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Housing Programs Complement Each
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**Do Tenant- and Place-Based Rental Housing Programs
Complement Each Other? Evidence from Ohio**

Brett Barkley, Amy Higgins, and Francisca G.-C. Richter

We characterize Housing Choice Voucher (HCV) use in Low-Income Housing Tax Credit (LIHTC) units with the intent to explore whether the subsidy overlap responds to needs unmet by the HCV program alone. Lacking the data to contrast HCV use in and out of LIHTC units, we turn to a comparison of HCV users in LIHTC units relative to the overall HCV population. Our analysis of 2011 tenant-level LIHTC data from Ohio and HCV data from HUD suggests place-based vouchers, which must be redeemed in an LIHTC unit, are more likely allocated to extremely low-income or special-needs households. On the other hand, HCV users who freely choose to redeem their voucher in an LIHTC unit are similar to the overall HCV population in terms of incomes and ethnicity, although they tend to be older. There is little evidence that using both programs in concert enables access to better neighborhoods for HCV users: households across both programs live in neighborhoods that tend to have poverty rates above 20 percent, with HCV-LIHTC users actually living in higher-poverty neighborhoods in most urban Ohio counties when compared to the HCV population as a whole.

JEL Codes: R38, H71, R23.

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1. Introduction

The longstanding debate over cost-effectiveness in the provision of rental housing subsidies is influenced by whether the housing goods offered by tenant-based and place-based programs are considered substitute or complement products. Assuming that both programs provide equal access to housing units and environments of similar quality, researchers show that tenant-based programs are less costly than their place-based counterparts (Olsen 2009; GAO 2002). Thus, under the substitutability assumption, it is possible to house a larger number of eligible households when allocating funds away from place-based and into tenant-based programs. Alternatively, when place-based programs supply housing in a tight rental market, deliver human or educational services, or support neighborhood revitalization efforts, they may reach subpopulations whose needs would be unmet under a tenant-based program alone. Thus, some argue that the programs should be best seen as complementary in the provision of housing for low-income households. These programs can also be complementary at the individual level. For instance, an elderly, extremely low income individual may need the human services provided through a place-based program, and the deep rental subsidy provided by a housing voucher. Under the complementarity assumption, the goal is to optimally allocate resources across both programs in order to cover the heterogeneous needs of eligible families.

While, to the extent of our knowledge, there is not an explicit coordination of programs at the federal level, the number of households using vouchers in units produced by place-based programs is not insignificant. By 2011, 34% of Housing Choice Vouchers (HCVs) were being used to subsidize the rent of Low-Income Housing Tax Credit (LIHTC) units in Ohio. Based on a sample from ten states, O'Regan & Horn (2013) report that between 33.7% and 49.6% of low-income qualifying LIHTC tenants received additional rental assistance-- HCV or otherwise. Such overlap is not necessarily a recent phenomenon; two older studies, GAO (1997) and Abt (Burton et al. 2000), reported that 37%-39% of LIHTC tenants receive additional project-based or tenant-based rental assistance as of 1994. In order to understand to what extent such programs complement each other, it is important to identify and characterize the subset of users who receive simultaneous subsidies from both types of programs.

Previous economic and policy research focusing on LIHTC users has documented the incidence of using a voucher in LIHTC but has not looked into whether this subsidy overlap provides housing services unmet by either program alone (Galvez 2010). For that, a comparison of HCV users

in and out of LIHTC would be needed. Lacking the data required for such approach, we resort to a comparison between the entire HCV population in Ohio and its subset of HCV holders living in LIHTC. The time period analyzed spans 2011 and 2012. A discussion of the relevant literature precedes the analysis and the last section provides some concluding thoughts. We use subsidized tenant level data in Ohio for 2011, provided by the Ohio Housing Finance Agency (OHFA) and HUD's Public Use Microdata Sample (PUMS) for the year 2012. Tract level data for HCV users is from HUD's A Picture of Subsidized Households, 2011, and neighborhood quality variables are from the Census Bureau¹, 2010.

2. The incidence of voucher use in LIHTC units

The Low Income Housing Tax Credit Program is the main source of subsidies for the construction of rent-controlled housing units. LIHTC is designed so one of the following affordability² conditions apply: at least 40% of its units are affordable to households with incomes at 60% of area median income (AMI), or at least 20% of units are affordable to households with incomes at 50% of AMI. The Housing Choice Voucher program is the main source of tenant-based subsidies. As conceived, the program relies on the market supply of rental units at the Fair Market Rent (FMR)³ and requires the voucher holder to pay 30% of their income on housing. The remaining portion of the rent is covered by the voucher, conditional on the unit and tenant meeting certain requirements specified by HUD. Thus, by design, housing should be affordable (or close to affordable) and accessible to all HCV users, provided the market supplies enough units satisfying HUD requirements to meet demand.

While LIHTC units are not affordable to individuals with incomes below 50% of AMI in the absence of additional subsidies, some argue that the program is important in broadening the supply of quality units offered at or around the FMR. In fact, under minimum requirements, LIHTC owners may not refuse to rent to HCV holders⁴, whereas landlords in the private market can freely choose to go through the HUD certification process in order to accept HCV tenants or abstain from renting to HCV holders. O'Regan & Horn (2013) argue that the HCV program has a significant role in allowing households with extremely low income to access LIHTC developments. Their data consists of 480,000 LIHTC units from fifteen state housing finance agencies (HFAs) for 2009 and 2010,

¹ 2010 data in 2000 tract boundaries by Geolytics, Inc.

² Housing affordability refers to being able to afford rent and utilities with 30% or less of income

³ The Fair Market Rent is set at the 40th percentile of gross rent for typical, non-substandard units in a given local housing market.

⁴ Internal Revenue Code § 42(h)(6)(B)(iv)

representing approximately 30% of the national LIHTC housing stock. The analysis finds that states with higher rates of HCV use in LIHTC also have higher rates of extremely low-income households served by LIHTC, suggesting more focused resources for the most disadvantaged populations. They also point out that LIHTC households without additional rental assistance experience higher levels of instability (i.e. occupancy turnover) than LIHTC households using a HCV.

Williamson et al. (2009) analyze 2004 tenant level data from Florida to determine the extent of the HCV-LIHTC overlap in general. They are able to identify HCV holders in LIHTC units, but cannot discriminate between project-based vouchers (PBVs) and tenant-based vouchers (TBVs). PBVs are HCVs allocated by the local Public Housing Authority to units in certain LIHTC projects. A tenant making use of a PBV cannot leave the LIHTC unit without losing her voucher. On the other hand, TBVs denote vouchers assigned to tenants, who can then choose to rent a LIHTC unit. The study finds that a significant portion of HCV-LIHTC users (30%) are housed in LIHTC units located in Qualified Census Tracts (QCTs), usually low-income neighborhoods where developers receive 1.3 times the tax credit that would be allocated outside of QCTs. In a subsequent study, Williamson (2011) finds that LIHTC tenants also receiving HCV assistance are much less likely to be cost burdened than other LIHTC tenants. Her analysis shows that 65% of HCV-LIHTC users do not experience a housing cost burden compared to only 9% of LIHTC households without a voucher.

