Internet Appendix

A Dynamic Model of the Racial Wealth Gap

Sylvain Catherine Ellen Jiayang Lu[†] James D. Paron[‡]

A Details on empirical construction of racial wealth gap

A.1 Computation of the racial wealth gap

This section details the construction of Figure 1. Let W_{jt} denote the average net worth of households in racial group $j \in \{\mathrm{W}, \mathrm{B}\}$ at time t. The White-to-Black wealth gap is then the ratio $W_{\mathrm{W}t}/W_{\mathrm{B}t}$. Net worth includes the values of equity (E_{jt}), housing (H_{jt}), and mortgages (M_{jt}), as well as a residual for other assets for which we account below.[1]

For our counterfactual with equal portfolio shares, we need to compute (i) portfolio shares and (ii) returns on each asset between survey waves. Let $r_{k,t,t+3}$ denote the cumulative net return on asset k from year t to year $t+3$. By definition, average wealth must evolve as

$$W_{j,t+3} = W_{jt}\left(1 + \frac{E_{jt}}{W_{jt}} r_{E,t,t+3} + \frac{H_{jt}}{W_{jt}} r_{H,t,t+3} - \frac{M_{jt}}{W_{jt}} r_{M,t,t+3} + \theta_{j,t,t+3}\right), \tag{1}$$

where $\theta_{j,t,t+3}$ is a residual. We use this identity to first back out these residuals from the data. Then, to do our counterfactual, we compute Black wealth assuming everything about this identity remains the same except for the portfolio weights. In particular, the counterfactual black wealth equals

$$W^{\mathrm{CF}}_{\mathrm{B},t+3} = W^{\mathrm{CF}}_{\mathrm{B}t}\left(1 + \frac{E_{\mathrm{W}t}}{W_{\mathrm{W}t}} r_{E,t,t+3} + \frac{H_{\mathrm{W}t}}{W_{\mathrm{W}t}} r_{H,t,t+3} - \frac{M_{\mathrm{W}t}}{W_{\mathrm{W}t}} r_{M,t,t+3} + \theta_{\mathrm{B},t,t+3}\right), \tag{2}$$

The Wharton School, University of Pennsylvania, USA, scath@wharton.upenn.edu
[†]The Wharton School, University of Pennsylvania, USA
[‡]Stanford Graduate School of Business, USA

[1]We depart from the notation in the main paper in this section to simplify exposition.

starting from the initial condition $W^{\mathrm{CF}}_{\mathrm{B}t_0} = W_{\mathrm{B}t_0}$ in the first year t_0. The counterfactual White-to-Black wealth gap is then the ratio $W_{\mathrm{W}t}/W^{\mathrm{CF}}_{\mathrm{B}t}$.

A.2 Data

We use real equity price data from Robert Shiller's website for equity returns $r_{E,t,t+3}$.[2] To compute housing returns $r_{H,t,t+3}$, we include both house-price growth and imputed rental yields. We use real residential property price in the United States (QUSR628BIS) from FRED for housing-price growth rates.[3] Rental yields come from Davis, Lehnert, and Martin (2008), who update the time series of rent-to-price ratios of owner-occupied housing in the U.S. starting in 1960 using Decennial Census of Housing (DCH) survey, which we extend to 2022 using the same method.[4] Finally, mortgage rates $r_{M,t,t+3}$ equal the 30-year fixed-rate mortgage average in the United States, adjusted for inflation.[5]

The variables W_t, E_t, H_t, and M_t above are listed as *networth*, *equity*, *houses*, and *mrthel* in the Survey of Consumer Finances (SCF) extract.

B Model appendix

B.1 SNAP eligibility criteria

As discussed in Section 1.4, SNAP-eligibility requires that the household pass two income tests.[6] The first is that "gross income" is lower than 130% of the poverty line for a family of that size. In reality, SNAP gross income includes both earned and unearned income, such as rental income and dividend and interest income. Since we do not model unearned income explicitly, we use SCF data and find that earned income is on average 85% of earned plus unearned income; hence, we model gross income as

$$L^g_{it} \equiv \frac{L_{it}}{0.85}. \tag{3}$$

[2] https://shillerdata.com/, Access time: 06/12/2023.
[3] https://fred.stlouisfed.org/series/QUSR628BIS, Access time: 06/12/2023.
[4] https://www.aei.org/historical-land-price-indicators/, Access time: 06/12/2023
[5] https://fred.stlouisfed.org/series/MORTGAGE30US, Access time: 06/12/2023
[6] Note that most states do not have an asset test for SNAP after Broad-Based Categorical Eligibility (BBCE), so we consider only these two income criteria.

The poverty line for a family of size $N = n_A + n_C$ equals $\varrho(N)L_{1t}$ and takes the following values relative to the wage:

$$\varrho(N) = \begin{cases} 0.23 & \text{if } N = 1, \\ 0.32 & \text{if } N = 2, \\ 0.40 & \text{if } N = 3, \\ 0.48 & \text{if } N = 4, \\ 0.57 & \text{if } N = 5, \\ 0.65 & \text{if } N = 6, \\ 0.73 & \text{if } N = 7, \\ 0.81 & \text{if } N \geq 8. \end{cases} \tag{4}$$

Because we model the number of children n_C as a continuous variable over the life cycle, we linearly interpolate the poverty line between these points. The second test is that "net income" is below 100% of the poverty line. Net income is defined as

$$\begin{aligned} L_{it}^{\mathrm{n}} \equiv L_{it}^{\mathrm{g}} - \underbrace{d(N_{it})L_{1t}}_{\substack{\text{standard}\\\text{deduction}}} - \underbrace{0.2L_{it}}_{\substack{\text{earned-income}\\\text{deduction}}} \\ - \underbrace{\min\{0.1123L_{1t}, \max\{0, \text{Shelter}_{it} - 0.5 \times (L_{it}^{\mathrm{g}} - d(N_{it})L_{1t} - 0.2L_{it})\}\}}_{\text{shelter deduction}}, \end{aligned} \tag{5}$$

which is gross income, less a standard deduction, earned-income deduction, and a shelter deduction. The standard deduction depends on family size as

$$d(N) = \begin{cases} 0.0333 & \text{if } N \leq 3, \\ 0.0346 & \text{if } N = 4, \\ 0.0404 & \text{if } N = 5, \\ 0.0463 & \text{if } N \geq 6, \end{cases} \tag{6}$$

where, again, we linearly interpolate between points for N. The shelter deduction defines shelter cost as either rent expense (for renters) or property tax and mortgage payments (for homeowners):

$$\text{Shelter}_{it} \equiv \begin{cases} X_{it} & \text{if renter,} \\ T^{\text{H}}_{it} + (R_{Mit} - 1)(P_t H_{it} - W_{it})^+ & \text{if homeowner.} \end{cases} \tag{7}$$

In words, net income deducts any shelter costs in excess of the household's post-standard-deduction income, up to a cap of 11.23% of the wage index.

If a household passes these income tests, then it receives size-dependent benefits $(b^{\text{SN}}(N_{it})L_{1t} - 0.3L^{\text{n}}_{it})^+$, where the maximum benefit percentage is given by

$$b^{\text{SN}}(N) = \begin{cases} 0.053 & \text{if } N = 1, \\ 0.087 & \text{if } N = 2, \\ 0.138 & \text{if } N = 3, \\ 0.176 & \text{if } N = 4, \\ 0.209 & \text{if } N = 5, \\ 0.250 & \text{if } N = 6, \\ 0.277 & \text{if } N = 7, \\ 0.316 & \text{if } N \geq 8, \end{cases} \tag{8}$$

with linear interpolation between points.

