Public Housing Assistance and Social Security Disability Program Participation: Do Vouchers Crowd Out Disability Applications and Receipt?

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Abstract

The Department of Housing and Urban Development (HUD) and the Social Security Administration (SSA) both administer programs providing economic support to non-elderly individuals with disabilities, but we know little about interactions between these independently funded and administered programs and the resulting implications for the economic security of individuals with disabilities. We address this knowledge gap by leveraging ZIP code-level variation in HUD funding to local housing authorities arising from policy changes to rental ceilings for the Housing Choice Voucher program. We use this variation to estimate the causal impact of voucher receipt on Supplemental Security Income and Social Security Disability Insurance program participation at the ZIP code level. Across numerous specifications, we consistently find a strongly statistically significant negative relationship, where additional voucher utilization leads to fewer SSI and SSDI applications and lower SSI rolls. Our estimates range from a reduction of one SSI applicant for between 10 and 40 additional vouchers utilized, a smaller effect size for SSDI applicants, and a larger effect size for SSI recipients. These results point to significant substitutability between income support and housing support programs, potentially mediated by local housing authorities themselves, which has important implications for interactions between federal programs supporting individuals with disabilities as well as the net federal costs of funding additional housing vouchers.

Keywords: housing vouchers, social security, HCV, SSI, SSDI

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1.0 Introduction

The Department of Housing and Urban Development (HUD) and the Social Security Administration (SSA) independently administer major benefit programs providing economic support to non-elderly individuals with disabilities. HUD's housing choice voucher (HCV) program is the second largest housing support program (after the Low Income Housing Tax Credit program, which subsidizes the production of privately operated affordable housing), with an annual budget of over $32 billion (HUD 2023). SSA's Supplemental Security Income (SSI) program paid out over $47 billion to disabled beneficiaries (SSA 2021), with Social Security Disability Insurance (SSDI) paying out a further $128 billion to disabled workers. Despite the size and importance of these safety net programs to millions of Americans facing financial challenges related to disability, we know little about how these programs interact.

A common feature of both types of programs is that they require significant efforts to gain access to. There is a stringent disability determination process required for medical benefit eligibility for both SSI and SSDI which is administered at the state level and requires significant documentation. Initial determination and benefit receipt can take at least 6 months, and appealing an initial denial can result in a years-long process. The two programs differ in terms of their non-medical eligibility based on which populations they target: SSDI benefits are intended for workers with a recent onset of a severely disabling and long-lasting health condition, and thus also includes limits on earnings. SSI benefits are intended to low-income, low-asset households, and benefits are offset by other income receipt or entirely withheld if individual assets exceed a $2,000 limit. The result is that application to and receipt of these benefits is far from costless,

and these burdens can be particularly sizable for those experiencing housing insecurity (Burt and Wilkins 2012, Sizemore et al. 2023).

Housing is the largest expenditure for virtually all households and is disproportionately high for low-income households: in 2021, renter households in the lowest income quintile spent more than 60 percent of gross income on housing (Mateyka and Yoo, 2023). Housing vouchers limit rents to 30 percent of holders income, potentially greatly mitigating these housing costs. However, HUD voucher programs are not entitlements and are administered by local public housing authorities, which may include substantial waitlists, if said waitlists are open. Additionally, in many localities, landlords are not required to accept vouchers, and thus even with a voucher in hand, it may be difficult for a renter to employ this benefit.

An increasingly important intersection of these two programs is occurring among individuals with experiences of chronic homelessness. Due to the definition of chronic homelessness, which includes, importantly, the presence of a disability including serious mental illness, post-traumatic stress disorders, or traumatic brain injury, many individuals experiencing chronic homelessness are likely to be eligible for SSI.

As such, there are specific efforts to encourage take-up of both types of programs by advocates and government agencies. For example, housing authorities often employ preferences for voucher applicants with disabilities (Chyn et al. 2018) and there are specific vouchers targeted to individuals with disabilities (e.g., Non-Elderly Disabled vouchers), as well as specific initiatives like SSI/SSDI Outreach, Access, and Recovery, administered by the Substance Abuse and Mental Health Services Administration.

However, the costs and uncertainty associated with program application, as well as the ongoing potential burdens even if a recipient, may lead to individuals with disabilities, especially

those on the margin of applying, to choose just one of these program types for support. In this analysis, we construct a simple mathematical model that articulates this tradeoff both for individuals as well as for housing authorities that provide assistance to voucher holders in applying for SSI or SSDI benefits.

We then leverage a natural experiment in the provision of vouchers arising from the introduction of Small Area Fair Market Rents (SAFMRs) throughout the 2010s, wherein ZIP codes in certain MSAs no longer had a shared Fair Market Rent (FMR), a key policy parameter, but had separate FMRs determined by their specific locality. We show this change effectively increased the number of vouchers issued by affected housing authorities, which we then use as exogenous variation to estimate the impact of local voucher availability on ZIP-level counts of SSI applications, SSDI applications, and the number of SSI beneficiaries.

Our primary finding is that there is a statistically significant and large substitution between housing and disability programs at the local level which is approximately an order of magnitude larger than employing ordinary least squares (OLS). We estimate that SSI applications rise by 1 applicant for every 10 to 40 vouchers issued. Effect sizes for SSDI applications are smaller, while effect size for SSI beneficiaries are larger. We conclude by discussing the implications for the full net costs of vouchers, incorporating these offsetting effects on disability program participation, as well as for program design of each of these program types in turn.

The next section reviews the pertinent policy background for each program type, as well as briefly discusses evidence we gathered on SSI/SSDI application assistance programs in California to illustrate the role of sub-federal government entities in mediating disability program participation. We then turn to our simple mathematical model of the program participation

decisions from both the individual and housing authority perspectives. We go on to discuss the data and methods we employ, review our results, and conclude.

Disability and Housing Policy Background

Approximately 13% of Americans were reported to be living with a disability in 2021 (Leppert and Schaeffer, 2023). Among those, disabilities that affected mobility, daily living, and cognition were the most cited. While the elderly are more likely to have a disability, according to the 2021 census, 12% of adults between 35 and 64, and 8% of those between 18 and 34 had a disability (Leppert and Schaeffer, 2023). These individuals face unique challenges that often lead to negative economic outcomes, including unemployment, low income, and homelessness, for which the federal government provides income and benefit support, including disability-targeted housing vouchers, SSDI income (with associated Medicare coverage) for disabled workers, and SSI income (with associated Medicaid coverage) for low-income, low-asset individuals with disabilities.

