

Neighborhood and Individual Effects of Housing Production Trust Fund (HPTF) Buildings and Residents

Additional Benefits of the City's Primary Affordable Housing Policy Tool

Jose Elias Serrania Bravo

University of Chicago

Office of Revenue Analysis
Office of the Chief Financial Officer
District of Columbia Government

Issued November 2019

I. Introduction

In this study, we analyzed the individual and the neighborhood effects of affordable housing units funded by the Housing Production Trust Fund (HPTF). The HPTF is a special revenue fund administered by the District of Columbia Department of Housing and Community Development (DHCD) that provides gap financing for residential projects affordable to low- and moderate-income households.¹ Since 2001, over 9,000 affordable housing units have been produced using the HPTF.²

Via a series of difference-in-differences econometric models, this study compares city individual income tax filers that moved into HPTF financed buildings in 2014 (the treatment group) to socio- and demographically similar individual income tax filers residing in comparable nonsubsidized multifamily buildings (the control group). We found individual income tax filers that moved into HPTF buildings had a higher likelihood of receiving the Child Care Tax Credit and claimed higher values for the credit compared to the control group. And using a cross sectional analysis at the census tract level, we found additional HPTF residential units and residents in a neighborhood had positive effects on median neighborhood wages and median neighborhood single-family home values.

II. Policy Background

The HPTF was created by the Housing Production Trust Fund Act of 1988, and first received regular funding in 2001. This legislation requires for each fiscal year:

- At least 40 percent of HPTF spending serves households with incomes below 30 percent of the area median family income (MFI),
- At least another 40 percent serves households with incomes between 30 and 50 percent MFI, and
- The balance of funds serves households with up to 80 percent MFI.

Income limits and rents for HPTF buildings are shown in tables below:³

¹ The HPTF is funded through dedicated tax revenue equal to 15 percent of all deed recordation and transfer taxes as well as periodic special revenue dedications from the city's General Fund. Most HPTF funds are for rental housing.

² District of Columbia Department of Housing and Community Development. Housing Production Trust Fund. <https://dhcd.dc.gov/page/housing-production-trust-fund>

³ District of Columbia Department of Housing and Community Development. (2019). Housing Production Trust Fund (HPTF) Program Limits. Washington, DC. <https://dhcd.dc.gov/sites/default/files/dc/sites/dhcd/publication/attachments/HPTF%20Program%20Limits%20of%20July%201%202018.formatted%20a.pdf>

Table 1. HPTF Program Income Limits (effective on July 1, 2019)

Income Band	1 Person	2 Person	3 Person	4 Person	5 Person	6 Person	7 Person	8 Person
0-30% of MFI	\$25,450	\$29,100	\$32,750	\$36,400	\$40,050	\$43,650	\$47,300	\$50,950
31-50% of MFI	\$42,450	\$48,500	\$54,600	\$60,650	\$66,700	\$72,800	\$78,850	\$84,900
51-80% of MFI	\$67,950	\$77,650	\$87,350	\$97,050	\$116,450	\$126,150	\$126,150	\$135,850

Source: Department of Housing and Community Development.

Table 2. HPTF Program Rent Limits (effective on July 1, 2019)

Income Band	Efficiency	1 bedroom	2 bedrooms	3 bedrooms	4 bedrooms	5 bedrooms
0-30% of MFI	\$640	\$730	\$820	\$1,000	\$1,180	\$1,270
31-50% of MFI	\$1,060	\$1,210	\$1,360	\$1,670	\$1,970	\$2,120
51-80% of MFI	\$1,700	\$1,940	\$2,180	\$2,670	\$3,150	\$3,400

Source: Department of Housing and Community Development.

