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THE RISE OF RETIREMENT AMONG AFRICAN AMERICANS: WEALTH AND SOCIAL SECURITY EFFECTS

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ABSTRACT

I examine the effects of an unearned income transfer on the retirement rates and living arrangements of a very poor population by studying the effects of pensions on the decisions of black Union Army veterans. I find that blacks were 2 to 5 times as responsive as whites to income transfers in their retirement decisions and 6 to 8 times as responsive in their choice of independent living arrangements. I argue that blacks' greater poverty explains their responsiveness to pensions. My findings have implications for understanding racial differences in trends in retirement and independent living. I show that the retirement rates of both blacks and whites rose between 1900 and 1930 but that convergence in black and white rates and in living arrangements only occurred between 1930 and 1950. I argue that income effects from the institution of Social Security explain up to half of the convergence in black-white retirement rates and in living arrangements.

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The first generation of African Americans to reach age 65 in the twentieth century could not afford to retire. The majority had grown up in slavery and left it with no accumulated wealth. In the south in the late nineteenth and early twentieth century blacks had only 5.8 cents of wealth for every dollar of white wealth (Margo 1984). As Gunnar Myrdal (1962: 205) wrote of African Americans in the 1930s, "Their incomes are not only low but irregular. They thus live from day to day and have scant security for the future." One group of African Americans was more fortunate in their old age – the veterans of the Union Army. These men became eligible for a pension that was a pure income transfer given regardless of own income, wealth, or labor force participation.

This paper uses the Union Army pension program to examine the effects of an unearned income transfer on the retirement rates and living arrangements of a very poor population. Understanding the effect of income on elderly labor supply and living arrangements is important for policy makers because Social Security programs have both income and substitution effects. It is also important for researchers interested in understanding how secular increases in wealth have affected trends in retirement and independent living. Unfortunately isolating an income effect is hard and in the search for both exogenous and substantial income transfers researchers have looked at lottery winners (Imbens, Rubin, and Sacerdote 2001) and recipients of inheritances (Holtz-Eakin, Joulfaian, and Rosen 1993), but the focus of these studies has not been the elderly.

Studying the Union Army generation can provide insights into how increases in wealth have affected the experiences of later cohorts of African Americans because African Americans remained poor for a long time. Virtually all of the increase in the black-white earnings ratio occurred in the 1940s and from 1963 to 1975 (Donohue and Heckman 1991). The gap in white-black homeownership rates fell slightly from 1920 to 1940 but did not fall substantially until the 1960s (Collins and Margo 2001). Even in the 1990s, white households held five to ten times the net worth of black households (Smith 1995; Hurst, Luoh, Stafford 1998; Wolff 1998; Davern and Fisher 201), largely

because of differences in black-white earnings (Barsky, Bound, Charles, and Lupton 2002).[1]

My findings will have implications for the rise in black retirement rates prior to 1930 and for the convergence in black and white retirement rates and living arrangements between 1930 and 1950. As the paper will show, although both black and white retirement rates rose between 1880 and 1930, the black-white retirement gap did not narrow until 1940. The convergence in black-white retirement rates was accompanied by convergence in living arrangements among the retired. If independent living is a normal good, then black retirees became much better off between 1930-50. Could rising wealth explain the rise in black retirement rates prior to 1930? Could rising wealth and the institution of Social Security in 1935 explain the 1930 and 1950 convergence?

There have been many studies of the effects of Social Security Old Age and Survivors' Insurance on retirement rates and elderly living arrangements (e.g. Hurd and Boskin 1984; Hausman and Wise 1985; Krueger and Pischke 1992; Michael et al. 1980; McGarry and Schoeni 2000; Costa 1999), but most studies do not estimate wealth effects; studies of living arrangements have focused on older, non-married women; and, the applicability to the past of estimates based on recent data is questionable. Wealth levels have risen, health has improved, and as retirement rates have risen, the characteristics of the marginal person in the labor force have changed. Studies of past populations have examined white Union Army veterans (Costa 1998, 1997, 1995) and may thus reveal little about the experience of blacks. For example, Friedberg's (1999) study of the effects of Social Security Old Age Assistance, a means and wealth tested program, found that blacks were three times as responsive as whites to benefit increases between 1940 and 1950. Research on modern families has emphasized that norms of filial responsibility are greater among blacks than among non-Hispanic whites (e.g. Burr and Mutchler 1999) and scholars have argued that the importance attached to familial relations has persisted from African history and culture (e.g.

[1] Although two-thirds of the recent mean difference in wealth between blacks and whites can be explained by differences in earnings (Barsky, Bound, Charles, and Lupton 2002), blacks' greater spending on conspicuous consumption to increase social status may also play a role (Charles, Hurst, and Roussanov 2007).

McDaniel 1990; Morgan et al. 1993). Did blacks have different preferences from whites or were they simply poorer?

1 Trends

The rise of retirement began before the institution of Social Security (see Figure 1). The retirement rates of all non-institutionalized men older than 64 rose from slightly more than 20 percent in 1880 to 40 percent in 1930, doubling in the fifty years prior to the institution of Social Security in 1935. Between 1940 and 1980 retirement rates rose from 55 to 80 percent, remaining roughly at that level to the present day.[2] Black men also experienced increases in retirement rates, but began at much lower levels. Their retirement rates rates rose from somewhat more than 10 percent in 1880 to 25 percent in 1930 and then to over 80 percent in 1980.[3]

Figure 1 provides suggestive support for the role of Social Security in explaining black-white convergence in retirement rates. In 1930 there was a 16 percentage point difference in retirement rates between black and white men older than 64, a larger gap than in 1880. By 1940 the gap had narrowed to 7 percentage points and by 1950 to 2 percentage points. After 1950 black men older than 64 were slightly more likely to be retired than whites. Convergence patterns were roughly similar in both the North and South (see Figure 2). However, while in the North convergence had occurred by 1940, in the South convergence had to wait until 1950. The retirement rates of men age 55 to 64 converged between 1940 and 1950 and the retirement rates of blacks exceeded those

[2]Retirement rates pre- and post-Social Security are not strictly comparable. In 1940 the definition of the labor force changed in 1940 from one of gainful employment to the current definition. See Moen (1987) for a consistent labor force participation series using the gainful definition of employment. Moen (1987) estimates only a 1.7 percentage point difference in retirement rates calculated using the gainful definition compared to the current definition in 1940 and a 5.6 percentage point difference in retirement rates in 1950, with slightly lower retirement rates using the gainful definition of employment. When I calculated retirement rates in 1940 and 1950 using Moen's gainful definition of employment for 1940 and 1950, I found a 7 percentage point difference in black-white retirement rates in 1940 and a 3 percentage point difference in black-white retirement rates in 1950. These differences were similar to those calculated under the current definition of employment.

[3]Differential institutionalization rates cannot explain these patterns. Between 1870 and 2000 the institionalization rate of men older than 64 never reached 4 percent among whites and never reached 5 percent among blacks.

of whites by 1950 (see Figure 3).

Figure 4 shows that black retirees' adoption of independent living co-incided with the institution of Social Security whereas this change predated the institution of Social Security for white retirees. Among black retirees age 64 and older headship rates fluctuated between 47 and 56 percent between 1870 and 1930. Headship rates rose from 50 percent in 1930 to 66 percent in 1940 and reached a peak of 84 percent in 1970 before declining to 80 percent in 2000. In contrast, among white retirees headship rates rose steadily from 41 percent in 1870 to 64 percent in 1930 and continued rising steadily thereafter. Headship rates of black men still in the labor force never fell below 81 percent between 1870 and 2000, averaging around 87 percent. Those of white non-retirees never fell below 84 percent in this period and averaged around 89 percent. Examining the fraction of elderly men living with at least one of their own children shows that among both black and white men still in the labor force the fraction living with one of their children has been declining since 1870. The pattern for retirees resembles that observed when examining headship rates.

Blacks' retirement rates may have converged to those of whites not because of the institution of Social Security but because in the 1930s they were more adversely affected by the Great Depression, by New Deal acreage restrictions that encouraged capital intensive farming methods, and by the mechanization of cotton picking in the 1940s (Donohue and Heckman 1991). Migration from the farm may have forced the elderly to live on their own. The convergence of retirement rates even among men age 55 to 64, a group ineligible for Social Security, suggests that labor demand drove the change in black retirement rates. However, between 1940 and 1950, when black retirement rates surpassed those of whites, unemployment rates in this age group fell for both whites and blacks.[4] Because few black births would have been registered, men in this age group might have been collecting Social Security benefits. A comparison of ages at death on death certificates

[4]Unemployment rates fell from 9.2 percent to 6.0 percent for blacks and from 9.6 to 4.0 for whites.

with ages at death in the Social Security database shows younger ages on the death certificates (Kestenbaum 1992).[5]

2 Retirement and Living Arrangement Decisions

Union Army pensions represent a pure income effect on labor supply and therefore should have induced more men to retire at any given age. The question I pose is by how much Union Army pensions reduced labor supply for veterans in their later years. Pensions might have two different effects on the retirement decision. They will directly affect income flows and the receipt of pensions in the past will increase current assets, allowing veterans to retire earlier. I estimate only the direct effect of pensions. The estimated effect of pensions will therefore be a lower bound estimate.[6]

The effect of an income transfer will depend on the size of the pension relative to income. Low earners should be more responsive to pension income than high earners, that is black veterans should be more responsive to pension income than white veterans. However, those without any wealth, as was true for most black veterans, may not find a pension enough to retire on, particularly if they subsidize needy friends and relatives (see Case and Deaton 1998 and Ardington, Case, and Hosegood 2007 for evidence on income pooling among South Africans receiving pensions). A Civil War widow (and pension recipient) interviewed in the 1930s reported that "the negroes of East Austin consider her a sort of bank. Whenever any one needs a dime or a quarter, he or she thinks, 'Nancy has the money'" (Works Progress Administration 2000). Ninety-four percent of black men employed as domestic servants in Philadelphia at the end of the nineteenth century had parents or others dependent on them (Du Bois 1899: 461).

[5]Linking individuals to previous censuses shows that age in the census tends to be overstated beginning as early as age 50 (Elo and Preston 1994), but does not preclude that men listed as age 55-64 in the 1940 census were collecting Social Security benefits.

[6]Given the poverty of African-Americans, it is unlikely that pension income contributed much to asset holdings.

If independent living is a normal good then examining the living arrangements of retirees provides some clues about their financial wherewithall. I therefore examine the effect of Union Army pensions on living arrangements. The impact of pensions on living arrangements is theoretically ambiguous. The decision of older men and their kin to share living quarters is a function of income, including pension income, and prices, including shadow prices, faced both by the older men and their relatives. Such demographic variables as kin availability and such institutional variables as the rules of the Union Army program can be thought of as affecting the shadow price. The impact of these income and price variables on living arrangements will depend on the underlying model of living arrangements, the preferences of individuals, and household decisions made throughout the life cycle. For example, under a bargaining model if a man preferred to live on his own then a sizable government transfer would enable him to do so whereas if he preferred to live with relatives then it would enable him to bribe them. Under an altruism model a government transfer might either wholly or partially displace children's transfers and therefore have either no or very little impact on the living arrangements of older men.