B.2 Details of Medicare and Medicaid

As described in the main text, Total medical benefits B^{M}_{it} are the sum of Medicare benefits B^{M1}_{it} and Medicaid benefits from being categorically needy B^{M2}_{it} or medically needy B^{M3}_{it}. In retirement, households pay the Medicare premium if they are not eligible for Medicaid

$$\Phi_{Mt} = \begin{cases} 0.03 n_A L_{1t} & \text{if } B^{\text{M2}}_{it} + B^{\text{M3}}_{it} = 0, \\ 0 & \text{if } B^{\text{M2}}_{it} + B^{\text{M3}}_{it} > 0, \end{cases} \tag{9}$$

and they receive benefits

$$B^{\text{M1}}_{it} = 0.66 M_{it} \quad \text{if } t < t_{\text{ret}}. \tag{10}$$

A household receives Medicaid benefits by way of being categorically needy if it meets the following criteria:

$$B_{it}^{\mathrm{M2}} = \begin{cases} M_{it} & \text{if } L_{it} \leq 1.38\varrho(N_{it})L_{1t} \text{ and } t < t_{\mathrm{ret}}, \\ M_{it} - B_{it}^{\mathrm{M0}} & \text{if } B_{it}^{\mathrm{SN}} > 0 \text{ and } t \geq t_{\mathrm{ret}}, \end{cases} \tag{11}$$

where $\varrho(N)$ is the poverty line for a household of size N, defined in Internet Appendix B.1. Alternatively, a household receives Medicaid benefits by way of being medically needy if it meets the following criteria:

$$B_{it}^{\mathrm{M3}} = \begin{cases} (M_{it} - (L_{it} - 0.104L_{1t})^+ - (W_{it} - P_t H_{it} - 0.3L_{1t})^+)^+ \\ \qquad\qquad \text{if } B_{it}^{\mathrm{M2}} = 0,\ n_A = 1,\ \text{and } t < t_{\mathrm{ret}}, \\ (M_{it} - (L_{it} - 0.141L_{1t})^+ - (W_{it} - P_t H_{it} - 0.564L_{1t})^+)^+ \\ \qquad\qquad \text{if } B_{it}^{\mathrm{M2}} = 0,\ n_A = 2,\ \text{and } t < t_{\mathrm{ret}}, \\ (M_{it} - B_{it}^{\mathrm{M1}} - (B_{it}^{\mathrm{SS}} - 0.104L_{1t})^+ - (W_{it} - P_t H_{it} - 0.3L_{1t})^+)^+ \\ \qquad\qquad \text{if } B_{it}^{\mathrm{M2}} = 0,\ n_A = 1,\ \text{and } t \geq t_{\mathrm{ret}}, \\ (M_{it} - B_{it}^{\mathrm{M1}} - (B_{it}^{\mathrm{SS}} - 0.141L_{1t})^+ - (W_{it} - P_t H_{it} - 0.564L_{1t})^+)^+ \\ \qquad\qquad \text{if } B_{it}^{\mathrm{M2}} = 0,\ n_A = 2,\ \text{and } t \geq t_{\mathrm{ret}}. \end{cases} \tag{12}$$

The total Medicare and Medicaid benefit is then $B_{it}^{\mathrm{M}} = B_{it}^{\mathrm{M1}} + B_{it}^{\mathrm{M2}} + B_{it}^{\mathrm{M3}}$.

B.3 Income tax rates and EITC

Federal income taxes In working life, the marginal income tax rates paid on labor income L_{it} are as follows:

$$\text{Marginal Tax Rate}_{it} = \begin{cases} 0.10 & \text{if } L_{it} < 0.18L_{1t}, \\ 0.12 & \text{if } 0.18L_{1t} < L_{it} < 0.72L_{1t}, \\ 0.22 & \text{if } 0.72L_{1t} < L_{it} < 1.54L_{1t}, \\ 0.24 & \text{if } 1.54L_{1t} < L_{it} < 2.94L_{1t}, \\ 0.32 & \text{if } 2.94L_{1t} < L_{it} < 3.73L_{1t}, \\ 0.35 & \text{if } 3.73L_{1t} < L_{it} < 9.32L_{1t}, \\ 0.37 & \text{if } L_{it} > 9.32L_{1t}. \end{cases} \tag{13}$$

In retirement, the exact same marginal tax rates and tax brackets are applied to Social Security benefits B_{it}^{SS} instead of labor income.

Medicare tax Medicare taxes in working life are determined according to the following thresholds, where k is number of earners:

$$T_{it}^{\mathrm{M}} = \begin{cases} 0.029L_{it} & \text{if } L_{it} \leq 3.135L_{1t},\ k = 1,\ \text{and } t < t_{\mathrm{ret}}, \\ 0.029(3.135L_{1t}) + 0.009(L_{it} - 3.135L_{1t}) & \text{if } L_{it} > 3.135L_{1t},\ k = 1,\ \text{and } t < t_{\mathrm{ret}}, \\ 0.029L_{it} & \text{if } L_{it} \leq 3.918L_{1t},\ k = 2,\ \text{and } t < t_{\mathrm{ret}}, \\ 0.029(3.918L_{1t}) + 0.009(L_{it} - 3.918L_{1t}) & \text{if } L_{it} > 3.918L_{1t},\ k = 2,\ \text{and } t < t_{\mathrm{ret}}. \end{cases} \tag{14}$$

Earned Income Tax Credit (EITC) The Earned Income Tax Credit (EITC) provides a refundable benefit to low-income households. For a one-parent, one-child household, the EITC gives a benefit of 34 cents for each dollar of income earned up to 19% of the wage index. For income between 19% and 35% of the wage index, the benefit remains fixed at this level. Then, for each additional dollar of income earned beyond this amount, the benefit decreases by 16 cents, until a benefit of zero is received. In units of the wage index, this one-child benefit formula is[7]

$$B_{it}^{\text{EITC}} = \begin{cases} 0.34L_{it} & \text{if } L_{it}/L_{1t} < 0.19, \\ 0.065L_{1t} & \text{if } 0.19 < L_{it}/L_{1t} < 0.35, \\ (0.065L_{1t} - 0.16(L_{it} - 0.35L_{1t}))^{+} & \text{if } L_{it}/L_{1t} > 0.35. \end{cases} \tag{15}$$

For a two-parent, two-child household, the formula is

$$B_{it}^{\text{EITC}} = \begin{cases} 0.40L_{it} & \text{if } L_{it}/L_{1t} < 0.27, \\ 0.108L_{1t} & \text{if } 0.27 < L_{it}/L_{1t} < 0.45, \\ (0.108L_{1t} - 0.21(L_{it} - 0.45L_{1t}))^{+} & \text{if } L_{it}/L_{1t} > 0.45. \end{cases} \tag{16}$$

In the data (see Internet Appendix Figure C.3), we find that, before retirement and regardless of race, the typical single-adult household ($n_A = 1$) has one child while the typical two-adult household ($n_A = 2$) has two children. Thus, which of the above formulas applies depends only on the state n_A.

B.4 Solving the model

To solve the model, we first rescale the household's problem to reduce its dimensionality. Denote variables scaled by the aggregate wage index with hats: $\hat{Z} \equiv Z/L_1$. To see how the problem rescales, we first note the following facts. First, the utility function can be rewritten in terms of scaled variables as

$$u(C_t, H_t, N_t) = L_{1t}^{1-\gamma} P_t^{-\nu(1-\gamma)} u(\hat{C}_t, \hat{P}_t H_t, N_t). \tag{17}$$

Likewise, the budget constraints scale so that

$$\hat{W}_{t+1} = (\hat{W}_t + \hat{Y}_t - \hat{C}_t - \hat{X}_t - \hat{\Phi}_{Ht} - c_{\pi}) R_{W,t+1} \frac{L_{1t}}{L_{1,t+1}}, \tag{18}$$

where, for renters,

$$\hat{X}_t = \frac{\hat{P}_t H_t}{\chi_j} \tag{19}$$

[7] The values in this formula correspond to the EITC in 2020, when the wage index was $55,629.

and, for house sellers,

$$\hat{\Phi}_{Ht} = c_H \hat{P}_t H_t + (1-\theta_j)\mathbb{I}_{\zeta_{it}=\zeta_{it}^-}\hat{P}_t H_{t-1}. \tag{20}$$

The house size constraints can be rescaled

$$\hat{P}_t H_t \leq \kappa_{\max}\hat{W}_t \quad \text{and} \quad \hat{P}_t H_t \geq \kappa_{\min}. \tag{21}$$

Finally, the liquidity constraint can be rescaled

$$(\hat{Y}_t + \varpi \hat{W}_t - \hat{C}_t)\mathbb{I}_{\zeta_{it}=\zeta_{it}^-} \geq 0. \tag{22}$$

What is particularly important to note about these rescaled constraints is that they are all independent of the level of L_{1t} and, instead of depending on P_t, now depend on $\hat{P}_t H_t$ and $\hat{P}_t H_{t-1}$.

