FEDERAL RESERVE BANK
PHILADELPHIA

Working Papers
RESEARCH DEPARTMENT

The Racial Wealth Gap, Financial Aid, and College Access

Phillip Levine
Wellesley College and
Federal Reserve Bank of Philadelphia Consumer Finance Institute
Visiting Scholar

Dubravka Ritter
Federal Reserve Bank of Philadelphia
Consumer Finance Institute

WP 22-32

PUBLISHED
September 2022

FRB CFI
PHILADELPHIA

ISSN: 1962-5361

DOI: https://doi.org/10.21799/frbp.wp.2022.32

The Racial Wealth Gap, Financial Aid, and College Access

Phillip B. Levine*
Wellesley College and National Bureau of Economic Research

Dubravka Ritter†
Federal Reserve Bank of Philadelphia

September 2022

ABSTRACT

We examine how the racial wealth gap interacts with financial aid in American higher education to generate a disparate impact on college access and outcomes. Retirement savings and home equity are excluded from the formula used to estimate the amount a family can afford to pay. All else equal, omitting those assets mechanically increases the financial aid available to families that hold them. White families are more likely to own those assets and in larger amounts. We document this issue and explore its relationship with observed differences in college attendance, types of institutions attended, degrees attained, and education debt using data from the Survey of Consumer Finances (SCF), the National Postsecondary Student Aid Study (NPSAS), and the Panel Study of Income Dynamics (PSID). We show that this treatment of assets provides an implicit subsidy worth thousands of dollars annually to students from families with above-median incomes. White students receive larger subsidies relative to Black students and Hispanic students with similar family incomes, and this gap in subsidies is associated with disadvantages in educational advancement and student loan levels. It may explain 10 percent to 15 percent of white students' advantage in these outcomes relative to Black students and Hispanic students.

Keywords: racial wealth gap, racial wealth inequality, consumer finance, household finance, financial aid, FAFSA, college access, student loans, student debt

JEL Codes: D31, G51, I22, I24, J15

* Federal Reserve Bank of Philadelphia, Ten Independence Mall, Philadelphia, PA 19106-1574; email: dubravka.ritter@phil.frb.org.
† 106 Central Street, Wellesley, MA 02481; email: plevine@wellesley.edu.

Disclaimer: The views expressed here are those of the authors and do not necessarily reflect the views of the Federal Reserve Bank of Philadelphia or the Federal Reserve System. The authors simulate certain calculations from the federal financial aid system using a proprietary algorithm developed by nonprofit organization MyinTuition Corp; Levine is the founder and CEO of MyinTuition Corp. Nothing in the text should be construed as an endorsement of any organization or its products or services. No statements here should be treated as legal advice.
The collection of the Panel Study of Income Dynamics data used in this study was partly supported by the National Institutes of Health under grant number R01 HD069609 and R01 AG040213, and the National Science Foundation under award numbers SES 1157698 and 1623684.

We thank Kristin Butcher, Julia Cheney, Susan Dynarski, Robert Hunt, Igor Livshits, Trevon Logan, Samuel Lucas, Robin McKnight, Joy St. John, Lesley Turner, Douglas Webber, participants at the Spring 2022 meeting of the NBER Working Group on Race and Stratification, and seminar participants at the Federal Reserve Bank of Philadelphia, the University of Richmond, the University of Pennsylvania, and Wellesley College for helpful comments. We gratefully acknowledge excellent research assistance by Veronika Konovalova and Ian McGroarty.

The purpose of the financial aid system is to reduce the monetary constraint that families with fewer financial resources face in sending their children to college. Families with greater income and more assets are expected to pay more. The formula used to determine eligibility for financial aid is not contingent on students' race or ethnicity. Indeed, information on race and ethnicity are not requested on financial aid forms.

Yet race-neutral processes can generate disparate impacts if the underlying inputs are correlated with race and ethnicity.[1] For instance, assigning police officers to geographic locations today based on the spatial distribution of past arrests would not be race neutral if historical arrest rates were the result of racially disparate policing practices (Richardson, Schultz, and Crawford, 2019). And Brown (2021) documents that several components of the United States tax code provide an advantage to white taxpayers because racial differences in the sources and composition of income can generate racial disparities in tax burdens.

In this paper, we show that the college financial aid system's treatment of parental assets similarly has a disparate impact on racial and ethnic minority groups.[2] This disparate impact occurs because the federal financial aid formula does not factor in retirement savings and home equity associated with the parents' primary residence (*uncounted assets*). Failure to count these assets means that the amount of educational expenses some families are estimated to be able to afford is lower than it would have been if these assets were included in the formula. This may lead to relatively more financial aid for families who have retirement savings and own their own

[1] Throughout this paper, we refer to *disparate impact* as the effect of policies, practices, rules, or systems that appear to be neutral but result in a disproportionate negative impact on a protected group (in this paper, members of racial/ethnic minority groups).

[2] Bleemer and Mehta (2022) provide another example of a seemingly race-neutral higher education policy that has a disparate impact. In their analysis, they find that GPA cutoffs to major in popular disciplines at public universities contribute to racial/ethnic gaps in college major, restricting access to higher-paying fields for these students.

homes, generating an *implicit subsidy* enabling additional investment in education for these families.

White students are more likely to benefit from this implicit subsidy because white families are more likely to hold such assets and in larger amounts (Bhutta et al., 2020).[3] We document that these racial gaps in asset holdings also hold for families with children approaching college age. These disparities are very long-standing in nature and have existed for decades for a variety of reasons, including structural factors (Derenoncourt et al., 2022). If the financial aid system makes college more accessible for students whose families own these assets, then white students would be more likely to benefit through greater educational attainment and subsequent economic standing. Chetty et al. (2020), among others, document the improvements in social mobility associated with a college education.

We document the existence of these implicit subsidies in the financial aid system and the racial and ethnic disparities in their prevalence and magnitude.[4] Using data from the 2019 Survey of Consumer Finances (SCF), we confirm that white families with children approaching college age (ages 13 to 17) have considerably greater home equity and retirement savings than Black families or Hispanic families, particularly in the upper half of the income distribution. In fact, these assets represent most of their wealth for all but very high-income families. Our analysis of data from the 2015–2016 National Postsecondary Student Aid Study (NPSAS)

[3] Along with Brown (2021), Choukhmane et al. (2022) discuss the impact of tax advantages for retirement savings on the racial wealth gap. Auclert, Dobbie, and Goldsmith-Pinkham (2019) also show that the favorable treatment of home equity favors white families in bankruptcy laws.

[4] In all analyses, we focus on Black students and Hispanic students compared with white students, omitting a separate analysis of other racial and ethnic groups, including students of Asian American and Pacific Islander background. We do so partly because of insufficient sample sizes in the data we use and partly because wealth disparities are particularly prevalent and relevant for our analysis for Black students and Hispanic students. We also note that white, Black, and Hispanic students are mutually exclusive categories (i.e., white students and Black students are not also included in the category of Hispanic students). In much of our data, we are not able to separately identify students who have one parent that is Black or Hispanic.

indicates that many of these students who attend four-year institutions (public or private), who enroll full-time, and who live away from home are still quite likely to be eligible for financial aid.

Overall, we estimate that 851,000 students annually may benefit from the implicit subsidy associated with uncounted assets. That number represents 10 percent of all dependent students enrolled in college and 27 percent of those enrolled full-time, living away from home, and at a four-year institution. We estimate that white students tend to receive implicit subsidies that are $2,200 and $800 per year greater than subsidies received by Black students and Hispanic students, respectively. The aggregate value of this implicit subsidy, which disproportionally benefits students from white families, is $2.3 billion per year, which is twice the annual budget of the Federal Work–Study program.

We also present a descriptive analysis highlighting how these differences in affordability are consistent with patterns in college enrollment and how parents and students pay for college once enrolled. Again, using data from the 2015–2016 NPSAS, we show that white students with above-median family incomes are more likely to enroll at institutions that charge higher prices than Black students or Hispanic students with similar incomes. This is consistent with the greater ability of white students to leverage their uncounted assets to attend a higher-priced college. Those institutions typically have higher rates of persistence and graduation.[5]

We also show that the implicit subsidy is correlated with the way parents help their children pay for college. We consider students attending comparably priced institutions and

[5] Data available in National Student Clearinghouse Research Center (2022) document that college completion rates are highest in four-year private, nonprofit colleges, then four-year public colleges, and lowest at two-year public colleges. These categories align with typical costs of attendance. Our own analysis of IPEDS data also indicates a strong correlation between cost of attendance and graduation rates. These statistics ignore possible issues of selection bias.

focus on families with higher levels of income and counted assets who are more likely to receive the subsidy. We find that parents of white students are more likely to pay *out of pocket* than to cover educational costs using debt relative to Black parents and Hispanic parents, even after controlling for income and counted assets. They may do so because they can take advantage of the additional financial resources — in the form of uncounted assets — that are overlooked in the financial aid process.

Finally, we conduct an econometric analysis using data from the Panel Study of Income Dynamics (PSID), examining the role that the treatment of uncounted assets likely plays in determining racial differences in college outcomes. We examine racial/ethnic gaps in enrollment, type of institution attended, completion, and student borrowing. We relate those outcomes to the estimated size of the implicit subsidy, controlling for students' estimated ability to pay determined by the federal financial aid system (based solely on income and counted assets), along with other indicators of socioeconomic status, and, in some specifications, grades and test scores.

Our results indicate that the estimated implicit subsidy associated with uncounted assets is related to differences in the examined educational outcomes, even after controlling for income and counted assets. Racial and ethnic differences in the implicit subsidy can "explain" 10 percent to 15 percent of the gaps in most college outcomes we examined.

We acknowledge that it is challenging to unequivocally conclude that the identified relationships are causal based on any single data source or analysis in this paper. Nevertheless, the weight of the evidence, taken together, is consistent with an interpretation that the treatment of uncounted assets in the federal financial aid system leads to disparities in college access and outcomes, with Black students experiencing the largest disparities.

I. The Financial Aid System

A. Financial Need, Expected Family Contribution, and the Role of Assets

How much financial aid should a student receive? A need-based financial aid award is generally capped at a level defined as *financial need*, which represents an institution's cost of attendance (COA) less the amount the family is estimated to be able to pay.[6] The COA is a broad measure of college costs, including tuition, living expenses that may include room and board, and other miscellaneous expenses, such as books and travel. Each institution that participates in the federal financial aid program is required to report this total amount as its COA.

The difficult part of the process is determining how much a family can afford to pay, a concept that is inherently nebulous. Despite the obvious difficulties in defining and measuring an ability to pay, the financial aid system includes such a calculation based on the information that students and their parents provide in the Free Application for Federal Student Aid (FAFSA).[7] Not surprisingly, income and assets are important components of that calculation. The result of that data collection and calculation is the Expected Family Contribution (EFC).

In the current version of FAFSA, Questions 88 through 90 focus on wealth.[8] They ask about the "current balance of cash, savings, and checking accounts" (Question 88), the value of

[6] The analysis provided in this paper focuses on dependent students because we are concerned with how the racial gap in family wealth may lead to disparate outcomes for children. We acknowledge the myriad challenges faced by adult learners and independent students more generally.

[7] Roughly 250 largely private colleges and universities also require students to complete a more detailed financial aid form, the CSS Profile. That form also asks about home equity; many institutions that require students to complete the CSS Profile do count at least some of that home equity in determining their financial aid awards. As we discuss next, though, the vast majority of college students attend institutions that rely exclusively on FAFSA. We will restrict our analysis to the details of the federal system.

[8] This discussion is based on the current version of FAFSA and the time of our analysis. The FAFSA Simplification Act, passed in December 2020, will change the specifics of the FAFSA form with a scheduled phase-in beginning in July 2023. The details of the new form are not currently available, but changing the treatment of assets was not a focus of the legislation.

"parent's investments, including real estate" (Question 89), and the value of "current businesses and/or investment farms" (Question 90). Question 89 specifically indicates "**Don't include** the home in which your parents live (emphasis included)." It also directs applicants to a note, which indicates that "**investments do not include** … retirement plans (401[k] plans, pension funds, annuities, non-education IRAs, Keogh plans, etc.)" (emphasis included).

The argument in favor of ignoring home equity and retirement savings was that families should not be expected to borrow against their homes or diminish their retirement savings to pay for a child's college education.[9] From an economic perspective, however, those with greater resources have a greater ability to pay than those with lesser. Edlin (1993) argues in favor of an approach based on permanent income, but a blend of current income and assets may be the closest feasible approach to capture that concept.

B. The Impact of the Racial Wealth Gap on the EFC

The racial wealth gap interacts with these institutional features of the federal financial aid system to generate racial disparities in college affordability *between students with the same EFC*. We use data from the 2019 SCF to document the wealth gap, focusing specifically on families with children approaching college age (ages 13 to 17). We categorize assets into those that are counted by the federal financial aid formula (such as cash and financial investments) and those that are uncounted (including primary home equity and retirement savings).

