How Much Can Families Afford to Pay for College?

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Abstract: This chapter studies the capacity to pay for college in the United States, focusing on changes over time and differences by race and socioeconomic status. I use data from the National Postsecondary Student Aid Study (NPSAS) to document changes over time in the Expected Family Contribution (EFC) from the Free Application for Federal Student Aid (FAFSA). I then use data from the Panel Study of Income Dynamics (PSID) to calculate alternative measures of the ability to pay for college.

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1 Introduction

Research consistently finds that college is a worthwhile investment for many people and that a college degree leads to important pecuniary and nonpecuniary benefits (Oreopoulos and Salvanes, 2011; Oreopoulos and Petronijevic, 2013; Smith, Goodman, and Hurwitz, 2020; Zimmerman, 2014). However, there are racial and socioeconomic gaps in college attendance and completion (Bailey and Dynarski, 2011; Chetty et al., 2014; Reber and Smith, 2023). There is also concern that not everyone is able to afford to attend college (Council of Economic Advisers, 2023; Levine, 2022; National Collegiate Attainment Network, n.d.). If people are deterred from attending college because they cannot afford to do so, or because they perceive that they cannot afford to do so, this could result in unfulfilled potential and lost productivity. And if this is related to race, ethnicity, or family background, the result could be an increase in inequality.

This chapter studies the capacity to pay for college in the United States, focusing on changes over time and differences by race and socioeconomic status. Although my focus is on the families that comprise the demand side of higher education, this information is also relevant to the colleges and universities on the supply side. The relationship between race, socioeconomic status, and ability to pay sheds light on the challenges colleges face as they seek to diversify their student bodies given the changing income distribution and racial composition of the U.S. population. And from a societal level, if we wish to draw more people into college, knowing how much they would be able to pay can help determine how much extra support they need from the government, universities, and private sources.

The empirical analysis has two components. First, I use data from the National Postsecondary Student Aid Study (NPSAS) to document changes over time in the Expected Family Contribution (EFC) from the Free Application for Federal Student Aid (FAFSA), focusing on differences between racial and socioeconomic groups. The EFC is a basic measure of ability to pay that is calculated by the federal government and used by many colleges. Although the EFC is being replaced with the Student Aid Index (SAI) beginning in 2024–2025, many of the same principles carry over to this newer measure.

Second, I use data from the Panel Study of Income Dynamics (PSID) to calculate alternative measures of the ability to pay for college. In particular, I make various assumptions about what percentages of income and wealth families can reasonably afford to pay. I focus on the distributional consequences of various possible changes to the EFC or SAI formula.

The next section of this chapter discusses in more detail why a family's ability to pay for college might matter. After that, I review prior research related to the ability to pay for college. I then describe two important recent events related to college pricing: the redesign of the FAFSA and the

ongoing antitrust litigation involving financial aid at elite private universities. I then turn to the empirical work, beginning with a discussion of the data and continuing with results on the changes in the EFC over time and the simulations of alternative measures of the ability to pay. The final section concludes.

2 Why Might Ability to Pay Matter?

One might question whether family resources actually matter for college attendance decisions. After all, the United States has a large and robust financial aid system in which various levels of government, higher education institutions, and private organizations supply a variety of loans and grants to college students and their parents. Moreover, many colleges are committed to meeting a student's full financial need. So why would a family's available resources matter?

One reason a family's resources might matter is that a number of colleges actually do take the ability to pay into account in admissions decisions. Thus, a greater ability to pay may expand a potential college student's choice set and have a very direct effect on college access. Second, even if a college does not take ability to pay into account in admissions decisions, it still might not offer financial aid packages that meet the full financial need of every admitted student. This could result in different financial aid packages and different prices for a student at different colleges, which could affect a student's choice of which college to attend. Third, even colleges that meet full financial need may make different calculations of how much a student is able to pay and how much financial aid the student needs. For example, many colleges use the CSS Profile, a supplemental financial aid form that allows universities to ask customized questions about a family's finances. If two colleges are asking different questions and using different information about family resources, it is natural that they may arrive at different conclusions about how much a family will be able to pay and how much financial aid a student needs. Fourth, even if colleges meet financial need and calculate need in the exact same way, they might differ in the mix of loans versus grants. Receiving a financial aid package that is heavy on loans that need to be repaid is less desirable than receive a package that is heavy on grants that do not need to be repaid. Fifth, even if a college would offer a very generous financial aid package to a student, the student might not necessarily be aware of this before applying (Levine, 2022). Financial aid offers are generally not given until a student has been admitted to a university, and so the perception that a college is too expensive may deter students from applying in the first place.

In addition, even if a family is able to pay for college, that may not necessarily be willing to do so. Some families may be averse to taking out loans, and students who come from families with fewer resources may be less willing to borrow because their families might be less able to help them

in the event that they run into difficulty repaying.[1]

All of these reasons suggest that family resources might affect whether a student attends college and which college the student attends. These decisions are highly consequential, given the earnings advantage associated with higher education (Oreopoulos and Salvanes, 2011; Oreopoulos and Petronijevic, 2013; Smith, Goodman, and Hurwitz, 2020; Zimmerman, 2014) and the earnings differences across colleges (Chetty, Deming, and Friedman, 2023; Cohodes and Goodman, 2014; Hoekstra, 2009).

Moreover, even in cases for which a family's resources do not affect a student's college choice, college tuition can still strain the student's and family's finances before, during, and after the time the student is in college. Paying a large amount for college tuition may make it more difficult to finance major purchases such as homes and automobiles or to save for retirement.

Even apart from the impacts on students, the amount of money that families can afford to pay has direct implications for the finances of universities and governments. To the extent that students demonstrate greater need, colleges and governments may need to contribute more. Knowing how much students can afford to pay can help colleges decide on their pricing strategies and help with financial planning. It might also help governments formulate financial aid policies.

Colleges have an interest in enrolling more first generation students and also in diversifying their student bodies along a variety of dimensions, including race and socioeconomic status, and they may be able to use financial aid policy to do so. Financial aid policy may become even more important following the Supreme Court's ruling limiting the use of race-based affirmative action in *Students for Fair Admissions, Inc. v. President and Fellows of Harvard College*. This ruling will make it more difficult for colleges to diversity their student bodies through admissions policies, and so they may thus turn to offering greater financial aid across the board. Earlier research on affirmative action, which primarily studied statewide bans, suggests that the challenge may be compounded. This research finds that affirmative action leads underrepresented minority students to "cascade down" from highly selective higher education institutions to somewhat less selective ones (Arcidiacono, 2005; Bleemer, 2022; Hinrichs, 2012; Long, 2004b). In light of this, the result of the Supreme Court affirmative action ruling might be a shift of students from universities with greater resources and more generous financial aid policies to those with fewer resources and less generous financial aid policies.

[1] One caveat is that there are some cases in which loans are forgiven. Although the Supreme Court invalidated a large-scale loan forgiveness proposal in *Biden et al. v. Nebraska et al.*, smaller and more targeted loan forgiveness programs remain.

3 Prior Research

A small body of research directly studies how families save for college, how much they can afford to pay, and how college affects households' balance sheets. Levine (2022, Ch. 5) acknowledges the difficulty of defining "affordability" but assumes that a student should be able to pay their EFC plus a $5,500 student loan and $2,500 from working. Based on this definition, college is unaffordable for a high percentage of people, although private institutions with large endowments are actually more affordable than other institutions due to their more generous financial aid policies. Souleles (2000) uses data from the Consumer Expenditure Survey from 1980 through 1993 to study the relationship between spending money for college and other expenditures. He generally finds that other expenditures do not fall at the time that families are paying for college, suggesting that they do a good job of planning in advance and smoothing their consumption. Li, Mitchell, and Zhu (2023) study saving for college using 529 savings plans, finding that many people are investing suboptimally because they could earn higher returns by investing in a different state.

The work of Levine and Ritter (2022) is highly relevant to Section 7 of this chapter. They note that the Expected Family Contribution calculation ignores home equity and retirement savings, and White people disproportionally hold these assets relative to Black people and Hispanic people. As a result, the financial aid system creates an implicit subsidy that disproportionally benefits White people.