III. Data

For this study, we used the following data sources:

- **HPTF-funded Residential Buildings.**
 - FY2015 Housing Production Trust Fund Annual Report⁴ (DHCD)
 - Development Finance Division Pipeline – Public Dashboard⁵ (DHCD)
 - DC Preservation Catalog⁶ (Urban Institute)

⁴ Available at <https://dhcd.dc.gov/sites/default/files/dc/sites/dhcd/publication/attachments/2015%20HPTF%20Affordable%20Housing%20Annual%20Report.pdf>

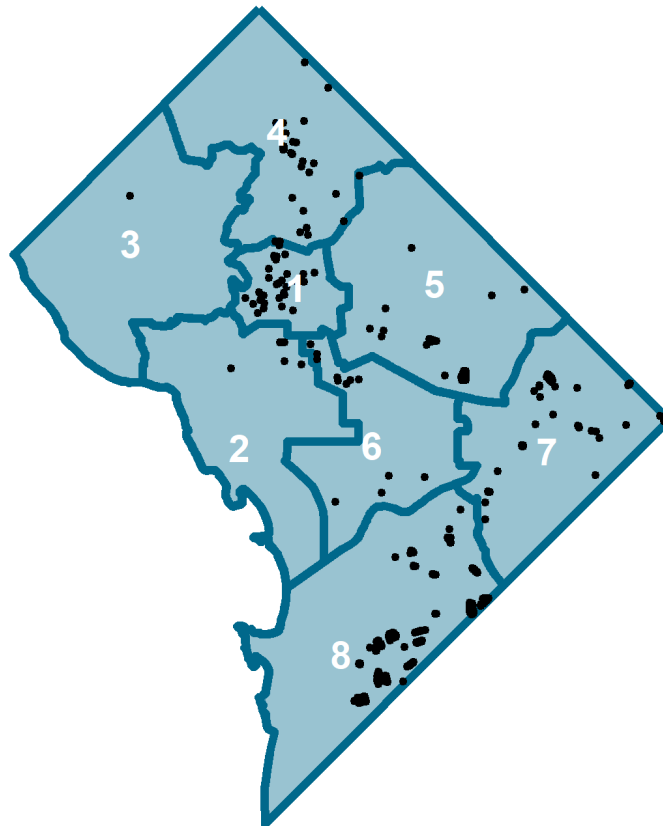
⁵ Available at <https://octo.quickbase.com/db/bit4kvfmq?a=showpage&pageid=3>

⁶ Available at <http://dcpres.urban.org/dcp/>

- **Individual Income Tax Data.** This data was geocoded and includes information on income, filing status, addresses and tax credits for all city income tax filers. (District of Columbia Office of Revenue Analysis)
- **Property Tax Data.** Contains information related to each property’s assessment value. (District of Columbia Office of Revenue Analysis)
- **American Community Survey 5-Year estimate.** Contains socioeconomic information at the census tract level. (U.S. Census Bureau)
- **Master Address Repository.** Dataset that contains locations and attributes of all the District’s address points.⁷ (District of Columbia Office of the Chief Technology Officer)

We identified 740 HPTF-funded residential rental buildings across the city (Figure 1). And while there are HPTF-funded buildings in every ward, the vast majority of HPTF buildings are in the eastern half of the city (Wards 1, 4, 5, 6, 7 and 8). Notably, Ward 3 had only one HPTF building in 2019.

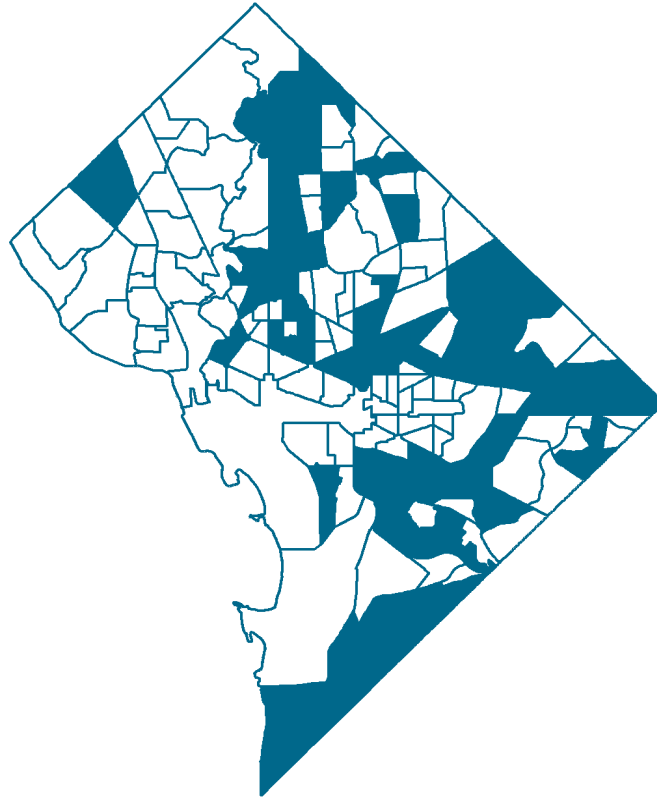
Figure 1. Location of HPTF Buildings by Ward



