University Loans and Grants: Effects on Educational and Labor Market Outcomes*

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Abstract

This study examines the long-term effects of student loans and grants in Chile through a regression discontinuity design. It finds that university loans significantly boost degree completion, especially among women and low-income students, with marginal positive effects on employment and earnings for women. Vocational loans benefit only those ineligible for university loans. Conversely, grants, alongside loans, do not affect education or labor market outcomes. The minimal response of tuition decrease due to grants, coupled with significant benefits for low-income students, underscores existing credit constraints.

1 Introduction

Given the importance of education, individuals and their families are willing to invest significant resources to attain a university degree. The high tuition costs and the imperfect credit markets force some individuals to rely on institutional financial aid to afford the challenge. Financial aid is designed to increase post-secondary education, especially among talented students with limited wealth and credit access. The goal is to provide individuals access to opportunities embodied in college education.

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While ample literature focuses on the impacts of grants on college enrollment, much less is known about the effects of loans on degree completion and post-degree decisions, despite student loans being the prevalent form of aid. Different aid forms affect decisions differently. While grants reduce the cost of education in the present, loans are long-run commitments to move payments to the future. Consequently, the evidence from these two aid forms is not necessarily comparable. This paper compares the impacts of grants and loans on degree completion and subsequent labor market decisions using administrative data from Chile.

Measuring the impacts of financial aid on student outcomes is challenging because financial aid is generally not randomly assigned and is usually correlated with variables that are unobserved by the econometrician, resulting in biased estimates. To address this challenge, I examine the unique features of the Chilean college admissions system that provides quasi-experimental variation in access to loans and grants. Moreover, the Chilean setting provides a rich set of administrative data — including all students from all institutions in the country — tracking educational and labor market outcomes for over a decade. Specifically, I study three policies that determine eligibility for financial aid in the form of 1) loans for university programs; 2) loans in vocational colleges; and 3) grants in a subset of university programs. In each margin, eligibility is determined solely by the family income quintile assigned by the tax authority and the score on the national admission test or the high school grade point average (GPA). The sharp rules on eligibility enable a regression discontinuity (RD) analysis to estimate the causal effect of aid eligibility on outcomes.

In the literature, most of the variation in aid considers small increments. However, in this case, the assigned loans are the first form of financial assistance available, allowing the analysis of interesting cases. For a group of students, I compare outcomes when there is no aid available vs. when students have access to loans (for vocational or university programs), resembling a scenario in which credit constraints are partially lifted. However, eligibility for vocational and university loans overlap; thus, for another group of students, I compare outcomes when loan eligibility expands from vocational to university loans. Finally, I compare outcomes when students can substitute university loans for grants (covering identical amounts), allowing the study of decisions regarding debt.

The results at the cutoff show that eligibility for university loans impacts degree completion positively. Eligible students are four percentage points more likely to complete a bachelor's degree, relative to a graduation rate of 30% among the ineligible. Ten years after high school, students accumulate about one additional semester in university enrollment. Access to loans affects mainly women, whose likelihood of earning a

bachelor's degree increases by 5.6 percentage points, while the gains for men are statistically zero (1.5 percentage points). Importantly, university loan eligibility diverts enrollment from vocational programs, which have a slightly higher graduation rate and require fewer years for completion. Although the overall degree completion from tertiary education does not change (increasing by 0.3 percentage points), years of higher education increase significantly.

University loans also affect the quality aspects of the programs students enroll in. Eligible students attend institutions with more and better-qualified teachers and higher program- and institutional accreditation, although with higher tuition and longer duration.[1]

In the labor market, I find that access to university loans has a negative impact on early-life earnings due to enrollment in longer programs with lower graduation rates and, therefore, delaying labor force entry. However, the earnings effects become positive over time, and 11 years after high school, earnings are 2.7 percent higher for loan-eligible students at the cutoff (although not statistically significant). The observed trend suggests an increasing effect, with lifetime income profiles for university education crossing the corresponding vocational one between eight and ten years after high school. Importantly, earnings are significantly higher for females 11 years after high school, consistent with the stronger effects on degree completion.

On the other hand, eligibility for vocational loans significantly affects vocational enrollment, which does not translate into higher degree completion. However, this positive effect on enrollment is completely offset by a reduction in university enrollment. Only among students who never become eligible for university loans do we observe that access to vocational loans causes a higher vocational degree attainment. Moreover, access to vocational loans negatively impacts the program quality in which students enroll, consistent with students enrolling less in university programs. Similarly, vocational loans imply slightly negative effects on the labor market.

The impacts of grant eligibility are slightly negative, although in most cases, not statistically different from zero. Even though loans have to be repaid over time and grants do not, grants and loans are equally effective in helping students attain a university degree. Moreover, grant eligibility does not impact the quality of the chosen programs, except for a significant increase in tuition costs in the programs selected by students

[1]Another decision margin affected by the eligibility of loans is the timing of enrollment (see, for example, Kane (1996) and Johnson (2013)). Students without access to university loans may postpone college enrollment to accumulate resources or attempt the admission test to gain eligibility. The average students take approximately six years to graduate, so measuring completion ten years after high school can not detect any entry delay below four years. However, delayed entry may affect experience in the labor market and earnings.

receiving grants.

Given that grant eligibility does not affect university degree completion, potential impacts in the labor market can only appear through differences in accumulated student debt. In effect, around the grant cut-off, students receiving loans accumulate significantly more debt before entering the labor market than those receiving grants, potentially affecting career decisions. In this regard, a growing literature documents how debt burden affects post-degree outcomes (e.g., Gicheva (2016) and Mezza et al. (2020)). Nevertheless, the results show that grant eligibility does not affect earnings or labor participation in general. Labor participation shows slightly increasing effects over time, but the estimates are very imprecise and insignificant. The absence of detectable differences suggests that debt burden plays a minor role in career decisions in this context.

Finally, I divide the results by the family income quintile to test whether the impacts are homogeneous across socioeconomic backgrounds. The results show that most effects are due to university loans and are concentrated among women and those from lower-income families, groups that are more likely to face liquidity constraints to finance education. Together with the low sensitivity to tuition cost observed at the grant eligibility cutoff, this suggests that the alleviation of credit constraints potentially drives the results.

The paper contributes to different strands of the economics of education literature by presenting evidence on two standard financial aid policies — i.e., student loans and grants (see, for example, Dynarski (2003)). Understanding the impacts of financial aid on student decisions is crucial for the design of policies. The paper also contributes to the literature discussing the effects of credit constraints on education attainment and labor decisions. It shows that access to loans has long-lasting effects on an individual's human capital accumulation and career paths. (e.g., Carneiro and Heckman (2002)).[2]

This paper proceeds as follows: Section 2 describes the institutional background and the data. Section 3 introduces the estimation strategy, and Section 4 validates it. Finally, Sections 5 and 6 present the results, and Section 7 concludes.

[2]The paper uses a strategy and data similar to Bucarey, Contreras, and Muñoz (2020), although they focus on only one of the two available university loans. I describe the differences in Section 3.

2 Institutional background and Data

2.1 Institutional background

There are two types of higher education institutions in Chile: universities granting bachelor's and graduate degrees and vocational education centers ("vocational colleges" for simplicity) granting technical degrees and professional certificates.[3] University programs usually last five years, while vocational programs typically last two to three years.

The university sector in Chile is divided into "traditional" and "private" universities, with separate financial aid systems. The traditional universities are 25 public and private institutions founded before 1981 that receive substantial direct government funding. The so-called "private" universities are 33 institutions founded after 1981, which do not receive direct government funding and are financed mainly by student tuition.