3 Union Army Pensions

Both black and white veterans were eligible for a pension. Congress established the basic system of pension laws, known as the General Law pension system, in 1862 to provide pensions to both regular recruits and volunteers who were disabled as a direct result of military service. The dollar amount depended on the degree of disability, regardless of the veteran's employment status, his job if employed, or his wealth. Application was through a pension attorney, and the degree of disability was determined by a board of three local doctors employed by the Pension Bureau and following guidelines established by the bureau.[7]

The act of 27 June 1890 instituted a univeral disability and old-age pension program for Union

[7]Black attorneys were active in processing claims (Brimmer 2006).

Army veterans. According to the veterans' lobby, the new law would "place upon the rolls all survivors of the war whose conditions of health are not practically perfect" (quoted in Glasson 1918: 223). Within a year of the act's passage, the number of pensioners on the rolls more than doubled. Any disability now entitled a veteran to a pension and a veteran who could not claim a service related disability received from $6.00 to $12.00 per month or from 19 to 38 percent of the monthly income of a laborer. However, an applicant who could trace his disability to the war (often because of the incorrect medical theories of the time such as marching in the damp causing rheumatism) received substantially more for the same disability than his counterpart who could not.

In 1890 the Pension Bureau instructed the examining surgeons to grant a minimum pension to all men at least 65 years of age, unless they were unusually vigorous. At age 75 men became eligible for an even larger pension. In 1904, Executive Order 78 officially authorized the Pension Bureau to grant pensions on the basis of age. Under the Service and Age Pension Act of 6 February 1907 pensions were $12.00 per month for veterans age 62 to 69, $15.00 per month for those age 70 to 74, $20.00 per month for those older than 74. This act did not increase the total number of pensioners on the rolls; it mainly induced pensioners to switch from the 1890 law to the 1907 law.

When the pension system was first created blacks had close to the same approval rate as whites (roughly 85 percent for blacks and 89 percent for whites). However, by 1890, 81 percent of whites who had applied for pension support had been approved, compared to only 44 percent of black applicants. In the years prior to the 1890 liberalization, the pension board approved more and more pensions, even though the conditions being pensioned often had a tenuous link to service in the war. But black veterans apparently were not granted the same leniency.

The 1890 Law increased black participation in the pension system. By 1900 91 percent of black applicants had applied under the 1890 Law whereas only slightly more than half of all white applicants had done so. Because pension amounts were lower under the 1890 Law than under the

General Law, the average black pension in 1900 was $7.59 per month compared to $12.94 per month for whites. Nonetheless blacks and whites received roughly equal treatment under the 1890 Law. Between 1890 and 1899, 74 percent of black applications under the 1890 Law were approved by the end of the period, compared to 81 percent of white applications under the 1890 Law. The mean pension awarded to whites during this period was only 80 cents higher per month than the mean pension awarded to blacks.[8] In 1900 median pensions awarded to blacks were the same in both the north and the south, suggesting that system was a federal one and did not depend on region of residence.

By 1910, when by law men could receive a pension purely on the basis of age, 83 percent of black applicants had applied under the aged-based 1907 Law, 16 percent under the 1890 Law, and only 1 percent under the General Law. Among whites the respective figures were 64 percent applying the 1907 Law, 14 percent under the 1890 Law, and 22 percent under the General Law. Blacks were less likely to suffer from war wounds but had greater rates of arteriosclerosis and congestive heart failure than whites (Costa, Helmchen, and Wilson 2007). Pension recipiency among blacks in 1910 was probably slightly lower than among whites. I was able to find in the pension records 86 percent of a sample of whites who identified themselves as Union veterans in the 1910 census and 79 percent of blacks who reported themselves to be veterans.[9]

Although mean pensions were lower for blacks than for whites, pensions replaced a higher fraction of blacks' wage income. In 1900 the mean pension of $12.94 per month given to whites replaced 36 percent of the earnings of a manufacturing worker. In contrast, the mean pension of

[8]The boards of physicians who examined pension applicants seem to have had a systematic upward bias in designating white veterans as disabled relative to blacks. For example, by 1900, 4.5 percent of black examinees were blind in at least one eye, compared to 4.0 percent of whites. However, of those who were blind in at least one eye, only 44 percent of blacks had been rated as disabled, compared to 88 percent of whites.

[9]Because many African Americans changed their names after the war, it may be harder to find black veterans than white veterans. Interviews with former slaves in the 1930s discuss both military service (either own, a father's, or a husband's) and pension recipiency. Only one interview revealed lack of knowledge of pensions: "After I went blind I had hard times. Folks, white folks and all, brought me food. But that wasn't any good way to get along. Sometimes I ate, sometimes I didn't. So some of my white, friends dug up my record with the Yankees and got me a pension. How I'm setting pretty for de rest of my life" (Works Progress Administration 2000, interview of Uncle William Baltimore).

$7.59 per month given to blacks replaced 47 percent of their earnings.[10]

4 Data

Two datasets are used in the analyses. The first dataset is based on the military service and pension records of 5,673 black Union Army soldiers in 51 infantry companies.[11] This sample is representative of the US Colored Troops in terms of geography and slave status. Twenty-nine percent of the men in the sample were free; 28 percent of them were from the free states and the remaining 72 percent were from the border and southern states. Twenty-two percent of these men died while in the service, a higher service mortality rate than that of 14 percent for white soldiers, mainly because sanitary conditions for black troops were so poor. Over 90 percent of black service deaths were from disease.

The military service records provide information on state of birth, age and occupation at enlistment, year and place of enlistment, and on all military service events such as death, injury, and illness. The pension records provide information on pension recipiency and dollar amount received, date of death (if on the pension rolls), post-bellum residence, and occupation.[12] The records of the examining surgeons provide information on height, weight, and various chronic conditions.

Veterans are linked to the 1870, 1880, 1900, 1910, 1920, and 1930 censuses which provide information on occupation (and therefore labor force participation), head of household status, whether any own children were present in the household, and characteristics such as literacy. Past

[10] Average annual earnings for a manufacturing worker in 1900 were $432 per year (see Table Ba4298-4313, p$\dot{2}$-268 of *Historical Statistics of the United States: Earliest Times to the Present, Millenial Edition*). Smith (1984) estimates that in 1900 the black-white wage ratio was 0.449.

[11] The original sample of 52 companies contained one company of old men. The sample represents roughly 2.7 percent of all blacks serving. The data are available from the Center for Population Economics at the University of Chicago, http://www.cpe.uchicago.edu.

[12] Soldiers who survived the war were less likely to have a pension record if they had ever deserted (deserters who never returned to fight were ineligible), if they had never been injured in the war, if they were not from a fighting regiment, if they had never been promoted, if they were born in the Confederacy, if they were freemen, and if they were light-skinned.

censuses and the pension records provide information on last occupation, a measure of opportunity cost. Only men linked to the 1900 and 1910 censuses are used in the analysis. Because black mortality rates were relatively high, only 1,060 black veterans survived to 1900 and 744 survived to 1910. Of these, 76 percent are linked to the 1900 census and 83 percent are linked to the 1910 census.[13] I restricted the sample to the non-institutionalized. When using health information in the analyses, I also limited the sample to men for whom this information is available. Total sample sizes are 885 in 1900 and 548 in 1910. When I restrict the samples to men with information on pension amount, the sample sizes become 877 and 542, respectively.

The second dataset is drawn from the 1.4 percent 1910 Integrated Public Use Micro Sample (IPUMS), which identified veteran status. This census identifies 204 black non-institutionalized Union Army veterans age 60-85. Veterans were undernumerated: only 45 percent of black men in the Union Army sample are listed as veterans in the census.[14] I therefore add veterans from the Union Army sample to create an "expanded IPUMS" sample, giving me 729 black Union Army veterans 729 men age 60-85. When I restrict to states in which I have both veterans and non-veterans, the sample size falls to 678 men.

Veterans in the Union Army sample were similar to the self-identified veterans in IPUMS in most characteristics, but they were more likely to be household heads, less likely to be home owners, and were more likely to live in a smaller town (see Table 1). Using age as reported in the military service and pension records, veterans in the Union Army sample were on average one year younger than IPUMS veterans. But in the census Union Army veterans reported themselves one year older on average than their ages in their military service and pension records.

Table 1 also reveals that compared to non-veterans all black veterans were more likely to be literate, less likely to live on a farm and more likely to live in a larger town, and were about one

[13]Men were less likely to be found in the 1900 and 1910 censuses if they were living in one of the largest 100 cities circa and if they were from a free state.

[14]Men were more likely to state that they were veterans if they were out of the labor force, were receiving a higher pension, and were household heads.

year older. In contrast, white Union Army veterans were more likely to be in a smaller town than white non-veterans who had been born in a northern state or who had immigrated prior to 1865. Similarly, white Confederate veterans were more likely to be in a small town than white southern-born non-veterans. White Union Army veterans were more likely to be retired than non-veterans, but the difference in retirement rates was not as large as the difference between the retirement rates of black veterans and non-veterans.

5 Empirical Framework

5.1 Retirement

I use four different empirical strategies to estimate the effect of pensions on the retirement rates of black Union Army veterans. The first two strategies compare pension recipients and non-recipients. The last two strategies examine recipients using variation in pension amount between recipients. The four strategies identify different pension effects when response to pension amount depends on the size of the transfer. Consider a simple case in which non-recipients have a pension of zero and do not retire; some recipients have a small pension of p_1 and do not retire because the pension is not enough for subsistence; and other recipients have a large pension of p_2 and retire. When I look at the sample of recipients, the average treatment effect on the treated is $(1-0)/(p_2-p_1)$. When I look at the sample of recipients and non-recipients, the average treatment effect on the treated is $(\bar{r}-0)/(\bar{p}-0)$ where $\bar{r}$ is the mean retirement rate and $\bar{p}$ is mean pension amount among recipients. Because $(1-0)/(p_2-p_1) > (\bar{r}-0)/(\bar{p}-0)$, estimates of the average treatment effect from the sample of recipients will be greater than estimates comparing the sample of recipients and non-recipients.[15] Both estimates will over-estimate the effect of giving

[15] If the fraction of men receiving pensions of p_1 is n_1 and the fraction of men receiving pensions of p_2 is n_2 then $\bar{r} = n_2$ and $\bar{p} = n_1 p_1 + n_2 p_2$. $\bar{r}/\bar{p}$ can be written as $1/(\frac{n_1}{n_2} p_1 + p_2)$ and the denominator of this term is greater than $p_2 - p_1$.

men a small pension (which is 0) and under-estimate the effect of going from no pension to a large pension.