Because the utility function rescales as (17), a reasonable conjecture is that the value function can similarly be rescaled as

$$V(P_t, H_{t-1}, L_{1t}, z_t, \eta_t, \text{AIYE}_t, W_t) = L_{1t}^{1-\gamma} P_t^{-\nu(1-\gamma)} V(1, \hat{P}_t H_{t-1}, 1, z_t, \eta_t, \text{AIYE}_t, \hat{W}_t).$$

Henceforth, we will use the shorthand $V_t = L_{1t}^{1-\gamma} P_t^{-\nu(1-\gamma)} \hat{V}_t$. We prove this conjecture by induction. The conjecture is true at the maximum time period $t_{\max}$, since $V_{t_{\max}} = u_{t_{\max}}$, and so

$$\hat{V}_{t_{\max}} = u(\hat{C}_{t_{\max}}, \hat{P}_{t_{\max}} H_{t_{\max}}, N_{t_{\max}}).$$

For the induction step, suppose that the conjecture is true at time $t+1$ (i.e., $V_{t+1} = L_{1,t+1}^{1-\gamma} P_{t+1}^{-\nu(1-\gamma)} \hat{V}_{t+1}$). Then

$$V_t = \max_{\{C_t, \pi_t, H_t, \mathbb{I}_{\text{own},t}\}} \left\{ L_{1t}^{1-\gamma} P_t^{-\nu(1-\gamma)} u(\hat{C}_t, \hat{P}_t H_t, N_t) + \beta \mathbb{E}_t \left[L_{1,t+1}^{1-\gamma} P_{t+1}^{-\nu(1-\gamma)} \hat{V}_{t+1} \right] \right\}. \tag{23}$$

Note that the maximum this function over $\{C_t, \pi_t, H_t, \mathbb{I}_{\text{own},t}\}$ is identical to the maximum over $\{\hat{C}_t, \pi_t, \hat{P}_t H_t, \mathbb{I}_{\text{own},t}\}$. Thus, we can change the arguments of the maximization and factor out

Table C.1: Coefficient estimates for income profiles

	Single (W)	One-earner (W)	Two-earner (W)	Single (B)	One-earner (B)	Two-earner (B)
age	−0.015	0.192	0.109	0.038	0.145	−0.043
age^2/10	0.014	−0.031	−0.016	0.006	−0.025	0.018
age^3/100	−0.002	0.001	0.000	−0.002	0.001	−0.002
Constant	−0.597	−3.298	−1.412	−2.072	−2.045	−0.152

This table reports the OLS coefficients of household income profile as a function of age. There are six categories of households. We use CPS from 1978 to 2021 to obtain the results.

$L_{1t}^{1-\gamma} P_t^{-\nu(1-\gamma)}$ to see that

$$\begin{aligned} V_t &= L_{1t}^{1-\gamma} P_t^{-\nu(1-\gamma)} \\ &\quad \times \max_{\{\hat{C}_t, \pi_t, \hat{P}_t H_t, \mathbb{I}_{\text{own},t}\}} \left\{ u(\hat{C}_t, \hat{P}_t H_t, N_t) + \beta \mathbb{E}_t \left[\left(\frac{L_{1,t+1}}{L_{1t}} \right)^{1-\gamma} \left(\frac{P_{t+1}}{P_t} \right)^{-\nu(1-\gamma)} \hat{V}_{t+1} \right] \right\} \\ &= L_{1t}^{1-\gamma} P_t^{-\nu(1-\gamma)} \hat{V}_t. \end{aligned}$$

The function collapsed into $\hat{V}_t$ is independent of L_{1t} and P_t, so the conjecture is also true at time t.[8] This proves the conjecture by induction.

C Calibration appendix

C.1 Income profile fit

We model the income profiles f_{it} as a cubic polynomial of age. There are six types of households, and Table C.1 reports the coefficients.

[8] To be more precise, $\hat{V}$ is independent of L_1 and P because, given the household's choices, both rescaled preferences and budget constraints are independent of L_1 and P. We changed the household's choice variables from C_t and H_t to $\hat{C}_t$ and $\hat{P}_t H_t$. Hence, given choices, the dynamic budget constraint (18) shows that the distribution of next period's rescaled wealth depends only on the time-t states in $\hat{V}_t$. Likewise, given choices, the rescaled housing constraints depend only on scaled wealth $\hat{W}_t$. Thus, this rescaled problem with rescaled choice variables yields identical policies to the original problem, but without explicit dependence on L_1 and P.

C.2 Estimation of income process

Figure C.1 presents the values and fit of targeted and simulated moments from the estimation of the idiosyncratic labor income shocks. Single-earner's income processes are targeted on empirical cross-sectional moments from Social Security Administration data computed by Guvenen, Ozkan, and Song (2014). We generate simulated data for couples using simulated single earner process. Then, we compute cross-sectional moments from the simulated double-earners' data and use those moments as targeting moments.

C.3 Medical expenditure

We estimate the process for medical expenditures in two steps. First, to estimate the deterministic component $g(a_t, j, n_A)$, we run the regressions

$$\log M_{it} = \beta_0(j, n_A) + \beta_1(j, n_A)a_{it} + \beta_2(j, n_A)\frac{a_{it}^2}{10} + \beta_3(j, n_A)\frac{a_{it}^3}{100} + \delta_{it}, \tag{24}$$

for each combination of race and age $(j, n_A) \in \{\mathrm{B}, \mathrm{W}\} \times \{1, 2\}$. Panel A of Table C.2 reports the coefficient estimates.

Second, we take the residuals $\delta_{it} = \log M_{it} - \log \hat{M}_{it}$ and directly compute estimators for the persistence and volatility of the stochastic component. Specifically, we invert the two moments $\mathrm{var}(\delta_{it}|j, n_A)$ and $\mathrm{var}(\delta_{i,t+1} - \delta_{it}|j, n_A)$ to get

$$\rho_\delta(j, n_A) = 1 - \frac{\mathrm{var}(\delta_{i,t+1} - \delta_{it}|j, n_A)}{2\mathrm{var}(\delta_{it}|j, n_A)}, \tag{25}$$

$$\sigma_\delta(j, n_A)^2 = \mathrm{var}(\delta_{it}|j, n_A)(1 - \rho_\delta(j, n_A)^2). \tag{26}$$

Panel B of Table C.2 reports these values. Figure C.2 A shows model-simulated medical expenditures incurred by Black and White American households over the life cycle. Figure C.2 B displays the total medical bill, defined as the sum of out-of-pocket medical payments and insurance premiums. The discontinuity around retirement arises from switching from private insurance to Medicare and from tighter Medicaid eligibility at retirement. For higher-earning two-adult households, the total medical bill declines at retirement because Medicare premiums

Table C.2: Coefficient estimates for medical expenditure

	White		Black	
	One adult	Two adults	One adult	Two adults
Panel A: Deterministic component				
Age	−0.059	−0.138	−0.085	−0.175
	(0.006)	(0.007)	(0.011)	(0.020)
Age^2 / 10	0.017	0.033	0.022	0.041
	(0.001)	(0.001)	(0.002)	(0.004)
Age^3 / 100	−0.001	−0.002	−0.001	−0.002
	(0.0001)	(0.0001)	(0.0001)	(0.0003)
Constant	−2.897	−1.355	−2.564	−0.946
	(0.100)	(0.110)	(0.177)	(0.316)
Observations	104,464	123,498	38,377	17,103
Adjusted R^2	0.142	0.179	0.118	0.146
Panel B: Stochastic component				
ρ_δ	0.5381	0.4953	0.5430	0.4768
σ_δ	0.9399	0.9837	0.9651	1.0218

The table reports estimates for the health expenditure process by race and number of adults. The data source is the 1996–2022 Medical Expenditure Panel Study (MEPS). Panel A reports the result of OLS regression of log medical expenditure on age. Panel B reports the persistence and volatility of the residuals from these regressions.

are lower than private insurance premiums. In contrast, low-earning single Black households are more likely to rely on Medicaid. As Medicaid eligibility tightens at retirement, many become ineligible and face higher medical costs. The hump-shaped pattern in medical expenditures during working years also reflects Medicaid eligibility: younger and older workers are more likely to receive Medicaid coverage, while middle-aged households are more likely to rely on private insurance.

C.4 Mortgage spread

We estimate the mortgage spread as a function of a household's wage-indexed income, debt-to-value ratio, and race. Specifically, we run the regression[9]

$$\log(R_{M,it} - R_{ft}) = \beta_0 - \beta_1 \log(\text{income}_{it}) + \beta_2 \mathbb{I}_{\text{B}it} + \beta_3 \log\left(\frac{\text{debt}_{it}}{\text{value}_{it}}\right),$$

[9]Note that, in the data, we estimate mortgage spreads relative to the riskfree rate. In the model, differences in implicit riskfree rates (i.e., $r_{f\text{B}} < r_{f\text{W}}$) are an additional, separate spread over these estimates.

Table C.3: Coefficient estimates for mortgage spread

	(1)	(2)	(3)	(4)
Log income	−0.119			−0.110
	(0.005)			(0.005)
Log debt-to-value		0.075		0.070
		(0.007)		(0.007)
Race (Black)			0.157	0.111
			(0.011)	(0.011)
Constant	0.723	0.685	0.660	0.710
	(0.004)	(0.003)	(0.004)	(0.005)
Observations	47,505	48,562	48,677	47,404
Adjusted R^2	0.014	0.002	0.004	0.015

The table reports the result of regression of the log mortgage spread on log income (scaled by the wage index), log debt-to-value ratio, and a race indicator (0 if White and 1 if Black). The data include 12 waves of SCF surveys from 1989 to 2022. Standard errors are reported in parentheses.

where $\mathbb{I}_{Bit}$ equals one if the household is Black. Table C.3 reports the main results (specification (4)), along with results for each individual regressor.

We use all waves of SCF surveys from 1989 to 2022 to estimate the coefficients. Our analysis is restricted to White or Black households that own only one residential property. The mortgage spread is defined as the ratio between the weighted average of initial mortgage and refinancing rates and the 10-year Treasury bill rate. We scale household income, which is the sum of labor income and benefits including Social Security, by the wage index. Debt-to-value is calculated as the sum of initial mortgage and refinancing amounts divided by initial price of the property.