⁷ Available at <https://opendata.dc.gov/datasets/address-points>

When examining the locations of HPTF buildings at the census tract level, we find there are HPTF buildings in 77 (43 percent) of the city's 179 census tracts (see Figure 2).

Figure 2. Census Tracts with HPTF Buildings.



Individual Effects

Using geocoded income tax data, we identified all tax filers that had a home address (as reported on their income tax form) that matched any HPTF building address. According to city income tax data, 2014 was the year with the highest number of tax filers moving into HPTF buildings. The treatment group for this study only comprise tax filers who filed city income taxes from 2012 to 2016, moved into a HPTF building in 2014, and did not move out of a HPTF building (if at all) until after 2014.

For our control group, we first identified a large pool of potential tax filers who filed city income taxes from 2012 to 2016, did not live in an HPTF building at any time, stayed in the same address during those years and resided in a census tract containing at least one HPTF building in 2014. After obtaining this large pool of tax filers, we selected a subset by matching each member of the treatment group to one observation in the potential control group using the

MatchIt R package.⁸ Specifically, we identified our control group using the method of nearest neighbor matching⁹ based on the following variables: number of dependents in 2012, federal adjusted gross income (FAGI) in 2012, being an Earned Income Tax Credit (EITC) beneficiary in 2012, wages and salaries in 2012, number of dependents in 2013, FAGI in 2013, being an EITC beneficiary in 2013, wages and salaries in 2013, filing status, age in 2012 and census tract. Descriptive statistics of the treatment and control groups can be seen in Table 3.

Table 3. Control and treatment groups descriptive variables

Variable	Control	Treatment
Number of observations	442	442
Mean number of dependents (2012)	1.17	1.18
Mean age (2012)	38.55	38.64
Percentage filed as single (2012)	43%	40%
Percentage filed as married (2012)	5%	7%
Percentage filed as head of household (2012)	51%	51%
Mean FAGI (2012)	\$35,028	\$28,574
Percentage EITC beneficiary (2012)	61%	60%
Mean wages (2012)	\$27,783	\$27,358
Mean FAGI (2013)	\$37,496	\$30,056
Percentage EITC beneficiary (2013)	60%	58%
Mean wages (2013)	\$29,468	\$28,873
Mean Child Care Tax Credit Value	\$45	\$50

Neighborhood Effects

In order to identify the effects of HPTF funded projects on neighborhoods, we identified individual income tax filers that filed from HPTF buildings in 2016. We aggregated all income tax information at the census tract level. We used the property tax data to obtain each census

⁸ Matchit is an R program that selects matched samples of the original treated groups based on similar covariate distributions, propensity scores and a variety of other matching procedures. It allows for a reduce dependence of causal inferences on hard-to-justify, but commonly made, statistical modeling assumptions. Matchit essentially creates matched samples by pruning away individuals in the control group that are dissimilar from units in the treated group. That is, reducing selection bias. (Ho, D. E., Imai, K., King, G., & Stuart, E. A. (2011). MatchIt: Nonparametric preprocessing for parametric causal inference. *Journal of Statistical Software*, 42(8), 1-28.)

⁹ Nearest neighbor matching is a statistical technique that involves pairing a given point with another, 'closest' point. Setting up a nearest neighbor analysis involves choosing the criteria for 'closeness'—this could be a list of properties, the value of one particular property, or a propensity score.

tract’s median property value for single-family homes and the American Community Survey 5-year estimates to obtain each socioeconomic information for each census tract in the analysis.

