Does Condominium Development Lead to Gentrification?

Leah Boustan	Robert A. Margo	Matthew Miller	James Reeves	Justin Steil
Princeton & NBER	BU & NBER	Amazon	U Michigan	MIT

Online Appendix

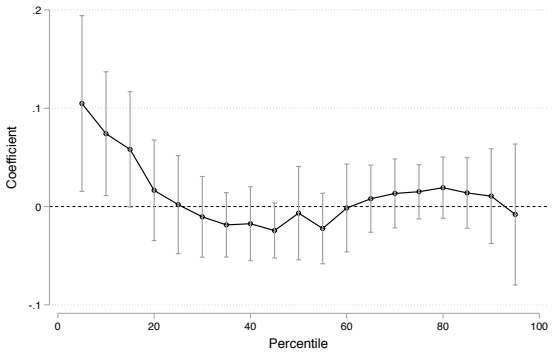
Appendix A: Additional Results

Appendix Figure 1: Geographic Dispersion of Metro Areas in Estimation Sample

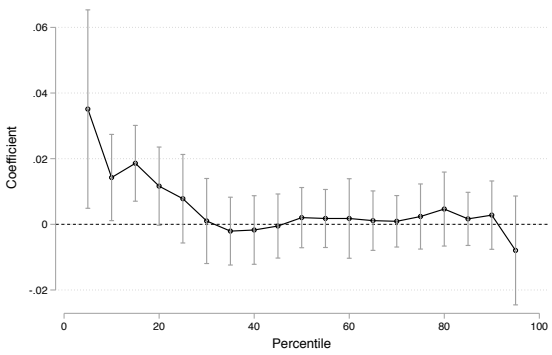
Note: This figure maps the metro areas in our estimation sample. Red dots indicate metro areas that ever passed a condo conversion ordinance as of 2015.

Appendix Figure 2: Treatment Effects Across the Income Distribution at City/Suburban Level

Panel A: All Housing Units



Panel B: Single-Family Attached and All Multi-Family



Note: These figures report two-stage least squares estimated coefficients of condo density on log personal income across the income distribution. Each point represents a separate regression and the associated 95 percent confidence interval. All regressions are weighted by number of household heads. See the notes to Table 4 for additional details on the sample and estimation.

Appendix Table 1: Condo Ordinances in Estimation Sample

	Year Passed	Severity
	(1)	(2)
Ann Arbor, MI		
Atlanta, GA		
Austin, TX		
Bakersfield, CA		
Baltimore, MD	1983	2
Baton Rouge, LA		
Boston, MA/NH	1979	2
Bridgeport, CT		
Buffalo-Niagara Falls, NY		
Chattanooga, TN/GA		
Chicago, IL	1977	3
Cleveland, OH		
Dallas-Fort Worth, TX		
Denver-Boulder, CO		
Des Moines, IA		
Detroit, MI	1980	3
Erie, PA		
Flint, MI		
Fort Wayne, IN		
Fresno, CA	1980	3
Grand Rapids, MI		
Hartford-Bristol-Middleton- New Britain, CT		
Houston-Brazoria, TX		
Kansas City, MO/KS		
Los Angeles-Long Beach, CA	1980	2
Memphis, TN/AR/MS		
Milwaukee, WI		
Minneapolis-St. Paul, MN	1979	1
Mobile, AL		
Nashville, TN		
New Haven-Meriden, CT		
New Orleans, LA		
New York, NY-Northeastern NJ	1982	3
Oklahoma City, OK		
Philadelphia, PA/NJ	1979	3
Pittsburgh, PA		
Portland, OR/WA	1980	2
Providence-Fall River-Pawtucket, MA/RI		
Riverside-San Bernardino, CA	2007	2
Rochester, NY		
Sacramento, CA	1980	3
San Antonio, TX	1979	2
San Francisco-Oakland-Vallejo, CA	1979	3
Seattle-Everett, WA	1978	2
Spokane, WA		
St. Louis, MO/IL		
Stockton, CA	2009	2
Syracuse, NY		
Tampa-St. Petersburg-Clearwater, FL		
Toledo, OH/MI		
Tulsa, OK		
Ventura-Oxnard-Simi Valley, CA		
Washington, DC/MD/VA	1976	3
Worcester, MA		

Note: This table reports the metropolitan areas in the estimation sample and the year it first passed an ordinance restricting condominium conversions.