Tuition fees are relatively expensive, and students take, on average, 5.7 years to graduate, forcing individuals to rely heavily on financial aid and government loans. The average annual tuition was about 2.1 million pesos in 2017 (4,200 US dollars), equivalent to 47 percent of the median household earnings.[4] Even at the lowest cost public university, a family in the poorest quintile would pay about 84 percent of its available earnings to cover one year of tuition.

Private lenders typically do not offer university loans, but special programs exist for a restricted portion of the population. Banks set strict high-income requirements to offer student loans. For example, in 2007, the most generous bank (a partly state-owned bank, BancoEstado) had a minimum parental earning requirement above the 40th percentile of the earnings distribution. Furthermore, banks required parents to prove formal employment to process a loan— a very restrictive condition, as 36 percent of the labor force belongs to the informal sector.

Paying tuition fees with students' labor earnings is not a plausible strategy either, since the average wage for high school graduates is about 420 USD per month, so a full-time job is needed to pay one year of tuition.

The Ministry of Education provides the most relevant funding source for tertiary education,[5] and the

[3] Vocational colleges differ, as well, between technical education centers (Centros de Formación técnica) and professional institutes (Institutos Profesionales).

[4] The amounts for households in the second and third family income quintiles are 50 and 32 percent, respectively.

[5] Universities may offer loans and scholarships to attract outstanding students, a segment of students that is irrelevant in our analysis.

application for funding relies solely on observable characteristics: 1) the national university admission test, *Prueba de Selección Universitaria* (PSU); 2) the high school grade point average (GPA); and 3) the family income quintile assigned by the tax authority. The PSU score used for aid eligibility is the average of the mandatory mathematics and language tests normalized to have a mean of 500 and a standard deviation of 110, similar to SAT scores.[6]

The admissions process for all institutions is highly centralized and starts with registration for the PSU test before graduating from high school in November.[7] Students seeking financial aid (loans and grants) from the Ministry of Education must submit the unique application form for all forms of aid,[8] which the tax authority uses to determine the family income quintile.[9,10] During the second week of December, all students take the PSU test simultaneously. During the first week of January, the process of determining PSU scores and income classification is completed, revealing who is eligible for the loans and grants. Starting in the second week of January, students apply to and enroll in a university or a vocational program. All programs report the list of enrolled students to the Ministry of Education and the payments (of loans and grants) are transferred directly to the educational institutions. Income classification is private information and, thus, is not used in the admissions process. On-campus lectures usually begin in March.

I study the three main financial aid programs in the country, covering about 65% of the students enrolled in higher education: first, university loans that consist of two separate programs sharing the same eligibility criteria; second, a loan program that allows students to finance vocational education; and third, a tuition grant only available for students enrolling in traditional universities. All programs finance identical amounts.

2.1.1 University loans: TUL and SGL

There are two university loan programs available for students enrolling in bachelor's degrees: the Traditional University Loan (TUL), which is available for students enrolling in traditional universities and the State-

[6]The PSU test in Chile and the SAT (Scholastic Assessment Test) in the US display a similar range of scores (SAT: [200, 800] and PSU: [150,850]) and use a normalized distribution. The registration fees for the PSU and SAT are about 50 dollars. However, the PSU registration fee is waived for all students graduating from public and voucher schools who apply for a waiver. The PSU also contains optional history and science tests used by universities to rank applicants, but the Ministry of Education does not consider these tests for financial aid eligibility.

[7]The typical instruction period runs from March to November.

[8]The "unique form of socioeconomic accreditation" or Formulario Único de Acreditación Socioeconómica (FUAS).

[9]This declaration is similar to the financial information reported on the Free Application for Federal Student Aid (FAFSA) to determine the student's expected family contribution (EFC) by the U.S. Department of Education.

[10]Students may have incentives to misreport their family income. This would not be a problem for identification as long as such manipulation is balanced across the cutoffs.

Guaranteed Loan (SGL) for students going to private universities.[11] Both programs cover tuition costs up to an amount determined by the Ministry of Education called *reference tuition.* On average, the reference tuition covers 84% of the nominal tuition fee for the period; thus, students need alternative sources to pay for any other expenses, such as room and board, books, and transportation, to finance the full cost of university.[12]

To be eligible for any university loans, students must be classified in the lowest four income quintiles and score 475 or more points on the PSU test. Students can retake the PSU every year; therefore, they may change their eligibility status after their first attempt. Moreover, eligibility for the SGL can also be obtained by accumulating enough credits on the courses during university enrollment.

TUL is an income-contingent loan granted by traditional universities and financed by government spending. TUL offers partially subsidized loans (2% real interest rate) and is managed by the university, which determines the assigned loan amounts and collects repayments after graduation.[13] Consequently, repayment enforcement is expected to be lower than SGL due to universities' lack of specialization and expertise in debt management (World Bank (2011)).

Conversely, the SGL is managed by commercial banks, which buy loan portfolios in government-sponsored auctions. A crucial feature of the SGL program is that, for the period analyzed in this paper, it resembles available loans in the conventional credit market in terms of interest rates, installment calculations, and repayment enforcement. SGL offers a 6% real interest rate per year, which is slightly higher than the yearly average mortgage rate observed in the same period.

For both loans, repayments are scheduled in fixed monthly installments for 15-20 years. TUL beneficiaries can divert payments in case of low income, while SGL students pay installments regardless of their economic situation. Both loans have a grace period of 12 to 18 months after graduation.

The educational institution and the State guarantee repayments of SGL to the commercial bank. The educational institution "guarantees" the bank payments for 90, 70, and 60 percent of the capital and accumulated interest if the student drops out in her first, second, third, or later year, respectively. The government

[11]The TUL loan was introduced in 1981 and was the primary source of financial aid for students until the introduction of the SGL in 2006. Before 2006, each university determined eligibility independently, based on the government's public budget granted to each institution.

[12]The reference tuition is calculated using an index of institutional quality and the labor market prospects of graduates in each program. The reported average was calculated using official reports from the Ministry of Education.

[13]Since universities grant TUL based on the budget assigned by the government, the amounts can be lower than the reference tuition. However, the student can top up the assigned TUL with SGL up to the reference tuition.

covers the difference up to 90 percent in any other event, including post-graduation default.[14]

2.1.2 Loans for Vocational Programs: SGL vocational

The SGL program offers a different set of loans that are restricted to students who enroll in vocational/technical education. To be eligible for SGL vocational loans, students need to be classified in the lowest four income quintiles and graduate from high school with a GPA equal to 5.3 points or higher.[15] In all other matters, the vocational loan is identical to the SGL granted in universities.

It is important to note that the eligibility criteria for the available loans overlap and produce three different treatment groups, explained in Figure 1: 1) students with a low high school GPA and low PSU scores are ineligible for any loan; 2) students with a higher GPA but low PSU scores have access to vocational loans only, and 3) students scoring 475 points or more on the PSU test have access to both loans.

2.1.3 The Bicentennial Grant

Finally, the third financial aid program is the Bicentennial Grant (BG),[16] which also covers the reference tuition. Students are eligible for this grant if they are classified into the two lowest income quintiles (who have family incomes below the 40th percentile of the national income distribution), enroll in a traditional university, and score at least 550 points on the PSU test. This program serves about five percent of the overall population and more than 50 percent of all qualified individuals. Importantly, students scoring just below the 550-point cutoff are still eligible for loans.

