Obama, Katrina, and the Persistence of Racial Inequality

Robert A. Margo
Boston University and NBER

Keynote Address: Conference on
"The Economic History of Race, Gender, and Class",
Middlebury College, April 25-26, 2015

Acknowledgements

- Many thanks to Leticia Arroyo Abad for inviting me.
- Thanks to Bill Collins and Marianne Wanamaker for detailed comments. Suggestions today are most welcome!

Agenda

- Presentation slides for my presidential address (in progress) to be given at the upcoming EHA meetings in Nashville in September.
- Backstory
- Long-Term Evolution of Racial Differences in Per Capita Income, Wealth and Human Capital
- Interpreting the History
- Concluding Remarks

Backstory

- At BU I frequently teach two courses that are cross-listed in Economics and African-American Studies.
- EC363 is for undergraduates. US economic history with emphasis on race (slavery, post-bellum South, Civil Rights Movement).
- EC 569 is for MA students. Research-oriented course on current work in African-American economic history.

More Backstory

- I arrived at BU from Vanderbilt in fall 2005.
- I taught EC569 my first semester. I was concerned about enrollments, being a new faculty member teaching a new course.
- Course was full on first day of class and stayed that way.
- First day occurred shortly after Katrina. The Storm was on everyone's mind.
- Especially, two students from New Orleans. One was African-American male, recent graduate of Xavier (MA student). The second, a White female, was an undergraduate from Tulane.

Yet More Backstory

- Recall two visual images.
- Image #1: September 2005 – the (Lower) Ninth Ward and Katrina.
- Image #2: November 2008. -- Grant Park, Chicago, the evening of the election. Historic doesn't quite capture it.
- Tulane student was very disturbed by #1. Physical destruction, yes, but more generally the visual evidence of Black poverty in her hometown which she found shocking.
- Black student from Xavier was also upset by #1 but he wasn't surprised.
- Can invoke many other contrasting images of African-American poverty vs. "success". Some very recent.


The Water
is
Rising
Pleas

My Goals Today

- Goal #1: Review the historical evolution of racial differences in income, wealth, and human capital.
- Goal #2: Make intellectual sense of this evolution using economics.
- Time period and focus are broad: end of the Civil War to the present, national averages.

My Points

- Today: Two very simple points and a corollary.
- Point #1: Long-run "convergence" (narrowing) of racial differences in income, wealth, human capital.
- Implication: Obama may have been a surprise, but growing number of economically successful African-Americans not surprising.
- Point #2: Convergence far from complete, even after 140+ years.
- Implication: Continued Black poverty not a surprise.
- Corollary: To explain pace of convergence, useful to have a "causal" model of intergenerational transmission in which initial conditions die out slowly but (more or less) continuously.
- Not today but at EHA: (1) Inequality within Black community has increased in the long run (2) "Missing" Black males from economic life.

Some General Caveats

- Many serious data problems. Lots of research potential pre-WW2.
- Practical solutions are imperfect but not impossible. I'm after the big picture, not the (super) fine details.

Initial Conditions

- Initial conditions: B/W differences ca. 1870
- Ca. 1870, vast majority of African-Americans were former slaves.
- Adult Blacks were overwhelmingly illiterate, and extremely poor on average.
- Why? Deficits in human and physical capital, racial discrimination, and location inherited from slavery.
- Physical capital: Blacks had very little wealth.
- Human capital: lack of formal schooling, workforce skills, health.
- Location: After Civil War, per capita incomes far lower in South. Vast majority of Blacks live in the South.
- Initial conditions create potential for “intergenerational drag” (Margo 1990).

Conventional Wisdom: B/W Income Differences in the Long Term

- Conventional wisdom on B/W convergence: (1) some from 1870-1900 (2) little from 1900-1940 (3) fairly rapid 1940-80, concentrated in two episodes (1940-50 and 1963-75 (5) not much from 1980-present.
- Cast of characters: Donohue and Heckman, Freeman, Higgs, Margo, Ransom and Sutch, Smith and Welch, Vigdor, Wright (among others).
- I wish to revisit item (2), above.

Black-White Convergence 1900-1940: A Revision, I

- Three reasons why there probably was more B/W income convergence between 1900 and 1940 than previously thought.
- Reason #1: general wage compression and secular decline in returns to schooling, 1900 to 1940 (Goldin and Katz 2008). Post-WW2 periods in which wage inequality is decreasing are periods of B/W convergence (and vice versa). 1940s is a good example (Margo 1995).

Black-White Convergence 1900-1940: A Revision, II

- Reason #2 (more on this later): Per capita incomes in the South were below the national average (≈ 0.50) in 1900. Gap narrows somewhat before WW2.
- Blacks overwhelmingly Southern in 1900 but move out of the region. Direct effect is to raise B/W income ratio.
- Indirect effect: Incomes in the South rise relative to the national average. Blacks benefit disproportionately because, despite migration, they are still disproportionately Southern ca. 1940.
- Wage compression and migration effects NOT reflected in conventional pre-WW2 estimates (Smith 1984).

Black-White Convergence 1900-1940: A Revision, III

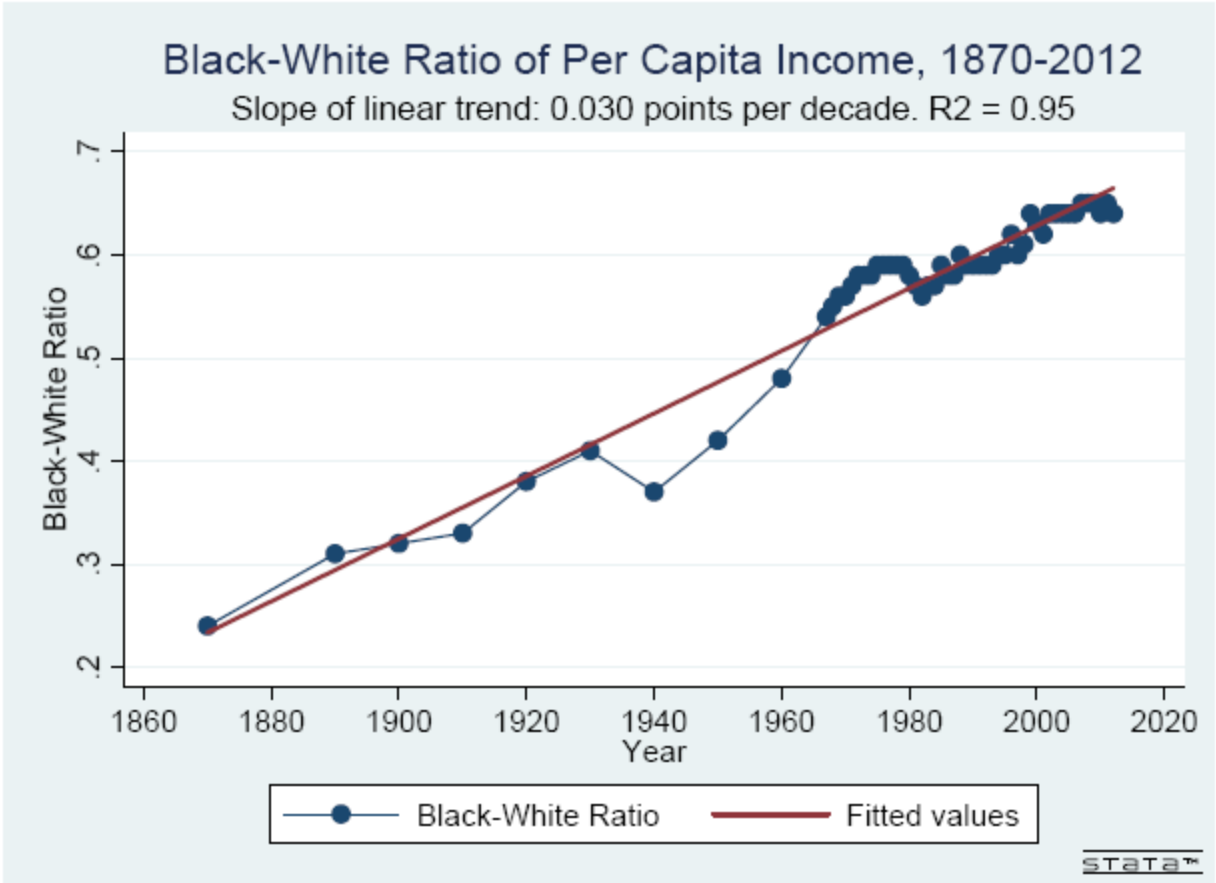
- Reason #3 more speculative: impact of “passing”
- Recent research by Nix and Qian (2015) suggests a non-trivial fraction of Black males may have “passed” for White before WW2. See also Mill and Stein (2012).
- “Passers” likely came from the right tail of the Black income distribution. Positive return to passing BUT into left tail of White income distribution on average.
- Consistent long term series should reclassify pre-WW2 “passers” to the Black population. Likely effect is to increase B/W convergence before WW2. Effect probably small.