The aforementioned studies characterize the HCV-LIHTC population in relation to other LIHTC tenants. However, such analyses are unable to inform on whether the subsidy overlap responds to needs unmet by the HCV program alone. The relevant counterfactual analysis for such test would imply comparing the housing conditions of HCV households within a locality, with and without the availability of LIHTC rentals. As Williamson et al. (2009) suggest, it is possible that the use of HCV holders in LIHTC units is a response to the scarcity of HUD-certified affordable housing units in the private rental market. It may also signal household preferences for newer, higher quality units than what are typically available to HCV users -- all LIHTC units have been built since 1987 (Galvez 2010). HCV users may also choose LIHTC units in search for better neighborhoods or the provision of special need services within the living environment.

Focusing on the potential issue around the supply of FMR units, Eriksen (2010) suggests that LIHTC developments may actually crowd out unsubsidized rental housing that would have otherwise been built. But the extent of such an effect is not entirely clear. Baum-Snow and Marion (2009) find that LIHTC projects crowd out new rental construction in areas where property values are rising but do not have the same effect in stable or declining areas. One of the largest experiments conducted

by HUD in 1973 provides valuable insight on private rental market responses to an expansion of tenant-based housing subsidies (Frieden 1980). The Experimental Housing Allowance Program (EHAP) consisted of three components: a demand-side experiment (how families would make use of their allowances), a supply-side experiment (local housing market responses to increased demand), and an administrative experiment (to test effectiveness of different administrative arrangements). Despite the fear that discriminatory practices would affect take-up rates, the experiment showed that minority and “hard to house” families were able to find housing of acceptable quality. Female headed-households and families on welfare assistance were the main participants, but participation by the elderly was low. Still, only about half of families eligible for allowances participated and the program had small effects on mobility and quality of housing. Partly due to the low take-up rate, there was virtually no increase in rents following the open enrollment policy.

While the use of HCV in LIHTC units might be a response to tight rental markets, desirability of newer units, or need for special services, it could also represent an opportunity for HCV households to access better neighborhoods in close proximity to their social networks. Neighborhood environment influences can have a profound impact on the lives of individuals. The program design of both HCV and LIHTC consider the importance of neighborhood quality. HCVs were originally designed to allow for movement out of public housing units by providing neighborhood choice to poor households, and many states preference LIHTC credits to projects that are part of a broader community revitalization plan in an effort to improve neighborhoods.

Deng (2007) studied HCV and LIHTC programs in six Metropolitan Statistical Areas (MSAs), San Jose, New York, Boston, Cleveland, Atlanta, and Miami. She finds that both HCV and LIHTC units are predominantly located in areas with low school quality. On the other hand, Newman and Schnare (1997) find slightly better prospects for HCV than LIHTC households. Compared to public housing, LIHTC units provide poor households access to better quality neighborhoods; but when compared to HCVs, LIHTC unit dwellers experience lower neighborhood quality.

Lens et al. (2011) investigate whether HCVs assist tenants in moving to neighborhoods with less crime. Their analysis makes use of two datasets, 2000 census tract level crime data for 91 cities and census tract data from 1998-2008 for Austin, Chicago, Cleveland, Denver, Indianapolis, Philadelphia, and Seattle. The authors find that voucher households occupied lower crime neighborhoods compared to tenants occupying LIHTC and public housing units. Residents living in LIHTC and public housing units experienced crime rates comparable to poor renters in general.

Richter et al. (2013), consider neighborhood quality of HCV and LIHTC households in 2000 and the 2006- 2009 period for Cuyahoga, Franklin, and Hamilton counties in Ohio, as well as Allegheny County in Pennsylvania (quality is a function of poverty, education, and employment indicators). They find that Allegheny County neighborhoods with LIHTC projects placed in service by 2000 improved in quality relative to other poor neighborhoods without LIHTC projects. And the level of quality experienced by LIHTC users in 2006-2009 was comparable to that of HCV users. However, these results did not hold for any of the Ohio counties studied.

3. Characteristics of the HCV and LIHTC populations in Ohio

HCV is the largest subsidized housing program in Ohio, with 33% of all subsidized households falling under this program in 2011. LIHTC comprises the third largest component of subsidized housing in Ohio, at 23% in 2011 (Figure 1.2). While the number of participants across both programs adds to about 154,000, the number of unique households covered is less than 124,000 due to the fact that about 30,000 households use a voucher in a LIHTC unit.

HCVs may be used in a LIHTC unit via a place-based voucher (PBV) or a tenant-based voucher (TBV). While PBV holders can only use their subsidy in the unit attached to the voucher, TBV users are unrestricted, but choose to redeem their voucher in a LIHTC unit. In Ohio, during 2011, 34% of HCVs were being used in a LIHTC unit, with 23% of them being PBVs and 11% TBVs (Figure 1.2). Relative to all LIHTC households, PBV holders represented 34% of that pool, while 15% of LIHTC households were TBV users. 51% of LIHTC users were not subsidized under the HCV program (denoted as “LIHTC-only.”)

We compare PBV, TBV, LIHTC-only, and all HCV users (includes PBV, TBV, and HCV-non LIHTC) by the characteristics of individuals they house. HCV data is from PUMS, for the year 2012, while PBV and TBV data is from OHFA for the year 2011⁵. Our comparisons are limited to those characteristics collected in both data sets. Figure 2.1 shows a higher incidence of elderly (62 and older) among LIHTC users as compared to the entire HCV population. However, non-elderly head of households with a disability are clearly more represented in the HCV program than in any of the LIHTC categories. Comparing TBV holders with the entire HCV population, it is possible to say that the elderly are more likely to use their voucher in a LIHTC unit, while the reverse is true for the non-elderly, disabled population of HCV holders.

⁵ The PUMS for subsidized households is not available in 2011.

The income distribution of subsidized households across programs shows that TBV holders are very similar to the overall population of HCV users with a median income of about \$10 000 (Figure 3.1). On the other hand, PBV holders tend to be on the lower end of the distribution, with a median income under \$8 000 and about 10% of its population receiving no income at all. Other characteristics of the PBV population suggest this group may lack family support. Over fifty percent of PBV users have a household size of 1, compared to a larger household size, on average, for all HCV users. Accordingly, PBV users also tend to live in much smaller units—nearly fifty percent are one or zero bedroom apartments. As expected, LIHTC dwellers with no additional housing subsidies are less needy. In Ohio, the median income for this group was about \$20 000 in 2011.

We also look at the distribution of households by race under each subsidy combination (Figure 2.2). Issues such as discrimination in the private rental market could lead to a higher share of African-American households using their HCVs in LIHTC units when compared to the HCV holder population as a whole. However, the data only tells us that the shares of African-American head of households in the HCV population and the population of TBV holders is comparable, at about 60%.

3.1 Characterizing voucher use within LIHTC

While we are limited in our comparison of HCV users in and out of LIHTC units, data does allow for a richer comparison of HCV users within LIHTC. We specify a multinomial logit model to characterize households belonging to the following three groups: TBV holders, PBV holders and other LIHTC users.

$$(1) \quad P\{y_i = j\} = \frac{\exp(x'_{ij}\beta_j)}{1 + \exp(x'_{i2}\beta_2) + \exp(x'_{i3}\beta_3)}, \quad j = 1, 2, 3$$

The model expresses the probability of being in each of the three categories (indexed by j) as a function of several explanatory variables associated with households in each housing category (x_{ij} vector). Specifically, we use the age, race, and gender of household head; number of children; homelessness status; disability status; and an income from employment dummy. We compute marginal effects for the model that allow comparing households using PBVs relative to those using TBVs or no additional subsidy.

