

# Black/white differences in wealth

---

**Joseph G. Altonji, Ulrich Doraszelski,  
and Lewis Segal**

## Introduction and summary

The gap in wealth holdings between African-Americans and white Americans is enormous—much larger than the gap in earnings. For example, Menchik and Jianakoplos (1997) find that the average wealth of black households is 20 percent of the average wealth of white households in the 1976 National Longitudinal Survey of mature men and 23 percent in the 1989 Survey of Consumer Finances, even though average black income is 60 percent and 50 percent of average white income, respectively, in the two samples. Blau and Graham (1990) use data from the 1976 and 1978 waves of the National Longitudinal Surveys of young men and women and find that, on average, young black families hold only 18 percent of the wealth of young white families, while the corresponding percentage for income is 64.9.

Wealth is important in any society. It influences access to capital for new businesses, is a source of political and social influence, and provides insurance against fluctuations in labor market income. It influences the quality of housing, neighborhoods, and schools a family has access to as well as the ability to finance higher education. The fact that friendships and family ties tend to be within racial groups serves to amplify the effect of the race gap in wealth on the financial, social, and political resources available to blacks relative to whites.<sup>1</sup>

What explains the huge wealth gap? In this article, we summarize some of the results of our ongoing research on this question, drawing heavily on the analysis in Altonji, Doraszelski, and Segal (1999). We focus much of our attention on the most obvious possibility, which is that the wealth gap may arise because whites have higher incomes than blacks and have marriage and fertility patterns that are more favorable to wealth accumulation. Indeed, the existence of a gap in wealth is not surprising in view of the well-established income disparity.<sup>2</sup> Both savings

levels and savings rates are positively related to income. Since blacks on average have lower incomes than whites, we would expect blacks to have lower savings. A lower flow of savings translates into less wealth. Similarly, the fact that blacks are less likely to marry, have less stable marriages, and have more children implies that blacks will have less wealth per household than whites. The issue is whether differences in income and demographic patterns can explain the large gap.

Several studies, including those mentioned above, have found large wealth differences even after controlling for differences between blacks and whites in average income and other factors. For example, Blau and Graham (1990) conclude that as little as one-quarter of the wealth gap can be attributed to racial differences in income and demographic variables. There are some limitations to previous studies that lead us to revisit the issue. For example, the wealth of a married couple is likely to depend not only on earnings last year but also on earnings in previous years. Earnings in any one year are influenced by transitory factors, such as whether an individual experiences a layoff or has opportunities to work overtime, and are a very rough indicator of the resources available to a household over the extended time frame in which wealth accumulation takes place. Smith (1995) and Avery and Rendall (1997) base their wealth

*Joseph G. Altonji is a professor of economics and associate director of the Institute for Policy Research at Northwestern University, a research associate at the National Bureau of Economic Research, and a consultant to the Federal Reserve Bank of Chicago. Ulrich Doraszelski is a graduate student at Northwestern University. Lewis Segal is vice president of analytics and technology at InfoWorks Incorporated. The authors' research has been supported by the Institute for Policy Research and the Russell Sage Foundation.*

models on current income alone, and this is not an adequate control for race-related differences in earnings streams. Consider a white family and a black family who have the same income in the previous year. In most cases, the white family will have enjoyed a higher income in other years than the black family, and thus will have higher wealth. Blau and Graham (1990) and Menchik and Jianakoplos (1997) decompose income into current income and the normal or usual flow of income to the household, which we refer to as permanent income. They measure the permanent component of income as the part of income that is predictable given race, sex, age, education, health status, number of children, and geographic location. This approach is a clear improvement over the use of only current income to measure the contribution of differences in income streams to the wealth gap. However, it is inadequate for a number of somewhat technical reasons.<sup>3</sup>

In this article, we take advantage of the fact that our data set, the Panel Study of Income Dynamics (PSID), contains several years of data on the income of each individual in our sample. We use an adjusted average of the income across years as our measure of permanent income in our models of wealth holding.

We also take advantage of the rich data in the PSID to do a better job of controlling for differences in household characteristics that influence wealth holding than has been possible in previous work. The earlier studies control for current demographic variables such as marital status and presence of children. Since wealth at a point in time reflects a flow of savings over many previous years, it is likely to be influenced by demographic histories as well as by current demographic variables. To address this fact, we construct measures of the marriage histories and child bearing and rearing histories of each sample member and add them to our models of wealth.

We use standard *regression techniques* to decompose the race gap in wealth holding into a part that is due to differences between whites and blacks in the income and demographic characteristics that we observe and a part that is not explained by these factors. We can explain most of the difference in wealth holding with income and demographic variables, provided that we use the wealth model that has been estimated on a sample of whites. That is, we find that blacks and whites would have similar wealth levels if 1) the relationship between wealth and income and demographics for blacks was the same as it is for whites, and 2) blacks and whites had the same distributions of income and demographic characteristics. On the other hand, when we ask, “If the relationship

between wealth and income and demographics for whites were the same as it is for blacks, how much wealth would whites hold?” we conclude that whites would hold much less wealth than they actually hold. While our results are somewhat sensitive to the particular form of the regression model, they suggest that race-related differences in the sensitivity of wealth to income and demographics are a major factor in determining the race gap in wealth. We draw similar conclusions from separate analyses of home equity, stocks/mutual funds and individual retirement accounts (IRAs), and the value of farms and businesses.

So we have traded one question for another. The question becomes, “Why does the relationship between wealth and income/demographics differ so significantly between blacks and whites?” Racial differences in rates of return, inter vivos transfers and inheritances, and savings behavior could all underlie the race difference in wealth models and contribute to the part of the wealth gap not explained by income and demographics. Blau and Graham (1990) and other researchers have hypothesized that differences in inter vivos transfers and inheritances play a major part in the wealth gap. We provide some indirect evidence on the effects of transfers and gifts on the race differences in wealth models by using data on siblings to estimate the effects of income and demographics on wealth holding. Basically, we estimate the relationship between wealth and income and demographics by regressing differences among siblings in wealth on differences among siblings in income and household characteristics. We do this using a statistical technique called *fixed effects* regression. Using differences among siblings to estimate wealth models largely neutralizes the effects of differences between whites and blacks in inter vivos transfers and inheritances from parents. This is because parental gifts and bequests do not differ greatly among siblings. Consequently, the analysis of siblings provides a way of controlling for the effects of adverse history on the relative position of blacks. Our results for siblings, while somewhat imprecise, confirm our basic finding that wealth holdings are much less strongly related to income and demographic variables for blacks than whites. They tentatively suggest that the race difference in the wealth models is not driven primarily by inter vivos gifts and inheritances.<sup>4</sup>

## Data

The data source we use for our study is the PSID, which is collected by the University of Michigan, Institute for Social Research. The PSID is based on a random sample of U.S. households in 1968 and a

separate low-income sample. The households were interviewed annually through 1997, providing many years of income data and long demographic histories for the panel members. Detailed wealth data were collected in 1984, 1989, and 1994, and form the heart of our analysis. We use both the random and the low-income samples without weighting to estimate the wealth models. However, we use survey weights to make our estimates nationally representative when computing decompositions of the wealth gap and descriptive statistics.