New Series of Black/White Per Capita Income Ratios, 1870-present

- From 1969-present based on Census Bureau estimates (CPS)
- 1949-69: scaled from B/W earnings ratios
- 1940: ditto (but more adjustment may be necessary, in progress).
- 1890-1930: Smith (1984) occupational status ratios, scaled to per capita income, with novel adjustment for wage compression. See next slide.
- 1870: Higgs (1977)

Adjustment for Wage Compression

- State-level regression for 1960. Relative to B/W occupation status, actual B/W earnings ratio declines as college earnings premium for Whites increases.
- Goldin and Katz (2007, Figure 6) document 14 log point decline in returns to college from 1915 to 1940. I assume this actually occurs between 1910 and 1940, spread evening. Adds about 3 additional log points to trend in B/W income ratio.

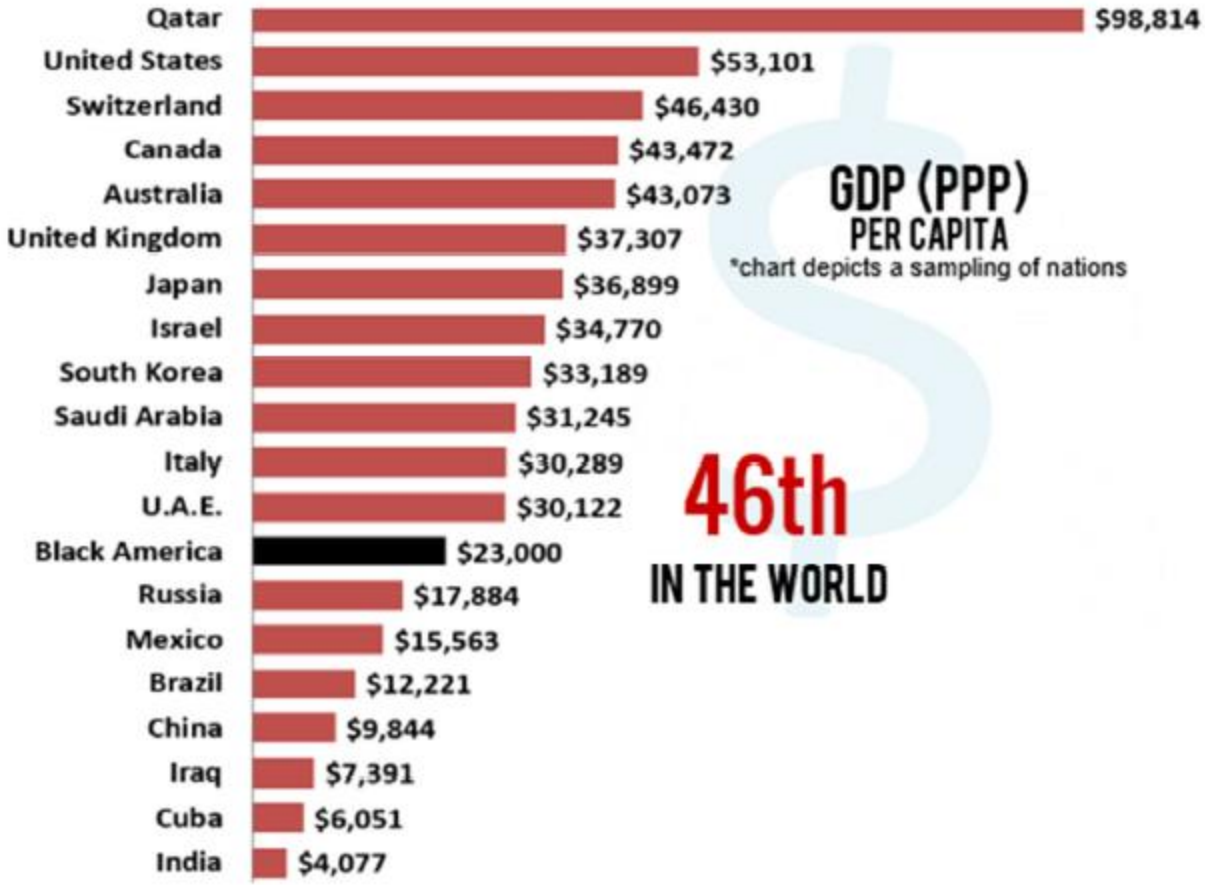

Black-White Ratio of Per Capita Income, 1870-2012
Slope of linear trend: 0.030 points per decade. R2 = 0.95
Black-White Ratio
.2
.3
.4
.5
.6
.7
1860
1880
1900
1920
1940
1960
1980
2000
2020
Year
Black-White Ratio
Fitted values

Comments on New B/W Income Series

- Larger (negative) effect of Great Depression than previously thought. Makes sense to me.
- 1940-60: some of this is business cycle mean reversion but specific factors (e.g. WW2, Great Compression, early anti-discrimination legislation) also play a role.
- 1960-1970s: Civil Rights era
- Post-1980: back to long run trend (halting, with some reversals)
- Key point: R^2 of linear time trend is 0.95 (if restricted to census years, R^2 is 0.94). Very persistent long-run process w/shocks and medium-run deviations from trend.

Sidebar: African-Americans vs. Other Countries: Income Ratios (Per Capita)

- Graph in following slide (http://www.theatlantic.com/national/archive/2014/10/what-if-black-america-were-a-country/380953/) shows Black per capita income "today" versus per capita income in selected group of countries. For example: Australia: 0.53; UK: 0.62; Switzerland: 0.50; Canada: 0.53; Japan: 0.62.
- What would these ratios look like ca. 1870? I use Higgs estimate for 1870 for US Blacks and Angus Maddison for other countries.
- Result: **Divergence**, for most high income countries today. Ca 1870: Australia: 0.17; UK: 0.20; Switzerland: 0.30; Canada: 0.40. Exception is Japan: 0.90 (Japan was very low-income in 1870).
- What about the rest of the world? Very likely even greater divergence since 1870. Why? US average has diverged from ROW and Black income per capita has grown faster than US average since 1870.
- Conclusion: Relative to most other countries, US Black per capita income has (likely) grown more rapidly since 1870. Probably NOT true for other New World slave economies.

