

1 **Differences in Wealth, Evidence from Structural Regression Decomposition, 1850-1870**

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13 **ABSTRACT**

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15 Recent studies have used regression decomposition to analyze recent data and found that over seventy  
16 percent of the black-white wealth differences remained unexplained (See, e.g., Gittleman and Wolff 2000;  
17 Altonji, Doraszelski and Segal 2000; and Blau and Graham 1990). Their results are limited to the variation  
18 in modern data. This study contributes improved methodology and historical empirical results to the  
19 literature on economic discrimination. In this paper, (i) James Curtis Jr presents structural regression  
20 decompositions, which are modifications to methods developed by Becker (1957) and Oaxaca (1973);  
21 (ii) James Curtis Jr presents a basic empirical test when analyzing structural regression decompositions;  
22 (iii) James Curtis Jr reports the estimated sources of black-white differences in wealth directly before and  
23 after emancipation; and (iv) James Curtis Jr links these findings to recent studies. Empirical estimates  
24 confirm that the size and persistence of modern black-white wealth differences have historical roots.

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26 JEL Codes: J7 D9 E2 C2 H5 N3

27  
28 Key words: theory of economic discrimination, structural regression decomposition, wealth inequality,  
29 free blacks and slavery.

30  
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37 their generous financial support.

38 **Introduction**

39

40 The study of racial differences in factor market supply decisions and prices, as reflected in the extensive  
41 literature on labor supply, wages and income, presents only a subset of the variables that determine the  
42 accumulation and storage of assets over the lifetime of black and white households. Andrew Brimmer  
43 (1988) stated “ The ownership of wealth by blacks reflects the same pattern of deficits evident when one  
44 looks at money income. However, the shortfall of wealth is much larger. To a considerable extent the latter  
45 can be traced to a long history of deprivation in this country” (p. 153). However, the empirical analyses  
46 necessary to substantiate this proposition have been absent in the literature because the origin of the black-  
47 white wealth gap is vastly understudied. Researchers typically conduct statistical tests on the most recent  
48 data to analyze wealth differences by race and use these results to propose policies that address the wealth  
49 gap. But this methodology confines such tests to the variation observed in recent data. Instead, I propose  
50 conducting similar tests using historical data and comparing these results to studies using recent data. I  
51 employ such an approach in this paper and provide new insights about the historical and intertemporal  
52 dimensions of the black-white wealth gap.

53

54 The structure of the paper is as follows: **Section I:** I present a review of the literature on modern black-  
55 white wealth differences and a brief discussion on the theory behind these differences; **Section II:** I present  
56 the method of structural regression decomposition and an empirical test; **Section III:** I present the empirical  
57 results and provide a brief summary; and **Section IV:** I present several appendices, including an analysis  
58 the sample dataset and descriptive statistics.

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60

61 **Literature Review**

62

63 Overall, economic research shows that wealth differences were larger than income differences. Brimmer  
64 (1988) used 1984 US census data to find that blacks held 7.2 percent of US income and only three percent  
65 of US wealth. Additionally, Wolff (1992) uses SCF, SFCC, and SIPP data from 1940 – 1988 to show that  
66 blacks possessed between 13-23 percent of white mean wealth and 4-10 percent of white median wealth.  
67 Wolff (1998) affirms his earlier results using SCF data. He shows that the black-white ratio of mean net  
68 worth fell to 17 percent by 1995 while the ratio of median net worth rose to only twelve percent.

69

70 Blau and Graham (1990) produced a foundational study of black-white wealth differences using regression  
71 decomposition. They employed data from the National Longitudinal Surveys (NLS) of young men and  
72 women in 1976 and 1978, respectively, to conduct regression decompositions of wealth by race. After  
73 controlling for income and demographic variables, they found that 78 percent of wealth gap remained  
74 unexplained. But they obtained different results when decomposing wealth based on white and black  
75 coefficient weights: 22 percent of blackwhite wealth differences (for couples and singles) were unexplained  
76 using white coefficients.

77

78 However, 74 percent (for couples), and 97 percent (for singles) of black-white differences were  
79 unexplained using black coefficients. They state that “from a policy perspective, the more relevant question  
80 appears to be one addressed when black functions are employed: what would happen to black wealth if  
81 blacks were given the white means but retained there own functions?” (p. 332). Based on the large  
82 unexplained differences in wealth, they proposed that barriers to businesses and housing, differences in  
83 labor market uncertainty<sup>1</sup> and differences in inheritances may be possible sources of these differences.

84 Altonji, Doraszelski and Segal (2000) confirmed large unexplained differences in wealth among blacks and  
85 whites. They analyzed a sample of pooled data from the Panel Study of Income Dynamics (PSID) in 1984,  
86 1989 and 1994 by multiple models of regression decomposition and found that 70 percent of the  
87 differences were still unexplained, based on the results using black coefficient weights. Their OLS  
88 decompositions show large unexplained black-white wealth differences using black and white coefficients:  
89 Explained wealth differences were six percent for couples and 27 percent for single males using black  
90 coefficients, and 67 percent for couples and 108 percent for single males using white coefficients.

91 Gittleman and Wolff (2000) also confirmed large unexplained black-white differences. They used PSID  
92 data from 1984-1994 and found at least 75 percent of differences remained unexplained depending on the  
93 coefficient. Using black coefficients, 32 percent of the wealth differences were explained in 1984, 44  
94 percent in 1989, and 28 percent 1994, and using whit coefficients, 81 percent (1984), 78 percent(1989), and  
95 77 percent(1994) of the wealth differences were explained. Furthermore, using simulated counterfactuals  
96 and substituting observed savings and inheritance rates in black wealth function, the authors found the gap

97 would remain and take another 72 years to close gap. For an extended review of the modern literature see  
98 Appendix A.

99  
100 *However*, these studies lack a sufficient time dimension to understand the evolution of black-white  
101 differences in wealth. Comparing empirics from decompositions that are further apart in time, for instance,  
102 may help identify the underlying causes of black-white differences in wealth. Additionally, a thorough  
103 analysis of the variables that explain wealth accumulation patterns would provide readers additional  
104 confidence in the results<sup>2</sup>. This study attempts to address these concerns by analyzing the source of the  
105 black-white wealth gap directly before and after emancipation of blacks in the United States, and  
106 comparing historical differences to modern differences.

