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RESEARCH ARTICLE

The racial wealth gap, financial aid, and college access

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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.

INTRODUCTION

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 et al., 2019). And Brown (2021) has documented 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 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; they 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, documented 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; Federal Reserve System, 2019), 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; National Center for Education Statistics, 2018) indicates that many of these students who attend 4-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% of all dependent students enrolled in college and 27% of those enrolled full time, living away from home, and at a 4-year institu-

[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, this refers to members of racial/ethnic minority groups) or a disproportionate positive impact on members not in that group.

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

[3] Along with Brown (2021), Choukhmane et al. (2022) discussed the impact of tax advantages for retirement savings on the racial wealth gap. Auclert and colleagues (2019) also showed 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 backgrounds. 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. In the broader population, wealth in Asian households is comparable to that in White households (Eggleston & Hays, 2019). 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 who is Black or Hispanic.

tion. 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 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. Our results are consistent with other research showing that parents with low wealth holdings (and particularly Black parents) are considerably more likely to borrow for their children's education and in higher amounts, and subsequently more likely to struggle with repayment (e.g., Baum et al., 2019; Perry et al., 2021; Perry & Romer, 2021; Scott-Clayton, 2018).

Finally, we conduct an econometric analysis using data from the Panel Study of Income Dynamics (PSID),[6] 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% to 15% 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.

Perhaps the most direct way of reducing the disparities created by the existing federal financial aid eligibility formula is to incorporate at least a portion of the currently uncounted home equity and retirement savings in the calculations. That said, important concerns, including the liquidity of those forms of savings, must be considered. We conclude the paper by providing a discussion of potential policy alternatives, addressing these concerns.

[5] Data available in National Student Clearinghouse Research Center (2022) document that college completion rates are highest in 4-year private, nonprofit colleges, then in 4-year public colleges, and lowest in 2-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 do not take into account possible issues of selection bias.

[6] https://psidonline.isr.umich.edu

THE FINANCIAL AID SYSTEM

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.[7] 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).[8] 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.[9] They ask about the "current balance of cash, savings, and checking accounts" (Question 88), the value of "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** [emphasis included] the home in which your parents live." It also directs applicants to a note, which indicates that "**investments do not include** [emphasis included]… retirement plans (401[k] plans, pension funds, annuities, non-education IRAs, Keogh plans, etc.)."

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.[10] From an economic perspective, however, those with greater resources have a greater ability to pay than those with lesser. Edlin (1993) argued 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. From a practical perspective, families' ability to access and to assume the cost of accessing illiquid assets to help pay for their children's college expenses should also be considered. We address this question in more detail in the discussion section below.

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

[7] 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.

[8] 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.

[9] This discussion is based on the current version of FAFSA at 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 initially slated for July 2023 and since delayed until December 2024. Changing the treatment of assets was not a focus of the legislation.

[10] Mullaney (2019) expressed 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.