Eligibility for SSDI is determined through age, disability, and work history; SSI benefits require eligibility through income and disability or age. SSA benefits provide monthly cash transfers subject to a maximum per eligible individual or couple (SSA, 2023a), and additionally qualify participants for other government assistance programs including Medicaid and the Supplemental Nutrition Assistance Program (SNAP) (SSA, 2023b). The SSA programs do not directly provide housing support, however, the qualifying disability for SSDI/SSI provides eligibility for the HCV program (Hembre and Urban, 2022). Generally, HCV eligibility is based on citizenship or immigration status and income levels. HCV program participants receive vouchers that allow them to find adequate, safe, and sanitary housing in the private market,

where they pay 30% of the household income towards the rent, and the voucher supplements the remaining amount, paid directly to the landlord by the local PHA up to a specified rent ceiling (HUD, 2017). However, unlike SSA programs, which are entitlements, eligible applicants for the HCV program are not entitled to receive a voucher. Instead, the HCV program has a binding funding constraint and public housing authorities must ration scarce housing vouchers. On average, approximately, 1 in 4 eligible households receive rental assistance, due to financial constraints on the program's size (Hembre and Urban, 2022).

Consequently, many individuals and families that need this housing support are put on waitlists, where they can remain for as long as eight years (Acosta and Gartland, 2021). This has serious implications, where even within the general US population, renters are already cost-burdened, with low-income renters having a median rent-cost ratio of 63% (Mateyka and Yoo, 2023). For the most vulnerable subpopulations, including those with disabilities, increasing housing cost burden can lead to homelessness (Glynn, Byrne, and Culhane, 2021). In 2018, at least half of the adults in homeless shelters also had a disability, and three-quarters of those experiencing unsheltered homelessness were living with a physical or mental condition (Bailey *et al.*, 2021). Additionally, 1 in 5 homeless individuals experience chronic homelessness, which is defined as having a disability and one or more conditions of long-term or recurring homelessness (Bailey *et al.*, 2021). Among housed individuals, 1 in 8 households that have a worst-case housing need also have a non-elderly person with disabilities (Alvarez and Steffen, 2021).

There is therefore an overlap between the individuals that are targeted by both the SSDI/SSI and HCV programs. More specifically, over a million individuals with disabilities rely on HCV for housing (Bailey *et al.*, 2021) and 82% of families with a non-elderly member with a disability depend on SSA benefits as the main source of income (Brucker and Garrison, 2021). Further, the

authors estimate that public housing assistance is received by 13% more SSDI/SSI participants than non-SSDI/SSI working-age adults. The income-eligibility structure of HCV, where a combination of income-based means testing and a limit on the share of household income that must go towards rent, means that local housing authorities pay a share of housing costs for program participants that varies inversely with participant income. The total size of the obligation in a given jurisdiction is, thus, nearly always the binding constraint on the number of vouchers that can be issued.[1] Thus, the population eligible for both SSA programs could increase their income through SSA benefits, thereby reducing the value of the HCV rent supplement and enabling the HCV program to cover more eligible households. Qualitative research shows that many SSDI/SSI participants remain unhoused while they are on HCV waiting lists (Gettens and Henry, 2019). However, there is limited research on the interactions of these two programs.

Prior research on SSA income support programs has explored labor market incentives in the presence of benefits (Maestas *et al.*, 2013; Gelber *et al.*, 2017), consequences for rejected applicants (Bound, 1989), disparities in outcomes and well-being for SSA beneficiaries (Moore and Ziebarth, 2014). While, on housing vouchers, research has mainly focused on reviews of the program and the economic and labor market outcomes of participants (Horn *et al.*, 2014; Chyn *et al.*, 2019; Ellen, 2020). The most relevant research related to our focus comes from Hembre and Urban (2022) who explore how HCV affects SSI participation using quasi-random variation in applicant access to HCV program waitlists that do and do not have preferences for applicants with disabilities. Their key finding is that in their research setting the two programs act as substitutes among low-income households with disabilities (Hembre and Urban, 2022).

[1] There is also a constraint on the potential number of vouchers each local PHA can issue, but in practice the funding constraint is nearly always binding, whereas the voucher total is not (cite?).

In this context of substitutability between programs, an important issue is differences in the costs associated with accessing these programs. Both application costs and use costs can make accessing benefits difficult (Chyn *et al.*, 2019).

Reducing the costs associated with applying to these programs is important and has been shown to increase the benefits provided, demonstrating that eligible participants were being excluded by these barriers. In previous work, Armour (2018) demonstrated that increasing information through social security statements was associated with an increase in disability benefits among old adult workers who had work-limiting health conditions (Armour, 2018). Similarly, the switch from primarily in-person applications for SSA benefits to the incorporation of online options increased both applications and appeals, by reducing barriers to access and increasing information access (Foote *et al.*, 2019). On the other hand, the closing down of SSA field offices (which assisted with filing applications but did not make determining decisions) was found to reduce applications and recipients by 10% and 16% respectively, persisting for up to two years (Deshpande and Li, 2019).

Increasing access to HCVs could also play an important role in reducing inequality in access to adequate housing for people of color with disabilities, particularly within the historical context of discriminatory housing policies (Bailey *et al.*, 2021). There is, however, mixed evidence on the extent to which this is the case. HCVs have been found to reduce housing racial disparities between minority and White families (Solari *et al.*, 2021) (Reina, 2019). While other research has also provided evidence that suggests minorities are not made better off through access to HCVs, because of other discriminatory factors within the pipeline such as landlords, which consequently affects voucher uptake (Cunningham, Mary *et al.*, 2018; Chyn *et al.*, 2019).

Given these challenges, there are several benefits maximization and support programs and individuals that assist with applications for disability and housing benefits, in addition to the support available through SSA and local public housing authority representatives. These range from government-funded programs, such as SSI/SSDI Outreach, Access and Recovery (SOAR) (SOAR Works, 2023) and The Housing and Disability Advocacy Program (HDAP), which aim to increase access to disability and housing benefits through individual support, to social workers, non-profit organizations, and legal pro-bono services. These services are often paid for through representative reimbursements, which come from past-due benefits, although they can be no more than 25% of the benefits or greater than $7,200 (SSA, 2023c). Others provide free services for free to applicants, although there may be other incentives these parties gain. For example, Workers Compensation and Long-Term Disability insurers stand to shift liability to the federal government; housing authorities may be responsible for a lower portion of voucher-holders' rents; and even legal aid clinics are providing training for law students.