The PSID contains a full set of variables only for household heads (“heads”) and their spouses (“wives”). Our analysis is based on all persons who were either a head or a wife in at least one of the three years for which wealth data are available. Household heads include the male in a married couple as well as the male or female heads from single adult households. We also created a demographic history for each individual that describes past and present marriages and child bearing and rearing. We use wealth including home equity as the measure of wealth. We also analyze main home equity (house value net of mortgage balance), stocks/mutual funds and IRAs, and wealth in farms/businesses.<sup>5</sup>

Real nonasset family income (deflated by the Consumer Price Index for urban areas) is our measure of current income.<sup>6</sup> We take advantage of the panel nature of the PSID by using all of the available data for an individual when estimating permanent income. Our measure of permanent income is basically a time average of past, current, and future income for each person adjusted for age, marital status, presence of children, and time. The averaging reduces the influence of measurement error and transitory variation in income. See box 1 for details. Our measure has sufficient variation over individuals to permit us to work with nonlinear models of the relationship between income and wealth, in contrast to the linear specifications used in previous studies. In Altonji et al. (1999), we show that the use of linear specifications may lead one to understate the importance of the race gap in income as a source of the wealth gap.

### Descriptive statistics

It is useful to begin with a brief discussion of race differences in wealth as well as some of the key income and demographic variables. To save space, we present statistics for the pooled sample of observations for 1984, 1989, and 1994. The weights are normalized so that the means are estimates of the average of the population means across the three years. We provide variable definitions and descriptive

#### BOX 1

##### Permanent income

To construct our measure of permanent income, we make use of the panel nature of the PSID. The measure is based on the regression model

$$Y_{it} = X_{it}\gamma + e_{it},$$

where  $Y_{it}$  is nonasset family income of person  $i$  in year  $t$ , and the vector  $X_{it}$  consists of a fourth-order polynomial in age (centered at 40), a marital status dummy, an indicator for children, the number of children, and a set of year dummies. In turn,  $e_{it}$  is the sum of an individual-specific effect and an idiosyncratic error term,  $e_{it} = v_i + u_{it}$ . We estimate the parameters of the above equation from race- and gender-specific regressions using all observations in which the person was either a head or wife. Our measure of permanent income is the individual-specific effect  $v_i$ , estimated as the person-specific mean of the residuals from the regression. We construct separate measures for the level and the log of permanent income and normalize them to refer to the year of the wealth survey. To ensure the quality of our permanent income measures, we dropped persons with less than four observations in the subsequent analysis. Note that the permanent income variables are normalized to refer to the flow of income at a specific age, 40, for a person in a household with a particular set of characteristics. Consequently, the mean of permanent income may differ substantially from the mean of current income.

statistics for the key variables used in our analysis in tables 1 and 2.

Table 1 provides descriptive statistics for wealth, current income, and permanent income in 1989 dollars. There are separate columns for white couples, black couples, single white males, single black males, single white females, and single black females. A person may be in multiple samples if their marital status changes over time. In the case of couples, the mean of wealth is \$54,357 for blacks and \$206,386 for whites, a ratio of 0.26. The race gap for income is much smaller, with a mean of \$30,236 for blacks and \$41,471 for whites, a ratio of 0.73. This is reflected in our permanent income measures, which have a mean of \$31,717 for black household heads and

TABLE 1						
Descriptive statistics for wealth and income variables						
	White couples	Black couples	Single white males	Single black males	Single white females	Single black females
Wealth, including main home equity	\$206,386.54 (600,271.64)	\$54,357.54 (140,186.57)	\$63,085.88 (154,851.15)	\$15,492.33 (35,991.84)	\$71,032.20 (208,611.65)	\$15,228.90 (407,11.16)
Main home equity	58,207.66 (74,142.09)	25,694.76 (52,626.45)	18,537.59 (42,916.79)	6,701.92 (16,246.51)	27,739.75 (114,047.48)	9,213.12 (25,739.83)
Farm/business	37,317.57 (253,246.67)	2,695.27 (43,804.92)	8,261.79 (49,746.52)	8,19.13 (22,559.72)	4,406.91 (32,473.38)	104.21 (2,602.34)
Stocks/mutual funds/IRAs	27,745.31 (189,505.85)	4,109.96 (22,228.30)	8,704.90 (63,122.62)	585.52 (3,663.64)	9,105.07 (40,662.64)	516.71 (4,185.33)
Main home equity, excluding 0	69,727.91 (76,037.64)	38,390.03 (60,419.77)	50,076.88 (58,276.33)	30,930.56 (21,651.04)	57,327.17 (158,694.18)	30,740.53 (39,355.64)
Farm/business, excluding 0	182,532.08 (535,903.74)	60,064.02 (198,283.17)	72,540.20 (130,635.90)	38,866.08 (150,564.01)	80,798.82 (114,724.86)	25,752.15 (31,827.34)
Stocks/mutual funds/IRAs, excluding 0	69,013.89 (294,076.23)	26,963.97 (51,238.27)	34,181.45 (121,552.20)	8,724.18 (11,357.29)	38,503.63 (76,551.80)	8,949.50 (15,097.33)
Total taxable nonasset income	41,471.30 (43,812.12)	30,236.65 (19,933.27)	22,446.70 (19,231.00)	14,077.71 (11,878.50)	14,636.77 (26,904.87)	10,622.19 (8,854.27)
Permanent income	45,680.89 (20,976.23)	31,717.42 (12,590.99)	44,098.38 (14,577.26)	27,463.24 (8,161.70)	38,241.75 (12,161.26)	25,103.79 (7,033.50)
Spouse permanent income	42,343.33 (22,991.73)	29,553.00 (13,840.07)				
Number of observations	7,600	2,509	1,395	1,133	2,705	3,179

Notes: Computed from the pooled sample using weights. Standard deviations in parentheses. The weights are normalized so that for each subgroup the means are estimates of the average of the population means for 1984, 1989, and 1994. The definition of permanent income is given in the text.  
Source: Authors' calculations based on data from the PSID.