C.5 Inheritance

The SCF asks respondents about their three largest inheritances received and the years in which they received them. Using this information, we compute the probability and the cross-sectional distribution of inheritances that Black and White households receive at each age. The probability $p_I(a_t, j, \hat{y}_t)$ and conditional mean inheritance size $\mu_I(a_t, j, \hat{y}_t)$ are polynomials of age a_{it}, race j, and log income $\hat{y}_{it}$, defined in the data as either labor income or Social Security benefits. Let $\mathbb{I}_I$ and $\mathbb{I}_B$ denote indicators that equal one if the household received inheritance

Table C.4: Coefficient estimates for inheritance profiles

	Probability p_I	Mean μ_I	Volatility σ_I
age (a)	-0.0019	-0.049	
	(0.0001)	(0.020)	
Black ($\mathbb{I}_{\mathrm{B}}$)	-0.0128	-0.521	1.58
	(0.0033)	(1.130)	(0.0234)
age $\times\ \mathbb{I}_{\mathrm{B}}$	0.0012	0.087	
	(0.0002)	(0.078)	
age^2/10	0.0005	0.0189	
	(0.0000)	(0.0042)	
(age^2/10) $\times\ \mathbb{I}_{\mathrm{B}}$	0.0002	-0.0088	
	(0.0000)	(0.0167)	
age^3/100	-0.0004	-0.0017	
	(0.0000)	(0.0003)	
(age^3/100) $\times\ \mathbb{I}_{\mathrm{B}}$	-0.0001	0.0006	
	(0.0000)	(0.0012)	
Income ($\hat{y}$)	0.0001	0.108	
	(0.0000)	(0.008)	
Constant	0.0237	-0.326	1.72
	(0.0013)	(0.307)	(0.0062)
Observations	5,007,370	40,715	
R^2	0.0026	0.0172	

This table reports OLS estimates for the probability of receiving inheritance (p_I) and the average log inheritance amount (μ_I), modeled as polynomials of age, race, and income. Income $\hat{y}$ is defined as either labor income in working life and Social Security benefits in retirement. The indicator $\mathbb{I}_{\mathrm{B}}$ equals 1 if the household is Black. Standard errors are in parentheses.

and is Black, respectively. The regression for the probability of receiving inheritance is then

$$\mathbb{I}_{Iit} = \beta_0 + \beta_1 a_{it} + \beta_2 \frac{a_{it}^2}{10} + \beta_3 \frac{a_{it}^3}{100} + \beta_4 \mathbb{I}_{\mathrm{B}it} + \beta_5 a_{it} \times \mathbb{I}_{\mathrm{B}it} + \beta_6 \frac{a_{it}^2}{10} \times \mathbb{I}_{\mathrm{B}it} + \beta_7 \frac{a_{it}^3}{100} \times \mathbb{I}_{\mathrm{B}it} + \beta_8 \hat{y}_i + \varepsilon_{Iit},$$

and the regression for the mean of log inheritance, conditional on receiving it, is analogous, with $\log I_{it}^+$ as the dependent variable. The variance $\sigma_I(j)^2$ of log inheritance, conditional on receiving it, is simply estimated by race, using the residuals from the regression on $\log I_{it}^+$. Table C.4 reports the results of these two regressions.

C.6 Family size

We model family size as polynomial of household head's age. We categorize Black and White households into single adult, two adults with one earner, and two adults with two earners,

Table C.5: **Coefficient estimates for household size**

	White households			Black households		
	Single	One-earner	Two-earner	Single	One-earner	Two-earner
age	0.20	0.90	0.75	0.37	0.75	0.59
	(0.04)	(0.06)	(0.07)	(0.06)	(0.09)	(0.07)
$age^2/10$	-0.04	-0.19	-0.15	-0.08	-0.17	-0.12
	(0.01)	(0.01)	(0.02)	(0.01)	(0.02)	(0.02)
$age^3/100$	0.002	0.13	0.009	0.006	0.01	0.008
	(0.0007)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)
Constant	-1.33	-8.92	-8.05	-2.49	-6.18	-5.03
	(0.54)	(0.78)	(0.97)	(0.74)	(1.23)	(0.09)
Observations	42	42	423	42	42	42
Adjusted R^2	0.88	0.98	0.95	0.93	0.93	0.93

This table reports the OLS coefficients of household size as a function of age. There are six categories of households. We use the CPS from 1978 to 2021 to obtain the results. Standard errors are reported in parentheses.

resulting in 6 types of households. We use the CPS from 1978 to 2021 to obtain the family size profile. Table C.5 reports the model coefficients from OLS regression. Figure C.3 plots the distribution of household size over age for the six types of households.

D Interaction effects between economic channels

In this section, we report the interaction effects on portfolio and wealth between pairs of economic channels. The discussion of these tables is in Section 4.4.

E Effect of economic channels on White households

In this section, we perform a complementary counterfactual analysis to the one presented in Section 4.2. Whereas the earlier exercise began with Black households and replaced their economic channels with those of White households, we now start with White households and substitute each channel with its Black household counterpart. This approach allows us to examine how adopting Black-specific economic characteristics, such as lower earnings or higher income risks, would affect White households' portfolios, wealth, and welfare. Table E.1 shows the results and the effects of these channels on White households are similar to those in Table 7,

Table D.1: **Interaction effects between economic channels**

Panel A: Income risk × stochastic asset returns

	Equity share (%)	Wealth
Black baseline	14.73	2.34
With White income risk	+3.80	+0.07
With stochastic return realization	+0.48	+0.16
Interaction: income risk × stochastic asset return	**−1.67**	**−0.43**
Joint total effect	+2.61	−0.20

Panel B: Earnings gap × health risk

	Equity share (%)	Wealth
Black without health risks	16.38	2.13
With White earnings level	+5.11	+0.78
With health risks	−1.66	+0.21
Interaction: earnings × health risks	**−0.43**	**−0.07**
Joint total effect	+3.02	+0.92

Panel C: Family structure × house prices

	Housing share (%)	Wealth
Black baseline	98.60	2.34
With White family structure	+12.03	+0.50
With White house prices	−52.87	−0.24
Interaction: family structure × house prices	**+3.39**	**−0.04**
Joint total effect	−37.45	+0.22

This table documents the interaction effects between pairs of economic channels. The baseline reports the model-simulated Black equity share and wealth (indexed by the wage index) under all existing economic disparities. We then turn off each channel individually to observe how equity or housing shares and wealth respond. A positive value indicates an increase in the variable to the baseline when that specific economic channel is turned off. The joint total effect measures the change in equity share and wealth when both channels are turned off simultaneously, compared to the baseline. The interaction effect captures the differences between joint effects and the sum of two individual effects.

confirming the robustness of our findings.

F Results under stochastic returns

Consider the alternative assumption that asset returns in the simulated data are drawn from the ex-ante expected distribution. We call these “stochastic returns" and contrast them with

Table E.1: **Effect of economic channels on White balance sheet**

	Effect of channel on White households						
	(0) Black–White difference	(1) Earnings gap	(2) Income risk	(3) Distressed sale	(4) House price	(5) Mortgage rate	(6) Property tax
Balance sheet composition:							
Stock market part. (%)	−28.18	−8.34	−12.73	−0.09	−0.25	−0.13	−0.15
Equity share (%)	−7.89	−3.24	−7.67	−0.03	−0.27	−0.17	0.08
Cond. equity share (%)	11.68	0.16	−5.90	0.01	−0.30	−0.21	0.25
Homeownership rate (%)	−28.27	−6.78	−0.25	−0.07	6.67	−0.82	−1.01
Housing share (%)	−20.24	−6.64	2.08	−0.02	12.61	−3.88	−3.63
Cond. housing share (%)	11.68	0.16	−5.90	0.01	−0.30	−0.21	0.25
Exp. return on wealth (%)	−1.10	−0.47	−0.54	0.00	2.01	−0.18	−0.29
Welfare:							
Welfare (%)		−16.24	−2.47	−0.07	9.19	−0.04	−0.06
Wealth, standalone effect:							
Wealth per adult	−2.55	−0.91	−0.29	−0.01	0.07	−0.01	−0.04
Wealth per household	−5.20	−1.56	−0.50	−0.01	0.12	−0.02	−0.08
Share of excess wealth gap (%)		12.85	13.24	0.34	−3.83	0.50	2.44

This table decomposes the effect of each economic factor on White portfolio composition, wealth, and welfare in the model. Column (0) reports the total difference between Black and White households; a negative value means the variable is lower for Black than for White households. Each subsequent column (1) through (12) reports the difference between a White household and a White household with the parameters controlling a given economic factor set to their value for Black households. For example, (1) reports the difference between White households and White households with the same earnings level as Black households. Wealth is reported in units of the national wage index. The expected return to wealth is the portfolio weighted sum of bond returns, equity returns, mortgage costs, and housing returns. Housing returns can be further decomposed into changes in house prices, implicit rental yield, distress costs, and property tax. The excess wealth gap is defined in Eq. 28. Welfare measures how Black households' lifetime consumption would change due to exposure to each channel. A negative welfare change indicates that that an economic factor adversely affects Black households, lowering their equivalent lifetime consumption by the reported percentage points.

the realized "historical returns" of the past decades. Historical returns on stocks in the last half-century were better-than-expected, so this alternative assumption is mainly studying the consequence of lower realized equity returns. Table F.1 reports how economic disparities affect Black portfolios, wealth, and welfare if housing and equity returns are stochastic. Table F.2 reports how social programs influence balance sheets and wealth accumulation under the stochastic return assumption.