As grounding for our analysis, we conducted a thorough review of the benefit maximization or assistance programs available in California. This review took the form of state- and county-by-county level programs as well as legal support programs. Of the 130 legal services and support centers registered in California, our research team identified 46 providers that described their services as including assistance accessing public benefits.

Overall, in addition to these 46 legal aid organization in California that offer support accessing public benefits, we identified 15 state and regional non-governmental programs in California that provide benefit maximization services and 15 government-led or partnered programs that help low-income individuals access and maximize benefits. Some overlap exists between the government-led and partnered programs and those offered by legal aid providers,

because several government benefit maximization programs partner with legal aid providers. While we collected data on a range of maximization programs, the government-led and partnered programs had the largest number of individuals aided and were most likely to engage low-income individuals and people experiencing homelessness who are eligible for government funded housing assistance. Although we do not directly use presence or variation in these assistance programs in this analysis, we note that the county-administered benefit programs intended to assist in SSI/SSDI applications for individuals experiencing housing insecurity we found we concentrated in the counties that issued the largest number of vouchers in the state, namely Los Angeles County, Alameda County, San Diego County, and San Francisco.

Motivating Model

As discussed above, the small body of prior research on the interaction between HCVs and disability program participation has focused on the role of the incentives facing the potential applicant in choosing to apply for SSI/SSDI or not. In this section, we provide a simple model of the primary economic factors involved in that decision as a way to formalize the factors that have been the focus of prior work, those that we focus on in this analysis, and what remains unexplored. Furthermore, we introduce a stylized model of the incentives facing *housing authorities*, or local governments writ large, that can predict what empirical relationships we might expect to observe between HCVs and disability program participation.

We model two decisions by individuals navigating both HCV and SSI: the decision to apply for SSI and the decision of whether to leave the SSI program. First, we assume there are two types of benefits that SSI recipients can accrue: the direct value of being on the program, including both cash and Medicaid coverage, represented by v_{SSI}, and the increased likelihood of

receiving a HCV given a successful SSI award. However, acceptance onto SSI is not guaranteed, and although an individual applying incurs a cost of c_{app} if they apply, there is only a probability p_{SSI} of being awarded benefits. Furthermore, SSI receipt requires that individuals do not exceed an asset cap of $2,000, which we model as carrying with it a utility cost of c_{asset}. The expected utility value from applying to SSI is then represented by:

$$p_{SSI}(p_{HCV|SSI}v_{HCV} + v_{SSI} - c_{asset}) + (1 - p_{SSI})(p_{HCV|!SSI}v_{HCV} + v_{!SSI}) - c_{app}$$

We note that for ease of representation, we're focusing on SSI application; SSDI application can be modeled as removing the utility cost from the asset cap, as well as varying the direct utility value from SSI (i.e., no unearned income offset, the individualized benefit from SSDI, and Medicare instead of Medicaid coverage).

The utility if the individual does not apply is then given by:

$$p_{HCV|!SSI}v_{HCV} + v_{!SSI}$$

An individual will therefore apply for SSI if:

$$p_{SSI}(p_{HCV|SSI} - p_{HCV|!SSI})v_{HCV} + p_{SSI}(v_{SSI} - v_{!SSI}) - p_{SSI}c_{asset} - c_{app} \geq 0$$

The results from Hembre and Urban (2022) can be represented as a decline in the increased probability of receiving a HCV conditional on receiving SSI; that is, a reduction in:

$$(p_{HCV|SSI} - p_{HCV|!SSI})$$

Specifically, their variation stems from the opening of wait lists for HCVs in areas with existing disability preferences, which serves to increase the probability of any eligible household receiving a voucher, which increases the second term, leading to fewer individuals seeking HCVs to apply for SSI.

Our context is similar: our endogenous regressor is the number of households receiving HCVs in a given area. We address this endogeneity by using changes in the number of HCVs in

an area induced by policy changes in local voucher rent ceilings among a subset of PHAs. This increase in HCVs also effectively raises $p_{HCV|!SSI}$, predicting that fewer will apply for SSI in these areas.

But given the potentially binding asset ceiling required for continued SSI eligibility, especially for households that have secured stable housing and thus may have a greater ability to accumulate financial resources, remaining on SSI is itself a choice that may be affected by the availability of HCVs. Our simple model of this decision to remain on SSI assumes resulting utility of:

$$v_{SSI} - c_{asset} + p_{HCV|SSI} v_{HCV}$$

That is, the net direct value of SSI beneficiary status, the costs associated with complying with the asset ceiling, and the likelihood of gaining or maintaining a HCV award conditional on being a SSI beneficiary. If the individual leaves SSI, they thus receive utility of:

$$v_{!SSI} + p_{HCV|!SSI} v_{HCV}$$

An SSI beneficiary with a HCV will therefore choose to remain on SSI if:

$$(v_{SSI} - v_{!SSI}) + (p_{HCV|SSI} - p_{HCV|!SSI}) v_{HCV} - c_{asset} \geq 0$$

In our context, the greater availability of HCVs would lead to a reduced incentive to stay on SSI. Therefore, we would expect not only a negative local effect of an increase in HCVs on SSI applications, but also a negative on the number of SSI beneficiaries.

These formulations largely follow past work that has focused on the role of individual incentives in application to SSI and SSDI (Autor and Duggan 2003, Armour 2018, Deshpande and Li 2019, Foote et al. 2019, Hembre and Urban 2022). However, there has been a small set of recent studies focused on the role of representation in mediating applications to disability programs and resulting award rates (Tuttle and Wilson 2021, Hoynes et al. 2022). Although this

body of research is nascent, it has generally focused on the incentives facing paid legal representatives. We hypothesize that in our context, local housing authorities themselves have a direct incentive to facilitate SSI participation, since doing so leads to an increase in HCV recipient income and a shifting of housing costs from the housing authority to SSA (through the increased income of SSI/SSDI recipients). That is, given the cap of 30 percent of income that voucher recipients are responsible for in paying rent, increasing their income effectively reduces the remaining fraction that the housing authority is responsible for. However, increasing SSI participation carries with it higher operating costs for a housing authority.