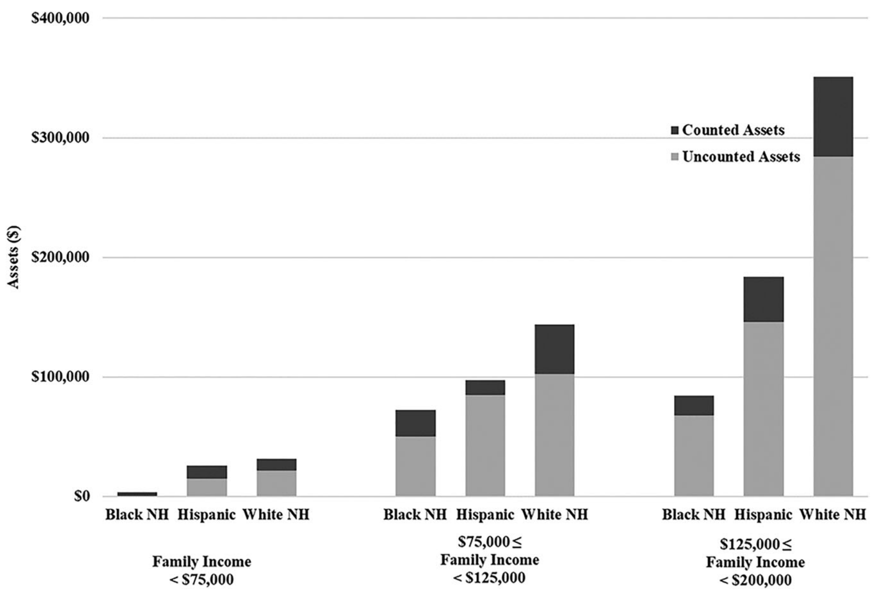

FIGURE 1 Median assets for families with children approaching college age, by family income, race/ethnicity, and asset category.

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.

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 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 4-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).[11]

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). In this and other sections of the paper, the simulations rely on a proprietary algorithm devel-

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

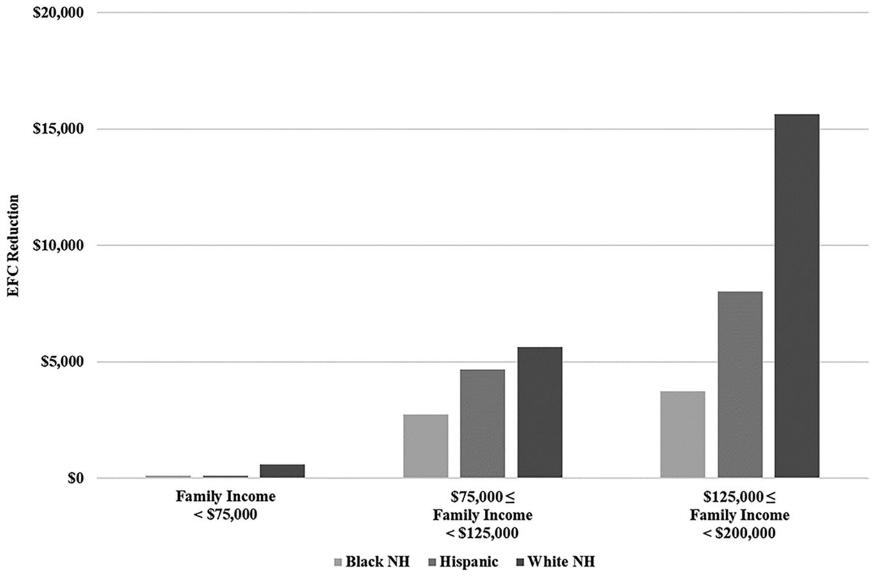

FIGURE 2 Median EFC reduction associated with uncounted assets by income category and race/ethnicity.

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-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. The sample includes respondents with children between the ages of 13 and 17.

oped 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 expected 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 twice as large for White students as it is for Black students ($5,600 versus $2,800). Among those with incomes between $125,000 and $200,000, the advantage that students from White families face is 4 times as large as it is for students from Black families. For them, their EFC is $15,600 lower than it would be if all their assets were counted. Students from Black families benefit as well, but the EFC reduction for them is only $3,700. Students from Hispanic families fall between these two racial/ethnic groups.

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

[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.

(or sticker price) less grant-based financial aid, which does not need to be paid back. The 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 the student's EFC from that. 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 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 that is 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.

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 that 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.[15] 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

[13] Grant-based aid is also available from other state and federal sources, but it represents 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.

[15] All appendices are available at the end of this article as it appears in JPAM online. Go to the publisher's website and use the search engine to locate the article at http://onlinelibrary.wiley.com.

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 who are ineligible for Pell Grants are much more likely to own such assets.[16] 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, live away from home, and attend 4-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% of all dependent students enrolled in college and 27% of those enrolled at 4-year institutions. Of those, 581,000 (more than two-thirds) actually received institutional grant-based aid (column 3).

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 about 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 students who are likely to be eligible 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 is twice as large for White students as it is for Black students (averaging $4,100 and $1,900 per year, respectively) and one-third larger for White students relative to Hispanic students ($4,100 and $3,300 per year, respectively). 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

[16] Data from the SCF support these assertions. Based on the asset data available and our simulated EFC values, we find that 89% 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% of Pell Grant-eligible families have uncounted assets, and the amounts are lower (median value for those who have these assets is $45,000).

