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Economic Sociology & Theoretical Differences in Wealth, Reports from Econometric Tests of Differences in Non-Linear Regression Coefficients, Using National Samples from the US Census Historical Statistics, 1850-1870

James Edward Curtis Jr, Ph.D., 1 202 718 7796, igri@jecjefuniversity.org.

Abstract: *Researchers have a long-standing interest in understanding the causes and consequences of inequality. One approach to analyzing inequality is to compare average economic choices from a classical theoretical framework. Another approach considers the impact of the formation of society, through statutes and institutions, on average economic outcomes. This dissertation studies the effects of slavery on black-white wealth inequality upon the emancipation of slaves in the US using historical, cross-sectional data from the Integrated Public Use Microdata Samples (IPUMS).*

Foremost, a theory of relative wealth is presented, where wealth is determined by group-specific wages, hours of work, consumption, and interest rates. Historical black-white differences in wealth were estimated using regression decomposition. This technique decomposes economic differences into the portion explained by differences in characteristics and the unexplained portion due to different returns to a set of characteristics (See, e.g., Blinder 1973 and Oaxaca 1973). Results confirm that we cannot reject that the claim that, when comparing the wealth of ex-slaves to the wealth whites, differences in wealth due to unexplained (or discrimination) effects dominate the portion due to classical characteristic differences.

Furthermore, the size and source of contemporary black-white wealth differences have historical roots: In 1870, at least 75 percent of white-black wealth differences were not explained by characteristic differences described by the classical model when employing the primary index. This is consistent with wealth decompositions of late twentieth century data that shows that three-quarters of white-black differences in wealth were unexplained (See, e.g., Blau and Graham 1990).

Finally, since unexplained differences in states that abolished slavery after the Civil War were 10 percent higher than unexplained effects in states that abolished slavery well before the Civil War and the magnitudes of the unexplained effects were similar over the long-run, we cannot reject the existence of a negatively bounded correlation between the duration of time from enslavement and the magnitude of unexplained differences in wealth.

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1. INTRODUCTION

The day after a slave is emancipated from an intergenerational experience of enslavement, what are his or her goals? Does the slave have a short-run objective to supply labor and consume necessary commodities in a manner that highly discounts the future in order to survive on a day to day basis at the expense of future consumption, or does the slave have a long-run objective to store material possessions in a manner that minimizes current consumption, possibly below subsistence, in order to provide a better experience for his or her children?

Prior to mass emancipation of southern slaves after the Civil War, only a small number of 'free' blacks had an opportunity to make such decisions. The experiences of Black-Americans in the United States can be divided into three separate investigations based on the status of their citizenship: (*i*) the experience of free blacks prior to the adoption of the fourteenth amendment of the US Constitution, (*ii*) the experience of slaves prior to emancipation, and (*iii*) the experiences of all blacks after the adoption of the fourteenth amendment to the US Constitution.

2. AFTER SLAVERY, THE DOMINANT EMPLOYMENT OF BLACKS WAS SHARECROPPING

"The super-exploitation of black tenants and sharecroppers was commonplace in the South. In theory the poor black farmer could sell his or her share of crops, pay off his or her debts, and buy his or her own land. But most were not able to make enough to escape the cycle of debt and to think of becoming landowners. The next down from sharecropping was debt peonage, where the planter would by force not allow a cropper to leave. Debt peonage involved the creation of laws to keep black laborers from leaving their 'employment.' They had limited choices: Suffer quietly under the burden of debt and semi-slave working conditions or 'run away and be pursued'"(p.253).

Ira Berlin (1974) reminds us that the experience of the blacks after slavery is directly linked to that of free blacks: "In learning to deal with free blacks before the Civil War, …whites developed institutions, standards of personal relations, and patterns of thought which they applied to all blacks after Emancipation. Segregation, black codes, the convict-lease system, and the various forms of peonage usually associated with post-bellum South all victimized the antebellum free Negro caste.

When the Emancipation Proclamation and the Thirteenth Amendment freed all blacks, whites applied the panoply of attitudes and institutions they had long used to control the free Negro caste. In many instances, the magnitude of the Emancipation and the libertarian spirit that accompanied it forbade immediate reinstatement of the forms of white domination. But within a generation the web of constraints that had dominated the lives of antebellum free Negroes had been imposed on all Negroes. In many ways, freedom—not slavery—was the taproot of postwar…race relations" (Berlin, p. xiv)

Therefore, this study focuses on the economic plight of the average Black-American directly after the Civil War, which, in hindsight, illuminated the path of the average contemporary Black-American. The study of racial differences in factor market supply decisions and prices, as reflected in the literature on labor supply, wages and income, presents only a subset of the factors that contribute to the wealth portfolios of black and white households. Andrew Brimmer (1988) confirms this when stating: "The ownership of wealth by blacks reflects the same pattern of deficits evident when one looks at money income. However, the shortfall of wealth is much larger. To a considerable extent the latter can be traced to a long history of deprivation in this country" (p. 153).

3. RELATED STUDIES

Andrew Brimmer (1988) found that blacks held 7.2 percent of US aggregate income, but only 3 percent of US aggregate wealth in 1984. This large disparity in wealth have persisted throughout the twentieth century: Between 1940 and 1988, the black mean was 13 to 23 percent of white mean, and the black median 4 to 10 percent of white median (Wolff 1992). But the origin of these differences has not been researched. Several studies (See, e.g., Pennsylvania Abolitionist Society 1838, Society of Friends 1849, Dubois 1899, Jackson 1939, Soltow 1972, Soltow 1975, Berlin 1979, Higgs 1982, Spriggs 1984, Margo 1984, Hornsby 1989, Eggert 1997, Hershberg 1997, and Bodenhorn 1999) have addressed historical differences in wealth. However, their results are often limited by non-representative local samples, small samples, or descriptive analyses that do not employ potential explanatory variables.

Historical Studies

Lee Soltow (1972; 1975) conducted one of the first in-depth studies of overall mid-nineteenth century wealth accumulation patterns using the census population schedules. Note that these schedules were originally stored on microfilms. He spun the microfilm half-turns to collect random, cross-sectional samples from 1850-1870. Soltow used Gini coefficients to find that black wealth was less equally distributed among blacks than white wealth among whites. He finds that "their inequality levels are strangely similar in the sense that a few held wealth" (Soltow, 1975, p.145). Note that Soltow employs a small sample of 393 non-whites (1975) and 151 blacks (1972) to calculate his results.

Several studies have analyzed the experience blacks prior to the mass emancipation of southern slaves. John Hope Franklin (1943), Leon Litwick (1961) and Ira Berlin (1974) provide comprehensive accounts of free blacks. Furthermore, Philadelphia Abolitionist Society (1838), Society of Friends (1849), Dubois (1899), Eggert (1997) and

Hershberg (1997) provided original studies on free black wealth in localities within Pennsylvania. Also, Bodenhorn (1999) studied racial inequality by analyzing wealth differences among darker and lighter free blacks in Maryland, Virginia, North Carolina, Kentucky and Louisiana. But free blacks were only two percent of the US population at any given time period.

Several studies have analyzed black-white wealth differences among in the south well after emancipation. Robert Higgs (1982), Robert Margo (1984) and Anne Hornsby (1989) used tax records to analyze southern black-white wealth differences between 1865 and 1915. They found strong yet limited wealth grains among blacks after emancipation although their results are limited the southern economy.

Contemporary Studies

Researchers have also studied different aspects of white-black wealth differences using contemporary data For instance, several studies have focused on white-black wealth differences due to differences in inheritance (See, e.g., Kotlikoff and Summers 1981, Menchik and Jianakopolis 1997, Wolff 1998, and Altonji, Doraszelski and Segal

2000). Other studies have focused on white-black wealth differences due to differences in income, savings and preferences (See, e.g., Terrell 1971, Franklin and Smith 1977, Oliver and Shapiro 1989, Wolff 1992, Oliver and Shapiro 1997, Conley 1999, Keister 2000a, Keister 2001,and Wolff 2001). Additional studies have focused on white-black wealth differences due to differences in assets and homeownership (See, e.g., Terrell 1971, Birmbaum and Weston 1974, Brimmer 1988, Snyder 1989, Wolff 1992, Wolff 1998, Hurst, Luoh and Stafford 1998, Chiteji and Stafford 1999, and Keister 2000b).

Several studies attempt assess the dominant source of wealth and wealth differences. Kotlikoff and Summers (1981) produced a foundational study on aggregate wealth and found that intergenerational transfers were the most significant factor in wealth accumulation. Conely (1999) proposed that legal and class barriers were the source of black-white wealth differences[1]. Blau and Graham (1990) produced a seminal study of racial wealth inequality using regression decomposition. After controlling for income and demographic variables, they found that 78 percent of the wealth gap remained unexplained in 1976.

These studies have made significant contributions to our understanding of economic discrimination in terms of modern wealth differences. This study will build upon their findings by analyzing white-black wealth differences directly after the Civil War and mass emancipation of southern slaves to obtain new insights into the historical and intertemporal dimensions of the white-black wealth gap.

4. CLASSICAL VERSUS INSTITUTIONAL ECONOMIC DISCRIMINATION

Classical Perspectives

In general, discrimination is defined as "offering different opportunities to similar individuals who differ by color of skin, ethnicity, gender, age or other characteristic" (Mankiw, 1997, p. 408). Statistical discrimination implies "making predictions about a person based on membership in a certain group" (Stockton, 1999, p. 434) or "using an individual's membership in a certain group as information on the individual's skill and productivity" (Borjas, 2000, p.357). These types of discrimination are quite different than economic discrimination.