We thus model a housing authority as facing a constrained maximization problem, whereby it seeks to maximize the expected number of individuals successfully leasing up as renters *r*. It faces an operating budget and a voucher-funding budget and has three choice variables: rental assistance services *s* intended to increase the likelihood that a given voucher holder is able to successfully find a rental, the number of vouchers issued given by h_V, and the number of voucher holders applying for SSI given by h_{SSI}.[2] They therefore seek to maximize:

$$E(r|s, h_v)$$

Subject to their operating budget:

$$b_O \geq s + f(h_{ssi})$$

Which includes the cost of rental assistance services to aid voucher holders in securing rentals, as well as the cost of assisting voucher holders in applying for SSI. We assume that *f* is an increasing and convex function: that is, housing authorities are able to prioritize voucher holders that have the lowest cost in SSI application (or, to generalize, the higher probability of initial

[2] PHAs also face a statutory constraint on the total number of vouchers that can be issued that limits h_V but, as mentioned earlier, this constraint is rarely binding since the overall budget constraint typically decides the number of vouchers issued.

award). Note that h_{SSI} does not directly affect the voucher holder's chances of securing housing; instead, it relaxes the housing authority's *voucher* budget constraint:

$$b_V \geq h_{ssi}(V - pb) + (h_v - h_{ssi})V$$

That is, each voucher holder not applying for SSI "costs" the housing authority V, but for those who apply for SSI and are successfully awarded benefits (with probability p), the cost to the housing authority is reduced by b. Rearranging this constraint gives us the Lagrangian:

$$Max_{s,h_{ssi},h_v}\ E(r|s,h_v) + \lambda_1(b_O - s - f(h_{ssi})) \\ +\lambda_2(b_V - h_v V + h_{ssi} pb)$$

Note that we assume that $E(r|s,h_v)$ is strictly increasing but strictly concave in both s and h_v. Taking the first order conditions for our choice variables and combining them yields the necessary condition:

$$f'(h_{ssi}) = \frac{pb}{V} \frac{\frac{\partial E(r|s,h_v)}{\partial h_v}}{\frac{\partial E(r|s,h_v)}{\partial s}}$$

Recall that we assumed f is increasing and *convex*, since housing authorities will prioritize the least costly SSI applicants. Thus, the left-hand side is increasing in SSI assistance, which suggests that housing authorities facing particularly high SSI award probability or large reductions in voucher costs will engage in more SSI assistance. Similarly, if housing authorities have low marginal lease-up rates, then recouping voucher costs through SSI receipt will have less of an impact on successful rentals, and authorities will invest less in SSI assistance. If the impact of rental assistance services is relatively low, then the opportunity cost of aiding in SSI assistance is low, and authorities are likely to invest more in SSI assistance.

But the most notable result arises from what happens if the voucher budget constraint is relaxed, the effect of which is that a housing authority is able to issue more vouchers.[3] Given the concavity of expected rentals in h_V, the numerator of the right-hand side declines, implying lower investment in SSI assistance. Given that this assistance can take the form of both application assistance and assistance in maintaining eligibility, we therefore expect that an increase in the number of HCVs will also decrease SSI applications and SSI beneficiaries through this additional channel: that housing authorities' incentives to provide SSI beneficiaries are marginally reduced.

Data and Methodology

To quantitatively estimate the causal impact of HCVs on disability program participation, we rely on five-digit ZIP code level administrative data from HUD and SSA, from 2004 to 2021. We focus our primary analysis on the implementation of Small Area Fair Market Rents (SAFMRs), a recent change to the approach for setting rent ceilings for voucher holders. Prior to 2011, all PHAs used a metro-wide set of rent ceilings simply referred to as "fair market rents" (FMRs) for each housing unit type (studio, one bedroom, two bedroom, etc.) that were set at a target level of the 40th percentile of rental prices (24 CFR § 888.113). This meant that in areas with highly heterogeneous housing costs, some small areas (zip codes in our approach) had average market rents that were considerably higher than the metro wide level, while others had

[3] We can see straightforwardly that an increase in b_V will increase h_V – otherwise, the housing authority would be "spending" all their increased voucher budget on providing less SSI assistance. Making this choice would require, in our model, that the return to spending less on SSI assistance, captured by the marginal benefits from being able to increase rental assistance services $f'(h_{ssi})\frac{\partial E(r|s,h_v)}{\partial s}$ strictly exceeds the costs of foregone investments in issuing additional vouchers $\frac{pb}{V}\frac{\partial E(r|s,h_v)}{\partial h_v}$. But that would violate the necessary condition identified above, where these two terms are equal at the maximizing-level of SSI assistance.

rents considerably lower than the FMR level. However, in many areas with low market rents but high levels of voucher holders, evidence suggests that rents in units occupied by voucher holders were often set above the local market rent level, suggesting that local landlords set these rents according to the FMR.

A pilot SAFMR program was adopted across a small set of jurisdictions in 2011 and 2012, then expanded substantially in 2018 to cover 23 additional metropolitan areas across the country (Patterson and Silverman, 2019). Research on the pilot implementation of SAFMRs in five metro areas found that the use of SAFMRs increased the pool of potential rental units for voucher holders and some evidence emerged that after the switch to SAFMRs, a larger share of new HCV households or existing HCV households that moved resided in higher-rent, higher-amenity areas relative to comparison PHAs that did not adopt SAFMRs (Dastrup et al., 2018). Importantly for this study, at the PHA level, there was evidence that the SAFMR switch led to modest savings for PHAs likely due to savings from areas that experienced reduced payment standards in zips that experienced reductions in rent ceiling more than offsetting increases in areas with higher ceilings.[4] Additionally, in SAFMR metros, tenant contributions to rent increased modestly across both lower-rent and higher-rent areas relative to comparison PHAs. Both of these changes suggest that the SAFMR program did relax the financial constraints faced by affected PHAs.

Our data on HCV recipients are custom tabulations provided by HUD that include a range of characteristics at the ZIP level, including the number of households receiving any

[4] This reduction likely resulted from two sources. The first is the net effect of areas experiencing reduced ceilings outweighing the effect of areas experiencing increased ceilings on net. The second is that PHAs have flexibility to adjust payment standards in practice between 90 and 110 percent of HUD standards and the study found that SAFMR PHAs tended to adjust down standards in areas with low to moderate rents after the policy change (Dastrup et al., 2018).

housing vouchers, the fractions of these vouchers that are HCVs (versus project-based vouchers), ZIP-level shares of racial/ethnic and sex composition of household heads, shares of subsidized housing units by size, and average rent of subsidized units by size.[5] We merged these data with ZIP -level data from HUD on FMR or SAFMR ceilings and we hand coded a set of ZIP -level dummy variables corresponding to each PHA indicating the timing of the switch to SAFMR ceilings.[6]

We merged these ZIP-by-year data from HUD with administrative data provided by SSA on the number of annual SSI and SSDI applications in that ZIP, as well as the number of SSI beneficiaries. We note that these data were censored for ZIPs with fewer than 10 applicants or recipients for confidentiality purposes. We use these data to construct annual differences in SSI and SSDI applications and SSI beneficiaries within-ZIP, as well as changes in the number of households receiving vouchers relative to 2007. We limited our outcome years to begin in 2008 (three years before the first area introduced SAFMRs) and to end in 2019 (before pandemic-era housing and SSI policy changes).