The first strategy uses propensity score matching to compare black Union Army veterans with non-veterans, using both the IPUMS sample and the expanded IPUMS sample. In comparing veterans and non-veterans, I cannot control for poor health arising from wartime service, but, by comparing retirement rates between Confederate veterans and southern-born non-veterans, I can use a differences in differences strategy to account for war-time health shocks. Because Confederate veterans were ineligible for a Federal pension (and served longer and in worse health conditions than Union Army soldiers), any differences in retirement rates between Confederate veterans and southern-born non-veterans must be due to their worse health. I can examine whether black soldiers were more or less responsive to pensions than white soldiers by comparing the retirement rates of white Union Army veterans with those of white non-veterans who were either northern-born or who had immigrated to the United States prior to 1865. I first derive propensity scores from a probit regression of veteran status on age; the log of population in the town of residence; dummies for literacy, marital status, whether the man was residing on a farm, whether the man owned property (known only for household heads), whether the man was the head of the household, and whether any own children were living with the man; and state fixed effects. (Because some of these variables may be determined by pension amount, I also run regressions using only age and region of residence fixed effects.) The propensity scores were then used in nearest neighbor matching with a caliper of 0.1 and with no replacement. A disadvantage of this approach is that if black veterans have a higher probability of being in worse health relative to whites, I will overestimate pension effects.

The second strategy also compares pension recipients with non-recipients but uses the Union Army sample and compares retirement rates in 1900 of veterans who were not on the rolls because their pension application had been rejected with veterans who were on the rolls. There were

143 rejectees in 1900 and 745 pensioners. (In 1910 there were only 9 rejectees.) Again, comparisons are done using propensity score matching. The propensity scores were derived from a probit regression of veteran status on age; the logarithm of town population; dummies for literacy, marital status, whether the man was residing on a farm, whether the man was the head of the household, whether the man owned property, and whether any own child was in the household; area of residence (either a state or a region) fixed effects; dummies for last occupation; Body Mass Index (BMI=weight in kilograms divided by height in meters squared) and BMI squared; and four dummies indicating whether the veteran had difficulty walking or bending and whether he was paralyzed or blind. The propensity scores were then used in nearest neighbor matching with a caliper of 0.1 and no replacement. An advantage of this approach is that I can explicitly control for functional limitations such as difficulty in walking.

The third strategy examines discontinuities in retirement rates at age 70 in 1910 when pension rates rose from $12 to $15 per month. I present suggestive evidence from a regression discontinuity design and more definitive results from a propensity matching score estimator. My estimate compares veterans age 65 to 69 with those age 70 to 74 and controls for age effects by double differencing using non-veterans.

The fourth strategy uses instrumental variable estimation in the Union Army sample in both 1900 and 1910. The Pension Bureau was not supposed to take labor force participation into account in awarding pensions, but the examining surgeons may have considered labor force status in rating disabilities. If being out of the labor force was a sign of disability, there will be a spurious positive relationship between pensions and retirement. If being out of the labor force indicated laziness and therefore unworthiness, this will lead to a spurious negative relationship between pensions and retirement. Alternatively, those in the labor force may have been better able to obtain pensions and to obtain bigger pensions because they could pay the attorney fees or because they were better connected. This will produce a spurious negative relationship between pensions and retirement.

The instrumental variable used is a dummy equal to one if the veteran's last application (or last successful application if he was on the pension rolls) prior to 1900 was under the General Law. Men who successfully applied under the General Law received a larger pension for the same disability than 1890 Law applicants. Because men's ability to trace their disability to the war depended on the incorrect medical theories of the time, the law itself should not affect their decision to retire. Control variables in the instrumental variables regression include age; two dummies indicating occupation (artisan, professional, or proprietor and laborer, with farmer as the omitted category); a dummy equal to one if the veteran was married; BMI and BMI squared; four dummies indicating whether the veteran had difficulty walking or bending and whether he was paralyzed or blind; dummies indicating literacy, property ownership, whether the veteran had been wounded in the war, whether the veteran was free at the time of enlistment, whether the veteran lived on a farm, and whether there were any own children in the household; the logarithm of town population; and area of residence fixed effects (equal to either a state or a region).

5.2 Living Arrangements

I examine the effect of pensions on elderly living arrangements in 1910. I compare living arrangements between black Union Army veterans and non-veterans, white Union Army veterans and northern non-veterans, and white Confederate veterans and southern non-veterans. I look at both retirees and non-retirees to understand differences in their living standards. Because the the Union Army sample contains too few retirees, I use only the expanded IPUMS sample. The two measures of living arrangements that I use are whether the man was the household head and whether the man was living with any of his own children. The samples are restricted to non-institutionalized men age 60-85. I obtained matches by deriving propensity scores from a probit regression of veteran status on age; the logarithm of population in the area of residence; dummies for literacy, marital status, whether the man was residing on a farm, and whether the man owned property; and, state

fixed effects.

6 Results: Retirement

6.1 Recipients and Non-Recipients

Table 2 shows that in a matched sample the difference in retirement rates between black Union Army veterans and non-veterans ranges from 6.2 to 7.5 percentage points. (When I match only on age and region of residence fixed effects, the difference in retirement rates ranges from 5.4 ($\hat{\sigma}$ =3.7) to 6.9 ($\hat{\sigma}$ =1.9) percentage points.) In contrast, there was no difference in retirement rates between white Confederate veterans and non-veterans. Had all black non-veterans received a pension comparable to the Union Army pension, their retirement rates would have been either 15.2 or 16.5 percent, implying that pension income explains roughly 61 (=6.2/10.1) to 75 (=7.5/12.1) percent of the difference in retirement rates between black veterans and non-veterans in the IPUMS sample.[16]

White veterans were less responsive to pension income than black veterans. The difference in retirement rates between white Union Army veterans and non-veterans who were either born in a northern state or who had immigrated prior to 1865 was 3.9 percentage points. Assuming that all black veterans were receiving the average pension of $13.50 in 1910 (as estimated from the Union Army sample), the average treatment effect on the treated ranges from 0.5 (=6.2/13.5) to 0.6 (=7.5/13.5). Assuming that all white Union Army veterans were receiving the average pension of $16.90 (as estimated from the Union Army sample), the average treatment effect on the treated is 0.2 (=3.9/16.9). When I use the matched samples to run probit regressions in which the dependent

[16]I found no evidence that the wives of black Union Army veterans in the expanded IPUMS sample were less likely to work than the wives of black non-veterans. In the unmatched sample 34.3 percent of the wives of veterans were working compared to 43.3 percent of the wives of non-veterans. However, in the matched sample labor force participation rates of non-veteran wives fell to 36.8 percent, a statistically insignificant difference of 2.4 ($\hat{\sigma}$ =3.2) percentage points.

variable is retirement status and the independent variables are veteran status and the variables used in the matching regression the resulting derivatives calculated at the mean are 0.071 ($\hat{\sigma}$ =0.018), -0.022 ($\hat{\sigma}$ =0.068), and 0.049 ($\hat{\sigma}$ =0.013) for black Union Army veterans, white Confederate veterans, and white Union Army veterans, respectively. Double-differencing with the coefficient for Confederate veterans, the implied average treatment effects on the treated are 0.7 for black Union Army veterans and 0.4 for white Union Army veterans.

Table 3 shows the characteristics of men in the Union Army sample in 1900 and in 1910 and compares the characteristics of rejects in 1900 with those of pensioners. Rejectees had lower retirement rates than pensioners but they also lived in smaller towns, were less likely to have been free at enlistment, and were in better health. Compared to rejectees, pensioners were more likely to have difficulty walking and bending and were more likely to be paralyzed and blind.

The difference between the retirement rates of rejects and pensioners was 8.8 percentage points. When rejects and pensioners were matched using only variables available in the census, the difference rises to 9.9. However when additional controls from the pension records are added (including the health controls), the difference becomes 7.8 percentage points (see Table 4). Because in the matched sample of pensioners the monthly pension amount was $8.60, the average treatment effect on the treated is 0.9 ($\hat{\sigma}$ =0.3), greater than the average treatment effect obtained using the IPUMS samples. This estimate implies that had all non-veterans received a pension in 1910, their retirement rates would have risen to 21.5, a slightly higher retirement rate than that of veterans.

6.2 Using the Age Discontinuity

The 1907 Law, under which 83 percent of black veterans had applied by 1910, introduced discontinuities in pension amount at ages 70 and 75. Figure 5 shows that monthly pension amount jumps by an estimated $2.52 ($\hat{\sigma}$ =0.73) at age 70, slightly less than the expected $3.00. At age 75, monthly pension amount jumps by an estimated $1.53 ($\hat{\sigma}$ =2.30), much less than the expected

$5.00, and a statistically insignificant jump. Sample size at older ages is too small to obtain meaningful estimates.

Examining the discontinuity at age 70 in the extended IPUMS sample (see Figure 6) provides suggestive evidence of a substantial jump in retirement probabilities at that age. Age in the census is mis-stated by, on average, one year. The only statistically significant predictor of the difference between age as given in the pension records and age as given in the census was literacy and the regression explained hardly any of the variation. Because I cannot adjust age, I therefore use age as given in the census for everyone. When I do so, I find a negligible jump in retirement probabilities at age 70 (0.042, $\hat{\sigma}$ =0.047), but a qualitatively large though statistically insignificant jump in retirement probabilities at age 71 (0.071, $\hat{\sigma}$ =0.060). In contrast, for black non-veterans the estimated jump in retirement probabilities at age 70 is 0.015 ($\hat{\sigma}$ =0.022) and the estimated jump in retirement probabilities at age 71 is -0.003 ($\hat{\sigma}$ =0.028). Because the average pension difference was $2.50, the implied average treatment effect on the treated ranges from 1.08 (=(4.2-1.5)/2.5, estimated at age 70 using a double difference with non-veterans) to 2.8 (=7.1/2.5, calculated using only the estimated jump for veterans at age 71).

Table 5 provides further evidence of a jump in retirement rates at age 70. Comparing the retirement rates of black Union Army veterans in the expanded IPUMS sample at ages 70 to 74 and 65 to 69 yields a difference of 13.7 percentage points when men are matched on basic demographic and geographic characteristics.[17] The same matching with black non-veterans yields a difference of 5.7 percentage points. Assuming that the difference in pension amount between the two age groups of veterans was $2.50, the average treatment effect on the treated becomes 3.2 (=(13.7-5.7)/2.5). Assuming that the difference in pension amount was $3, the average treatment effect on the treated becomes 2.7.

[17]When I examined Union Army veterans only and included health as a control for the matches, the difference in retirement rates was 12.1 ($\hat{\sigma}$ =4.5).

6.3 IV Estimates

Men who could trace their disability to wartime service (those receiving money under the General Law) obtained a larger pension than those could not do so. In 1900 the difference in pension amount in a matched sample between those who applied under the General Law and those who applied under the 1890 Law was $3.30. The difference in retirement rates was 5.4 percentage points, implying an average treatment effect on the treated of 1.6 (=5.4/3.3, $\hat{\sigma}$ =2.62). When I restrict the sample to non-rejectees I find that the difference in pension amount was $3.00 and the difference in retirement rates was 10.3 percentage points, implying an average treatment effect on the treated of 3.5 (=10.3/3.0, $\hat{\sigma}$ =2.75).

Table 6 shows the determinants of monthly pension income in 1900 and in 1910. Veterans who applied under the General Law in 1900, who were older, who were paralyzed, who were blind, who had been wounded in the war, who were home owners, and who were from larger towns received larger pensions. In 1910 the literate received smaller pensions, controlling for all other factors. Because the program was largely age-based in 1910, age was a stronger predictor of pension amount in 1910 than in 1900 and ill health was a stronger predictor of pension amount in 1900 than in 1910. More of the variation in pension amount is explained in 1910 than in 1900, largely because the program was age-based in 1910. Observables explain less of the variation in pension income for blacks than for whites and applying under the General Law was not as strong a predictor of pension income for blacks as it was for whites. In contrast to the results for blacks, home ownership was not a statistically significant predictor of pension amount for whites (see Costa 1995 for the results for whites).