Figure 1 displays the composition of counted and uncounted assets by race/ethnicity and family income. The sum of median counted and uncounted assets approximates net worth. The

[9] Mullaney (2019) expresses concerns along these lines. Note that home equity was considered in determining eligibility for federal financial aid prior to 1992. This 1992 EFC formula change potentially offers the opportunity to examine its impact, but it occurred in the context of broader legislation that altered other aspects of the financial aid system, limiting our ability to use it as a natural experiment.

income bands include those below $75,000 (roughly the median family income for this sample), incomes between $75,000 and $125,000 (often eligible for financial aid at public residential four-year universities with typical levels of counted assets) and between $125,000 and $200,000 (often eligible for financial aid at private universities with typical counted asset levels).[10]

Not surprisingly, asset holdings are higher for families in the higher income bands. Within each income band, white families have more assets, confirming the existence of a racial wealth gap. That wealth gap is larger in the higher family income bands. Those with below-median income levels have few assets regardless of race or ethnicity, although even at those low asset levels, a small racial wealth gap is apparent. The other obvious pattern displayed in Figure 1 is that most assets among families in income bands likely to be eligible for financial aid are uncounted in the federal financial aid system. For those with incomes in the top two of the displayed ranges, median uncounted assets are roughly three times as large as counted assets.

Omitting home equity and retirement savings from the EFC calculation provides students from white families with a significant financial advantage in college affordability. We measure that advantage by simulating *current EFC* (the value the current federal financial aid formula generates) and *full-asset EFC* (the value that would result if all assets were treated the same way as counted assets are now).[11] In this and other sections of the paper, the simulations rely on a

[10] In our sample, the shares of families with children approaching college age in the three family income categories in Figure 2 are 40 percent, 23 percent, and 17 percent, respectively for white families; 71 percent, 19 percent, and 7 percent for Black families; and 72 percent, 13 percent, and 11 percent for Hispanic families. The remaining shares of families are in the excluded income category of greater than $200,000. In our sample, 50.8 percent of families have family incomes above $75,000.

[11] We note that there are generally limits to how much equity can be extracted from one's home in the form of a home equity loan and that there are sometimes penalties for early withdrawals of retirement funding. Since parents would be expected to extract only a small fraction of their assets toward their child's education, we do not believe this constraint would be binding for many families.

proprietary algorithm developed by MyinTuition Corp.[12] The difference between full-asset EFC and current EFC represents the reduction in EFC due to uncounted assets.

Figure 2 documents the extent of the EFC reduction associated with uncounted assets by income and race/ethnicity. As one might expect based on the low level of assets held by families with below-median incomes, the distinction between counted and uncounted assets generates a modest racial and ethnic gap. The racial wealth gap is less consequential among families with little wealth.

This is not true, though, among families with incomes in the upper half of the income distribution. For those students from families with incomes between $75,000 and $125,000, we calculate that the median EFC reduction associated with uncounted assets is $5,600 for white students and $2,800 for Black students. Among those with incomes between $125,000 and $200,000, the advantage that students from white families face is even larger. For them, their EFC is $15,600 lower than it would be if all their assets were counted. Students from Black families would benefit as well, but the EFC reduction for them is only $3,700. Students from Hispanic families fall between these two racial/ethnic groups.

C. The Relationship Between EFC and Net Price

Omitting retirement savings and home equity lowers the EFC, but that does not necessarily translate dollar-for-dollar to a reduction in the *net price* of college. The net price is defined as the COA (or *sticker price*) less *grant-based financial aid*, which does not need to be paid back. The

[12] MyinTuition is an online tool that dozens of colleges and universities use to provide ballpark financial aid estimates based on a small number of financial inputs and the number of siblings enrolled in college. Levine is the founder and CEO of MyinTuition Corp. Minor differences across schools exist in the computation of the EFC, but the approach used here would be relevant for typical institutions. For present purposes, the algorithm used simulates the federal methodology based on FAFSA. To simplify the subsequent analysis and discussion, we restrict all calculations to cases in which the family has only one child in college at a time.

net price is equivalent to the sum of direct payments, student loans, and work–study funding. If the expected direct payments equaled the EFC, which occurs at institutions that *meet full need*, then the EFC and net price would be perfectly correlated because the institution would always cover COA less EFC with grants. Any impact of uncounted assets on EFC would translate directly to reductions in net price.

But most institutions do not meet full need. Students eligible for financial aid make direct payments beyond the amount they can afford, as calculated by the EFC. These institutions are said to *gap*. The financial aid award calculation starts with the COA and subtracts from that the student's EFC. Aid available from the federal government is subtracted next: Pell Grants, Direct Student Loans, and work–study funding.[13] If there is remaining financial need, colleges can provide *institutional grant-based aid*.[14] Most institutions, though, are not able to provide enough institutional grant-based aid to fill the difference between COA and the sum of EFC and federal financial aid completely (Levine, 2022). The student is expected to pay whatever remains, meaning that direct payments from students and their families are usually greater than the EFC.

Consider, for instance, a new student with a $20,000 EFC (reasonable for a family with $100,000 in income and typical assets) attending an institution with a $40,000 sticker price. This student is not eligible for a Pell Grant but could receive $2,500 in work–study funding and borrow $5,500, the federal limit for first-year students. The remaining need is $12,000. Institutional grant aid would equal that amount at institutions that met full need; the net price would be $28,000 ($20,000 EFC + $2,500 work–study + $5,500 federal loans). Instead, if the

[13] Grant-based aid is also available from other state and federal sources, but they represent a relatively small share of the financial aid pie.

[14] This form of aid may include both need-based and merit-based awards, but we note that merit-based awards often substitute for need-based awards, at least partially, for students with financial need (Levine, 2022), often making the distinction arbitrary.

institution provided $8,000 in grant aid, the net price would be $32,000. The student would be expected to pay $24,000 directly, greater than the EFC by $4,000 (i.e., the gap).

Now suppose the student's EFC dropped to $15,000, perhaps because some of their assets were uncounted. The remaining need would increase to $17,000 after federal sources of aid are included, increasing the need for institutional grant aid. How would the amount of institutional grant aid awarded change? The effect on net price depends on each institution's financial aid policy. It is not definitive.

Ultimately, the relationship between the EFC and net price is an empirical question that we address next. But before doing so, we need to distinguish the population of students who are likely to receive additional grant aid because of uncounted assets. These are the students whose net price would likely be affected.

D. How Many Students' Net Price May be Affected by Uncounted Assets?

Three conditions need to be met for a student to benefit from the preferential treatment of home equity and retirement savings in the financial aid system. First, their family must own those forms of assets. Second, they must be eligible for grant-based financial aid provided by the educational institution. Third, their financial need must be extensive enough that it exceeds the gaps institutions typically use in determining financial aid awards.

In **Appendix A**, we operationalize these conditions, applying 2015–2016 NPSAS data to estimate the number of students who currently are likely to benefit from the treatment of uncounted assets. The NPSAS data are high quality, merging administrative data from the U.S. Department of Education and data from the higher educational institutions that students attend, among other sources. The sample size is large; in these data, we restrict our analysis to the

33,000 dependent students enrolled at a single higher-educational institution. The students in the NPSAS sample are representative of 8.8 million of the 19 million total students enrolled each year.

In these data, detailed information on asset ownership is not available, but we consider Pell Grant recipients to be unlikely to own uncounted assets in meaningful amounts. Students ineligible for Pell Grants are much more likely to own such assets.[15] Students are eligible for institutional grant-based financial aid if their COA is greater than the sum of their EFC, maximum federal student loan, and work–study funding, all of which are available in these data. Finally, we use these data to estimate that the median value of the gap observed in financial aid awards at a typical four-year institution (public or private) is $5,000. Eligibility for grant-based aid would likely need to exceed that amount to benefit from the presence of uncounted assets.

The results of this analysis are presented in **Appendix Table A.1**. In summary, we find that the students most likely to benefit from omitting home equity and retirement savings from the EFC calculation include those who are enrolled full-time, who live away from home, and attend four-year institutions. Those are the students who face a high enough COA so that they still have sufficient financial need despite a greater likelihood of uncounted asset ownership. Among the 8.8 million dependent students enrolled at a single institution (column 1), we find that 851,000 satisfy the conditions identified that would make them eligible to benefit from the preferential treatment of uncounted assets (column 2). This represents 10 percent of all

[15]Data from the SCF support these assertions. Based on the asset data available and our simulated EFC values, we find that 89 percent of families with EFCs between $5,750 (the Pell Grant cutoff in 2015–2016) and $60,000 have uncounted assets (median value for those who do is $141,000). Meanwhile, only 47 percent of Pell Grant-eligible families have uncounted assets, and the amounts are lower (median value for those who have these assets is $45,000).

dependent students enrolled in college and 27 percent of those enrolled at four-year institutions. Of those, 581,000 (over two-thirds) actually received institutional grant-based aid (column 3).

E. The Impact on Net Price, the Size of Implicit Subsidies, and Their Total Cost

For those students whose net prices are likely to be affected by ownership of uncounted assets (851,000), we estimate the relationship between EFC and net price. We distinguish between private and public institutions, further separating students in the latter category into those who live in the state of the institution from those who do not. **Figure 3** shows those relationships. The results indicate that net prices clearly rise with the EFC, but the slopes are less than one in all categories of institutions. As an approximation, the average slopes are around 0.6 in each category of institution. For these students, the presence of uncounted assets that reduce the EFC by $1 would reduce the students' net price by around 60 cents.

Earlier, we provided data on EFC reductions based on the presence of uncounted assets, which were considerably greater for white students than for Black students and Hispanic students. We now have the ability to convert those EFC reductions to a *net price reduction,* based on the preceding analysis. This net price reduction is the implicit subsidy provided to holders of those assets. **Appendix B** provides the details regarding these calculations.

Overall, we estimate that the average subsidy available to likely eligible students amounts to $3,900. Based on the racial and ethnic differences observed in the EFC reduction, it is not surprising that white students in this group are eligible for larger net price reductions/implicit subsidies compared with Black students and Hispanic students because of their families' greater ownership of uncounted assets. The net price reduction averages $4,100 per year for white students, $1,900 per year for Black students, and $3,300 per year for Hispanic students.

Ultimately, excluding home equity and retirement savings from the EFC makes college $2,200 per year less expensive for white students relative to Black students and $800 per year less expensive relative to Hispanic students, on average, among students likely to receive the implicit subsidy. This subsidy is not only regressive (because higher-income households receive larger subsidies), but its disparate impact rises with incomes as well, just as with the EFC itself.

Earlier, we reported that 851,00 students were estimated to fall into the category of likely eligible students, and 581,000 of them actually received institutional grant aid. Using the smaller number to be conservative, these implicit subsidies amount to $2.3 billion per year ($3,900×581,000).[16] Of that amount, $1.8 billion (78.9 percent) is awarded to white students, $66 million (2.9 percent) to Black students, and $134 million (5.9 percent) to Hispanic students (students of other race/ethnicity groups receive the rest).

These differences in college costs are meaningful enough to potentially alter the college-going plans of affected students, including whether to attend at all, as well as the type and cost of institution selected. The subsequent analysis addresses some of those choices, distinguishing students solely by their family finances.

II. College Choice and Means of Payment

We extend our analysis by providing descriptive evidence regarding the relationship among college affordability, race/ethnicity, and college outcomes. Specifically, we compare differences

[16] This number is slightly overstated because some students attend institutions that use the institutional methodology (IM) incorporated into the CSS/Profile, not the federal methodology (FM) that FAFSA relies on. IM includes home equity in its formula. Those students would still receive a subsidy, but it would be smaller. We find that of the 581,000 recipients of institutional grant aid included in this calculation, 80 percent attend institutions that rely on FM.

in affordability by race and ethnicity with differences in the types of colleges students attend and how they pay for them using data from the 2015–2016 NPSAS.

Initially, we consider the COA at the institutions in which these students enroll, disaggregated by race/ethnicity and families' financial status. The COA (or the *sticker price*) at an institution is strongly correlated with rates of persistence and graduation. Many students do not pay this sticker price because they are eligible for financial aid, but it is an indication of the overall expense of the type of institution students choose to attend. Those students who can afford it may be more likely to enroll at institutions that generally charge their students higher prices.

Figure 4 presents enrollment patterns for students by categories of the EFC, which incorporates both data on income, as in Figures 1 and 2 using SCF data, and counted assets. Perhaps not surprisingly, these data indicate that higher EFC families enroll their children at institutions with a higher COA. Racial and ethnic differences, though, emerge in this relationship. For families with an EFC below $5,000 (close to the cutoff for Pell Grant eligibility), the average COA is similar between white students and Black students. As the EFC rises, a gap by race emerges. Students from higher-EFC white families attend institutions that charge considerably higher sticker prices. One potential explanation is that those institutions are more affordable for them, despite similar levels of income and uncounted assets — perhaps because their families hold higher levels of uncounted wealth, as evidenced by our analysis of SCF data.

Enrollment patterns of Hispanic students from higher EFC families (between $30,000 and $60,000) fit the pattern we would anticipate based on Figures 1 and 2. Their level of uncounted wealth is between white students and Black students, and the average COA at the institutions

these students attend is between white and Black students, as well. Lower- and middle-EFC Hispanic students, though, attend institutions that typically cost less than those of the other groups — conditional on financial resources — and that is reflected in the lowest average COA of all three groups. Although a full examination of the differences in enrollment patterns between Black students and Hispanic students is beyond the scope of this analysis, we do know that Hispanic students are particularly likely to enroll in community colleges that have a low COA (Ma and Baum, 2016). That said, it is apparent from this descriptive analysis that differences in the types of institutions families can afford broadly reflect the racial/ethnic gaps in uncounted assets presented in earlier figures.