\$45,680 for white heads. The permanent income values are \$29,553 and \$42,343 for black wives and white wives, respectively. The black/white ratios of permanent income are about 0.70. Moreover, the distributions for current and permanent income are much more concentrated than the distributions for wealth. We also report descriptive statistics on several key components of wealth, including home equity, the value of a farm or business, and the value of stocks, mutual funds, and IRAs. For each component we report the mean and standard deviation for the households that have nonzero values, as well as the overall mean and standard deviation including the zero values. It is interesting to note that the race gap in home equity is smaller than the gap in total wealth. With zero values included, the mean of home equity is \$25,694 for black couples, which is 44 percent of the value of \$58,207 for white couples. In contrast, black couples hold only \$4,110 in stocks, mutual funds, and IRAs, which is only 15 percent of the corresponding mean value for whites. Only 15 percent of black households hold wealth in this category, while 40 percent of white households do.

The black self-employment rate is only about one-third of the white self-employment rate, and this ratio has been relatively constant for the past 70 years

(see Fairlie and Meyer, 1997). Given this fact, one would expect the value of farms and businesses to be much smaller for blacks than whites. The data confirm this. Only 4 percent of black couples report having assets in a farm or business, while 20 percent of white couples report such assets. Including the zero values, black couples hold an average of \$2,695 in farms or businesses, which is only 7 percent of the mean for whites.

The situation for singles mirrors the one for couples. In the case of single women, the mean of wealth is \$15,228 for blacks and \$71,032 for whites, a ratio of 0.22. The race gap for income is again much smaller, with a mean of \$10,622 for blacks and \$14,637 for whites, a ratio of 0.73. The means of permanent income of individuals who are single heads of households in 1984, 1989, or 1994 exceed the means of current income dramatically. The numbers are \$38,242 for whites and \$25,103 for blacks.

In table 2 we present the definitions and descriptive statistics of regional and demographic variables that influence wealth. Many of these show substantial differences across races. Since housing prices vary across regions, and a much higher proportion of blacks live in the South, we control for region and residence in a standard metropolitan statistical area

(SMSA) in our analysis. In the case of couples, the number of children currently living in the family unit is higher for blacks (1.20) than for whites (0.92), although the number of dependents is similar (0.25 for whites and 0.29 for blacks). The difference in the total number of own or adopted children is even bigger, with 2.42 (2.41) for white husbands (wives) and 2.88 (2.85) for black husbands (wives). This points

to the potential importance of controlling not only for current demographics but also for demographic histories.

Blacks describe themselves as being in poor or fair health more often than whites.<sup>7</sup> Whites are better educated than blacks, with almost three times as many whites holding a college degree and two times as many whites holding advanced or professional degrees.

**TABLE 2**

**Descriptive statistics for demographic variables**

	White couples	Black couples	Single white males	Single black males	Single white females	Single black females
Northeast region	0.23	0.15	0.22	0.15	0.22	0.15
Midwest region	0.29	0.18	0.29	0.22	0.28	0.23
South region	0.30	0.60	0.28	0.55	0.29	0.53
West region	0.18	0.07	0.21	0.08	0.21	0.09
SMSA	0.48	0.64	0.55	0.72	0.56	0.71
Spouse annual hours worked	936.18 (933.12)	979.05 (955.71)				
Age	48.06 (15.18)	47.83 (15.45)	41.08 (17.66)	38.60 (14.69)	53.23 (20.61)	43.90 (17.30)
Spouse age	45.46 (14.71)	44.65 (14.55)				
Number of children in family	0.92 (1.13)	1.20 (1.33)	0.11 (0.46)	0.17 (0.56)	0.36 (0.81)	1.04 (1.28)
Children in family	0.48	0.58	0.07	0.11	0.21	0.53
Number of dependents outside family	0.25 (0.77)	0.29 (0.93)	0.36 (0.81)	0.56 (1.02)	0.16 (0.63)	0.10 (0.42)
Dependents outside family	0.14	0.15	0.21	0.30	0.09	0.07
Health fair or poor	0.14	0.30	0.16	0.25	0.25	0.31
Spouse health fair or poor	0.12	0.29				
Schooling						
0-8	0.08	0.18	0.07	0.12	0.13	0.15
9-11	0.13	0.19	0.14	0.21	0.16	0.28
12-15	0.53	0.52	0.54	0.59	0.55	0.50
16	0.17	0.06	0.17	0.08	0.11	0.05
17+	0.10	0.05	0.08	0.01	0.06	0.02
Spouse schooling						
0-8	0.05	0.09				
9-11	0.12	0.24				
12-15	0.65	0.57				
16	0.13	0.05				
17+	0.06	0.05				
Number of marriages	1.18 (0.49)	1.12 (0.43)	0.64 (0.72)	0.54 (0.67)	0.97 (0.75)	0.71 (0.65)]
Tenure of current marriage	21.83 (15.34)	20.67 (14.85)	1.81 (7.50)	2.43 (6.85)	2.01 (7.76)	3.05 (8.98)
Spouse number of marriages	1.18 (0.47)	1.11 (0.45)				
Number of children born or adopted	2.42 (1.66)	2.88 (2.31)	1.10 (1.65)	1.75 (2.11)	1.99 (1.98)	2.61 (2.37)
Spouse number of children	2.41 (1.65)	2.85 (2.41)				
Number of observations	7,600	2,509	1,395	1,133	2,705	3,179

Notes: Computed from the pooled sample using weights (see table 1). Standard deviations in parentheses. SMSA refers to standard metropolitan statistical area. Schooling refers to highest level of education.  
Source: Authors' calculations based on data from the PSID.

Finally, whites have a slightly higher tendency to marry, as reflected in the number of marriages and the tenure of the current marriage.

