The Effects of Rent Control Expansion on Tenants, Landlords, and Inequality: Evidence from San Francisco

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Online Appendix

Table A1: Race of Tenants in Multi-Family Residence ($2-4$ Units)

Predicted Race	(1) Freq.	(2) Share	(3) Avg. Racial Probability	(4) 1990 SF Overall
White	28771	75.01%	0.95	57.36%
Black	537	1.40%	0.93	7.72%
Hispanic	3144	8.20%	0.95	14.18%
Asian	5902	15.39%	0.98	20.16%
Other	.	.	.	0.59%
Total	38354	100%	0.95	100%

Notes: Sample consists of all tenants between 20 and 65 years old living in San Francisco as of December 31, 1993 and in multi-family residences with $2-4$ units that were built during $1900-1990$. Table shows the racial distribution for the 38354 tenants with a classified race/ethnicity. In addition, 8009 tenants are not assigned a race, corresponding to 17.27% of our sample of tenants. They are not assigned a predicted race because their maximum racial probability from the set of predicted racial probabilities for all ethnic categories is below 0.8, following the procedure detailed in section 3.2. Columns 1 and 2 report the number of tenants and the share of the sample by predicted race. Column 3 reports the average final racial probability by predicted racial categories. Column 4 reports the share of tenants in San Francisco between 20 and 65 years old who were living in small multi-family residences by racial/ethnic categories according to the 1990 U.S. Census. The category "Other" refers to all other racial/ethnic categories from the Census which include non-hispanic American Indian and Alaska Native, and non-hispanic Multi-racial.

Table A2: Prediction of 2010 Census Block Racial Distribution using Racial Classification

	(1) Share White	(2) Share Black	(3) Share Hispanic	(4) Share Asian
White	0.385	-0.199	-0.123	-0.064
	(0.010)	(0.004)	(0.006)	(0.008)
Hispanic	0.089	-0.178	0.071	0.021
	(0.011)	(0.004)	(0.007)	(0.009)
Asian	0.133	-0.199	-0.111	0.180
	(0.011)	(0.004)	(0.007)	(0.008)
R^2	0.212	0.062	0.129	0.189
Observations	36656	36656	36656	36656

Notes: Sample consists of all tenants with a classified race/ethnicity between 20 and 65 years old living in San Francisco as of December 31, 1993 and in multi-family residences with $2-4$ units that were built during $1900-1990$. We geocode the 2010 addresses of tenants in our sample to the census block level. The dependent variable is share of white, black, hispanic or asian population in the census block that contains a tenant's 2010 address. The independent variable is a tenant's racial classification. black is the omitted category.

Table A3: Treatment Effect on Parcel Level Average Income for Multi-Family Residence (2-4 Units)

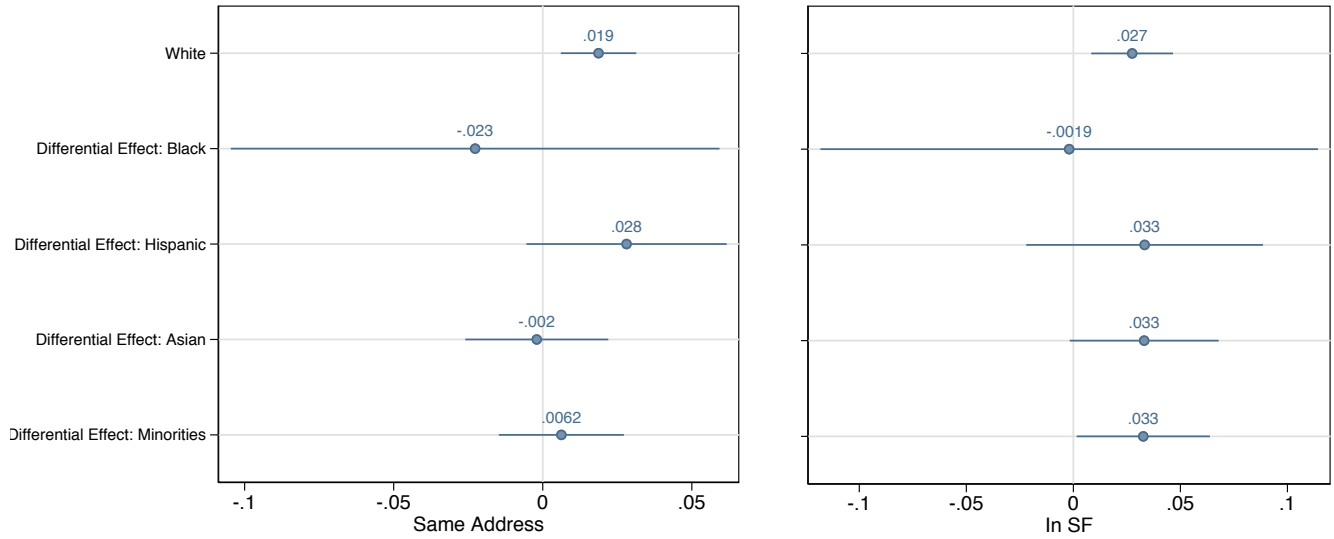
	(1) Per Capita Income
Treat	1292
	(522)
Constant	53084
	(514)
Control Mean	45703
Control S.D.	22071
R^2	0.398
Observations	24271