Gary Becker (1957) suggests that economic discrimination can be described as a 'taste for discrimination,' meaning the individual "must act as if he were willing to pay something, either directly or in the form of reduced income, to be associated with some persons instead of others…The money costs of a transaction do not always completely measure net costs and a discrimination coefficient acts as a bridge between money and net costs" (Becker, 1957, p.14).

Therefore, economic discrimination is either based on individual productivity differences or individual preferences for a member of a particular group. The remedy to the latter is promoting competition for market discipline to prevent sustaining such practices.

[1] i.e. black codes in the south, coerced failure of Freedman's Bank in 1874, racial discrepancies in Old Age Insurance in 1935, redlining in HOLC in 1933, and redlining in Federal Housing Authority & Veterans Administration in 1937.

5. INSTITUTIONAL PERSPECTIVES

The definition economic discrimination is contingent upon one's perspective of the organization of society: via the individual or the institution. Howard Sherman (1996) suggests that the latter viewpoint is based upon dividing social progress into: "Institutional and technical processes. The institutions include all human relationships in the processes of production and distribution. These institutions thus include under capitalism the work relationship of workers and bosses, the corporate structure, the trade unions, the whole financial process, and so forth. These relationships or (non-preordained) processes can only be described for a single type of economy because evolution has witnessed various types of economies and will most likely witness many more in the future. Thus, the, institutionalist, must always be historically specific and must base its laws on the specific institutions of a specific society"(Sherman, 1996, p.40).

Therefore economic discrimination occurs when these human relationships lead to divisions where one group with at least one dominant factor, such as a population or resource majority, pursue an economically elevated position in a common society over the other group via the technical processes of the institutions.

6. WEALTH AND DISCRIMINATION

The Purpose of Wealth

The purpose of wealth has varied from over time. From an economics perspective, wealth is the accumulation of resources that have market value and can be liquidated for present and future consumption. This study proceeds based on the most measurable assumption: households reside in a country with a mixed economy of markets and social planning, such that they have an incentive to accumulate material wealth for intertemporal household consumption and social influence. The following sections present: (*i*) the determinants of wealth, (*ii*) a decomposition of wealth determinants into structural components and discrimination, and (*iii*) theoretical differences in average wealth between members of two groups.

Becker (1957) and Arrow (1972) developed the most general theories of wage discrimination and favoritism. Oaxaca (1973) and Blinder (1973) have mechanized their theories for empirical analysis. While their findings are insightful, they cannot be directly applied to studying wealth differences since wealth is a complex combination of wages and other variables.

7. A MODEL OF WEALTH FAVORITISM

To understand the determinants of wealth by groups, consider the following wealth identity:

$$W_{w,t} = \exp\left[(1 + i_w) W_{w,t-1} + (r_{w,t} h_{w,t} - p_t c_{w,t})\right] \quad [1]$$

where $W_{w,t}$ represents the portfolio of wealth for members of group w, at time $t=1 \ldots T$; $W_{w,t-1}$ represents the previous period portfolio of wealth for members of group w, at time $t=0 \ldots T-1$; i_w represents the average interest rate earned on previous period portfolio of wealth for members of group w, at time $t=1 \ldots T$; $r_{w,t}$ represents the wages for group w, at time $t=1 \ldots T$; $h_{w,t}$ represents the number of hours worked for members of group w, at time $t=1 \ldots T$; p_t represents prices for goods consumed at time $t=1 \ldots T$; and $c_{w,t}$ represents the goods consumed by members of group w, at time $t=1 \ldots T$; such that:

$$W_{w,t} = \exp\left[\sum_{t=1}^{t} (1 + i_w)^{t-1} (r_{w,t} h_{w,t} - p_t c_{w,t}) + (1 + i_w)^t W_{w,0}\right] \quad [2]$$

where $W_{w,0}$ are the initial assets of whites.

Now consider the wealth identity with discrimination or, more specifically, favoritism in favor of members of group w. Let $\delta_{k,w,t}$ represent the variable k favoritism coefficient for members of group w, at time $t=1 \ldots T$, where $\delta_{k,w,t} > 0$ for all variables, such that equation [2] becomes:

A Model of Wealth Favoritism

To understand the determinants of wealth by groups, consider the following wealth identity:

$$[1] \quad W_{wt} = exp\{(1+i_w)W_{w,t-1} + (r_{wt}h_{wt} - p_t c_{wt})\}$$

where W_{wt} represents the portfolio of wealth for members of group w, at time t=1…T ; $W_{w,t-1}$ represents the previous period portfolio of wealth for members of group w, at time t=0…T-1 ; i_w represents the average interest rate earned on previous period portfolio of wealth for members of group w, at time t=1…T; r_{wt} represents the wages for group w, at time t=1…T; h_{wt} represents the number of hours worked for members of group w, at time t=1…T; p_t represents prices for goods consumed at time t=1…T; and c_{wt} represents the goods consumed by members of group w, at time t=1…T; such that:

$$[2] \quad W_{wt} = exp\left\{\sum_{\tau=1}^{t}(1+i_w)^{t-\tau}(r_{w,\tau}h_{w,\tau} - p_\tau c_{w,\tau}) + (1+i_w)^t W_{w,0}\right\}$$

where $W_{w,0}$ are the initial assets of whites.

Now consider the wealth identity with discrimination or, more specifically, favoritism in favor of members of group w. Let $\delta_{k,w,\tau}$ represent the variable k favoritism coefficient for members of group w, at time τ=1…T, where $\delta_{k,w,\tau}>0$ for all variables, such that equation [2] becomes:

$$[3] \quad W_{wt} = exp\{\tilde{W}_{wt} + F_{wt}\}$$

where

$$\tilde{W}_{wt} = \sum_{\tau=1}^{t}(1+\tilde{i}_w)^{t-\tau}(\tilde{r}_{w,\tau}\tilde{h}_{w,\tau} - p_\tau \tilde{c}_{w,\tau}) + (1+\tilde{i}_w)^t \tilde{W}_{w,0}$$

$$F_{wt} = \delta_{i,w}\sum_{m=1}^{t-1}\sum_{\tau=1}^{t-m}(1+\tilde{i}_w+\delta_{i,w})^{t-m-1}(1+\tilde{i}_w)^{t-1}\cdot$$

$$(\tilde{r}_{w,\tau}\tilde{h}_{w,\tau} + \tilde{r}_{w,\tau}\delta_{k,w,\tau} + \delta_{r,w,\tau}\tilde{h}_{w,\tau} + \delta_{r,w,\tau}\delta_{h,w,\tau} - p_\tau(\tilde{c}_{w,\tau} + \delta_{c,w,\tau}))$$

$$+ \delta_{i,w}\sum_{m=1}^{t}\sum_{\tau=1}^{t}(1+\tilde{i}_w+\delta_{i,w})^{t-m}(1+\tilde{i}_w)^{t}(\tilde{W}_{w,0} + \delta_{W_{0,w}})$$

$$+ \sum_{\tau=1}^{t}(1+\tilde{i}_w)^{t-\tau}(\delta_{r,w,\tau}(\tilde{h}_{w,\tau} + \delta_{h,w,\tau}) - p_\tau\delta_{c,w,\tau}) + (1+\tilde{i}_w)^t\delta_{W_{0,w}}$$

where tilda represents the variable in absence of discrimination such that $\tilde{W}_{wt}$ is group w in absence of discrimination (favoritism) at time τ=1…T, and F_{wt} is the difference between the observed wealth and wealth in absence of discrimination due to favoritism for members of group w at time τ=1…T. The following comparative static analysis shows what happens to wealth with an increase in discrimination, such that:

$$[4] \quad \frac{\partial \ln W_{wt}}{\partial \delta_{r,w,\tau}} = \left[\sum_{\tau=1}^{t}(1+\tilde{i}_w)^{t-\tau} + \delta_{i,w}\sum_{m=1}^{t-1}\sum_{\tau=1}^{t-m}(1+\tilde{i}_w+\delta_{i,w})^{t-m-1}(1+\tilde{i}_w)^{t-1}\right]h_{w,\tau} \quad > 0$$

$$[5]\quad \frac{\partial \ln W_{w,t}}{\partial \delta_{h,w,\tau}} = \left[\sum_{\tau=1}^{t}\left(1+\bar{i}_w\right)^{t-\tau} + \delta_{i,w}\sum_{m=1}^{t-1}\sum_{s=1}^{t-\tau}\left(1+\bar{i}_w+\delta_{i,w}\right)^{t-m-1}\left(1+\bar{i}_w\right)^{t-1}\right] r_{w,\tau} \qquad > 0$$

$$[6]\quad \frac{\partial \ln W_{w,t}}{\partial \delta_{c,w,\tau}} = -\left[\sum_{\tau=1}^{t}\left(1+\bar{i}_w\right)^{t-\tau} + \delta_{i,w}\sum_{m=1}^{t-1}\sum_{s=1}^{t-\tau}\left(1+\bar{i}_w+\delta_{i,w}\right)^{t-m-1}\left(1+\bar{i}_w\right)^{t-1}\right] p_\tau \qquad < 0$$

$$[7]\quad \frac{\partial \ln W_{w,t}}{\partial \delta_{W_{\tau},w}} = \left(1+\bar{i}_w\right)^{t} + \delta_{i,w}\sum_{m=1}^{t}\sum_{s=1}^{t}\left(1+\bar{i}_w+\delta_{i,w}\right)^{t-m}\left(1+\bar{i}_w\right)^{s} \qquad > 0$$

$$[8]\quad \frac{\partial \ln W_{w,t}}{\partial \delta_{i,w,\tau}} = \sum_{\tau=1}^{t}(t-\tau+1)\left(1+\bar{i}_B+\delta_{i,w}\right)^{t-\tau}\left(r_{w,\tau}h_{w,\tau}-p_\tau c_{w,\tau}\right) + \sum_{\tau=1}^{t}\tau\left(1+\bar{i}_w+\delta_{i,w}\right)^{t-1}W_{w,0} \qquad > 0$$

Equation [4] shows that the size of the increase in log wealth due to a unit increase in wage favoritism depends on the size of the rate of return, compounded through time, and the number of hours worked. Similarly, equation [5] also shows that the size of the increase in log wealth due to a unit increase in hours-worked favoritism depends on the size the wage rate and the compounded rate of return. Furthermore, equation [6] shows that the size of the reduction in log wealth due to a unit increase in consumption favoritism depends on the size of the price of commodity consumption and the compounded rate of return. Note that equation [7] shows that the size of the increase in log wealth due to a unit increase in initial wealth discrimination depends solely on the size of the compounded rate of return. Finally, equation [8] shows that the size of the increase in log wealth due to a unit increase in interest rate discrimination depends on the size of initial wealth, periodic savings, and the compounding rate of return.

