non-significant coefficients on the future voucher variables suggest that it is

Table 2. Baseline model results, city sample

	Dependent variable: violent crimes per person (n = 2404)		*Dependent variable: property crimes per person (n = 2426)*	
Voucher rate, *t*	−0.0595*	−0.0581*	0.0435	0.0141
	(0.0314)	(0.0318)	(0.108)	(0.114)
HopeVI $/Person, *t*	−0.00106	−0.00303	−0.00489	−0.000153
	(0.00256)	(0.00247)	(0.00999)	(0.00911)
Public housing rate, *t*	0.0498	0.0433	0.129	0.233*
	(0.0479)	(0.0419)	(0.171)	(0.133)
LIHTC rate, *t*	0.0255	0.0430	−0.168	−0.168
	(0.0596)	(0.0613)	(0.178)	(0.178)
Percentage Hispanic, *t*	−0.0110**	−0.00700	0.000961	0.00255
	(0.00539)	(0.00519)	(0.0190)	(0.0190)
Percentage non-Hispanic Black, *t*	0.0682***	0.0605***	0.136***	0.116***
	(0.0146)	(0.0159)	(0.0413)	(0.0343)
Percentage poverty, *t*	0.0146**	0.0151**	−0.0146	0.00310
	(0.00593)	(0.00671)	(0.0205)	(0.0206)
Median family income ($1000), *t*	−0.000139	−0.000854	−0.00997*	−0.00729
	(0.00136)	(0.00150)	(0.00598)	(0.00628)
MSA unemployment rate, *t*	0.00850	0.000403	−0.00778	−0.0110
	(0.00621)	(0.00707)	(0.0272)	(0.0300)
State incarceration rate, *t*	0.0735	−0.0324	−0.226	−1.129
	(0.209)	(0.298)	(0.728)	(0.944)
Adjusted R^2	0.130	0.209	0.291	0.359

Notes: Standard errors clustered at the city level in parentheses. All models include constant term and city fixed effects. Columns 1 and 3 include year fixed effects and columns 2 and 4 include region*year fixed effects. *** p <0.01; ** p <0.05; * p <0.1.

relatively unlikely that voucher households are disproportionately moving to high-crime cities. The weakly significant and negative coefficients on lagged vouchers suggest that, while it is unlikely that increased voucher presence leads to lower crime rates, there is absolutely no evidence that vouchers *increase* crime. Additionally, I estimated models using lagged versions of the public housing, HOPE VI and LIHTC variables, and none of those coefficients was significant in any models.

As noted, the lagged specifications may not be perfectly isolating the causal relationship between vouchers and crime. Households may identify trends in crime rates and use this information to anticipate future crime and use these assumptions in their residential location decisions. Although the region*year fixed effects control for these trends to some extent, those controls are at a larger level of geography. As a robustness check, I add a linear city-specific time trend in a set of models displayed in Table 4. At the top of the table, voucher and crime rates are measured in the same year and, in the bottom section, the lag/lead specifications are displayed as in Table 3. In these models, the region–year interaction term and city fixed effects are replaced with city–year interactions on the right-hand side of the equation. The results are relatively consistent with the other baseline results. The biggest change is that the coefficient on

Table 3. Identifying causality using lags and leads, city sample

	Dependent variable: violent crimes per person		*Dependent variable: property crimes per person*	
Voucher rate, $t-1$	−0.0608**	−0.0563*	−0.0611	−0.0115
	(0.0302)	(0.0317)	(0.0991)	(0.100)
Voucher rate, $t+1$		0.0140		0.0863
		(0.0258)		(0.106)
HopeVI $/person, t	0.000964	0.000667	0.00685	0.00354
	(0.00188)	(0.00323)	(0.00809)	(0.0127)
Public housing rate, t	0.0498	0.0458	0.305**	0.257*
	(0.0359)	(0.0343)	(0.150)	(0.152)
LIHTC rate, t	0.0395	0.0536	−0.138	−0.102
	(0.0489)	(0.0545)	(0.192)	(0.195)
Percentage Hispanic, t	−0.00627	−0.00656	0.00961	0.00865
	(0.00471)	(0.00455)	(0.0198)	(0.0202)
Percentage non-Hispanic Black, t	0.0545***	0.0554***	0.0975***	0.0960**
	(0.0142)	(0.0147)	(0.0344)	(0.0390)
Percentage poverty, t	0.0127**	0.0131**	0.0111	−0.00191
	(0.00593)	(0.00645)	(0.0211)	(0.0229)
Median family income ($1000), t	−0.000114	−0.000226	−0.00591	−0.00722
	(0.00139)	(0.00144)	(0.00587)	(0.00572)
MSA unemployment rate, t	0.00194	0.000575	−0.0103	−0.00790
	(0.00624)	(0.00677)	(0.0297)	(0.0310)
State incarceration rate, t	−0.182	−0.144	−1.658*	−1.718*
	(0.267)	(0.289)	(0.902)	(0.946)
Observations	2177	2047	2192	2054
Adjusted R^2	0.203	0.197	0.335	0.305

Notes: Standard errors clustered at the city level in parentheses. All models include constant term and city and region*year fixed effects. *** p <0.01; ** p <0.05; * p <0.1.

the voucher rate in time t is significant at the 10 per cent level. However, that coefficient is no longer significant if the voucher rate is lagged. In fact, the coefficient on voucher rates in the following year (voucher rate, $t+1$) is very similar to the coefficient in time t and the standard error is larger than the coefficient on the lagged term. This suggests that any positive relationship between vouchers and crime is more likely to reflect the fact that voucher households move to higher crime cities, than that voucher households cause higher crime rates in cities.