2.2 Data and Sample

The paper combines several sources of administrative records to track the sample of PSU takers from high school graduation until they are several years into the labor market. The main analysis is performed for three student cohorts, graduating from high school in 2006, 2007, and 2008, for which I observe complete educational histories and longer labor market participation. For these cohorts, the data allows for the observation of outcomes up to 2016 for their academic outcomes and 2017 for labor market outcomes. In addition,

[14] If a bank cannot collect the loan from a defaulting student, the guarantors (the state and the educational institution) must pay the bank and become responsible for enforcing repayment from the student.

[15] A passing high school GPA ranges from 4 to 7 in intervals of 0.1.

[16] Beca Bicentenario is the original name in Spanish.

younger cohorts will be briefly used to have a broader view of the evolution of the impacts.

Education and Financial Aid Data

First, the paper uses administrative data on PSU test takers for the high-school cohorts from 2006 onward, including PSU scores, high school GPA, demographics (age, gender), and details about household socioeconomic backgrounds, such as household size, parental education, and parents' labor status.

Second, I combined this data with the enrollment records from the Ministry of Education that contains yearly enrollment and graduation rates for all programs in the country.

Third, I observe whether students applied for financial aid through the FUAS data set, which provides information on the family income quintile, determined by the tax authority, and assignment to financial aid and loan take-up of the TUL program for the analysis period. Moreover, I use a data set containing the registry of students who *default* on their TUL loan.[17]

Finally, the paper uses information from the INGRESA commission,[18] containing the assignment and take-up for the SGL for the first year of enrollment.

Labor Market data

The labor market outcomes combine data from two sources to capture the private and public sectors. The primary data come from the mandatory unemployment insurance (UI) recorded by the Ministry of Labor of Chile. The UI covers almost the entire formal sector, equivalent to 63 percent of the total labor force in 2016.[19] The groups excluded from the insurance are workers with training contracts, those under the age of 18, those in domestic service, pensioners, the self-employed, and public-sector employees. Only 2.2 percent of the workers in the informal sector have voluntarily enrolled in the UI.[20]

The UI data contain individual-level information on labor earnings and participation in the formal sector from high school graduation until the end of 2017 — i.e., 11 years after high school for the oldest cohort.

To cover the public sector, I downloaded wages for the year 2017 from public domain websites from about 500 different organizations within the Chilean government (e.g., ministries, municipalities, and public hospi-

[17] The data is available at https://www.consejoderectores.cl/fondo-solidario-de-credito-universitario
[18] INGRESA commission is a governmental organization created in 2006 to oversee and manage the SGL loan.
[19] Source: INE (National Agency of Statistics).
[20] Source Berstein (2010).

tals), accounting for more than 350,000 employees.[21] These agencies are mandated by law to publish detailed payroll information of all (civilian) employees in the public sector.[22] The information includes earnings, job characteristics, and contract type.

In the Appendix, I provide a detailed description of the scraping procedure and the several tests I performed for accuracy and consistency. The information is merged with the PSU data set through names.[23] This merge based on names could introduce measurement error if some specific names are not unique. However, the data seem robust to several checks using different merging samples. About 50,000 public employees are successfully matched to the pool of student names (about 10% of the sample).

The main labor outcome is *log earnings* (the average of positive monthly earnings). Also, I explore experience and participation in the formal sector. *Experience* is defined as the number of months with positive earnings since high school, and *participation in the formal sector* is defined as whether the individual has a month with positive earnings in a given year.

2.2.1 Sample

I restrict the analysis to students who applied for financial aid and were classified on eligible income quintiles. I also limited the sample to those who took the PSU test for the first time just after high school graduation. This restriction prevents the over-representation of high-earnings students, who are more likely to retake or delay the test date to improve PSU scores.

3 Estimation Strategy

Human capital models predict that, in the absence of credit constraints, increasing the availability of loans (at market rates) should not affect educational decisions. Similarly, a reduction in tuition costs should increase investments in education (See Lochner and Monge-Naranjo 2011, 2012). This section describes the empirical methodology used to test these predictions.

I exploit the different eligibility cutoffs, which arguably produce exogenous variation in the availability

[21] All the information is available at www.portaltransparencia.cl. The web scraper used and the data resulting from the scrape are available at https://github.com/AlexSolis11/public_sector_data_chile.

[22] Non-civilian information is not listed due to security concerns.

[23] Names in Chile consist of both parents' last names plus the first and middle name, facilitating an accurate matching with our original sample of students. Using PSU takers after 2007, I constructed a pool of names containing 1.7 million individuals. I restricted the merge to the unique names in the sample, corresponding to 99.34 percent of the students.

of loans and the direct cost of education to estimate the effects of the aid policies in a regression discontinuity design. Intuitively, students who end up scoring just above or below the corresponding cutoff will be very similar on observed and unobserved characteristics. However, only those who score at the eligibility cutoff or above gain access to loans/grants, providing a treatment assignment that is as good as random for evaluating the effect of these policies (see Lee (2008) and Lee and Lemieux (2010)).

For income-qualified students (see Section 2), a cutoff determines eligibility for each financial aid. For university loans, the cutoff is equal to 475 points on the PSU test; for vocational loans, the cutoff is equal to 5.3 points in the high school GPA; and for BG grants, the cutoff is equal to 550 points on the PSU test.

Following Lee and Lemieux (2010), I estimate the effects of loan eligibility on y_i using the reduced form specification:

$$y_i = \alpha + \beta \cdot \mathbb{1}(S_{i0} \geqslant c) + f(S_{i0} - c) + \varepsilon_i, \tag{1}$$

where y_i represents an educational or labor market outcome; $\mathbb{1}(S_{i0} \geqslant c)$ is an indicator variable of whether the student score, S_{i0}, is greater than or equal to the eligibility cutoff, c. Depending on the policy under evaluation, S_{i0} represents the PSU score in the first attempt (denoted T_{i0} in the tables) or the high school GPA (denoted G_i in the tables). While the cutoff c is 475, 5.3, and 550 for university loans, vocational loans, and BG grants, respectively. Finally, $S_{i0} - c$ represents the running variable (the distance between the student's score and the cutoff), and $f(S_{i0} - c)$ is a piece-wise linear function to control for the influence of the running variable away from the cutoff.[24]

The constant α in equation (1) represents the outcome mean for students who score just below the cutoff. The parameter of interest, β, corresponds to the change in the outcome mean associated with scoring at the cutoff.

The sample is restricted to students who score in a relatively narrow bandwidth around the eligibility threshold. To present consistent results, university loans and grants consider students scoring at most 44 PSU points away from the corresponding cutoff. Similarly, the analysis for vocational loans considers students at most 0.4 GPA points away from the cutoff.[25] The results are robust to using different specifications, including

[24] Specifically, $f(S_{i0} - c) = \phi_0 \cdot (S_{i0} - c) + \phi_1 \cdot (S_{i0} - c) \cdot \mathbb{1}(S_{i0} \geqslant c)$,representing the slopes relative to the running variable, $(S_{i0} - c)$, at each side of the cutoff.

