CASH FOR CLASS: THE EFFECT OF PAYING STUDENTS FOR FULL-TIME COMMUNITY COLLEGE ENROLLMENT

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Abstract

Despite enrolling nearly half of U.S. undergraduates, completion rates in community colleges remain far below those in four-year colleges. Community college students are much more likely to be enrolled only part-time and to face financial hardships resulting from coming from lower-income backgrounds. This study examines the impact of eligibility for the largest financial aid program in California, the Cal Grant B, which offers low-income community college students financial assistance for living expenses. It also includes large supplements (up to $4,000 per year) for students who enroll in enough units per term to finish an associate degree within two years. Using a regression discontinuity design applied to statewide data from the community college and financial aid systems, we find little evidence that Cal Grant B eligibility improves student outcomes, including enrolling in enough units to trigger the supplemental aid. However, for students who happened to have enrolled in enough units to receive the supplemental aid, we find that grant eligibility improves several indicators of postsecondary attainment. Evidence from student surveys suggest information frictions may undermine the effectiveness of the program.

By the time of the NBER SI, we will have results for more recent cohorts that receive even larger supplemental grants than what the students in our current analysis faced. Specifically, students now receive $8,000 per year in supplemental aid for enrolling in 15 units per term, or twice what students in our current analysis faced (and larger than even the maximum aid students receive from the federal Pell Grant program).

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1 Introduction

While nearly half of U.S. undergraduates attend community colleges (U.S. Dept. of Education, 2025), less than half of community college students earn a college degree (National Student Clearinghouse, 2023). Improving completion rates at these institutions could therefore have large human capital benefits and contribute to economic mobility. One possible way to do so is to reduce the financial hardships community college students face. While community colleges have lower tuition than four-year colleges, students attending community college disproportionately come from low-income backgrounds and can have difficulty paying for living expenses.[1] Financial hardship could lead to poor academic outcomes by diverting energy and time away from coursework (Bozick, 2007). For instance, the need to work long hours could be one reason why over 70 percent of community college students enroll only part-time (U.S. Dept. of Education, 2025), impeding progress towards a degree.

Whether providing assistance with living expenses would improve community college student outcomes remains unclear. A large body of research on college costs supports the view that college costs have important impacts on college access and completion (Dynarski and Scott-Clayton, 2013; Page and Scott-Clayton, 2016; Scott-Clayton, 2017; Nguyen et al., 2019). However, much of this research examines four-year colleges or state aid programs that only provide tuition assistance. Studies of community college students have focused on changes to sticker-price tuition (Denning, 2017; Acton, 2021), or interventions that make it difficult to isolate the role of reducing the burden of living expenses (Marx and Turner, 2019; Barrow et al., 2014; Mayer et al., 2015; Richburg-Hayes et al., 2015).

In this paper, we examine the effects of a grant aid program that provides community college students assistance with living expenses. We conduct our analysis in the California Community Colleges (CCC), the largest higher education system in the U.S., serving over 2 million students. To be eligible for the

[1] Nearly three-quarters of average total cost of community college attendance consists of living expenses. In 2023, the average total cost of attendance for a full-time community college student paying the in-district 'sticker price' tuition was $19,860, of which only $5,460 (27 percent) was for tuition, books and supplies (College Board, 2023). Reflecting the burden these living expenses impose, community college students face high rates of food and housing insecurity (Goldrick-Rab et al., 2017).

program we study, the Cal Grant B High School Entitlement Award (henceforth, Cal Grant B), students must demonstrate financial need. We use a regression discontinuity design based on the income cutoffs used to determine eligibility for the award. We implement this approach using statewide data from financial aid applications linked to administrative student records. The resulting dataset contains detailed information on students' financial need, financial aid, and indicators of postsecondary success.

Three features of the institutional context make our analyses especially informative. First, students eligible for the Cal Grant B pay no tuition (via waivers from a separate state aid program). Thus the entire Cal Grant B award can be used to pay for living expenses. Moreover, other aid programs such as the Pell Grant do not "crowd out" Cal Grant B aid, in contrast to some programs in other states (Eng and Matsudaira, 2021). Second, the Cal Grant B awards are sizable. During our study period, students could receive up to $5156 in Cal Grant B aid, an amount comparable to the maximum Pell Grant award and about one-fifth of mean family income among income-eligible students. Third, the structure of the Cal Grant B awards creates strong incentives for students to enroll in a large number of units each semester. To receive the maximum award students must enroll in at least 15 units each semester, while students enrolling in 11 units each semester (i.e., just below full-time status) only receive $1,296 per year.[2] Thus, in addition to providing assistance with living expenses, the program also targets low enrollment intensity, which some point to as a reason for low community college completion rates (Complete College America, 2023).

We begin the analysis by examining how eligibility for the Cal Grant B affects college choice and enrollment. We find no effect on overall college enrollment or on enrollment in community college, and only small increases in the likelihood of attending a four-year college. Because we are most interested in the effect of the Cal Grant B aid on community college students, we then restrict the sample to students who enroll in community college. The lack of effects of grant eligibility on community college enrollment

[2]The rationale for structuring aid in this way is to encourage students to take enough units to finish an associate degree in two years. Most associate degree programs require 60 units of coursework, which can only be completed in four semesters (two years) if students take at least 15 units per semester.

suggests this restriction does not introduce sample selection bias, which is further supported by empirical tests of the validity of the RD design for the community college enrollment sample.

In this sample, we find little evidence that Cal Grant B eligibility improves student outcomes. For short-run outcomes, we find small or null effects on units in the first fall or spring semester, fall-to-spring persistence, and the likelihood of taking 15 or more units a term - the behavior that the program intended to incentivize. We also find little indication of improvements in longer-term attainment outcomes, with the possible exception of a small increase in transfering to a four-year university.

Because the Cal Grant B does not appear to induce students to take the 15 units per term necessary to trigger the largest grant aid amounts, it effectively operates as a sizable windfall for students who do happen to enroll in this many units. To examine whether this additional aid affects student outcomes, we conduct analyses restricted to students who took 15 units in their first fall semester. While an obvious concern with this approach is that it could introduce imbalance between students above and below the eligibility cutoff, the lack of an effect of eligibility on selection into this sample allays that concern. Moreover, we present evidence that is largely consistent with a valid RD design for this sample. The findings from these analyses suggest that Cal Grant B eligibility does improve student outcomes. For instance, we find that transfer to a four-year college and attainment of an associate degree within 2 years both increase by about 3 percentage points.

It may seem puzzling that the Cal Grant B program did not generate stronger effects on the likelihood of taking 15 or more units per term. For many students, this would only entail taking one or two additional classes, and doing so would substantially increase their financial aid award. One explanation for this null result is a lack of awareness of the details regarding each part of their financial aid package by the student. Many students do not know from which source some of their financial aid comes, suggesting that students are not aware that enrolling as a full-time student would provide more generous benefits. Responses to a survey we administered to all California financial aid applicants in fall 2020 suggest many students have

only a limited understanding of the financial aid they receive. We therefore believe that it is quite plausible that students do not know about the incentives embedded in the Cal Grant B program, and that receipt of the large aid supplements as a consequence of enrolling in 15 units actually may lead students to better understand how the program works and thus respond more strongly to the incentives it creates in subsequent terms.

This study builds on several strands of prior research. A large literature examines how college costs affect student outcomes (Dynarski and Scott-Clayton, 2013; Page and Scott-Clayton, 2016; Scott-Clayton, 2017; Nguyen et al., 2019), with a number of studies focusing on community colleges.Denning (2017) and Acton (2021) investigate how reducing community college "sticker price" tuition affects community college enrollment and postsecondary degree attainment. A number of studies examine the effect of Pell Grant aid on community college students (Schudde and Scott-Clayton, 2016; Park and Scott-Clayton, 2018; Liu, 2020), while others examine impacts of state and private aid programs Angrist et al. (2016); Anderson et al. (2020). We contribute to this work by focusing on impacts of aid for living expenses as opposed to changes in sticker price or aid that is used for tuition or living expenses.

In this way, our work is related to research that examines the impacts of programs and policies that may alleviate financial hardships, including a study by (Marx and Turner, 2019) on the effect of nudging community students to take out larger loans and a study on the effect of giving $1,200 "completion grants" to students nearing degree completion who have substantial unmet financial (Goldrick-Rab et al., 2022). Several studies have examined the effect of scholarships for living expenses that are conditional on meeting academic performance benchmarks and that in some cases offer non-financial student supports (Mayer et al., 2015; Richburg-Hayes et al., 2015; Barrow et al., 2014). The most closely related studies to ours are those that examine the impact of programs that provide community college students aid that can be used for living expenses. Anderson and Goldrick-Rab (2018) find that offering Pell Grant recipients who were already enrolled in community college an additional $1,800 per year does not improve academic outcomes.

Anderson (2020) finds that a Wisconsin state grant program that provides $1,080 per year in aid to community college students improves degree completion for those with the highest financial need. Gurantz (2022) finds a separate Cal Grant program that targets older students did not increase degree completion among students who indicated they planned to attend a community college.

We build on this work in several ways. First, the maximum awards students in our sample could receive are much larger (over $5,000 per year) than those considered in earlier work.[3] Second, the design of the program we study allows us to shed light on whether tying grants for living expenses to taking on a more than full-time unit load changes enrollment intensity and student outcomes.[4] Third, in contrast to the Anderson (2020) and Gurantz (2022) studies, we we examine aid targeting high school graduates who had not yet started college.

