Family Ties: The Effects of the Price of College on Parent and Student Finances

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Abstract

Paying for college is often a family affair, with both parents and students contributing. The rising cost of college has led families to increasingly rely on debt to finance education. We study the effects of college on family finances using administrative data on all FAFSA applicants in California linked to credit records. We first use an event-study framework to explore how students and parents' use of debt changes in response to a child's college attendance. We find that parents increase the use of educational loans when their child attends college. Parents also shift borrowing from credit cards and auto loans. Further, we find that parents are less likely to declare bankruptcy. These patterns suggest that educational loans provide a useful mechanism for financing household spending. Second, we use discontinuities in eligibility for generous financial aid to test how an exogenous change in the price of college affects parents and students. We find that parents finance increases in the price of college through educational loans as well as home equity loans. We find that financial aid for children decreases parental delinquency on debt. The findings from this novel, comprehensive analysis of administrative financial aid and credit data indicate an important channel by which college and its rising cost may spill over into the broader financial health of families and economy.

1. Introduction

The price of a college degree has been growing over the last several decades, with published tuition rising dramatically. As a result, families are increasingly using debt to finance a college education.[1] Educational debt totaled $1.6 trillion in 2023, up from $260 billion in 2004, more than a six-fold increase (New York Federal Reserve, 2024).

While most research has focused on the effects of rising college costs on students, families often fund college jointly, with contributions from both parents and children.[2] In one survey, families report that parents pay for an average of 48 percent of college costs (Sallie Mae 2023). Aggregate data on parental borrowing for their child's education suggest that parents rely heavily on debt to finance these contributions to college costs.[3] However, there is surprisingly little research on how a child's college attendance affects parental finances. Ignoring the effects of college on parents' finances neglects an important channel through which college affects household finance which can have both short-run and long-run effects. The lack of evidence on parental financing has primarily been due to a lack of parent-student linked data.[4]

[1] Many studies have found that college benefits students in the long-run but the financial cost is a hurdle, as whether a student earns a degree is affected by the cost of college or their access to grants or loans (Bettinger, Gurantz, Kawano, Sacerdote, & Stevens, 2019; Denning, Marx, & Turner, 2019; Sun & Yannelis, 2016; Webber, 2016).

[2] For examples of studies that focus on student finances see Castleman and Long (2016), Marx and Turner (2018), Bettinger et al (2019); Scott-Clayton and Zafar (2019); Denning, Marx, and Turner (2019), Goodman, Isen, & Yannelis 2021, and Black et al (2023). A recent exception that considers the effects on parents is Grobon and Wolff (2024) which use a survey in France to study how parents react to student scholarships but they are limited to a sample of fewer than 700 students, particularly in the areas of policy discontinuities.

[3] For example, federal Parent PLUS loans, which are educational loans taken out by parents, had over $108 billion outstanding in 2022. Parent PLUS loan disbursements are roughly 50% as large as loan disbursements to undergraduate students.[3] (Ma and Pender 2023). Parents can also finance their child's college attendance with other educational loans (e.g. private student loans), assets, Home Equity Lines of Credit (HELOCs), credit card debt, or other forms of debt.

[4] Some research has explored how parents who borrow differ from parents who do not (Walsemann, Ailshire 2017; Kelchen 2021). A related set of research studies how parental wealth/income affects college decisions (Lovenheim 2011; Lovenheim & Reynolds 2013; Bastian & Michelmore 2018; Manoli and Turner 2018; Bulman et al. 2021).

We attempt to fill this void by exploring several important questions. First, how is debt for college allocated between children and parents? Second, which sources of debt do parents use when their child goes to college given that they have access to additional sources of financing (e.g. home equity, higher credit limits)? Does parental debt and these sources of financing evolve over the course of a student's enrollment in college? How does this debt affect parent's financial health? Finally, given the importance of college tuition, how does parental (and child) debt respond to changes in the price of college?

To do so, we study the effect of college on parents' finances using newly-available administrative data from California. California provides an ideal laboratory to study these questions, with one of the largest public university systems in the country and approximately 1 in 8 students in higher education in the United States attending a California institution of higher education (Cook 2024). These data capture the universe of Free Application for Federal Student Aid (FAFSA) filers for California residents from 2006 through 2014, which is then linked at the individual-level to the universe of detailed credit and debt records from a large credit bureau.[5] Importantly, these data enable us to link parents and children and examine how debt shifts between the two with college going. We can track credit outcomes for parents and students from 2004 to 2023 to examine the effects of college for over a decade both before and after a student's application to college at a level of detail that allows us to consider many different types of debt. The data allow us to take a comprehensive approach, whereby we analyze both how families use debt when their child attends college and how prices affect those decisions. We use distinct empirical strategies that yield different, but complementary insights into how families finance college expenditures. Importantly, our focus on parents is novel and adds an important dimension to the study of how households finance college.

The motivation for and consequences of parent borrowing are quite different from student borrowing. Student borrowing is most often thought of in terms of investment in a productive asset—a college education—and students who make a human capital investment using debt

[5] Data security processes are governed by the California Policy Lab, and all records used by the research team are de-identified after matching.

have been shown to be able to service that additional debt with the increases in earnings post college (Black et al 2023). However, parents are not investing in their own human capital and thus do not expect earnings increases from taking out a loan to finance their child's college. They may be motivated by other factors such as a bequest motive, consumption value, or because they expect the increased earnings for their child to be helpful when they need assistance in old age. As a result, educational debt for parents may have different long-term consequences than the educational debt that students accumulate.

We first conduct an event study analysis using timing differences across families to examine how parental credit and financial health changes at the time their child enrolls in college similar to the child penalty literature (Kleven, Landais, and Søgaard 2019). This captures the consequences of college attendance which are a result of application, admissions, and enrollment decisions that families make. We describe these expenditures using variation in timing across families and compare families whose child applied to college to families whose child has not yet, but will soon, apply.[6] If parents anticipate that their child will go to college when their child is 18 years old, parents may change their consumption and savings behavior (and hence debt usage) in anticipation of this expected expenditure. However, if parents face liquidity or credit constraints, borrowing may increase steeply at the time of college entry. Understanding how families use debt is important for policymakers who are worried that families overborrow for college.

We find that parents meaningfully increase educational loan use when their child attends college. However, this increased educational borrowing is entirely offset by reductions in other debt such as auto loans and credit cards (there is a relatively small increase in credit card balances in the year of college enrollment). These results are consistent with models of

[6] This relates to the large literature in macroeconomics on consumption smoothing and the Permanent Income Hypothesis which suggests that changes in income are smoothed over the lifecycle. The Permanent Income Hypothesis is highly scrutinized, with many papers trying to understand departures from the simple model's predictions (Zeldes 1989; Kaplan Violante 2014). Our work is related to this but focuses on debt usage rather than consumption. Campbell and Hercowitz (2019) consider how an expected expense such as paying for a child' college can affect consumption behavior. We are interested in a related idea—does debt use change when a large, but expected expense occurs?

consumption smoothing where parents forecast expected college costs and hence do not increase debt use when their child enters college. This is also consistent with college expenditures not being a major barrier for many families, as debt is shifting from other sources to parental student loans.[7] However, college consumption might displace consumption of other goods and affect assets in ways that we do not observe. We also see that delinquencies shift in a similar way from HELOCs and credit cards to education loans, resulting in a small overall increase in delinquency. Interestingly, we find that parents are *less* likely to declare Chapter 7 bankruptcy after their child applies to college.

Second, we study the effect of a shock to the price of college via a discontinuity in the availability of grant funding. In contrast to the previous exercise, here we use an exogenous change in access to grant aid to identify the causal effect of the effective price of college on children's and parents' credit use and financial health. This exercise is similar to previous studies of the effects of financial aid on students but instead focuses on parents as well as on children (Castleman and Long (2016), Marx and Turner (2018), Bettinger et al (2019); Scott-Clayton and Zafar (2019); Denning, Marx, and Turner (2019); Angrist, Autor, and Pallais (2022)). We use sharp discontinuities in Cal Grant eligibility, a set of generous state grant aid programs in California, to identify the effect of increased access to grants—and a decrease in the cost of college attendance--on family finances.

We find that grant aid reduces parental borrowing while having very little effect on student borrowing. Grant aid reduces both parental educational loans and HELOC balances. Grant aid also reduces the chance that parents are delinquent on their debt, especially for parents with a prior history of delinquency. Importantly, the effect for parents varies by whether or not they have a mortgage; parents with mortgages reduce HELOC usage when their child gets a Cal Grant whereas parents without mortgages respond by taking out fewer student loans.[8] We find no differences by race for the relevant student population. Our findings suggest that the

[7] Some families clearly benefit from access to loans so college expenditures do matter meaningfully for some students (Black et al 2023).

[8] This result is consistent with a pathway of housing wealth affecting college enrollment (Lovenheim 2011; Lovenheim and Reynolds 2013).

consequences of changes in the price of college are felt unequally by financial situation. Additionally, when we drill down on the effects of price on student and parental debt, we find that indeed price is an important driver of changes in parental debt levels and sources when children go to college.

Our findings have important implications for policy. We provide novel evidence on a hypothesized pathway where increases in the price of college affect broader financial markets. There is concern about debt burdens placed on families by college enrollment (Zaloom 2019) but this has primarily come from qualitative research. We provide empirical evidence and a direct link between the price of college and parents' financial portfolio and longer-run financial health. The rise in the price of college over the past 30 years likely had important implications, not only for students, but for their parents. Focusing on students alone, as has been done to this point, misses the important effects of college on families' finances. We also document the magnitude of parent's reliance on debt which suggests that many families are able to finance college through means besides additional debt.

The paper proceeds as follows. In Section 2, we describe the linked administrative data and measurement issues. Section 3 presents the event study results. Section 4 describes the regression discontinuity design and checks its validity. Section 5 presents the first-stage results and main results for student and parental financial outcomes. Finally, Section 6 concludes.

2. Background and Data

Our data primarily come from two administrative sources: the universe of FASFA submissions from California residents from 2006 to 2015 matched to the universe of credit bureau data of individuals who ever lived in California from 2004 to 2023.

FAFSA data

Our initial sample consists of the universe of FAFSA submissions by California residents provided by the California Student Aid Commission (CSAC), the state agency that administers the state aid program known as the Cal Grant. Students must submit the FAFSA—which contains information about parent and child income and assets--if they want federal financial

aid such as the Pell Grant or federal student loans. In California, this form is also required for a student to be eligible for the Cal Grant program, described in more detail below. Approximately 70 percent of college students submit the FAFSA, and they come from a lower SES family than college students on average (Kofoed 2017). They are, however, the relevant population to study when considering the role of financial aid on family and student outcomes because financial aid predominately requires a FAFSA submission.