[25] For university loans and grants, this is equivalent to saying that the RD is estimated using a uniform kernel using a bandwidth of 44 points around the cutoff. The range of 44 PSU points corresponds to the optimal bandwidth from Imbens and Kalyanarman

a rich set of covariates, and using several bandwidths.[26]

Importantly, eligibility for university loans and BG grants could change over time because students retake the PSU test. Although in the first period, eligibility shifts from zero to one at the cutoff, ineligible students can keep retaking the PSU test (non-compliers) to become eligible in later years. Given this imperfect compliance, we would like to estimate the local average treatment effect of eligibility (LATE) using 2SLS estimates.[27]

Although I observe all PSU attempts and family income quintiles to recover eligibility at every period; a very small group becomes eligible for the SGL loan by completing enough course credits in the enrolled program.[28] In practice, ignoring this unobserved fraction of students would overestimate the eligibility change for SGL loans, thus underestimating the true LATE. To be conservative, and despite this problem affecting eligibility only for SGL loans, the paper reports reduced-form estimates for all three policies, which can be interpreted as the intention-to-treat effect.

Bucarey et al. (2020) (BCM20) uses a similar strategy and data. BCM20 claims to estimate the causal effect of taking SGL university loans on educational and labor market variables. Given that loan take-up is endogenous, they instrument it using the university loan eligibility cutoff (scoring 475 or more points on the PSU test) and report two-stage least-squares estimates. However, the instrument affects eligibility and take-up for two loan programs, the SGL and TUL loans, and the latter is ignored in BCM20. Since TUL also impacts enrollment, degree completion, and variables in the labor market, the BCM20's procedure is partly attributing the TUL impacts to the SGL.[29]

Econometrically, BCM20 estimates violate the exclusion restriction assumption because the instrument (the cutoff indicator) affects the variable of interest not only through its effect on the endogenous variable (SGL loan take-up) but also through the TUL take-up.

(2012) (IK) in the university loan sample. Other methods produce similar results. In particular, the optimal bandwidth of Calonico, Cattaneo, and Titiunik (2014) yields a range of 50 PSU points for the university loan sample. I keep the IK optimal bandwidth throughout the paper to have consistent and comparable samples.

[26] A note regarding standard errors in the models: Since the PSU score is a discrete variable in intervals of 0.5 points, I cannot observe observations below the cutoff in a neighborhood strictly smaller than 0.5 inducing a group correlation in the error term. I test the robustness of our findings by using clustered standard errors at the different discrete values of the PSU test (See Lee and Card (2008) for details). Generally, the corrected standard errors are slightly smaller than the alternatives corrected by heteroskedasticity. To be conservative, I report the latter. The same occurs for GPA, which is a discrete variable in 0.1 intervals.

[27] Note that the exogenous change in eligibility is one minus the rate of students who gain eligibility after the first attempt. Those who become eligible keep their status over time; therefore, we have one-side noncompliance.

[28] Inspecting the data on loan take-up for a restricted set of years in which there is complete information on take-up, I can estimate that students who gain eligibility through course credits may account for, at most, 5% of the eligible students.

[29] In practice, the effects of the TUL university loans are larger than those of their SGL counterpart. See Table 4, columns 3 and 4.

Alternatively, BCM20 could have estimated the effect of taking any university loan (TUL or SGL) on the variables of interest. This implies considering both loans take-up as first stage estimation. The variation in loan take-up at the cutoff is twice as large when considering TUL; therefore, the 2SLS estimates for taking up any university loan are much smaller than those reported in BCM20.

In this paper, I use eligibility for loans instead of loan take-up because eligibility resembles the existence of a credit market where the student decides whether borrowing to enroll is an optimal decision, which is an important question in economics regarding the effect of complete credit markets on different outcomes.

4 Validity of the Regression Discontinuity Design (RDD)

To ensure the validity of the RDD, I follow Imbens and Lemieux (2008) and perform three tests to guarantee:

1. the existence of an exogenous change in eligibility for loans/grants at the respective cutoffs;
2. that the conditional means of predetermined characteristics are continuous across each threshold (balance of covariates); and
3. the absence of manipulation of the running variable.

Figure 2 summarizes the change in the loans and grants eligibility. The top figures show eligibility for university loans, the middle shows eligibility for vocational loans, and the bottom shows the equivalent analysis for the Bicentennial grant. Panels on the left show eligibility, considering all possible PSU attempts between high school and 2016, and panels on the right show their respective take-up rates.

As mentioned above, eligibility for university loans does not consider those who become eligible for SGL due to course-credit completion. In contrast, eligibility for grants and vocational loans are fully observable over the years. Moreover, SGL loan take-up is observed partially, for the first year only, and is included as a reference.

There are three important facts in Figure 2. First, there is a clear change in the probability of becoming eligible for all three aid types. At the cutoff, eligibility for university loans, vocational loans, and BG grants increases by 70, 50, and 80 percentage points, respectively (see figures on the left). Second, eligibility translates to more students taking up loans and grants significantly (see figures on the right). The take-up rate for university loans increases by 19 percentage points at the loan cutoff and decreases by 18 percentage points

at the grant cutoff, consistent with students substituting loans for grants. Moreover, vocational loans and BG grant take-up increase by six and 37 percentage points, respectively. Third, the figures on the left show that students self-select into treatment by retaking the PSU test when they initially score below the cutoffs. Thus, eligibility below the cutoff is never zero.

Additionally, Figure 3 shows that eligibility for loans and grants implies significant changes in the amount of resources received by students in the year of assignment, relative to the PSU score. Panel A shows the sum of all loans available, for which we observe a clear change in the amounts borrowed at both PSU cutoffs. In effect, below 475 PSU points, loan amounts reflect what is borrowed in vocational programs; at 475 PSU points, the amounts increase with the introduction of university loans, TUL, and SGL; while at 550 PSU points, the borrowed amounts decrease with the introduction of the BG grant, which allows the substitution of loans for grants in traditional universities. Panel B restricts the analysis to university loans only, while Panels C and D split these amounts by type of university (TUL in traditional and SGL in private universities). Panel E shows vocational loans, which imply much lower amounts due to lower fees in technical programs. There is no jump at the PSU cutoffs for vocational loans because they depend solely in high school GPA. Finally, Panel F shows the amount received by students in the BG grant.

Balance of Covariates

Table 1 shows a series of estimated reduced-form specifications (equation (1)), taking each student's predetermined characteristics as a dependent variable. For each characteristic, I estimate the average value for each predetermined variable among students just below the cutoff (α in equation 1 in columns 1, 3, and 5) and the estimated change in these means (β in equation 1 in columns 2, 4, and 6).

I find little evidence of discontinuities at the cutoff for university loans and BG grants. For university loans, in columns 1 and 2, for the 14 tests around 475, only one ("age at PSU") rejects the null of no change at 10% significance.

The tests around the GPA cutoff, in columns 3 and 4, reject the null on four occasions. This may be a consequence of the discrete nature of the running variable, which increases the sensitivity to bandwidth definition. However, most of these failed tests are only significant at the 10% level.

For the BG grant, in columns 5 and 6, three variables appear "imbalanced" (whether the students work, whether the father has a formal-sector job and whether the mother is a housewife). However, the estimated

magnitudes of the changes seem negligible. For example, the age difference for university loans is equivalent to 0.04 years, or 2.2 weeks. Moreover, these rejections are aligned with a type I error, as a rejection of a true null is expected to occur for 1.4 out of 14 tests at 10% significance.

Manipulation of the running variable

The third test for the validity of the regression discontinuity design explores whether, around the eligibility cutoffs, students are able to manipulate the running variable.

It is important to note that the PSU test contains only multiple-choice questions graded by a photo-optical device, thus limiting the scope for manipulation by students or teachers. Consistent with this idea, Panel A in Figure 4 shows the histogram of PSU scores, which appear to be continuous at both PSU eligibility cutoffs. More formally, following McCrary (2008), for university loans and the BG grant, I fit three piece-wise fourth-order polynomials for the frequency distribution of PSU scores in the three intervals generated by the two PSU cutoffs, no significant changes were found.