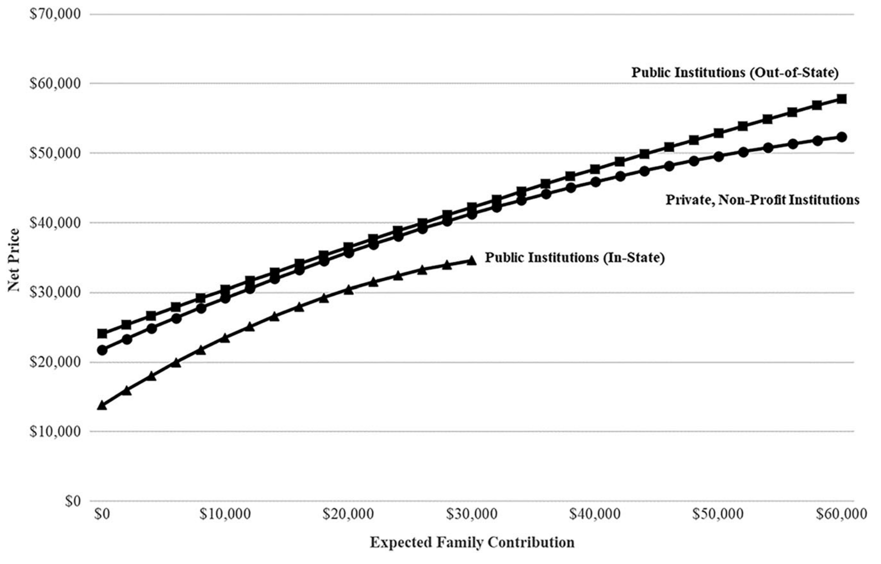

FIGURE 3 Relationship between the expected family contribution and net price, 4-year public and private colleges and universities.

Source: Previously unpublished tabulations based on 2015–2016 National Postsecondary Student Aid Study (National Center for Education Statistics, 2018).
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).

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).[17] Of that amount, $1.8 billion (78.9%) is awarded to White students, $66 million (2.9%) to Black students, and $134 million (5.9%) 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.

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 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.

[17] 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% attend institutions that rely on FM.

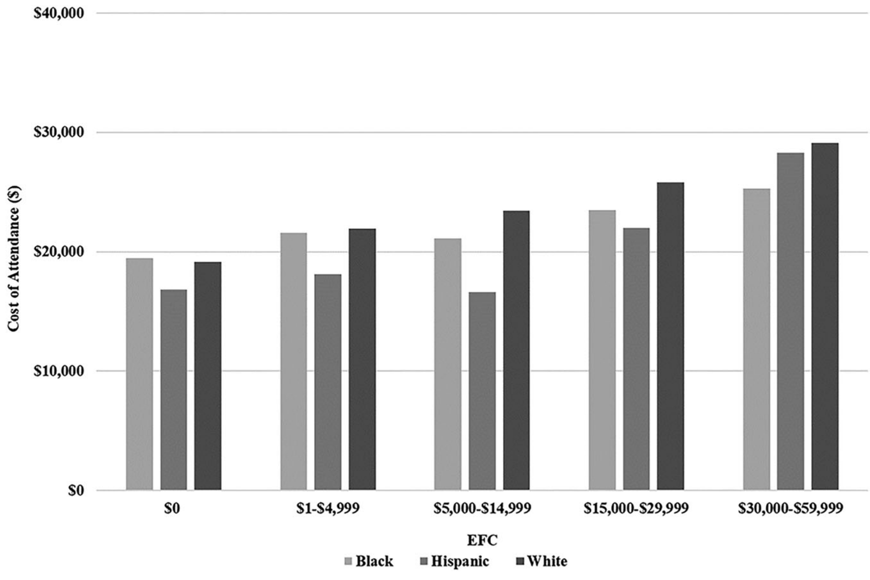

FIGURE 4 Cost of attendance at dependent students' institution, by income category and race/ethnicity.

