AER: Insights 2025, 7(4): 429–446
https://doi.org/10.1257/aeri.20240467

Race and Economic Well-Being in the United States[†]

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We construct a measure of consumption-equivalent welfare for Black and White Americans, which incorporates life expectancy, consumption, leisure, and inequality. Based on these factors, welfare for Black Americans was 40 percent of that for White Americans in 1984 and 59 percent by 2022. There has been remarkable progress for Black Americans: The level of their consumption-equivalent welfare increased by a factor of 3.5 over the last 38 years when aggregate consumption per person only doubled. Despite this progress, the welfare gap in 2022 remains disconcertingly large at 41 percent, much larger than the 16 percent gap in consumption per person. (*JEL* D12, I12, I31, J15, J31, K42)

An enormous literature has documented large and persistent differences in economic outcomes by race in the United States. These outcomes include income, earnings, wealth, education, life expectancy, access to good neighborhoods and other public goods, unemployment, and incarceration.

Across these different measures, some differences are huge. Average wealth for Black Americans was just 16 percent of that of White Americans in 2019 (Derenoncourt et al. 2022). Incarceration rates were five to six times higher for Black Americans than for White Americans in 2005 (Mauer and King 2007). Other differences appear to be smaller. For example, average earnings by Black Americans were 77 percent of that for White Americans in 2019 (Chetty et al. 2020). Average life expectancy was even closer, reaching 95 percent in recent years (Centers for Disease Control and Prevention 2024b).

It is hard to compare these measures because they are in different units. Put differently, if you could magically close one of these gaps, which one would you choose? To answer this question, and to think about policy priorities more generally, one needs to put these outcomes into common units.

Note that it is not the average gap across different measures that we should care about. Instead, these gaps compound: The economic well-being of Black Americans is reduced by low consumption, low life expectancy, and high rates of incarceration. The overall loss of welfare is much larger than from any individual component.

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[†]Go to https://doi.org/10.1257/aeri.20240467 to visit the article page for additional materials and author disclosure statement(s).

The goal of this project is to make progress by putting some key outcomes into common units and showing how they compound. Following Jones and Klenow (2016), we combine several factors into a single utility-based welfare metric. We incorporate microdata on consumption, mortality, incarceration, and leisure to estimate consumption-equivalent welfare by race over time.[1]

Relative to the long list of economic outcomes mentioned, we make progress but are unable to include everything, usually because it is not clear in the literature how to convert some outcomes into consumption-equivalent units. For example, conventional utility functions do not depend on wealth and education once consumption, leisure, and mortality have been included. This is not to say that there are no additional channels whereby wealth or education matter for welfare. Because they are omitted from standard utility analysis, however, we do not have a body of empirical work that tells us quantitatively how these forces should enter.

With these caveats in mind, we summarize our findings as follows. Our main analysis begins in 1984 and runs through 2022. We find a large welfare difference at the end of our sample: Consumption-equivalent welfare for Black Americans was only 59 percent of the level for White Americans in 2022. The gap in welfare was even larger historically: Relative welfare was only 40 percent in 1984.

The good news is that substantial progress has been made over the past 38 years; the bad news is that the remaining gap is much larger than the gaps in consumption, earnings, or life expectancy alone would suggest. The gap in welfare was 41 percent in 2022, versus a 16 percent gap in consumption. Life expectancy is the largest contributor to the remaining gap, followed by consumption. Life expectancy and consumption contributed the bulk of convergence in recent decades. Of lesser importance were changes in incarceration, leisure, and within-group inequality in both consumption and leisure.

The large role played by life expectancy may come as a surprise given that life expectancy for Black Americans, at 74.5 years, is 95 percent of that for White Americans (at 78.5 years) in 2022. This illustrates the importance of using a consumption-equivalent metric: Because each year of life is worth roughly five years of consumption according to the standard calibration in the literature, a four-year gap in life expectancy is actually worth around 20 percent of annual consumption.

In Section I, we lay out our consumption-equivalent welfare framework. Section II describes the data for life expectancy, incarceration, consumption, leisure, and inequality. Section III describes how we calibrate key parameters in the utility function, while Section IV presents our welfare results from 1984 to 2022. Section V concludes.

Literature Review.—Our paper relates to a number of recent studies. Perhaps closest is Curtis, Garín, and Lester (2022). They also focus on welfare differences across demographic groups. Relative to our paper, they consider a richer set of demographics, including cuts by gender and education. Data requirements for this finer detail limit their results to recent years, 2013 to 2017, as opposed to our longer time series back to 1984.

[1] Falcettoni and Nygaard (2023) look at welfare across US states and incorporate education and housing but do not concentrate on patterns by race.

Margo (2016) documents Black-White income differences going back to 1870 and finds slow convergence, except for a quickening in the 1940s and 1960s. Bayer and Charles (2018) dissect Black-White earnings differences since 1940 and find convergence from 1940 to 1970 and then divergence afterward. Chetty et al. (2020) document Black-White earnings and employment gaps from 1989 to 2015 and report lower rates of upward mobility and higher rates of downward mobility for Black workers. Derenoncourt and Montialoux (2021) connect a sharp narrowing in the Black-White earnings gap in the late 1960s and the early 1970s to the extension of the minimum wage to predominantly Black occupations. Aizer et al. (2020) trace a significant narrowing of the earnings gap during World War II to war contracts. Karger and Wray (2024) look at the lifetime earnings of Black versus White males and finds substantial convergence early in the century but then little afterward.

Cook (2014) provides evidence that violence against Black Americans hindered their patenting activity. Hsieh et al. (2019) trace Black-White occupational and earnings gaps to barriers in the labor market and to human capital accumulation.[2] They find that human capital barriers fell in the 1960s and 1970s, but progress has stalled since then. They emphasize that reducing barriers not only reduces wage inequality but also raises overall economic growth by mitigating the misallocation of talent.

