

# The Dynamics of the Racial Wealth Gap

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**Abstract:** Numerous studies in the empirical microeconomics literature have led to the conclusion that the racial wealth gap in the US is too large to be explained by the racial income gap. This paper uses a heterogeneous agents dynamic stochastic general equilibrium model to study the key mechanisms contributing to the racial wealth gap. We find that, when viewed through the lens of a dynamic model, the large and persistent racial wealth gap is entirely consistent with the smaller racial income gap. We calibrate our model to the initial conditions of the time period over which there has been racial equality under the law in the US. A baseline experiment predicts that after 100 years the black/white mean wealth ratio will only increase to 0.22, and 259 years would be required for the ratio to reach 0.90. Accounting for several factors over a transition path to equality, we find that the labor income gap is responsible for three-fourths of the wealth gap, with initial conditions being the next largest contributor. Neither differences in bequests nor returns to capital are major contributors to the wealth gap.

**Keywords:**

**JEL Classification Codes:**

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# 1 Introduction

The racial wealth gap in the United States is considerably larger than the racial earnings gap. The average wealth of white households has been 5-10 times that of black households over recent decades, while the average earnings of white households has stayed around 2 times that of black households (Figure 1a). To put the wealth gap in context, we note that the black wealth distribution in 2016 is first-order stochastically dominated by the white wealth distribution from 1962 (Figure 1b).

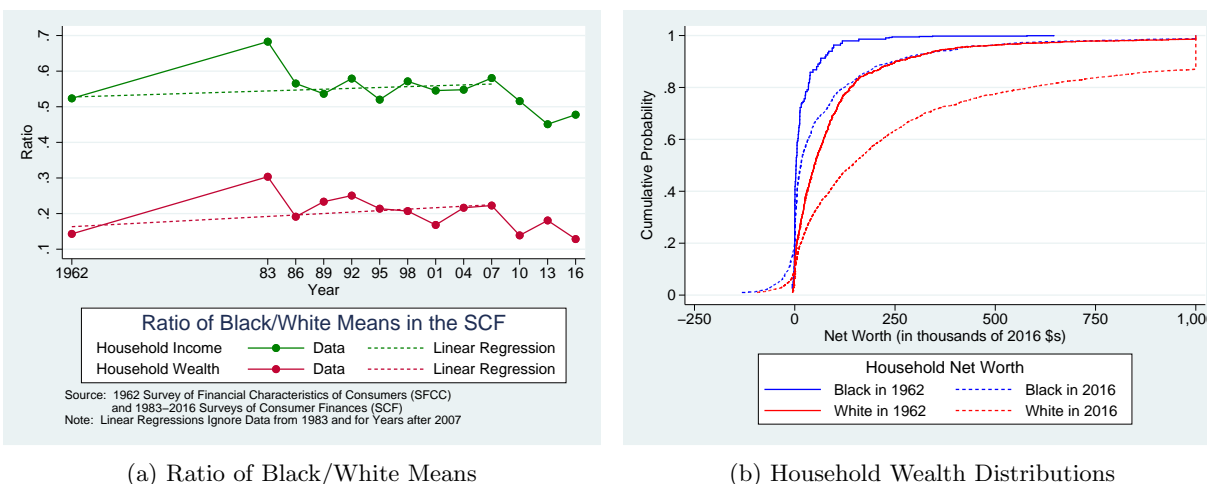


Figure 1: Earnings and Wealth in the Surveys of Consumer Finances (SCFs)

Note: These figures display data from the 1962 Survey of Financial Characteristics of Consumers (SFCC) and the 1983-2016 Survey of Consumer Finances (SCF). All households have heads aged 30-60 who are either black or white. We use the net worth variable constructed by the SCF in the years 1983 and after, and for 1962 we define net worth as total assets minus total debts, where we construct total assets and total debts from the list of component variables (available [here](#)) according to the SCF definitions to match the net worth programs for 1983 onwards.

Conventional wisdom is that the racial wealth gap is too large to be explained by the earnings gap alone. This view began at least with Terrell (1971) and has only been strengthened by the results of cross-sectional studies that also include demographic differences and improve measurement. Blau and Graham (1990) concludes that two-thirds of the racial wealth gap is unexplained even after controlling for earnings and other demographic factors. The issue is not resolved by improving measurement of permanent income and permanent demographics like marriage and child-bearing histories, since this results in large disparities when predicting wealth by race (Altonji and Doraszelski (2005)).<sup>1</sup> The robustness of the result that earnings cannot account for the racial wealth gap has led researchers to study whether other factors can account for the racial wealth gap, such as differences in intergenerational transfers (Menchik and Jianakoplos (1997),

<sup>1</sup>The different relationships between earnings and wealth across blacks and whites makes it unclear what is the most reasonable comparison when using race-specific coefficients and counterfactual demographics to predict wealth. Altonji and Doraszelski (2005) find that predicting wealth after changing demographics using the black model leaves 75 percent of the wealth gap unexplained. Conducting a similar prediction exercise with the coefficients from the white sample explains 79 percent of the wealth gap. Another problem is that there is limited overlap between the black and white earnings distributions (Barsky et al. (2002)).

Avery and Rendall (2002)), differences in savings behavior (Charles et al. (2009)), or differences in rates of return (Gittleman and Wolff (2004)).<sup>2</sup>

In contrast to these empirical studies, we find that the large and persistent racial wealth gap is entirely consistent with the smaller racial earnings gap when viewed through the lens of a dynamic model. When our model is initialized to the 1962 wealth distribution and fed a sequence of slowly converging earnings differences, it predicts that it will take a very long time for the gap in average wealth between black and white households to equalize. For instance, after 100 years, the black/white mean wealth ratio is only 0.22, and an additional 159 years are required for the ratio to reach 0.90. Accounting for several factors over a transition path, we find that the labor income gap is responsible for three-fourths of the wealth gap, with initial conditions being the next largest contributor. Even when there are very large differences across race, neither differences in bequests nor returns to capital are major contributors to the wealth gap.

Our analysis uses a heterogeneous agents dynamic stochastic general equilibrium model in the spirit of Bewley (1986), Aiyagari (1994), Huggett (1993), and Krusell and Smith (1998) to study the key mechanisms thought to drive the racial wealth gap. Agents in the model (i) have a life cycle in which they work, retire, and face increasing mortality risk; (ii) are heterogeneous in terms of earnings and wealth within race; (iii) receive idiosyncratic income shocks; and (iv) may give or receive intergenerational transfers. To our knowledge, the only other study of the black-white wealth gap with a dynamic model of optimizing agents accumulating wealth is White (2007).<sup>3</sup> The model in White (2007) has dynastic households that face no idiosyncratic risk, and along the equilibrium path black households never accumulate positive assets, so his model is not suitable for our question.