Source: Previously unpublished tabulations based on 2015–2016 National Postsecondary Student Aid Study (National Center for Education Statistics, 2018).
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.

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 students 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 know that Hispanic students are particularly likely to enroll in community colleges that have a low COA (Ma & 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, 4-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.[18] The amounts of parental contributions are 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).[19]

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.[20]

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% to 20%. 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.

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

[18] Complete data regarding all payment types by race/ethnicity are reported in Appendix Tables D.1 and D.2 for private and public 4-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.

[19] 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. We note that direct parent payments may include funds obtained through loans other than educational ones and may represent some form of debt (e.g., home equity or retirement account extractions).

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

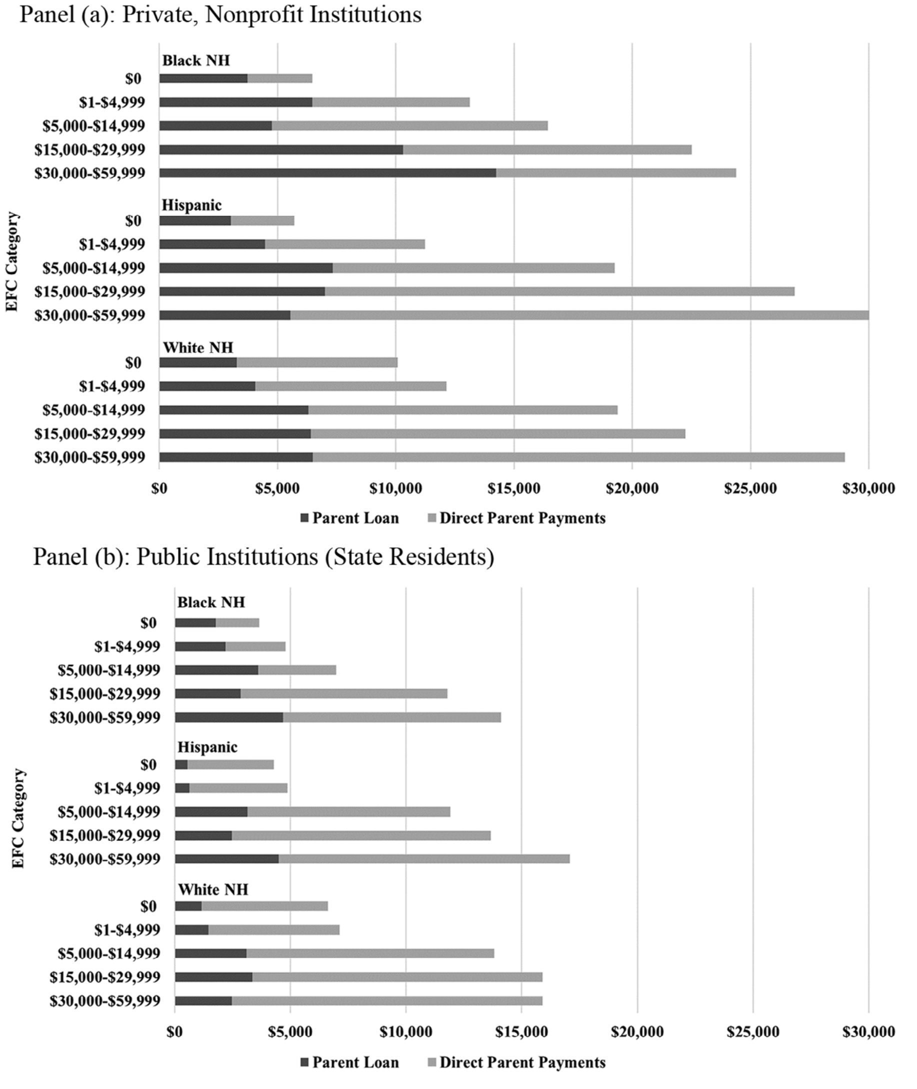

FIGURE 5 Average payments made by parents at 4-year private and public institutions, by expected family contribution category, payment type, and race/ethnicity.

