Supplementary Information for "The Policy Adjacent: How Affordable Housing Generates Policy Feedback Among Neighboring Residents"

Contents

A Media Coverage and LIHTC's Traceability

In this section, we present evidence that voters associated new affordable housing developments in their neighborhoods with the statewide bonds. Contemporaneous media coverage commonly referred to the 2002 and 2006 statewide bonds as the "low-income housing bond" (e.g., Gledhill 2002) or the "affordable housing bond" (e.g., de Sa 2006). Furthermore, following the 2002 bond's passage, local media reported on how the infusion of funds would lead to over 130,000 new housing units statewide (e.g., Wedner 2004). For example, 24 cities in Los Angeles County received $62.6 million, which was estimated to fund 1,767 units, whereas the $13.9 million to San Bernardino and Riverside would fund 444 units (Stewart 2004). By mid-2004, Los Angeles County's total had reached $92.2 million which would translate into nearly 7,200 new housing units.

Local advocates credit-claimed for the use of the bonds to fund development in their region. In the *Los Angeles Times*, the mayor of Los Angeles touted how the city's receipt of $36 million would be used to build 807 rental units, "so that Los Angeles can continue to make investments that shelter working families, create jobs and improve neighborhoods, despite a tough budgetary year" (Stewart 2004). In the Bay Area, the *San Francisco Chronicle* wrote about how the $100 million awarded to the Bay Area would be spent. Not only would two new affordable projects begin construction with the funding, but two ongoing developments—100 units and 76 units—"would have been stalled without the cash" (Fulbright 2005).

In the run-up to the 2006 election, these claims were reiterated in support of the new affordable housing bond. For example, a local news article published one month before the 2006 election makes this connection explicit (Coit 2006):

> State bond funds from Proposition 46 have been critical to Burbank's helping meet demand for more affordable housing across the county. The bond money accounts for 35 percent of the Larkfield Oaks project, which also was funded by Burbank's usual complex array of public and private financing to lower development costs and rents.
>
> Proposition 46, approved by voters four years ago, provides $2.1 billion for low-income housing, home buyer assistance, and other targeted efforts. With that funding likely to be spent over the next year, state lawmakers placed Proposition 1C on the Nov. 7 ballot to provide an additional $2.85 billion toward similar efforts.
>
> Burbank has received $38 million in Proposition 46 money, second among all nonprofit affordable housing builders throughout California. "It's allowed us to do more, and it's allowed us to reach a deeper level of affordability," [affordable housing developer John] Lowry said.

Similar reporting connected the 2002 bond to not only over 100,000 new homes, but to the 2006 bond (de Sa 2006):

> "Prop. 46 prompted the construction of thousands of homes affordable to Bay Area families, and we expect a similar return through Prop. 1C," said Carl Guardino, president and CEO of the Silicon Valley Leadership Group and the initiative's statewide co-chair.

B Data

The purpose of this section is to provide additional detail about the data used in the study and how our final dataset was constructed.

B.1 Housing Bond Data

In this study, we use electoral data from two California housing bonds passed by voters statewide in 2002 and 2006. Figure B-1 shows the change in support for the housing bonds between the two elections at the Census block level. Observations are weighted by the average number of votes recorded on the housing bonds across both elections. We drop blocks that recorded zero votes on either the 2002 or the 2006 bonds, as we cannot reliably estimate the change in support between the elections for these blocks. Fortunately, these blocks have very few voters. The vertical line shows the mean change in support for bonds between the two elections, weighted by the average number of voters in each block. Support for the bonds was largely stable across the two elections. The voter-weighted average block only increased support for the bonds by 0.3 percentage points with a weighted standard deviation of 12 percentage points.

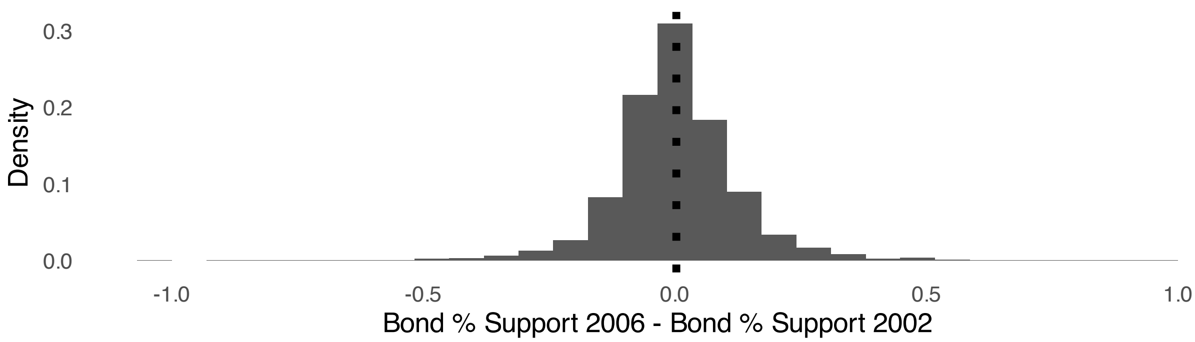

Figure B-1: Histogram of block-level change in support for housing bonds from 2002 to 2006, weighted by the average number of voters across elections. Weighted mean change in support shown by dashed vertical line.

B.2 LIHTC Data

As our treatment, we use exposure to new, nearby LIHTC-funded affordable housing construction that is placed in service during the 4-year period between the 2002 and 2006 election. As shown in Figure B-2, LIHTC locations during this time period were broadly distributed across CA, matching the state's population distribution. For context, federal guidelines stipulate that, in order to qualify for the tax credit, at least 20% of tenants in the proposed project must earn below 50% of the area median gross income (AMGI) or, alternatively, at least 40% of tenants must earn less than 60% of AMGI. Developers must restrict rents for low-income residents to 30% of the relevant income limit for a minimum of 30 years.

On average, there is a 1 year lag between credit allocation for a development and a development being placed in service. Studying property values via transactions, Diamond and McQuade (2019) use year of credit allocation to measure the effect of affordable housing, arguing that the announcement of affordable housing should immediately affect transactions even before construction begins. This may be reasonable for identifying effects on transaction values, as property purchasers are

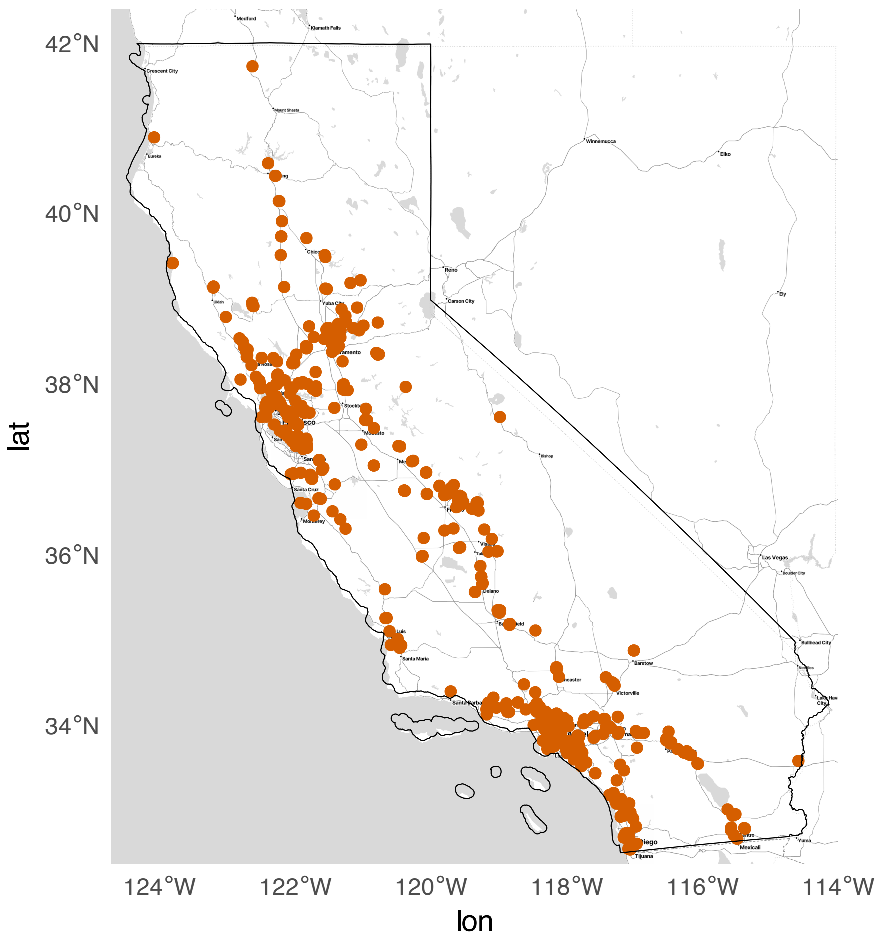

Figure B-2: Distribution of LIHTC developments composing our treatment group, i.e., those placed in service from 2003 to 2006.

likely to have a high awareness of changes in the area that may affect the long-term value of the large asset they are about to purchase. We expect nearby voters to become responsive once they become aware of rising housing prices *and* connect this increase to affordable housing policy, which we believe is most likely to come with the advent of new physical infrastructure. Thus we define treatment based on when each building is placed into service.

B.3 Other Variables

Income-related variables are not available at the Census block level. Some of our later analyses involve subsetting the data based on Census tract-level household income measures, but we cannot control for income in block-level analyses. To give a sense of scale, tracts generally contain between 1,200 and 8,000 people, with an optimum size of 4,000 people. Census blocks are not defined by population but are much smaller in area; for example, one block in a city typically comprises a Census block. Thus, tract data is useful as a moderating variable across LIHTC developments, but not for capturing variation within the area treated by an individual LIHTC development.

B.4 Dataset Construction

When defining proximity, we use the centroid of each Census block as its precise location. For the "Binary" treatment, we define treated blocks as those within 350 meters of a LIHTC development. For cases where the treatment radius cuts through a block, we calculated what percent of the block's area was within the treatment radius. If $\geq$50% of the block's area was covered by the treatment radius, the block was treated, otherwise the block was part of the near-far control group.

