Web Appendix

Race and Home Ownership from the End of the Civil War to the Present

William J. Collins and Robert A. Margo[*]

This appendix provides addition detail regarding our estimates and analysis of racial differences in home ownership rates since the Civil War (William J. Collins and Robert A. Margo 2011). Most of the figures in our article are based on the home ownership information available in the IPUMS census samples (Steven Ruggles et al. 2010). For some census years, however, consistent information on home ownership is not available, and so we have adjusted the existing data for comparability. The first part of the appendix discusses these adjustments. The second part of the appendix reports information that is referenced in the article's text but omitted for considerations of space.

I. Adjustments to Census Data

For data points in 1870, 1880, 1890, and 1950, we have adjusted data from the IPUMS (Ruggles et al. 2010) or published census volumes for the sake of consistency with our estimates based on the IPUMS homeownership question in other years. This section of the appendix describes these adjustments in detail.

1870: The 1870 census collected information on the value of real property owned by each individual. Using the 1870 IPUMS sample, we create a dummy variable indicating whether or

[*] Collins: Department of Economics, Box 351819-B, Vanderbilt University, Nashville, TN 37235 (email: william.collins@vanderbilt.edu). Margo: Department of Economics, Boston University, 270 Bay State Road, Boston, MA 02215 (email: margora@bu.edu).

not the head of the household owned real property. This dummy variable will capture any household head who was an owner-occupant (assuming the census question was answered properly) because, by definition, this person would have owned real estate. However, with this approach, some individuals who rented their primary residence but owned real estate elsewhere will be counted as owner-occupying when in fact they were not. The likelihood of overstatement, we believe, is negligible except possibly for household heads living in multi-family dwellings. Therefore, for household heads who lived in multi-family housing, we assume that anyone who claimed to own real estate but who resided in a dwelling with five or more housing units was not, in fact, an owner-occupant. For this adjustment, we use the IPUMS variable NUMHH, which records the number of households in the dwelling unit (the IPUMS considers this variable to be approximately equivalent to the variable UNITSSTR, which is available beginning in 1960 and which records the number of housing units in the building structure). In 1870 the probability of owning real estate was a steep negative function of multi-family status. Among whites in the core sample the rate of ownership for heads living in single family dwellings (NUMHH = 1) was 61.8 percent, whereas for heads living in dwellings with five or more units (NUMHH $\geq$ 5) the real estate ownership rate was 7.4 percent. In Web Appendix Table 1, figures reported in square brackets assume that heads living in all multi-family dwellings (NUMHH > 1) with positive real estate holdings were renters.

1880: Roger L. Ransom and Richard Sutch (1977, Table 5.1, p. 84) report that 19.6 percent of farms operated by African-Americans were owner-occupied. The estimate is derived from their sample of manuscript records from the 1880 census of agriculture. The sample pertains to the "Cotton South" which, because it crosses state boundaries, is not readily mapped into state totals. We assume that this figure pertains to the entire South. This may be incorrect; however, we

believe that any bias imparted to the final estimate is small.[1] For non-farm homes we estimate

the fraction owner-occupied to be 0.108 for blacks. This figure is the average of an estimate for

1870 using the IPUMS (all black household heads, 0.049) and the published figure for 1890

(0.167) from U.S. Department of Commerce, Bureau of the Census (1918, p. 459). Using the

IPUMS, we estimate that 31.3 percent of black household heads lived in farm homes in 1880.

Therefore, the estimated black owner-occupancy rate in 1880 (all household heads) is 0.135

(=0.108 x 0.687 + 0.196 x 0.313) or 13.5 percent. To adjust this for comparability with the core

sample figures, we multiply it by an estimate of the ratio of the core sample occupancy rate to

the all household heads rate; this estimate (1.015) is linearly interpolated from its value in 1870

(1.0) and 1900 (1.048 = 22.0/21.0), computed from Web Appendix Tables 1 and 2.