Source: Previously unpublished tabulations based on 2015–2016 National Postsecondary Student Aid Study (National Center for Education Statistics, 2018).
Notes: All students are dependents, enrolled full time, live away from their parents, and, for public institutions, are state residents.

subsidy) is related to differences in educational outcomes after holding constant potentially confounding factors.

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 (Bulman et al., 2021; Charles et al., 2018; Hotz et al., 2021; Johnson, 2020; Lovenheim, 2011; Lovenheim & Reynolds, 2013). 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.[21]

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:

$$y_i = \beta_0 + \beta_1 black_i + \beta_2 hisp_i + \beta_3 efc_i + \beta_4 efc_i^2 + \beta_5(netpricereduction_i) + \beta_6(netpricereduction_i^2) + \beta_7 X_i + \varepsilon_i. \quad (1)$$

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 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 the 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 students receive 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 assets 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 & 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, which are 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 & Reeves, 2020) are another limitation in including them in our analysis. In our main specifications provided next, we report results

[21] 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 (2019) focused on that issue.

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.[22]

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) examined the type of colleges that students attend as a function of recent home price changes, which represents a reduced form variant of Lovenheim (2011). Cooper and Luengo-Prado (2015) estimated a similar reduced form specification to examine young adult earnings, comparing the behavior of renters and homeowners as a specification check. Johnson (2020) also estimated 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.[23]

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. 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.

[22] Haider and McGarry (2018) similarly reported 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.

[23] Three additional papers address other aspects of the relationship between wealth and college attendance. Hotz et al. (2021) have shown that the relationship between home equity and college attendance is moderated by transfers of that wealth between parents and their children. Charles et al. (2018) found that college attendance dropped among students who live in areas experiencing large changes in housing prices (booms or busts) because of the opportunity cost of employment options. Bulman et al. (2021) found 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.

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 matured, 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.[24] 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 4-year, public 4-year, or other—mainly community colleges), and whether they received a bachelor's degree. Our full sample includes 2,464 individuals.[25]

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 and colleagues (2015) reported 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 concluded that "the estimates in the two sources are, in general, fairly similar, although some differences do exist" (p. 8). 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).[26] 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.[27] We use

[24] 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.

[25] 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 https://nces.ed.gov/ipeds.

[26] 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.

[27] 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 et al., 2019). According to the Investment Company Institute (2020), IRA balances total $11 trillion compared with $8.7 trillion in defined contribution pension plans.

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.[28]

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 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.[29]

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

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 because of 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 like-

[28] 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.

[29] 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.

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-year 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.

lihood 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 4-year institutions. Enrollment at other institutions (mainly community colleges) would fall.

Table 3 provides results from the same analysis focusing on ultimate degree completion (2-year or 4-year) and student loan debt at ages 21 or 22.[30] 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 4-year college for student loan debt. The results are consistent with a beneficial impact of increased grant aid because of uncounted assets on subsequent education outcomes. Uncounted assets

[30] Our goal is to measure student loan debt around the time a student may have graduated from a 4-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.

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% level. Net price reduction is defined as 60% 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).

are positively related to graduation from a 4-year institution and negatively related to receiving a 2-year degree and to owing student loan debt.[31]

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.

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

[31] 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.

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% level. *Net price reduction* is defined as 60% 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).

smaller, but it is 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).

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 et al. (2019) found that, for each $1,000 in Pell Grant aid given to low-income students at 4-year college entry, the probability of graduating within 5 years later increases by about 5 percentage points, or around 15% 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 4-year degree by 0.9 percentage points for students

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).

who enrolled in college, or 2% of the baseline completion rate.[32] It makes sense that a $1,000 implicit subsidy should have a considerably smaller impact on graduating from a 4-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 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% to 15% of the raw gap in college enrollment and graduation from a 4-year institution between Black students and White students could be attributable to the racial gap in uncounted assets via additional grant aid.[33]

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

[32] 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 1/10th to convert it to a $1,000 increase in the net price reduction. That represents a 2% increase relative to the baseline rate of college completion (among those who start college) of 49.3%, as reported in Table 1.

[33] 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.

students is small because of the 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% to 15%.