Some LIHTC developments are sited in close proximity to each other, such that the same block can be treated by more than one LIHTC development. Because our near-far estimation strategy relies on a LIHTC-level fixed effect, each block requires a LIHTC identifier, making the unit of analysis a block-LIHTC dyad. When a block is treated by more than one development, the block will appear in the near-far dataset however many times it is treated and with each observation referencing a unique LIHTC development.

In contrast, sometimes a block may be a control unit for one LIHTC development but also treated by another LIHTC development. Because the block was treated by any LIHTC development, it is considered a treated unit and all control observations of the block are dropped from the model. This ensures that blocks will only ever appear as treated or control, never both. 91% of blocks only appear once in the near-far data. The maximum number of appearances for a block is six times (<.04% of all blocks), meaning a few blocks were within 350 meters of six LIHTC buildings placed in service between 2003 and 2006.

Like the near-far design, the near-near design requires that blocks appear as many times as they are treated by different LIHTC developments. But if a block is treated not only by new LIHTC housing in 2003-2006 but also by new LIHTC in 2007-2010, then the block only appears as a treated unit. This leaves as control units blocks that were only treated in 2007-2010, after the second housing bond election.

C Balance Tables

C.1 Near-Far Balance

	Mean (treated)	Mean (control)	Std. mean difference
Homeownership rate	0.34	0.45	-0.34
Percent voted in 2002	0.42	0.44	-0.14
Percent non-Hispanic white	0.34	0.39	-0.17
Percent non-Hispanic Black	0.10	0.09	0.05
Percent Hispanic	0.37	0.35	0.08
Vacancy rate	0.05	0.05	0.04
Density (pop./km-squared)	13467.50	8754.27	0.28

Table C-1: Balance, Near-Far Analysis, All Blocks

	Mean (treated)	Mean (control)	Std. mean difference
Homeownership rate	0.85	0.85	-0.01
Percent voted in 2002	0.50	0.52	-0.08
Percent non-Hispanic white	0.45	0.49	-0.12
Percent non-Hispanic Black	0.07	0.06	0.01
Percent Hispanic	0.29	0.28	0.04
Vacancy rate	0.04	0.04	0.03
Density (pop./km-squared)	3774.38	3759.55	0.00

Table C-2: Balance, Near-Far Analysis, Homeowner Blocks

	Mean (treated)	Mean (control)	Std. mean difference
Homeownership rate	0.06	0.07	-0.04
Percent voted in 2002	0.38	0.39	-0.05
Percent non-Hispanic white	0.31	0.36	-0.16
Percent non-Hispanic Black	0.10	0.08	0.08
Percent Hispanic	0.38	0.35	0.10
Vacancy rate	0.05	0.05	0.02
Density (pop./km-squared)	22271.75	16211.35	0.36

Table C-3: Balance, Near-Far Analysis, Renter Blocks

C.2 Near-Near Balance

	Mean (treated)	Mean (control)	Std. mean difference
Homeownership rate	0.34	0.34	-0.01
Percent voted in 2002	0.42	0.42	-0.03
Percent non-Hispanic white	0.34	0.38	-0.12
Percent non-Hispanic Black	0.10	0.09	0.01
Percent Hispanic	0.37	0.37	0.01
Vacancy rate	0.05	0.05	-0.03
Density (pop./km-squared)	13467.50	11011.33	0.12

Table C-4: Balance, Near-Near Analysis, All Blocks

	Mean (treated)	Mean (control)	Std. mean difference
Homeownership rate	0.85	0.84	0.02
Percent voted in 2002	0.50	0.49	0.06
Percent non-Hispanic white	0.45	0.43	0.07
Percent non-Hispanic Black	0.07	0.08	-0.06
Percent Hispanic	0.29	0.35	-0.19
Vacancy rate	0.04	0.04	0.07
Density (pop./km-squared)	3774.38	4836.58	-0.05

Table C-5: Balance, Near-Near Analysis, Homeowner Blocks

	Mean (treated)	Mean (control)	Std. mean difference
Homeownership rate	0.06	0.07	-0.02
Percent voted in 2002	0.38	0.39	-0.04
Percent non-Hispanic white	0.31	0.36	-0.17
Percent non-Hispanic Black	0.10	0.10	-0.02
Percent Hispanic	0.38	0.36	0.08
Vacancy rate	0.05	0.06	-0.05
Density (pop./km-squared)	22271.75	16569.14	0.29

Table C-6: Balance, Near-Near Analysis, Renter Blocks

D Results in Tabular Form

D.1 Results - Full Sample

	Binary	Proximity	Units	Continuous
LIHTC Project	0.021***	0.019**	0.023**	0.020**
	(0.006)	(0.006)	(0.008)	(0.007)
% Renters	0.013	0.003	0.002	0.019*
	(0.007)	(0.006)	(0.006)	(0.008)
LIHTC x % Renters	−0.030***	−0.029***	−0.038***	−0.028**
	(0.008)	(0.007)	(0.010)	(0.009)
LIHTC FE	Yes	Yes	Yes	Yes
LIHTC SE Clusters	Yes	Yes	Yes	Yes
R^2	0.236	0.236	0.237	0.219
Adj. R^2	0.175	0.175	0.175	0.180
Num. obs.	6000	6000	6000	9292
RMSE	0.477	0.477	0.476	0.468
N Clusters	444	444	444	446

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table D-7: Effect of new, nearby LIHTC on change in support for housing bonds using near-far design.

	Binary	Units	Continuous
LIHTC Project	0.025**	0.018*	0.025*
	(0.009)	(0.008)	(0.011)
% Renters	−0.002	−0.022***	−0.006
	(0.010)	(0.006)	(0.013)
LIHTC x % Renters	−0.038**	−0.041***	−0.041*
	(0.013)	(0.011)	(0.016)
CBSA FE	Yes	Yes	Yes
LIHTC SE Clusters	Yes	Yes	Yes
R^2	0.063	0.065	0.064
Adj. R^2	0.055	0.057	0.059
Num. obs.	4038	4038	6144
RMSE	0.516	0.515	0.503
N Clusters	763	763	810

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table D-8: Effect of new, nearby LIHTC on change in support for housing bonds using near-near design.

D.2 Results - Using blocks not treated by new LIHTC from 1999-2002 ("Clean" Sample)

	Binary	Proximity	Units	Continuous
LIHTC Project	0.022***	0.019**	0.024**	0.022**
	(0.006)	(0.006)	(0.008)	(0.007)
% Renters	0.014	0.003	0.002	0.022**
	(0.007)	(0.006)	(0.006)	(0.008)
LIHTC x % Renters	−0.032***	−0.029***	−0.044***	−0.033**
	(0.008)	(0.008)	(0.012)	(0.010)
LIHTC FE	Yes	Yes	Yes	Yes
LIHTC SE Clusters	Yes	Yes	Yes	Yes
R^2	0.243	0.242	0.244	0.225
Adj. R^2	0.177	0.176	0.178	0.183
Num. obs.	5527	5527	5527	8649
RMSE	0.478	0.478	0.478	0.470
N Clusters	443	443	443	445

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table D-9: Effect of new, nearby LIHTC on change in support for housing bonds using near-far design, "Clean" sample.

	Binary	Units	Continuous
LIHTC Project	0.026**	0.019*	0.026*
	(0.009)	(0.009)	(0.011)
% Renters	−0.003	−0.021**	−0.006
	(0.010)	(0.007)	(0.014)
LIHTC x % Renters	−0.033*	−0.043***	−0.038*
	(0.014)	(0.012)	(0.018)
CBSA FE	Yes	Yes	Yes
LIHTC SE Clusters	Yes	Yes	Yes
R^2	0.062	0.065	0.065
Adj. R^2	0.054	0.057	0.060
Num. obs.	3647	3647	5602
RMSE	0.522	0.521	0.506
N Clusters	734	734	788

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table D-10: Effect of new, nearby LIHTC on change in support for housing bonds using near-near design, "Clean" sample.

D.3 Treatment Effect Heterogeneity by Price Effects

	Prices decreased		Prices increased	
	Near-far	Near-near	Near-far	Near-near
LIHTC Project	0.017	0.018	0.034^{**}	0.017
	(0.012)	(0.022)	(0.012)	(0.018)
% Renters	0.027	0.008	0.030	−0.013
	(0.014)	(0.026)	(0.015)	(0.023)
LIHTC x % Renters	-0.036^{*}	−0.049	-0.041^{*}	−0.037
	(0.017)	(0.035)	(0.018)	(0.026)
LIHTC FE	Yes	No	Yes	No
CBSA FE	No	Yes	No	Yes
LIHTC SE Clusters	Yes	Yes	Yes	Yes
R^2	0.290	0.098	0.175	0.080
Adj. R^2	0.257	0.087	0.131	0.064
Num. obs.	3068	2150	2604	1604
RMSE	0.451	0.507	0.478	0.479
N Clusters	134	270	129	217

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table D-11: Effect of new, nearby LIHTC on change in support for housing bonds based on continuous rentership model, with positive and negative price effects cut by tercile.

D.4 Gentrification Status Analysis for Renters

	Near-Far			Near-Near	
	Binary	Units	Proximity	Binary	Units
LIHTC Project	0.006	0.003	0.005	−0.006	−0.011
	(0.007)	(0.007)	(0.008)	(0.012)	(0.010)
Gentrifying	−0.000	−0.011	−0.010	−0.039*	−0.042**
	(0.010)	(0.010)	(0.010)	(0.019)	(0.013)
LIHTC x Gentrifying	−0.030**	−0.021	−0.024	−0.015	−0.018
	(0.011)	(0.011)	(0.013)	(0.020)	(0.014)
CBSA FE	Yes	Yes	Yes	Yes	Yes
LIHTC SE Clusters	Yes	Yes	Yes	Yes	Yes
R^2	0.290	0.288	0.290	0.110	0.118
Adj. R^2	0.220	0.219	0.221	0.098	0.105
Num. obs.	2187	2187	2187	1820	1820
RMSE	0.429	0.430	0.429	0.483	0.481
N Clusters	192	192	192	330	330

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table D-12: Effect of new, nearby LIHTC on change in support for housing bonds among renters, treatment interacted with neighborhood gentrification status.