Table 1 shows the number of ZIP codes with non-missing SSI application SSA data by year and whether these ZIPs had transitioned to SAFMRs. Although some localities introduced SAFMRs earlier – namely, a set of counties in Texas in 2011 and the Cook County Housing Authority in Illinois in 2012 – the vast majority of SAFMR implementation occurred in 2018 due to HUD's final rule in April of that year mandating SAFMR introduction across 23 additional metropolitan areas, as previously mentioned.

[5] HUD makes available a rich set of data at the ZIP level as part of the agency's "Picture of Subsidized Households" data products, but this ongoing, valuable data series did not go far back enough in time for our analysis.
[6] A small number of zips in our data were served by more than one PHA (most often cases when there was a municipal- or county-level PHA and an overlapping state PHA). In these cases the state level PHA typically had a number of vouchers that was an order of magnitude or more smaller than the local PHA in the affected areas so we coded these zips to be associated with the local PHA. Our results were also very robust to dropping these zips.

Table 2 provides descriptive statistics for the major dependent and independent variables available in our data for 2018. We note that there is substantial variation in the number of households receiving vouchers as well as the change in vouchers from one year to the next. Our HUD data contain ZIP-level averages for receipt of other government programs among voucher-holders, including General Assistance (GA), SSI for disabled adults (SSI 22-64), and SSI for the elderly (SSI 65+). Rates of SSI receipt are high relative to the general population, with a mean of more than one in five voucher holders also receiving SSI as disabled adults, and nearly a third at the 90th percentile. Thus, descriptively, there is substantial overlap between these programs. Rates of General Assistance receipt also vary dramatically, from zero at the 10th percentile, ten percent at the median, and 65 percent at the 90th percentile.

The racial and ethnic composition of voucher holders varies substantially across ZIPs, especially for Black voucher holders, reflecting the long history of residential racial segregation in the U.S.. The majority of voucher holders are female, with a mean of roughly 80 percent. Two bedroom rentals are the modal housing unit type by size, although one bedroom and three bedroom are nearly as common.

There is a substantial amount of variation in both the levels and changes in SSI and SSDI program participation. As of 2018, both SSI and SSDI program participation has been declining nationally (Liu and Quinby 2023), which is reflected in the declines of all disability program participation statistics for the majority of ZIPs.

We note that local FMR is more likely to rise than to fall from 2017 to 2018, and that the majority of SAFMR-affected ZIPs resulted in an increase in FMR rather than a decrease. The mean SAFMR-induced change of $63.67 to two-bedroom FMRs represents approximately a 6.6 percent increase relative to the average of $963.93 in the year before implementation.

Table 3 shows the ZIPs, and corresponding MSA or county, that implemented SAFMR in 2018 and experienced either the largest increases in their FMR or the largest decrease. Although there are multiple ZIPs from the same MSAs or counties in these "Top 10" lists, there is also representation from multiple states in each list. Key to our empirical analysis is the within-state and within-MSA heterogeneity in both whether SAFMR was introduced as well as its effects. This variation allows for us to control for area fixed effects that may impact disability program participation independently of changes in voucher policy, effectively isolating the role of HUD policy in inducing changes to local HCVs.

Our primary equation of interest aims to estimate the causal impact of the number of local HCVs used in ZIP code area j in year t (h_{jt}) on annual changes in SSDI/SSI program participation in that jurisdiction, while also controlling for year fixed effects and either state or PHA-level fixed effects:

$$\Delta SS_{jt} = \alpha + \beta h_{jt} + y_t + x_s + \varepsilon_{jt}$$

The immediate concern for causal identification is that the number of vouchers is endogenous to market changes in rents, themselves the equilibrium outcome of both supply and demand that could influence many local economic and social processes that could also affect disability program participation independently of any influence of housing voucher availability. As in Collinson and Ganong (2018), we address this endogeneity by instrumenting for h_{jt} using HUD-induced policy change. Namely, we use the introduction of SAFMRs and the corresponding change in each ZIP's rent ceilings compared to the year preceding SAFMR introduction, among the "treated" ZIPs that implemented SAFMRs. We pursue two complementary IV approaches. In the first approach, we construct two binary instruments, one of which indicates that when a ZIP introduced SAFMR, it increased the local rent ceiling, and another indicating that SAFMR

introduction decreased that ZIP's rent ceiling. For ZIPs that did not experience the SAFMR policy change, these indicators are both zero. Our second IV approach instead uses a continuous instrument measuring the change in local rent ceilings after SAFMR introduction.

Results

Table 4 reports results for IV regressions with the number of households receiving HCVs as the endogenous regressor and the number of SSI applications as the dependent variable. We show results for a range of specifications based on the inclusion of different fixed effects, as well as our two alternative IV approaches. Our first stage regressions show that our instruments are highly statistically significant and thus strongly predictive of the number of households receiving HCVs in a given ZIP. Our second stage results are also highly statistically significant across all specifications. In general, the IV approach using a continuous instrument produces systematically lower point estimates, although in these results and nearly all others, there is a strong and statistically significant negative relationship between disability program participation and the number of vouchers, suggesting, as predicted, a strong substitution effect between participation in the HCV and SSI/SSDI programs. For the specifications including both year and PHA fixed effects, which we believe account together for any significant confounding factors not addressed by the IV approach, our estimate ranges from a -0.04 to a -0.1 effect of a one voucher increase on a change in SSI applications. That is, for every 100 additional vouchers, there is an estimated decrease of 4 to 10 SSI applications. This effect is large: given the standard deviations

from Table 2, a one standard deviation increase in households receiving vouchers leads to a between 0.7 and 1.8 standard deviation change in SSI applications.[7]

One concern with this approach is that since our endogenous regressor is the *level* of households receiving vouchers, we may not be accounting for persistent differences within ZIPs in voucher availability and use that are not captured by area fixed effects. To address this concern, we instead use the within-ZIP *change* in vouchers relative to a baseline in 2007 as our endogenous regressor. We report the results of this IV regression using our continuous instrument for SSI applications in Table 5 (we generally prefer this measure since it is more directly interpretable in terms of magnitudes relative to the dual-binary instrument approach). Although our statistical significance slightly declines, our point estimates remain large and are consistent with the upper range of estimates from Table 4. Our preferred specification is in column 4, which includes year and PHA fixed effects, and results in a -0.09 point estimate. Again, this effect is large, although plausible: a one standard deviation increase in the ZIP-level change in HCVs leads to a 0.6 standard deviation decrease in ZIP-level changes in SSI applications. The mean change in HCVs is 34, implying a change of -3.1 SSI applicants. Since the interquartile range for SSI disabled adult *receipt* among voucher holders is 16.6 percent to 26.7 percent, this roughly one-in-ten change in applications falls within this interquartile range.