The rest of the paper is organized as follows. Section 2 describes the details of financial aid programs in California. Section 3 explains the data sources used in the analysis and how we constructed the analytic sample. Section 4 presents the research design and econometric specification. Section 5 reports the main results and Section 6 presents the results for students who enroll in 15 units in their first semester. Finally Section 7 provides some explanations for our findings and offer directions for future research.

2 State Financial Aid Context and the Cal Grant B Program

California accounts for nearly a quarter of all need-based undergraduate aid in the U.S. (NASSGAP, 2016). A distinctive feature of California's higher education system is the importance of public community colleges, which enroll about 2 million students. Of all high school seniors who enroll in college in the year after graduating, 57 percent enroll in the state's community colleges (Kurlaender et al., 2018), whereas nationally only about 40 percent of undergraduates attend two-year colleges (CCRC, 2024). These patterns

[3] During the **?** study period, the maximum Cal Grant awards were only $1,551 per year.

[4] Jung and Shrestha (2018) finds that the Affordable Care Act's elimination of the requirement that young adults had to be enrolled in college full-time to remain on their parent's health insurance plan led to reductions in full-time college enrollment.

may reflect the relatively low cost of community college in California, with tuition and fees only $46 per unit ($1,380 per year for 30 units), and over half of students receiving means-tested full tuition waivers during our study period.[5]

This program studies the Cal Grant B high school entitlement program.[6] To be eligible for this program, students have to enroll in college within one year of high school graduation and meet several eligiblity criteria. First, students have to demonstrate financial need by having income and assets below a specified level. These cutoffs vary by year, dependency status, and family size (as reported on the FAFSA). Students also must have a high school GPA of at least 2.0 and have residency in California for at least one year.

Students eligible for the Cal Grant B can use the award at public and private colleges in California. Community college students students receive a base "subsistence grant" equal to $1,656 per year.[7] Students attending four-year college also receive the subsistence grant in their first year, which is replaced by tuition assistance in subsequent years.[8] A key feature of the institutional context for community college students is that all Cal Grant B recipients receive community college tuition waivers (as part of other state aid programs). Thus, Cal Grant B aid in community colleges essentially acts as a cash transfer that students can use for living expenses.

In addition to the base Cal Grant, community college students can earn sizable supplemental aid by enrolling in additional units beyond the 12 units per term needed for full-time enrollment. The size of these supplements increased over our study period. In 2017, students earned an additional $500 per term for enrolling in more than 12 units from the Full-Time Student Success Grant and an additional $750 per term for enrolling in 15 or or more units from the College Completion Grant program. Starting in 2018, these pro-

[5]Currently, all students in California can attend community college tuition free for two years

[6]In addition, California offers other types of Cal Grant awards. The high school entitlement Cal Grant A program can only be used at four-year colleges and covers full tuition and fees for in-state public universities. In contrast to the Cal Grant B, the income and asset cutoffs are higher for the Cal Grant A (i.e., the Cal Grant A is available to more middle-income families) and the GPA cutoff is 3.0. **?** study the impact of the Cal-Grant A on longer-run student outcomes. In addition, the competitive Cal Grant program is available to "non-traditional" age students who first enroll in college more than two years after high school graduation.

[7]This amount represents the full amount a student could receive if they were enrolled as a full-time student. Part-time students receive an amount proportional to the number of credits taken.

[8]The amount of tuition assistance depends on college sector. The Cal Grant B covers full tuition and fees for public universities, and partial tuition at private universities.

grams were combined into the Student Success Completion Grant. Under this program, students enrolling in 12-14 units per term received $649 and those enrolling in 15+ units received $2,000 per term. Thus, students taking 15 units in both fall and spring received a total of $2,500 per year in 2017 and $4,000 per year in 2018, 2019 and 2020. These amounts are substantially larger than the base Cal Grant B subsistence award.

3 Data

Our study uses a dataset assembled from several California administrative datasets. We first describe these datasets. Then explain how we form the analytic sample we use to produce estimates of Cal Grant B eligibility and discuss summary statistics for this sample.

3.1 Data Sources

3.1.1 California Student Aid Commission (CSAC)

The Cal Grant program and other state financial aid programs are administered by the California Student Aid Commission (CSAC). CSAC data files cover all California students who submit a Free Application for Federal Student Aid (FAFSA). The FAFSA records contain detailed information on a student's financial circumstances including income, assets, family size, dependency status, and other demographic and family background variables (e.g., gender and age). CSAC uses this information to determine financial eligiblity for state aid programs including the Cal Grant. In addition to the FAFSA, CSAC collects other information from applications students submit for state aid programs including high school GPA (sent directly to CSAC by high schools) and length of residency in California. CSAC records also contain information on grant payments, including award amounts, timing of payments, and the higher education institution to which payments were sent.

3.1.2 California Community Colleges Chancellor's Office (CCCCO)

Student records from the California Community Colleges Chancellor's Office contain detailed information about enrollment, academic performance, and degree completion for all students in the state's public community colleges. Specifically for this study, we use information on term enrollment, cumulative GPA, credit accumulation, transfer to four-year college, and degree completion. academic performance (GPA by term), academic major, credit. The CCCCO data also includes detailed information on financial aid eligibility and awards. This information allows us to observe aid from programs not administered by CSAC including community college tuition waivers, federal student loans, and Pell Grant aid.

3.1.3 California Department of Education (CDE)

We use data from California Department of Education (CDE) to obtain students' pre-college characteristics, such as demographics (e.g. ethnicity and economic disadvantage) and standardized test scores. Data is available for students enrolled in public schools in California. Test scores for math and English Language Arts (ELA) are available for students in grades 3-8 and grade 11. For each subject, we first compute standardized z-scores by grade-year to make scores comparable across years (including across different tests used throughout the study period). We then compute the average of the 8th and 11th grade z-scores by subject.[9].

3.1.4 National Student Clearinghouse (NSC)

Our final data source is enrollment records from the National Student Clearinghouse (NSC) that we use to examine whether Cal Grant B eligibility affects college choice. The NSC data we use comes from a match between 11th grade California public high school students and NSC enrollment records and covers all the high school graduation cohorts used in this study. NSC records indicate whether a student was enrolled in

[9]For students with missing scores for either 8th or 11th grade, we use the available score.

a particular college in a given academic term, with coverage for the vast majority of public and non-profit private colleges and universities throughout the U.S.

3.2 Analysis Sample

We construct our sample from CSAC records of financial aid applicants who complete the FAFSA and who have non-missing data on GPA from a California public high school. We form cohorts of students who submit financial aid applications for the academic year following high school graduation. We focus on these students because the Cal Grant B entitlement award we study is only available to students first applying for aid within one year of finishing high school. Our sample consists of the four cohorts of students who graduated from high school in the period 2017-2020. During this period, Cal Grant B recipients attending community college received up to $4,000 per year for enrolling in 15 units per term.

We impose several additional sample restrictions. First, we only include students who meet the non-income eligibility criteria for the Cal Grant B. Specifically, we drop students who did not apply by the March 2 deadline, have a GPA below 2.0, have assets above the eligibility threshold, and were not California residents for at least one year prior to applying. With this restriction, income determines eligibility for the Cal Grant B, which enables us to use the sharp RDD described in the next section. Second, we only include students that we link to CDE high school records. This restriction is made so we have information on high school test scores and because our data on college enrollment comes from a match between NSC and CDE records.[10]

For most of our analyses, we also limit the sample to students who actually enroll in community college.[11] We do so because we focus on impacts on community college outcomes. While this restriction may introduce sample selection bias since community college enrollment may be endogenous to Cal Grant B

[10]The match between CSAC and CDE records is done via a fuzzy match on name and date of birth.

[11]To determine whether a student enrolls in community college, we first match CSAC financial aid application records to CCCCO records using a fuzzy match on name and date of birth. For records that we are able to link in the two datasets, we then examine whether a student is enrolled in at least one unit in either the fall or spring semester in the year following high school graduation.

eligibility, prior research has found that similar programs such as the Pell Grant and federal student loans have minimal effect on college enrollment or choice (Marx and Turner, 2019). Furthermore, as we discuss below, we find little evidence that Cal Grant B eligibility affects the likelihood of enrolling in a community college.

3.3 Summary Statistics

Tables 1 and 2 compare the average characteristics and outcomes of students who are income-eligible and ineligible for Cal Grant B across the entire sample, not restricted to those who actually enroll in community college. The only difference between these two sets of students are that one set of students are income ineligible for Cal Grant B, while the other set are. However, both groups of students are eligible for Cal Grant B in all other aspects (GPA, assets, etc).

We see that Cal Grant B income eligible students are more likely to be Black, Hispanic, or Asian, with lower high school GPAs and lower average ELA and math standardized test scores. Income eligible students are also more likely to have enrolled in community college although the difference is only 3 percentage points.

Next, Panel B conditions on students who enroll in a California community college, we see patterns similar as to the full sample of students. Cal Grant B eligible students are again more likely to be Black, Latino, or Asian, with lower high school GPA. By construction, income-inelgible students have much lower income, and also have other indicators of greater financial need (e.g., lower assets and higher rates of receiving tuition fee waivers). A little less than 60 percent of income-eligible students receive a Cal Grant B in the fall semester. Table 2 shows that eligible and ineligible students within $20,000 of the income cutoff (one of the bandwidths we use for the RDD estimation) have fairly similar outcomes.