107  
108 In this study, I employ Integrated Public Use Microdata Samples (IPUMS) collected from the US. The final  
109 sample includes a 1-in-100 random sample from the 1850-70 censuses and supplemental samples of 1-in-50  
110 blacks in 1860 and 1870. The racial breakdown of the pooled sample is 21,416 blacks and 154,569 whites.  
111 See Appendix B for an analysis of the data source and descriptive statistics.  
112

113 **Econometric Analysis**

114

115 The following statistical methods will employ a modified form of regression decomposition to analyze the  
116 wealth discrimination coefficient. Ronald Oaxaca (1973) applied the market discrimination coefficient to  
117 formulate a regression decomposition of wage differences by gender, commonly known as the Oaxaca  
118 decomposition. Researchers have applied the decompositions presented by Oaxaca (1973), Blinder (1973)  
119 and Juhn, Murphy and Pierce (1991) to studies of gender, ethnicity and racial discrimination in wages,  
120 income and wealth.

121

122 To test the source of differences in wealth among blacks and whites, I conduct structural regression  
123 decomposition. Structural regression decomposition suggests that the aggregate variation of parameterized  
124 variables, identified by economic theory, can be completely captured even though the econometric model is  
125 reduced in form. This result should hold as long as the components in the composite error term are  
126 uncorrelated with each other and the  
127 explanatory variables.

128

129 Although *wage* data is not available in the data set, this does not hinder our analysis. Wages are  
130 determined by the value of the marginal product of labor plus a discrimination coefficient. Marginal  
131 products are empirically difficult to observe but we can use a proxy variable such as literacy to capture this  
132 theoretical relationship. The ability to read and write, or literacy, might be interpreted as a minimum level  
133 of schooling required for higher productivity. Since we can expect a positive relationship between literacy  
134 and the marginal product of a laborer, we can also expect a positive relationship between literacy and  
135 wages. Thus, since we expect a positive relationship between wealth and wages, according to the identity,  
136 we can expect wealth and literacy to be positively correlated in the regression analysis<sup>9</sup>.

137

138 The wealth identity shows that more *hours of work and lower consumption* causes wealth to grow. Ham,  
139 Jakubson and Reily (1998) present a

140

141 “‘Quasi - Marginal Rate of Substitution’ equation between labor and consumption to empirically  
142 estimate explanatory variables for hours of work and consumption. Since it is formed from the  
143 demand equations...thus contains the price of other nondurable consumption. The usual marginal  
144 rate of substitution equation between hours and food consumption based on the first order  
145 conditions... would contain instead the quantity of other non-durable consumption which is not  
146 observed in the PSID” (p.10). Thus, when data on hours of work and consumption are not  
147 available, unemployment rates and prices can be used as a proxy<sup>10</sup>.

148

149 *Initial wealth* is determined by social endowment, family endowment, and preferences for parental versus  
150 child consumption. None of these variables are available in the dataset, but the constant reports the amount  
151 of wealth held by individuals when all other variables equal zero. Thus, the constant produces a strong  
152 estimate of the impact of initial wealth on current wealth

153

154 Finally, the *rate of return* is explained by age variables. Age variables control for life cycle investment  
155 decisions. Including age and age-squared in the regression equation assumes a concave relationship  
156 between age and wealth. Masson (1986), Mirer (1979) and Shorrocks (1975) found cross-sectional age-  
157 wealth profiles that were concave only when they did not control for factors such as cohort and mortality  
158 differences.

159

160 Thus, we can rewrite the structural regression in terms of a reduced form of the parameters. See  
161 Appendix C for more literature concerning the wealth identity.

162

163 *Empirical Test*

164

165 The following empirical test more directly ascertains the source of black-white wealth differences when  
166 using regression decomposition.

167

168 This test states that the differences in wealth explained by differences in wealth due to differences in  
169 characteristics are greater than differences in wealth due to differences in returns to characteristics,. If the  
170 test holds, we do not reject the proposition that a significant portion of black-white wealth differences can  
171 be explained by differences in investing in the optimal wealth-generating characteristics. If the test fails to  
172 hold, then we can reject the proposition.

173

174 To conduct this test, I will obtain estimated parameters and sample means from a subsample of married  
175 household heads, a sub-sample of single household heads, and a pooled sample of all household heads to  
176 calculate the explained and unexplained differences in wealth among blacks and whites in 1860 and  
177 187014. Then, I will compare these results to estimates by Blau and Graham (1990); Altonji, Doraszeki and  
178 Segal (2000); and Gittleman and Wolff (2000).

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180

181 **Empirical Results**

182

183 Estimates show that large, unexplained, black-white differences in wealth levels can be traced back to the  
184 era before and directly after emancipation. 73.9 percent of the 1860 differences in black and white wealth  
185 were due to different returns to the optimal wealth-generating characteristics. This result was based on  
186 estimates using (i) level differences in wealth, (ii) the pooled sample of married and single household  
187 heads, and (iii) black coefficients. However, these estimates remained between 64.8 percent and 84.3  
188 percent even when estimating unexplained differences in black and white wealth levels using married or  
189 single household heads and white coefficients. By 1870, unexplained differences in wealth levels grew to a  
190 range between 79.3 percent and 87.2 percent using black coefficients but results also began to depend on  
191 coefficients analyzed.

192

193 These results show that the three quarters of wealth level differences first observed by Blau and Graham  
194 (1990) have historical roots.

195

196 Estimates of black-white log wealth differences produce large but less dramatic unexplained differences in  
197 wealth. For the pooled sample, unexplained black-white differences in log wealth were approximately 45.4  
198 percent using either the free black or white coefficients. 42.2-43.0 percent of the black-white differences in  
199 log wealth were unexplained among married free black and married white households. However, these  
200 unexplained differences grew dramatically for single households in 1860. The differences in log wealth due  
201 to differences in returns to the optimal wealth-generating characteristics grew to a range between 75.9 and  
202 55.0 percent among single free black and single white households. The difference in these results may be  
203 explained by the relative stability of married households due to a possible longer experience of freedom.  
204 Married, free black households were more likely to be free over multiple generations and able to structure  
205 their experience in manner that is conducive to wealth accumulation while single households may be  
206 recently freed slaves or refugee slaves. These single, free black households may not have had the tradition  
207 of investing their savings in a manner conducive to wealth accumulation producing larger differences in the  
208 returns to the optimal wealth-generating characteristics<sup>15</sup>. Black-white differences in log wealth among  
209 single and married households followed the same pattern in 1870<sup>16</sup>.