In the next analysis, I test whether the nature of this relationship differs in suburban areas. In the results discussed thus far, the sample has included about 90 cities that would be considered suburbs (such as Plano, TX, several non-central cities in southern California, Stamford, CT), but many of these suburbs are quite urban. As discussed earlier, the voucher population has also suburbanised considerably over the years. There is reason to believe that these trends could potentially affect crime in those areas. Less urban, more affluent areas may be ill-equipped to serve and police an influx of lower-income households, and crime rates may spike as a result.

To test this theory, I take the 114 MSAs that contain the cities in the previously analysed sample of cities and run these models using variables constructed only from the non-central-city portions of these MSAs.

Table 4. Robustness checks: controlling for linear crime trend, voucher coefficients

	Dependent variable: violent crimes per person	*Dependent variable: property crimes per person*
Voucher rate, t	0.0377	0.192*
	(0.0250)	(0.103)
Observations	2404	2426
Adjusted R^2	0.420	0.535
Voucher rate, $t-1$	−0.0272	0.0280
	(0.0184)	(0.0864)
Voucher rate, $t+1$	0.0614***	0.173
	(0.0221)	(0.107)
Observations	2047	2054
Adjusted R^2	0.491	0.505

Notes: Standard errors clustered at the city level in parentheses. All models include constant term and control for log(population), log(HOPE VI spending), log(public housing), log(LIHTC units), percentage Hispanic, percentage non-Hispanic Black, percentage poverty, median family income, MSA unemployment rate, state incarceration rate and city fixed effects and a city-specific linear time trend (city*year interactions). *** p <0.01; ** p <0.05; * p <0.1.

Table 5 presents the results of models using the same specification outlined in equation (1) on the suburban sample. The results here are very consistent with those in the city sample. The weakly significant coefficients found in the violent crime models in the city sample are not significant in the suburban sample, but this is perhaps due to the smaller sample size. The magnitude of the (insignificant) voucher coefficients is very similar across the two samples.

Looking at the other housing subsidy variables, HOPE VI spending has a weakly negative relationship with violent crime. LIHTC units per capita have a strong, positive relationship with property crime. I also estimated models with lagged versions of these variables in models not shown here. Lagged HOPE VI spending had a stronger, negative relationship with both types of crime, suggesting a lag between HOPE VI spending and demolition effects. Public housing continued to have no relationship and the LIHTC's relationship with property crime disappeared (although there was a weakly significant and positive coefficient in the violent crime models.

The conclusion from these models is that there does not appear to be a relationship between vouchers and crime in US cities and suburbs. There are some weakly significant findings that suggest a negative relationship, but these results are not very robust. However, it is important to note that regression models using rates have disadvantages. Some argue that using population as the denominator for both the dependent variable and key independent can amplify bias resulting from inaccurate population measurement, particularly in fixed effects models (Ellen and O'Regan, 2010; Griliches and Hausman, 1986; Levitt, 1998). Annual population estimates for this paper are provided by the FBI's Uniform Crime Report system and are not likely to be as accurate as decennial census counts. Thus, I ran a set of models using counts of the key variables—crimes, vouchers, LIHTC and public housing units, HOPE VI dollars—rather than per capita rates, presented in Table 6. The

Table 5. Model results, suburb sample

	Dependent variable: violent crimes per person		*Dependent variable: property crimes per person*	
Voucher rate, *t*	0.0538		0.259	
	(0.0924)		(0.343)	
Voucher rate, *t*−1		0.0137		0.249
		(0.0837)		(0.340)
Voucher rate, *t*+1		0.0455		0.368
		(0.0514)		(0.275)
HopeVI $/Person, *t*	−0.0183*	−0.0159*	−0.0923	−0.114
	(0.0104)	(0.00926)	(0.0819)	(0.0718)
Public housing rate, *t*	−0.145	0.0178	−0.00423	0.00254
	(0.147)	(0.128)	(0.596)	(0.530)
LIHTC rate, *t*	−0.0439	−0.0499	1.224***	1.047***
	(0.0528)	(0.0651)	(0.213)	(0.276)
Suburb percentage Hispanic, *t*	0.00830	0.00810	0.0969***	0.122***
	(0.00613)	(0.00617)	(0.0313)	(0.0348)
Suburb percentage non-Hispanic Black, *t*	0.00164	−0.000616	−0.0156	−0.0135
	(0.00389)	(0.00251)	(0.0203)	(0.0173)
Suburb percentage poverty, *t*	−0.00402*	−0.00388	0.0190	0.0355***
	(0.00229)	(0.00240)	(0.0116)	(0.00561)
MSA unemployment rate, *t*	0.0181*	0.0126*	0.00386	0.00380
	(0.0103)	(0.00735)	(0.0347)	(0.0328)
State incarceration rate, *t*	0.764*	0.693**	0.592	1.403
	(0.415)	(0.309)	(1.278)	(1.386)
Observations	1179	951	1188	955
Adjusted R^2	0.119	0.115	0.377	0.406