We also use the NPSAS data to examine how families pay for college. For this analysis, we restrict the sample of students to those who were enrolled full-time, at a not-for-profit, four-year institution, and living away from their parents. We also distinguish between public and private institutions, focusing our analysis of public institutions on state residents because they are far more numerous. All these decisions are designed to narrow the gap considerably in terms of the cost of attending these institutions.

We also go one step further and distinguish students by their EFC, a statistic available in these data and drawn from the students' FAFSA filing. If the financial aid system worked as intended, the gap in net prices between students within these EFC categories should be small, based on the sample restrictions imposed. We examine all forms of contributions, including student loans and earnings, along with contributions from other family members, but we focus this discussion on contributions made by parents.[17] The amounts of parental contributions are

[17] Complete data regarding all payment types by race/ethnicity are reported in Appendix Tables D.1 and D.2 for private and public four-year institutions, respectively. We use *contribution* to denote any type of funds received by the institution (cash or cash equivalent and loan disbursements), while *payments* are direct cash or cash equivalent transfers to colleges.

distinguished by whether they were made as direct payments (i.e., the parents *wrote a check*) or whether they took the form of debt (i.e., a Parent PLUS or private education loans).[18]

Figure 5 reports the results of this exercise. The main results are not surprising — parents of students from higher EFC families made larger contributions to cover their children's educational expenses. That pattern is roughly consistent by race and ethnicity. In fact, the level of those total contributions within an EFC category across racial and ethnic groups is similar.[19]

Where we do see a striking pattern is the source of those contributions among families in the higher EFC categories. Among these families, Black parents with children enrolled at both types of institutions and Hispanic parents with children enrolled at public institutions make a larger share of their contributions by borrowing. At private institutions, one-third to one-half of parent contributions among higher EFC Black families comes from debt. For white parents, that figure is more like 10 percent to 20 percent. For families with children attending public institutions, parents typically borrow less, which is consistent with the lower price tag. Still, both Black families and Hispanic families in the highest EFC category rely more heavily on parental loans than the comparable EFC parents of white students. The existence of considerably higher uncounted assets among white families, as detailed in Figures 1 and 2, may help to explain that discrepancy. White parents in these EFC categories have more assets from which to draw to reduce borrowing relative to Black parents or Hispanic parents.

[18] In the NPSAS data, private loans for undergraduates are categorized as *student loans*. As the vast majority of private loans to undergraduates are originated or cosigned by parents and repaid by parents, we attribute those loan amounts to parents (MeasureOne, 2021). The overall conclusions from this exercise are unaffected by this data choice.

[19] Within an EFC category, white families do have a higher average EFC, but differences between them and Black families or Hispanic families is not large.

III. Behavioral Analysis of College Enrollment, Graduation, and Debt

In this section, we use data from the Panel Study of Income Dynamics (PSID), extending our analysis to examine whether the extent of uncounted assets and the associated net price reduction (implicit subsidy) is related to differences in educational outcomes after holding constant potentially confounding factors.

A. Methodological Approach

The role that wealth plays in college enrollment and subsequent economic outcomes for children has been previously documented, focusing primarily on variation in home equity (Lovenheim, 2011; Lovenheim and Reynolds, 2013; Charles, Hurst, and Notowidigdo, 2018; Johnson, 2020; Bulman et al., 2021; and Hotz et al., forthcoming). For the most part, though, these studies omit the detail that some forms of wealth are largely overlooked (*uncounted*) by the federal financial aid system, and none have explored the impact of racial disparities in wealth.[20]

We modify the general approach used in previous analyses to highlight the role played by uncounted assets. Specifically, the basic econometric model we seek to estimate takes the form:

$$y_i = \beta_0 + \beta_1 black_i + \beta_2 hisp_i + \beta_2 efc_i + \beta_3 efc_i^2 + \boldsymbol{\beta_4(net\ price\ reduction_i)} + \boldsymbol{\beta_5(net\ price\ reduction_i^2)} + \beta_6 X_i + \varepsilon_i. \quad (1)$$

In this specification, *y* reflects the educational outcomes we consider for student *i*; we focus on college enrollment (any enrollment and type of institution), graduation, and debt holdings. We hold constant race and ethnicity along with nonlinear controls for a student's EFC. That variable represents a combination of income and counted assets; it is estimated from publicly available PSID data comparably to the approach we described earlier using the SCF (we provide more

[20] Similar issues exist regarding the consideration of disparities in transfers of wealth from extended family members, such as grandparents, in the context of paying for college. Lefebvre (2018) focuses on that issue.

details on the data we use below and in **Appendix C**). We also include measures of a family's socioeconomic status as additional control variables.

The key right-hand side variables in this model, though, is the net price reduction, included as a quadratic. It is constructed by first estimating the EFC reduction using an analogous approach to that described earlier using SCF data (as displayed in Figure 2). We scale the EFC reduction by 0.6 to estimate the net price reduction based on the estimated relationship between EFC and net price reported previously in Figure 3. Again, the net price reduction acts as an implicit subsidy toward the financing of higher education for families who hold those uncounted assets.

In this model, the EFC holds constant direct measures of ability to pay, as calculated by the current federal financial formula, which only incorporates family income and counted assets. The extent of financial aid a student receives is linked to their EFC; students with a higher EFC tend to pay a higher net price to attend college. The financial aid that families with lower levels of income and counted asset receive should dampen the impact on college attainment of having fewer resources to pay for college. The relationship between financial resources and college pricing is nonlinear, though. At some point, as resources get large enough, they no longer affect the amount of financial aid available; the student is no longer eligible. This explains why we include both the EFC and the net price reduction in this specification nonlinearly.

Other unobserved family and neighborhood characteristics are likely to be linked to college outcomes and to family income and counted measures of wealth (such as the quality of K–12 schooling; see Baum and McPherson, 2022). The EFC is at least partially controlling for those factors as well. These other characteristics likely introduce a positive bias in the estimated

relationship between the EFC and college outcomes. Our focus, though, is not on the EFC coefficient directly, but as a control variable.

It is the relationship between the net price reduction and educational outcomes that we highlight. If a larger net price reduction improves educational outcomes controlling on the EFC, that suggests a benefit associated with the greater affordability resulting from the uncounted assets excluded from the financial aid formula (subject to the caveats to this interpretation, discussed next).

We also estimate alternative specifications that add controls for students' high school records, measured by test scores and grades. The presence of greater financial resources may improve students' high school record, making them more attractive to colleges and universities. Controlling for the high school record reduces the potential influence of that confounding factor. Alternatively, though, students who anticipate college will be less affordable may *invest less* in their academic performance. Concerns regarding racial and ethnic gaps in test scores (Smith and Reeves, 2020) are another limitation in including them in our analysis. In our main specifications provided next, we report results excluding test scores and grades, but we also test the sensitivity of these estimates, reporting results from models that include test scores and grades in additional tables provided in **Appendix D**.

Regardless of the specification, there remains the potential that our key explanatory variable, the net price reduction, is endogenous. Holding certain forms of assets, such as home equity and retirement savings, represents a portfolio decision. Those choosing to hold assets in those forms may also have greater preferences toward providing their children with a college education. It is possible that our included explanatory variables do not fully capture those preferences, which would likely introduce an upward bias in the relationship between the net

price reduction and educational outcomes. Alternatively, uncounted assets could be affecting college outcomes directly by purchasing more college preparatory classes, for example. This would similarly introduce an upward bias.[21]

One approach to addressing this problem is to implement an instrumental variables strategy. Past research has done so in analyses addressing the impact of wealth on college outcomes. Lovenheim (2011) was the first study to estimate models of college attendance as a function of wealth, instrumented by recent home price changes. Lovenheim and Reynolds (2013) examine the type of colleges students attend as a function of recent home price changes, which represents a reduced form variant of Lovenheim (2011). Cooper and Luengo-Prado (2015) estimate a similar reduced form specification to examine young adult earnings, comparing the behavior of renters and homeowners as a specification check. Johnson (2020) also estimates an instrumental variables model on college graduation similar to Lovenheim (2011), but also distinguishing renters from homeowners. Each of these papers found that greater housing wealth improved college outcomes.[22]

Our application is somewhat different, and more complicated, though. We focus on the composition of wealth along with its level. In essence, an instrumental variables strategy would require a source of exogenous variation both in counted assets and uncounted assets separately.

[21] Haider and McGarry (2018) similarly report the results of OLS models relating college outcomes to financial wealth using the same component of the PSID data we use (the Transition to Adulthood supplement, described next) along with the Health and Retirement Survey. They similarly find a strong relationship between wealth and college outcomes.

[22] Three additional papers address other aspects of the relationship between wealth and college attendance. Hotz et al. (forthcoming) shows that the relationship between home equity and college attendance is moderated by transfers of that wealth between parents and their children. Charles, Hurst, and Notowidigdo (2018) find that students who live in areas experiencing large changes in housing prices (*booms* or *busts*) found that college attendance dropped because of the opportunity cost of employment options. Bulman et al. (2021) finds that children in households that recently received moderate lottery payouts are only somewhat more likely to attend college. Large lottery winners, however, are considerably more likely to attend.

Beyond capturing total wealth, it would require identification of portfolio choice. Moreover, we have a conceptual expectation based on the structure of the financial aid system that any such impact of wealth should be nonlinear. Past research provides one possible instrument; recent changes in home prices as a predictor of home equity in the years leading up to college entry, but that instrument is insufficient to overcome the identification problem we face.

Instead, we estimate OLS models of the forms reported in Equation 1. Our methods enable us to provide some support regarding causation. First, we conduct a placebo test, estimating the same model for high school graduation, an outcome in which the structure of the financial aid system and the existence of uncounted assets should play less of a role. Second, as we discussed earlier, any effect of uncounted assets should enter the model nonlinearly, consistent with our characterization of the relationship between financial resources and college pricing. Neither of these additional pieces of evidence can definitively distinguish a causal effect from a spurious one, but they do move us in that direction. It is the combination of these results along with our earlier analyses that provides the ability to suggest a causal conclusion based on the preponderance of the evidence.

B. The PSID Data

To implement this approach, we use data from the PSID. Data collection for the PSID began in 1968, initially surveying around 5,000 families and 18,000 individuals. Those original members, their offspring, and any new members of those households continue to be interviewed biennially, with the last available data from the 2019 survey at the time of our analysis.

For our purposes, these data possess two components critical for our analysis, detailed data on college outcomes for one cohort of children, and income and asset data necessary to

construct the relevant EFC and net price reduction measures. Beginning in 1997, the PSID began the Child Development Supplement (CDS), which included detailed information on the lives of children ages 12 and younger. As those children aged, they transitioned into the subsequent Transition to Adulthood Supplement (TAS), which began in 2005 and has been conducted biennially since then. The TAS provides extensive additional information not included elsewhere in the survey. Our focus is on the CDS cohort as they progressed from ages 18 to 28.

We use the extensive detail obtained from TAS cohort members in our PSID data regarding their educational outcomes, including the IPEDS institution identifier for those students who enrolled in college.[23] We use these data to create indicators of whether TAS respondents enrolled in college by age 19, the type of institution in which they enrolled if they did attend college (private four-year, public four-year, or other — mainly community colleges), and whether they received a bachelor's degree. Our full sample includes 2,464 individuals.[24]

Along with these measures of educational attainment, the TAS data also enable us to examine the extent to which students took on debt to finance a college education. Information on parent and student educational debt were also collected in the TAS. Andreski et al. (2015) report a comparison of these student loan data with other data in NPSAS. The two sources of data differ somewhat in the borrowing being measured (all student borrowing versus borrowing among currently enrolled students). The authors conclude that "the estimates in the two sources are, in

[23] The institution identifier is only available for users with a restricted use agreement. The TAS also includes data on student test scores (ACT and/or SAT) and high school grades. Appendix C provides more detail regarding the construction of those and other measures obtained from the PSID.

[24] In all analyses, we include sample weights that account for the longitudinal structure of the PSID data and the differential attrition that takes place over time (*individual longitudinal weights*). We use the value of this weight in the survey year relevant for the outcome measured (i.e., college enrollment in the year respondents were ages 17/18 and college graduation at ages 23/24. Note: Two ages are required because of the biennial nature of the survey). A small number of TAS respondents did not complete the survey in the relevant years. We omit those individuals from our analysis. The IPEDS data are from the U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), 2019.

general, fairly similar, although some differences do exist." We use these PSID data on student debt as an outcome measure in our analysis.

One outcome that would have been desirable to add to this analysis is the amount of parent loans that families took out to pay these students' higher education bills. We saw important patterns in that measure in the NPSAS data. Unfortunately, these data are not separately broken out in the TAS supplement.

The detailed data on income and wealth available in the PSID provide us with the ability to construct our key explanatory variables, the EFC, and the net price reduction. PSID data on income and wealth have been shown to compare favorably with data available from the SCF (Pfeffer et al., 2016).[25] As we described in our earlier analysis of those SCF data, dividing wealth into the parts that are counted by the financial aid system and the parts that are not (distinguished by the treatment of retirement savings and home equity) is critical for generating measures of the EFC and the net price reduction for each survey respondent. The PSID contains that level of detail.[26] We use the family-based structure of the PSID to obtain the wealth components we need for TAS respondents based on their parents' wealth in the years leading up to potential college entry for dependent students.[27]

Beyond these data items specific to our key explanatory and outcome measures, the overall structure of the PSID provides other advantages. We use the longitudinal, family-based

[25] Net worth data from the SCF are somewhat higher than that in the PSID, although most of the gap results from SCF respondents in the very top of the wealth distribution. Differences in wealth throughout the remainder of the distribution are modest.