210

211 Results can also be used to compare pre- and post-emancipation wealth within groups. Almost all white  
212 wealth losses were unexplained between 1860 and 1870. The pooled and married samples show that  
213 differences in wealth due to differences in returns to characteristics ranged between 84.1 percent and 110.2  
214 percent using (i) differences in log wealth and wealth levels, and (ii) 1860 and 1870 coefficients.

215 Unexplained differences in wealth were only slightly lower using the sample of single household heads.

216 Thus, we may be able attribute nearly all of its losses in white average wealth between 1860 and 1870 due

217 to southern dependence on the abolished practices of slavery. This proposition will be analyzed when these  
218 results are further decomposed.

219

220 Similarly, when focusing on the 1860 free black coefficients, all of the differences in black wealth between  
221 1860 and 1870 can be traced to freedom-slavery differences. 99.7 percent to 150.0 percent of log and level  
222 wealth differences among 1860 free blacks and 1870 ex-slaves were due to differences in returns to the  
223 optimal wealth-generating characteristics. Thus, blacks experienced a 100 percent return to freedom.

224

225 *Decomposed Differences.* To analyze the estimates in a more detailed manner, the pooled samples were  
226 further decomposed. Oaxaca and Ransom (1999) reminds us to be careful when decomposing regressions  
227 with dummy variables beyond explained and unexplained differences:

228

229 “Generally, conventional decomposition methodology cannot identify the separate contributions  
230 of dummy variables to the wage decomposition, because it is only possible to estimate the relative  
231 effects of a dummy variable. So the discrimination component is not invariant to the choice of the  
232 ‘left-out’ reference group...However, overall decomposition into discrimination and qualifications  
233 is invariant to the choice of reference groups, so that major results of papers attempting to make  
234 separate imputations of discrimination to the unadjusted wage differential are not affected”  
235 (p.154).

236

237 Thus, given the set of variables analyzed, the contribution of the rate of return, as measured by age, and  
238 preferences, as measured by the number of household members and children, are the only invariant results.

239

240 Foremost, literacy was employed as a proxy measure for wages differences among blacks and whites.  
241 Between 1860 and 1870, black-white differences in log wealth due to differences in literacy ranged  
242 between 7 and 26 log basis points relative to illiterates. However, differences in returns to literacy ranged  
243 between 70 and 74 log basis points relative to illiterates. The rate of return, as measured by age, has a larger  
244 impact on log wealth differences due to literacy. Differences in returns to age increased 1860 black-white  
245 differences in log wealth by 233 log basis points. By 1870, black-white differences in returns to age grew  
246 to 605 log basis points. These results show that black-white differences in returns to the growth rate of  
247 wealth outweighed differences in log wealth due to differences in investments in and returns to literacy.

248

249 The decomposed results can also be used to compare pre- and post-emancipation wealth within groups.  
250 1860-1870 differences in literacy and differences in returns to literacy caused log wealth differences to  
251 grow or fall by no more than ten log basis points relative to illiterates for both blacks and whites. Note that  
252 differences in log wealth due to southern residence were much larger for both blacks and whites. The mass  
253 residence of 1870 ex-slaves in the south relative to the more even dispersion of 1860 free blacks and the

254 decline in southern wealth accumulation after emancipation caused 1860-1870 black wealth differences to  
255 grow 115 log basis points relative to the Midwest while 1860-1870 white wealth differences grew 30 log  
256 basis points relative to Midwestern whites due to differences in returns to residing in the south. Southern  
257 residence was the largest factor that expanded 1860-1870 white wealth differences, confirming earlier  
258 results that most of 1860 white wealth losses were due to southern dependence on slaves that were  
259 emancipated. But the rate of return was the fact expanded 1860-1870 black wealth differences the most:  
260 differences in free black-ex-slave wealth grew 191 basis points due to differences in the return to age17.

261

262 Thus, these results may provide evidence that continuously compounded growth rates of wealth caused by  
263 large initial wealth differences contributed to significant black-white wealth differences before and after  
264 emancipation.

265

266 *Empirical Tests.* The empirical test results show that unexplained differences in wealth were a significant  
267 portion of black-white differences in wealth. Since the test statistics does not exceed K for all cross-  
268 sections and time periods, we reject that proposition that a significant portion of black-white wealth  
269 differences can be explained by differences in investing in the optimal wealth-generating characteristics.

270

271 Furthermore, these statistics can be used to analyze long-run patterns in black-white wealth differences.  
272 When observing test statistics based on wealth levels and black coefficients, results from the pooled sample  
273 are less conclusive than results from the married and single samples. Test statistics from the sample of  
274 single household heads grow from 0.15-0.19 in the mid nineteenth century to 0.28 in the mid 1970's to 0.37  
275 in the 1980's through the 1990's. Thus, unexplained differences in black and white wealth remain  
276 significantly large over the last 140 years but black-white differences are, somewhat, increasingly  
277 explained by characteristics of the single household head. To the contrary, test statistics from the sample of  
278 married household heads fell from 0.32 in 1860 to 0.26 in 1870, which remained approximately the same  
279 through mid 1970's at 0.28 to 0.06 in the 1980's through 1990's. Thus, even when blacks structured their  
280 household in manner conducive to generating wealth, as might be represented by households with two  
281 productive adults, unexplained differences in black and white wealth were persistent and compounded over  
282 time.

283

284 **Summary**

285

286 This paper presents a structural decomposition of differences in wealth among blacks and whites over the  
287 last 140 years. The standard analysis, based on the market discrimination coefficient and the Oaxaca  
288 decomposition, was modified because it does not capture differences in the underlying processes that  
289 determine wages and wealth. Additionally, the empirical test provides a systematic method for analyzing  
290 results from regression decompositions. To summarize the results in this paper, (i) I confirmed that large,  
291 unexplained black white differences in modern wealth have historical roots; (ii) I found that most of white  
292 wealth losses after emancipation were due to southern dependence on the abolished practice of slavery; (iii)  
293 I found that 100 percent of the wealth differences between 1860 and 1870 blacks were due to freedom—or  
294 lack of freedom—(iv) I found that the compounding growth rate of wealth was a dominant factor in black-  
295 white wealth differences; and (v) I found that unexplained differences in black and white wealth continue  
296 to persist and grow over time. These results may indicate that initial *nominal* differences in wealth and the  
297 returns to the optimal wealth-generating characteristics vastly understate the *effective* differences, which are  
298 continuously compounded over time and across generations.