IV. Methodology

Individual Effects

While individual or household annual consumer expenditure data would be useful for this investigation, that specific data was not available for analysis. A second-best data source is administrative individual income tax data. By focusing on the various credits, deductions and exemptions in the District of Columbia and federal tax code, it is possible for us to identify nontrivial changes in tax filers’ consumer expenditures albeit for a very narrow range of items (e.g. child care, health care, education, business expenses) but not for the more illuminating individual private purchase categories of durable goods, non-durables and services.

More specifically, we are interested in finding if there are any statistically significant tax behavior effects/differences within the treatment group compared to the control. We tested for differences in the probability of being an EITC, Child Care Tax Credit, Elderly Care Tax Credit, Business Tax Credit, Education Tax Credit, Self-employment Tax Credit, Student Loan Deduction, or Retirement Savings Credit beneficiary. We tested for differences in the probability of claiming medical, dental and other credits, deductions and exemptions. And finally, we also tested for significant changes in income levels and composition of income sources for the treatment group relative to the control group. We did not find any statistically significant differences in tax behaviors between the two groups except for in terms of the Child Care Credit using the following model:

(Equation 1)

$$\Pr(\mathit{ChildCareCredit} = 1|X)$$

$$= G(\beta_0 + \beta_1 * \mathit{Inter} + \beta_2 * \mathit{Year2013} + \beta_3 * \mathit{Year2014} + \beta_4 * \mathit{Year2015} + \beta_5 * \mathit{Year2016} + \beta_6 * \mathit{Ward2} + \beta_7 * \mathit{Ward3} + \beta_8 * \mathit{Ward4} + \beta_9 * \mathit{Ward5} + \beta_{10} * \mathit{Ward6} + \beta_{11} * \mathit{Ward7} + \beta_{12} * \mathit{Ward8} + \beta_{13} * \mathit{Married} + \beta_{14} * \mathit{HeadHousehold} + \beta_{15} * \mathit{EITCQualifiedChildren} + \beta_{16} * \mathit{Age} + \beta_{17} * \mathit{Treatment})$$

Where:

- $\Pr(\mathit{ChildCareCredit} = 1|X)$: conditional probability of being a beneficiary of the Federal Child Care Tax Credit
- ***Inter***: interaction term indicating the effect of moving into an HPTF building which equals one for the treatment group in the post-treatment period (2014 onwards)
- *Year2013 – 16*: dummies for each year
- *Ward2 – 8*: dummies for each ward
- *Married*: dummy indicating married filing status
- *HeadHousehold*: dummy indicating head of household filing status

- *EITCQualifiedChildren*: Number of EITC qualified children
- *Age*: age of tax filer in 2012
- *Treatment*: dummy for the treatment group
- $G(w)$: logistic function $G(w) = \frac{\exp(w)}{1+\exp(w)}$

After finding that HPTF building residents had a higher probability to claim the federal (and consequently District of Columbia¹⁰) Child Care Tax Credit, we ran the following model to quantify the average size of the Child Care Tax Credit for the treatment group relative to the control group using the following model.

(Equation 2)

ChildCareCreditValue

$$\begin{aligned}
 &= \beta_0 + \beta_1 * \mathbf{Inter} + \beta_2 * \mathbf{Year2013} + \beta_3 * \mathbf{Year2014} + \beta_4 * \mathbf{Year2015} \\
 &+ \beta_5 * \mathbf{Year2016} + \beta_6 * \mathbf{Ward2} + \beta_7 * \mathbf{Ward3} + \beta_8 * \mathbf{Ward4} + \beta_9 \\
 &* \mathbf{Ward5} + \beta_{10} * \mathbf{Ward6} + \beta_{11} * \mathbf{Ward7} + \beta_{12} * \mathbf{Ward8} + \beta_{13} * \mathbf{Married} \\
 &+ \beta_{14} * \mathbf{HeadHousehold} + \beta_{15} * \mathbf{EITCQualifiedChildren} + \beta_{16} * \mathbf{Age} \\
 &+ \beta_{17} * \mathbf{Treatment}
 \end{aligned}$$

Where:

- *ChildCareCreditValue*: value of the Federal Child Care Tax Credit
- ***Inter***: interaction term indicating the effect of moving into an HPTF building which equals one for the treatment group in the post-treatment period (2014 onwards)
- *Year2013 – 16*: dummies for each year
- *Ward2 – 8*: dummies for each ward
- *Married*: dummy indicating married filing status
- *HeadHousehold*: dummy indicating head of household filing status
- *EITCQualifiedChildren*: number of EITC qualified children
- *Age*: age of tax filer in 2012
- *Treatment*: dummy for the treatment group

Neighborhood Effects

We then performed a cross-sectional analysis at the census tract level in order to identify the effect of additional HPTF rental units and HPTF residents on different neighborhood outcomes for year 2016. First, we ran a model (Equation 3) for all the District’s census tracts containing HPTF buildings to assess the effect of the number of HPTF units in the census tract on the median single-family home value in respective census tracts.

¹⁰ While this model includes only the federal Child Care Tax Credit, the District of Columbia offers an additional Child Care Tax Credit that equals 32 percent of the federal Child Care Tax Credit.

(Equation 3)

MedianPropertyValues

$$\begin{aligned} &= \beta_0 + \beta_1 * \mathbf{HPTFUnits} + \beta_2 * \mathit{PercentageWhite} + \beta_3 \\ &* \mathit{PercentagePoverty} + \beta_4 * \mathit{MedianAge} + \beta_5 * \mathit{Ward2} + \beta_6 * \mathit{Ward3} \\ &+ \beta_7 * \mathit{Ward4} + \beta_8 * \mathit{Ward5} + \beta_9 * \mathit{Ward6} + \beta_{10} * \mathit{Ward7} + \beta_{11} * \mathit{Ward8} \end{aligned}$$

Where:

- **MedianPropertyValues**: median property value for single-family homes and condos in the census tract.
- **HPTFUnits**: the number of HPTF residential rental units in the census tract
- *PercentageWhite*: proportion of white population in the census tract
- *PercentagePoverty*: proportion of population below 100% of the poverty line
- *MedianAge*: Median age of the census tract
- *Ward2 – 8*: dummies for each ward

Next, we ran a model (Equation 4) for all the District’s census tracts containing HPTF buildings to assess the effect of the number of HPTF units in the census tract on the median income in respective census tracts.

(Equation 4)

MedianIncome

$$\begin{aligned} &= \beta_0 + \beta_1 * \mathbf{HPTFUnits} + \beta_2 * \mathit{PercentageWhite} + \beta_3 \\ &* \mathit{PercentagePoverty} + \beta_4 * \mathit{MedianAge} + \beta_5 * \mathit{Ward2} + \beta_6 * \mathit{Ward3} \\ &+ \beta_7 * \mathit{Ward4} + \beta_8 * \mathit{Ward5} + \beta_9 * \mathit{Ward6} + \beta_{10} * \mathit{Ward7} + \beta_{11} * \mathit{Ward8} \end{aligned}$$

Where:

- **MedianIncome**: median federal adjusted gross income for all tax filers in the census tract.
- **HPTFUnits**: the number of HPTF residential rental units in the census tract
- *PercentageWhite*: proportion of white population in the census tract
- *PercentagePoverty*: proportion of population below 100% of the poverty line
- *MedianAge*: Median age of the census tract
- *Ward2 – 8*: dummies for each ward

And finally, we ran a model (Equation 5) for all the District’s census tracts containing HPTF buildings to assess the effect of the number of tax filers residing in HPTF buildings in the census tract on the median single-family home value in respective census tracts.

(Equation 5)

MedianPropertyValues

$$= \beta_0 + \beta_1 * \mathbf{HPTFTaxfilers} + \beta_2 * \mathit{PercentageWhite} + \beta_3 * \mathit{PercentagePoverty} + \beta_4 * \mathit{MedianAge} + \beta_5 * \mathit{Ward2} + \beta_6 * \mathit{Ward3} + \beta_7 * \mathit{Ward4} + \beta_8 * \mathit{Ward5} + \beta_9 * \mathit{Ward6} + \beta_{10} * \mathit{Ward7} + \beta_{11} * \mathit{Ward8}$$

Where:

- ***MedianPropertyValues***: median property value for single-family homes and condos in the census tract.
- ***HPTFTaxfilers***: the number of tax filers residing in HPTF buildings in the census tract
- *PercentageWhite*: proportion of white population in the census tract
- *PercentagePoverty*: proportion of population below 100% of the poverty line
- *MedianAge*: Median age of the census tract
- *Ward2 – 8*: dummies for each ward

V. Empirical Results

Individual Effects

We found that tax filers living in HPTF buildings had a higher probability of being a Child Care Tax Credit beneficiary. The effect was positive and significant for the treatment group at the 10 percent significance level. The marginal effect at the mean is 2.2 percent (Table 4). This indicates that income tax filers that live in HPTF buildings are 2.2 percent more likely to claim the child care tax credit than income tax filers that live in similar but unsubsidized rental buildings. This is after controlling for location, filing status, age and number of children per tax filer.

Table 4. Logistic Regression Model Results

Dependent Variable: Probability of Being a Child Care Tax Credit Beneficiary						
	Estimate	Marginal effect at the mean	Std. Error	z-value	Pr(> z)	
(Intercept)	-2.337		0.377	-6.193	0.000	***
Interaction	0.358	0.022	0.208	1.719	0.086	*
Year2013	0.275	0.017	0.165	1.663	0.096	
Year2014	1.944	0.191	0.334	5.827	0.000	***
Year2015	1.910	0.185	0.335	5.705	0.000	***
Year2016	1.798	0.169	0.337	5.336	0.000	***
Ward2	-0.374	-0.018	0.408	-0.916	0.360	
Ward3	-13.676	-0.079	227.287	-0.060	0.952	
Ward4	-0.295	-0.015	0.238	-1.239	0.215	
Ward5	0.036	0.002	0.213	0.169	0.865	
Ward6	-0.071	-0.004	0.230	-0.310	0.756	
Ward7	-0.368	-0.019	0.213	-1.728	0.084	
Ward8	-0.125	-0.007	0.180	-0.696	0.486	
Married	1.209	0.113	0.515	2.349	0.019	**
Head of Household	2.191	0.225	0.300	7.296	0.000	***
EITC Qualified Children	0.193	0.011	0.047	4.102	0.000	***
Age	-0.049	-0.003	0.005	-9.877	0.000	***
Treatment	0.123	0.007	0.165	0.743	0.457	

Note: statistical significance indicated at the 1% (***), 5% (**), and 10% (*) level.

As shown in Table 5, tax filers moving into an HPTF building also had a positive effect on the amount of the federal Child Care Tax Credit. On average, the treatment group received an annual average of \$20 dollars more (or \$65 dollars in total) in years 2013 to 2016 after controlling for location and specific demographic factors. This represents an increase of 44 percent more than the control group’s average Child Care Tax Credit value (see Table 3). And while the actual credit amounts per tax filer in this study are small, the main takeaway is that these tax filers tend to spend more on child care services. And, these credit amounts do not include the automatic District of Columbia Child Care Tax Credit that equals 32 percent of the federal credit for respective tax filers.

Child care is indispensable for many families because it allows parents to work and supports healthy child development. And while quality child care is expensive and hard to find for many, the challenge is particularly acute for lower-income parents. Research suggests that increased access to more or better-quality child care tend to result in a range of longer-term benefits for children and their families. Where higher-quality child care can benefit their children’s development, increased family income (e.g. via lower housing costs) and reduced poverty can have short- and long-term benefits for children’s achievement and success. This analysis’ Child

Care Tax credit finding suggests that more or improve child care outcome is just one externality of the city’s primary affordable housing program.¹¹