Table E.1: **Effect of economic channels on White balance sheet, cont.**

	Effect of channel on White households					
	(7) Inheritance	(8) Race-dep. return	(9) Health exp.	(10) Mortality rate	(11) Family structure	(12) Preference
Balance sheet composition:						
Stock market part. (%)	−0.70	−1.02	−1.98	−13.39	−0.17	3.93
Equity share (%)	−0.09	0.08	−0.16	−5.86	−0.14	10.02
Cond. equity share (%)	0.33	0.87	1.14	−1.22	−0.13	13.94
Homeownership rate (%)	0.07	−3.93	−1.32	−6.84	−0.91	−14.10
Housing share (%)	1.29	−11.44	2.82	−9.46	−2.59	−10.84
Cond. housing share (%)	1.47	−7.36	6.03	0.85	−1.56	14.99
Exp. return on wealth (%)	0.01	−0.79	0.01	−0.82	−0.11	0.34
Welfare:						
Welfare (%)	−0.34	−0.48	−0.72			
Wealth, standalone effect:						
Wealth per adult	−0.21	−0.20	−0.24	0.20	−0.05	−0.99
Wealth per household	−0.36	−0.35	−0.41	−1.70	−0.05	−1.71
Share of excess wealth gap (%)	11.63	11.06	13.13	−11.76	2.34	54.70

In column (2), the income risk channel is adjusted so that the expected wage remains constant when varying the volatility of log earnings. This table is comparable to Table 7 but starts with White households.

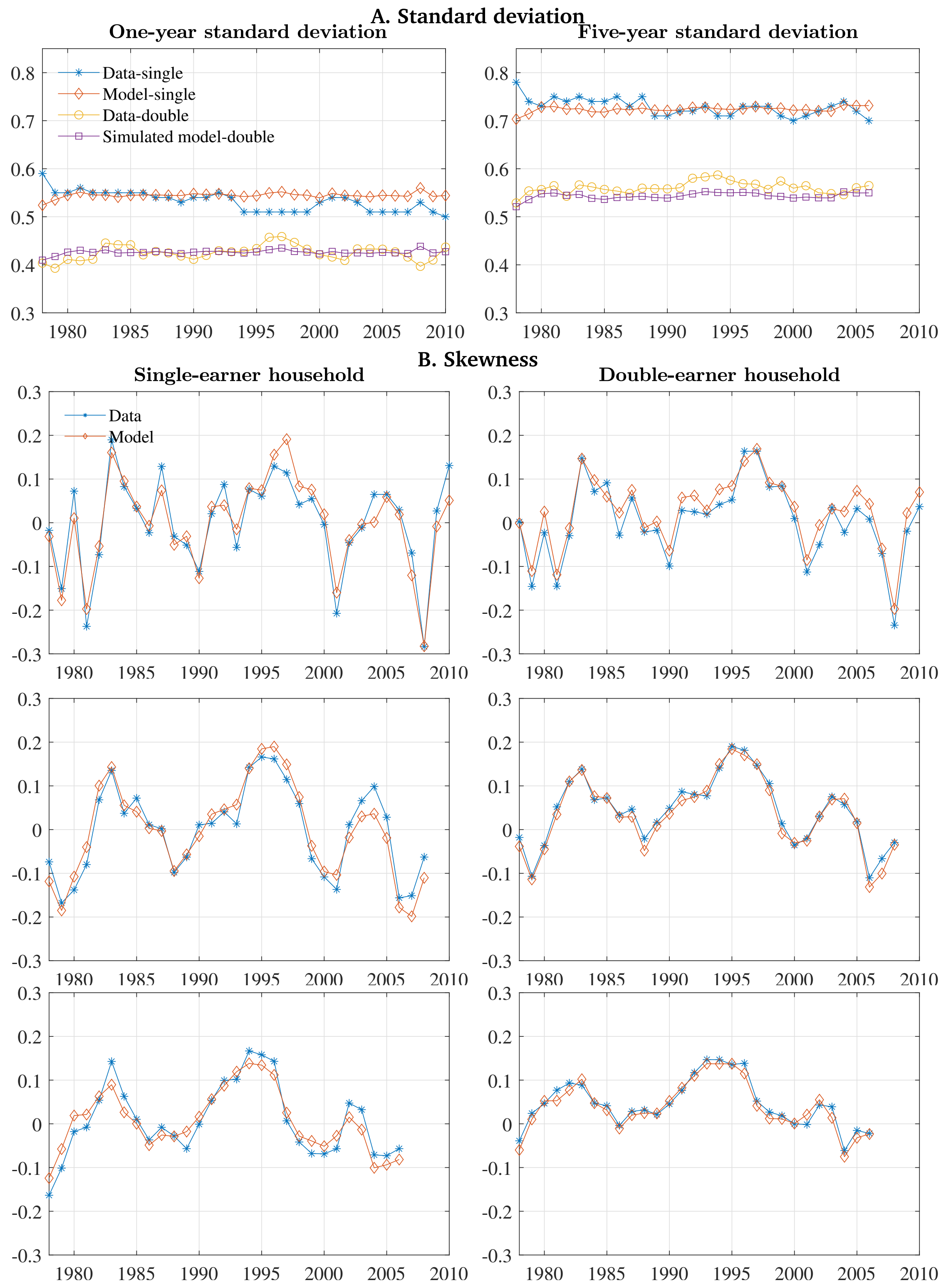

Figure C.1: **Fitness of idiosyncratic labor income risk model**

This figure reports the empirical and simulated values of moments targeted in the idiosyncratic labor income risk process. The cross-sectional empirical moments of the distribution of labor income log growth are from Guvenen, Ozkan, and Song (2014). We generate cross-sectional moments for double-earners from simulated data for couples. Panel A reports the fit of the standard deviation for one- and five-year horizon for single- and double-earner households. Panel B reports the fit of the skewness for one-, three-, and five-year horizon. The results for single- and double-earner households are presented on the left and right side, respectively.

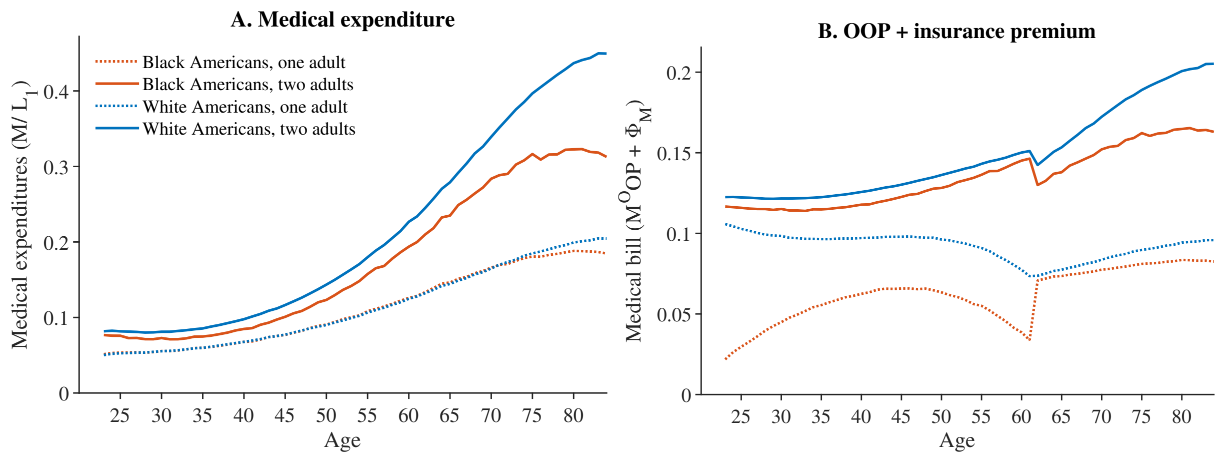

Figure C.2: **Distribution of health costs in model**

These two figures show the distribution of model-simulated total medical expenditures incurred and medical bill paid (including out-of-pocket payment and insurance premium) for White and Black households by the household head's age. Out-of-pocket payments represent the amounts households pay after coverage from private insurance, Medicare, and Medicaid.