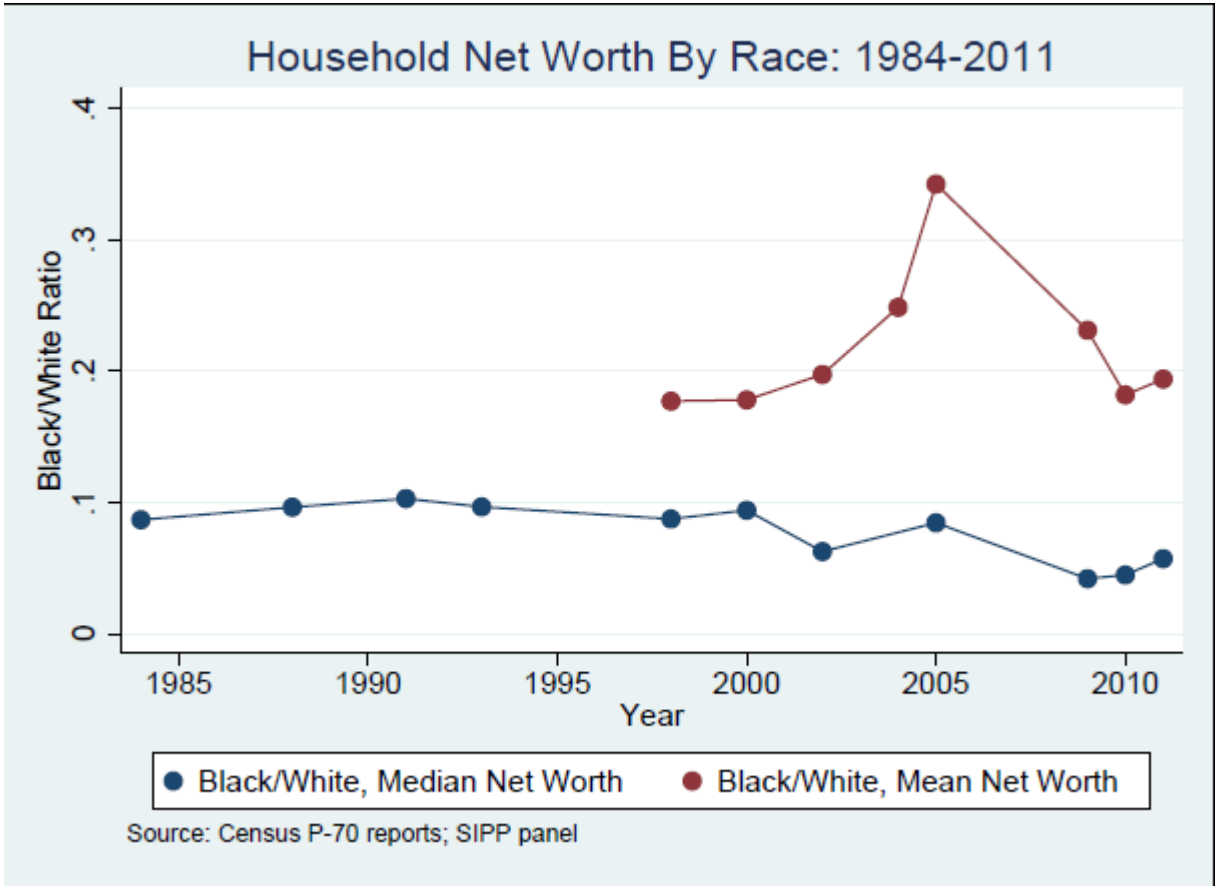

Qatar $98,814
United States $53,101
Switzerland $46,430
Canada $43,472
Australia $43,073
United Kingdom $37,307
Japan $36,899
Israel $34,770
South Korea $33,189
Saudi Arabia $31,245
Italy $30,289
U.A.E. $30,122
Black America $23,000
Russia $17,884
Mexico $15,563
Brazil $12,221
China $9,844
Iraq $7,391
Cuba $6,051
India $4,077
GDP (PPP)
PER CAPITA
*chart depicts a sampling of nations
46th
IN THE WORLD

Wealth: Historical

- Other than home ownership (in a moment) historical data on B/W wealth are spotty.
- Earliest data are for 1870. Pertain to gross value of real estate > 0 + value of all personal property (exclusive of clothing) > $100. For heads of households (imputed) in 1870 ages 15 and over, B/W median wealth ratio is 0. B/W mean ratio is 0.04.
- Higgs (AER 1982), Margo (AER 1984): taxable wealth in six southern states, end of Civil War to WWI (AR, GA, KY, LA, NC, VG). Per capita figures for census and other years. Trend growth in B/W per capita ratio (regression with state dummies) is 0.015 points per decade, 1870-1910.

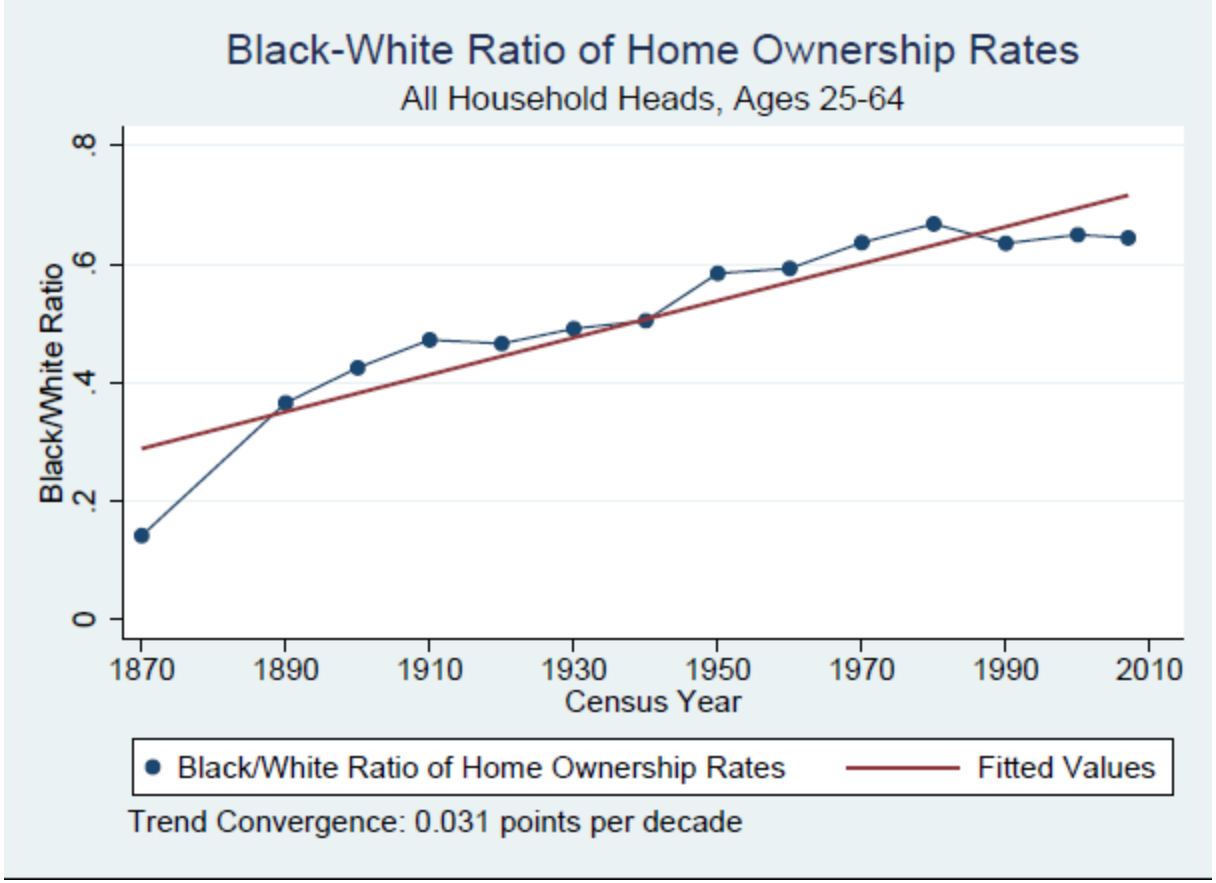
Wealth: Contemporary

- Post WW2: early SCFs having limited wealth questions and do not separately identify Blacks from Non-Whites; ditto, 1962 SFCC.
- 1980s-present: SCF, PSID, SIPP. Detailed questions but race-specific sample sizes are small and sampling variability is a problem. Extensive re-weighting necessary. Estimates pertain to households.
- Stylized Fact #1: B/W median wealth ratio roughly stable at 0.09, but falls during the Great Recession.
- Stylized Fact #2: B/W mean wealth ratio > B/W median wealth ratio. Moral: in modern survey data, wealth inequality among Blacks > among Whites.
- Using 1870-1910 trend, predicted increase in B/W mean wealth ratio is 0.21 points from 1870 to 2010. In ballpark.


Household Net Worth By Race: 1984-2011
Black/White Ratio
0
.1
.2
.3
.4
1985
1990
1995
2000
2005
2010
Year
Black/White, Median Net Worth
Black/White, Mean Net Worth
Source: Census P-70 reports; SIPP panel

Home Ownership

- Most comprehensive long-term data pertain to home ownership.
- Collins and Margo (2011) estimate home ownership rates by race for census years from 1870-present. B/W ratio shown in next figure.
- Relatively rapid convergence from 1870-1900. Consistent with state-level assessed wealth data.
- Steady relative convergence from 1900 to 1980, but trend is flat (or slightly decreasing) since.
- Caveat: If we look at absolute gap (rather than relative) there is long term convergence but most of this occurs before WWI.