### Econometric models and methods

Let  $i$  index individuals or couples and  $j$  index blacks and whites, where  $j$  is  $b$  for blacks and  $w$  for whites. Let  $W_i^j$  denote a measure of wealth,  $Y_i^j$  a vector of income variables, and  $X_i^j$  a vector of demographic variables.

Our basic model specifies wealth to be linear in the income and demographic variables and is given by

$$W_i^w = \alpha_0^w + Y_i^w \alpha^w + X_i^w \beta^w + \varepsilon_i^w$$

$$W_i^b = \alpha_0^b + Y_i^b \alpha^b + X_i^b \beta^b + \varepsilon_i^b,$$

where  $\alpha_0^w$ ,  $\alpha^w$ , and  $\beta^w$  are the regression intercept and slope parameters for whites,  $\varepsilon_i^w$  is the error term, and  $\alpha_0^b$ ,  $\alpha^b$ ,  $\beta^b$ , and  $\varepsilon_i^b$  are the corresponding parameters and error term for blacks. Separate sets of regressions are specified for single males, single females, and married couples, so the slopes and intercepts depend on sex and marital status as well as on race. The observations are pooled across time with year indicator variables to control for differences over time.

We use the regressions to decompose the difference in wealth between whites and blacks into two parts. The first part is due to the difference between whites and blacks in the average values of income and demographic variables, and the second part is due to a racial difference in the parameters of the wealth model. We refer to the first part as the “explained” gap, meaning “explained by the income and demographics” and to the second as the “unexplained gap.” Such decompositions are standard in the literature on group differences, including the studies of the race gap in wealth cited in the introduction. We perform two different decompositions. One uses the parameters of the regression model for whites,  $\alpha_0^w$ ,  $\alpha^w$ , and  $\beta^w$ , to measure the contribution to the wealth gap of the differences between whites and blacks in income  $Y_i$  and demographic characteristics  $X_i$ . The second decomposition uses the parameters of the regression model for blacks,  $\alpha_0^b$ ,  $\alpha^b$ , and  $\beta^b$ , to compute how much the race differences in income and demographics matter for wealth holding. See box 2 for details.

### Basic results

Here, we present decompositions of the race gap into a component explained by differences in income and demographic variables and an unexplained component measuring the portion of the gap that remains

after conditioning on income and demographics. First, we discuss our findings for married couples.

### Couples

Before turning to the wealth decompositions, we must describe the specification of the regression model that is used to produce them. The dependent variable is the level of wealth. In the case of couples, the controls for income and earnings capacity  $Y_i$  are current family income, permanent family income of the husband, and permanent family income of the wife. We also include the squares of current income, head’s permanent income, wife’s permanent income, and the products of current income with the head’s and the wife’s permanent income. The vector of geographic and demographic controls,  $X_i$ , contains region dummies, a dummy for residence in an SMSA, four education dummies for the husband and four for the wife, the wife’s work hours in the previous year,<sup>8</sup> a dummy equal to 1 if the wife’s health is fair or poor, and a dummy equal to 1 if the husband’s health is fair or poor. It also includes fourth-order polynomials in the age of the husband and the age of the wife (centered at age 40), a dummy equal to 1 if there are children under 18 in the family unit and 0 otherwise, the number of children under 18 in the household, controls for whether the household head has dependents outside of the family unit, the number of dependents outside the family unit, controls for the number of marriages of the head, the respective number for the wife, the tenure of the current marriage, the total number of children of the head, and the total number of children of the wife. Finally, we include year dummies for the 1984 and the 1994 surveys. Estimates of the regression models are reported in Altonji et al. (1999). Our focus here is on the wealth decompositions based on the regression equations listed above rather than on the coefficients of specific variables.

The estimate of the wealth gap is \$150,656 with a standard error of \$13,872 (table 3, column 5).<sup>9</sup> We emphasize that the group means have substantial standard errors, which is a reflection of the extreme values in the wealth distribution and is not always appreciated in the literature making group comparisons. Using the estimates of  $\alpha_0^w$ ,  $\alpha^w$ , and  $\beta^w$  to assess the importance of the white/black difference in the explanatory variables, we conclude that the race gap in income and demographics explains \$101,391, or 67 percent, of the gap for couples (table 3, column 6). We obtain strikingly different results when we use the estimates of  $\alpha_0^b$ ,  $\alpha^b$ , and  $\beta^b$  from the wealth equation for blacks to evaluate the wealth gap. Using these coefficients we find that only 6 percent of the wealth gap is explained by differences in the explanatory variables

## Regression decomposition

We evaluate the explanatory power of our wealth models using a regression decomposition. The predicted values of the mean of wealth for whites and blacks are, respectively,

$$\begin{aligned}\hat{W}^w &= \alpha_0^w + \bar{Y}^w \alpha^w + \bar{X}^w \beta^w \\ \hat{W}^b &= \alpha_0^b + \bar{Y}^b \alpha^b + \bar{X}^b \beta^b,\end{aligned}$$

where  $\bar{Y}^w$  and  $\bar{X}^w$  are weighted means of the income and demographic variables for the sample of whites and  $\bar{Y}^b$  and  $\bar{X}^b$  are the weighted means for blacks. (Note that we estimate the wealth models without using sampling weights to avoid introducing additional heteroscedasticity into the analysis but weight the observations when performing decompositions so that they will be representative of the U.S. population. As a result,  $\hat{W}^w$  and  $\hat{W}^b$  differ somewhat from the weighted sample means  $\bar{W}^w$  and  $\bar{W}^b$  of wealth for whites and blacks, respectively.)

In addition to predicting wealth holdings, we can use our wealth models to ask a counterfactual question, namely “How much wealth would blacks hold if they had the same relationship between income and demographic variables and wealth holdings as whites?” The answer is given by

$$\alpha_0^w + \bar{Y}^b \alpha^w + \bar{X}^b \beta^w.$$

Using the above equations, we can decompose the wealth gap into a part that is explained and a part that remains unexplained. Specifically, it is easy to show that

$$\begin{aligned}\hat{W}^w - \hat{W}^b &= \{(\bar{Y}^w - \bar{Y}^b) \alpha^w + (\bar{X}^w - \bar{X}^b) \beta^w\} \\ &+ \{\alpha_0^w - \alpha_0^b + \bar{Y}^b (\alpha^w - \alpha^b) + \bar{X}^b (\beta^w - \beta^b)\}.\end{aligned}$$

The first term in brackets is the part of the total wealth gap  $\hat{W}^w - \hat{W}^b$  between whites and blacks that is explained by racial differences in the mean of income  $\bar{Y}^w - \bar{Y}^b$ , and the means of the demographic variables  $\bar{X}^w - \bar{X}^b$  based on the coefficient estimates from the white sample. In other words, it is an estimate of the contribution of income and demographic differences to the wealth gap, assuming the dependence of wealth on income and demographics for blacks is the same as it is for whites. The second term represents the “unexplained” part of the wealth gap—the difference that arises because the relationship between characteristics and wealth, as summarized by the regression parameters, differs between whites and blacks.