Using an ordinary probit model yields a small but statistically significant effect of monthly pension amount on retirement rates of 0.005 in 1900 and the statistically insignificant and small effect of monthly pension on retirement rates of 0.006 in 1910 (see Table 7). When the sample is restricted to men less than 74 years of age, the coefficient on pension amount remains 0.005

($\hat{\sigma}$ =0.001) in 1900 and has the statistically significant but still small value of 0.007 ($\hat{\sigma}$ =0.004) in 1910. There is some suggestive evidence that men who were not home owners in 1910 were more responsive to pension income. Although the interaction of home ownership with pension income was not statistically significant (nor jointly statistically significant), the estimated effect of pensions on retirement rates for non-home owners was 0.012 ($\hat{\sigma}$ =0.006).

The instrumental variable estimates of the effect of pension income on retirement are much larger in both 1900 and in 1910. In 1900 the instrumental variables estimate implies that a dollar increase in pension income increases retirement rates by 2.4 percentage points and that in 1910 such an increase leads to a rise in retirement rates of 3.8 percentage points.[18] The implied income elasticities of retirement at the means are 1.8 ($= 0.024[\frac{7.6}{0.102}]$) in 1900 and 2.5 ($= 0.038[\frac{13.5}{0.206}]$) in 1910, much larger than the elasticities for white Union Army veterans of 0.7 in 1900 and 0.5 in 1910 obtained by Costa (1998: 47).[19]

The results in Table 7 suggest that blacks faced greater hurdles than whites in obtaining pensions. In contrast to the results for blacks, results for whites showed no increase in the size of the pension coefficient when I instrumented and no evidence of pension endogeneity (Costa 1995). Given that home ownership predicted pension income, it is possible that those with higher incomes and therefore those in the labor force were better able to obtain bigger pensions.

Table 8, which shows predicted values for the instrumental variables regression at different pension amounts, suggests that blacks were more responsive to increases in pension income once they had a basic pension amount. In 1900 the local average treatment effect of going from a pension of $6 per month to one of $8 per month was 2.4 but that as pension amount increased, the local average treatment effect rose. As pension amount fell to 0 (for rejectees, for pensioners pension

[18] When I restrict to men who are matched on all observed characteristics in 1900, including health, and run the same IV regression on the resulting sample of 125 men, I obtain a derivative of 0.041 ($\hat{\sigma}$=0.018), statistically significant at the 5 percent level.

[19] The elasticities are calculated as $\beta[\frac{x}{y}]$ where β is the coefficient on pension amount, x is mean pension amount, and y is the mean retirement rate.

amount cannot be less than $6 per month), the local average treatment effect fell to 1.2. Thus even when pensions replaced roughly the same fraction of income as for whites (37 percent), blacks were still more responsive to pension income. (Although replacement income may have been the same, wealth levels would have been lower among blacks.) In 1910 the local average treatment effect of going from a pension of $12 per month to one of $15 per month was 4.2 and again the local treatment effect became even greater at larger pension amounts.

Using predicted retirement rates in 1910 to simulate the effect of giving all black non-veterans in the 1910 IPUMS a pension equal to $13.50 per month (the average amount received by Union Army veterans) more than explains the difference in retirement rates between veterans and non-veterans. Predicted retirement rates for veterans in 1910 not receiving a pension are less than 1 percent. The predicted retirement rate if all veterans had been receiving a monthly pension of $13.50 is 21.6 percent. The implied average treatment effect is 1.6. If all black non-veterans had been given a pension of $13.50 their retirement rates would have risen to 30.6 percent, more than those of veterans.

If pensions improved health outcomes and therefore enabled men to stay in the labor force longer I might underestimate the effect of pensions on retirement rates. Using the General Law as an instrumental variable I am able to determine if men with larger pensions in 1900 were less likely to have died by 1910 controlling for socioeconomic status, demographic characteristics, and region of residence. I find that pension amount in 1900 raised the probability of dying by 1910 by a small but statistically insignificant amount (the derivative on monthly pension amount was 0.024 ($\hat{\sigma}$ =0.024) controlling for health in 1900 and 0.029 ($\hat{\sigma}$ =0.021) not controlling for health).

6.4 Reconciling the Estimates

Table 9 summarizes the various estimates of the treatment effect of Union Army pensions for black and white veterans. In 1900 the estimates range from 0.9 to 2.4 and in 1910 they range from 0.7

to 3.8. Why is there such a large range in estimates? The estimates were obtained using different methodologies, samples, and sources of identification. The lowest estimates in both 1900 and 1910 were obtained by comparing pension recipients with non-recipients and the highest estimates used variation induced by pension rules within the sample of recipients. Table 8 showed that as pension amount rose, then controlling for all other factors, the treatment effect of Union Army pensions rose. These results suggest that the effect of a minimum pension transfer on retirement rates might be relatively small because the minimum pension amount by itself was not enough to retire on, However the effects of going from a small pension to a larger pension were quite substantial.

The upper bound income effects that I calculated are greater than most estimates of the effects of Social Security or asset income on retirement obtained from more recent populations, whether in the U.S. (e.g. Krueger and Pischke 1992; Hausman and Wise 1985; Hurd and Boskin 1984; Bound 1989) or in developing countries (e.g. Carvalho 2008; Ranchhod 2006; Pérez-Estrada 2008). Friedberg's (1999) study of the effect of OAA benefits on retirement in 1940 and 1950 imply elasticities of 0.4 for whites and 1.2 for blacks. Her elasticity estimates for both whites and blacks are smaller than my results for U.S. veterans, perhaps because she was examining a means and wealth tested program. Like my results, hers suggest that blacks were more responsive to income transfers than whites. And, as Table 8 showed, they were more responsive than whites even at lower replacement rates. But even in the US in 1940 and 1950 and in recent developing country populations, retirement rates were higher than those of African Americans in 1910.

7 Results: Living Arrangements

Pension income enabled black veterans not just to retire but also to maintain a household independent of their children. Table 10 shows that while black veterans were 6.9 percentage points more likely to be household heads than black non-veterans, most of the increase in headship comes

among the retired. Headship rates among retired black veterans were 19.9 percentage points greater than among non-veterans.[20] Although retired white Confederate veterans were also more likely to be household heads than non-veterans, the difference in headship rates was small: only 3.8 percentage points. The double-difference estimate implies a difference of 16.1 percentage points between retired black veterans and non-veterans. In contrast, the double-difference estimate for retired white Union Army veterans implies a difference of 3.1 percentage points.

Table 11 shows that while the percentage of men living with at least one of their children was lower among black veterans than non-veterans by 6.5 percentage points, the difference was greater among the retired. Among the retired, black veterans were 13.5 percentage points less likely to be living with a child than non-veterans. Retired white Confederate veterans were less likely to live with their children than southern-born non-veterans by only 1.2 percentage points. The implied double difference estimate is -12.3. In contrast, for retired white Union Army veterans the implied double-difference estimate is only -2.1.

Both Tables 10 and 11 show that blacks' living arrangements, regardless of retirement status, were much more responsive to pension income than those of whites, but that responsiveness to pension income was particularly large among the retired. Using the double-difference estimate for the retired and the average pension in the Union Army sample for the retired ($15.30 for blacks and $18.90 for whites), the average treatment effect on the treated for black headship rates was 1.1 whereas for white headship rates it was only 0.2. The average treatment effect on the treated for rates of coresidence with children among the retired was -0.8 for blacks and -0.1 for whites.

[20]The Union Army sample is too small to examine retirees. In the sample as a whole, the derivative on pension amount in an instrumented probit where headship is the dependent variable is 0.015 ($\hat{\sigma}$ =0.012).

8 Implications for Rising Retirement Rates and Black-White Convergence

Rising incomes could account for all of the increase in black retirement rates between 1900 and 1930. Real national income per capita rose by 55.2 percent between those years. Given that there was roughly an 8 percent improvement in the black-white income ratio in those years (Smith 1984) real national income per capita may have risen by 54.8 percent for blacks.[21] Assuming an elasticity of 1.8 this would lead to a 98.7 percent increase in retirement rates. In the South retirement rates rose from 13 to 25 percent between 1900 and 1930. Increases in incomes imply that retirement rates should have been 26 percent in 1930. Rising incomes cannot explain patterns in headship among retirees prior to 1930 – headship rates among black retirees fell between 1900 and 1930. If rising retirement is unaccompanied by independent living, even though I have shown that independent living is a normal good, then perhaps retirement rates rose because of economic dislocation.[22]

Rising wealth cannot account for the black-white convergence in retirement rates observed between 1930 and 1950. Most of the convergence occurred between 1930 and 1940. But national income fell between 1929 and 1939. Census data show that between 1930 and 1940 the fraction of non-farm men age 45 to 54 owning a home fell by 4 percentage points among whites and by almost 6 percentage points among blacks. The real value of housing wealth fell by 30 percent for whites and by 36 percent for blacks (estimated from the Integrated Public Use Census Samples).

I estimate the impact of the institution of Social Security on the retirement rates of blacks and whites by examining how retirement rates of whites and blacks in the south (where most

[21] Per capita assessed wealth statistics are available for only a few states and are not available after World War I. Margo (1984) finds that there was considerable variation across states. In North Carolina per capita assessed wealth between 1900 and 1910 rose by 26 percent for whites and by 74 percent for blacks. However in Louisiana (a state affected by the boll weevil) white assessed wealth rose by 33 percent and black assessed wealth rose by 10 percent.

[22] Lange, Olmstead, and Rhode (2007) document how the boll weevil reduced cotton yields, the staple crop of the South.

blacks were located in 1930) would have changed if in 1930 Social Security had been instituted in its 1950 form. The Social Security Act of 1935 included two programs targeting the elderly – Old Age Assistance (OAA), a need based program which made federal subsidies available to states with Old Age Assistance programs, and Old Age Insurance, which in 1939 became Old Age and Survivors' Insurance (OASI). In 1950 73 percent of all combined expenditures on Old Age and Survivors' Insurance and Old Age Assistance went to Old Age Assistance. OAA recipiency expanded sharply between 1940 and 1950, particularly in the southern states where most blacks were located. By 1950 at most 9 percent of men older than 64 were collecting OASI, whereas 23 percent of all elderly were collecting OAA.[23]

Convergence in black-white retirement rates between 1930 and 1950 was greater in the states that instituted a more generous OAA program. Using published census data for the 17 states that provided statistics on the non-white labor force, I regressed the change in the state difference in white-black retirement rates between 1930 and 1950 on the average yearly OAA payment and recipiency rate in 1950. (Published census data was used because of sample size considerations.) The coefficient on OAA payments divided by 100 was -0.021 ($\hat{\sigma}$ =0.007) and the coefficient on recipiency rates was 0.075 ($\hat{\sigma}$ =0.053). When I regressed the change in the state difference in white-black retirement rates between 1930 and 1940 on the average yearly OAA payment in 1940 and recipiency rate in 1940, I obtained a coefficient of -0.020 ($\hat{\sigma}$ =0.008) on the OAA payment divided by 100 and a coefficient of 0.042 on the recipiency rate ($\hat{\sigma}$ =0.054). When I regressed the change in the state difference in white-black retirement rates between 1940 and 1950 on the difference in real average yearly OAA payments divided by 100 and recipiency rates between 1940 and 1950, I obtained a coefficient of -0.016 ($\hat{\sigma}$ =0.009) on the difference in OAA payments and a coefficient of -0.136 ($\hat{\sigma}$ =0.059) on the difference in recipiency rates. When I controlled for the difference in state unemployment rates (unavailable for 1930), the coefficient on the difference in

[23] See Series H 238-244 and H 346-367 in U.S. Bureau of the Census 1975: 350, 356 and Friedberg (1999). In 1974 Old Age Assistance was incorporated into Supplemental Security Income.

