Wealth Inequality between Americans: Exploring Recent Trends in the Racial Wealth Gap

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Abstract

Wealth inequality between white and black Americans has grown dramatically in recent decades, without any comparable intensification of income inequality. This paper addresses the racial disparity in wealth holdings and investigates the following questions: How much can the wealth gap be explained by income and demographic variables, and how have these relationships changed over time? Using 39 waves of longitudinal data from the Panel Study of Income Dynamics, I implement the Blinder-Oaxaca decomposition as well as nonparametric methods to study wealth outcomes from 1984 to 2015. My findings reveal that the racial wealth gap can no longer be explained by observable characteristics to the extent that it could thirty years ago.

*I am extremely grateful to Professor Altonji for his wisdom and guidance. I would also like to thank my parents, without whom this essay would never have been started; Will, without whom this essay would never have been completed; and Arizona, for always reminding me to normalize my graphs. All errors are my own.

1 Introduction

One of the fundamental issues in American society is our history of racial disparities in economic well-being. The gap between white Americans and African-Americans is particularly conspicuous, not only because these are the two largest racial groups in the U.S., but also because they are the two groups that hold the most wealth per capita and the least wealth per capita. A household's net wealth is a key determinant not only of its annual consumption power, but also of its educational opportunities, future income range, and social environment. Adjusted for inflation, the average wealth gap between white Americans and black Americans has more than doubled over the past thirty years, growing from a real value of $196,000 in 1984 to $402,000 in 2015 (see Figure 3). This is a dramatic trend, and one that has troubling implications for the future of intergenerational equity.

Economists and policymakers have yet to develop a complete understanding of the black-white wealth gap or of the drivers behind its continued growth. Many studies have examined the extent to which the wealth gap can be attributed to the measurable characteristics that are usually associated with wealth accumulation, such as income, education, and family size. In 2001, Altonji and Doraszelski used longitudinal data from the Panel Study of Income Dynamics (PSID) to investigate the extent to which the black-white wealth gap could be explained by income and demographic variables. To account for the systematic differences in wealth between each family type, they divided their sample into single men, single women, and married couples. They then predicted the mean and median amount of wealth each racial group would hold if they experienced the same relationships between wealth and the predictor variables as the other racial group. Using wealth data from the years 1984, 1989, and 1994, they found that most of the wealth disparity could be explained when using the models estimated

on a sample of white Americans, but considerably less so when using the models estimated on black Americans. In their paper, the authors discussed several potential reasons why black wealth would be so much less sensitive to income and demographic variables than white wealth, such as dissimilar savings behaviors between the two groups. Ten waves of the PSID have been collected since the publication of their original paper, inviting new research to extend our understanding of wealth in the twenty-first century. Over the course of those two decades, wealth in America has continued to evolve, interacting with national economic events such as the rise of the internet economy, the housing bubble, and the Great Recession.

In my senior essay, I implement the methodologies developed in Altonji & Doraszelski (2001) to examine the new waves of the PSID. To explore the extent to which the black-white wealth gap has changed since 1994, I present wealth decompositions across several time samples. I also implement the non-parametric method of Barsky, Bound, Charles & Lupton (2002) to validate these results with a less constrained model. My findings indicate that income and demographic predictors no longer explain as much of the wealth gap as they did before 1994, with a much larger drop in explanatory power for the white models than for the black models. Using the white model, for example, differences in characteristics explain 95% of the wealth gap between married couples from 1984–1994, and only 73% from 1999–2015. For married black couples, on the other hand, differences in characteristics explained 36% and 31% of the wealth gap in 1984–1994 and 1999–2015, respectively. Using the non-parametric model, I find that much greater portions of the wealth gap can be explained in both time periods, but still more so in the earlier period than in the later period, especially for the black counterfactual.

To further examine these trends, I perform another decomposition of the change in the wealth gap itself, and find that the relative trends in the income and demographic

characteristics of whites and blacks would have been expected to decrease the wealth gap over time. I also evaluate how the effect of income on wealth may have changed over the past thirty years, and find that the relationship between permanent income and the income component of wealth has grown more intensely for single white Americans than for single black Americans, but has decreased more intensely for married white Americans than for married black Americans. I discuss some of the possible implications of these trends, and how they may have reveal systematic advantages in wealth accumulation for some groups of Americans over others.

The remainder of the paper proceeds as follows. Section 2 examines some basic trends in how the wealth gap has changed over the years. Section 3 reviews the current economic literature on the black-white wealth gap. Section 4 describes my data, explains my measure of permanent income, and discusses the treatment of outliers. Section 5 explains the econometric models used. Section 6 presents my results and discusses some possible implications. Section 7 concludes.

2 White and Black Wealth from 1984 to 2015

Over the past three decades, the average wealth of white Americans has grown much more quickly than the average wealth of black Americans. Table 1 and Table 2 present the mean wealth values each year in real 2015 dollars for single males, single females, and married couples[1] of each race. The two tables together encompass every wealth survey year (see Section 4) from 1984 to 2015. Comparing the first column of Table 1 to the last column of Table 2, we see that the gap between mean white wealth and mean black wealth has increased from $95,312 in 1984 to $267,568 in 2015 for single men; from $95,428 to $183,302 for single women; and from $241,292 to $519,082 for

[1] I separate couples from singles based solely on legal marital status.

Table 1: Average wealth by group: 1984–2003

	1984	1989	1994	1999	2001	2003
White male	111,663	119,595	135,423	182,729	202,451	226,016
	(13,886)	(13,107)	(13,746)	(23,228)	(21,524)	(24,040)
Black male	16,351	24,984	46,688	42,149	87,913	58,889
	(1,974)	(2,640)	(3,384)	(5,091)	(10,540)	(7,841)
White female	119,487	135,381	150,115	194,082	195,238	195,693
	(7,286)	(8,930)	(8,679)	(12,787)	(12,242)	(13,228)
Black female	24,059	29,910	35,996	33,486	38,427	44,045
	(1,783)	(2,398)	(2,245)	(2,408)	(3,484)	(3,288)
White couple	326,950	379,787	383,305	472,809	504,497	513,737
	(13,294)	(14,236)	(13,620)	(18,176)	(18,388)	(18,770)
Black couple	85,658	105,260	110,296	108,778	135,845	128,203
	(4,248)	(6,174)	(6,655)	(8,137)	(8,578)	(8,968)
Gap: male	95,312	94,611	88,735	140,580	114,538	167,127
Gap: female	95,428	105,471	114,119	160,596	156,811	151,648
Gap: couple	241,292	272,527	273,009	364,031	368,652	385,534

Note: Standard errors are shown in parentheses. All values are in real 2015 dollars, and are computed using the family core weights.

Table 2: Average wealth by group: 2005–2015

	2005	2007	2009	2011	2013	2015
White male	283,465	240,782	264,488	258,172	256,153	304,401
	(27,783)	(24,287)	(28,049)	(25,925)	(27,665)	(33,226)
Black male	83,649	74,099	59,062	30,930	33,418	36,833
	(10,214)	(8,367)	(8,363)	(4,023)	(4,078)	(4,718)
White female	224,169	243,725	221,758	218,208	204,349	225,716
	(14,475)	(14,850)	(14,595)	(15,149)	(14,820)	(17,323)
Black female	51,439	54,975	54,672	39,086	25,014	42,414
	(3,678)	(3,792)	(4,316)	(3,300)	(3,898)	(3,127)
White couple	554,487	608,031	525,338	532,021	559,667	629,439
	(18,661)	(19,715)	(18,928)	(19,091)	(20,404)	(23,740)
Black couple	103,415	138,076	102,890	86,644	43,969	110,357
	(6,717)	(8,294)	(6,982)	(6,460)	(8,082)	(7,393)
Gap: male	199,816	166,683	205,426	227,242	222,735	267,568
Gap: female	172,730	188,750	167,086	179,122	179,335	183,302
Gap: couple	451,072	469,955	422,448	445,377	515,698	519,082

Note: Standard errors are shown in parentheses. All values are in real 2015 dollars, and are computed using the family core weights.

Figure 1: White and black wealth by group: 1984–2015.

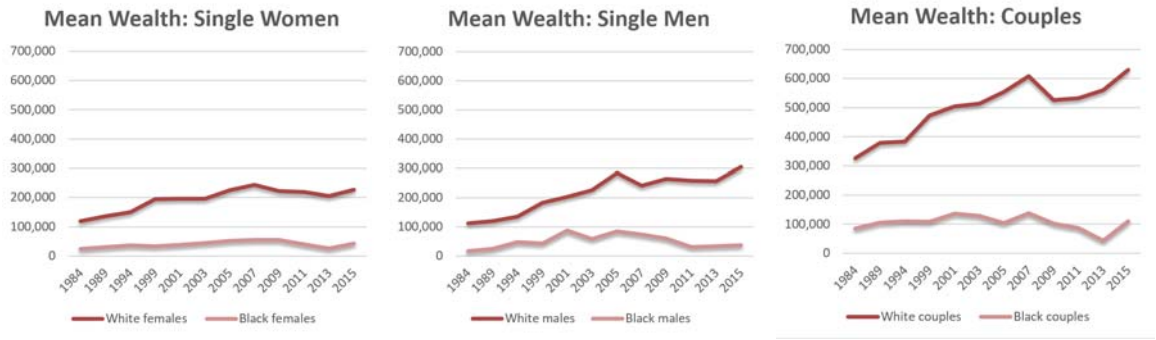
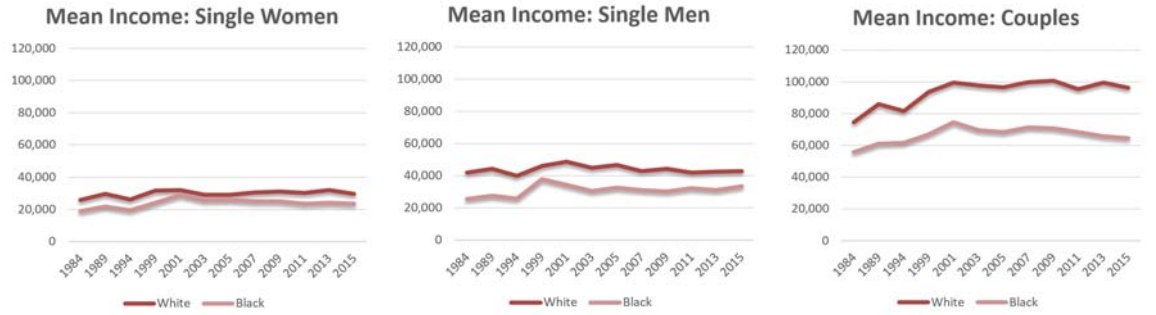


Figure 2: White and black income by group: 1984–2015.

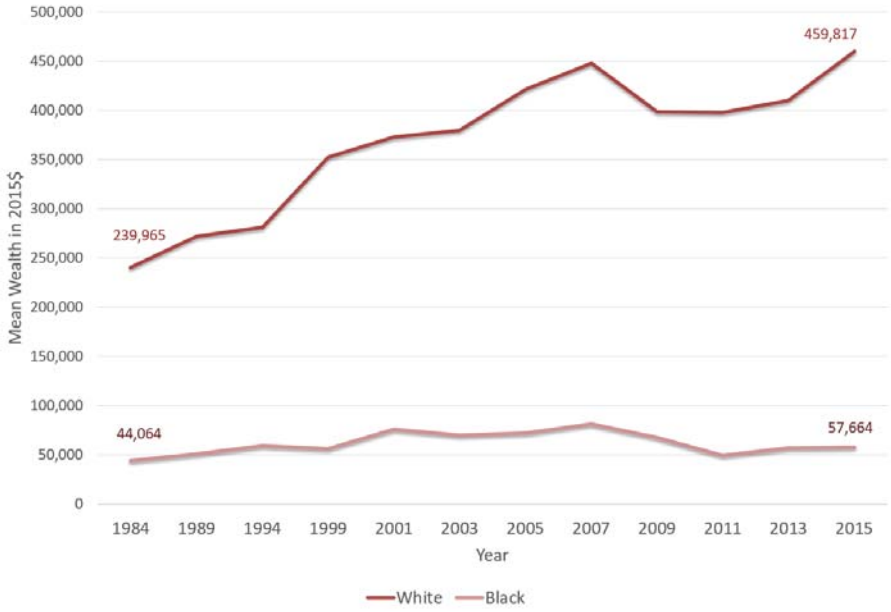


married couples. In all three groups, the ratio of average white wealth to black wealth has increased too, not just the numerical gap between them. In 1984, white couples held about 3.8 times as much wealth as black couples, while in 2015, that ratio had climbed to 5.7.

