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Introduction

The 1944 Servicemen's Readjustment Act, commonly known as the GI Bill, gave returning WWII veterans access to a variety of benefits to ease the veterans' transition into civilian life, and to compensate veterans in gratitude for their service. The bill also stands as one of the premier vehicles that enabled Americans to amass wealth and fostered a vibrant middle-class through the 20th century. When President Roosevelt signed the GI Bill into law in 1944, he opened the door for generous subsidies for education and housing, which constituted substantial financial transfers to many veterans. However, Black and white veterans faced two very different realities when they returned from the war. As consistent with many policies the era,^{i,ii} the GI Bill did not reference race. For many this omission of assuring fair and equitable administration of the bill across racial/ethnic groups across the country, created space for localized discriminatory practices.

Moreover, Black veterans approved by the VA who attempted to use their benefits faced a society openly hostile to their success. Redlining and racial covenants kept Black veterans and their families from benefiting from the well-funded schools and blossoming property values of post-war suburbia. Educational segregation and discrimination limited the opportunities available to Black veterans and also overburdened HBCUs without providing funding to raise their capacity.ⁱⁱⁱ Historical accounts abound of discrimination in workforce training and placement.^{iv,v} Across large swaths of the country, Jim Crow enforced second-class citizenship in nearly every aspect of life for the very men and women who put their lives on the line to fight for their country.^{vi} The purpose of our study is to empirically investigate disparate economic impact for Black veterans. Our findings illustrate a complex set of interactions between policy and society that left Black veterans at a disadvantage compared to their white counterparts.

The following report is organized into three sections:

1. **The Voices of Black Veterans and Their Descendants:** This section highlights the lived experience of Black WWII veterans and their descendants utilizing GI Bill benefits.
2. **The Average Value of GI Bill Benefits:** This section estimates the value of GI Bill benefits for Black and white veterans.
3. **The Intergenerational Wealth Effects of the GI Bill:** This section estimates the relationship between GI Bill benefits and wealth over generations with a focus on racial wealth disparities.

Major takeaways

- White and Black veterans and their descendants highlighted very different experiences when it comes to receiving and taking advantage of GI Bill benefits
- The cash equivalent value of GI Bill benefits for Black veterans was only 70% of the value of GI Bill benefits for white veterans.^{xiii}
- The unadjusted racial wealth gap magnified from parents' generation to children's generation. The average Black veteran household owned 23 cents to each dollar a typical white veteran household owned. Their children owned just 17 cents to every dollar own by a descendant of a white WWII veteran.
- The long-term benefit of having veteran parents was larger for white veterans' descendants than Black veteran descendants. On average, a Black parent who could use the G.I. Bill benefits increased descendant wealth by \$23,847 whereas having a white veteran parent increased descendant wealth by \$59,638.

The Voices of Black Veterans and Their Descendants

As part of this study, we interviewed Black and white veterans and their descendants about their experiences navigating and receiving GI Bill benefits. To obtain in-depth information about the experience of Black and white WWII veterans and their descendant's interaction with GI Bill benefits, we produced an interview guide and questionnaire. Drawing on sources from our literature review we proceeded with a purposeful sampling technique to maximize interview time with veterans and recruit additional potential participants. Interviews were conducted virtually via Zoom, on the phone, and in-person, and lasted approximately 90 minutes. We were particularly interested in learning about where and how veterans grew up, what their expectations were of the GI Bill, the impact of the GI Bill on them, their family, and community, and the impact of the GI Bill on their fellow servicemen and descendants. We reached out to a broad array of networks to connect with WWII veterans and their families. These included referrals from federal and municipal government, participants in the study, and social media networks.

However, due to challenges associated with the COVID-19 pandemic throughout the duration of the research project, we were limited in our contact with veterans. For individuals who declined to participate, they cited "Not feeling knowledgeable enough to speak on the topic," "not wanting to participate for privacy concerns," and "explanations about memory and health issues," as the main reasons for not participating. For individuals who participated, palpable excitement about the research and its potential impact was cited as their main reason for participating. For example, one descendant interviewed made introductions to others in his network due to his father's service as a Tuskegee Airman and the potential to share more about Tuskegee Airmen personal histories. Overall, we found descendants and veterans were more comfortable when someone they knew and trusted made the introduction to the research project. In total, we spoke with four Black and four white veterans and their descendants. Additional details from our qualitative study will be released in the following months.

White veterans have been nearly unanimous in their positive experiences of the GI Bill. One white veteran described the policy as the *“greatest gift a country could have ever given its servicemen and women.”* One descendant of a white veteran highlighted the economic mobility that the bill facilitated for their family, *“If my father had not received the GI Bill, there was no money. He wasn't going to go to college. He would've been a draftsman probably somewhere. So, it changed our lives, it changed his life dramatically.”*

Our conversations with Black veterans and their descendants were more mixed, containing experiences of discrimination beginning with their time in the military and lasting through their attempts to receive the benefits they were entitled to. When speaking about discrimination in different military branches, one Black veteran said, *“I would go to jail before I go to the Navy.”* On the more extreme side, many accounts in the literature and in some in our interviews include people who were excluded from utilizing their benefits. One descendant said of their father's experience,

“He spent three years in the Pacific. He earned three medals... He was able to avoid injury during the war and then come home, and within 5 hours, he's blinded for life at the age of 27 - after serving his country, after sacrificing everything. Only then to be denied veterans benefits.”

Another descendant said,

“He [my father] was a leader in terms of establishing a business to gain wealth - generational wealth. But it's sad that it took that long for the opportunity to come to fruition for him. He could have done so much more in those 15 years [he didn't have benefits].”

Our interviews paint a clear picture. While many Black veterans were able to collect GI Bill benefits which were often transformative for them and their families, many others were denied or given less support from VA offices and other post-war government programs. The empirical analysis that follows is an attempt to better understand this experience.

The Average Value of GI Bill Benefits

The GI bill had three components: education and training benefits, loan guarantees for home purchases and businesses, and readjustment allowances consisting of unemployment and self-employment benefits. Eden (2023)^{vii} constructs estimates of the disbursements of each of these benefits by race by combining data on participation rates from veteran surveys (1950, 1979 and 1987) and historical estimates of the programs' costs. The education and training benefits are priced using historical estimates of tuition rates (both for college and for vocational training), as well as the stipend amounts provided by the GI bill. Loan guarantees are monetized by combining data on home values from the 1979 Survey of Veterans with estimates of the difference between the guaranteed loan rates and the unsubsidized market mortgage rates from the Census 1960 Residential Housing Survey. Finally, readjustment allowances are calibrated based on participation rates from the 1950 Survey of Veterans and total amounts reported in the VA Annual Reports 1945-1953.