A Model of Wealth Discrimination

Analogous to equation [2], we can write for blacks:

$$[9]\quad W_{B,T} = exp\left\{\sum_{\tau=1}^{t}(1+i_B)^{t-\tau}\left(r_{B,\tau}h_{B,\tau}-p_\tau c_{B,\tau}\right)+(1+i_B)^{t}W_{B,0}\right\},$$

where $W_{B,T}$ represents the portfolio of wealth for black, *B*, at time t=1…T ; $W_{B,T-1}$ represents the previous period portfolio of wealth for blacks, *B*, at time t=0…T-1 ; i_B represents the average interest rate earned on previous period portfolio of wealth for blacks, *B*, at time t=1…T; $r_{B,t}$ represents the wages for blacks, *B*, at time t=1…T; $h_{B,t}$ represents the number of hours worked for blacks, *B*, at time t=1…T; p_t represents prices for goods consumed at time t=1…T; and $c_{B,t}$ represents the goods consumed by blacks, *B*, at time t=1…T, and where $W_{B,0}$ is the initial assets of blacks.

Now consider the wealth identity with discrimination or, more specifically, pure discrimination in against members of group *B*. Let $\bar{\delta}_{k,B,\tau}$ represent the variable *k* favoritism coefficient for members of group *B*, at time τ=1…T, where $\bar{\delta}_{k,B,\tau}<0$ for all

variables, such that equation [4] becomes[2]:

$$[10] \quad W_{B,t} = \exp\left(\tilde{W}_{B,t} + D_{B,t}\right)$$

where

$$\tilde{W}_{B,t} = \sum_{\tau=1}^{t} (1+\tilde{i}_B)^{t-\tau}\left(r_{B,\tau}\tilde{h}_{B,\tau} - p_\tau \tilde{c}_{B,\tau}\right) + (1+\tilde{i}_B)^t \tilde{W}_{B,o}$$

$$D_{B,t} = -\delta_{i,B}\sum_{m=1}^{t-\tau}\sum_{z=1}^{t-\tau}(1+\tilde{i}_B-\delta_{i,B})^{t-m-1}(1+\tilde{i}_B)^{t-1}\cdot$$

$$\left(r_{B,\tau}\tilde{h}_{B,\tau} - r_{B,\tau}\delta_{h,B,\tau} - \delta_{r,B,\tau}\tilde{h}_{B,\tau} + \delta_{r,B,\tau}\delta_{h,B,\tau} - p_\tau\left(\tilde{c}_{B,\tau} - \delta_{c,B,\tau}\right)\right)$$

$$-\delta_{i,B}\sum_{m=1}^{t}\sum_{z=1}^{t}(1+\tilde{i}_B-\delta_{i,B})^{t-m}(1+\tilde{i}_B)^t\left(\tilde{W}_{B,o} - \delta_{W,B}\right)$$

$$+\sum_{\tau=1}^{t}(1+\tilde{i}_B)^{t-\tau}\left(-\delta_{r,B,\tau}\left(\tilde{h}_{B,\tau} - \delta_{h,B,\tau}\right) + p_\tau\delta_{c,B,\tau}\right) - (1+\tilde{i}_B)^t\delta_{W,B}$$

where tilda represents the variable in absence of discrimination such that $\tilde{W}_{B,t}$ is group B in absence of discrimination at time $\tau=1\ldots T$, and $D_{B,t}$ is the difference between the observed wealth and wealth in absence of discrimination due to discrimination against members of group B at time $\tau=1\ldots T$. The following comparative static analysis shows what happens to wealth with an increase in discrimination, such that:

$$[11] \quad \frac{\partial \ln W_{B,t}}{\partial \delta_{r,B,\tau}} = -\left[\sum_{\tau=1}^{t}(1+\tilde{i}_B)^{t-\tau} - \delta_{i,B}\sum_{m=1}^{t-\tau}\sum_{z=1}^{t-\tau}(1+\tilde{i}_B-\delta_{i,B})^{t-m-1}(1+\tilde{i}_B)^{t-1}\right]h_{B,\tau} < 0$$

$$[12] \quad \frac{\partial \ln W_{B,t}}{\partial \delta_{h,B,\tau}} = -\left[\sum_{\tau=1}^{t}(1+\tilde{i}_B)^{t-\tau} - \delta_{i,B}\sum_{m=1}^{t-\tau}\sum_{z=1}^{t-\tau}(1+\tilde{i}_B-\delta_{i,B})^{t-m-1}(1+\tilde{i}_B)^{t-1}\right]r_{B,\tau} > 0$$

$$[13] \quad \frac{\partial \ln W_{B,t}}{\partial \delta_{c,B,\tau}} = \left[\sum_{\tau=1}^{t}(1+\tilde{i}_B)^{t-\tau} - \delta_{i,B}\sum_{m=1}^{t-\tau}\sum_{z=1}^{t-\tau}(1+\tilde{i}_B+\delta_{i,B})^{t-m-1}(1+\tilde{i}_B)^{t-1}\right]p_\tau > 0$$

$$[14] \quad \frac{\partial \ln W_{B,t}}{\partial \delta_{W,B}} = -\left[(1+\tilde{i}_B)^t - \delta_{i,B}\sum_{m=1}^{t}\sum_{z=1}^{t}(1+\tilde{i}_B+\delta_{i,B})^{t-m}(1+\tilde{i}_B)^t\right] < 0$$

$$[15] \quad \frac{\partial \ln W_{B,t}}{\partial \delta_{i,B,\tau}} = -\sum_{\tau=1}^{t}(t-\tau+1)(1+\tilde{i}_B-\delta_{i,B})^{t-\tau}\left(r_{B,\tau}h_{B,\tau} - p_\tau c_{B,\tau}\right)$$

$$-\sum_{\tau=1}^{t}\tau(1+\tilde{i}_B-\delta_{i,B})^{t-1}W_{B,o} < 0$$

Equation [11] shows that the size of the decrease in log wealth due to a unit increase in wage discrimination depends on the size of the rate of return, compounded through time, and the number of hours worked. Similarly, equation [12] also shows that the size of the reduction in log wealth due to a unit increase in hours-worked discrimination depends on the size the wage rate and the compounded rate of return. Note that equation [13] shows that a unit increase in consumption discrimination can overstate wealth, especially if consumption is forced below subsistence. The size of this effect depends on the price of the commodity and the compounded rate of return from savings in each period.

Furthermore, equation [14] shows that the size of the decrease in log wealth due to a unit increase in initial wealth discrimination depends solely on the size of the compounded rate of return. Finally, equation [15] shows that the size of the decrease in

2 Let $\tilde{\delta}_{k,B,\tau} = -\delta_{k,B,\tau}$ where $\delta_{k,B,\tau} > 0$

log wealth due to a unit increase in interest rate discrimination depends on the size of initial wealth, periodic savings, and the compounding rate of return.

A Model of Relative Wealth

In theory, the average wealth of group B is some proportion of the average wealth of group w, such that,

[16] $$\overline{W}_{w,t} = \left(\frac{1}{\phi}\right)\overline{W}_{B,t}$$

where $1/\phi$ is the theoretical proportion of wealth. If ϕ equals one, then the average wealth of group B is the same the average wealth of w. As ϕ goes to zero, the average wealth of w becomes infinity times the average wealth of group B. As ϕ goes to infinity, the average wealth of group w becomes an infinitesimal proportion of the average wealth of the average wealth of group B. Let $\phi = e^{-(\Sigma+\Lambda)}$, then,

[17] $$\frac{\partial \overline{W}_{w,t}}{\partial \Sigma} = \lambda\phi\overline{W}_{B,t}$$

[18] $$\frac{\partial \overline{W}_{w,t}}{\partial \Lambda} = \gamma\phi\overline{W}_{B,t}$$

such that,

[19] $$\lambda = \sigma + \gamma$$

$$where\ \sigma = \phi\overline{W}_{B,t}\left(\frac{\partial \overline{W}_{w,t}}{\partial \Sigma}, \frac{\partial \overline{W}_{w,t}}{\partial \Lambda}\right)$$

8. DATA

This study employs a national representative sample and supplemental oversample of blacks, or ex-slaves, from the Integrated Public Use Microdata Sample, IPUMS, in 1870. The source of IPUMS data is the population schedules of the US census manuscripts. The US conducted its first census in 1790 and its first modern census in 1850 when individuals became the units of enumeration[3]. Note that we must always be conscious of possible errors in

[3] The 1870 census manuscripts contain responses to important socioeconomic inquiries including age, sex, color, marital status, literacy status, whether the individual attended school during the year, occupation, state or country of birth, value of real estate, and value of personal estate (other forms of wealth) for all individuals in a given household.
Real estate value was enumerated based on guidelines specified in the Circular to Marshals. It specified that "under heading 8 insert the value of real estate owned by each individual enumerated. You are to obtain the value of real estate by inquiry of each individual who was supposed to own real estate, be the same located where it may, and insert the amount in dollars. No abatement of the value is to be made on account of any
lien or encumbrance thereon in the nature of debt" (Magnuson 1995, p347) Personal estate value (other wealth) was also enumerated based on guidelines that specified
"Personal estate is to be inclusive of all bonds, stocks, mortgages, notes, live stock, plate, jewels, or furniture, but exclusive of wearing apparel" (p.349). For more on the quality of historical census data, see Wright 1900, Steckel 1991, and Magnuson 1995.