Between 1994 and 1999, average wealth dips by a few thousand dollars for all three black demographic groups, while continuing to grow for the three white demographic groups. There are several possible explanations for this, namely a stock market boom, the rise of employment in successful technology firms, and increased income concentration in the 1990s (Cagetti & De Nardi 2008). Any of these factors could have benefited wealthier individuals while disadvantaging those with less wealth to invest.

One particularly interesting trend is that average wealth for whites ultimately in-

Figure 3: Average white and black wealth: 1984–2015.



creases over time, with the highest wealth value shown in the most recent year (or the second-highest value, in the case of single females). For all three black demographic groups, on the other hand, average wealth in 2015 is remarkably low, retreating to its levels from the mid-1990s. Instead, the highest wealth averages are seen in 2005 for black single males and 2007 for black couples and single females. After that point, average wealth steadily plummets for black Americans until 2013, while growing continuously for whites. A large portion of this disparity can be attributed to the Great Recession of 2007–2009, when housing prices plunged and many homeowners found themselves underwater. Between 2009 and 2013, the percentage of homeowners underwater gradually lessened for white households, but continued to rise among black households (Wolff 2014), likely delaying the recovery of average wealth for black Americans overall.

Figure 1 graphs the average wealth values per family type, as shown in Table 1 and Table 2. Figure 3 graphs the average wealth value for the full sample of

white and black Americans. Notice, in both sets of graphs, the persistent decline in black wealth between 2007 and 2011. White wealth experiences a much briefer dip, followed by a swifter recovery. Meanwhile, consider Figure 2, which illustrates average current family income for the same households over the same time period. The ratio of current income for white Americans to current income for black Americans has remained relatively stable from 1984 to 2015, with white households receiving income roughly twice as high as black households. It seems unlikely that income inequality has been the sole culprit behind wealth inequality, and herein lies the motivating question behind this paper: to what degree do income and demographic variables explain the wealth gap, and how has that interaction changed over the past thirty years?

3 Existing Literature Review

A rich body of research has been devoted to the economic progress of racial minorities in America. Although the bulk of these papers address inequalities in income, noteworthy studies have also been conducted on the determinants of the racial wealth gap. One of the first such was a study by Blau & Graham (1990), who decompose differences in white and black wealth using data from the National Longitudinal Survey. After controlling for income and demographic factors, the authors' models explain as much as 73.6% of the wealth gap for married couples and 96.6% of the gap for singles when using the white wealth functions. However, they only explain 22% of the wealth gap when using the black wealth functions, which Blau and Graham deem to be more relevant to the goal of understanding the nature of black and white wealth differences.

Menchik & Jianakoplos (1997) run a similar set of decompositions, with a specific focus on measuring the effect of intergenerational transfers. Using the 1989 Survey of Consumer Finances and the 1976 National Longitudinal Study, they find that white households are more than twice as likely as black households to receive an inheritance, and that this racial difference in inheritances accounts for between 10% and 20% of the average difference in black-white household wealth. They note that this finding may be specific to the time period of 1976–1989, and that future research might be necessary to develop a broader hypothesis.

Altonji, Doraszelski & Segal (1999) and Altonji & Doraszelski (2001) incorporate more detailed explanatory variables than those used by Blau & Graham (1990) or Menchik & Jianakoplos (1997), such as a more precise measure of permanent income, as well as marital and childbearing histories. They are able to explain more of the black-white wealth gap than the previous authors, but again they find that the black model has much less explanatory power than the white model. They suggest that this might be due to white households having higher rates of return, to different savings behaviors between the two groups, or to a correlation between inheritance and household income. The authors test for this last phenomenon using siblings data to create a family fixed effects model, but they ultimately find that including these fixed effects does not change their results in any meaningful way, and that inheritance may not make much of an impact. In this paper, I implement the same decomposition models implemented by Altonji and Doraszelski, but omit the additional model with fixed family effects.

3.1 Studies of Other Racial Minorities

Several authors have included other American racial minorities in their analysis of racial wealth disparities. For example, Lusardi (2005) researches the differential savings behavior of both African-American and Hispanic households. Hanna & Lindamood (2008) examine the decrease in stock ownership of multiple minority racial groups, including black, Hispanic, and Asian populations. Furthermore, Campbell & Kaufman (2006) perform their decomposition analysis on white, black, Asian-American, Mexican-American, and other Hispanic groups, using data from the 1992 Survey of Income and Program Participation, and find that group differences in the determinants of wealth, particularly indicators of socioeconomic status, have stronger effects for white populations than for racial minorities. The PSID does not provide enough wealth data about other racial groups to allow for analysis outside of the black and white demographics, but other communities of color are nevertheless important to consider in the broader discussion of the interactions between wealth and race.

3.2 Studies using the PSID

The Panel Study of Income Dynamics has been used in several existing studies to investigate the black-white wealth gap. One innovative example is that of Barsky et al. (2002), which proposes a new non-parametric model for wealth decompositions. The authors argue that the normal Blinder-Oaxaca decomposition is limited by its assumption of linearity, and point out that any parametric estimates of the conditional expectation function of wealth will likely be inaccurate over large segments of the wealth distribution. Their model involves assigning weights to the sample of white households so that the income distribution is the same as the observed income distribution in the sample of black households. Weighting the PSID wealth data in

this way, they find that income differences explain 64% of the black-white wealth gap at the mean, much more than previous studies.

Other authors have used the PSID to examine specific components of wealth and their contribution to the racial gap. Conley (2001) studies the relative impact of intergenerational forces compared to the impact of current market dynamics. He compares the historical legacy thesis, which attributes the wealth of current generations of white Americans to the asset accumulation of previous generations, with the contemporary dynamics thesis, which suggests that current dynamics of institutional racism in the housing and credit markets drive the modern-day wealth gap. His findings indicate that parental wealth and inheritances all have a significant impact on the wealth levels of the current generation, but still do not completely explain the black-white wealth gap. In a 2014 study, McKernan, Ratcliffe, Simms & Zhang (2014) also use the PSID to research the effect of racial disparities in familial transfers on black and white wealth. They find that the lower number of large inheritances received by black Americans accounts for only about 12% of the racial wealth gap, consistent with the earlier results of Menchik & Jianakoplos (1997).

Another approach is that of Gittleman & Wolff (2004), who use the PSID to study wealth accumulation, rather than wealth levels. They divide each household's wealth accumulation over time into three different categories – savings, capital gains, and inheritances – to examine the effect of each category on the overall racial difference in wealth accumulation. Their results indicate that racial differences in savings rates are not significant after controlling for income, but that black Americans would have gained significant ground relative to whites if they had inherited the same amounts, had comparable levels of family income, and had similar portfolio compositions.

One final example is that of Shapiro, Meschede & Osoro (2013), who use data on only the PSID households included in both the 1984 data and the 2009 data.

They take the total wealth gain of households over those 25 years, and use the log of that gain as their dependent variable to estimate the extent to which their predictor variables influence the probability of positive growth in wealth. They find that the biggest factor is the number of years that a household has owned a home, which accounts for 27% of the difference in wealth growth between white and black families, and that the second most important factor is average family income, which accounts for 20% of the difference. Other important predictors of wealth include whether or not a household has been unemployed, whether or not the head of household holds a college degree, and the amount of financial support the household has received from older generations. Shapiro et. al's research focuses on offering actionable insights for American policymakers hoping to make strides towards wealth equality.

While the existing literature provides a wide range of insights into the specific factors behind the wealth gap, few studies have focused on how the gap has changed over time, which is crucial for isolating the socioeconomic trends that are contributing to its dramatic growth. Family income was found to be a significant predictor of wealth by both Blau and Graham in 1990 and Shapiro et. al in 2013, but neither focused on possible changes in the models through which income interacts with wealth. By performing the analyses of earlier authors on both wealth data from both 1984–1994 and 1999–2015, my paper seeks to tie together research from the 1980s to the present day by developing a better understanding of how the wealth models themselves have evolved.

4 Data

I use data from the Panel Study of Income Dynamics (PSID). Conducted by the Survey Research Center at the University of Michigan, the PSID provides longitudinal

panel data on a nationally representative sample of families in the United States. The survey began in 1968 with a randomly selected sample of over 18,000 individuals in 5,000 families, and has since expanded to include each new member or family branch of the original households.[2] The PSID offers a rich set of variables regarding the demographics, family life, education, income, and wealth holdings of American households from 1968 to the present day. It also includes a series of supplemental wealth files with household-level wealth and asset variables. Alternative sources of data with detailed wealth variables, such as the Survey of Consumer Finances, do not track the same households over time, so the PSID remains an ideal choice for longitudinal wealth analyses (Cagetti & De Nardi 2008).

I construct my dataset using the main PSID files, as well as the supplemental wealth files. The main survey consists of thirty-nine single-year family files and a cross-year individual file. These family files contain data for each household in each year they were interviewed, while the individual file contains individual-level variables collected since 1968 for all individuals who have ever been included in the sample. This data was collected annually up through 1997, and then every other year from 1999 to 2015. The supplemental wealth surveys were conducted in 1984, 1989, and 1994, and then every other year from 1999 to 2015.

I merge the main files together and construct a unique identifer for each individual. Using the cross-year individual file, I select the individuals who were interviewed in at least one wealth survey year, which results in 377,316 observations (individual-years). I further restrict my analysis to household heads ("heads"), leaving 116,166 observations for singles and 130,575 observations for couples. Additionally, I drop individuals with missing values for a required demographic variable (race, sex, age[3],

[2]I use both the original SRC (Survey Research Center) sample and the SEO (Survey of Economic Opportunity) sample, which provides an additional sampling of minority and low-income households.

[3]Following the precedent set by Altonji & Doraszelski (2001), I make no restrictions on age.

region, and health in health-surveying years). For variables that remain constant over time or that can be easily calculated, I fill in missing values for each individual with his or her data from other years. I then drop 14,863 observations (individual-years) that still have missing values. Table 3 gives the final number of observations (individuals) per demographic group that I observe in each wealth survey year.

Table 3: Number of observations.

	1984	1989	1994	1999	2001	2003	2005	2007	2009	2011	2013	2015
White male	450	502	650	542	565	612	609	638	600	564	537	471
Black male	368	427	525	289	308	368	378	414	432	409	399	381
White female	859	868	1047	798	785	812	847	865	887	847	790	717
Black female	1058	1074	1253	879	928	1017	1115	1192	1211	1173	1134	1070
White couple	2671	2861	3168	2537	2616	2614	2822	2896	2907	2719	2547	2282
Black couple	1040	993	1046	724	763	769	825	851	834	798	759	693
Total	6446	6725	7689	5769	5965	6192	6592	6856	6871	6510	6166	5614

I do some additional data editing to enter missing values and assign brackets to unbracketed variables, such as the variable for head's and spouse's education between 1968 and 1990. Due to changes in the types of wealth and income questions asked in recent waves of the PSID, I construct my key variables slightly differently than Altonji et. al did. My income variable is the sum of the taxable non-asset income of the head of household, the taxable non-asset income of the spouse, and any transfer income from other family members. Net wealth is defined as the total value of eight categories of household assets: home equity, real estate other than the main residence, the farm or business, checking and savings accounts, stocks, vehicles, life insurance and retirement accounts, and "other assets."