Derenoncourt et al. (2022) document the Black-White wealth gap from 1860 to 2020. They find the fastest convergence from 1860 to 1910, but that progress came to halt in the mid-twentieth century and gaps widened in recent decades. They see Black wealth trending toward only 20 percent of White wealth (both in per capita terms), driven in part by differences in rates of return.

Boerma and Karabarbounis (2021) model barriers and how they influence racial gaps in occupations, income, and wealth. They, too, see a major role for differences in risky investments and rates of return in contributing to the Black-White wealth gap. They argue that policies promoting Black entrepreneurship would be more effective at reducing the long-run wealth gap than would onetime reparations.

Schwandt et al. (2021) report a 50 percent reduction in the Black-White life expectancy gap in the United States from 1990 to 2012 and a plateau in the gap through 2018. Meara, Richards, and Cutler (2008) document large gaps in life expectancy by race and education. Case and Deaton (2015, 2017) underscore the recent decline in life expectancy for White men, in particular those with less education. Although not their focus, they report that life expectancy has continued to climb for Black Americans, narrowing the gap with White Americans. Chetty et al. (2016) use income from tax records and deaths from the Social Security Administration to establish the positive correlation between income and life expectancy at age 40, suggesting that welfare gaps are reinforced by combining these differences.

Higgins (2022) finds that Black Americans spend a lower share of income on housing and argues that this pattern reflects residential segregation. Black Americans often live in worse neighborhoods than White Americans, in part due to redlining restrictions and other historical forms of discrimination. Our consumption measure does incorporate differences in expenditures on housing but is surely incomplete in capturing access to public goods such as parks and good neighborhoods. Moreover,

[2] Monge-Naranjo and Vizcaino (2018) document the occupational distribution of Hispanic workers in the United States and how it has moved into skilled occupations but still lags behind the overall workforce.

Fogli and Guerrieri (2019) and Higgins (2022) emphasize how residential segregation can lead to persistent inequality through its effect on human capital investments and wealth, respectively.

In addition to the quality of housing and neighborhoods, consumption prices may differ across locations in ways correlated with race. Diamond and Moretti (2021) show that consumption wages are lower in more expensive cities, in particular for less educated workers. Butters, Sacks, and Seo (2022) establish that Black Americans pay several percentage point higher prices per unit than White Americans in the AC Nielsen scanner data. Neither our baseline measure nor our extensions capture neighborhood quality or price differences, primarily because of data limitations. Our measures of welfare therefore likely understate both the current gap as well as the historical progress that has been made. We hope that future research will incorporate these and other forces.

I. Expected Utility Framework

We define lifetime expected utility "behind the veil" for an individual of race i:

$$U_i = \sum_{a=0}^{100} \beta^a S_{ia}\left(1 - I_{ia}\right) \cdot \mathbb{E}\left[u\left(c_{ia}, \ell_{ia}\right)\right].$$

Here, a indexes age, $0 < \beta \leq 1$ is the discount factor, S_{ia} is the probability a person survives from birth to age a, I_{ia} is the incarceration rate, c is consumption, and ℓ is leisure. This formulation implies that flow utility is equal to zero while incarcerated.[3]

While it is customary to think of applying this equation to an individual as they age, we do not have the requisite data to calculate life expectancy and the other variables by cohort. Looking at individuals born from 1984 onward, we would necessarily be making many extrapolations. Instead of trying to calculate "cohort" (or generation) life expectancy, we instead calculate what demographers call "period" life expectancy. This is a summary of the cross section of mortality rates that prevail in a given year. We apply this period methodology to consumption, leisure, and incarceration in a cross section of people at a point in time.

Our utility function has the following interpretation: Consider an individual alive in some year, and suppose that that individual lived his or her entire life traveling through the cross section of consumption, leisure, and mortality rates that prevail in those years. More specifically, this individual receives a draw from the joint distribution at each age. Expected utility behind the veil (i.e., knowing one's race and the distribution of outcomes by race but not the exact realizations) would be U_i. In our benchmark calculations that follow, we assume $\beta = 1$, so the only discounting across ages/people in the cross section occurs because of mortality.[4]

[3] We show robustness to this assumption in Table 2.

[4] Because our preferences are time separable and we look at consumption and leisure *conditional* on survival, we do not need to assume that survival is independent of consumption and leisure.

To implement our consumption-equivalent welfare calculation, let $U_i(\lambda)$ denote expected lifetime utility for an individual of race i if consumption is multiplied by a factor λ at each age:

$$U_i(\lambda) \;=\; \sum_{a=0}^{100} S_{ia}(1 - I_{ia}) \cdot \mathbb{E}\big[u(\lambda c_{ia}, \ell_{ia})\big].$$

By what factor λ must we adjust the consumption of all White Americans to make them indifferent between living in the conditions prevailing for Black Americans and their own? That consumption adjustment satisfies

$$U_W(\lambda) \;=\; U_B(1). \tag{1}$$

Denoting the sampling weight of an individual j of race i and age a as ω_{ia}^j, and the number of individuals of the same race and age as N_{ia}, we replace the expectation operator with the estimate provided by the sample mean:

$$U_i(\lambda) \;=\; \sum_{a=0}^{100} S_{ia}(1 - I_{ia}) \sum_{j=1}^{N_{ia}} \omega_{ia}^j u\big(\lambda c_{ia}^j, \ell_{ia}^j\big).$$