[26] We note that the PSID estimates of the net price reduction are a lower bound because respondents are asked about retirement funds in individual retirement accounts, not balances in employer defined contribution pension plans (Cooper, Dynan, and Rhodenhiser, 2019). According to the Investment Company Institute (2020), IRA balances total $11 trillion compared with $8.7 trillion in defined contribution pension plans.

[27] Typically, parent wealth is measured when the child is age 17 or 18, but in those instances where the family is not included in the survey when the child is that age, we use parent wealth at ages 15 or 16 if those data are available.

structure of these data to provide additional measures of each family's socioeconomic status (SES) beyond their current EFC. In all econometric models, we also control for mother's educational attainment along with her marital status at birth and her age when the student was born.[28]

Table 1 presents a series of descriptive statistics from our PSID-TAS extract. The top panel of the table provides details of families' financial characteristics for all respondents and by race/ethnicity. We present both the median and 75th percentile values of family income, net worth, and counted and uncounted assets separately. Income and wealth differences by race/ethnicity are well documented. Table 1 also supports earlier findings that most assets are uncounted at these positions in the wealth distribution; white families have considerably more uncounted assets. The formula for calculating the EFC would therefore affect college affordability more for these families.

The remainder of the table documents differences in the educational outcomes we examine in this analysis. Statistics are segmented by whether the population included is all students, those enrolled in college, or those who graduated from college, with relevant outcomes considered in each category. The patterns observed here are largely consistent with those observed elsewhere (de Brey, 2019). In particular, differences in educational patterns between white students and Black students are large. Gaps between white students and Hispanic students are still evident in places. The question we address in this analysis is whether any of those disparities in college outcomes, and particularly those between white students and Black

[28] We focus on mother's characteristics because children are more likely to be living with their mothers throughout their childhood, increasing mothers' influence on children's outcomes. We also measure marital status at birth rather than contemporaneously because of the possible endogeneity of current marital status and family finances.

students, can be attributable to differences in college affordability driven by omitting some forms of assets from financial aid calculations.

C. Econometric Results

The results of our regression analysis are reported in **Tables 2 and 3**. Analogous results of models that also include test scores and grades are reported in **Appendix Tables D.3 and D.4**. As highlighted earlier, our focus is on the impact of the net price reduction that prospective college students face if they have greater assets in the form of home equity and retirement savings. Our tables focus on those coefficients. We also report the coefficients on race/ethnicity indicator variables, since differences across groups are also a focus of this analysis. We also report in these tables the results of regressions with just those indicator variables included to estimate unadjusted differences across groups in later tables.

We initially focus on the likelihood of graduating from high school and then the decision to enroll in college in Table 2. The top panel of the table demonstrates the same raw gaps in educational attainment as reported in Table 1. The bottom panel of the table reports the results of our multivariate analysis. The results indicate that even after controlling nonlinearly for estimated EFC and other indicators of socioeconomic status, the presence of additional grant aid due to greater uncounted assets (quantified by our net price reduction) is positively related to college enrollment (column 2). We interpret the magnitude of these effects next.

Moreover, note that the exact same specification for high school graduation yields different results. We find no statistically significant relationship between the net price reduction and the likelihood of high school graduation (column 1). Neither of these findings is definitive in "proving" our proposed mechanism is causal, but they are consistent with a causal interpretation.

The remainder of the table indicates that these increases in enrollment would be more common at public and private four-year institutions. Enrollment at other institutions (mainly community colleges) would fall.

Table 3 provides results from the same analysis focusing on ultimate degree completion (two-year or four-year) and student loan debt at ages 21 or 22.[29] We conduct this analysis separately for all survey participants and for those who started college for degree completion and for those who graduated from a four-year college for student loan debt. The results are consistent with a beneficial impact of increased grant aid due to uncounted assets on subsequent education outcomes. Uncounted assets are positively related to graduation from a four-year institution and negatively related to receiving a two-year degree and to owing student loan debt.[30]

We also have estimated alternative specifications that control for student grades and test scores (ACT/SAT), which are available in these data. As discussed previously, the advantage of including these variables is that they can capture differences in student performance —which may be attributable to disparities along geographic dimensions, like public investments made at earlier stages in a student's life — or help to absorb some broader unobserved heterogeneity. They may also capture differences in anticipated college affordability, though. Students more comfortable in their ability to afford college may be more likely to take the SAT (perhaps paying for courses to increase their scores), for instance.

[29] Our goal is to measure student loan debt around the time a student may have graduated from a four-year institution but had not yet started repaying the loan or taken out additional debt to pay for graduate school. With a biennial survey, we chose ages 21 and 22.

[30] We conducted an analogous exercise (not shown) where the dependent variable represents the 10-year out median earnings of graduates of the institutions TAS respondents first attended (for those who enrolled in college). These data are available from the College Scorecard (https://collegescorecard.ed.gov/). Earnings are strongly correlated with the types of institutions students attend. As a result, it is not surprising that additional grant aid due to greater uncounted assets is also positively related to attending an institution where graduates tend to earn higher wages.

Adding these variables somewhat reduces the estimated differences in outcomes by race/ethnicity (see Appendix Tables D.3 and D.4). The estimated impact of the net price reduction is also somewhat smaller, but qualitatively similar to what we reported in earlier when we omitted the grades and scores from the set of controls. These results suggest that the disparate impact in terms of our outcome variables is not due to differences in student achievement (after controlling for family characteristics and the EFC).

D. Interpreting the Results

First, we consider the magnitude of our estimated effect of the net price reduction on college outcomes in the context of findings from other studies. Denning, Marx, and Turner (2019) find that, for each $1,000 in Pell Grant aid given to low-income students at four-year college entry, the probability of graduating within five years later increases by about 5 percentage points, or around 15 percent relative to mean completion rates of ineligible students. Our estimates from column (4) of Table 3 indicate that an additional $1,000 in net price reduction increases completion of a four-year degree by 0.9 percentage points for students who enrolled in college, or 2 percent of the baseline completion rate.[31] It makes sense that a $1,000 implicit subsidy should have a considerably smaller impact on graduating from a four-year college among those who enroll than a $1,000 increase in the Pell Grant. Families of Pell Grant recipients have incomes at least somewhat below the median, and families of students who receive the implicit

[31] The 0.9 percentage point figure comes from the net price reduction, measured in $10,000 units, increasing from 0 to 1. The coefficients on the net price reduction and its square are 0.099 and -0.0075, respectively, indicating that a $10,000 increase in the net price reduction increases college enrollment by 0.099 - 0.0075 = 0.0915, or 9 percentage points. We scale that by one-10th to convert it to a $1,000 increase in the net price reduction. That represents a 2 percent increase relative to the baseline rate of college completion (among those who start college) of 49.3 percent, as reported in Table 1.

subsidy associated with uncounted assets typically have above median incomes. The former should benefit more from an additional dollar of grant aid than the latter.

Next, to interpret the magnitude of the potential impact of the net price reduction on gaps in educational attainment, we conduct a simulation exercise. We use our underlying individual data and the regression coefficients reported in Tables 2 and 3 to simulate the impact of the additional grant aid due to uncounted assets each individual's family holds on our outcome measures. Then we aggregate those simulated impacts, calculating the mean values for each racial and ethnic group. The difference in these simulated outcomes between groups informs our primary question of the potential aggregate impact of uncounted assets on educational disparities by race/ethnicity. We ask the following question: According to our estimates, if Black (Hispanic) families had the same uncounted assets as white families did, how would their educational outcomes change relative to white families through the implicit subsidy channel alone?

The results of this analysis are reported in **Table 4** for our main specification and **Appendix Table D.5** for our alternative specification that also includes grades and test scores. The results are clear that the racial and ethnic gap in uncounted assets generates substantive differences in the simulated educational outcomes by race/ethnicity. If the families of Black students and white students had the same uncounted assets, the gap in college enrollment would close by an estimated 2.9 percentage points. The raw gap in that statistic, reported in the top panel of Table 3, is 21 percentage points. The 29.8 percentage point raw gap in graduating from a four-year institution between Black students and white students who enrolled in college by age 19 would close by an estimated 4 percentage points. Hence, our estimates indicate that some 10 percent to 15 percent of the raw gap in college enrollment and graduation from a four-year

institution between Black students and white students could be attributable to the racial gap in uncounted assets via additional grant aid. [32]

The pattern is similar for Hispanic students relative to white students, suggesting that eliminating the gap in uncounted assets would also reduce the gap in estimated educational outcomes. The difference for Hispanic students is that the unadjusted gap in overall college enrollment relative to white students is small due to relatively high enrollment in community colleges among Hispanic students. Nevertheless, according to our estimates, eliminating the gap in uncounted assets would similarly reduce the Hispanic/white gap in four-year college completion by 10 percent to 15 percent.

IV. Discussion

We document that the presence of uncounted assets has the effect of making college more affordable for students from white families relative to students from Black families and Hispanic families with above-median incomes. In fact, the magnitude of the implicit subsidies associated with our current treatment of retirement savings and home equity is large. We calculate that these subsidies amount to $2.3 billion per year — twice the annual budget of the Federal Work-Study program — with a disproportionate share awarded to students from middle- to higher-income white families.

We also provide evidence suggesting that the resulting racial and ethnic differences in affordability contribute to the observed gaps in educational outcomes by race and ethnicity. We acknowledge that we are unable to definitively provide causal evidence of these effects.

[32] Alternatively, if we conducted the simulation using the Appendix D tables that also control test scores and grades, the Black/white gap in college enrollment would close by an estimated 1.9 percentage points, and the Black/white gap in graduation would close by an estimated 2.7 percentage points.

Nevertheless, our descriptive analysis using SCF and NPSAS data and our econometric results based on PSID data indicate that racial differences in implicit subsidies associated with uncounted assets are linked to college choices. Students receiving larger subsidies are more likely to enroll in college and to enroll in different types of institutions. The racial gap in uncounted assets may account for 10 percent to 15 percent of the raw gap in college enrollment and graduation from a four-year institution between Black students and white students.

We note that for most families with below median incomes, wealth holdings are so low that the differential treatment of these forms of wealth is largely moot. This is consistent with past research, which shows that assets play a relatively small role in determining financial aid awards in the aggregate (Dynarski and Scott-Clayton, 2006). It is also supports the "Simplified Needs Test" built into the federal financial aid system, which allows students with family incomes below $50,000 ($60,000 starting in 2024) to skip entering information on any assets (Congressional Research Service, 2022).

For above-median income families, though, a relevant issue becomes what to do about the racial and ethnic disparities in college affordability that this treatment of assets creates. One potential path is to target additional grant aid to families disadvantaged by the current system (above-median income families with low levels of uncounted assets). This would improve college access for all such students, but particularly for Black students and Hispanic students. Another option is to modify the financial aid formula to include some or all of the currently uncounted forms of assets, but then reduce the implicit *tax rate* on income and assets used to

estimate families' ability to pay (a nebulous concept in the first place).[33] This is analogous to a revenue neutral tax reform proposal where the tax base is broadened, while tax rates are lowered.

Incorporating currently uncounted assets into the federal financial aid formula may affect the simplicity of the system. One shortcoming of the current financial aid system is its complexity; completing complicated forms to obtain financial aid that is difficult to forecast can stifle college attendance (Dynarski et al., 2021; and Levine, 2022). One could incorporate information regarding home equity and retirement savings, though, without making the current form more complicated (for instance, simply editing the notes to Question 89 on the FAFSA, which were described previously). Alternatively, one could simply ask a single, direct, question regarding total net worth that includes all forms of assets. Both should certainly be combined with the Simplified Needs Test.

Fundamentally, our society must decide how much we want to prioritize protecting home equity and retirement wealth held predominantly by white families with above-median family incomes. Brown (2021) has documented how the tax treatment of these assets generates racial disparities in the tax system. The policy choice of ignoring these assets from the federal financial aid system also appears to benefit predominantly middle- and higher-income white students by funneling additional grant aid to them. Its disparate impact should not be ignored.

.

[33]It is possible that including home equity and retirement savings in the financial aid formula could provide a disincentive to accumulating those types of wealth. We believe this is unlikely, though, given that the significant subsidies and tax advantages inherent in owning a primary residence and saving for retirement (particularly in an employer-sponsored plan) vastly outweigh the expected contribution out of those assets during college years. Early studies of disincentives to the accumulation of financial assets due to federal financial aid rules (e.g., Edlin, 1993; Feldstein, 1995), found strong disincentive effects, but later studies (e.g., Monks, 2004; Reyes, 2008), concluded that estimates from those earlier studies overstated the disincentive. Long (2004) and Darolia (2017) found no evidence of a strong response to implicit taxes on assets and earned income, respectively, in the financial aid system.

REFERENCES

Andreski, Patricia, Daniel Kreisman, and Robert Schoeni (2015). "Comparing Estimates of Student Loans Measured in the PSID-TAS with the National Postsecondary Student Aid Survey. PSID Technical Series Paper 15-02.

Auclert, Adrien, Will S. Dobbie, and Paul Goldsmith-Pinkham (2019). "Macroeconomic Effects of Debt Relief: Consumer Bankruptcy Protections in the Great Recession." National Bureau of Economic Research Working Paper 25685.

Baum, Sandy, and Michael McPherson (2022). *Can College Level the Playing Field?: Higher Education in an Unequal Society.* Princeton, NJ: Princeton University Press.