We observe many student and family characteristics on the FAFSA, including: student age, gender, dependency status, and education level; parental education, marital status, and zip code of residence; family income and expected family contribution (EFC); and the list of schools where applicants want their financial information sent. Importantly, students who are financial dependents are required to submit their parents' social security numbers (SSNs) to be eligible for federal grant aid but do not need to do so if they are independent. (These SSNs then enable us to match parents to credit records.) Dependent students are "traditional students" who are younger than 24, and not married with a few other requirements.[9]

Credit data

We match the FAFSA data to the University of California Consumer Credit Panel (UCCCP), which contains anonymized consumer credit information for the universe of individuals who

[9] In general, a student is considered independent if they turn 24 before January 1 of the school year, if they are married, if they are a graduate student, if they are a veteran or member of the armed forces, or for other less common reasons. In our initial sample, 97% of dependents submit at least one parental SSN compared to only 3% of independents. Per FAFSA rules, a parent means a biological, adoptive, or legal parent, and students who do not live with their parents are still required to report their information unless they have been legally adopted. Students must report information for both parents if their parents are married or live together. Otherwise, the student must report information for the parent they lived with most over the past 12 months, and if they split time equally then whichever parent provided more financial support. In this case, if the reported parent has remarried then the student must also report the stepparent's information for financial purposes. Focusing just on dependent students, we observe students with married, single, divorced, and widowed parents report at least one SSN 98%, 93%, 98%, and 96% of the time. The biggest difference is how often the student reports two parent SSNs, which is 94% for students with married parents, compared to 1% or less for the other marital status categories. These statistics are based on students in the years 2013-14 and before. In the 2014-15 FAFSA the federal government changed the marital status category to include a new category "Unmarried and both legal parents living together", whereas before most of these families were likely listed as "Single".

ever lived in California, starting in 2004 and continuing to 2023. Each individual is observed in the credit data for the entire period of 2004 and onward, provided that they lived in California at any point during this time period and had a credit record (i.e. outmigrants are followed). All data are linked by developing a "hashed" number that connects the individual on the FAFSA to the credit data.

The credit dataset includes quarterly snapshots of an individual's credit outcomes. These matches were made in March, June, September, and December; for simplicity, we focus on the September snapshots. We primarily use the tradeline portion of the credit data. A tradeline is an account-level data set; for each person we have information for every active credit account including balances, repayment status, type of credit and additional information. We aggregate these tradeline level data into five primary categories: (i) educational loans; (ii) credit cards; (iii) auto loans; (iv) mortgages, and (v) HELOCs (home equity line of credit). For each of these categories we can aggregate tradeline information to create variables for whether they had a credit line of this type, the balance for each credit line, and whether an individual was delinquent on the credit line. Credit bureau records also contain an individual's credit score, detailed information about their geographic residence, and information on bankruptcy filings.

For dealing with jointly held debt (i.e. both individuals within a household are listed on the mortgage or the credit card), we allocate half of the balance to each person in the couple. We then sum the balances for all parents listed on the FAFSA. This avoids double counting of balances.[10] The data appendix describes our variable construction in more detail.

Our Sample

[10] For two parents who jointly hold a mortgage, this method would return the total mortgage. For a person who holds the mortgage with someone other than the other parent reported on the FAFSA, this method would attribute half of a jointly held balance to the parent. The FAFSA historically asked for "father/stepfather's SSN" followed by "mother/stepmother's SSN", in that order, before switching to "parent 1 (father/mother/stepparent)" and "parent 2 (father/mother/stepparent)" in the 2014 aid cycle. In the rare case that the parent does not match to the credit data then we take values from the second parent listed. Appendix Table XX shows the results are quite robust to the choice of parent or parent combinations used.

Our sample consists of the universe of California residents who submitted a FAFSA for potential enrollment in the 2006-07 through 2015-16 academic years (henceforth, 2006 through 2015).[11] In our analysis, we identify the first year a student submitted the FAFSA.[12]

Unfortunately, we do not observe enrollment in college for some students in the sample. From CSAC, we observe enrollment in California four-year public colleges (i.e., the University of California (UC) and California State University (CSU) systems) and California community colleges for our last two cohorts (2014 and 2015). Although we only have data on public sector college enrollment, prior work suggests that among high school graduates – which closely mirrors our sample – we are observing approximately 85% of total college enrollment (57% and 28% in two- and four-year colleges, respectively) (Kurlaender et al., 2018).[13]

Finally, we can use Cal Grant payments to estimate first-stage impacts on state aid receipt.

Cal Grant

Many California residents who submit the FAFSA also apply for Cal Grants, the state's primary state aid program that allows qualifying students choose between four years of: full tuition and fees for in-state, four-year public colleges, with tuition in 2014-15 at the California State University (CSU) and University of California (UC) systems valued at $5,472 and $11,220, Most Cal Grant awards – and the focus of this paper – are for students within one year of high school

[11] Resident is determined as any individual who answered California for "What is your state of legal residence?"

[12] We were able to access a separate data source that allows us to identify whether a student submitted a FAFSA in the four years prior to our sample period (2002 through 2005).

[13] Using just 2014 and 2015 data, we find that 62% of our sample attended a public two- or four-year college, which closely matches the study by Kurlaender et al. (2018) that finds 63% of high school graduates attend college. CSAC's CSU and UC enrollment records only includes students who submitted the FAFSA and has income below $150,000, but this constitutes roughly 95% of our sample. We do use Cal Grant payments, which identify the college attended and the total aid received in each term, to examine where students use their state aid, but this is only observed for one side of our eligibility threshold and cannot directly measure enrollment outcomes. An additional benefit is that Cal Grant payments identify in-state, private college enrollment, further expanding our range of observed outcomes (approximately 4% of college attendees attend an in-state, private college (Kurlaender et al., 2018)).

graduation who become eligible under what is referred to as the "Entitlement" program.[14] This is the largest program that applies to recent high school graduates.

To apply for the Cal Grant, FAFSA filers must additionally submit a one-page form that includes an applicant's high school attended and GPA[15]. Our data include individual-level data on any Cal Grant application, payment received including the amount of the subsidy, the term of enrollment, and the name of the college that received the payment.

Our regression discontinuity analysis primarily focuses on what we refer to as "middle-income" students who earn a 3.0 GPA, which makes them eligible for Cal Grant aid. For these students, they may only take aid to a four-year college, and cannot use state aid at community colleges. In the appendix we described an alternate cutoff for lower-income students who earn a 2.0 GPA and can use the aid at community colleges.

3. Event Study

College attendance is one of the most expensive investments parents can make in their children. However, parents can help finance college expenses in a number of ways. Parents can save in anticipation of college attendance; however, saving while a child is younger is difficult as expenses are high and income is relatively low earlier in the life-cycle. Parents can also help children pay for college by borrowing. Parents often have several options, including student loans targeted at parents (Parent PLUS loans), private loans, credit cards, and, in many cases, home equity loans.

While there are a number of theoretical possibilities, there is surprisingly little evidence on the effects of children's college-going behavior on parents' finances. To address this, we first describe how family finances change at the time of college enrollment. To do this, we compare parents whose child enrolls in college at time relative to similar parents whose child has not yet

[14] Alternate programs that include much smaller group of students are: the "Competitive" program that targets older, "non-traditional" students, the "Transfer Entitlement" program for a set of students transferring from community colleges into four-year colleges, and "Cal Grant C" which is a smaller award for vocational education programs.

[15] High schools are asked to report the unweighted average of 10th and 11th grade GPA, rounded to the nearest 0.01.

enrolled in college. In contrast to event studies in a policy-evaluation, we do not necessarily expect the trends prior to enrollment to be flat. For instance, parents could reduce mortgage payments leading up to a child's enrollment to build assets for enrollment. Hence, we view this as a description of a phenomenon that has received very little attention thus far. We focus on parents because students typically have no credit prior to enrollment if they enroll at traditional ages, so the pre period in the event study is not informative.

For this analysis, we use a 10% sample of all first-time FAFSA filers between 2006 and 2015 (see summary statistics in Table 1). We estimate an event study specification where the event is first FAFSA submission. Here, t=0 represents September of the first year of receiving aid (the first year of college enrollment, if the student enrolls.) We also control for parent age dummies, time invariant family fixed effects and calendar year fixed effects. Two ingredients of this analysis would lead to bias in traditional two-way fixed effect estimates of event studies: staggered timing of college enrollment, and the effects of college enrollment on parent finances grow as a student progresses through college, (Goodman-Bacon 2021). We estimate our event study using the method outlined in Callaway Sant'anna (2021) to address this problem and related issues of heterogeneity of treatment effects.[16] We use not-yet-treated students/parents as the comparison group.

As noted above, we do not observe enrollment for some of our sample. Instead, we observe FAFSA submission. Our "event" is thus the first time a student submits a FAFSA. Our estimate can thus be interpreted as the change in parental financial outcomes relative to their child's first FAFSA submission. Insofar as a FAFSA submission suggests that students are seriously considering college enrollment, our results in the pre period represent how parents' finances change for students who are considering going to college. In the period after the initial FAFSA submission, some students will not enroll in college. This will attenuate our estimates on the "effect" of college relative to directly observing college enrollment.

[16] During our sample period there were large changes in several measures of debt—especially those related to housing such as mortgages and HELOC. These changes suggest heterogeneous effects across time.

We present the event study results graphically; point estimates are available in the appendix. When we consider the effect on all balances, summing across all types, including educational loans, HELOCs, credit cards, auto loans, and total balances (Figure 1a) we see that there is no significant change in total balances, although there is some suggestive evidence that balances increase a few years later. However, this figure hides significant heterogeneity across types of credit. Educational debt increases for parents dramatically beginning in the year their child first submits a FAFSA (see Figure 1). On average, 5 years after a student's first FAFSA submission, parents have roughly an additional $3,000 in educational loan balances. This large increase makes sense, as parents generally do not have access to educational loans prior to their child's enrollment in college.

While education loans increase following college enrollment, we see accompanying decreases in credit card balances and auto loans (see Figures 1 and 1.) For credit cards we see an initial increase in the year a child files a FAFSA, but then a steady decline up to eight years later. We also see decreases in auto loans. The total decrease in these two balances is approximately $2000, which substantially offsets the increase in educational loans. This suggests that parents primarily shift debt across types rather than increase indebtedness when their child goes to college. In Figure 1, we see no change in the use of HELOCs when a child goes to college. Why is there a shift to educational loans from other forms of credit? Are educational loans more favorable to parents than auto loans and credit cards? Educational loans generally have lower interest rates than credit cards. A common form of educational loans, Parent PLUS loans, are offered as part of their child's FAFSA/financial aid process and so PLUS loans may be particularly easy to obtain for parents. Educational debt may have fewer restrictions on how can access it in many cases relative to auto debt for instance. For instance, Parent PLUS loans do not use credit scores to determine eligibility. However, educational loans are not dischargeable in bankruptcy.

When we examine financial health and delinquency behavior, we find that the likelihood of having any delinquency (which is defined as 90 days delinquent) goes up 6 and 7 years after college enrollment, although the magnitude is quite small—approximately .007 from a base of

10 percent (see Figure 2). Again, however, the source of delinquencies is quite informative. Not surprisingly, given that parents did not have access to educational loans prior to their child's college enrollment, we see an increase in the probability of being delinquent for educational loans after college enrollment. However, again consistent with a shift in debt allocation, we see that delinquency rates decline for credit cards, auto loans, and HELOCs.

Interestingly, we also see a slight decline in Chapter 7 bankruptcy with no change in Chapter 13 Bankruptcy (see Figure 3).[17] The decline in Chapter 7 may be in part because student loans are generally not dischargeable in bankruptcy, reducing the benefit of bankruptcy for those with more educational loans. We also see that delinquencies shift in a similar way from HELOCs and credit cards to education loans, resulting in a small overall increase in delinquency. Interestingly, we find that parents are *less* likely to declare Chapter 7 bankruptcy after their child applies to college.

Finally, when we examine the credit score, which is a summary measure of financial health (see Figure 4). Here, we see that, with initial enrollment, the credit score declines, but then recovers and actually increases over time. This may reflect the added debt in the short-run but the decline in bankruptcy in the longer-run and longer-term improvements from paying off debt.