We use our model to answer the following question: “Given unequal initial conditions and a gap between black and white labor incomes that closes as slowly as observed in the data, how long should one expect the wealth gap to persist?” To answer this question, we first calibrate the model to a final steady state in which all processes are identical across households, so that conditional distributions are identical across race. We then use the calibrated model to run a baseline numerical experiment in which the model is initialized to the income and wealth distributions for black and white households in the 1962 Survey of Consumer Finances (SCF). We compute the terminal steady state, and solve for a transition path from the initial to the final steady state. We assume along the transition path that there is an exogenous path for the labor income gap which begins at the ratio observed in the 1962 Survey of Financial Characteristics of Consumers (SFCC), closes at the rate observed in the subsequent SCFs (1986-2007), and remains at 1.0 after reaching this value somewhere along the path. As described above, our baseline experiment predicts that unequal initial conditions and persistent differences in labor income like those observed in the data will generate a wealth gap that is very slow to close.

In addition to our baseline experiment, we also use the calibrated model to simulate a series of

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<sup>2</sup>Early work on differences in savings behavior includes Klein and Mooney (1953) and Galenson (1972).

<sup>3</sup>There is an empirical literature on related topics. In addition to those studies already cited, see also Bleakley and Ferrie (2016), Sacerdote (2005), and Collins and Wanamaker (2017).

alternative counterfactual transition paths to investigate the next logical question: “Which are the main determinants of the convergence rate?” We study the relative importance of the labor income gap, differences in returns to capital, differences in bequests, and initial differences in wealth by conducting experiments that equalize these factors one by one or in combination, and we document how the resulting transition path changes. We find that the labor income gap accounts for about three-fourths of the wealth gap along the transition path. On average over the first fifty years, initial differences in wealth account for a third of the wealth gap. Naturally, the importance of this factor declines rapidly with time, so that by 2012 initial wealth conditions account for only 5 percent of the wealth gap.

Our numerical experiments indicate that neither differences in bequests nor differences in returns to capital play central roles in maintaining the racial wealth gap. This result might be surprising because there are very large differences in intergenerational transfers across race. In the data, white households are about three times more likely to have received an inheritance, and white households receive larger gifts conditional on receiving an inheritance.<sup>4</sup> Our calibrated model broadly reproduces this large disparity across race. The mean gift is two times average wealth (all households) for white households but only one-third for black households. Yet over the first 100 years, differences in bequests account for only a small fraction of the wealth gap, because as a fraction of total wealth bequests are small (roughly 1.7 percent).

Similarly, differences in rates of return to capital played a major role in generating the differences in the initial wealth distributions we study (Aaronson et al. (2017), Hamilton and Darity (2010)), and are therefore thought to play a major role in maintaining the wealth gap. We conduct a numerical experiment in which there is an implausibly large gap in the return to capital across race, at least for the time period we study, set to be equal to the labor income gap. Even with such a large gap in returns to capital, the different rates of return only account for basically none of the racial wealth gap over the first 100 years of the transition.

Our model’s findings underscore the importance of differences in labor market outcomes between black and white households for understanding persistent wealth inequality between them. While we remain (intentionally) agnostic as to the sources of these labor income differences, we take our findings as evidence that policies aimed improving this factor, whether through higher wages or through better labor market attachment, would be the most effective policy for eliminating the racial wealth gap. For instance, one might consider policies aimed at equalizing opportunity within public education.<sup>5</sup> Beyond this broad focus it is difficult to discern what would be most effective among policies like early childhood interventions (Elango et al. (2016)), expanding apprenticeship

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<sup>4</sup>In the Health and Retirement Study (HRS) in 1992, Smith (1995) finds that 34 percent of older white households had received an inheritance compared to 11 percent of older black households, with the mean gift for white households being almost double that for black households (\$149,000 vs \$86,000, respectively). In the 1989 SCF, Avery and Rendall (2002) find mean inheritances of \$159,000 for white recipient households and \$87,000 for black recipient households.

<sup>5</sup>Pre-market factors influenced by education are strong predictors of wages and employment (Neal and Johnson (1996), Keane and Wolpin (1997)). We are mindful of the caveat that any policy implications of our work depend on the marginal rate of transformation of public dollars into changes in the mechanisms studied here.

opportunities (Lerman (2014)), increasing resources for schools (Lafortune et al. (2018)), improving the production technology within schools (Tough (2016)), or coordinating and expanding place-based enrichment through [Promise Neighborhoods](#) (Tough (2009)). We do note, however, that there is likely to be an important spatial component to any policy response. Given the history of racial segregation in the US, even slight racial preferences can maintain segregation (Bayer et al. (2018)), and this mechanism appears to be more consequential than earnings and wealth combined (Aliprantis et al. (2018)).<sup>6</sup>

The remainder of the paper is organized as follows: Section 2 presents the model, stating the household’s problem recursively. Section 3 describes the calibration of the model. Section 4.1 documents the transition path under our baseline numerical experiment, in which there are no differences in returns to capital and the path of the labor income gap and bequests match what we observe in the data. In Section 4.2 we conduct additional numerical experiments in which we counterfactually alter key mechanisms in order to quantify their contributions to the wealth gap over time. Section 6 concludes.

## 2 Model

There is a unit continuum of households divided between black and white in time-invariant fractions  $s$  and  $1 - s$ . Each household is endowed with one unit of discretionary time to divide between leisure  $\ell$  and working  $h$ . All households value consumption and leisure according to the period utility function  $u(c, \ell)$ . Households also value leaving wealth bequests according to the function  $z(\cdot)$ .

Households have a life cycle: They are born at age  $\underline{a}$ , face increasing mortality risk as they age, and will die with certainty by age  $\bar{a}$ . At age  $a_b$  households receive a bequest  $b$ , and retire at age  $a_r$  where  $a_b < a_r < \bar{a}$ . Households differ by labor productivity  $\Phi(a)\varepsilon$ , where  $\Phi(a)$  is a deterministic age-earnings profile and  $\varepsilon$  follows an AR(1) process:

$$\log(\varepsilon') = \rho \log(\varepsilon) + \eta'$$

Households cannot insure against labor productivity shocks, but can smooth consumption by saving an asset that returns  $1 + R$  units of consumption tomorrow. Because households cannot perfectly insure their future consumption, different productivity histories will generate a distribution of wealth. During retirement households receive a benefit  $\Omega$  which is indexed to the households labor productivity in its last period of working life and is funded by a tax  $\tau$  on labor earnings.

To state the household’s problem recursively, define the state vector as wealth  $k$ , labor market productivity  $\varepsilon$ , age  $a$ , and race  $j \in \{B, W\}$ . Households value consumption  $c$ , leisure  $1 - h$ , and

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<sup>6</sup>Job networks experienced through neighborhoods are likely to be an important factor in any policy related to the income process (Rothstein (2018), Aliprantis and Richter (2016)).

leaving bequests, with their problem stated as

$$V(k, \varepsilon, a, j) = \max_{c, k', h} u(c, h) + \psi_a \beta \mathbb{E} [V(k', \varepsilon', a + 1, j)] + (1 - \psi_a) z(k')$$

$$st \begin{cases} c + k' \leq (1 - \tau) \varphi \Phi(a) \varepsilon w h + (1 + R) k + D(k) & \text{when } a < a_r \text{ and } a \neq a_b; \\ c + k' \leq (1 - \tau) \varphi \Phi(a) \varepsilon w h + (1 + R) k + D(k) + b & \text{when } a = a_b \\ c + k' \leq \Omega + (1 + R) k + D(k) & \text{when } a \geq a_r \end{cases}$$

where  $\psi_a$  is the conditional probability of surviving from age  $a$  to  $a + 1$  and  $D$  is a dividend from ownership of a stand-in firm.