E Multiple Hypothesis Adjustment

Our analysis is built around two hypotheses. The first is that homeowners exposed to new, nearby LIHTC developments will increase their support for funding affordable housing. The second is that renters will have a negative reaction to LIHTC, expressing less support for affordable housing after being treated by new, nearby LIHTC.

To account for these two hypotheses, we use the Holm-Bonferroni correction (Holm 1979), which is a uniformly more powerful, sequential application of the Bonferroni correction (Rice 1989). To implement this adjustment, we order our two hypotheses from lowest to highest based on their maximum p-values (i.e., H_1,..., H_m, where $m = 2$). Next, each p-value is compared to a significance threshold defined by the position of its respective hypothesis (k) and the standard of $\alpha = 0.05$. If $P_k < \frac{\alpha}{(m+1-k)}$, then we reject the null hypothesis and proceed to the next hypothesis. We report all comparisons between p-values and adjusted significance thresholds in Table E-13.

To begin, we organize our hypotheses according to the maximum p-value from the seven models (four "near-far" models and three "near-near" models). The lowest maximum p-value comes from our hypothesis that homeowners would have a positive response to new, nearby LIHTC ("Homeowners > 0"). We compare each p-value from this hypothesis to an adjusted significance threshold based on $P_k < \frac{\alpha}{(2+1-1)}$ or $P_k < 0.025$. In Table E-13, we indicate whether each p-value is less than this adjusted significant threshold. For this hypothesis, 6 out of 7 tests produce p-values below the adjusted significance threshold.

Our second hypothesis is that renters would show a negative response to new, nearby LIHTC ("Renters < 0"). We compare the p-values from the tests of this hypothesis to a new adjusted threshold: $P_k < \frac{\alpha}{(2+1-2)}$ or $P_k < 0.050$. For this hypothesis, 4 out of 7 tests produce p-values below the adjusted significance threshold. Thus, evidence for this hypothesis is less conclusive than that for the previous hypothesis.

All confidence intervals in Figures 4 and 5 in the text are adjusted according to the procedure outlined here.

Table E-13: Significance of Main Results using Holm-Bonferroni-Adjusted Significance Threshold

Hypothesis	Design	Model	p-Value	H-B Threshold	Adjusted Sig.?
Homeowners > 0	Near-Far	Binary	0.000	0.025	✓
Homeowners > 0	Near-Far	Distance	0.001	0.025	✓
Homeowners > 0	Near-Far	Units	0.003	0.025	✓
Homeowners > 0	Near-Far	Continuous	0.003	0.025	✓
Homeowners > 0	Near-Near	Binary	0.004	0.025	✓
Homeowners > 0	Near-Near	Units	0.028	0.025	-
Homeowners > 0	Near-Near	Continuous	0.020	0.025	✓
Renters < 0	Near-Far	Binary	0.045	0.050	✓
Renters < 0	Near-Far	Distance	0.028	0.050	✓
Renters < 0	Near-Far	Units	0.035	0.050	✓
Renters < 0	Near-Far	Continuous	0.055	0.050	-
Renters < 0	Near-Near	Binary	0.205	0.050	-
Renters < 0	Near-Near	Units	0.006	0.050	✓
Renters < 0	Near-Near	Continuous	0.099	0.050	-

F Sensitivity Analysis

F.1 Distance Bands

The following figures show the effects of the “Binary” treatment based on different radii for defining treated blocks versus control blocks. All datasets are based on an outer limit of the control ring set at 600 meters. The radii listed on the x-axis represent the radius of the outer limit of the treated ring, which is also the inner limit of the control ring. As the radius increases, more blocks will be defined as treated and fewer will be defined as control. At some hypothetical radius, the entire treatment effect will be captured, providing the clearest contrast with the control blocks. We believe that radius is 350 meters. However, as shown in these figures, the point estimates are stable across a wide variety of distance band specifications.

Here, all tercile cutpoints are set based on the cutpoints for our preferred distance band specification (350 meters). The cutpoints are $> 67\%$ homeownership rate for homeowner blocks and $< 21\%$ homeownership rate for renter blocks

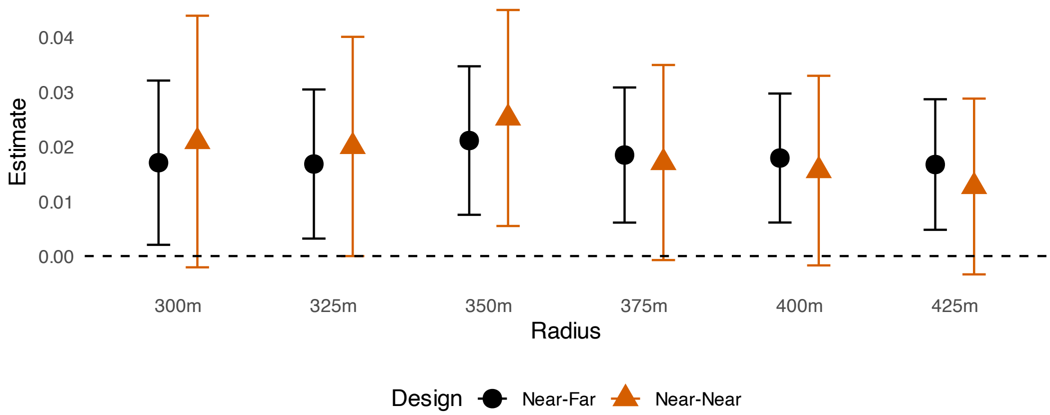

Figure F-3: Sensitivity of results for homeowner blocks across various distance band specifications, including 95%-confidence intervals adjusted for multiple hypothesis testing.

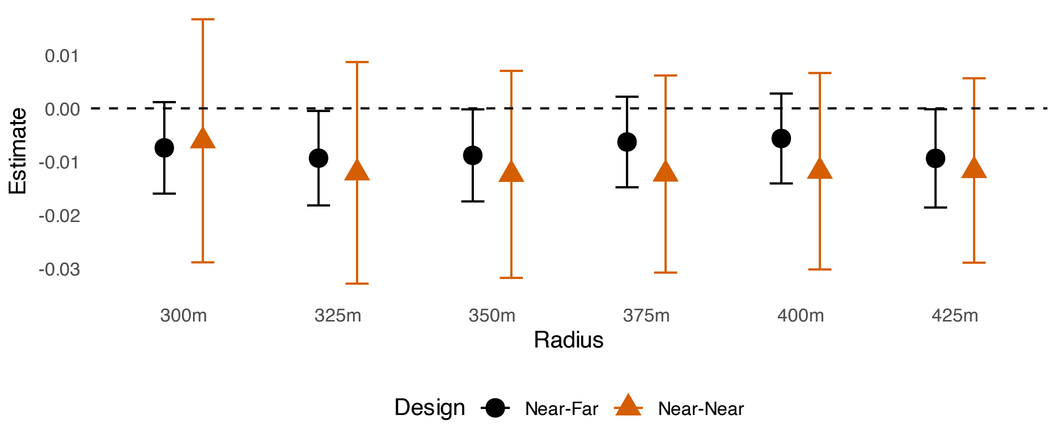

Figure F-4: Sensitivity of results for renter blocks across various distance band specifications, including 95%-confidence intervals adjusted for multiple hypothesis testing.

F.2 Homeownership Cutpoints

For all moderating variables, we categorize blocks based on the tercile cutpoints of the variable among all unique blocks. These cutpoints allow us to define "homeowner blocks" as blocks with homeownership rates of $> 67\%$ and "renter blocks" as blocks with homeownership rates of $< 21\%$ as of 2000 (Figure F-5). Setting the cutpoints for categorizing high and low subgroups strikes a balance between maximizing the homogeneity of the residents within that subgroup while also ensuring that enough units remain in each subgroup to estimate a treatment effect should one exist.

We test the sensitivity of our binary treatment specification to different cutpoints in defining homeowner blocks and renter blocks. Figures F-6 through F-7 show the average treatment effects for the "Binary" treatment for the near-far and near-near designs on homeowner and renter blocks at higher and lower cutpoints. The results are substantively similar at cutpoints ± 10 percentage points for each subgroup and design.

Of note, in many of our model specifications, we drop Census blocks that are neither in the top nor bottom tercile of the homeownership rate. Of the 458 LIHTC developments in our analysis sample, only 12 developments are dropped from the analysis because they solely consists of middle-tercile blocks. Additionally, while some areas have higher homeownership rates overall, 39% of the LIHTC developments have both homeowner and renter blocks within 350 meters. For example, even in the majority renter city of San Francisco, 10 LIHTC developments were constructed from 2003-2006, 6 of which have homeowner blocks within 350 meters.

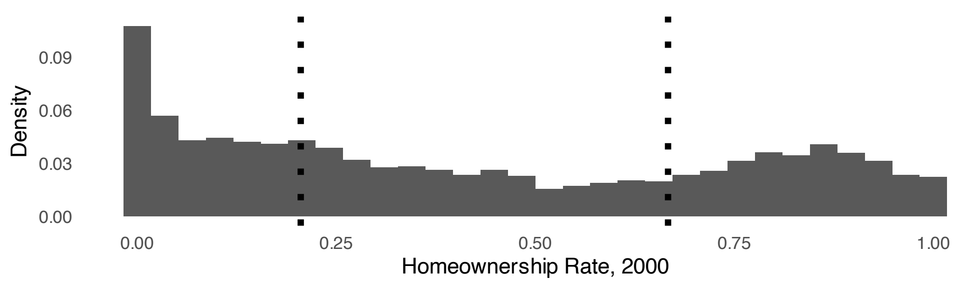

Figure F-5: Histogram of block-level homeownership rate among treated units, weighted by the average number of voters across elections. Tercile cutpoints shown by dashed vertical line.