Tables 6 and 7 provide analogous estimates for SSDI. In general these point estimates, although strongly statistically significant, are lower than those for SSI. Although SSI and SSDI share the same disability determination process, they differ in terms of financial and work history eligibility, as discussed above, with SSI application being more burdensome in terms of financial

[7] Appendix Table A1 provides OLS estimates that ignore potential endogeneity of the number of households receiving vouchers. Although we also find statistically significant results, point estimates are approximately an order of magnitude lower. One reasonable interpretation of this difference is that the *marginal* household receiving a voucher is much less likely to apply for SSI, as estimated via our IV regression.

eligibility. The lower observed point estimates for SSDI application are thus consistent with SSI applicants likely needing more assistance and there being fewer SSDI-eligible marginal voucher recipients. However, there is still a measurable and consistently statistically significant substitution between HCVs and SSDI applications.

Finally, Tables 8 and 9 report analogous results for SSI *beneficiaries*. That is, the number of local recipients. Consistent with our simple motivating model, we find that the number of recipients also falls. As we showed, this can be driven by both a reduction in new awards and by greater exits from the program, especially if beneficiaries with more secure housing begin to accumulate financial resources and are thus no longer eligible for SSI. Indeed, we find that the estimated effect on SSI beneficiaries is two to four times higher than the estimated effect on SSI applications. Although impacts of policy on "stocks" of program participants are generally lower than on "flows," we note that in this context, we're examining changes in SSI beneficiary stocks, and there are both sizable flows onto and off of this program in any given year, both margins of which can be directly affected by voucher availability and housing authority benefit assistance.

Conclusion

Our primary finding in this analysis is a strong substitution between the number housing vouchers issued in a given ZIP and disability program participation in that ZIP. We first note the primary caveat for this analysis: it is conducted at the ZIP code level, not at the individual level. The corresponding limitation is that we cannot directly establish that the new vouchers issued in a ZIP and the reduction in disability program participation are coming from the same households. However, we would expect general equilibrium effects to operate in the opposite

direction; that is, if greater voucher issuance leads to greater competition for scarce housing, then we would expect *more* individuals to be driven to rely on public benefit programs such as SSI and SSDI.

Moreover, our findings are consistent with theoretical predictions of incentives facing both individuals as well as housing authorities when housing voucher availability increases; that is, increased availability of vouchers leads to a decrease in applications for or continued participation in disability programs with costly application processes and strict asset restrictions. Our findings are also consistent with recent similar findings showing that open voucher waitlists lead to lower rates of disability program participation (Hembre and Urban 2022), although our estimated effects are substantially larger. This difference in effect size can be explained by the policy margin: whereas the Hembre and Urban (2022) study looked at the impact of opening wait lists (which still carries with it substantial uncertainty), this study looks at actual voucher issuance. Consistent with our findings, a 2006 randomized-control trial that experimentally varied voucher receipt found that SSI receipt was three percentage points lower in their treatment group, an effect consistent with our range of estimates (Abt 2006).

The size of our effects are substantial, although we note that disability program participation is generally high in the voucher population and thus large shifts in applications are plausible. There are two primary implications of our findings: the first is that our results are consistent with housing authorities playing a strong mediating role in access to disability program participation among those with insecure housing; and the second is that the substitution between vouchers and disability program participation suggests that the net costs of providing more vouchers from a federal budget perspective is substantially reduced via savings from administrative application costs, determination costs, and disability benefits paid out. Future

research may further explore and quantify these relationships, but the general finding is that federal housing policy has direct implications for federal disability program participation, with these implications strongly mediated by local government policy.

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Table 1: Number of ZIPs with Uncensored SSI Application Data and SAFMR Implementation, by Year

	Non-SAFMR	SAFMR
2008	22,530	0
2009	23,284	0
2010	23,155	0
2011	22,700	289
2012	22,406	472
2013	21,966	458
2014	21,666	453
2015	21,617	462
2016	21,285	447
2017	21,112	452
2018	18,463	2,677
2019	18,393	2,894

Source: Merged HUD and SSA-provided data.

Table 2: 2018 Descriptive Statistics

		10th	25th	50th	75th	90th	Mean	SD
Households with Vouchers		18.0	38.0	107.0	277.5	540.0	221.81	328.33
Change in Households Relative to 2007		-41.0	-11.0	7.0	45.0	134.0	34.11	127.62
% HCV Holders Receiving GA		0.0	0.6	9.8	38.0	65.0	21.86	25.48
% HCV Holders Receiving SSI 22-64		11.1	16.6	21.5	26.7	32.1	21.76	8.51
% HCV Holders Receiving SSI 65+		3.2	5.9	9.1	14.3	21.7	11.44	9.70
% HCV Holders Black		2.1	10.2	36.4	72.0	90.7	41.63	32.82
% HCV Holders Hispanic		0.0	1.4	5.7	16.9	37.5	13.48	19.31
% HCV Holders Other Non-White, Non-Hispanic Race		0.0	0.0	0.5	2.5	6.7	2.80	7.21
% HCV Holders Female		65.0	73.3	81.1	88.0	92.9	79.50	12.12
% HCV Holders Bedrooms	0	0.0	0.0	0.0	1.4	6.0	2.39	7.51
	1	5.1	13.8	26.7	41.0	55.6	28.98	19.51
	2	16.7	26.1	34.9	43.2	52.0	34.74	14.15
	3	8.5	17.9	30.6	46.7	63.4	33.89	21.30
2-Bedroom FMR		670.0	712.0	846.0	1,066.0	1,422.0	963.93	357.98
Annual Change in 2-Bedroom FMR		-29.7	2.0	25.9	52.0	89.0	30.18	54.77
SSI Applicants		0.0	11.0	28.0	79.0	171.0	63.84	95.33
Annual Change in SSI Applicants		-23.0	-10.0	-2.0	2.0	9.0	-5.41	18.03
SSDI Applicants		0.0	18.0	42.0	94.0	162.0	66.37	70.14
Annual Change in SSDI Applicants		-18.0	-8.0	-1.0	4.0	12.0	-2.34	13.94
SSI Recipients		42.0	93.0	219.0	555.0	1,127.0	454.44	652.50
Annual Change in SSI Recipients		-18.0	-7.0	-1.0	3.0	10.0	-3.12	16.34
% SAFMR Led to Increase in FMR		0.0	1.0	1.0	1.0	1.0	0.88	0.32
% SAFMR Led to Decrease in FMR		0.0	0.0	0.0	0.0	1.0	0.12	0.32
SAFMR Induced Change in FMR		-22.0	37.3	52.0	75.0	183.0	63.67	63.70