The stand-in firm purchases effective labor and rents capital from households. The firm pays white workers their marginal product labor but pays black workers only a fraction  $\varphi$  of theirs. As a result, the firm earns profits equal to  $(1 - \varphi) w N_B$ . These profits are rebated to white households through a dividend that is proportional to their wealth,  $D(k)$ . The firm produces output according to a Cobb-Douglas production function  $Y = AK^\alpha N^{1-\alpha}$ , and capital depreciates at constant rate  $\delta \in [0, 1]$ . The return on capital paid by the firm is the marginal product of capital minus the depreciation rate,  $R = r - \delta$ .

### 3 Calibration

We calibrate the model to a final steady state in which all processes are identical across households, so that conditional distributions are identical across race. One time period in our model is five years.

We specify preferences over consumption and leisure as

$$u(c, h) = \frac{c^{1-\gamma_c}}{1-\gamma_c} + \theta_h \log(1-h)$$

and we set  $\gamma_c = 2$ .  $\theta_h$  is calibrated to 1.57 in order to match an average hours of work equal to 30 percent of discretionary time. The warm-glow bequest function  $z(k')$  is specified as

$$\theta_b \frac{(1+k')^{1-\gamma_b}}{1-\gamma_b}$$

where we set  $\theta_b$  to 0.12 to match a ratio of bequested wealth to total wealth equal to 1.7 percent.  $\gamma_b$  is set to 1.5 to ensure that bequests are a luxury good.

Wealth is transferred across generations as follows. When a household dies,  $(1 - \nu)k$  is given to a newborn household of the same race.  $\nu k$  is put into a pool that that is distributed to households of the same race at the bequest age ( $a = a_b$ ). Bequests  $b$  to middle age households take one of three values: 70 percent receive no bequest, 28 percent receive a small amount  $b_2$ , and 2 percent receive a large amount  $b_3$ , where  $b_3$  is set to 70 percent of middle age inheritances. These features of the bequest schedule come from the stylized facts in Hendricks (2001).

The age profile of earnings  $\Phi(a)$  is constructed using the 2007 Survey of Consumer Finances (SCF). We regress household earnings on a quadratic function of age, measured at an annual frequency, for white households between ages 20 and 64 with positive household incomes.<sup>7</sup> Then for the middle age in each of our 5-year age bins we generate the predicted mean. The age profile  $\Phi(a)$  is this predicted mean divided by the overall mean. Figure 2 plots the age-earnings profile. The profile rises quickly over the working ages, peaks in the late 50’s, and declines just before retirement.

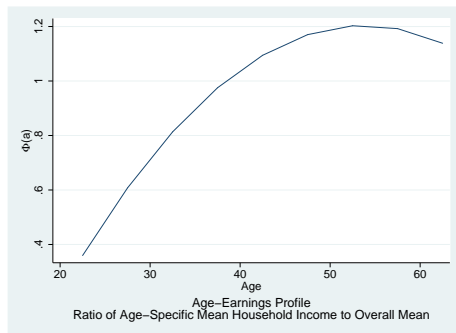


Figure 2: Age-Earnings Profile  $\Phi(a)$

The parameters  $\rho$  and  $\sigma_\eta$  from the stochastic component of labor productivity are set to 0.66 and 0.23 which correspond to the measures from Floden and Lindé (2001) in 5-year rates.<sup>8</sup>

Survival probabilities  $\psi_a$  are calculated using data from the Center for Disease Control National Vital Statistics Reports<sup>9</sup>). The total factor productivity parameter  $A$  is set to 2.68 so that five-year output is 1. The capital share of production  $\alpha$  is set to 0.36, and the depreciation rate of capital  $\delta$  is set to 0.25, which implies that investment is 15 percent of annual output.

The tax rate on labor income is calibrated to clear the government budget constraint. We set  $\eta$  to 0.12, which implies the benefit to retirees is, on average, 40 percent of their labor earnings. The calibrated labor tax to fund this transfer is 0.098.

We set the black share of the population to 0.103 as the weighted share of black households in the 1962 SCF. We calibrate  $\beta$  to match the aggregate capital stock being 3 times annual output.

## 4 Numerical Experiments

### 4.1 Baseline Results

As a baseline, we first use the calibrated model to address our primary question: “Given unequal initial conditions and a gap between black and white labor incomes that closes as slowly as observed in the data, how long should one expect the wealth gap to persist?” To answer this question, we

<sup>7</sup>Including African-Americans in the regression sample does not change the estimated age-earnings profile.

<sup>8</sup>We have repeated the exercises from Floden and Lindé (2001) separately for whites and blacks. We found no significant difference in either the  $\rho$  or  $\sigma_\eta$ . For more details see the appendix.

<sup>9</sup>Data from cohorts beginning in 1929-1931 and ending in 2012 (see Table 20 of Arias et al. (2016))

run the following experiment:

1. Initialize the model with a wealth distribution for black and white households taken from the 1962 SCF.
2. Compute the terminal steady state arising from blacks and whites having identical income processes (i.e., no earnings gaps).
3. Solve for a transition path from the initial to the final steady state, assuming an exogenous path for the labor income gap which begins at the ratio observed in the 1962 SCF, reaches 1.0 at some point along the path, and then remains at 1.0 thereafter.

While the violence that led to the differences in the initial 1962 black and white distributions must be acknowledged (Coates (2014)), that history is not the focus of this analysis.<sup>10</sup> Our exercise is to take the initial differences in 196 as given, and then to suppose that both races are treated equally in all markets and aspects of life. While there are clearly lingering forms of discrimination (Bertrand and Mullainathan (2004)), our exercise can be thought of as a best-case scenario for how Civil Rights legislation and changes in social norms would reduce the racial wealth gap.

Step 1 of the exercise requires the construction of a suitable initial wealth distribution over productivity, age, and race. For this construction, we use kernel density estimates to smooth the initial distributions of wealth within race and age groups in the 1962 Survey of Financial Characteristics of Consumers (SFCC), the precursor to the SCF. Age groups are chosen to maximize sample size while grouping similar distributions (Appendix A provides further details). Figure 3 shows the best fitting kernel density approximations to the raw data.

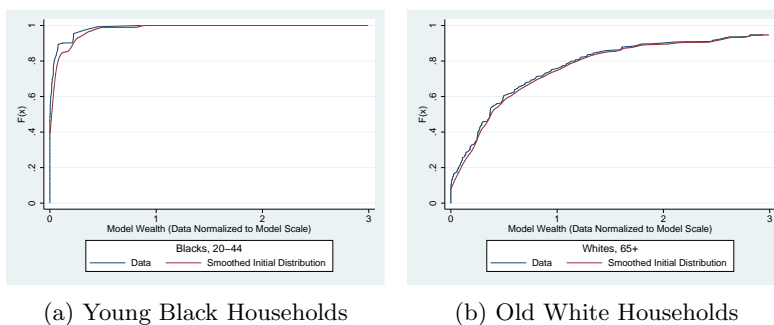


Figure 3: Initial Wealth Distributions for Young Black and Old White Households, 1962 SFCC  
 Note: These figures display data from the 1962 Survey of Financial Characteristics of Consumers (SFCC). All households have heads aged 30-60 who are either black or white. We define net worth as total assets minus total debts, where we construct total assets from the list of component variables according to the SCF definitions (available [here](#)), and do the same for total debts.