For whites, we back out an estimate of the white ownership rate of farm homes (0.807)

using the overall rate of farm ownership reported in the census (0.744, computed from series

Da532 and Da530, Susan B. Carter et al. 2006, Volume 4, p. 4-71), our estimate rate of farm

ownership for blacks (see above) and the proportion of farm homes occupied by black

households (0.103, computed from the 1880 IPUMS). The 1880 non-farm ownership rate for

whites (0.379) is the average of our estimate for 1870 (0.395) from the IPUMS and 1890 (0.363)

from George K. Holmes and John S. Lord (1896, p. 175). According to the 1880 IPUMS, 40.5

percent of white households resided in farm homes. The overall rate for whites is 0.553 (=0.405

x 0.807 + 0.595 x 0.379) or 55.3 percent. This figure pertains to all household heads. To make it

comparable to our core sample figures, we multiply it by an estimate of the ratio of occupancy

---

[1] Based on the 1870 IPUMS sample we estimate that 13.5 percent of farm homes occupied by
black households were owner-occupied. If we average this figure with the published ownership
rate from the 1890 census for black farm homes (0.220) we get 0.178, which is slightly lower (12
percent) than Ransom and Sutch's figure.

rates for our core sample to all household heads; this estimate (1.018) is linearly interpolated from its value in 1870 (1.042) and 1900 (0.969), computed from Web Appendix Tables 1 and 2.

1890: In 1890 the census attempted to determine the tenure status of every family. If the home occupied by the family was owned by someone in the family, the family was owner-occupying; if not, the family was renting. If the family was owner-occupying the identity of the owner was so indicated on the census form. In 1896 the Census published a report (Holmes and Lord 1896) in which individuals who were owners (as designated on the 1890 census form) or heads of households (if the family was renting) were classified on the basis of various personal characteristics, including race. Some three decades later the Department of Commerce published *Negro Population of the United States, 1790-1915* (U.S. Department of Commerce, Bureau of the Census 1918), which included a chapter on "Home Ownership and Size of Families." The chapter contains a table classifying black families by their tenure status in 1890, 1900 and 1910 (p. 459). The 1900 counts by tenure status in the 1918 report are virtually identical to those reported in the 1900 published census, but the 1890 counts in the 1918 report are uniformly higher than those given in the 1896 report, more so for owners than renters. As a result, the 1918 counts imply a slightly higher owner-occupancy rate in 1890 (18.7 percent) than do the counts in the 1896 report (17.5 percent). Unfortunately, the text of the 1918 report is silent as to why the census evidently made upward adjustments to its original 1890 figures. On the belief that the census statisticians of the era had good reasons to make the upward adjustments, we have elected to rely on the 1918 counts when constructing our African-American time series. The census made no subsequent adjustments to its original counts for whites; hence for whites we use the 1896 report.

As just noted, the 1918 report gives the percent of black families who were owner-occupying in 1890 (18.7 percent). We adjust this figure to make it comparable to our other figures by multiplying it by an estimate of the ratio of owner-occupancy for households in our core sample to the owner-occupancy rate for black families; this estimate (1.03) is linearly interpolated from its value in 1870 (1.0) and 1900 1.045 (from Appendix Tables 1 and 2). The adjusted figure for 1890 is shown in Appendix Table 1. For whites we follow a similar procedure, except that our 1890 occupancy rate for all white households (51.5) derives from Holmes and Lord (1896, p. 167). The adjustment ratio for whites (linearly interpolated between 1870 and 1900) is 0.994.

1950: The 1950 IPUMS sample does not report housing tenure status. For non-farm homes, tenure status by race is reported in U.S. Department of Commerce, Bureau of the Census (1953a, Table 2). For farm homes, tenure status is reported in U.S. Department of Commerce, Bureau of the Census (1953b, p. xxiv). For non-farm homes, the Bureau reported statistics separately for black households. For farm homes, the data are given for non-whites. We make no adjustment for this as the fraction of non-black households among non-white farm households was arguably very small in 1950. For each race we add the total number of owned homes from both sources and divide by total homes to get the figures shown in Appendix Table 2. We adjust the all household rates by an estimate of the ratio of occupancy in the core sample to all households; the estimated ratio is an average of the ratios for 1940 and 1960 (computed from Appendix Tables 1 and 2). The white adjustment ratio is 1.008; the black adjustment ratio is 0.994.