DISCUSSION

This study documents that the presence of uncounted assets has the effect of making college disproportionally more affordable for students with above-median incomes from White families relative to students from Black families and Hispanic families. The magnitude of the implicit subsidies associated with the current treatment of retirement savings and home equity is large. We calculate that these implicit 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 are likely to contribute to the observed gaps in educational outcomes by race and ethnicity, accounting for perhaps 10% to 15% of the raw gap in college enrollment and graduation from a 4-year institution between Black students and White students.

The obvious question that arises is: What, if anything, could and should policymakers do about it? There are several factors to consider when comparing alternative policy responses. We discuss those issues here.

Philosophical issues

From a theoretical perspective, "an asset is an asset." Any asset that has value, that can be traded, or that can be pledged as collateral, contributes to permanent income. A family who owns a house or has saved for retirement possesses greater resources that can be used to increase lifetime consumption. Extant evidence shows that home equity, in particular, is a source of wealth that families often use for consumption smoothing purposes (e.g., Hurst & Stafford, 2004, among many). Even in the absence of spending from these resources directly, owning them increases one's ability to consume more out of current income. Homeowners and those with retirement savings can afford to pay more for college, so perhaps these wealth holdings should be incorporated into the financial aid system?

As a matter of policy, our society has chosen to provide incentives for homeownership and retirement savings through the tax system because of the positive externalities they may provide. Some argue that homeownership encourages housing stability, which increases civic engagement, the strength of neighborhoods, and the quality of our schools, for instance (Yun & Evangelou, 2016). It is also beneficial for society to have a means of supporting older individuals beyond the end of their work lives, and private savings is one way to accomplish that goal. Using the tax system to promote private retirement savings has a social benefit as well, according to this line of reasoning (Myers, 2020). If our society has decided to advantage these savings in the tax system, is it inconsistent to remove their advantage in the financial aid system?

Whether the focus is the income tax or the federal financial aid systems, any impact of the personal or societal advantages associated with homeownership and retirement savings should be interpreted within the context of the racial and ethnic inequities those incentives create.[34] Brown (2021) has documented those inequities in the income tax system, and we do so in the present study for financial aid. In other words, any benefit associated with maintaining the favorable treatment of uncounted assets needs to be weighed against the inequities it creates.[35]

[34] Throughout the discussion, we use *inequities* to refer to disparities in resources, endowments, or access.

[35] This potential concern is exacerbated if savings behavior would respond strongly to eliminating the preferential treatment these assets receive. Past research investigating the elasticity of savings more broadly to the incentives of the financial aid system, though, indicates this may not be

Practical issues

If policymakers are to consider including home equity and retirement savings in determining financial aid eligibility, they must also consider how easy it is for families holding those assets to use them to help pay students' college costs. It is neither practical nor consistent with other policies designed to encourage accumulating these assets for families to sell their homes or liquidate retirement savings to pay for college. Realistically, the issue is whether families can easily withdraw a small share of or borrow against those assets to help pay college bills.[36] In other words, how easily can these relatively illiquid assets be accessed (or *liquified*) administratively or through credit markets?

It turns out that families routinely access home equity and retirement savings. In terms of home equity, earlier technological advances that enabled faster and cheaper underwriting by lenders made it easier to do so (e.g., Foote et al., 2019). Extractions of home equity reached their peak in the 2001 to 2004 period; some 30% of mortgage holders (and an even higher share of higher credit score mortgage holders) refinanced their homes or extracted home equity in other ways in 2003 (Amromin et al., 2020). Guren et al. (2021) provided evidence that this home equity boom was not driven by special features of the boom–bust cycle. They report that the elasticity of consumption to housing wealth is substantial and has been a fundamental feature of the economy going back to at least the 1980s. Currently 8 million homeowners hold home equity loans and 5 million home equity lines of credit (13 million total), representing 15% of the 85 million households that own their homes (Equifax, 2022).