After constructing these variables, I deflate all nominal variables to 2015 US$ using the CPIU. I create log wealth measures by setting all values below $50 to $50 before taking the natural log of all wealth values. I create log income measures in the

same way, truncated at $1000. After constructing permanent income (described in the Subsection 4.1), I also take a ratio specification of wealth over permanent income, which makes it possible to include negative wealth measures.

The PSID data includes family core weights[4] to make the data nationally representative. I use these weights when estimating descriptive statistics and wealth decompositions, but estimate my wealth models on unweighted samples.

4.1 Measuring Permanent Income

Following the example of Altonji & Doraszelski (2001), I construct a measure of permanent income using the regression model

$$y_{it} = X_{it}\gamma + e_{it}, \tag{1}$$

where y_{it} is either the level or the log of non-asset family income of person i in year t, deflated to 2015 dollars. X_{it} includes 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.

If we define e_{it} to be the sum of an individual-specific effect and an idiosyncratic error term, $e_{it} = v_i + u_{it}$, and assume that the serial correlation in u_{it} is sufficiently weak to be ignored in computing permanent income, then the individual-specific effect v_i can be estimated as the mean of the residuals from the regression for each person. My measure of permanent income is the sum of the mean of the residuals for each individual and the mean income for members of that individual's demographic group between the ages of 25 and 55. This essentially serves as a measure of each

[4] Altonji & Doraszelski (2001) renormalize the sample weights to weight all wealth survey years equally. I choose not to renormalize my sample weights, so as to capture the full variation of wealth between years.

individual's expected average lifetime income centered at age 40, after controlling for time-dependent variables such as marriage, dependents, and year-to-year fluctuations.

I estimate the mean regression parameters of equation (1) on four separate demographic samples, categorized by race and gender. For analyses that extend up through 2015, I use all observations for all household heads across all years to compute permanent income. For analyses restricted to 1984–1994, I use only observations from 1994 and earlier. In both cases, I drop individuals whose permanent income measures have been created from fewer than four individual-years, to minimize the effect of transitory variation in income on my permanent income measures.

4.2 Treatment of Outliers

I eliminate outliers using Altonji & Doraszelski's (2001) methodology. I estimate separate median regressions for white and black couples, single men, and single women, using the model described in Section 5. I then pool the residuals from the regressions and drop the observations that belong to the bottom 0.5 percent and top 0.5 percent of the residuals. I conduct these trimming procedures separately for the level, ratio, and log models. My main findings are not sensitive to excluding these outliers, though standard errors are slightly reduced after trimming.

4.3 Descriptive Statistics of Income and Demographics

Table 4 presents the mean, median, and standard deviation for my wealth and income variables. These consist of the log of wealth ($ln\ W$), the level of wealth (W), the log of income, the level of income, permanent log-income, permanent income (y), and the ratio of wealth to permanent income (W/y). These descriptive statistics are computed using the family core weights, and include observations across all wealth

survey years from 1984–2015.

Consider the statistics for couples. In the total data, white couples have a mean wealth of $573,133, compared to $114,252 for black couples. A much smaller percentage difference is reflected in their average current incomes, which equal $84,861 for white couples and $62,211 for black couples. A slightly larger difference is captured in their permanent income measures, which average $90,944 and $61,842, respectively. Similar differences between the two races are reflected in the levels and logs of wealth, income, and permanent income for single males and single females.

The ratio of wealth to permanent income varies dramatically across groups, and also varies between means and medians. For white couples, the group with the highest wealth-to-permanent-income ratio, the ratio is 4.14 at the mean but only 1.65 at the median. For black females, the group with the lowest wealth-to-permanent-income ratio, the ratio is 0.61 at the mean and only 0.06 at the median.

For single females, the average value of permanent income is much higher[5] than the average value of current income; the former is roughly 2.5 times the value of current income for white women, and 1.6 times the value of current income for black women. This difference is because when computing permanent income, I consider married women and single females to be part of the same category, even though the average household income of married women is nearly triple that of single women. This specification is necessary to estimate average income across a woman's entire working lifetime.

In Table 6, I present descriptive statistics for the demographic variables that I include in my regression models. The sample shows a slightly skewed distribution over the four regions of the United States, with a larger proportion of black households in the South, and a smaller proportion of both racial groups in the West and Northwest.

[5]This was also observed in Altonji and Doraszelski's descriptive statistics for permanent income.

Table 4: Descriptive statistics for wealth and income variables.

	White Couples	Black Couples	White Males	Black Males	White Females	Black Females
Log wealth						
Mean	11.66	9.81	9.55	7.92	9.88	7.66
Median	12.23	10.81	10.38	8.61	10.92	8.30
SD	(2.57)	(2.90)	(3.44)	(3.29)	(3.24)	(3.28)
Wealth						
Mean	573,133	114,252	242,237	102,395	219,594	52,017
Median	205,869	49,690	32,296	5,463	55,451	4,027
SD	(2,114,999)	(284,907)	(796,547)	(764,997)	(943,033)	(246,751)
Wealth/perminc						
Mean	4.14	1.79	2.13	1.44	1.42	0.61
Median	1.65	0.63	0.25	0.11	0.24	0.06
SD	(21.55)	(11.20)	(20.09)	(9.32)	(7.47)	(3.59)
Log income						
Mean	11.00	10.72	10.20	9.68	9.72	9.51
Median	11.16	10.93	10.45	10.05	9.54	9.72
SD	(1.00)	(0.98)	(1.20)	(1.34)	(1.24)	(1.17)
Income						
Mean	84,861	62,211	43,851	29,559	28,708	22,211
Median	70,608	55,773	34,625	23,145	21,030	16,655
SD	(90,897)	(42,108)	(44,096)	(30,356)	(30,345)	(20,127)
Permanent log-income						
Mean	11.16	10.68	11.05	10.56	11.05	10.27
Median	11.21	10.80	11.18	10.74	11.13	10.31
SD	(0.55)	(0.64)	(0.72)	(0.87)	(0.63)	(0.73)
Permanent income						
Mean	91,037	61,711	84,703	55,048	81,861	43,688
Median	81,386	58,021	77,034	51,537	77,837	41,248
SD	(59,255)	(30,447)	(43,418)	(24,102)	(30,711)	(17,106)

Notes: I show the mean (left), median (right), and standard deviation for each variable by demographic group, computed across all years. All values are computed using family core weights. "Wealth" refers to net wealth including home equity. "Income" refers to total taxable non-asset income. "Wealth/perminc" refers to the ratio of wealth to permanent income. The definition of permanent income is given in the text.

Table 5: Descriptive statistics for demographic variables.

	White Couples	Black Couples	White Males	Black Males	White Females	Black Females
Northwest region	0.22	0.16	0.21	0.14	0.21	0.15
Midwest region	0.30	0.17	0.29	0.19	0.29	0.23
South region	0.29	0.60	0.28	0.58	0.29	0.53
West region	0.18	0.07	0.21	0.09	0.21	0.09
Spouse: Annual hours worked	960	1,101				
	(935)	(951)				
Age	48.01	46.87	42.91	40.86	54.53	46.02
	(15.43)	(15.01)	(18.30)	(15.26)	(20.25)	(17.29)
Spouse: Age	45.49	43.81				
	(15.05)	(14.37)				
Number of kids in FU	0.97	1.28	0.11	0.14	0.33	0.97
	(1.22)	(1.46)	(0.45)	(0.52)	(0.80)	(1.33)
Whether kids in FU	0.49	0.59	0.07	0.09	0.19	0.48
Number of dependents outside FU	0.21	0.23	0.35	0.48	0.13	0.12
	(0.69)	(0.73)	(0.83)	(0.98)	(0.56)	(0.50)
Whether dependents outside FU	0.13	0.14	0.21	0.25	0.08	0.08
Health: fair or poor	0.13	0.25	0.17	0.25	0.25	0.31
Spouse health: fair or poor	0.12	0.25				
Education: grade school	0.08	0.16	0.06	0.10	0.12	0.14
Education: high school incomplete	0.12	0.19	0.12	0.19	0.15	0.26
Education: high school diploma	0.25	0.30	0.25	0.31	0.28	0.29
Education: high school diploma plus	0.27	0.23	0.29	0.30	0.26	0.23
Education: college degree	0.18	0.07	0.16	0.06	0.12	0.06
Education: advanced degree	0.11	0.05	0.11	0.04	0.07	0.03
Spouse: grade school	0.05	0.09				
Spouse: high school incomplete	0.11	0.22				
Spouse: high school diploma	0.35	0.29				
Spouse: high school diploma plus	0.27	0.27				
Spouse: college degree	0.14	0.07				
Spouse: advanced degree	0.08	0.06				
Self-employed	0.13	0.04	0.08	0.04	0.04	0.02
	(0.06)	(0.20)	(0.27)	(0.02)	(0.18)	(0.14)
Spouse: Self-employed	0.34	0.02				
	(0.23)	(0.17)				
Number of siblings	3.16	5.10	3.02	4.96	3.35	5.19
	(2.43)	(3.62)	(2.39)	(3.69)	(2.69)	(3.55)
Spouse: Number of siblings	3.04	4.77				
	(2.40)	(3.65)				

Note: The values shown are weighted means (standard deviations) computed across all years.

This distribution is not inconsistent with the average geographic concentrations of each demographic, and the family core weights serve to make the sample as nationally representative as possible.

Regarding the six brackets of educational achievement, larger shares of black individuals than white individuals appear in the lower three brackets. Consider the case of married heads of household, in the first and second columns. The percentage of blacks who have only a grade school education is twice as high as that of whites, while the percentage of blacks who have a college degree or an advanced degree is less than half that of whites. Similar trends hold true for single males and females, and may factor into the extent of the wealth gap.

Black individuals, in all demographic groups, have more children on average than white individuals, especially single black females, whose average number of children exceeds than that of single white females by 0.74. Black individuals also have more siblings on average, differing in every demographic group by more than 1.00. The same does not hold true for the number of dependents outside the family unit, where whites and blacks are relatively equal.

Furthermore, black individuals are much less likely than white individuals to be self-employed. Only 4% of black married heads are self-employed, compared to 13% of white married heads. This difference could have implications for wealth mobility, as self-employment has historically been an important factor for marginalized groups to create and accumulate wealth (Fairlie & Meyer 1997, Bradford 2015, Dunn & Holtz-Eakin 2000). These differences in demographic variables may be significant enough to explain a portion of the wealth gap. However, none of these demographic averages have changed dramatically between Table 6 and the equivalent table in the study by Altonji & Doraszelski (2001), so shifts in these demographic variables may not be able to account for the shift in the wealth gap over time.

5 Empirical Strategies

For my wealth decompositions, I implement the Blinder-Oaxaca method, originally used by Blinder (1973) to study wage discrimination. I first specify a linear model with a measure of wealth as my dependent variable and a vector of income and demographic measures as my explanatory variables. Then, through standard regression techniques, I estimate the model separately for each black and white demographic group. Using the resulting regression coefficients, I predict white households' wealth using the coefficients obtained from the corresponding black sample, and black households' wealth using the coefficients obtained from the corresponding white sample. The resulting predictions capture the extent to which the existing racial gap can be explained by the income and demographic variables for each racial group. Intuitively, using the black wealth function is equivalent to asking "What would happen to black wealth if blacks were given the white means but retained their own functions?" (Blau & Graham 1990).