A very general question related to college affordability is whether credit constraints hinder people from attending college. One set of research either directly estimates a structural model or uses the predictions of a theoretical model to formula a test for credit constraints. An example of this work is Cameron and Taber (2004), who do not find evidence that credit constraints affect schooling decisions. Two additional papers add nuance to this finding. Brown, Scholz, and Seshadri (2012) find that credit constraints are important for certain families in which parents underinvest in their children but not for other families. Caucutt and Lochner (2020) find that credit constraints at one particular point in time do not have much effect, but due to dynamic complementaries, relaxing credit constraints at multiple points in a person's life may have an impact. Lochner and Monge-Naranjo (2012) review evidence on credit constraints that focuses on this type of research.

A second set of research on credit constraints uses natural experiments to study the impacts of income, wealth, and easier access to credit.[2] Sun and Yannelis (2016) exploit variation in bank deregulation across U.S. states over time to estimate the effects of easier credit, finding that easier

[2]Certain research does not fall into either category. For example, Stinebrickner and Stinebrickner (2008) survey students at Berea College in order to estimate which students are credit constrained, and they find that credit constrained students are more likely to drop out of college. Using the RAND American Life Panel, Ringo (2019) finds that children whose parents have low credit scores are less likely to attend and graduate from college.

credit increases college enrollment. Manoli and Turner (2018) use a regression kink design with the Earned Income Tax Formula to find that tax refunds lead to increases in college enrollment. Bulman et al. (2021), using data on lottery winners, find that college-aged people are not deterred from attending college due to limited parental resources.

Some of the existing evidence on how families pay for college comes from a set of research on the impacts of housing wealth on college enrollment. Lovenheim (2011) finds that higher parental home equity results in higher college enrollment for college-aged children, while Johnson (2020) finds that increases in parental wealth induced by housing price shocks result in a higher probability that children graduate from college. Additional research examines the effect of housing wealth on the type of institution a student enrolls in. Lovenheim and Reynolds (2013) find that greater housing wealth increases the propensity to attend a public flagship university, decreases the propensity to attend a community college, and has little effect on the propensity to attend a four-year private institution, relative to a flagship public four-year institution. However, Hotz et al. (2018) do not find much impact of parental home equity on an index of college quality, although the results are somewhat imprecise. Lastly, a paper by Amromin, Eberly, and Mondragon (2016) gives direct evidence on how families finance higher education, finding that falling home prices lead people to have higher student loan debt and rely less on home equity to pay for college.

The financial aid system imposes implicit taxes on income and wealth. Although this is not an actual tax, it is as if there is a tax because earning additional income or having additional wealth can reduce the amount of financial aid offered by colleges. This issues is discussed in Case and McPherson (1986) and Edlin (1993), although the authors seem to come down on different sides of the issue. Edlin (1993) stresses the high level of the tax. The implicit tax on incomes is on top of the usual federal and state taxes, the tax on wealth can apply for a number of years in a row as long as a family has children in college receiving financial aid, and not only are assets taxes but the income received from them is taxed as well. All of these reasons suggest that the implicit taxes may create serious disincentives for savings and labor supply. On the other hand, Case and McPherson (1986) argue that the disincentives might only be relevant for a relatively small group of families with children attending expensive colleges. In other families, if the children even attend college at all, they may not receive financial aid anyway or may not receive the full amount of financial aid they need. In that case, an extra dollar of income could fully be used to pay tuition rather than crowding out financial aid. Also, the temporary nature of the financial aid tax means that the disincentive effects on labor supply are smaller than if the tax were permanent. In addition, parents may not understand the incentives to reduce labor supply and assets, in which case the disincentives may not have an effect.

Feldstein (1995) takes these ideas to the data using the 1986 Survey of Consumer Finances,

finding that families facing higher implicit tax rates do indeed have a lower level of assets. Dick and Edlin (1997) use data from the 1997 NPSAS to study how large the implicit tax rates actually are. Because colleges do not all meet all students' full financial need, an extra dollar of income may not reduce a financial aid offer by as much as it would based on the implicit tax rate one might assume solely from looking at the EFC formula. Nonetheless, Dick and Edlin (1997) still find that income and assets lead to fairly sizable reductions in financial aid offers.

Long (2004a) argues that it is difficult for a family to forecast what its implicit financial aid tax rate will be. He finds that the estimated effects on asset accumulation of this tax are sensitive to which assumptions are made, but the estimated effects are small when making the assumptions that he considers to be the most plausible. Dick, Edlin, and Emch (2003) run simulations using data from the 1986–1987 and 1995–1996 NPSAS, finding that the savings disincentives embedded in the financial aid system cause an inefficiency that is modest relative to the size of the overall economy but fairly large for particular families. Additional evidence of the importance of savings disincentives comes from Babiarz and Yilmazer (2009), who find using the 2001 Survey of Consumer Finances that households facing high implicit tax rates have higher shares of their wealth in retirement savings and home equity, which are not subject to such taxation. Gebbia (2023) uses the full set of FAFSA applicants from California from 2010 through 2021, along with two quasi-experimental research designs, to study the effects of the financial aid tax rates on taxable income. One of the research designs is based on an unexpected change in the year of income used to calculate the EFC, and the other is based on variation across families in the number of children they have in college at the same time. The results suggest that middle income families have an elasticity of taxable income of 0.10.

Lastly, although most research focuses on the negative incentives of the financial aid system, Fan, Fisher, and Samwick (2021) focus on a potential benefit. In particular, the fact that families receive greater financial aid if they have lower incomes and wealth but lower financial aid if they have higher incomes and wealth means that the financial aid system provides a type of income and wealth insurance. Fan, Fisher, and Samwick (2021) simulate a model of this and find that the insurance value of financial aid is large.

In addition to all the research mentioned above, there is a voluminous literature on the effects of college financial aid on enrollment, persistence, and other outcomes that is summarized in Dynarski, Page, and Scott-Clayton (2022). There is also a fair amount of research on student loan debt summarized in Yannelis and Tracey (2022). Hershbein and Hollenbeck (2015) is a collection of papers on this and related topics.

4 Background Information

4.1 Changes to the FAFSA and EFC

The Free Application for Federal Student Aid (FAFSA) is administered by the federal government and is the primary application form for student financial aid in the United States. Students and their families enter information on income, wealth, and family structure and then a formula is used to give an indication of how much the families might be able to pay for college. Some aspects of this formula are changing for 2024–2024 as a result of the FAFSA Simplification Act. As a matter of terminology, the name of the output of the formula is changing from "Expected Family Contribution" to "Student Aid Index." One major change is that families with multiple children in college at the same time will now be expected to contribute more than they did previously. The EFC formula had a step at the end of the section for the parents' contribution that divided by the number of children in college, but that step has been eliminated for the Student Aid Index calculation. There have been challenges with the rollout of the new FAFSA that have led to delayed student aid offers, and it remains to be seen what the impacts of the new FAFSA and SAI calculation will be in the future after these challenges are resolved.

In general, though, the structure of the EFC and SAI calculation has remained similar for many years. In particular, there are three branches: one for dependent students, one for independent students with their own dependents, and one for independent students without dependents.[3] For dependent students, who are the focus of the empirical work in this chaper, there is a parent component of the calculation and a student component of the calculation. Students are expected to contribute 50% of their own income above an allowance level, as well as 20% of their assets. For the parents, loosely, 12% of their assets are added to their income above an allowance level to form a quantity called the "adjusted available income." The amount that parents are expected to contribute from this quantity is determined by a graduated tax with six different implicit tax rates that range from 22% to 47%. In cases where the parents have an income below a certain threshold, the EFC uses a simplified formula that does not consider wealth. If parents have an income below an ever lower threshold, the EFC is automatically zero. For independent students without their own dependents, the structure is similar to the student part of the contribution for dependent students, except that a spouse's income and assets are included in the calculation and the allowances are calculated somewhat differently. For independent students with their own dependents, the structure is similar to the parents' part of the calculation for dependent students,

[3]There are a variety of criteria that make someone an independent student for financial aid purposes, including being at least 24 years of age by January 1 of the relevant school year, being married, being in the military, or having children to support.

except that a spouse's income and assets are included and only 7% of assets are added to income to form the adjusted available income.