Table 5. Regression Model Results

Dependent Variable: Value of Child Care Tax Credit					
	Estimate	Std. Error	t-value	Pr(> t)	
(Intercept)	64.55	16.25	3.973	0.000	***
Interaction	20.36	12.22	1.667	0.096	
Year2013	12.34	9.44	1.308	0.191	
Year2014	44.64	12.59	3.545	0.000	***
Year2015	46.20	12.58	3.673	0.000	***
Year2016	40.15	12.57	3.195	0.001	***
Ward2	17.62	19.84	0.888	0.374	
Ward3	-15.78	22.54	-0.700	0.484	
Ward4	-5.71	13.06	-0.437	0.662	
Ward5	18.15	12.84	1.414	0.158	
Ward6	-1.41	13.43	-0.105	0.916	
Ward7	-5.04	12.30	-0.410	0.682	
Ward8	12.82	10.82	1.185	0.236	
Married	6.57	19.84	0.331	0.740	
Head of Household	58.27	10.55	5.521	0.000	***
EITC Qualified Children	12.25	3.07	3.990	0.000	***
Age	-1.77	0.23	-7.776	0.000	***
Treatment	9.03	9.43	0.957	0.339	

Note: statistical significance indicated at the 1% (***), 5% (**), and 10% (*) level.

Neighborhood Effects

We initially ran our models considering all 179 DC census tracts. However, these models were being significantly affected by the census tracts without HPTF buildings. Thus, we narrowed our sample to only the 77 census tracts with HPTF buildings in them.

The median property value for single-family homes and condos in the census tracts with HPTF buildings in them for 2016 was \$403,445. And, the median wage for the same census tracts in 2016 was \$30,529. The model results indicate that an additional HPTF residential rental unit in a census tract is correlated with an average increase of \$425.64 (0.11 percent) in the median

¹¹ Giannarelli, Linda, Gina Adams, Sarah Minton and Kelly Dwyer. 2019. "What If We Expanded Child Care Subsidies?: A National and State Perspective." Washington, DC: Urban Institute.

home value (Table 6).¹² An additional HPTF residential rental unit in a census tract is correlated with an average increase of \$7.71 (0.03 percent) increase in the median wage (Table 7). And, additional tax filers living in HPTF units is correlated with a \$537.27 (0.13 percent) increase in the median home value (Table 8).

Table 6. Regression of the Number of HPTF units on median property values results

Dependent Variable: Median Property Values (single-family homes and condos)					
	Estimate	Std. Error	t-value	Pr(> t)	
(Intercept)	296,529.50	107,795.25	2.751	0.008	**
HPTFUnits	425.64	204.05	2.086	0.042	**
PercentageWhite	5,741.88	1,519.90	3.778	0.000	***
MedianAge	3,199.97	2,724.69	1.174	0.246	
Ward2	164,509.51	63,028.67	2.610	0.012	*
Ward3	-79,860.28	76,082.33	-1.050	0.299	
Ward4	-79,682.40	61,609.97	-1.293	0.202	
Ward5	-178,323.56	49,046.95	-3.636	0.001	***
Ward6	-98,088.66	67,465.23	-1.454	0.152	
Ward7	-247,784.65	68,767.80	-3.603	0.001	***
Ward8	-259,582.89	62,746.29	-4.137	0.000	***

Note: statistical significance indicated at the 1% (***), 5% (**), and 10% (*) level.

¹² It has also been recently found that new affordable housing developments throughout the nation, funded by the federal Low-Income Housing Tax Credit (LIHTC), tended to increase nearby home prices and incomes in their immediate areas. <https://www.nber.org/papers/w22204.pdf> The LIHTC is the largest federal program for the production and rehabilitation of affordable housing, and it supported 20,441 rental housing units in the District of Columbia in 2018. https://preservationdatabase.org/wp-content/uploads/2018/10/PD-Profile_2018_DC.pdf

Table 7. Regression of the number of HPTF units on median annual wage Income

Dependent Variable: Median Annual Wage Income				
	Estimate	Std. Error	t-value	Pr(> t)
(Intercept)	11,440.99	6,062.56	1.887	0.065
HPTFUnits	7.71	4.11	1.873	0.067 *
PercentageWhite	456.67	46.27	9.870	0.000 ***
MedianAge	391.41	193.36	2.024	0.048 **
Ward2	13,765.55	1,432.65	9.608	0.000 ***
Ward3	1,942.36	2,467.97	0.787	0.435
Ward4	-2,560.24	2,852.24	-0.898	0.374
Ward5	1,197.00	3,001.72	0.399	0.692
Ward6	11,388.37	2,097.10	5.431	0.000 ***
Ward7	-1,984.98	2,623.99	-0.757	0.453
Ward8	-3,545.06	2,225.92	-1.593	0.117

Note: statistical significance indicated at the 1% (***), 5% (**), and 10% (*) level.