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485

486 **Appendix A: Extended Review of Modern Literature**

487

488 The following review of the literature is based on *empirical* difference in wealth, (i) based on observed  
489 differences in distribution of wealth, (ii) locality differences in wealth, and (iii) regional differences in legal  
490 protections of individuals based on skin color.

491

492 Overall distributional comparisons also show significant differences in black and white wealth. Terrell  
493 (1971) used Gini coefficients and distributional analysis to show black wealth was less evenly distributed  
494 than whites. Hurst, Luoh and Stafford (1998) analyzed PSID data to analyze black-white wealth differences  
495 and found that the wealth of blacks was more mobile than the wealth whites due to a more narrow wealth  
496 range among blacks. They also found that 70 percent of blacks in the sample still had no wealth after 10  
497 years passed. Using distributional analysis such the Lorenz Curve, they found black wealth grew faster  
498 during the 10-year period but these changes were not observable in the overall distribution of wealth due to  
499 large difference in distributional patterns among blacks and whites.

500 Franklin Smith (1975) analyzed a sub-sample of DC residents in the mid 1960's to observe similar black-  
501 white wealth differences. He used 1967 DC Estate Records and descriptive statistics to show that blacks  
502 possessed 1/19 of white estate in DC. Using a log regression analysis of black wealth, he also found blacks  
503 in DC still owned \$3300 less wealth (in 1967) when controlling for age, gender, occupation, marital status  
504 and birthplace.

505

506 Conely (1999) used results from analyzing 1984-94 PSID data to propose that legal and class barriers were  
507 the source of black-white wealth differences. He suggested that there were legal barriers to economic  
508 growth in the black community, including black codes in the south (e.g. SC), coerced failure of Freedman's  
509 Bank in 1874, racial discrepancies in Old Age Insurance in 1935, redlining in HOLC in 1933, and redlining  
510 in Federal Housing Authority & Veterans Administration in 1937. Using regression analysis of log wealth,  
511 Conely found parental wealth had a more significant impact on net worth than race and suggested that  
512 social class is more important than racial differences.

513

514 Appendix C compiles literature on the subcomponents of wealth. **Wealth is a function of initial wealth,**  
515 **(inheritance), or intergenerational transfers; (income and) savings; rate of return to storing wealth in**  
516 **financial assets (including) homes; and the composition or size of family or household.** The following  
517 describes literature of statistical results concerning wealth.

518

519 **Inheritance.** Several studies have focused on the role of initial wealth or intergenerational transfers on  
520 black-white wealth differences. Menchik and Jiankopolos (1997) found effects of intergenerational  
521 transfers on black-white wealth differences. They used 1976 National Longitudinal Surveys and 1989  
522 Survey of Consumer Finances to conduct regression decomposition. Foremost, they calculated permanent

523 income using predicted current income at age 60. Explained wealth differences ranged between 30-37  
524 percent of the 1976 pooled sample; 58 percent of 1989 married sample; and 72 percent of the 1989 single  
525 sample. But they found 25 percent of white households and 10 percent of black households received  
526 inheritance but only 10-20 percent of the explained differences were due to inheritance. Using tobit  
527 analysis, they found white households with fewer children, with more schooling among fathers and with  
528 deceased parents had higher probability of receiving inheritance. Wolff (1998) confirmed these results. He  
529 used 1983 –1995 SCF data to show that blacks and whites possessed different proportions of their wealth  
530 originating from inheritance (blacks: 11 percent vs. 24 percent for whites).

531  
532 Altonji, Doraszelski and Segal (2000) observed limited effects of intergenerational transfers on black-white  
533 wealth differences. They used 1984-1994 PSID data to conduct OLS and fixed effect regression  
534 decomposition. To obtain the fixed effect, the calculated permanent income from an individual-specific  
535 effect of income regression normalizing age to 40. To conduct fixed effect decomposition, the authors used  
536 sibling differences to net out a fixed inheritance effect and found little change in results. Explained wealth  
537 differences ranged between 30-111 percent for pooled sample depending on the coefficient used in the  
538 analysis. After conducting a fixed effected analysis of sibling differences and comparing to OLS results  
539 with no fixed effect, the authors found no significant differences: controlling for inheritances does not  
540 change the portion of unexplained differences significantly. They proposed that differences in savings or  
541 rates of return might be more effective in explaining black-white differences in wealth than  
542 intergenerational transfers.

543  
544 **Income and savings.** Additional studies concentrated on this role of income and savings in black-white  
545 wealth differences. Using 1983-84 SIPP data, Oliver and Shapiro (1989) find that income differences do  
546 not explain wealth differences. They show that wealth and financial assets differed among blacks and  
547 whites when controlling for income groups. Blacks had less than 50 percent of the wealth held by whites  
548 across all income categories while less than 25 percent of the financial assets held by whites. Conley (1999)  
549 confirmed his results. He found that blacks had less wealth at all levels of income even though blacks saved  
550 more than whites<sup>19</sup> and blacks were self-employed more than whites (12 percent vs. 10 percent). Using the  
551 results , Henry Terrell (1971) also found large differences in black and white wealth when for  
552 education and income. Franklin and Smith (1977) used 1967 DC Estate Records to show that black and  
553 white net worth also differed when controlling for average income.

554  
555 Wolff (1992) uses SCF, SFCC, and SIPP from 1940 – 1988 to show that the black-white difference in net  
556 worth exceeded differences in income. The black-white income ratio held or rose to 60 percent from 1940  
557 to 1985 while the black-white ratio of net worth was below 25 percent from 1962 to 1988.

558

559 **Assets.** Additional studies have focused on the role of financial assets in wealth differences. Brimmer  
560 (1988) used 1984 Census data to show that blacks held 5 percent or less of any individual asset. Stocks  
561 consisted of 2 percent of black net worth and 0.13 percent of US stocks. Additionally, he found that whites  
562 at lower incomes were more likely to hold stocks than blacks. Snyder (1989) confirmed these asset  
563 differences. He used 1982 NBS data to show that black asset portion of the retirement portfolio (3.6  
564 percent) was smaller than the portion in the Hispanic portfolio (9-10 percent) and whites (20 percent).  
565 Terrell (1971) also confirmed significant asset differences among blacks and whites. Descriptive statistics  
566 from 1967 Survey of Economic Opportunity data show that blacks held 24.1 percent of white non-financial  
567 assets and 6 percent of white financial assets. But 72 percent of the black non-financial assets were in  
568 consumption services while only 53 percent of white assets were stored in this manner<sup>20</sup>. Wolff (1998)  
569 also found larger differences in financial assets decades later using 1983-95 SCF data. The black-white  
570 ratio of mean financial worth fell to 11 percent while black-white ratio median financial net worth held  
571 constant at 0 percent.