The model, as described by Altonji & Doraszelski (2001), works as follows. Let $i = 1, \ldots, N^j$ index individuals or couples and j demographic groups, where j is b for blacks and w for whites. Since I am using panel data, let t denote the year associated with each observation, and assume this time subscript to be implicit to variables that differ across years. Let W_i^j denote wealth, Y_t^j a vector of income variables, and X_t^j a vector of demographic variables.

The OLS regression is given by

$$W_i^w = \alpha_0^w + Y_i^w \alpha^w + X_i^w \beta^w + \epsilon_{it}^w, \tag{2}$$

$$W_i^b = \alpha_0^b + Y_i^b \alpha^b + X_i^b \beta^b + \epsilon_{it}^b, \tag{3}$$

where α_0^w, α^w, and β^w are the regression intercept and slope parameters for whites, ϵ_i^w is the error term, and α_0^b, α^b, β^b, and ϵ_{it}^b are the corresponding parameters and error term for blacks. Because separate regressions are conducted for each demographic group, the slopes and intercepts depend on sex and marital status as well as on race.

My income vector Y_i^j includes current income y_{it} and permanent income y_i, their squared[6] values y_{it}^2 and y_i^2, and the interaction of the two terms $y_{it} \cdot y_i$. My demographic vector X_i^j includes all of the demographic variables in Table 6: dummies for Midwest, South, and West geographic regions, a fourth-order polynomial in age (centered at age 40), the number of children in the family unit and a dummy indicator for children, the number of dependents outside the family unit and a dummy indicator for dependents, a dummy variable for poor health, dummies for the top five brackets of educational attainment, a dummy for self-employment, and the number of siblings. In the models for single males and single females, I use the variables associated with the head of household. In the case of couples, I include spouse variables as well, with the applicable interactions. I also include year dummies for the wealth survey years, excluding the earliest year dummy in relevant sample.

5.1 Decomposing the Wealth Gap

To evaluate the explanatory power of these wealth models, I use the Blinder-Oaxaca regression decomposition (Blinder 1973, Oaxaca 1973), modified to accomodate the use of median regression and population weights (Altonji & Doraszelski 2001). Altonji and Doraszelski specify the modifed regression as follows: Let $\{\omega_i^j\}_{i=1}^{N^j}$ denote a set of population weights such that $\omega_i^j > 0$ and $\sum_{i=1}^{N^j} \omega_i^j = 1$. Let $Z_i^j = (1, Y_i^j, X_i^j)$ and

[6] I also estimate a cubic model that includes cubes of y_{it} and y_i, and find that the results are not sensitive to using the cubic specification.

$\theta^j = (\alpha_0^j, (\alpha^j)', (\beta^j))'$. Equations (2) and (3) can be written as

$$W_i^j = Z_i^j \theta^j + \epsilon_i^j, \quad j = w, b.$$

Let $\hat{W}_\bullet^j = \sum_{i=1}^{N^j} \omega_i^j (Z_i^j \hat{\theta}^j)$ denote the mean of the predictions for individuals in demographic group j, where $\hat{\theta}^j$ is an estimate of θ^j, obtained separately from the black sample and the white sample. For each family type, I subtract the mean prediction of black wealth using the black model from the mean prediction of white wealth using the white sample. This yields the decomposition

$$\begin{aligned} \hat{W}_\bullet^w - \hat{W}_\bullet^b &= \sum_{i=1}^{N^w} \omega_i^w (Z_i^w \hat{\theta}^w) - \sum_{i=1}^{N^b} \omega_i^b (Z_i^b \hat{\theta}^b) \\ &= \left\{ \sum_{i=1}^{N^w} \omega_i^w (Z_i^w \hat{\theta}^b) - \sum_{i=1}^{N^b} \omega_i^b (Z_i^b \hat{\theta}^b) \right\} + \left\{ \sum_{i=1}^{N^w} \omega_i^w (Z_i^w \hat{\theta}^w) - \sum_{i=1}^{N^w} \omega_i^w (Z_i^w \hat{\theta}^b) \right\}. \end{aligned}$$

The first term measures the "endowments effect", which refers to the portion of the wealth gap that could be attributed to group differences in the explanatory variables if the relationship between wealth and the explanatory variables were given by $\hat{\theta}^b$, the coefficient vector for blacks. The second term measures the contribution to the wealth gap of differences in the regression coefficients, using the distribution of the explanatory variables for whites. The first term thus represents the part of the wealth gap[7] $\hat{W}_\bullet^w - \hat{W}_\bullet^b$ that is "explained" by differences between blacks and whites in the explanatory variables, while the second term represents the unexplained part of the wealth gap.

I also calculate the counterfactual predictions: the mean prediction of black wealth using the white model, and the mean prediction of white wealth using the black model.

[7]Because I estimate the regressions without weighting but weight the observations when performing decompositions, $\hat{W}_\bullet^w - \hat{W}_\bullet^b$ need not equal the difference in the weighted sample means of wealth.

These counterfactuals show the portion of the gap that can be explained specifically using the white coefficients or specifically using the black coefficients. The equation can be expressed as

$$\hat{W}_{\bullet}^{w} - \hat{W}_{\bullet}^{b} = \left\{ \sum_{i=1}^{N^w} \omega_i^w (Z_i^w \hat{\theta}^w) - \sum_{i=1}^{N^b} \omega_i^b (Z_i^b \hat{\theta}^w) \right\} + \left\{ \sum_{i=1}^{N^b} \omega_i^b (Z_i^b \hat{\theta}^w) - \sum_{i=1}^{N^b} \omega_i^b (Z_i^b \hat{\theta}^b) \right\}.$$

To analyze how the wealth gap has changed over time, I perform wealth decompositions on samples covering different time periods. I present results on the sample restricted to the years 1984–1994, on the sample for the newly added years 1999–2015, and on the pooled sample with all years.

5.2 Estimating the Role of Permanent Income

Because I use a vector of interaction variables Y_i^j to represent income, there is no immediate way to interpret the size of the effect that permanent income has on wealth for each demographic group. To examine the relationship between the two, I take the coefficients for each variable in the vector Y_i^j from the regression models specified by Equations (2) and Equations (3), and multiply them by the observed values of their respective variables, yielding the product $\alpha_x^j \cdot x_i^j$ for each specific income variable x. I then sum the five products to create an index D_i. This index essentially captures the estimated effect of my income variables on the dependent variable, the level of wealth.

By generating a binned scatterplot of the observations of this index D_i (normalized to zero) against the observations of permanent income y_i, I can obtain a nonparametric visualization of the conditional expectation function $E\Big[D_i \;\Big|\; y_i = x\Big]$. This is the best predictor of D_i given y_i, in the sense that it minimizes mean squared error. I use the coefficient on y_i to analyze the intensity of the relationship between perma-

nent income and wealth. As with the wealth decompositions, I perform this analysis separately for the years 1984–1994, the years 1999–2015, and the years 2003–2015. My results are presented in Subsection 6.3.

5.3 Taking a Nonparametric Approach

Barsky et al. (2002) propose an alternative form of wealth decomposition that uses a non-parametric specification instead of the standard Blinder-Oaxaca method. The authors found that the parametrically estimated wealth model is likely to be misleading when the true conditional expectation functions are nonlinear, because the errors attributable to misspecification are unlikely to average to zero over the counterfactual earnings distribution. Their method is similar to the one that DiNardo, Fortin & Lemieux (1996) developed to study the effect of changes in unionization rates on the distribution of wages, which involves reweighting the empirical distribution of the dependent variable to equalize the empirical distributions of the explanatory income and demographic variables, and then calculating counterfactuals. Essentially, this method allows the white households that have characteristics similar to those of black households to receive larger weights than those that have characteristics dissimilar to those of black households, and vice versa.

Given wealth W^w for whites and W^b for blacks and the set of explanatory income and demographic variables z, I reweight the black distribution of (W^b, z) so that the distribution of z matches the distribution of z for the white population. Conversely, I reweight the white distribution of (W^w, z) to match the characteristics of the black population. This requires generating weights that reflect differences in the earnings distributions between black and white households. Let $p(white|z)$ and $p(black|z) = 1 - p(white|z)$ denote the probabilities or "propensity scores" of an observation being

in the white sample or in the black sample, respectively, given z. I generate weights based on the following equation:

$$\psi(z) = \frac{p(white|z)}{p(black|z)} \frac{p(black)}{p(white)}. \tag{4}$$

To evaluate the counterfactual of imposing the black earnings distribution on the white conditional expectation function, I compute the weighted mean of white wealth using the weight $\psi(z)$ as defined above[8]. Conversely, I also evaluate the counterfactual of imposing the white earnings distribution on the black conditional expectation function by computing the weighted mean of black wealth. While the Blinder-Oaxaca decomposition expresses the mean counterfactual, this non-parametric technique provides a distributional counterfactual. I perform these analyses separately for the periods 1984–1994 and 1999–2015. My results are presented in Subsection 6.5.

5.4 Decomposing the Change in the Gap over Time

In addition to decomposing the wealth gap from different time periods and comparing those decompositions, I also directly decompose the *change* in the wealth gap before and after 1994. This method decomposes the change into the relative effects of changes in observable characteristics and changes in the wealth models themselves. Let the operator Δ represent the mean difference between the white population and the black population in a given time period. Let the subscript *94* denote the pre-1994 time period, and let the subscript *15* denote the post-1994 time period. Let the individual subscript i remain implicit.

[8]I generate these weights using probit regressions with the same explanatory variables used in Equations 2 and 3, using the family core weights given in the PSID. I multiply the weights by the family core weights to keep the final wealth estimates nationally representative. To reduce the effects of extreme outliers, I truncate the bottom 5th and top 95th percentile of $\psi(z)$ for each race.

I then evaluate a decomposition equation that is differenced between the two time periods:

$$\Delta W_{15} - \Delta W_{94} =$$
$$(\Delta X_{15} - \Delta X_{94})\beta_{94}^{w} + \Delta X_{15}(\beta_{15}^{w} - \beta_{94}^{w})$$
$$+(\Delta\beta_{15} - \Delta\beta_{94})X_{94}^{b} + (X_{15}^{b} - X_{94}^{b})\Delta\beta_{15}.$$

The first term in the above equation $(\Delta X_{15} - \Delta X_{94})\beta_{94}^{w}$ represents the effect of relative changes over time in the observed income and demographic variables for the white and black populations. The second term $\Delta X_{15}(\beta_{15}^{w} - \beta_{94}^{w})$ represents the effect of changes over time in the coefficients of the white model, after controlling for income and demographic variables. These two terms together capture the change in the explained portion the wealth gap, the component expressed as $\left\{\sum_{i=1}^{N^w} \omega_i^w (Z_i^w \hat{\theta}^b) - \sum_{i=1}^{N^b} \omega_i^b (Z_i^b \hat{\theta}^b)\right\}$ in the Blinder-Oaxaca decomposition.

The last two terms in the decomposition represent the change in the unexplained portion of the wealth gap, represented by $\left\{\sum_{i=1}^{N^w} \omega_i^w (Z_i^w \hat{\theta}^w) - \sum_{i=1}^{N^w} \omega_i^w (Z_i^w \hat{\theta}^b)\right\}$ in the Blinder-Oaxaca decomposition. Specifically, the third term shows the effect of changes in relative coefficients between the white model and the black model, while the fourth term captures the fact that changes over time in the characteristics of the black population affect the consequences of the difference in group coefificents.