We assume that flow utility takes the following form:

$$u(c, \ell) \;=\; \bar{u} + \log(c) + v(\ell),$$

where flow utility from leisure ℓ features a constant Frisch elasticity:

$$v(\ell) \;=\; -\frac{\theta\epsilon}{1+\epsilon} \cdot (1 - \ell)^{\frac{1+\epsilon}{\epsilon}}.$$

Here, $\epsilon > 0$ is the Frisch (compensated) elasticity of labor supply, and $\theta > 0$ is a weighting parameter. Denote average flow utility for an individual of race i and age a as

$$u_{ia} \;\equiv\; \sum_{j=1}^{N_{ia}} \omega_{ia}^j u\big(c_{ia}^j, \ell_{ia}^j\big).$$

Solving for the scaling constant in equation (1) under these assumptions, we obtain

$$\log(\lambda) \;=\; \frac{1}{\sum_{a=0}^{100} S_{Wa}(1 - I_{Wa})} \cdot \sum_{a=0}^{100} \{u_{Ba}(1 - I_{Ba})(S_{Ba} - S_{Wa}) \tag{2}$$

$$+\, u_{Ba} S_{Wa}(I_{Wa} - I_{Ba}) + S_{Wa}(1 - I_{Wa})(u_{Ba} - u_{Wa})\}.$$

This equation tells us that White Americans would need to have lower consumption to have the same lifetime utility as Black Americans to the extent that the latter have lower life expectancy and flow utility but face higher incarceration rates.

To ease notation, define survival and incarceration rates normalized by White incarceration-adjusted life expectancy:

$$s_{ia} \equiv \frac{S_{ia}(1 - I_{ia})}{\sum_{a=0}^{100} S_{Wa}(1 - I_{Wa})},$$

$$\Delta s_{Ba} \equiv \frac{(S_{Ba} - S_{Wa})(1 - I_{Ba})}{\sum_{a=0}^{100} S_{Wa}(1 - I_{Wa})},$$

$$\Delta i_{Ba} \equiv \frac{(I_{Wa} - I_{Ba})\, S_{Wa}}{\sum_{a=0}^{100} S_{Wa}(1 - I_{Wa})}.$$

Further denote average lifetime utility from consumption and leisure as

$$\mathbb{E}\log(c_i) \equiv \sum_{a=0}^{100} s_{Wa} \sum_{j=1}^{N_{ia}} \omega_{ia}^{j} \log\left(c_{ia}^{j}\right) \quad \text{and} \quad \mathbb{E}v(\ell_i) \equiv \sum_{a=0}^{100} s_{Wa} \sum_{j=1}^{N_{ia}} \omega_{ia}^{j} v\left(\ell_{ia}^{j}\right).$$

Finally, denote average lifetime consumption and leisure as

$$\bar{c}_i \equiv \sum_{a=0}^{100} s_{Wa} \sum_{j=1}^{N_{ia}} \omega_{ia}^{j} c_{ia}^{j} \quad \text{and} \quad \bar{\ell}_i \equiv \sum_{a=0}^{100} s_{Wa} \sum_{j=1}^{N_{ia}} \omega_{ia}^{j} \ell_{ia}^{j}.$$

Substituting these definitions into equation (2), we obtain the following decomposition of consumption-equivalent welfare:

$$\begin{aligned}
(3)\ \log(\lambda) \;=\; & \textstyle\sum_{a=0}^{100} \Delta s_{Ba} \cdot u_{Ba} && \text{Life expectancy} \\
& + \textstyle\sum_{a=0}^{100} \Delta i_{Ba} \cdot u_{Ba} && \text{Incarceration} \\
& + \log(\bar{c}_B) - \log(\bar{c}_W) && \text{Consumption} \\
& + v\left(\bar{\ell}_B\right) - v\left(\bar{\ell}_W\right) && \text{Leisure} \\
& + \mathbb{E}\log(c_B) - \log(\bar{c}_B) - \left[\mathbb{E}\log(c_W) - \log(\bar{c}_W)\right] && \text{Consumption inequality} \\
& + \mathbb{E}v(\ell_B) - v\left(\bar{\ell}_B\right) - \left[\mathbb{E}v(\ell_W) - v\left(\bar{\ell}_W\right)\right] && \text{Leisure inequality.}
\end{aligned}$$

Notice here that λ is an *equivalent* variation in that it adjusts the consumption of White Americans so that their welfare equals that of Black Americans. A *compensating* variation can be analogously defined, instead adjusting the consumption of Black Americans to equalize welfare across race. In the quantification of this welfare calculation in Section IV, we report the geometric average of the equivalent and compensating variations.

While our accounting exercise uses the general expression in equation (3), it is helpful for intuition to see how it simplifies under a few conditions. Suppose that (i) consumption is constant across ages, (ii) consumption is lognormally distributed

with variance σ^2, (iii) leisure is the same for all individuals within each race, and (iv) incarceration rates are equal to zero for all groups. With these assumptions, the previous decomposition becomes

$$\begin{aligned}\log\left(\lambda^{simple}\right) = & \frac{e_B - e_W}{e_W} \cdot \left[\bar{u} + \log\left(\bar{c}_B\right) + v\left(\bar{\ell}_B\right) - \sigma_B^2/2\right] \quad \text{Life expectancy} \\ & + \log\left(\bar{c}_B\right) - \log\left(\bar{c}_W\right) \quad \text{Consumption} \\ & + v\left(\bar{\ell}_B\right) - v\left(\bar{\ell}_W\right) \quad \text{Leisure} \\ & - \left(\sigma_B^2 - \sigma_W^2\right)/2 \quad \text{Consumption inequality.}\end{aligned}$$

The percent difference in life expectancy ($e_i \equiv \sum_{a=0}^{100} S_{ia}$) between the two groups matters for welfare, with the difference weighted by the average flow utility of one of the groups. With log utility and lognormal shocks, the variance of consumption in the cross section reduces welfare by the usual factor of one-half. Finally, a 1 percent difference in life expectancy is approximately equal to a $\bar{u}$ percent difference in consumption in a year, provided that we normalize $\bar{c} = 1$ and the $v\left(\ell\right)$ and σ^2 terms are small.