4 Research Design and Econometric Specification

We use a regression discontinuity design based on income cutoffs used to determine eligibility for the Cal Grant B. To understand the intuition behind the RD design based on income-eligibility cutoffs, recall that students with incomes above a cutoff specified by the state are not eligible for the Cal Grant B entitlement award. Conversely, students who meet the other pre-college eligibility criteria (e.g., a high school GPA of 2.0 or higher) can receive Cal Grant B aid if their income is below the cutoff and they enroll in a Cal Grant eligible college. As Table 1 showed, on average, financial aid applicants with incomes below this cutoff are likely to differ in many ways from those whose incomes are above it; however, these differences are likely to be much smaller among individuals whose incomes are close to the cutoff. This reasoning implies that comparisons of students just above and below the income cutoff will isolate the causal effect of eligibility for the Cal Grant B entitlement program.

The validity of this approach rests on the assumption that students with incomes that fall just above or below the cutoff are similar in all dimensions related to the outcome of interest. If this is true, then income eligibility is "as good as" randomly assigned in a narrow region around the income-eligibility cutoff. In this sense, our research design closely mimics an RCT, at least close to the cutoff. We implement standard empirical tests of this assumption Lee and Lemieux (2010); McCrary (2008). First, we examine whether baseline covariates trend smoothly through the income-eligibility cutoff. Second, we test whether the income distribution is continuous at the cutoff, as would be expected if there is no endogenous sorting around the cutoff.

There are two main ways this identification assumption could be violated in this context. One is that income reported on the FAFSA gets manipulated in such a way that students are not comparable on either side of the eligibility cutoff. This type of sorting is possible in theory; families may be aware of the cutoffs and either report lower income to fall below the threshold or not apply for financial aid if their income is above the threshold. Furthermore, students often have to resubmit FAFSA information as part of a process

known as income verification, and colleges may be more prone to require verification of students whose incomes are close to the eligibility cutoff. To address this concern, we use the income reported on a student's first FAFSA as the running variable for our analyses. We do so because, while we do find some evidence of manipulation of the final income reported near the eligibility threshold, we do not find any evidence of manipulation of the first reported income.

The second is that, for most of our analyses, we limit the sample to students enrolled in community college so that we can examine outcomes only available for students enrolled in community college (e.g., college GPA). If enrollment into college, or college sector choice, are affected by Cal Grant B eligibility, than conditioning the sample on community college enrollment may introduce selection bias. We show that eligibility has minimal effect on enrollment in community college. We also show that empirical tests of the design validity largely hold regardless of whether we limit the sample to community college enrollees.

4.1 Estimation

To estimate the effect of eligibility for the Cal Grant B entitlement award we estimate the following model:

$$Y_i = \theta E_i + f(R_i) + u_i \tag{1}$$

where Y_i represents an outcome of interest (e.g., units completed) for student i, E_i is a dummy variable for having income fall below the eligibility cutoff for the entitlement grant, R_i denotes the recentered income used as the running variable in this analysis, and u_i is a residual. Because Cal Grant B income and asset requirements change every year based on a student's family size and dependency status, we recenter each student's initial income to allow us to pool across students facing different cutoffs. Specifically, the running variable we use is $R_i = C_i - Income_i$, where C_i is the cutoff pertaining to student i and $Income_i$ is the uncentered income. Defined in this way, the eligibility cutoff is 0 for all students and income is decreasing

in R_i so that crossing the threshold from left to right means going from ineligible to eligible for the Cal Grant B.

The term $f(R_i)$ is a flexible function that describes the relationship between the R_i and the outcome away from the cutoff. The parameter θ represents the causal effect of being income-eligible for the Cal Grant B entitlement grant.

We estimate θ using standard local linear regression methods, where we limit the sample to a bandwidth around the eligibility cutoff and specify $f(R_i)$ as linear in R_i with slopes allowed to vary on either side of the cutoff. In the presentation of the main results, we report results using two bandwidths, a fixed bandwidth of $20,000 and the "optimal" bandwidth proposed by the Calonico et al. (2014). We also discuss robustness to the choice of bandwidth and to controlling for baseline covariates.

One complication for interpreting estimates of θ is that not all eligible students receive Cal Grant B aid. One reason is that some eligible students will not enroll in college (or enroll in a college that is not eligible for Cal Grant funding). However, even among students enrolling in a community college, some may not enroll in enough credits, or may turn down the Cal Grant to preserve semesters of lifetime eligibility in the case they decide to transfer to a four-year college.[12] Additionally, since we use the student's first reported income as the running variable, there will be a discrepancy between the income actually used to determine eligibility and the income used in the RD models. In this paper, we focus on the "intent-to-treat" effect of having an initial income just above or below the eligibility cutoff. We also discuss estimated impacts on student outcomes with respect to additional aid students receive as a result of eligibility to help interpret magnitudes of the effects we find.

The empirical models laid out above specify a constant intent-to-treat effect and even though both are likely to vary across students. Our research design captures the effect for the subset of students whose

[12]Conversely, some students who are ineligible for the Cal Grant entitlement award receive Cal Grant aid through the competitive Cal Grant program. The competitive Cal Grant awards are intended for "non-traditional" students who have been out of high school for longer than one year, so we do not expect to see many competitive Cal Grant recipients in our dataset of recent high school graduates. Nonetheless, the competitive Cal Grants introduce another potential source of slippage between income eligibility and award receipt.

incomes are close to the income-eligibility cutoff. This is a standard limitation of the RD design. However, the effect near the income cutoff is highly policy relevant; for instance, it would be useful for understanding changes in the cutoff that were caused by changes to the program's budget.

5 Main Results

5.1 College Choice

We first examine the effects of Cal Grant B eligibility on college enrollment and choice. Table 3 shows estimated discontinuities for various enrollment outcomes at the Cal Grant B eligibility cutoff. We find little evidence that Cal Grant B eligibility affects overall enrollment, with magnitudes less than one percentage point and only marginally statistically significant. There is some indication that eligibility increases enrollment at four-year colleges but the magnitudes are modest (about 1 percentage point) that is statistically significant in the specification that includes controls for baseline covariates.

We find no evidence that eligibility affects enrollment in community colleges. This is true whether we consider enrollment in any two-year college and no concurrent four-year enrollment as well as looking only at enrollment in a California community college. The point estimates are all close to zero (with magnitudes mostly around 0.5 percentage points or smaller) and never statistically significant.

Overall, these results suggest that Cal Grant eligibility has limited effects on college enrollment and choice, and specifically no effect on community college enrollment. Base on these results, we conclude that limiting the sample to community college enrollees will not generate selection bias at the eligibility cutoff, and henceforth, all analyses are conducted using students who enroll in a California community college following high school graduation.

5.2 Validity of RD Design

The validity of the RD estimates would be undermined if students "sort" around the income cutoff in a way that generates systematic differences between those just above and below the cutoff. To test whether such sorting occurs in practice, we first implement the procedure proposed by McCrary (2008) to test whether the density of the recentered initial income (R_i) exhibits discontinuities at the eligibility cutoff, which would suggest there is sorting around the cutoff. Figure 1 depicts the distribution of R_i for students whose initial incomes are within $20,000 of the eligibility cutoff. There is no visual evidence of a discontinuity in the distribution and the p-value for the hypothesis that the density is continuous is 0.4.

Next, we examine whether baseline covariates "trend smoothly" through the cutoff. Table 4 shows estimated discontinuities in demographic characteristics, high school academic performance, and information from the FAFSA. Overall, we find little indication that these covariates change discontinuosly at the eligibility cutoff, with small point estimates that are never statistically significant at the 5 percent level.

5.3 Financial Aid Receipt

Table 5 shows estimated discontinuities in financial aid measures. As expected, crossing the eligibility has a strong effect on receiving a Cal Grant B, with a 46 percentage point increase in the likelihood of receiving the award in the fall semester. This discontinuity is plainly seen in Figure 2. Another important pattern revealed in Figure 2 is that the "fuziness" in Cal Grant B receipt mainly comes from eligible students not receiving an award, which is consistent with students trying to save years of Cal Grant eligibility or with students not taking enough units to receive a Cal Grant. On the other hand, very few students with initial incomes just below the eligibility cutoff wind up receiving a Cal Grant, suggesting that it is rare for incomes that are initially below the eligiblity cutoff to be revised upward above the eligibility threshold.

Eligibility for the Cal Grant B substantially increases grant aid received. For the full year, eligibility increases Cal Grant B aid by about $1,300, which corresponds to average annual aid of $2,800 ($\frac{1,300}{0.46}$) for

students receiving a Cal Grant. This is substantially more than the amount of the base Cal Grant B ($1,656), indicating that many Cal Grant B recipients receive supplmentary aid for enrolling in 12 or more units.

Being eligible for Cal Grant B aid has little effect on other types of financial aid. The estimates in Table 5 indicate eligibility for Cal Grant B leads to about a one percentage point increase in receiving a tuition and fee waiver.[13] There is some evidence that Cal Grant B eligibility reduces Pell Grant receipt, but the estimates are not robust to different bandwidths and the estimates are close to zero and statistically insignificant when using the Calonico et al. (2014) optimal bandwidth. Effects on total grant aid (shown in panel (b) of Figure 2) are very similar to effects on Cal Grant B aid.

5.4 Community College Outcomes

Tables 6 and 7 contain our main estimates of impacts of Cal Grant B eligibility on student outcomes. Focusing first on shorter-run outcomes, the results in Table 6 provide no indication that eligibility increases enrollment intensity in the fall or spring as well as persistence to the spring semester. In particular, we do not find large behavioral responses to the financial incentives to enroll in 15 or more units per semester. This can be seen in the visual evidence in Figure 3, and the negative point estimates in Table 6 for fall and only an increase of about 1 percentage point in spring that is marginally statistically significant.