Web Appendix Table 1: Estimated Rates of Owner-Occupancy per 100 Households,

Core Sample (Male Household Heads, Ages 25-64, In Labor Force, Not in School)

Year	White	Black	Racial Gap (White – Black)
1870	56.5 [53.6]	7.7 [7.2]	48.8 [46.4]
1880	56.3	13.7	42.6
1890	51.2	19.3	31.9
1900	47.9	22.0	25.9
1910	47.0	23.5	23.5
1920	47.0	22.9	24.1
1930	48.3	24.2	24.1
1940	43.2	21.1	22.1
1950	59.2	34.1	25.1
1960	68.8	40.8	28.0
1970	73.1	49.7	23.4
1980	76.8	58.0	18.8
1990	74.4	54.1	20.3
2000	77.6	56.5	21.1
2007	76.5	54.0	22.5
2007 – 1870	20.0	46.3	-26.3
1910 – 1870	- 9.5	15.8	-25.3
1980 – 1910	29.8	34.5	- 4.7
2007 – 1980	-0.3	-4.0	3.7

Notes: Figures give the rate of owner occupancy per 100 households in our core sample. To be included in the core sample households (years which use the IPUMS or American Community Survey) had to be headed by males between the ages of 25 and 64, in the labor force, not enrolled in school. Observations with unreported tenure status are excluded if possible. Figures in square brackets assume all individuals in 1870 living in multi-family dwellings with positive values of real property were renting as opposed to owner-occupancy. For years which the IPUMS (or ACS) is used households are weighted by the IPUMS (or ACS) household weight variable prior to computing sample statistics.
Sources: 1900-1940, 1960-2000: IPUMS 1/100 samples; see Ruggles et al. (2010). For 1970 we use the F2 Metro sample (this sample reports school attendance); in 1990 and 2000 we use the "un-weighted" or "flat" samples (see Ruggles et al. 2010). For other years, see the description in the Web Appendix (above).

Web Appendix Table 2: Rates of Owner-Occupancy per 100 Households, All Household Types

Year	White	Black	Racial Gap (White – Black)	White, Core Sample Fraction	Black, Core Sample Fraction
1870	54.2 [53.6]	7.7 [7.2]	46.5 [46.4]	0.762	0.657
1880	54.9	13.5	41.4	NA	NA
1890	51.1	18.7	32.4	NA	NA
1900	49.4	21.0	28.4	0.743	0.642
1910	48.5	22.9	25.6	0.745	0.665
1920	48.3	22.5	25.8	0.746	0.676
1930	49.9	24.5	25.4	0.725	0.659
1940	45.6	23.0	22.6	0.690	0.613
1950	58.7	34.3	24.4	NA	NA
1960	64.3	38.1	26.2	0.637	0.540
1970	65.4	41.6	23.8	0.567	0.449
1980	67.7	45.2	22.5	0.499	0.358
1990	68.2	43.3	24.9	0.462	0.303
2000	71.3	46.3	25.0	0.433	0.266
2007	72.2	46.5	25.7	0.358	0.251

Notes and sources: See Web Appendix Table 1.

II. Additional Data and Results

The text of Collins and Margo (2011) refers to several results that were omitted to save space. More detailed information is reported here. First, we noted that there was a large difference in home ownership for white farm households relative to white non-farm households in the late nineteenth and early twentieth century. Appendix Table 3 reports the relevant gaps for 1870, 1890, and 1910. Given this gap, the transition of whites out of the farm sector put downward pressure on the overall white ownership rate in the late nineteenth and early twentieth centuries. The ownership gap for black households between the farm and nonfarm sector is comparatively small, and the ownership rate is low in both cases.