Table 1. Average Marginal Effects estimate the average change in probability of being a PBV user due to a one unit increase in the explanatory variable. Age is in years and the remaining variables are dichotomous (1=yes, 0=no). These estimates are for relative risk ratio estimates in the multinomial logit of equation 1, with TBV is the base outcome.

	PBV	Std. Err.	z	P> z	95% CI	
age of household head	-0.019	0.001	-29.56	0	-0.021	-0.018
age of household head^2	0.000	0.000	21.7	0	0.000	0.000
female household head	0.033	0.006	5.9	0	0.022	0.044
household with children	-0.019	0.002	-7.9	0	-0.024	-0.014
disabled head or spouse	0.188	0.007	27.23	0	0.175	0.202
income from employment	-0.312	0.005	-62.78	0	-0.321	-0.302
homeless	0.109	0.012	9.4	0	0.087	0.132

Results confirm that PBV holders are clearly a more vulnerable population relative to other LIHTC dwellers. All else equal, having been previously homeless increases the probability of being a PBV user by 11%. Among all LIHTC dwellers, disability status also increases the probability of being a PBV holder, whereas the probability decreases for male-headed households or for those that have income from employment. Altogether, the data suggests that PBVs are purposely allocated to the most vulnerable individuals among LIHTC users. Unfortunately, we cannot examine how or to what extent this population is served by the voucher program outside of LIHTC.

Figure 3.2 shows the 2011 share of elderly and disabled Ohio LIHTC tenants by year in which the units were placed in service. Between 30% to 50% of subsidized LIHTC units placed in service since 2007 are inhabited by elderly residents. The fact that newer buildings house a higher share of elderly suggests that over time, the program has purposely offered housing units and services that are more attractive or suitable for this population.

3.2 Neighborhood Quality for HCV users in LIHTC units relative to all HCV users

Previous work comparing neighborhood quality under place- and tenant-based programs has not identified neighborhood quality for the group of households subsidized under both programs. There is no way of uncovering the complex decision making process by which individuals decide where to locate with a voucher. However, we can see whether those selecting into a LIHTC unit –via a TBV or PBV- experience better neighborhood quality as compared to the entire population of HCV users. We know that the HCV population is made of individuals living in and out of LIHTC units and that those in LIHTC units represented about 34% of the HCV population in Ohio, 2011.

$$\text{HCV_pop} = \text{TBV_pop} + \text{PBV_pop} + \text{HCV-non LIHTC_pop}.$$

Unable to identify HCV users not living in LIHTC units (HCV_non LIHTC_pop), we compare average neighborhood quality for the voucher population in LIHTC (TBV_pop+PBV_pop) with that of the HCV population as a whole (HCV_pop).

Figure 4 shows the average neighborhood quality for voucher users in select Ohio counties versus that for the subset of TBV and PBV holders, jointly. Figure 5 compares neighborhood quality for TBV and PBV holders. Neighborhood quality is measured at the census tract level and it is relative to all tracts in the United States in 2010. We use quantiles of the first principal component estimated from the following variables: percent poverty, percent in the labor force, percent with a high school diploma, percent with a bachelor's degree, and percent employed.⁶ Thus, the highest quality neighborhood in the US would have an index of 100 and the median quality neighborhood according to our measure would have an index of 50. The average neighborhood quality is calculated for all tracts within a county, weighted by the number of HCV, TBV or PBV holders per tract, accordingly. Counts of HCV holders within each tract are from the Picture of Subsidized Households, 2011 and counts for TBV and PBV holders are from the OHFA – 2011 LIHTC data⁷. Similarly, average poverty rates experienced by HCV, TBV and PBV users at the county level are presented in Figures 6 and 7. The size of the bubble in these graphs reflects the relative share of TBV and PBV users in the HCV

⁶ The first component explains 67% of the variation in the 2010 data.

⁷ Because these two data sets are collected at different points in time, and low-income populations are highly mobile, we cannot expect alignment of counts at the census tract level. However, the data does give us a snapshot of the distribution of voucher holders across neighborhoods and thus, we can compare neighborhood quality for all three groups (HCV, PBV, TBV) aggregated to the county level. Counties included in our study had a population greater than 50,000 to primarily capture urban areas, per US Census Bureau definition, and greater than 50 PBV & 50 TBV holders to ensure low voucher populations aren't given undue weight.

populations. The larger the bubble, the more TBV and PBV holders there are in the county relative to the total number of HCV holders.

By focusing on the bottom left quadrant of figure 4, we see that on average, HCV holders in Ohio counties live in neighborhoods of below median quality; and for those voucher holders living in a LIHTC unit (TBV+PBV holders), neighborhood quality tends to remain below the median. Figure 5 shows that in some counties PBV holders experience higher average neighborhood quality than TBV holders, yet in these counties, both groups remain below the median of quality (bottom left quadrant). There are, however, a few counties in which subsidized households experience above the median neighborhood quality (right side quadrants). In these counties, it is most likely that TBV holders are located in better neighborhoods than their PBV counterparts.

To complement the rank-based analysis of neighborhood quality we provide graphs using actual neighborhood poverty rate averages experienced by the subsidized populations within counties. Here, we divide the plots into four quadrants to mark average poverty rates below and above 0.2 or 20%. It is worth noting that the average neighborhood poverty rate for the HCV population is above 10% for all counties studied and HCV-LIHTC households do not benefit from living in less poor neighborhoods relative to the overall HCV population (Figure 6). Figure 7 shows that compared to PBV users, TBV users -- those who chose to live in LIHTC unit -- tend to live in less poor neighborhoods, but only in a handful of counties the average neighborhood poverty for TBV users is below 20%.

Conclusions

Evidence from Ohio suggests that HCV and LIHTC programs exhibit some degree of complementarity, particularly, when serving populations with very low incomes and need for special services. The overlap of programs is not at all insignificant: In Ohio, during 2011, 34% of LIHTC households received place-based voucher assistance and another 15% of LIHTC dwellers were using their tenant-based voucher to live in a tax-credit unit. The characteristics of the PBV population seem to reflect the desire of local housing administrators to combine the deep subsidy of the HCV with the supportive services that some LIHTC projects provide in order to serve those most needy. On the other hand, the population of TBV users, who freely choose to live in LIHTC units, is similar to the overall HCV population in terms of incomes and ethnicity, but they tend to be older. Such observations are consistent with the trend that 30% to 50% of subsidized LIHTC units placed in service since 2007 are occupied by elderly tenants.