As seen in Tables 7 and Figure 4 also find little evidence that eligibility for the Cal Grant B improves longer run outcomes. The estimated effects on units attempted and earned are all less than one percent of the sample average and we can statistically rule out an increase larger than 3 percent for units earned and 2 percent for units attempted. Similarly, we can rule out improvement in coursework performance (measured by cumulative GPA) larger than 1 percent. We do find modest that eligibility leads to a modest increase in transfer of about 1 percent (on a base of 12 percent). The impacts on Associate's Degree attainment are positive but less than 1 percentage point and statistically insignificant.

[13] While all students with incomes near the Cal Grant eligibility cutoff should also be eligible for the fee waiver, it is possible some college financial aid offices only correctly processed the fee waiver when also processing the Cal Grant B award.

Tables 8 and 9 show results for alternative bandwidths. The first two columns repeat the specification used in the earlier tables, with a bandwidth of $20,000 and the Calonico et al. (2014) optimal bandwidth. The remaining columns show narrower and wider bandwidths. Overall, the main findings do not appear sensitive to the choice of bandwidth.

Finally in Table 10, we examine results for select outcomes by gender, race, and entering academic credentials measured by high school GPA. For the most part, we do not find large differences across these groups. Two exceptions are that the effect of Cal Grant B eligibility on transfer within 2 years is stronger for non-underrepresented minority (URM) students and the effect on units earned in spring is larger for students with higher high school GPA's.

6 Results for Students Enrolling in 15 Units

The results in the preceding section suggest that Cal Grant B eligibility has, at most, limited effects on college outcomes for students with incomes near the program eligibility threshold. One factor potentially limiting the impacts of the Cal Grant B is that almost 80 percent of students in our sample enroll in fewer than 15 units a semester, thus missing out on much of the Cal Grant B aid available to them. This observation raises the important question of whether the effects of aid eligibility are different among students who do enroll in 15 or more units and who be able to receive up to an additional $4,000 in aid per year. To explore this possibility, this section examines effects of eligibility among students who took 15 units in the fall of their first year in college.

6.1 Validity of RD Design for the Restricted Sample

The obvious concern with this analysis is that it entails conditioning the sample on a behavior that eligibility strongly incentivizes, at least in theory, which could lead to a violation of the assumption underlying the RD design. However, the evidence in the prior section reveals that eligibility has no effect on the likeli-

hood of enrolling in 15 or more units in the fall. This suggests obtaining causal effects of eligibility among this sample may be possible.

To further examine the validity of the research design for these analyses, we repeat the tests discussed earlier on the restricted sample. Appendix Figure A1 shows that the distribution of recentered initial income is smooth through the cutoff and the p-value for the hypothesis of a continuous distribution is 0.93. Table 11 reports estimated discontinuities of baseline covariates at the eligibility cutoff. For the most part, these discontinuities are statistically insignificant and small in magnitude. One exception, however, is for derived assets, which are about $1,000 higher for students that are barely eligible.

Thus, while the bulk of the evidence is consistent with a valid RD design for the restricted sample, one important concern is that student wealth appears to differ on either side of the cutoff. We address this imbalance in two ways. First, we compare estimates that do and do not include baseline controls (including assets). Second, we examine estimates for students with zero reported assets and where derived assets are by definition balanced on either side of the eligibility threshold.

6.2 Impacts on Financial Aid and College Outcomes

Table 12 reports estimated effects of eligibility for the Cal Grant B for students that enroll in at least 15 units in the fall semester. While the estimated impact on receiving a Cal Grant B is a bit larger than it is for the full sample, the effect on aid received in the first year is about $2,200, or 66 percent larger than it is for the full sample.

Similar to what we find for the full sample, we find no evidence in this subsample that eligibility for the Cal Grant B improves first-semester outcomes such as units earned, persistence from fall to spring, or cumulative GPA. We can statistically rule out effects on fall-to-spring persistence larger than 1.5 percentage points and effects on GPA larger than 0.1 grade points.

However, as seen in Table 12 and Figure 5, we do find that Cal Grant B eligibility leads to improvements

on a number of other dimensions. Eligibility leads to an increase of 0.5 units earned in spring and about 2 units earned over the first two years in college. Eligibility also increases the likelihood of of transfer by about 3 percentage points, and attainment of an associate degree within 2 years by almost 3 percentage points. These are notable effect sizes and consistent with the program's goal of helping students progress through college in a timely manner.

Comparing the estimates in Table 12 with and without controls reveals that, if anything, the estimated improvements in postsecondary attainment are larger when we control for baseline covariates. This pattern suggests the imbalance in derived assets at the eligibility cutoff is not driving these results. Further evidence for this claim can be found in Table 13, which contains results for students who have derived assets equal to zero. The results are quite similar to, or even slightly larger than, those in Table 12.

Tables 14 and 15 show estimates using alternative bandwidth choices, and Table 16 shows estimates when restricting to students with zero assets. The results are quite consistent across bandwidths. This finding suggests that the improvements in college attainment caused by eligibility seen for this sample are robust to bandwidth choice.

7 Discussion and Conclusion

Combining financial aid with academic requirements meant to expedite student success has become an important policy tool to address financial constraints and low completion rates across colleges. As community colleges in particular become more and more popular as a way to increase access to postsecondary education, understanding the effects of financial aid on this understudied population, especially assistance covering living expenses, has become increasingly crucial for policymakers.

This study examines the effect of eligibility for the Cal Grant B on community college student outcomes using an RD design based on income eligibility cutoffs. Because of California's fee waiver program for low-income students, the entirety of Cal Grant B aid can be used for living expenses. Additionally, students

can receive large supplements of aid, up to $4,000 per year, if they enroll in 15 units per semester. This setting therefore offers a unique opportunity to understand how sizable assistance for living expenses as well as strong financial incentives to take a heavy load of units affects student outcomes.

Overall, we find little evidence that being barely income-eligible for the Cal Grant B affected students outcomes. In particular, we find no effect of eligibility on the likelihood of enrolling 15 or more units per semester, nor do we find effects on measures of college persistence and attainment. However, when focusing on students who do enroll in 15 or more units, and who receive much larger grant aid than students who enroll in fewer units, we find eligibility for the Cal Grant increases transfer to four-year universities, degree attainment within two years, and units earned. Importantly, these results do not appear to be an artifact of selection bias generated by differential selection into taking 15 units.

There are at least two explanations for this pattern of results. One is that grant aid for living expenses must be large enough to have meaningful effects on student outcomes. In this context, the "base" awards of $1,656 per year may be insufficient to help students overcome financial challenges that impair their academic progress, but the larger awards given to students taking 15 or more units are large enough to produce improved student outcomes. An alternative explanation is that this type of financial aid has larger effects for students with greater enrollment intensity. Such an interpretation would be in contrast to **?**, who find that college scholarships had largest effects for students who had a lower propensity to enroll in college. Our findings are consistent with the possibility that aid for living expenses given to students already enrolled in college may instead have larger effects for students with a stronger attachment to postsecondary schooling. In future work, we will further examine these two possible explanations for our findings.

It may seem puzzling why we find little effect on the likelihood of taking 15 or more units per term despite the strong financial incentives to do so. Information frictions offer one possible explanation. A common criticism of the U.S. financial aid system is its opacity. In this setting, students may have little understanding of what the Cal Grant B is, much less the details about how aid amounts are tied to the

number of enrolled units. The fact that students eligible for the Cal Grant B largely receive tuition fee waivers, it may be even more likely that students do not understand the details of their financial aid since they can enroll and attend class without first having to sort out how they would cover tuition. regarding tuition costs, and how their financial aid might cover those costs.

To explore this possibility, we turn to results from an online survey we sent to all students who applied for financial aid for the the 2020-21 school year in fall 2020. Although the response rate to this survey was low (about 10 percent), we nonetheless received over 100,000 survey responses from students enrolled at both the CCC and four-year institutions. The survey asked students what types of financial aid they were receiving, and only 49% of the students who reported receiving a Cal Grant and enrolling in 12 or more units also stated that they received a Student Success Completion Grant, even though receipt should have been automatic with Cal Grant receipt and full-time enrollment. Furthermore, by comparing responses to administrative records, we found that over one-quarter of SSCG recipients thought they did not receive it.

These results suggest inaccurate information about financial aid programs is widespread and supports the view that information frictions weaken the incentives created by the Cal Grant program. It also suggests another reason why we find larger effects for students who initially enrolled in 15 units – they may have learned about the details of the Cal Grant B program only after receiving the large supplemental aid.

Our results raise two important questions for future work. One is to document the extent of incomplete information about key paramaters of financial aid programs and the degree to which these information frictions undermine the effectiveness of aid programs. Relatedly, it would be valuable to understand whether these frictions can be overcome by providing students with better information. Second, what is the most effective way to target aid, especially aid for living expenses rather than tuition. In particular, it will be important to better understand heterogeneity in impacts of financial aid by factors such as a student's attachment to postsecondary schooling and financial need.

