

Decomposing the Black-White Wealth Gap in the United States, 1989-2013*

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Abstract

This paper analyzes the evolution of wealth for Black and White individuals in the United States over the period of 1989 to 2013. Using the Survey of Consumer Finances, I find that the stock of wealth owned by Black individuals grew slower than that of Whites. This increased the ratio of White to Black wealth per capita from 4.8 to 6.6 over the period. I decompose wealth accumulation to show that higher income and, in particular, higher savings rates for Whites all contributed to this increase in the Black-White wealth gap. Furthermore, I show that Black wealth suffered greater losses than White wealth during and after the Great Recession. Housing prices played a key role in this— housing comprised a larger fraction of Black wealth, and home prices fell more than any other asset class during the recession. Finally, I show that the increase in the Black-White wealth gap is driven by the growth in the wealth of rich White individuals at the top of the distribution. Excluding the top quartile the White wealth distribution, the dynamics of Black and White wealth were almost identical over this period.

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1 Introduction

Rising wealth inequality has recently sparked heated public debate in the United States. Empirical research shows that the capital stock has steadily accumulated in most developed countries over the past several decades, as evidenced by increasing ratios of capital to annual national income. While the capital-income ratio in the United States is not as quite high as in Europe and Japan (roughly 400-500% in the U.S. compared to 500-700% in Europe and Japan), research suggests that it is nonetheless on the rise (Piketty and Zucman 2014). If future savings rates remain stable and growth in output continues to slow, then the wealth-income ratio may continue to increase in the long term, making the study of wealth increasingly important to the study of inequality.

Recent work on wealth inequality in the U.S. shows that wealth has indeed become more concentrated in recent years. The fraction of wealth owned by the top 0.1 percent increased from 7 percent in 1978 to 22 percent in 2012 (Saez and Zucman 2016). This level of inequality is almost as high as it was at the beginning of the 20th Century. Conversely, the share of wealth owned by the bottom 90 percent of the distribution has declined since the middle of the 1980s. This increase in wealth inequality is due to a combination of increasing income inequality and inequality in savings rates across the wealth distribution (Saez and Zucman 2016).

The increasing concentration of wealth could have important repercussions for racial inequality in the U.S. The economics literature has focused significant effort toward understanding racial inequalities in labor income. Over the past three decades, the ratio of White income to Black income has been fairly constant, with White individuals receiving roughly twice as much as Black individuals. Even more dramatic, however, is the gap in wealth, which has steadily expanded over the same time period, with the ratio of White to Black wealth per capita increasing

from 4.8 to 6.6 from 1989 to 2013. Though the U.S. continues to make great strides towards racial equality in many respects, racial wealth inequality is increasing.

In this thesis, I conduct an empirical analysis of the dynamics of the Black-White wealth gap between 1989 and 2013. The gap between Black and White wealth is an interesting and important topic because in recent history, the White and Black populations have been the largest and second largest racial groups in the U.S. as well as the wealthiest and the least wealthy (respectively) racial groups per capita. Using the U.S. Survey of Consumer Finances, I document trends in Black and White wealth using a number of macro-level measures. I show that the gap between the median Black and the median White individual has increased from approximately US\$60,000 to US\$80,000 from 1989 to 2013. I find that the difference between the total stock of Black and White wealth (net of changes in population) follows a similar pattern, and that in the aggregate Black wealth suffered more dramatic losses during and after the Great Recession.

Next, I study the determinants of these trends, decomposing the dynamics of wealth growth for Black and White individuals. Using methods developed in Saez and Zucman (2016), I attribute changes in wealth to income, savings rate, and price effects, finding that White wealth grew faster than Black wealth because income and, in particular, savings rates were higher for the White population. Price effects were important to the fall of Black wealth during and after the recession, as Black capital gains were substantially more negative than White capital gains in this period. This is largely due to the fact that a larger proportion of Black wealth is held as housing, and home prices suffered more than any other asset class during the recession.

As Black individuals are disproportionately represented at the bottom of the wealth distribution, and top quantiles are almost entirely White, it is conceivable that the increase in the Black-White wealth gap could simply be a side effect arising mechanically due to the increase in the concentration of wealth at the top.

What is unclear from tracking macro-level trends is whether there is something specific to race at play, or if the divergence between Black and White wealth is driven by differences between the wealth distributions of the Black and White populations. To answer this question, I conduct identical decompositions, excluding the top quartile of the White wealth distribution from my analysis. Excluding these wealthy White individuals, Black and White wealth become very similar, both in levels and in the determinants of wealth growth. Finally, I use regression analysis to show that the gap between Black and White individuals is smaller and does not increase nearly as much once controls for income are included.

This thesis proceeds as follows. Section 2 gives a historical overview of the forces that shaped Black wealth in the United States from the time of slavery up until the period where my data begins in 1989. Section 3 discusses the relevant economics literature on wealth inequality in the U.S. and the Black-White wealth gap. Section 4 presents my data and the methods used to calculate individual wealth. Section 5 explores broad trends in Black and White wealth over the period covered by my data, 1989 to 2013. Section 6 uses the techniques of Saez and Zucman (2016) to decompose Black and White wealth accumulation into income, savings rate, and price effects. Section 7 conducts similar decompositions with a limited sample that excludes wealthy White individuals at the top, and uses regression analysis to explore the relationship between income, demographics, and the Black-White wealth gap. Section 8 concludes.

2 Historical Overview

2.1 Pre-Civil War

In the United States, the history of capital and the history of racial inequality are inextricably tied. From 1619, when the first captive Africans were sold into slavery

at Jamestown, Virginia, until the ratification of the Thirteenth Amendment to the U.S. Constitution in 1865, White men were granted legal ownership over Black slaves, and Black people were counted as part of the capital stock of White people. In fact, if slaves were counted as private wealth, the market value of slaves would have been equal to as much as 150 percent of U.S. national income, or roughly the same amount as the market value of all agricultural land at the time. In the South, the market value of slaves was equal to approximately 300 percent of total annual output, and much more than the market value of agricultural land (Piketty and Zucman 2014). For centuries, particularly in the South, White slaveholders built their fortunes on exploiting the labor of Black slaves. Slavery was central to the accumulation of the stock of wealth of White people in the early United States.

2.2 Reconstruction Era

This changed dramatically after the Civil War, when slavery was abolished nationwide. Although some freed slaves in the North had begun to accumulate wealth, and even some slaves in the South owned small amounts of capital, most Black people in the United States held little to no wealth at the end of the Civil War (Schweninger 1990). During the twelve years following the Civil War, known as the Reconstruction Era, there was heated debate over the transfer of wealth. The nation's leaders were deeply divided over who, if anyone, should receive transfers in the wake of emancipation, and how much they were entitled to. Although in the U.K. it was the slaveholders who were paid compensation for freed slaves, transfers to former slaveholders were only effected in the United States in the District of Columbia (Stauffer 2007). In the rest of the country, the debate over transfers centered on the transfer of wealth to former slaves. Former slaves argued that they had a right to own all of the land that they had previously worked on as

slaves. Former slaveholders, unsurprisingly, argued against any transfer of their land or other capital to former slaves (Foner 1988).

One proposal that gained significant traction was that of General William Tecumseh Sherman, who issued military orders, known as Sherman's Special Field Orders, No. 15. These orders laid out plans for the confiscation of 400,000 acres of land along the coastline of Florida, Georgia, and South Carolina and the redistribution of up to 40 acres per family to 18,000 families of freed slaves and other local Black residents. Sherman's orders were the provenance of the notion commonly taught in U.S. history classes that freed slaves were entitled to "forty acres and a mule" (although the mule was not included in Tecumseh's original orders) at the end of the Civil War (Gates 2013). Although some small amounts of land were indeed transferred to Black families, Tecumseh's original plan was not brought to fruition due to Andrew Johnson, who became president after Abraham Lincoln's assassination and swiftly revoked Tecumseh's orders. Ultimately, the federal policies of the Reconstruction Era focused on wage labor rather than the redistribution of capital. In practice, most of the land in the South remained under White ownership, with Black farmers working for wages on White-owned farms. Thus, although they were finally free from slavery, Black people in the United States began the post-Civil War period almost entirely represented at the very bottom of the wealth distribution (Engs 2004).

2.3 Post-Reconstruction until the Civil Rights Movement

Following the Reconstruction Era, Black families began to accumulate capital, but at times they faced considerable barriers that tempered the growth potential of their wealth. Often, individuals and financial institutions alike would go to great lengths in attempt to prevent Black people from purchasing capital. This was perhaps most clear in the housing market in the middle of the 20th century. The

Great Migration, which saw approximately 6 million Black individuals migrate from the rural South to cities in the North between 1910 and 1970, put increased pressure on urban housing markets. Some White homeowners responded to this by refusing to sell their homes to Black families. Others used intimidation and violence to try to prevent Black people from purchasing homes in their neighborhoods. Many lenders prevented Black families from owning their homes by denying mortgage applications purely on the basis of skin color; this is evidenced by the fact that Black families were less likely to have a loan application approved, even when controlling for the measures of creditworthiness used by lenders (Schafer and Ladd 1981). Other lenders would less overtly discriminate against potential homeowners by “redlining” certain neighborhoods that had a mostly Black population, and refusing credit in these neighborhoods (Sugrue 1996).

Inequality in income and in capital gains also limited the ability of Black individuals to accumulate wealth. One source of these income differences was that it was more difficult for Black workers to invest in their human capital due to education segregation. School segregation began shortly after the Reconstruction Era with the passage of the Jim Crow laws, which mandated racial segregation in all public facilities of formerly confederate states in the South. While these laws ordered that Black and White facilities be “separate but equal,” schools for Black children were notoriously resource-poor compared to schools for White children. In many places, this created a racially segregated labor market, where Black workers were employed almost entirely in low-skilled, low-income jobs, and only White workers had the opportunity to accrue the human capital required to work in high-skilled jobs. Even when Black workers were able to achieve high levels of education, they faced discrimination in hiring and the setting of salaries. These two forces—unequal access to education and discrimination—limited the earnings potential of Black workers, which unequivocally restricted their ability to accrue wealth at the same rate as the White population (Klarman 2004).

Another institutional force that historically perpetuated Black-White wealth inequality was the difference in price effects of Black-owned and White-owned assets. Often due to discrimination, White wealth had a higher rate of return than Black wealth (Oliver and Shapiro 2006). Again, this is most evident in the case of housing. Historically, revealed preference showed that many White homeowners were averse to living near Black neighbors, and “White flight” is the term used to describe the mass movement of White families from urban city centers to the suburbs in response to the influx of Black families who began to purchase homes in cities. Since then, homes in majority Black neighborhoods have appreciated more slowly than homes in majority White neighborhoods, even conditional on neighborhood characteristics (Long and Caudill 1992). Although there is some evidence suggesting that the decline in urban home prices due to White flight had the “silver lining” of facilitating Black home ownership (Boustan and Margo 2013), it is unclear whether this would be net positive or negative for Black wealth after accounting for inequality in appreciation rates.

2.4 The Civil Rights Movement and Beyond

Starting around 1955, a major organized movement to end racial segregation and discrimination began to emerge. This movement, which was centered in the South and was characterized by protests and acts of civil disobedience, led to a number of policy changes that institutionalized racial equality. Several of these policies related directly to economic equality and aimed to address the problems driving a wedge between White and Black wealth. For example, the Fair Housing Act of 1968 prohibited the refusal to sell or rent a home to someone on the basis of skin color. The Equal Credit Opportunity Act of 1974 also established that financial institutions could not deny credit based on an applicant’s race. This made it less difficult for Black people to accumulate wealth in the form of housing.

Additionally, the Civil Rights Act of 1964 banned employment discrimination and ended racial segregation in schools. These policy changes are at least part of the reason the relative wages of black workers rose so dramatically during this period (Donohue and Heckman 1991).