N = 21,140 (2,677 for SAFMR Variables). Five-digit ZIP-level statistics on key variables of interest for 2018.

Table 3: Areas that Experienced the Largest Increases or Decreases due to 2018 SAFMR Introduction

10 Largest 2018 SAFMR-Induced Increases			10 Largest 2018 SAFMR-Induced Decreases		
ZIP	MSA/County	Change in FMR	ZIP	MSA/County	Change in FMR
32926	Titusville MSA, FL	134.0	95724	Nevada County, CA	-123.0
32955	Titusville MSA, FL	134.0	95959	Nevada County, CA	-123.0
32783	Titusville MSA, FL	134.0	29707	Charlotte MSA, SC	-98.0
07495	Bergen-Passaic Counties, NJ	134.0	19977	Dover MSA, DE	-94.2
32903	Titusville MSA, FL	134.0	19938	Dover MSA, DE	-93.6
07436	Bergen-Passaic Counties, NJ	134.0	96161	Nevada County, CA	-88.4
07013	Bergen-Passaic Counties, NJ	134.0	06034	Hartford MSA, CT	-54.0
32908	Titusville MSA, FL	134.0	06088	Hartford MSA, CT	-54.0
07407	Bergen-Passaic Counties, NJ	134.0	06146	Hartford MSA, CT	-54.0
07010	Bergen-Passaic Counties, NJ	134.0	06424	Hartford MSA, CT	-54.0

Note: Change in 2-bedroom Fair Market Rent from 2017 to 2018 among areas that implemented SAFMR in 2018.

Table 4: Instrumental Variable Results of Impact of Number of Housing Choice Vouchers on SSI Applications

	Annual Change in SSI Applications							
	Binary SAFMR Instruments				Continuous SAFMR Instrument			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Endogenous Regressor: Level of HCVs	-0.0882***	-0.0494***	-0.0544***	-0.1037***	-0.0353***	-0.0236***	-0.0261***	-0.0412**
	(0.0123)	(0.0073)	(0.0069)	(0.0209)	(0.0057)	(0.0053)	(0.0056)	(0.0125)
First Stage								
SAFMR Increased FMR	62.03***	55.59***	62.15***	37.81***				
	(12.02)	(13.27)	(11.07)	(9.194)				
SAFMR Decreased FMR	71.96***	70.67***	62.53***	27.02**				
	(16.43)	(17.33)	(13.00)	(8.967)				
SAFMR-Induced Change in FMR					0.5121***	0.4588***	0.4420***	0.2571***
					(0.0930)	(0.0984)	(0.0792)	(0.0664)
Fixed Effects								
Year	No	Yes	Yes	Yes	No	Yes	Yes	Yes
State	No	No	Yes	No	No	No	Yes	No
PHA	No	No	No	Yes	No	No	No	Yes
Cluster of Standard Errors	ZIP	ZIP	ZIP	ZIP	ZIP	ZIP	ZIP	ZIP

Note: Unit of analysis is the 5-digit ZIP-year combination. Results from two-stage instrumental variable estimation equation from methods section. Outcome is annual change in SSI applications. Endogenous regressor is number of vouchers in ZIP-year. Instrumental variables are based on Small-Area Fair Market Rent changes for affected ZIPs; columns 1-4 use two binary variables, one indicating whether the SAFMR introduction led to an increase in the ZIP FMR relative to year prior to SAFMR introduction among localities that implemented SAFMRs, and another indicating that SAFMR decreased the ZIP FMR. Columns 5-8 show analyses with a single continuous instrumental variable measuring the difference in ZIP FMR induced by the introduction of SAFMR. * represents significance at 10% level, ** at 5% level, *** at 1% level.

Table 5: Instrumental Variable Results of Impact of Change in Number of Housing Choice Vouchers on SSI Applications

	Annual Change in SSI Applications			
	Continuous SAFMR Instrument			
	(1)	(2)	(3)	(4)
Endogenous Regressor: Change in HCVs	-0.1080***	-0.0999*	-0.0986**	-0.0915**
	(0.0279)	(0.0405)	(0.0374)	(0.0327)
First Stage				
SAFMR-Induced Change in FMR	0.1874***	0.1248**	0.1283**	0.1303**
	(0.0452)	(0.0468)	(0.0423)	(0.0401)
Fixed Effects				
Year	No	Yes	Yes	Yes
State	No	No	Yes	No
PHA	No	No	No	Yes
Cluster of Standard Errors	ZIP	ZIP	ZIP	ZIP

Note: Unit of analysis is the 5-digit ZIP-year combination. Results from two-stage instrumental variable estimation equation from methods section. Outcome is annual change in SSI applications. Endogenous regressor is the change in vouchers relative to 2007. Instrumental variable is based on Small-Area Fair Market Rent changes for affected ZIPs; columns 1-4 use a single continuous instrumental variable measuring the difference in ZIP FMR induced by the introduction of SAFMR. * represents significance at 10% level, ** at 5% level, *** at 1% level.