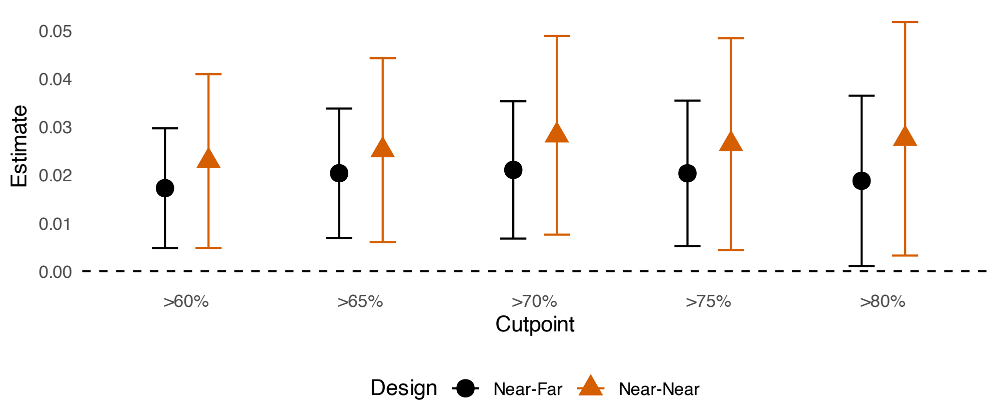

Figure F-6: Sensitivity of results to homeowner cutpoints, including 95%-confidence intervals adjusted for multiple hypothesis testing.

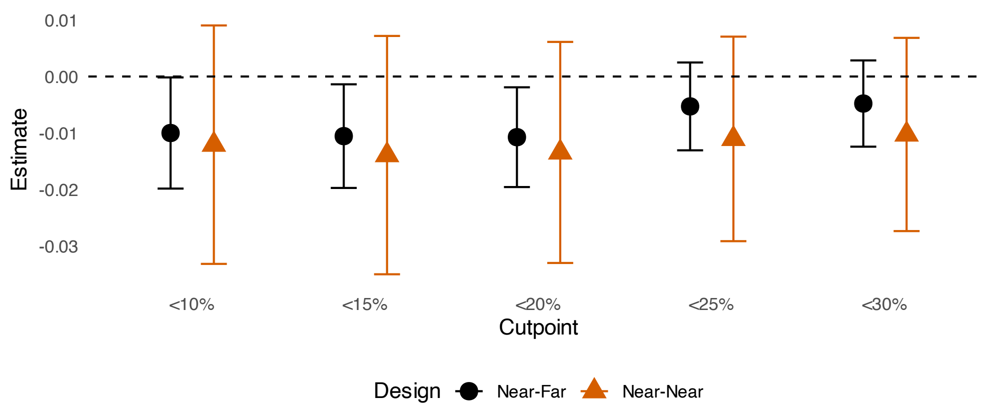

Figure F-7: Sensitivity of results to renter cutpoints, including 95%-confidence intervals adjusted for multiple hypothesis testing.

G Robustness Checks

G.1 Placebo Test

	Binary	Proximity	Units	Continuous
LIHTC Project	0.004	0.002	0.010	0.003
	(0.007)	(0.007)	(0.006)	(0.007)
% Renters	0.016*	0.014*	0.014*	0.016
	(0.007)	(0.006)	(0.006)	(0.008)
LIHTC x % Renters	−0.005	−0.004	−0.004	−0.004
	(0.009)	(0.010)	(0.012)	(0.012)
LIHTC FE	Yes	Yes	Yes	Yes
LIHTC SE Clusters	Yes	Yes	Yes	Yes
R^2	0.254	0.254	0.254	0.241
Adj. R^2	0.191	0.191	0.191	0.201
Num. obs.	5465	5465	5465	8623
RMSE	0.477	0.477	0.476	0.467
N Clusters	423	423	423	431

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table G-14: Effect of new, nearby LIHTC on change in support for housing bonds using near-far design, placebo check with 2007-2010 LIHTC developments.

G.2 Other Block-Level Covariates

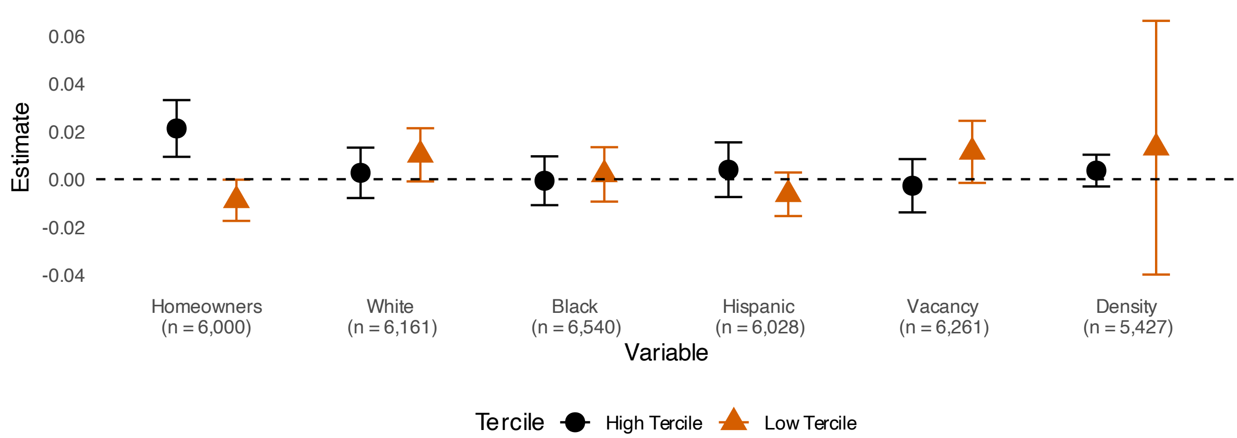

Figure G-8: Treatment effects from the near-far design, using other block-level covariates as binary treatments, including 95%-confidence intervals. These "Homeowners" confidence intervals are not adjusted for multiple hypothesis testing so as to present an equivalent comparison of the treatments across all block-level covariates.

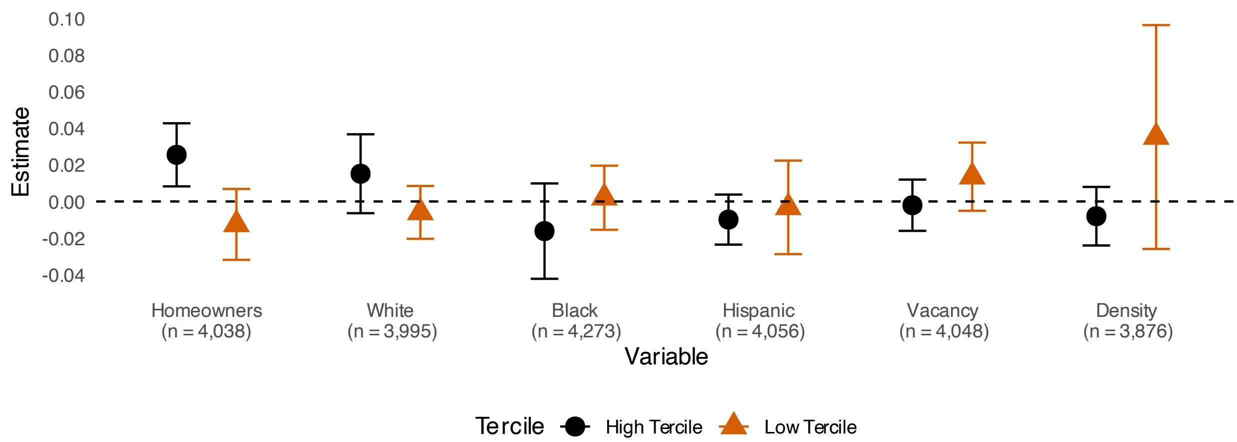

Figure G-9: Treatment effects from the near-near design, using other block-level covariates as binary treatments, including 95%-confidence intervals. These "Homeowners" confidence intervals are not adjusted for multiple hypothesis testing so as to present an equivalent comparison of the treatments across all block-level covariates.

G.3 Middle Tercile of Homeownership

	Near-Far	Near-Far	Near-Far	Near-Near	Near-Near
LIHTC Project (binary)	0.003			−0.007	
	(0.005)			(0.009)	
LIHTC Project (proximity)		0.002			
		(0.005)			
LIHTC Project (units)			−0.004		−0.022*
			(0.006)		(0.009)
LIHTC FE	LIHTC	LIHTC	LIHTC	CBSA	CBSA
LIHTC SE Clusters	Yes	Yes	Yes	Yes	Yes
R^2	0.300	0.300	0.300	0.092	0.096
Adj. R^2	0.212	0.212	0.212	0.079	0.083
Num. obs.	3260	3260	3260	2087	2087
RMSE	0.447	0.447	0.447	0.475	0.474
N Clusters	365	365	365	572	572

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table G-15: Effect of new, nearby LIHTC on change in support for housing bonds using blocks in middle tercile of homeownership.

G.4 Naive Difference in Means

As a validation check, we present a nonparametric difference-in-means estimate of the effect of LIHTC developments by calculating the voter-weighted average change in housing bond support between treated and control blocks. We use the "Binary" approach outlined above, as the sharp cutpoints are most intuitive for a simple difference. Table G-16 shows our dependent variable, the change in support for the housing bonds, as a voter-weighted mean within both the treated and control groups. Starting with homeowner blocks (top row), we find that treated blocks on average increased their support for the housing bonds by 2.8 percentage points whereas control blocks increased their support by 1.2 percentage points. The difference in means between treated and control blocks is 1.7 percentage points, representing our nonparametric estimate of the effect of new LIHTC development on voters in homeowner blocks.

The second row shows the change in support among renter blocks. In contrast to homeowners, the average treated renter block *decreased* support for funding affordable housing by 1.3 percentage points while the average control renter block increased support for funding by 0.1 percentage points. The difference of means between treated and control blocks suggests that renter blocks near new LIHTC development decrease their support for affordable housing by 1.4 percentage points compared to renter blocks farther away. Both the differences for homeowner and renter blocks match our parametric estimates from the near-far design.