572  
573 Some research has estimated the source of asset differences among blacks and whites. Using **probit**  
574 regression analysis, Hurst, Luoh and Stafford (1998) found blacks are less likely to own stocks and  
575 transaction accounts when controlling for income and demographic variables. They suggested that lack of  
576 experience with transaction account ownership may impact potential ownership of other assets. Chiteji and  
577 Stafford (1999) confirmed this proposition. They used 1984 and 1994 PSID data to analyze the role of  
578 financial asset accumulation on black-white wealth differences. Probit analysis shows that parental  
579 ownership of stock increases the probability of stock ownership among young families causing race to  
580 become statistically insignificant. Keister (2000) also confirmed these findings. She used SCF data from  
581 1983 and 1986 to analyze black-white wealth differences. Using **logit** regression analysis, she shows that  
582 blacks were less likely to own high-risk assets (such as business assets, stocks, and bonds) after controlling  
583 for income, education, age, marital status and ownership. She also found that past ownership of assets  
584 predicts current ownership of assets.

585  
586 Furthermore, income predicts ownership of assets but education variables were not consistent across past  
587 and current owners. Finally, she used a simulation method to show aggregate improvements occur in the  
588 distribution of wealth when removing race effects and augmenting black education effects.

589  
590 **(Assets of) Homeownership.** Wolff (1992) uses SCF, SFCC, and SIPP from 1940 – 1988 to show that the  
591 black-white difference in net worth exceeded differences in homeownership. The black-white  
592 homeownership ratio held or rose to 60 percent from 1940 to 1985 while the black-white ratio of net worth  
593 was below 25 percent from 1962 to 1988. Even though wealth differences ranged further than  
594 homeownership differences, their correlation remained unchanged. Birmbaum and Weston (1974) used  
595 1967 SEO data to show the correlation of wealth and homeownership. They used GLS regression analysis

596 to calculate the predicted probability of owning home using a sample split by race. They found differences  
597 in wealth increased the explained differences in the probability of homeownership. They also found that the  
598 black wealth portfolio primarily consisted of homes unlike white wealth: 72 percent of black wealth  
599 while only 35 percent of white wealth was in homes. However, 59 percent of whites own homes while only  
600 39 percent of blacks owned homes.

601

602 **The Household Structure.** Keister (2000) shows a significant impact of resource dilution of (household  
603 structure) on wealth. She used 1985 and 1996 NLSY data to analyze the role of household structure on  
604 black-white wealth differences. She provides a review of the literature on the theory of resource dilution—  
605 the impact of family organization on material resources, parental attention, intervention and child  
606 opportunities—and shows that it accounts for an inverse relationship between the number of children and  
607 education outcomes. Using GLS regression analysis and **logit** analysis, she found that resource dilution  
608 impacted the accumulation of black and white assets differently, the probability of blacks and whites  
609 owning assets differently, and upward mobility among blacks and whites differently.

610

611

612 **Appendix B: Data and Descriptive Statistics**

613

614 This study compares modern analyses with modern empirical results to the modern analyses of James Curtis Jr  
615 with older data and empirical results from the IPMUS (Integrated Public Use Microdata Samples). IPUMS data  
616 are based on national representative samples and supplemental over-samples of minorities from the population  
617 schedules of the US census manuscripts. The US conducted its first census in 1790 and its first modern census in  
618 1850. By 1850, the census had improved such that we can now investigate the past with new insights. Modern  
619 census data is a rich set of cross-sectional, individual-level data on American families and individuals 21.

620

621 This study analyzes US census samples from the 1850-70 . These census manuscripts contain responses to  
622 important socioeconomic inquiries including age, sex, color, marriage status, literacy, whether the  
623 individual attended school during the year, occupation, state or country of birth, value of real estate, and  
624 value of personal estate (1860 and 1870 only)<sup>22</sup>. Economists have conducted an extensive amount of  
625 research based on national samples from the early US census manuscripts (see e.g. Ferrie 1999, 1994;  
626 Steckel 1990; Becker and Tomes 1986 and Soltow 1975, 1972).

627

628 The sample studied in this paper was restricted to heads of households. Investigating the wealth from a  
629 random sample of household heads is more productive than investigating a random sample of individuals.  
630 Wealth is often used to purchase durable goods and durables are more likely to benefit the entire household  
631 rather than one individual in a household.

632

633 Furthermore, census enumerators tended to sum up the wealth of a household and report it under the head  
634 of household. The final sample includes a 1-in-100 random sample from the 1850-70 censuses and  
635 supplemental samples of 1-in-50 blacks in 1860 and 1870. The racial breakdown of the pooled sample is  
636 21,416 blacks and 154,569 whites<sup>23</sup>.

637

638 *Descriptive Statistics*

639

640 The following describes the means of the variables in the sample. Five years after emancipation, blacks, on  
641 average, held \$71 in real estate wealth while whites held \$2,437 <sup>24</sup>. Given that blacks held only 2.9 percent  
642 of the average white real estate wealth in 1870--up from the 1.5 percent in 1850 and 1860, the fact that the  
643 growth of real estate wealth favored blacks over this time period may not be surprising. Among blacks,  
644 average real estate wealth, adjusted by regional prices, grew by 28 percent between 1850 and 1860 and 33  
645 percent between 1860 and 1870. Among whites, price-adjusted real estate wealth also grew by 28 percent  
646 between 1850 and 1860 but fell by 25 percent between 1860 and 1870. This white wealth recession was  
647 primarily due to the losses incurred by the southern whites after the Civil War.

648

649 Property-holding patterns were similar to real estate wealth patterns. Only 6.7 percent of blacks in 1870  
650 held property (or a positive value of real estate wealth) while 54.6 percent of whites held property in 1870.  
651 The growth in black property-holders outpaced the growth of black real estate wealth. Blacks property  
652 holders grew 17 percent between 1850 and 1860 and 148 percent between 1860 and 1870. Among whites,  
653 property holders grew by five percent between 1850 and 1860 and fell two percent between 1860 and 1870.  
654 Overall, the ratio of black to white property holders was 12.2 percent in 1870, up from 4.3 percent in 1850  
655 and 4.8 percent in 1860.