Notes: Standard errors clustered at the MSA level in parentheses. All models include constant term and city and region*year fixed effects. *** p <0.01; ** p <0.05; * p <0.1.

counts are logarithmically transformed to reduce the impact of outliers. These models also include the natural log of population on the right-hand side to control for population differences between cities and years.

The top of the table shows the city-level results, which are largely consistent with the findings using rates. We see here that even the weak relationships between vouchers and violent crime observed in the previous models no longer hold. Once more, I ran these models using the natural log of vouchers on the suburban sample, shown in the bottom half of the table. Current year, lagged and future vouchers all have an insignificant and negative relationship with crime in the suburbs, controlling for population, and there is no relationship with property crime. These results provide further evidence that the relationship expressed using rates is consistently weak.

Discussion

There is a growing body of work that examines the relationships between subsidised housing and crime, largely focusing on these relationships at the neighbourhood level. This paper attempts to identify whether there are aggregate effects across

Table 6. Logarithmic count variables: voucher coefficients

	Dependent variable: log(violent crimes)		*Dependent variable: log(property crimes)*	
City sample				
Log(vouchers), t	0.00501		−0.00311	
	(0.0427)		(0.00605)	
Log(vouchers), $t-1$		−0.0152		−0.00393
		(0.0211)		(0.00539)
Log(vouchers), $t+1$		−0.00607		−0.00153
		(0.0114)		(0.00703)
Observations	2404	2086	2426	2107
Number of cities	215	215	215	215
Adjusted R^2	0.262	0.194	0.319	0.289
Suburb sample				
Log(vouchers), t	−0.199		−0.0463	
	(0.123)		(0.0441)	
Log(vouchers), $t-1$		−0.0934		−0.0221
		(0.0570)		(0.0301)
Log(vouchers), $t+1$		−0.472**		−0.0383
		(0.209)		(0.0731)
Observations	1097	897	1143	936
Number of cities	109	109	110	110
Adjusted R^2	0.106	0.156	0.069	0.073

Notes: Standard errors clustered at the city level in parentheses. All models include constant term and control for log(population), log(HOPE VI spending), log(public housing), log(LIHTC units), percentage Hispanic, percentage non-Hispanic Black, percentage poverty, median family income, MSA unemployment rate, state incarceration rate and city and region*year fixed effects. *** p <0.01; ** p <0.05; * p <0.1.

cities. The results suggest that recent controversies over increased voucher presence in suburban communities are fuelled by misinformation—there is no observable relationship between city or suburban crime rates and the proportions in those communities. If there is a relationship at all, these data suggest that there is a weak, negative relationship between vouchers and crime in large cities and there is no relationship at all between vouchers and crime in suburban areas.

A sensible explanation for this lack of a relationship is simply that voucher households do not alter the crime landscape in metropolitan areas and, if they do, they do not do so to the extent that is detectable at such a large level of geography. However, these findings are consistent with much of the growing body of work at the neighbourhood level, summarised earlier.

Recent events and trends suggest that we pay particular attention to how these relationships play out in suburban communities. The mayor of suburban Lancaster, CA, is being sued for harassing voucher households, acts he justifies by asserting that these households are responsible for elevated crime rates in his city. Further, Lancaster is part of a greater trend of robust growth in suburban voucher populations. Allard and Roth (2010) document that suburban social

service agencies are less numerous, handle larger service areas and are less equipped to handle increased demand in the face of the suburbanisation of poverty. Given this context, it is likely that the suburbs that house a growing number of voucher households are often relatively distressed and lacking in the kind of social service safety-net that is more common in central cities. This could have impacts on a number of social problems, including crime. According to the evidence compiled in this paper, that has not been the case in recent years.

The goal of the voucher programme to increase access to higher opportunity neighbourhoods is a laudable one. And the evidence here suggests that these efforts are unlikely to increase crime in suburban communities, where many such neighbourhoods exist. It may not be sensible, however, to rapidly accelerate and incentivise mobility to suburban jurisdictions, particularly without attending to the weaker social safety-net that Allard and Roth (2010) describe. Rather, it is more logical to engage in what Popkin *et al.* (2012) term 'responsible relocation'. Popkin and colleagues suggest several aspects of housing policy that could constitute responsible relocation, including relocation counselling and follow-up supportive services, while expanding incentives to voucher households for locating in better neighbourhoods.

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Note

1. There are actually 238 such cities, 23 of them did not have useable crime data for most of the relevant years. I also removed Honolulu from the sample, because the city and MSA are one in the same, a fact that skewed the results in some models.

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