Bhutta, Neil, Andrew C. Chang, Lisa J. Dettling, and Joanne W. Hsu (2020). "Disparities in Wealth by Race and Ethnicity in the 2019 Survey of Consumer Finances." *FEDS Notes*, https://www.federalreserve.gov/econres/notes/feds-notes/disparities-in-wealth-by-race-and-ethnicity-in-the-2019-survey-of-consumer-finances-20200928.htm.

Bleemer, Zachary, and Aashish Mehta (2022). "Will Studying Economics Make You Rich? A Regression Discontinuity Analysis of the Returns to College Major." *American Economic Journal: Applied Economics* 14(2): 1–22.

Brown, Dorothy A. (2021). *The Whiteness Of Wealth: How the Tax System Impoverishes Black Americans – and How We Can Fix It*. New York: Crown.

Bulman, George, Robert Fairlie, Sarena Goodman, and Adam Isen (2021). "Parental Resources and College Attendance: Evidence from Lottery." *American Economic Review* 111(4): 1201–1240.

Charles, Kerwin Kofi, Erik Hurst, and Matthew J. Notowidigdo (2018). "Housing Booms and Busts, Labor Market Opportunities, and College Attendance." *American Economic Review* 108(10): 2947–2994.

Chetty, Raj, John N Friedman, Emmanuel Saez, Nicholas Turner, and Danny Yagan (2020). "Income Segregation and Intergenerational Mobility Across Colleges in the United States." *Quarterly Journal of Economics* 135(3): 1567–1633.

Choukhmane, Taha, Jorge Colmenares, Cormac O'Dea, Jonathan Rothbaum, and Lawrence Schmidt (2022). "Who Benefits from Retirement Saving Incentives in the U.S.? Evidence on Racial Gaps in Retirement Wealth Accumulation." Unpublished manuscript.

Congressional Research Service (2022). The FAFSA Simplification. Washington, D.C.: Congressional Research Service, https://crsreports.congress.gov/product/pdf/R/R46909.

Cooper, Daniel, and María José Luengo-Prado (2015). House Price Growth When Children Are Teenagers: A Path to Higher Earnings? *Journal of Urban Economics* 86 (March): 54–72.

Cooper, Daniel, Karen Dynan, and Hannah Rhodenhiser (2019). "Measuring Household Wealth in the Panel Study of Income Dynamics: The Role of Retirement Assets." Federal Reserve Bank of Boston Working Paper 19-6.

Darolia, Rajeev (2017). "Assessing the College Financial Aid Work Penalty." *Journal of Higher Education* 88(3): 350–375.

de Brey, Cristobal, Lauren Musu, Joel McFarland, Sidney Wilkinson-Flicker, Melissa Diliberti, Anlan Zhang, Claire Branstetter, and Xiaolei Wang (2019). *Status and Trends in the Education of Racial and Ethnic Groups 2018* (NCES 2019-038). U.S. Department of Education. Washington, D.C.: National Center for Education Statistics, https://nces.ed.gov/pubs2019/2019038.pdf.

Denning, Jeffrey T., Benjamin M. Marx, and Lesley J. Turner (2019). "ProPelled: The Effects of Grants on Graduation, Earnings, and Welfare." *American Economic Journal: Applied Economics* 11(3): 193–224.

Derenoncourt, Ellora, Chi Hyun Kim, Moritz Kuhn, and Moritz Schularick (2022). "The Racial Wealth Gap, 1860-2020." National Bureau of Economic Research Working Paper 30101.

Dynarski, Susan, and Judith E. Scott–Clayton (2006). "The Cost of Complexity in Federal Student Aid: Lessons From Optimal Tax Theory and Behavioral Economics." *National Tax Journal* 59(2): 319–356.

Dynarski, Susan, CJ Libassi, Katherine Michelmore, and Stephanie Owen (2021). "Closing the Gap: The Effect of Reducing Complexity and Uncertainty in College Pricing on the Choices of Low-Income Students." *American Economic Review* 111 (6): 1721–1756.

Edlin, Aaron S. (1993). "Is College Financial Aid Equitable and Efficient?" *Journal of Economic Perspectives* 7(2): 143–158.

Feldstein, Martin (1995). "College Scholarship Rules and Private Saving." *American Economic Review* 85(3): 552–566.

Haider, Steven J., and Kathleen McGarry (2018). "Postsecondary Schooling and Parental Resources: Evidence from the PSID and HRS." *Education Finance and Policy* 13(1): 72–96.

Hotz, V. Joseph, Emily Wiemers, Joshua Rasmussen, and Kate Maxwell Koegel (forthcoming). "The Role of Parental Wealth and Income in Financing Children's College Attendance and Its Consequences." *Journal of Human Resources*.

Investment Company Institute (2020). *Ten Important Facts About IRAs*, www.ici.org/pdf/ten_facts_iras.pdf.

Johnson, Rucker C. (2020). "The Impact of Parental Wealth on College Degree Attainment: Evidence from the Housing Boom and Bust." *AEA Papers and Proceedings* 110: 405–410.

Lefebvre, Stephan (2019). "The Effect of Extended Family Wealth on College Enrollment." American University, unpublished manuscript.

Levine, Phillip B. (2022). *A Problem of Fit: How the Complexity of College Pricing Hurts Students —— and Universities.* Chicago: University of Chicago Press.

Long, Mark (2004). "The Impact of Asset-Tested College Financial Aid on Household Savings." *Journal of Public Economics* 88, 63–88.

Lovenheim, Michael F., and C. Lockwood Reynolds (2013). "The Effect of Housing Wealth on College Choice: Evidence from the Housing Boom." *Journal of Human Resources* 48(1): 1–35.

Lovenheim, Michael F. (2011). "The Effect of Liquid Housing Wealth on College Enrollment." *Journal of Labor Economics* 29(4): 741–771.

Ma, Jennifer and Sandy Baum (2016). "Trends in Community Colleges: Enrollment, Prices, Student Debt, and Completion," College Board Research Brief, April 2016, https://research.collegeboard.org/media/pdf/trends-community-colleges-research-brief.pdf.

MeasureOne (2021). The MeasureOne Private Student Loan Report, December 15, 2021, https://fs.hubspotusercontent00.net/hubfs/6171800/assets/downloads/MeasureOne%20Private%20Student%20Loan%20Report%20Q3%202021%20FINAL%20VERSION.pdf.

Monks, James (2004). "An Empirical Examination of the Impact of College Financial Aid on Savings." *National Tax Journal* 57, 189–207.

Mullaney, Tim (2019). "Colleges Want Some of Your Retirement Cash. How to Keep That Money." *Barron's,* https://www.barrons.com/articles/retirement-home-equity-college-tuition-51561739799.

National Student Clearinghouse Research Center (2022). *Completing College: National and State Reports,* https://nscresearchcenter.org/completing-college/.

Panel Study of Income Dynamics, public use dataset and restricted use data (2021). Produced and distributed by the Survey Research Center, Institute for Social Research, University of Michigan, Ann Arbor, MI.

Pfeffer, Fabian, Bob Schoeni, Arthur Kennickell, and Patricia Andreski (2016). "Measuring Wealth and Wealth Inequality." *Journal of Economic and Social Measurement* 41(2): 103–112.

Reyes, Jessica Wolpaw (2008). "College Financial Aid Rules and the Allocation of Savings." *Education Economics* 16, 167–189.

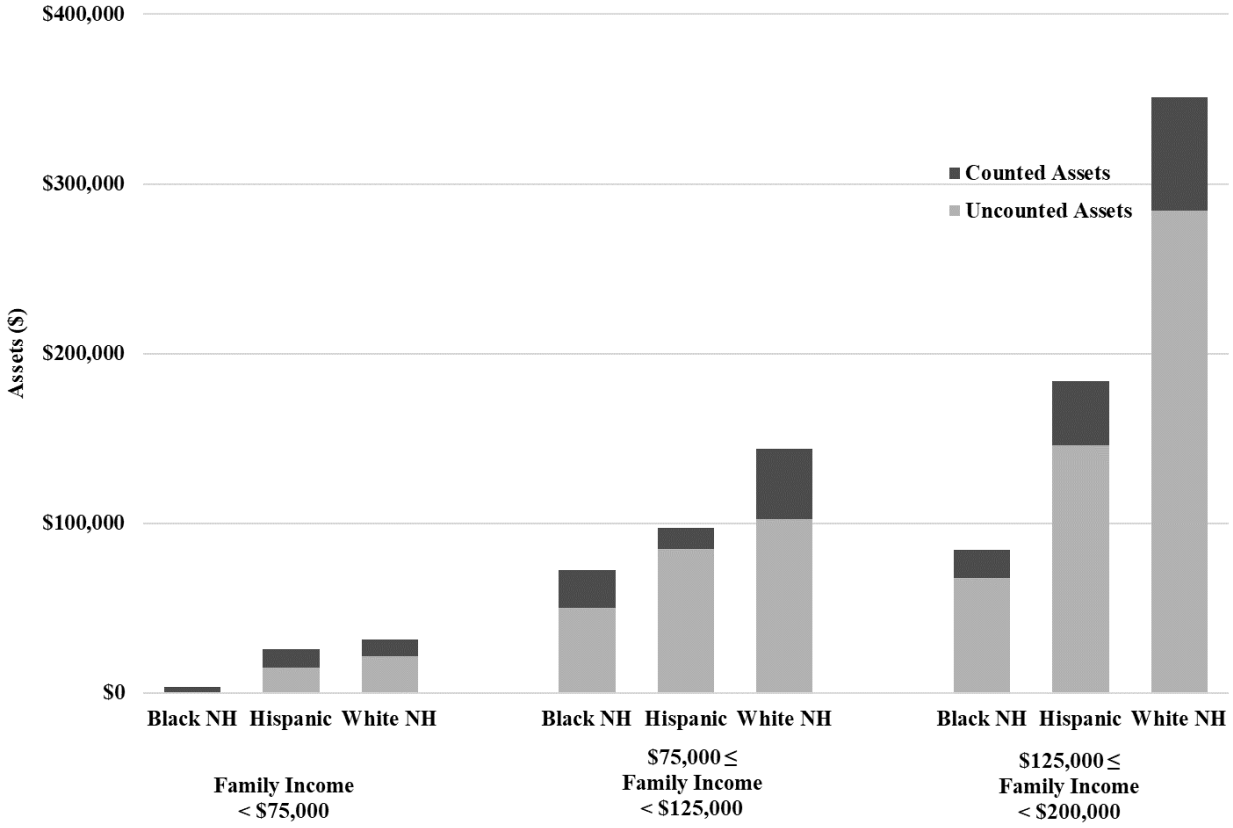
Richardson, Rashida, Jason Schultz, and Kate Crawford (2019). "Dirty Data, Bad Predictions: How Civil Rights Violations Impact Police Data, Predictive Policing Systems, and Justice." *New York University Law Review* (94 N.Y.U. L. REV. ONLINE 192).

Smith, Ember, and Richard V. Reeves (2020). "SAT Math Scores Mirror and Maintain Racial Inequity." Brookings Institution, https://www.brookings.edu/blog/up-front/2020/12/01/sat-math-scores-mirror-and-maintain-racial-inequity/.

U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), 2019, Institutional Characteristics.

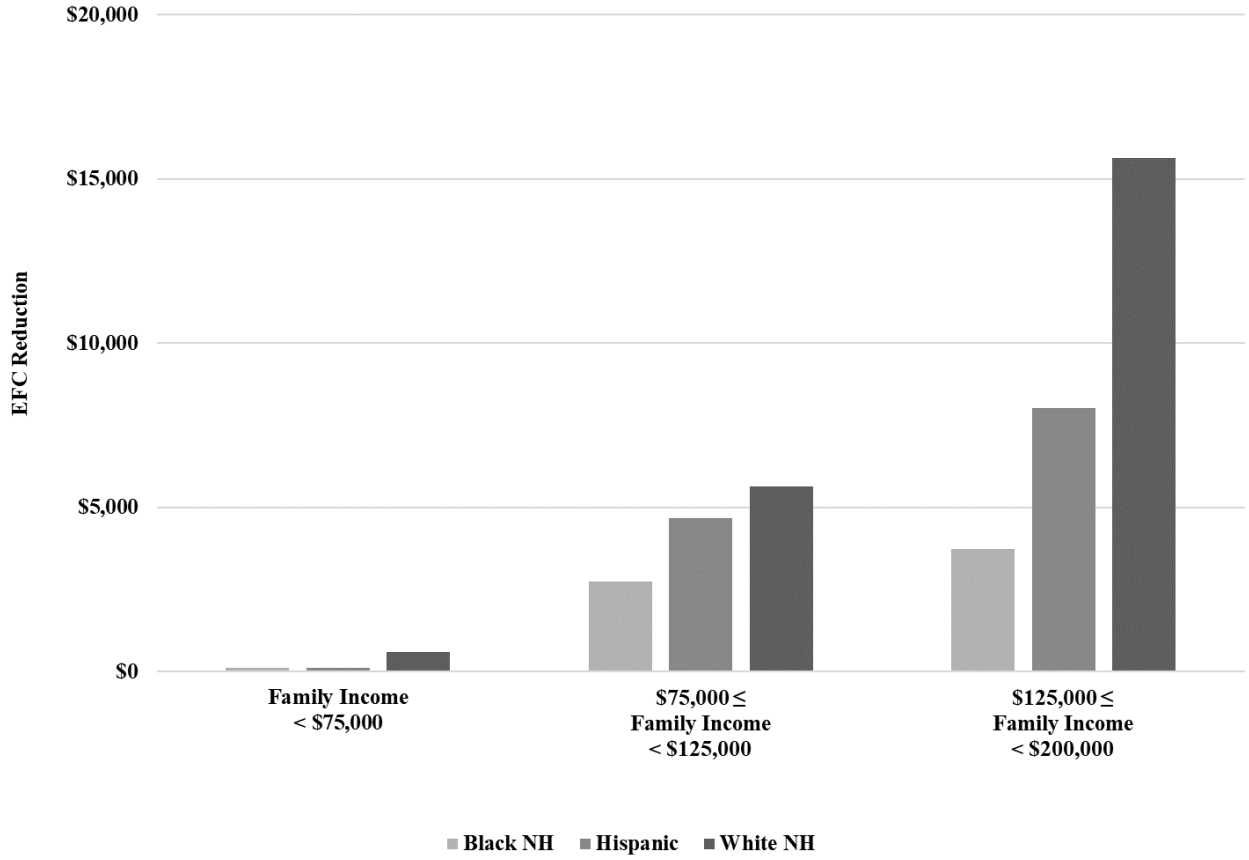
U.S. Department of Education, National Center for Education Statistics, 2015–2016 National Postsecondary Student Aid Study (NPSAS:16).