	Treated	Control	Difference
Homeowners	0.028	0.012	0.017
	n = 1,096	n = 2,506	
Renters	-0.013	0.001	-0.014
	n = 1,569	n = 2,034	

Table G-16: Nonparametric effect of LIHTC on change in support for housing bonds (2002 to 2006) using near-far design. Sample size reported is the number of Census blocks in each subgroup.

For the near-near design, we again start with our nonparametric difference in means between treated and control units in Table G-17. The sample size of treated blocks in the near-near design is the same as the near-far design because the treated units are the same across both approaches. The near-near design only changes the control group against which the treated units are being compared. That the two different control groups show similar stability in housing bond support from 2002 to 2006 makes us more confident in the analytical strategy.

	Treated	Control	Difference
Homeowners	0.028	0.005	0.023
	n = 1,096	n = 783	
Renters	-0.013	0	-0.013
	n = 1,569	n = 1,409	

Table G-17: Nonparametric effect of LIHTC on change in support for housing bonds (2002 to 2006) using near-near design. Sample size reported is the number of Census blocks in each subgroup.

H Mechanisms

H.1 Price Effects

In Table H-18, we report population-weighted means of key pretreatment characteristics of the LIHTC developments sited from 2003 to 2006 that were in the top tercile of price effects, with nearby home prices increasing by at least 7% ("Prices Increased"), as well as the bottom tercile, where prices decreased by at least 5% ("Prices Decreased"). The unit of analysis is unique blocks within our treated sample.[29] The final column of Table H-18 shows the p-values from two-sided t-tests comparing the two groups.

Broadly speaking, blocks in the bottom tercile look similar to blocks in the top tercile. They have similar homeownership rates, vacancy rates, population densities, and pretreatment levels of support for the 2002 statewide affordable housing bond. The blocks are also almost identical in their racial/ethnic composition, as even the statistically significant difference in percent Black is substantively small ($\sim$3 percentage points). However, these blocks substantively differ in their local economic conditions. Areas where LIHTC decreased home prices had higher median home values in the year 2000 (+17%, $p < 0.001$) as well as higher median household incomes (+5%, $p < 0.05$).

In short, the LIHTC developments in our sample increased property values in areas where the new development may have been more likely to replace blight. In contrast, the developments in our sample decreased property values in more middle-class neighborhoods, where the LIHTC was less likely to replace blight and may have been more associated with negative externalities (e.g., noise and congestion due to higher density housing). These trends align with our expectations as well as other research showing that LIHTC development increases property values in lower-income and distressed neighborhoods (e.g., Diamond and McQuade 2019; Dillman, Horn, and Verrilli 2017).

Table H-18: Summary statistics of treated blocks using pretreatment variables at the block-level, based on LIHTC's effects on nearby housing prices.

Price Effects	Prices Decreased			Prices Increased			
Variable	N	Wt. Mean	Wt. SD	N	Wt. Mean	Wt. SD	Test
% homeowners (2000)	1,113	0.26	0.27	951	0.27	0.3	0.421
% white, non-Hispanic (2000)	1,119	0.22	0.25	959	0.21	0.25	0.33
% Black, non-Hispanic (2000)	1,119	0.11	0.17	959	0.078	0.14	<0.001
% Hispanic (2000)	1,119	0.54	0.32	959	0.56	0.33	0.179
Median household income (2000)	1,090	34,517	16,090	860	32,812	18,925	0.038
Median home value (2000)	1,058	224,448	137,473	811	192,649	103,010	<0.001
% vacant (2000)	1,117	0.051	0.063	959	0.048	0.063	0.239
Density, pop./km-squared (2000)	1,195	12,558	11,721	1,030	12,323	11,201	0.642
% support housing bond (2002)	1,063	0.77	0.15	916	0.77	0.16	0.62
Estimate	1,195	-0.19	0.27	1,030	0.21	0.16	<0.001

H.2 Opinion Change vs. Replacement

We have shown, across a variety of specifications, conceptualizations of treatment, and data subsets, that high-homeownership neighborhoods receiving new LIHTC developments subsequently become

[29] We focus on the treated sample because we are most interested in how the neighborhoods where LIHTC either increased or decreased prices compare to one another, and these are the areas where housing prices were most acutely affected by LIHTC according to the logic of our research design.

more supportive of additional public spending on affordable housing. But our ability to test behavioral outcomes directly is hindered by our inability to observe individual voting decisions. In particular, changes in the composition of the electorate from the pre-treatment to post-treatment periods would threaten the validity of our claims about how new LIHTC development shapes voter preferences. Below we interrogate whether the estimated treatment effects can be attributed to changes in *who* votes.

We first attempt to disentangle *opinion change* — the effect predicted by our theory — from *replacement*, whereby opponents of nearby LIHTC move away from the area and supporters disproportionately move in. First, we derive a decomposition of our dependent variable — change in average support for the bond between 2002 and 2006 — into a weighted sum of opinion change and replacement components. Although we cannot compute these components directly, since we cannot observe the vote choice of people who move in and out a particular area, we can compute bounds on opinion change based on residential churn data and some assumptions about the replacement process. Specifically, the lower bound on opinion change is achieved when the replacement component is at its maximum: that is, when everyone who moves away from a LIHTC-treated area between the two affordable housing bonds opposes the bond and everyone who moves in supports it. Conversely, the upper bound is achieved in the (unlikely) scenario when everyone who moves away supports the bond, and everyone who moves in opposes it.

Decomposition of the dependent variable. Our dependent variable, the change in the proportion of voters in a block who supported the bond from 2002 to 2006, can be decomposed as follows:

$$\begin{aligned}
\Delta_{2006,2002} &= \overbrace{\frac{1}{N_{06}}\sum_{i=1}^{N_{06}} \mathbb{1}(Vote_{i,2006}=Yes)}^{\text{prop. support in 2006}} - \overbrace{\frac{1}{N_{02}}\sum_{i=1}^{N_{02}} \mathbb{1}(Vote_{i,2002}=Yes)}^{\text{prop. support in 2002}} = \\
&\underbrace{\left[\frac{n_B}{N_{06}}\frac{1}{n_B}\sum_{i=1}^{n_B} \mathbb{1}(Vote_{i,2006}=Yes) + \frac{n_{06}}{N_{06}}\frac{1}{n_{06}}\sum_{i=1}^{n_{06}} \mathbb{1}(Vote_{i,2006}=Yes)\right]}_{\text{prop. support in 2006}} - \\
&\underbrace{\left[\frac{n_B}{N_{02}}\frac{1}{n_B}\sum_{i=1}^{n_B} \mathbb{1}(Vote_{i,2002}=Yes) + \frac{n_{02}}{N_{02}}\frac{1}{n_{02}}\sum_{i=1}^{n_{02}} \mathbb{1}(Vote_{i,2002}=Yes)\right]}_{\text{prop. support in 2002}}
\end{aligned} \tag{4}$$

where we have divided the total voting population into three types:

- Voters who were there (in the block) in both 2002 and 2006, of whom there are n_B
- Voters who were there in 2002 and left before 2006, of whom there are n_{02}
- Voters who were not there in 2002 and moved in by 2006, of whom there are n_{06}

And we have N_{02} as the total number of voters in the 2002 election as well as N_{06} as the total number of voters in the 2006 election, giving us:

- $N_{02} = n_B + n_{02}$

- $N_{06} = n_B + n_{06}$

Rearranging Equation 4:

$$\Delta_{2006,2002} = \overbrace{\left[\frac{n_B}{N_{06}}\frac{1}{n_B}\sum_{i=1}^{n_B}\mathbb{1}(Vote_{i,2006} = Yes) - \frac{n_B}{N_{02}}\frac{1}{n_B}\sum_{i=1}^{n_B}\mathbb{1}(Vote_{i,2002} = Yes)\right]}^{\text{part due to opinion change}} + \underbrace{\left[\frac{n_{06}}{N_{06}}\frac{1}{n_{06}}\sum_{i=1}^{n_{06}}\mathbb{1}(Vote_{i,2006} = Yes) - \frac{n_{02}}{N_{02}}\frac{1}{n_{02}}\sum_{i=1}^{n_{02}}\mathbb{1}(Vote_{i,2002} = Yes)\right]}_{\text{part due to replacement}} \tag{5}$$

We can write this more compactly as:

$$\Delta_{2006,2002} = \underbrace{\left(\frac{n_B}{N_{06}}\bar{x}_{B,2006} - \frac{n_B}{N_{02}}\bar{x}_{B,2002}\right)}_{\text{opinion change}} + \underbrace{\left(\frac{n_{06}}{N_{06}}\bar{x}_{06,2006} - \frac{n_{02}}{N_{02}}\bar{x}_{02,2002}\right)}_{\text{replacement}} \tag{6}$$

where:

- $\bar{x}_{B,2006}$ is the proportion of voters who were in the block in both 2002 and 2006 who supported the bond in 2006
- $\bar{x}_{B,2002}$ is the proportion of voters who were in the block in both 2002 and 2006 who supported the bond in 2002
- $\bar{x}_{06,2006}$ is the proportion of voters who moved in between 2002 and 2006 who supported the bond in 2006
- $\bar{x}_{02,2002}$ is the proportion of voters who moved out between 2002 and 2006 who supported the bond in 2002

Rearranging, we can isolate opinion change as:

$$\text{opinion change} = \Delta_{2006,2002} - \underbrace{\left(\frac{n_{06}}{N_{06}}\bar{x}_{06,2006} - \frac{n_{02}}{N_{02}}\bar{x}_{02,2002}\right)}_{\text{replacement}} \tag{7}$$

Computing bounds on opinion change. We assume that in control blocks, there is no differential residential turnover, so that $\bar{x}_{B,2006} = \bar{x}_{B,2002} = \bar{x}_{06,2006} = \bar{x}_{02,2002}$. For treatment blocks, the lower bound on opinion change is achieved when the replacement component is at its maximum, which is when $\bar{x}_{06,2006} = 1$ and $\bar{x}_{02,2002} = 0$. Then, opinion change is:

$$\min(\text{opinion change}) = \Delta_{2006,2002} - \frac{n_{06}}{N_{06}} \tag{8}$$

Conversely, the upper bound is achieved when $\bar{x}_{06,2006} = 0$ and $\bar{x}_{02,2002} = 1$. Then, opinion change is:

$$\max(\text{opinion change}) = \Delta_{2006,2002} + \frac{n_{02}}{N_{02}} \tag{9}$$

It is also possible to consider any combination of intermediate values for $\bar{x}_{02,2002} \in [0,1]$ and $\bar{x}_{06,2006} \in [0,1]$. This is what we do in Figures H-10 and H-11. Here, we plot treatment effect estimates from our near-far and near-near designs, respectively, where the dependent variable is opinion change computed using Equation 7 above with different values of $\bar{x}_{02,2002}$ and $\bar{x}_{06,2006}$. For clarity of presentation, we focus on the binary definition of treatment and on homeowner blocks.