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Table 1: Summary Statistics

	Overall (2017-2020)	Income Eligible	Income Ineligible
	Panel A: Full Sample		
Asian	13%	13%	12%
Black	5%	6%	4%
White	21%	13%	30%
Latino	54%	63%	43%
Male	43%	41%	44%
Econ. Disadvantage	59%	83%	30%
High School GPA	3.14	3.05	3.25
Family Size	4.25	4.18	4.34
Dependent Status (=1 if yes)	96%	93%	100%
Derived Income	$66,878	$25,974	$118,030
Derived Assets	$3,237	$421	$6,760
Receiving CGB (Fall, CSAC)	14%	25%	0%
Receiving CGB (Spring, CSAC)	13%	23%	0%
Enrolled in CCC (matched)	39%	40%	37%
Obs	531,795	295,498	236,297
	Panel B: Enrolled in CCC Sample		
Asian	9%	10%	8%
Black	5%	6%	4%
White	21%	14%	29%
Latino	59%	65%	50%
Male	44%	43%	46%
Econ. Disadvantage	62%	83%	34%
High School GPA	2.93	2.85	3.02
Family Size	4.26	4.18	4.36
Dependent Status (=1 if yes)	95%	92%	100%
Derived Income	$61,090	$25,815	$108,229
Derived Assets	$2,403	$348	$5,151
Receiving CGB Baseline (Fall, CCC)	33%	57%	1%
Receiving CGB Supplemental (Fall, CCC)	25%	43%	0%
Receiving Pell (Fall)	54%	80%	18%
Receiving BOG (Fall)	85%	96%	71%
Amount CGB Received (Fall)	$493	$854	$10
Total Amount Received (Fall)	$1,758	$2,895	$237
Receiving CGB Baseline (Spring, CCC)	29%	51%	1%
Receiving CGB Supplemental (Spring, CCC)	20%	35%	1%
Receiving Pell (Spring)	47%	70%	16%
Receiving BOG (Spring)	74%	83%	62%
Amount CGB Received (Spring)	$932	$1,614	$20
Total Amount Received (Spring)	$1,515	$2,491	$211
Obs	206,725	118,243	88,482

Notes: This sample consists of high school seniors who submitted a financial aid application before March 2nd for the academic year following high school graduation for the first time. These students are also Cal Grant B asset eligible, GPA eligible (GPA $\geq$ 2.0), not have a bachelor's or professional degree, and not in default, *except* for income eligibility.

Table 2: Summary Statistics for Outcmes

	Overall (2017-2020)	Income Eligible	Income Ineligible
	Enrolled in CCC Sample and within Bandwidth		
Units Attempted (Fall)	12.42	12.38	12.48
Attempted at Least 15 Units (Fall)	23%	23%	24%
Units Earned (Fall)	9.26	9.12	9.45
Persist to Spring	87%	86%	87%
Units Attempted (Spring)	10.53	10.47	10.63
Attempted at Least 15 Units (Spring)	21%	21%	21%
Units Earned (Spring)	7.78	7.66	7.95
Units Attempted within 2 years	43.14	42.97	43.37
Units Earned within 2 years	32.77	32.39	33.31
Cumulative GPA within 2 years	2.40	2.36	2.46
Transfer within 2 years	12%	11%	12%
Attain Associate Degree within 2 years	9%	9%	9%
Obs	67,973	39,883	28,090

Notes: This sample consists of high school seniors who submitted a financial aid application before March 2nd for the academic year following high school graduation for the first time. These students are also Cal Grant B asset eligible, GPA eligible (GPA $\geq$ 2.0), not have a bachelor's or professional degree, and not in default, *except* for income eligibility. Compared to Table 1, sample is further restricted to students enrolled in CCC and with running variables within the range of the bandwidth for main specification.

Table 3: Enrollment Results (Eligible sample)

	(1)	(2)	(3)	(4)
	w/ 15 units incentive (2017-2020)			
	h(20k)	h(20k) + control	CCT bw	CCT bw + control
Any College Enrollment (Fall)	0.004	0.006	0.004	0.007*
	(0.004)	(0.004)	(0.005)	(0.004)
Any College Enrollment (Spring)	0.007	0.009*	0.007	0.009*
	(0.005)	(0.004)	(0.004)	(0.004)
2-year but no 4-year Enrollment (Fall)	-0.003	-0.005	-0.003	-0.006
	(0.005)	(0.005)	(0.005)	(0.005)
2-year but no 4-year Enrollment (Spring)	-0.002	-0.004	-0.003	-0.005
	(0.005)	(0.005)	(0.005)	(0.004)
4-year Enrollment (Fall)	0.007	0.011**	0.007	0.011**
	(0.005)	(0.005)	(0.005)	(0.005)
4-year Enrollment (Spring)	0.009	0.013***	0.009*	0.013***
	(0.005)	(0.005)	(0.005)	(0.005)
CCC Enrollment(CCCCO, Fall)	-0.001	-0.004	-0.001	-0.005
	(0.005)	(0.005)	(0.005)	(0.005)
CCC Enrollment(CCCCO, Spring)	-0.002	-0.004	-0.003	-0.007
	(0.005)	(0.005)	(0.005)	(0.004)
Bandwidth	20,000	20,000	CCT	CCT
Controls	No	Yes	No	Yes
Observations	531,795	531,795	531,795	531,795

*** p<0.01, ** p<0.05, * p<0.1

Table 4: Estimated Discontinuities in Baseline Covariates (Enrolled in CCC Sample)

	(1)	(2)
	w/ 15 units incentive (2017-2020)	
Econ. Disadvantage	-0.006	-0.013
	(0.008)	(0.010)
Average ELA Score	0.009	0.005
	(0.012)	(0.012)
Average Math Score	-0.005	-0.005
	(0.012)	(0.012)
HS GPA	-0.010	-0.009
	(0.009)	(0.008)
Latinx	0.003	0.003
	(0.008)	(0.008)
Black	0.006*	0.006*
	(0.003)	(0.004)
White	-0.001	-0.002
	(0.006)	(0.006)
Asian	-0.004	-0.003
	(0.005)	(0.004)
Other Race	-0.003	-0.004
	(0.004)	(0.004)
Male	-0.003	-0.004
	(0.008)	(0.009)
White	-0.001	-0.002
	(0.006)	(0.006)
Family Size	-0.035	-0.029
	(0.025)	(0.032)
Dependent Status (=1 if yes)	0.001	-0.001
	(0.001)	(0.002)
Derived Assets	85.793	202.329
	(128.346)	(154.006)
Bandwidth	20,000	CCT
Observations	206,725	206,725

*** p<0.01, ** p<0.05, * p<0.1

Table 5: Effect of Cal Grant B Eligibility on Financial Aid Outcomes (Enrolled in CCC)

	(1)	(2)	(3)	(4)
	w/ 15 units incentive (2017-2020)			
Receive CGB Base (Fall)	0.463***	0.463***	0.455***	0.456***
	(0.006)	(0.006)	(0.008)	(0.007)
Receive Fee Waiver (Fall)	0.010***	0.010***	0.011**	0.011**
	(0.004)	(0.004)	(0.004)	(0.005)
Receive Pell (Fall)	-0.027***	-0.027***	0.001	0.008
	(0.008)	(0.008)	(0.010)	(0.013)
Total CGB Aid (Fall)	700.816***	701.797***	689.892***	695.076***
	(10.828)	(10.761)	(13.270)	(11.821)
Total Grant Aid (Fall)	743.393***	746.252***	709.808***	712.333***
	(21.668)	(21.498)	(31.235)	(30.247)
Total CGB Aid (Year)	1,344.750***	1,346.971***	1,326.920***	1,329.472***
	(20.364)	(20.201)	(25.118)	(23.529)
Total Grant Aid (Year)	1,440.721***	1,447.208***	1,392.051***	1,393.353***
	(41.521)	(41.052)	(61.459)	(56.618)
Bandwidth	20,000	20,000	CCT	CCT
Controls	No	Yes	No	Yes
Observations	206,725	206,725	206,725	206,725

*** p<0.01, ** p<0.05, * p<0.1

Table 6: Effect of Cal Grant B Eligibility on Short-Run Outcomes (Enrolled in CCC)

	(1)	(2)	(3)	(4)
	w/ 15 units incentive (2017-2020)			
Units Attempted (Fall)	-0.063	-0.063	-0.061	-0.074
	(0.058)	(0.058)	(0.057)	(0.060)
Attempted at Least 15 Units (Fall)	-0.004	-0.004	-0.006	-0.004
	(0.007)	(0.007)	(0.006)	(0.007)
Units Earned (Fall)	-0.146*	-0.128	-0.145	-0.130
	(0.086)	(0.082)	(0.090)	(0.089)
Persist to Spring	-0.007	-0.007	-0.007	-0.007
	(0.006)	(0.006)	(0.006)	(0.006)
Units Attempted (Spring)	-0.048	-0.040	-0.055	-0.037
	(0.092)	(0.089)	(0.089)	(0.091)
Attempted at Least 15 Units (Spring)	0.012*	0.012*	0.010	0.011*
	(0.007)	(0.007)	(0.006)	(0.006)
Units Earned (Spring)	0.059	0.082	0.051	0.110
	(0.098)	(0.092)	(0.096)	(0.099)
Bandwidth	20,000	20,000	CCT	CCT
Controls	No	Yes	No	Yes
Observations	206,725	206,725	206,725	206,725

*** p<0.01, ** p<0.05, * p<0.1

Table 7: Effect of Cal Grant B Eligibility on Longer-Run Outcomes (Enrolled in CCC)