Notes: Table reports parcel level regression for the 2015 cross-section of parcels in San Francisco that we can match people living there. We further restricts to parcels that we can match someone living there before 1994. The dependent variable is the average per capita income across individuals living in each parcel. Per capita income is measured in 2010 dollars in the census block group of each individual's 2010 address. Regression includes zipcode fixed effects. Robust standard errors are reported.

Figure A1: Heterogeneity by Tenant's Race in Tenant Treatment Effect, Full Renter Sample

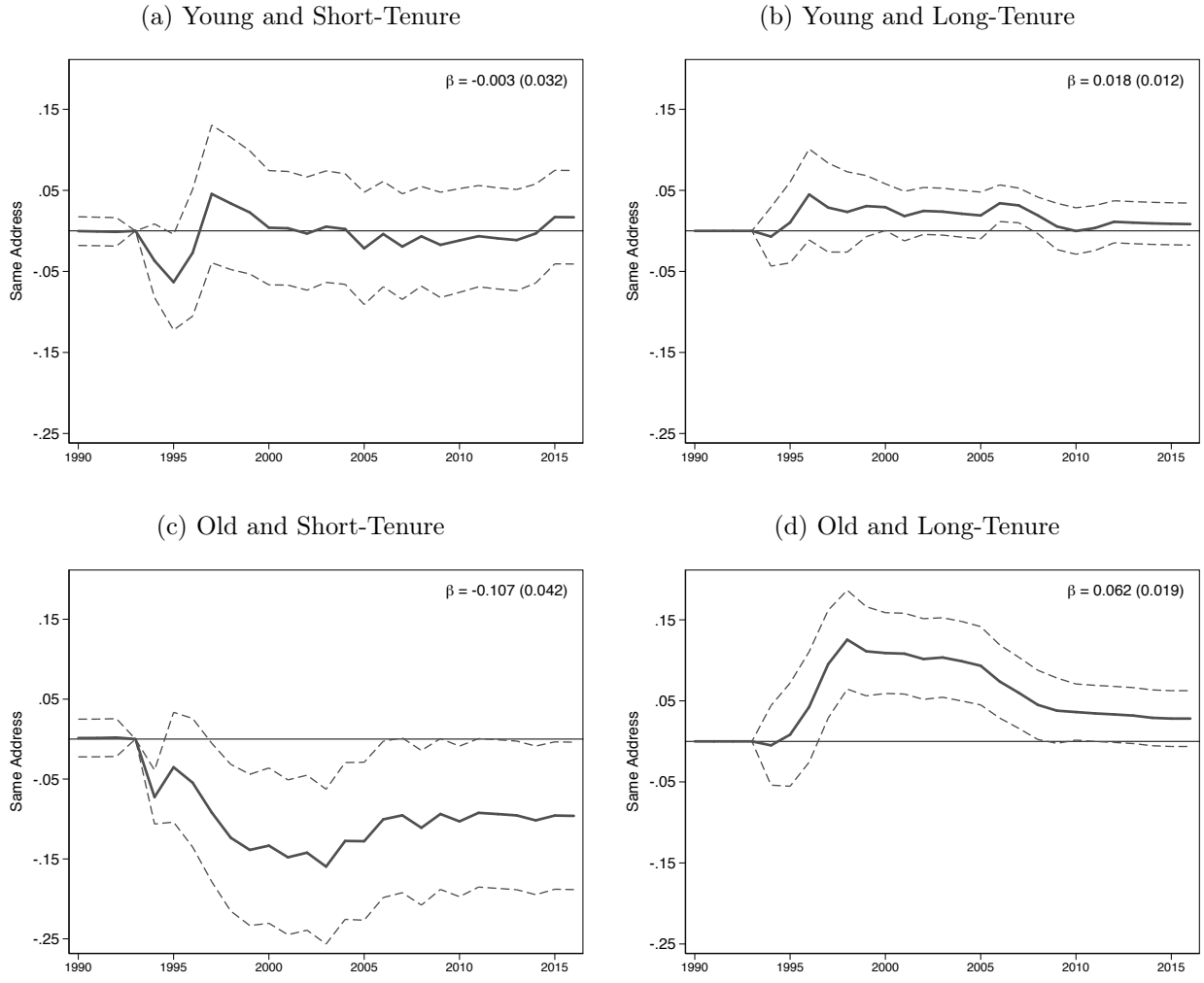
(a) Staying at Same Address

(b) Staying in San Francisco



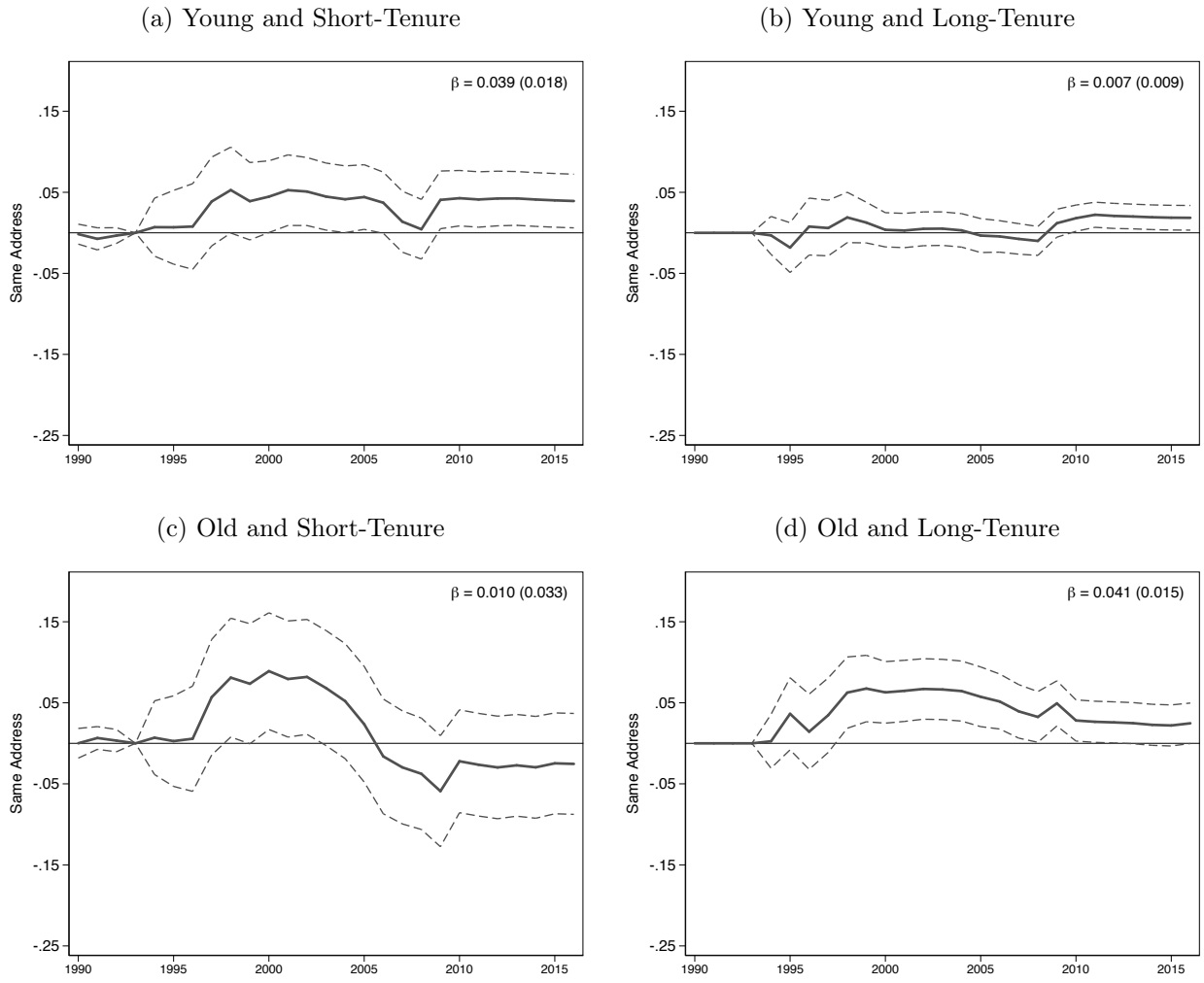
Notes: Sample consists of all tenants with between 20 and 65 years old living in San Francisco as of December 31, 1993 and in multi-family residences with $2-4$ units that were built during $1900-1990$. For each tenant, we assign a racial/ethnic category that has the maximum racial probability from the set of predicted racial probabilities. For white tenants, we report the average treatment effect in the post-1994 period along with 90% CI. For the other ethnic categories, we report the differential treatment effect in the post-1994 period between white and each ethnic category along with 90% CI. Minorities consist of all ethnic groups other than white. Standard errors are clustered at the person level.