Web Appendix Table 3: Race and Owner-Occupancy by Farm Home Status, 1870-1910

	1870	1890	1910
Panel A: White, All Households			
Proportion Farm Home	0.41 {0.45}	0.38	0.29
Owner-Occupancy Rate, Farm Home	75.6 [73.7]	71.7	69.2
Owner-Occupancy Rate, Non-Farm Home	39.5 [35.7]	39.4	40.0
Gap (Farm – Nonfarm)	36.1 [38.0]	32.3	29.2
Panel B: Black, All Households			
Proportion Farm Home	0.19 {0.63}	0.39	0.40
Owner-Occupancy Rate, Farm Home	13.5 [13.0]	22.0	25.5
Owner-Occupancy Rate, Non-Farm Home	4.9 [4.6]	16.7	21.2
Gap (Farm – Nonfarm)	8.6 [8.4]	5.3	4.3

Notes: Figures pertain to all household heads. Farm = 1 if the census considered the home to be a farm. Figures in square brackets assume that all households living in multifamily housing (as indicated by the IPUMS variable NUMHH > 1) were renters. Figures in curved brackets are the proportion of household heads reporting agriculture as industry of employment.

Sources: For 1870 and 1910, figures are computed from IPUMS samples. See Web Appendix discussion (above) for definition of ownership in 1870. In 1890, the African-American rate is computed from United States Department of Commerce, Bureau of the Census (1918, p. 459); the white rate is computed from Holmes and Lord (1896, Table 61, p. 175).

Second, the article's text refers to ownership regressions using the core sample pertaining to metropolitan areas in which a dummy variable for race (Black = 1) is interacted with measure of residential segregation, the dissimilarity index. These regressions include metropolitan area fixed effects, so that while the level effect of segregation (the dissimilarity index) is not identified, the race interaction effect is identified. In essence, these are difference-in-differences regressions asking whether the black-white ownership gap is larger in metro areas that are more segregated residentially. We report results for a base specification, which includes no individual covariates (other than the race dummy and the interaction term), as well as a specification that adds covariates. As reported in the text, we find a negative correlation between segregation and

blacks' relative ownership rate (i.e., as segregation increases, black ownership falls relative to white ownership) in 1920 and 1930 that coincides with the timing of the onset of the Great Migration, but by 1970 the correlation is positive although not statistically significant.

Web Appendix Table 4: Effect of Residential Segregation on Black-White Ownership Gap

| Year	Number of Metro Areas	Coefficient of (Black = 1) x Dissimilarity Index, No Additional Covariates	Coefficient of (Black = 1) x Dissimilarity Index, Full Set of Covariates
1900	44	-0.037 (0.090)	-0.084 (0.076)
1910	57	0.020 (0.125)	0.048 (0.115)
1920	71	-0.124** (0.065)	-0.119** (0.062)
1930	86	-0.142* (0.055)	-0.111** (0.056)
1940	79	0.017 (0.073)	0.002 (0.070)
1970	111	0.061 (0.196)	0.081 (0.118)
1980	239	0.062 (0.083)	0.040 (0.074)
1990	230	-0.059 (0.057)	-0.043 (0.047)

Notes: Core sample households living in a metropolitan area for which Cutler-Glaeser-Vigdor dissimilarity index has been computed (1999). All regressions include a metropolitan area fixed effect, a race dummy (=1 if black), and the race dummy interacted with the dissimilarity index. Full set of covariates: adds fourth degree polynomial in age, dummy variables for literacy of the household head (1900-1930) or single years of schooling (1940-1990), marital status, citizenship status, occupational status (using 1950 occupational weights as coded by the IPUMS), and a linear term in family size. Standard errors are shown in parentheses (* = significant at 5 percent level, ** = significant at 10 percent level). No results are shown for 1950 or 1960 because usable IPUMS data are not available.

Third, the article's text cites information regarding the size of the racial ownership gap at relatively young ages and at relatively old ages. Between 1940 and 1960, the racial gap surged among relatively young households. This is evident in Web Appendix Figure 1. The underlying

data are reported in Web Appendix Table 5. Mortgage market reforms, World War II veterans'

benefits, and suburbanization had differential effects across race and age groups, with young

white families experiencing a relatively large surge in ownership.