656

657 Blacks made similar gains in the total estate. Total estate includes the value of personal estate and real  
658 estate 25. On average, the value of black total estate wealth, adjusted by regional prices, was \$124 in 1870  
659 while whites held \$3,548 in total estate. Total estate wealth grew by 47 percent between 1860 and 1870  
660 among blacks while white total estate wealth fell 33 percent between 1860 and 1870. Black total estate  
661 holders (or blacks possessing a positive value of total estate wealth) grew by 265 percent to 23.5 percent in  
662 1870 while white total estate holders fell by 9.6 percent to 75.8 percent in 1870. Overall, the ratio of black  
663 to white total estate wealth was 3.5 percent while the ratio of black to white total estate holders was 31  
664 percent in 1870.

665

666 Black-white differences in schooling and employment were also quite large in 1870. 14.6 percent of the  
667 black population was literate while 88.5 percent of the white population could read and write. While 89  
668 percent of both, blacks and whites, were employed, occupation concentrations were different. In 1870, 70.5  
669 percent of blacks had unskilled jobs, compared to 23 percent of whites. In contrast, 18.8 percent of blacks  
670 were either white-collar workers or farmers, compared to 53.8 percent of whites<sup>26</sup>.

671

672 Blacks and whites were also different demographically in 1870. 18 percent of black households had female  
673 heads while only 10.7 percent of white households had female heads. Similarly, only 71.6 percent of black  
674 household heads were married while 81.8 percent of white household heads were married. White  
675 households also had more residents, including children. Furthermore, the average age of the white  
676 household head, youngest child and oldest child is older than the average ages of the black household head,  
677 youngest child and oldest child, respectively 27.

678

679 Regional differences were also quite large in 1870<sup>28</sup>. Only one-in-four whites lived in former slave states  
680 while nine out of ten blacks lived in former slave states. As a result blacks were more likely to live in rural  
681 areas than blacks (86.3 percent of blacks to 71.8 percent of whites). This occurred because whites were  
682 more regionally mobile than blacks. 35.9 percent of blacks migrated from their birth state and 45 percent  
683 these migrants reside in a new region.

684

685 However, 59.7 percent of whites migrated from their birth state and 80 percent of these migrants changed  
686 regions. The key regional difference may be that only 11.4 percent of blacks were born outside the  
687 Southeast while the largest birth segment among whites were foreign born (28.2 percent)<sup>29</sup>.

688

689 These descriptive statistics document the general improvements in the condition of the  
690 average black relative to the average white after the abolition of slavery.

691

692 **Appendix C: Theory of the Components of the Wealth Identity**

693

694 Wealth is determined by (i) *wage* rates offered by firms, (ii) individual choices of *hours of work* and  
695 commodity consumption, (iii) *market prices of commodities*, (iv) *initial wealth* of individuals and (v)  
696 market *rates of returns* on invested initial wealth and savings. See Appendix A for (comparative literature  
697 on) the theory behind each of these elements of wealth.

698

699 (i) *Wages*. Consider the following single period model, formalized by Arrow (1972), where owners of firms  
700 seek to maximize their utility, which includes short-run profits & types of labor.

701

702 (ii) *Choice of Hours of Work and Commodity Consumption*. Ham, Jakobsun and Reily (1998) estimate  
703 parameters from labor supply equations derived from the Lucas-Rapping Model where:

704 “The lifetime utility function is assumed to be additively separable over time. The current within-  
705 period utility is a non-additively separable function of food consumption, other non-durable  
706 consumption and male labor supply... We rule out corner solutions by assuming that the individual  
707 consumes a positive amount of both goods and provides at least one hour of male labor supply in  
708 each period. Finally, the consumer is assumed to face no additional constraints in any market,  
709 including the labor market. In this situation the consumer faces only a period t lifetime wealth  
710 constraint. (pp.7-8). Using the first order conditions, Ham, Jakobsun and Reily (1998) show how  
711 structural and reduced-form labor supply regression equations can be estimated. They also “consider  
712 a Keynesian or disequilibrium model of the labor market as an alternative to the L-R model. In  
713 these models unemployed individuals cannot work as much as they would like to during a given  
714 year because they face a constraint on their labor supply” (p.11).

715 They show that hours of work can be estimated using wage rates, food prices, non-durable commodity  
716 prices and industry or occupation unemployment rates.

717

718 (iii) *Market prices of commodities*. When markets are competitive and firms have all the same cost  
719 structure, a large number of firms and buyers in the market cause prices to be fixed at the additional cost to  
720 providing the good or service because information is fully available on alternative suppliers and customers.  
721 Furthermore, free entry and exit price markups, causing market prices to be at equilibrium and markets to  
722 be efficient—where voluntary participation in a market-oriented distribution of goods and services  
723 maximizes the net gains to producers and consumers.

724

725 However, when markets are less competitive, such as monopoly, prices are marked up over the additional  
726 cost to providing the good or service, based on consumers’ responsiveness to price and the producer’s share  
727 of the market. This leads to an amount of goods and services, which are bought and sold, that is below the  
728 competitive market outcome leading to inefficiencies and additional gains from government regulation.

729 Moreover, when markets are less competitive, producers can price discriminate if they know the  
730 willingness and ability of individual consumers to purchase their goods and services. While such practices  
731 are generally accepted and encouraged for goods such as senior and student movie theater tickets or lunch  
732 and dinner restaurant prices, price discrimination based on race is equivalent to statistical discrimination—  
733 making predictions about a person based on membership in a certain group (Stockton, 1999, p. 434) and  
734 using an individual’s membership in a certain group as information on the individual’s skill and  
735 productivity (Borjas, 2000, p.357). Offering an individual in a racial group a price that is different from a  
736 price offered to an individual in another racial group, such as mortgage rate, (holding all other variables  
737 constant), constitutes economic discrimination. The gains to firms from these practices are the equivalent to  
738 the gains to firms specified from offering different wage rates discussed in section one.

739

740 (iv) *Initial Wealth*. Initial wealth is obtained through inheritance or intergenerational transfers. Becker and  
741 Tomes (1979) formulate a model for initial wealth where families choose wealth of the children or  
742 investments in children and parental consumption to maximize the family utility function subject to  
743 parental income constraint, child (or children) income constraint and endowments.