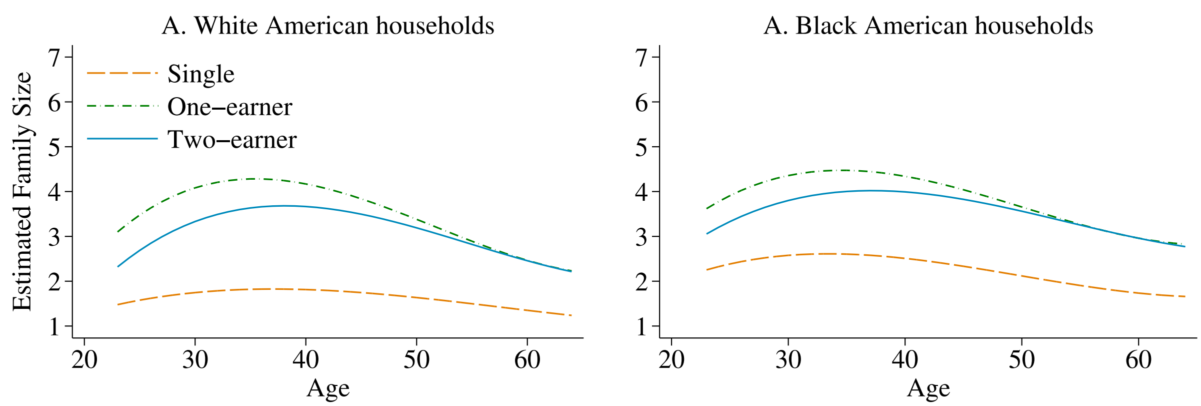

Figure C.3: **Distribution of household size**

These two figures show the implied distribution of White and Black household size relative to the household head's age. We use CPS data and we focus on three types of households: single adult, two adults with one earner, and two adults with two earners.

Table F.1: **Effect of economic channels on Black balance sheet**

	Effect of channel on Black households						
	(0) Black–White difference	(1) Earnings gap	(2) Income risk	(3) Distressed sale	(4) House price	(5) Mortgage rate	(6) Property tax
Balance sheet composition:							
Stock market part. (%)	−20.82	−8.41	−2.58	−0.03	−0.01	−0.14	−0.12
Equity share (%)	−5.28	−4.45	−3.02	−0.01	−1.17	−0.13	0.05
Cond. equity share (%)	11.09	−0.21	−5.26	0.02	−3.98	−0.20	0.39
Homeownership rate (%)	−26.22	−8.67	1.37	−0.08	17.28	−1.36	−1.43
Housing share (%)	−25.77	−12.59	2.84	−0.12	45.89	−5.77	−4.96
Cond. housing share (%)	33.25	7.33	0.36	0.06	38.08	−6.15	−4.26
Exp. return on wealth (%)	−0.70	−0.65	−0.13	−0.01	1.70	−0.24	−0.29
Welfare:							
Welfare (%)		−10.95	−0.74	−0.03	8.14	0.01	0.01
Wealth, standalone effect:							
Wealth per adult	−1.73	−0.57	0.14	−0.00	0.16	−0.01	−0.02
Wealth per household	−3.84	−0.72	0.18	−0.00	0.20	−0.01	−0.03
Share of excess wealth gap (%)		19.57	−13.82	0.40	−17.63	0.89	2.55
Wealth, interaction with other channels:							
Wealth per adult		−0.19	−0.02	−0.00	−0.10	−0.00	−0.01
Wealth per household		−0.57	0.03	−0.01	−0.10	−0.01	−0.02
Share of excess wealth gap (%)		−2.94	2.99	0.16	12.31	−0.13	0.14

This table decomposes the effect of each economic factor on Black portfolio composition, wealth, and welfare in the model. Column (0) reports the total difference between Black and White households; a negative value means the variable is lower for Black than for White households. Each subsequent column (1) through (12) reports the difference between a Black household and a Black household with the parameters controlling a given economic factor set to their value for White households. For example, (1) reports the difference between Black households and Black households with the same earnings level as White households. Wealth is reported in units of the national wage index. The expected return to wealth is the portfolio weighted sum of bond returns, equity returns, mortgage costs, and housing returns. Housing returns can be further decomposed into changes in house prices, implicit rental yield, distress costs, and property tax. The excess wealth gap is defined in Eq. 28. Welfare measures how Black households' lifetime consumption would change due to exposure to each channel. A negative welfare change indicates that that an economic factor adversely affects Black households, lowering their equivalent lifetime consumption by the reported percentage points. This table is under the stochastic return assumption and is comparable to Table 7.

Table F.1: **Effect of economic channels on Black balance sheet, cont.**

	Effect of channel on Black households					
	(7) Inheritance	(8) Race-dep. return	(9) Health exp.	(10) Mortality rate	(11) Family structure	(12) Preference
Balance sheet composition:						
Stock market part. (%)	−1.39	−0.72	−0.77	−0.33	−7.67	9.92
Equity share (%)	−0.51	−0.05	−0.21	−0.22	−4.37	8.20
Cond. equity share (%)	0.70	1.10	0.64	−0.15	−1.03	15.75
Homeownership rate (%)	−0.64	−4.64	−0.70	−2.00	−7.43	−12.91
Housing share (%)	1.17	−15.02	0.42	−5.59	−18.07	−15.11
Cond. housing share (%)	4.80	−11.07	3.54	−3.33	−6.36	16.00
Exp. return on wealth (%)	−0.00	−0.87	−0.03	−0.23	−0.80	−0.11
Welfare:						
Welfare (%)	−0.37	−0.19	0.06			
Wealth, standalone effect:						
Wealth per adult	−0.17	−0.10	−0.07	−0.03	0.17	−0.47
Wealth per household	−0.22	−0.12	−0.09	−0.03	−0.58	−0.60
Share of excess wealth gap (%)	19.49	10.85	7.67	3.29	−18.14	52.54
Wealth, interaction with other channels:						
Wealth per adult	−0.01	−0.05	−0.13	−0.00	0.00	−0.29
Wealth per household	−0.10	−0.12	−0.25	−0.01	−0.84	−0.70
Share of excess wealth gap (%)	−3.48	1.47	9.35	−0.86	1.99	12.85

The *standalone* wealth effects are obtained by turning off each economic factor while keeping all other model parameters at their calibration for Black households. The *interaction with other channels* is defined as the difference between the effect of an economic factor when all other parameters are calibrated for White households and the standalone effect. In column (2), the income risk channel is adjusted so that the expected wage remains constant when varying the volatility of log earnings.

Table F.2: **Racial portfolio gap and social programs under stochastic returns**

	(1) Baseline			(2) Remove SS Progressivity			(3) Cut SN and EITC by 90%			(4) All		
	B	W	B − W	B	W	B − W	B	W	B − W	B	W	B − W
Stock market part. (%)	29.23	50.04	−20.82	31.25	52.52	−21.27	28.08	51.11	−23.03	30.35	55.25	−24.90
Equity share (%)	115.21	20.49	−5.28	16.12	21.71	−5.58	13.47	20.04	−6.57	14.38	21.33	−6.94
Cond. equity share(%)	52.03	40.94	11.09	51.59	41.33	10.26	47.99	39.22	8.77	47.39	38.60	8.79
Homeownership rate (%)	49.57	75.79	−26.22	51.97	78.20	−26.23	53.25	82.91	−29.66	57.70	85.58	−27.88
Housing share (%)	96.37	122.14	−25.77	99.41	124.00	−24.60	85.96	124.35	−38.39	92.77	99.64	−6.87
Cond. housing share (%)	194.41	161.16	33.25	191.29	158.58	32.71	161.44	149.99	11.46	160.79	116.44	44.36
	B	W	B/W	B	W	B/W	B	W	B/W	B	W	B/W
Wealth per adult	1.96	3.69	0.53	1.98	3.64	0.54	2.19	3.95	0.55	2.24	4.23	0.53
Wealth per household	2.51	6.35	0.39	2.52	6.26	0.40	2.80	6.80	0.41	2.86	7.28	0.39
Share of excess wealth gap(%)			0			2.12			4.24			−0.57

This table presents the model-implied racial balance sheet and wealth under various social program scenarios. Scenario (1) is our baseline model, with real-life levels of Social Security, safety net, and EITC benefits. In scenario (2), we remove the progressivity of Social Security. Specifically, we replace baseline Social Security cash flow with 40% of lifetime income, measured by average indexed yearly earnings (AIYE) at age 60 defined in equation (14). In scenario (3), we cut down safety net and EITC programs by 90%; eligible households will receive only 10% of the baseline benefits. In scenario (4), we both remove the progressivity of Social Security and cut down safety net and EITC simultaneously. The term "share of excess wealth gap" refers to the portion of the wealth gap that cannot be explained by the income gap and is defined in equation (28).This table is under the stochastic return assumption and is comparable to Table 9

G Empirical evidence of differences in savings behavior

G.1 Survey evidence on savings behavior

To corroborate our finding that the discount factor β is on average lower for Black households, we examine survey data on savings behavior. The survey we consider is the 2019-2024 National Financial Capability Study (NFCS), which asks American households questions about their saving patterns and beliefs. Two survey questions serve as proxies for whether households are saving at high rates out of income. The first question (J3) asks, "Over the past year, would you say your [household's] spending was less than, more than, or about equal to your [household's] income?" The possible answers are "Spending less than income," "Spending more than income," "Spending about equal to income," "Don't know," and "Prefer not to say." The second question (J4) asks, "In a typical month, how difficult is it for you to cover your expenses and pay all your bills?" with possible responses "Very difficult," "Somewhat difficult," "Not at all difficult," "Don't know," and "Prefer not to say."