Web Appendix Figure 2 and Web Appendix Table 6 report similar information, but for

older household heads (ages 55-64). From this perspective, which is closer to the end of the life-

cycle, the narrowing of the ownership gap since the Civil War has been more pronounced and

persistent than among young households.

Web Appendix Figure 1: Owner-Occupancy Rates by Race, Core Sample, Ages 25-34
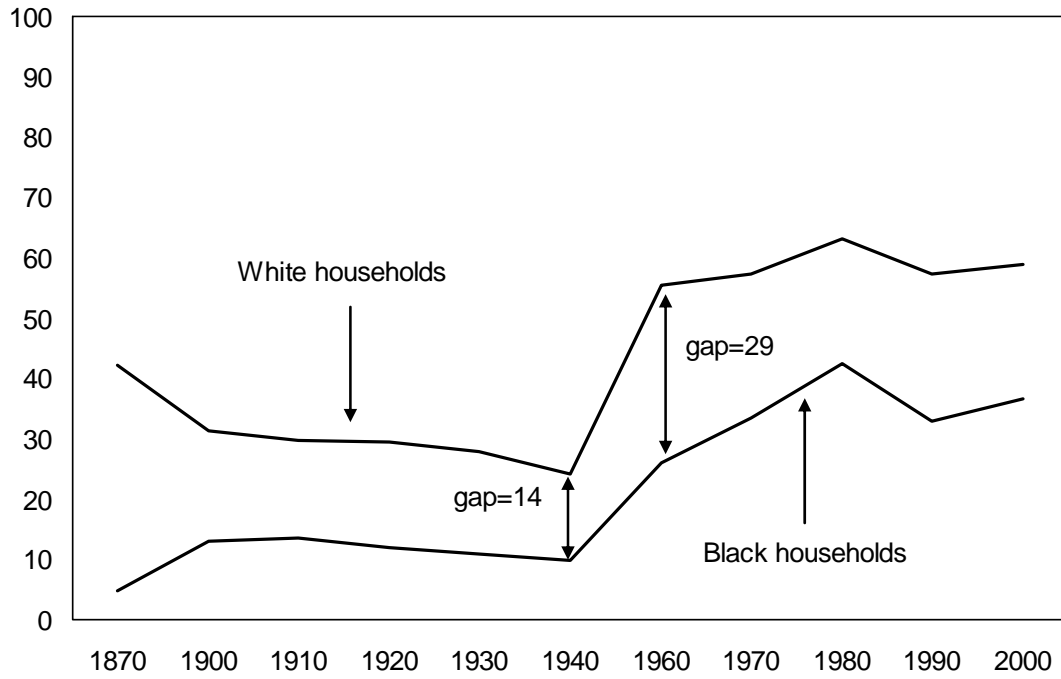
Web Appendix Figure 2: Owner-Occupancy Rates by Race, Core Sample, Ages 55-64
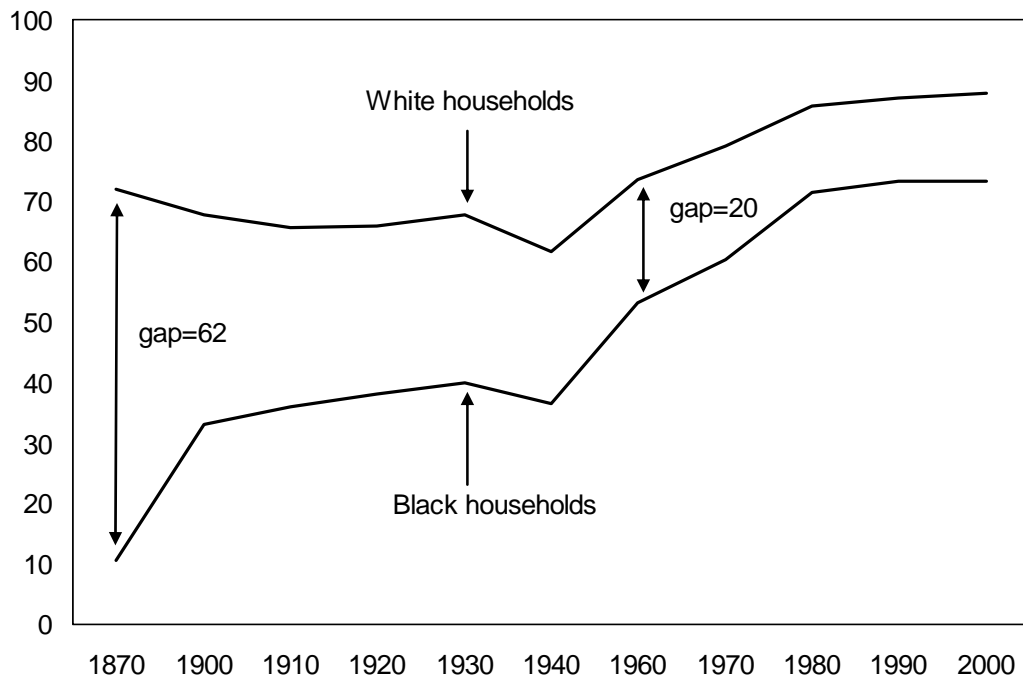
Web Appendix Table 5: Rates of Owner-Occupancy per 100 Households: Male Household Heads, Ages 25-34, Not in School, in Labor Force (Core Sample), IPUMS Census Years