II. Datasets

Our consumption-equivalent welfare calculation requires microdata on survival rates, incarceration rates, consumption, and leisure by race. We draw on four sources: Life Tables and mortality data from the US Centers for Disease Control and Prevention (CDC), National Prisoner Statistics (NPS) and the Annual Survey of Jails (ASJ) from the US Bureau of Justice Statistics (BJS), the Consumer Expenditure Survey (CEX) from the US Department of Labor, and the Current Population Survey (CPS) from the US Census Bureau.

A. *Racial Definitions*

In all the data sources we use, we follow the 1977 Office of Management and Budget (OMB) standards for race and ethnicity. Those standards define four racial groups (White, Black, Native American, and Asian or Pacific Islander).

In 1997, the OMB revised its standards to allow respondents to report two or more racial groups. From 1997 on, therefore, we treat multiple-race observations as fractional and divide each observation's sampling weight by the number of groups reported for that observation. Because Latin origin is not always reported over time in some of our data sources, and because the CDC only started publishing Life Tables by Latin origin in 2006, people of Latin ethnicity are incorporated into the Black and White American categories in all years and for most of our data sources.[5]

[5] The exception is for the incarceration data. Indeed, the NPS only reports prisoner counts for Black and White Americans who are not of Latin origin.

B. *Survival Rates*

Our data on survival rates come from the CDC's Life Tables (Centers for Disease Control and Prevention 2024b), which are available for the Black and White population since 1890. However, starting in 2018, the CDC stopped publishing Life Tables for Black and White Americans irrespective of Latin origin. Therefore, from 2018 onward, we calculate survival rates using individual death records from the mortality data files of the CDC's National Vital Statistics System (NVSS) (Centers for Disease Control and Prevention 2021, 2024a). Each record contains information on the deceased's gender, race, and age. We then use the CDC's bridged-race population estimates to determine the population at risk by gender, race, and age from 2018 onward.

Figure 1, panel A plots life expectancy at birth for Black and White Americans from 1984 to 2022. In 1984, Black Americans had approximately six fewer years of life expectancy compared to White Americans, a gap that narrowed to about four years by 2022. The COVID-19 pandemic caused a temporary widening of this gap in 2020 and 2021; however, by 2022, it had mostly reverted to prepandemic levels.[6] Note that life expectancy fell mostly for older individuals during the pandemic, and this is captured by our "period" life expectancy measure based on cross-sectional mortality rates in each year.

From 1984 to the mid-1990s, lifespans diverged before converging significantly through the early 2010s. Over the past decade, life expectancy has plateaued or declined for both White and Black Americans. Case and Deaton (2015, 2017) attribute this stagnation to "deaths of despair," which include suicide, opioid overdoses, and alcohol-related chronic illnesses.

C. *Incarceration Rates*

Our data on incarceration come from the US Bureau of Justice Statistics (1978–2022, 1985–2022), which provides comprehensive data on the incarcerated population by race since the 1980s. For the purposes of our analysis, we focus on Black and White Americans, aggregated across both federal and state prisons as well as local jails. We calculate incarceration rates by dividing the number of incarcerated individuals in each group by the corresponding population estimates from the US Census Bureau (2024).[7] To address changes in population measurement methods over time, we use the Census Bureau's bridged-race population estimates for consistency across time.

Figure 1, panel E illustrates incarceration rates for Black and White Americans from 1984 to 2022. In 1984, the incarceration rate for Black Americans was almost seven times higher than for White Americans, a gap that narrowed slightly but persisted through 2022. The 1990s marked a sharp increase in incarceration due to tougher sentencing laws and the war on drugs, peaking in the mid-2000s. Since then,

[6] See Almagro and Orane-Hutchinson (2022) and Benitez, Courtemanche, and Yelowitz (2020) for evidence on racial disparities in COVID-19 exposure and its determinants.

[7] To account for the fact that the vast majority of incarcerated individuals are between the ages of 18 and 84, we set the incarceration rate outside this range equal to zero.