Figure A2: Heterogeneity by Age and Tenure in Treatment Effect of Staying at Same Address within Neighborhoods with High House Price Appreciation



Notes: Sample consists of all tenants between 20 and 65 years old living in San Francisco as of December 31, 1993 and in multi-family residences with $2-4$ units that were built during $1900-1990$. We first divide individuals into two groups by whether their 1993 zipcode experienced above or below median house price appreciation during $1990-2000$, and restrict our sample to individuals living in zipcodes that experienced high appreciation. We further sort the sample by age group. The young group refers to residents who were aged $20-39$ in 1993 and the old group are residents who were aged $40-65$ in 1993. Finally, we cut the data by number of years the individual has been living at their 1993 address. We define a "long-tenure" group of individuals who had been living at their 1993 address for greater than or equal to four years and a "short-tenure" group of individuals who had been living at their address for less than four years. The treatment effects along with 90% CI are plotted. Standard errors are clustered at the person level. The average treatment effects in the post-1994 period and their standard errors are reported in the upper-right corner.

Figure A3: Heterogeneity by Age and Tenure in Treatment Effect of Staying at Same Address within Neighborhoods with Low House Price Appreciation



Notes: Sample consists of all tenants between 20 and 65 years old living in San Francisco as of December 31, 1993 and in multi-family residences with $2-4$ units that were built during $1900-1990$. We first divide individuals into two groups by whether their 1993 zipcode experienced above or below median house price appreciation during $1990-2000$, and restrict our sample to individuals living in zipcodes that experienced low appreciation. We further sort the sample by age group. The young group refers to residents who were aged $20-39$ in 1993 and the old group are residents who were aged $40-65$ in 1993. Finally, we cut the data by number of years the individual has been living at their 1993 address. We define a "long-tenure" group of individuals who had been living at their 1993 address for greater than or equal to four years and a "short-tenure" group of individuals who had been living at their address for less than four years. The treatment effects along with 90% CI are plotted. Standard errors are clustered at the person level. The average treatment effects in the post-1994 period and their standard errors are reported in the upper-right corner.