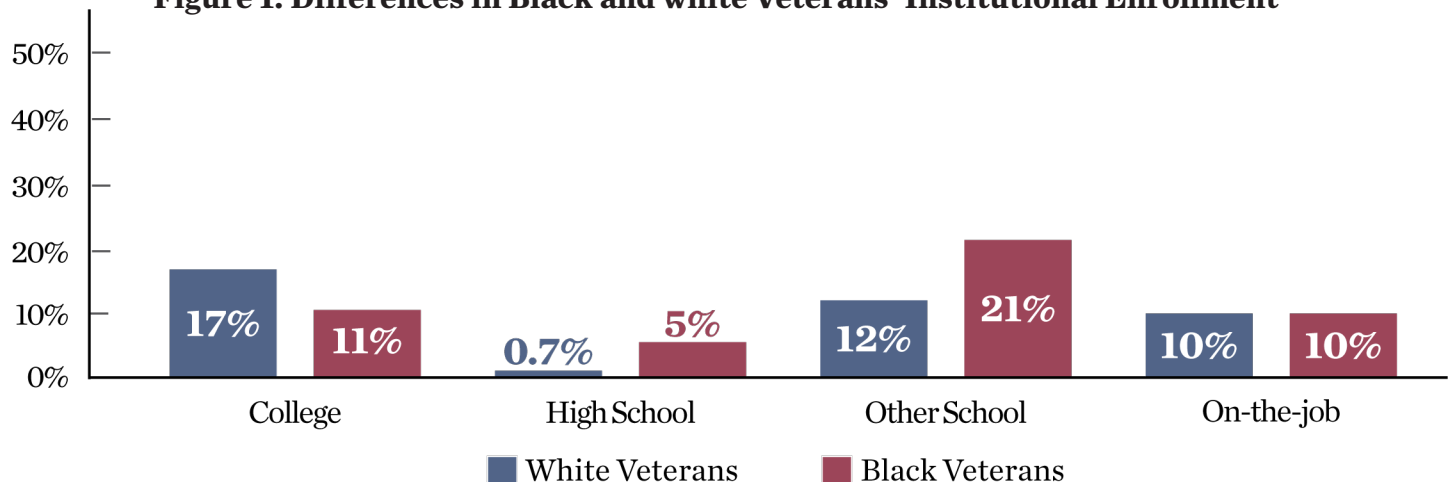
The analysis suggests that the government spent roughly the same amounts on GI benefits for Black veterans and for white veterans. However, the overall distribution of benefits was different. Black veterans received less in home loan guarantees. This is consistent with Agbai (2022),^{viii} who uses VA administrative records to document that, in the years 1944-1956, Black veterans were significantly less likely to participate in the home loan guarantee program. At the same time, average spending on education and training benefits and on readjustment allowances were higher for Black veterans, resulting in slightly higher total spending per-veteran.

However, segregation and systemic racism limited the ways in which Black veterans were able to use their benefits. To capture this, Eden (2023) estimates of the cash-equivalents for each of the benefits. The cash-equivalent of a benefit is the minimal amount of money that the veteran would be willing to accept in exchange for forgoing the benefit. Cash-equivalents tended to be lower for Black veterans, who often took advantage of the GI benefits only because they were heavily subsidized, and not because they were particularly useful to them. For example, the education and training benefits included a stipend that was roughly 80% of the average market wage for Black veterans, but only about 50% of the average market wage for white veterans. At a subsidy rate of close to 100%, Black veterans were incentivized to enroll in education and training programs even if the only programs that they could access were of low quality.

This is reflected in Black and white veterans' educational enrollment patterns. Despite similar utilization rates, we found differences between how these education benefits were used by the Black and white veterans in our analysis of the 1987 veteran's survey data. We find that white veterans were more likely to enroll in high school, college, or graduate school, while Black veterans were more likely to enroll in vocational and technical institutions (Figure 1). This supports previous findings about veteran's educational enrollment patterns.^{ix} The literature suggests that vocational education has lower returns to graduates than academic education when we look at the lifetime earnings.^{x,xi}

The analysis is summarized in Table 1, and is detailed in Eden (2023).

Figure 1: Differences in Black and white Veterans' Institutional Enrollment^{xii}



It is worth noting that the reported racial gap in the value of the GI benefits in Eden (2023) was estimated under highly conservative assumptions.^{xiii} Although the precise numbers are sensitive to the various imputation procedures, the robust conclusion of the analysis is that there was a large racial gap in the value of the GI benefits: Black veterans received at most 70% of the value that white veterans received, which amounts to a gap of at least \$80,000 today (Table 1).

Table 1: Estimated average net-present-values of GI benefits by race^{xiv}

Benefit (1944 dollars)	Government Spending		Cash Equivalent	
	White	Black	White	Black
Education and training	\$427	\$477	\$245	\$107
Housing loans	\$101	\$70	\$89	\$61
Readjustment allowances	\$237	\$278	\$223	\$235
Total, 1944 dollars	\$766	\$826	\$557	\$404
Total, 2021 dollars	\$9,259	\$9,988	\$6,728	\$4,880
-with 5% real interest	\$396,000	\$428,000	\$288,000	\$209,000

The Wealth Effects of the GI Bill

Intergenerational wealth effects of GI Bill

Racial disparities in the access and the use of the GI Bill benefits among WWII veterans have been reported numerous times. Our own qualitative research showed that some Black veterans were not able to use the GI Bill benefits and the benefits utilization section above highlights that Black veterans received only 70% of the value of the benefits that white veterans received. While the disparate access to the GI Bill benefits played a role in shaping the Black-white wealth gaps in the U.S., we still have little knowledge on how this color-blind GI Bill benefit program for WWII veterans had long-term impacts on racial wealth gaps in the 2000s through generational wealth.

In this section we estimate the intergenerational effect of military service during the WWII on their descendants' wealth. Numerous studies including our own qualitative research showed that Black WWII veterans could not receive the GI Bill benefits. In this report, we aim to expand our understanding the long-term, intergenerational effect of the racial disparity among veterans who were eligible for GI Bill

benefits and their descendants. We aim to analyze the racial difference in the effect of having WWII veteran parents on their children's wealth, and to document the racial wealth gaps among veterans' descendants and compare them to non-veterans' descendants (Black-white wealth gap).

Our specific research questions are as follows:

- 1. Generational wealth gap:** How has veteran/non-veteran wealth changed from parent generation to child generation, and what differences can we observe for Black and Whites?
- 2. Veteran-Non-veteran wealth gap:** Was the gap between veteran and non-veteran descendants larger or smaller among Black descendants than white descendants?
- 3. Black-white wealth gap:** Was the Black-white racial wealth gap larger or smaller among children of the WWII veterans than children of non-veterans?