While our analysis of HCV users in LIHTC points to benefits of the overlap for certain populations, there is very little evidence to support PBV or TBV usage enables access to better quality neighborhoods relative to other HCV users. In the Ohio counties studied, the average HCV user and the average voucher holder living in LIHTC units, occupy neighborhoods which are below the 50% median neighborhood quality index, with poverty rates of above 20%. There are only a few Ohio counties—Clermont (Cincinnati MSA) and Delaware (Columbus MSA)—where PBV or TBV users, on average, reside in better neighborhoods than the HCV population as a whole, and at the same time, experience above median neighborhood quality. Unfortunately, households across both programs live in neighborhoods that tend to have above 20% poverty rates, with PBV and TBV users actually living in higher poverty neighborhoods in the most urban counties (e.g., Cuyahoga, Hamilton, Summit, and Franklin) when compared to the HCV population as a whole.

Voucher use in LIHTC units can be perceived as beneficial insofar as the most disadvantaged populations are provided access to important supportive services and quality rental units that would otherwise not be available. However, it is important for housing administrators and policy makers to address the low neighborhood quality that prevails for users of both programs. A further exploration of the county-level variation in neighborhood quality and poverty illustrated by our analysis may shed some light into how to better coordinate the provision of rental housing subsidies to improve the living conditions and opportunities of low-income families.

References

- Baum-Snow, Nathaniel and Justin Marion**, “The Effects of Low Income Housing Tax Credit Developments on Neighborhoods,” *Journal of Public Economics*, 2009, 93 (5-6), 654–666.
- Buron, Larry, Sandra Nolden, Kathleen Heintzi, and Julie Stewart**, “Assessment of the Economic and Social Characteristics of LIHTC Residents and Neighborhoods,” 2000. Cambridge, MA: Abt Associates.
- GeoLytics, Inc., “2010 Summary File 1 in 2000 Boundaries”, East Brunswick, NJ, .
- Deng, Lan**, “Comparing the Effects of Housing Vouchers and Low-Income Housing Tax Credits on Neighborhood Integration and School Quality,” *Journal of Planning Education and Research*, 2007, 27, 20–35.
- Eriksen, Michael**, “The Market Price of Low-Income Housing Tax Credits,” *Journal of Urban Economics*, 2009, 66 (2), 141 – 149.

Frieden, Bernard J., “Housing allowances: an experiment that worked,” *The Public Interest*, 1980, Number 59, 15-35.

Galvez, Martha M., “What Do We Know About Housing Choice Voucher Program Locations Outcomes? A Review of Recent Literature,” 2010. Washington D.C.: Urban Institute.

Khadduri, Jill and Charles Wilkins, “Designing Subsidized Rental Housing Programs: What Have We Learned?” 2007. Working paper, Joint Center for Housing Studies, Harvard University.

Lens, Michael C., Ingrid Gould Ellen, and Katherine O’Regan, “Neighborhood Crime Exposure among Housing Choice Voucher Households,” 2011. Prepared for U.S. Department of Housing and Urban Development Office of Policy Development and Research.

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

Olsen, Edgar, “The Cost-Effectiveness of Alternative Methods of Delivering Housing Subsidies,” November 2009. Presented at the Thirty-First Annual APPAM Research Conference, Washington D.C.,

O’Regan, Katherine M. and Keren M. Horn, “What Can We Learn About the Low-Income Housing Tax Credit Program by Looking at the Tenants?” *Housing Policy Debate*, 2013, 23(3), 597-613.

Richter, Francisca G.-C. and Mark Sniderman, with Matthew Klesta and Frank Manzo, “Low-Income-Rental-Housing Programs in the Fourth District,” 2013. Working Paper 13-11, Federal Reserve Bank of Cleveland.

Rosenbaum, James, “Changing the geography of opportunity by expanding residential choice: Lessons from the Gautreaux program,” *Housing Policy Debate*, 1995, 6 (1), 231–269.

U.S. General Accounting Office, “Federal Housing Assistance: Comparing the Characteristics and Costs of Federal Programs,” 2002. GAO Publication 02-76. Washington, D.C.: U.S. Government Printing Office.

---, “Tax Credits: Opportunities to improve oversight of the low-income housing program,” 1997. Report to the Chairman, Committee on Ways and Means; and the Chairman, Subcommittee on Oversight, Committee on Ways and Means, House of Representatives.

Williamson, Anne R., “Can They Afford the Rent? Resident Cost Burden in Low Income Housing Tax Credit Developments,” *Urban Affairs Review*, 2011, 47(6), 775-799.

---, **Marc T. Smith and Marta Strambi-Kramer**, “Housing Choice Vouchers, the Low-Income Housing Tax Credit, and the Federal Poverty Deconcentration Goal,” *Urban Affairs Review*, 2009, 45(1), 119-132.

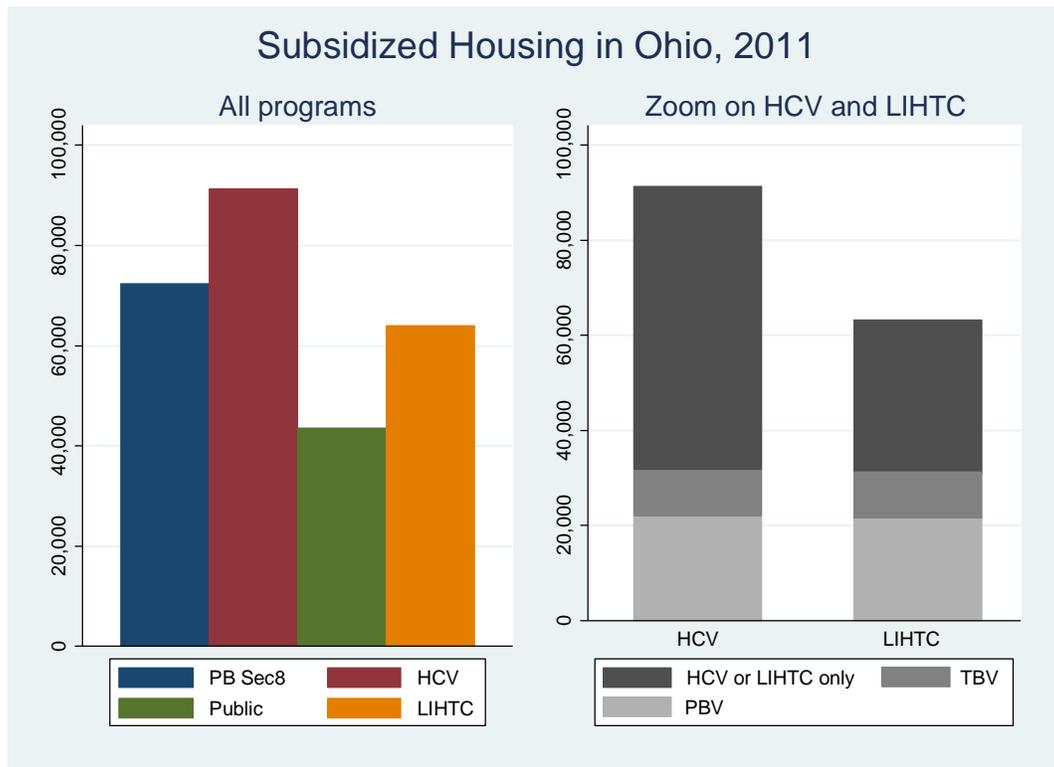
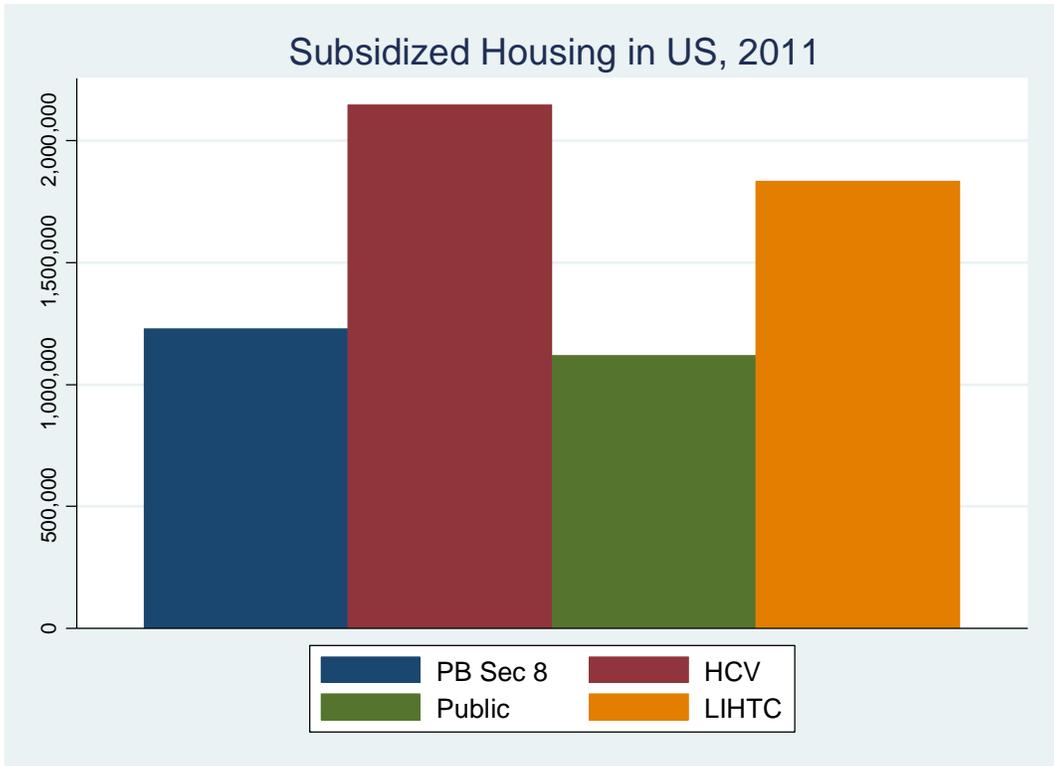