Data Appendix

Variable name	Equations and tables/figures using this variable	Exact definition of variable	Data sources for these inputs	Conceptual use of this variable
Population/average population 1990–1994	Table 1.B, 7, Figure 7 Panel A	population living at a parcel divided by the average population living there during 1990-1994	To measure population in a parcel, we match each Infutor panelist's addresses to their offcial parcel numbers from the San Francisco Assessor's. The parcel numbers are from the Secured Roll data, provided by San Francisco Planning Office.	Measure the change in residential population in the treatment group versus the control group, as evidence for landlords redeveloped or converted their properties so as to exempt them from rent control. See p3388 "We estimate a decline of approximately 6.4 percent over the long run, although this effect is not statistically significant."
Renters/average population 1990–1994	Table 1.B, 7, Figure 7 Panel B	number of renters living at a parcel divided by the average population living there during 1990-1994	To measure population in a parcel, same source as above. To measure number of renters in a parcel, we link Infutor addresses to property records provided by DataQuick. For each property, DataQuick details its transaction history since 1988, including transaction prices, as well as the buyer and seller names. By comparing last names in Infutor to the listed owners of the property in DataQuick, we are able to distinguish owners from renters.	Measure the change in the supply of rentals in the treatment group versus the control group, as evidence for landlords redeveloped or converted their properties so as to exempt them from rent control. See p3388 "we find that there is a significant decline in the number of renters living at a parcel, equal to 14.5 percent in the late 2000s, relative to the 1990–1994 level", and 15 percent (rounded) reduction in rental housing supplies quoted in introduction and conclusion.
Owners/average population 1990–1994	Table 1.B, 7, Figure 7 Panel C	number of owners living at a parcel divided by the average population living there during 1990-1994	Same source as above	Measure the change in owner population in the treatment group versus the control group, as evidence for landlords redeveloped or converted their properties so as to exempt them from rent control. See p3388 "the decline in renters was counterbalanced by an increase of 8.1 percent in the number of owners in the late 2000s."
Renters in redeveloped buildings/average population, 1990–1994	Table 1.B, 7, Figure 8 panel B	number of renters living at a parcel with a redeveloped building divided by the average population living there during 1990-1994; These redevelopment activities include tearing down the existing structure and putting up new single family, condominium, or multi-family housing or simply converting the existing structure to condos.	We code up these redevelopments combining several data sources. First, a property's parcel number allows us to link to the parcel history file from the Assessor's office. This allows us to observe changes in the parcel structure over time. In particular, this allows us to determine whether parcels were split off over time, a common occurrence when a multi-family apartment building (one parcel) splits into separate parcels for each apartment during a condo conversion. If the parcel number's use code today is condo, and conditioning on we finding renters living at the parcel using our Infutor data before it got split, we have identified a condo conversion. We also see the date when a property converts to condo. Conversions into single-families can be defined similarly this way. Second, we also include data from all building permits issued in San Francisco, this includes construction permits, demolition permits, and large renovation permits. Many permits detail within the text comments of these permits the prior use code of the property and the new use code of the property. For example, a permit would include existing use type: Apartments, proposed use type: single family. Finally, we further identify new construction by looking at changes in the year built of the property from our assessor data.	Measure the redevelopment activities on rent controlled properties that allows them to evade rent control. See p3388 "These redeveloped buildings replaced 7.2 percent of the initial rental housing stock treated by rent control."
Renters in rent-controlled buildings/average population, 1990–1994	Table 1.B, 7, Figure 8 panel A	number of renters living at a parcel with a building remained rent controlled divided by the average population living there during 1990-1994	A property remains rent controlled if it has not gone through any redevelopment that allows exiting rent control; Same data sources as those for the variable "Renters in redeveloped buildings/average population, 1990–1994"	Measure the redevelopment activities on rent controlled properties that allows them to evade rent control. See p3388 " there is an eventual decline of 24.6 percent in the number of renters living in rent-controlled apartments, relative to the 1990–1994 average."