To answer these questions, we report the unadjusted median wealth and wealth gaps (descriptive statistics) and estimate the median wealth gaps by Unconditional Quantile Regression (UQR) method. This chapter includes an overview of the quantitative methods and findings and detailed data and methods are in appendices.

Data and Methods

Data

We used the Panel Study of Income Dynamics (PSID) which is the longest running panel survey of the U.S. households which began in 1968 and collects data for subsequent generations of the original sample.^{xv} Data include wealth, income, education, veteran status, and numerous other topics. Parent-child linkage is one of the greatest advantages of using PSID as it is possible through the PSID Family Identification Mapping System (FIMS). Using FIMS, we linked Black and white household heads in the 2005-2019 PSID to their parents in the 1968 PSID. For the descendants, PSID waves from 2005-2019 were selected to represent wealth holdings at similar age ranges for parents and descendants. Of those, we only included parents if they were born between 1910 and 1927, a birth year range when individuals were most likely to serve during the WWII.^{xvi} More detailed information about the data is in Appendix 1.

Key variables

- Descendants' wealth (dependent variable)
 - › Our dependent variable is wealth of children who were interviewed on their wealth in 2005-2019. Wealth is measured as total wealth including home equity that is normalized in 2019 US dollars using the Personal Consumption Expenditure (PCE) deflator.
 - › Since wealth is severely right-skewed due to high wealth outliers of extremely high wealth holders, we applied the top and bottom codes for wealth by race to exclude extreme cases.^{xvii}

- Independent variables
 - › Descendant characteristics: age, age squared, marital status (never married, currently married, previously married), years of education, and the interview year.
 - › Parent characteristics: veteran status (from 1968 PSID), region (south^{xviii}), and race.

Methods

To understand wealth gaps evolved from the parents' generation to children's generation, we compare the parents' wealth as of 1984 and their children's wealth averaged between 2005 and 2019 (RQ 1).

We implemented the Unconditional Quantile Regression (UQR), which provides estimates at the 25th, 50th (median), and 75th percentiles of wealth (RQ2, RQ3). We chose the UQR method rather than the more commonly used Ordinary Least Squares (OLS) as UQR estimates are more robust against outliers (such as extreme wealth among a few households).

More detailed description of our methods is available in Appendix 1.

Research Question 1. How has veteran/non-veteran wealth changed over generations, and what differences can we observe for Black and white veterans?

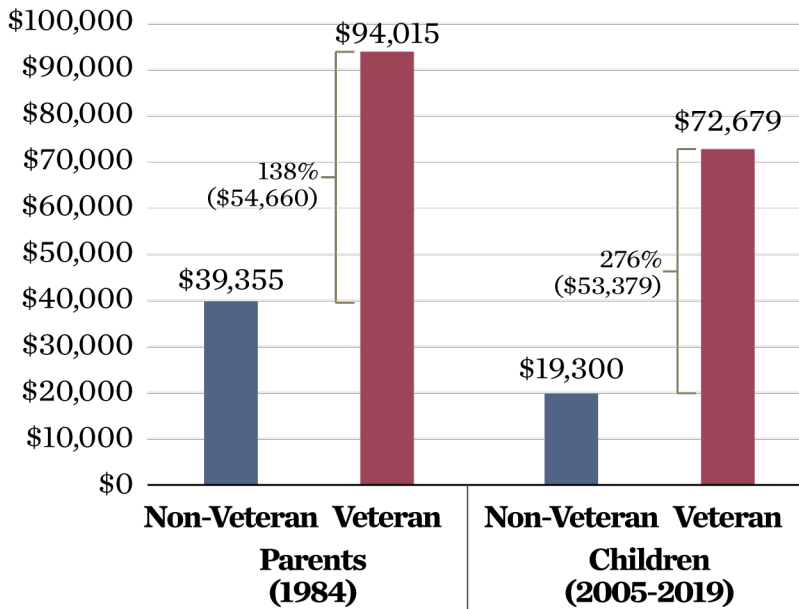
Major takeaways

- For both, Black and white households, veterans' descendants had more wealth than non-veterans' descendants, providing some evidence of the impact of the GI bill in general.
- The veteran versus non-veteran gap measured in relative terms (as percentage) was larger among Black households, mostly due to very low wealth of non-veteran Black households. The absolute gap between veterans and non-veterans for Black descendants was smaller than White descendants.
- For veteran households, the racial wealth gap has widened from parents to descendant compared to the racial gap among non-veteran households.

In this section, we aim to provide an overview of how the unadjusted (raw) racial wealth gaps evolved from the WWII veterans' generation to their children's generation. We focus on median household wealth that includes home equity.

After excluding the extreme values (top and bottom coded at the 1st and 99th percentiles)^{xix}, we calculated the median wealth of Black and white households in 2005-2019 (descendants) and their parents' wealth in 1984. The mean age of descendants was 56 for Black and 58 for white descendants.^{xx} For parents, we calculated the mean wealth based on their 1984 interview when they were between 57 and 74 years old.

Figure 2: Median Black household wealth in 2019 dollars



Among Black households, for both parent and child generations, veteran households had more wealth than non-veteran households (Figure 2). In the parent generation, Black veteran households had about \$54,660 more than the non-veteran Black households. This veteran to non-veteran wealth gap was reduced in the descendant generation in absolute terms (\$53,379), however, the gap in relative terms enlarged. This disparity may have been driven by the very low wealth of Black non-veteran descendant households. Black veterans' children also had less wealth than their parents' generation. This might be due to a difference in life stage (age) when this wealth information was recorded. Yet,

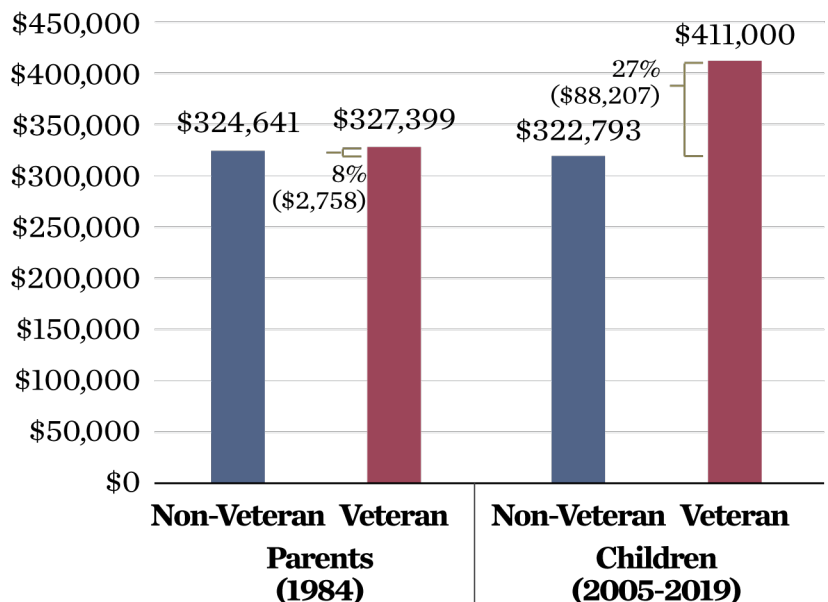
it's notable that the percentage decline in intergenerational wealth among veterans' households was less than half the percentage decline among Black non-veterans.