To compute these estimates, we require block-level estimates of n_{06} and N_{06}. We measure N_{06} as the number of voters in the 2006 election. We estimate n_{06} as the number of transactions recorded in the block in the years 2003 through 2006, inclusive,[30] multiplied by the number of adults per household,[31] multiplied by the statewide voter turnout rate in the 2006 election.[32]

The left-most estimate of the effect of nearby LIHTC on opinion change under the near-far approach, achieved when $\bar{x}_{02,2002}$ is 1 and $\bar{x}_{06,2006}$ is 0, represents the upper bound on this effect, 0.16; at the other end, the lower bound is -0.09. The estimated opinion change effect is approximately zero when 62% of voters who leave the block oppose the bond, while 62% of voters who move in support it, representing a total 24 percentage point gap between those who move out and those who move in. Note that $\bar{x}_{02,2002}$ and $\bar{x}_{06,2006}$ need not sum to 1. We choose symmetric values only so that we can visualize the upper and lower bounds, and for general ease of interpretation. Results are very similar under the near-near approach: the opinion change effect is approximately zero when 64% of voters who leave the block oppose the bond and 64% of those who move in support it, representing a 28 percentage point difference.

[30] Since our elections of interest took place in November 2002 and November 2006, this gives us a close enough estimate of residential turnover between the two elections.

[31] Measured at the tract level in the 2010 Decennial Census.

[32] The 2006 turnout rate in California was 39.29%.

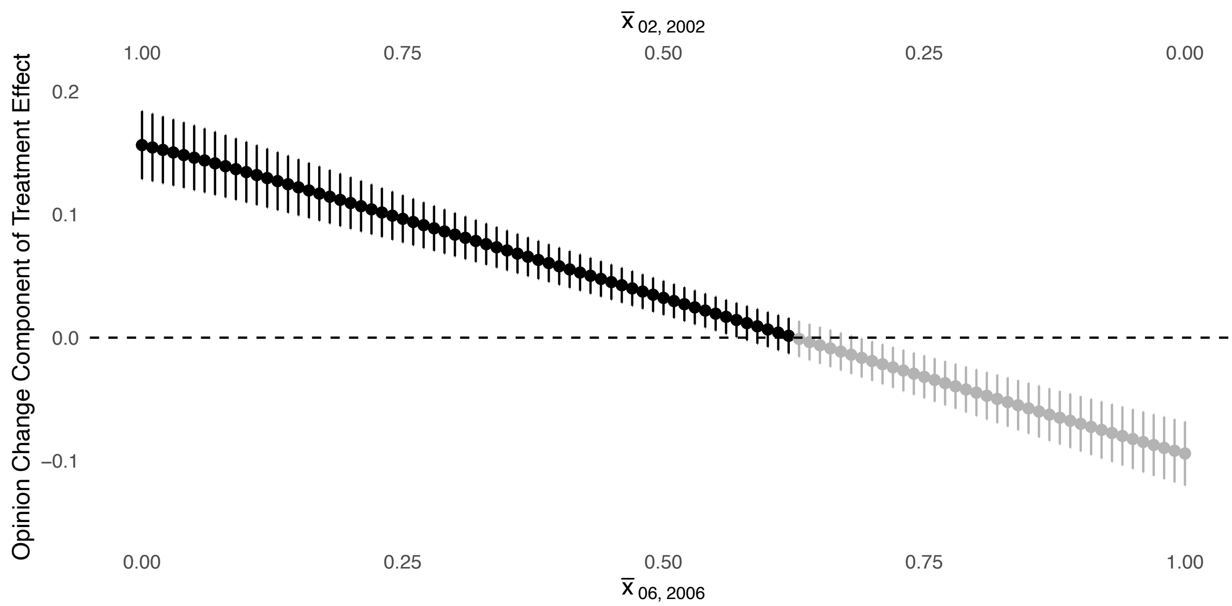

Figure H-10: Treatment effects of nearby LIHTC on opinion change, as implied by assumptions on differential churn given by upper and lower x-axes. The x-axis at top of figure represents the proportion of voters who moved out of the block between 2002 and 2006 that is assumed to have supported the bond in 2002. The x-axis at bottom represents the proportion of voters who moved into the block between 2002 and 2006 that is assumed to have supported the bond in 2006. Estimates are generated using the regression model that produces our main results for homeowner blocks, near-far analysis, with binary treatment (the specification for column 1 of Table D-7), but here the dependent variable is not total change in support for the bond but rather the change in support due only to opinion change, under the corresponding assumptions.

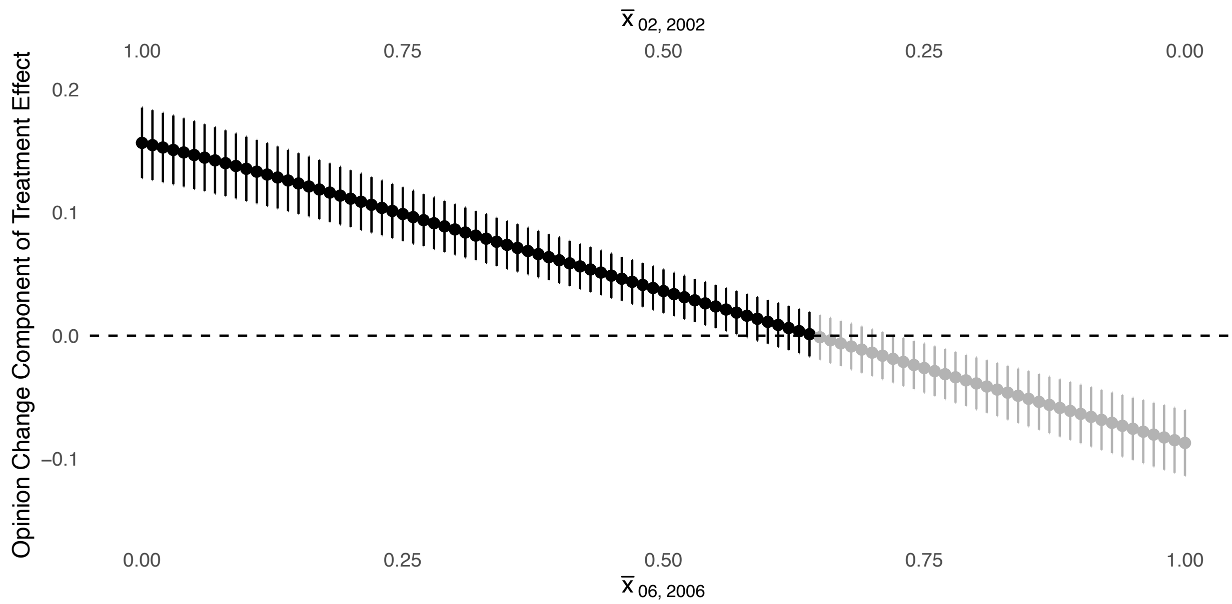

Figure H-11: Treatment effects of nearby LIHTC on opinion change, as implied by assumptions on differential churn given by upper and lower x-axes. The x-axis at top of figure represents the proportion of voters who moved out of the block between 2002 and 2006 that is assumed to have supported the bond in 2002. The x-axis at bottom represents the proportion of voters who moved into the block between 2002 and 2006 that is assumed to have supported the bond in 2006. Estimates are generated using the regression model that produces our main results for homeowner blocks, near-near analysis, with binary treatment (the specification for column 1 of Table D-8), but here the dependent variable is not total change in support for the bond but rather the change in support due only to opinion change, under the corresponding assumptions.

H.3 Turnout

Mobilization could be driving our effects if the new LIHTC development increased or decreased voter turnout. The first question is whether we see differential voter turnout across elections in treated blocks versus control blocks. The CA Statewide Database records both the total number of voters who turned out in each election and the total number of registered voters at the block level.

Figures H-12 and H-13 show the estimated effect of a LIHTC development on the change in block-level turnout using the standard array of models with our near-far and near-near designs, respectively. Point estimates are small and never statistically significant, making it unlikely that turnout is behind our effect.

We also assess effects on turnout using a 2007 California voter file. This approach not only allows us to avoid the problems of ecological inference (at least for turnout), but it allows us to subset to voters who we know were registered at an address within 600 meters of a future LIHTC development prior to the 2002 election. In other words, we are able to study precisely those who are experiencing the advent of LIHTC as a treatment rather than those selecting into the neighborhood after the affordable housing has been built.

To use the voter file data, we geocode all voters who were registered to vote prior to the 2002 general election within 600 meters of our LIHTC treatments. We then assign voters a treatment status according to our near-far and near-near designs. Voters are assigned homeownership terciles according to their block's homeownership rate using the 2000 Census data and the cutpoints used throughout this analysis.[33] We then use the same OLS models as with our block-level outcomes.