Taken together, the event study results indicate that parents do not substantially increase indebtedness at the time their child applies to go to college. However, parents generally know the timing of their child's college entry, and so minimal increases in indebtedness is consistent with parents' anticipating the event and planning accordingly. However, we do find changes in the composition of debt; the shift towards educational debt likely is in response to parents gaining access to previously unavailable educational loans with potentially favorable terms. The

[17] Chapter 7 is a faster process—discharge typically takes 3-5 months, relative to 3-5 years for Chapter 12—and involves the liquidation of assets, relative to the reorganization/restructuring of assets in Chapter 13. Chapter 7 remains on credit reports for 10 years, while Chapter 13 only remains for 7 years after initial filing. (See https://www.experian.com/blogs/ask-experian/bankruptcy-chapter-7-vs-chapter-13/ for more information.)

shift to student loan debt leads to a decline in bankruptcy and an increase in overall credit score in the longer-run.

We interpret these results as parents acting strategically about which loans to use to finance their spending on college. Educational loans appear to be valuable to parents more in securing more favorable terms for debt rather than in granting access to borrowing that they otherwise would not have.

These results shed new insight into research that shows changes in housing wealth increase enrollment (Lovenheim 2011; Lovenheim and Reynolds 2013). One hypothesized pathway for housing wealth effects is through increased access to liquidity from HELOCs or cash-out refinancing. However, we do not find increased use of debt, on average, which suggests that the effects found in those papers might be driven by changes in wealth rather than changes in liquidity.[18] The results could be reconciled because Lovenheim 2011 and Lovenheim and Reynolds 2013 examine *shocks* to housing wealth where we study anticipated costs of college.

4. Regression Discontinuity

While the event study provides an overview of the trajectory of parental finances when children go to college, it tells us little about the causal effects of changes in the price of college induced by changes in grant aid. Because grant receipt—and thus the cost of college—is endogenous, we take advantage of the fact that Cal Grant awards depend on strict cutoffs by student high school GPA and family income. We thus leverage thresholds based on GPA and family income that generate sharp discontinuities in whether students are Cal Grant eligible and can receive state aid, thereby reducing the cost of college. Eligible students are entitled to the following aid: (1) up to four years of full tuition and fees at a four-year public college (University of California or California State University); (2) up to an approximately $9,000 annual tuition subsidy at in-state private colleges for up to four years, or (3) a "subsistence" award of approximately $1,500 cash per year for up to four years, which is the only option for community college students.

[18] This is also consistent with work by Bulman et al (2021) that finds limited evidence from lottery winners that financial constraints inhibit college attendance among children.

In the regression discontinuity analysis, we focus on one specific discontinuity, as this represents the largest subsidy provided by the state to families. Our sample consists of "middle-income" families who become Cal Grant eligible based on student GPA; students with a 3.0 GPA or above become eligible for the Cal Grant, whereas those with a GPA below 3.0 are not. The income cutoffs that determine who is "middle-income" vary by application year and family size.[19] For students who qualify for the Cal Grant at this threshold, the monetary value is large, as they are only eligible to take the Cal Grant to a four-year college (public or private) and cannot use the award to attend a community college.[20]

We use a regression discontinuity design to compare income-eligible families just above and below the GPA cutoff. In some specifications, we examine student outcomes, whereas in others we examine parent outcomes. In either case, the specification is:

$$Y_{it} = \beta_0 + \theta \cdot \mathbf{1}(R_i > 0) + f(R_i) + \sigma_t + \varepsilon_{it}$$

where Y_{it} is an outcome such as educational borrowing for person i in FAFSA filing cohort t (2006 through 2015), R_i is a student's GPA recentered so that $R_i = 0$ is 3.0, $\mathbf{1}(R_i > 0)$ is an indicator for being above the GPA cutoff, $f(R_i)$ is a function of GPA that is allowed to vary above and below the threshold, σ_t are a set of fixed effects to account for FAFSA filing cohort t, and ε_{it} is an idiosyncratic error term. Standard errors are calculated using heteroskedasticity-robust variance.

The parameter of interest is θ, which captures the effect of crossing the GPA threshold, and hence being eligible for the Cal Grant, on outcome Y_{it}. Our preferred specification uses ordinary least squares to estimate f(R_i) using a local linear specification and allowing the slope to vary on

[19] Appendix Table 1 shows the full range of income limits that define "middle-income" families across years, which is the sample used in this analysis. For a family of two this includes families with income from $30,300 to $65,000 in 2006, which increased to a range from $36,600 to $78,300 in 2015. For students from larger families of six or more, the income range was $45,900 to $83,600 in 2006, increasing to $55,400 to $100,800 in 2015.

[20] Although not the primary focus of the paper, there are alternate Cal Grant cutoffs that pertain to "low-income" families; we discuss these other cutoffs later and in the appendix.

each side of the cutoff. In our main specification, we report a fixed bandwidth of 0.3 GPA points (i.e., 2.7 through 3.3) but we show that our results are not sensitive to this choice. We estimate the model separately for each year before, during, and after filing the FAFSA. We also estimate effects non parametrically using a triangular kernel and find similar results (Calonico, Cattaneo, Titiunik 2014).

Sample Description

For the RD sample, we restrict our sample to middle-income dependent students near the 3.0 GPA eligibility threshold. The analytical sample is restricted to the first FAFSA submission for each individual who is classified as a dependent, submitted their high school GPA for Cal Grant eligibility, and reported at least one parent's social security number on the FAFSA (see Table 1b for summary statistics). Because the relevant sample is restricted to recent high school graduates, the average age is just under 19 and almost 96% self-report as frosh. Average family income is approximately $60,150. 58% are female, and 68% listed a bachelor's degree as their primary educational objective. Almost 56% of parents had a mortgage in the year prior to FAFSA application, and the average credit score was 692.

Validity of Research Design

Our key identifying assumption is that potential outcomes are smooth through the GPA cutoff. To test this, we would ideally show that there is no extra mass just above the cutoff that might suggest that families are manipulating their position to be on the positive side of the Cal Grant eligibility threshold.

In practice, however, the GPA distribution is not expected to be smooth. Instead, we expect there to be large jumps at values of 2.5, 2.75, 3.0, and other values that occur with higher frequency due to the averaging of typically discrete grade point values. We can see these jumps in Figure 5, Panel A, which is a histogram of the distribution of GPA for our sample (although a GPA of 3.0 still only represents less than 5% of the sample). We do not view the mass point as evidence of manipulation. In fact, this same distribution was found in very early work on the Cal Grant before the 3.0 GPA became the eligibility threshold (See Bettinger et al., 2019). When

we examine higher-income families above the income eligibility thresholds, where students on both sides of the 3.0 GPA threshold would be ineligible for the Cal Grant and have no incentive to manipulate their GPA, we find the same pattern (see Figure 5, Panel B).[21] Nonetheless, for our analysis, we remove all students with a 3.0 GPA (i.e. a "donut hole" RD design) to avoid the leverage that this large number of students may have on the functional form of our estimates.[22] Later we show that the results are similar when these students are included.

As another check, we examine whether there are discontinuities in the observable characteristics of Cal Grant applicants at the threshold. Table 2 presents these results. Using a fixed GPA bandwidth of 0.3, we find no statistically significant differences in student characteristics at the cutoff when examining family income or size, whether the applicant has other siblings in college, parental education, student age or parent age, gender, degree objective, citizenship status (relative to non-citizen legal residents), and parents' marital status (other covariates omitted for brevity).[23] The lack of discontinuities in these characteristics suggests that it is unlikely that there is selection on one side of the cutoff.

Finally, we also will show "placebo" estimates where we look at outcomes in years prior to FAFSA submission. We find no effects, suggesting there is no sorting on lagged outcomes of interest, such as balances or delinquencies.

5. Results

First Stage

[21] This situation is quite similar to that of Zimmerman (2014) and Ost, Pan, and Webber (2018), who also provide evidence of bunching for ineligible students.
[22] See Barreca, Lindo, & Waddell (2016) for further discussion of the "donut hole" RD design.
[23] When including 3.0 GPA students two of these thirteen values are statistically significant at the 1% level, as the large group of 3.0 GPA students exhibit slightly different values than students with GPAs just above and below this value. As noted above, in our main analysis we exclude individuals with a 3.0 GPA.

Table 3 presents the results when we estimate our first stage, showing that crossing the 3.0 GPA threshold leads to large changes in Cal Grant eligibility and the amount of state-based grant aid received by students.

Students crossing the 3.0 GPA threshold experience a 36-percentage point increase in the likelihood of receiving a state aid payment the following year. While this might seem low, there are several reasons that eligible students do not receive a Cal Grant payment, including if they choose not to attend college, or they attend a community college or an out-of-state college. Importantly, for this cutoff, they can only use the Cal Grant award at a four-year college, so any student choosing to attend a community college – which constitutes roughly 50% of our sample at the threshold – would not receive a Cal Grant payment.[24]

In terms of the amount of aid received, the treatment-control contrast is $2,150 in the first year after submitting the FAFSA and increases to almost $5,900 over a six-year timeframe (see Table 3, or Figure 6). Given that not all eligible students take up the grant, these estimates imply that conditional on receiving aid, students receive, on average, roughly $6,040 their first year, and around $16,500 over time. Thus, Cal Grant eligibility leads to a substantial subsidy to support students to attend four-year colleges in California.

Table 4 and Figure 7 use data capturing in-state public college enrollment for the 2014 and 2015 cohorts to estimate whether the grant offer altered the sector of postsecondary attendance.[25] Overall, we find that the Cal Grant offer produces small changes in sector of enrollment, shifting enrollment at community colleges by roughly 2.5 percentage points (from a base of 49%) to enrollments at CSUs (from a base of 29%). UC enrollment is relatively unchanged, though only 3% of students near the 3.0 GPA cutoff attend a UC.

[24] When we examine whether a student received at least one state aid payment in the six years after first submitting the FAFSA, the difference is 31 percentage points. The difference is somewhat smaller because some of the control group students also earn a state aid award via a number of other potential programs, including a specific Cal Grant award that targets "non-traditional" students for whom at least two years have passed since graduating from high school (Gurantz, 2022).

[25] As noted above, we only have administrative data on enrollment in CSU and UC campuses for the last two cohorts in our sample (2014 and 2015).

These results suggest that the generous state aid provided by the Cal Grant went primarily to students who were likely to attend college irrespective of the grant aid.[26] If anything, we see a small increase in the probability of attending a *more* expensive college which would attenuate the effects of additional grant aid on price. Imputing the cost of full-time enrollment for students at public two- and four-year colleges, the predicted net change in tuition is a statistically insignificant $70 in the first year.[27]

Results

Given that eligibility for the Cal Grant results in a large drop in the cost of attending college, we next examine how this change in the effective price of college affects both student's future credit health as well as that of their parents. We first discuss the results for student outcomes.

Throughout, we estimate placebo estimates of the effect of the Cal Grant prior to attending college (to test for pre-treatment differences across the threshold); however, given that we never find any meaningful effects, we focus on the effects in years after FAFSA submission. (The pre-period results are presented in Appendix Tables.) The columns estimate effects of grant aid in the year the student first submitted the FAFSA (time zero) and the subsequent ten years. For each estimate we show the baseline mean rate for students just below the GPA cutoff (i.e., students with GPA of 2.90 through 2.99). Given the nature of the FAFSA (2006 through 2015 cohorts) and credit data (2004 through the present), we note that the fully balanced part of our panel includes only estimates from two years prior to initial FAFSA submission through the first eight years from FAFSA submission.