Our model says that, controlling for age, family structure, and income, a household's savings rate (and spending rate) out of income is a function of preferences: its discount factor β and precautionary saving demand. Under the null hypothesis that Black and White households have identical discount factors β, we should see that households with the same age, family structure, and income have the same savings rates out of income on average.[10] Thus, if after controlling for these characteristics we still see a significant effect of race on savings rates, then it suggests that group has a lower β.

To estimate the relative response rate of Black versus White households, we run multinomial logit regressions of survey responses Y_i on race k_i and control characteristics X_i (including a constant). Specifically, letting $Y_i \in \{0, 1, \ldots, J\}$ denote the categorical outcome for household

[10] Indeed, we should actually expect to find higher savings rates out of income for Black households, for two reasons. First, the need for precautionary savings is higher for Black households. And second, income in the NFCS includes both labor and capital income, and Black households have lower capital returns. If a Black household has the same total income from labor and capital as a comparable White household, it will on average have higher wealth due to the lower yield on savings.

i's response to the question, we estimate

$$P(Y_i = j | k_i, X_i) = \frac{\exp\{\Gamma_{kj} k_i + \Gamma_{Xj}^\top X_i\}}{1 + \sum_{j'=1}^{J} \exp\{\Gamma_{kj'} k_i + \Gamma_{Xj'}^\top X_i\}} \tag{27}$$

The controls X_i include bins for gender-age (A3B), marital status (A7A), and income (A8), as reported in the NFCS. The NFCS categorizes race (A4A_new_w) as either White and non-White. This poses a potential problem, as the majority of non-White Americans are not Black. To address this, we run the same regressions on only those households residing in states in which Black individuals account for more than 25% and 50% of the non-White population. For the 25% threshold, this subset includes 25 of the 50 states and D.C.; for the 50% threshold, this includes 14 of 51. All regressions are weighted using the survey weights.

Table G.1 reports the results of these regressions for the question: "Over the past year, would you say your [household's] spending was less than, more than, or about equal to your [household's] income?" The reference response ($Y_i = 0$) is "Spending less than income." The specifications (1), (2), and (3) correspond to Black-in-non-White proportions greater than 0%, 25%, and 50%, respectively. The coefficient reported is then the estimated relative-risk ratio for non-White versus White:

$$\frac{\widehat{P}(Y_i = j | k_i = \text{non-White}, X_i)/\widehat{P}(Y_i = 0 | k_i = \text{non-White}, X_i)}{\widehat{P}(Y_i = j | k_i = \text{White}, X_i)/\widehat{P}(Y_i = 0 | k_i = \text{White}, X_i)} = \exp\{\hat{\Gamma}_{\text{non-White},j}\}, \tag{28}$$

which is the relative likelihood that a non-White household with characteristics X will choose that response over "Spending less than income," compared to an otherwise equivalent White household. For example, the interpretation of the coefficient 1.092 in regression (1) of Table G.1 is that a non-White household is 9.2% more likely to respond with "Spending more than income" over "Spending less than income" than a White household with the same age, composition, and income.

Table G.1 shows that, across all three regression specifications, non-White households are between 9% and 12% more likely to report that they spent more than their income over the past year. This higher rate of spending (lower rate of saving), controlling for age and income, is suggestive of a lower β for Black households. Table G.2 shows the analogous regression

Table G.1: **Race and rate of spending more than income**

	(1)	(2)	(3)
Spending less than income			
Non-White	1	1	1
	-	-	-
Spending more than income			
Non-White	1.092***	1.097***	1.124***
	(0.0164)	(0.0199)	(0.0258)
Spending about equal to income			
Non-White	0.873***	0.861***	0.891***
	(0.0112)	(0.0136)	(0.0181)
Don't know			
Non-White	1.003	0.992	1.009
	(0.0307)	(0.0360)	(0.0490)
Prefer not to say			
Non-White	1.186**	1.147	1.111
	(0.0840)	(0.100)	(0.130)
Controls			
Gender-age	Yes	Yes	Yes
Marital status	Yes	Yes	Yes
Income bin	Yes	Yes	Yes
Observations	158,500	93,390	61,480
Black threshold	$> 0\%$	$> 25\%$	$> 50\%$

The table reports the estimated relative-risk ratio (28) for non-White versus White households in the multinomial logit regression (27) for the question "Over the past year, would you say your [household's] spending was less than, more than, or about equal to your [household's] income?" See the text for interpretation of coefficients. The "Black threshold" conditions on only the subset of households residing in states (and D.C.) in which the percentage of the Black population in the total non-White population exceeds that threshold. Standard errors are in parentheses. *** denotes significance at the 5% level against the null hypothesis that the coefficient equals 1.

results for the question "In a typical month, how difficult is it for you to cover your expenses and pay all your bills?" Non-White households are 3% to 8% more likely to say that saving is very difficult than that it is not difficult at all.

G.2 Survey evidence on financial literacy and confidence

As discussed in the main text, one possible cause of a lower discount factor β is cognitive discounting due to neglect of future states of the world. This could follow from a lack of financial education and literacy or from a discomfort with making financial decisions that causes an individual to think less about the future. The NFCS also asks respondents questions to assess

Table G.2: **Race and perceived difficulty saving**

	(1)	(2)	(3)
Very difficult			
Non-White	1.061***	1.075***	1.034
	(0.0191)	(0.0232)	(0.0286)
Somewhat difficult			
Non-White	1.076***	1.079***	1.051**
	(0.0138)	(0.0168)	(0.0210)
Not at all difficult			
Non-White	1	1	1
	-	-	-
Don't know			
Non-White	1.172***	1.097*	1.042
	(0.0501)	(0.0571)	(0.0732)
Prefer not to say			
Non-White	1.177***	1.224***	1.068
	(0.0716)	(0.0897)	(0.108)
Controls			
Gender-age	Yes	Yes	Yes
Marital status	Yes	Yes	Yes
Income bin	Yes	Yes	Yes
Observations	158,500	93,390	61,480
Black threshold	> 0%	> 25%	> 50%

The table reports the estimated relative-risk ratio (28) for non-White versus White households in the multinomial logit regression (27) for the question "In a typical month, how difficult is it for you to cover your expenses and pay all your bills?" See the text for interpretation of coefficients. The "Black threshold" conditions on only the subset of households residing in states (and D.C.) in which the percentage of the Black population in the total non-White population exceeds that threshold. Standard errors are in parentheses. *** denotes significance at the 5% level against the null hypothesis that the coefficient equals 1.

their confidence making future-oriented financial decisions. We consider the question (M1_1), "How strongly do you agree or disagree with the following statements? - I am good at dealing with day-to-day financial matters, such as checking accounts, credit and debit cards, and tracking expenses." The responses range from 1 to 7, with 1 corresponding to "Strongly Agree," 4 to "Neither Agree nor Disagree," and 7 to "Strongly Disagree."

We estimate the same multinomial logit regressions as in the previous section, and the results are in Table G.3. Across all three regression specifications, non-White households are 27% to 34% more likely to report that they strongly disagree with the statements, compared to otherwise similar White households.

Table G.3: **Race and confidence making financial decisions**

	(1)	(2)	(3)
1 – Strongly Disagree			
Non-White	1.338***	1.308***	1.273***
	(0.0417)	(0.0489)	(0.0605)
2			
Non-White	1.111***	1.011	0.956
	(0.0417)	(0.0461)	(0.0557)
3			
Non-White	1.078***	0.981	0.975
	(0.0312)	(0.0348)	(0.0431)
4 – Neither Agree nor Disagree			
Non-White	1.171***	1.090***	1.052*
	(0.0203)	(0.0227)	(0.0281)
5			
Non-White	1.057***	1.006	0.967
	(0.0180)	(0.0209)	(0.0257)
6			
Non-White	0.986	0.937***	0.933***
	(0.0147)	(0.0172)	(0.0222)
7 – Strongly Agree			
Non-White	1	1	1
	-	-	-
Don't know			
Non-White	1.476***	1.429***	1.257**
	(0.0882)	(0.102)	(0.123)
Prefer not to say			
Non-White	1.376***	1.269***	1.227*
	(0.0952)	(0.107)	(0.140)
Observations	158,500	93,390	61,480

The table reports the estimated relative-risk ratio (28) for non-White versus White households in the multinomial logit regression (27) for the question "How strongly do you agree or disagree with the following statements? - I am good at dealing with day-to-day financial matters, such as checking accounts, credit and debit cards, and tracking expenses." See the text for interpretation of coefficients. The "Black threshold" conditions on only the subset of households residing in states (and D.C.) in which the percentage of the Black population in the total non-White population exceeds that threshold. Standard errors are in parentheses. *** denotes significance at the 5% level against the null hypothesis that the coefficient equals 1.