Unlike our block-level estimates, we see consistent negative and statistically significant effects of LIHTC development on voter turnout (Tables H-19 and H-20). Using the near-far design, voters in homeowner blocks are 2 percentage points less likely to turnout in the 2006 general election compared to 2002. The interaction with voters in renter blocks shows a substantively large and generally statistically significant effect, one which counters the negative point estimates among homeowner blocks. This is evidence that the negative effect of affordable housing on turnout is concentrated in blocks comprising more than 2/3 homeowners. The near-near design shows larger negative effects among homeowners, but with less precision. Here the renter interaction is still positive but not large enough to counter the negative homeowner effect. While voter turnout shows more inconsistency between the near-far and near-near design than the rest of our analyses, the body of evidence suggests that this negative effect on turnout is real among voters who were registered to nearby addresses prior to the 2002 election.

[33]This assignment of homeownership tercile based on Census block implies that even this analysis requires some degree of ecological inference.

H.3.1 Turnout Analysis Using Block Data

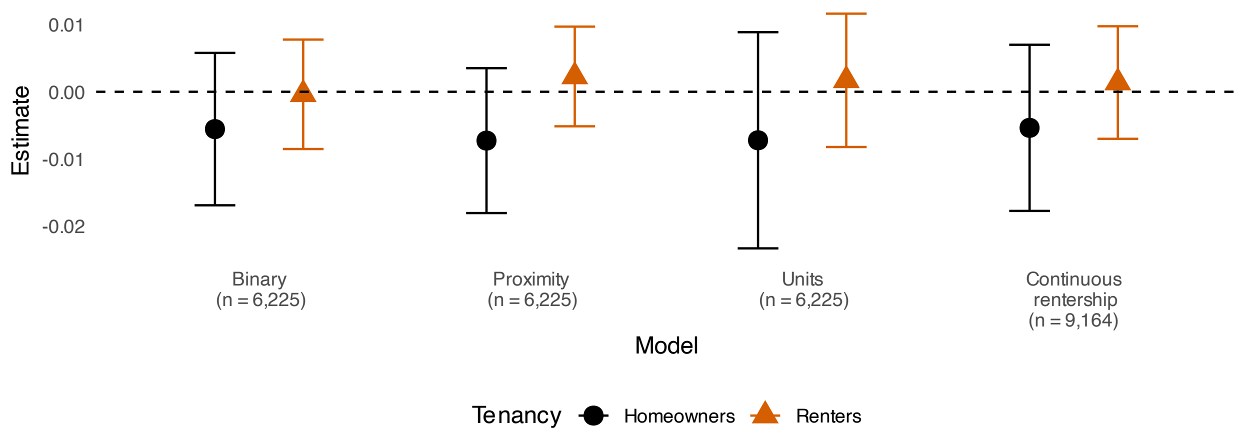

Figure H-12: Results from the near-far design on change in block-level voter turnout, including 95%-confidence intervals.

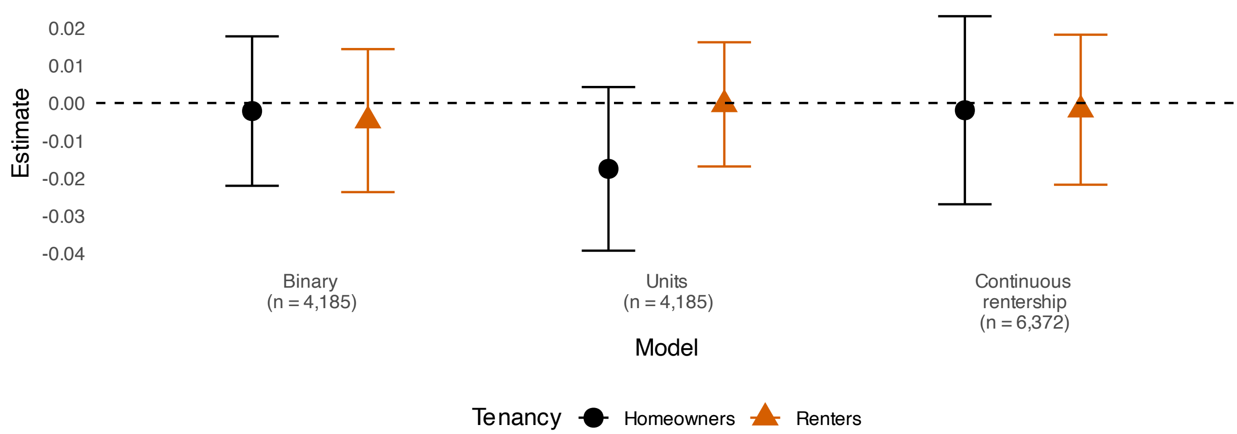

Figure H-13: Results from the near-near design on change in block-level voter turnout, including 95%-confidence intervals.

H.3.2 Turnout Analysis Using Voter File Data

	All	Clean
LIHTC Project	-0.019^{***}	-0.021^{***}
	(0.005)	(0.005)
Renter Blocks	-0.021^{*}	-0.023^{**}
	(0.008)	(0.009)
LIHTC x Renter Blocks	0.016^{*}	0.017^{*}
	(0.007)	(0.009)
LIHTC FE	Yes	Yes
LIHTC SE Clusters	Yes	Yes
R^2	0.197	0.190
Adj. R^2	0.194	0.187
Num. obs.	136416	121908
RMSE	0.514	0.511
N Clusters	456	456

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table H-19: Near-Far Design with Homeownership, DV = Voted in 2006 − Voted in 2002

	All	Clean
LIHTC Project	-0.047^{*}	-0.052^{*}
	(0.023)	(0.023)
Renter Blocks	0.042^{*}	0.039
	(0.021)	(0.023)
LIHTC x Renter Blocks	0.021	0.025
	(0.030)	(0.033)
CBSA FE	Yes	Yes
LIHTC SE Clusters	Yes	Yes
R^2	0.135	0.122
Adj. R^2	0.134	0.122
Num. obs.	90941	79453
RMSE	0.545	0.543
N Clusters	843	824

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table H-20: Near-Near Design with Homeownership, DV = Voted in 2006 − Voted in 2002

H.4 Roll-Off

Roll-off is a second mechanism that could be behind our treatment effects. Along with federal, state and local races, the 2002 California ballot had seven propositions on it. 2006 had thirteen. Consequently, the voter-weighted average roll-off from turning out to vote for the housing bonds in the 2002 and 2006 elections was 21% and 20%, respectively. Despite this consistently high roll-off rate, it is possible that local LIHTC construction could have mobilized nearby individuals to cast a vote on those down-ballot bonds — an effect that would not be detectable simply by examining turnout (i.e., whether an individual voted in the elections at all). Using data on the number of votes for each housing bond divided by the total number of votes at the block level, we find null effects with the exception of one model: the near-near design with a binary treatment (Figures H-14 and H-15). However, because of the inconsistency in size and direction of the effects, we are not convinced that our results are explained by differential roll-off between treated and control blocks.

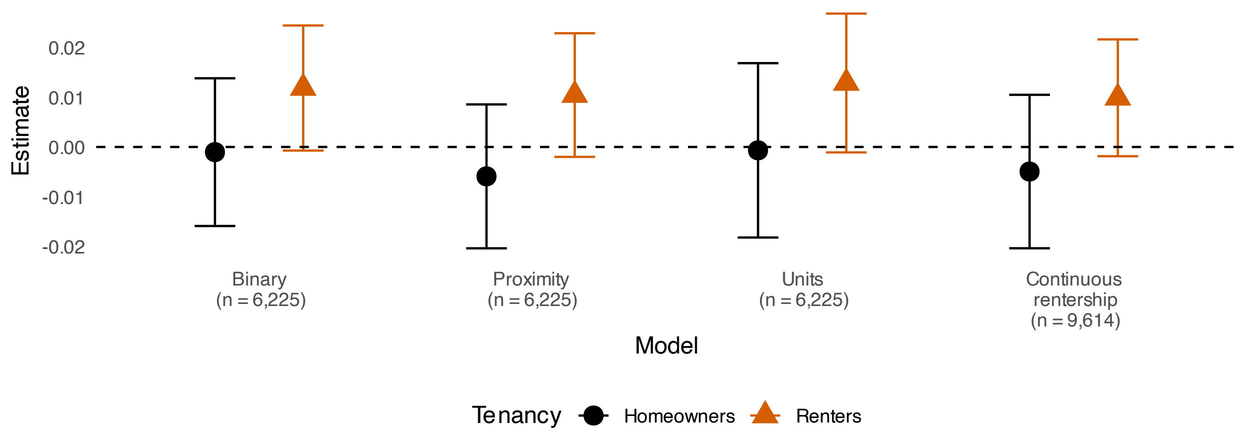

Figure H-14: Results from the near-far design on change in block-level voter roll-off, including 95%-confidence intervals.

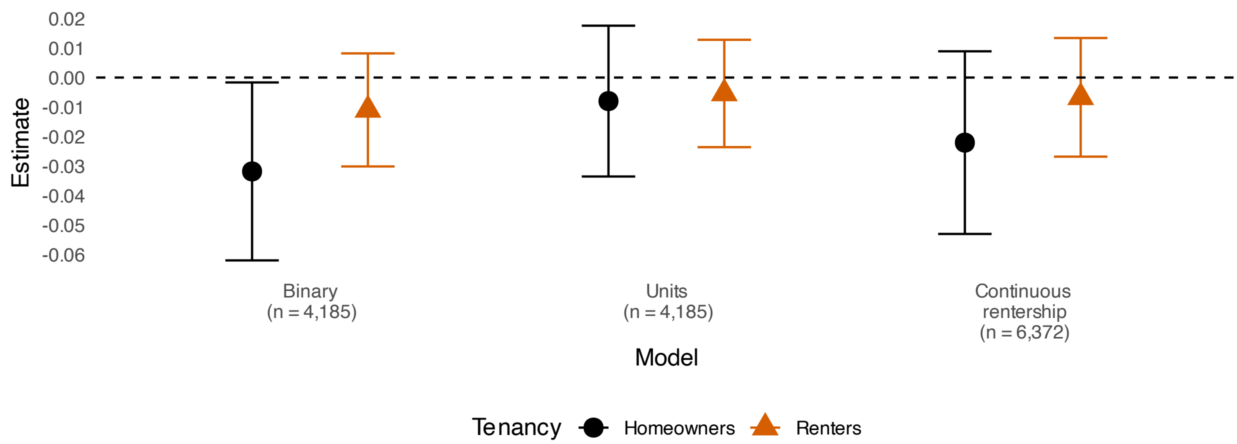

Figure H-15: Results from the near-near design on change in block-level voter roll-off, including 95%-confidence intervals.