A criticism of the FAFSA and EFC/SAI is that they exclude housing wealth and retirement savings from the calculation, which may in some cases give a distorted view of a family's true ability to pay. As noted earlier, some colleges supplement the FAFSA with the College Board's CSS Profile, which does ask about housing wealth, retirement savings, and other more detailed financial information.[4] However, the exact ways in which this information is used are not publicly available. On the other hand, the EFC formula from the FAFSA is publicly available, the EFC is directly included as a variable in the NPSAS data that I use, and I estimate the EFC using income and wealth data in the PSID.

4.2 Litigation Surrounding Financial Aid

A recent lawsuit has the potential to substantially impact college pricing and financial aid, especially among highly selective institutions. In 2022, a set of former students filed a lawsuit against 16 selective private universities, alleging that the universities conspired to raise the price of college attendance by colluding on financial aid.[5] The institutions were members of a now-dissolved group called the 568 Presidents Group, which met regularly to discuss and coordinate on financial aid policy. According to the universities, they were cooperating to ensure that financial aid dollars were targeted to needy students rather than being used by colleges to compete based on price to attract students that were desirable for the colleges to enroll but did not have as much financial need. The universities argue that this cooperation was allowed under Section 568 of the Improving America's Schools Act of 1994, which carved out an antitrust exemption for universities to formulate shared general financial aid principles, as long as all the universities involved admitted students on a need-blind basis. The plaintiffs in this case, which has been known by several names, including *Carbone et al. v. Brown University et al.* and *Henry et al. v. Brown University et al.*, argue that the universities do not all admit students on a need-blind basis and are thus ineligible for the antitrust exemption because, among other reasons, they consider ability to pay when admitting students from the waitlist, give admissions preferences to students from wealthy families that have made or may make large donations to the university, and practice "enrollment management" that integrates admissions and financial aid decisions. Following the University of Chicago, a number of

[4] A list of colleges using this form can be found at https://profile.collegeboard.org/profile/ppi/participatingInstitutions.aspx.

[5] The 16 universities are Brown University, California Institute of Technology, University of Chicago, Columbia University, Cornell University, Dartmouth College, Duke University, Emory University, Georgetown University, Massachusetts Institute of Technology, Northwestern University, University of Notre Dame, University of Pennsylvania, Rice University, Vanderbilt University, and Yale University. The lawsuit has since expanded to include Johns Hopkins University.

the universities have agreed to settle the case. However, others remain as plaintiffs.[6]

The 568 Presidents Group followed an earlier group called the Overlap Group, a group of selective institutions that cooperated more specifically on financial aid offers for individual students. In 1991, the U.S. Department of Justice sued the eight Ivy League institutions and the Massachusetts Institute of Technology (MIT), which were all members of this group, alleging a conspiracy on financial aid policy. The Ivy League institutions agreed to settle the case, but MIT went to trial in 1992. MIT lost at the district court level, but in the 1993 the circuit court reversed the decision and remanded the case back to the district court. MIT then settled the case. Meanwhile, the Higher Education Act of 1992 permitted some amount of cooperation on financial aid, and this gave way to Section 568 of the Improving America's Schools Act of 1994.

It is unclear whether the more recent case will eventually lead to an outcome that allows a limited amount of cooperation, which was the outcome of the earlier case. The outcome of the more recent case could be that it becomes more difficult for highly selective institutions to coordinate on financial aid, which could lead to more price competition but also potentially less financial aid for students with need.

5 Data

5.1 National Postsecondary Student Aid Study

The National Postsecondary Student Aid Study (NPSAS) is conducted by the National Center for Education Statistics in the U.S. Department of Education. NPSAS includes background information on the students in the sample, as well as highly detailed information on financial aid. NPSAS is a random sample that, when using appropriate weights, is intended to be representative of U.S. college students enrolled at institutions that participate in federal financial aid programs.[7] NPSAS data come from a student survey, as well as administrative sources. NPSAS also surveys graduate students, but I use data only from the undergraduate survey. Although a restricted-use version of NPSAS is available to researchers, I analyze publicly available NPSAS data using PowerStats on the NCES DataLab (https://nces.ed.gov/datalab).

NPSAS began in 1987 and has generally been conducted every three or four years.[8] In particular, it was conducted in 1987, 1990, 1993, 1996, 2000, 2004, 2008, 2012, 2016, and 2020.[9] The time

[6] The remaining institutions are California Institute of Technology, Cornell University, Georgetown University, Johns Hopkins University, Massachusetts Institute of Technology, University of Notre Dame, and University of Pennsylvania.

[7] NPSAS excludes the U.S. service academies because those institutions have a special funding model.

[8] NPSAS uses the second calendar year in a school year to refer to a school year. Thus, the 1987 NPSAS covers the 1986–1987 school year.

[9] There is also a 2018 NPSAS that I do not use and that contains information from administrative sources only.

span and frequency of the NPSAS allow for meaningful comparisons over time. Additional features of the NPSAS include its large sample size and its EFC variable, which is taken directly from administrative records when possible. A disadvantage of NPSAS relative to the PSID is that the data on family income and wealth are not as detailed in NPSAS. An additional caveat is that the NPSAS sample only contains people who are already enrolled in college. If someone has been deterred from attending college due to the perception that college is unaffordable, this person would not be represented in the data.

In my analysis of the NPSAS data, I limit the sample to full-time full-year dependent students who are between the ages of 18 and 22 and are U.S. citizens. Additionally, I limit the sample to students enrolled at four-year institutions in the 50 states and the District of Columbia. Some years of NPSAS involve a small number of students enrolled at institutions in Puerto Rico, but these students are dropped from my analysis. Finally, all analyses use weights provided in the data, and I convert dollar values to 2020 dollars using the Consumer Price Index.

Limiting the sample to U.S. citizens and excluding institutions in Puerto Rico both change the results very little. The other restrictions I make can change the results somewhat, although I impose restrictions in order to focus attention on "traditional" college students. Although nontraditional students are certainly worthy of study, they may face a different set of issues in financing higher education.

5.2 Panel Study of Income Dynamics

The Panel Study of Income Dynamics (PSID) is a comprehensive survey that includes information on demographics, education, income, wealth, and more. The PSID began in 1968 and initially data were collected every year, but, beginning in 1997, data have only been collected every other year. The most recent data available are from 2021. As with the NPSAS, the timing and frequency of the PSID allow for a meaningful analysis of changes over time. Unlike the NPSAS, which is a pooled cross section, the PSID is a panel that follows the same families over time. In particular, the PSID began in 1968 with a sample of 1872 low-income families and 2930 families that are nationally representative. It includes descendants of these families, as well as new members who joined the families through marriage. A strength of the PSID is the detailed financial information it provides in recent years. A limitation of the PSID is that the sample size can be small when limiting the sample to subgroups. However, Black families are well represented in the PSID due to the initial sample design that involved a large number of low-income families. The PSID contains individual-level data and family-level data. I link individual-level data for students to data from the family a student's mother belongs to using the PSID parent identification file. As with my

analysis of NPSAS data, I report PSID results using the provided weights.

Some of the PSID data I use come from the Transition into Adulthood Supplement (TAS). This supplement has been conducted every other year beginning in 2005. The 2005 TAS includes people who were in the earlier 1997 Child Development Supplement and were at least 18 years old in 2005. The 2007 TAS and 2009 TAS have similar eligibility criteria. The 2011 TAS, 2013 TAS, and 2015 TAS also have similar eligibility criteria but impose a maximum age of 28. The 2017 TAS and 2019 TAS include everyone in the PSID between the ages of 18 and 28. The TAS is particularly well suited for simulating the EFC/SAI because it (a) contains information on the income and wealth of college students and (b) it can be merged to the main PSID, which includes information on parental income and wealth.

6 Differences in the Expected Family Contribution

I begin the empirical work by using the NPSAS to show how the FAFSA EFC and related variables change over time and differ by demographic group. Studying the EFC gives a first pass at the question of how much we might expect families to be able to pay for college.