Student Results

Table 4 reports estimates of the causal impact of receiving grant aid on credit balances by types of credit, where students with no balance are included and listed as zero dollars. When we

[26] In prior work on the Cal Grant, Bettinger et al. (2019) show that it induced larger changes in persistence towards graduation than on measures of initial enrollment.
[27] This value is close to what we would expect, as the difference in full-time tuition between the CSU system and a community college ($5,472 minus $1,380) multiplied by 2.5 percentage points is roughly $100.

examine balances for each type of credit line as the outcome, we find no consistent evidence of effects on student balances. There are only a few statistically significant point estimates, and even the point estimates that are larger in magnitude, such as those on mortgage balances, fluctuate between positive and negative values while remaining statistically insignificant.

At a first pass, these results may be surprising; the Cal Grant has no effect on student loan take up or balances. However, Bettinger et al (2019) found similar results for the Cal Grant program in earlier years using different data. Similar null findings have been shown for students receiving the maximum Pell Grant in Texas (Denning, Marx, and Turner 2019).[28] Taken at face value, these studies suggest that the price of college/grant aid has minimal effects on borrowing at the margin. However, we show that this conclusion is no longer true once one incorporates parents' behavior as well.

Parent Results

We first examine the causal effect of reduced college cost on parent debt. Table 5 presents these results. First, we see statistically significant reductions in Student loan balances starting 2 years after first FAFSA submission and continuing to 8 years after first FAFSA submission. These reductions are meaningful, peaking at $935 from a base of nearly $9000, or a 10 percent reduction in balances. While we don't see an effect on credit card balances, we do see a decrease in auto balances of $417 in the year of FAFSA submission. When we dig deeper, we see that this coincides with a decline in the probability of having an auto loan in that year. We find no effects on mortgage balance but do see reductions in home equity loan balances (HELOC) that reach statistical significance 4 through 6 years after a student submits their first FAFSA. These reductions are large, peaking at $866 from a base of $6,741, a 12 percent reduction. The sum of HELOC and educational loans is approximately a $1,600 reduction in debt; however, when we look at total debt, we find no statistically significant effects, likely due to the large mortgage balances swamping our types of debt.

[28] In another case, the West Virginia PROMISE scholarship actually increased student loan balances (presumably by increasing enrollment) (Scott-Clayton and Zafar 2019). Marx and Turner 2018 show that the Pell Grant crowds out borrowing (Marx and Turner 2018).

Figures 8-11 show the results graphically, focusing on Educational Loans and HELOCs. Figures 8 and 9 show the RD estimates for Student Loans and HELOCS 4 years after initial FAFSA application by distance from the threshold. For both, we see balances increasing up to the cutoff but then a distinct drop after the threshold. Figures 10 and 11 then present the RD estimates by year; we see no effects in the years prior to FAFSA application but then a decline in both types of loans after, with the reduction peaking about 5 or 6 years after application.

Given this change in debt, we next examine parental repayment behavior for evidence of improved financial health. Table 6 shows the change in parent 90-day delinquency rates on the main six tradelines, along with an aggregate measure for having a delinquency on any account in that year. We find that parents are less likely to be delinquent overall, with meaningful and statistically significant effects in the first years after first filing the FAFSA. The magnitude is 0.9 percentage points less likely to be more than 90 days delinquent on any debt from a base of 7.8 percent points, which represents a 12 percent reduction in delinquency. This reduction in delinquency seems to be largely driven by a reduction in being delinquent on credit cards, but point estimates are also negative for student loan and HELOC delinquency. However, we find little evidence at the extreme; when we look at Bankruptcy (both Chapter 7 and Chapter 13), we find no causal effect of college cost.

Overall, we find significant causal effects of college cost on parental debt portfolios and financial health. The Cal Grant reduces parent's use of educational loans and HELOCs. Further it reduces parent's delinquency on debt, particularly credit card debt.

Heterogeneity

We examine heterogeneity in Tables XXX. Given that we see evidence of parents responding through home equity loans, we examine heterogeneity by whether the parents had a mortgage in the year prior to their child's first FAFSA submission. Among those without a mortgage (for whom a home equity loan is not readily available), we see that the reduction in education loans is larger, peaking near a $1,600 reduction. However, unsurprisingly there is no change in HELOCs. For parents who did have a mortgage prior to FAFSA application, there is no statistically significant reduction in educational loans, but a large decrease in HELOC balances

which peaks at over $1,700. This suggests that the way that parents face a price shock depends critically on what credit options are available to them.

We also examine heterogeneity by predicted race, as there is substantial research showing that, both currently and historically, policies have directly and indirectly affected access to credit by race. While we don't observe race directly, we do have a measure of predicted race from the credit bureau which uses information from a person's name and address. We split race into two mutually exclusive groups, this first is likely white or likely Asian and the second is likely Hispanic or likely Black.. We estimate smaller reductions in HELOC and educational loan balances for likely white and likely Asian students though they are similar in magnitude to the overall sample. We estimate larger reductions for likely Black and likely Hispanic students than for the sample overall or for likely white and likely Asian students. These are not statistically different.

Overall, our heterogeneity results suggest that the effects of a reduction in the price of college affects parents differently depending on their background.

Robustness Checks

Robustness of student and parent loan results

We conduct a variety of sensitivity checks to demonstrate that robustness of our conclusions. Appendix Tables XX and XX show the robustness of the educational loan results for students, with bandwidths ranging from 0.10 to 0.50 GPA, and varying whether 3.0 GPA students are included or not. Results based on removing the 3.0 GPA students are consistently null and small, and range from a decline of $121 to an increase of $102 in the balanced portion of the panel. When we include 3.0 GPA students, we find some evidence of declines in education loan balances that range from $100 to $500 depending on the period studied, though many of these estimates are statistically insignificant and larger when the bandwidths are short (0.15 GPA). In addition, we show that covariate smoothness is weaker when we include the 3.0 GPA students (Table 2), raising some skepticism of these results. Thus we conclude that most reasonable estimates find no impact on student's educational loan balances.

Table 12 shows the robustness of the educational loan results for parents, and consistently finds declines in educational loans, as previously shown in Table 10. For instance, five years after submitting the FAFSA the point estimates all range from to a decline of $553 to $812 in the primary parent's educational loan balances. This table provides strong evidence that our estimated impact is not due to minor sample restrictions or specifically related to the bandwidth selection process.

Table 13 examines the robustness of the parent's educational loan balances to different ways of measuring these balances. In this table we always use a 0.3 GPA bandwidth and omit the 3.0 GPA students. The first row reproduces our results from Table 10, based on the primary parent. We then vary this approach by focusing just on the first parent (when available), just on the second parent (when available), on the average balance of the two parents, and on their sum of educational loan balances for both parents. Results are consistent in each case, though strongest when we focus on the sum of the two parent's educational loan balances. For instance, we find a $800 to $900 decline in educational loan balances five to eight years after FAFSA submissive provide graphical evidence of these results in Figure 7.

Overall, we find little evidence that receiving grant aid leads to substantial changes in credit outcomes for the student who received the state aid payment, but strong evidence that grant aid reduces the student loan burden of the parents. We do not find other impacts on parents' credit outcomes (e.g., lower balances or default rates on mortgage payments).

Other Thresholds

As noted earlier, there are a variety of discontinuities in the eligibility for Cal Grants. We also investigated alternate Cal Grant thresholds and generally found null effects, in large part because these thresholds produced much smaller first-stage changes in state aid receipt. Briefly, one threshold is for low-income students as they surpass the 2.0 GPA threshold. At this benchmark most students attend community college where they receive approximately one-quarter of the subsidy at our threshold above, and many exhibit low levels of persistence perhaps due to weak academic preparation. Another threshold involves low-income students who surpass the 3.0 GPA threshold. At this benchmark students both below and above the

threshold are eligible for aid, though the exact benefits increase slightly as they cross the 3.0 threshold. We again find first-stage increases in state aid are roughly one-quarter of the size of our main threshold. We describe these thresholds in Appendix XXX for transparency and because they may be informative for future research.

5. Conclusion

Our analysis of the universe of FAFSA filers in California linked to restricted-access credit bureau data reveals the large role that parents play in financing their children's college enrollment. The absence of previous research on the parental role is an important omission. We find that parents use educational debt, and shift from credit card and auto debt when their child attends college. They also reduce bankruptcy and experience increases in credit scores. We find that parents meaningfully increase educational loan use when their child attends college but this increased educational borrowing is entirely offset by reductions in other debt.

These results are consistent with models of consumption smoothing where parents anticipate expected college costs and hence do not increase debt use when their child enters college. This is also consistent with college expenditures not being a major barrier for many families as debt is shifting one-for-one from other sources to parental student loans. However, college consumption might displace consumption of other goods and affect assets in ways that we do not observe.

Our analysis of California administrative data also provides novel findings on the role that the price of college plays in family financial outcomes, We show that parents reduce borrowing in response to grant aid especially through reliance on educational debt and HELOCs. The resulting crowd out of borrowing is roughly one-third. Importantly, there is some inequity by home ownership. Parents with mortgages use HELOCs to finance college going whereas parents without mortgages rely on educational loans. The finding of less than 100 percent crowd-out suggests that families are changing consumption and/or savings to cushion shocks to the price of college.

Overall, the growth in the price of college has previously undocumented effects on household balance sheets. Policies that change the price of college are likely to affect parents finances as much or more than students' finances.