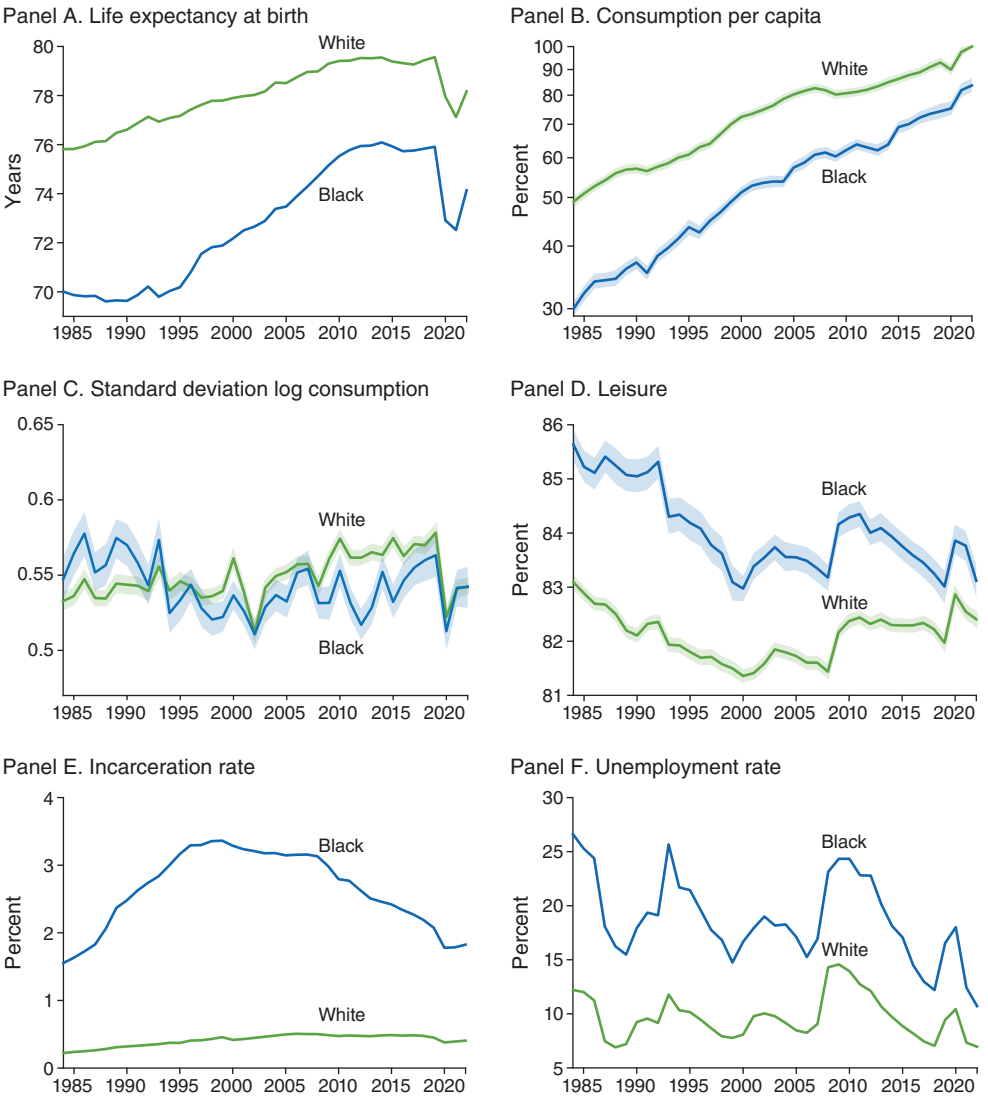

FIGURE 1. KEY DATA BY RACE

Notes: Author calculations using data from the CDC, the BJS, the CEX, and the CPS. For our inequality measures, we use nondurable consumption in order to avoid the overstatement that would otherwise arise from the lumpiness of durable spending. Shaded areas represent the 95 percent confidence interval of each series from 1,000 bootstrap samples.

incarceration rates have declined, especially for Black Americans, though significant racial disparities remain.

D. *Consumption*

Our consumption data come from the CEX interview samples (US Bureau of Labor Statistics 2024). For each year from 1984 to 2022, a rotating panel of about 20,000 households is interviewed about their expenditures on hundreds of goods and

services for up to four quarters. The survey asks about total household expenditures on each of those items, but it also contains the race, age, gender, and educational attainment of each household member. Our measure of household expenditures includes housing (rent paid by renters and self-reported rental equivalence for homeowners). To arrive at a measure of individual consumption, we divide household spending evenly among household members.

It is well known that consumption expenditures from the CEX do not align with personal consumption expenditures in the National Income and Product Accounts (NIPA) (Aguiar and Bils 2015). To address this, we rescale total individual consumption in the CEX so that it matches the NIPA personal consumption expenditures per capita for each year from 1984 to 2022 (US Bureau of Economic Analysis 2024a, b). However, Aguiar and Bils (2015) also document that high-income expenditures, such as spending on luxuries, are increasingly underreported in the CEX. Since White Americans have higher earnings than Black Americans on average, this underreporting could lead to an underestimation of White Americans' consumption relative to that of Black Americans. If this underreporting were significant, we would expect average earnings growth to outpace average consumption growth for White Americans compared to Black Americans. However, we find that the ratio of average earnings growth in the CPS to average consumption growth in the CEX between 1984 and 2022 is similar for both groups and even slightly lower for White Americans (0.75 and 0.83, respectively).

Figure 1, panel B plots consumption per capita for Black and White Americans when White consumption is normalized to 100 in 2022. Consumption per person was about 39 percent lower for Black Americans in 1984 but only 16 percent lower in 2022. Notice that here (and elsewhere whenever possible) we provide bootstrapped 95 percent confidence intervals. The bands are typically narrow and sometimes hard to see as a result.[8]

Figure 1, panel C displays the standard deviation of log nondurable consumption across people within a group by year. Consumption dispersion is choppy across years due to modest sample sizes, especially for Black Americans. The standard deviations for both groups hover around 0.55. If consumption is lognormally distributed, then with log utility, such inequality lowers consumption-equivalent welfare by 15 percent for each group.[9]

E. *Leisure*

Our leisure estimates are derived from hours worked in the CPS for each year from 1984 to 2022 (Flood et al. 2024). We define leisure as the fraction of total waking hours that are not spent on market work over the year:

$$\ell \equiv \frac{5{,}840 - \text{hours worked in the year}}{5{,}840}.$$

[8] This is in line with the results of Fernández-Villaverde and Krueger (2007), who also perform bootstrap simulations in the CEX to assess the precision of consumption life cycle profile estimates. They find that those estimates are precise with tight confidence intervals.

[9] In the case of additively separable utility from consumption and lognormally distributed consumption, the loss in consumption-equivalent welfare from behind-the-veil inequality is the coefficient of relative risk aversion times the variance of log consumption divided by two.