Among white households, the difference between veteran and non-veteran wealth was very small (\$2,758) (Figure 2). This small gap grew in descendant generations so that white veterans' children had \$88,207 more than white non-veterans' children. This can be explained by the wealth of white veterans' children growing, as opposed to the wealth of Black veteran's children shrinking.

However, in relative terms, the disparity was 0.27 times that of white non-veterans' children. If we compare this relative gap of 0.27 to that of Black descendants (2.76), it might obscure how wealth was passed from the parent generation to the child generation and significant differences in absolute terms.

Overall, the raw difference in median wealth by parent's WWII veteran status indicates a positive relationship between veteran status and wealth from parent to child generation. However, since this finding is the result of descriptive analysis, we have yet to confirm this association was

Figure 3: Median white household wealth in 2019 dollars



not due to other factors, for example, age, region, education, and/or marital status – all of which could have affected wealth as well. In the following section, we will present the regression results controlling for these factors.

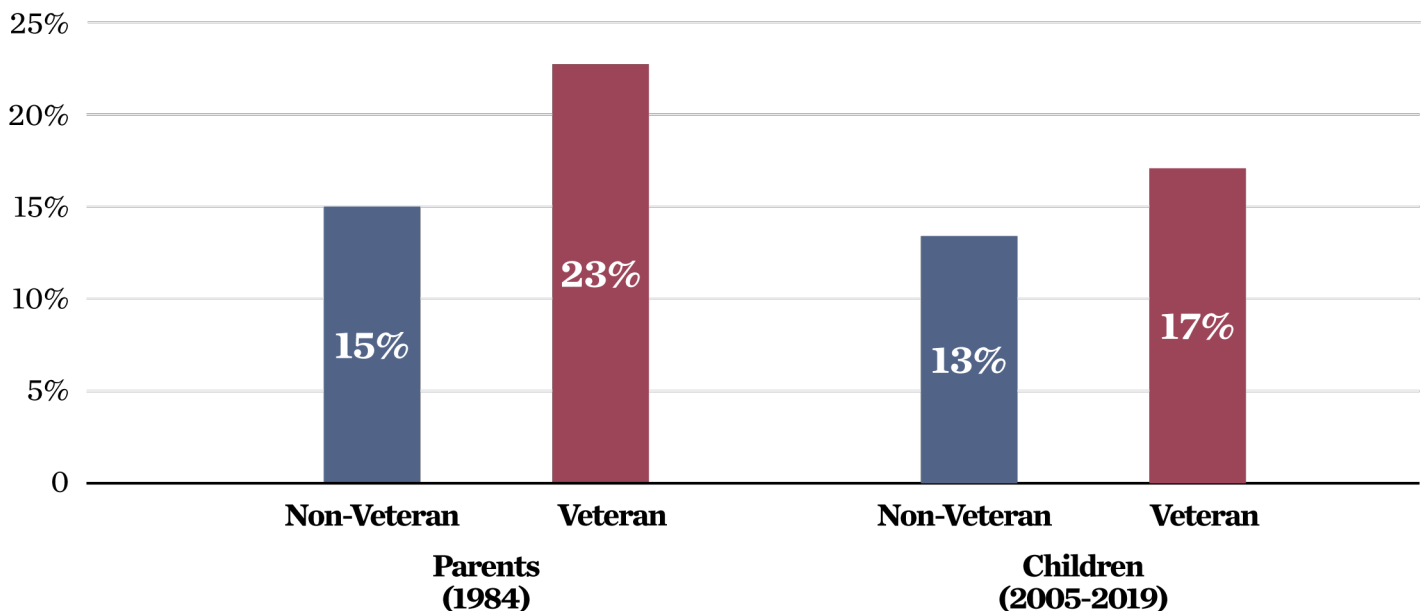
Before moving to the regression analysis, it is worth noting once again the importance of acknowledging existing racial wealth inequality. The above results showed that comparing wealth gaps between races that were measured in either absolute or relative terms can lead to a very different conclusion. Our findings suggest that, in relative terms, veteran status had a much larger positive impact on their wealth for Black households and their descendants than their white counterparts (276% vs. 27% in child generation). This is because of the low wealth of Black non-veterans and their descendants. A change in the small numbers can result in a large percentage change.

In 1984, the white parent median wealth was \$488,912 whereas Black parent median wealth was \$50,344. The white parent wealth was nearly six times that of Black parents. To express differently, Black parents had about 15% of white parents' wealth. white descendants had \$373,220 in 2005-2019 whereas Black descendants had \$41,000. white descendant wealth was about nine times that of Black descendants. In other words, Black descendants had only 11% of what white descendants had.

Now we measure the wealth gaps from a different angle. The above findings hint that the racial wealth gap might be smaller among veterans' families.

The racial wealth gaps by parents' veteran status showed that the wealth gap was smaller among veterans and their descendants. However, we find that this gap was enlarged in the children's generation (17%) from the veterans' generation (23%).^{xxi} This increased racial disparity was due to a decrease the median

Figure 4: Black-white wealth gap Median Black household wealth as a percentage of median white household wealth



wealth of Black veterans' descendants while the median wealth of white veterans' descendants increased. This ratio also decreased among non-veteran parents and their descendants (from 15% to 13%) mainly due to a significant decrease in wealth for Black non-veterans' descendants. Since these are unadjusted gaps, we need to investigate further by controlling for factors of wealth.