Black-White Ratio of Home Ownership Rates
All Household Heads, Ages 25-64
Black/White Ratio
0
.2
.4
.6
.8
1870
1890
1910
1930
1950
1970
1990
2010
Census Year
Black/White Ratio of Home Ownership Rates
Fitted Values
Trend Convergence: 0.031 points per decade

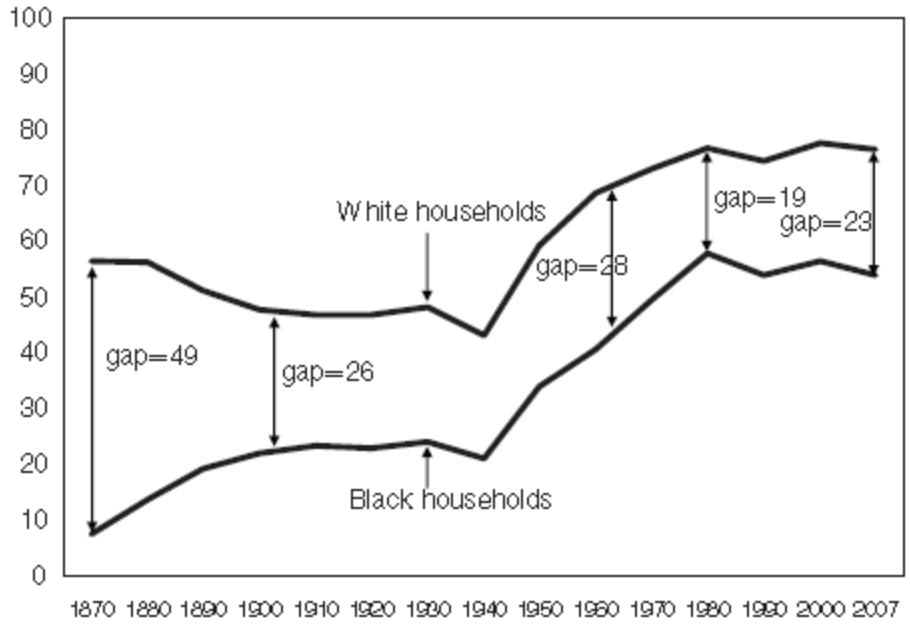


FIGURE 1. RATES OF OWNER OCCUPANCY, CORE SAMPLE, 1870–2007

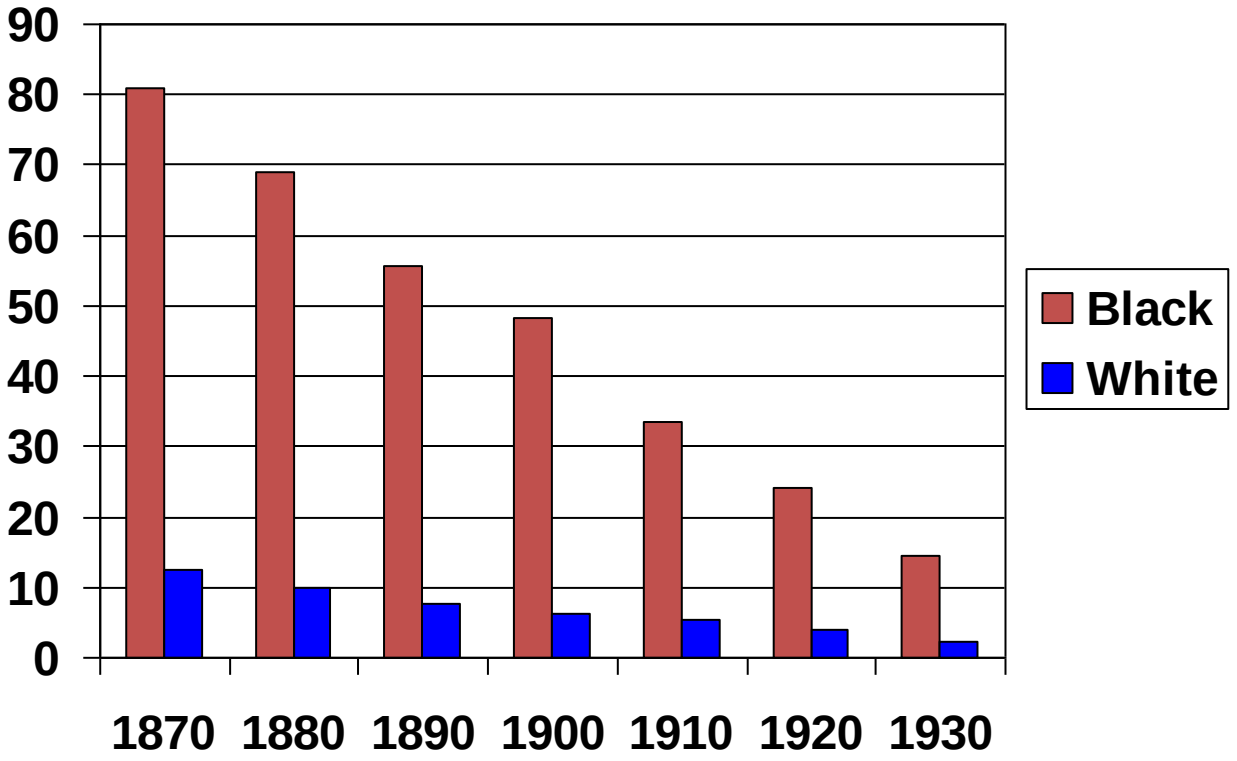
Human Capital: Education

- Vast majority of slaves were illiterate. Illegal to teach slaves to read/write. Free Blacks better off, but still had high rates of illiteracy relative to antebellum Whites. Upshot is very high initial gap in literacy.
- During War and for a short time after, children of former slaves living in the South are able to attend Freedmen's Bureau Schools.
- Post-bellum, southern states (ex-confederate) establish schools for Black children (*de jure* segregated).

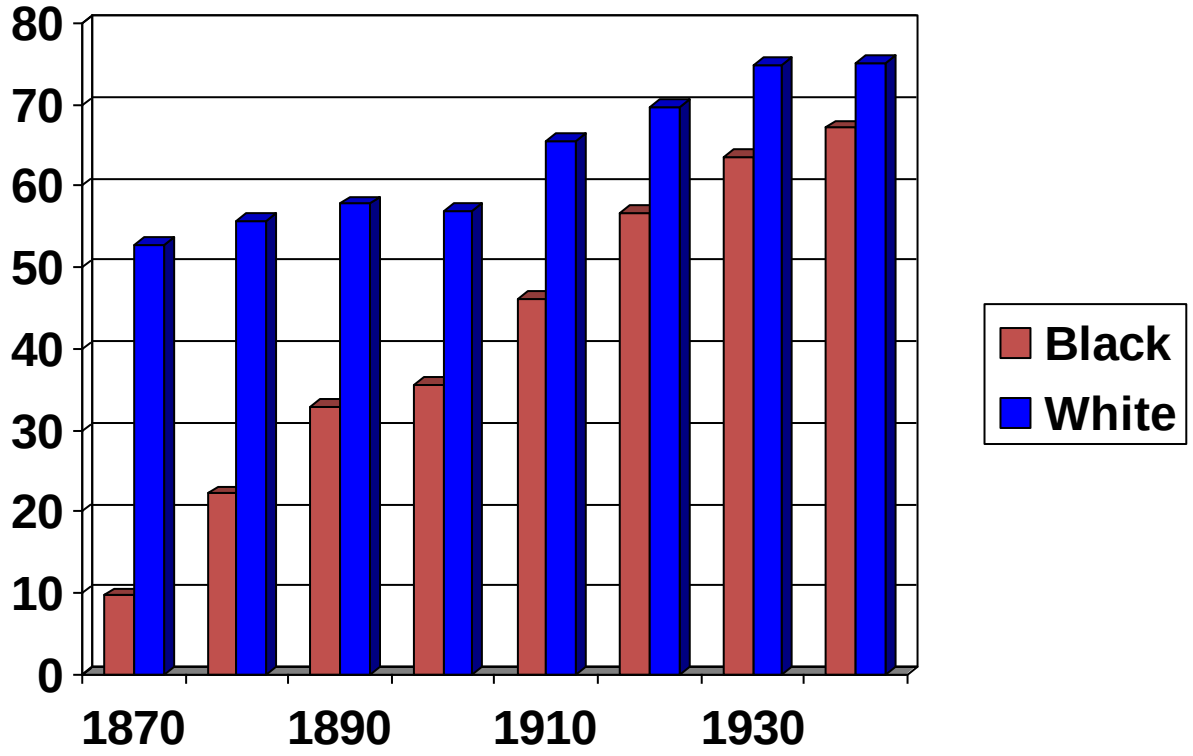
Literacy and School Attendance

- For 1870-1930: Census literacy (read and write in any language). Roughly equivalent to a second grade education. Ages 10 and above.
- School attendance: did person of "school age" attend school in the previous year?
- Substantial narrowing between 1870 and 1930 in racial gap in literacy and in school attendance. Latter is the principal factor in the former (Collins and Margo 2006).