744

745 (v) *Rate of Return*. Schlomo Yitzhaki (1987) models the group-specific rates of return using sale and  
746 purchase price of assets:

747 “The...simpler way for calculating the rate of growth of wealth for comparing groups of investors,  
748 is to find out, for each group the total value of wealth at the beginning and the end of the period,  
749 and then calculate the instantaneous rate of growth of wealth. Formally...we have to aggregate the  
750 costs and the proceeds for each holding period and then calculate the rate of growth. Actually, this  
751 is the rate of return of the investors for their investments... (Furthermore) if we have several  
752 observations on the rate of return on a portfolio—we have to aggregate them first and then  
753 calculate the rate of return.” (pp. 80-82).

754 Thus, the rate of return is function of sale and purchase price of assets.

755

756 Discrimination in the price of assets, such as real estate assets, can cause certain groups to obtain a lower  
757 sale price or pay a higher purchase price, and thus, obtain a lower rate of return than obtained by members  
758 of other groups. There is an extensive literature on how such discrimination can occur in housing market  
759 prices. For instance, Martin Bailey (1959) first introduced the border model. His model assumes that:

760 “Members of group X prefer living near group Y to living entirely surrounded by other members  
761 of group X, while members of group Y prefer to live entirely surrounded by other members of  
762 group Y. ” (Members of group Y) considers it unpleasant to live near people with lower incomes  
763 and with tastes and habits ‘inferior’ to their own, while the reverse is sometimes and perhaps not  
764 generally true...(Furthermore) Suppose streets A, B, C, and D are occupied entirely by members  
765 of group X, while streets E, F, G, etc. are occupied entirely by members of group Y; and suppose

766 that only occupants of streets D and E consider themselves affected by their proximity to members  
767 of the opposite group. Under the assumed conditions, if people do not anticipate any change, the  
768 properties along street D will sell (and rent) at prices higher than those along streets A, B, and C,  
769 and the properties along street E will sell (and rent) at prices lower than those on streets F, G, etc.”  
770 (pp.288-89).

771 Thus, group specific rates of returns are not only determined by sale and purchase price of assets, but are  
772 also determined by the preferences of those that affect the price of the asset, similar to the discrimination  
773 coefficient that affects the size of wages paid to different groups.

774 **END NOTES**

775

776 1 Ham (1982) describes how labor market constraints impact worker decisions.

777

778 2 Gittleman and Wolff (2000) critique results produced by Blau and Graham (1990). "It is evident that, as  
779 in past research, the amount of wealth difference that can be 'explained' hinges critically on the  
780 coefficients...Blau and Graham (1990) use their decomposition results to make speculations as to whether  
781 the large differences in wealth functions are related to differences in savings behavior, capital appreciation  
782 or intergenerational transfers. Because of the methodological difficulties with this approach, we use a  
783 different procedure" (p.5).

784

785 7 Oaxaca (1973) states: "It is clear that the magnitude of the estimated effects on discrimination critically  
786 depends upon the choice of control variables for the wage (or wealth) regressions. A researcher's choice of  
787 control variables implicitly reveals his or her attitude toward what constitutes discrimination in the labor  
788 market. If it were possible to control for virtually all sources of variation in wages, one could pretty well  
789 eliminate labor market discrimination as a significant factor in determining wage differentials....the other  
790 extreme is to control for virtually nothing and thereby minimize the role of productivity differences"  
791 (p.699).

792

793 8 " McCallum(1972) and Wickens (1972) show that the asymptotic bias (actually, degree of consistency) is  
794 worse if the proxy variable is omitted, even if it is a bad one (has a high proportion of measurement error).  
795 This neglects, however, the precision of the estimates. Aigner (1974) analyzed this aspect of the problem  
796 and found, as might be expected that it could go either way. He concluded, however, that 'there is evidence  
797 to broadly support use of the  
798 proxy'" (Greene 1997, p.443).

799

800 9 Note that the discrimination coefficient in the wage will be captured when decomposing the regression  
801 into unexplained effects.

802

803 10 Data on unemployment rates are not available in this dataset.

804

805 11 Oaxaca and Ransom (1999) show that the size of constant is sensitive to the referenced variables when  
806 dummy variables are employed. But this sensitivity does not affect the amount of the unexplained  
807 differences in average wealth between two groups when aggregated.

808

809 12 Juhn, Murphy and Pierce (1991) reformulated these decompositions into observed and unobserved parts  
810 of differences in wages. But applying the their method of decomposition to wealth may errantly ignore the

811 difficulties of inference due to the reduced-form regression. The reduced-form error term is a function  
812 idiosyncratic and person-specific disturbance in wealth, and the proxy variables for wages, hours of work,  
813 commodity prices and commodity consumption. I employ occupational skill dummy variables to capture  
814 most of the person-specific variation. But further decomposition of unobserved variation will simply  
815 capture more idiosyncratic disturbance from multiple sources of variance than unobserved structure.

816

817 13 With this formulation of wealth, we cannot infer about the contribution of prices to current wealth. Note  
818 that such inference is limited since we cannot separately identify the contribution of hours of work,  
819 commodity consumption and commodity prices using the price index. Here, the inference gains to  
820 analyzing the value of wealth upon liquidation far outweigh the losses from not estimating reduced form  
821 parameter on price using this dataset.

822

823 14 Blau and Graham (1990), Altonji, Doraszeki and Segal (2000), and Hurst, Luoh and Stafford (1998)  
824 show significant differences in wealth among married and single families.

825

826 15 This proposition needs to be further researched by linking cross-sectional variables to freedom dates of  
827 free blacks.

828

829 16 Note that explained differences in wealth after emancipation also reflect pre-emancipation legal barriers  
830 from choosing characteristics conducive to wealth accumulation.

831

832 17 1860-1870 white differences in wealth fell 158 basis points due to differences in returns to age.

833

834 19 Blacks saved 11 percent of their income while whites saved 10 percent of their income.<sup>20</sup> A unique  
835 finding was that stocks and bonds, however, were less evenly distributed among whites when considering  
836 nonzero wealth.