The gap in wealth may also be decomposed using regression coefficients  $\alpha^b$  and  $\beta^b$  for blacks to assess the contribution to the wealth gap of the race differences in income and demographics. This wealth decomposition is given by

$$\begin{aligned}\hat{W}^w - \hat{W}^b &= \{(\bar{Y}^w - \bar{Y}^b) \alpha^b + (\bar{X}^w - \bar{X}^b) \beta^b\} \\ &+ \{\alpha_0^w - \alpha_0^b + \bar{Y}^w (\alpha^w - \alpha^b) + \bar{X}^w (\beta^w - \beta^b)\}.\end{aligned}$$

The first term is the portion of the wealth gap explained by income and demographic variables based on the wealth model for blacks. The second term is the unexplained portion.

As we shall see, the coefficients of the wealth model tend to be much larger in absolute value for whites than for blacks. This fact drives a central finding of our study—a much larger portion of the race gap in wealth can be attributed to white advantages in income and demographic characteristics when these differences are evaluated using the wealth model for whites rather than the wealth model for blacks.

(table 3, column 7). This large discrepancy between the white and the black wealth models in the degree to which racial differences in the distributions of the income/human capital and demographic variables can explain the gap in wealth levels is a key theme in our analysis. Underlying this result is the fact that wealth differences among blacks are much less sensitive to differences in income and demographics than wealth differences among whites. Blau and Graham (1990) obtain qualitatively similar results using the National Longitudinal Survey of Young Men and Young Women.

To illustrate the role of the difference in the white and black wealth equations, we compute the index  $Y_i \alpha^i$ , corresponding to the vector of income variables  $Y_i$  for each observation in the combined sample of blacks and whites. We then regress the value of the index  $Y_i \alpha^b$  in the combined sample on  $Y_i \alpha^w$  and a constant. We would expect a coefficient of 1 on  $Y_i \alpha^w$  if the coefficient vectors  $\alpha^b$  and  $\alpha^w$  are identical. We would expect a coefficient below 1 if the elements of  $\alpha^b$  are of the same sign but smaller in absolute value than the corresponding elements of  $\alpha^w$ .<sup>10</sup>

The regression of  $Y_i^b$  on  $Y_i^w$  and a constant is 0.1485 (with a standard error of 0.0038). A similar regression involving the  $X_i^w$  and  $X_i^b$  indexes also shows that differences in demographics have a stronger association with wealth levels for whites than for blacks. The slope coefficient of the regression of  $X_i^b$  on  $X_i^w$  and a constant is 0.1570 (with a standard error of 0.0024). We obtain qualitatively similar results for single women and single men.

### Single women

Table 3 reports wealth decompositions for single women. The specification of the regression model that we use for single women and single men corresponds to the model for couples, with all variables pertaining to a spouse excluded. For single women the estimate of the mean wealth gap is \$57,026 (with a standard error of \$6,730). Using wealth regression coefficients for the white sample, we find that single black women would have 90 percent of the wealth that white women hold if they had the same income and demographics as whites. This suggests that the large wealth gap is for the most part a reflection of racial differences in income streams, human capital variables, and current and past demographic variables. However, the wealth model for blacks tells a completely different story. Using the wealth coefficients for black single women, we find that only \$15,931 or 28 percent of the total gap is attributable to income and demographics.

### Single men

Table 3 also reports results for single males. The results parallel those for single females and couples. Using the estimates of the regression model for the white sample, we find that single black men would have 108 percent of the wealth of single white men if they had the same income and demographics as whites. This result, like the result for single females, suggests that the large wealth gap is simply a reflection of racial differences in income streams, human capital variables, and current and past demographic variables. However, we again find that the estimated coefficients of the wealth model for blacks tell a completely different story. Only \$13,262 or 27 percent of the total gap of \$49,731 (\$5,810) is attributable to income and demographics.

### Summary

We find that most or all of the race gap in the wealth level for single men and single women and a substantial portion of the gap for married couples would disappear if blacks and whites had the same distribution of income and demographic variables *and* if the slope coefficients of the white wealth equation also held for blacks. However, the wealth models for blacks exhibit much less sensitivity to income and demographics, indicating that both the race gap in the income and demographics *and* race differences in the distribution of wealth *conditional* on income and demographic variables play important roles in the gap in wealth levels.

TABLE 3							
Regression decompositions of race gap, level of wealth							
Demographic group	White coefficients		Black coefficients		Total gap	Explained gap, white coefficients	Explained gap, black coefficients
	White characteristics	Black characteristics	Black characteristics	White characteristics			
Couples	\$203,869 (7,906)	\$102,478 (20,061)	\$53,213 (11,399)	\$62,433 (13,813)	\$150,656 (13,872)	\$101,391 (67%)	\$9,220 (6%)
Males	64,277 (5,157)	10,326 (11,126)	14,546 (2,677)	27,808 (3,781)	49,731 (5,810)	53,951 (108%)	13,262 (27%)
Females	70,967 (6,368)	19,864 (12,596)	13,941 (2,176)	29,872 (5,119)	57,026 (6,730)	51,103 (90%)	15,931 (28%)

Notes: Computed from pooled sample using weights (see table 1). Standard errors in parentheses, columns 1–5. The regression coefficient estimates are estimated without sample weights. The dependent variable in the regressions is the level of wealth in 1989 dollars. Columns 1 and 2 are based on coefficient estimates from the white sample; columns 3 and 4 are based on coefficient estimates from the black sample. The variables included in the model are discussed in the text. Column 1 predicts wealth holdings for whites and column 3 for blacks. Column 2 uses the white coefficient estimates with the black sample to calculate counterfactual wealth holdings for blacks; column 4 uses the black coefficient estimates with the white sample to calculate counterfactual wealth holdings for whites. Column 5 is the difference between columns 1 and 3; column 6 is the difference between columns 1 and 2; and column 7 is the difference between columns 4 and 3. The percentage gap explained is in parentheses in columns 6 and 7. It is 100 times column 6 (and column 7) divided by column 5.