Figure 1.1 & 1.2: Subsidized Housing in the US and Ohio. 2011 LIHTC data is from the Ohio Housing Finance Agency. 2011 Ohio PB Sec 8, Public and HCV data and all US-level data are from the Center of Budget and Policy Priorities.

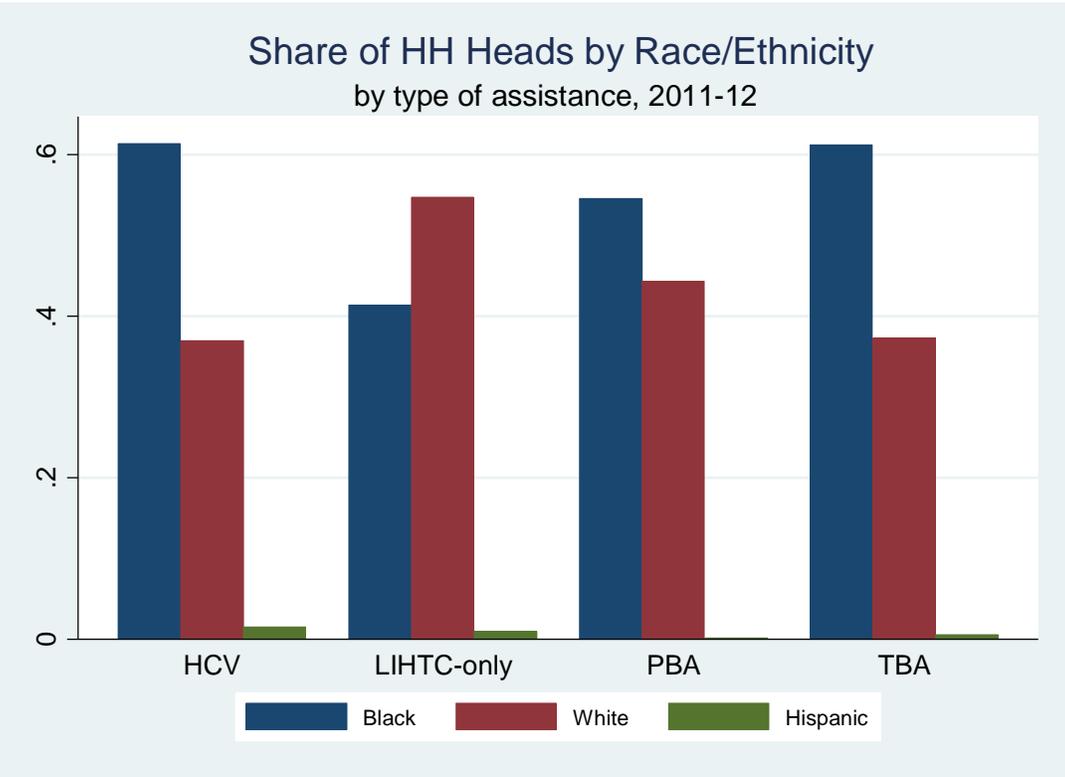
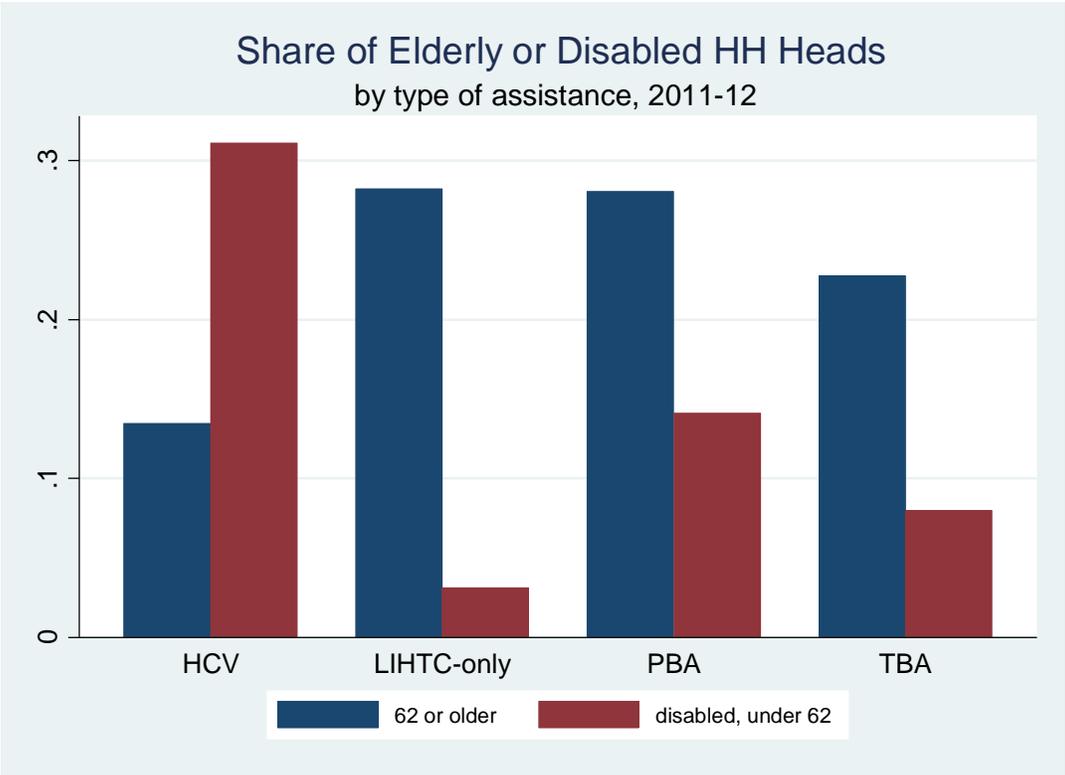