We obtain 5,840 total hours available as the product of 16 hours per day and 365 days.[10] In a rough attempt to account for the division of nonmarket work, we divide hours worked per year equally among individuals between 25 and 64 years old within each household.[11] For household members outside this age range, we make no adjustment. The resulting split in leisure time between men and women is similar to that found in Aguiar and Hurst (2007), who carefully delineate leisure from home production work in time-use surveys.

Recognizing that unemployment may not be equivalent to leisure, we perform an adjustment where unemployed individuals have their hours worked set to full-time hours.[12] This adjustment ensures that leisure hours are no longer greater for unemployed individuals. We also consider a broad definition of unemployment, including the unemployed and marginally attached workers as well as workers who are involuntarily working part-time. As illustrated in Figure 1, panel F, Black Americans face a persistently higher rate of unemployment than White Americans in our sample.

Figure 1, panel D shows that leisure is about 3 percentage points higher for Black Americans than for White Americans in 1984 but only around 1 percentage point higher in 2022. There are sizable fluctuations in between, with leisure rising notably for both groups in the 2008–2009 Great Recession and its aftermath. Using this same data, we also computed the standard deviation of leisure across individuals within groups. Just as for consumption, unequal leisure lowers average utility due to diminishing marginal utility from leisure. Leisure inequality is similar across racial groups, especially at the end of the sample.

III. Calibration

The three key parameters to be calibrated are the Frisch elasticity ϵ, the utility weight on leisure θ, and the intercept in flow utility $\bar{u}$. We provide our baseline parameter values here but explore robustness to alternative parameter values in Section IVA.

We consider a Frisch elasticity of labor supply of 1.0, which implies that the disutility from working rises with the square of the number of hours worked. This is a compromise between Hall (2009), who advocates for a Frisch elasticity of 1.7, and Chetty et al. (2013), who recommend a value closer to 0.5.

We use the first-order condition for the labor-leisure choice to calibrate the weight on leisure in the utility function. The corresponding static first-order condition is $u_\ell/u_c = w(1-\tau)$, where w is the real wage and τ is the marginal tax rate on labor income. With logarithmic utility from consumption and a constant Frisch elasticity, this implies $\theta = w(1-\tau)(1-\ell)^{-1/\epsilon}/c$. The marginal tax rate τ is borrowed from Barro and Redlick (2011), who report a value of 0.353 for the United States in 2006. Consumption per person in 2006 is obtained from NIPA Table 2.4.5, where we

[10] We use 366 days for leap years and assume eight hours a day of sleep.

[11] Aguiar and Hurst (2007) and Erosa et al. (2017), among many others, document that women typically spend more time on home production than men.

[12] Surveys by Krueger and Mueller (2011) shed light on how flow utility varies with employment status. They find that the same leisure activities yield less enjoyment when a person is unemployed compared to when they are employed. They also find that those unemployed had similar hours worked in their previous jobs as employed individuals.

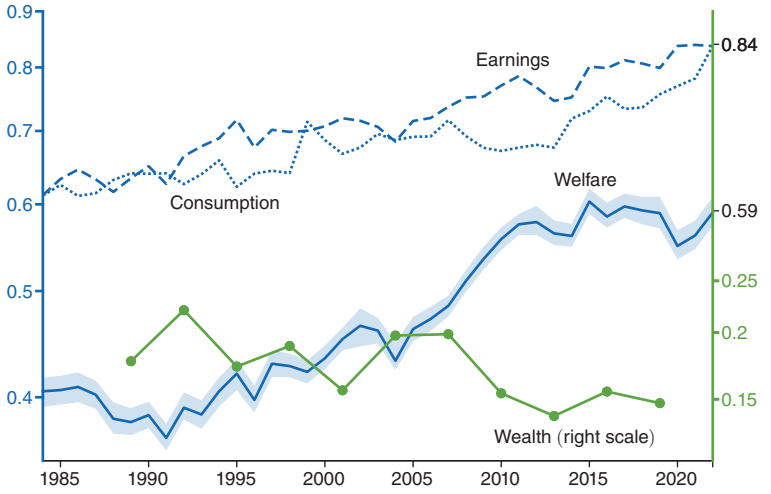

Figure 2. Consumption-Equivalent Welfare, Black versus White Americans

Notes: The figure shows the consumption-equivalent welfare for Black relative to White Americans from 1984 to 2022, computed according to equation (3). The shaded area represents the 95 percent confidence interval from 1,000 bootstrap samples of the CEX and CPS. For comparison, we also show the corresponding relative consumption, earnings, and wealth level. The earnings series is from the CPS and includes wage, salary, business, and farm income before taxes and transfers. The wealth series is from Aladangady and Forde (2021) and corresponds to total net worth.

subtract insurance from total personal consumption expenditures to obtain a value of $31,046 in 2012 dollars. Average earnings and leisure are calculated directly from the CPS, where we restrict on prime-age workers (25–55 years old) and obtain values of $38,491 in 2012 dollars and 0.70, respectively. This delivers a value of $\theta = 8.9$.

The intercept in flow utility, $\bar{u}$, is critical for valuing differences in mortality. The US Environmental Protection Agency (2020) recommends $7.4 million for the value of remaining life in 2006 dollars for those aged 25 to 55 (of all races). Hall, Jones, and Klenow (2020) use this figure when valuing lives at risk from COVID-19. Matching this number leads to $\bar{u} = 6.26$ when consumption per capita is normalized to 1.0 in 2022. This means that $\bar{u}$ has a natural interpretation for our utility function: One additional year of life is valued at $\bar{u} = 6.26$ years of 2022 consumption. Note that we assume that the intercept in utility $\bar{u}$ is common for Black and White individuals, but this does not imply the same flow utility given differences in mortality, consumption, leisure, and incarceration.