From the Civil Rights Movement up until the period where my analysis begins in 1989, the basic legal framework in which Black and White wealth evolved remained relatively constant. However, making racial discrimination illegal did not entirely prevent it from occurring. The Fair Housing Act of 1968 did not give the government much authority to enforce its new non-discrimination laws, and the Department of Housing and Urban Development only had the power to oversee discrimination disputes occurring between parties once one party filed a complaint. A number of studies have shown that firms continued to discriminate against minorities in employment, lending, and other realms, even in spite of anti-discrimination law (see Darity and Mason 1998; Ladd 1998). While affirmative action has been used (perhaps most famously in university admissions) in attempt to actively increase minority representation in the upper echelons of society, these efforts have been limited and in some situations have been outlawed.

In summary, the gap between Black and White wealth that existed when my data begins in 1989 was created by a number of factors across the history of the U.S., ranging from the almost non-existent initial wealth of former slaves after the civil war to the covert forms of discrimination that persisted even in the face of anti-discrimination law, and including almost a century in between of institutionalized discrimination that prevented Black wealth from growing as quickly as White wealth. In this thesis, I focus on what has happened since then, in the 24 years covered by the Survey of Consumer Finances, beginning in 1989.

3 Literature Review

This thesis is related to several strands of the literature on race and wealth inequality in the United States. In this section, I present an overview of some of this literature. I begin by examining a series of articles that seek to explain the Black-White wealth gap using a variety of financial and demographic variables. Then, I will briefly discuss the literature on wealth inequality in the United States in general.

3.1 The Black-White Wealth Gap

Some of the first economists who studied the determinants of the gap between the wealth of Black and White families in the U.S. were Blau and Graham (1990). They develop a strategy of decomposing racial differences in wealth that relies on ordinary least squares regression to see how much of the wealth gap they can explain using observed variables. First, they specify a linear model where the relevant explanatory variables determine wealth additively. The variables that Blau and Graham include in their model are income and a number of demographic and geographic covariates, such as the number of children, whether the head of household is a woman, and whether the family lives in an urban area or in the South. Then, using the National Longitudinal Survey, they estimate the model separately for Black and White families to get a different set of regression coefficients for each race. Finally, they predict White families' wealth using the coefficients for Black families, and vice versa, to determine what percentage of the gap between the two racial groups is "explained" by the model. This technique, which was first used by Blinder (1973) to study wage discrimination, is known as a means-coefficient analysis.

One limitation of this approach is that when the two groups of interest have a wealth function that is very different, the results will vary drastically depend-

ing on which group’s wealth function is used. This is indeed a concern in Blau and Graham (1990). When the White wealth function is employed, the variables included in the model explain 73.6 percent of the wealth gap for married couples and 96.6 percent of the gap for single-headed households. Alternatively, when the Black wealth function is used, differences in means only explain 22 percent of the wealth differential. The authors argue that using the Black wealth function answers a more relevant research question. Intuitively, this approach asks “what would happen to black wealth if blacks were given the white means but retained their own functions?” (Blau and Graham 1990, 332). The answer they find is that 78 percent of the Black-White wealth gap would remain. Blau and Graham conclude that their variables explain a relatively small fraction of the wealth gap, and that unobserved factors, such as differences in rates of return or intergenerational transfers, could be an important part of the story.

Altonji and Doraszelski (2005) perform wealth decompositions similar to those used in Blau and Graham (1990) using the Panel Study on Income Dynamics (PSID). Their main analysis specifies a model of wealth that is linear in income and a number of demographic variables. They refine the methods used by Blau and Graham by including improved explanatory variables, such as a measure of permanent income and demographic histories in addition to current demographic variables. Additionally, because the distribution of wealth is very skewed and often negative or zero, Altonji and Doraszelski build on earlier work by using median and mean regression, and models of wealth in levels, logs, and the ratio of wealth to permanent income. Using these methods, they are able to explain more of the Black-White wealth gap than previous authors. When using the model of White wealth, they are able to explain the entire wealth gap using their improved income and demographic variables. However, as was the case with Blau and Graham (1990), the authors find that the Black model of wealth has much less explanatory power. Again, it seems that Black wealth is much less sensitive

to income and demographic variables than White wealth. Thus, when using the Black model, the authors can only explain 25 percent of the wealth gap using their income and demographic variables.

Altonji and Doraszelski discuss some possible explanations of their finding that household wealth is more sensitive to income and demographic variables for White households than for Black households. One possibility is that White households have higher rates of return, which would increase the effect that underlying variables, such as income and demographics, have on wealth for Whites. Another potential explanation is a difference in savings rates. The savings behavior of Black households might vary less with changes in income or demographic variables, which would make Black wealth less sensitive to these variables. Lastly, Altonji and Doraszelski focus their attention on inheritance. If inheritance received is correlated with the income that a household earns (which it likely is), then the fact that White households on average receive greater inheritances than Black households would help explain White White wealth is more sensitive to income than Black wealth, on average. The authors test for this phenomenon using a family fixed effects model to compare siblings within the same family. If the stronger relationship between income and wealth for Whites is driven by inheritance, the income coefficients should be closer for Black and White households when family fixed effects are included in the model. Because siblings are likely to inherit very similar amounts, family fixed effects effectively controls for inheritance. Ultimately, the authors find that including these fixed effects does not change their results in any meaningful way. This result suggests that the stronger relationship for White households between wealth and variables such as income and demographics cannot be attributed to differences in inheritance.

Altonji and Doraszelski conclude their paper by using the same method described above to decompose the Black-White gap in the growth of wealth by looking at changes in wealth, income, and demographic variables over the span

of three PSID waves, each separated by 5 years. This analysis, though not the main focus of their paper, is closely related to the research I will present in section 5, which explores not only the levels of wealth for Black and White households, but also wealth growth. Once more, Altonji and Doraszelski find that income and demographic variables can explain a large fraction of the difference between Black and White households when the White model is used (explaining 74 percent of the difference in growth of wealth), but that when the Black model is used, a much smaller fraction (49 percent) of the gap can be accounted for.

Barsky et al. (2002) study the determinants of the Black-White wealth gap using a slightly different approach. They critique the method used by Blau and Graham and Altonji and Doraszelski, arguing that their decomposition is limited by the assumption of linearity required by their wealth model. The authors note that any parametric estimates of the conditional expectation function of wealth will likely be inaccurate over large segments of the wealth distribution. In order to address these concerns, they propose a new non-parametric method to estimate how much of the Black-White wealth gap can be explained by differences in income. This method involves assigning weights to the sample of White households so that the income distribution for is the same as the observed income distribution in the sample of Black households. Then, the remaining difference between the estimated wealth of White and Black households is amount of the gap that cannot be explained by differences in income. This method is desirable because it avoids the issue of misspecification in the conditional expectation function, and also because it provides estimates of differences between Black and White wealth at all points on the conditional wealth distribution.

Barsky et al. (2002) empirically test their new methodology using the Panel Study of Income Dynamics, the same data used in Altonji and Doraszelski. Imposing the income distribution of Black households on the conditional expectation function of White households, they find that income differences explain 64 percent

of the Black-White wealth gap at the mean. They also report that income plays a larger role in explaining the wealth gap at the bottom of the wealth distribution, and that by the top of the distribution, income plays almost no role in explaining the gap.

In the past decade, the literature has focused more on understanding the individual mechanisms that affect racial inequalities in wealth than on decomposing the aggregate racial wealth gap. Bayer et al. (2012) find that minority home buyers pay a statistically significant three percent premium on their homes, controlling for income, wealth, credit access, and home and neighborhood characteristics. Similarly, Bayer, Ferriera, and Ross (2016) report that Black homeowners are more likely to have high cost mortgages than their White counterparts. This result holds even when controls for risk factors, such as credit score, are included. Because most minorities hold most of their wealth as owner occupied housing, these phenomena could have important implications for the evolution of the racial wealth divide.

Fairlie and Robb (2007) focus on sole proprietorships, using the Characteristics of Business Owners survey to show that Black-owned businesses in the U.S. have lower rates of return than White-owned businesses. They show that Black business owners are less likely to have had a family member who was self-employed in the past, and less likely to have worked in that family member's business. They argue that this limits the human capital of Black entrepreneurs, and that the lack of experience working for a family business is part of what limits the success of Black-owned sole proprietorships.

3.2 Wealth Inequality in General

My research also relates to the literature on wealth inequality in the United States more generally. Saez and Zucman (2016) use income tax returns and household

balance sheets to measure wealth the distribution of wealth in the U.S. from 1913 to the present. Using a capitalization method to estimate wealth from income tax records, they show that the concentration of wealth was high at the beginning of the twentieth century, fell between 1929 and 1978, and then increased consistently until it reached levels of inequality today that are almost as high as those of 1929. They show that the share of wealth owned by the top 0.1 percent of the distribution increased from 7 percent in 1978 to 22 percent in 2012. As I will show in my analysis, the top of the wealth distribution is disproportionately White, so the picture that Saez and Zucman paint of increasing wealth concentration is closely related to my study of Black and White wealth shares. Also relevant to my thesis is the method that Saez and Zucman use to decompose wealth accumulation into income, price, and savings rate effects. Using decomposition formulas that I will explain in Section 4, the authors show that differences in savings rates were particularly important contributors to the increased concentration of wealth, and low middle-class savings were a key driver of the decreasing wealth share of the bottom 90 percent. I use the decomposition formulas developed by Saez and Zucman to as the basis of my analysis of differences in the evolution of Black and White wealth.

Other authors have tracked trends in the concentration of wealth in the U.S. Using the Survey of Consumer Finances, Kennickell (2011), Wolff (2012), and Bricker et al. (2014) all find similar results to those of Saez and Zucman: wealth today is very concentrated at the top (with the top 1 percent owning approximately 36 percent of all wealth), and wealth inequality has followed an increasing trend over the past several decades. Conversely, Kopczuk and Saez (2004) find, using estate tax records and a mortality multiplier methods to estimate wealth, that wealth concentration is much lower and more stable. They estimate that the top 1 percent owned only 20 percent of all wealth.

This thesis contributes to the literature described in this section in several

ways. To my knowledge, no previous research has explored the drivers of the Black-White wealth gap by decomposing the evolution of wealth into income, savings rate, and price effects. A large portion of the literature about the racial dimension of wealth inequality looks at how variables that are correlated with race, such as demographics, access to credit, and home ownership might explain differences in wealth. I will contribute to the literature by looking directly at the mechanics of wealth growth to explore their relative importance in the persistence of racial wealth inequality.

4 Data

To calculate individual wealth, Saez and Zucman (2016) use the capital income that individuals report on their tax returns. This information is provided to the U.S. Internal Revenue Service (IRS), broken down by the amount of income coming from each asset class (such as equities, bonds, and fixed income claims). This allows them to use a “capitalization” method to estimate the total stock of wealth owned by each tax unit during a particular year based on the amount of capital income obtained in each category in that year. To do so, they compute a “capitalization factor”, which amounts to the total wealth reported in a category in the U.S. Financial Accounts, divided by the total tax income generated in the same category. This allows them to estimate household wealth by multiplying a household’s capital income in each wealth class by the capitalization factor, and then summing across classes. In this way, the total amount of wealth estimated by Saez and Zucman is consistent, by definition, with the totals from the Financial Accounts (Saez and Zucman 2016).

The data used by Saez and Zucman contain no information about individuals’ race, nor is it currently possible to match tax data with demographic information from other sources. Therefore, for my analysis, I turn to the Survey of Consumer

Finances (SCF). The SCF is a triennial survey of U.S. households that collects information on income, wealth, and other variables related to household finances, as well as demographic characteristics. The SCF is sponsored by the Federal Reserve Board and the Treasury Department, and the data is collected by the National Opinion Research Center (NORC) at the University of Chicago. The survey is administered either in person or by telephone (a large majority are administered in person) and the median survey lasts approximately 90 minutes. The data I use are cross sectional samples collected every three years from 1989 to 2013. Although the SCF was also collected in 1962, 1983, and 1986, these surveys relied on a different sampling method, and therefore are not reliably comparable to the surveys from 1989 and later (Kennickell 2011).