In Step 2 we compute the terminal steady state where all households in state  $(k, \varepsilon, a)$  are identical (i.e., race is irrelevant).

Finally, for Step 3 we feed the model a sequence of exogenous labor income gaps  $\{\varphi_t\}_{t=1}^T$ . We begin the sequence with  $\varphi_1 = 0.52$ , the ratio of average black household labor income to white

<sup>10</sup>White (2007) uses the end of the Civil War as an initial condition, but does not explicitly consider the various legal, illegal, and extralegal methods of discrimination that continued to affect blacks for many year.



household labor income in the 1962 SCF.<sup>11</sup> We then create a sequence of earnings gaps by assuming that the gap closes at an exponential rate. Matching the mean incomes observed in the 1962 and 2007 SCFs,  $\varphi_{45} = \varphi_1 (1 + g)^{44}$  requires that  $g = 0.0026$  in order to generate an earnings gap of 0.58 in 2007. Specifically, for  $t > 1$ ,  $\varphi_t = \min \{ \varphi_1 (1 + g)^{t-1}, 1.0 \}$ . In this sequence the earnings gap disappears by the year 2217.

We make two decisions about handling the data that both bias our simulations towards a labor income gap that closes more quickly than actually observed in the data. The first decision is to ignore the Great Recession as a transitory shock. The Great Recession produced a sharp decline in the ratios of both mean black earnings to mean white earnings and mean black wealth to mean white wealth (Figure 1a). If we used data from post-2007 surveys, we would infer that the income gap is widening rather than closing; we can introduce the Great Recession as an exogenous shock to wealth that hits blacks more heavily than whites, but we expect the results to be obvious. We also choose to ignore data from the 1983 SCF. If we include the 1983 data point into the regression to estimate the rate at which the income gap has been closing, the gap is actually estimated to have been increasing, although at a rate that is statistically indistinguishable from zero. Given the other waves of the SCF lie on a regression line and the 1983 observation is well above that line, we suspect some data problems in 1983.

Our baseline experiment predicts that unequal initial conditions and persistent differences in labor income like those observed in the data will generate a wealth gap that is very slow to close. Figure 4 plots the wealth gap in the baseline experiment along with the path of the labor income gap. By the year 2007, the ratio of black to white wealth is 0.10 as compared to 0.21 in the data. To get a sense of how slowly the wealth ratio rises, we note that after 100 years it is still only 0.18. Even in the year 2217, when the income gap has completely closed, mean black wealth is only 88 percent that of white households.

Nearly all of the discrepancy between the data and the model in 2007 is due to the immediate decline in the wealth ratio in the first period of transition from 0.18 to 0.09. This decline is due to the fact that the ratio of white wealth to black wealth is lower than it would be in a stationary distribution with the observed earnings gap, combined with a strong gap in savings behavior driven by the luxury-good warm-glow function; as a result, white households accumulate very strongly at the beginning of the transition when the earnings gap has not changed significantly, pushing the interest rate down and leading to reductions in black wealth.

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<sup>11</sup>This number is close to the value from the 1960 Census noted in ?.

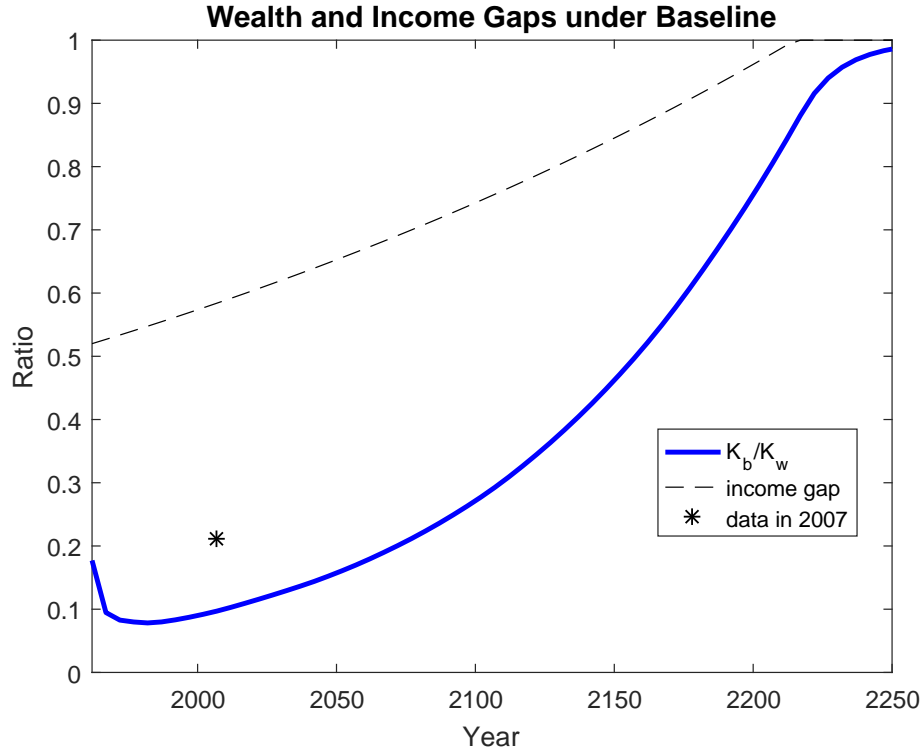


Figure 4: The Transition Path of Black/White Wealth in the Baseline Experiment

In addition to broadly matching the time series, our model predicts cross-sectional relationships between earnings and wealth that are consistent with those documented in the data. Figure 5 reproduces the key figure in Barsky et al. (2002) with SCF data from 2007 along with data from the baseline experiment. At all levels of income, black households have lower expected wealth. Our model produces this cross-sectional relationship without racial differences in preferences to save (beyond those induced by the non-homothetic warm-glow function); persistent differences in labor income and unequal initial wealth conditions are sufficient to generate this relationship.