OAA payments remained statistically significant at the 10 percent level of significance.

Had OAA been instituted in its 1950 form in 1930, results from the Union Army sample imply that the difference in retirement rates between blacks and whites in the south would have fallen by up to 54 percent. Given the population distribution of blacks and whites in the southern states, average monthly OAA payments in 1910 dollars were $10.50 for blacks and $11.40 for whites. Average OAA recipiency rates were 37.4 percent for blacks and 35.0 percent for whites.[24] Using the 1900 IV estimates of the percentage point increase in retirement rates for a dollar increase in pension income of 2.4 for blacks (see Table 7) and of 1.1 for whites (Costa 1995, 1995, 1998: 46), retirement rates in the south would have risen from 25.5 to 34.9 percent for blacks and from 37 to 41.4 percent for whites, thus explaining 54 percent of the initial difference in retirement rates (=(41.4-34.9)/(37.0-25.5)). Using estimates of the average treatment effect on the treated derived from the 1910 comparison of veterans and non-veterans (Table 2), the difference in retirement rates would have fallen by only 7 percent. Because OAA as a means tested program included large work disincentives, the pure income effect estimated from Union Army pensions may underestimate the effect of OAA on retirement rates. (However, because OAA was targeted toward the poor who might not have enough income to retire, this will lead to an upward bias.) Differences in retirement rates that cannot be explained by the income effects and work disincentives of Social Security may be explained by changes in labor demand.

Instituting OAA in its 1950 form in 1930 would have reduced the difference in black and white headship rates of retirees up to 43 percent. In 1930 49 percent of southern black retirees headed their own household compared to 56 percent of southern white retirees, a difference of 7 percentage points. Using the estimates of the average treatment effects on the treated derived from the 1910 comparison of veterans and non-veterans (Table 10) and average southern recipiency rates and payouts implies that headship rates would have risen to 53.3 percent for retired blacks and to 56.8

[24]Estimated from Table 1 in Friedberg (1999). Because blacks were over-represented on the OAA rolls relative to their size in the population (Friedberg 1999) recipiency rates for blacks are under-estimated.

percent for retired whites, a difference of 3.5 percentage points.

9 Conclusion

Most studies of black economic progress have focused on prime-aged men (e.g. Donohue and Heckman 1991; Margo 1990; Smith and Welch 1989). Less is known about long-run trends in the economic status of the elderly and even if rates of retirement and independent living can be used as indicators of well-being is uncertain. The Union Army pension program provided me with the unique opportunity to examine the effect of an exogenous, unearned income transfer on the retirement rates and living arrangements of African Americans at the beginning of the twentieth century and therefore to show that retirement and independent living were normal goods not just for whites but also for blacks. In fact, blacks were even more responsive to income than whites in making their retirement and living arrangement decisions. There is no evidence of historical differences in norms of work or co-residence dating either to slavery or African traditions (cf. Ruggles 1994). This European pattern differs from that observed in South Africa where pensions have had no effect on independent living (Edmonds, Mammen, and Miller 2005) but is similar to that observed in Brazil (Carvalho 2000). Black rates of retirement and independent living were low prior to 1940 because they could not afford to retire and, when retired, to live independently of their children.

Social concern over the plight of the elderly poor remains timely. Comparisons of alternative Social Security reform proposals consider the effects of these reforms on African Americans because they are more dependent on Social Security than whites (e.g. Liebman 2002). Looking to the past suggests that government played a large role in improving the economic status of elderly African Americans. My results implied that income effects from the institution of Social Security explain up to half of the convergence in black-white retirement rates and in living arrangements

that occurred from 1930 to 1950.

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Table 1: Characteristics of 1910 Union Army Sample and 1910 Census Samples

				IPUMS			
	Black	Black		White, Northern		White, Southern	
	UA Sample	Veteran	Non-Veteran	Veteran	Non-Veteran	Veteran	Non Veteran
Fraction Retired	0.208	0.191	0.089	0.383	0.308	0.234	0.224
Age from							
pension and military	68.665						
census	69.265	69.622	66.721	69.167	68.093	68.861	66.530
Dummy=1 if							
literate	0.446	0.368	0.273	0.948	0.951	0.861	0.877
married	0.773	0.688	0.730	0.749	0.713	0.755	0.774
living on a farm	0.309	0.266	0.532	0.270	0.333	0.640	0.580
household head	0.886	0.849	0.849	0.846	0.804	0.831	0.836
home owner	0.375	0.509	0.380	0.718	0.698	0.700	0.699
own child in household	0.455	0.479	0.551	0.531	0.559	0.640	0.643
if foreign-born				0.153	0.200		
Town population	79,829	133,807	57,831	179,870	231,517	13,672	32,141
No. observations	525	204	3,821	3,116	22,196	1,162	5,503

The samples were restricted to non-institutionalized men age 60-85. Estimated from the Union Army (UA) sample and the 1.4% 1910 Integrated Public Use Micro Sample (IPUMS) using the sample weights.

Table 2: Retirement Rates in 1910 by Veteran Status

Sample	Retirement Rates (%)			
	Veteran	Non-veteran	Difference	Std. Err.
Blacks, IPUMS				
Not Matched	19.1	9.0	10.1	(2.9)
Matched	19.1	12.9	6.2	(3.5)
Blacks, Expanded IPUMS (unweighted)				
Not Matched	20.8	9.2	11.6	(1.3)
Matched	20.8	14.2	6.6	(2.0)
Blacks, Expanded IPUMS (weighted)				
Not Matched	21.0	8.9	12.1	(1.6)
Matched	21.0	13.5	7.5	(1.9)
Northern-born and Pre-Civil War Immigrant Whites, IPUMS				
Not Matched	38.3	30.8	7.6	(0.1)
Matched	38.3	34.5	3.9	(0.1)
Southern-born Whites, IPUMS, Veteran=Confederate Veteran				
Not Matched	23.5	22.5	1.0	(1.4)
Matched	23.5	24.3	-.1	(1.6)

The samples were restricted to non-institionalized men age 60-85. All numbers are generated from the 1.4% Integrated Public Use Micro Sample for 1910 (IPUMS), except for the sample labeled Expanded IPUMS which includes black veterans from the Union Army sample. All estimated using the IPUMS were obtained using the sampling weights. Results for the Expanded IPUMS sample are given using both weights (=72 for men from the Union Army sample) and no weights. Matches were obtained by deriving propensity scores from a probit regression of veteran status on age, the log of population in the area of residence, dummies for literacy, marital status, whether the man was residing on a farm, whether the man was the head of the household, whether the man owned property, and whether any children were living with the man, and state fixed effects. The propensity scores were then used in nearest neighbor matching with a caliper of 0.1 and with no replacement. The sample "Black, IPUMS" contains 204 black Union veterans and 3,768 black non-veterans. The sample "Black, Expanded IPUMS" adds black veterans from the Union Army sample and contains 678 veterans and 3,799 non-veterans. The sample "Northern-born and Pre-Civil War Immigrant Whites, IPUMS" consists of whites born in a northern state or foreign-born whites who immigrated before 1865. The sample has 3,115 Union veterans and 22,187 non-veterans. The sample "Southern-born Whites, IPUMS" consists of whites born in a Confederate state and has 1,161 Confederate veterans and 5,373 non-veterans. Bootstrap standard errors were calculated for all weighted samples and all matched samples.

Table 3: Characteristics of 1900 Union Army Sample by Reject Status and of 1910 Union Army Sample

		1900		1910
	All	Rejectees	Pensioners	All
Fraction retired	0.102	0.028	0.116	0.206
Monthly pension	7.591	0.000	9.057	13.529
Age	60.963	59.282	61.284	69.343
Dummy=1 if				
literate	0.428	0.352	0.443	0.442
married	0.797	0.796	0.797	0.768
living on a farm	0.325	0.394	0.312	0.396
household head	0.904	0.901	0.904	0.881
home owner	0.392	0.246	0.420	0.374
own child in household	0.600	0.620	0.596	0.458
is/was farmer	0.379	0.430	0.369	0.396
is/was artisan, professional, or proprietor	0.069	0.085	0.066	0.075
is/was laborer	0.553	0.486	0.565	0.529
difficulty walking	0.334	0.183	0.363	0.398
difficulty bending	0.247	0.106	0.275	0.358
paralyzed	0.038	0.021	0.042	0.040
blind	0.052	0.007	0.061	0.062
wounded in war	0.167	0.155	0.171	0.153
free at enlistment	0.165	0.063	0.184	0.139
Town population	72,556	65,683	73,869	84,010
BMI	23.536	23.381	23.566	23.589
Dummy=1 if applied				
under General Law in 1900	0.083	0.042	0.092	0.071
No. observations	885	142	743	548

The sample was restricted to non-institutionalized men and to men with health information. There were only 9 rejectees in 1910.

Table 4: Retirement Rates in 1900 Among Black Union Army Veterans, Rejectees and Pensioners

Sample	Retirement Rates (%)			
	Rejectees	Pensioners	Difference	Std. Err.
Unmatched	2.8	11.6	8.8	(2.8)
Matched,				
IPUMS-style variables	2.8	12.7	9.9	(3.2)
Matched,				
Additional variables	2.8	10.6	7.7	(3.0)

The sample was restricted to non-institutionalized men and contains 885 observations (142 rejectees and 743 pensioners). Matches for "IPUMS-style variables" were obtained by deriving propensity scores from a probit regression of veteran status on age, the log of population in the area of residence, dummies for literacy, marital status, whether the man was residing on a farm, whether the man was the head of the household, whether the man owned property, and whether any children were living with the man, and area of residence (either a state or a region) fixed effects. Matches for "Additional variables" added occupation (current occupation for non-retirees and past occupation for retirees), BMI and BMI squared and four dummies indicating whether the veteran had difficulty walking or bending and whether he was paralyzed or blind. Sample size falls to 877 men (142 rejectees and 735 pensioners). The propensity scores were then used in nearest neighbor matching with a caliper of 0.1 and with no replacement. Bootstrap standard errors were calculated for the matched sample. For the matched sample of pensioners, the monthly pension amount was $8.60.