Note that sample includes the reported wealth of household heads. Enumerators only recorded the value of wealth if an individual had more than 100 dollars in nominal wealth. Furthermore, zero wealth is not equivalent to zero dollar-wages per hour, where one must account for the participation decision to obtain robust estimates. Instead, not having any initial wealth, savings, and assets leads to one possessing zero wealth.

enumeration when analyzing census data[4]. This sample overcomes some of these issues by combining a 1-in-100 random sample with a supplemental sample of 1-in-50 blacks from the 1870 US census manuscripts. The final sample includes 18,929 black household heads and 68,096 white household heads[5].

Descriptive Statistics

Sample descriptive statistics were presented in Table 1. In 1870, the average black household had $124 in wealth while the average white household had $3,553 in wealth, such that the black mean was 3.5 percent of the white mean. These estimates are consistent with the estimates by Lee Soltow (1972, 1975). Although Soltow (1972) only collected a sample of 393 non-white individuals in 1870, he found the average black wealth was $73 and average white wealth was $2,661. Using a sample of 151 black individuals, Soltow (1975) found similar results: average black wealth was $74 while average white wealth in $2,691 in 1870.

On average, white household heads were likely to be literate more than black household heads: Table 1 shows that 89 percent of the white household heads in the sample could read and write while only 15 percent of black household heads in the sample could read and write[6].

Additionally, the structure of the average white household tended to differ from the structure of the average ex-slave household in 1870. Foremost, Table 1 shows that the average white household head in the sample was 43 years old while the average black household head in the sample was 40 years old. Furthermore, Table 1 shows that 82 percent of white household heads in the sample were married while 72 percent of black household heads in the sample were married. Similarly, the average white household head in the sample had 2.5 children and 5.2 household members while the average black household head in the sample had 2.2 children and 4.7 household members.

To analyze the statistical significance of racial differences in sample variables, hypothesis tests results were presented in Table 2. T-tests were used to test the null hypothesis that the white-black difference in the population

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[4] Steckel (1991) recommends cautious use of the 19th and early 20th century U.S. census results. The original purpose of the U.S. census was for taxation and U.S. House of Representatives appropriations. However, a "growing desire for statistical information, curiosity about society, and heightened interest in international and regional comparisons led to expanded collection by the federal census" (pp.582-83). He suggests that as the census data is more disaggregated, the likelihood of error increases with early U.S. census data. He noted that under-enumeration, over-enumeration and misreporting are errors that affect the quality of census data and led to the creation of the Census Bureau in 1902. Some of these errors may be attributed to the poor training of early enumerators and lower quality of early census administration. He found that larger households, non-traditional households (converted homes), lower-educated persons and persons with poor English-language skills tended to be omitted from the census. Steckel provides several examples of errors in census data collected on Blacks. For instance, changes in the Black population over census years suggested under-enumeration in the 1870 census. "The extraordinarily low increase during the 1860's and very large increase during the 1870's suggest the black population was significantly underenumerated in the 1870 Census" (p.587). The change in back population was 9.9 percent between 1860 and 1870, and 34.9 percent between 1870 and 1880. Note that one must also consider the impact of the 1850 Fugitive Slave Act and the 14th Amendment to the US Constitution, adopted in 1870, on the changes in these percentages and the incentives of blacks to be enumerated.

[5] Note that the sample studied in this paper was restricted to heads of households. Investigating the wealth from a random sample of household heads is more productive than investigating a random sample of individuals since wealth is often used to purchase durable goods and durables are more likely to benefit the entire household rather than one individual in a household. Furthermore, census enumerators tended to sum up the wealth of a household and report it under the head of household.

[6] Note that most slaves were barred from learning to read and write. After emancipation, the only ex-slaves that were likely to learn to read or write were younger household heads.

means equals zero. Since the t-statistics were greater than critical value (2.576), we can reject the null hypothesis that the white-black difference in the population means equals zero for all the variables in regression analysis at a one percent level of significance.

9. STATISTICAL ANALYSIS

STATISTICAL ANALYSIS

To empirically analyze white-black differences in wealth, this study will employ a regression decomposition technique developed by Ronald Oaxaca (1973) and Alan Blinder (1973).

The Econometric Equation for Group *w*

Appendix A shows how the wealth identity, in equation [2], can be represented in the following equation:

$$[20] \quad lnW_{w,t} = \pi_{0,w,t} + \pi_{1,w,t}A_{w,t} + \pi_{2,w,t}A^2_{w,t} + \pi_{3,w,t}L_{w,t} + \pi_{4,w,t}A \cdot L_{w,t} + \pi_{5,w,t}Z_{w,t} + \varepsilon_{w,t}$$

$$[21] \quad = \pi_{w,t}X_{w,t} + \varepsilon_{w,t}$$

where $lnW_{w,t}$ is the log wealth for a vector of white household heads, w, at time t=1…T; $\pi_{w,t}$ are the regression parameter for white household heads, w, at time t=1…T; $A_{w,t}$ is the age for a vector of white household heads, w, at time t=1…T; $L_{w,t}$ is a dummy variable for literacy for a vector of white household heads, w, at time t=1…T, which equals one if the household head can read or write and zero otherwise; $Z_{w,t}$ represents a matrix of preference characteristics for white household heads, w, at time t=1…T; and $\varepsilon_{w,t}$ is the error term for a vector of white household heads, w, at time t=1…T.

The Econometric Equation for Group *B*

By the same reasoning,

$$[22] \quad lnW_{B,t} = \pi_{0,B,t} + \pi_{1,B,t}A_{B,t} + \pi_{2,B,t}A^2_{B,t} + \pi_{3,B,t}L_{B,t} + \pi_{4,B,t}A_{B,t} \cdot L_{B,t} + \pi_{5,B,t}Z_{B,t} + \varepsilon_{B,t}$$

$$[23] \quad = \pi_{B,t}X_{B,t} + \varepsilon_{B,t}$$

where $lnW_{B,t}$ is the log wealth for a vector of black household heads, B, at time t=1…T; $\pi_{B,t}$ are the regression parameter for black household heads, B, at time t=1…T; $A_{B,t}$ is the age for a vector of black household heads, B, at time t=1…T; $L_{B,t}$ is a dummy variable for literacy for a vector of black household heads, B, at time t=1…T, which equals one if the household head can read or write and zero otherwise; $X_{B,t}$ represents a matrix of preference characteristics for black household heads, B, at time t=1…T; $\varepsilon_{B,t}$ is the error term for a vector of black household heads, B, at time t=1…T.

Oaxaca- Blinder Decomposition Equation Based on the Primary Index

To decompose white-black differences in wealth, first estimate regression equations [5] and [7], and subtract the fitted version of equation [7] from the fitted version of equation [5] such that:

$$[24] \quad ln\overline{W}_{w,t} - ln\overline{W}_{B,t} = \hat{\pi}_{w,t}\overline{X}_{w,t} - \hat{\pi}_{B,t}\overline{X}_{B,t}$$

where a bar denotes a mean value; $\hat{\pi}_{w,t}$ is the vector of estimated regression coefficients for white household heads, w, at time t=1…T; and $\hat{\pi}_{B,t}$ is a vector of estimated regression coefficients for black household heads, B, at time t=1…T. Let:

$$\hat{\pi}_{w,t} = \hat{\pi}_{B,t} + (\hat{\pi}_{w,t} - \hat{\pi}_{B,t}) \quad [25]$$

$$X_{B,t,} = X_{w,t} + (X_{B,t} - X_{w,t}) \quad [26]$$

Finally, substituting equation [10] and [11] in to equation [9] produces:

$$ln\overline{W}_{w,t} - ln\overline{W}_{B,t} = \hat{\pi}_{B,t}(X_{w,t} - X_{B,t}) + X_{w,t}(\hat{\pi}_{w,t} - \hat{\pi}_{B,t}) \quad [27]$$

where $\{X_{w,t}(\hat{\pi}_{w,t} - \hat{\pi}_{B,t})\}$ measures white-black differences in log wealth due to different wealth returns to the classical wealth-generating variables. This portion captures unexplained differences in wealth, due, in part, to discrimination; and $\{\hat{\pi}_{B,t}(X_{w,t} - X_{B,t})\}$ measures white-black differences in log wealth due to different averages of variables

necessary for generating wealth[7]. This latter portion captures explained differences in wealth due to differences in classical characteristics. The index of coefficients and means on the difference in means and coefficients, respectively, can impact the empirical results. Blau and Graham (1990) recommend

> indexing coefficients from the racial group that is most likely to experience economic discrimination: "From a policy perspective, the more relevant question appears to be the one addressed when black functions (coefficients) are employed: what would happen to black wealth if blacks were given the white means but retained there own functions?" (p. 332).