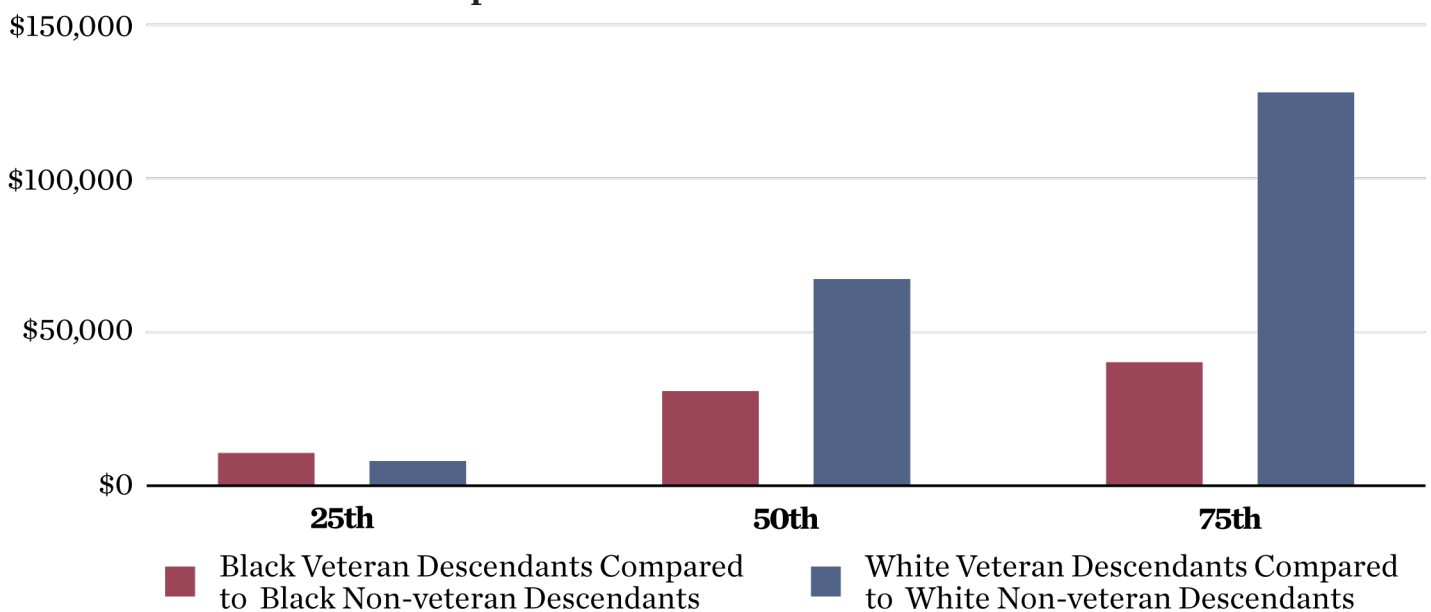
Research Question 2. Was the gap between veteran and non-veteran descendants larger or smaller among Black descendants than white descendants?

Major takeaways

- When looking at absolute wealth differences, white descendants benefited more from having a veteran parent than their Black counterparts

In the previous section, we presented the comparison of median wealth of WWII veterans and non-veterans, and their descendants. Yet, we do not know the relationship between parents' WWII veteran status and their children's wealth. There can be other influences that might affect this relationship, such as education. It is possible that veteran descendants had higher educational attainment than non-veteran descendants, enabling them to amass more wealth. In this section, we control for such possible factors and estimate the net effect of having veteran parents on descendants' wealth compared to the non-veterans' descendants.

Figure 5: Absolute differences in wealth of veterans' descendants compared to non-veterans' descendants



Using the unconditional quantile regression method, we measured the difference in descendants' wealth by their parents' veteran status. We controlled for the region, year, age, marital status, and education of descendants. A complete list of variables and summary statistics are available in Appendix 1.

The wealth of white veterans' descendants was \$126,862 more than their non-veterans' counterparts. This veteran-non-veteran wealth gap for black veterans' descendants at the 75th percentile was only about one-third that of white descendants (Figure 5).

The greater wealth effect of having veteran parents for white descendants suggests a possibility that the wealth disparity might be worse among veterans' descendants. In the next section, we estimated the median wealth of Black and white descendant households and compared those with veteran parents to those without.

Research Question 3. Was the Black-white racial wealth gap larger or smaller among children of the WWII veterans then children of non-veterans?

Major takeaways

- The absolute racial wealth gap adjusted for demographics and education was worse among veterans' than non-veterans' descendants.
- The adjusted median household wealth of black veteran descendants was \$12,193, whereas median wealth of white veterans' descendants was \$391,904, about 32 times that of black veterans' descendants.

Our findings from the last section showed that the veteran premium was not equal: parents' WWII veteran status had a greater positive impact on white descendants' wealth than Black descendants. In this section, we aim to examine whether it led to a larger racial wealth gap among veterans' descendants compared to non-veterans' descendants. To that end, we implemented median regression models by parents' veteran status and obtained the predicted wealth of Black and white households at the 25th, 50th, and 75th of wealth distribution.

At medians, Black non-veterans' descendant households had -\$15,462 and white non-veterans' descendant households had \$283,499, about 19 times that of Black non-veterans' descendants. The median household wealth of Black veterans' descendants was \$12,193 and that of white veterans' descendant was \$391,904, about 32 times that of Black non-veterans' descendants (Figure 6 and Table 2).

This finding is different from our unconditional analysis. The unadjusted wealth gap was larger among the non-veterans' descendants than veteran's descendants, but when we controlled for demographic and parents' characteristics, the adjusted gap became larger among the veterans' descendants.