6 Results

I present the results of my mean wealth decompositions in Subsections 6.1 and 6.2. Tables 6, 7, and 8 show the results for the 1984–1994 sample, the 1999–2015 sample, and the full sample across all years, respectively. For each time period, I describe

decompositions of the black-white wealth gap in the level of wealth (W), the ratio of wealth to permanent income (W/y), and the log of wealth ($ln\ W$).

In Subsection 6.3, I discuss the coefficients of permanent income on the income component of wealth. In Subsection 6.4, I present my results for the decomposition of the change in the wealth gap. Finally, in Subsection 6.5, I describe my findings from the non-parametric specification originally used by Barsky et al. (2002).

6.1 Decompositions for 1984–1994

Table 6 reports the results of my wealth decompositions for 1984–1994, the years of data originally included in the work of Altonji & Doraszelski (2001). The trends in my table are consistent with their findings. Like theirs, my results demonstrate that a significantly higher percentage of the wealth gap can be explained by the white coefficients than the black coefficients. Consider the decompositions for levels of wealth, shown in Panel A. The mean wealth gap $\hat{W}_{\bullet}^{w} - \hat{W}_{\bullet}^{b}$ is \$170,984 for couples, \$55,330 for single men, and \$56,573 for single women. The portion of that number that can be explained using the white model is 95% for couples, 125% for single men, and 120% for single females. Using the black model, on the other hand, the explained percentage of the total gap for those respective groups is only 36%, 49%, and 56%[9], a significantly smaller portion.

The ratio and log wealth measures reflect a similar pattern. The difference between the explanatory powers of the black model and the white model is slightly more pronounced in the wealth ratio models, and slightly less pronounced in the log wealth models. This persistent difference across all three wealth models suggests that the coefficient estimates for the white equation $\hat{\theta}^{w} = (\hat{\alpha}_{0}^{w}, (\hat{\alpha}^{w})', (\hat{\beta}^{w})')'$ allow racial dif-

[9]For couples, single males, and single females, respectively, Altonji & Doraszelski (2001) find that the white coefficients explain 79%, 120%, and 103% of the wealth gap, and that the black coefficients explain 25%, 31%, and 33% of the wealth gap.

Table 6: Wealth Decompositions: 1984–1994.

	White Coefficients		Black Coefficients				
Demographic group	White characteristics	Black characteristics	Black characteristics	White characteristics	Total gap	Explained gap (white)	Explained gap (black)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
A: Wealth measure: Level of wealth							
Couples	254,158	92,029	83,274	144,429	170,884	162,129	61,155
	(3,906)	(5,132)	(2,196)	(1,942)		*95%*	*36%*
Males	86,000	16,781	30,670	57,769	55,330	69,219	27,099
	(3,593)	(3,109)	(1,334)	(2,080)		*125%*	*49%*
Females	77,907	9,790	21,334	53,242	56,573	68,117	31,908
	(2,257)	(1,404)	(608)	(1,296)		*120%*	*56%*
B: Wealth measure: Ratio of wealth to permanent income							
Couples	2.87	1.69	1.19	1.55	1.68	1.18	0.36
	(0.03)	(0.05)	(0.02)	(0.02)		*70%*	*21%*
Males	1.05	0.49	0.53	0.67	0.52	0.56	0.14
	(0.04)	(0.04)	(0.02)	(0.02)		*108%*	*27%*
Females	0.97	0.33	0.45	0.67	0.52	0.64	0.22
	(0.02)	(0.02)	(0.01)	(0.01)		*123%*	*42%*
C: Wealth measure: Log of wealth							
Couples	11.27	9.97	9.59	10.42	1.68	1.30	0.83
	(0.02)	(0.04)	(0.05)	(0.03)		*77%*	*49%*
Males	9.34	8.09	7.55	8.66	1.79	1.26	1.11
	(0.07)	(0.08)	(0.08)	(0.08)		*70%*	*62%*
Females	9.32	7.90	6.92	8.59	2.40	1.42	1.67
	(0.06)	(0.04)	(0.05)	(0.06)		*59%*	*70%*

Notes: Following the example of Altonji & Doraszelski (2001), the regression coefficient estimates are estimated from the trimmed sample without sample weights. Columns (1) and (2) are based on coefficient estimates from the white sample, columns (3) and (4) on coefficients from the black sample. Column (1) predicts wealth holdings for whites, column (3) for blacks. Column (2) uses the white coefficient estimates with the black sample to calculate counterfactual wealth holdings for blacks, column (4) 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), column (7) the difference between columns (4) and (3). Standard errors account for arbitrary forms of heteroscedascity and correlation across time.

Table 7: Wealth Decompositions: 1999–2015.

	White Coefficients		Black Coefficients				
Demographic group	White characteristics	Black characteristics	Black characteristics	White characteristics	Total gap	Explained gap (white)	Explained gap (black)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
A: Wealth measure: Level of wealth							
Couples	278,772	141,409	94,871	151,554	183,901	137,363	56,683
	(2,102)	(2,706)	(1,338)	(1,353)		*75%*	*31%*
Males	108,281	51,914	30,537	45,620	77,744	56,367	15,083
	(2,692)	(1,817)	(839)	(1,056)		*73%*	*19%*
Females	78,818	18,129	24,336	50,459	54,482	60,689	26,123
	(1,374)	(713)	(322)	(679)		*111%*	*48%*
B: Wealth measure: Ratio of wealth to permanent income							
Couples	3.02	2.38	1.35	1.53	1.67	0.64	0.18
	(0.02)	(0.02)	(0.01)	(0.01)		*38%*	*11%*
Males	1.24	0.93	0.51	0.50	0.73	0.31	-0.01
	(0.02)	(0.02)	(0.01)	(0.01)		*42%*	*-1%*
Females	0.91	0.53	0.49	0.62	0.42	0.38	0.13
	(0.01)	(0.01)	(0.00)	(0.01)		*90%*	*31%*
C: Wealth measure: Log of wealth							
Couples	11.06	10.10	9.46	9.84	1.60	0.96	0.38
	(0.01)	(0.02)	(0.02)	(0.01)		*60%*	*24%*
Males	8.89	8.24	7.41	7.54	1.48	0.65	0.13
	(0.03)	(0.03)	(0.04)	(0.03)		*44%*	*9%*
Females	8.74	7.45	7.30	7.95	1.44	1.29	0.65
	(0.03)	(0.02)	(0.02)	(0.02)		*90%*	*45%*

Notes: Following the example of Altonji & Doraszelski (2001), the regression coefficient estimates are estimated from the trimmed sample without sample weights. Columns (1) and (2) are based on coefficient estimates from the white sample, columns (3) and (4) on coefficients from the black sample. Column (1) predicts wealth holdings for whites, column (3) for blacks. Column (2) uses the white coefficient estimates with the black sample to calculate counterfactual wealth holdings for blacks, column (4) 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), column (7) the difference between columns (4) and (3). Standard errors account for arbitrary forms of heteroscedascity and correlation across time.

Table 8: Wealth Decompositions: All years.

Demographic group	White Coefficients: White characteristics	White Coefficients: Black characteristics	Black Coefficients: Black characteristics	Black Coefficients: White characteristics	Total gap	Explained gap (white)	Explained gap (black)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
A: Wealth measure: Level of wealth							
Couples	271,243	133,605	92,444	148,693	178,799	137,638	56,249
	(1,795)	(2,311)	(1,122)	(1,123)		*77%*	*31%*
Males	106,751	43,644	30,298	51,873	76,453	63,107	21,575
	(2,304)	(1,577)	(721)	(1,293)		*83%*	*28%*
Females	80,370	20,668	23,681	51,352	56,689	59,702	27,671
	(1,202)	(628)	(281)	(619)		*105%*	*49%*
B: Wealth measure: Ratio of wealth to permanent income							
Couples	2.95	2.29	1.33	1.54	1.62	0.66	0.21
	(0.01)	(0.02)	(0.01)	(0.01)		*41%*	*13%*
Males	1.21	0.83	0.50	0.55	0.71	0.38	0.05
	(0.02)	(0.02)	(0.01)	(0.01)		*54%*	*7%*
Females	0.93	0.56	0.47	0.63	0.46	0.37	0.16
	(0.01)	(0.01)	(0.00)	(0.01)		*80%*	*35%*
C: Wealth measure: Log of wealth							
Couples	11.09	10.11	9.50	9.98	1.59	0.98	0.48
	(0.01)	(0.02)	(0.02)	(0.01)		*62%*	*30%*
Males	8.98	8.20	7.41	7.75	1.57	0.78	0.34
	(0.03)	(0.03)	(0.03)	(0.03)		*50%*	*22%*
Females	8.84	7.82	7.22	8.01	1.62	1.02	0.79
	(0.02)	(0.02)	(0.02)	(0.02)		*63%*	*49%*

Notes: Following the example of Altonji & Doraszelski (2001), the regression coefficient estimates are estimated from the trimmed sample without sample weights. Columns (1) and (2) are based on coefficient estimates from the white sample, columns (3) and (4) on coefficients from the black sample. Column (1) predicts wealth holdings for whites, column (3) for blacks. Column (2) uses the white coefficient estimates with the black sample to calculate counterfactual wealth holdings for blacks, column (4) 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), column (7) the difference between columns (4) and (3). Standard errors account for arbitrary forms of heteroscedascity and correlation across time.

ferences in income and demographics to explain much more of the racial difference in wealth than do the coefficient estimates for the black equation $\hat{\theta}^b = (\hat{\alpha}_0^b, (\hat{\alpha}^b)', (\hat{\beta}^b)')'$.

6.2 Decompositions for 1999–2015

In Table 7, I present the results of the wealth decompositions for 1999–2015, the newly added years of data. The most remarkable difference between Table 7 and Table 6 is that in nearly every case, the portion of the total wealth gap that can be explained by racial differences in income and demographics was higher in 1984–1994 than in 1999–2015. This is true of both the white coefficients and the black coefficients. Consider Panel A of Table 7. The white models now only explain 75%, 73%, and 111% of the total wealth gap for couples, single men, and single women, respectively; this is significantly lower than the 95%, 125%, and 120% from Table 6. Similarly, the black models now explain only 31%, 19%, and 48% of the wealth gap for the respective family types, compared to 36%, 49%, and 56% before 1994. The decrease in the explanatory power of the black coefficients is slightly less drastic than it is for the white coefficients, but still fairly pronounced.

The same pattern holds true with the ratio and log specifications, showing stark percentage decreases almost across the board. The one exception is that of the white model for single females in the log specification. In this one case, the model explains more of the gap in 1999–2015 than it did in 1984–1994, moving from capturing 59% of the gap in log wealth to capturing 90%. In every other case, the explained portion of the gap is smaller than it used to be. In the ratio specification for single males, for example, the explained gap using the black model is actually negative, implying that unmarried black men would have an even higher wealth-to-permanent-income ratio than unmarried white men if not for unexplained factors beyond income and

demographics.[10]

Finally, the size of the predicted gap itself has also increased between 1984–1994 and 1999–2015, for all groups except single females. The total gap in levels has increased from 170,984 to 183,901 for couples and from 55,330 to 77,744 for single men, but decreased from 56,573 to 54,582 for single women. In the ratio specification, the gap for couples has also decreased, but only by 0.01, while the gap for single women has decreased from 0.52 to 0.42. Indeed, referring back to Figure 1, the gap in the level of wealth for single women was the one that increased the least from 1984–2015 out of the three demographic groups.

Ultimately, the effects of income and demographics on wealth explain much less of the wealth gap in the new data than they did in the early data, especially for the models estimated on white Americans. This suggests that the original reasons why black wealth was less sensitive to income than white wealth – such as differential returns on investment or biases in the housing and lending markets – may have become even more constrictive in recent years.