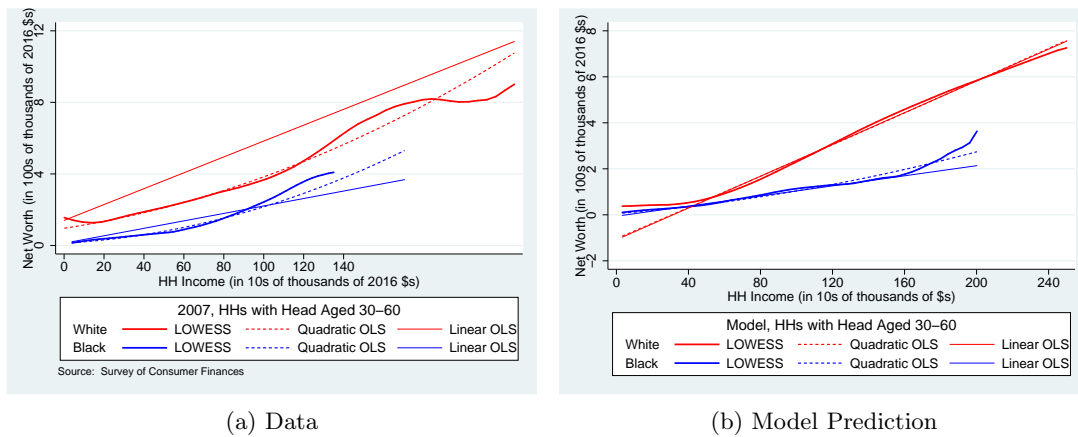


Figure 5: Income and Wealth

Note: These figures display data from the 2007 Survey of Consumer Finances (SCF) along with simulated data from the model under the baseline numerical experiment. All households have heads aged 30-60 who are either black or white.

## 4.2 Counterfactual Experiments

Based on the results of our baseline experiment, the slow convergence of the black-white wealth gap is not surprising. Now we investigate the next logical question, “Which factors are the main determinants of the convergence rate?” We use the model to decompose the effects of (i) the dynamics of the earnings gap, (ii) the segregation of bequests by race, and (iii) the initial wealth inequality. We also consider how the introduction of a return gap (which is not clearly evident in the data) would play a role in the dynamics of wealth inequality.

### 4.2.1 What if the Labor Income Gap Closes More Quickly?

How important is the labor income gap in determining the wealth gap? To answer this question, we consider two alternative paths for labor income gaps in addition to the baseline path described in Section 4.1. In the first alternative path the labor income gap is eliminated immediately in 1962 and in the other alternative the gap closes even more slowly than observed in the data ( $g = 0.0016$  rather than the rate  $g = 0.0026$  observed in the data). We refer to these as the fast and slow cases, respectively.

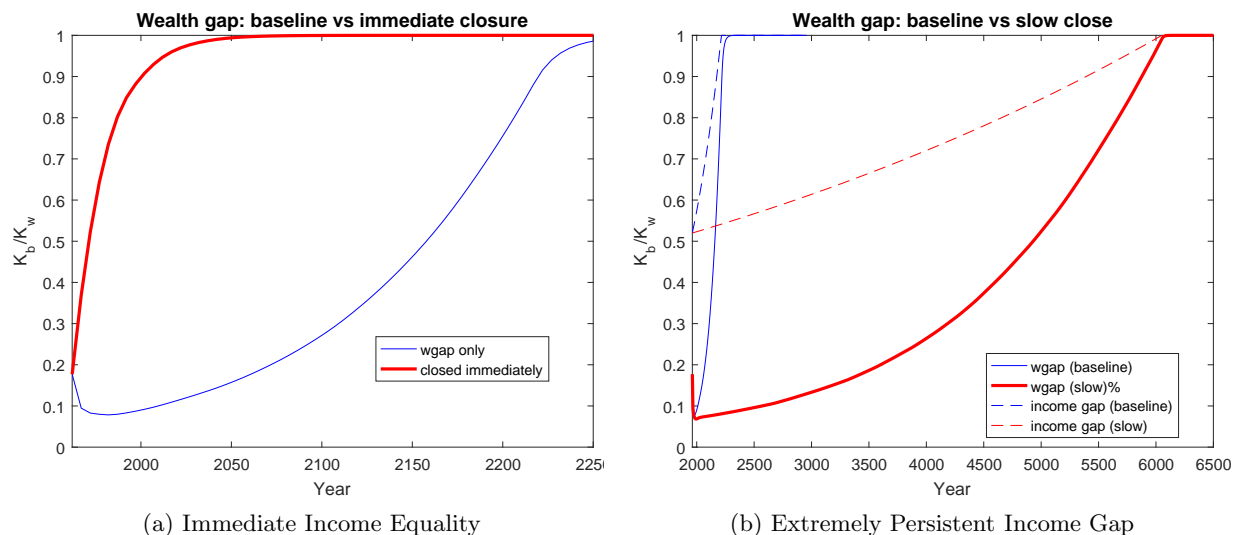


Figure 6: The Transition Path of Black/White Wealth and the Labor Income Gap

The rate at which the wealth gap closes in our model is extremely sensitive to the assumed labor income gap path. Figures 6a and 6b plot the fast and slow cases, respectively, against the baseline. The model predicts that if labor income was equalized in 1962, the wealth gap would have closed to 0.93 by 2007, obviously well above the observed value. On the other hand, if we assume the second, very slow path, the wealth gap persists for an enormous amount of time. Under the this scenario, the wealth gap remains below 0.90 until the year 5877.

### 4.2.2 What if Bequests Were Equalized?

Differences in inheritances between black and white households has been identified in the literature as a potential source of the persistent wealth gap. Black households are less likely to receive an inheritance. In their study using the 1989 SCF, Menchik and Jianakoplos (1997) found that 26 percent of households headed by whites reported receiving inheritances, versus 10.4 percent of households headed by blacks. Moreover, black households that do receive an inheritance tend to receive a smaller sum. Avery and Rendall (2002) calculate that the means for these groups were, respectively, \$159 thousand among white-recipient households and \$87 thousand among black-recipient households.

In our model, black households face a much lower expected bequest size conditional on receiving an inheritance. To avoid transitory complications in the bequest paths arising from heterogeneous inheritance probabilities, all households have the same probabilities of receiving the three inheritance sizes; however, because black wealth is so much lower than white wealth, white households in the model get much larger bequests throughout most of the baseline transition. Regardless of bequest size class ( $b_2$  or  $b_3$ ), during the first 100 years of transition, black inheritance averages just 12 percent of white inheritance. Table 1 reports the 1962 bequest size in the model as a fraction of average wealth.

Table 1: Model Bequests in 1962 as Fractions of Average Wealth

	Black	White	Probability
$b_1$	0	0	0.70
$b_2$	0.11	0.66	0.28
$b_3$	3.62	21.50	0.02
$Avg(b_2, b_3)$	0.35	2.05	–

Note:

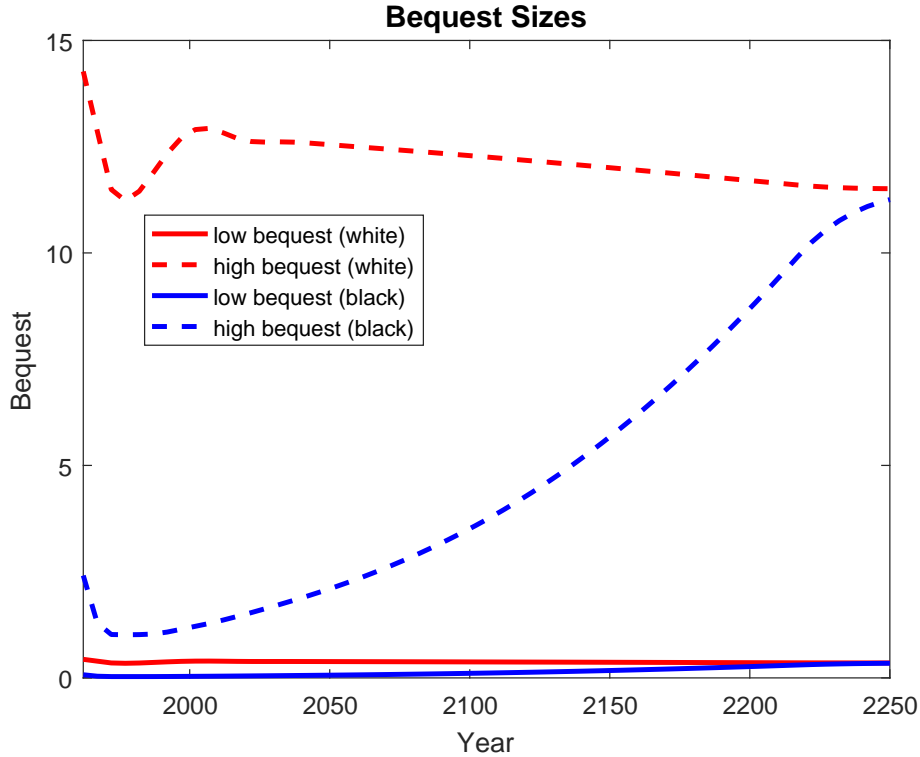


Figure 7: The Transition Path for Bequests under the Baseline

Figure 7 plots the bequest to middle-aged households by race. For much of the transition period, white households of either the high bequest or the low bequest type receive substantially larger inheritances than their black counterparts. Although both black and white households have the same structural preferences for leaving bequests, the unequal nature of the initial wealth distribution produces long lasting differences in bequests for two reasons. First, because mean wealth is higher for white households and the relative fraction of households dying in a period is the same for both races, the pool of bequests will be larger for white households. Second, because leaving bequests is a luxury good, the white distribution of wealth is much more skewed than the black distribution.

To study how our baseline results are affected by bequests, we consider an alternative case in which estates left by deceased black and white households are pooled jointly, and middle-aged households of either race draw from the same pool. Thus, the only differences in bequests across households come from the realizations of the bequest lottery, not from differences in the stocks of resources. We consider the effect of equalizing bequests on our baseline transition as well as our alternative ‘no gap’ transition. As one would expect, removing racial inequality in bequests speeds the rate of convergence of the wealth ratio.

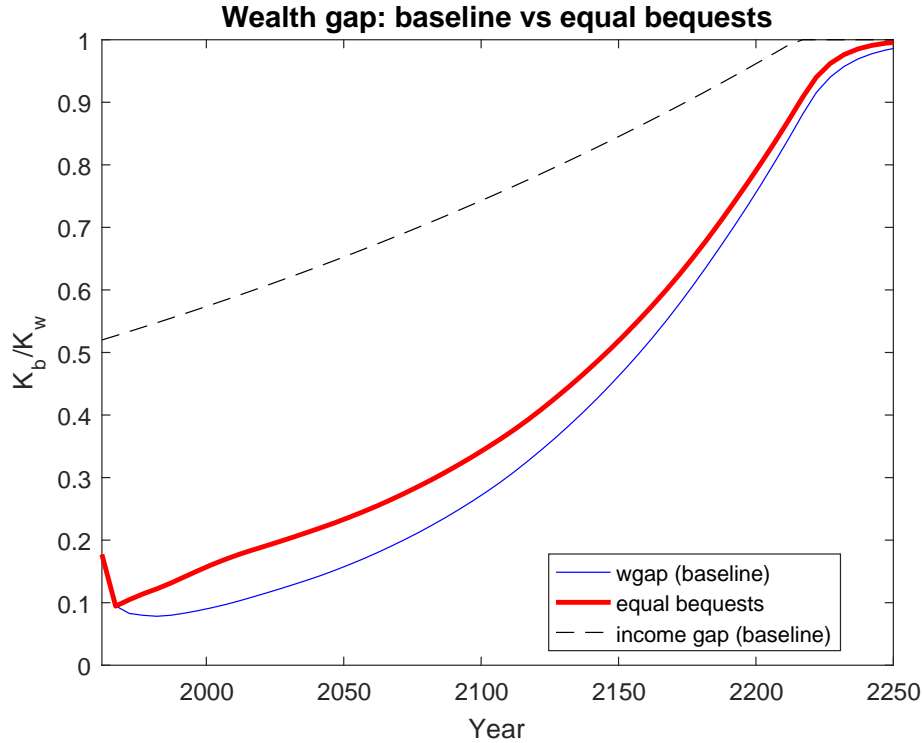


Figure 8: Contributions of Factors to the Black/White Wealth Gap, 1962-2262

### 4.2.3 What if Blacks and Whites Have Different Rates of Return on Capital?

In our baseline experiment, we assume that there is no meaningful gap between black and white returns on savings. While this is consistent with the results in Gittleman and Wolff (2004) pertaining to 1984 to 1994, we might suspect that there is a return gap over earlier or later periods. One relevant mechanism here would be the practice of limiting credit to black areas, known as redlining (Aaronson et al. (2017)).

To investigate the importance of a gap in rates of return, we run two counterfactuals under which black households experience a gap in their capital income. In each experiment we set the sequence of return gaps equal to the sequence of labor income gaps in the baseline model, so that at each time  $t$  the return on capital enters the household's budget constraint as  $(1 + \varphi_t R) k$  rather than  $(1 + R) k$ . Put another way, under this counterfactual the labor income gap in the baseline is a gap on total income.