Year	White	Black	Racial Gap (White – Black)
1870	42.2 [40.0]	4.9 [4.6]	37.3 [34.4]
1900	31.2	12.9	18.3
1910	29.8	13.6	16.2
1920	29.5	12.0	17.5
1930	27.9	10.8	17.1
1940	24.2	9.8	14.4
1960	55.4	26.0	29.4
1970	57.3	33.3	24.0
1980	63.0	42.5	20.5
1990	57.4	32.9	25.7
2000	58.8	36.6	25.3
2000 - 1870	16.6	31.7	- 12.0 [- 9.1]
1910 - 1870	-12.4	8.7	- 21.1
1960 - 1940	31.2	16.2	15.0

Source: see Appendix Table 1. Figures in this table are computed the same way as in Appendix Table 1, except that household heads are between the ages of 25 and 34.


Web Appendix Table 6: Rates of Owner-Occupancy per 100 Households: Male Household Heads, Ages 55-64, Not in School, in Labor Force (Core Sample), IPUMS Census Years

Year	White	Black	Racial Gap (White – Black)
1870	72.0 [68.2]	10.7 [10.1]	61.7 [58.1]
1900	67.6	33.2	34.4
1910	65.7	36.1	29.6
1920	66.0	38.0	28.0
1930	67.7	40.0	27.7
1940	61.7	36.6	25.1
1960	73.5	53.2	20.3
1970	79.0	60.2	18.8
1980	85.7	71.3	14.4
1990	87.0	73.3	13.7
2000	87.8	73.4	14.4
2000 - 1870	15.8	62.7	- 46.9
1910 - 1870	-6.3	26.1	- 32.4
1960 - 1940	11.8	16.6	- 5.3

Source: see Appendix Table 1. Figures in this table are computed the same way as in Appendix Table 1, except that household heads are between the ages of 55 and 64.

The more pronounced and persistent narrowing of the ownership gap by the end of the life-cycle is consistent with an historical interpretation that emphasizes changes in blacks' permanent income and educational attainment. Figure 2 in the article showed the relationship between the ownership gap and the income gap for older households in the core sample. Below, Web Appendix Figure 3 shows a similar pattern that strongly links the gap in ownership to the gap in average educational attainment.