The Internal Revenue Service allows for no penalty withdrawals of funds from IRA accounts for educational expenses for all holders. Those individuals age 59½ or older or those with demonstrated financial hardship are also able to withdraw funds from 401(k) accounts. For all other individuals, a 10% penalty for withdrawals may apply, or the individual can take out a loan against the account. Such loans are relatively common, with some 17% of Baby Boomers and 23% of Generation X account holders having an outstanding loan against their 401(k) in recent years (Fidelity Investments, 2021).

Generally, there are limits to how much can be extracted from home equity and retirement savings. Home equity loans are constrained by maximum loan-to-value ratios, for example. Withdrawals from defined contribution retirement accounts may be subject to a penalty, as previously mentioned. And extracting funds from defined benefit pension plans entail nearly insurmountable limitations. In practice, though, the extent of any anticipated withdrawals based on reasonable policy alternatives (discussed below) would be relatively small. Families with high levels of counted assets typically have high levels of uncounted assets. Even the most ambitious policy options described would ask families to extract only a small fraction of these assets, and no larger than the expected contribution rates in the current EFC formula.

Surveys asking parents how they pay for their children's college education already indicate that many parents borrow against home equity and retirement savings. One recent survey (Sallie Mae, 2022) finds that 18% of parents used a retirement account withdrawal, 8% used a retirement account loan, and 7% used a home equity loan to cover college costs. The use of these funds is just as common, if not more so, as other sources of borrowing—12% used a federal Parent PLUS loan and 9% used a private education loan. And these statistics understate the extent of borrowing from home equity and retirement savings because ownership of these types of assets is not universal, even among families of college-going children. Overall, home equity and retirement savings appear to provide those holding them greater ability to pay for college.

true. Early research by Edlin (1993) and Feldstein (1995) reported strong savings responses, but more recent evidence indicates the responsiveness to be much smaller or non-existent (e.g., Darolia, 2017; Long, 2004; Monks, 2004; Reyes, 2008) even when resources are not tax advantaged. We would posit that disincentives to accumulating tax advantaged savings like home equity or 401(k) savings should be minimal given the comparably small clawback rate on assets in the EFC formula relative to the tax subsidies.

[36] For context, the 2022–2023 EFC formula assumes contribution of 12% out of *discretionary* assets, and a considerably lower share of *total* assets because of various allowances and protections (U.S. Department of Education, 2021).

Policy issues

How should the financial aid system treat home equity and retirement savings in light of the documented racial and ethnic inequities in their holdings? There are several options available to policymakers in the federal financial aid system that could be informed by the analysis in this study.

Option 1: Fully incorporate home equity and retirement savings as counted assets[37]

Families who own more of these assets (if any) would be eligible for less financial aid, eliminating the disparate impact of the implicit subsidy we identified in earlier sections.[38] This would eliminate the racial and ethnic inequities that exist in the current formula.

One may be concerned, however, that the greater equity is achieved by imposing a penalty on the owners of those assets, who are more likely to be White, rather than by providing greater assistance to those who do not hold those assets, who are more likely to be Black or Hispanic. Such an approach can be described as a "bringing down the top" method of addressing inequality, which may be one of its limitations. Implementing such an approach would reduce overall eligibility for financial aid, with those increases borne by families with uncounted assets.

Option 2: Adopt a "revenue-neutral" policy change

This alternative is similar to past efforts at tax reform. In the current EFC formula, income and assets are "taxed" (in terms of an expected contribution toward EFC) in that those with more of either resource have higher EFC and are generally eligible for less financial aid than those with less of either resource. If we counted retirement savings and home equity, that would increase the cumulative EFC, which can be thought of as the *tax revenue*. That could be offset by lowering the tax rate on income in a way that would be *tax neutral*, in the sense that overall aid eligibility (determined by cumulative EFC) would remain unchanged.

The distribution of EFC, and therefore financial aid eligibility, though, would change. In particular, Black students and Hispanic students would be less affected by counting the additional assets because they are less likely to hold them or to hold them in larger amounts. They would benefit from the lower tax on income that would reduce their EFC. This approach would reduce the cost of college for these students, encourage greater access, and support a more equitable federal financial aid system. Lower-income White students with few assets would also benefit from this approach. Higher-income students whose families hold more assets (and are more likely to be White) would end up eligible for less financial aid than they are now.