Figure 1: Median Assets for Families with Children Approaching College Age, by Family Income, Race/Ethnicity, and Asset Category



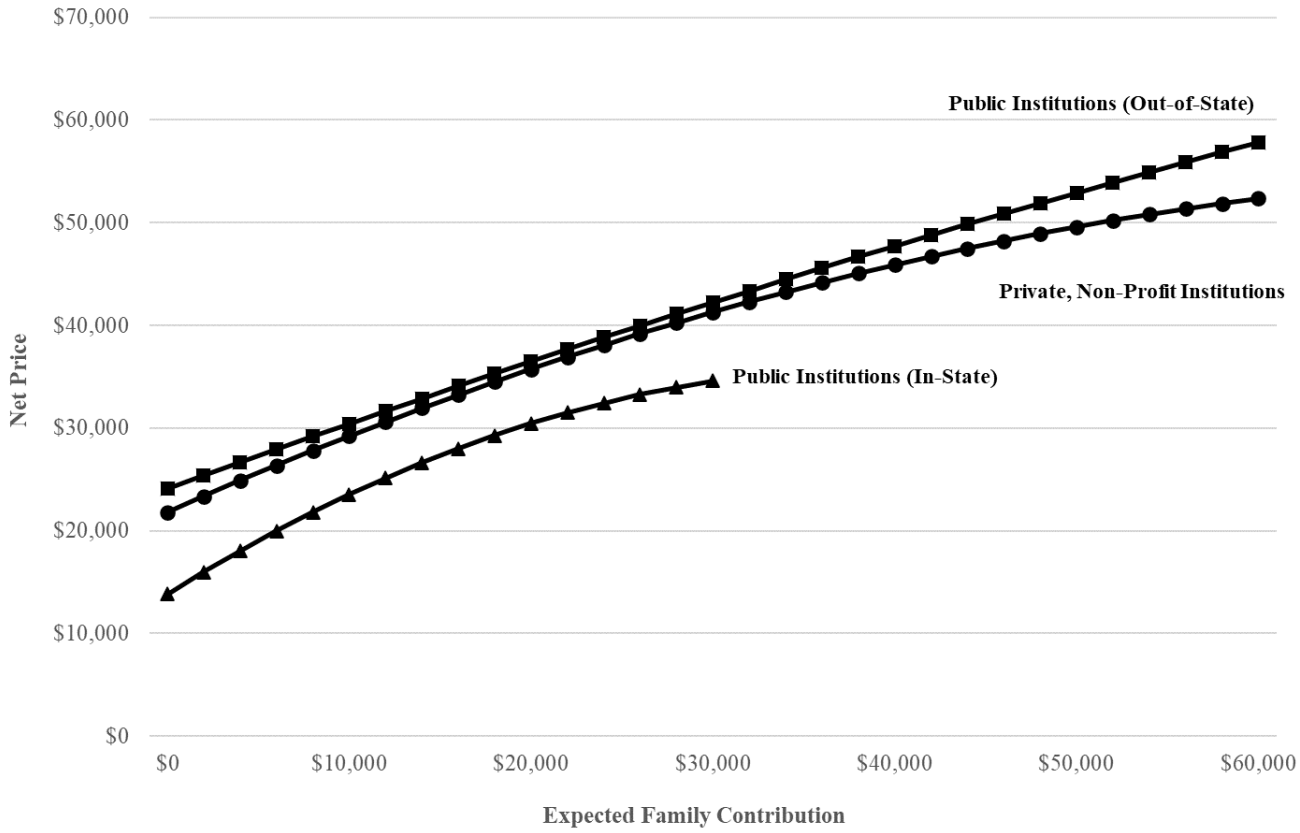
Source: Authors' calculations based on data from the 2019 Survey of Consumer Finances (SCF).
Notes: Sample includes respondents with children between the ages of 13 and 17.

Figure 2: Median EFC Reduction Associated with Uncounted Assets, by Income Category and Race/Ethnicity



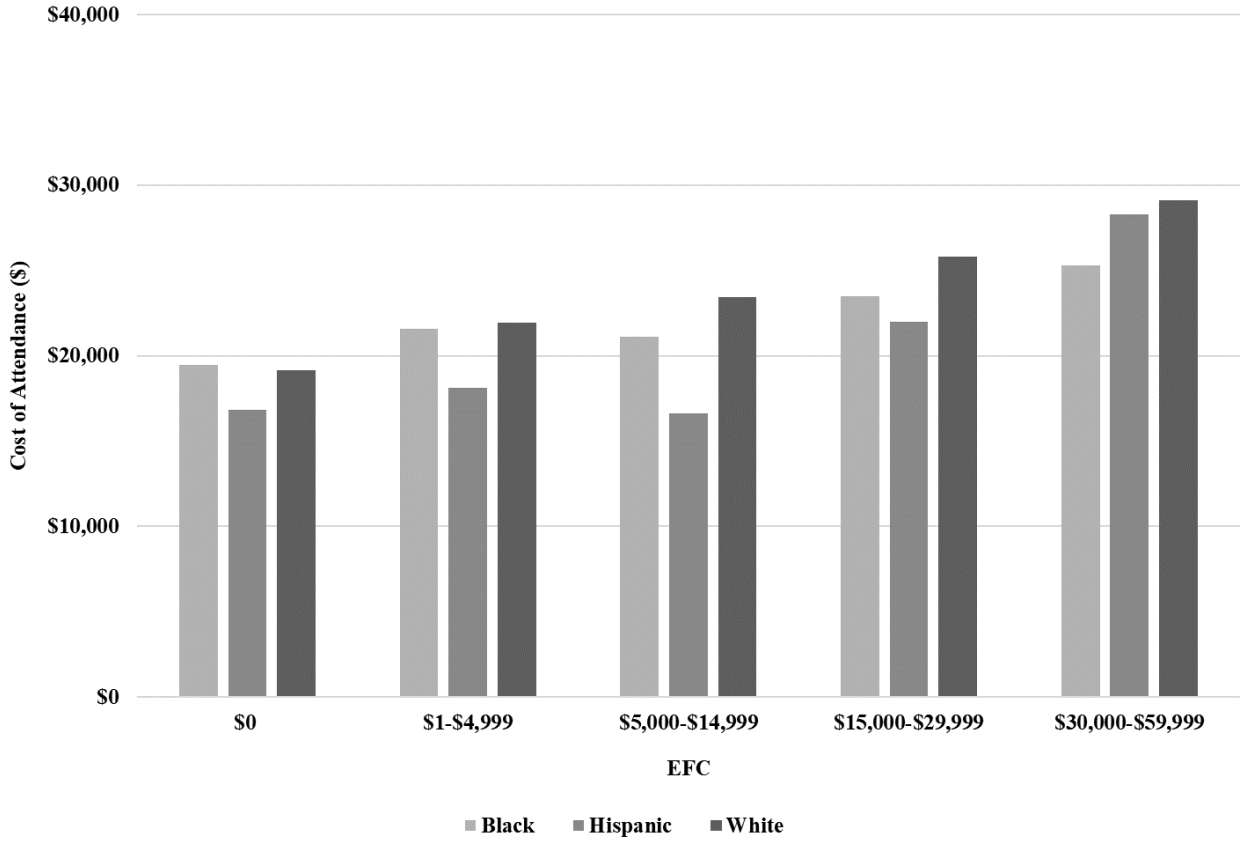
Source: Authors' calculations based on data from the 2019 Survey of Consumer Finances (SCF).
Notes: The EFC Reduction is defined as the difference between *full-asse*t EFC and *current* EFC. Full-asset EFC simulates EFC levels if uncounted assets were treated the same as counted assets by the financial aid system. Current EFC simulates the current formula that excludes uncounted assets. The sample includes respondents with children between the ages of 13 and 17.

Figure 3: Relationship Between the Expected Family Contribution and Net Price, Four-Year Public and Private Colleges and Universities



Source: Previously unpublished tabulations based on the U.S. Department of Education, National Center for Education Statistics, 2015–2016 National Postsecondary Student Aid Study (NPSAS:16).
Notes: The net price is defined to be the Cost of Attendance less grant-based financial aid. The Expected Family Contribution (EFC) is defined using calculations performed based on data entered into the FAFSA. Calculations based on students attending school full-time, living away from home, and having remaining financial need of greater than $5,000 after accounting for federal sources of aid (see Appendix A).

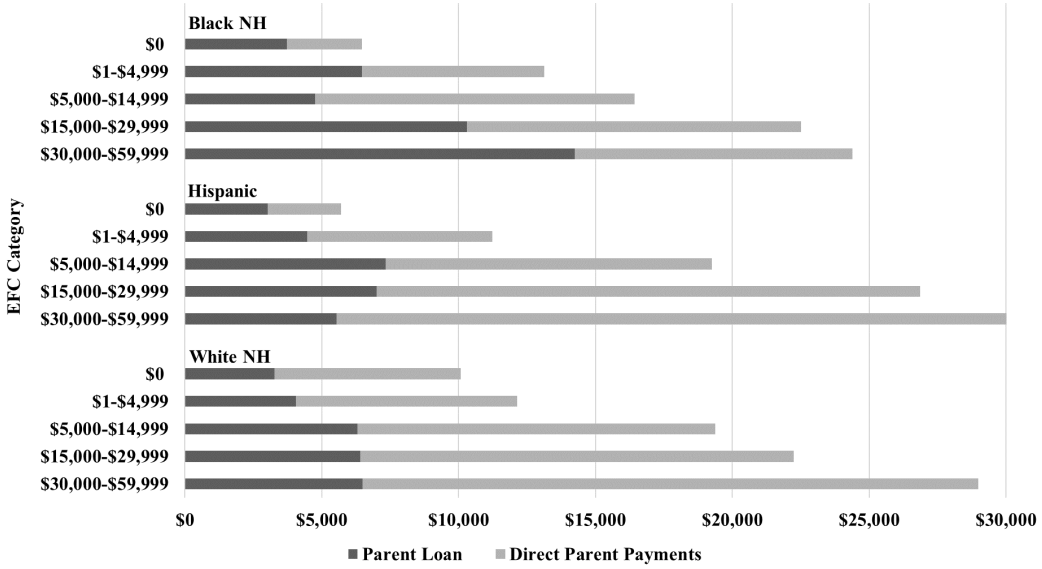
Figure 4: Cost of Attendance at Dependent Students' Institution, by Income Category and Race/Ethnicity



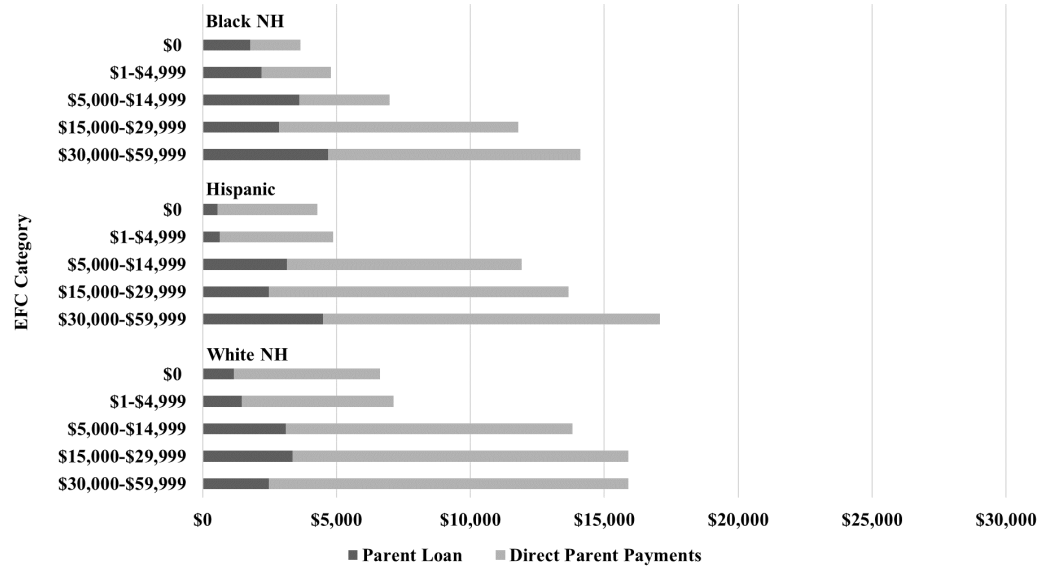
Source: Previously unpublished tabulations based on the U.S. Department of Education, National Center for Education Statistics, 2015-2016 National Postsecondary Student Aid Study (NPSAS:16).
Notes: Cost of attendance is a broad measure of college costs, including tuition, living expenses that may include room and board, and other miscellaneous expenses, such as books and travel.