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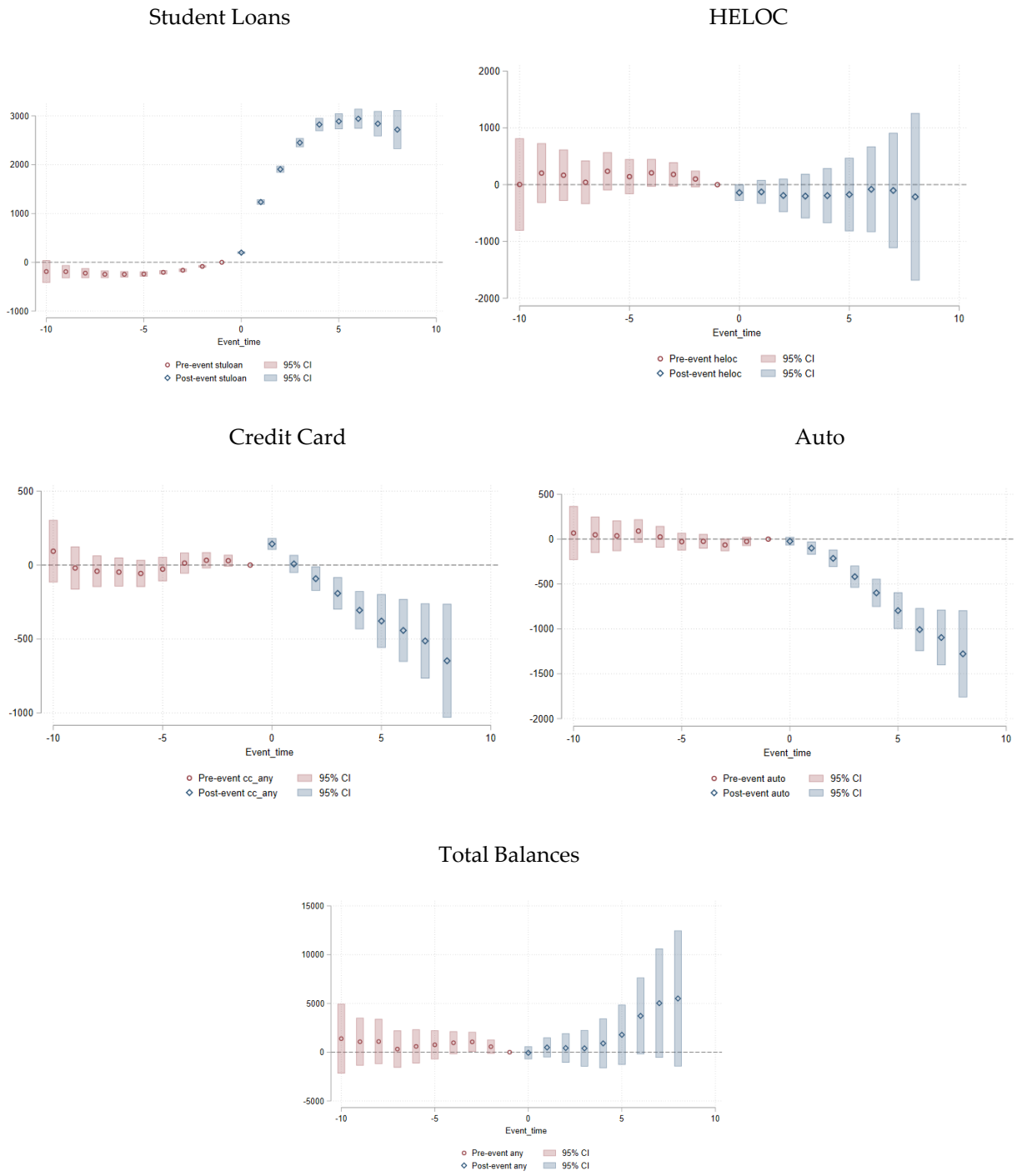
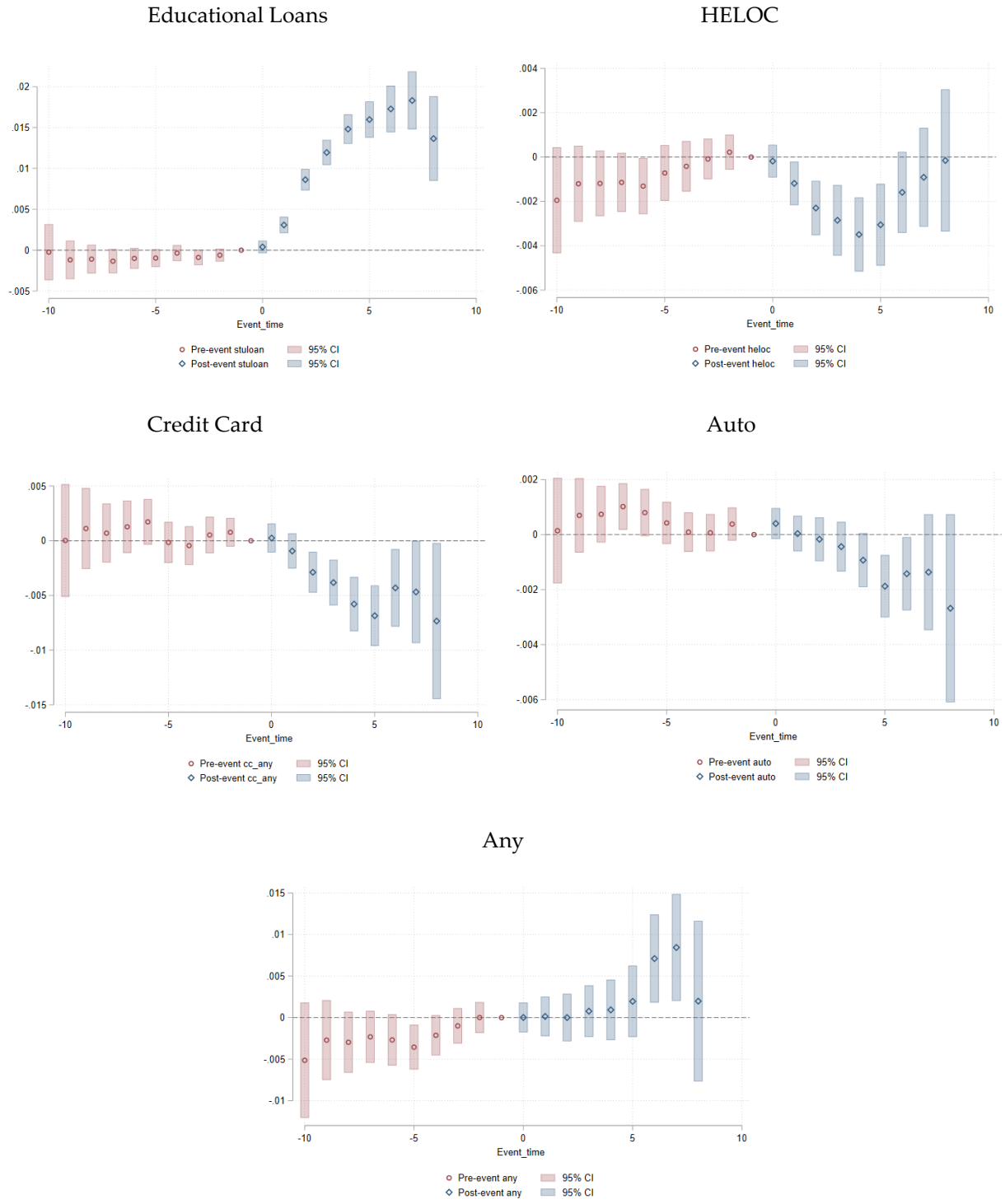
Figures and Tables

Figure 1: Parent Debt Event Study



Notes: These figures plot event study estimates described in the text. We implement the estimator described in Callaway and Sant'anna (2021). Event time is the year that a student first files a FAFSA. Our sample consists of the parents of dependent students who submitted a FAFSA and listed a California school between 2006-07 and 2015-16.

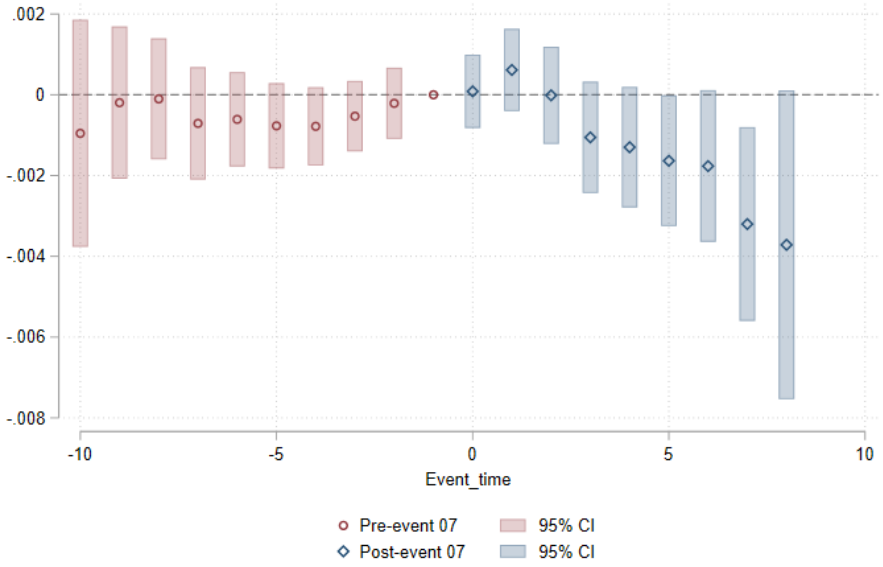
Figure 2: Parent Delinquency Event Study



Notes: These figures plot event study estimates described in the text. We implement the estimator described in Callaway and Sant'anna (2021). Event time is the year that a student first files a FAFSA. Our sample consists of the parents of dependent students who submitted a FAFSA and listed a California school between 2006-07 and 2015-16.

Figure 3: Bankruptcy

Chapter 7



Chapter 13

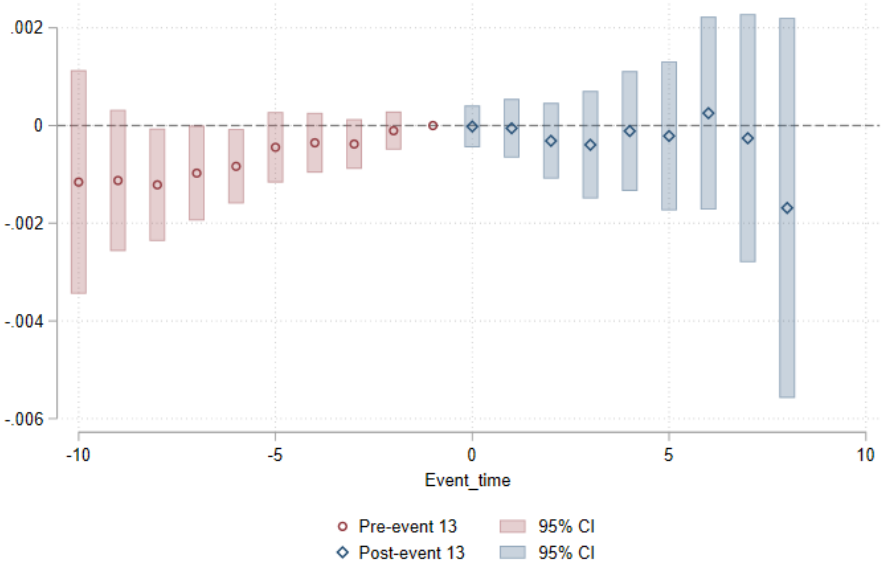


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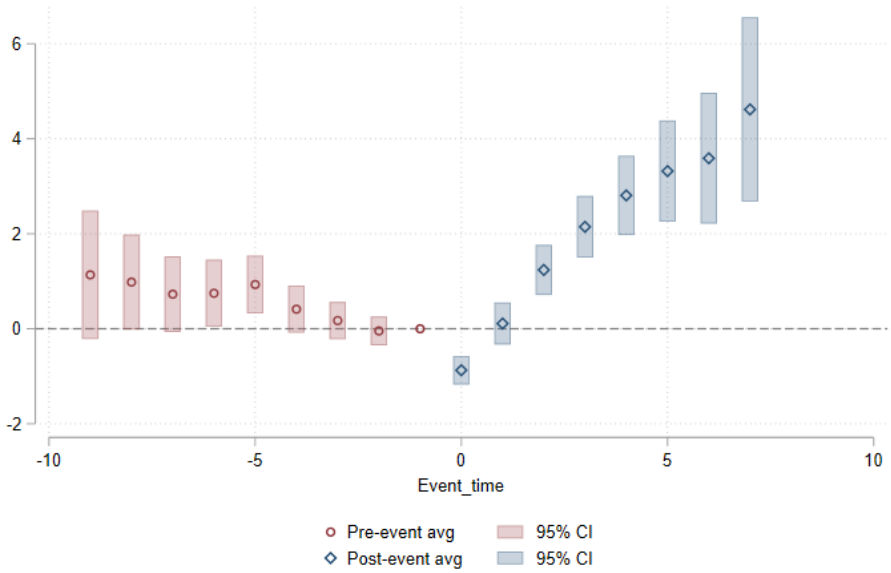
Figure 4