Figures 1, 2, and 3 show changes over time in the average EFC, broken down by demographic group. These results give some indication of how much members of different groups may be able to contribute toward their college education. Figure 1 shows results by family income quartile. Higher family income is associated with higher EFCs. After being fairly stable for a number of years, the average EFC rose substantially between 2012 and 2020. The figure shows that increase was concentrated in the top income quartile. especially for White and Asian students.

Figure 2, which focuses on racial differences, shows largely similar results and makes clear that White students and Asian students were particularly affected by an increase in EFC between 2012 and 2020. At a given point in time, the average EFC for White students is higher than that for Hispanic students, which is turn in higher than that for Black students. With the exception of the early years of the sample, Asian students have an average EFC somewhat below that of White students.

Figure 3 shows similar trends when breaking the results down by the highest level of education either of a student's parents completed. For first-generation college students, or those for whom neither parent completed college, the EFC has been relatively stable over time and has even fallen by a small amount in recent years. For students who have a parent that completed a bachelor's degree or an advanced degree, the average EFC rose substantially between 2012 and 2020. At a given point in time, students who have more educated parents have higher EFCs on average.

Changes over time in the EFC can come about for two reasons: changes in the inputs to the

Figure 1: Average EFC by Family Income (NPSAS)

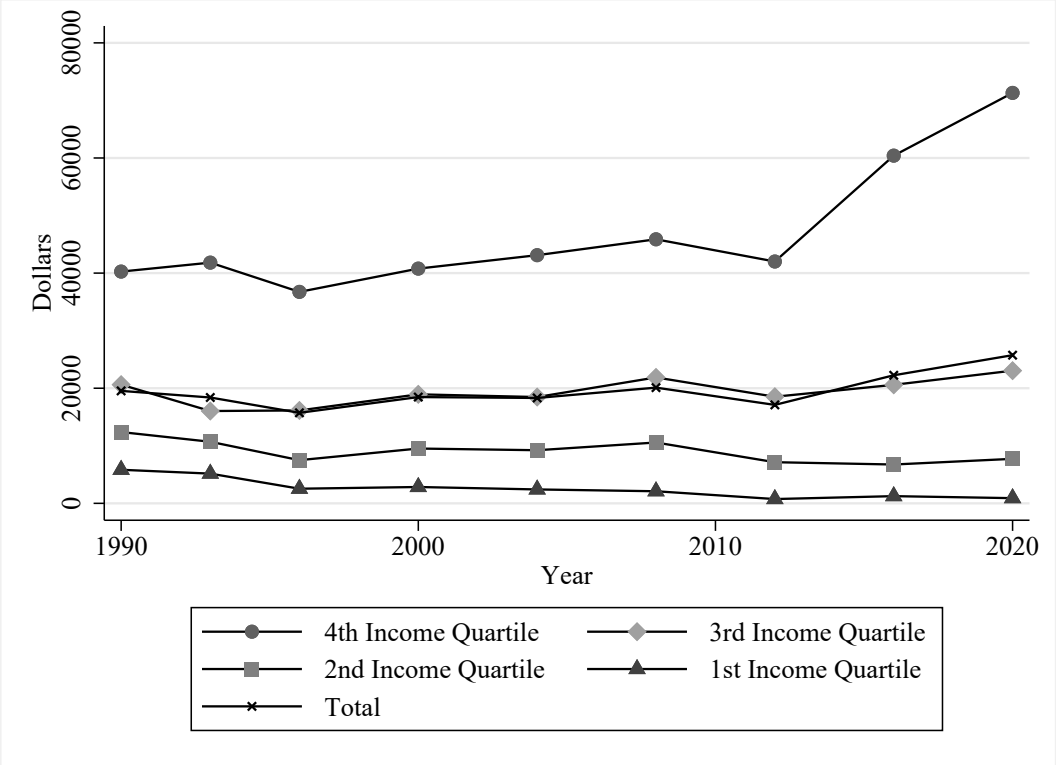


Figure 2: Average EFC by Race (NPSAS)

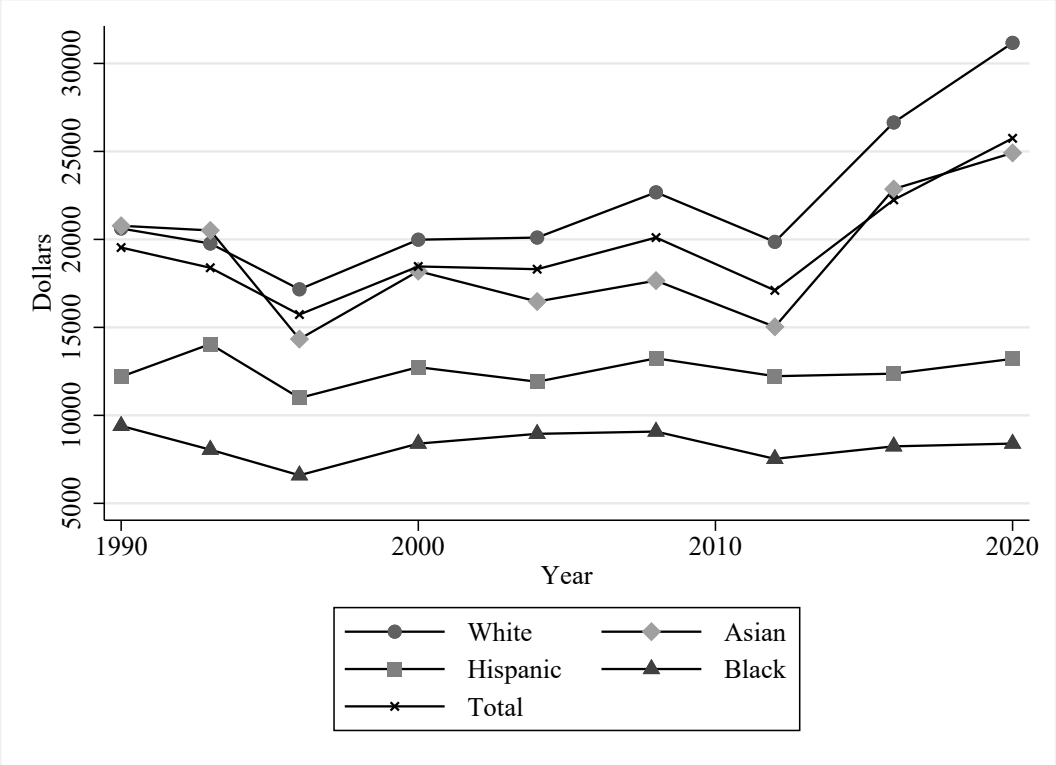


Figure 3: Average EFC by Parental Education (NPSAS)