Graph 1: Illiteracy in the United States, 1870-1930: Ages 10-69

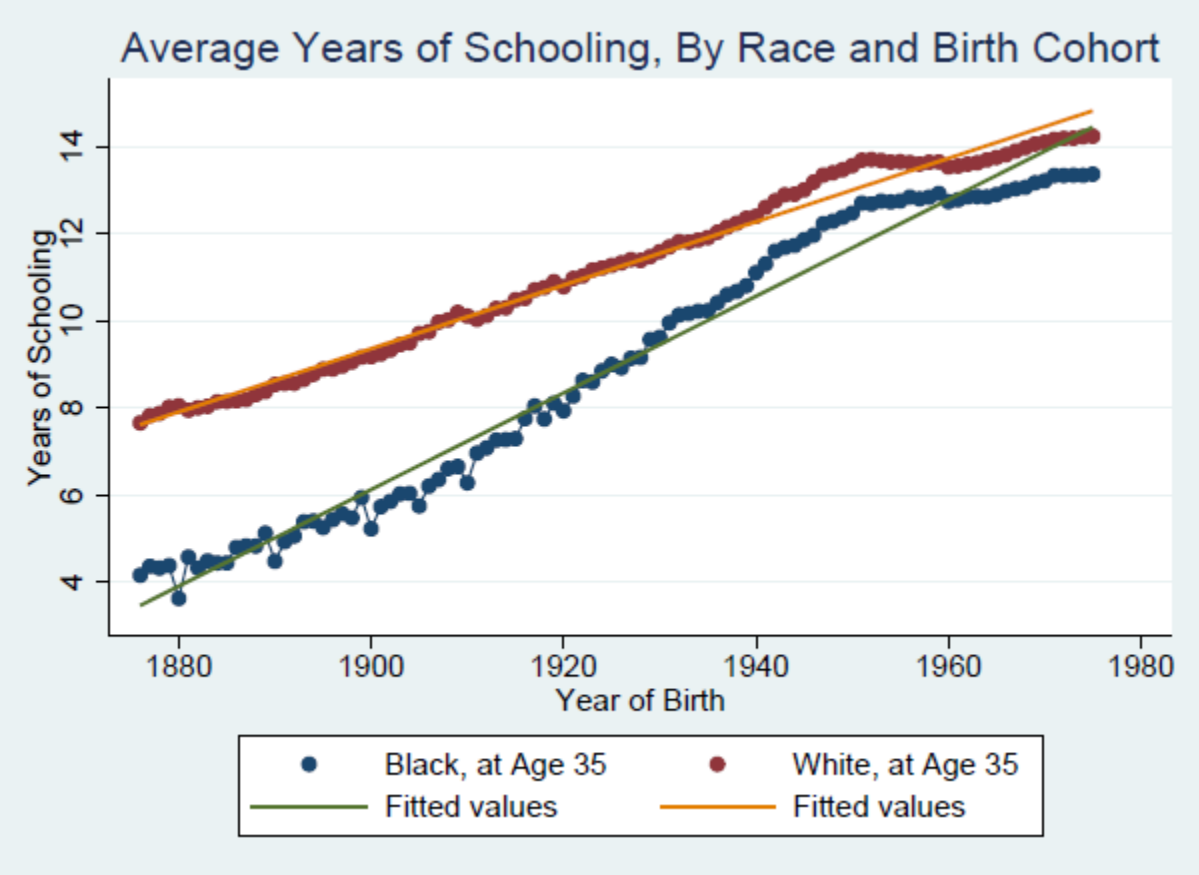


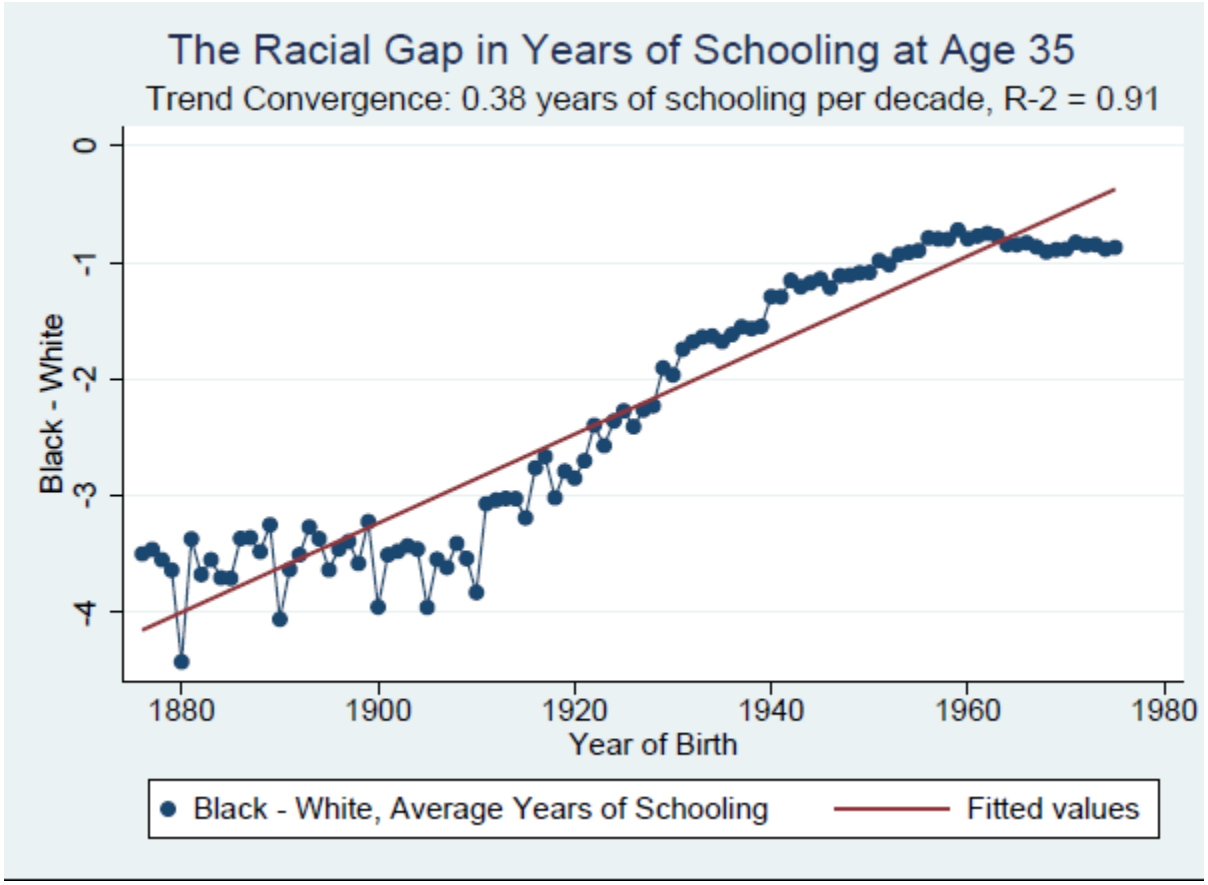
Graph 2: School Attendance, Ages 5-19: 1870-1940



Years of Schooling

- 1940-present: Census, CPS, ACS record "years of schooling" or highest grade completed. Can be back-cast to produce cohort estimates.
- Next two slides are based on estimates by Goldin and Katz (2008). Pertain to birth cohorts, measured at age 35. Estimates for earliest cohorts may be overstated because of mortality bias.
- Trend rate of convergence is about 1.1 years per 30 year generation. R^2 is pretty high, 0.91.
- B/W trend for Black cohorts from mid-1880s to ca. 1910 biased downwards because of transition to graded schools (Margo JEH 1986). Correction would improve fit of linear trend in early C20.
- Convergence has stagnated for post-1960 cohorts. Part of general phenomenon (Goldin and Katz 2008).
- CAVEAT: no adjustment (thus far) for school quality. Much relevant historical work on the South, but little on the non-South. My best guess: relative quality rises from 1870-90, flattens out (or possible declines) from 1890-1920, rises (fairly slow secular trend) from 1920 to present. Return to later in talk.