Conversion	Table 1.B, 7, Figure 8 panel C	whether the small multi-family apartment is converted into a condominium	Same data sources as those for the variable "Renters in redeveloped buildings/average population, 1990–1994". Here we are focusing on the outcome of whether the existing small multi-family structure is converted into a condominium.	To further investigate whether properties fell under rent control in 1994 are more likely to go through redevelopment activities that allow them to exit rent control, we directly check wether properties in our treatment group are more likely to be conveted into condominium, relative to those in our control group. We show in panel C of Figure 8 on p.3388 that treated buildings are 8 percentage points likely to convert to condo in response to the rent control law. In the text we say that this graph plots the combination of condo and TIC conversions. This is a typo. It only plots condo conversions, not TICs, since TICs are not exempt from rent control. We apologize for this error in the text, especially if it made our results confusing to interpret.
Cumulative add/alter/repair per unit	Table 1.B, 7, Figure 8 panel D	Total number of addition/alteration (i.e., renovation) permits issued per housing unit since 1980	We match each address to its official parcel number from the San Francisco Assessor's office. Using the parcel ID number from the Secured Roll data, we merge in any building permits that have been associated with that property since 1980. These data come from the San Francisco Planning office.	We examine whether the landlords of rent-controlled properties disproportionately take out addition/alteration (i.e., renovation) permits and found treated buildings received 4.6 percent more addition/alteration permits per unit as shown in panel D of Figure 8 on p.3388.
Zipcode house price change	Table 6, 7, Figure A.3	Zip code experienced above- or below-median house price appreciation during 1990–2000.	Zip code house price appreciation from 1990 to 2000 was measured by a hedonic house price index using the housing transactions data from DataQuick.	heterogeneity in parcel level effects between high and low house price appreciation zip codes
Age in 1993	Table 1.A, 6. Figure A.2, A.3	Age of person, in years.	Month and year of birth from Infutor is used to calculate age as of 1993.	We analyze treatment effect heterogeneity by renter age.
In SF	Table 1.A, 4, 5, Figure 4, 5, A.1	Dummy for whether person lives in San Francisco in a given year	City of residence, as recorded in Infutor	We analyze out-migration from San Francisco.
Same Address	Table 1.A, 4, 5, Figure 4, 5, A.1, A.2, A.3	Dummy for whether person lives at their 1993 address in a given year.	Address, as recorded in Infutor	We analyze migration away from their address of residence at the time the rent control expansion was passed.
Years at Address	Table 1.A, 6, Figure A.2, A.3	Number of years renter had already lived at their address, as of 1993	Address and move-in data, as recorded in Infutor	We analyze treatment effect heterogeneity by tenancy duration.
Population by Age Group, Infutor	Table 2A, Figure 1	Count of population within given age brackets by census tract in the Infutor data	Census tracts were geocoded based on the address reported in Infutor	We compare population distributions across census tracts and age brackets within Infutor and US census data to assess the representativeness of the Infutor data
Population by Age Group, US Census	Table 2A, Figure 1	Count of population within given age brackets by census tract in the US Census data	Tabulations of the 1990 and 2000 US censuses by tract.	We compare population distributions across census tracts and age brackets within Infutor and US census data to assess the representativeness of the Infutor data
Homeownership rate, Infutor-DataQuick	Figure 2	Share of population that is a homeowner in each Census Tract in the Infutor-DataQuick data	Infutor merged to Dataquick to compare last names of residents to last names of property owners to measure whether resident is the owner of the property.	We compare home ownership rates across census tracts within Infutor-DataQuick and US Census data to assess the representativeness of the Infutor data.
Homeownership rate, US Census	Figure 2	Share of population that is a homeowner in each Census Tract in the US Census data	Tabulations of the 1990 and 2000 US censuses by tract.	We compare home ownership rates across census tracts within Infutor-DataQuick and US Census data to assess the representativeness of the Infutor data.
Age of Occupied Housing, Infutor-DataQuick	Table 2B	Fraction of buildings built in each	Infutor merged to Dataquick, with property age provided in DataQuick	We compare the age distribution of occupied housing stock across census tracts within Infutor-DataQuick and US Census data to assess the representativeness of the Infutor data.
Age of Occupied Housing, US Census	Table 2B	Fraction of buildings built in each	Tabulations of the 1990 and 2000 US censuses by tract.	We compare the age distribution of occupied housing stock across census tracts within Infutor-DataQuick and US Census data to assess the representativeness of the Infutor data.
Race, imputed	Table 3, A.1, A.2, Figure 5, A.1	Predicted race, based on name and census block of residence	See text for details on race imputation.	We analyzes treatment effect heterogeneity by race in the effects of rent control expansion.
Race, US Census	Table 3	Racial mix in 2010 Census block	Tabulations of racial mixes in 2010 at the census block level.	We compare our racial impuations to the racial mixes of where these residents live in 2010 to validate our race imputation.
Median Household Income	Figure 6	Census tract median household income	Tabulations of median census tract income from 1990, 2000 census and 5 year pooled ACSs from 2005-2016	We analyzes the types of neighborhoods residents move to by census tract characteristics

Share College Graduate	Figure 6	Census tract share of 4-year college graduates among those 25 years+	Tabulations of college share from 1990, 2000 census and 5 year pooled ACSs from 2005-2016	We analyzes the types of neighborhoods residents move to by census tract characteristics
Median House Value	Figure 6	Census tract median house value	Tabulations of median census tract house value among owner oppupied houses from 1990, 2000 census and 5 year pooled ACSs from 2005-2016	We analyzes the types of neighborhoods residents move to by census tract characteristics
Share Unemployed	Figure 6	Census tract share unemployed	Tabulations of share unemployed from 1990, 2000 census and 5 year pooled ACSs from 2005-2016	We analyzes the types of neighborhoods residents move to by census tract characteristics
Per Capita Income	Table A.3	For the 2015 cross-section of parcels in San Francisco that we can match people living there. We further restricts to parcels that we can match someone living there before 1994. The average per capita income across individuals living in each parcel. Per capita income is measured in 2010 dollars in the census block group of each individual's 2010 address.	Block group level per capita income measured in 2010 inflation-adjusted dollar, from table B19301 of the 5-year American Community Survey (2006-2010) found in the NHGIS database.	We compare the income of 2015 residents living in properties treated by rent control to those living in the control buildings in 2015. We use the block group level per capita income of an individual's 2010 address as an proxy for his income.