Online Appendix for "Race, Ethnicity, and Discriminatory Zoning"

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Appendix Table I. Pre-existing Sorting of Minority Groups

	Number 4+ story buildings	Number 4-10 story buildings	Population density	Commercial enterprises per acre	Noxious facilities per acre	Industrial facilities per acre
Panel A (no controls)	(1)	(2)	(3)	(4)	(5)	(6)
Southern black share	0.0167	-0.105	9.211	0.461	0.0553*	0.0750
	(0.125)	(0.162)	(18.55)	(0.393)	(0.0297)	(0.0464)
Northern black share	-0.718***	-0.849**	11.42	0.355	-0.115**	-0.130
	(0.255)	(0.372)	(37.47)	(0.804)	(0.0551)	(0.0886)
First-gen. immigrant share	-0.123***	-0.216***	38.85***	1.212***	0.0116***	0.0436***
	(0.0335)	(0.0466)	(5.800)	(0.106)	(0.00410)	(0.00865)
Second-gen. immigrant share	-1.239***	-1.655***	-75.03***	-1.965***	-0.0307***	-0.0575**
	(0.0971)	(0.136)	(16.22)	(0.304)	(0.0119)	(0.0272)
R-squared	0.128	0.104	0.112	0.243	0.030	0.058
Panel B (with controls)						
Southern black share	0.150	0.173	0.357	0.0187	0.0734**	0.0875*
	(0.121)	(0.133)	(16.17)	(0.366)	(0.0306)	(0.0471)
Northern black share	-0.307	-0.287	-13.74	0.886	-0.121**	-0.132*
	(0.225)	(0.298)	(32.05)	(0.733)	(0.0470)	(0.0769)
First-gen. immigrant share	-0.0592	-0.0446	24.39***	0.755***	0.00420	0.0106
	(0.0452)	(0.0606)	(7.188)	(0.141)	(0.00678)	(0.0135)
Second-gen. immigrant share	-0.303***	-0.188	-52.20***	-0.907***	0.0105	0.0104
	(0.0991)	(0.138)	(17.02)	(0.325)	(0.0158)	(0.0353)
R-squared	0.576	0.641	0.541	0.547	0.187	0.273

Notes: This table compares the sorting patterns of blacks and immigrants using a reverse regression analysis to identify the relationship between demographic groups and land uses while controlling for potentially confounding correlations with other demographic or spatial variables. Panel A includes no spatial or land use controls; the results can be thought of as the characteristics of areas in the cities where minority groups lived relative to third-generation whites. Panel B presents the results of the same specifications with the full set of geographic controls listed in Appendix Table II; these results can be thought of as the urban characteristics faced by minorities relative to third-generation whites conditional on the particular neighborhood of the city in which they lived. See Figure 1 for demographic group definitions. *** Significant at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level.

Appendix Table II. Full Results with Manufacturing Zoning as Outcome

	Percent of ED Zoned Industrial (1)	Ind. for Industrial Zoning in ED (2)
Southern black share	0.0338***	0.0767***
	(0.00947)	(0.0233)
Northern black share	-0.0235***	-0.0224
	(0.00815)	(0.0219)
First-generation immigrant share	0.0142**	0.0671***
	(0.00711)	(0.0201)
Second-generation immigrant share	-0.00550	0.0164
	(0.00631)	(0.0163)
Geographic controls		
ED area (acres)	-0.000142	0.000311
	(0.000258)	(0.000556)
ED area^2 (acres)	-1.53e-07	-7.60e-07
	(5.18e-07)	(1.29e-06)
ED area^3 (acres)	2.98e-10	6.94e-10
	(3.72e-10)	(9.10e-10)
ED area^4 (acres)	0.0000	0.0000
	0.0000	0.0000
CBD indicator	-0.0461*	-0.0575
	(0.0240)	(0.0556)
Distance to the CBD	-0.0678**	-0.0202
	(0.0313)	(0.0707)
Distance to the CBD^2	-0.0160	0.0138
	(0.0156)	(0.0390)
Distance to the CBD^3	-0.0233***	-0.0516***
	(0.00777)	(0.0194)
Distance to the CBD^4	0.0101**	0.0162
	(0.00394)	(0.0101)
Major street indicator	0.0121	-0.0222
	(0.0200)	(0.0666)
Distance to nearest major street	0.00468	-0.0101
	(0.0106)	(0.0330)
Distance to nearest major street^2	-0.00138	0.000285
	(0.00118)	(0.00374)
Population Density	-0.00551***	-0.00560**
	(0.00109)	(0.00218)
Population Density^2	4.98e-05***	3.32e-05
	(1.34e-05)	(2.80e-05)