Web Appendix Figure 3: Ownership Gap and Educational Attainment Gap, 1940-2000,
Ages 55-64 from Core Sample
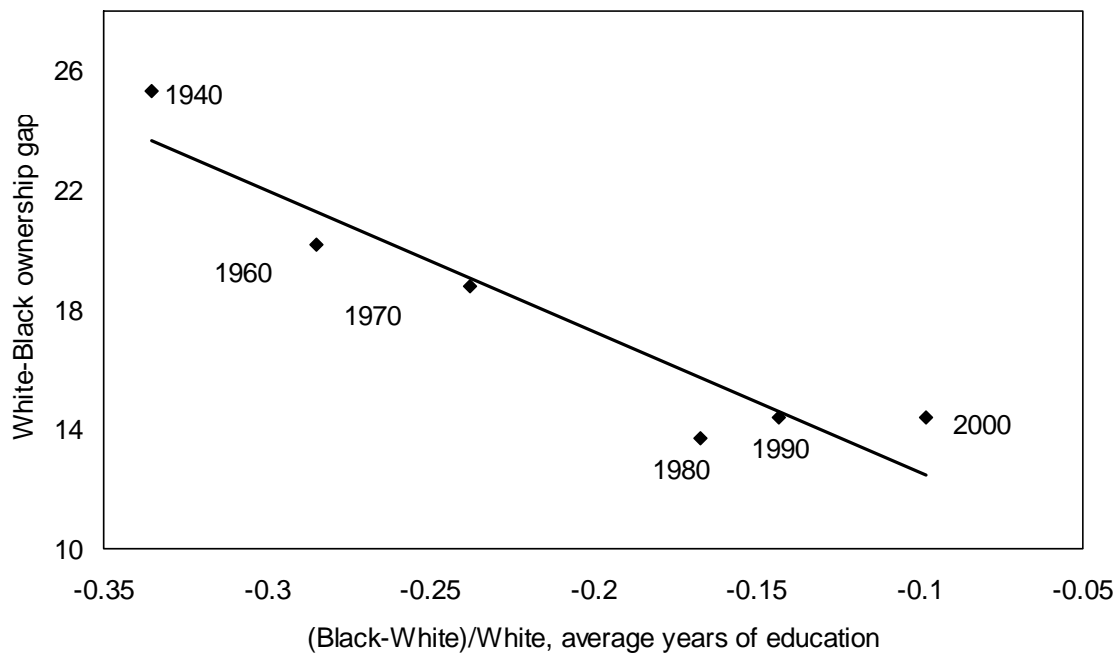
WEB APPENDIX REFERENCES

Carter, Susan B., Scott Sigmund Gartner, Michael R. Haines, Alan L. Olmstead, Richard Sutch,

and Gavin Wright, eds. 2006. *Historical Statistics of the United States: Earliest Times to*

the Present. Volume 4, *Economic Sectors*. New York: Cambridge University Press.

Collins, William J. and Robert A. Margo. 2011. "Race and Home Ownership from the End of the

Civil War to the Present." *American Economic Review, Papers and Proceedings* 101(2):

xxx-xxx.

Cutler, David M., Edward L. Gleaser, and Jacob L. Vigdor. 1999. "The Rise and Decline of the

American Ghetto." *Journal of Political Economy* 107(3): 455-506.

Holmes, George K. and John S. Lord. 1896. *Report on Farms and Homes: Proprietorship and*

Indebtedness in the United States at the Eleventh Census: 1890. Washington, DC:

Government Printing Office.

Ransom, Roger L. and Richard Sutch. 1977. *One Kind of Freedom: The Economic*

Consequences of Emancipation. New York: Cambridge University Press.

Ruggles, Steven, J. Trent Alexander, Katie Genadek, Ronald Goeken, Matthew B. Schroeder,

and Matthew Sobek. 2010. *Integrated Public Use Microdata Series: Version 5.0*

[Machine-readable database]. Minneapolis: University of Minnesota.

U.S. Department of Commerce, Bureau of the Census. 1918. *Negro Population of the United*

States, 1790-1915. New York: Arno Press, 1968.

United States Department of Commerce, Bureau of the Census. 1953a. *Census of Housing: 1950.*

Volume I: General Characteristics. Washington, DC: Government Printing Office.

United States Department of Commerce, Bureau of the Census. 1953b. *Census of Housing:*

1950. Volume III: Farm Housing Characteristics. United States and Economic Sub-

Regions. Washington, DC: Government Printing Office.