Oaxaca- Blinder Decomposition Equation Based on the Alternative Index

Alternatively, we can rewrite equation [12] by solving equation [10] for the vector of black coefficients and solving equation [11] for the vector of white means, producing:

$$ln\overline{W}_{w,t} - ln\overline{W}_{B,t} = \hat{\pi}_{w,t}(\overline{X}_{w,t} - \overline{X}_{B,t}) + \overline{X}_{B,t}(\hat{\pi}_{w,t} - \hat{\pi}_{B,t}) \quad [28]$$

where $\{\overline{X}_{B,t}(\hat{\pi}_{w,t} - \hat{\pi}_{B,t})\}$ also measures differences in log wealth due to different wealth returns to the classical wealth-generating variable; and $\{\hat{\pi}_{w,t}(\overline{X}_{w,t} - \overline{X}_{B,t})\}$ also measures differences in log wealth due to different averages of variables necessary for generating wealth[8]. This study will provide empirical results based on both indices in equation [12] and [13].

[7] Based on findings from Oaxaca and Ransom (1998), the variance is

$$Var(\hat{\pi}_{B,t}(X_{w,t} - X_{B,t})) = (\hat{\pi}_{B,t}(X_{w,t} - X_{B,t}))^2 (X_{w,t} - X_{B,t})' Var(\hat{\pi}_{B,t})(X_{w,t} - X_{B,t})$$

$$Var(X_{w,t}(\hat{\pi}_{w,t} - \hat{\pi}_{B,t})) = (X_{w,t}(\hat{\pi}_{w,t} - \hat{\pi}_{B,t}))^2 (X_{w,t})' [Var(\hat{\pi}_{w,t}) + Var(\hat{\pi}_{B,t})](X_{w,t})$$

Statistical Tests for Discrimination

Therefore, two hypothesis tests can be employed, such that:

[29] $H_o : \hat{\pi}_{w,t}(\overline{X}_{w,t} - \overline{X}_{B,t}) = 0, \ \hat{\pi}_{B,t}(\overline{X}_{w,t} - \overline{X}_{B,t}) = 0$
H_A : *otherwise*

[30] $H_o : \overline{X}_{B,t}(\hat{\pi}_{w,t} - \hat{\pi}_{B,t}) = 0, \ \overline{X}_{w,t}(\hat{\pi}_{w,t} - \hat{\pi}_{B,t}) = 0$
H_A : *otherwise*

Foremost, the null hypothesis, [14], states differences in means do not contribute to white-black differences in average wealth. If we reject the null hypothesis, then white-black differences in wealth are not solely unexplained but, in some part, due to differences in classical wealth-generating characteristics. Second, the null hypothesis, [15], states differences in coefficients do not contribute to white-black differences in average wealth. If reject the null hypothesis, then white-black differences in wealth are not solely due to white-black differences in classical wealth-generating characteristics, but, in some part, unexplained and, in some part, due to discrimination.

10. EMPIRICAL RESULTS

Least-Squares Regression Estimates

Least squares estimates of coefficients in equations [4] and [6] are presented in Table 3. Based on calculations of predicted average wealth differences between literate and illiterate households, literacy tended to provide a larger wealth advantage to white [9].

Pooled sample calculations show that literate whites held 75.8 percent more wealth than illiterate whites while literate blacks held only 18.6 percent more wealth than illiterate blacks. These results are confirmed when analyzing the standard errors: Table 3 shows that literacy was a (highly) statistically significant for whites but not for blacks.

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[8] Based on findings from Oaxaca and Ransom (1998), the variance is

$$Var(\hat{\pi}_{w,t}(\overline{X}_{w,t} - \overline{X}_{B,t})) = (\hat{\pi}_{w,t}(\overline{X}_{w,t} - \overline{X}_{B,t}))^2 (\overline{X}_{w,t} - \overline{X}_{B,t}) Var(\hat{\pi}_{w,t}) (\overline{X}_{w,t} - \overline{X}_{B,t})$$

$$Var(\overline{X}_{B,t}(\hat{\pi}_{w,t} - \hat{\pi}_{B,t})) = (\overline{X}_{B,t}(\hat{\pi}_{w,t} - \hat{\pi}_{B,t}))^2 (\overline{X}_{B,t}) [Var(\hat{\pi}_{w,t}) + Var(\hat{\pi}_{B,t})] (\overline{X}_{B,t})$$

[9] Instead of analyzing regression coefficients on dummy variables in Table 3, differences in wealth were calculated based on dummy variables, *D*, such as literacy status, marital status and urban/rural status, such that:

[31] $$\frac{\hat{W}_{J,D=1} - \hat{W}_{J,D=0}}{\hat{W}_{J,D=1}} = \frac{\exp(\ln \hat{W}_{J,D=1}) - \exp(\ln \hat{W}_{J,D=0})}{\exp(\ln \hat{W}_{J,D=1})}$$

When separating the sample by marital status, similar results were produced in the married sample: married whites that were literate held 73.5 percent more wealth than married whites that were illiterate. However, married blacks that were literate held 25.4 percent more wealth than married blacks that were illiterate. Furthermore, while literacy was a critical wealth-generating factor for single whites, literacy did not provide wealth gains among single blacks: single whites that were literate held 79.3 percent more wealth than single whites that were illiterate. But single blacks that were literate held 6.2 percent less wealth than single blacks that were illiterate. Table 3 shows that literacy was a, highly, statistically significant for whites but not for blacks.

Additionally, we can predict an increase wealth with an increase in age although the magnitude of the increase was larger among literate and white household heads[10]. For blacks, we can predict a 3.3 percent increase in wealth with an additional year of age among literate blacks and 1.9 percent increase among illiterate blacks, holding all other variables constant. For whites, we can predict a 6.5 percent increase in wealth with an additional year of age among literate whites and a 5.6 percent increase among illiterate whites, holding all other variables constant.

These findings did not vary significantly when separating the sample by marital status. For married blacks, we can predict a 3.8 percent increase in wealth with an additional year of age among literate blacks and 2.3 percent increase among illiterate blacks, holding all other variables constant. For single blacks, we can predict a 2.7 percent increase in wealth with an additional year of age among literate blacks and 1.2 percent increase among illiterate blacks, holding all other variables constant.

Furthermore, for married whites, we can predict a 6.7 percent increase in wealth with an additional year of age among literate whites and 5.6 percent increase among illiterate whites, holding all other variables constant. For single whites, we can predict a 5.3 percent increase in wealth with an additional year of age among literate whites and 1.2 percent increase among illiterate blacks, holding all other variables constant. All relevant variables were statistically significant except the age-literacy interaction variable for single whites. Age, age-squared and age-literacy interaction terms were, highly, statistically significant in the black and white pooled samples.

Similarly, whites obtained higher wealth returns to household formation variables, such as marital status, rural/urban status, and household size. Foremost, married whites held 62.1 percent more wealth than single whites while married blacks possessed 49.5 percent more wealth than single blacks[11]. Table 3 shows that marital status was a, highly, statistically significant wealth-generating factor for whites and blacks. Additionally, pooled sample estimates show that rural whites held 77.2 percent more wealth than urban whites while rural blacks held 1.9 percent *less* wealth than urban blacks[12].

Similar results were obtained when segmenting the sample by marital status: married whites residing in rural areas held 77.3 percent more wealth than married whites residing in urban areas while married blacks residing in rural areas held 8.0 percent more wealth than married blacks residing urban areas. Likewise, single whites residing in rural areas held 76.6 percent more wealth than single whites residing in urban areas while single blacks residing in rural areas held 25.9 percent less wealth than single blacks residing urban areas. Rural/urban status was statistically insignificant only among single blacks.

Note that rural residence was, highly, statistically significant for whites but not statistically significant for blacks. Pooled sample estimates also show that we can predict a 16.2 percent increase in white wealth with an additional household member, holding all other variables constant, while we can predict an 8.2 percent increase in black wealth with an additional household member, holding all other variables constant. Table 3 shows that household size was, highly, statistically significant for blacks and whites.

[10] Based on equations [4] and [6], the marginal effect of an additional year of age, at average age, for group *j=w, B* is

$$[32] \qquad \frac{\partial \ln W_j}{\partial A_j} = \hat{\pi}_{j,1} + 2\hat{\pi}_{j,2}\overline{A}_j + \hat{\pi}_{j,3}$$

[11] See note 8 for methodology.

[12] See note 8 for methodology.

When dividing the sample by marital status, whites obtain similar wealth advantages for whites: we can predict a 17.9 percent increase in wealth among married whites, holding all other variables constant, while we can predict a 12.5 percent increase among single whites, holding all other variables constant, with an additional household member. For blacks, we can predict a 9.2 percent increase in wealth with an additional household member among married blacks, holding all other variables constant, while we can predict a 5.6 percent increase among single blacks, holding all other variables constant, with an additional household member. Table 3 shows that household size was a, highly, statistically significant for blacks and whites in all samples.

Unlike other household formation variables, more children tended to lower average white wealth: We can predict a 8.0 percent decrease in white wealth, holding all other variables constant, and a 10.8 percent decrease in wealth among married whites holding all other variables constant, with additional child. These estimates were, highly, statistically significant, but Table 3 shows that the number of children in a household was not a statistically significant factor for the wealth of singles and blacks, in all samples.

11. A TEMPORAL OAXACA-BLINDER DECOMPOSITIONS

Characteristic Test Results

Foremost, we reject the null hypothesis, [29], that differences in classical characteristics do not contribute white-black differences in wealth with a 99 percent level of confidence.