Population Density^3	-1.83e-07***	-4.69e-08
	(6.13e-08)	(1.35e-07)
Population Density^4	2.22e-10***	0.0000
	(8.54e-11)	(1.94e-10)
Coast indicator	-0.0716***	0.0460
	(0.0221)	(0.0561)
Distance to Lake Michigan	-0.0361	-0.147***
	(0.0267)	(0.0537)
Distance to Lake Michigan^2	-0.00909	-0.000609
	(0.0126)	(0.0342)
Distance to Lake Michigan^3	0.0428***	0.121***
	(0.00805)	(0.0195)
Distance to Lake Michigan^4	-0.0125***	-0.0373***
	(0.00278)	(0.00735)
Distance to the nearest river	0.0383**	0.166***
	(0.0177)	(0.0423)
Distance to the nearest river^2	-0.00268	-0.103***
	(0.0115)	(0.0311)
Distance to the nearest river^3	-0.00669	-0.0385*
	(0.00944)	(0.0212)
Distance to the nearest river^4	0.00293	0.0226**
	(0.00366)	(0.00936)
Railroad indicator	0.0640***	0.0423
	(0.0156)	(0.0425)
Distance to nearest railroad	-0.00806	-0.0438**
	(0.00616)	(0.0206)
Distance to nearest railroad^2	0.0456***	0.176***
	(0.00652)	(0.0213)
Distance to nearest railroad^3	-0.0196***	-0.0893***
	(0.00522)	(0.0180)
Distance to nearest railroad^4	0.00204**	0.0126***
	(0.000976)	(0.00395)
Ancillary railroad indicator	0.123***	0.295***
	(0.0227)	(0.0497)
Distance to ancillary railroad	0.0271*	0.114***
	(0.0163)	(0.0440)
Distance to ancillary railroad^2	0.0256**	0.0687**
	(0.0105)	(0.0284)
Distance to ancillary railroad^3	-0.0187**	-0.0558**
	(0.00905)	(0.0245)
Distance to ancillary railroad^4	0.00351	0.00723
	(0.00251)	(0.00738)
Pre-existing land use controls		

Commercial land use indicator	0.0377***	0.0545
	(0.0141)	(0.0338)
Mfg. A land use indicator	0.00491	0.0591***
	(0.00701)	(0.0197)
Mfg. B land use indicator	0.0679***	0.229***
	(0.0199)	(0.0430)
Mfg. C land use indicator	0.0313	0.116**
	(0.0283)	(0.0563)
Mfg. S land use indicator	0.0972**	0.0713
	(0.0425)	(0.0846)
Indicator for large parcel with mfg. C or S use	0.130***	0.0619
	(0.0232)	(0.0435)
Indicator for overlap with Union Stockyards	0.323***	0.472***
	(0.0540)	(0.0932)
Indicator for proximity to Union Stockyards	0.0369	0.0644
	(0.0355)	(0.0643)
Density of commercial uses	-0.0519***	-0.0992***
	(0.0155)	(0.0342)
Number of warehouses	-0.00146	0.00198
	(0.00133)	(0.00318)
Density of mfg. A uses	-0.0287	0.0129
	(0.0432)	(0.115)
Density of mfg. B uses	0.00600	-0.444
	(0.355)	(0.732)
Density of mfg. C uses	-0.466	-0.454
	(0.554)	(1.138)
Density of mfg. S uses	-1.154	-1.103
	(1.585)	(2.926)
Density of commercial uses^2	0.00925*	0.0170
	(0.00539)	(0.0107)
Density of mfg. A uses^2	-0.0287	-0.0730
	(0.0331)	(0.0851)
Density of mfg. B uses^2	0.104	0.803
	(1.100)	(2.100)
Density of mfg. C uses^2	2.135	0.370
	(2.178)	(4.334)
Density of mfg. S uses^2	5.291	4.648
	(6.689)	(13.86)
Density of 4 story buildings	-0.0316*	-0.00681
	(0.0183)	(0.0502)
Density of 5 story buildings	0.0186	0.0571
	(0.0638)	(0.186)
Density of 6 story buildings	0.0240	-0.0183