Figure 6: Predicted wealth of non-veterans' and veterans' descendants

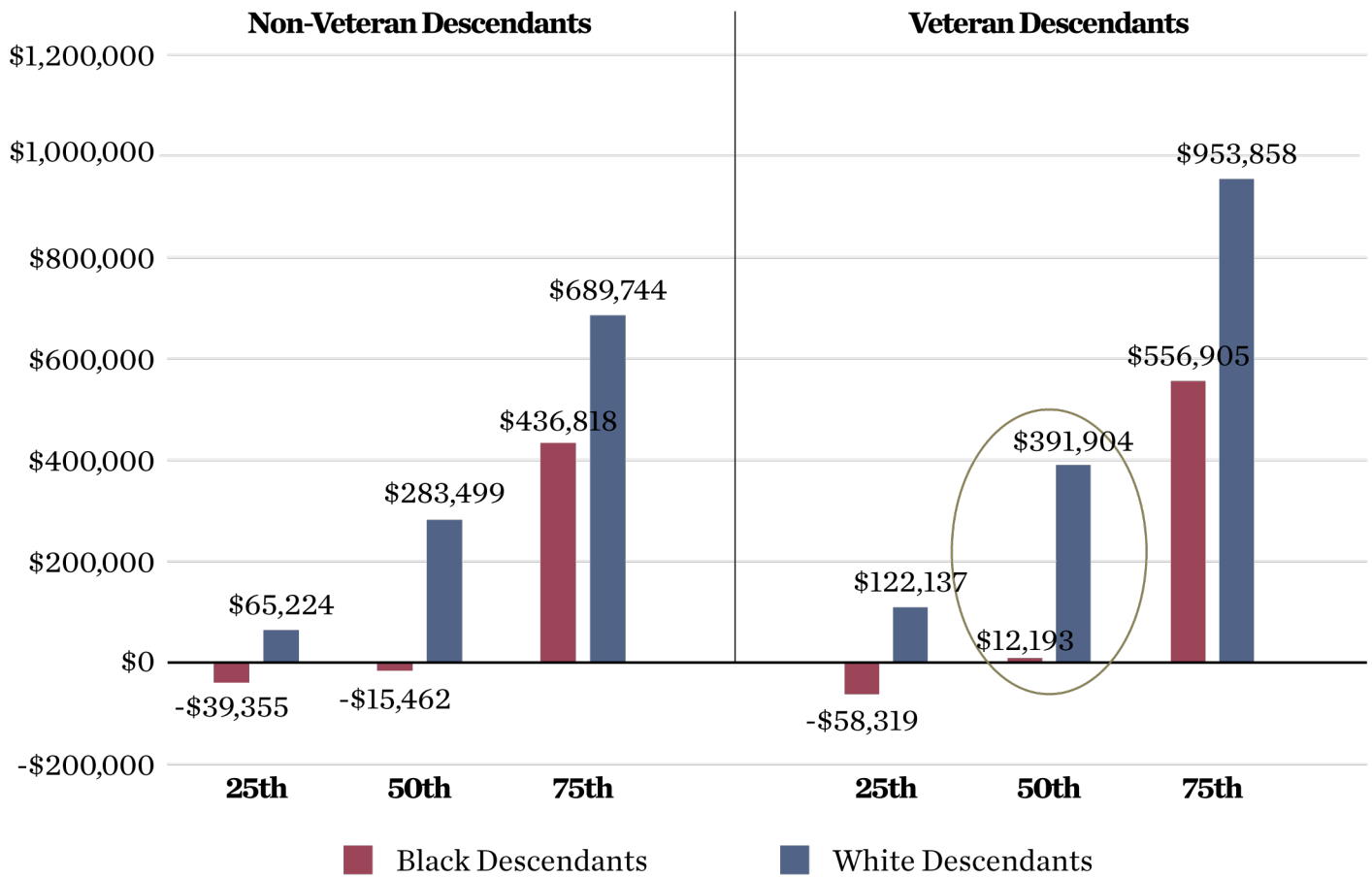


Table 2: Racial wealth gaps among non-veterans' and veterans' descendants

	Non-Veteran Descendants			Veteran Descendants		
	25th	50th	75th	25th	50th	75th
A: Black Descendants	-\$39,355	-\$15,462	\$436,818	-\$58,319	\$12,193	\$556,905
B: White Descendants	\$65,224	\$283,499	\$689,744	\$122,137	\$391,904	\$953,858
B-A: Difference	\$104,635	\$298,961	\$252,925	\$170,456	\$379,712	\$396,952
B/A: Difference as percentage	-165%	-1834%	158%	-192%	3214%	171%

Research Illustrates the Unequal Implementation and Impact of the GI Bill

Inequities reproduce themselves in populations and can magnify over time. In this way, a nominally colorblind benefits policy like the GI Bill, introduced into an unequal society and distorted by unequal implementation, can lead to large disparities for families. While the GI Bill was a transformational policy for the veterans who were able to collect the benefits they were entitled to, data indicates that white veterans were able to get more value from their benefits than Black veterans, and this disparity would continue to manifest itself among their descendants.

A small, yet positive veteran/non-veteran gap in the parent generation magnified in the child generation for white households. The veteran/non-veteran gap also enlarged for Black households, but the absolute level of wealth declined substantially for descendants of both veterans and non-veterans. Our results show that white descendants of WWII veterans benefitted more than Black veterans' descendants, which led to a much larger racial wealth gap among veterans' descendants than that among non-veterans' descendants. Consistent with the lived experience of Black WWII veterans and their descendants we interviewed, our quantitative results showed the disparate impact of the G.I. Bill that disproportionately benefited white veterans continued to be felt by their descendants.

On May 23rd, the Heller School for Social Policy and management invited Chinyere Abgai from Brown University, Lukas Althoff and Christiane Szerman from Princeton University, and Maya Eden from Brandeis University to present their research into racial discrimination in the GI Bill. Following these presentations, Omer Ali from Duke University, Sarah Turner of the University of Virginia, and Job Boerma from the University of Wisconsin acted as discussants. Eden's work is reflected in this report already; however, Abgai and Althoff and Szerman's research revealed deep and intergenerational effects of racial disparities in the GI Bill, particularly in home ownership.

Abgai (2022) showed significant racial differences in who received the Home Loan Guaranty (HLG) among veterans. The unequal implementation of the HLG increased racial inequality in home ownership and, therefore, increased absolute racial wealth inequality. Althoff and Szerman (2022) also highlighted racial inequities in home ownership, showing that GI Bill housing benefits increased the home ownership gap by 60%. As housing is one of the primary ways families in the United States pass down wealth to their to the next generation, this cemented and widened the homeownership and wealth gaps for veterans' children.

Acknowledgments

We are grateful to Chinyere Agbai, Omer Ali, Lukas Althoff, Christiane Szerman, Sarah Turner, and Joe Boerma who participated in our panel discussion on Racial Disparities in the 1944 GI Bill. Their presentation and discussion deepened our understanding of the issue and helped us to refine our quantitative approaches.

Our reviewers, Chinyere Agbai, William Darity Jr, William Gale, A. Kirsten Mullen, and Chad Williams, provided thoughtful input and helped us shape our interim and final reports.

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- xii. Estimates are based on a sample of 4,220 white WWII veterans and 309 Black WWII veterans. The category “other school” groups together the categories “Flight school (not correspondence)”, “Other school (not correspondence)” and “Correspondence”. The category “On-the-job” groups together the categories “Apprentice”, “On-the-job” and “Farm training”.
- xiii. Other methodological choices result in larger gaps: in a previous version of her paper, Eden reported that Black veterans received only 40% of the value of GI benefits that white veterans received -- a gap that amounts to about \$180,000 today. In the current version, the corresponding numbers are 70% and \$80,000. The revised estimates reflect different methodological choices (such as imputing tuition rates based on a 1936 household survey, instead of from tuition rates in the 1980s).
- xiv. Estimates correspond to unconditional averages across all veterans, including those who did not use GI benefits.
- xv. The PSID interviews were conducted annually from 1968 to 1997 and biennially after 1997. For the period of our interest (2005-2019), the surveys were conducted every other year (2005, 2007, ..., 2019).
- xvi. These parents were age 18-35 at the end of the war.
- xvii. We top and bottom-coded the extreme values at the top 1st and bottom 99th percentiles. We found small differences when we used different values for top and bottom codes. See Appendix 3 for details.
- xviii. 17 southern states are AL, AR, DC, DE, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV.
- xix. For the results when different top and bottom codes are applied, see Appendix 3.
- xx. Sample descendants' characteristics are reported in Appendix 2 table 1.
- xxi. Full descriptive analysis result is in Appendix 2.