Table 8. Regression of the number of tax filers living in HPTF buildings on median property values results

Dependent Variable: Median Property Values (single-family homes and condos)				
	Estimate	Std. Error	t-value	Pr(> t)
(Intercept)	253,385.83	118,173.33	2.144	0.037 *
HPTFTaxfilers	537.27	252.85	2.125	0.038 *
PercentageWhite	6,225.58	1,483.37	4.197	0.000 ***
MedianAge	3,741.40	2,960.87	1.264	0.212
Ward2	136,250.26	58,686.80	2.322	0.024 *
Ward3	-52,521.44	69,553.46	-0.755	0.454
Ward4	-74,575.70	60,522.46	-1.232	0.224
Ward5	-152,926.49	50,410.47	-3.034	0.004 **
Ward6	-72,611.84	68,752.59	-1.056	0.296
Ward7	-203,172.85	66,535.61	-3.054	0.004 **
Ward8	-238,067.90	62,016.85	-3.839	0.000 ***

Note: statistical significance indicated at the 1% (***), 5% (**), and 10% (*) level.

VI. Conclusions

The Housing Production Trust Fund is the District's primary affordable housing policy tools. The fund supports the construction, rehabilitation, and/or acquisition of housing affordable to low- and moderate-income households. Since 2001, over 9,000 affordable housing units have been produced using the HPTF. However, this study finds that the benefits of this important program extends beyond merely providing affordable housing to low- and moderate-income households residents.

We tested for differences in the probability of being an EITC, Child Care Tax Credit, Elderly Care Tax Credit, Business Tax Credit, Education Tax Credit, Self-employment Tax Credit, Student Loan Deduction, or Retirement Savings Credit beneficiary. We also tested for differences in the probability of claiming medical, dental and other credits, deductions and exemptions. And finally, we also tested for significant changes in income levels and composition of income sources for the treatment group relative to the control group. We did not find any statistically significant differences in tax behaviors between the two groups except for in terms of the Child Care Credit. This study finds tax filers that reside in HPTF buildings have a higher probability of taking the Child Care Tax Credit after controlling for the number of children, age, filing status and location of these tax filers. We also found that these tax filers receive a federal Child Care Tax credit that is on average \$20 dollars higher (44 percent more) than those in the control group. And, this does not include the automatic District of Columbia Child Tax Credit that equals 32 percent of the federal credit for respective tax filers.

These results provide an indication to a change in expenditure behavior of these tax filers as a result of the change of residency to a rent-subsidized housing unit. This finding suggest that these tax filers could be using their savings from lower housing expenditures to purchase more and/or better-quality child care for their school age children. Or, the finding might be the result of an endogeneity problem where tax filers who tend to spend more on child care may be more likely to choose HPTF housing (i.e. maximizing public benefits).

In terms of neighborhood effects, we find that an additional HPTF residential rental unit in a neighborhood is correlated with a 0.11 percent increase in the median home value and a 0.03 percent increase in the area's median wage. We also find an additional tax filer living in an HPTF building is correlated with a 0.14 percent increase in the median home value.

HPTF buildings tend to be in neighborhoods with relatively higher poverty rates and lower employment rates. And since new affordable housing tenants are working adults that meet specified income requirements, it might be that new or newly renovated HPTF buildings help to increase the share working adults (tenants) in respective neighborhoods which in turn might mitigate some poverty-related characteristics of the neighborhood. Also, the new or newly renovated HPTF buildings represent an upgrading/modernizing of a neighborhood's housing stock in that HPTF projects replace or help outnumber much-older or even blighted residential buildings in respective neighborhoods. To some, this may be considered neighborhood revitalization which in turn attract higher-income residents to the broader low-income

neighborhood. In essence, the current drive of using the HPTF to help build and renovate affordable housing developments in low-income area appears to be running parallel to the gentrification trends also taking place in many of the same neighborhoods. This may be one explanation for the positive effects on neighborhood income. Nevertheless, this study has identified several important positive externalities related to the city's largest program to increase the stock of affordable housing.