6.3 Role of Permanent Income

To analyze the role of permanent income on wealth, I plot the estimated income effect on wealth D_i (normalized to zero) for each bin of permanent income y_i, using a linear functional form. The resulting binned scatterplots are shown in Figures 4–9 for white and black males, females, and couples, respectively. Each figure displays the scatterplot for 1984–1994 on the left and the scatterplot for 1999–2015 on the right. Table 9 reports the coefficients associated with y_i in the regressions illustrated

[10]The data includes some high wealth values associated with very low permanent income values, which may account for this negative estimate in the ratio specification. Truncating the ratio at the 99th percentile prior to the regression results in predictions of 0.47 (0.01) for both black and white single males under the black model, similar to the reported 0.51 (0.01) and 0.50 (0.01) respectively, which suggests that this finding may be realistic even disregarding extreme outliers.

Table 9: Coefficient on permanent income.

Demographic	1984–1994	1999–2015	Change
White males	2.29	2.93	+0.64
	(0.05)	(0.05)	
Black males	0.88	1.35	+0.47
	(0.04)	(0.01)	
White females	1.61	2.21	+0.60
	(0.02)	(0.01)	
Black females	1.11	1.08	-0.03
	(0.03)	(0.01)	
White couples	4.49	3.78	-0.71
	(0.03)	(0.01)	
Black couples	1.94	1.91	-0.03
	(0.02)	(0.01)	

by each scatterplot.

For all three demographic groups, the relationship between permanent income and the income effect on wealth has changed less dramatically for the black sample than for the white sample. For single whites, for example, the relationship between permanent income and the income effect on wealth has increased over the two periods, growing from 2.29 to 2.93 for single males and from 1.61 to 2.21 for single females. For single blacks, the regression coefficient increases from 0.88 to 1.35 for single males and decreases from 1.11 to 1.08 for single females. This is a somewhat unexpected change, because it implies that wealth for single whites has become more closely tied to permanent income, which does not explain the differential growth in the wealth and income gaps, and suggests that other factors must be at play in this relationship.

For married couples, however, the coefficient on permanent income falls from 4.49 to 3.78 (-0.71) for white couples and from 1.94 to 1.91 (-0.03) for black couples. This suggests that the wealth of married Americans has become more independent from income over time, but that this separation has affected white couples more than black couples. Based on Tables 1 and 2, we know that white wealth has grown much faster

Figure 4: White males.

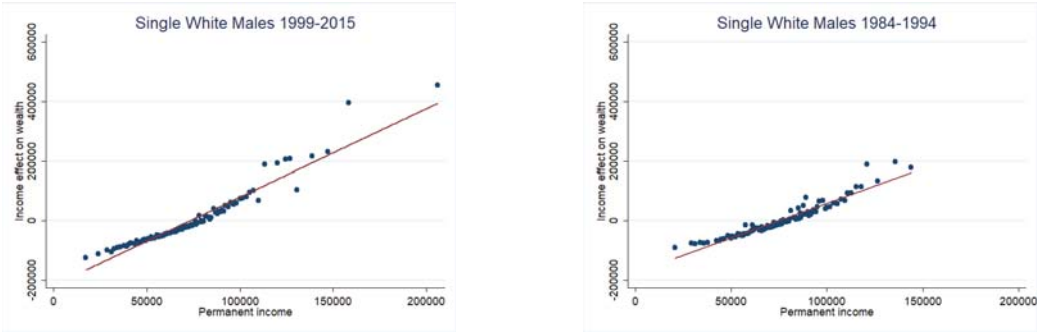


Figure 5: Black males.

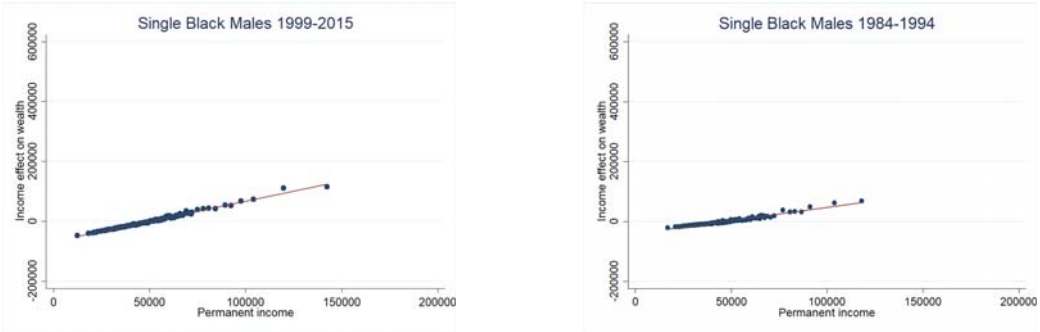


Figure 6: White females.

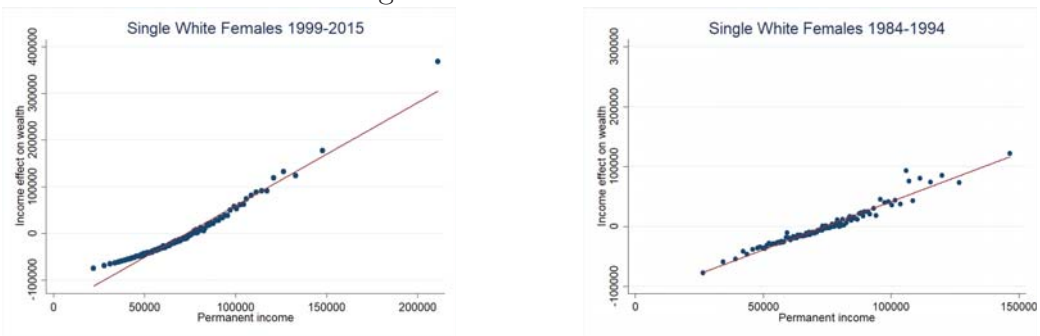


Figure 7: Black females.

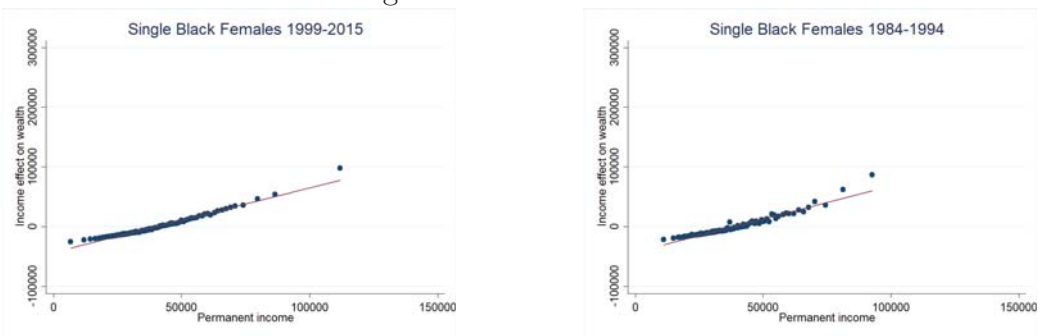


Figure 8: White couples.

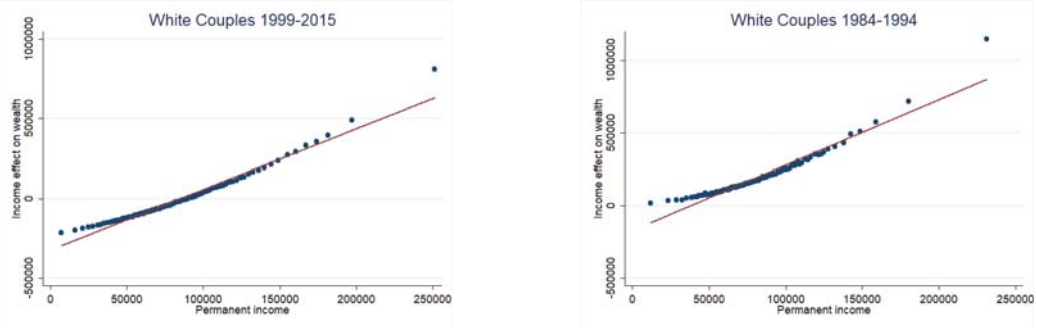
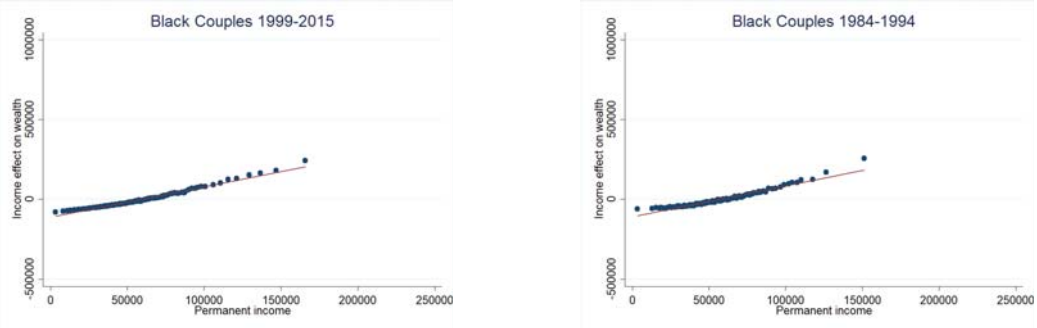


Figure 9: Black couples.



than black wealth over this time period, which may have been made possible by this separation of wealth from income. This could have intensified the existing structures that led to accelerated wealth growth for the wealthy, while continuing to limit those with fewer wealth holdings.

6.4 Decomposition of the Change in the Wealth Gap

Table 10 presents the results for the decomposition of the change in the wealth gap, using data from the years 1984–1994 as the earlier sample and data from the years 1999–2015 as the recent sample.

The change in the wealth gap itself, shown in Column (1), varies depending on the wealth model and the family type. For couples and males, the gap in levels has grown over time, but not the gap in log wealth. For single females, the wealth gap

Table 10: Decomposition of the Change in the Wealth Gap.

Demographic group	Gap change	Explained Gap: Effect of characteristics	Explained Gap: Effect of coefficients	Unexplained Gap: Relative term	Unexplained Gap: Interaction term
	(1)	(2)	(3)	(4)	(5)
A: Wealth measure: Level of wealth					
Couples	13,017	-32,225	7,459	-22,908	60,691
		-248%	*57%*	*-176%*	*466%*
Males	22,415	-15,647	2,795	15,407	19,859
		-70%	*12%*	*69%*	*89%*
Females	-2,091	-12,421	-3,818	-7,935	22,083
		594%	*183%*	*379%*	*-1,056%*
B: Wealth measure: Ratio					
Couples	-0.01	-0.49	-0.04	0.07	0.45
		4,842%	*396%*	*-652%*	*-4,485%*
Males	0.20	-0.22	-0.03	0.16	0.29
		-112%	*-16%*	*82%*	*146%*
Females	-0.09	-0.17	-0.08	-0.02	0.18
		187%	*83%*	*25%*	*-195%*
C: Wealth measure: Log of wealth					
Couples	-0.09	-0.20	-0.14	0.20	0.05
		226%	*166%*	*-234%*	*-57%*
Males	-0.31	-0.29	-0.34	0.32	-0.01
		92%	*108%*	*-104%*	*4%*
Females	-0.97	-0.42	-0.13	-0.56	0.15
		44%	*14%*	*58%*	*-16%*

Notes: Column (1) gives the total change in the wealth gap between 1984–1994 and 1999–2015, and is equivalent to the difference between Columns (5) in Table 6 and Table 7. Column (2) represents the effects of relative changes over time in the characteristics of the two groups weighted by the coefficients for whites in 1984–1994, and Column (3) represents the effect of changes over time in the coefficients for the white model, holding differences in observed characteristics fixed. Columns (4) represents the effect of changes over time in relative coefficients between the two groups, and Column (5) captures the fact that the changing characteristics of blacks over time affected the consequences of differences in group coefficients. The regression coefficient estimates are estimated from the trimmed sample without sample weights, but all values shown are weighted means (standard errors). Standard errors account for arbitrary forms of heteroscedascity and correlation across time.

has decreased in every wealth model. It was also for single females that the size of the "explained" percentage of the total gap had decreased the least, according to the previous decompositions, so it seems likely that the unmeasured factors behind the wealth gap are affecting single women less strongly than couples and single men.