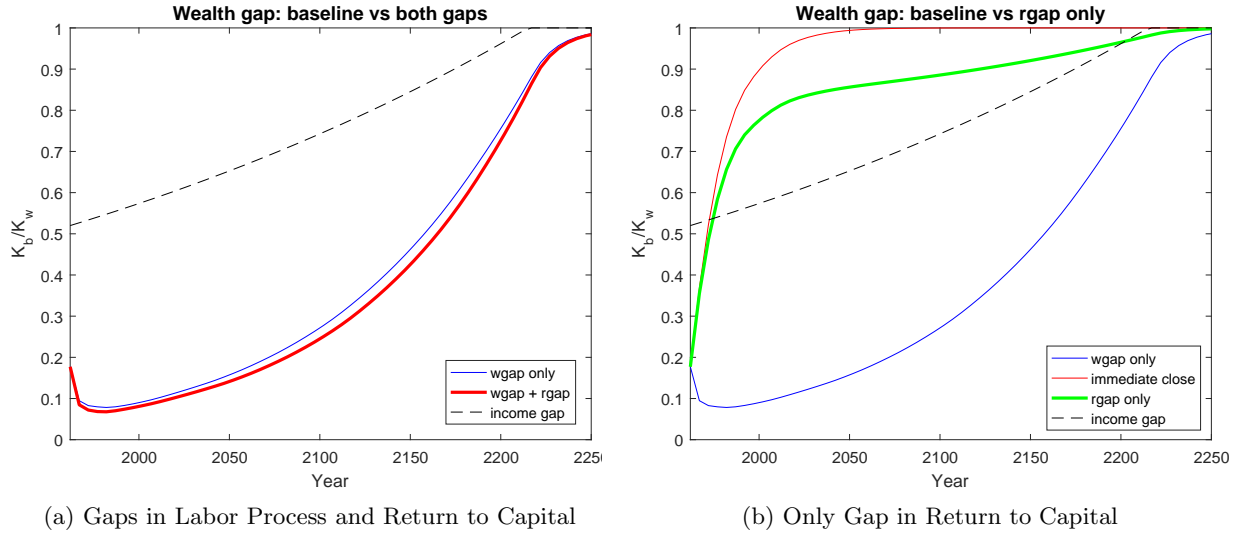


Figure 9: The Transition Path of Black/White Wealth and Rates of Return

In the presence of a wage gap, the return gap slows the convergence of the wealth gap only moderately. Figure 9a plots the wealth ratio when black households have lower returns and lower wages against the baseline. With both income and return gaps, the wealth ratio only requires an additional 2 years over the baseline to reach 0.90.

In the absence of a wage gap, however, the return gap plays a non-trivial role in slowing the convergence of the wealth gap. Figure 9b shows the results of our second return gap counterfactual, in which the labor income gap is eliminated immediately but the return gap follows the baseline path. The wealth gap closes rapidly in the beginning of the path. By 2007, the wealth ratio is 0.80. After this point, the path slows markedly relative to the path with neither a wage nor a return gap.

## 5 Discussion

Table 2 describes our numerical experiments in terms of the key mechanisms they explore. As described in Section 4.1, in the baseline experiment we set key mechanisms to replicate what we observe in the data. Accordingly, we set the sequence of labor income gaps to close at the exponential rate implied by the data between 1962 and 2007 in the SCF. We assume there is no gap in returns on savings as documented in Gittleman and Wolff (2004), but that inheritances are different across race (Avery and Rendall (2002), Menchik and Jianakoplos (1997)). Under this baseline experiment, the wealth gap is nearly closed (at 0.90) in 257 years. The gap implied by the model in 2007 would be 0.10, and the gap we observe in the data is 0.21.

If we keep all aspects of the experiment the same but immediately close the earnings gap, setting  $\varphi_t = 1.0$  for all  $t$ , then the racial wealth gap will close much sooner. In this experiment, the wealth gap will be nearly closed more than 5 times as quickly as in the baseline, taking 219 years less time. Equalizing bequests in addition will imply modest changes, while introducing a gap in returns will slow convergence modestly.

In contrast to the substantial acceleration to the closing of the wealth gap induced by immediately equalizing incomes, if labor incomes converge at the observed rate, then changes to returns on savings or bequests will have no economically significant effect. In addition, if we slow the convergence of the labor income gap, then the wealth gap becomes effectively permanent.<sup>12</sup>

Table 2: Years until Wealth Gap Is Nearly Closed for Various Numerical Experiments

	Convergence of Income Process	Returns to Capital	Bequests	Additional Years* until $\frac{K_t}{K_w} = 0.90$
Baseline	Data	No Gap	Unequal	–
	Immediate	No Gap	Equal	–225
	Immediate	No Gap	Unequal	–219
	Immediate	Gap	Unequal	–97
	Data	No Gap	Equal	–4
	Data	Gap	Unequal	+2
	Slow	No Gap	Unequal	+3,657

\*Years relative to the baseline of 257 years.

Note:

In order to relate our findings back to the literature on accounting for the wealth gap, we also run a decomposition using our transition results. The wealth gap at time  $t$  is defined as  $gap_t = 1 - x_t^{base}$ , where  $x_t^{base}$  is the wealth ratio at time  $t$  under the baseline. The contribution from unequal bequests is calculated as  $\frac{x_t^{beq} - x_t^{base}}{gap_t}$ . Next we calculate the additional contribution from both equalizing bequests and eliminating the gap in labor income. Call this ratio  $x_t^{equal}$  which is  $\frac{x_t^{equal} - x_t^{base}}{gap_t}$ . The remaining  $\frac{1 - x_t^{equal}}{gap_t}$  is due to the inequality in initial conditions. Finally, because introducing a gap in returns contributes negatively to closing the gap, we calculate it against the baseline as  $\frac{x_t^{rgap} - x_t^{base}}{gap_t}$ .

<sup>12</sup>If the earnings gap remains fixed at the 1962 value, the wealth gap converges to the earnings gap of 0.57.