Table 5: Retirement Rates in 1910 Among Black Men Age 65-74 by Age Group and Veteran Status

Sample	Retirement Rates (%)			
	Age 65-69	Age 70-74	Diff-erence	Std. Err.
Veterans, Expanded IPUMS				
Not Matched	15.4	27.2	11.9	(4.3)
Matched	13.6	27.2	13.7	(4.3)
Non-Veterans, IPUMS				
Not Matched	6.7	12.5	5.8	(1.6)
Matched	6.8	12.5	5.7	(1.4)

The samples were restricted to non-institionalized men. All numbers are generated from the 1.4% Integrated Public Use Micro Sample for 1910 (IPUMS), except for the sample labeled Expanded IPUMS which includes black veterans from the Union Army sample. All estimated using the IPUMS were obtained using the sampling weights. Results for the Expanded IPUMS sample are given using both weights (=72 for men from the Union Army sample). Matches were obtained by deriving propensity scores from a probit regression of veteran status on the log of population in the area of residence, dummies for literacy, marital status, whether the man was residing on a farm, whether the man was the head of the household, whether the man owned property, and whether any children were living with the man, and state fixed effects. The propensity scores were then used in nearest neighbor matching with a caliper of 0.1 and with no replacement. The veteran samples contains 388 veterans and the non-veteran sample contains 1642 non-veterans. Bootstrap standard errors.

Table 6: Predictors of Monthly Pension Amount Among Black Union Army Veterans, 1900 and 1910

	1900		1910	
	Coef-icient	Std. Error	Coef-icient	Std. Error
Dummy=1 if				
applied under General Law	3.014‡	0.660	2.855‡	0.640
Age	0.135‡	0.027	0.379‡	0.030
Dummy=1 if occupation is/was				
Farmer				
Artisan, professional, or proprietor	-1.329	0.901	1.000	0.726
Laborer	-0.941	0.633	-0.606	0.483
BMI	-0.499	0.552	-0.547	0.590
BMI squared	0.010	0.011	0.010	0.012
Dummy=1 if				
Difficulty walking	0.516	0.392	-0.369	0.345
Difficulty bending	0.281	0.449	0.580	0.362
Paralysis	3.091‡	0.948	0.692	0.845
Blind	4.630‡	0.823	-0.497	0.678
Wounded in war	1.275‡	0.498	1.652†	0.462
Free at enlistment	-0.114	0.525	1.028	0.497
Literate	-0.279	0.388	-0.667†	0.347
Home owner	1.405‡	0.329	0.957‡	0.361
Lives on farm	-0.972	0.684	-0.297	0.533
Own child present	0.411	0.378	-0.297	0.533
Logarithm of town population	0.074*	0.042	0.026	0.041
Adjusted R^2	0.145		0.303	

Restricted to non-institutionalized men. Robust standard errors are clustered on the company. ‡, †, and $*$ indicate significance at the 1%, 5%, and 10% level, respectively. Additional control variables include area of residence (state or region) fixed effects. 877 observations in the 1900 regression and 542 observations in the 1910 regression.

Table 7: Effect of Pensions on Retirement Rates Among Black Union Army Veterans, 1900 and 1910

year	$\frac{\partial P}{\partial x}$	IV $\frac{\partial P}{\partial x}$	Test of null of exogeneity (p-value of null of exogeneity, Hausman test)
1900	0.005‡	0.024∗	0.039
	(0.001)	(0.013)	
1910	0.006	0.038∗	0.118
	(0.121)	(0.023)	

Restricted to non-institutionalized men. Robust standard errors, clustered on the company are in parentheses. ‡ indicates significance at the 1% level and ∗ indicates significance at the 10% level. Derivatives are mean derivatives. The control variables for both the probit model and the instrumented probit model are age; two dummies indicating occupation (artisan, professional, or proprietor and laborer with farmer as the omitted dummy); a dummy equal to one if the veteran was married; BMI and BMI squared; four dummies indicating whether the veteran had difficulty walking or bending and whether he was paralyzed or blind; dummies indicating literacy, propety ownership, whether the veteran had been wounded in the war, whether the veteran was free at the time of enlistment, whether the veteran lived on a farm, and whether there were any children present in the household; the logarithm of town population; and, area of residence fixed effects (equal to either a state or a region). The instrumental variable is a dummy equal to one if the veteran applied under the general law in 1900. There are 877 observations in the 1900 regression and 542 in the 1910 regression.

Table 8: Predicted Retirement Rates at Specific Monthly Pension Amounts, 1900 and 1910

	Monthly Pension Amount ($)							
Year	All	0	6	8	10	12	15	20
1900	15.5	1.9	9.1	13.8	19.9	27.5		
	(8.2)	(1.4)	(4.9)	(7.2)	(10.3)	(14.1)		
1910	23.7	0.3				15.9	28.4	55.7
	(8.7)	(0.8)				(7.8)	(11.1)	(24.9)

Restricted to non-institutionalized men and predicted from the instrumented probit regressions. Standard errors in parentheses.

Table 9: Summary of Treatment Effects of Pension for Black and White Veterans

	Black		White	
Comparison Groups	1900	1910	1900	1910
Recipients and non-recipients	0.9	0.7		0.4
Recipients, using age discontinuity at age 70		2.7 - 3.2		
Recipients and non-recipients, using General Law as IV	2.4		0.7	
Recipients, using General Law as IV		3.8		0.5
Recipients, using age discontinuity at age 70		2.7 - 3.2		

Table 10: Percentage of Men who were Household Heads by Veteran and Retirement Status

	All			Retired			Not retired		
	Veteran	Non-veteran	Δ	Veteran	Non-veteran	Δ	Veteran	Non-veteran	Δ
Blacks, Expanded IPUMS									
Not matched	88.1	84.8	3.3	78.0	53.1	24.9	90.7	88.0	2.7
			(1.5)			(4.8)			(1.5)
Matched	88.1	81.1	6.9	78.0	58.2	19.9	90.7	85.5	5.2
			(1.8)			(5.3)			(1.7)
Southern-born Whites Veteran=Confederate Veteran									
Not matched	83.1	83.6	-0.5	58.6	59.0	-0.4	90.6	90.8	-0.2
			(1.2)			(3.3)			(1.0)
Matched	83.1	84.0	-0.8	58.6	54.8	3.8	90.6	92.1	-1.5
			(1.7)			(4.7)			(1.2)
Northern-born and Pre-Civil War Immigrant Whites, IPUMS									
Not matched	84.6	80.4	4.1	76.4	65.5	10.8	89.6	87.0	2.6
			(0.7)			(1.4)			(0.8)
Matched	84.6	82.3	1.9	76.4	69.5	6.9	89.6	88.7	0.9
			(0.8)			(1.7)			(1.0)

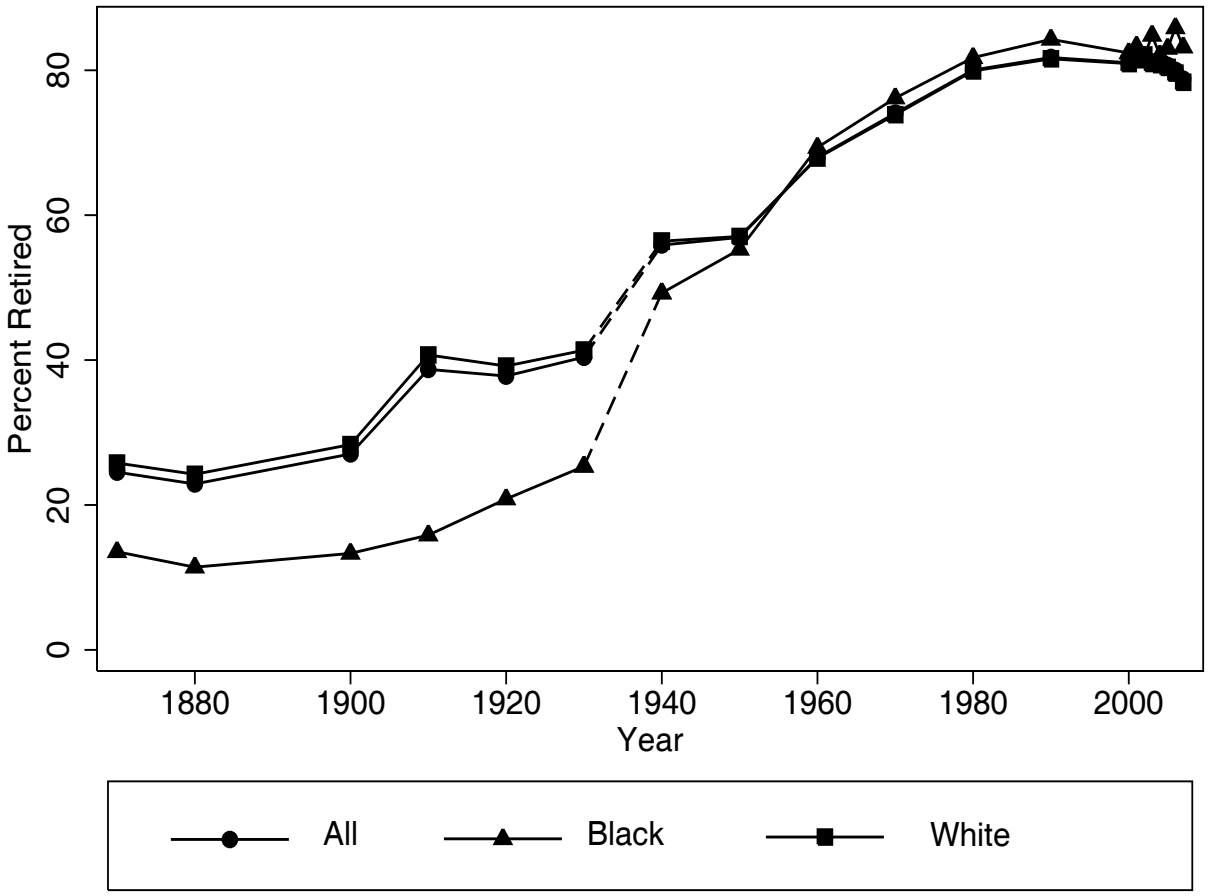
Restricted to non-institutionalized men age 60-85. All numbers are generated from the 1.4% Integrated Public Use Micro Sample for 1910 (IPUMS), except for the sample labeled Expanded IPUMS which includes black veterans from the Union Army sample. Results for the Expanded IPUMS sample are unweighted. All other sample results are weighted. Matches were obtained by deriving propensity scores from a probit regression of veteran status on age, the log of population in the area of residence, dummies for literacy, marital status, whether the man was residing on a farm, whether the man was the head of the household, whether the man owned property, and whether any children were living with the man, and state fixed effects. The propensity scores were then used in nearest neighbor matching with a caliper of 0.1 and with no replacement. The sample "Black, IPUMS" contains 204 black Union veterans and 3,768 black non-veterans. The sample "Black, Expanded IPUMS" adds black veterans from the Union Army sample and contains 678 veterans and 3,799 non-veterans. The sample "Northern-born and Pre-Civil War Immigrant Whites, IPUMS" consists of whites born in a northern state or foreign-born whites who immigrated before 1865. The sample has 3,115 Union veterans and 22,187 non-veterans. The sample "Southern-born Whites, IPUMS" consists of whites born in a Confederate state and has 1,161 Confederate veterans and 5,373 non-veterans. Bootstrap standard errors in parentheses.