Column (2) captures the effect of relative changes over time in the observable characteristics of the white sample compared to those of the black sample, expressed as $(\Delta X_{15} - \Delta X_{94})\beta_{94}^{w}$ in the decomposition model. The values here are consistently negative, suggesting that the income and demographics of black and white families have grown more similar over the two time periods. If the observable income and demographic characteristics had been the sole predictors of wealth, the wealth gap would have decreased by \$32,225 for couples, by \$15,647 for single males, and by \$12,421 for single females. The observed wealth gap has indeed decreased for females, but only by \$2,091. For married couples and single males, on the other hand, the wealth gap has increased by \$13,017 and \$22,415, respectively, moving in the opposite direction from the change predicted by income and demographic characteristics.

Column (3) represents the effect of changes over time in the coefficients of the white model, expressed as $\Delta X_{15}(\beta_{15}^{w} - \beta_{94}^{w})$ in the decomposition equation. This value varies more between wealth specifications and family types, predicting a decrease in the racial gap for wealth ratios and log wealth, but predicting an increase in the gap in levels for couples (+\$7,459) and single males (+\$2,795). However, these values are still not large enough to account for most of the observed growth in the wealth gap for these two family types, especially considering the negative values in Column (2).

Ultimately, the increase in the wealth gap seems to be largely due to growth in the unexplained portion of the wealth gap. These values are represented by Columns (4) and (5), equivalent to $(\Delta\beta_{15} - \Delta\beta_{94})X_{94}^{b}$ and $(X_{15}^{b} - X_{94}^{b})\Delta\beta_{15}$, respectively, in the decomposition equation. Specifically, the effect of the interaction between changes in

characteristics of the black population and the changes in group coefficients, captured by Column (5), seems to be the most significant perpetrator of the expansion of wealth inequality over these two time periods.

6.5 Non-parametric Results

Finally, I present the mean wealth predictions obtained after reweighting the samples to impose the income and demographic distributions of the opposite race. Figures 10 through 15 show the kernel density estimates of the actual and counterfactual values of wealth by race, using the Epanechnikov kernel function. All of the figures are truncated at a maximum of between $400,000 and $1,000,000 to better visualize the noticeable differences between the factual and counterfactual densities, though the true maximum wealth values are much higher, especially for whites. The factual densities are expressed by the dotted lines, and the counterfactuals by the solid lines. These graphs show that the counterfactual wealth distributions do a fairly accurate job of imitating the factual wealth distributions for the opposite race.

Tables 11 and 12 display the numerical wealth predictions for 1984–1994 and 1999–2015, respectively. The tables show both the counterfactual and the actual mean wealth values for whites and blacks of each family type, as well as the predicted wealth gaps in these counterfactual worlds. The real gap is calculated as the difference between the actual mean wealth values of the two races, while the counterfactual gaps are calculated as the difference between the counterfactual wealth value of one race and the actual wealth value of the other.

In both tables, the reweighted white population has a much lower average wealth than the actual white population, with a drop from $351,560 to $138,342 for white couples in the early period, and a steeper drop from $452,892 to $157,385 for white

Table 11: Non-parametric wealth predictions, 1984–1994.

Demographic group	White Wealth		Black Wealth		Real Gap	Counterfactual Gaps	
	Weighted	Actual	Weighted	Actual		White Gap	Black Gap
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Couples	138,342	351,560	128,976	113,639	237,921	24,703	222,584
	(4,026)	(9,495)	(5,462)	(7,399)		*90%*	*6%*
Males	40,427	111,873	52,994	34,325	77,548	6,102	58,879
	(3,338)	(6,520)	(3,005)	(2,230)		*92%*	*24%*
Females	39,251	134,472	38,395	31,110	103,362	8,141	96,077
	(2,767)	(5,808)	(2,000)	(1,423)		*92%*	*7%*

Notes: Counterfactuals are computed using the weight $\psi(z)$ as defined in the text and the sample weights given in the PSID. Actual wealth means are computed using only the sample weights. Standard errors are given in parentheses. Column (1) gives the nonparametric estimate of the conditional wealth function for whites imposing the earnings and demographic distribution of blacks, and Column (3) gives the nonparametric estimate for blacks imposing the earnings and demographic distribution of whites. Column (2) and (4) give the actual means for white wealth and black wealth. Column (5) gives the real wealth gap, calculated as the difference between Columns (2) and (4). Column (6) gives the wealth gap using the white counterfactual, calculated as the difference between Columns (1) and (4). Column (7) gives the wealth gap using the black counterfactual, calculated as the difference between Columns (2) and (3). The percent explained is one minus the ratio of each counterfactual to the actual gap. Standard errors account for arbitrary forms of heteroscedascity and correlation across time.

Table 12: Non-parametric wealth predictions, 1999–2015.

Demographic group	White Wealth		Black Wealth			Counterfactual Gaps	
	Weighted	Actual	Weighted	Actual	Real Gap	White Gap	Black Gap
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Couples	157,385	452,892	106,541	112,926	339,966	44,459	346,351
	(2,087)	(8,851)	(2,673)	(2,767)		*87%*	*-2%*
Males	50,920	196,783	46,005	41,994	154,789	8,926	150,778
	(2,431)	(7,847)	(2,273)	(1,726)		*94%*	*3%*
Females	42,199	191,914	48,179	50,555	141,359	-8,356	143,735
	(1,544)	(4,361)	(1,157)	(1,982)		*106%*	*-2%*

Notes: Counterfactuals are computed using the weight $\psi(z)$ as defined in the text and the sample weights given in the PSID. Actual wealth means are computed using only the sample weights. Standard errors are given in parentheses. Column (1) gives the nonparametric estimate of the conditional wealth function for whites imposing the earnings and demographic distribution of blacks, and Column (3) gives the nonparametric estimate for blacks imposing the earnings and demographic distribution of whites. Column (2) and (4) give the actual means for white wealth and black wealth. Column (5) gives the real wealth gap, calculated as the difference between Columns (2) and (4). Column (6) gives the wealth gap using the white counterfactual, calculated as the difference between Columns (1) and (4). Column (7) gives the wealth gap using the black counterfactual, calculated as the difference between Columns (2) and (3). The percent explained is one minus the ratio of each counterfactual to the actual gap. Standard errors account for arbitrary forms of heteroscedascity and correlation across time.

Figure 10: Couples, 1984–1994.

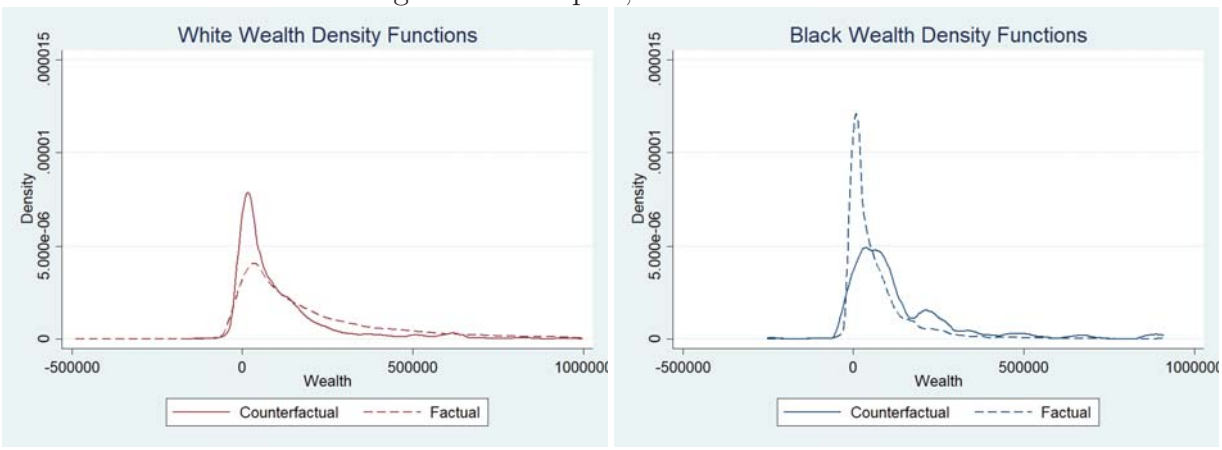


Figure 11: Single men, 1984–1994.

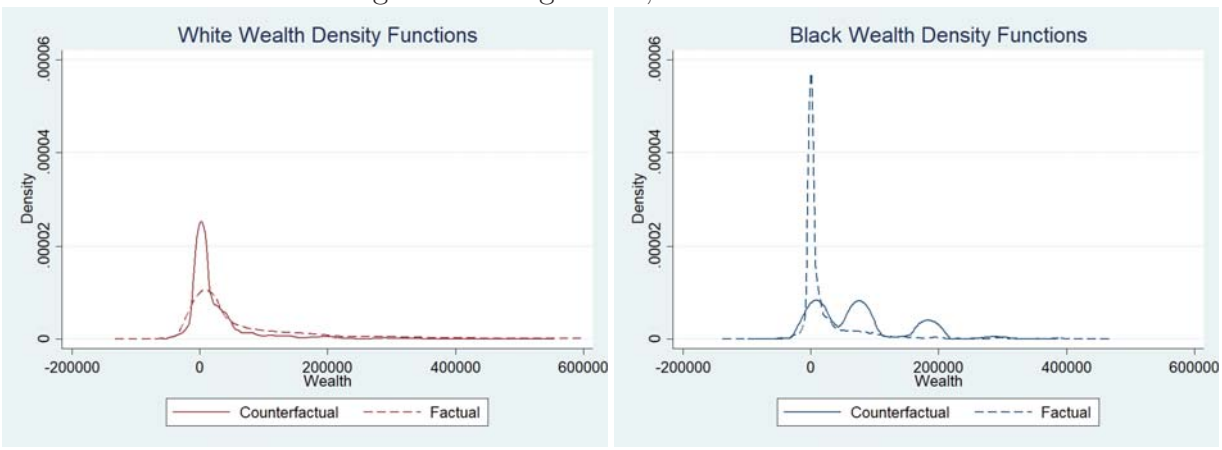


Figure 12: Single women, 1984–1994.

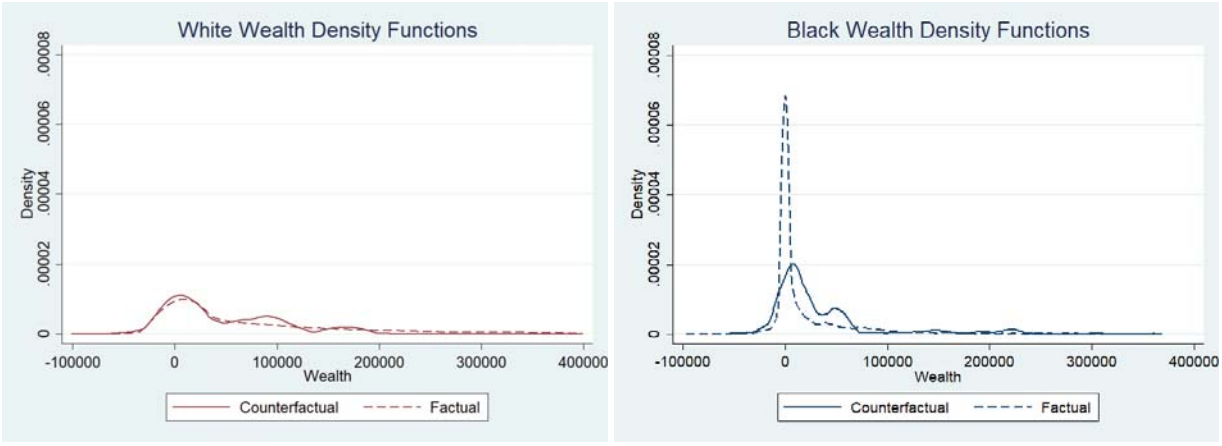


Figure 13: Couples, 1999–2015.