An equivalent analysis is done for vocational loans around the GPA cutoff (Panel B in Figure 4), with similar results. Although high school teachers may have incentives to push students' grades to achieve the threshold, the figure shows no apparent manipulation.

5 Results

The empirical analysis is divided into three sections. Results are organized showing the effects on degree completion, years of enrollment, and education quality, followed by results for the labor market. Section 5.1 presents the effects of eligibility for university loans, including effects divided by sex because of the important differences. Sections 5.2 and 5.3 examine the impacts of eligibility for vocational loans and the Bicentennial grant, respectively. Finally, Section 6 presents heterogeneous effects by family income.

5.1 Eligibility for university loans.

There are only a few papers documenting the causal impacts of student loans. Most evidence focuses on short-term outcomes, such as enrollment or persistence (e.g., Gurgand, Lorenceau, and Melonio (2011), Solís (2017), Marx and Turner (2018, 2019), Bucarey et al. (2020) and Card and Solis (2022)). Nevertheless, in a re-

cent paper, Black, Denning, Dettling, Goodman, and Turner (2020) study degree attainment and post-college earnings using a difference-in-difference identification strategy.[30] The evidence presented here complements this literature by presenting results on degree completion and labor market outcomes.

5.1.1 Educational outcomes

Degree completion

The rate of degree completion is key to understanding whether or not the effects observed on enrollment help close the gaps in attainment and earnings. Table 2 shows the impacts of university loan eligibility on degree attainment at the 475-point PSU cutoff. Given the variability in the results, the table presents results for three samples: all students, male students, and female students.

The first column shows strong and significant changes in eligibility at the cutoff discussed in Section 4 and Figure 2. The second column displays one of the most important outcomes of the paper: university loan eligibility causes a significant increase in university degree completion by four percentage points (Column 2 in Panel A). Given that the average graduation rate just under the cutoff is 30 percent (intercept in column 2), the increment represents a 13 percent relative increase in the rate of degree completion.[31]

Interestingly, Column 2 in panels B and C shows that the effect is mainly driven by women. While the impact is large and significant for female students (5.6 percentage points), it is low and insignificant for males (1.5 percentage points).[32]

To test the relevance of the loan conditions, and given that TUL is assigned in traditional universities and SGL in private ones, columns 3 and 4 show completion by type of university. Overall degree completion increases in both types of institutions (by 2.1 and 1.9 percentage points in traditional and private universities, respectively).[33]

Importantly, the sex gap is strong and statistically significant.[34] The effects are stronger for women in

[30] Black et al. (2020) exploit increments in federal loan limits and data from Texas. Similar to the evidence presented here, their results suggest that loan availability improves degree completion and post-college earnings.

[31] See Figure A.2 in the Appendix for a graphical representation of these results.

[32] Moreover, Column 2 shows a significant sex gap in university degree completion, with women much more likely to graduate (0.35 vs. 0.24).

[33] Note that degree completion in traditional universities plus completion in private universities does not add up exactly to completion in any university presented in column 2. This occurs because few individuals obtained degrees from both types of universities in the period of analysis. The same occurs for the aggregation between university and vocational graduation, which should be equal to graduation from any higher education institution, with some students completing degrees in both.

[34] with p-value for one side test, $H_0 : \beta^{female} \leqslant \beta^{male}$, equal to 0.0255.

both traditional and private universities (2.8 and 2.9 percentage points, respectively), while they are weakly statistically positive only in traditional universities (1.2 percentage points significant at the 10% level).

Column 5 in Table 2 shows the effects on vocational college degree attainment. Consistent with the previous literature (see, for example, Angrist, Autor, Hudson, and Pallais (2016)), loan eligibility diverts students from vocational programs to bachelor's degrees. In particular, we observe that degree attainment in vocational programs decreases by 5.2 percentage points, with a larger substitution among female students (-6.3 vs. -3.6 percentage points).

Column 6 aggregates all post-secondary institutions to analyze overall attainment, but the effects are very close to zero consistent with an almost perfect university-to-vocational college substitution. This cross-institutional exchange in enrollment is due mainly to the availability of loans for technical schools based on students' GPAs for those scoring below the PSU threshold. I further explore the interaction between the university- and the vocational-loan thresholds in Section 5.2.

Finally, the last two columns show the effects on years of enrollment. Here I observe that the substitution was not absolute, and while university enrollment increased by 0.47 years (practically one additional semester of studies), vocational enrollment decreased by 0.29 years. On the other hand, any post-secondary enrollment increased significantly by 0.19 years.[35] In this case, the effects on years of university are positive for both women and men and negative for years of vocational enrollment. Overall, enrollment in any tertiary education increased by 0.23 years for women and 0.14 years for men (both highly significant).

It is important to note that the positive effects on degree completion are concentrated among students of high ability (measured by high-school GPA), who were eligible for vocational loans because of their high-school GPA above the vocational loan cutoff. Table A.1 in the Appendix splits the sample around 475 into two categories: first, students with high-school GPA equal or greater than 5.3, who are eligible for vocational loans before taking the PSU test; second, students with high-school GPA below 5.3, and therefore, ineligible for aid. For the latter, scoring 475 or more in the PSU implied moving from being ineligible for any loan to being eligible for loans at any institution (See Figure 1). For the first group, the impacts are stronger relative to the effects observed in the whole sample, suggesting the importance of ability to enjoy the benefits of loan availability. In contrast, for the second group, completion from university is not affected, despite more years of university enrollment.

[35]Estimates are not shown in the table. The value of the t-test for a null hypothesis with a coefficient equal to zero is 6.13.

Program and Institution Quality

The availability of loans also affects other educational decision margins. Table 3 presents reduced-form models for different education quality measures and costs. The Table considers six outcomes: 1) program accreditation; 2) institution accreditation; 3) number of teachers (FTE, full-time equivalent);[36] 4) number of FTE teachers with a Ph.D. degree; 5) tuition fees; and 6) program duration. Keep in mind that the data on the programs/institutions are measured at the first program/institution in which the student enrolls. Although the enrollment timing is an important consideration, I exploit the fact that 98% of all students enroll during the 11 years we observe.

The first column shows that students are more likely to choose accredited programs (by 1.8 percentage points). Program accreditation is voluntary but follows strict quality protocols enacted by the educational authority (Comisión Nacional de Acreditación) and is often used as a quality seal to advertise programs.

Institutional accreditation is more important for the enrollment decision because all loans and grants are restricted to enrollment in accredited institutions. Consequently, crossing the eligibility threshold leads to more students enrolling in accredited institutions (Column 2).

Columns 3 and 4 show that the programs chosen by loan-eligible students have more FTE teachers and teachers holding Ph.D. degrees. The effects are strongly significant in both cases, with one more FTE in the institution above the cutoff relative to 41 teachers just under the cutoff. Similarly, eligible students enrolled in institutions with 0.7 additional doctorate holders relative to 2.9 Ph.Ds below the eligibility threshold.[37]

Finally, columns 5 and 6 show that the costs and program duration are also affected. Students above the loan cutoff enroll in more expensive programs, paying additional 70,000 Chilean pesos of 2017 (110 USD) in tuition for programs that are 0.3 semesters longer. In general, higher tuition fees and program duration signal higher-quality programs. [38]

5.1.2 Labor Market Outcomes

Most students have finished their education by the time they are observed; thus, the educational results presented above can be measured precisely. In contrast, labor market outcomes are only observed in the

[36] This data are available only at the institutional level.