Appendix I: Data and Methodology for Wealth Analysis

Data

We used 2005-2019 Panel Study of Income Dynamics (PSID) which is the longest running panel survey of the U.S. households which began in 1968. The PSID collects information on sample families and descendants covering income, wealth, employment, education, veteran status, and numerous other topics. The PSID conducted interviews annually from 1968 to 2007, then biennially after 2007. For the time period of our study, the surveys were conducted biennially (2005, 2007, ..., 2019).

Sample restrictions

Among black and white household heads in the 2005-2019 PSID, we selected those whose parents were in the 1968 and 1984 surveys. Parent-child linkage is one of the greatest advantages of using PSID as it is possible through the PSID Family Identification Mapping System (FIMS). Parents' 1968 interview was used to identify their WWII veteran status and the 1984 survey was used to get their wealth information which was used as an independent variable of our regression analysis. If the individuals in 2005-2019 did not have parents who interviewed in 1968 and 1984, they were excluded from our sample. In other words, the parents who interviewed in 1968 and 1984 did not have records of children in the 2005-2019 PSID, they were excluded from our sample.

We also had a age restriction for parents: we restricted our descendant sample to those with parents who were born between 1910 and 1927. This birth year range of parents is when individuals were most likely to serve during the WWII. These parents were age 18-35 at the end of the war.

Our sample size is 6,580 (person-year) from 368 black descendants and 584 white descendants. Summary statistics are in Appendix 2.

Method and key measures

We estimate the effect of parents' veteran status on their descendants' wealth by OLS and unconditional quantile regression (UQR).[†] We regress our outcome variable (descendants' total wealth including equity) on parents' and descendants' characteristics. Parents' characteristics include veteran status, race, and region; descendants' characteristics include age, marital status, years of education, and survey year.

Variables

- Dependent variables: Descendant total wealth including equity (2005-2019)
 - › Wealth is measured as total wealth including home equity that is normalized in 2019 US dollars using the Personal Consumption Expenditure (PCE) deflator. We chose 2019 as reference because it is the latest year in our sample time period.
 - › Since wealth is likely to be right-skewed, we took inverse hyperbolic sine (IHS) transformation which is defined as $\sinh^{-1}(x) = \log(x + \sqrt{x^2 + 1})$. IHS transforms the value of x that approximates the natural log transformation when x is positive. The advantage of using an

[†] We use `rifhdreg` command to implement on Stata.

IHS-transformation includes (1) it is defined for any real number including zeros, (2) it brings extreme values closer to the center, i.e. to approximate a normal distribution.

- › We also applied the top and bottom codes for wealth by race.
- Independent variables
 - › Our independent variables come from both parents' and descendants' surveys. From the parents' interview, we extract the following time-invariant independent variables: veteran status, region (south), race, and the average wealth between 1984 and 1989. From the descendants' interview, we construct the following variables: age, age squared, marital status (never married, currently married, previously married), years of education, and interview year.

Appendix II: Descriptive Statistics

Table 1. Sample Characteristics

PSID 2005-2019		
	Black	White
Age	55.98* [55.50, 56.45]	58.23 [58.01, 58.45]
Years of education	13.81* [13.67, 13.94]	14.91 [14.84, 14.98]
Never married	0.22* [0.20, 0.25]	0.07 [0.06, 0.08]
Married	0.45* [0.42, 0.48]	0.76 [0.74, 0.77]
Previously married	0.33* [0.30, 0.36]	0.18 [0.16, 0.19]
South	0.87* [0.86, 0.89]	0.19 [0.17, 0.20]
Northeast	0.02* [0.02, 0.03]	0.25 [0.24, 0.27]
Midwest	0.08* [0.06, 0.09]	0.38 [0.36, 0.39]
West	0.03* [0.02, 0.04]	0.18 [0.17, 0.19]
Non-veteran parent	0.55* [0.52, 0.58]	0.28 [0.27, 0.30]
Veteran parent	0.45* [0.42, 0.48]	0.72 [0.70, 0.73]
N	2,511	4,069

Note: * Estimate is statistically different from the mean for White, $p < .05$. 95% confidence intervals are in brackets. Cross-sectional weights are applied for calculating means and confidence intervals. Number of observations is unweighted.

Table 1 reports the sample characteristics of black and white descendants. The average age of black descendants was 48 and white descendants were 50. White descendants had more education than black (difference by about a year). The ratio of never married among black descendants was 22%, married was 47% and previously married (divorced, widowed, separated) was 31%. In contrast, a larger proportion of white descendants were married (77%). There was a significant difference in region. While 86% of black descendants was from southern states, white descendants were more evenly distributed across regions with the highest concentration in the Midwest (37%). The ratio of having veteran parents was lower among black descendants (43%) compared to white descendants (71%).

Table 2 compares the non-censored wealth of parents and descendants by race and parents' veteran status. Note that the wealth variable used in this analysis is total wealth including equity that is the total value of all assets minus all debts. Since we cover a long time period (1984 for parents and 2005-2019 for descendants), the values are normalized to 2019 dollars. The columns show the mean value and the values at the 1st, 5th, 25th, 50th

(median), 75th, 95th, and 99th wealth percentiles to provide what values will be top and bottom-coded in our analyses. In all rows, the mean values were higher than the median values because the wealth distribution is skewed right and has fewer numbers at the high end. It implies that the estimate of the mean (OLS) can lead to an inaccurate conclusion based on the wealthier portion of our sample.

Panel A of Table 2 shows the wealth of parents from the 1984 interview. The mean parents' wealth of black was \$85,725 and the median was \$50,344: of those, the wealth of non-veterans was lower than that of veterans. The median wealth of black veterans was more than twice as large as that of non-veterans. The gap between veterans and non-veterans was smaller among white parents. Comparing the median wealth of white veterans and non-veterans, they were almost the same.

Table 2. Wealth including equity of parents and descendants.