IV. Welfare

We combine our ingredients into a single measure of consumption-equivalent welfare as described in Section I. Figure 2 plots Black versus White welfare from 1984 through 2022. The initial level in 1984 is surprisingly low at 40 percent. It rises to around 60 percent from the mid-1990s to the early 2010s. The gap between Black and White Americans remains disappointingly wide.

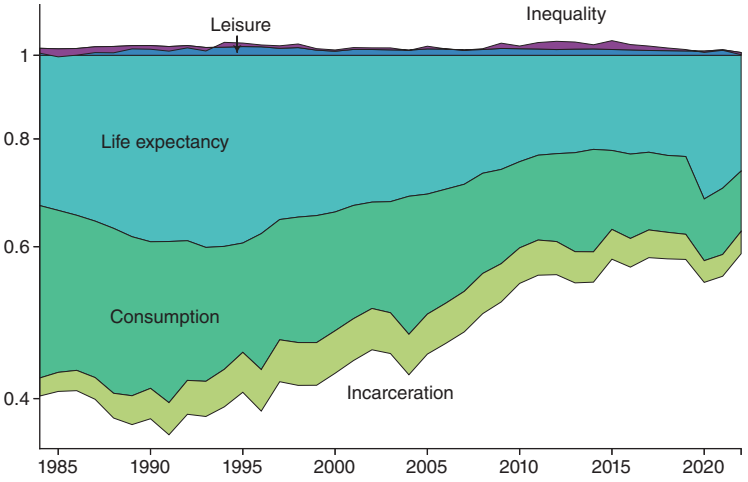

FIGURE 3. RELATIVE WELFARE DECOMPOSITION

Notes: The figure shows the decomposition of consumption-equivalent welfare for Black relative to White Americans from 1984 to 2022, computed according to equation (3). Author calculations using data from the CDC's NVSS, the BJS's NPS and ASJ, and the Department of Labor's CPS and CEX.

The figure also plots consumption from the CEX, earnings from the CPS, and wealth from Aladangady and Forde (2021), who use the Federal Reserve's Survey of Consumer Finances. Earnings include wages, salaries, business income, and farm income before taxes and transfers.[13] In Supplemental Appendix Figure A5, we also plot the racial gap in earnings after taxes and transfers.[14] Black relative earnings were notably higher than Black relative welfare until the 2010s. In contrast, Black relative wealth is significantly lower throughout the period, actually declining in recent years to just 15 percent. This illustrates the contribution of life expectancy (versus earnings and wealth) to gaps in welfare.

Figure 3 decomposes the drivers of the overall welfare differences using the expression in equation (3). The three biggest contributors are life expectancy, consumption, and incarceration. Leisure, inequality in consumption, and inequality in leisure contribute surprisingly little to both levels and trends.

We next examine welfare growth rates in Table 1 by applying equation (3) over time. From 1984 to 2022, Black consumption-equivalent welfare grew 3.28 percent per year, faster than earnings growth of 2.21 percent per year. For White Americans,

[13] Our approach differs from that of Derenoncourt and Montialoux (2021) in several key aspects. While they restrict their sample to individuals aged 25–65 and exclude self-employed workers, unpaid family workers, individuals in group quarters, workers employed for less than 13 weeks in the previous year or less than three hours in the previous week, and those with missing industry or occupation data, we do not apply these restrictions. Additionally, they focus solely on wage earnings, whereas we include total earnings from wages, business, and farm income. Furthermore, we calculate individual earnings as the sum of a family's earnings divided by the number of family members.

[14] The Supplemental Appendix provides detail on the taxes and transfers included. Figure A5 there makes clear that the difference between the relative earnings and relative post-tax-and-transfer earnings of Black and White Americans has narrowed over time. This implies that the extent of racial progress in terms of consumption cannot be attributed to more generous transfers to Black Americans.

Table 1—Welfare Growth between 1984 and 2022 (Percent)

			Decomposition					
	Welfare	Earnings	*LE*	*I*	c	$\sigma(c)$	ℓ	$\sigma(\ell)$
Black	3.28	2.21	0.80	−0.03	2.61	0.00	−0.07	−0.03
White	2.17	1.37	0.45	−0.02	1.83	−0.03	−0.04	−0.02
Gap	1.11	0.84	0.35	−0.01	0.78	0.03	−0.02	−0.01

Note: The last six columns report the additive decomposition in equation (3), where σ denotes the inequality terms.

welfare also rose more quickly than earnings (2.17 percent versus 1.37 percent per year). Cumulating this growth over time, consumption-equivalent welfare grew by a factor of 3.5 for Black Americans from 1984 to 2022 and by a factor of 2.3 for White Americans.

Table 1 also decomposes the contributions to growth rates. From 1984 to 2022, the biggest contributor was consumption growth at 2.61 percent for Black Americans and 1.83 percent for White Americans.[15] Life expectancy was the next most important at 0.8 percent per year for Black Americans and 0.45 percent for White Americans.[16] Though dwarfed by other factors, rising inequality of consumption and leisure together subtracted 3 and 5 basis points a year from growth for Black and White Americans, respectively. Falling leisure and rising incarceration lowered growth by 10 basis points a year for Black Americans and 6 basis points a year for White Americans.

A. *Robustness*

In this section, we assess the robustness of our benchmark results to alternative assumptions and parameter values. Table 2 shows that the welfare gap between Black and White Americans is fairly robust in both the beginning and ending years of our sample to a variety of adjustments.

As described in Section I, our benchmark welfare calculation is a geometric average of *equivalent* and *compensating* variations. The second and third rows of Table 2 show that averaging between these two metrics (as our baseline calculation in the first row does) has a modest effect as the two variations differ by around 2 to 3 percentage points.