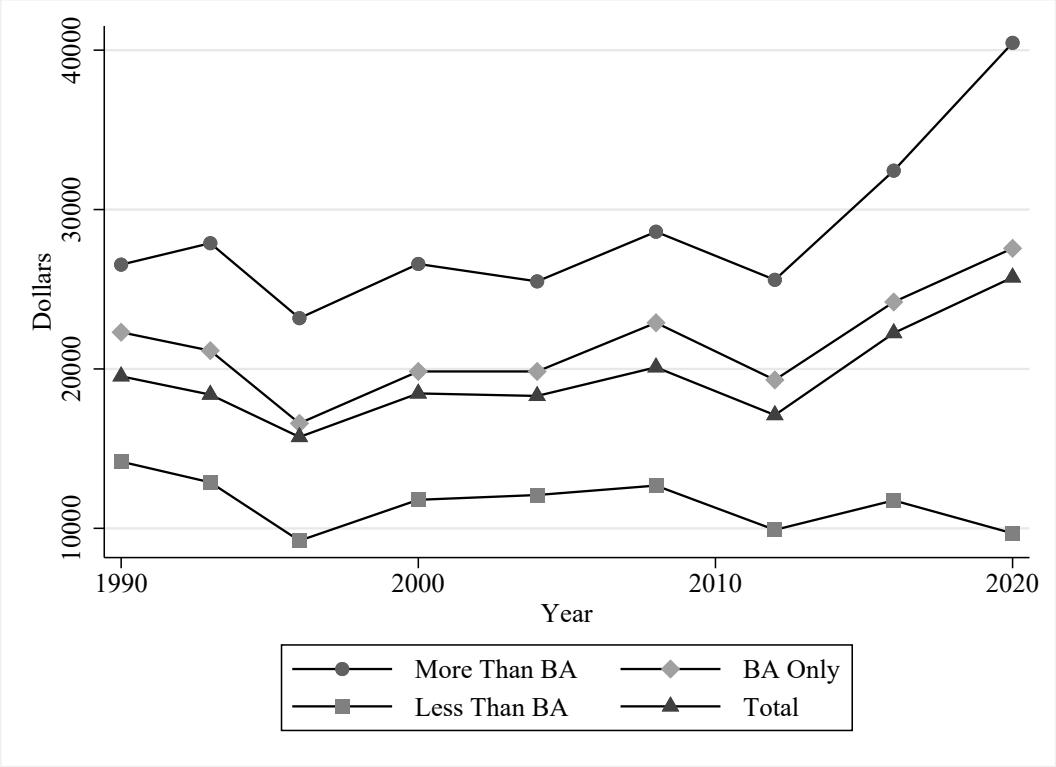
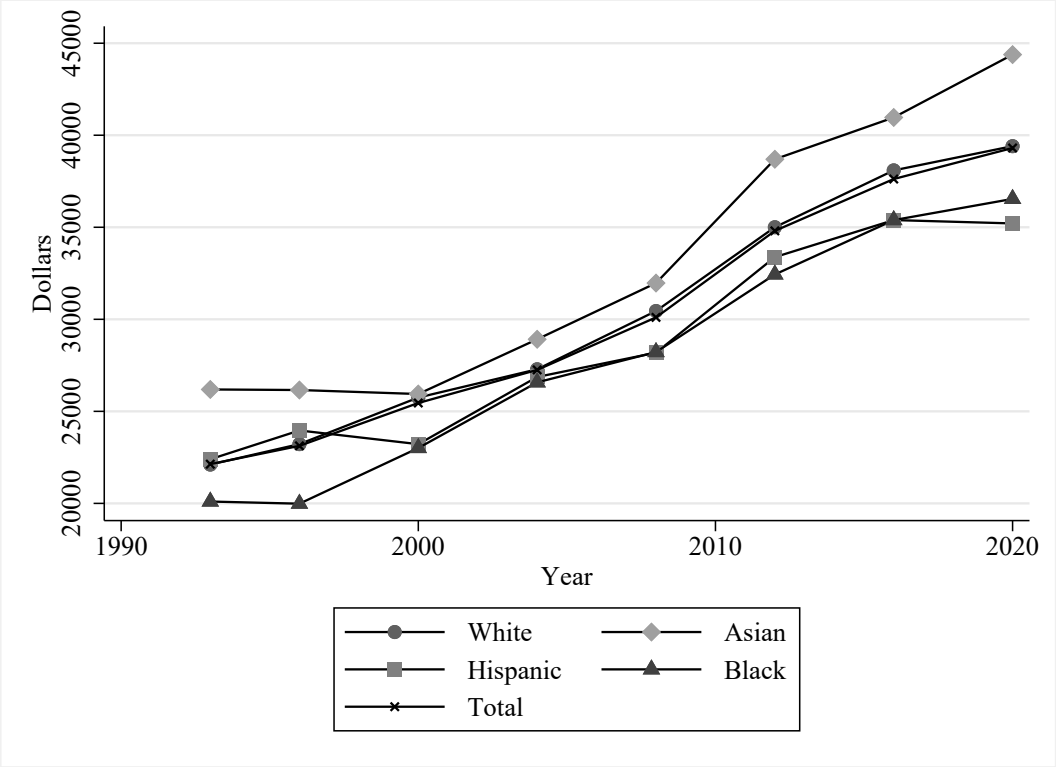


Figure 4: Budget by Race (NPSAS



EFC formula, and changes to the formula itself. The EFC formula, though, has been remarkably stable over time. For example, the implicit tax rates of 22% and 47% on parental adjusted available income have been the same for many years, although the income thresholds have changed over time as incomes and prices have risen throughout the economy. One parameter that has occasionally changed more sharply, though, is the income cutoff for an automatic zero EFC. In particular, there was a large increase in the cutoff from $20,000 in 2008–2009 to $30,000 in 2009–2010, making more families eligible for the automatic zero EFC. On the other hand, the threshold fell from $32,000 in 2012–2013 to $24,000 in 2013–2014, making fewer families eligible for the automatic zero EFC. However, it seems likely that the increases between 2012 and 2020 are due to changes in income and wealth in the overall population considering, for example, that the results of Figure 1 show that the increase in the EFC is primarily affecting those in the top income quartile.

Figure 4 shows the overall cost of attendance, or "budget," by racial group. The cost of attendance includes tuition and fees, housing, food, transportation, and other necessary expenses. The figure shows that the cost of attendance has been rising for all groups, even after adjusting for overall inflation. Although not shown here, the figures by family income and parental education show similar patterns.

Figure 5: Financial Need by Family Income (NPSAS)

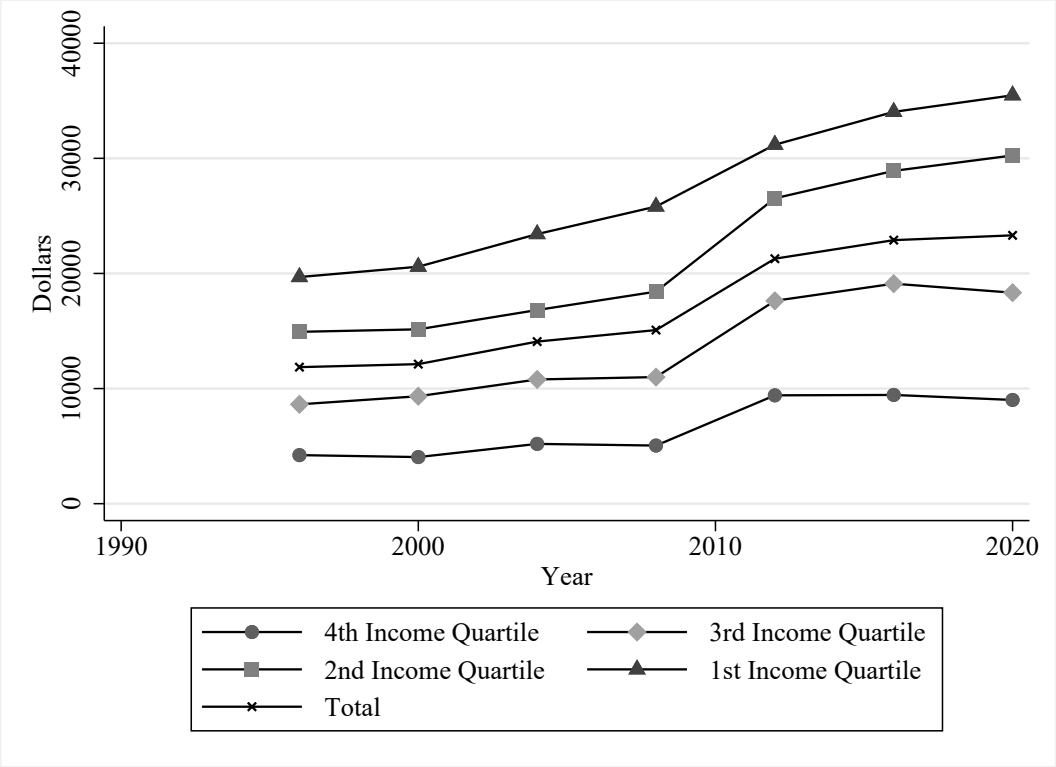


Figure 5, 6, and 7 show financial need, which shows the gap between the cost of attendance and the EFC. These figures show that financial need has been rising over time for all groups. Interestingly, Asian students have higher need on average than Hispanics students in most years even though Figure 2 also shows that they have higher EFCs. The reason for this is found in Figure 4, which shows that Asian students attend more expensive colleges on average. Asian students have lower EFCs than White students but attend more expensive colleges, implying a fairly large gap in financial need between White students and Asian students in Figure 6.