Source: Authors' calculations based on data from the PSID.



## Alternative models

In Altonji et al. (1999) we work with a number of alternative econometric models of the wealth gap. While the full analysis is beyond the scope of this article, we provide a summary of what we have learned using the alternatives.

### *Models with interaction terms*

One disadvantage of the linear models of wealth we estimate is that they implicitly restrict the interaction between the effects of income in the effects of demographic variables such as children, age, and marriage history. In Altonji et al. (1999) we experiment with including interactions between the demographic variables in the income terms. One can go only so far in this direction, because the sample sizes are not large enough to allow a rich set of interactions. For the most part, the results are quite consistent with the ones we report here. However, the explained portion of the wealth gap using the black coefficient estimates rises somewhat relative to the results reported in table 3.

### *Results for the log of wealth*

Another standard way to allow for interactions among the explanatory variables is to use the log of wealth as the dependent variable rather than wealth itself. A second reason to use the log of wealth is that the wealth distribution is highly skewed, with a small number of individuals accounting for a very large fraction of total wealth. The use of the log of wealth reduces the impact of outliers. On the other hand, there are a substantial number of people who hold zero or negative wealth. If the value of wealth is less than \$1,000, we set the log of wealth to the log of \$1,000. (The results are not very sensitive to this threshold.)

In Altonji et al. (1999) we present results for the log of wealth. In the log wealth regressions, we use the log of permanent income and current income as our income measures. We find that the fraction of the gap in the mean of log wealth that is explained by income and demographic variables is large when we use the white regression coefficients to weight the differences in the variables, but smaller than the corresponding estimates when we analyze wealth itself. Second, the fraction of the gap in log wealth explained using the black regression model is substantially larger than the fraction of the gap in wealth itself. For example, for couples, the explained fraction of the wealth gap using the black regression model is 58 percent in the case of log wealth and only 6 percent in the case of the level of wealth. Again, we find that the responsiveness of log wealth to income and demographics is larger for whites than blacks, although

the difference is not nearly as large as in the case of wealth itself.

Overall, the log results suggest that income and demographics play a major role in the wealth gap between whites and blacks, but the results based upon the white model are less dramatic than the results for wealth itself, and the portion of the gap explained using the black model is much larger for log wealth than wealth. However, for two reasons we are not sure how much weight to place on these results. First, a large number of observations are affected by the lower bound on wealth. Second, the translation between the log of wealth and wealth itself is not straightforward. In particular, since the log wealth model implies a multiplicative model of wealth, the race difference in the intercepts of the log regression model translates into a smaller response of wealth to income variables and demographic variables for blacks. This parallels our findings using wealth as the dependent variable.

### *Median regression results*

Median regression is a statistical technique to predict the median value of the dependent variable conditional on a set of regressors; in contrast, ordinary least squares regression predicts the conditional mean of the dependent variable. One might prefer to predict median wealth conditional on the income and demographic variables rather than use the more standard mean regression based upon ordinary least squares for two reasons. First, in view of the skewness of the wealth distribution, it may be easier to estimate conditional medians because median regression is more robust to outliers. Second, one may be more interested in the wealth of the “typical,” hence median, person with a given set of characteristics than in the mean of wealth for such people.<sup>11</sup> In the case of couples, using the set of explanatory variables that we use for the standard regression models, the total gap in the median is estimated at \$85,935, which compares to a gap in the mean of wealth of \$150,656. The income and demographic variables account for 62 percent of the wealth gap if we use the median regression function for whites. In contrast, the median wealth regression for blacks implies that demographic characteristics account for only 23 percent of the gap in the conditional median of wealth. For single men, the white median regression implies that 86 percent of the gap is explained, while the black regression implies only 43 percent is explained. The corresponding figures for females are 68 percent and 30 percent, respectively. Overall, income and demographics account for a somewhat smaller percentage of the race

gap in the conditional median of the wealth level than in the conditional mean, particularly in the case of single men and single women. When we use the wealth model for blacks to measure the contribution of observables to the race gap, the results are similar to our findings for the gap in the conditional mean. The black coefficient estimates imply a much smaller role for income and demographics.

### Results for subcomponents of wealth

A recurring theme throughout our analysis is the black/white difference in the relationship between wealth and income/demographics. Why are the coefficients so different across the black and white specifications? One hypothesis we can explore is whether the relationship differs for some forms of wealth assets but not for others. Table 4 analyzes main home equity (house value net of mortgage balance), stocks/mutual funds/IRAs, and wealth in farms/businesses for the sample of couples, applying the ordinary least squares regression decomposition technique to the level of each asset. The regressors are the same as those we use for couples in the other models. On average, whites hold \$33,079 more home equity than blacks (\$57,911 versus \$24,832), which is not surprising given the difference in home ownership rates across races. The white regression model explains 78 percent of this gap, compared with the 67 percent explained for the combined wealth assets in table 3. Again, the amount explained using the model for blacks is significantly smaller, only 30 percent.

The unconditional black/white difference in asset holdings is significantly larger for the other two asset categories (stocks and business wealth) and the wealth

model for whites explains less of the difference than the overall model (only 61 and 47 percent, respectively). However, the fractions explained by the black regression equation are negligible at only 17 and 3 percent, respectively.

### Results for siblings: Indirect evidence on the role of inheritances and parental transfers

Our results for total wealth as well as the individual components of wealth show substantial differences in the sensitivity of wealth holding to income and demographic variables. Because both the income and demographic characteristics of whites are more favorable for wealth holding, we assign higher fractions of the wealth gap to differences in income and demographics when we use the white wealth equations than when we use the black wealth equations. There are at least three possible explanations why wealth holding may be more sensitive to characteristics for whites than for blacks. First, whites may enjoy a higher rate of return on assets, in which case the same level of savings and inter-family transfers would lead to larger wealth levels, magnifying underlying differences that are associated with income and demographics. Second, inheritances and inter vivos transfers are larger among whites than among blacks because the long history of discrimination against blacks has inhibited the accumulation of wealth in the black population.<sup>12</sup> Third, the savings rates of blacks may be less sensitive to the income and demographic variables for reasons that are not clear. A reduced sensitivity of saving rates to income and demographics would lead to a reduced sensitivity of wealth to these variables.