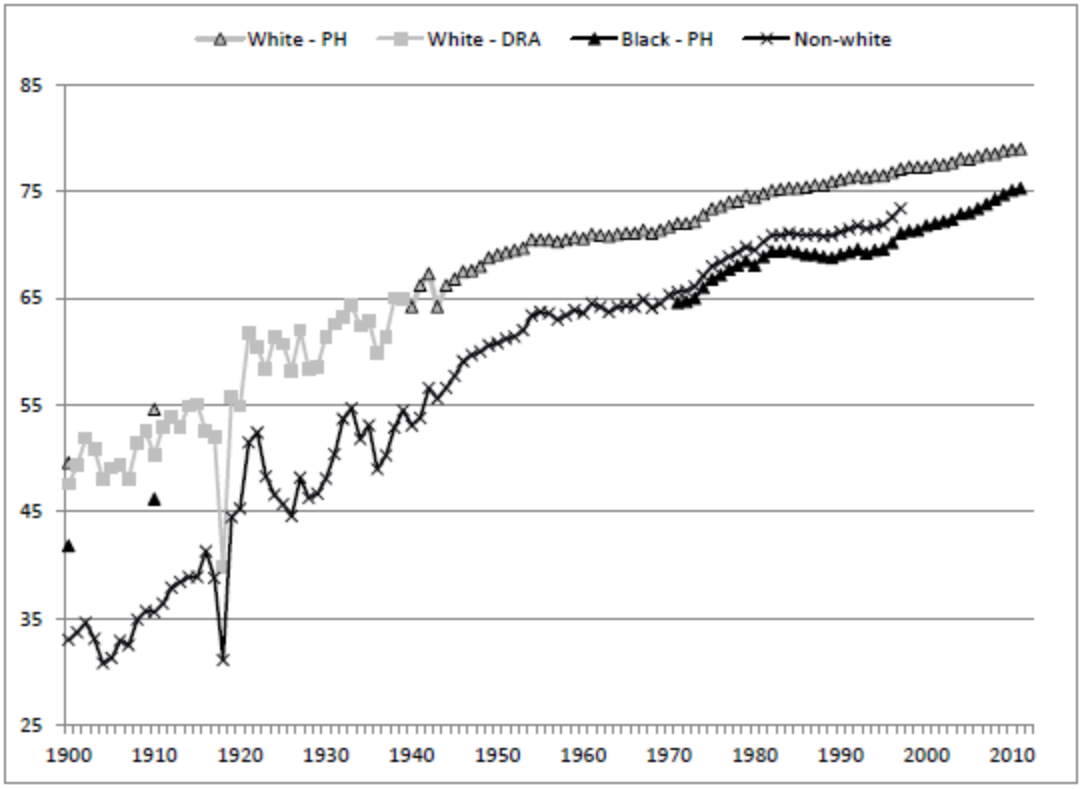

Average Years of Schooling, By Race and Birth Cohort
Years of Schooling
4
6
8
10
12
14
1880
1900
1920
1940
1960
1980
Year of Birth
Black, at Age 35
White, at Age 35
Fitted values
Fitted values


The Racial Gap in Years of Schooling at Age 35
Trend Convergence: 0.38 years of schooling per decade, R-2 = 0.91
Black - White
0
-1
-2
-3
-4
1880
1900
1920
1940
1960
1980
Year of Birth
Black - White, Average Years of Schooling
Fitted values

Human Capital: Health

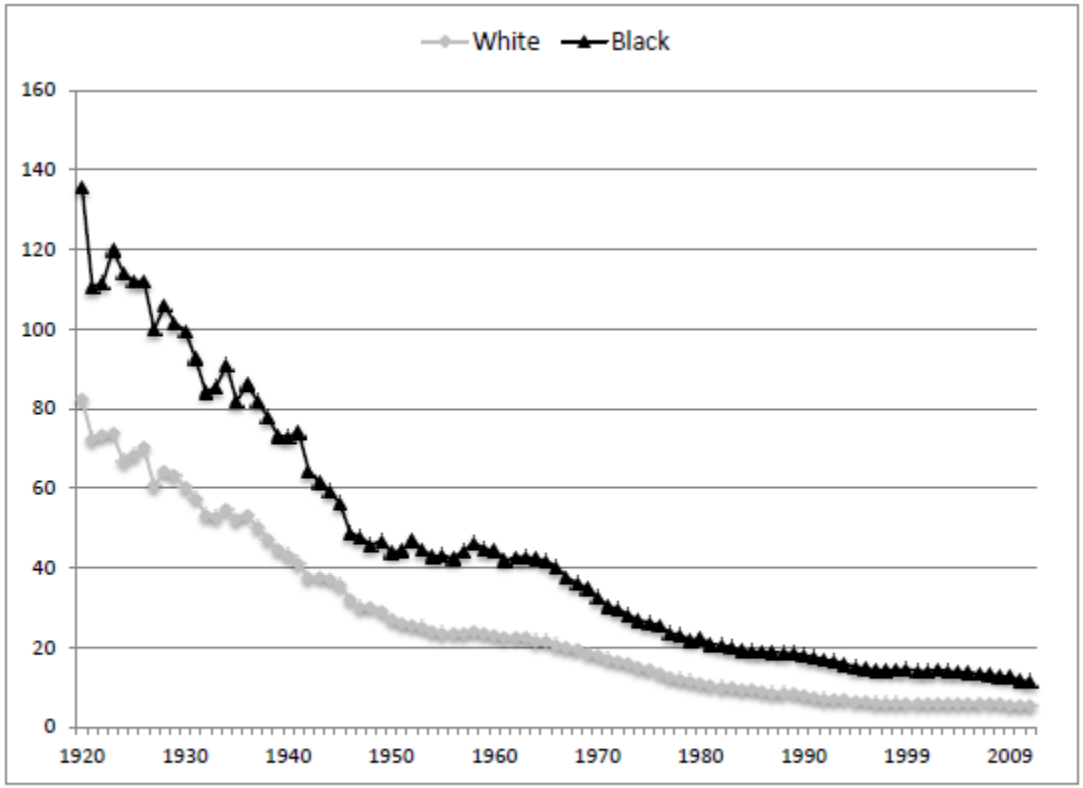
- Slave health relatively poor, especially children (Steckel 1986).
- Long-run B/W convergence in health in C20. Evidence: life expectation, infant mortality, chronic conditions (not shown).
- Likely interaction effects with schooling and migration (Bleakley 2007; Logan 2009).
- Some component of convergence is intergenerational via “Barker” effects. More study required.

Race and Life Expectation at Birth



Sources: "White - PH" and "Black - PH" values in 1900 and 1910 from Preston and Haines (1991, Table 2.5). All other values are from Haines (2006) (1900-1997) and National Center for Health Statistics (2013).