837

838 21 Magnuson (1995a) and Steckel (1991) recommend that researchers pay careful attention to enumeration  
839 the procedures before investigating this data. Magnuson reports that the U.S. Census is not a “pure  
840 reflection of general societal trends” (p. 11). The census is composed of questions, which have and have  
841 not persisted over time. Between 1790 and 1840, the unit of enumeration was the household, based on  
842 given set of characteristics, i.e. Colored-Male-Over Age 16. The 1850 U.S. Census was considered the first  
843 modern Census when the unit was changed to the individual. Magnuson also noted that a proposed slave  
844 schedule would have collected extensive information on the ancestors of modern-day African Americas. In  
845 1840, Congress formed the Census Board that unsuccessfully recommended a slave schedule for the 1850  
846 U.S. Census--which would have included the names of slaves, birthplace of slaves and number of children  
847 (Magnuson 1995a, p.19). Steckel reminds us that the original purpose of the US census was for taxation

848 and US House of Representatives appropriations. However, a “growing desire for statistical information,  
849 curiosity about society, and heightened interest in international and regional comparisons led to expanded  
850 collection by the federal census” (Steckel 1991, pp.582-83). Steckel suggested that the likelihood of error  
851 increases as early census data is more disaggregated. He noted that under-enumeration, over-enumeration  
852 and misreporting are errors that affect the quality of census data and led to the creation of the Census  
853 Bureau. Some of these errors may be attributed to the poor training of early enumerators and lower quality  
854 of early census administration. He found that larger households, lower-educated persons and persons with  
855 poor English-language skills tended to be omitted from the census. Steckel (1991) provided several  
856 examples of under-enumeration in census data collected on blacks. He recommended using census  
857 comparisons, census matching, and consistency checks to evaluate errors and improve the quality of  
858 samples from the early census.

859

860 22 Real estate value was enumerated based on guidelines specified in the Circular to Marshals. It specified  
861 that "under heading 8 insert the value of real estate owned by each individual enumerated. You are to  
862 obtain the value of real estate by inquiry of each individual who was supposed to own real estate, be the  
863 same located where it may, and insert the amount in dollars. No abatement of the value is to be made on  
864 account of any lien or encumbrance thereon in the nature of debt" (Magnuson 1995b, p347) Personal estate  
865 value was also enumerated based on guidelines that specified "Personal estate is to be inclusive of all  
866 bonds, stocks, mortgages, notes, live stock, plate, jewels, or furniture, but exclusive of wearing apparel"  
867 (p.349)

868

869 23 Prior to 1865, blacks were not only stratified by skin color--black and mulatto--but they also functioned  
870 based on heterogeneous legal rights. Blacks were either bounded in slavery or free, contingent on  
871 appropriate documentation. The 1850 and 1860 IPUMS samples only include free blacks. As reported  
872 earlier, no detailed individual-level data is available on slaves. Thus, averages of wealth and property  
873 holding in the descriptive statistics were weighted based on (i) the size of the free black population relative  
874 to slave population in 1850 and 1860 and (ii) the assumption that slaves had no personal and real estate.  
875 Blacks were 15.7 percent of the US population in 1850 and 14.2 percent of the population in 1860 (Cramer  
876 1997). But free blacks represented 11.9 percent and 11.0 percent of the black population, respectively. The  
877 unweighted averages in 1850 and 1860 represent the experience of (i) the average free black and (ii) the  
878 average black if slaves were freed earlier.

879

880 The decade before the Civil War was a ripe environment for economic prosperity. Thomas Weiss (1992)  
881 found that Gross Domestic Product (GDP) grew by 1.96 percent between 1850 and 1860--higher than any  
882 other decade in the pre-war era. He suggested that although perishable output and shelter were the primary  
883 components of the gain, residual output also increased significantly. The residual was “the portion of output  
884 beyond apparent basic necessities...this was the output needed for industrialization, and of course provided

885 as well the discretionary items that are the fruits of economic progress. In this light, Americans were  
886 advancing in style” (Gallman, p.30).

887

888 24 These estimates are consistent with the estimates of Soltow (1972; 1975). Although Soltow (1972) only  
889 collected a sample of 393 non-whites in 1870, he found their average wealth was \$73, compared to \$2,661  
890 among whites. Soltow (1975) found similar differences in free black and white wealth using a sample of  
891 151 blacks. He conducted one of the first in-depth studies of mid-nineteenth century wealth accumulation  
892 patterns using the census population schedules. Note that these schedules were originally are stored on  
893 microfilms. He spun the microfilm half-turns to collect random, cross-sectional samples from 1850-1870.  
894 He found that average black wealth in 1870 was \$74 while average white wealth in \$2,691.

895

896 25 The value of southern total estate was inflated by the value of slaves. Slave owners included the value of  
897 slaves in their personal estate.

898

899 26 White occupational concentrations changed quite dramatically between 1850 and 1870. The portion of  
900 white unskilled workers grew 46.2 percent between 1850 and 1860 and 57.3 percent between 1860 and  
901 1870 while the portion of white-collar worker grew less dramatically during this period. The portion of  
902 white-collar workers grew 25.8 percent between 1850 and 1860 and 12.1 percent between 1860 and 1870.  
903 Simultaneously, the portion of white farmers fell 9.3 percent between 1850 and 1860 and 8.4 percent  
904 between 1860 and 1870. Naturally, this coincided with a continual decline in farm ownership among whites  
905 over the twenty-year period.

906

907 27 White demographics gradually changed over the twenty-year period. The number of persons in a  
908 household, number households with children and number of children all fell. Simultaneously, the number  
909 of white male and white married household heads fell. Among free blacks, the proportion that was male  
910 and married also fell between 1850 and 1860.

911

912 28 The only dramatic regional differences among whites prior to 1870 were changes in the western and  
913 foreign-born population. 12 percent of whites lived in west in 1850. This portion of the population grew by  
914 129 percent between 1850 and 1860 and 12 percent between 1860 and 1870. Additionally, the portion of  
915 white foreign-born population grew by 52 percent between 1850 and 1860 and 10 percent between 1860  
916 and 1870. See Ferrie 1999. 1850 and 1860 free blacks were regionally different than whites and all blacks  
917 in 1870. Only one-in-two free blacks lived in slave states, with the remaining plurality living in the Mid-  
918 Atlantic. More than one-in-three free blacks lived in urban areas between 1850 and 1860—significantly  
919 larger than whites and all blacks in 1870. One-in-three free blacks were also born outside of the southeast  
920 region in 1850 and 1860. Furthermore, 34 percent of free blacks migrated to a different state in 1850 and  
921 1860 and over seventy percent of these migrants migrated to a new region.

922

923 29 Ferrie (1999) conducts a thorough analysis of the immigrant experience during this period.

924

925 30 Margo (1990) used data from Smith (1984) to show that the average amount of schooling was

926 seven years around the Civil War (Margo 1990, p.15).

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