Pooled sample decompositions, reported in Table 4, show that the average white household had 429.2 percent more wealth than the average black household. But if whites and blacks generated wealth according to black functions (or coefficients), whites would have only held 150.5 percent more average wealth than blacks. These results are consistent with results from segmenting the sample into married and single households in Table 5: Married whites had 426.4 more wealth the married blacks. But married whites would have still held 135.8 percent more wealth than married blacks if whites and blacks generated wealth according to black functions. Similarly, single whites had 396.5 percent more wealth than single blacks. But single whites would have still held 149.4 percent of single blacks if whites and blacks generated wealth according to black functions.

Instead of observing the 429 percent wealth advantage for whites, pooled sample estimates show that whites would have still held 79.2 percent more average wealth than blacks if whites and blacks generated wealth according to white functions. These results are also consistent with results from segmenting the sample into married and single households in Table 5. Married whites had 426.4 more wealth the married blacks. But married whites would have still held 77.8 percent more wealth than married blacks if whites and blacks generated wealth according to white functions. Similarly, single whites had 396.5 percent more wealth than single blacks. But single whites would have still held 56.0 percent of single blacks if whites and blacks generated wealth according to white functions. Note that these results, whether employing the white or black functions, must be interpreted with caution since slaves were often not permitted to read, write or choose the structure of their household.

Discrimination Test Results

Second, we reject the null hypothesis, [30], that discrimination did not contribute to white-black differences in wealth with a 99 percent level of confidence. Earlier, it was stated that pooled sample decompositions, reported in Table 4, show that the average white household had 429.2 percent more wealth than the average black household. But, in absence of discrimination, blacks would have held 350.0 percent more average wealth than they actually possessed in 1870 if whites and blacks generated wealth according to the black wealth-generating characteristics. Furthermore, these results are consistent with results from segmenting the sample into married and single households in Table 5.Earlier, it was stated that that married whites held 426.4 more wealth the married blacks. But, in absence of discrimination, married blacks would have held 348.5 percent more average wealth than they actually possessed in 1870 if whites and blacks generated wealth according to black wealth-generating characteristics.

Similarly, earlier it was stated that single whites had 396.5 percent more wealth than single blacks. But, in absence of discrimination, blacks would have held 340.6 percent more average wealth than they actually possessed in 1870 if whites and blacks generated wealth according to black wealth-generating characteristics.

Similarly, in absence of discrimination, blacks would have held 278.7 percent more average wealth than they actually possessed in 1870 if whites and blacks generated wealth according to the white wealth-generating characteristics. Moreover, these results are consistent with results from segmenting the sample into married and single households in Table 5.Earlier, it was stated that married whites held 426.4 more wealth the married blacks. But, in absence of discrimination, married blacks would have held 290.5 percent more average wealth than they actually possessed in 1870 if whites and blacks generated wealth according to white wealth-generating characteristics. Similarly, earlier it was stated that single whites had 396.5 percent more wealth than single blacks.

But, in absence of discrimination, blacks would have held 247.1 percent more average wealth than they actually possessed in 1870 if whites and blacks generated wealth according to white wealth-generating characteristics.

Dominance Test Results

Finally, characteristic tests results and discrimination test results in order to observe which factor was dominant. In Tables 4 and 5, 99 percent confidence intervals on the mean were presented. Based on the primary index and Pooled sample estimates in Table 4, 81.5 percent of white-black wealth differences were unexplained due, in part, to discrimination. The mean for the population is above 75 percent and ranged between 78.3 and 86.3 percent with a 99 percent level of confidence. Similar results were obtained when employing the primary index and separating the samples by marital status: 81.7 percent of wealth differences between married whites and married blacks were due, in part, to discrimination. The mean for the population ranged between 72.1 percent and 99.0 percent with a 99 percent level of confidence. Furthermore, 85.9 percent of wealth differences between single whites and single blacks were due, in part, to discrimination. The mean for the population was above 75 percent and ranged between 81.3 percent and 93.3 percent with a 99 percent level of confidence.

Significant differences were not observed in the empirical results when employing the alternative index. Pooled sample estimates based on the alternative index show that 64.9 percent of white-black wealth differences were unexplained due, in part, to discrimination. The mean for the population was still above 50 percent and ranged between 64.5 and 65.3 percent with a 99 percent level of confidence. Similar results were obtained when employing the alternative index and separating the samples by marital status: 68.1 percent of wealth differences between married whites and married blacks were due, in part, to discrimination. The mean for the population was above 50 percent and ranged between 67.4 percent and 68.6 percent with a 99 percent level of confidence.

Furthermore, 62.3 percent of wealth differences between single whites and single blacks were due, in part, to discrimination. The mean for the population was above 50 percent and ranged between 61.2 percent and 63.2 percent with a 99 percent level of confidence.

12. THE SLAVERY HYPOTHESIS

Descriptive statistics presented in Table 1 show that early ex-slaves held three percent of white wealth in 1870. Given the size of differences in black and white wealth, one might propose that enslavement constraints, as represented by limitations on most or all choices that impact economic outcomes, are improperly omitted from classical analyses. This proposition was tested by, *i*. comparing results of wealth decompositions over time and, *ii*. decomposing wealth differences between whites and ex-slaves in slave states, tates that abolished slavery after the Civil War, and northern states, states that abolished slavery well before the Civil War.

Intertemporal Oaxaca-Blinder Decompositions

Blau and Graham (1990) used data from the National Longitudinal Surveys, NLS, of young men and women in 1976 and 1978, respectively, to conduct a regression decomposition of wealth by race. After controlling for income and demographic variables, they found that 78.2 percent of wealth gap remained unexplained in the married sample and 78.1 percent was unexplained in the singles samples[13]. Similarly, in 1870, 81.7 percent of married white-differences were unexplained and 85.9 percent of single white-black differences were unexplained in 1870.

[13] They suggested that barriers to businesses and housing, differences in labor market uncertainty and differences in inheritances might explain their results.

Oaxaca-Blinder Decompositions by State Slavery Status

Characteristic Test Results

Foremost, we reject the null hypothesis, [29], that differences in classical characteristics do not contribute to differences in wealth among whites and blacks in slaves states and in northern states with a 99 percent level of confidence. Table 6 shows that the average northern white household had 297.2 percent more wealth than the average northern black household, and the average white household in a slave state had 411.0 percent more wealth than the average black household in a slave state. But northern whites would have only held 129.7 percent more average wealth than northern blacks and whites in slave states would have only held 137.5 percent more average wealth than blacks in slave states if whites and blacks generated wealth according to black functions.

Similarly, if whites and blacks generated wealth according to white functions, northern whites would have still held 66.0 percent more average wealth than northern blacks and whites in slave states would have still held 49.7 percent more average wealth than blacks in slave states. As stated earlier, these results must be interpreted with caution since slaves were often not permitted to read, write or choose the structure of their household.

Discrimination Test Results

Second, we reject the null hypothesis, [29], that discrimination did not contribute to white-black differences in wealth with a 99 percent level of confidence. Earlier, it was stated that decompositions, reported in Table 6, show that the average northern white household had 297.2 percent more wealth than the average northern black household and the average white household in slave states had 411.0 percent more wealth than the average black household in slave states. But if whites and blacks generated wealth according to the average black wealth-generating characteristics (or means), then, in absence of discrimination, northern blacks would have held 167.5 percent more wealth than they actually possessed and blacks in slave states would have held 273.5 percent more wealth than they actually possessed in 1870. Similarly, if whites and blacks generated wealth according to the average white wealth-generating characteristics, then, in absence of discrimination, northern blacks would have held 231.1 percent more average wealth than they actually possessed and blacks in slave states would have held 361.3 percent more average wealth than they actually possessed in 1870.

Dominance Test Results

Finally, 99 percent confidence intervals on the mean were presented in Table 6. Northern sample estimates based on the primary index show that 77.8 percent of white black wealth differences in northern states were unexplained due, in part, to discrimination. The mean for the population ranged between 74.5 and 85.7 percent with a 99 percent level of confidence. However, slave sample estimates based on the primary index show that 87.9 percent of white-black wealth differences in slave states were unexplained due, in part, to discrimination. The mean for the population ranged between 83.7 and 94.2 percent with a 99 percent level of confidence. Thus, unexplained effects were 10.1 percent higher in slave states based on the primary index.

Similarly, estimates based on the alternative index show that 56.4 percent of white-black wealth differences in northern states were unexplained due, in part, to discrimination. The mean for the population ranged between 50.7 and 60.3 percent with a 99 percent level of confidence. However, 66.5 percent of white-black wealth differences in slave states were unexplained due, in part, to discrimination. The mean for the population ranged between 65.9 and 67.0 percent with a 99 percent level of confidence.

Therefore, unexplained effects were also 10.1 percent higher in slave states based on the alternative index. Given the enhanced dominance of unexplained effects in slave states directly after mass emancipation of southern slaves, we, again, cannot reject the slavery hypothesis.

13. SUMMARY

In summary, since the lower boundary of the 99 percent confidence interval on the mean for unexplained effects remained above 72 percent for decompositions in all samples, based on the primary index and, at least, above 50 percent for decompositions in all samples, based on the alternative index, we cannot reject that the claim that, when

comparing the wealth of ex-slaves to the wealth whites, differences in wealth due to unexplained (or discrimination) effects dominate the portion due to classical characteristic differences.

Furthermore, since unexplained differences in states that abolished slavery after the Civil War were 10 percent higher than unexplained effects in states that abolished slavery well before the Civil War and the magnitudes of the unexplained effects were similar over the long-run, we cannot reject the existence of a negatively bounded correlation between the duration of time from enslavement and the magnitude ofunexplained differences in wealth.