TABLE 4							
Regression decompositions of race gap, level of wealth components (couples sample)							
Demographic group	White coefficients		Black coefficients		Total gap	Explained gap, white coefficients	Explained gap, black coefficients
	White characteristics	Black characteristics	Black characteristics	White characteristics			
Home equity	\$57,911 (978)	\$32,223 (2,482)	\$24,832 (1,336)	\$34,719 (1,620)	33,079 (1,656)	25,688 (78%)	9,887 (30%)
Farm/business	35,844 (3,771)	20,620 (9,570)	3,506 (4,501)	4,385 (5,454)	32,338 (5,872)	15,224 (47%)	879 (3%)
Stocks/mutual funds/IRAs	27,626 (2,266)	12,495 (5,750)	2,735 (583)	6,929 (706)	24,891 (2,340)	15,131 (61%)	4,194 (17%)

Notes: Computed from pooled sample of couples using weights (see table 1). Standard errors in parentheses, columns 1–5. The regression coefficient estimates are estimated without sample weights. The dependent variable is the level of the indicated wealth component in 1989 dollars. The definitions of the wealth components are given in table 1. Households with 0 values for a particular component are included in all computations. See table 3 for an explanation of columns.

Source: Authors' calculations based on data from the PSID.

Menchik and Jianakoplos (1997) provide some evidence that blacks experience a lower rate of return on assets. However, the evidence on this point is far from conclusive. In Altonji et al. (1999), we use data on siblings to explore the possibility that differences in intergenerational transfers are the source of differences in wealth holding. The PSID tracks all members of the families sampled in 1968, providing information on siblings after they form their own households. We analyze the data on siblings using fixed effects regression. It amounts to relating differences among siblings in wealth to differences among siblings in the income and demographic variables that determine wealth. These differences should not be affected by parental transfers or expected future transfers that are common to siblings. Consequently, our use of data on siblings largely neutralizes the effects of differences between whites and blacks in inter vivos transfers and inheritances, and provides a way of controlling for the effects of parental resources in our analysis of the link between wealth and income and demographics. Hence, if the analyses based on standard regression and fixed effects regression give similar answers, then we can conclude that race differences in gifts and inheritances that are correlated with income and demographic variables do not explain our finding that wealth levels are more sensitive to income and demographic variables in the case of whites than in the case of blacks. Our approach does not require us to observe the actual transfers; instead it assumes that siblings act under the belief that they will receive similar inheritances. This assumption is consistent with the empirical evidence that inheritances are evenly divided in about 70 percent of the cases and that sibling differences in inter vivos transfers from parents have only a modest relationship to sibling differences in income.<sup>13</sup>

To obtain adequate sample sizes we pool observations on single men, single women, and couples and add control variables for the three demographic groups. The results are presented in detail in Altonji et al. (1999); here, we provide a brief summary. Basically, we find that income and demographic differences over-explain the wealth gap and account for 111 percent of the wealth gap between the samples of black siblings and white siblings when we use the coefficients from the wealth model for whites and only 30 percent of the gap when we use the wealth model for blacks. The decompositions based on the application of fixed effects regression techniques to the sibling samples are similar to what we obtain when we apply standard regression to the sibling samples and to the results reported in table 3. We

continue to explain more of the wealth gap using the white coefficients than the black coefficients, particularly when we specify wealth and income in levels. There is little indication that differences in factors such as inheritances or inter vivos transfers that are likely to vary across families provide an explanation for the racial difference in the sensitivity of wealth to income and demographics. However, the standard error of the difference in the percentage of the wealth gap explained by the white and black models is approximately 31.8. Consequently, the results using fixed effects regression are not sufficiently precise to rule out the possibility that inheritances and family transfers partially explain the stronger relationship for whites between income and demographics and wealth. Furthermore, Altonji et al. (1999) point out that there may be an interaction between parental transfers and income and demographics that is missed in our sibling analysis. Nevertheless, our results to date tentatively suggest that differences in savings behavior and/or rates of return may be more important than intergenerational transfers in explaining the very different wealth models that we obtain for whites and blacks.<sup>14</sup>

## Conclusion

We use improved income and demographic measures and unique data on siblings to assess the role of differences in income and demographic characteristics, such as marriage patterns and fertility, in the huge disparity in wealth between whites and blacks. When we use the level of wealth as the dependent variable, we can explain a large part of the difference in wealth holdings with income and demographic variables, provided that we estimate the wealth model on a sample of whites. That is, we find that blacks would have wealth levels similar to whites, particularly for single males and females, if 1) the relationship between wealth and income and demographics for blacks was the same as it is for whites, and 2) blacks and whites had the same income and demographic characteristics. On the other hand, we can explain only a small fraction of the race gap when we ask the question: “If the relationship between wealth and income and demographics for whites was the same as it is for blacks, how much wealth would whites hold?” In general, the regression coefficients relating income and demographic characteristics to wealth are much smaller for blacks. The smaller coefficients mean that less of the race gap in wealth is explained by the gap in income and demographics.

Our results are robust to a number of experiments regarding estimation methodology and functional form, which are discussed in more detail in Altonji

et al. (1999). However, they are much less dramatic when we use the log of wealth as the dependent variable, and further research on alternative functional forms is high on our research priorities. But our results suggest that the race gap resulting from the sensitivity of wealth to income and demographics is as important as the race gap in actual income and demographics.

Given the substantial differences in the sensitivity of wealth holding to income and demographics, it becomes important to determine the degree to which race differences in inter vivos transfers and inheritances, savings rates, and rates of return on savings contribute to the unexplained part of the wealth gap.

We attempt to isolate the role of differences in transfers and inheritances by analyzing wealth differences among siblings. The fact that we obtain similar results when we relate sibling differences in wealth to sibling differences in income and demographics tentatively suggests that much of the difference between whites and blacks in the effect of income and demographics on wealth is due to differences in savings behavior and/or in rates of return on assets rather than to differences in inter vivos transfers and inheritances. In future research, we intend to investigate the race gap in savings behavior and rates of return by studying differences in the specific assets held and in growth rates.

## NOTES

<sup>1</sup>Another important reference on the black/white wealth gap is Oliver and Shapiro (1997).

<sup>2</sup>See Altonji and Blank (1999) for a recent survey of the literature on the black/white gap in earnings.