	(0.0721)	(0.224)
Density of 7 story buildings	-0.115	-0.888***
	(0.132)	(0.317)
Density of 8 story buildings	0.0846	-0.175
	(0.154)	(0.442)
Density of 9 story buildings	0.284	0.416
	(0.461)	(1.201)
Density of 10 story buildings	-0.339	-0.372
	(0.280)	(0.810)
Density of 11-25 story buildings	0.108	-0.288
	(0.0930)	(0.229)
Number of mfg. B uses within 500ft of ED	0.00714**	0.0199***
	(0.00283)	(0.00652)
Number of mfg. C uses within 500ft of ED	-0.00375	-0.00464
	(0.00428)	(0.0100)
Number of mfg. S uses within 500ft of ED	0.0115*	0.00229
	(0.00600)	(0.0140)
Number of mfg. B uses within 1000ft of ED	0.00447**	0.00468
	(0.00201)	(0.00402)
Number of mfg. C uses within 1000ft of ED	-0.00201	-0.00624
	(0.00327)	(0.00702)
Number of mfg. S uses within 1000ft of ED	0.00208	0.00676
	(0.00757)	(0.0180)
Economic and political controls		
Maids per heads of households	-0.101	-0.287**
	(0.149)	(0.128)
Average land value in 1913 dollars	-0.0124***	0.0107
	(0.00392)	(0.0104)
Alderman on Board	-0.0124	-0.0395
	-0.0172	-0.0542
Constant	0.204***	0.462***
	(0.0536)	(0.129)
Ward FE	Y	Y
Observations	1,800	1,800
R-squared	0.739	0.635

Notes: Full set of coefficients (excluding coefficients on ward fixed effects) from OLS regressions with industrial zoning outcomes (continuous and indicator). All specifications include the full set of controls listed in Appendix Table 1. See Figure 1 for demographic group definitions. *** Significant at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level.

Description of Appendix Table III

 As a second approach to documenting existing patterns of minority residential location (Section V), we compare the sorting patterns of blacks and immigrants using a reverse regression analysis to identify the relationship between demographic groups and land uses while controlling for potentially confounding correlations with other demographic or spatial variables. We regress land use variables on our slate of demographic variables and (in some cases) additional controls. Panel A of Appendix Table III includes no spatial or land use controls; the results can be thought of as the characteristics of areas in the cities where minority groups lived relative to third-generation whites (the omitted demographic group).[1] Panel B of Appendix Table III presents the results of the same specifications with the full set of spatial controls, including the area of the enumeration district, ward fixed effects, and distances to the central business district, major street, Lake Michigan, nearest river, and nearest railroad; these results can be thought of as the urban characteristics faced by minorities relative to third-generation whites conditional on the particular neighborhood of the city in which they lived.

 The results from these regressions suggest relationships similar to those obtained from the average exposure exercise. Areas of the city with more first-generation immigrants and northern blacks had fewer tall structures compared with areas having more native whites. This finding is consistent with the pictorial evidence in Figure 1 showing that second-generation immigrants lived the furthest from the center city. Whether we look across the city (Panel A) or within neighborhoods (Panel B), first-generation immigrants lived in the densest, most commercial areas while southern blacks were exposed to more noxious and non-noxious manufacturing relative to third-generation whites.

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[1] We include only our proxy for income, maids per head of household, as a control.