There are some key differences between the SCF sample and the tax data used by Saez and Zucman. The SCF is collected at the household level, whereas Saez and Zucman's unit of observation is the tax unit. There are roughly 25 percent more tax units than SCF households (Saez and Zucman 2016). This is because in the SCF, unmarried adults who live in the same home are counted as one household, whereas in tax data these adults are observed as separate tax units. I discuss how I deal with this difference below, in Section 4.2.

Another difference lies in the SCF's sampling methods at the top of the wealth distribution. The SCF over-samples households at the top of the distribution, except for those on the Forbes 400 list of the richest individuals in the U.S., who are intentionally excluded from the sample. While this detail is treated carefully in Saez and Zucman's (2016) study of top wealth shares, it is less important to my analysis. Because my interests lie in the differences between the wealth of Black and White households across the entire wealth distribution, precision at the top, while obviously desirable, is less important. Furthermore, because the Forbes 400 list currently only includes two Black individuals, media mogul Oprah Winfrey and investor Robert Smith, including the Forbes 400 list could say more

about the wealth of a few individuals than it would about aggregate trends in the Black-White wealth gap.

4.1 Measuring Wealth

These differences lead to a number of issues in terms of measurement of wealth, and there are some strengths and drawbacks of both sources of data. One complication of using the capitalization method to calculate wealth is that not all wealth generates taxable income. In particular, owner-occupied housing is one such form of wealth. To estimate the amount of wealth held in owner-occupied housing, Saez and Zucman rely on the amount of property taxes paid, assuming that the effective property tax rate is the same for all homeowners across all states. While this is a fairly strong assumption, it is of marginal importance to their analysis, as housing makes up a small fraction of wealth portfolios at the top of the distribution. For my analysis, however, accurate measurement of housing wealth is of great importance. For most households at the middle of the wealth distribution and for the majority of Black households, more than half of all wealth is held as housing. (I will discuss the composition of wealth portfolios in greater depth in Section 6.) In this respect, the Survey of Consumer Finances, which is one of the most reliable large-scale sources of data on housing wealth, suits my analysis quite well.

In their paper, Saez and Zucman (2016) explore the difference between wealth as measured in the SCF and wealth as measured in tax data. They find that for the wealth share of the top 10%, the SCF and the capitalized income estimates follow each other closely across all SCF years. At higher percentiles, the SCF and capitalized income estimates diverge, but again, these differences at the top are less important to my analysis of the Black-White wealth gap across the entire distribution. Still, the SCF is an imperfect measure of wealth. As a survey, some

of its weaknesses are that unlike with administrative data, the SCF could suffer due to the fact that wealth figures are self-reported and there is non-response. The second point is a particularly common criticism of the SCF. In the most recent SCF, for example the response rate decreased from approximately 50 percent at the bottom of the wealth distribution down to 12 percent at the top. This suggests that any estimates made using the SCF could suffer from selection bias. Some recent evidence argues that the SCF succeeds in constructing a representative sample, even in spite of high non-response, showing that the distribution of income and wealth is observationally equivalent between SCF respondents and a sample of non-respondents (Bricker et al. 2015). Ultimately, while the SCF is certainly not without flaws, it is currently one of the best instruments available for studying race and household wealth.

There are some important differences between the definition of wealth that I use in this thesis and the way that wealth is defined in the summary variables constructed for use in SCF summary charts. To be consistent with the United Nations System of National Accounts, I exclude consumer durables from my definition of net wealth. In the SCF, cars represent most of the wealth in consumer durables. In general, the amount of wealth held as consumer durables is quite small. Because durables make up a smaller fraction of total assets for wealthy households, the exclusion of durables will slightly increase the overall concentration of wealth. Furthermore in some, but not all, SCF years, the value of consumer durables is statistically significantly less for Black individuals than for White individuals (controlling for net wealth excluding durables). If anything, this would make my measures of the Black-White wealth gap slightly smaller than they would be if I were to include durables in my definition of wealth. This distinction is minor and does not change my results in any meaningful way.

4.2 Level of Observation

As discussed above, the SCF is collected at the household level, and most questions on the survey refer to the finances of the entire household. All else equal, it is likely that households with two adults would have more opportunities to accumulate wealth, either through inheritance or saved earnings, than households headed by a single adult. In the SCF, a larger proportion of White households are headed by a couple than are Black households. To account for this difference, I split households headed by a couple into two separate observations, dividing their wealth between the two of them.¹ In this way, I ensure that any racial differences in wealth are not driven by differences in marriage rates. In the rest of my analysis, the observation level is the individual, meaning that wealth is measured per capita rather than per household.

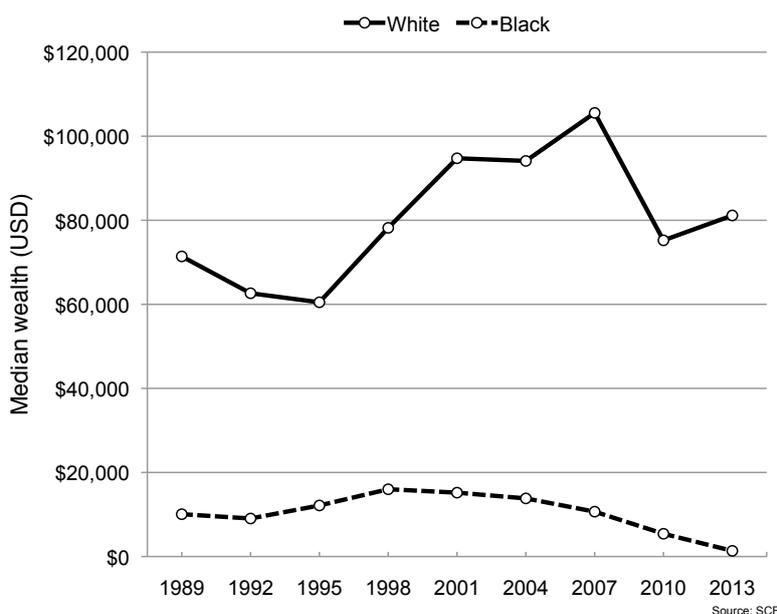
5 Trends in Black and White Wealth, 1989-2013

The SCF data show that the Black-White wealth gap has increased over the past two decades. Figure 1 plots the median Black and White wealth from 1989 to 2013. The difference between the median Black and White individuals is striking. From 1989 to 2013, the difference between the median Black and White individuals increases from roughly 60 thousand dollars to 80 thousand dollars. The wealth of the median White individual followed a generally increasing trend, with one large decrease during the Great Recession, while the wealth of the median Black individual has gradually decreased since 1998. This, however, does not mean that the wealth of White individuals suffered more from the Great Recession. In fact,

¹Ideally, I would be able to assign wealth to each member of the couple according to the amount of wealth they contributed to the total stock of wealth of the household. Because the SCF does not collect enough information to do this reliably, I split wealth evenly between the two partners. For the most part, analyzing the Black-White wealth gap for individuals rather than households affects the size of the gap slightly, but changes little in terms of trends and the dynamics of wealth growth.

the results presented in the next section will show that in the aggregate, Black wealth suffered greater capital losses during the recession than White wealth. Part of the reason that the evolution of wealth looks so different for the median Black and the median White individuals is that these individuals have fundamentally different wealth profiles. In 2013, the median Black individual had a net wealth of \$1,350, placing them in the 27th percentile of the total wealth distribution, while the median White individual's net wealth was \$81,150, falling in the 58th percentile of the total distribution. Because they hold so little wealth to begin with, it is not surprising that the wealth of the median Black individual did not fall as dramatically during the Great Recession.

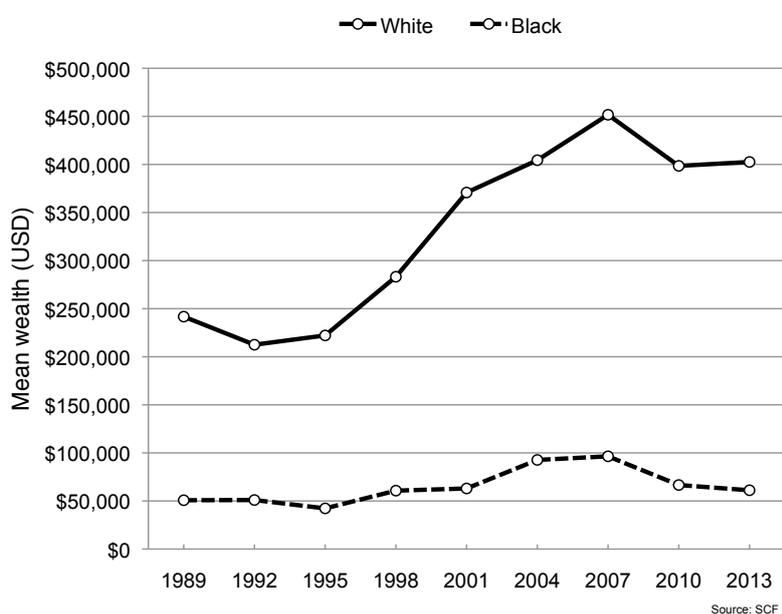
Figure 1: Median wealth for Black and White individuals



Perhaps more informative about the evolution of the total mass of Black- and White-owned wealth in the U.S. is the mean net wealth in each group. Figure 2 shows that mean White wealth increased significantly from 1989 to 2013, while Black wealth stayed relatively constant. Although the mean is a familiar figure, it is useful to think about how the mean can be interpreted in the context of wealth. In some senses, mean wealth can be somewhat misleading, as it is greatly

influenced by the large sums of wealth held by individuals at the top of the distribution. In a more macro sense, however, the mean is quite revealing: it represents the total mass of Black-owned or White-owned wealth, scaled by the number of people in each group. In this way, trends in the mean represent trends in the overall mass of Black- and White-owned wealth, net of any trends in the population size of either group.