G.3 Survey evidence on time discounting

To further evaluate our finding of a lower discount factor β among Black households, we use survey evidence about time discounting from Health and Retirement Study (HRS) and Understanding America Study (UAS) [11]. HRS 2014 module 5 (time inconsistency), HRS 2020

[11] The project described in this paper relies on data from survey(s) administered by the Understanding America Study, which is maintained by the Center for Economic and Social Research (CESR) at the University of Southern

module 2 (time discounting), and UAS module 603 each give respondents a sequence of binary choices between receiving a dollar amount today versus a greater dollar amount in 12 months. The delayed amount escalates across nodes until the respondent switches from "today" to "in 12 months."

We identify the dollar amount at which each respondent switches answers and use these switching points to construct a semi-annual discount rate following Huffman, Maurer, and Mitchell (2019). Huffman, Maurer, and Mitchell (2019) call this the internal rate of return (IRR). A higher discount rate means that the respondent has a lower discount factor and is less patient. To test whether Black households have a comparatively higher discount rate, we run the regression

$$\mathrm{IRR}_i = \Gamma_{\mathrm{B}} \mathbb{I}_{\{j_i=\mathrm{B}\}} + \Gamma_X^\top X_i + \epsilon_i,$$

where $\mathbb{I}_{\{j_i=\mathrm{B}\}}$ is the indicator variable that takes a value of 1 if the respondent is Black. The controls X_i include marital status, gender, age, income, and a constant. Table G.4 shows that, in the HRS, Black household have a discount rate 13 to 16 percentage points higher than otherwise similar White respondents. Table G.5 shows a very similar magnitude of difference in discount rate for Black and White households in the UAS data (about 13 to 19 percentage points).

H Survey expectations of stock returns by race

In Section 5.1, we study the effect of differences in expected stock returns on Black wealth. To evaluate whether Black and White households have different expectations of stock returns, we look to survey data from the Health and Retirement Study (HRS), which asks respondents questions about their financial beliefs. Specifically, the HRS elicits three probabilities from respondents: the probability that the stock return is positive next year (ppr), the probability that it will be less than −20% (pdown20), and the probability that it will be greater than 20% (pup20). These probabilities imply intermediate probabilities that the return will be between −20% and 0% (ppr−pup20) and that it will be between 0% and 20% (1−ppr−pdown20).

California. The content of this paper is solely the responsibility of the authors and does not necessarily represent the official views of USC or UAS.

Table G.4: **Black-White differences in time discounting (discount rate), HRS**

	(1)	(2)	(3)
Black	0.164***	0.166***	0.132***
	(0.030)	(0.031)	(0.032)
Married		-0.022	0.033
		(0.021)	(0.023)
Age		0.002**	0.000
		(0.001)	(0.001)
Male		-0.025	-0.017
		(0.021)	(0.022)
Log income			-0.067***
			(0.011)
Constant	0.551***	0.417***	1.245***
	(0.011)	(0.080)	(0.164)
Observations	1171	1171	1063
R^2	0.024	0.032	0.061

This table reports the estimated semi-annual time-discount rate (IRR) implied by the Health and Retirement Study (HRS) 2014 time discounting module and 2020 time inconsistency module. The module asks respondents whether they are willing to trade off today's money for next year's (e.g., "Would you rather receive \$100 today or \$154 in 12 months?"), and we back out the implied semi-annual IRR following Huffman, Maurer, and Mitchell (2019). All regressions are weighted, and standard errors are in parentheses. Higher IRR indicates greater impatience (a lower annual discount factor β in our model's notation). *** denotes significance at the 1% level against the null that the coefficient equals zero.

We compute these implied intermediate probabilities and drop all individuals whose reported probabilities imply negative probabilities (i.e., those for whom `pup20>ppr` or `ppr+pdown20>1`).

Figure H.1 plots the average stated probability for each group in the 2010–2020 HRS waves. Assessed probabilities of extreme outcomes ($< -20\%$ or $> 20\%$) are similar between races. The most notable difference is that, on average, Black households assign a significantly higher probability to a negative return, between -20% and 0%, than do White households; and, conversely, White households assign a much higher probability to a positive return between 0% and 20%. This suggests more pessimism in the mean return by the typical Black household.

We emphasize that this evidence is at best suggestive, and should be interpreted with caution. These survey data are quite noisy, and many respondents report probabilities that sum to more than one (though, as mentioned, we do exclude these individuals from the computations

Table G.5: **Black-White differences in time discounting, UAS**

	Predictors of time discount rate		
	(1)	(2)	(3)
Black	0.188***	0.161***	0.129***
	(0.009)	(0.009)	(0.009)
Married		-0.043***	-0.009
		(0.006)	(0.006)
Age		-0.003***	-0.002***
		(0.000)	(0.000)
Male		-0.041***	-0.035***
		(0.006)	(0.006)
Log income			-0.098***
			(0.005)
Constant	0.453***	0.634***	0.834***
	(0.003)	(0.011)	(0.014)
Observations	10485	10474	10448
R^2	0.044	0.076	0.112

This table reports the estimated semi-annual time-discount rate (IRR) implied by the Understanding America Survey module 603 The module asks respondents whether they are willing to trade off today's money for next year's (e.g., "Would you rather receive $1,000 today or $1,300 in 12 months?"), and we back out the implied semi-annual IRR following Huffman, Maurer, and Mitchell (2019). Higher IRR indicates greater impatience (a lower annual discount factor β in our model's notation). *** denotes significance at the 1% level against the null that the coefficient equals zero.

above). If one were to take these distributions literally—say, by fitting normal distributions to them—then they would imply overly pessimistic expectations that do not align with actual portfolio choices. In particular, the implied expected return for Black households would be negative, creating a puzzle as to why they invest in stocks at all.

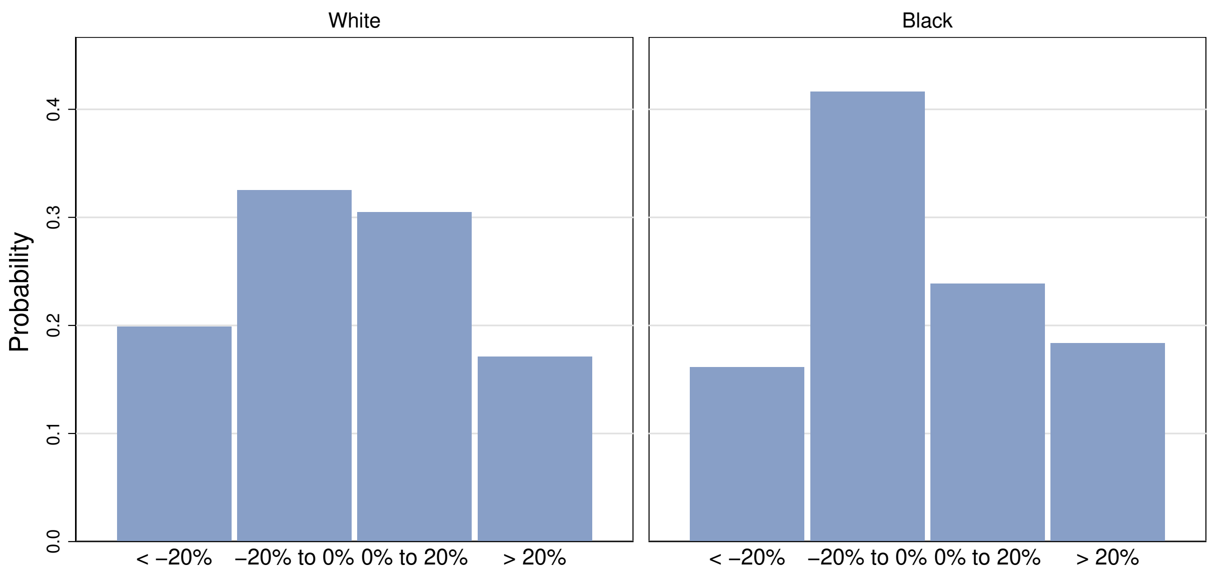

Figure H.1: **Subjective probability distribution of stock returns by race**
This figure shows the average probability distribution of stock returns by Black and White respondents to the Health and Retirement Study (HRS). Each bar represents the average stated probability that the stock return next year will be within the stated range. See the text for details of computation.