Figure 5: Average Payments Made by Parents at Four-Year Private and Public Institutions, by Expected Family Contribution Category, Payment Type, and Race/Ethnicity

Panel A: Private, Nonprofit Institutions



Panel B: Public Institutions (State Residents)



Source: Previously unpublished tabulations based on the U.S. Department of Education, National Center for Education Statistics, 2015–2016 National Postsecondary Student Aid Study (NPSAS:16).
Notes: All students are dependents, enrolled full-time, live away from their parents, and, for public institutions, are state residents.

Table 1: Descriptive Statistics of Family Finances and Educational Outcomes

	All	White, non-Hispanic	Black, non-Hispanic	Hispanic
	Income and Assets (median/75th percentile), in $1,000s of 2019$			
Family Income	$89/$140	$106/$162	$45/$83	$53/$94
Net Worth	$112/$333	$162/$406	$13/$79	$50/$154
Counted Assets	$23/$104	$38/$141	$4/$27	$8/$37
Uncounted Assets	$72/$202	$100/$259	$0/$51	$37/$118
	Educational Outcomes (All Students): N = 2,464			
High School Graduate	89.7%	90.9%	79.6%	89.6%
Enrolled in:				
College by Age 19	75.8%	77.8%	56.8%	76.6%
Private 4 Year	13.0%	15.5%	7.9%	6.6%
Public 4 Year	29.8%	32.5%	18.4%	25.2%
Other	33.0%	29.8%	30.4%	44.8%
Graduated from:				
2-Year Institution	9.9%	10.5%	5.0%	9.8%
4 -ear Institution	37.3%	43.6%	15.3%	25.3%
Mean Student Loan Debt	$5,393	$6,091	$4,412	$3,361
	Educational Outcomes (Enrolled in College by Age 19): N=1,742			
Enrolled in:				
Private 4 Year	17.1%	19.9%	13.9%	8.6%
Public 4 Year	39.3%	41.8%	32.5%	32.9%
Other	43.6%	38.3%	53.6%	58.5%
Graduated from:				
2-Year Institution	13.1%	13.5%	8.9%	12.9%
4-Year Institution	49.3%	56.1%	27.0%	33.0%
Mean Student Loan Debt	$6,934	$7,672	$7,516	$4,244
	Educational Outcomes (Bachelor's Degree): N = 752			
Mean Student Loan Debt	$9,839	$9,971	$18,266	$7,087

Source: Authors' calculations based on data from the Panel Study of Income Dynamics' (PSID) Transition to Adulthood Supplement.

Table 2: Impact of Uncounted Assets on High School Graduation and College Enrollment

	Dependent Variable:				
	Graduate High School	Enroll in College	Enroll in 4-Year Private	Enroll in 4-Year Public	Enroll Other
			No Controls		
Black	**-0.113**	**-0.210**	**-0.076**	**-0.141**	0.007
	(0.034)	**(0.045)**	**(0.028)**	**(0.034)**	(0.042)
Hispanic	-0.013	-0.012	**-0.089**	**-0.073**	**0.150**
	(0.024)	(0.032)	**(0.020)**	**(0.034)**	**(0.037)**
			With Controls (including Mother's SES)		
Black	-0.047	-0.078	-0.008	-0.065	-0.005
	(0.037)	(0.045)	(0.029)	(0.037)	(0.047)
Hispanic	**0.062**	**0.141**	0.002	0.021	**0.119**
	(0.029)	**(0.038)**	(0.026)	(0.038)	**(0.043)**
EFC	**0.012**	**0.024**	0.007	0.006	0.011
(in $10,000s)	**(0.003)**	**(0.005)**	(0.006)	(0.007)	(0.007)
EFC Squared	**-0.0002**	**-0.0005**	**-0.0002**	-0.0001	**-0.0003**
	(0.0001)	**(0.0001)**	**(0.0001)**	(0.0002)	**(0.0001)**
Net Price Reduction	0.018	**0.077**	**0.060**	**0.080**	**-0.063**
(in $10,000s)	(0.012)	**(0.021)**	**(0.02)**	**(0.030)**	**(0.026)**
Net Price Reduction	-0.0020	**-0.0074**	**-0.0052**	-0.0055	0.0034
Squared	(0.0013)	**(0.0030)**	**(0.0022)**	(0.0036)	(0.0022)
Sample Size	2,464	2,464	2,464	2,464	2,464

Source: Authors' calculations based on data from the Panel Study of Income Dynamics' (PSID) Transition to Adulthood Supplement.

Notes: Bolded cells represent coefficients statistically significant at the 5 percent level. Net price reduction is defined as 60 percent of the EFC reduction (or the difference between *full-asset* EFC and *current* EFC). Full-asset EFC simulates EFC levels if uncounted assets were treated the same as counted assets by the financial aid system. Current EFC simulates the current formula that excludes uncounted assets. Additional control variables in lower panel include mother's level of education, mother's age at birth of child, and mother's marital status at time of birth. All specifications are weighted by *individual longitudinal weight*s in the PSID, measured in the survey year relevant for the outcome measured (i.e., college enrollment in the year respondents were ages 17/18 and college graduation at ages 23/24).

Table 3: Impact of Uncounted Assets on College Graduation and Student Debt

	Dependent Variable:					
	Received 2-Year Degree		Received 4-Year Degree		Student Loan Debt	
	Full Sample	Enrolled in College	Full Sample	Enrolled in College	Full Sample	4-Year College Graduates
	No Controls					
Black	**-0.055**	-0.039	**-0.301**	**-0.298**	**-1,775.4**	**9,055.5**
	(0.018)	(0.030)	**(0.033)**	**(0.051)**	**(834.9)**	**(2,153.6)**
Hispanic	-0.003	-0.011	**-0.145**	**-0.200**	**-2,908.3**	-3,245.7
	(0.025)	(0.030)	**(0.038)**	**(0.045)**	**(855.8)**	(1,757.7)
	With Controls (including Mother's SES)					
Black	**-0.066**	**-0.084**	**-0.137**	**-0.149**	-685.9	**6,842.3**
	(0.023)	**(0.035)**	**(0.039)**	**(0.061)**	(832.1)	**(2,379.3)**
Hispanic	-0.019	**-0.078**	0.064	0.014	-502.8	**-4,254.8**
	(0.026)	**(0.034)**	(0.040)	(0.052)	(901.4)	**(2,099.1)**
EFC	0.007	0.004	**0.033**	**0.023**	-15.8	**-610.5**
(in $10,000s)	(0.005)	(0.005)	**(0.007)**	**(0.008)**	(175.3)	**(264.3)**
EFC Squared	-0.0001	-0.0001	**-0.0008**	**-0.0005**	-5.4	6.4
	(0.0001)	(0.0001)	**(0.0002)**	**(0.0002)**	(3.7)	(5.6)
Net Price Reduction	**-0.0347**	**-0.053**	**0.0134**	**0.099**	-1343.5	**-2,999.3**
(in $10,000s)	**(0.010)**	**(0.019)**	**(0.031)**	**(0.030)**	(837.7)	**(950.8)**
Net Price Reduction	0.0016	**0.0034**	**-0.00102**	**-0.0075**	**301.5**	**470.4**
Squared	(0.0014)	**(0.0016)**	**(0.0041)**	**(0.0033)**	**(112.3)**	**(85.8)**
Sample Size	2,371	1,676	2,160	1,510	2,370	778

Source: Authors' calculations based on data from the Panel Study of Income Dynamics' (PSID) Transition to Adulthood Supplement.

Notes: Bolded cells represent coefficients statistically significant at the 5 percent level. Net price reduction is defined as 60 percent of the EFC reduction (or the difference between *full-asset* EFC and *current* EFC). Full-asset EFC simulates EFC levels if uncounted assets were treated the same as counted assets by the financial aid system. Current EFC simulates the current formula that excludes uncounted assets. Additional control variables in lower panel include mother's level of education, mother's age at birth of child, and mother's marital status at time of birth. All specifications are weighted by *individual longitudinal weights* in the PSID, measured in the survey year relevant for the outcome measured (i.e., college enrollment in the year respondents were ages 17/18 and college graduation at ages 23/24).

Table 4: Simulated Impact of Net Price Reduction on Gaps in Educational Outcomes

		White/Black Gap		White/Hispanic Gap	
	Sample	Unadjusted	Impact of Uncounted Assets	Unadjusted	Impact of Uncounted Assets
Enroll in College by Age 19	All students	21.0%	2.9 pp	1.2%	2.1 pp
Graduating from 2-Year Institution	Enrolling Students	3.9%	-2.2 pp	1.1%	-1.8 pp
Graduating from 4-Year Institution	Enrolling Students	29.8%	4.0 pp	20.0%	3.0 pp
Student Loan Debt	4-Year Graduate	$9,056	-$856	$-3,246	-$584

Source: Authors' calculations based on data from the Panel Study of Income Dynamics' (PSID) Transition to Adulthood Supplement.
Notes: pp indicates percentage point changes. The percent change in the enrollment/graduation outcomes reflects the percentage point change divided by the unadjusted percentage (x 100).

Appendix A: How Many Students' College Costs Are Affected by the Racial Wealth Gap?

As described in the text, the only students whose net price is likely to be affected by the racial wealth gap are those attending institutions that offer substantial institutional grant-based aid. Students attending those institutions also need to have sufficient assets for their differential treatment to matter. This imposes a number of restrictions on who is likely to be affected.

First, only students facing a higher cost of attendance are likely to receive such aid. At a community college, for instance, federal financial aid, including loans, will cover most of the cost. Students enrolled part-time or students who live with their parents also face lower college costs, reducing the need for the institution to offer its own grant-based aid. These enrollment decisions among students are endogenous, of course, which is an issue we return to later in the paper.

Second, the practice of gapping also limits the extent of institutional grant-based aid available. To address this issue in more detail, we examine data from the 2015–2016 National Postsecondary Student Aid Survey (NPSAS). These data are high quality, merging administrative data from the U.S. Department of Education and from the higher educational institutions that students attend, among other sources.[34] We find that pricing at a typical four-year institution includes a median gap (net price less the sum of EFC, work–study funding, and student loans) of roughly $5,000. Students whose remaining financial need after accounting for their EFC and federal financial aid is within $5,000 of the COA is unlikely to receive institutional grant-based aid.

To estimate the number of students for whom uncounted assets may affect their financial aid awards, we start with 8.8 million dependent students enrolled at a single institution (column

[34] The disadvantage of these data is that they only include students enrolled in college, preventing us from using them to examine the decision to enroll.

1). Then we limit the sample to the 3.6 million students who are enrolled full-time and living away from their parents (column 2). Of those, we estimate that 2.1 million are likely to be eligible for institutional grant-based aid (i.e., greater remaining financial need than the estimated $5,000 gap; column 3). Almost all (2 million) of those students are enrolled at four-year institutions.

We then incorporate the fact that lower-income students are unlikely to be affected by the differential treatment of assets since they are unlikely to possess them. We use Pell Grant-eligibility as a simple indicator to exclude those students. In the end, we find that the net price of attending college for 851,000 students is likely to be affected by omitting home equity and retirement savings from the EFC calculation. This means that 10 percent of all dependent students (851,000 out of 8.8 million), and 27 percent of all dependent students attending a single four-year institution (851,000 out of 3.13 million) are eligible to receive additional grant aid from their educational institution because their EFC is lower under the current EFC formula than it would be if uncounted assets were considered in the EFC formula.

For those students who satisfy all of restrictions previously imposed who are likely to benefit from the availability of uncounted assets, we then calculate the number of who actually receive institutional grant-based aid (column 4). Of those 851,000 students, we find that 581,000 (68 percent) actually received institutional grant-based aid.

Appendix Table A.1: Number of Students Affected by the Net Price Reduction Associated with Uncounted Assets

	Number of Students (in 1,000s)		
	All (1)	Likely Eligible for Institutional Grant-Based Financial Aid (2)	Recipients of Institutional Grant-Based Financial Aid (3)
Dependent College Students	8,842	1,276	801
Enrolled Full-Time	5,102	988	646
Not Living with Parents	3,567	881	589
Enrollment Among This Group:			
Public 4-Year (in-state)	1,679	241	109
Public 4-Year (out-of-state)	381	125	68
Private 4-Year	1,068	485	404
Other	123	20	24
Community College	316	10	2
4-Year Total	3,128	851	581

Source: Previously unpublished tabulations based on the U.S. Department of Education, National Center for Education Statistics, 2015–2016 National Postsecondary Student Aid Study (NPSAS:16).