Appendix Table 2: Condo Ordinance Severity

	Law Severity		
	1	2	3
	(1)	(2)	(3)
Vacancy Rate Minimum			X
Replacement of Low-Income Housing			X
Tenant Approval Required			X
Lifetime Lease			X
Annual Conversion Cap			X
Owner Occupancy Requirement		X	X
Tenant Assistance/Relocation Payments		X	X
Right of First Refusal	X	X	X
Notice of Conversion	X	X	X
FD/BC/Warranties/Right to Cancel	X	X	X

Note: This table reports the law components that we use to code ordinance severity.

Appendix Table 3: First Stage Relationship Between Condo Ordinance Passage and Condo Density in Simple DiD Framework at City/Suburban Level

	Ordinance (0-1)	
Panel A: All Housing Units	(1)	(2)
Ordinance × Post × Central City	−0.483	−0.993**
	(0.412)	(0.382)
	[1.782]	[2.421]
Panel B: SFA and All Multi-Family		
Ordinance × Post × Central City	−1.460	−3.340**
	(1.071)	(1.292)
	[4.855]	[5.031]
Observations	196	196
Metro X CC FE	Yes	Yes
Metro X Year FE	Yes	Yes
Weighted	No	Yes

Note: This table reports first stage results of a triple interaction on percent condo and owner occupied using only observations from 1980 and 1990 in a simple difference-in-differences framework. We drop metro areas that adopted a condo ordinance before 1979 and after 2000, and assume 1980 is the "pre-period" for all areas and 1990 is the "post-period" for all areas. See the text for additional details on the sample and specification. Panel A reports results using all housing types and Panel B reports results using single-family attached and all multi-family units. Column 2 weights by number of household heads. All specifications include metro-by-year and metro-by-central city fixed effects. Robust standard errors are reported in parentheses. *** = significant at the 1 percent level, ** = significant at the 5 percent level, * = significant at the 10 percent level.

Appendix Table 4: First Stage Relationship Between Condo Ordinance Passage and Condo Density at Census Tract Level - Full Housing Stock

	<200 Meters	<500 Meters	<1000 Meters	<2000 Meters	All Tracts
	(1)	(2)	(3)	(4)	(5)
Post × Ordinance	0.782	0.888	0.116	0.255	1.516***
	(0.843)	(0.776)	(0.681)	(0.561)	(0.344)
	[5.799]	[6.036]	[6.227]	[6.297]	[6.714]
Observations	15,896	17,910	21,918	29,498	67,684
Tract FE	Yes	Yes	Yes	Yes	Yes
Metro x Year FE	Yes	Yes	Yes	Yes	Yes

Note: This table reports first stage results of a post x ordinance interaction on percent condo using data from the Neighborhood Change Database. The sample contains all tracts whose centroids are within the distance to the city-suburban border listed in the column title. All specifications include tract and metro area-by-year fixed effects. Dependent variable means are reported in brackets. Robust standard errors are reported in parentheses. *** = significant at the 1 percent level, ** = significant at the 5 percent level, * = significant at the 10 percent level.

Appendix Table 5: Two-Stage Least Squares Relationship Between Condo Density and Resident Characteristics at Census Tract Level