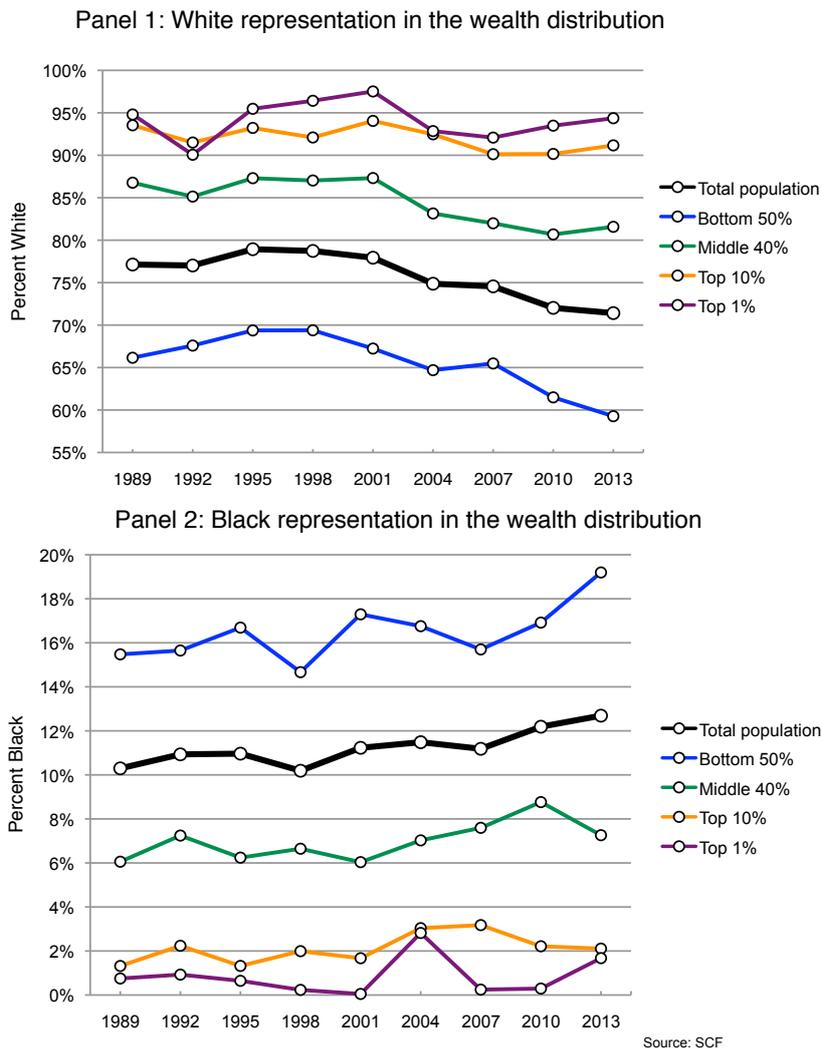
Figure 2: Mean wealth for Black and White individuals



Though these simple summary statistics give a quick overview of changes in the Black-White wealth gap in recent years, it is useful to look more closely at different segments of the wealth distribution to get a better sense of where these changes come from. Figure 3 plots the White and Black representation in different quantiles of the wealth distribution over time. In panel 1 of Figure 3, we see that that top quantiles of the wealth distribution are disproportionately White. Across all SCF years, the top 1 percent of the wealth distribution was approximately 95 percent White and the top 10 percent was generally 90 to 95 percent White, compared to the entire population, which was between 71 and 79 percent White. Panel 2 of Figure 3 shows that Black individuals are overrepresented in the bottom

half of the wealth distribution, and under-represented at all higher quantiles. Black representation is particularly low at the top; the top 10 percent and top 1 percent of the wealth distribution were under 4 percent Black in all SCF years. In general, it appears that over the past 20 years, Black representation at different points in the wealth distribution changed very little.

Figure 3: White and Black representation in the wealth distribution



6 Decomposing the Evolution of Black and White Wealth

6.1 Conceptual Framework

In this section, I will analyze the role of income, savings, and asset prices in the evolution of Black and White wealth over the 1989 to 2013 period. I begin by presenting the conceptual framework behind this empirical analysis. This framework is based off of that of Saez and Zucman (2016). An individual i 's wealth in the period following the current period t depends on the current stock of wealth W_t^i , the amount S_t^i that they save, and the change in asset prices q_t^i as follows:

$$W_{t+1}^i = (1 + q_t^i) (W_t^i + S_t^i) \quad (1)$$

Here, I assume that savings are made before asset prices change such that savings, in addition to the current stock of wealth, are subject to price changes. S_t^i therefore represents the increase in wealth from period t to period $t + 1$ that cannot be attributed to a price effect. S_t^i is a flow representing the amount of money the individual decides to transmit from period t to period $t + 1$. The individual's saving rate is simply $s_t^i = S_t^i/Y_t^i$, or the fraction of income earned in period t that the individual saves for the next period. Using this notation, the wealth transmission equation can be rewritten:

$$W_{t+1}^i = (1 + q_t^i) (W_t^i + s_t^i Y_t^i) \quad (2)$$

Therefore, if wealth, income, and changes in asset prices (the capital gains rate) are observed in all periods, one can easily back out an individual's savings rate:

$$s_t^i = (W_{t+1}^i - (1 + q_t^i) W_t^i) / (1 + q_t^i) Y_t^i \quad (3)$$

The synthetic savings rate of a certain racial group is defined by Saez and Zucman (2016) as the savings rate required to justify the change in wealth of that group with its income and change in asset prices. In practice, the set of individuals belonging to a certain racial group can change from year to year, which is why this is referred to as the synthetic savings rate, rather than the actual savings rate. The synthetic savings rate of racial group R is:

$$s_t^R = (W_{t+1}^R - (1 + q_t^R) W_t^R) / (1 + q_t^R) Y_t^R \quad (4)$$

where W_t^R is group R 's average net wealth, Y_t^R is the average income in group R , and $1 + q_t^R$ is group R 's average change in asset prices, weighted by wealth such that $1 + q_t^R = \frac{\sum_{i \in R} (1 + q_t^i) W_t^i}{\sum_{i \in R} W_t^i}$.

If individuals' wealth, income, and capital gains rate (asset price effect) were observed annually, it would be straightforward to deduce the synthetic savings rate of each racial group. This would allow me to decompose the evolution of wealth into income, savings, and price effects, and determine which of these effects were important to the persistence of the Black-White wealth gap over the past several decades. However, because of data limitations, backing out a synthetic savings rate using the SCF requires some further assumptions. One of the main difficulties in using the SCF for this exercise arises because the SCF is only conducted every three years. Thus, we must account for changes in wealth between periods t and $t + 3$, rather than just t and $t + 1$. The accumulation of wealth between periods t and $t + 3$ is slightly more complicated, and can be expressed as follows. First, we can iterate the initial wealth accumulation formula forward one period, writing:

$$W_{t+2}^R = (1 + q_{t+1}^R) (W_{t+1}^R + s_{t+1}^R Y_{t+1}^R) \quad (5)$$

Then, substituting for W_{t+1}^i using the original equation, we can write:

$$W_{t+2}^R = (1 + q_{t+1}^R) (1 + q_t^R) W_t^R + (1 + q_{t+1}^R) (1 + q_t^R) s_t^R Y_t^R + (1 + q_{t+1}^R) s_{t+1}^R Y_{t+1}^R \quad (6)$$

Iterating and substituting once more gives an expression for W_{t+3}^R in terms of the initial wealth observed in period t and the savings accrued in each intermediate period multiplied by their respective price effects:

$$\begin{aligned} W_{t+3}^R &= (1 + q_{t+2}^R) (1 + q_{t+1}^R) (1 + q_t^R) W_t^R \\ &+ (1 + q_{t+2}^R) (1 + q_{t+1}^R) (1 + q_t^R) s_t^R Y_t^R \\ &+ (1 + q_{t+2}^R) (1 + q_{t+1}^R) s_{t+1}^R Y_{t+1}^R \\ &+ (1 + q_{t+2}^R) s_{t+2}^R Y_{t+2}^R \end{aligned} \quad (7)$$

W_t^R and W_{t+3}^R are directly observed in the SCF. Still, calculating a synthetic savings rate requires some further assumption and imputation of data from other sources. First, I will assume that the synthetic savings rate is the same in the unobserved years as it is in the previous SCF sample. This approximation allows me to use equation 7 to solve for the synthetic savings rate across the three-year period as follows:

$$s_{t,t+2}^R = \frac{W_{t+3}^R - \prod_{s=0}^2 (1 + q_{t+s}^R) W_t^R}{\sum_{j=0}^2 [Y_{t+j}^R \prod_{s=0}^{2-j} (1 + q_{t+s+j}^R)]} \quad (8)$$

Next, I need to account for the income from intermediate years, which cannot be directly observed using the SCF. To deal with this, I estimate a group's average income for the two years in between surveys using a weighted average of the average income for that group in the two nearest SCF years. I give the closest year a weight of $2/3$ and the second closest year a weight of $1/3$, such that Y_{t+1}^R would be equal to $(2/3)*Y_t^R + (1/3)*Y_{t+3}^R$ and Y_{t+2}^R would be equal to $(1/3)*Y_t^R + (2/3)*Y_{t+3}^R$. As these

are estimates of the average income for large groups, which is not highly volatile from year to year, I believe that this approximation is reasonable. However, if the actual observed income from these intermediate years is higher (lower) than the weighted average, my estimates of the synthetic savings rate will be overstated (understated).

Finally, I need to account for price effects. There is not a reliable way to estimate the capital gains rate of individuals using only the SCF. Therefore, I turn to the annual rate of capital gains reported by Saez and Zucman (2016) using the Federal Reserve Board's Flow of Funds balance sheets and Flow of Funds investment rates. These capital gains rates are reported annually by asset class. For each individual in my data set, I multiply the amount of wealth held in each asset class by the capital gains rate for that asset class reported by Saez and Zucman. This gives me the total annual capital gains (realized and unrealized) for each racial group. Dividing this by the total amount of wealth held by that group gives the capital gains rate, or asset price effect, for that year. This is the same method used by Saez and Zucman (2016) to calculate capital gains rates. For intermediate, non-SCF years, I estimate the amount of wealth held in each asset class using a weighted average of the wealth held in the two surrounding years, as described above. It is important to note that when capital gains rates are constructed in this way, the asset price effect of an individual or a group depends only on the composition of their wealth into different classes and the aggregate capital gains rate of each class of asset that they own. This method assumes that there are no differential asset price effects within an asset class. In reality, this is likely not the case. For example, there is some evidence that all else equal, Black homeowners face a slightly lower rate of return on housing than White homeowners (Oliver and Shapiro 2006). Similarly, it is conceivable that wealthy individuals might have more access to information or resources that allow them to pick stocks that are more likely to be successful. Therefore, if a certain

racial group faces higher (lower) than average price effects within asset classes, my estimates of the synthetic savings rate will be overstated (understated).

6.2 Results

In this section, I will use the methods described above to estimate the role of income, savings, and price effects in determining the evolution of the Black-White wealth gap. Table 1 shows the real rate of growth of White and Black wealth, net of population growth, over the period covered by the SCF. The top panel of the figure reports the annual growth rates over the three year periods between surveys. Because growth in the short run can be fairly noisy, it is helpful to look at growth of wealth over a longer period. This is presented in the bottom panel, which shows the annual growth rate of wealth over the first half, second half, and entire period of years covered by the SCF. In Table 1, we can notice several interesting facts. The first key result from this table is that in the shorter term neither Black nor White wealth grew consistently faster than the other. Up until the Great Recession, whether Black or White wealth growth was greater alternated in each period between surveys. A second important fact is that although both White and Black wealth suffered losses during the Great Recession, Black wealth had a substantially more negative growth rate during the recession, and Black wealth failed to recover as much as White wealth in the period following the recession. Finally, it is helpful to look at the longer run figures shown in the bottom panel, where White wealth grew faster than Black wealth over the entire period covered by the SCF, both before and after the turn of the millennium.

What contributed to this differential growth rate of wealth, and why did Black wealth accrue greater losses during and after the Great Recession? Table 2 shows the real growth rates of White and Black income over the 24 years covered by the SCF. Like in Table 1, the top panel reports the annual growth rate over the

Table 1: Annual growth rate of wealth

Years	Black	White
1989-1992	0.2%	-4.2%
1992-1995	-6.0%	1.5%
1995-1998	12.8%	8.4%
1998-2001	1.2%	9.4%
2001-2004	13.7%	2.9%
2004-2007	1.3%	3.8%
2007-2010	-11.6%	-4.1%
2010-2013	-2.8%	0.3%
1989-2001	1.8%	3.6%
2001-2013	-0.3%	0.7%
1989-2013	0.8%	2.1%

three year periods between surveys. Again, no clear racial advantage is appears; in some periods income growth is higher for the White population than for the Black population, while in others the opposite is true. In the longer term, although income grew slightly faster for the White population than for the Black population across the entire 24 year period, this advantage is driven by gains in the second half of the SCF period; from 1988 to 2000,² Black income grew faster than White income. Additionally, Black and White income decreased at almost the exact same rate in the period covering the Great Recession. Therefore, it is clear that income does not tell the whole story of why Black wealth performed worse than White wealth from 1989 to 2013 and during and after the recession.³

Next, I turn my attention to the role of capital gains in determining the evolution of White and Black wealth. Because I calculate capital gains using imputed capital gains rates for each asset class from the Federal Reserve Flow of Funds, as described above, Table 3 shows the capital gains rate for Black and White wealth

²Because SCF respondents were asked to report their income from the previous year, SCF income data spans from 1988 to 2012 rather than 1989 to 2013.