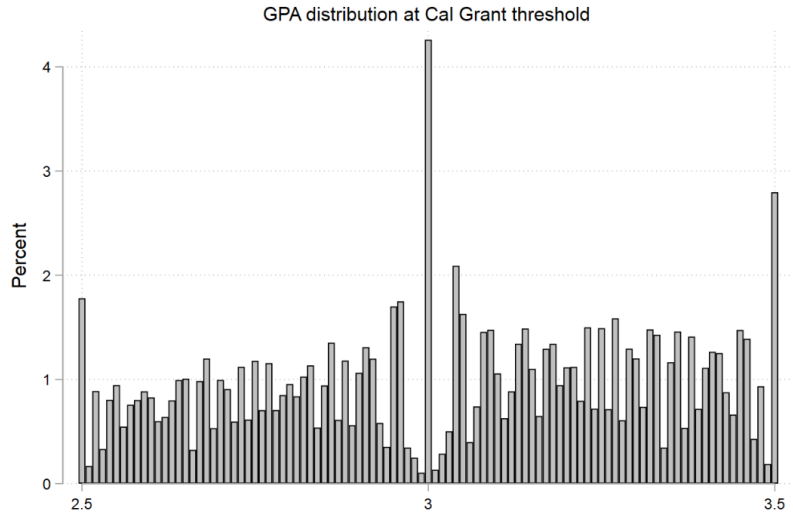
Average Credit Score



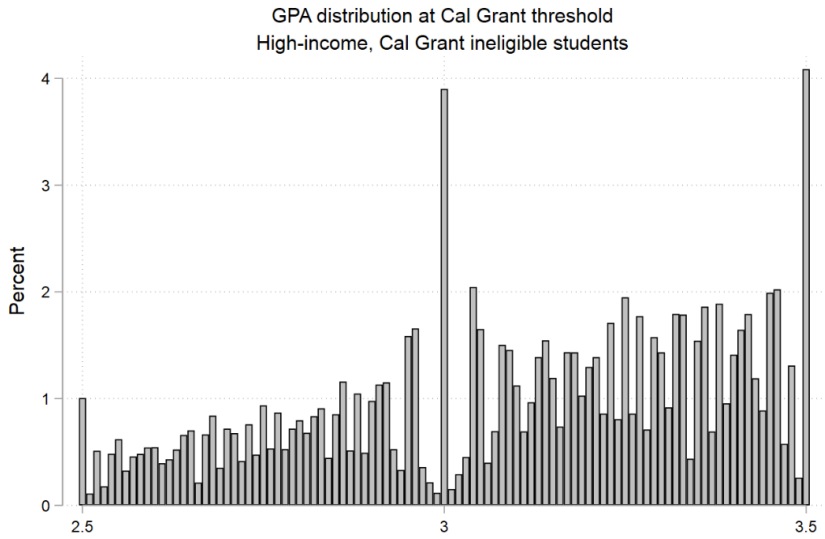
Notes: These figures plot event study estimates described in the text. We implement the estimator described in Callaway and Sant'anna (2021). Event time is the year that a student first files a FAFSA. Our sample consists of the parents of dependent students who submitted a FAFSA and listed a California school between 2006-07 and 2015-16.

Figure 5. Distribution of Cal Grant applicants

(A) Analytic sample of "middle-income" FAFSA submissions who become eligible for the Cal Grant by surpassing the 3.0 GPA threshold

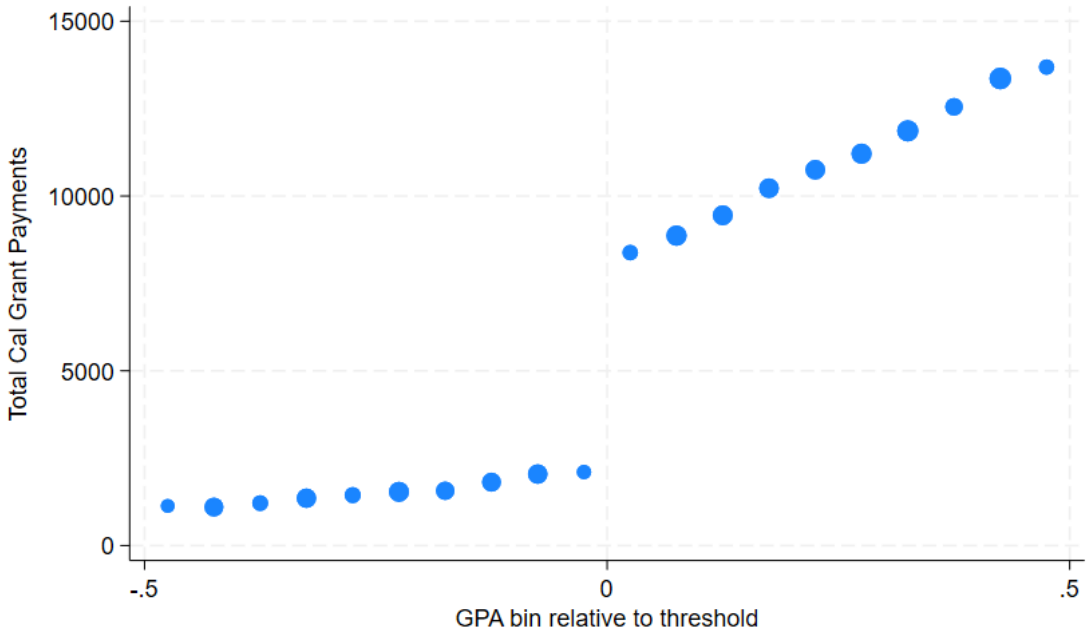


(B) Placebo Sample of "high-income" FAFSA submissions who are ineligible for the Cal Grant, regardless of GPA



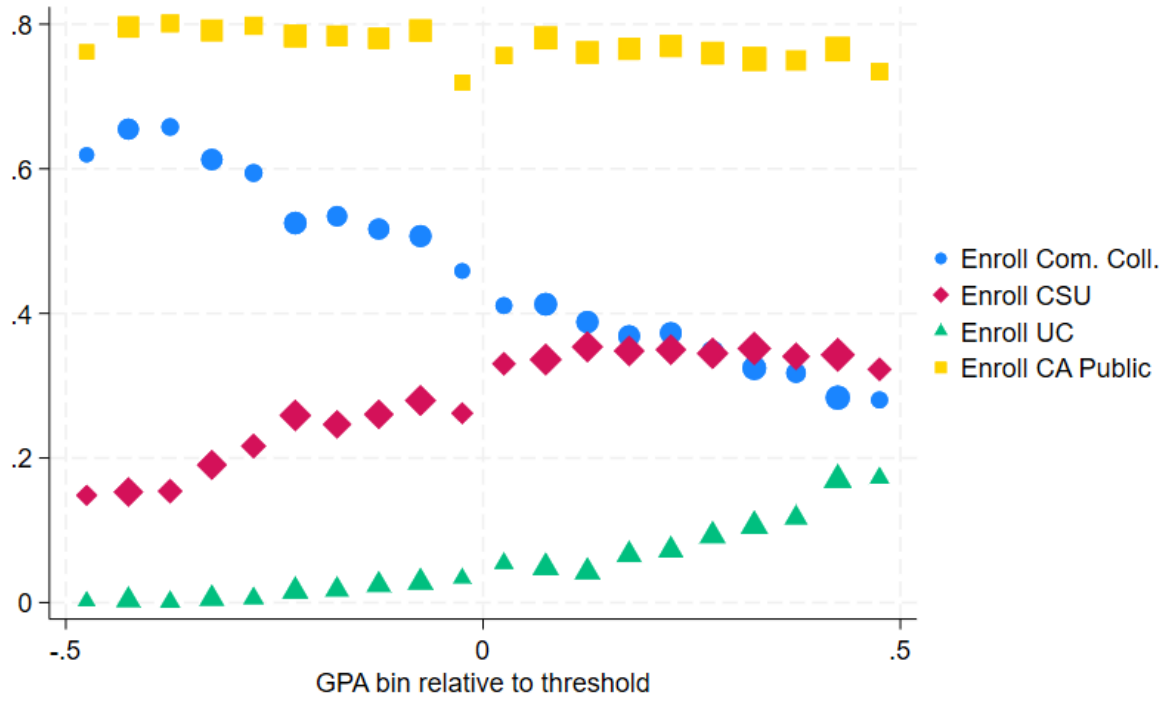
Notes: These figure plots the fraction of observations in GPA bins of size 0.01, from 2.50 through 3.50, using the regression discontinuity sample of students from "middle-income" families, as described in the text. Panel A focuses on students that we use in the RD sample. Panel B focuses on students who are not eligible for the Cal Grant due to high income

Figure 6: Payments



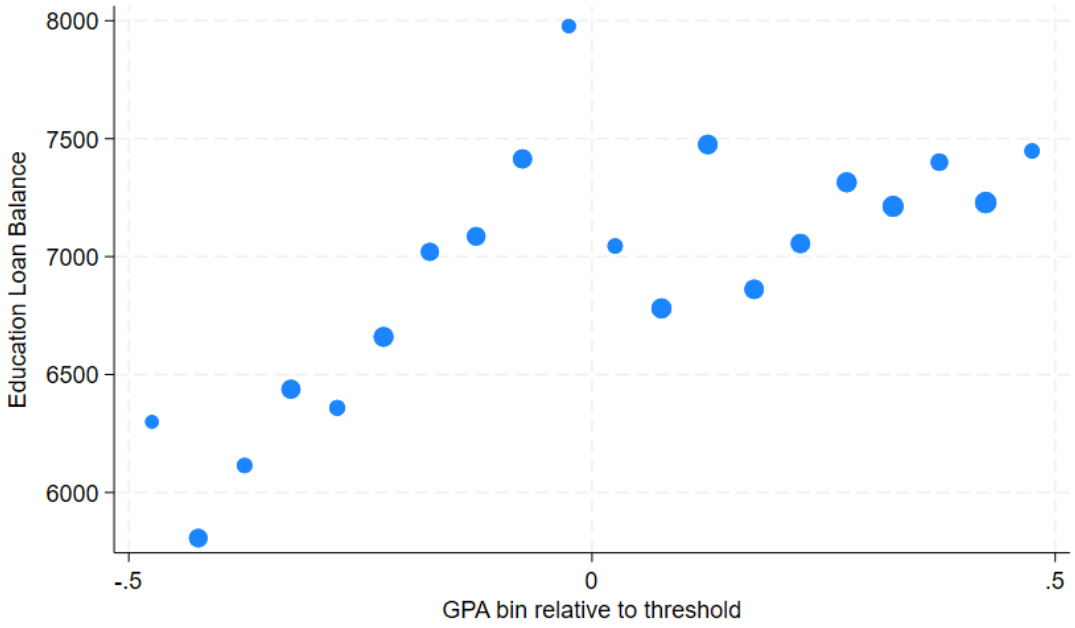
Notes: This figure plots the average amount of Cal Grant aid received over the first six years after the student's initial FAFSA application. Results use the regression discontinuity sample of students from "middle-income" families, as described in the text, in GPA bins of size 0.05 but removing students with a 3.0 GPA.