	(1)	(2)	(3)	(4)
	w/ 15 units incentive (2017-2020)			
Units Attempted within 2 years	0.189	0.213	0.156	0.233
	(0.340)	(0.329)	(0.332)	(0.334)
Units Earned within 2 years	0.147	0.231	0.164	0.270
	(0.369)	(0.344)	(0.372)	(0.354)
Cumulative GPA within 2 years	-0.019	-0.013	-0.021	-0.013
	(0.019)	(0.016)	(0.018)	(0.017)
Transfer within 2 years	0.011**	0.012**	0.008*	0.012**
	(0.005)	(0.005)	(0.005)	(0.005)
Attain Associate Degree within 2 years	0.005	0.005	0.002	0.007
	(0.005)	(0.005)	(0.004)	(0.005)
Bandwidth	20,000	20,000	CCT	CCT
Controls	No	Yes	No	Yes
Observations	206,725	206,725	206,725	206,725

*** p<0.01, ** p<0.05, * p<0.1

Table 8: Robustness to Alternative Bandwidths, No Baseline Covariates

	(1)	(2)	(3)	(4)	(5)	(6)
Receive CGB Base (Fall)	0.463***	0.455***	0.456***	0.460***	0.465***	0.466***
	(0.006)	(0.008)	(0.007)	(0.006)	(0.006)	(0.005)
Total CGB Aid Amount in 1st year	1,344.750***	1,326.920***	1,327.316***	1,337.449***	1,351.492***	1,355.596***
	(20.364)	(25.118)	(24.660)	(21.548)	(19.339)	(18.463)
Units Earned (Fall)	-0.146*	-0.145	-0.128	-0.145	-0.145*	-0.142*
	(0.086)	(0.090)	(0.103)	(0.091)	(0.082)	(0.079)
Persist to Spring	-0.007	-0.007	-0.005	-0.007	-0.008	-0.008
	(0.006)	(0.006)	(0.007)	(0.006)	(0.006)	(0.005)
Units Earned (Spring)	0.059	0.051	0.165	0.080	0.036	0.018
	(0.098)	(0.096)	(0.117)	(0.103)	(0.093)	(0.089)
Units Earned within 2 years	0.147	0.164	0.467	0.229	0.079	0.047
	(0.369)	(0.372)	(0.441)	(0.389)	(0.351)	(0.337)
Cumulative GPA within 2 years	-0.019	-0.021	-0.007	-0.017	-0.020	-0.022
	(0.019)	(0.018)	(0.023)	(0.020)	(0.018)	(0.017)
Transfer within 2 years	0.011**	0.008*	0.015**	0.012**	0.009*	0.008*
	(0.005)	(0.005)	(0.007)	(0.006)	(0.005)	(0.005)
Attain Associate Degree within 2 years	0.005	0.002	0.009	0.006	0.004	0.003
	(0.005)	(0.004)	(0.006)	(0.005)	(0.005)	(0.004)
Bandwidth	20,000	CCT	14,000	18,000	22,000	24,000
Controls	No	No	No	No	No	No
Observations	206,725	206,725	206,725	206,725	206,725	206,725

*** p<0.01, ** p<0.05, * p<0.1

Table 9: Robustness to Alternative Bandwidths, With Baseline Covariates

	(1)	(2)	(3)	(4)	(5)	(6)
Receive CGB Base (Fall)	0.463***	0.456***	0.456***	0.460***	0.465***	0.466***
	(0.006)	(0.007)	(0.007)	(0.006)	(0.006)	(0.005)
Total CGB Aid Amount in 1st year	1,346.971***	1,329.472***	1,328.066***	1,339.539***	1,353.666***	1,357.545***
	(20.201)	(23.529)	(24.453)	(21.371)	(19.188)	(18.323)
Units Earned (Fall)	-0.128	-0.130	-0.131	-0.130	-0.125	-0.121
	(0.082)	(0.089)	(0.098)	(0.086)	(0.078)	(0.075)
Persist to Spring	-0.007	-0.007	-0.005	-0.007	-0.008	-0.008
	(0.006)	(0.006)	(0.007)	(0.006)	(0.005)	(0.005)
Units Earned (Spring)	0.082	0.110	0.165	0.100	0.062	0.045
	(0.092)	(0.099)	(0.110)	(0.097)	(0.088)	(0.084)
Units Earned within 2 years	0.231	0.270	0.456	0.299	0.175	0.148
	(0.344)	(0.354)	(0.411)	(0.362)	(0.328)	(0.314)
Cumulative GPA within 2 years	-0.013	-0.013	-0.007	-0.012	-0.014	-0.015
	(0.016)	(0.017)	(0.020)	(0.017)	(0.016)	(0.015)
Transfer within 2 years	0.012**	0.012**	0.014**	0.013**	0.010**	0.009*
	(0.005)	(0.005)	(0.006)	(0.006)	(0.005)	(0.005)
Attain Associate Degree within 2 years	0.005	0.007	0.009	0.007	0.004	0.004
	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)	(0.004)
Bandwidth	20,000	CCT	14,000	18,000	22,000	24,000
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	206,725	206,725	206,725	206,725	206,725	206,725

*** p<0.01, ** p<0.05, * p<0.1

Table 10: Effects of Cal-Grant B Eligibility by Student Subgroup

	(1) Male	(2) Female	(3) URM	(4) non-URM	(5) HSGPA < 3	(6) HSGPA ≥ 3
Attempted at Least 15 Units (Fall)	-0.008	-0.008	-0.002	-0.010	0.002	-0.012
	(0.010)	(0.010)	(0.008)	(0.015)	(0.009)	(0.011)
Units Earned (Fall)	0.043	-0.115	-0.191*	0.007	-0.266**	0.032
	(0.118)	(0.114)	(0.100)	(0.168)	(0.117)	(0.119)
Units Earned (Spring)	0.192	0.185	-0.026	0.341*	-0.090	0.282**
	(0.133)	(0.130)	(0.112)	(0.196)	(0.128)	(0.139)
Cumulative GPA within 2 years	-0.005	-0.016	-0.028	0.016	-0.041*	0.015
	(0.024)	(0.025)	(0.022)	(0.036)	(0.025)	(0.024)
Transfer within 2 years	-0.010	0.012	0.004	0.034**	0.011**	0.012
	(0.006)	(0.008)	(0.006)	(0.013)	(0.005)	(0.010)
Attain Associate Degree within 2 years	-0.002	0.005	0.001	0.017	0.001	0.011
	(0.004)	(0.007)	(0.005)	(0.011)	(0.005)	(0.009)
Bandwidth	20,000	20,000	20,000	20,000	20,000	20,000
Controls	No	No	No	No	No	No
Observations	84,969	115,096	145,378	61,347	112,505	94,220

*** p<0.01, ** p<0.05, * p<0.1

Table 11: Estimated Discontinuities in Bseline Covariates for Students Enrolling in 15+ Units in Fall (Enrolled in CCC Sample)

	(1)	(2)
	w/ 15 units incentive (2017-2020)	
Econ. Disadvantage	-0.006	-0.006
	(0.017)	(0.018)
Average ELA Score	0.011	-0.002
	(0.025)	(0.022)
Average Math Score	-0.009	-0.012
	(0.025)	(0.024)
HS GPA	-0.014	-0.013
	(0.018)	(0.015)
Latinx	0.025	0.019
	(0.017)	(0.015)
Black	0.002	0.002
	(0.007)	(0.007)
White	-0.001	-0.001
	(0.014)	(0.012)
Asian	-0.010	-0.011
	(0.010)	(0.011)
Other Race	-0.016*	-0.015*
	(0.010)	(0.008)
Male	0.006	0.010
	(0.018)	(0.014)
White	-0.001	-0.001
	(0.014)	(0.012)
Family Size	0.038	0.037
	(0.050)	(0.059)
Dependent Status (=1 if yes)	0.002	0.001
	(0.002)	(0.003)
Derived Assets	835.810***	1,110.787***
	(289.674)	(351.781)
Bandwidth	20,000	CCT
Observations	50,228	50,228

*** p<0.01, ** p<0.05, * p<0.1

Table 12: Effect of Cal Grant B Eligibility for Students Enrolling in 15+ Units in Fall (Enrolled in CCC Sample)

	(1)	(2)	(3)	(4)
		w/ 15 units incentive (2017-2020)		
Receive CGB Base (Fall)	0.535***	0.536***	0.524***	0.537***
	(0.012)	(0.012)	(0.016)	(0.012)
Total CGB Aid Amount in 1st year	2,181.757***	2,190.128***	2,153.848***	2,212.078***
	(55.668)	(55.151)	(65.028)	(50.401)
Units Earned (Fall)	-0.013	0.034	-0.012	0.027
	(0.169)	(0.157)	(0.184)	(0.172)
Persist to Spring	-0.004	-0.003	-0.004	-0.003
	(0.008)	(0.008)	(0.008)	(0.009)
Units Earned (Spring)	0.482**	0.535***	0.414**	0.529***
	(0.203)	(0.188)	(0.179)	(0.186)
Units Earned within 2 years	1.787**	1.980***	1.763**	2.039***
	(0.774)	(0.722)	(0.768)	(0.734)
Cumulative GPA within 2 years	0.029	0.035	0.029	0.035
	(0.036)	(0.031)	(0.035)	(0.030)
Transfer within 2 years	0.031**	0.033**	0.027**	0.030**
	(0.014)	(0.013)	(0.012)	(0.012)
Attain Associate Degree within 2 years	0.027**	0.029**	0.023**	0.027**
	(0.013)	(0.012)	(0.011)	(0.011)
Bandwidth	20,000	20,000	CCT	CCT
Controls	No	Yes	No	Yes
Observations	50,228	50,228	50,228	50,228