³Some of my estimates for the annual growth rate of income (most notably the growth in income between 1997 and 2000) are higher than the growth rates documented in the Bureau of Economic Analysis's National Income Product Accounts (NIPA). However, my estimates are consistent with the estimated growth rates in the Federal Reserve Board's SCF summary tables. A full comparison of my estimates of annual income growth, the estimates in SCF summary tables, and the NIPA annual income growth rates are presented in appendix tables 1-3.

Table 2: Annual growth rate of income

Years	Black	White
1988-1991	0.8%	-5.1%
1991-1994	-3.7%	1.2%
1994-1997	5.8%	4.1%
1997-2000	5.9%	6.2%
2000-2003	0.1%	-0.6%
2003-2006	0.4%	2.8%
2006-2009	-3.8%	-4.0%
2009-2012	-1.5%	2.5%
1988-2000	2.1%	1.5%
2000-2012	-1.2%	0.1%
1988-2012	0.4%	0.8%

for all years from 1989 to 2013. Here, we see that prior to the year 2001, Black and White capital gains followed each other closely. This changed in the period leading up to, during, and after the Great Recession. In the years immediately prior to the recession, Black capital gains rates substantially exceeded the capital gains rates of White wealth. During and after the recession, however, Black wealth suffered far greater capital losses than White wealth, and these losses were larger than the gains experienced before the recession. This suggests that differences in price effects explain a large part of how Black wealth was hit harder by the recession than White wealth.

To better understand this inequality in capital gains rates, I look at the composition of wealth and the composition of capital gains. Figure 4 breaks wealth down by asset class for the average Black and White individual. Here, we see that White wealth is much more diversified than Black wealth in terms of the composition of different asset classes. In particular, housing makes up a larger share of Black wealth than it does White wealth. During the period covered by the SCF, housing ranged from approximately 50 to 70 percent of total wealth for the Black population, while it was only made up 30 to 40 percent of the wealth of the White population. Furthermore, most of the increase and decrease in wealth

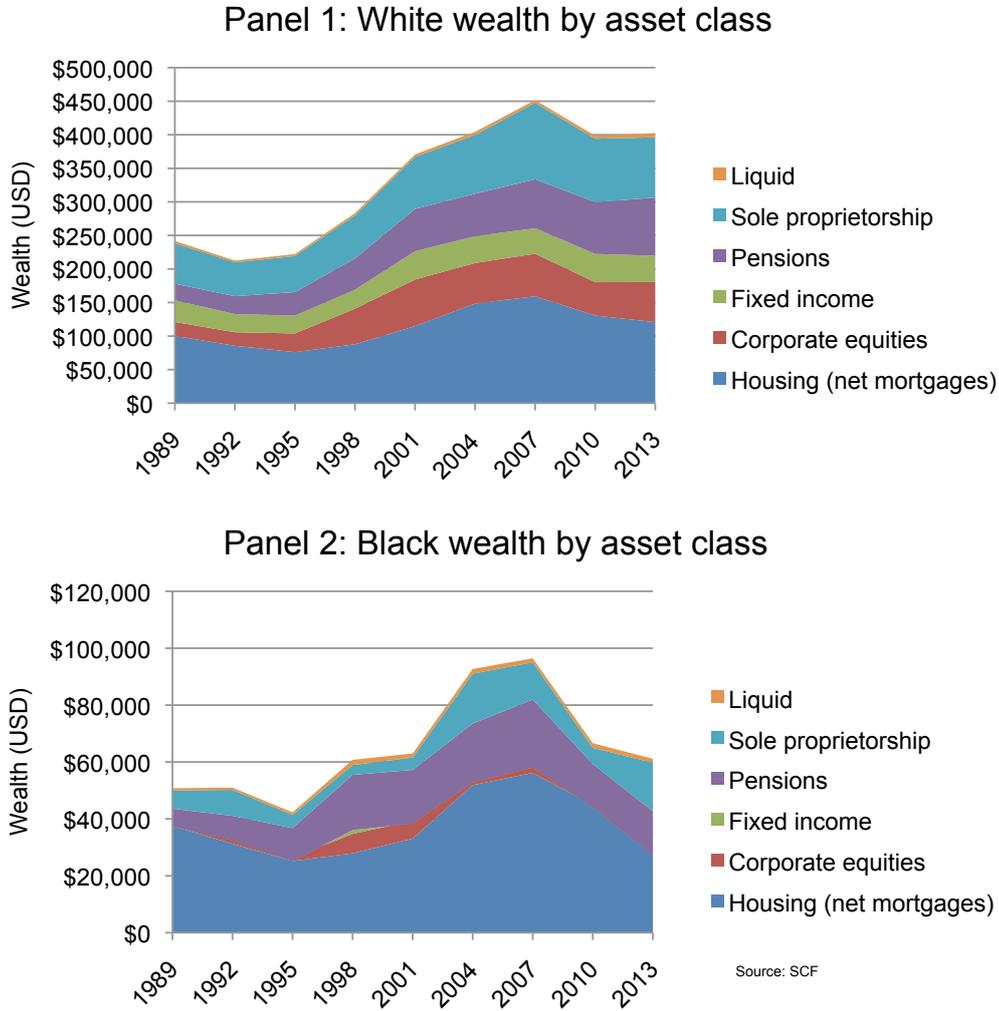
Table 3: Capital gains rate

Years	Black	White
1989	4.2%	2.6%
1990	-1.1%	-1.3%
1991	-4.2%	-2.9%
1992	-1.2%	-1.1%
1993	-1.1%	-1.1%
1994	1.0%	0.1%
1995	1.6%	1.7%
1996	3.4%	3.4%
1997	5.4%	5.5%
1998	9.8%	9.0%
1999	10.9%	8.6%
2000	7.9%	4.4%
2001	3.2%	-0.7%
2002	3.2%	-1.6%
2003	7.3%	3.3%
2004	13.2%	9.8%
2005	14.0%	8.8%
2006	5.9%	5.1%
2007	-3.6%	0.5%
2008	-20.4%	-11.7%
2009	-16.2%	-12.1%
2010	0.9%	0.3%
2011	-3.3%	-0.4%
2012	3.7%	2.3%
2013	13.1%	8.9%
1989-2001	2.9%	2.3%
2001-2013	1.1%	0.7%
1989-2013	2.0%	1.5%

before, during, and after the recession comes, unsurprisingly, from housing wealth. This is more dramatically true for Black wealth than for White wealth. Figure 5 sheds more light on this, breaking down Black and White capital gains into the capital gains accrued by each asset class. Clearly, the main source of gains since 2001 were related to the housing bubble and subsequent crash of housing prices during the recession. However, for Black wealth, we can see that the high capital gains rate before the recession and the very negative rate during comes virtually entirely from housing prices, while this is less true for White wealth. Thus, Black wealth suffered more during and after the recession largely because a larger fraction of Black wealth is held in the form of housing, and home prices were hit more

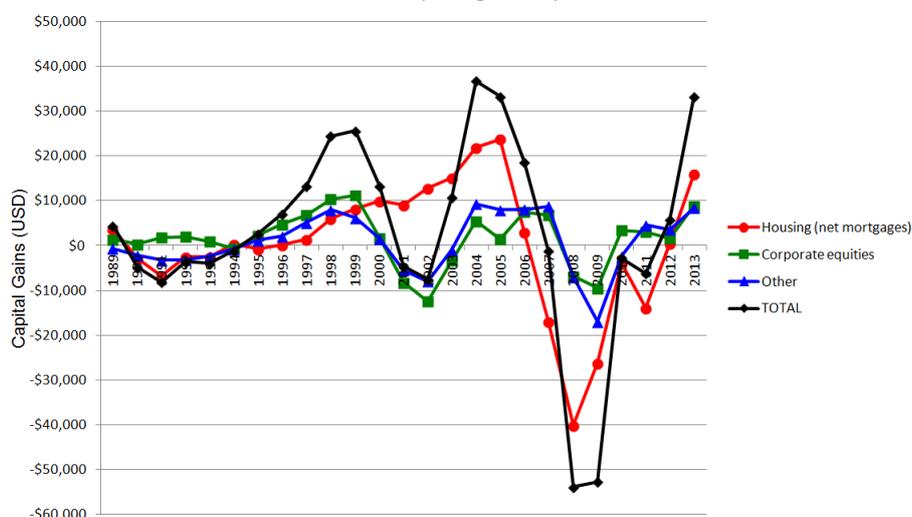
dramatically than any other asset class during the recession.

Figure 4: Average wealth by asset class

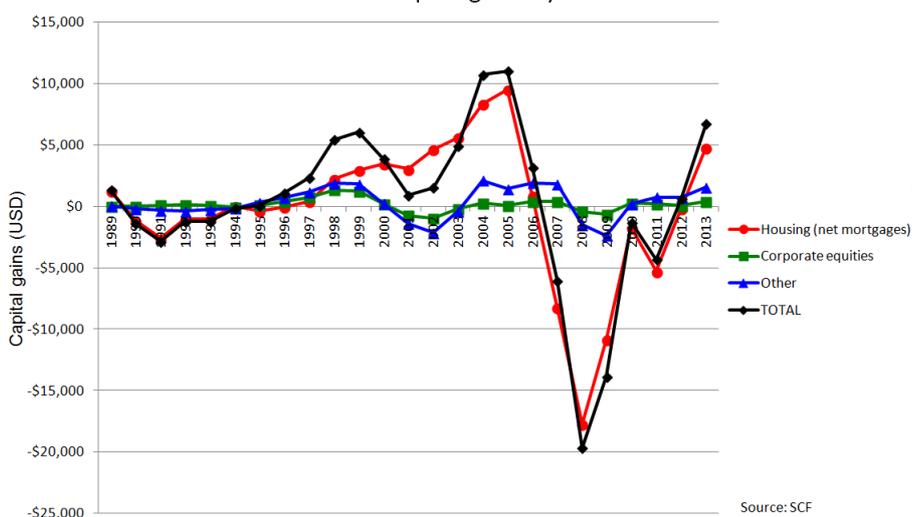


Now, I am able to back out the synthetic savings rate of the Black and White population using the methodology described in the previous section. The results of these calculation are presented in Table 4. The synthetic savings rates of the Black population and the White population generally increased and decreased together, but the actual levels of the Black and White synthetic savings rate were often quite different from each other. As Saez and Zucman (2016) note, savings rates often fluctuate dramatically in the short term, so it is especially helpful to look at longer term figures when analyzing differences in synthetic savings rates.

Figure 5: Average capital gains by asset class
 Panel 1: White capital gains by asset class



Panel 2: Black capital gains by asset class



Source: SCF

In the bottom panel of Table 4, we see that the synthetic savings rate across the entire SCF period was generally small and negative for the Black population and roughly larger in magnitude and positive for the White population. In total, these synthetic savings rates are roughly consistent with those estimated by other authors using data from the same time period (Saez and Zucman 2016). Here, we see that the difference in savings rates between Black and White people was an important part of why wealth grew faster for Whites on average over all SCF years.

Table 4: Synthetic savings rate

Years	Black	White
1989-1992	1.1%	-17.5%
1992-1995	-9.7%	10.5%
1995-1998	15.8%	23.4%
1998-2001	-14.6%	11.0%
2001-2004	17.3%	16.0%
2004-2007	-23.1%	-25.7%
2007-2010	6.2%	29.7%
2010-2013	-6.3%	-2.4%
1989-2001	-2.5%	5.7%
2001-2013	-2.7%	2.2%
1989-2013	-2.6%	4.0%

It is important to note that because I calculate capital gains rates using the economy-wide capital gains rate for each asset class and the composition of individuals' wealth portfolios, the differences in price effect of Black and White wealth are due to differences in portfolio composition. If there are differences in price effects for Black and White wealth within a given asset class, these differences will be erroneously attributed to a difference in synthetic savings rates. There is some existing evidence that suggests that within asset classes, capital gains rates are lower for minorities than for Whites (Farlie and Robb 2007).