Table 11: Percentage of Men Living with at Least one of their Children by Veteran and Retirement Status

	All			Retired			Not retired		
	Veteran	Non-veteran	Δ	Veteran	Non-veteran	Δ	Veteran	Non-veteran	Δ
Blacks, Expanded IPUMS									
Not matched	46.2	55.1	-9.0	38.3	53.4	-15.1	48.2	55.3	-7.1
			(2.1)			(4.9)			(2.3)
Matched	46.2	52.7	-6.5	38.3	51.8	-13.5	48.2	52.7	-4.5
			(3.3)			(6.5)			(4.5)
Southern-born Whites Veteran=Confederate Veteran									
Not matched	64.1	64.4	-0.3	60.3	59.3	-1.0	65.2	65.9	-0.6
			(1.6)			(3.3)			(1.8)
Matched	64.1	67.0	-2.9	60.3	61.5	-1.2	65.2	67.7	-2.5
			(1.8)			(4.1)			(2.3)
Northern-born and Pre-Civil War Immigrant Whites, IPUMS									
Not matched	53.2	55.9	-2.8	50.6	56.2	-5.6	54.7	55.8	-1.1
			(1.0)			(1.6)			(1.2)
Matched	53.2	53.1	0.1	50.6	53.9	-3.3	54.7	53.1	1.6
			(1.2)			(2.0)			(1.5)

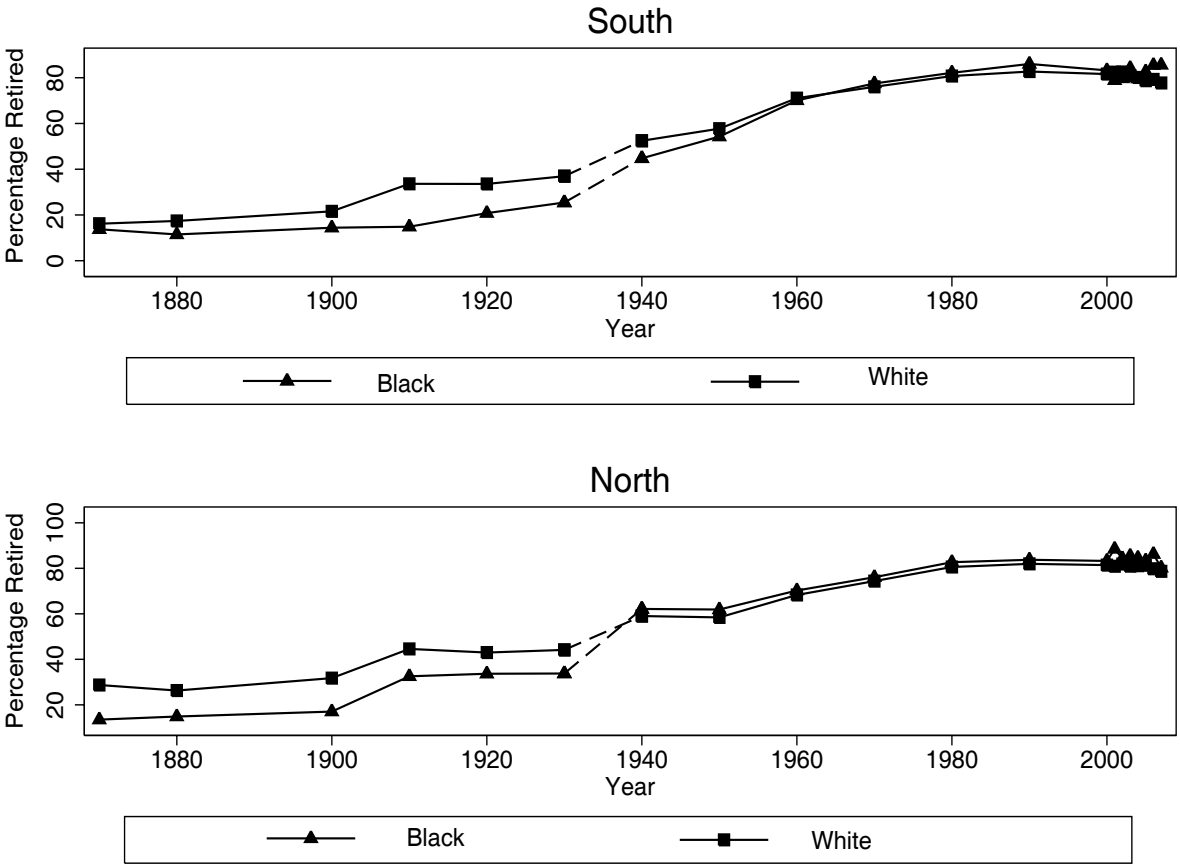
Restricted to non-institutionalized men age 60-85. All numbers are generated from the 1.4% Integrated Public Use Micro Sample for 1910 (IPUMS), except for the sample labeled Expanded IPUMS which includes black veterans from the Union Army sample. Results for the Expanded IPUMS sample are unweighted. All other sample results are weighted. Matches were obtained by deriving propensity scores from a probit regression of veteran status on age, the log of population in the area of residence, dummies for literacy, marital status, whether the man was residing on a farm, whether the man was the head of the household, whether the man owned property, and whether any children were living with the man, and state fixed effects. The propensity scores were then used in nearest neighbor matching with a caliper of 0.1 and with no replacement. The sample "Black, IPUMS" contains 204 black Union veterans and 3,768 black non-veterans. The sample "Black, Expanded IPUMS" adds black veterans from the Union Army sample and contains 678 veterans and 3,799 non-veterans. The sample "Northern-born and Pre-Civil War Immigrant Whites, IPUMS" consists of whites born in a northern state or foreign-born whites who immigrated before 1865. The sample has 3,115 Union veterans and 22,187 non-veterans. The sample "Southern-born Whites, IPUMS" consists of whites born in a Confederate state and has 1,161 Confederate veterans and 5,373 non-veterans. Bootstrap standard errors in parentheses.

Figure 1: Retirement Rates by Race, Age 65+



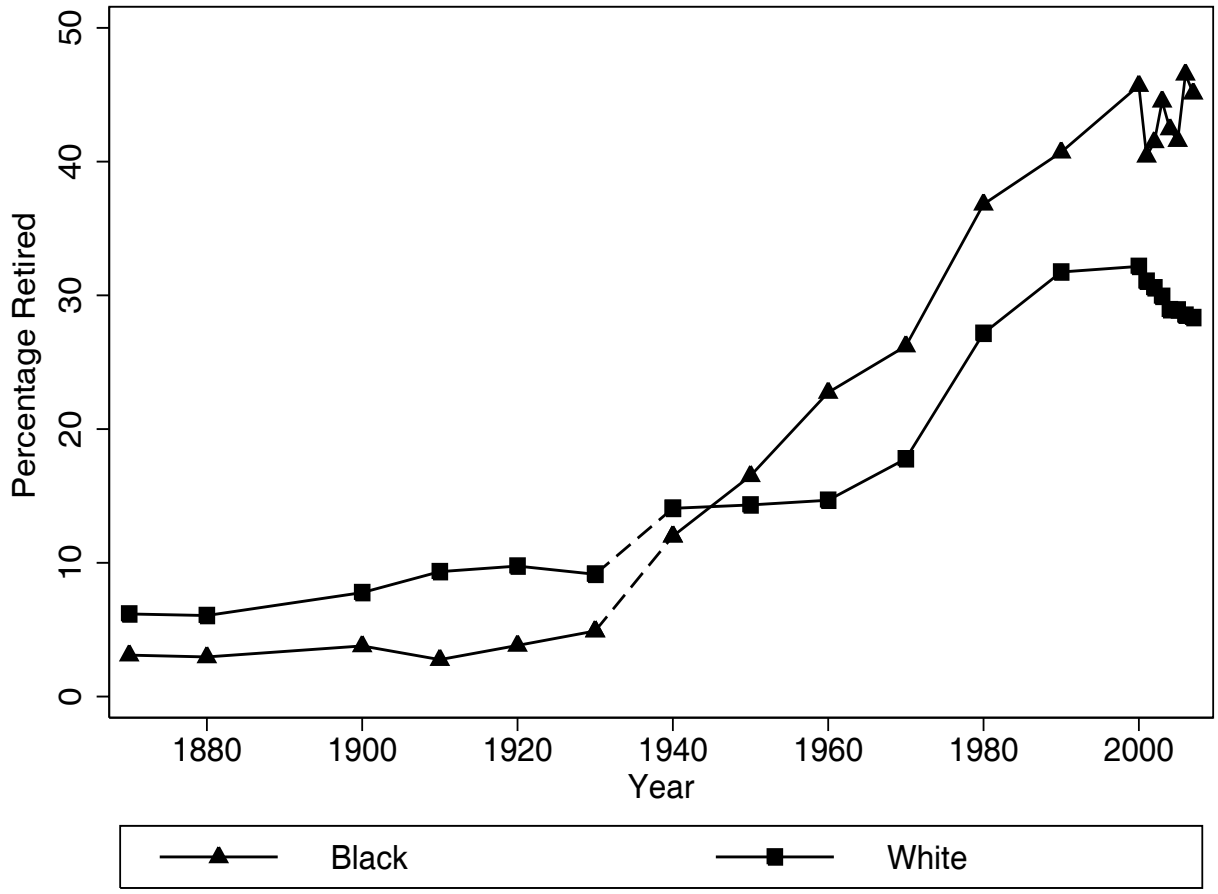
Estimated from the Integrated Public Use Census and Current Population Survey Micro Samples (IPUMS) for non-institutionalized men using the gainful definition of labor force participation until 1940 and the current definition of labor force participation beginning in 1940.