Figure 8 shows the net price as a percentage of income. Net price is the difference between the budget and financial aid, which shows the amount of money students and their families will need to come up with. Looking at changes over time in the percentage of income people are paying for college is particularly useful because the precise meaning of whether a college is "affordable" or "unaffordable" in the absolute sense is subjective, but the meaning of relative affordability arguably is clearer. For example, suppose someone is able to attend college only by exhausting nearly all of their income and existing wealth and also taking out a sizable loan. That person may be able to afford college in the sense that it technically satisfies their budget constraint, but in the colloquial sense most people would probably consider college to be unaffordable under those circumstances.

Figure 6: Financial Need by Race (NPSAS)

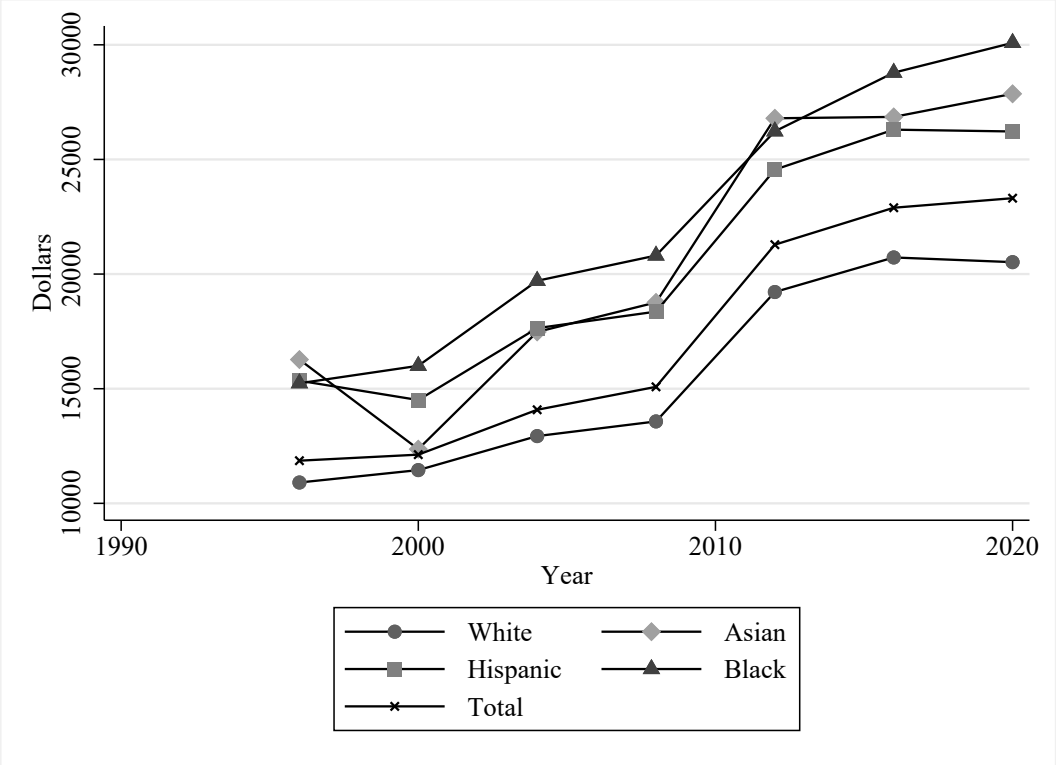


Figure 7: Financial Need by Parental Education (NPSAS)

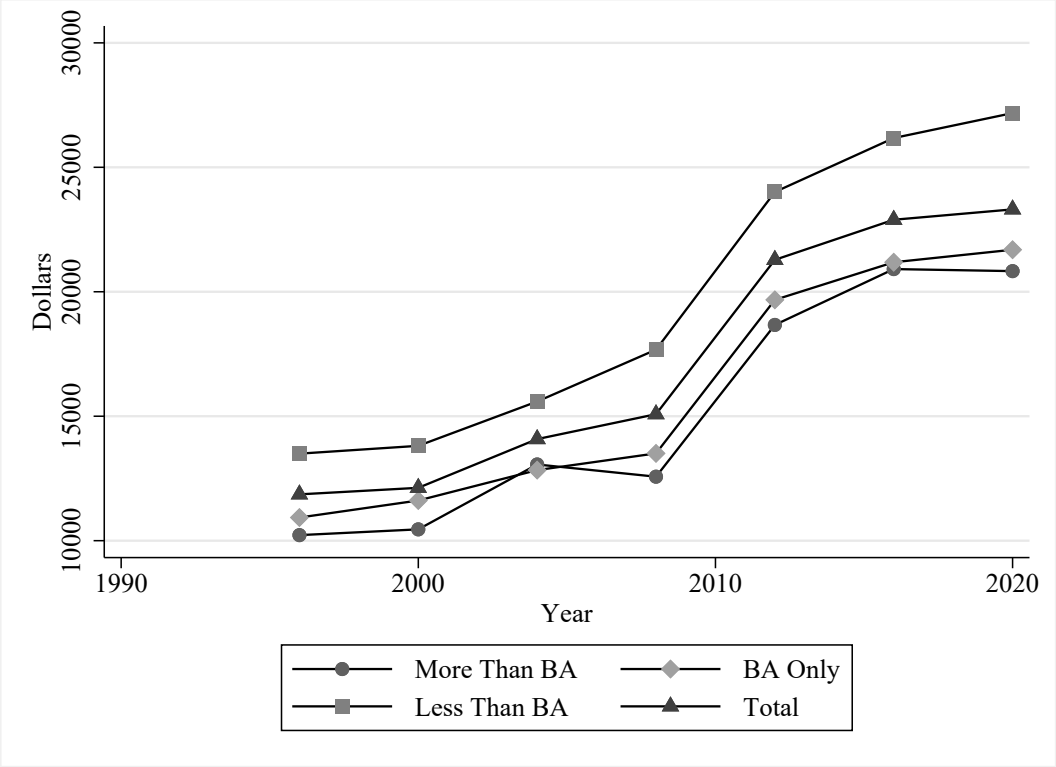
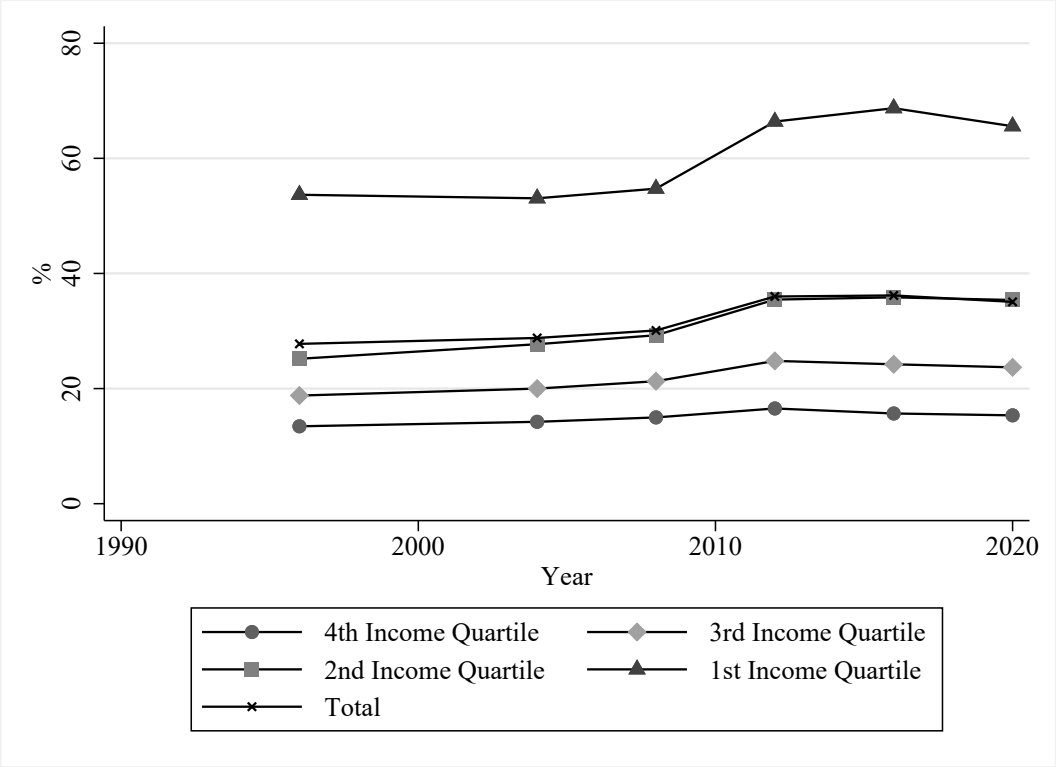