<sup>3</sup>A cross-sectional decomposition is insufficient to accurately determine the permanent flow of income to an individual. Much of the variation in permanent income is within the categories used by the previous studies to define permanent income. Were wealth a linear function of income, ignoring the within-cell variation would not be much of an issue. Since wealth is a nonlinear function of income, making use of the within-cell variation is necessary to precisely estimate wealth models. Moreover, since high-income individuals tend to have large wealth holdings, failure to accurately measure differences in the distribution of permanent income might lead to an underestimate of the wealth gap that is out of proportion to the difference in the mean of permanent income. The problem is made more severe by the fact that there are substantial differences between whites and blacks in the distribution of income. The limited overlap in the permanent (and current) income distribution makes it difficult to use a wealth model estimated on one group to predict the wealth holding of the other group.

<sup>4</sup>Our results leave open the possibility that the level of inter vivos transfers and inheritances differs between whites and blacks and plays a role in the wealth gap. They rule out such intergenerational transfers as the main reason why the wealth of whites is more sensitive to income and demographic characteristics.

<sup>5</sup>The other components of wealth that are elicited in the wealth surveys are checking/savings, credit card, other real estate, vehicles, and other savings/assets.

<sup>6</sup>Throughout this article, income is short for nonasset income and all income and wealth amounts are expressed in 1989 dollars using the Consumer Price Index for urban consumers.

<sup>7</sup>Smith (1995) finds that “healthier households are wealthier ones” for both blacks and whites. Hence, controlling for health status helps to explain the wealth gap. The question of causality, however, is tricky.

<sup>8</sup>We include this because it has been used in previous studies, although there are some obvious endogeneity issues and these may lead to different biases for whites and blacks. The wealth decompositions in table 3 are not very sensitive to dropping it.

<sup>9</sup>This value is  $\hat{W}^w - \hat{W}^b$ , the difference in the weighted mean of the predictions of wealth for whites and blacks, respectively, based on the regression model. As we point out in box 2,  $\hat{W}^w - \hat{W}^b$  need not be exactly equal to  $\bar{W}^w - \bar{W}^b$ , the difference in the weighted sample means of wealth for whites and blacks. From columns 1 and 2 of table 1, the latter figure is \$152,029.

<sup>10</sup>We work with the indexes rather than the individual coefficients because the individual coefficients are hard to interpret given the nonlinear terms in our model and the strong covariance among some of the regressors. The relationship between the two indexes provides an overall summary of the relative sizes of the elements of  $\alpha^b$  and  $\alpha^w$  that is weighted by the variability of  $Y_i$ .

<sup>11</sup>When we use median regression we measure the wealth gap as the difference between the population-weighted averages of the conditional medians of wealth based on the median regression for the white sample and the distribution of characteristics for the white sample and the median regression and distribution of characteristics for the black sample. We refer to this as the gap in the conditional median of wealth. For more detail, see Altonji et al. (1999).

<sup>12</sup>Indeed, this “sedimentation of racial inequality” is one of three major themes in Oliver and Shapiro’s (1997) sociological analysis of the wealth gap. For a simple model that shows how historical barriers to wealth holding among blacks could lead to present day differences in between blacks and whites in the slopes of wealth models, see Altonji et al. (1999).

<sup>13</sup>See Menchik (1980), Wilhelm (1996), and Menchik and David (1983) for evidence on inheritances and Altonji, Hayashi, and Kotlikoff (1997) and McGarry and Schoeni (1995) for evidence on transfers.

<sup>14</sup>The work of Smith (1995), Avery and Rendall (1997), and Menchik and Jianakoplos (1997) suggests that differences in intergenerational transfers contribute to the race gap in wealth. Our study of siblings does not necessarily contradict this work. Our evidence shows that intergenerational transfers are unlikely to explain why the wealth of black families is less sensitive to income and demographic variables than the wealth of white families.

---

## REFERENCES

- Altonji, J., and R. Blank,** 1999, "Race and gender in the labor market," in *Handbook of Labor Economics*, O. Ashenfelter and D. Card (eds.), Vol. 3C, Amsterdam: North-Holland, pp. 3143–3259.
- Altonji, J., U. Doraszelski, and L. Segal,** 1999, "The role of permanent income and demographics in black/white differences in wealth," Northwestern University, working paper.
- Altonji, J., F. Hayashi, and L. Kotlikoff,** 1997, "Parental altruism and inter vivos transfers: Theory and evidence," *Journal of Political Economy*, Vol. 105, No. 6, pp. 1121–1166.
- Avery, R., and M. Rendall,** 1997, "The contribution of inheritances to black–white wealth disparities in the United States," Board of Governors of the Federal Reserve System, working paper.
- Blau, F., and J. Graham,** 1990, "Black–white differences in wealth and asset composition," *Quarterly Journal of Economics*, Vol. 105, No. 2, pp. 321–339.
- Fairlie, R., and B. Meyer,** 1997, "Ethnic and racial self-employment differences and possible explanations," *Journal of Human Resources*, Vol. 31, No. 4, pp. 757–793.
- McGarry, K., and R. Schoeni,** 1995, "Transfer behavior in the Health and Retirement Study: Measurement and the redistribution of resources within the family," *Journal of Human Resources*, Vol. 30, Supplement, pp. S184–S226.
- Menchik, P.,** 1980, "Primogeniture, equal sharing, and the U.S. distribution of wealth," *Quarterly Journal of Economics*, Vol. 94, No. 2, pp. 299–316.
- Menchik, P., and M. David,** 1983, "Income distribution, lifetime savings, and bequests," *American Economic Review*, Vol. 73, No. 4, pp. 672–690.
- Menchik, P., and N. Jianakoplos,** 1997, "Black–white wealth inequality: Is inheritance the reason?," *Economic Inquiry*, Vol. 35, No. 2, pp. 428–442.
- Oliver, M., and T. Shapiro,** 1997, *Black Wealth/White Wealth*, London: Routledge.
- Smith, J.,** 1995, "Racial and ethnic differences in wealth in the Health and Retirement Study," *Journal of Human Resources*, Vol. 30, Supplement, pp. S158–S183.
- Wilhelm, M.,** 1996, "Bequest behavior and the effect of heirs' earnings: Testing the altruistic model of bequests," *American Economic Review*, Vol. 86, No. 4, pp. 874–892.