To summarize, the results presented here establish four main facts about the dynamics of White and Black wealth between 1989 and 2013. First, over the entire period, White wealth grew at a faster rate than Black wealth, and Black wealth suffered greater losses during and after the recession. Second, while White income also increased faster than Black income, a substantial amount of the difference between White and Black wealth growth cannot be explained by differences in income. Third, Black capital gains rates were greater than White capital gains rates prior to the recession, while Black capital gains rates were substantially more negative than those of Whites during and after the recession. This can pri-

marily be attributed to the rise and fall of housing prices, since housing comprised a relatively larger fraction of the Black assets. Fourth, the synthetic savings rate was also higher for the White population than for the Black population. This played a particularly important role in determining the faster rate of growth of White wealth over the period. A summary of the figures behind these findings is presented in Table 5, which compiles the medium to long run aggregate statistics from Tables 1 through 4.⁴

Table 5: Summary of wealth growth decomposition

Race	Real growth rate of household wealth	Real growth of household income	Capital gains rate	Synthetic savings rate
<i>1989-2001</i>				
Black	1.8%	2.1%	2.9%	-2.5%
White	3.6%	1.5%	2.3%	5.7%
<i>2001-2013</i>				
Black	-0.3%	-1.2%	1.1%	-2.7%
White	0.7%	0.1%	0.7%	2.2%
<i>1989-2013</i>				
Black	0.8%	0.4%	2.0%	-2.6%
White	2.1%	0.8%	1.5%	4.0%

7 Is the Increasing Black-White Wealth Gap Just a Class Issue?

Now that I have established these facts, I will examine whether differences in these aggregate measures are due to heterogeneity in each racial group's wealth distribution, or if there is something more specific to race at play. Saez and

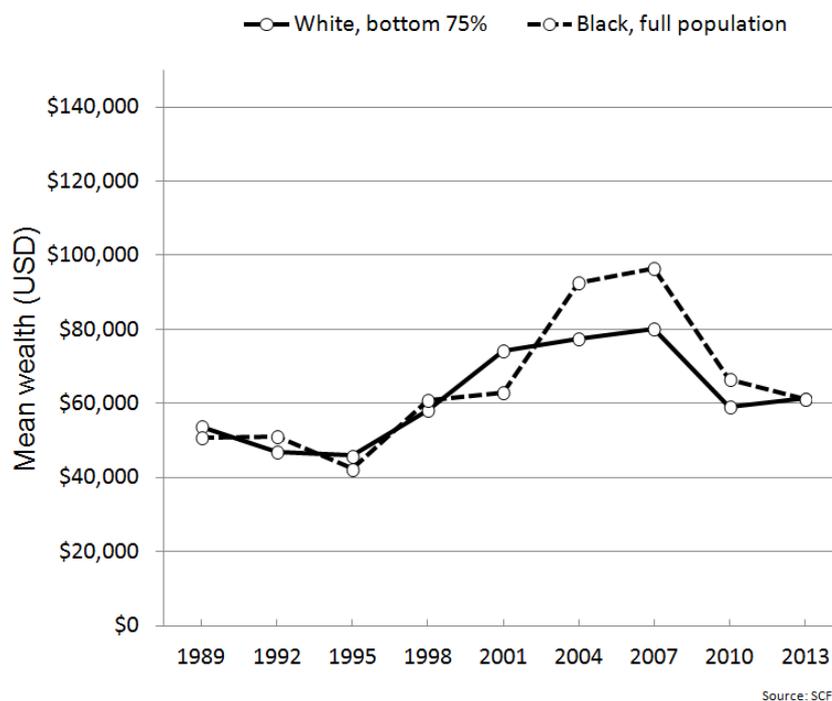
⁴Appendix tables 4-7 are analogous to tables 1-4, and present the wealth growth, income growth, capital gains rates, and synthetic savings rates between all SCF periods for the entire Black population and the bottom 75 percent of the White population.

Zucman (2016) document an overall rise in wealth inequality, which they find is driven by a surge in the wealth of the top 0.1 percent. According to the Survey of Consumer Finances, the top 0.1 percent of the wealth distribution is over 95 percent White (the general population is approximately 70 percent White). Thus, a lack of Black representation at the top, combined with growth in top wealth shares, could potentially explain the persistence of the Black-White wealth gap.

To explore the importance of very wealthy White individuals in determining the overall gap between White and Black wealth, I conduct the same decompositions as in Section 6, this time excluding the top quartile of White individuals. Figure 6 motivates this analysis. It shows that across all periods of the SCF, the wealth of bottom 75 percent of White individuals evolves almost in parallel to the wealth of the entire Black population. If we exclude White individuals at the top, average Black and White wealth look quite similar, both in levels and in growth rates. Table 6 decomposes the dynamics of wealth for Black and White individuals, excluding the top quartile of the White wealth distribution, and is analogous to Table 5. However, compared to Table 5, we see that the determinants of Black and White wealth accumulation are much more similar when the top quartile of Whites is excluded. In fact, in the aggregate over the entire period covered by the SCF, all three components of wealth accumulation are virtually identical between the Black sample and the restricted sample of the White population. This suggests that the differential growth rates of Black and White wealth is driven by very wealthy White people at the top.

A natural question that arises from these results is to what extent the Black-White wealth gap is related to observed variables such as income and demographics. Does the Black-White wealth gap persist because Black and White individuals are different in terms of characteristics such as average earnings, education levels, and family structures, or is there something else at play? To shed light on this question, I use regression analysis, adding an increasing number of control vari-

Figure 6: Mean wealth for Black and White individuals, excluding the top quartile of Whites



ables to measure how much of the Black-White wealth gap persists, conditional on observables. The main regression model I estimate is:

$$wealth_i = \beta_1 + \beta_2 White_i + \beta_3 income_i + \beta_4 demographics_i + \varepsilon_i$$

where the left hand side variable is net wealth, β_2 is the main coefficient of interest representing the gap between White and Black wealth (as *White* is a binary variable indicating if an individual is White or Black), **income** is a vector of non-linear income variables, and **demographics** is a vector of demographic controls including age, sex, number of children, years of education, and whether the individual is currently employed. Table 6 presents the coefficient of interest in each SCF years using a number of different specifications.⁵ In Panel 1, the only right hand side variable included is the binary variable for being White,

⁵Full regression results, including the coefficients on all control variables in all specifications, are presented in appendix tables 8-11.

Table 6: Summary of wealth growth decomposition, excluding the top quartile of Whites

Race	Real growth rate of household wealth	Real growth of household income	Synthetic savings rate	Capital gains rate
<i>1989-2001</i>				
Black, full population	1.8%	2.1%	2.9%	-2.5%
White, bottom 75%	2.7%	1.0%	3.3%	-1.0%
<i>2001-2013</i>				
Black, full population	-0.3%	-1.2%	1.1%	-2.7%
White, bottom 75%	-1.6%	-0.4%	1.5%	-4.4%
<i>1989-2013</i>				
Black, full population	0.8%	0.4%	2.0%	-2.6%
White, bottom 75%	0.5%	0.3%	2.3%	-2.7%

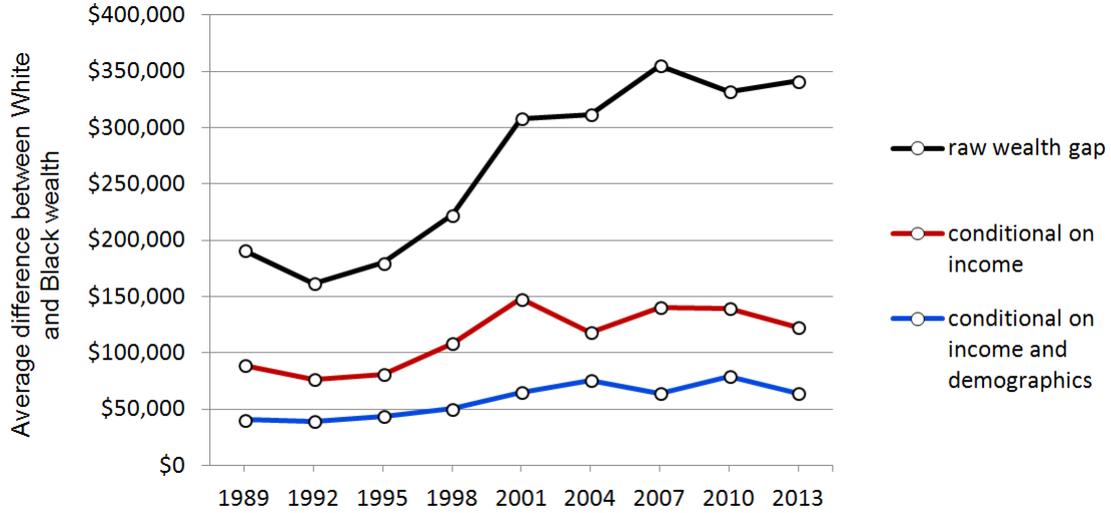
such that the coefficient on this variable is the raw gap between Black and White individuals' average wealth. In Panel 2, a quadratic income term is included, such that the coefficient of interest represents the size of the Black-White wealth gap once income is controlled for. Here we see that the wealth gap decreases substantially when income is included in the regression. The coefficients in Panel 3 can be interpreted in the same way as in Panel 2, with the only difference between the two specifications being that income is included not as a quadratic, but is instead broken into deciles such that a different income coefficient and constant is estimated for each decile. This allows more flexibility for non-linearities in income, and for this reason it is my preferred specification. Panel 4 is the same as Panel 3 except that the vector of demographic controls described above are also included on the right hand side of the regression equation. This shows that when observed demographic variables are controlled for, the gap between White and Black wealth becomes even smaller.

Table 7: Measuring the Black-White wealth gap, conditional on income and demographics

Year	1989	1992	1995	1998	2001	2004	2007	2010	2013
<i>Panel 1: Raw wealth gap</i>									
<i>Independent variable</i>									
black	190,936 (22,401)	161,501 (20,603)	179,846 (20,095)	222,436 (28,781)	307,778 (27,116)	311,716 (31,223)	355,207 (36,007)	331,875 (26,920)	341,426 (29,335)
<i>Panel 2: Wealth gap conditional on income</i>									
black	119,789 (20,309)	54,155 (18,158)	68,645 (17,128)	47,201 (23,843)	191,838 (23,880)	116,049 (24,988)	168,577 (28,336)	118,690 (21,837)	138,889 (24,459)
income	3.005 (0.0421)	6.720 (0.0836)	5.482 (0.0534)	8.109 (0.0667)	4.433 (0.0512)	7.783 (0.0606)	6.252 (0.0453)	8.099 (0.0536)	6.311 (0.0520)
income2	-3.17e-08 (8.93e-10)	9.09e-09 (4.69e-09)	-8.27e-08 (2.11e-09)	-6.18e-08 (6.51e-10)	-4.45e-08 (3.12e-09)	-5.58e-08 (1.99e-09)	-3.26e-08 (6.62e-10)	-4.54e-08 (5.79e-10)	-5.36e-08 (1.54e-09)
<i>Panel 3: Wealth gap conditional on income, with non-linearities by decile in income</i>									
black	89,051 (20,974)	76,823 (18,484)	81,311 (17,815)	108,612 (27,077)	147,921 (23,920)	118,478 (25,525)	140,688 (29,354)	139,607 (23,381)	122,691 (25,097)
Income non-linearities	X	X	X	X	X	X	X	X	X
<i>Panel 4: Wealth gap conditional on income and demographics</i>									
black	40,597 (21,670)	39,399 (18,958)	43,852 (18,134)	50,471 (27,609)	65,100 (24,435)	75,654 (25,957)	64,305 (29,859)	79,396 (23,642)	64,070 (25,671)
Income non-linearities	X	X	X	X	X	X	X	X	X
Demographic controls	X	X	X	X	X	X	X	X	X

Figure 7 plots the coefficients of interest from Panels 1, 3, and 4 over time. Here, we can see several interesting results. First, we see that income and demographics can explain a sizable fraction, but not all, of the Black-White wealth gap. Even conditional on these observed variables, there is a gap of more than US\$50,000 between Black and White average wealth. This gap could remain because of unobserved variables such as discrimination, or simply because wealth is a stock whose level in period t depends directly on the level of wealth in period $t-1$, and Black wealth has historically been lower than White wealth. Therefore, even if Black and White individuals were equal in every way, a wealth gap could persist simply because Black people had less wealth to begin with. A second striking result from Figure 7 is that the increase in the Black-White wealth gap is much less dramatic once income is controlled for. This suggests that a large portion of the recent increase in the Black-White wealth gap may be attributed to differences in income.