Notes: The sample is restricted to undergraduate students who attended a single institution (relevant for column 1). Students are categorized as likely to be eligible for institutional grant-based financial aid (relevant for column 2) if they are not Pell Grant-eligible and if their remaining financial need after factoring in EFC, the maximum federal student loan (both subsidized and unsubsidized), work–study funding, is more than $5,000. The latter amount roughly represents the average gap in financial aid awards at public four-year institutions. The Pell Grant eligibility threshold in the 2015–2016 academic year is $5,750. We further restrict the sample to individuals from column 2 who actually received institutional grant-based financial aid (relevant to c3).

Appendix B: Calculating the Size of Net Price Reductions Associated with Uncounted Assets

For this exercise, we start with SCF data to estimate the relationship between the EFC and the EFC reduction associated with uncounted assets. We described how we used these data to calculate those quantities earlier in the text of the paper. Then we ran a regression relating the EFC reduction to the level of EFC, distinguishing the relationship by race and ethnicity. Since the EFC reduction should be $0 at an EFC of $0, we restricted the intercept to be zero. The resulting regression equation is:

efc_reduction = efc*0.4010818 + efc_black*-.1860651 + efc_hisp*-.0825105 +

efc_other*-.002126,

where *efc_black, efc_hisp*, and *efc_other* represent interaction terms between EFC and indicator variables for whether the student is Black, Hispanic, or other non-white race.

We use this relationship to forecast the EFC reduction for students in the 2015–2016 NPSAS (which contains no information on uncounted assets). We restrict these data to dependent students enrolled at a single institution who are living away from their parents and enrolled full-time at a public or private four-year institution. We omit students whose EFC is greater than $60,000 and who would be unlikely to be eligible for need-based financial aid at most institutions. We also omit students who are eligible for Pell Grants (EFC less than $5,750 in 2015–2016) because their likelihood of owning substantial uncounted assets is low. Then we apply the 0.6 estimate of the relationship to convert the EFC reduction to the net price reduction, which is the implicit subsidy.

This approach provides us with an estimated value of the implicit subsidy for all students who satisfy these data restrictions. The statistics reported in the text reflect averages of these values within racial/ethnic groups.

Appendix C: Additional Details Regarding the PSID Data

Respondents in TAS are linked to parents and grandparents using the Parent Identification File and using fields Family ID and Person ID. Each TAS respondent is assigned guardian(s) at ages 17–18 (or, if not available, at ages 15–16), based on the match between the child's Interview Number and the parents' Interview Numbers. All income and wealth metrics, defined next, are pulled from the assigned guardian(s)' Wealth Supplement data at the relevant age (17–18 or, if not available, 15–16) and adjusted for inflation.

Variable	PSID Module or Supplement	Notes
	Family Resources	
Family Income	Wealth Supplement	
Counted Assets	Wealth Supplement	Net Worth – Uncounted Assets
Uncounted Assets	Wealth Supplement	Retirement Savings (excl. Defined Benefit and Defined Contribution) and Home Equity on Primary Residence
Net Worth	Wealth Supplement	
Mother's Socioeconomic Status	Wealth Supplement	
	Educational Outcomes	
Graduated from High School by Age X	Transition into Adulthood	
Enrolled in College by Age X	Transition into Adulthood	
Graduated from College by Age X	Transition into Adulthood	
High School Background	Transition into Adulthood	Defined at ages 17–18
Student Loan Debt	Transition into Adulthood	Undergraduate debt only (Stafford, Perkins)
	Demographics	
Demographics: Child	Transition into Adulthood	
Demographics: Parents	Parents: Individual Files	

Appendix D: Additional Tables

Appendix Table D.1 Form of Family Payments Toward a Child's College Education, by Expected Family Contribution at Private Four-Year Institutions

	Student		Parent		
	Loan	Earnings	Loan	Direct	Other Family
EFC			White		
$0	$4,513	$3,652	$3,273	$6,803	$1,546
$1–$4,999	$4,530	$3,836	$4,060	$8,080	$1,295
$5,000–$14,999	$4,621	$3,918	$6,297	$13,086	$1,590
$15,000–$29,999	$4,071	$3,224	$6,415	$15,836	$1,252
$30,000–$59,999	$3,710	$3,042	$6,486	$22,508	$1,769
			Black		
$0	$6,662	$4,139	$3,720	$2,739	$566
$1–$4,999	$6,424	$3,420	$6,474	$6,655	$294
$5,000–$14,999	$4,626	$2,093	$4,761	$11,661	$663
$15,000–$29,999	$3,385	$1,363	$10,312	$12,194	$177
$30,000–$59,999	$4,027	$2,196	$14,239	$10,149	$65
			Hispanic		
$0	$4,455	$3,011	$3,020	$2,688	$691
$1–$4,999	$4,681	$3,666	$4,471	$6,757	$226
$5,000–$14,999	$4,990	$2,635	$7,338	$11,907	$1,246
$15,000–$29,999	$3,006	$2,184	$7,007	$19,854	$484
$30,000–$59,999	$2,233	$2,882	$5,545	$25,929	$1,675

Source: Previously unpublished tabulations based on the U.S. Department of Education, National Center for Education Statistics, 2015–2016 National Postsecondary Student Aid Study (NPSAS:16).
Notes: Student payment options include debt (loans) and work–study and other forms of employment (earnings). Parent payment options include debt (Parent PLUS loans) and direct payments to the college ("writing a check" with no indication of how those funds were obtained). Payments from other families may reflect financial help provided by a student's grandparents or other relatives.

Appendix Table D.2 Form of Family Payments Toward a Child's College Education, by Expected Family Contribution at Public 4-Year Institutions (State Residents)

	Student		Parent		
	Loan	Earnings	Loan	Direct	Other Family
EFC			White		
$0	$4,565	$4,967	$1,161	$5,456	$909
$1–$4,999	$4,258	$4,670	$1,473	$5,670	$1,058
$5,000–$14,999	$3,684	$4,668	$3,118	$10,687	$1,972
$15,000–$29,999	$3,554	$4,559	$3,361	$12,532	$690
$30,000–$59,999	$2,641	$4,690	$2,468	$13,434	$974
			Black		
$0	$5,507	$4,320	$1,783	$1,866	$140
$1–$4,999	$6,004	$4,311	$2,193	$2,600	$393
$5,000–$14,999	$4,400	$5,387	$3,603	$3,373	$120
$15,000–$29,999	$4,794	$4,582	$2,852	$8,946	$306
$30,000–$59,999	$4,533	$2,906	$4,698	$9,408	$118
			Hispanic		
$0	$3,142	$4,285	$549	$3,739	$600
$14,999	$3,645	$3,456	$633	$4,235	$369
$5,000–$14,999	$4,237	$4,102	$3,152	$8,761	$495
$15,000–$29,999	$3,022	$3,114	$2,486	$11,186	$328
$30,000–$59,999	$3,308	$2,733	$4,488	$12,599	$352

Source: Previously unpublished tabulations based on the U.S. Department of Education, National Center for Education Statistics, 2015–2016 National Postsecondary Student Aid Study (NPSAS:16).

Appendix Table D.3: Impact of Uncounted Assets on High School Graduation and College Enrollment (includes grades and test scores as explanatory variables)

	Dependent Variable:				
	Graduate High School	Enroll in College	**Enroll in 4-Year Private**	Enroll in 4-Year Public	Enroll Other
			No Controls		
Black	**-0.113**	**-0.210**	**-0.076**	**-0.141**	0.007
	(0.034)	**(0.045)**	**(0.028)**	**(0.034)**	(0.042)
Hispanic	-0.013	-0.012	**-0.089**	**-0.073**	**0.150**
	(0.024)	(0.032)	**(0.020)**	**(0.034)**	**(0.037)**
			With Controls (including Mother's SES)		
Black	0.004	-0.011	0.024	-0.017	-0.019
	(0.033)	(0.037)	(0.029)	(0.037)	(0.046)
Hispanic	0.003	**0.110**	0.005	0.016	**0.088**
	(0.017)	**(0.034)**	(0.025)	(0.037)	**(0.042)**
EFC	0.002	0.013	0.004	-0.001	0.010
(in $10,000s)	(0.002)	(0.004)	(0.006)	(0.007)	(0.007)
EFC Squared	0.0000	**-0.0003**	-0.0001	0.0000	**-0.0002**
	(0.0000)	**(0.0001)**	(0.0001)	(0.0002)	**(0.0001)**
Net Price Reduction	0.000	**0.052**	**0.046**	**0.062**	**-0.056**
(in $10,000s)	(0.009)	**(0.017)**	**(0.022)**	**(0.028)**	**(0.026)**
Net Price Reduction	0.0000	**-0.0050**	**-0.0043**	-0.0040	0.0032
Squared	(0.0008)	**(0.0020)**	**(0.0020)**	(0.0031)	(0.0021)
Sample Size	2,464	2,464	2,464	2,464	2,464

Source: Authors' calculations based on data from the Panel Study of Income Dynamics' (PSID) Transition to Adulthood Supplement.

Notes: Bolded cells represent coefficients statistically significant at the 5 percent level. Net price reduction is defined as 60 percent of the EFC reduction (or the difference between *full-asset* EFC and *current* EFC). Full-asset EFC simulates EFC levels if uncounted assets were treated the same as counted assets by the financial aid system. Current EFC simulates the current formula that excludes uncounted assets. Additional control variables in lower panel include mother's level of education, mother's age at birth of child, and mother's marital status at time of birth. All specifications are weighted by *individual longitudinal weights* in the PSID, measured in the survey year relevant for the outcome measured (i.e., college enrollment in the year respondents were ages 17/18 and college graduation at ages 23/24).

Appendix Table D.4: Impact of Uncounted Assets on College Graduation and Student Debt (includes grades and test scores as explanatory variables)

	Dependent Variable:					
	Received 2-Year Degree		Received 4-Year Degree		Student Loan Debt	
	Full Sample	Enrolled in College	Full Sample	Enrolled in College	Full Sample	College Graduates
	No Controls					
Black	**-0.055**	-0.039	**-0.301**	**-0.298**	**-1,775.4**	**9,055.5**
	(0.018)	(0.030)	**(0.033)**	**(0.051)**	**(834.9)**	**(2,153.6)**
Hispanic	-0.003	-0.011	**-0.145**	**-0.200**	**-2,908.3**	-3,245.7
	(0.025)	(0.030)	**(0.038)**	**(0.045)**	**(855.8)**	(1,757.7)
	With Controls (including Mother's SES)					
Black	**-0.065**	**-0.112**	-0.035	-0.045	703.8	**7,425.0**
	(0.023)	**(0.036)**	(0.033)	(0.052)	(762.3)	**(2,418.4)**
Hispanic	-0.032	**-0.091**	0.059	0.063	-557.1	-3,929.5
	(0.026)	**(0.035)**	(0.037)	(0.046)	(881.2)	(2,117.9)
EFC	0.007	0.004	**0.021**	**0.019**	-169.0	**-601.1**
(in $10,000s)	(0.005)	(0.005)	**(0.007)**	**(0.007)**	(174.7)	**(261.8)**
EFC Squared	-0.0001	-0.0001	**-0.0005**	**-0.0004**	-2.2	6.4
	(0.0001)	(0.0001)	**(0.0002)**	**(0.0002)**	(3.7)	(5.5)
Net Price Reduction	**-0.034**	**-0.046**	**0.085**	**0.071**	**-1,998.6**	**-2,960.6**
(in $10,000s)	**(0.017)**	**(0.018)**	**(0.025)**	**(0.026)**	**(786.6)**	**(948.9)**
Net Price Reduction	0.0019	**0.0030**	**-0.0070**	**-0.0060**	**355.5**	**469.7**
Squared	(0.0014)	**(0.0015)**	**(0.0027)**	**(0.0026)**	**(96.4)**	**(86.0)**
Sample Size	2,371	1,676	2,160	1,510	2,370	778

Source: Authors' calculations based on data from the Panel Study of Income Dynamics' (PSID) Transition to Adulthood Supplement.

Notes: Bolded cells represent coefficients statistically significant at the 5 percent level. Net price reduction is defined as 60 percent of the EFC reduction (or the difference between *full-asset* EFC and *current* EFC). Full-asset EFC simulates EFC levels if uncounted assets were treated the same as counted assets by the financial aid system. Current EFC simulates the current formula that excludes uncounted assets. Additional control variables in lower panel include mother's level of education, mother's age at birth of child, and mother's marital status at time of birth. All specifications are weighted by *individual longitudinal weights* in the PSID, measured in the survey year relevant for the outcome measured (i.e., college enrollment in the year respondents were ages 17/18 and college graduation at ages 23/24).

Appendix Table D.5: Simulated Impact of EFC Reduction on Gaps in Educational Outcomes (includes grades and test scores as explanatory variables)

		White/Black Gap		White/Hispanic Gap	
	Sample	Unadjusted	Impact of Uncounted Assets	Unadjusted	Impact of Uncounted Assets
Enroll in College by Age 19	All students	21.0%	1.9 pp	1.2%	1.4 pp
Graduating from 2-Year Institution	Enrolling Students	3.9%	-1.9 pp	1.1%	-1.5 pp
Graduating from 4-Year Institution	Enrolling Students	29.8%	2.7 pp	20.0%	2.1 pp
Student Loan Debt	4-Year Graduate	$9,056	-$837	$-3,246	-$569

Source: Authors' calculations based on data from the Panel Study of Income Dynamics' (PSID) Transition to Adulthood Supplement.
Notes: pp indicates percentage point changes. The percent change in the enrollment/graduation outcomes reflects the percentage point change divided by the unadjusted percentage (x 100).