Figure 2: Retirement Rates by Race and Region, Age 65+



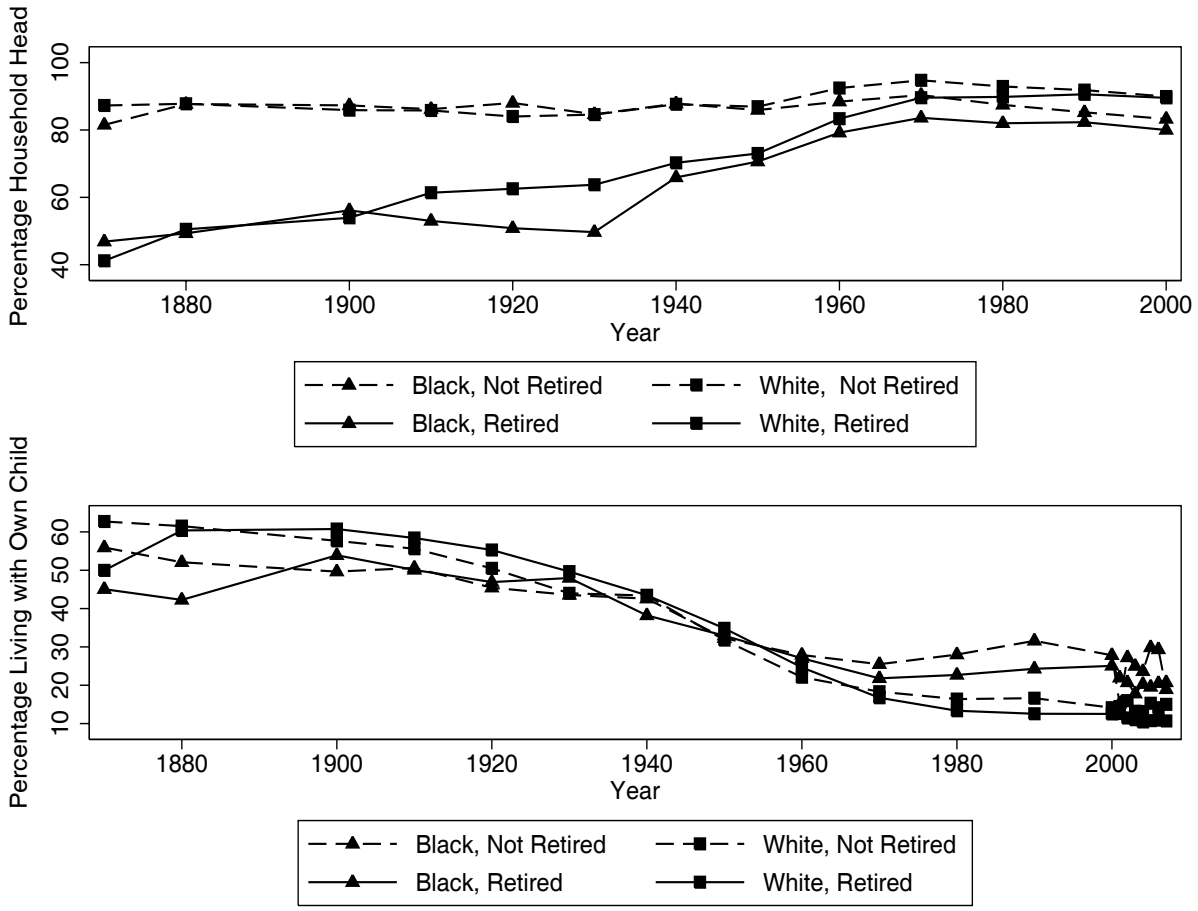
Estimated from the Integrated Public Use Census and Current Population Survey Micro Samples (IPUMS) for non-institutionalized men using the gainful definition of labor force participation until 1940 and the current definition of labor force participation beginning in 1940.

Figure 3: Retirement Rates by Race, Ages 55-64



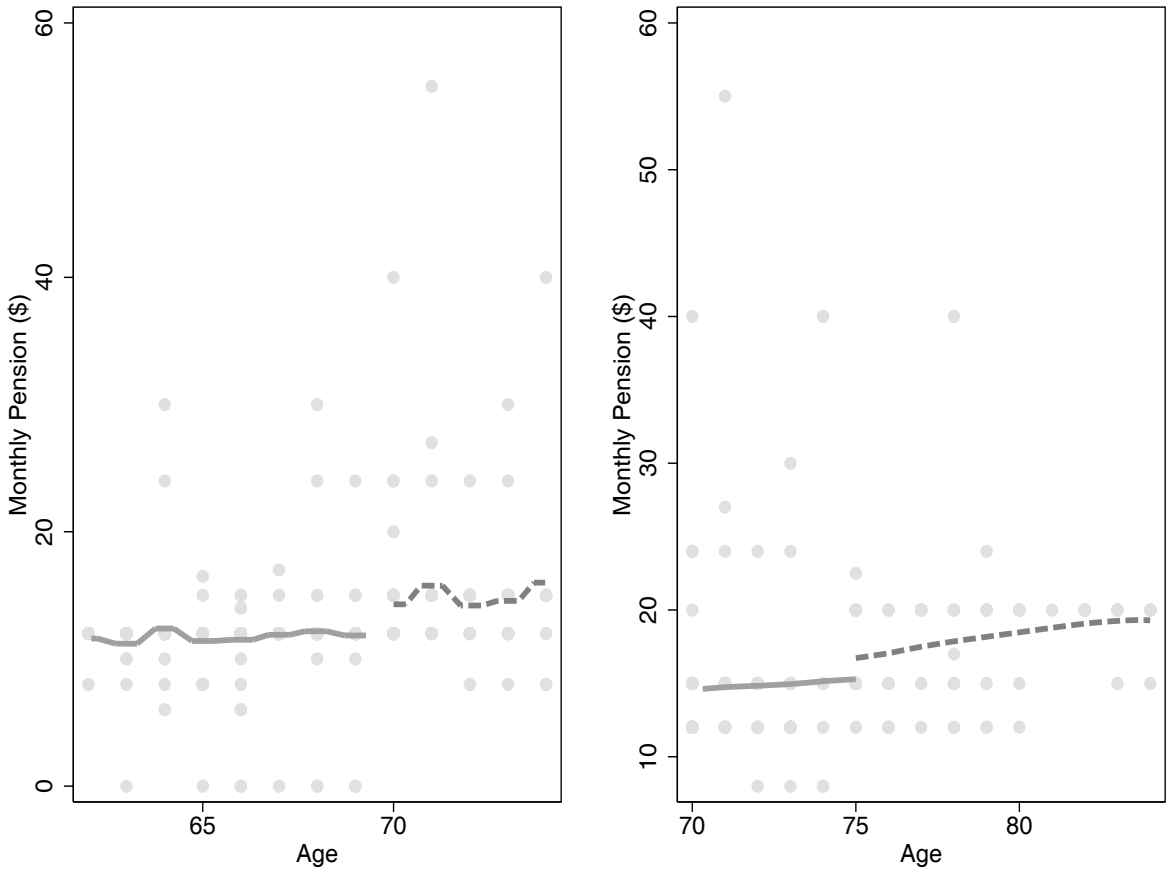
Estimated from the Integrated Public Use Census and Current Population Survey Micro Samples (IPUMS) for non-institutionalized men using the gainful definition of labor force participation until 1940 and the current definition of labor force participation beginning in 1940.

Figure 4: Living Arrangements by Race, Age 65+



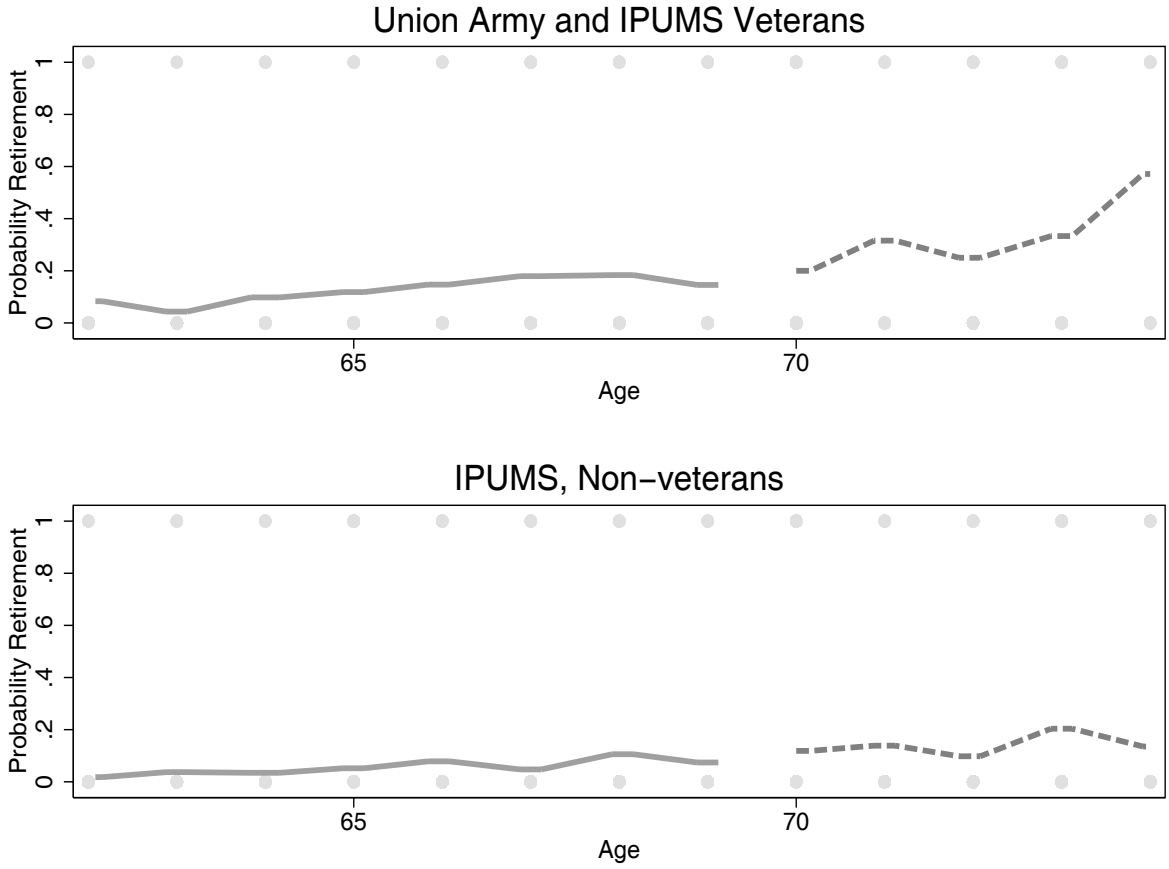
Estimated from the Integrated Public Use Census and Current Population Survey Micro Samples (IPUMS) for non-institutionalized men using the gainful definition of labor force participation until 1940 and the current definition of labor force participation beginning in 1940. The series giving the percentage of household heads ends in 2000 because in 2000 the percentages calculated from the census and the CPS no longer corespond. In the census, the "householder" designation is entirely up to respondents. They identify the householder when they fill out the form. The CPS is based upon phone interviews and it is quite plausible that, as the BLS staff is interviewing a woman, they would put her as the householder and list her husband as the spouse.

Figure 5: Monthly Pension Amount by Age in 1910



Estimated from a local linear regression of pension amount on age using Nichol's (2007) rd Stata module. The age used is age as inferred from the pension and military service records. The estimated jumps in pension amount using a bandwidth of 20 at ages 70 and 75 are \$2.52 ($\hat{\sigma}$ =0.73) and \$1.53 ($\hat{\sigma}$ =2.30). When age as given in the census is used the estimated jumps in pension amount using a bandwith of 20 age 70 and 75 are \$1.94 ($\hat{\sigma}$ =0.79) and \$0.86 ($\hat{\sigma}$ =1.06).

Figure 6: Retirement Probabilities in 1910 by Age, Veterans and Nonveterans, Age 62-74



Estimated from a local linear regression of a dummy equal to one if the person was retired on age using Nichol's (2007) rd Stata module. The age used is age as given in the 1910 census. The estimated jump in retirement probabilities for veterans at age 70 is 0.042 ($\hat{\sigma}$ =0.047) and the estimated jump in retirement probabilities at age 71 is 0.071 ($\hat{\sigma}$ =0.060). The estimated jump in retirement probabilities for non-veterans at age 70 is 0.015 ($\hat{\sigma}$ =0.022) and at age 71 the estimated jump is -0.003($\hat{\sigma}$ =0.028).