[37] Again, female students tend to enroll in programs with more FTE teachers holding a Ph.D. Although the effects are almost identical, the relative change is more important for male students (more results by sex are presented in Table A.2 in the Appendix).

[38] The results are very similar for both sexes, thus presented in the Appendix in Table A.2.

beginning of students´ labor careers. Nevertheless, the labor data used in the paper include outcomes from high school to the end of 2017, which implies observing students for 11, ten, and nine years after high school for cohorts 2006, 2007, and 2008, respectively. On average, these cohorts spend 4.7 years in higher education, consequently they are observed for up to six years in the labor market.

This section presents estimates for the impacts of university loan eligibility on labor market outcomes over two-time horizons: 11 and nine years after high school. On the one hand, 11 years after high school is the longest observed period (for the 2006 high school cohort). On the other hand, the "nine years after high school" horizon allows pooling the three main cohorts to increase the precision of the estimates.

Although the results for all students are statistically insignificant, Table 4 shows that loan eligibility increases labor earnings by 2.7 percent 11 years after high school (Column 1 in Panel A). However, the impacts are slightly negative nine years after high school, for the three cohorts pooled together.

Consistent with the strong effects on degree completion and years of enrollment found for women, female earnings 11 years after high school increase significantly by seven percent (Column 3 in Panel A). However, this effect is almost zero nine years after high school (Column 4 in Panel A). In contrast, for male students, the effects are negative and insignificant for both horizons (columns 5 and 6 in Panel A), consistent with an insignificant increase in university completion.

Panel B in Table 4 turns to results for accumulated labor experience. Considering all students, I observe that university loan eligibility reduces labor experience by 1.3 months in both time horizons. However, the estimate for the longest horizon is less precise and, thus, statistically insignificant. This result is not surprising because ineligible students enroll in shorter programs, allowing them to enter the labor market earlier.

The data, split by sex in columns 3 to 6, reveals a significant change over time in the impact on women's labor experience. Initially, there was a negative effect equivalent to a loss of 1.13 months of labor experience within nine years post-high school. However, this negative impact diminishes to just 0.6 months at the most extended measured interval. These results suggest that eligible female students can catch up on labor experience despite staying longer in university. In contrast, men suffer an increasingly negative effect, missing 1.62 months of labor experience nine years after high school and 2.15 months after 11 years.

Finally, Panel C in Table 4 shows labor market participation in a given year. In this case, the effects are homogeneous and very close to zero for all samples.

Graphical analysis for other horizons

The outcomes shown in Table 4 reflect early-career prospects that are static for the chosen horizons. To explore how these labor market outcomes evolve over time, I present results for additional time horizons that are more precise by including younger cohorts.

Although younger cohorts offer an imperfect picture of the labor market because of the difficulty of determining whether they have completed their education, their behavior during their initial years in the labor market reveals decisions regarding the labor market that are also affected by university loan eligibility. For example, students choosing easier and shorter programs can work while studying and complete their degree earlier to enter the labor market.

Figure 5 presents the estimated effects at the university loan eligibility cutoff (β in equation 1) on log-earnings for all observable horizons since high school. I observe negative impacts on earnings for earlier periods, consistent with faster degree completion in vocational programs. Nevertheless, the figure depicts a steady positive trend in the effects on earnings for loan-eligible students. Although the estimates are not statistically different from zero in the last period, the trend suggests a potential positive impact for longer horizons.

This finding is consistent with the lifetime earning profiles found in the literature (see, for example, Lemieux (2006), Zimmerman (2014), and Bhuller, Mogstad, and Salvanes (2017)), suggesting that the vocational and university earning paths cross around the seventh or eighth year after high school.[39]

The two bottom graphs in Figure 5 present equivalent impacts by sex. The figure on the left shows a similar positive trend for women, which becomes positive and significant for the oldest cohort only (after an important increase in the last year). On the contrary, the figure on the right suggests that the earnings effects are never positive for males, consistent with weaker educational impacts.

I present further sensitivity tests of the results for cohort 2006 in the Appendix. Although reducing the sample size to only one cohort leads to a higher variance in the results, the effects show a consistent increase in earnings for women in the poorest income quintile (see Figure A.3).[40]

[39] In particular, in a very similar setting, Zimmerman (2014) (Figure 7) shows that students who enroll in college need about seven years to surpass their non-college counterparts in terms of earnings.

[40] Other labor outcomes present very similar trends. Figure A.4 in the Appendix shows results for experience and participation in the labor market.

5.2 Vocational loans

This section turns to the impacts of eligibility for vocational loans. Consistent with Figure 2, Panel A in Table 5 shows that eligibility for these loans increases by 49 percentage points at the threshold (Column 1). It is important to note that a substantial fraction of the students who are ineligible because of their low GPA become eligible for vocational loans when they score 475 points or more on the PSU test (about 51% indicated by the intercept in Column 1).[41]

Eligibility for vocational loans has null effects on degree completion (columns 2 to 6). However, vocational loans do impact students' years of enrollment. Enrollment in technical programs increases by 0.1 years (approximately a 5% relative increase), which is entirely offset by a reduction in university enrollment by -0.12 years. One possible explanation for this outcome is based on the incentives for ineligible students to rewrite the PSU test to access university loans or grants.

To explore this result further, Panel B presents results for students who never become eligible for university loans— i.e., they never scored 475 points or more on any PSU test. For this sample, the GPA cutoff implies that eligibility changes from zero to one (Column 1 Panel B). Eligibility among this sample causes vocational degree completion to increase by 2.1 percentage points. Moreover, we observe a greater change in years of enrollment. While vocational enrollment increases by 0.19 years, university enrollment decreases by 0.1 years.

Eligibility for vocational loans also impacts educational quality. Panel A in Table 6 shows that students choose institutions with fewer teachers holding Ph.D.s and prefer shorter and lower-tuition programs, with effects that are only weakly significant. In contrast, the probability of choosing an accredited institution, a requirement to receive any financial aid, increases significantly.[42] These results are consistent with the higher probability of enrolling in university programs for students who are initially ineligible for vocational loans, but retake the PSU frequently to gain access to aid.

In the labor market, the impacts are moderately negative but mostly insignificant. The most salient result is labor experience measured 11 years after high school, which falls by 1.8 months (relative to 49 months of experience just below the cutoff). Interestingly, the three labor market outcomes worsen relative to the shorter horizon.

[41] Students below the GPA cutoff are more likely to retake the test, increasing their likelihood of accessing financial aid.

[42] When I restrict the sample to students who never become eligible through the PSU test, these quality measures turn out to be slightly positive, consistent with vocational loans being the only financial aid available. See details in Table A.3 in the Appendix.

Given that students above the GPA cutoff accumulate fewer years of university and more vocational training, these slightly negative effects suggest a higher return for university degrees, consistent with the results in Section 5.1.2.[43]

Figure 6 presents labor outcomes for more horizons, expanding the sample to younger cohorts as in Section 5.1.2 and Figure 5. Panel A shows that the effects are always very close to zero and insignificant for vocational loans.

5.3 Bicentennial Grants

Finally, we focus on the effects of the Bicentennial grants for programs in traditional universities. In the literature, the evidence about the impact of grant availability is broad and sometimes controversial. Several papers survey the literature, pointing out identification problems (See, e.g., Deming and Dynarski (2010), Dynarski and Scott-Clayton (2013), and Nguyen, Kramer, and Evans (2019)). Recent papers, however, exploit randomized control trials and discontinuities in grant access that improve the causal estimation (See, for example, Cohodes and Goodman (2014), Angrist et al. (2016), Denning, Marx, and Turner (2019) and Barr (2019)).