Figure 8: Net Price After Grants as % of Income by Family Income (NPSAS)



However, if attending college used to require paying 30% of income but now requires 40%, then college has become less affordable in a relative sense. One caveat with this, though, is that I measure the amount paid at the college students actually attend. It is possible that students could save money by attending a less expensive college. With this caveat in mind, Figure 8 shows that the net price paid after grants as a percentage of income has risen in recent years, especially for students from families with lower incomes. Thus, college has become somewhat more expensive in a relative sense, although not as much as one might think by looking at the increases in the cost of attendance shown in Figure 4.

Figure 9 delves deeper into the distribution of the EFC by race using data from 2020. Differences in the mean can sometimes obscure other differences in the distributions. The distribution of EFC is interesting in that it has substantial mass at zero and also an extremely long right tail. Figure 9 shows that 36.3% of Black students had an EFC of zero, compared to 8.6% of White students. On the other hand, 5.4% of White students had an EFC of over $100,000, while only 0.7% of Black students had an EFC in this range.

Lastly, Figure 10 shows the distribution of financial need for White students and Black students. A fairly large share of White students have no financial need, while the share of Black students

Figure 9: Distribution of Expected Family Contribution by Race (2020 NPSAS

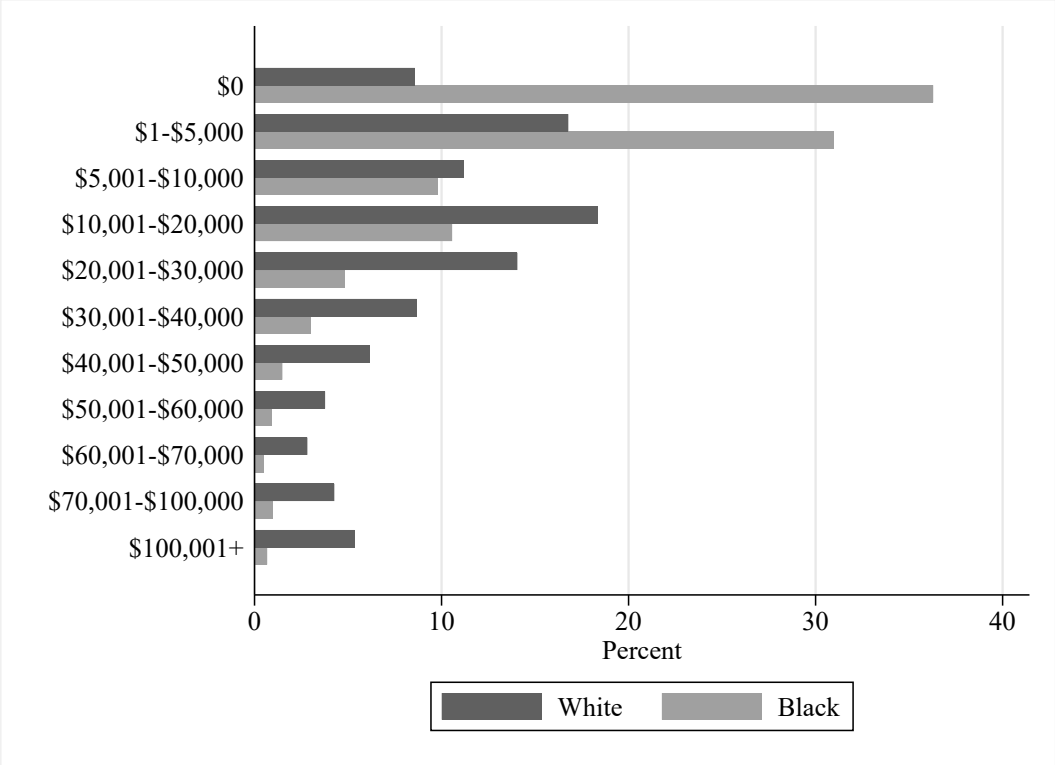
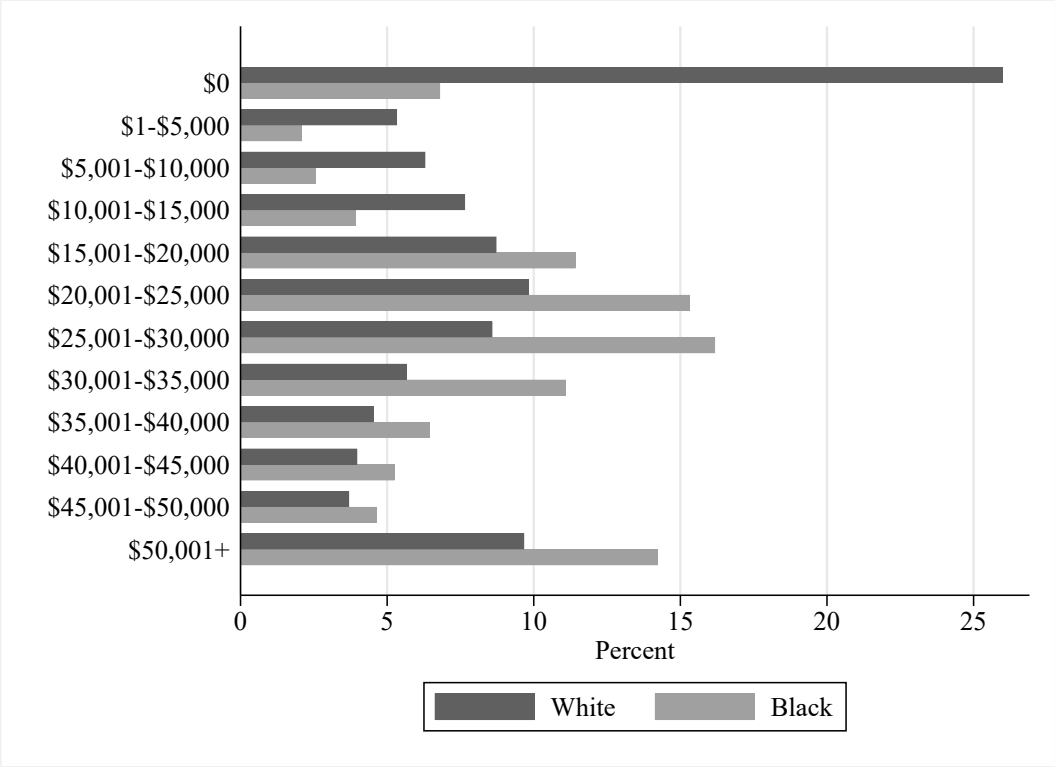


Figure 10: Distribution of Financial Need by Race (NPSAS)



with no financial need is much lower. A fairly large share of students in both racial groups have more than $50,000 of need.

7 Alternative Measures of Ability to Pay

This section uses the PSID to examine alternative measures of the ability to pay for college. The purpose of this analysis is twofold. First, it is useful to study how overall "revenue" would change if some of the financial aid formulas were changed. Second, it is useful to study the distributional effects of possible policy changes, including revenue-neutral changes.

Because there is no universal definition of "ability to pay," I calculate a range of estimates based on alternative assumptions about what is reasonable for a family to pay. In particular, I make various assumptions about what percentages of income and wealth families can reasonably afford to pay. Which percentage of income and wealth we can reasonably expect people to pay are real questions faced by those who design the FAFSA and the CSS Profile, as well as the college administrators who determine financial aid packages.