Figure 7: The Black-White wealth gap, controlling for income and demographics



8 Conclusion

This thesis analyzed the evolution of the Black-White wealth gap between 1989 and 2013, establishing several main findings. The gap between Black and White wealth increased over the entire period, as the total stock of White wealth grew at a faster rate than the stock of Black wealth. This result was partially driven by the substantial losses suffered by Black wealth during and after the Great Recession, although White wealth grew faster in the period prior to the recession as well. Using the techniques used in Saez and Zucman (2016), I decomposed the accumulation of Black and White wealth into income, savings rate, and price effects. The differential growth rate between Black and White wealth can be attributed to inequalities in income and, importantly, in savings rates. Capital gains are important to understanding why Black wealth was hit harder by the Great Recession than White wealth. A larger fraction of the Black population's stock of wealth is held as housing, and housing was the asset class that had the greatest capital losses during the recession. In the longer run, however, Black and White capital gains rates were roughly equal on average.

Because the top of the wealth distribution is almost entirely White, and because the share of wealth going to the top has increased in recent years, it is conceivable that the increase in the Black-White wealth gap could be driven mechanically by an increase in the overall concentration of wealth in at the top of the distribution. I show that much of the difference between the evolution of Black and White wealth is driven by the top quartile of White individuals. Excluding these wealthy White individuals, White and Black wealth become very similar in levels, in growth rates, and in the individual determinants of wealth accumulation. Furthermore, regression analysis shows that the wealth gap between Black and White individuals is substantially smaller and does not increase nearly as much once controls for income and demographics are included.

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9 Appendix

Table A1: Growth of income per household in the SCF

Annual growth rate of income per adult, SCF			
Years	Black	White	Total
1988-1991	0.8%	-5.1%	-4.1%
1991-1994	-3.7%	1.2%	1.2%
1994-1997	5.8%	4.1%	3.8%
1997-2000	5.9%	6.2%	5.8%
2000-2003	0.1%	-0.6%	-0.9%
2003-2006	0.4%	2.8%	2.5%
2006-2009	-3.8%	-4.0%	-3.7%
2009-2012	-1.5%	2.5%	1.2%
1988-2000	2.1%	1.5%	1.6%
2000-2012	-1.2%	0.1%	-0.2%
1988-2012	0.4%	0.8%	0.7%

Source: My own tabulations using the SCF.

Table A2: Growth of income per household, SCF summary tables

Annual growth rate of household income, SCF			
Years	Non-White	White	Total
1988-1991	2.1%	-5.4%	-4.2%
1991-1994	0.1%	1.2%	1.4%
1994-1997	2.3%	4.2%	3.8%
1997-2000	4.0%	6.9%	6.2%
2000-2003	1.3%	-1.2%	-1.4%
2003-2006	2.8%	3.0%	2.7%
2006-2009	-1.1%	-3.9%	-3.9%
2009-2012	-4.0%	2.5%	1.0%
1988-2000	2.1%	1.6%	1.7%
2000-2012	-0.3%	0.1%	-0.4%
1988-2012	0.9%	0.8%	0.6%

Source: SCF summary tables, compiled by the Federal Reserve using the public data and downloaded from the Federal Reserve website.

Table A3: Growth of income per adult in the NIPA

Annual growth rate of income per adult, NIPA

Years	Total
1988-1991	0.0%
1991-1994	2.2%
1994-1997	3.2%
1997-2000	3.5%
2000-2003	0.4%
2003-2006	2.7%
2006-2009	-2.3%
2009-2012	2.6%
1988-2000	2.2%
2000-2012	0.8%
1988-2012	1.5%

Source: Saez and Zucman (2016) tabulation of annual income per adult, using data from the NIPA, presented in Appendix Table A0, available in their online data appendix.

Table A4: Annual growth rate of wealth

Years	Black, full population	White, excluding top quartile
1989-1992	0.2%	-4.5%
1992-1995	-6.0%	-0.7%
1995-1998	12.8%	8.3%
1998-2001	1.2%	8.4%
2001-2004	13.7%	1.4%
2004-2007	1.3%	1.2%
2007-2010	-11.6%	-9.7%
2010-2013	-2.8%	1.3%
1989-2001	1.8%	2.7%
2001-2013	-0.3%	-1.6%
1989-2013	0.8%	0.5%

Table A5: Annual growth rate of income

Years	Black, full population	White, excluding top quartile
1988-1991	0.8%	-2.0%
1991-1994	-3.7%	0.8%
1994-1997	5.8%	2.5%
1997-2000	5.9%	2.9%
2000-2003	0.1%	0.6%
2003-2006	0.4%	-0.9%
2006-2009	-3.8%	-1.6%
2009-2012	-1.5%	0.3%
1988-2000	2.1%	1.0%
2000-2012	-1.2%	-0.4%
1988-2012	0.4%	0.3%

Table A6: Capital gains rate

Years	Black, full population	White, excluding top quartile
1989	4.2%	4.8%
1990	-1.1%	-0.9%
1991	-4.2%	-4.1%
1992	-1.2%	-0.5%
1993	-1.1%	-0.8%
1994	1.0%	1.6%
1995	1.6%	1.9%
1996	3.4%	3.5%
1997	5.4%	5.3%
1998	9.8%	10.0%
1999	10.9%	11.0%
2000	7.9%	8.6%
2001	3.2%	3.9%
2002	3.2%	4.3%
2003	7.3%	8.8%
2004	13.2%	16.2%
2005	14.0%	16.3%
2006	5.9%	6.6%
2007	-3.6%	-4.4%
2008	-20.4%	-23.1%
2009	-16.2%	-18.2%
2010	0.9%	1.8%
2011	-3.3%	-4.0%
2012	3.7%	4.1%
2013	13.1%	16.3%
1989-2001	2.9%	3.3%
2001-2013	1.1%	1.5%
1989-2013	2.0%	2.3%

Table A7: Synthetic savings rate

Years	Black, full population	White, excluding top quartile
1989-1992	1.1%	-7.0%
1992-1995	-9.7%	-1.1%
1995-1998	15.8%	6.7%
1998-2001	-14.6%	-2.2%
2001-2004	17.3%	-7.8%
2004-2007	-23.1%	-21.4%
2007-2010	6.2%	13.9%
2010-2013	-6.3%	1.2%
1989-2001	-2.5%	-1.0%
2001-2013	-2.7%	-4.4%
1989-2013	-2.6%	-2.7%

Table A8: Regression analysis: Raw Black-White wealth gap

VARIABLES	(1) 1989	(2) 1992	(3) 1995	(4) 1998	(5) 2001	(6) 2004	(7) 2007	(8) 2010	(9) 2013
<i>White</i>	190,936 (22,401)	161,501 (20,603)	179,846 (20,095)	222,436 (28,781)	307,778 (27,116)	311,716 (31,223)	355,207 (36,007)	331,875 (26,920)	341,426 (29,335)
<i>Constant</i>	50,774 (21,041)	51,003 (19,280)	42,305 (18,829)	60,754 (27,082)	63,010 (25,351)	92,695 (29,072)	96,451 (33,577)	66,605 (24,896)	61,140 (27,032)
Observations	4818	5822	6583	6447	6758	6620	6565	9028	8387
R-squared	0.003	0.002	0.002	0.002	0.004	0.003	0.003	0.003	0.003

Table A9: Regression analysis, Black-White wealth gap, controlling for income (quadratic income specification)

VARIABLES	(1) 1989	(2) 1992	(3) 1995	(4) 1998	(5) 2001	(6) 2004	(7) 2007	(8) 2010	(9) 2013
<i>White</i>	119,789 (20,309)	54,155 (18,158)	68,645 (17,128)	47,201 (23,843)	191,838 (23,880)	116,049 (24,988)	168,577 (28,336)	118,690 (21,837)	138,889 (24,459)
<i>income</i>	3.005 (0.0421)	6.720 (0.0836)	5.482 (0.0534)	8.109 (0.0667)	4.433 (0.0512)	7.783 (0.0606)	6.252 (0.0453)	8.099 (0.0536)	6.311 (0.0520)
<i>income2</i>	-3.17e-08 (8.93e-10)	9.09e-09 (4.69e-09)	-8.27e-08 (2.11e-09)	-6.18e-08 (6.51e-10)	-4.45e-08 (3.12e-09)	-5.58e-08 (1.99e-09)	-3.26e-08 (6.62e-10)	-4.54e-08 (5.79e-10)	-5.36e-08 (1.54e-09)
<i>Constant</i>	-33,255 (19,090)	-141,565 (17,115)	-97,843 (16,077)	-184,507 (22,485)	-96,109 (22,369)	-187,482 (23,326)	-130,849 (26,444)	-195,721 (20,228)	-133,894 (22,546)
Observations	4818	5822	6583	6447	6758	6620	6565	9028	8387
R-squared	0.183	0.229	0.278	0.318	0.230	0.364	0.384	0.347	0.310

Table A10: Regression analysis, Black-White wealth gap, controlling for income (income constant and coefficient separated by deciles)