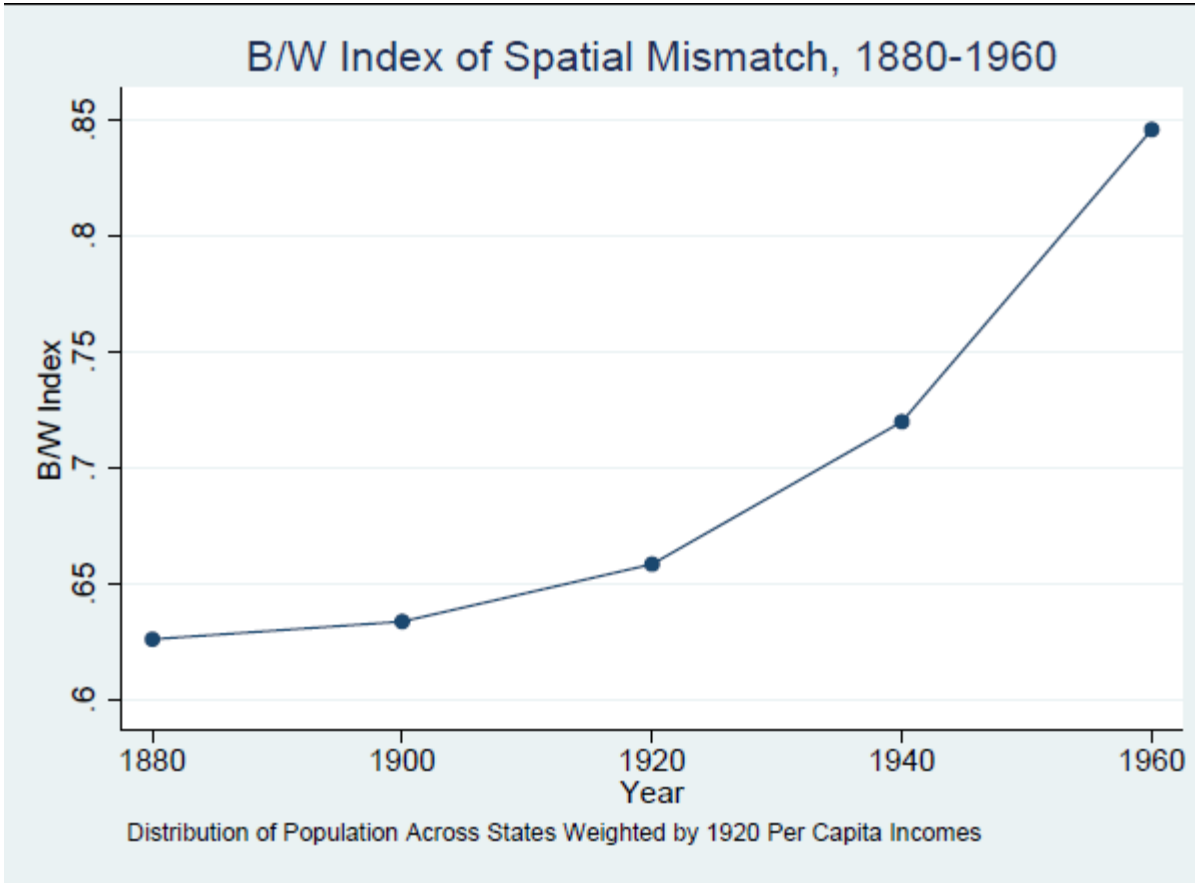
Race and Infant Mortality



Sources: 1920-1997 from Haines (2006); 1998-2011 fromNational Center for Health Statistics (2013). .

Location: B/W Regional "Spatial Mismatch"

- From modern urban economics literature: "spatial mismatch". Modern: between CC and suburb.
- Post-bellum spatial mismatch is regional . Post-bellum Blacks disproportionately live in the South, where per capita incomes are much lower than national average.
- Next slide evaluates regional spatial mismatch from 1880-1960 by weighting race-specific state population by 1920 per capita income. General shape is robust to weighting year.
- Mismatch erodes over time as adult Blacks leave the South and subsequent generations more likely to be born outside the South. Erosion more rapid after WWI (well known).
- NOTE: Blacks (to this day) avoid certain non-Southern states, even when per capita income is relatively high.
- Abundant evidence that Black out-migration contributes to B/W convergence directly for movers and indirectly for stayers (general equilibrium effect). Historical effects are largely completed by 1960s (Smith and Welch 1989) BUT have resumed more recently as Blacks return to the South.
- Important (but insufficiently researched): how do historical patterns of Black settlement (i.e. residential segregation) affect Black geographic mobility, within and across generations?


B/W Index of Spatial Mismatch, 1880-1960
B/W Index
.6
.65
.7
.75
.8
.85
1880
1900
1920
1940
1960
Year
Distribution of Population Across States Weighted by 1920 Per Capita Incomes

Race and Intergenerational Transmission

- B/W per capita income ratio increased from 0.24 to 0.64 in 140 years (1870-2010). Convergence in income is mostly along a linear trend (w/some medium-run episodes). Ditto educational convergence across cohorts.
- Key question in explaining pace of convergence: role of "initial conditions" versus subsequent "shocks"
- Point of departure: to answer, consider an empirical model of "intergenerational transmission".
- Intergenerational transmission: correlation between income of generation t and generation t – 1. Generation t: middle age adult. Generation t-1: parent of this person when at the same age.
- Very active area of research in labor economics and economic history. Modern evidence based on Panel Study of Income Dynamics and similar household surveys. Historical evidence: census data.

(Gary) Solon Regression Model

- Basic "Solon" regression model is $\ln y(t) = \beta \times \ln y(t-1) + \varepsilon(t)$
- β: intergenerational elasticity (IGE). ε is mean zero, random error, uncorrelated across generations. N.B.: Model is stationary.
- Modern evidence is that β falls into the range (0.3-0.6) with 0.5 being a typical estimate.
- Historical β's pertain to occupation status, not income. Even so, broadly similar to modern estimates.

Implications for multi-generational inequality: Solon regression

- Substitute for earlier values of ln y: $\ln y(t) = \beta^n \times \ln y\,(t- n) + \varepsilon\,(t) + \beta \times \varepsilon(t-1) + \ldots + \beta^n \times \varepsilon(t-n)$ up to $n = t - 1$.
- Average across racial groups. KEY POINT: Errors ("shocks") are mean zero in the population BUT NOT within race.
- Initial condition is ln [Y(B)/Y(W)] in 1870 (-1.427). "t" is a generation, so $t \approx 4$ from 1870 to 1990. Assume $\beta = 0.5$.
- Starting from t = 0 (1870), model can be solved recursively. At t =1, predicted ln B/W ratio is 0.5 x (-1.427) = -0.714. So, racial gap in mean "shock" is -0.425. And so on.
- As shown in following table, initial condition dies out quickly. Therefore, to fit the time series, Blacks (Whites) must draw negative (positive) values of ε in every generation → persistent negative race "shock".
- For: Comparison of free Blacks vs. ex-slaves (Sacerdote 2005) suggests specific effects of slavery die out quickly.
- Against: Solon regression not intended to be "causal".

Solving the Solon Regression: Black-White Income Differences across Generations

Year	Ln [Y(AA)/Y(W)]	# of Generation	β^N x Initial Income Gap	Racial Gap, Average Current Residual	Racial Gap, Cumulative Lagged Residual	Total Residual
1870	-1.427	0				
1900	-1.139	1	-0.714	-0.425		-0.425
1930	-0.892	2	-0.357	-0.322	-0.213	-0.535
1960	-0.755	3	-0.179	-0.308	-0.268	-0.574
1990	-0.528	4	-0.090	-0.150	-0.288	-0.438

Column 1: natural logarithm of Black/White per capita income. Column 2: number of post-slavery generation. Column 3: $\beta = 0.5$.

Extension: A "Causal" Solon Model

- Two equation model: labor market equation and intergenerational transmission.
- Labor market: $\ln y(t) = \alpha h(t) + \varepsilon(t)$
- Transmission: $h(t) = \phi h(t-1) + \nu(t)$
- Assume errors are uncorrelated within and across generations and standardize ln y and h. Then $\beta = \alpha^2\phi$. More generally, $\beta(t, t-n) = \alpha^2\phi^n$.
- Remark #1: $\beta(t, t-n)$ decays MORE slowly than β^n.
- Remark #2. If $\phi = 0.8$ (approximately fits B/W schooling trend) and $\beta = 0.5$, then $\alpha \approx 0.8$. Given initial B/W income ratio of 0.24, implied initial racial gap in h is -1.78. Predicted B/W income ratio in 1990 (N = 4) is 0.63, compared with actual ratio of 0.59.