*** p<0.01, ** p<0.05, * p<0.1

Table 13: Effect of Cal Grant B Eligibility for Students Enrolling in 15+ Units in Fall and Zero Assets (Enrolled in CCC Sample)

	(1)	(2)	(3)	(4)
	w/ 15 units incentive (2017-2020)			
Receive CGB Base (Fall)	0.537***	0.539***	0.525***	0.528***
	(0.013)	(0.013)	(0.017)	(0.014)
Total CGB Aid Amount in 1st year	2,179.340***	2,189.029***	2,146.841***	2,210.997***
	(57.763)	(57.229)	(68.537)	(52.727)
Units Earned (Fall)	-0.064	0.007	-0.080	-0.011
	(0.176)	(0.163)	(0.197)	(0.182)
Persist to Spring	-0.002	-0.000	-0.002	0.000
	(0.009)	(0.009)	(0.009)	(0.009)
Units Earned (Spring)	0.473**	0.567***	0.424**	0.578***
	(0.213)	(0.197)	(0.198)	(0.199)
Units Earned within 2 years	1.894**	2.226***	1.874**	2.279***
	(0.806)	(0.749)	(0.800)	(0.761)
Cumulative GPA within 2 years	0.034	0.049	0.033	0.049
	(0.037)	(0.032)	(0.037)	(0.032)
Transfer within 2 years	0.036**	0.041***	0.033**	0.037***
	(0.014)	(0.014)	(0.013)	(0.012)
Attain Associate Degree within 2 years	0.028**	0.032**	0.025**	0.029**
	(0.013)	(0.013)	(0.011)	(0.012)
Bandwidth	20,000	20,000	CCT	CCT
Controls	No	Yes	No	Yes
Observations	44,881	44,881	44,881	44,881

*** p<0.01, ** p<0.05, * p<0.1

Table 14: Robustness to Alternative Bandwidths for Students Enrolling in 15+ Units in Fall

	(1)	(2)	(3)	(4)	(5)	(6)
Receive CGB Base (Fall)	0.535***	0.524***	0.523***	0.530***	0.540***	0.544***
	(0.012)	(0.016)	(0.015)	(0.013)	(0.012)	(0.011)
Total CGB Aid Amount in 1st year	2,181.757***	2,153.848***	2,155.819***	2,168.554***	2,194.752***	2,205.030***
	(55.668)	(65.028)	(67.417)	(58.833)	(52.840)	(50.412)
Units Earned (Fall)	-0.013	-0.012	0.005	-0.011	-0.002	0.022
	(0.169)	(0.184)	(0.202)	(0.178)	(0.161)	(0.154)
Persist to Spring	-0.004	-0.004	-0.002	-0.004	-0.005	-0.004
	(0.008)	(0.008)	(0.010)	(0.009)	(0.008)	(0.008)
Units Earned (Spring)	0.482**	0.414**	0.626***	0.516**	0.448**	0.427**
	(0.203)	(0.179)	(0.243)	(0.213)	(0.193)	(0.185)
Units Earned within 2 years	1.787**	1.763**	2.376**	1.956**	1.669**	1.637**
	(0.774)	(0.768)	(0.925)	(0.814)	(0.738)	(0.707)
Cumulative GPA within 2 years	0.029	0.029	0.039	0.030	0.028	0.025
	(0.036)	(0.035)	(0.043)	(0.038)	(0.034)	(0.033)
Transfer within 2 years	0.031**	0.027**	0.033**	0.032**	0.029**	0.028**
	(0.014)	(0.012)	(0.017)	(0.015)	(0.013)	(0.013)
Attain Associate Degree within 2 years	0.027**	0.023**	0.035**	0.030**	0.025**	0.024**
	(0.013)	(0.011)	(0.015)	(0.013)	(0.012)	(0.012)
Bandwidth	20,000	CCT	14,000	18,000	22,000	24,000
Controls	No	No	No	No	No	No
Observations	50,228	50,228	50,228	50,228	50,228	50,228

*** p<0.01, ** p<0.05, * p<0.1

Table 15: Robustness to Alternative Bandwidths for Students Enrolling in 15+ Units in Fall, With Controls

	(1)	(2)	(3)	(4)	(5)	(6)
Receive CGB Base (Fall)	0.536***	0.537***	0.525***	0.532***	0.541***	0.546***
	(0.012)	(0.012)	(0.015)	(0.013)	(0.012)	(0.011)
Total CGB Aid Amount in 1st year	2,190.128***	2,212.078***	2,159.671***	2,175.797***	2,203.765***	2,214.333***
	(55.151)	(50.401)	(66.730)	(58.273)	(52.364)	(49.968)
Units Earned (Fall)	0.034	0.027	0.026	0.034	0.046	0.070
	(0.157)	(0.172)	(0.188)	(0.165)	(0.150)	(0.143)
Persist to Spring	-0.003	-0.003	-0.002	-0.003	-0.004	-0.003
	(0.008)	(0.009)	(0.010)	(0.009)	(0.008)	(0.007)
Units Earned (Spring)	0.535***	0.529***	0.646***	0.567***	0.503***	0.482***
	(0.188)	(0.186)	(0.224)	(0.198)	(0.179)	(0.172)
Units Earned within 2 years	1.980***	2.039***	2.446***	2.135***	1.872***	1.842***
	(0.722)	(0.734)	(0.861)	(0.759)	(0.689)	(0.660)
Cumulative GPA within 2 years	0.035	0.035	0.036	0.035	0.035	0.033
	(0.031)	(0.030)	(0.037)	(0.032)	(0.029)	(0.028)
Transfer within 2 years	0.033**	0.030**	0.034**	0.035**	0.032**	0.030**
	(0.013)	(0.012)	(0.016)	(0.014)	(0.013)	(0.012)
Attain Associate Degree within 2 years	0.029**	0.027**	0.035**	0.032**	0.027**	0.026**
	(0.012)	(0.011)	(0.015)	(0.013)	(0.012)	(0.011)
Bandwidth	20,000	CCT	14,000	18,000	22,000	24,000
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	50,228	50,228	50,228	50,228	50,228	50,228

*** p<0.01, ** p<0.05, * p<0.1

Table 16: Robustness to Alternative Bandwidths for Students Enrolling in 15+ Units in Fall and Zero Assets

	(1)	(2)	(3)	(4)	(5)	(6)
Receive CGB Base (Fall)	0.537***	0.525***	0.525***	0.532***	0.542***	0.547***
	(0.013)	(0.017)	(0.015)	(0.014)	(0.012)	(0.012)
Total CGB Aid Amount in 1st year	2,179.340***	2,146.841***	2,148.077***	2,164.808***	2,193.521***	2,205.021***
	(57.763)	(68.537)	(70.125)	(61.090)	(54.785)	(52.228)
Units Earned (Fall)	-0.064	-0.080	-0.067	-0.068	-0.047	-0.016
	(0.176)	(0.197)	(0.211)	(0.185)	(0.168)	(0.160)
Persist to Spring	-0.002	-0.002	0.001	-0.001	-0.002	-0.002
	(0.009)	(0.009)	(0.011)	(0.009)	(0.008)	(0.008)
Units Earned (Spring)	0.473**	0.424**	0.603**	0.510**	0.437**	0.417**
	(0.213)	(0.198)	(0.255)	(0.224)	(0.203)	(0.194)
Units Earned within 2 years	1.894**	1.874**	2.334**	2.037**	1.793**	1.772**
	(0.806)	(0.800)	(0.961)	(0.848)	(0.769)	(0.737)
Cumulative GPA within 2 years	0.034	0.033	0.042	0.036	0.032	0.030
	(0.037)	(0.037)	(0.045)	(0.039)	(0.036)	(0.034)
Transfer within 2 years	0.036**	0.033**	0.037**	0.037**	0.034**	0.033**
	(0.014)	(0.013)	(0.017)	(0.015)	(0.014)	(0.013)
Attain Associate Degree within 2 years	0.028**	0.025**	0.036**	0.032**	0.027**	0.026**
	(0.013)	(0.011)	(0.016)	(0.014)	(0.013)	(0.012)
Bandwidth	20,000	CCT	14,000	18,000	22,000	24,000
Controls	No	No	No	No	No	No
Observations	44,881	44,881	44,881	44,881	44,881	44,881