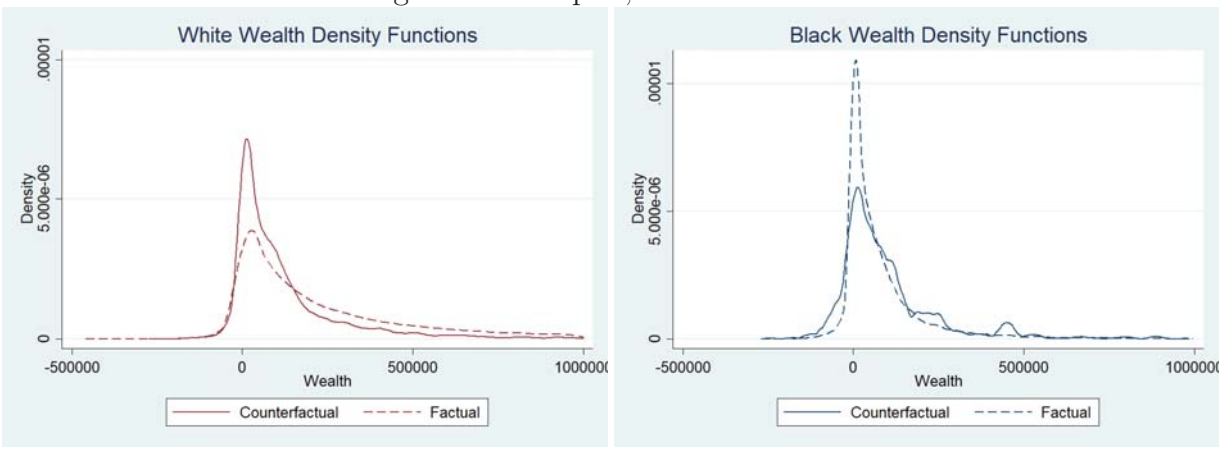


Figure 14: Single men, 1999–2015.

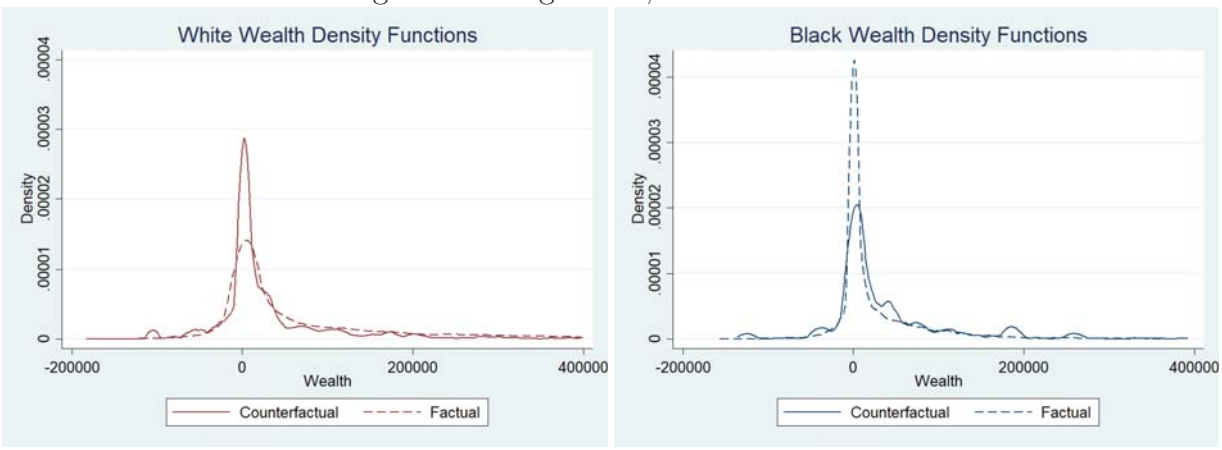
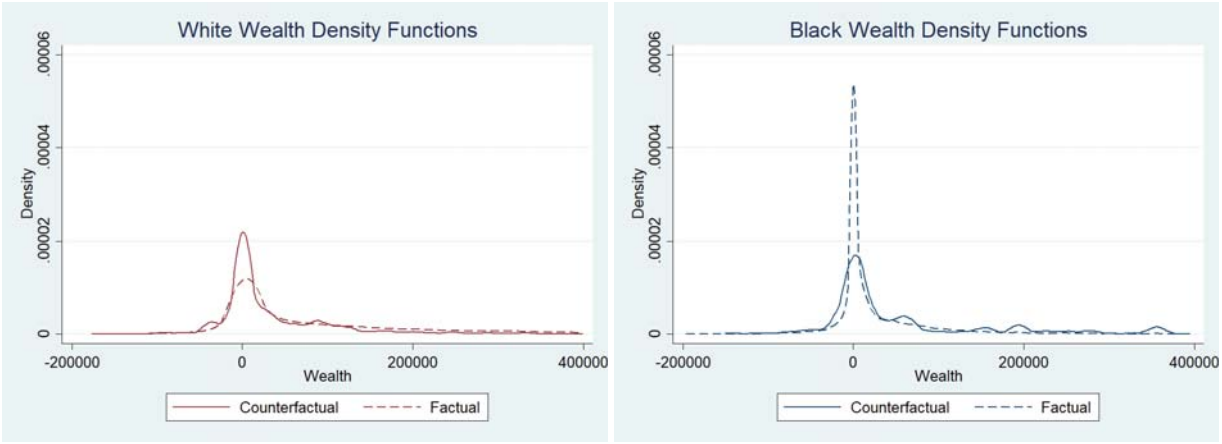


Figure 15: Single women, 1999–2015.



couples in the later period. For black couples, real average wealth and counterfactual average wealth differ less severely, with a small increase in the early period from $113,639 to $128,976, and a small decrease in the later period from $112,926 to $106,541. Similar trends can be observed for single men and single women as well. The fact that the white counterfactual is so different from actual white wealth, to the point of becoming comparable to actual black wealth, suggests that white Americans would have wealth as low as the wealth of black Americans in the the early period if they had had the same income and demographic characteristics. On the other hand, black Americans given the same characteristics as white Americans would not have had wealth nearly as high as that of white Americans, and in the case of couples and females in the more recent period, would actually have lower wealth than they do in reality. Like the results from the Blinder-Oaxaca decompositions, these observations confirm that the black wealth model constrains wealth differently from the white wealth model, and that the income and demographic characteristics of black Americans do not explain their lower wealth.

Furthermore, these relationships have both changed over time. Contrasting Table 11 with Table 12, we see that the percentage of the total wealth gap that can be explained by the black non-parametric model is higher in 1984–1994 than in 1999–2015, implying that the effect of income and demographics on wealth has diminished in the past two decades. From Column (7), we see that the model explains 6%, 24%, and 7% of the real wealth gap for couples, single males, and single females in the earlier time period, but only -2%, 3%, and -2% in the later time period. This implies that blacks would have higher wealth with their own characteristics than they would with those characteristics reweighted to resemble white characteristics. These numbers show a strong decrease in the relationship between observable characteristics and wealth, which supports the findings from the parametrically estimated models. In

the case where the white sample is reweighted to match black characteristics, shown in Column (6), the model explains 90%, 92%, and 92% of the real wealth gap for couples, single males, and single females in the earlier time period, compared to 87%, 94%, and 106% in the later time period. Unlike the parametrically estimated decompositions, the relationship between observable characteristics and wealth actually strengthens for single whites.

These results, which avoid the issue of specifying an arbitrary functional form for the conditional expectations function, confirm the findings of the parametrically estimated decompositions. Ultimately, both methods find that the explanatory power of income and demographic variables have generally decreased over time, and the non-parametric results reveal that this change has actually been particularly significant for black Americans.

7 Conclusion

This study contributes a new analysis of the enormous wealth disparity between white Americans and African-Americans and the ways in which that disparity has changed over the past thirty years. Using PSID data from 1984 to 2015, I build upon the results of Altonji & Doraszelski (2001) to decompose the racial gap in wealth with twenty new years of data and additional empirical strategies. In keeping with their findings, as well as those of previous authors like Blau & Graham (1990), the results of my Blinder-Oaxaca decompositions indicate that the higher capital endowments of white Americans relative to black Americans – including higher incomes, better educations, and more favorable marriage and family patterns – are far from being enough to predict their higher net worth. Furthermore, I conclude that these income and demographic characteristics explain even less the wealth gap now than they did thirty

years ago. By decomposing the change in the wealth gap itself, I find that the unexplained portion of the gap has grown significantly, while the observed characteristics of blacks and whites would actually predict a shrinking wealth gap. Implementing the non-parametric method proposed by Barsky et al. (2002), I find evidence that the weakening of the relationship between wealth and income and demographics has been even more dramatic for the black population than for the white population, when no assumptions are imposed on the functional form of wealth.

Though my focus is on estimating the quantitative decompositions, it is also important to contextualize these results within the more qualitative discussion of the growing black-white wealth gap and the socioeconomic factors at play. One potential explanation for my findings lies in the structural methods of wealth accumulation utilized by white Americans, perhaps harder to access for black Americans. Some of these structures have likely become even greater barriers since 1994, especially due to the effects of the Great Recession. Homeownership is one front on which black households have been shown to stand at a systematic disadvantage, since "skewed access to mortgage and housing markets and the racial valuing of neighborhoods on the basis of segregated markets result in enormous racial wealth disparity", and "banks turn down qualified blacks much more often for home loans than they do similarly qualified whites" (Oliver & Shapiro 1995). After the Recession diminished the wealth of millions of homeowners, these biases in the housing markets may have allowed white Americans to recover more quickly. In keeping with this theory, Rugh & Massey (2010) find that black residential segregation was a powerful predictor of foreclosures across U.S. metropolitan areas during the subprime lending crisis. Similarly, Shapiro, Meschede & Sullivan (2010) mention the continuous discrimination of housing, credit, and labor markets in America. They also point out that the recent growth in the racial wealth gap may reflect public policies, such as tax cuts that benefit the wealth-

iest, such as tax deductions for home mortgages, retirement accounts, and college savings, all of which are examples of legal structures that may disproportionately benefit the wealthy.

Other studies have pointed to the different behavior patterns of the two racial groups as potential reasons for the growing gap. Hanna & Lindamood (2008) finds that African-Americans are less likely to invest in high-return investments; between 2001–2004, the rate of stock ownership decreased significantly for minority groups, but not for white households. Owning high-return stocks require households to assume some risk, but also provides the potential benefit of long-term gains. Another behavioral theory posits that blacks and Hispanics devote more of their expenditures to visible goods, and that this conspicuous consumption may be a reason for slower wealth accumulation (Charles, Hurst & Roussanov 2007). The evolution of any of these factors could be possible reasons why capital endowments, like income and demographic variables, explain less of the wealth gap now than they did in the 1980s.

The evidence presented in my paper demonstrates that the uncaptured differences in models of wealth accumulation, beyond observables like income and education, are increasingly dividing white and black Americans. The goal of potentially closing the wealth gap will require more than simply eliminating income inequality, and the specific causes of the growing gap will be crucial to address in future research.

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