Figure 2.1 & 2.2: Share of Household Head by Demographic. 2011 LIHTC data is from the Ohio Housing Finance Agency. 2012 HCV data is from the Public Use Microdata Sample.

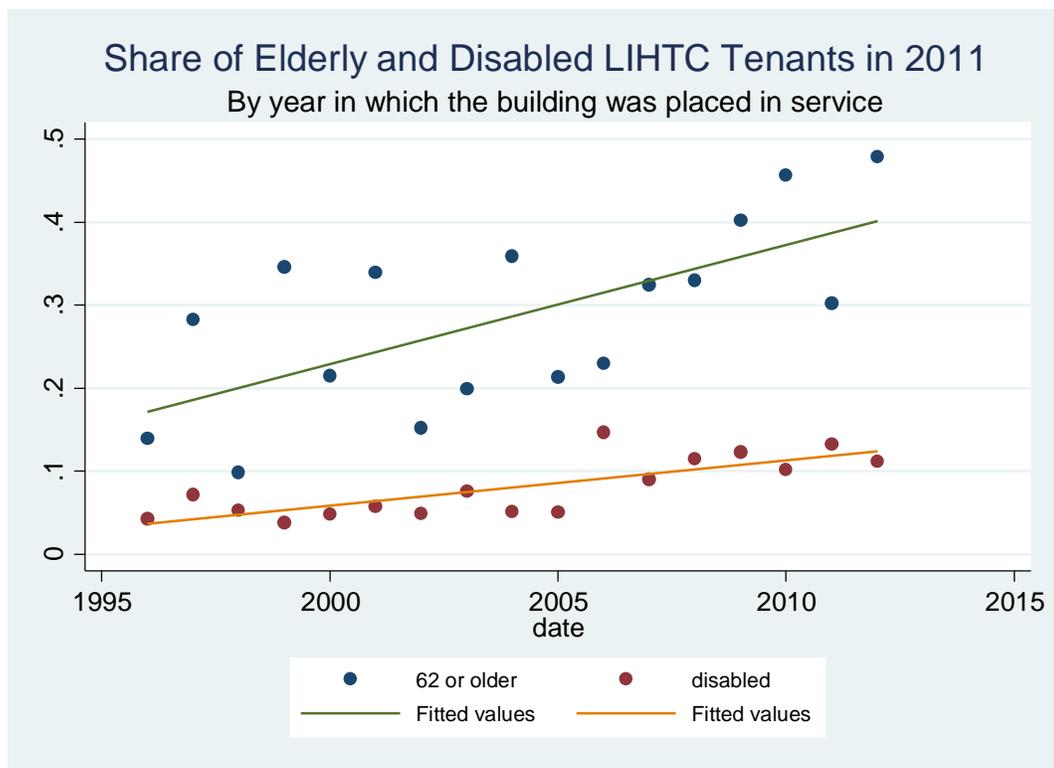
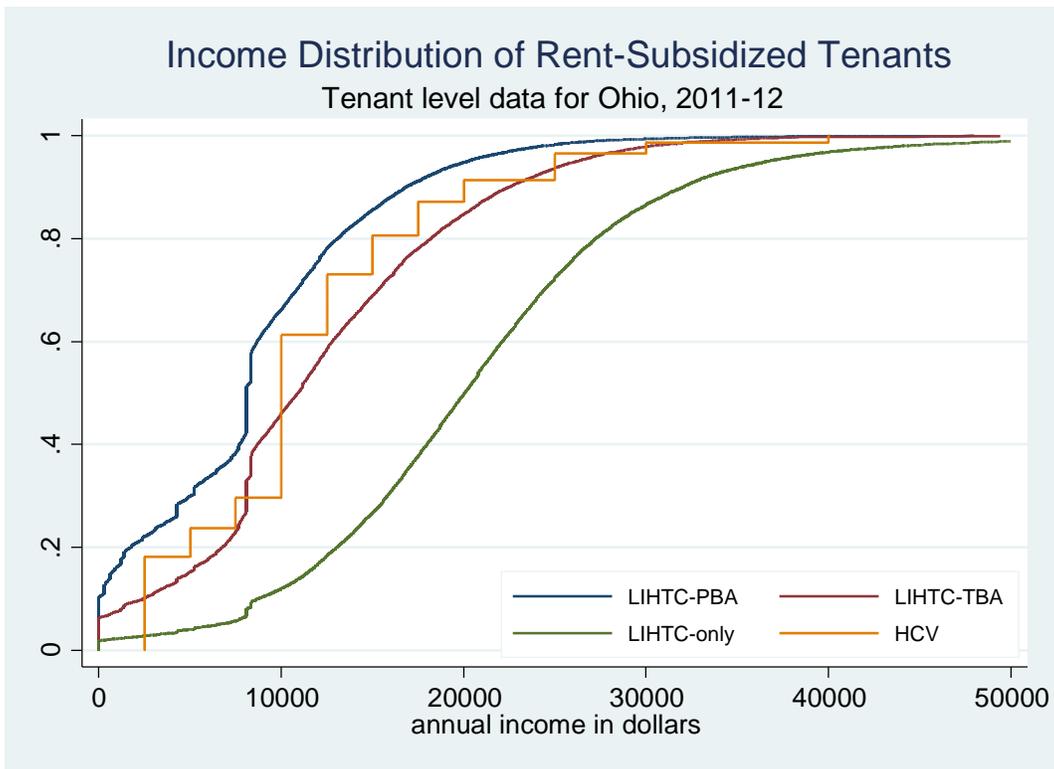


Figure 3.1 & 3.2: Income Distribution of Rent-Subsidized Tenants and Share of Elderly and Disabled LIHTC Tenants. 2011 LIHTC data is from the Ohio Housing Finance Agency. 2012 interval income data of HCV users is from the Public Use Microdata Sample.