Figure 7: Enrollment



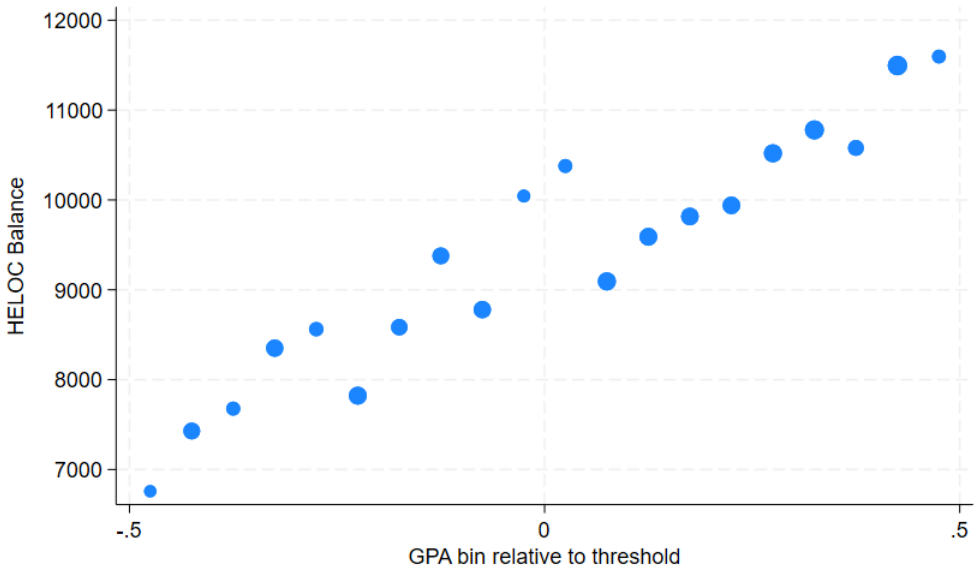
Notes: This figure plots rates of initial postsecondary enrollment in California's public two-year and four-year colleges. Results use the regression discontinuity sample of students from "middle-income" families, as described in the text, in GPA bins of size 0.05 but removing students with a 3.0 GPA. The sample is restricted to only the 2014 and 2015 cohorts, for which we have enrollment data for all three sectors.

Figure 8: Parent Education Loan Balances 4 Years After Entry



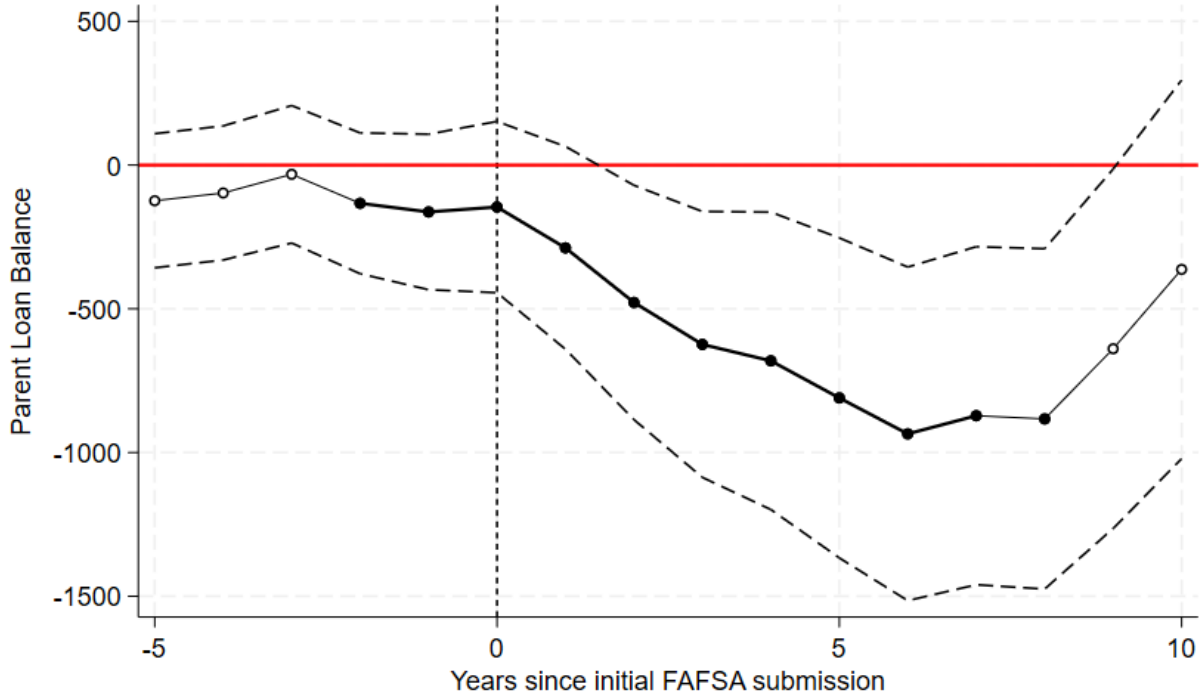
Notes: This figure plots the weighted sum of the parent's educational loan balances four years after the student's initial FAFSA submission. The weights are described in the text but are designed to avoid double counting of balances of jointly held debt. Results use the regression discontinuity sample of students from "middle-income" families, as described in the text, in GPA bins of size 0.05 but removing students with a 3.0 GPA.

Figure 9: HELOC Balances 4 Years after Entry



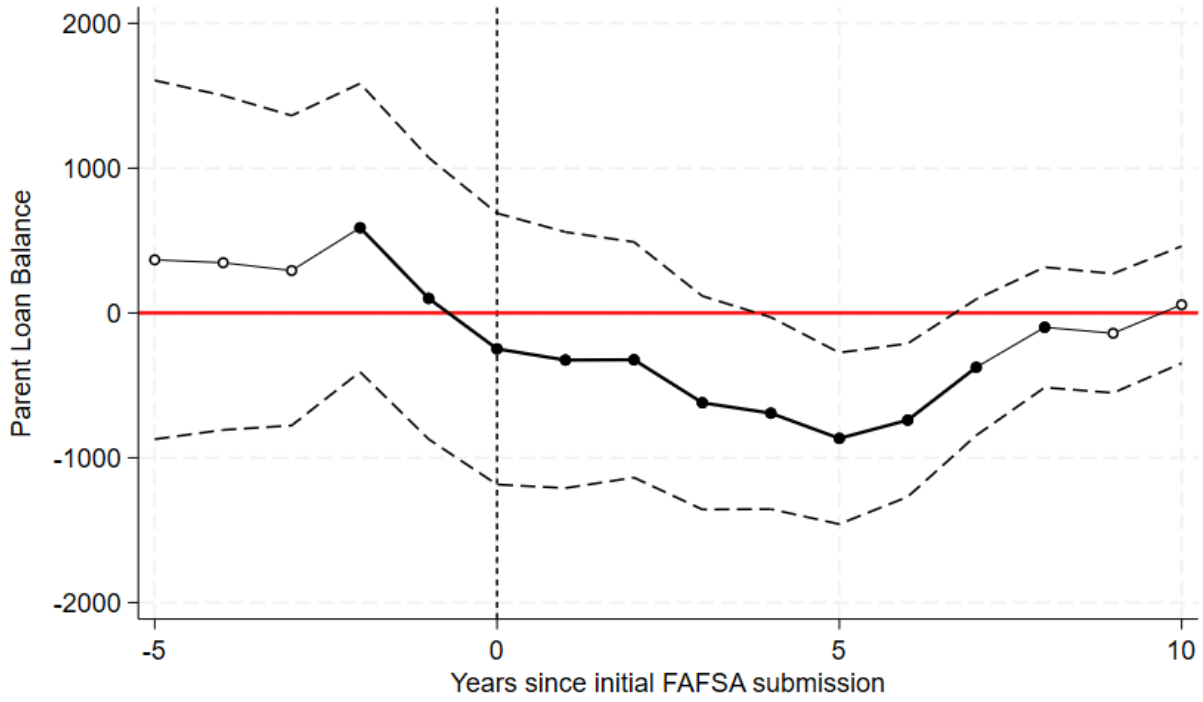
Notes: This figure plots the weighted sum of the parent's HELOC four years after the student's initial FAFSA submission. The weights are described in the text but are designed to avoid double counting of balances of jointly held debt. Results use the regression discontinuity sample of students from "middle-income" families, as described in the text, in GPA bins of size 0.05 but removing students with a 3.0 GPA.

Figure 10: RD Estimates by years since first FAFSA submission, Educational Loan Balances



Notes: Each circle is a point estimate from a regression discontinuity model estimating the impacts of receiving state aid on the associated outcome, using the regression discontinuity sample of students from "middle-income" families as described in the text. Each year uses credit bureau data from the September quarterly snapshot, with year 0 being the September following the student's initial FASFA submission when they would have enrolled in college. Dark circles represent estimates from the balanced panel and hollow circles represent estimates where not all cohorts can be tracked.

Figure 11: RD Estimates by years since first FAFSA submission, HELOC Balances



Notes: Each circle is a point estimate from a regression discontinuity model estimating the impacts of receiving state aid on the associated outcome, using the regression discontinuity sample of students from "middle-income" families as described in the text. Each year uses credit bureau data from the September quarterly snapshot, with year 0 being the September following the student's initial FASFA submission when they would have enrolled in college. Dark circles represent estimates from the balanced panel and hollow circles represent estimates where not all cohorts can be tracked.

Table 1a Summary Statistics, Event Study

Variable	Mean	St. Dev	Variable	Mean	St. Dev
Delinquency 90 Days CC	0.029	0.167	HS GPA	2.5	1.3
Delinquency 90 Days Auto	0.007	0.081	Student Age	19.3	1.3
Delinquency 90 Days HELOC	0.018	0.134	Family Size	4.1	1.4
Delinquency 90 Days Mortgage	0.037	0.189	Freshman	0.910	0.287
Delinquency 90 Days Ed Loans	0.019	0.137	Female	0.551	0.497
Delinquency 90 Days CC	0.037	0.189	Citizen	0.942	0.233
Delinquency 90 Days Any	0.104	0.306	BA intention	0.690	0.462
Has Credit Card	0.567	0.495	AA Intention	0.161	0.368
Has Auto Loan	0.370	0.483	Parent: College	0.519	0.500
Has HELOC	0.159	0.366	Parent: Married	0.628	0.483
Has Mortgage	0.403	0.491	Parent: Divorced	0.215	0.411
Has Educational Loan	0.118	0.323	Parent: Widowed	0.026	0.158
Has Credit Card	0.610	0.488	Parent 1 age	48.1	6.1
Hasy Any Credit Line	0.723	0.448	Parent 2 age	49.9	6.2
Balance: Auto Loans	6,285	11,475	Hispanic/Black Indicator	0.379	0.485
Balance: HELOCs	12,659	39,962			
Balance: Mortgages	119,212	206,793			
Balance: Edu Loans	2,529	10,169			
Balance: Credit Cards	5,223	10,384			
Balance: Any	146,627	235,824			
Bankruptcy Ch. 7	0.014	0.116			
Bankruptcy Ch. 13	0.008	0.089			
Avg Credit Score	675	103			

Notes: Sample Size is 395,768 except for Avg Credit Score(330441), GPA (211922), Family Size (391,310), Female (323,620), Intention (255,305), Parent 1 Age (239,150), Parent 2 Age (177,222),

Table 1b: Parent Summary Statistics for RD Sample

Credit Data

Variable	Mean	SD
Credit Score	692	93
Any Bankruptcy	0.031	0.172
Delinquency 30 days Any	0.192	0.394
Delinquency 90 days Any	0.066	0.249
Has Educational Loan	0.144	0.351
Has Credit Card	0.822	0.382
Has Auto Loan	0.494	0.500
Has Mortgage	0.559	0.496
Has HELOC	0.196	0.397
Has Secured Loan	0.134	0.340
Has Any Credit Line	0.940	0.237
Delinquency 30 days Ed. Loan	0.025	0.155
Delinquency 30 days Credit Card	0.142	0.349
Delinquency 30 days Auto	0.059	0.235
Delinquency 30 days Mortgages	0.092	0.289
Delinquency 30 days HELOCs	0.034	0.181
Delinquency 90 days Ed. Loan	0.021	0.142
Delinquency 90 days Credit Card	0.044	0.206
Delinquency 90 days Auto	0.006	0.079
Delinquency 90 days Mortgages	0.051	0.221
Delinquency 90 days HELOCs	0.024	0.153
Balance: Education Loans	3,127	10,975
Balance: Credit Cards	7,074	11,220
Balance: Auto Loans	8,630	12,701
Balance: Mortgages	153,500	206,476
Balance: HELOCs	14,602	40,630
Balance: Secured	900	3,669
Credit Prediction: Black or Hispanic	0.488	0.500
N	213,617	