H.5 Gentrification and Homeowners

Using the same approach as we did for renters, we identify homeowner blocks which were gentrifying from 1990 to 2000, prior to the 2002 election. But whereas renter blocks show a clear and consistent pattern, gentrification status does not moderate the treatment effect of LIHTC on homeowner support for the housing bonds. That gentrification exclusively plays a role in renter blocks makes us more confident that the negative treatment effect of LIHTC on renter support is driven by concerns about rising housing costs.

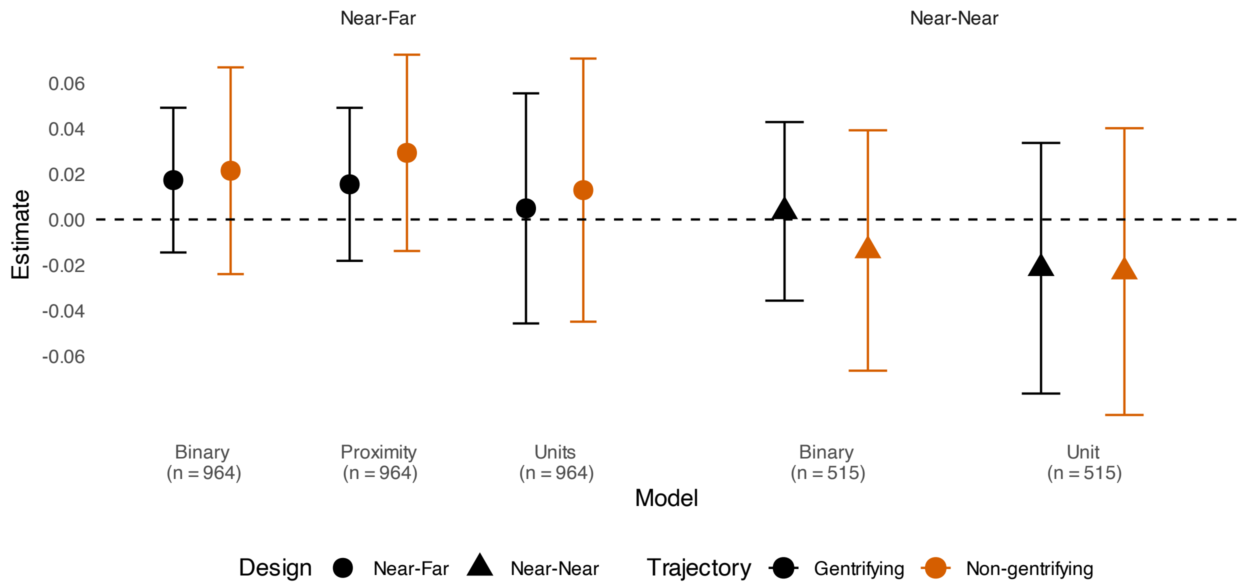

Figure H-16: Results for homeowners and gentrification analysis, including 95%-confidence intervals adjusted for multiple hypothesis testing.

H.6 Rent Control

As of 2006, the following 14 California cities had some form of strict rent control: Berkeley, Beverly Hills, Cotati, East Palo Alto, Hayward, Los Angeles, Los Gatos, Oakland, Palm Springs, San Francisco, San Jose, Santa Monica, Thousand Oaks, and West Hollywood. If new LIHTC development raises concerns about gentrification and displacement among renters, then we would expect the protections provided by rent control to mitigate some of these concerns. In other words, LIHTC in cities with rent control may not decrease renters' support for the affordable housing bond.

Unfortunately, of these cities with rent control, only 12 cities appear in our dataset, leaving an independent analysis of rent control cities underpowered. However, we can replicate our main results from Figures 4 and 5 using blocks from the 277 cities that *did not* have rent control in 2006. If rent control insulates renters from the negative effects of new LIHTC development, then we should see larger negative treatment effects among renters in cities without rent control.

Figure H-17 shows the effect of new, nearby LIHTC development on the change in support for the affordable housing bond using the near-far design. This sample only includes cities without rent control and includes with the same adjustment for multiple hypothesis testing as in Figure 4. Figure H-18 shows the results using the near-near design using only cities without rent control. The effects on renter blocks appear to be larger in magnitude compared to the full data. Rather than a 1 to 2 percentage point decrease in support for the bond (Figures 4 and 5), new LIHTC in cities without rent control decreases support for the affordable housing bond in renter blocks by 2 to 3 percentage points. Notably, the effects of nearby LIHTC on homeowner blocks in these cities is unchanged compared to Figures 4 and 5, suggesting that the moderating effect of rent control only shapes renter political behavior.

Due to insufficient data from cities with rent control, we cannot conduct a statistical test of the moderating effect of rent control on renter responsiveness to new LIHTC development. However, these exploratory analyses support the theory that renters' backlash towards LIHTC may be due to their concerns about housing instability. At the very least, the analyses suggest that theory generation about housing attitudes should be observed within the broader ecosystem of housing policies, including rent control, property taxes, etc.

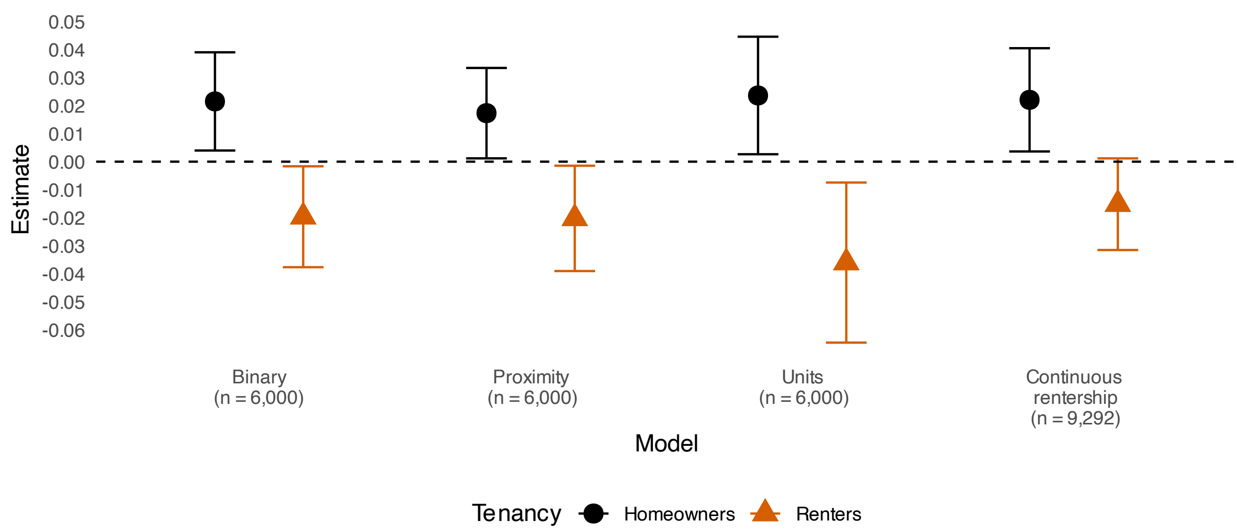

Figure H-17: Results from the near-far design among cities without rent control, including 95%-confidence intervals adjusted for multiple hypothesis testing.

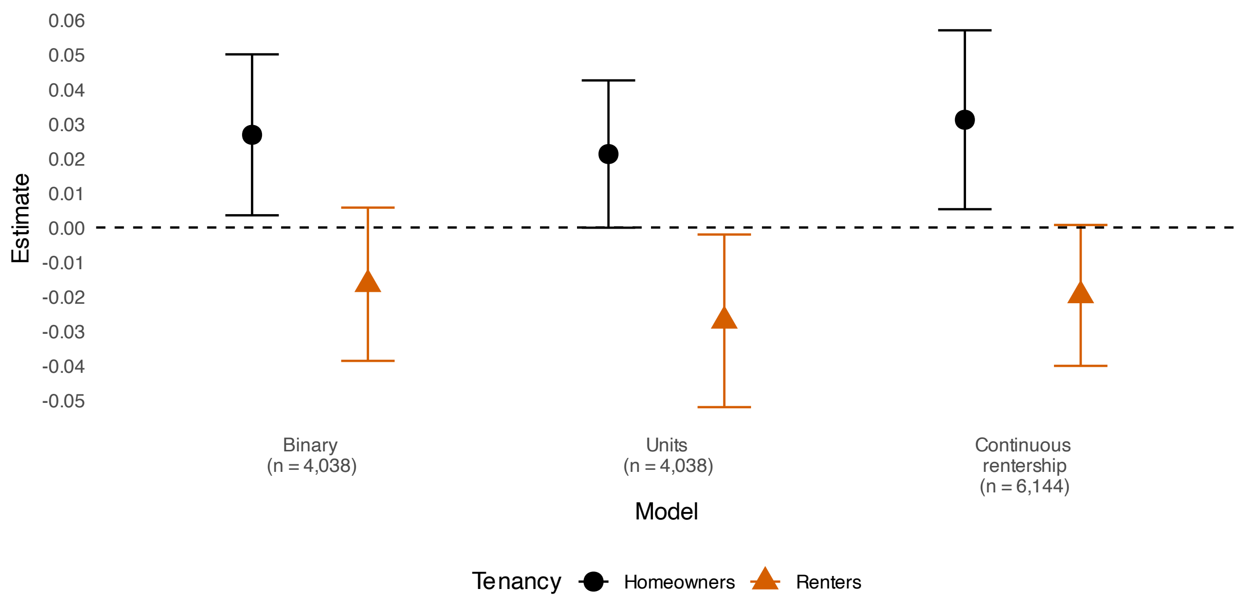

Figure H-18: Results from the near-near design among cities without rent control, including 95%-confidence intervals adjusted for multiple hypothesis testing.

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