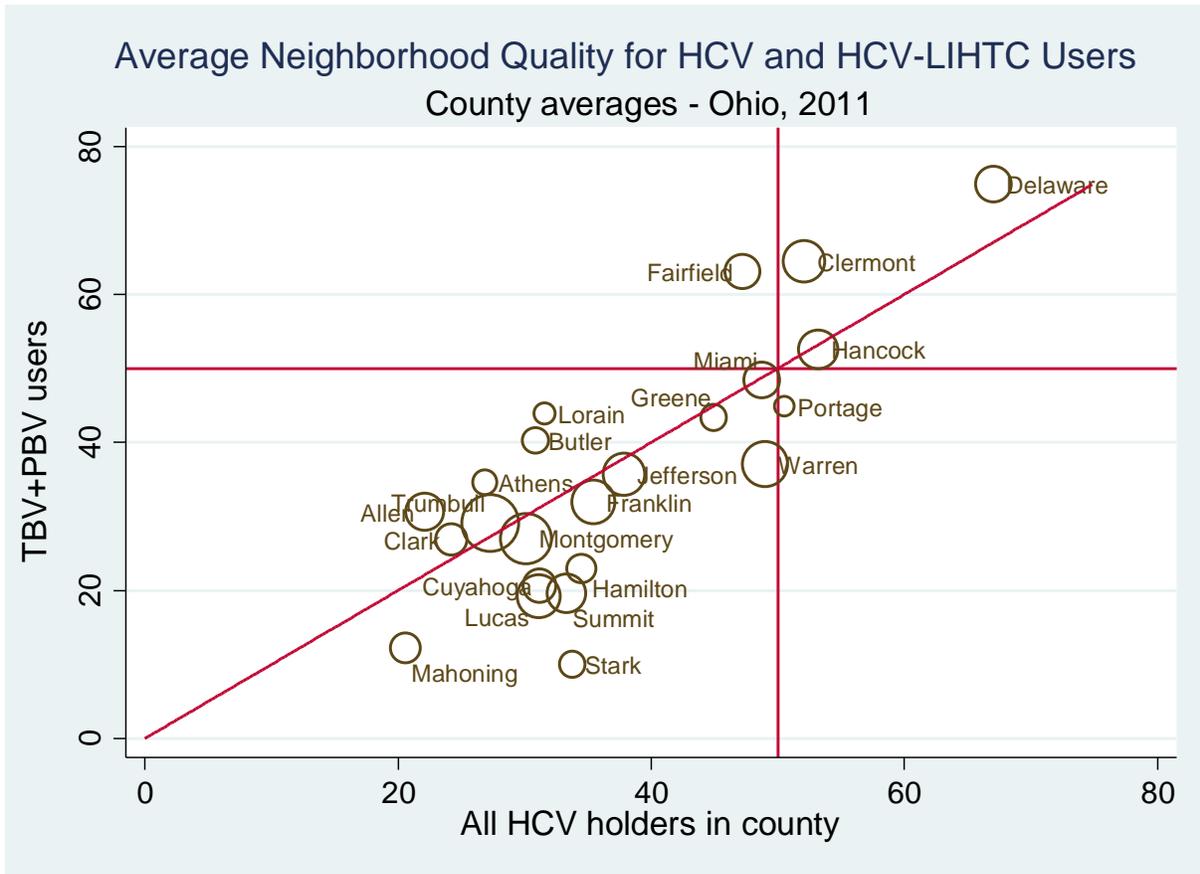


Figure 4: Average Neighborhood Quality for HCV (x-axis) and HCV-LIHTC Users (y-axis). Neighborhood quality measured as quantiles of first principal component of census tract level variables from Census 2010. We include %poor, %employed, %in labor force, %high school, %bachelors. Bubble size represents relative share of HCV use in LIHTC units across counties. 2011 LIHTC data is from Ohio Housing Finance Agency. 2011 HCV data is from A Picture of Subsidized Housing.

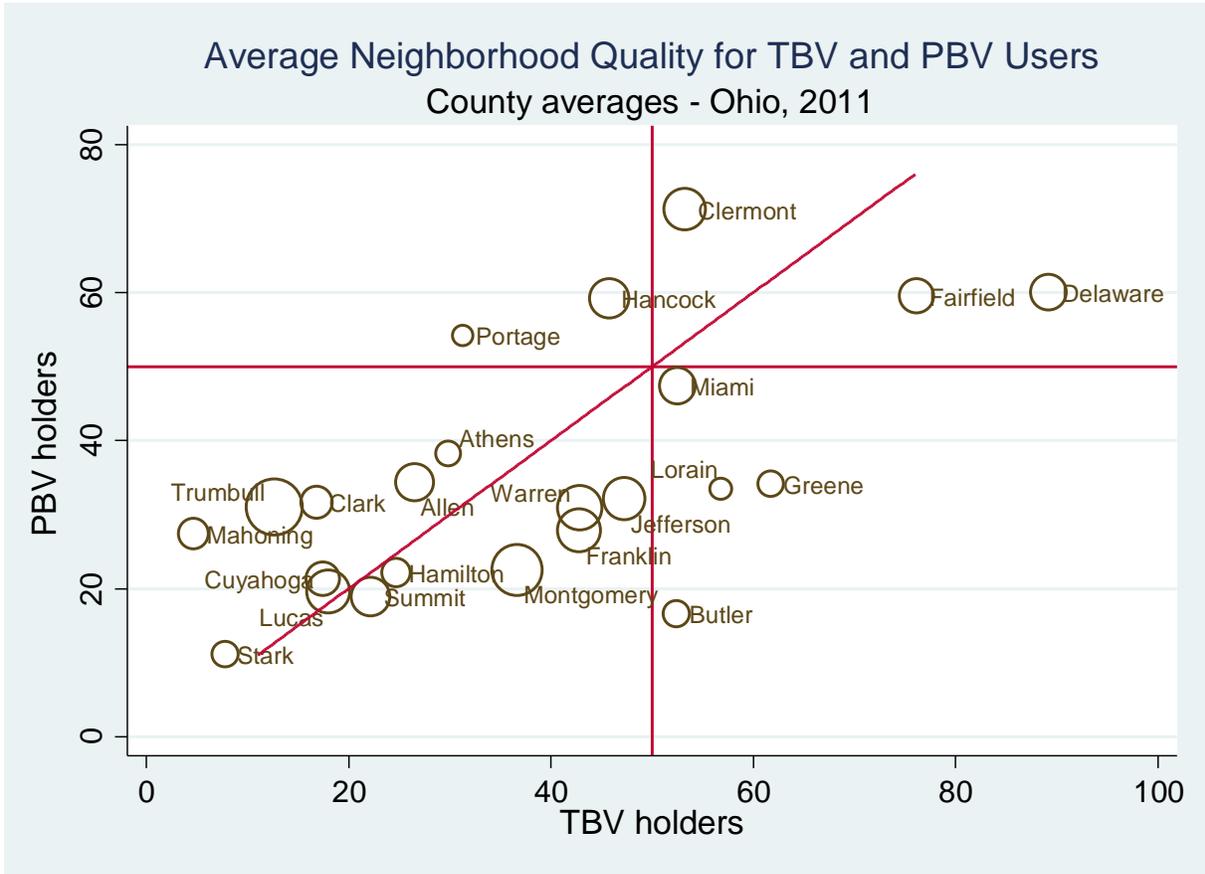


Figure 5: Average Neighborhood Quality for TBV and PBV Users. Neighborhood quality measured as quantiles of first principal component of census tract level variables from Census 2010. We include %poor, %employed, %in labor force, %high school, %bachelors. Bubble size represents relative share of HCV use in LIHTC units across counties. 2011 LIHTC data is from Ohio Housing Finance Agency.