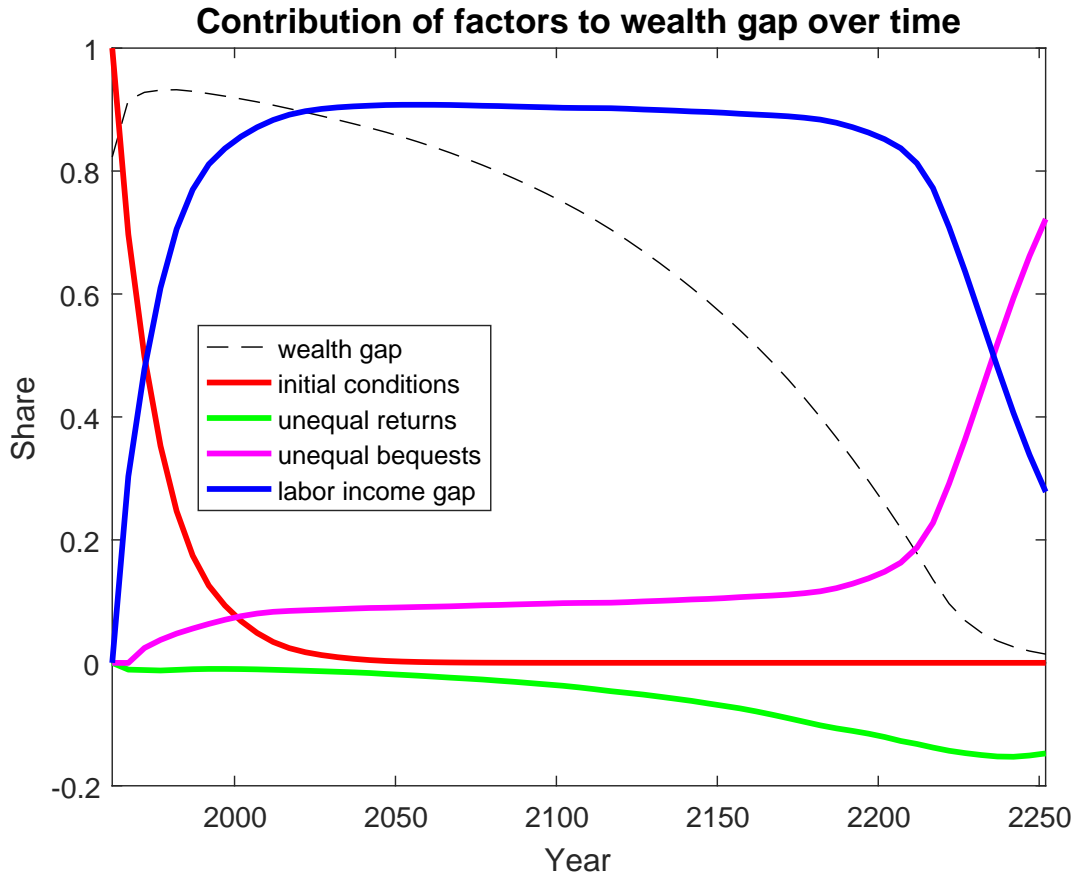


Figure 10: Contributions of Factors to the Black/White Wealth Gap, 1962-2262

Figure 10 plots the share of the wealth gap accounted for at each date for the first 300 years after which the baseline wealth gap falls below 1 percent. The contribution of initial conditions starts at 100 percent and decreases monotonically over time. Nevertheless, initial conditions continue to play a significant role for some time, taking 70 years before it no longer accounts for at least 1 percent of the gap. Over this period, the return gap plays only a small role, averaging  $-1.1$  percent over the period.

Bequest differences contribute little relative to the baseline early along the transition path. For the first 100 years, the average contribution is about 6.8 percent. The contribution of bequest differences grows over time, however, and become very important for slowing the convergence of the wealth gap once the ratio gets to roughly 0.20. The gap in labor income is by far the biggest factor behind closing the wealth gap, averaging a contribution of 77.0 percent from 1962 to 2262.

## 6 Conclusion

This paper used a heterogeneous agents dynamic stochastic general equilibrium model to study mechanisms that might generate the type of persistent black-white wealth inequality documented in the data. Our dynamic model was able to explain key features of the racial wealth gap across

both time and individuals. The observed racial wealth gap is no wider than what was predicted by our model, with a slow convergence achieved by the combination of highly unequal initial conditions and persistent differences in earnings. Moreover, the cross-sectional relationship between earnings and wealth predicted by our model differ by race in a similar way as observed in the data.

Our results point to the importance of understanding what drives the income process. In other work, we explore differences in neighborhood sorting and how this sorting could lead to differences in the labor income process (Aliprantis et al. (2018), Aliprantis and Carroll (2018)). Specifically, we find that black households in the upper quintiles of the wealth distribution tend to live in neighborhoods of similar quality to white households in the lowest quintile; that is, wealth is not a primary determinant of neighborhood sorting. Instead, we find that the racial composition of a neighborhood is of primary importance – black households tend to sort into neighborhoods with lots of other black households. Given the segregated nature of neighborhoods in 1962 and the presence of human capital externalities at the neighborhood level, this sorting could lead to very slow movements in earnings gaps, which our results here show will deliver very slow movements in wealth gap. Policies designed to move households out of low quality neighborhoods, such as Moving to Opportunity, may then serve to speed up convergence in wealth.

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## A Initial Wealth Distributions by Race and Age

Due to the size of the sample, some combinations of state variables will have zero mass in the survey. To deal with this sparsity, we use a kernel density to non-parametrically estimate the marginal distribution of wealth conditional on race and age. This smoothing of the distribution in the age and productivity dimensions prevents periodic behavior in aggregates along the transition path.<sup>13</sup>

We estimate wealth distributions after aggregating several 5-year age bins so as to increase sample size. The specific bins used were chosen because the distributions looked similar within smaller 5-year age bins. We use three age bins for white households corresponding to ages 20-34, 35-64, and 65+. For black households we use two bins, one for 20-44 and one for 45+. The estimated distributions, along with the scaled raw data, are shown in Figure 11.

For each wealth point on the initial wealth grid, we multiply the population weight from the appropriate marginal archetype by the race and age population share using the invariant distribution of age. We then allocate the population weight across initial productivity according to the invariant distribution of age.

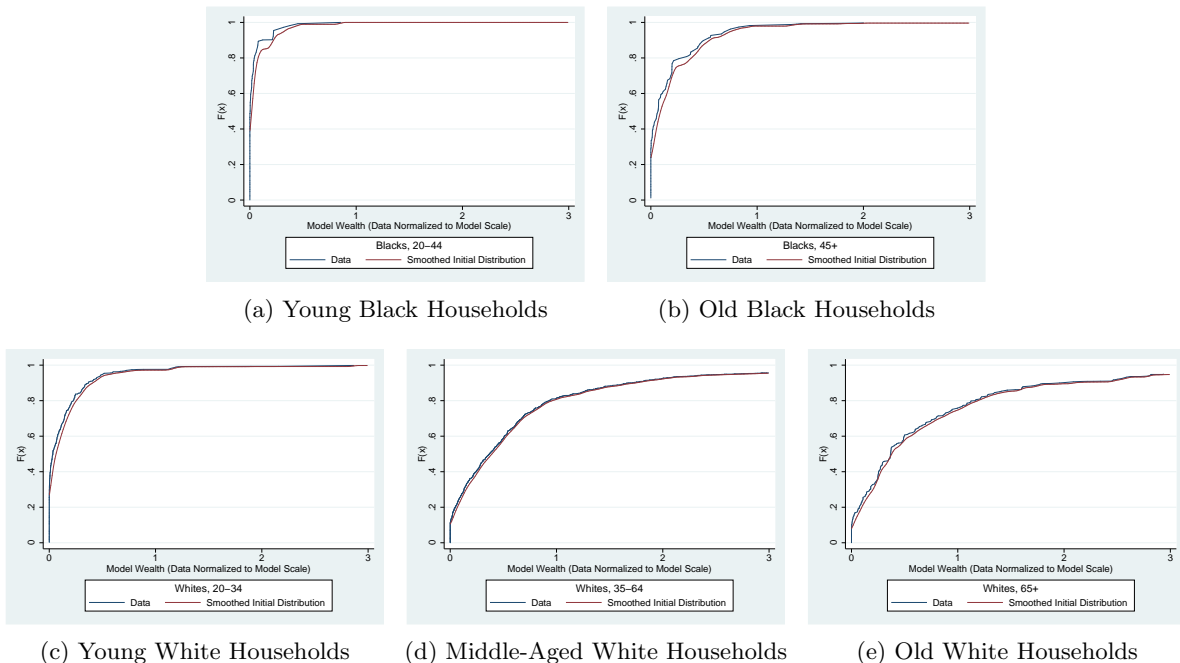


Figure 11: Initial Wealth Distributions by Race and Age, 1962 SFCC

Note: These figures display raw and smoothed data from the 1962 Survey of Financial Characteristics of Consumers (SFCC). All households have heads aged 30-60 who are either black or white. We define net worth as total assets minus total debts, where we construct total assets from the list of component variables according to the SCF definitions (available [here](#)), and do the same for total debts. Age groups were aggregated to increase sample size for estimating sparse distributions, and were chosen for having similar within-race distributions in all relevant 5-year bins.

<sup>13</sup>In calculations without smoothing, this periodic behavior overwhelms the broader wealth dynamics along a substantial portion of the early path. As the age and productivity processes settle into their ergodic states, the periodic effect dampens and eventually dies out.