The results in this section contribute to this literature by showing the effects of a generous grant that finances about 85% of the tuition costs in a context where students can access university loans to cover identical amounts.[44] The results are organized as in the previous section, with educational results first and labor market outcomes second.

Educational outcomes

Consistent with Figure 2, Table 7 shows that eligibility for the BG grant jumps by 79 percentage points at the 550-point cutoff (Column 1). However, this sharp change in grant availability does not translate into higher educational attainment. Column 3 shows almost zero (slightly negative) effect on degree completion from traditional universities.[45] The effects are also very close to zero for degree completion from private univer-

[43]The effects for female students are slightly stronger, but they are not statistically different from their male counterparts and, therefore, not included.

[44]The main difference in eligibility is that grants are available for students in the bottom two quintiles. See Section 2.1.3 for more details.

[45]BG grants are only available in traditional universities. Thus, degree completion from any university is a mix of universities participating in the program and privates that do not. The results are kept in the table for consistency with previous results.

sities, showing no signs of substitution for programs to enjoy the benefits of the grant. I observe a small negative effect on degree completion from vocational programs, possibly due to students substituting vocational education for traditional university programs, given the sizable tuition reduction. This substitution can also be observed for years of enrollment (columns 7 and 8), with more students choosing a university to the detriment of vocational programs. Overall, eligibility for BG grants does not produce significant changes in students' decisions, which starkly contrasts with the effects on university loans discussed above.[46,47]

Moreover, Panel A in Table 8 shows that most quality characteristics are not affected by the availability of grants, with only two exceptions. First, Column 2 shows that students above the grant cutoff are more likely to choose non-accredited institutions. This outcome is surprising because, to receive the grant, students need to enroll in institutions with accreditation. However, the estimate is small and significant only at the 10% level. Second, Column 5 shows that students opt for more expensive programs, which is consistent with their higher budget due to the grant.

Given that students below the cutoff are eligible for university loans, the grant implies a significant reduction in the outstanding debt needed to enroll in a university program. However, these results are at odds with previous literature showing evidence of debt aversion. Such studies find that loans can trigger negative responses, regarding educational decisions, beyond the rationale of risk-averse individuals, suggesting that individuals experience disutility from holding student loans (see Thaler (1990)).

For example, Field (2009) exploits a field experiment in which students face two financially-equivalent aid packages: one labeled as a grant that has to be reimbursed if the student chooses to work outside of public-interest jobs; the other labeled as a loan that will be forgiven if the student decides to work in a public-interest job. The results show that applications and enrollment are significantly larger for the group receiving the "grant" package.[48]

In contrast, the absence of any effect on enrollment and degree completion when students substitute loans for grants in the Chilean case suggests a minor role of debt aversion.

Alternatively, a student could believe that loans and grants are equivalent if she expects that loan re-

[46] For all the results in this section, the estimates are almost the same for both sexes and, therefore, are not shown.

[47] Solís (2013) shows similar results for short-run effects.

[48] See also Boatman, Evans, and Soliz (2017), who show a high degree of debt aversion among high school seniors using survey data; Caetano, Palacios, and Patrinos (2019), and Evans, Boatman, and Soliz (2019) show that labeling aid packages using the word "loan" significantly reduces the probability of taking aid offers. Cadena and Keys (2013) show that individuals are unwilling to accept a zero-interest loan as a self-control mechanism.

payments will not be enforced or the debt will be forgiven. In such a case, her financial situation does not change at the BG grant cutoff. To test this hypothesis, I calculate the TUL default rate using the registry of students "in default" provided by the Association of Traditional universities.[49] I find that TUL default rate is 58% around the BG cutoff, which is higher than the SGL default rate of 36% (See World Bank (2011) and MINEDUC (2021)). The results in Table A.4 and Figure A.5 in the Appendix show that payment behavior is not affected by the availability of loans. Although the repayment rate is low, as expected, at least 42% of the students pay their loans and do not consider them equivalent to grants.

Labor market outcomes

Similar to the potential ex-ante effects of debt on education decisions (debt aversion) described above, students may alter their career paths due to their level of student debt (debt burden). A small but growing literature has described the potential impacts of debt on post-graduation decisions.[50]

Thus, despite the null effects of the BG grant on attainment and educational quality at the cutoff, we could observe impacts on labor market decisions given the important changes in outstanding debt observed at the grant eligibility threshold. In effect, Panel B in Figure 3 shows a significant change in the amount that students borrow at the grant cutoff, which corresponds to the increase in the BG grants shown in Panel E in the same figure. Note also that the absence of educational effects allows to isolate the impacts, if any, of accumulated debt on labor market outcomes.

Panel B in Table 8 shows that earnings and labor participation are not affected by the availability of BG grants in both time horizons. The only exception is in Column 4, with a marginally significant reduction in experience of about 0.9 months relative to 29 months of experience below the cutoff. The lack of strong evidence suggests that the debt burden does not play an essential role at this margin.[51]

Finally, Figure 6 Panel B shows the evolution in earning effects since high school graduation (including

[49] Consejo de rectores de Universidades Chilenas, CRUCH. Data are available at https://www.consejoderectores.cl/fondo-solidario-de-credito-universitario.

[50] For example, Field (2009), described above, also shows that students assigned to loans choose different career paths than students assigned to equivalent grants; Rothstein and Rouse (2011) shows that students holding debt are more likely to choose high-paid, private-sector jobs; Zhang (2013) shows that debt has negative impacts on post-graduate enrollment; Velez, Cominole, and Bentz (2019) show how debt burden affects earnings, job choice, decisions to marry and have children, and net worth; Kim and Chatterjee (2019) show that student loan debt is negatively associated with life satisfaction and psychological well-being; Mezza, Ringo, Sherlund, and Sommer (2020) show effects on home ownership; and Ji (2021) showing how debt alters job search decisions.

[51] This result is also consistent with the evidence in Black et al. (2020), which finds that debt burden plays a minor role in career decisions

younger cohorts). In contrast to the effects on university loans, the effects here always appear very close to zero.

6 Mechanisms

The results presented so far showed that university loans have larger impacts on educational and labor market outcomes than equivalent financial aid in the form of vocational loans and grants. Notably, the zero effects for grant eligibility occur in a context where everyone is eligible for university loans, suggesting that credit constraints could be an important underlying cause for the effects at the university loan cutoff. Moreover, once loans are available, students choose higher levels of human capital and slightly improve their labor market prospects.

In this section, I present results by family income to test this potential channel. If credit constraints are an important mechanism behind the positive effects of university loans, the impacts should be larger among students from poorer families, who are potentially more credit constrained.

6.1 Degree Completion

Table 9 shows estimates of degree completion by family income. The three policies are shown in the table, and each sample is split into low- and high-income groups. For university and vocational loans, the low-income group encompasses the poorest two quintiles, while the high-income group consists of the third and fourth quintiles. Only the two poorest income quintiles were eligible for the BG grant, so I present the result by quintile.

First, Panel A presents the change in aid eligibility. In general, the change in eligibility is similar for all groups considered. The most significant difference appears for vocational loans, with a larger eligibility jump for the low-income group. This difference is due mainly to the correlation between family income and high school GPA.

Second, Panels B through E show the effects on completion for the different degree types studied earlier. Similarly, university loans affect almost all categories, while vocational loans and BG grants affect almost none.