Even More Structure: A Two-Factor Causal Model

- Suppose instead there are two causal factors, h (human capital) and w ("whiteness") that affect income: $\ln y(t) = \alpha_h h(t) + \alpha_w w(t) + \varepsilon(t)$. Vast literature in labor economics and economic history consistent with this.
- As before, assume $h(t) = \phi_h h(t-1) + \nu(t)$ and $w(t) = \phi_w w(t-1) + \eta(t)$ and ε, ν, and η are uncorrelated for all values of t. Then:
- $\beta(t, t-n) = \{\alpha_h^2 \phi_h^n + \alpha_h \alpha_w \sigma_{hw}(\phi_h^n + \phi_w^n) + \alpha_w^2 \phi_w^n\} > 0$
- As in previous model, $\beta(t, t-n)$ decays more slowly than β^n.

Remarks on Two-Factor Model, I

- Multi-generational elasticity $\beta(t, t-n)$ depends on parameters from labor market and intergenerational transmission, and initial joint distribution of h and w.
- Determinants of ϕ's: "family background", peer effects, institutions and social norms.
- Determinants of α's: labor market structure, "discrimination", institutions and social norms.
- In this model, initial conditions are B/W differences in h and w. As in the simpler version, effects can still matter after N generations if ϕ's are close to one.
- Model can accommodate time-varying parameters and h x w interaction (segregation) effect. Examples: establishment of public schools in South for Blacks after Civil War lowers value of ϕ_h for post-slavery Blacks (Rosenwald schools, ditto). BUT opposite during disenfranchisement era (Margo 1990).

Remarks on Two-Factor Model, II

- "Whiteness" in the model is a continuous variable. Skin complexion and physical appearance, but also speech, culture, personal behavior, social networks, etc. Endogenous within and across generations.
- Across generations whiteness may be diluted by (1) changing ethnic make-up of White population (2) racial "mixing". BUT (2) limited because of historical legal prohibitions (miscegenation laws) and social norms/networks (Fryer 2007; Fryer et. al 2012).
- Plausible multi-part hypothesis: (1) for most generations, $\phi_h < \phi_w$ (2) α_h follows U-shape over time (Goldin and Katz 2008) (3) α_w declines over time (but see Carruthers and Wanamaker 2014).

Remarks on Two-Factor Model, III

- Caveat #1: No causal role for income or physical capital in this model. See below.
- Caveat #2: “Luck” plays a role in the determination of income in each generation but luck *per se* is not inherited.
- Caveat #3: Implicit one parent-one child framework means that (a) “family structure/marriage” not modeled BUT **without question** affects intergenerational transmission of h and w (b) no quantity-quality tradeoff but, again, surely important and may differ across race.

Formal Dynamic Model: White (2007)

- Another possible approach is to specify a formal dynamic model and calibrate. Can incorporate capital accumulation. Not much on point, except for White (*Journal of Economic Dynamics and Control* 2007).
- Continuous time with race-specific representative agent(s), infinite horizon/perfect foresight. Max PDV of consumption subject to laws of motion of physical and human capital. Consumption good produced by competitive firms using human capital and physical capital.
- Law of motion for physical capital is standard. Human capital production function is race-specific.
- Labor earnings are w x H x (1 - time spent in human capital production). No racial discrimination in labor market but Blacks earn less because of lower H.

Household's problem: Infinite-horizon households choose consumption C_{it} in each period to solve the following problem:

$$\max_{C_{it}} \int_{t=0}^{\infty} \frac{(C_{it})^{1-\sigma}}{1-\sigma} \mathrm{e}^{-\rho t} \tag{1}$$

subject to

$$\begin{aligned} &\dot{K}_{it} = (r_t - \tau_t - \delta_k)K_{it} + w_t H_{it}(1 - s_{it}) - C_{it}, \\ &K_{i,t} \geqslant 0 \end{aligned} \tag{2}$$

given $K_{i,0}$, where $i \in \{B(lack), W(hite)\}^4$;

Firms and aggregation: Perfectly competitive firms choose capital and labor to maximize profits:

$$\max_{K_t, L_t} \{K^{\alpha} L^{1-\alpha} - r_t K_t - w_t L_t\}, \tag{5}$$

where aggregate effective labor, L_t, and capital, K_t, are given by

$$L_t = B(1 - s_{Bt}) H_{Bt} + (1 - B)(1 - s_{Wt}) H_{Wt}, \tag{6}$$

$$K_t = (1 - \tau_t)(BK_{Bt} + (1 - B)K_{Wt}). \tag{7}$$

The growth rate of human capital is given by

$$\frac{\dot{H}_{i,t}}{H_{it}} = DX_t^{1-\eta-\gamma} (E_{it})^{\eta} s_{it}^{\gamma} H_{it}^{\gamma-1} - \delta_{hit}. \tag{8}$$

$$BE_{B,t} + (1 - B)E_{W,t} = \tau_t (BK_{Bt} + (1 - B)K_{Wt}), \tag{4}$$

where B is the fraction of households that are black households.

Table 2
Parameter definitions and values

Parameter	Definition	Value	How chosen
ρ	Rate of time preference	0.04	Steady-state return to K
δ_k	Rate of depreciation of physical capital	0.10	Standard
δ_{hit}	Rate of depreciation of human capital	See Table 1	Life expectancy by race and year
σ	Reciprocal of intertemporal elasticity of substitution	1.0	Standard
α	Physical capital's share in goods production	0.36	Long-run average
B	Ratio of number of (native-born) blacks to sum of native-born blacks and whites	0.125	Average from decennial census 1860–1970 (see text)
η	Expenditure exponent in human capital production	0.06	Estimates of returns to school quality (see text)
γ	Human capital exponent in human capital production	0.4	Microestimates of Ben-Porath production function
τ_t	Tax rate on capital	Various	Primary and secondary school expenditures' GDP share 1870–1970
D	Scale parameter human capital production	0.10	Length of transition to 1980 H ratio
γ_X	Growth rate of technological progress	0.01	Average labor productivity growth 1870–1970

Remarks on White (2007)

- Initial conditions: Blacks have no K and much less H than Whites. Blacks wish to smooth consumption. In steady state, no K is accumulated by Blacks.
- E is a purchased input in H production (X is freely available), financed by tax on K. Because Blacks own no K, there is a net redistribution of income from Whites to Blacks. Important (and historically relevant).
- Note that stock of H enters on r.h.s. of eq. 8 with exponent $\gamma<1$. Because $\gamma-1<0$, there will be "regression to the mean" in dH/H. Moral: if Blacks allocate sufficient time to H production and racial discrimination in E is not too great, long run convergence in H.
- In simulations, White assumes that E and s are set exogenously. Base simulation: slow convergence in H, no convergence in K. Counterfactual simulations are intuitive: (1) Less discrimination in E produces faster convergence (2) substituting H(W) for H(B) in H production produces faster convergence (3) if Blacks can borrow, steady state K is lower and convergence is slower (4) convergence in faster if B/W differences in H depreciation (e.g. health) are smaller.
- If s is chosen endogenously, predicted convergence in H is much faster than actual. Suggests inter-temporal externality. Conjecture: OLG model would fit the data better.
- Caveat: White's time series on aggregate B/W differences in E exhibits substantial narrow between 1890 and 1910. I am (very) skeptical.

Table 3
White–black national per capita school expenditure ratios

Year	1890	1900	1910	1920	1930	1940	1950	1960
Ratio	7.9	6.9	3.4	3.2	4.5	3.3	2.9	1.76

Sources: Connolly (2001), Card and Krueger (1992), and author's calculations.

Economic History To Do List

- Substantial modern literature examining correlates of upward and downward mobility by race (e.g. Mazumder 2014).
- Historical analogues much more limited. Some insight from cross-sectional regressions (e.g. Margo 1990) but linked census data are more promising (Collins and Wanamaker 2014).
- New project (Baker and Margo 2015) linking Georgia tax records in 1910 with 1940 census. Explore race-specific impact of wealth while growing up on educational attainment and adult earnings.

Concluding Remarks

- Current economic state of Black America is (very) mixed: Much poverty, but also success. Illustrated on the national stage by extraordinary events (Obama; Katrina; Ferguson, Missouri).
- Current B/W differences are the outcome of a long historical process of convergence from (very) unequal initial conditions.
- Intergenerational transmission is an important part of the convergence process. Historical component needs greater empirical and theoretical attention.