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APPENDIX A

DERIVATION OF THE ECONOMETRIC EQUATIONS

If we assume static optimization[14]:

[A1] $h_{B,\tau} = h_B(r_{B\tau}, p_\tau)$

[A2] $h_{w,\tau} = h_w(r_{w\tau}, p_\tau)$

[A3] $c_{B,\tau} = c_B(r_{B\tau}, p_\tau)$

[A4] $c_{w,\tau} = c_w(r_{w\tau}, p_\tau)$

Thus, substituting equations [A1] and [A3] into equation [10] produces:

[A7] $$W_{Bt} = exp\{\tilde{W}_{Bt} + D_{B,t}\}$$

where

$$\tilde{W}_{Bt} = \sum_{\tau=1}^{t}(1+\tilde{i}_B)^{t-\tau}[r_{B,\tau}h_B(r_{B,\tau}, p_\tau) - p_\tau c_B(r_{B,\tau}, p_\tau)] + (1+\tilde{i}_B)^t \tilde{W}_{B,o}$$

such that:

[14] Note that MacCurdy (1981) shows that hours of work and consumption in an intertemporal optimization setting can be written as:

[A5] $$h_t = h_t(r_1, ..., r_T, p_1, ..., p_T, i_B)$$

[A6] $$c_t = c_t(r_1, ..., r_T, p_1, ..., p_T, i_B)$$

for both blacks and whites.

[A8] $$W_{Bt} = f(r_{B1}, r_{B2}, ..., r_{Bt}, p_1, p_2, ..., p_t, i_B)$$

Taking a log linear approximation:

[A9] $$lnW_{Bt} = \omega_{0,B} + \sum_{\tau=1}^{t}\gamma_\tau ln\, r_{B,\tau} + \sum_{\tau=1}^{t}\delta_\tau ln\, p_\tau + \theta t ln(i_B) + e_{Bt}$$

Note that:

[A10] $$lnr_{Bt} \approx \mu_{o,B} + \mu_{1,B}A_{Bt} + \mu_{2,B}A_{Bt}^2 + \mu_{3,B}S_{Bt} + \mu_{4,B}S_{Bt}^2 + \mu_{5,B}A_{Bt} \cdot S_{Bt} + v_{Bt}$$

[A11] $$\approx \tilde{\mu}_{o,B} + \tilde{\mu}_{1,B}A_{Bt} + \tilde{\mu}_{2,B}A_{Bt}^2 + \tilde{\mu}_{3,B}L_{Bt} + \tilde{\mu}_{4,B}A \cdot L_{Bt} + v_{Bt}$$

Substitute equation [A11] into equation [A9] produces:

[A12] $$lnW_{Bt} = \omega_{0,B} + \gamma_t(\tilde{\mu}_{o,B} + \tilde{\mu}_{1,B}A_{Bt} + \tilde{\mu}_{2,B}A_{Bt}^2 + \tilde{\mu}_{3,B}L_{Bt} + \tilde{\mu}_{4,B}A_{Bt} \cdot L_{Bt} + \xi_{Bt})$$

$$+ \sum_{\tau=1}^{t-1}\gamma_\tau ln\, r_{B,\tau} + + \sum_{\tau=1}^{t}\delta_\tau ln\, p_\tau + \theta t ln(i_B) + e_{Bt}$$

such that:

[A13] $$lnW_{Bt} = \pi_{0,Bt} + \pi_{1,Bt}A_{Bt} + \pi_{2,Bt}A_{Bt}^2 + \pi_{3,Bt}L_{Bt} + \pi_{4,Bt}A_{Bt} \cdot L_{Bt} + \pi_{5,Bt}Z_{Bt} + \varepsilon_{Bt}$$

where:

$$\pi_{o,Bt} = \omega_{0,B} + \gamma_t\tilde{\mu}_{0,B} + \sum_{\tau=1}^{t-1}\gamma_\tau ln\, r_{B,\tau} + \sum_{\tau=1}^{t}\delta_\tau ln\, p_\tau + \theta t ln(i_B)$$

$$\pi_{i,Bt} = \gamma_t\tilde{\mu}_{i,B} \quad for\ i = 1...5$$

$$\varepsilon_{Bt} = \gamma_t\xi_{Bt} + e_{Bt}$$

which is equivalent to equation [6], where t=1870. By the same reasoning, equation [4] is obtained.

Table 1: *Sample Descriptive Statistics*

	Observations	Minimum	Maximum	Mean	St Dev	St Error	95% C. I. on the Mean Lower	Upper
Age								
White	68,096	15	101	42.804	13.547	0.052	42.702	42.905
Black	18,929	15	114	39.840	14.209	0.103	39.637	40.042
Literacy Status								
White	68,096	-	1	0.885	0.319	0.001	0.883	0.888
Black	18,929	-	1	0.146	0.353	0.003	0.141	0.151
Total Wealth								
White	68,096	-	1,500,000	3,552.516	15,518.665	59.469	3,435.956	3,669.076
Black	18,929	-	165,000	124.228	1,604.806	11.664	101.365	147.091
Married								
White	68,096	-	1	0.818	0.386	0.001	0.815	0.821
Black	18,929	-	1	0.716	0.451	0.003	0.710	0.723
Number of Children								
White	68,096	-	9	2.503	2.129	0.008	2.487	2.519
Black	18,929	-	9	2.231	2.107	0.015	2.201	2.261
Number in Household								
White	68,096	1	30	5.166	2.585	0.010	5.147	5.186
Black	18,929	1	25	4.705	2.464	0.018	4.669	4.740
Rural Status								
White	68,096	-	1	0.729	0.445	0.002	0.725	0.732
Black	18,929	-	1	0.859	0.348	0.003	0.854	0.864

Source: Calculations are based on 1870 IPUMS data.

Table 2: *Testing White-Black Differences in Means*

	T-Statistics	Significance
Age	26.34	***
Literacy Status	275.71	***
Total Wealth	30.34	***
Married	30.79	***
Number of Children	15.57	***
Number in Household	21.95	***
Rural Status	-37.36	***

Source: Calculations are based on 1870 IPUMS data. Note that (*) indicates that the calculation is statistically significant at a ten percent level of significance; (**) indicates that the calculation is statistically significant at a five percent level of significance; and (***) indicates that the calculation is statistically significant at a one percent level of significance.

Table 3: *Least Squares Regression*

Coefficients by Race and Marital Status, Dependent Variable: Log Wealth

Sample:	Overall		Married		Singles	
Coefficients:	Black	White	Black	White	Black	White
Constant	-1.093 ***	-3.558 ***	-0.959 ***	-2.646 ***	-0.258	-3.476 ***
	(0.139)	(0.164)	(0.210)	(0.187)	(0.357)	(0.357)
Age	0.053 ***	0.191 ***	0.070 ***	0.196 ***	0.033 ***	0.181 ***
	(0.006)	(0.006)	(0.010)	(0.007)	(0.012)	(0.012)
Age-Squared	-0.000 ***	-0.002 ***	-0.001 ***	-0.002 ***	-0.000 ***	-0.001 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Age-Literacy Interaction	0.015 ***	0.009 ***	0.015 **	0.011 ***	0.015 ***	0.005
	(0.003)	(0.003)	(0.005)	(0.003)	(0.005)	(0.005)
Literacy Status	0.206	1.420 ***	0.293	1.330 ***	-0.060	1.576 ***
	(0.140)	(0.121)	(0.193)	(0.140)	(0.266)	(0.266)
Marital Status	0.683 ***	0.971 ***				
	(0.038)	(0.032)				
Number of Children	0.014	-0.080 ***	0.013	-0.108 ***	-0.008	0.014
	(0.013)	(0.009)	(0.018)	(0.010)	(0.021)	(0.021)
Household Size	0.082 ***	0.162 ***	0.092 ***	0.179 ***	0.056 ***	0.125 ***
	(0.011)	(0.007)	(0.015)	(0.008)	(0.015)	(0.015)
Rural/Urban Status	-0.019	1.477 ***	0.084	1.484 ***	-0.230 ***	1.451 ***
	(0.048)	(0.027)	(0.063)	(0.030)	(0.069)	(0.069)
Root MSE	2.247	3.128	2.402	3.054	1.784	3.438
R Squared	0.065	0.148	0.045	0.137	0.036	0.126
Adjusted R-Squared	0.065	0.148	0.045	0.136	0.034	0.125
F-Statistics for black and white coefficients in equations [4] and [6]	165.020 ***	1,474.430 ***	91.790 ***	1,257.100 ***	28.190 ***	254.000 ***
Number of Observations	18,929	68,096	13,558	55,684	5,371	12,413

Source: Calculations are based on 1870 IPUMS data. Standard errors are in parentheses. Note that (*) indicates that the calculation is statistically significant at a ten percent level of significance; (**) indicates that the calculation is statistically significant at a five percent level of significance; and (***) indicates that the calculation is statistically significant at a one percent level of significance. The dummy variables are defined as literacy equals one if the person can read write; marital status equals one if the person is married; and rural status equals one if the persons lives in a locality with less than 1,500 people.

Table 4: *Summary of Estimates from Decomposing*

White-Black Differences in Log Wealth for the Full Sample

	Differences	99 Percent C. I. Upper	Lower
Primary Index from Equation 12			
White-Black Wealth Differences:	4.292	5.025	3.560
in Coefficients (x White Means)	3.500 ***	3.933	3.068
Standard Errors	0.144		
Percent of Sum	*81.5%*	*78.3%*	*86.2%*
in Means (x Black Coefficients)	0.792 ***	1.092	0.492
Standard Errors	0.100		
Percent of Sum	*18.5%*	*21.7%*	*13.8%*
Alternative Index from Equation 13			
White-Black Wealth Differences	4.292	4.720	3.865
in Coefficients (x Black Means)	2.787 ***	3.084	2.491
Standard Errors	0.099		
Percent of Sum	*64.9%*	*65.3%*	*64.5%*
in Means (x White Coefficients)	1.505 ***	1.636	1.373
Standard Errors	0.044		
Percent of Sum	*35.1%*	*34.7%*	*35.5%*

Source: Calculations are based on 1870 IPUMS data. Standard errors are in parentheses. Note that (*) indicates that the calculation is statistically significant at a ten percent level of significance; (**) indicates that the calculation is statistically significant at a five percent level of significance; and (***) indicates that the calculation is statistically significant at a one percent level of significance. Note that the overall samples include 68,096 white observations and 18,929 black observations.