Option 3: Modify the "Simplified Needs Test"

This is a middle-ground approach. It is based on the current Simplified Needs Test, which allows students with family incomes below $50,000 ($60,000 starting in 2024) to skip entering information on any assets (Collins & Dortch, 2022). Lower-income families benefit from this system, eliminating some of its complexity (Dynarski & Scott-Clayton, 2006). That threshold could be extended, perhaps to $75,000 (roughly the median income of families with college-aged children) based on the results of our analysis. For households beyond that income level, though, the equity benefits associated with

[37] A variant on this option would exclude defined benefit pensions, whose value is difficult to measure and broadly illiquid.

[38] As discussed previously, the typical 4-year college offers about 60 cents of institutional grant aid for every dollar of EFC reduction, so we distinguish between financial aid eligibility (EFC) and financial aid receipt (grants) throughout the policy discussion.

counting assets, including home equity and retirement savings, are greater and may outweigh the complexity costs associated with counting them.

Option 4: Leave the existing system in place

One might argue that the current system, despite its deficiencies, should not be substantially changed. A disadvantage with Options 1 and 2 is that they have the potential to make an already complicated financial aid system even more complicated. Providing asset information can be difficult for families and those options require more of such data. This complexity can restrict college access (Dynarski et al., 2021; Levine, 2022). The idea of "FAFSA on a postcard" (Dynarski & Scott-Clayton, 2006) goes in the opposite direction of Options 1 and 2. Indeed, simplification efforts to the FAFSA are already underway, with the enhanced Simplified Needs Test as one aspect of the reforms (Levine & Desjean, 2023). We recognize the value of simplicity in the financial aid system. We also note, though, that any additional simplification in the direction of omitting asset information would exacerbate the disparities in financial aid eligibility and receipt we identify in this study. The question is, how do we trade off the value of simplicity against the cost of inequities that result if certain assets are not counted?

Context

The advantage provided by the federal financial aid system to students from White, above-median income families is just one mechanism that contributes to racial and ethnic inequities in our higher education system. If policymakers addressed the disparate impact created by the EFC formula's treatment of uncounted assets highlighted in our study, it would not fully eliminate inequities in access to and affordability of higher education.

Long before their EFC is calculated, students are influenced by the neighborhoods in which they live and the K–12 schools they attend. Research has documented that inequities in those contexts play an important role in influencing college application, attendance, and completion. For instance, Flores and colleagues (2017) considered the universe of college students at public universities in Texas and show that high school context accounts for some 60% of the college completion gap, and postsecondary factors account for only about 35%. Recent research also shows that per-pupil K–12 expenditure significantly affects future student outcomes (Jackson et al., 2016; Jackson & Mackevicius, 2021). Unfortunately, significant disparities remain in school district expenditures along income and along race/ethnicity lines (Bifulco & Souders, 2023; Education Trust, 2022). Resource gaps exist both in school district financial resources, as well as in social resources such as local rates of adult educational attainment, family structure, and adult unemployment (Bischoff & Owens, 2019).

Baum and McPherson (2022), among others, argued that the overhang of disparities by race/ethnicity in the first 18 years of life cannot be overcome solely by using higher education as the great equalizer. Since education is responsible for more than half of the growth in earnings inequality in the United States since the 1970s, and nearly 75% of the growth in inequality since the late 1980s (Hoffman et al., 2020), inequities at all levels of education require policy attention. A comprehensive strategy to address these inequities is necessary (Gordon & Reber, 2021) and focusing solely on college financial aid is insufficient to tackle inequality in college outcomes.

Our study identifies incremental inequities created by the advantageous treatment of uncounted assets held predominantly by above-median income White families who exacerbate disadvantages already faced by Black students and Hispanic students before the college financial aid stage. The unequal outcomes documented in the present study should be part of this larger policy discussion on equity in education access and student success.

FINAL THOUGHTS

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. Doing so generates inequities by race and ethnicity in the income tax, as Brown (2021) has highlighted, and in the financial aid system, as we have documented here. This disparate impact should not be ignored.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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