PSID 2005-2019								
	Mean	1th	5th	25th	50th	75th	95th	99th
<i>A. Parents' wealth including equity (1984)</i>								
Black	85,725	-9462	-9,462	10,823	50,344	140,974	229,950	506,702
Black non-veteran	59,406	-9462	-9,462	0	39,355	73,647	190,868	506,702
Black veteran	117,975	-3815	123	42,680	94,015	227,571	229,950	323,236
White	488,912	-661	38,677	172,275	326,916	555,011	1,432,704	4,780,183
White non-veteran	399,668	-661	12,974	154,408	324,641	513,723	1,176,796	1,523,743
White veteran	524,161	1,238	41,743	184,095	327,399	560,154	1,885,164	4,780,183
<i>B. Descendants' wealth including equity</i>								
Black	121,895	-65,000	-9,987	2,086	41,000	126,204	534,487	1,426,428
Black non-veteran	107,073	-56,830	-10,117	79	19,300	97,080	582,602	1,450,464
Black veteran	140,056	-70,114	-8,560	8,264	72,679	174,013	520,323	1,056,711
White	820,696	-36,400	1,043	111,700	373,220	939,521	3,360,000	7,402,908
White non-veteran	807,760	-38,723	755	93,705	322,793	789,934	3,610,142	7,402,908
White veteran	825,805	-25,268	1,043	122,545	411,000	983,620	3,207,582	7,010,272

Note: cross-sectional sampling weights are applied.

The variation in wealth by parents' veteran status was similar for descendants (Panel B). Black veterans' descendants had more wealth than black non-veterans' descendants; this veteran-non-veteran gap was larger among descendants than that among parents. The average black non-veterans' descendant wealth was \$107,073 and the median was \$19,300 whereas black veterans' descendants' mean wealth was \$140,056 and the median was \$72,679. The similar pattern was found for white descendants with a smaller difference between veterans and non-veterans.

The racial gap in median wealth seems to have widened in 2005-2019 from the parent generation in 1984. We found that white parents had \$276,572 more than black parents in 1984; the white descendants had \$332,220 more than black descendants in 2005-2019 (median wealth gaps). To express black's wealth as a ratio to white's wealth (white median wealth as 1), it was 0.254 for parents and 0.134 for descendants. The black to white wealth ratio was worse for non-veteran parents and their descendants than their veteran counterparts.

Appendix III: Regression coefficients tables

Table 3. Unconditional Quantile Regression coefficients on parents' veteran status (base category: non-veteran parents). Dependent variable: descendants' wealth (top- and bottom-coded at the 1st and 99th percentiles).

	25th	50th	75th
Black			
A. Region, year	17,303*	44,132*	71,675*
	[4,268]	[6,227]	[14,602]
B. A + Age, Marital Status, Education	9,329*	30,300*	39,413*
	[4,048]	[5,626]	[12,400]
C. B + Parents' Wealth	5,711	23,847*	27,483*
	[4,191]	[5,855]	[11,705]
Number of observations	2,511	2,511	2,511
White			
A. Region, year	28,755*	106,601*	184,439*
	[11,392]	[23,030]	[56,721]
B. A + Age, Marital Status, Education	6,709	66,879*	126,862*
	[10,338]	[21,242]	[54,421]
C. B + Parents' Wealth	5,039	59,638*	102,332+
	[10,352]	[21,179]	[54,220]
Number of observations	4,069	4,069	4,069

Standard errors in brackets

+ p<0.10, * p<0.05

Table 4. Unconditional Quantile Regression coefficients on parents' veteran status (base category: non-veteran parents). Dependent variable: descendants' wealth (top- and bottom-coded at the 5th and 95th percentiles).

	25th	50th	75th
Black			
A. Region, year	16,649*	43,448*	71,674*
	[4,106]	[6,130]	[14,602]
B. A + Age, Marital Status, Education	8,977*	29,830*	39,413*
	[3,895]	[5,538]	[12,400]
C. B + Parents' Wealth	5,495	23,477*	27,482*
	[4,033]	[5,765]	[11,705]
Number of observations	2,511	2,511	2,511
White			
A. Region, year	28,738*	106,601*	184,439*
	[11,386]	[23,030]	[56,721]
B. A + Age, Marital Status, Education	6,705	66,879*	126,862*
	[10,332]	[21,242]	[54,421]
C. B + Parents' Wealth	5,036	59,638*	102,332+
	[10,347]	[21,179]	[54,220]
Number of observations	4,069	4,069	4,069

Standard errors in brackets

+ p<0.10, * p<0.05

Table 5. Unconditional Quantile Regression coefficients on Black (base category: white). Dependent variable: descendants' wealth (top- and bottom-coded at the 1st and 99th percentiles).

	25th	50th	75th
Non-veterans' descendants			
A. Region, year	-158,659*	-491,794*	-618,771*
	[12,401]	[38,304]	[90,278]
B. A + Age, Marital Status, Educat	-104,635*	-298,961*	-252,925*
	[12,614]	[36,584]	[86,465]
C. B + Parents' Wealth	-84,019*	-190,241*	-61591
	[12,953]	[34,919]	[84,649]
Number of observations	2,554	2,554	2,554
Veterans' descendants			
A. Region, year	-248,583*	-543,733*	-677,291*
	[20,674]	[34,170]	[57,310]
B. A + Age, Marital Status, Educat	-170,456*	-379,712*	-396,952*
	[19,709]	[36,464]	[62,156]
C. B + Parents' Wealth	-168,042*	-358,695*	-318,922*
	[19,709]	[36,807]	[64,215]
Number of observations	4,026	4,026	4,026

Standard errors in brackets

+ p<0.10, * p<0.05

Table 6. Unconditional Quantile Regression coefficients on Black (base category: white). Dependent variable: descendants' wealth (top- and bottom-coded at the 5th and 95th percentiles).

	25th	50th	75th
Non-veterans' descendants			
A. Region, year	-152,883*	-491,794*	-702,935*
	[11,950]	[38,304]	[74,131]
B. A + Age, Marital Status, Educat	-100,826*	-298,961*	-410,833*
	[12,155]	[36,584]	[69,939]
C. B + Parents' Wealth	-80,961*	-190,241*	-239,229*
	[12,481]	[34,919]	[67,971]
Number of observations	2,554	2,554	2,554
Veterans' descendants			
A. Region, year	-248,248*	-543,733*	-757,167*
	[20,646]	[34,170]	[48,017]
B. A + Age, Marital Status, Educat	-170,226*	-379,712*	-475,492*
	[19,683]	[36,464]	[53,622]
C. B + Parents' Wealth	-167,815*	-358,695*	-397,906*
	[19,683]	[36,807]	[55,939]
Number of observations	4,026	4,026	4,026

Standard errors in brackets

+ p<0.10, * p<0.05