Table 5: *Summary of Estimates from Decomposing*

White-Black Differences in Log Wealth by Marital Status

Sample:	Married			Singles		
		99 Percent C. I.			99 Percent C. I.	
	Differences	Upper	Lower	Differences	Upper	Lower
Primary Index from Equation 12						
White-Black Wealth Differences:	4.264	5.469	3.059	3.965	4.899	3.032
in Coefficients (x White Means)	3.485 ***	3.943	3.028	3.406 ***	3.983	2.829
Standard Errors	0.153			0.192		
Percent of Sum	*81.7%*	*72.1%*	*99.0%*	*85.9%*	*81.3%*	*93.3%*
in Means (x Black Coefficients)	0.778 ***	1.525	0.031	0.560 ***	0.916	0.203
Standard Errors	0.249			0.119		
Percent of Sum	*18.3%*	*27.9%*	*1.0%*	*14.1%*	*18.7%*	*6.7%*
Alternative Index from Equation 13						
White-Black Wealth Differences	4.264	5.241	3.286	3.965	4.426	3.505
in Coefficients (x Black Means)	2.905 ***	3.595	2.215	2.471 ***	2.797	2.145
Standard Errors	0.230			0.109		
Percent of Sum	*68.1%*	*68.6%*	*67.4%*	*62.3%*	*63.2%*	*61.2%*
in Means (x White Coefficients)	1.358 ***	1.646	1.071	1.494 ***	1.629	1.359
Standard Errors	0.096			0.045		
Percent of Sum	*31.9%*	*31.4%*	*32.6%*	*37.7%*	*36.8%*	*38.8%*

Source: Calculations are based on 1870 IPUMS data. Standard errors are in parentheses. Note that (*) indicates that the calculation is statistically significant at a ten percent level of significance; (**) indicates that the calculation is statistically significant at a five percent level of significance; and (***) indicates that the calculation is statistically significant at a one percent level of significance. Note that the married samples include 55,683 white observations and 13,558 black observations; and the singles samples include 12,413 white observations and 5,371 black observations.

Table 6: *Summary of Estimates from Decomposing*

White-Black Differences in Log Wealth by Slave State Status

Sample:	North			Slave		
		99 Percent C. I.			99 Percent C. I.	
	Differences	Upper	Lower	Differences	Upper	Lower
Primary Index from Equation 12						
White-Black Wealth Differences:	2.972	4.187	1.757	4.110	4.910	3.310
in Coefficients (x White Means)	2.311 ***	3.117	1.506	3.613 ***	4.109	3.117
Standard Errors	0.269			0.165		
Percent of Sum	*77.8%*	*74.5%*	*85.7%*	*87.9%*	*83.7%*	*94.2%*
in Means (x Black Coefficients)	0.660 ***	1.069	0.251	0.497 ***	0.801	0.193
Standard Errors	0.136			0.101		
Percent of Sum	*22.2%*	*25.5%*	*14.3%*	*12.1%*	*16.3%*	*5.8%*
Alternative Index from Equation 13						
White-Black Wealth Differences	2.972	3.489	2.454	4.110	4.668	3.553
in Coefficients (x Black Means)	1.675 ***	2.106	1.243	2.735 ***	3.129	2.342
Standard Errors	0.144			0.131		
Percent of Sum	*56.4%*	*60.3%*	*50.7%*	*66.5%*	*67.0%*	*65.9%*
in Means (x White Coefficients)	1.297 ***	1.384	1.210	1.375 ***	1.539	1.211
Standard Errors	0.029			0.055		
Percent of Sum	*43.6%*	*39.7%*	*49.3%*	*33.5%*	*33.0%*	*34.1%*

Source: Calculations are based on 1870 IPUMS data. Note that (*) indicates that the calculation is statistically significant at a ten percent level of significance; (**) indicates that the calculation is statistically significant at a five percent level of significance; and (***) indicates that the calculation is statistically significant at a one percent level of significance. Note that the north samples include 48,090 white observations and 1,360 black observations, and the slave samples include 20,006 white observations and 17,539 black observations. North states equal one if the state is Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, New York, New Jersey, Pennsylvania, Ohio, Michigan, Iowa, Indiana, and Minnesota. Slave state equals one if the state is Virginia, Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Texas, Kentucky, Maryland, Tennessee, West Virginia, Missouri, Delaware and the District of Columbia.

Colleges Research Institutions & Universities, Certificates and Degrees of James E Curtis Jr

5th Phase	**Distinctions of James E Curtis Jr, designing a graduate program, institute & university**
2017-12-31	*Honorary Doctorate of Philosophy, career award,* Education, Education Foundation
2017-12-31	*Honorary Executive Master of Arts, career award,* Education Administration, Education Foundation
2017-12-31	*Honorary Doctorate of Philosophy*, *career award*, Political Science, Education Foundation
2017-12-31	*Honorary Doctorate of Philosophy*, *career award,* Sociology, Education Foundation
2017	*JECJEF Prize in Charity, career award*
2014-04-09	*Honorary Doctorate of Laws, career award,* Laws, Education Foundation
2014	*JECJEF Prize in Advocacy, career award*
2013	Founder, The James Edward Curtis Jr Education Foundation/JECJEF University
2012	Founder, Internet Graduate Research Institute, IGRI
2012-12-31	*Honorary Doctorate of Philosophy, career award,* Interdisciplinary Studies, Education Foundation
2012	*JECJEF Prize in Economics, career award*

4th Phase	**Distinctions of James E Curtis Jr, The Post-Doctoral Studies of James E Curtis Jr**
2011 - 2017	Doctoral Programs, Education, Laws, Political Science, Sociology, Education Foundation
2011 - 2017	Executive Master of Arts Programs, Education Administration, Education Foundation
2011 - 2012	Doctoral Program, Interdisciplinary, Accountancy Economics History Laws, Education Foundation
2003-2010	*Honorary Post-Doctoral Researcher, & sabbatical,* Education Foundation
3rd Phase	**Distinctions of James E Curtis Jr, The Ph.D. of James E Curtis Jr**
2003-12-31	*Doctorate of Philosophy,* Ph.D., Economics, Education Foundation
2003	Doctoral Program, Economics, Education Foundation, *transfer courses, exams, defenses, OSU*
2nd Phase	**Distinctions of James E Curtis Jr, The Ph.D. Program of James E Curtis Jr**
2002	Doctoral Program, Ph.D. Written Defense, Proxy, Ohio State University/OSU, Columbus, OH
2001	Doctoral Program, Ph.D. Oral Defense, Proxy, OSU, Columbus, OH
2000	Doctoral Program, Ph.D. Oral Proposal, OSU, Columbus, OH
2000	Doctoral Program, Ph.D. Written Proposal, OSU, Columbus, OH
1999	Doctoral Program, Ph.D. Program Exam Pass, Economic History, OSU, Columbus, OH
1999	Doctoral Program, Ph.D. Program Exam Pass, Macro/Monetary Economics, OSU, Columbus, OH
1999	Doctoral Program, Ph.D. Program Exam Pass, Microeconomics, OSU, Columbus, OH
1998	Doctoral Program, Ph.D. Program Exam Pass, Macroeconomics, OSU, Columbus, OH
1997 - 2003	Doctoral Program, Economics, 3.37 GPA, courses, OSU, Columbus, OH
1997 - 1998	Master of Arts Program, *Master of Arts*, Economics, OSU, Columbus, OH
1st Phase	**Distinctions of James E Curtis Jr, The Pre-Doctoral Programs of James E Curtis Jr**
1997-Summer	Pre-Doctoral Program, Economics, American Economic Association/Univ. of Texas, Austin, TX
1996-Autumn	Pre-Doctoral Program, Mathematics for Economists, Univ. of Maryland, College Park, MD
1995	International Studies, parliamentary government of Israel and Tel Aviv University, Israel
1994-Summer	*Certificate*, Management, Harvard School of Business/INROADS, Boston, MA
1991 – 1996	*Bachelor Degree*, Economics & *Bachelor Degree*, Political Science, Howard /transfer from Rutgers
1990-2019	Founder Owner President, Education Foundation
1990-Summer	Pre-Undergraduate Program, Mathematics, UDC, Washington, DC
1989 – 1991	Pre-Undergraduate Program Degree, *Diploma*, Calvin Coolidge/transfer from Garfield
Colleges, Research Institutions & Universities, Employment of James E Curtis Jr	
2003 – 2018	Independent Researcher & Research Economist, Education Foundation
2014 – 2018	Economics Education, Correspondent, Education Foundation
2002-Summer	Econometrics, Teaching Assistant including graduate school fundamentals, American Economic Association
	Summer Program at the University of Colorado, Denver, CO
2001-Summer	Economics, Instructor, Executive Education, OSU Business School, Columbus, OH

2000 – 2001	Applied Statistics, Instructor, Economics, Ohio Wesleyan University, Delaware, OH
1998 – 2002	Macroeconomics & Money and Banking, Teaching Assistant, Economics, OSU, Columbus, OH
1998 – 2002	Microeconomics & Intermediate Microeconomics, Instructor, Economics, OSU, Columbus, OH