VARIABLES	(1) 1989	(2) 1992	(3) 1995	(4) 1998	(5) 2001	(6) 2004	(7) 2007	(8) 2010	(9) 2013
<i>White</i>	89,051 (20,974)	76,823 (18,484)	81,311 (17,815)	108,612 (27,077)	147,921 (23,920)	118,478 (25,525)	140,688 (29,354)	139,607 (23,381)	122,691 (25,097)
<i>decile1</i>	41,470 (63,936)	-405.6 (49,868)	70,944 (39,718)	27,536 (61,427)	8,101 (76,168)	133,870 (76,504)	354,640 (93,402)	619,836 (74,343)	321,102 (94,058)
<i>decile2</i>	-154,196 (210,026)	-69,712 (171,132)	13,620 (170,122)	-39,601 (204,038)	-121,157 (209,846)	-68,684 (218,184)	-114,404 (278,638)	-153,603 (251,429)	100,916 (288,204)
<i>decile3</i>	-13,518 (211,426)	-32,788 (238,991)	-108,228 (190,420)	80,065 (407,075)	-135,398 (300,990)	-133,523 (337,528)	-100,587 (385,896)	1,013 (307,099)	-96,365 (431,265)
<i>decile4</i>	-228,181 (388,791)	68,071 (219,748)	185,006 (240,295)	-173,423 (374,592)	-114,669 (443,411)	-34,839 (426,400)	-29,859 (521,416)	52,589 (424,621)	-440,361 (417,550)
<i>decile5</i>	-50,939 (326,051)	-67,189 (412,302)	-11,630 (372,634)	89,253 (419,470)	-164,347 (430,491)	-206,309 (503,385)	-520,238 (527,601)	12,589 (503,115)	128,009 (431,344)
<i>decile6</i>	-191,905 (357,927)	204,619 (416,196)	-75,464 (338,460)	-85,276 (560,569)	-53,321 (370,874)	-103,559 (458,346)	-130,174 (558,329)	213,452 (412,525)	-208,729 (449,797)
<i>decile7</i>	125,289 (412,160)	-32,199 (341,329)	-206,635 (301,454)	72,902 (531,263)	-58,927 (478,622)	-72,857 (512,201)	136,360 (538,488)	-620,256 (425,002)	-16,210 (495,369)
<i>decile8</i>	-137,458 (320,205)	-409,091 (294,166)	149,973 (304,039)	-177,246 (443,146)	-98,643 (361,196)	124,108 (397,306)	-457,406 (458,068)	-605,184 (370,874)	-377,110 (388,180)
<i>decile9</i>	-366,830 (197,023)	-380,813 (192,618)	-156,552 (215,319)	-501,357 (338,417)	-444,160 (262,598)	-671,966 (270,756)	-835,727 (289,623)	-414,417 (248,424)	95,056 (247,210)
<i>decile10</i>	668,985 (29,145)	-159,430 (28,448)	330,479 (25,767)	778,051 (37,662)	769,182 (34,925)	330,164 (38,089)	848,475 (42,392)	682,422 (35,095)	703,721 (37,364)
<i>decile1*income</i>	-9.095 (8.586)	-2.482 (7.172)	-13.35 (5.941)	-8.702 (8.431)	-8.892 (9.317)	-19.10 (9.150)	-44.51 (10.49)	-74.74 (8.480)	-41.26 (10.83)
<i>decile2*income</i>	10.60 (16.97)	4.404 (14.05)	-2.917 (14.00)	1.741 (14.99)	5.310 (14.50)	3.541 (14.54)	4.435 (18.78)	8.238 (17.45)	-9.040 (20.43)
<i>decile3*income</i>	0.856 (12.00)	2.078 (14.20)	7.086 (11.23)	-4.220 (21.68)	5.400 (14.82)	6.523 (15.78)	4.638 (18.57)	-1.087 (15.78)	3.662 (22.93)
<i>decile4*income</i>	10.82 (17.08)	-2.164 (9.792)	-7.327 (10.35)	6.715 (15.56)	3.246 (16.93)	1.904 (15.31)	1.169 (19.57)	-2.557 (16.87)	18.01 (17.47)
<i>decile5*income</i>	3.090 (11.42)	3.871 (14.71)	1.186 (13.19)	-2.297 (13.80)	5.775 (13.28)	7.149 (14.88)	16.37 (15.99)	-0.489 (16.37)	-4.453 (14.35)
<i>decile6*income</i>	6.311 (10.11)	-5.349 (12.57)	2.910 (10.13)	3.118 (15.12)	2.007 (9.214)	4.140 (11.16)	4.602 (13.98)	-5.236 (11.07)	6.566 (12.19)
<i>decile7*income</i>	-1.705 (9.672)	1.993 (8.454)	6.454 (7.408)	-0.766 (11.96)	2.500 (9.871)	3.308 (10.32)	-1.366 (11.11)	14.45 (9.297)	1.922 (10.88)
<i>decile8*income</i>	3.823 (6.208)	9.974 (5.992)	-1.447 (6.047)	5.192 (8.252)	3.254 (6.124)	0.415 (6.529)	9.960 (7.626)	12.60 (6.511)	8.482 (6.872)
<i>decile9*income</i>	7.842 (2.891)	8.717 (2.984)	4.921 (3.355)	9.571 (4.905)	8.753 (3.399)	12.41 (3.366)	14.51 (3.638)	9.507 (3.267)	2.362 (3.201)
<i>decile10*income</i>	1.778 (0.0333)	6.934 (0.0834)	3.819 (0.0407)	2.534 (0.0423)	3.534 (0.0427)	6.589 (0.0555)	4.647 (0.0399)	4.922 (0.0444)	4.778 (0.0407)
Observations	4818	5822	6583	6447	6758	6620	6565	9028	8387
R-squared	0.204	0.253	0.275	0.170	0.277	0.378	0.377	0.295	0.322

Table A11: Regression analysis, Black-White wealth gap, controlling for income and demographics

VARIABLES	(1) 1989	(2) 1992	(3) 1995	(4) 1998	(5) 2001	(6) 2004	(7) 2007	(8) 2010	(9) 2013
<i>White</i>	40,597 (21,670)	39,399 (18,958)	43,852 (18,134)	50,471 (27,609)	65,100 (24,435)	75,654 (25,957)	64,305 (29,859)	79,396 (23,642)	64,070 (25,671)
<i>decile1</i>	-463,984 (84,340)	-278,215 (71,450)	-371,863 (62,991)	-393,528 (95,354)	-418,836 (100,675)	-294,258 (106,723)	-326,202 (126,339)	-96,306 (104,919)	-322,851 (123,102)
<i>decile2</i>	-566,802 (214,044)	-349,528 (176,339)	-629,275 (178,346)	-429,551 (213,758)	-716,641 (222,774)	-745,479 (228,432)	-1.094e+06 (290,106)	-962,396 (260,011)	-786,872 (296,109)
<i>decile3</i>	-662,495 (219,698)	-449,217 (244,817)	-685,916 (197,613)	-468,342 (411,514)	-729,741 (306,824)	-776,012 (342,501)	-852,208 (392,030)	-941,353 (312,248)	-719,681 (436,738)
<i>decile4</i>	-738,077 (389,590)	-362,886 (225,744)	-403,752 (246,490)	-560,621 (382,297)	-488,332 (444,652)	-638,869 (429,856)	-753,335 (526,959)	-1.088e+06 (429,552)	-1.179e+06 (423,012)
<i>decile5</i>	-383,934 (326,940)	-468,294 (413,904)	-455,633 (374,571)	-523,655 (425,787)	-627,897 (434,083)	-734,586 (505,503)	-1.287e+06 (533,182)	-961,926 (506,391)	-624,497 (437,288)
<i>decile6</i>	-473,979 (359,751)	-201,638 (417,508)	-535,875 (341,216)	-436,897 (562,052)	-517,186 (375,704)	-757,962 (462,311)	-1.137e+06 (564,732)	-754,551 (418,785)	-1.132e+06 (456,704)
<i>decile7</i>	-335,037 (414,081)	-402,740 (344,882)	-774,729 (305,072)	-261,836 (534,886)	-905,036 (480,961)	-742,123 (515,152)	-705,503 (545,825)	-1.230e+06 (429,227)	-832,014 (499,808)
<i>decile8</i>	-651,629 (323,385)	-708,789 (299,663)	-278,572 (305,575)	-843,361 (447,896)	-573,343 (364,900)	-585,643 (406,419)	-1.127e+06 (463,572)	-1.339e+06 (375,246)	-1.184e+06 (394,932)
<i>decile9</i>	-747,947 (203,327)	-660,334 (199,174)	-548,861 (220,704)	-910,356 (345,550)	-952,354 (270,573)	-1.008e+06 (280,906)	-1.483e+06 (303,393)	-1.244e+06 (258,575)	-658,370 (260,901)
<i>decile10</i>	51,917 (69,985)	-512,141 (67,464)	-176,426 (62,214)	263,405 (95,060)	225,645 (85,872)	-267,333 (97,583)	-22,462 (110,696)	-251,918 (93,116)	-159,410 (101,759)
<i>decile1*income</i>	-11.13 (8.546)	-10.96 (7.179)	-14.60 (5.922)	-13.34 (8.425)	-19.74 (9.284)	-31.00 (9.156)	-55.78 (10.48)	-81.16 (8.484)	-49.15 (10.85)
<i>decile2*income</i>	-0.940 (16.88)	-1.120 (14.03)	12.10 (14.05)	-5.134 (14.97)	8.132 (14.44)	12.11 (14.49)	18.38 (18.75)	6.757 (17.38)	1.268 (20.40)
<i>decile3*income</i>	7.091 (12.01)	7.174 (14.15)	13.50 (11.19)	-0.772 (21.62)	10.18 (14.72)	10.60 (15.72)	3.138 (18.51)	4.116 (15.73)	-4.551 (22.85)
<i>decile4*income</i>	8.574 (16.98)	1.951 (9.766)	-1.611 (10.32)	3.763 (15.52)	-0.889 (16.82)	4.464 (15.25)	-0.812 (19.47)	9.349 (16.78)	17.16 (17.41)
<i>decile5*income</i>	-4.359 (11.37)	6.430 (14.65)	0.885 (13.15)	2.489 (13.78)	4.680 (13.20)	7.168 (14.82)	16.01 (15.92)	4.165 (16.29)	-4.583 (14.30)
<i>decile6*income</i>	-1.422 (10.06)	-2.406 (12.52)	3.142 (10.09)	0.498 (15.08)	1.660 (9.159)	7.640 (11.11)	10.03 (13.92)	-1.489 (11.02)	10.46 (12.15)
<i>decile7*income</i>	-3.811 (9.622)	3.231 (8.424)	9.442 (7.382)	-3.597 (11.93)	9.878 (9.821)	5.826 (10.29)	-0.196 (11.06)	9.470 (9.251)	2.576 (10.84)
<i>decile8*income</i>	3.058 (6.170)	9.510 (5.969)	-1.868 (6.032)	8.783 (8.238)	3.157 (6.086)	3.336 (6.499)	7.613 (7.592)	10.32 (6.481)	8.920 (6.849)
<i>decile9*income</i>	4.991 (2.878)	7.763 (2.974)	3.677 (3.341)	8.311 (4.894)	8.647 (3.376)	9.615 (3.354)	12.13 (3.623)	8.753 (3.252)	1.563 (3.192)
<i>decile10*income</i>	1.764 (0.0331)	6.911 (0.0831)	3.807 (0.0405)	2.526 (0.0422)	3.519 (0.0424)	6.581 (0.0552)	4.630 (0.0397)	4.907 (0.0442)	4.769 (0.0406)
<i>age</i>	8,114 (543.7)	5,643 (495.6)	6,566 (461.4)	7,072 (693.2)	8,265 (626.6)	8,796 (679.0)	10,076 (776.1)	10,547 (630.3)	9,532 (706.6)
<i>sex of household head</i>	-36,759 (27,876)	-2,753 (24,000)	-45,080 (22,877)	-15,412 (32,323)	-28,941 (31,287)	-93,774 (32,151)	-7,019 (38,578)	-33,737 (30,604)	-47,048 (32,909)
<i>number of children</i>	5,387 (6,223)	-6,136 (5,732)	-6,092 (5,511)	-18,538 (8,353)	-7,188 (7,436)	-14,266 (8,279)	-9,177 (9,280)	-6,431 (7,482)	-14,321 (8,631)
<i>married</i>	-17,473 (25,004)	-22,218 (21,119)	21,089 (20,504)	-33,364 (28,824)	-28,565 (27,478)	41,960 (28,667)	-43,605 (34,061)	-35,603 (26,797)	-16,455 (29,290)
<i>year of education</i>	18,794 (2,566)	10,291 (2,472)	14,535 (2,355)	19,517 (3,666)	24,629 (3,256)	16,820 (3,850)	32,114 (4,453)	33,120 (3,860)	29,660 (4,117)
<i>participates in labor force</i>	40,399 (21,273)	-11,186 (19,234)	23,330 (18,085)	-7,517 (27,385)	-111,945 (25,425)	-25,679 (26,994)	-10,986 (30,512)	-6,306 (24,255)	18,504 (26,122)
Observations	4818	5822	6583	6447	6758	6620	6565	9028	8387
R-squared	0.215	0.259	0.283	0.175	0.287	0.384	0.384	0.303	0.327