Average Neighborhood Poverty Rate for HCV and HCV-LIHTC Users County averages - Ohio, 2011

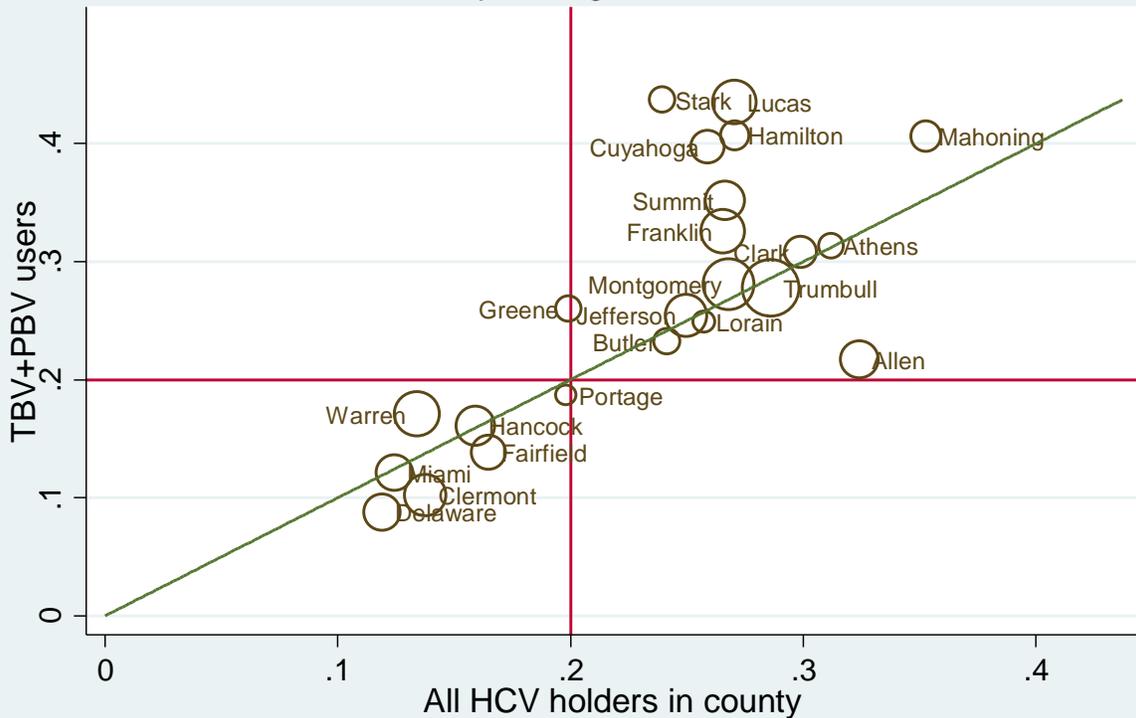


Figure 6: Average Neighborhood Poverty Rate for HCV and HCV-LIHTC Users. Census tract neighborhood poverty rates are from the Census 2010. Bubble size represents relative share of HCV use in LIHTC units across counties. 2011 LIHTC data is from Ohio Housing Finance Agency. 2011 HCV data is from A Picture of Subsidized Housing.

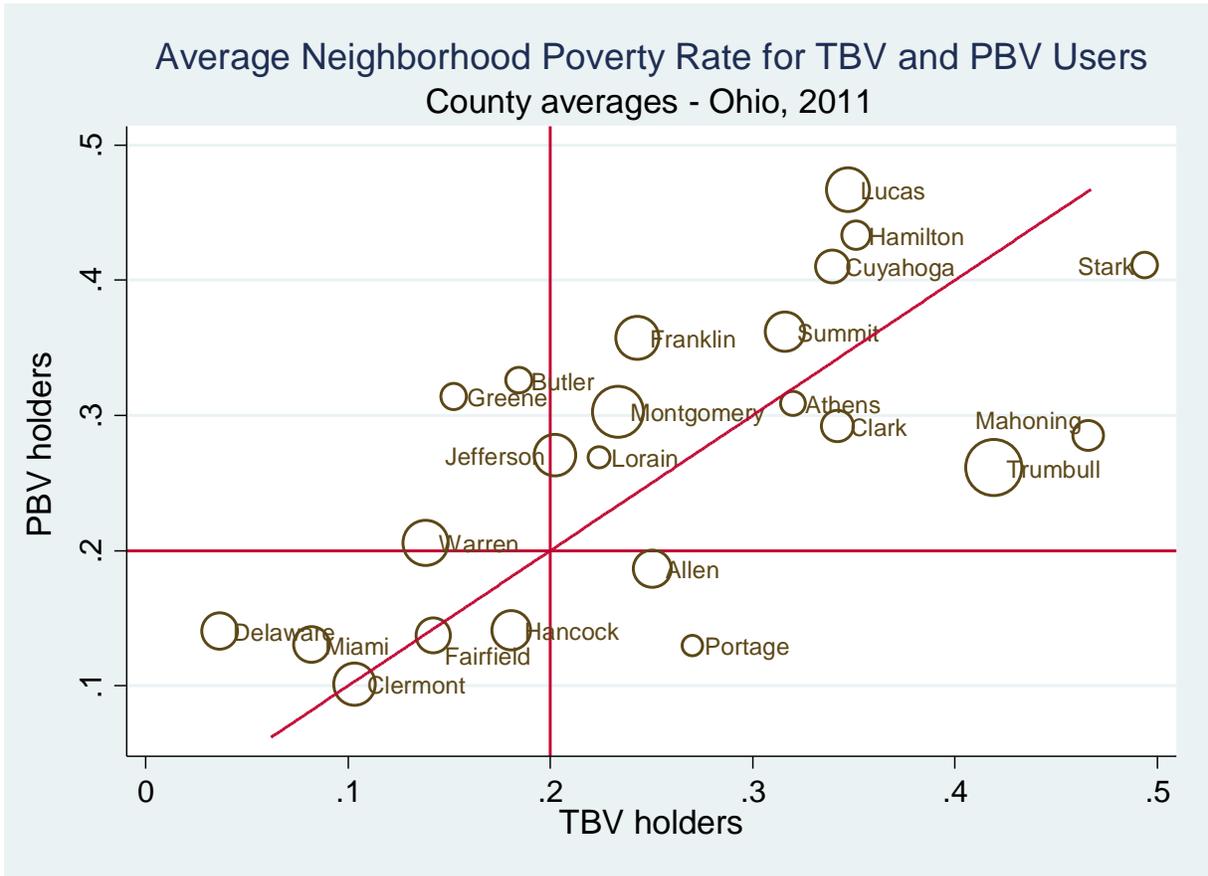


Figure 7: Average Neighborhood Poverty Rate for TBV and PBV Users. Census tract neighborhood poverty rates are from the Census 2010. Bubble size represents relative share of HCV use in LIHTC units across counties. 2011 LIHTC data is from Ohio Housing Finance Agency.