The fourth and fifth rows, respectively, show robustness to a discount factor of $\beta = 0.99$ as well as consumption growth of 2 percent per year and dividing household consumption by the square root of the number of household members rather than by the number of household members. Both of these changes move our bottom line estimates by at most 2 percentage points.

[15] It is not surprising that consumption growth does not track earnings growth perfectly. See, for example, Krueger and Perri (2006) or Heathcote, Storesletten, and Violante (2013).

[16] Becker, Philipson, and Soares (2005) similarly found that rising life expectancy was a major contributor to "full income" growth in the United States and other countries in recent decades.

TABLE 2—ROBUSTNESS RESULTS

	Consumption-equivalent welfare (%)	
	1984	2022
Benchmark case	40.5	59.0
Equivalent variation	42.1	60.0
Compensating variation	38.9	58.0
$\beta = 0.99$ and $g = 0.02$	38.9	58.2
Household size (square root)	42.3	58.6
Ages 1 and above	42.1	60.4
Ages 5 and above	41.4	59.7
$\gamma = 2$	53.7	60.8
Frisch elasticity = 0.5	40.6	58.9
Frisch elasticity = 2	40.5	59.0
Value of life = \$5 million	48.2	66.7
Value of life = \$10 million	33.6	51.7
Incarceration 50% utility	41.5	60.7
Unemployment 50% leisure	41.1	59.4

Note: See the main text for a discussion of the various robustness cases.

To make sure that infant mortality is not driving our results, the sixth and seventh rows report our welfare calculation when utility is evaluated starting at age one or five, respectively. In contrast, the next three rows show robustness to alternative parameter values for the utility function. As mentioned, leisure plays a relatively muted role in our calculation, which is why it is not surprising that a Frisch elasticity of labor supply of 0.5 or 2 instead of unity leaves our results almost unchanged.[17] However, imposing more curvature in the utility function slightly raises the welfare of Black relative to White Americans. More precisely, we consider the following flow utility function:

$$u(c,\ell) = \bar{u} + \frac{c^{1-\gamma}}{1-\gamma} \cdot \left[1 + (\gamma - 1)\theta \cdot \frac{\epsilon\left(1-\ell\right)^{\frac{1+\epsilon}{\epsilon}}}{1+\epsilon}\right]^{\gamma} - \frac{1}{1-\gamma},$$

which nests our baseline specification as $\gamma \to 1$. This formulation allows us to vary γ while holding the Frich elasticity of labor supply fixed at η.

The next two rows of Table 2 show that another consequential assumption in our calculation is the value assumed for the intercept $\bar{u}$ in the utility function. We vary this intercept such that the remaining value of life for a 40-year-old in 2006 dollars is \$5 million or \$10 million instead of our benchmark value of \$7.4 million. As discussed earlier, since life expectancy is such a critical ingredient in our calculation, changing the remaining value of life to \$5 million or \$10 million, respectively, narrows or widens the welfare gap by about 6 to 8 percentage points both in 1984 and 2022. However, life expectancy is also an important driver of the *convergence* in living standards between Black and White Americans, which means that a larger (lower) value of life implies a faster (slower) catch-up in welfare by a little over 1 percentage point over the entire sample.

[17] When changing this elasticity, we also recalibrate the weight of leisure in the utility function to ensure that the optimality condition for the labor-leisure choice is satisfied.

Finally, we assess the robustness of our estimates by modifying our assumptions about incarceration and unemployment. For incarceration, instead of assuming that flow utility is zero while incarcerated, we assign it a value equal to 50 percent of the average flow utility of individuals with a high school degree or less. For unemployment, rather than treating all the extra leisure time of the unemployed as nonleisure time, we assume that 50 percent of this additional time is considered as leisure. Implementing these adjustments results in minimal changes to our findings.

Geographic Heterogeneity.—Comparing the South to non-South census regions—the Midwest, Northeast, and West regions—offers a lens to assess whether geographic location influences welfare disparities. The South's unique historical and economic context makes it a particularly relevant comparison point. Our analysis begins in 1999 due to the unavailability of state-level life expectancy data before this year. Figure 4 in the Supplemental Appendix shows minimal variation between the South and non-South, with both regions showing similar levels and trends in Black-White welfare disparities over the 1999–2019 period.

Morbidity.—In the Supplemental Appendix, we also incorporate differences in morbidity, an extension that involves more speculative measurements and assumptions. We find that differences in morbidity could contribute importantly to Black-White welfare differences. A common measure of quality-adjusted life years from the 1997–2018 National Health Interview Survey implies that morbidity differences increase the Black versus White welfare gap by over 20 percentage points in 2018.

V. Conclusion

We study consumption-equivalent welfare for Black and White Americans to gauge the importance and cumulative impact of gaps in consumption, life expectancy, incarceration, leisure, and inequality in both consumption and leisure. According to our estimates, these factors combined to generate welfare for Black Americans that was only 40 percent of that for White Americans in 1984. Black welfare rose to 59 percent of White welfare by 2022, driven by narrowing differences in life expectancy and consumption. Of the sizable 41 percent welfare gap that remains, roughly 24 percent comes from life expectancy and 12 percent from consumption.

Improving our measurement would be a productive avenue for future research. It would also be valuable to include other considerations, such as differential access to good neighborhoods and differences in prices paid by race.

We view our calculations as potentially useful for evaluating policies to address racial inequality. Such policies often affect multiple outcomes, including consumption, life expectancy, and incarceration. Our methodology allows different outcomes to be expressed in common units, making it easier to conduct a full cost-benefit analysis.

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