The financial aid system implicitly taxes parents and students by allowing them to protect

Table 1: Racial Income and Wealth Differences

Variable	White	Black	Hispanic	Asian	Native Am.	BWratio
Wealth Excluding Home Equity	404,762	46,553	63,436	234,181	23,469	0.12
Wealth Including Home Equity	590,613	91,072	152,466	437,078	94,245	0.15
Income	148,596	63,372	71,806	135,769	88,038	0.43

some of their income and wealth but considering the remainder to be resources that are available to pay for college. The "tax rates" on parental wealth, parental income, student wealth, and student income are different from one another. Moreover, as shown in Table 1, the ratio of income to wealth varies by race.[10] Thus, changing the tax rates on income and wealth in the financial aid system would have distributional consequences. It may be possible to adjust these rates in a way that total government and university outlays for financial aid remain the same but some families pay more while others pay less.

Table 2 shows the results of my EFC/SAI simulations. The table shows overall results, as well as results broken down by racial group. The top row of the table shows the results for the 2020 NPSAS that comes primarily from administrative records, while the next row shows the results of my simulation. Although the formula is complicated, it is possible to get a good approximation using just a small number of variables and a simplified version of the formula.

The second row shows the results of my simulation. The sample includes individuals who either said they are enrolled in college in the Transition into Adulthood Supplement (odd years from 2005 through 2019) or who reported being in college in the individual-level section of the standard PSID (odd years from 2013 through 2021). The wealth and income data I use are for the family the student's mother is a member of, the race data are based on the race of the head of that family, and I report results using the weights provided in the main section of the PSID. My simulations use the six tax rates and the adjusted available income cutoffs for those tax rates in effect for 2020–2021, and they incorporate an automatic 0 EFC for people with a sufficiently low income. I assume allowances against income based on a 20% federal income tax, 4% state income tax, 8% Social Security tax, and $28,000 income protection allowance. I also assume that the average college student has 0.5 siblings currently enrolled in college, an assumption that seems reasonable based on results from NPSAS. Although this captures the general tenor of the EFC calculation, there are certainly limitations. For example, while on the one hand I assume that everyone is a dependent student, on the other hand I ignore the student part of the EFC calculation. Also, while the parameter values I assume may be reasonable in general, it would be possible to obtain better

[10]The fact that the wealth gap is larger than the income gap has been documented by others, including Aliprantis, Carroll, and Young (2023) and Barsky et al. (2002).

Table 2: Simulated Average EFC

Simulation	White	Black	Hispanic	Asian	Native Am.	Overall
2020 EFC from NPSAS	31,170	8,397	13,211	24,916	12,731	25,746
Simulated from PSID	34,524	6,242	7,412	25,465	9,037	25,008
Consider 16% of Wealth Available	39,560	6,812	8,157	28,137	9,372	28,484
Consider 8% of Wealth Available	29,504	5,681	6,680	22,801	8,711	21,547
Include Home Equity in Wealth	41,258	7,447	10,088	32,548	11,313	30,217
Consider 16% of Wealth Available - Revenue Neutral	34,811	5,849	7,004	24,683	8,044	25,008
Consider 8% of Wealth Available - Revenue Neutral	34,156	6,747	7,936	26,456	10,311	25,008
Include Home Equity in Wealth - Revenue Neutral	34,264	5,969	8,093	26,940	9,103	25,008

approximations by using additional data. For example, the actual income protection allowance depends on the household size and the number of people in the household enrolled in college, and state taxes depend on which state a person lives in.

But with these caveats in mind, the second row of the table shows that the approximation seems reasonable. When comparing the second fow of the table to the first row, it is clear that I overestimate EFCs somewhat for White students, underestimate them somewhat for Black students and Native American students, and underestimate them more substantially for Hispanic students. The average EFC is fairly close for Asian students, and the overall average EFC across all students is fairly close as well. In addition to what I have mentioned above, there are other reasons there might be a disparity between the top two rows of the table, though, including sampling error, standard measurement error, and differences in the available variables (and precise definitions of those variables) across data sets.

I next consider potential changes in the formula. Students sometimes attend colleges that do not meet their full financial "need" (i.e., the difference between the total cost of attending the college and the Expected Family Contribution), which suggests that at least some people can actually afford to pay more than the EFC. The third row shows what would happen if we considered 16% of wealth to be available rather than 12%. Note that this does not mean that families are expected to pay 16% of their wealth, but rather that 16% of their wealth is added to their income and then run through the nonlinear implicit tax schedule. The result of doing this is an increase in the EFC and potentially more revenue for colleges, with the average EFC rising from \$25,008 to \$28,484. The fourth row shows would would happen if we considered only 8% of wealth to be available. In this case, there is a drop the EFC and potentially less revenue for colleges, with the average EFC falling to \$21,547.

The fifth row of the table shows what would happen if we considered home equity to be available wealth for the purposes of the EFC formula but kept all other aspects of the formula the same. The result is an increase in the average EFC to \$30,217.

The final three rows of the table consider the distributional impacts of revenue neutral changes. The first of these considers 16% of wealth available for taxation but makes a corresponding change in the overall tax rates (shifting all six tax rates down additively by the same level) in order to maintain the same average EFC. The second considers 8% of wealth available for taxation but makes a corresponding change in the overall tax rates (shifting all six up additively by the same level) in order to maintain the same average EFC. The third considers home equity as available wealth but again makes a corresponding change in the overall tax rates (shifting all six down additively by the same level). In all three of these simulations, the average EFC is $25,008 (the same as in the second row of the table) by construction. These simulations change the distribution of the EFC across racial groups, although the effects are not massive. Increasing the reliance on wealth in the EFC formula increases the EFC for White students and lowers the EFC for Black students, while decreasing the reliance on wealth has the opposite effect. Interestingly, including home equity as a part of wealth decreases the EFC for both White and Black students but raises it for Hispanic students and Asian students.

This analysis studies the immediate effects of an unanticipated change in the financial aid formula. Although this analysis is somewhat naive because it is static and does not take into account changes in labor supply or saving by students or their parents in response to the new implicit tax rates, there are two reasons why it may still be useful. First, it is unclear that families actually will adjust their behavior in response to new financial aid rules, especially if those changes are relatively minor. Second, it is not unprecedented for the federal government to change financial aid rules without giving families time to fully respond. A somewhat trivial example of this is that the recent elimination of the EFC discount for having multiple children in college at the same time happened long after birth spacings of those children had been determined. Perhaps a more relevant example is that, beginning with the 2016–2017 school year, there was a shift back of one year in the year of income that was to be reported on the FAFSA. The 2016–2017 FAFSA used 2015 income, and the 2017–2018 school year also used 2015 income (rather than 2016 income). This change was announced in September 2015, which did not provide families a large amount of time to adjust their income in advance of completing the 2016–2017 FAFSA.

In the longer run, though, students and parents might adjust their labor supply or savings decisions. Colleges might even adjust their pricing strategies, and there may be an impact on students' enrollment decisions. If this happens, the government may need to spend more – or may not need to spend as much – in order to meet students' financial need, relative to the benchmark case in which tax rates do not affect the tax base.

A caveat to all of this analysis is that the results for how much we believe families can afford to pay might be different if we expect families to alter consumption and savings behavior before their

children attend college. Financial aid is based on family income and wealth at the time children apply for college, but some families may be able to afford to pay more if they consume less, save more, or work more before their children apply for college. Analyzing this issue would require making additional assumptions about how families would respond and is beyond the scope of this chapter, but the idea that families might change consumption and savings behavior in response to college financial aid is in the spirit of earlier work by Feldstein (1995) and others on the savings disincentives of the financial aid system.

Although I focus on income and wealth, there may be other features of the financial aid rules that have disparate impacts by race as well.

8 Conclusion

If the trends that I find continue, what implications will this have for aggregate ability to pay? How will this affect students, higher education institutions, and governments? The answers to these questions will have important implications for financing higher education.

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