CSAC Data

Variable	Mean	SD
Child's GPA	3.03	0.27
Adjusted Gross Income	60,168	13,109
Child's Age	18.9	0.8
Family Size	4.1	1.2
Have Different Child in College	0.070	0.255
Freshman	0.958	0.200
Female	0.577	0.494
Citizen	0.964	0.186
Objective: BA	0.683	0.465
Objective: AA general	0.168	0.373
Objective: AA tech	0.031	0.174
Objective: Tech Unknown	0.092	0.289
Parent: College Educated	0.464	0.499
Parent: Married	0.696	0.460
Parent Never Married	0.082	0.275
Parent: Divorced	0.203	0.402
Parent: Widowed	0.019	0.136
Parent 1 Age	47.1	6.1
Parent 2 Age	48.5	6.3

Notes: This tables presents the mean and standard deviation of several variables for the RD sample. This table includes a GPA bandwidth of .5 (from 2.51 to 3.49 GPA). Sample size is 213,617 for all outcomes except for Female (209,282), Objective variables (212,235), Parent 1 Age (199, 121), Parent 2 Age(151,208)

Table 2 Statistical Balance

	Family income	Family Size	Number of other children in college	At least one parent with a self-reported college education	Self-reported freshman	Age as of Sept 1
Discontinuity	43.091	0.006	-0.001	0.001	0.001	-0.007
	(157.397)	(0.015)	(0.003)	(0.006)	(0.003)	(0.010)
Baseline mean	60,075	4.109	0.069	0.450	0.954	18.963
N	125,467	125,467	125,467	125,467	125,467	125,467

	Age of Parent 1	Age of Parent 2	Female	Degree objection: Bachelor's	Citizen	Parents are married
Discontinuity	0.115	0.117	0.001	0.005	-0.004	-0.004
	(0.078)	(0.093)	(0.006)	(0.006)	(0.002)	(0.006)
Baseline mean	46.947	48.347	0.570	0.664	0.970	0.694
N	116,882	88,663	122,880	124,643	125,467	125,467

Notes: This table presents estimates of the discontinuity in Cal Grant eligibility at the 3.0 GPA cutoff. Robust standard errors appear in parentheses.

Table 3 Enrollment

	Enrollment in first year	Enrollment in fourth year
Community College	-0.023+	-0.006
	(0.013)	(0.012)
Baseline mean	0.494	0.345
California State University (CSU)	0.027*	0.025*
	(0.012)	(0.011)
Baseline mean	0.285	0.193
University of Californi (UC)	-0.005	-0.007
	(0.005)	(0.006)
Baseline mean	0.029	0.040
Any enrollment	0.001	0.011
	(0.011)	(0.013)
Baseline mean	0.785	0.551
Estimated Tuition	70.411	
	(73.047)	
Baseline mean	2399.409	

	Rec'd a payment first year	Total payment ($)	Ever rec'd a payment within six years	Total payment ($) over six years
Discontinuity	0.356**	2151.6**	0.311**	5905.6**
	(0.005)	(34.0)	(0.005)	(128.5)
Baseline mean	0.03	88.4	0.155	2,081.1
N	125,467	125,467	125,467	125,467

Notes: This table presents estimates of the discontinuity in Cal Grant eligibility at the 3.0 GPA cutoff. Robust standard errors appear in parentheses. All results use only the final two cohorts (2014 and 2015) for whom we can observe enrollment in in-state public colleges (e.g., CC, CSU, UC). Sample size: 29,671

Table 4 RD Estimates of Student Balances

Impacts of the offer of Cal Grant state aid on student's loan balances, by loan type

Years from initial FASFA	0	1	2	3	4	5	6	7	8	9	10
Student loan	1	-15	-49	4	-48	44	85	42	48	-2	174
	(14)	(54)	(89)	(123)	(156)	(184)	(214)	(242)	(269)	(316)	(366)
Baseline mean	166	2,260	3,987	5,814	7,696	9,035	10,015	10,884	11,739	12,820	13,600
Credit card	18*	3	-5	-10	-9	4	9	4	4	48	49
	(9)	(11)	(14)	(18)	(23)	(28)	(33)	(38)	(43)	(51)	(59)
Baseline mean	74	223	424	679	993	1,259	1,523	1,826	2,084	2,293	2,470
Auto	12	-7	-28	-36	-113+	-169*	-123	-3	-65	15	229+
	(19)	(30)	(42)	(55)	(67)	(79)	(90)	(99)	(105)	(116)	(129)
Baseline mean	156	464	934	1,528	2,188	2,997	3,760	4,475	4,970	5,331	5,521
Mortgage	-49	-171	-162	-246	-232	-375	-680+	-357	-317	893	1171
	(162)	(153)	(142)	(150)	(182)	(247)	(356)	(473)	(596)	(761)	(958)
Baseline mean	532	571	547	792	1,294	2,326	4,425	7,418	11,262	15,277	20,484
HELOC	2	-5	-15	4	6	-8	-10	6	1	-3	43
	(22)	(19)	(19)	(15)	(13)	(11)	(12)	(15)	(18)	(25)	(31)
Baseline mean	43	39	43	31	21	21	26	34	51	94	96
Secured/Unsecured	1	-4	4	0	-4	-10	-28*	-28	15	11	-1
	(4)	(6)	(7)	(7)	(9)	(11)	(14)	(19)	(23)	(28)	(35)
Baseline mean	17	42	62	71	95	142	202	306	401	504	617
Total Balance	-28	-190	-248	-281	-400	-544	-815+	-467	-498	979	1763
	(162)	(166)	(175)	(205)	(257)	(336)	(458)	(600)	(757)	(955)	(1200)

Baseline mean	914	3,429	5,826	8,809	12,363	16,172	20,893	26,896	33,888	40,768	48,660
N	126,510	126,510	126,510	126,510	126,510	126,510	126,510	126,510	126,510	111,164	96,364

Notes: This table presents estimates of the discontinuity in Cal Grant eligibility at the 3.0 GPA cutoff. Robust standard errors appear in parentheses.

Impacts of the offer of Cal Grant state aid on parent's loan balances, by loan type

Years from initial FASFA	0	1	2	3	4	5	6	7	8	9	10
Student loan	-146	-288	-478*	-624**	-681**	-810**	-935**	-872**	-883**	-639*	-363
	(152)	(180)	(208)	(236)	(264)	(284)	(296)	(300)	(302)	(319)	(336)
Baseline mean	3,843	5,190	6,271	7,234	8,112	8,731	8,974	8,889	8,699	8,285	7,748
Credit card	22	-104	-94	-16	-30	-35	-34	25	-86	-30	85
	(134)	(126)	(119)	(110)	(105)	(101)	(97)	(95)	(94)	(99)	(105)
Baseline mean	6,777	6,377	6,081	5,697	5,472	5,298	5,085	4,932	4,913	4,825	4,616
Auto	-417**	-108	53	71	206	235	173	-101	-72	-6	48
	(158)	(159)	(160)	(162)	(163)	(166)	(168)	(169)	(170)	(180)	(191)
Baseline mean	9,017	9,225	9,318	9,597	9,699	9,828	9,897	9,961	9,721	9,478	9,193
Mortgage	-1384	-980	603	289	83	164	1182	753	977	-17	-269
	(2468)	(2367)	(2247)	(2147)	(2056)	(1999)	(1974)	(1952)	(1939)	(2039)	(2170)
Baseline mean	146,457	140,084	132,485	128,012	124,027	122,237	121,035	120,125	120,107	118,437	116,249
HELOC	-248	-325	-323	-620+	-692*	-866**	-740**	-375	-99	-140	57
	(478)	(451)	(415)	(376)	(338)	(302)	(270)	(240)	(212)	(210)	(206)
Baseline mean	13,095	11,694	10,164	8,820	7,725	6,741	5,760	4,902	4,159	3,888	3,496
Secured/Unsecured	-23	-30	-23	-43	-46	-18	-37	-52	-27	39	51
	(43)	(38)	(36)	(36)	(37)	(41)	(44)	(48)	(54)	(59)	(63)
Baseline mean	861	829	850	872	953	1,030	1,135	1,299	1,428	1,454	1,451
Total Balance	-1925	-1641	-130	-652	-869	-1075	-33	-403	239	-552	116
	(2,542)	(2,471)	(2,376)	(2,293)	(2,233)	(2,207)	(2,217)	(2,254)	(2,303)	(2,448)	(2,631)
Avg Credit Score	0.045	0.288	0.871	1.287	0.412	0.934	1.096	0.567	0.658	0.250	0.214

	(1.169)	(1.165)	(1.156)	(1.150)	(1.138)	(1.118)	(1.093)	(1.072)	(1.053)	(1.104)	(1.171)
Baseline mean	703.142	707.227	710.635	714.930	720.470	726.233	731.572	736.947	742.125	746.392	749.531
N	125,467	125,467	125,467	125,467	125,467	125,467	125,467	125,467	125,467	110,388	95,796

Notes: This table presents estimates of the discontinuity in Cal Grant eligibility at the 3.0 GPA cutoff. Robust standard errors appear in parentheses.

Impacts of the offer of Cal Grant state aid on parent's likelihood of defaulting on a loan, by loan type

Years from initial FASFA	0	1	2	3	4	5	6	7	8	9	10
Student loan	-0.002	-0.003	-0.003	-0.003	-0.001	0.001	-0.002	-0.001	-0.002	0.000	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Baseline mean	0.025	0.026	0.029	0.029	0.029	0.03	0.028	0.026	0.021	0.017	0.015
Credit card	-0.002	-0.006*	-0.005+	-0.006*	-0.003	-0.004+	-0.002	0.000	-0.004+	-0.002	-0.003
	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Baseline mean	0.045	0.045	0.043	0.043	0.039	0.038	0.033	0.032	0.033	0.029	0.028
Auto	0.001	0.001	0.001	-0.001	-0.002*	-0.003*	-0.001	-0.001	0.000	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Baseline mean	0.006	0.007	0.007	0.007	0.008	0.008	0.006	0.006	0.006	0.006	0.005
Mortgage	-0.002	-0.005+	0.000	0.000	0.002	0.000	0.000	0.001	0.000	-0.002	0.000
	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
Baseline mean	0.055	0.053	0.045	0.04	0.031	0.023	0.016	0.013	0.009	0.008	0.007

HELOC	0.000	-0.003	-0.002	-0.003	-0.002	-0.001	-0.001	-0.001	0.000	-0.001	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Baseline mean	0.025	0.023	0.02	0.017	0.013	0.009	0.007	0.005	0.004	0.003	0.002
Secured/Unsecured	0.000	-0.002	0.000	0.000	0.000	-0.001	0.001	0.000	-0.001	0.000	-0.002*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Baseline mean	0.013	0.014	0.012	0.012	0.011	0.01	0.008	0.008	0.009	0.007	0.009
Total Balance	0.000	-0.009**	-0.004	-0.009**	-0.004	-0.003	-0.002	0.000	-0.003	-0.002	-0.004
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Baseline mean	0.072	0.078	0.074	0.077	0.073	0.068	0.064	0.06	0.057	0.049	0.048
N	125,467	125,467	125,467	125,467	125,467	125,467	125,467	125,467	125,467	110,388	95,796

Notes: This table presents estimates of the discontinuity in Cal Grant eligibility at the 3.0 GPA cutoff. Robust standard errors appear in parentheses.