*** p<0.01, ** p<0.05, * p<0.1

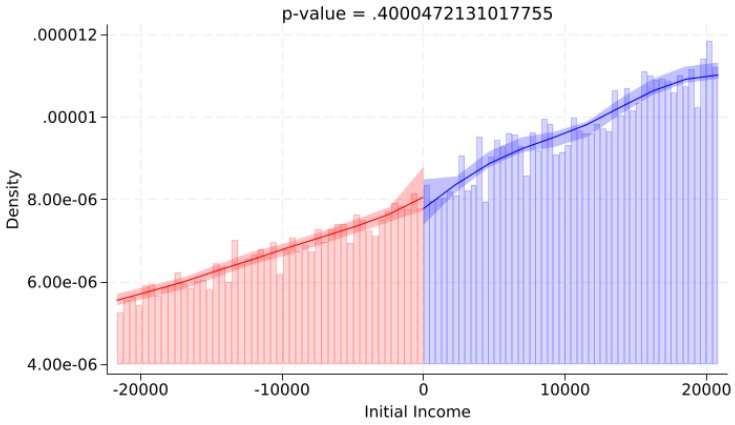
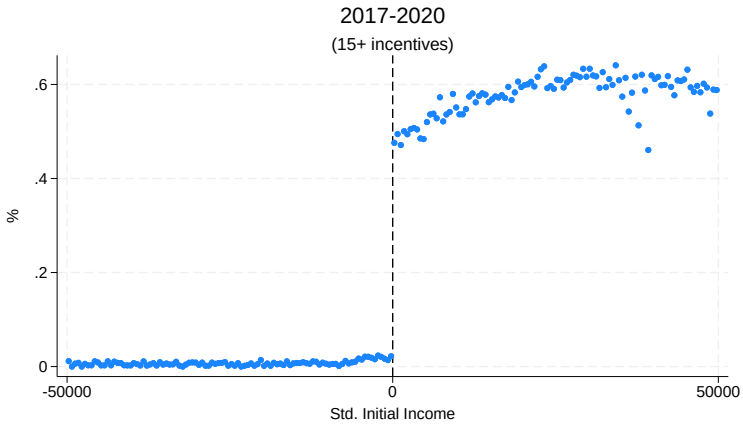
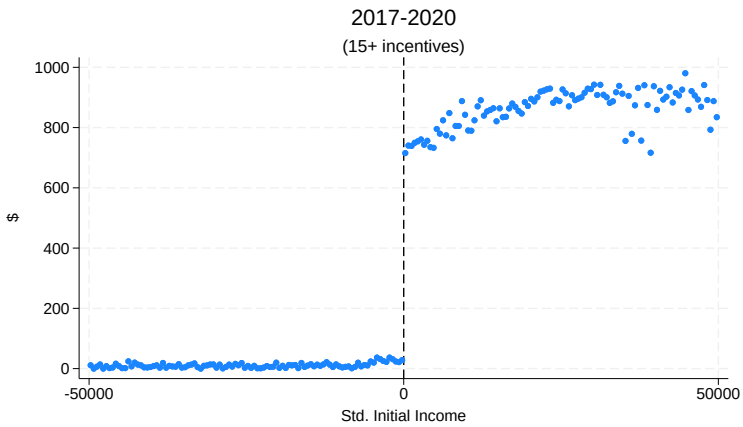


Figure 1: McCrary Test for CCC sample

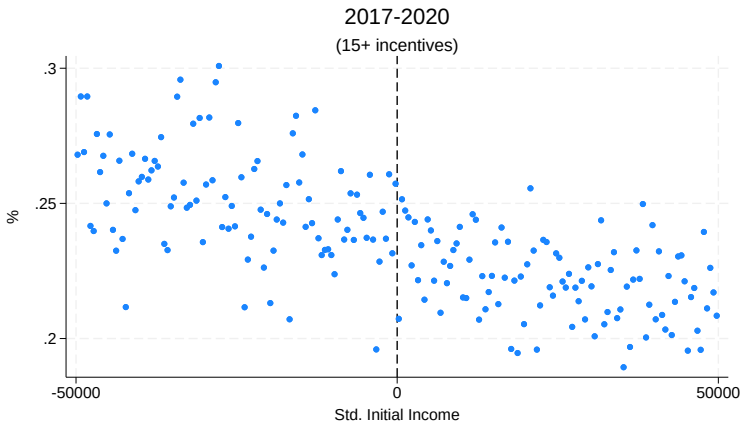


(a) Received CGB (Fall)

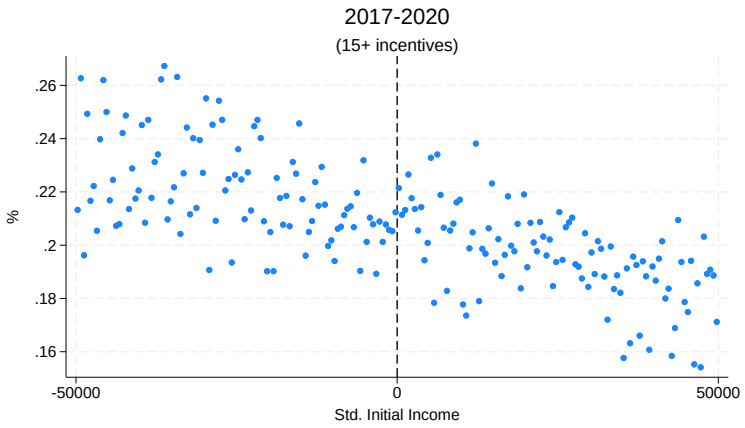


(b) Total Cal Grant Received (Fall)

Figure 2: Financial Aid Outcomes

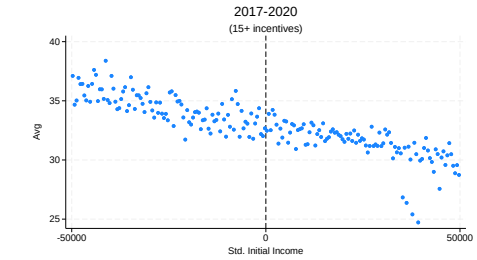


(a) in Fall

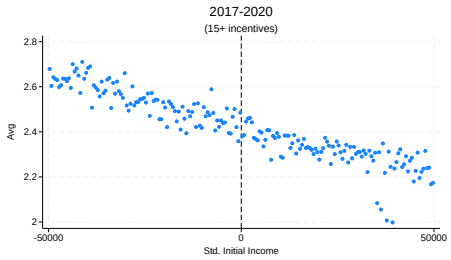


(b) in Spring

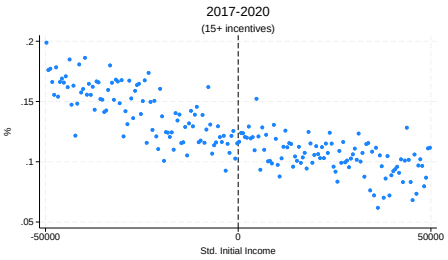
Figure 3: Units Attempted $\geq$ 15 (=1 if yes)



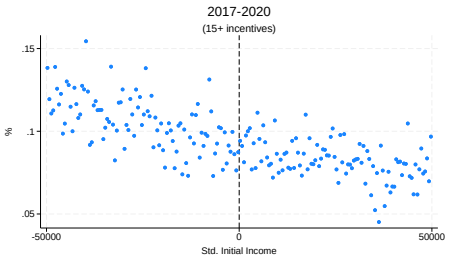
(a) Units Earned



(b) Cumulated GPA

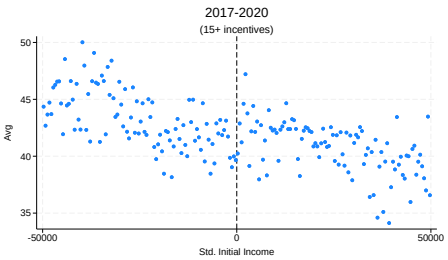


(c) Transfer or not

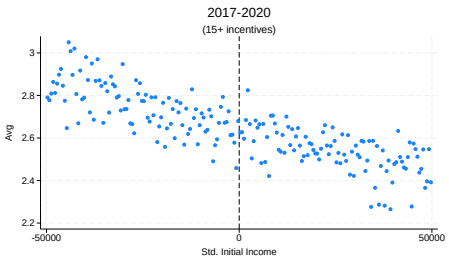


(d) Obtained Associate Degree or not

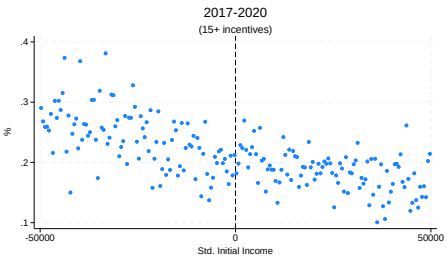
Figure 4: Long-run Outcomes within 2 years



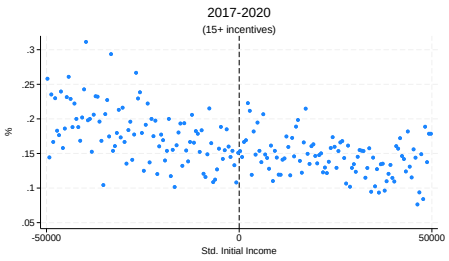
(a) Units Earned



(b) Cumulated GPA



(c) Transfer or not



(d) Obtained Associate Degree or not

Figure 5: Long-run Outcomes within 2 years for 15+ Sample

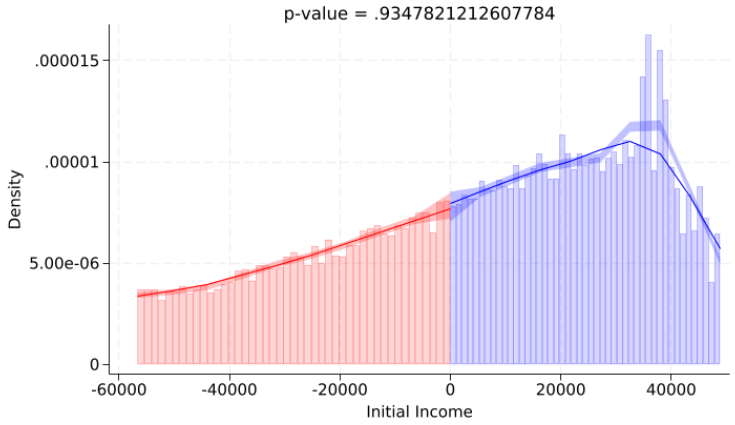


Figure A1: McCrary Test for CCC Enrolled at least 15 Units sample