	<200 Meters	<500 Meters	<1000 Meters	<2000 Meters	All Tracts
Panel A: Share SFA and 2-4 Units > 40%	(1)	(2)	(3)	(4)	(5)
Log Mean Income	0.001	−0.003	−0.003	−0.016	−0.024**
	(0.012)	(0.013)	(0.010)	(0.012)	(0.009)
	[10.816]	[10.828]	[10.833]	[10.811]	[10.809]
Observations	1,344	1,672	2,472	4,090	8,338
Share Bachelor's	−0.011	−0.013	−0.010	−0.009	−0.010**
	(0.012)	(0.013)	(0.009)	(0.006)	(0.005)
	[0.197]	[0.199]	[0.200]	[0.193]	[0.190]
Observations	1,368	1,696	2,496	4,116	8,388
Share Black	−0.013	−0.024*	−0.031**	−0.026***	−0.006
	(0.010)	(0.015)	(0.014)	(0.010)	(0.003)
	[0.276]	[0.278]	[0.285]	[0.309]	[0.300]
Observations	1,500	1,832	2,642	4,278	8,858
Panel B: Share 5+ Units > 60%					
Log Mean Income	0.029	0.018	0.004	−0.123	−0.007
	(0.035)	(0.017)	(0.012)	(0.390)	(0.005)
	[10.876]	[10.862]	[10.837]	[10.817]	[10.796]
Observations	1,062	1,318	1,832	2,786	5,952
Share Bachelor's	0.009	0.002	−0.004	−0.053	−0.000
	(0.009)	(0.006)	(0.007)	(0.174)	(0.002)
	[0.364]	[0.364]	[0.357]	[0.349]	[0.312]
Observations	1,114	1,372	1,894	2,864	6,066
Share Black	0.004	0.005	0.007	0.055	0.009***
	(0.005)	(0.005)	(0.005)	(0.136)	(0.003)
	[0.172]	[0.179]	[0.189]	[0.214]	[0.217]
Observations	1,250	1,512	2,042	3,030	6,538
Tract FE	Yes	Yes	Yes	Yes	Yes
Metro x Year FE	Yes	Yes	Yes	Yes	Yes

Note: This table reports two-stage least squares results of percent condo on the listed dependent variable. The sample contains all tracts whose centroids are within the distance to the city-suburban border listed in the column title and the baseline housing composition listed in the panel title. All specifications include tract and metro area-by-year fixed effects. Dependent variable means are reported in brackets. Robust standard errors are reported in parentheses. *** = significant at the 1 percent level, ** = significant at the 5 percent level, * = significant at the 10 percent level.

Appendix Table 6: Two-Stage Least Squares Relationship Between Condo Ordinance Passage and Condo Density in Simple DiD Framework at City/Suburban Level

	Ordinance (0-1)	
Panel A: All Housing Units	(1)	(2)
Log Mean Personal Income	−0.055	−0.002
	(0.100)	(0.030)
	[9.915]	[9.989]
Share Bachelor's or More	−0.032	−0.001
	(0.043)	(0.010)
	[0.230]	[0.243]
Share Black	0.023	−0.003
	(0.042)	(0.016)
	[0.136]	[0.137]
Panel B: SFA and All Multi-Family		
Log Mean Personal Income	−0.020	0.003
	(0.033)	(0.009)
	[9.613]	[9.725]
Share Bachelor's or More	−0.014	−0.000
	(0.018)	(0.005)
	[0.211]	[0.219]
Share Black	0.007	0.001
	(0.014)	(0.005)
	[0.164]	[0.196]
Observations	196	196
Metro X CC FE	Yes	Yes
Metro X Year FE	Yes	Yes
Weighted	No	Yes

Note: This table reports additional two-stage least squares results of percent condo and owner occupied on various outcomes using observations from 1980 and 1990 in a simple difference-in-differences framework. We drop metro areas that adopted a condo ordinance before 1979 and after 2000, and assume 1980 is the "pre-period" for all areas and 1990 is the "post-period" for all areas. See the text for additional details on the sample and specification. Percent condo and owner occupied is instrumented for using the triple interaction of Central City x Ordinance x Post. The dependent variable is listed in each row and is constructed using data from household heads. Bachelor's of more includes only household heads aged 25 or more. Dependent variable means are reported in brackets. Panel A reports results using all housing types and Panel B reports results using single-family attached and all multi-family units. Column 2 weights by number of household heads. All specifications include metro-by-year and metro-by-central city fixed effects. Robust standard errors are reported in parentheses. *** = significant at the 1 percent level, ** = significant at the 5 percent level, * = significant at the 10 percent level.