Appendix Table III. Effect of Minority Share on Manufacturing Zoning Robustness

	Ind. for Industrial Zoning in ED			Percent of ED Zoned Industrial		
	OLS			Tobit		
	(1)	(2)	(3)	(4)	(5)	(6)
Southern black share	0.092***	0.079***	0.033	0.145***	0.136***	0.158***
	(0.0271)	(0.0269)	(0.0229)	(0.0277)	(0.0288)	(0.0371)
Northern black share	-0.028	-0.021	0.012	-0.0651***	-0.0443**	-0.0485**
	(0.0247)	(0.0259)	(0.0240)	(0.0213)	(0.0217)	(0.0242)
First-gen. immigrant share	0.063***	0.063***	0.068***	0.0996***	0.110***	0.127***
	(0.0208)	(0.0218)	(0.0241)	(0.0244)	(0.0280)	(0.0357)
Second-gen. immigrant share	0.031*	0.033*	0.033*	0.0212	0.0378	0.0488
	(0.0165)	(0.0168)	(0.0174)	(0.0208)	(0.0246)	(0.0299)
Observations	1,560	1,294	1,064	1,560	1,294	1,064

Notes: All specifications include the full set of controls listed in Appendix Table 1. Demographic variables are standardized. See Figure 1 for demographic group definitions. Columns (1) and (4) include only enumeration districts with no Class C or S manufacturing. Columns (2) and (5) include only enumeration districts with no Class C or S manufacturing that are at least 500 feet away from such uses. Columns (3) and (6) include only enumeration districts with no Class C or S manufacturing that are at least 1,000 feet away from such uses. *** Significant at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level.

Appendix Table IV. Immigrant Breakdown for Manufacturing Zoning

	Ind. for Industrial Zoning in ED Tobit (2)	Percent of ED Zoned Industrial Probit (4)
Southern black	0.115***	0.079***
	(0.0209)	(0.0148)
Northern black	-0.062***	-0.023*
	(0.0173)	(0.0118)
Polish	0.049***	0.023**
	(0.0149)	(0.0119)
Russian	0.031**	0.031***
	(0.0130)	(0.0109)
Italy	0.043***	0.028***
	(0.0134)	(0.0106)
Irish	0.034***	0.016**
	(0.0093)	(0.0068)
German	0.022*	0.026***
	(0.0113)	(0.0092)
Other immigrant	0.046***	0.033***
	(0.0130)	(0.0099)
Second generation	-0.024	0.027**
	(0.0163)	(0.0135)
1913 land values	0.007	0.040**
	(0.0111)	(0.0179)
Observations	1,800	1,789

Notes: All specifications include the full set of controls listed in Appendix Table 1. See Figure 1 for demographic group definitions. *** Significant at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level.

Data Appendix

Below we provide details on how the spatial and land use variables were constructed.

Land use variables were derived from a comprehensive 1922 land use survey conducted by the Chicago Zoning Commission to inform the drafting of the 1923 zoning ordinance. The following variables were obtained from these records:

Railroads denote major rail routes into and out of the city.
Ancillary railroads are smaller routes that fed into specific industrial areas.
Commercial uses includes retail stores, offices, hotels, garages, gas stations, showrooms, theaters, undertakers, and small scale manufacturing with not more than 5 skilled workers and no noise, smoke, odor, fumes, gases, danger, or yard storage.
Manufacturing A includes general manufacturing without yard storage or nuisance features (includes dry cleaners, stables, and printers).
Manufacturing B includes larger scale manufacturing uses which require yard storage but excludes nuisance uses.
Manufacturing C includes manufacturing uses that emit noise, smoke, odor, or fumes or present some danger to neighboring uses.
Manufacturing S includes rail yards and grain storage/milling facilities.
Indicator for large parcel equals 1 if the block is at least eight acres and contains a manufacturing C or S use.
The Union Stockyards was a large meatpacking district active until 1971.

Data on the locations of major streets, the central business district, the Chicago River, and Lake Michigan were obtained from the City of Chicago GIS repository.

The Centennial List of Mayors, City Clerks, City Attorneys, City Treasurers, and Aldermen, 1937 was used to derive a list of alderman serving in Chicago during the drafting of the zoning ordinance. These individuals were then located in Ancestry.com, where we were able to obtain their enumeration district of residence in 1920.

Land price data was obtained by Dan McMillen and Gabriel Ahlfeldt using the 1913 edition of Olcott's Blue Book.