Table 6: Instrumental Variable Results of Impact of Number of Housing Choice Vouchers on SSDI Applications

	Annual Change in SSDI Applications							
	Binary SAFMR Instruments				Continuous SAFMR Instrument			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Endogenous Regressor: Level of HCVs	-0.0371***	-0.0148***	-0.0216***	-0.0334***	-0.0202***	-0.0160***	-0.0219***	-0.0323**
	(0.0060)	(0.0034)	(0.0038)	(0.0094)	(0.0041)	(0.0040)	(0.0047)	(0.0101)
Fixed Effects								
Year	No	Yes	Yes	Yes	No	Yes	Yes	Yes
State	No	No	Yes	No	No	No	Yes	No
PHA	No	No	No	Yes	No	No	No	Yes
Cluster of Standard Errors	ZIP	ZIP	ZIP	ZIP	ZIP	ZIP	ZIP	ZIP

Note: Unit of analysis is the 5-digit ZIP-year combination. Results from two-stage instrumental variable estimation equation from methods section. Outcome is annual change in SSDI applications. Endogenous regressor is number of vouchers in ZIP-year. Instrumental variables are based on Small-Area Fair Market Rent changes for affected ZIPs; columns 1-4 use two binary variables, one indicating whether the SAFMR introduction led to an increase in the ZIP FMR relative to year prior to SAFMR introduction among localities that implemented SAFMRs, and another indicating that SAFMR decreased the ZIP FMR. Columns 5-8 show analyses with a single continuous instrumental variable measuring the difference in ZIP FMR induced by the introduction of SAFMR. * represents significance at 10% level, ** at 5% level, *** at 1% level.

Table 7: Instrumental Variable Results of Impact of Change in Number of Housing Choice Vouchers on SSDI Applications

	Annual Change in SSDI Applications			
	Continuous SAFMR Instrument			
	(1)	(2)	(3)	(4)
Endogenous Regressor: Change in HCVs	-0.0617***	-0.0677*	-0.0821**	-0.0710**
	(0.0169)	(0.0277)	(0.0300)	(0.0252)
Fixed Effects				
Year	No	Yes	Yes	Yes
State	No	No	Yes	No
PHA	No	No	No	Yes
Cluster of Standard Errors	ZIP	ZIP	ZIP	ZIP

Note: Unit of analysis is the 5-digit ZIP-year combination. Results from two-stage instrumental variable estimation equation from methods section. Outcome is annual change in SSDI applications. Endogenous regressor is the change in vouchers relative to 2007. Instrumental variable is based on Small-Area Fair Market Rent changes for affected ZIPs; columns 1-4 use a single continuous instrumental variable measuring the difference in ZIP FMR induced by the introduction of SAFMR. * represents significance at 10% level, ** at 5% level, *** at 1% level.

Table 8: Instrumental Variable Results of Impact of Number of Housing Choice Vouchers on Number of SSI Beneficiaries

	Annual Change in SSI Beneficiaries							
	Binary SAFMR Instruments				Continuous SAFMR Instrument			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Endogenous Regressor: Level of HCVs	-0.1296***	0.0084	-0.0279***	-0.1196***	-0.1768***	-0.0428***	-0.0719***	-0.1684***
	(0.0238)	(0.0088)	(0.0080)	(0.0302)	(0.0276)	(0.0089)	(0.0118)	(0.0431)
Fixed Effects								
Year	No	Yes	Yes	Yes	No	Yes	Yes	Yes
State	No	No	Yes	No	No	No	Yes	No
PHA	No	No	No	Yes	No	No	No	Yes
Cluster of Standard Errors	ZIP	ZIP	ZIP	ZIP	ZIP	ZIP	ZIP	ZIP

Note: Unit of analysis is the 5-digit ZIP-year combination. Results from two-stage instrumental variable estimation equation from methods section. Outcome is annual change in SSI beneficiaries. Endogenous regressor is number of vouchers in ZIP-year. Instrumental variables are based on Small-Area Fair Market Rent changes for affected ZIPs; columns 1-4 use two binary variables, one indicating whether the SAFMR introduction led to an increase in the ZIP FMR relative to year prior to SAFMR introduction among localities that implemented SAFMRs, and another indicating that SAFMR decreased the ZIP FMR. Columns 5-8 show analyses with a single continuous instrumental variable measuring the difference in ZIP FMR induced by the introduction of SAFMR. * represents significance at 10% level, ** at 5% level, *** at 1% level.

Table 9: Instrumental Variable Results of Impact of Change in Number of Housing Choice Vouchers on Number of SSI Beneficiaries

	Annual Change in SSI Beneficiaries			
	Continuous SAFMR Instrument			
	(1)	(2)	(3)	(4)
Endogenous Regressor: Change in HCVs	-0.5233***	-0.1936**	-0.2702**	-0.3437**
	(0.1220)	(0.0732)	(0.0912)	(0.1092)
Fixed Effects				
Year	No	Yes	Yes	Yes
State	No	No	Yes	No
PHA	No	No	No	Yes
Cluster of Standard Errors	ZIP	ZIP	ZIP	ZIP

Note: Unit of analysis is the 5-digit ZIP-year combination. Results from two-stage instrumental variable estimation equation from methods section. Outcome is annual change in SSI beneficiaries. Endogenous regressor is the change in vouchers relative to 2007. Instrumental variable is based on Small-Area Fair Market Rent changes for affected ZIPs; columns 1-4 use a single continuous instrumental variable measuring the difference in ZIP FMR induced by the introduction of SAFMR. * represents significance at 10% level, ** at 5% level, *** at 1% level.

Table A1: Ordinary Least Squares Results of Impact of Number of Housing Choice Vouchers on SSI Applications

	Annual Change in SSI Applications							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
OLS: Level of HCVs	-0.00842***	-0.00793***	-0.00801***	-0.00793***				
	(0.000339)	(0.000332)	(0.000320)	(0.000328)				
OLS: Change in HCVs					-0.0112***	-0.00617***	-0.00700***	-0.00707***
					(0.00192)	(0.00169)	(0.00169)	(0.00172)
IV Estimates: Continuous Instrument	-0.0353***	-0.0236***	-0.0261***	-0.0412**	-0.1080***	-0.0999*	-0.0986**	-0.0915**
	(0.0057)	(0.0053)	(0.0056)	(0.0125)	(0.0279)	(0.0405)	(0.0374)	(0.0327)
Fixed Effects								
Year	No	Yes	Yes	Yes	No	Yes	Yes	Yes
State	No	No	Yes	No	No	No	Yes	No
PHA	No	No	No	Yes	No	No	No	Yes
Cluster of Standard Errors	ZIP	ZIP	ZIP	ZIP	ZIP	ZIP	ZIP	ZIP

Note: Unit of analysis is the 5-digit ZIP-year combination. Outcome is annual change in SSI applications. Shows naive OLS estimates, not accounting for endogeneity of HCV size. * represents significance at 10% level, ** at 5% level, *** at 1% level.