The overall impacts on university degree completion are stronger for the lower-income group (Panel

B). In absolute terms, the low-income group increased its completion by 4.1 percentage points compared to 3.3 for the high-income group, which implies a relative increase of 14% in degree attainment for low-income students versus 9% for the high-income counterpart. This is especially strong in private universities (Panel D), where loan eligibility does not affect degree completion among high-income students.[52] However, in traditional universities, the effects are reversed, and they are slightly higher for the high-income group (Panel C).

As before, the increase in university degree attainment for both groups is at the expense of a lower graduation rate from a vocational college (Panel E). Following the higher impacts on university attainment for the low-income group, the university/vocational substitution is slightly stronger for these students. At the same time, degree completion from any tertiary education remains unaffected for both groups.

For the other two policies, the effects are not discernible from zero for any income group, with only one exception: a significant negative impact of grant eligibility on vocational degree completion among students from the high-income group (Column 6 on Panel E). This effect suggests that individuals from higher-income families are able to substitute lower-quality vocational programs for traditional university programs when grants are available, likely because the policies do not cover all educational expenses, thus, restricting poorer students who cannot afford to pay these extra costs.

6.2 Labor market outcomes

Table 10 shows estimated effects for labor market variables by family income quintile. The table is organized as before, with each policy divided between low and high-income groups.

The first two columns show the effects of university loan eligibility on log earnings. Panel A shows that 11 years after high school, the effects are positive (4.1%) for low-income students (Column 1) while negative for higher-income students (-2%, Column 2)). Unfortunately, this evidence is very imprecise, and both estimates are statistically insignificant. Measuring earnings nine years after high school shows close to zero estimates for both groups (Panel B).

Panels C and D show the effects on accumulated labor experience for the two horizons, suggesting opposite results for the two groups. While experience increases for the low-income group (still negative, but closer to zero), the effect becomes even more negative for the high-income students. However, the low-

[52] The differences are not statistically significant.

income group enjoys more accumulated experience in both horizons. This fact suggests that students from low-income families work more during their studies than students from higher-income backgrounds. However, there is no discernible difference across income groups.

Columns 3 and 4 repeat the analysis for vocational loans. In panels A and B, all earning effects of this policy appear insignificant. The effects seem to worsen between time horizons, with lower-income students experiencing more negative effects 11 years after high school. Regarding experience, in panels C and D, although students from the low-income group show higher accumulated experience on both horizons (intercept), vocational loan eligibility impacts them negatively, consistent with lower labor prospects for vocational studies.

Finally, Columns 5 and 6 show the effects of the BG grant. The impacts on earnings for the high- (low-) income group appear positive (negative) in both horizons, but all estimates are insignificant. Finally, students from the low-income group face negative impacts on experience in both horizons (although marginally significant for nine years after high school). In contrast, the effect changes signs between horizons for the high-income group, but most results are imprecise due to the reduced sample sizes.

7 Conclusion

The Chilean aid system uses a series of cutoff rules to determine eligibility for financial aid, enabling a regression discontinuity design to estimate the effects of aid on students' decisions. Using high-quality data, this paper estimates the impacts of university loans, vocational loans, and grants on degree completion and early labor market outcomes.

The paper shows that access to university loans increases bachelor's degree completion rates by four percentage points, measured ten years after high school. However, this increase in degree attainment is concentrated among students with high ability, measured by high school GPA, who are also eligible for vocational loans. Consequently, the positive impact on university completion is offset by a reduction in graduation from vocational programs. Moreover, university loans allow students to choose higher-quality programs, as evidenced by their move from vocational to university programs, and measured by institution and program accreditation, number of teachers, and teacher qualifications.

Interestingly, the impacts at the eligibility cutoff for university loans are driven mainly by female stu-

dents. The highly significant effects on educational attainment for female students contrast with the mostly insignificant results for males. Consequently, female students experience a positive and significant impact on labor market earnings 11 years after high school, while male students lag. In addition, although university loans cause negative impacts on earnings during schooling (consistent with longer and more demanding programs), earnings increase faster over time, resulting in a weakly positive effect.

Similarly, vocational loans cause an increase in technical degree attainment and an improvement in program quality only when students are unable to qualify for university loans. In contrast, the effects are slightly negative when university loans are available because eligibility for vocational loans discourages students from rewriting the PSU test to gain eligibility for university loans.

On the other hand, once students are eligible for university loans, the availability of grants with equivalent funding has little impact on bachelor's degree completion at eligible universities. Despite the significant change in student debt, university loans and grants are equally effective in helping students complete a bachelor's degree, suggesting the absence of debt aversion in educational decisions. Similarly, the lack of a labor market effect around the grant cutoff indicates that students' debt burden plays a minor role in career decisions in this context.

The larger impacts of university loans among students from low-income families, together with the lack of sensitivity to changes in tuition costs around the grant cutoff suggest that credit restrictions are the main driver of the impact observed for the loan program.

Relative to the evidence from previous literature, this paper presents a broader picture of the influence of different aid packages on the dynamics of education and the labor market. Moreover, this evidence allows the comparison between types of aid in the same context, providing relevant information for the design of aid policies and shedding light on the importance of credit availability on social mobility.

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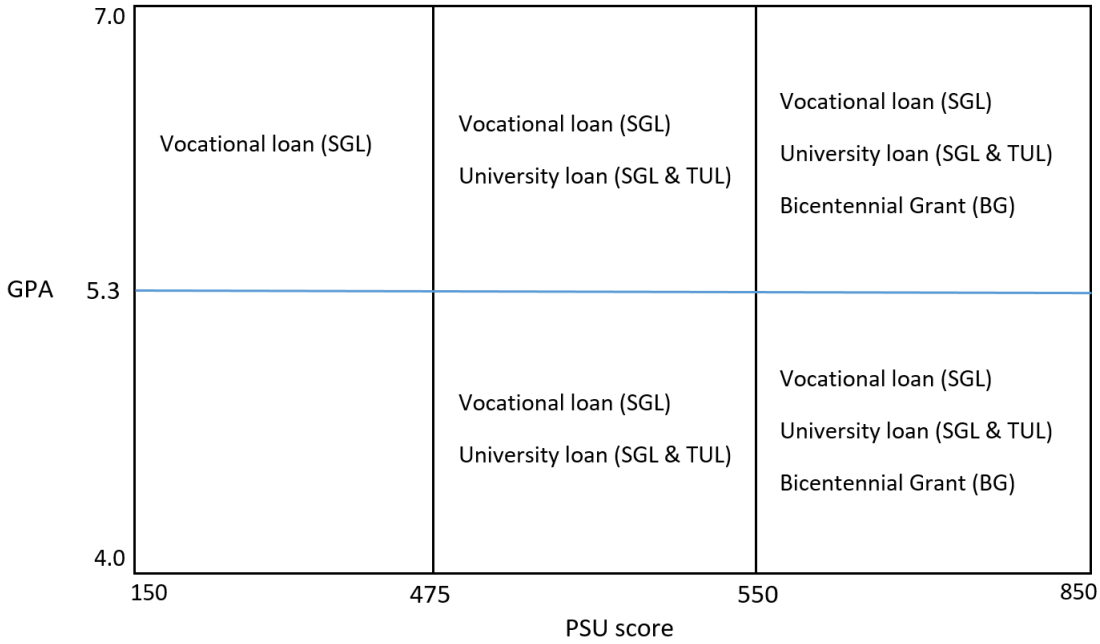
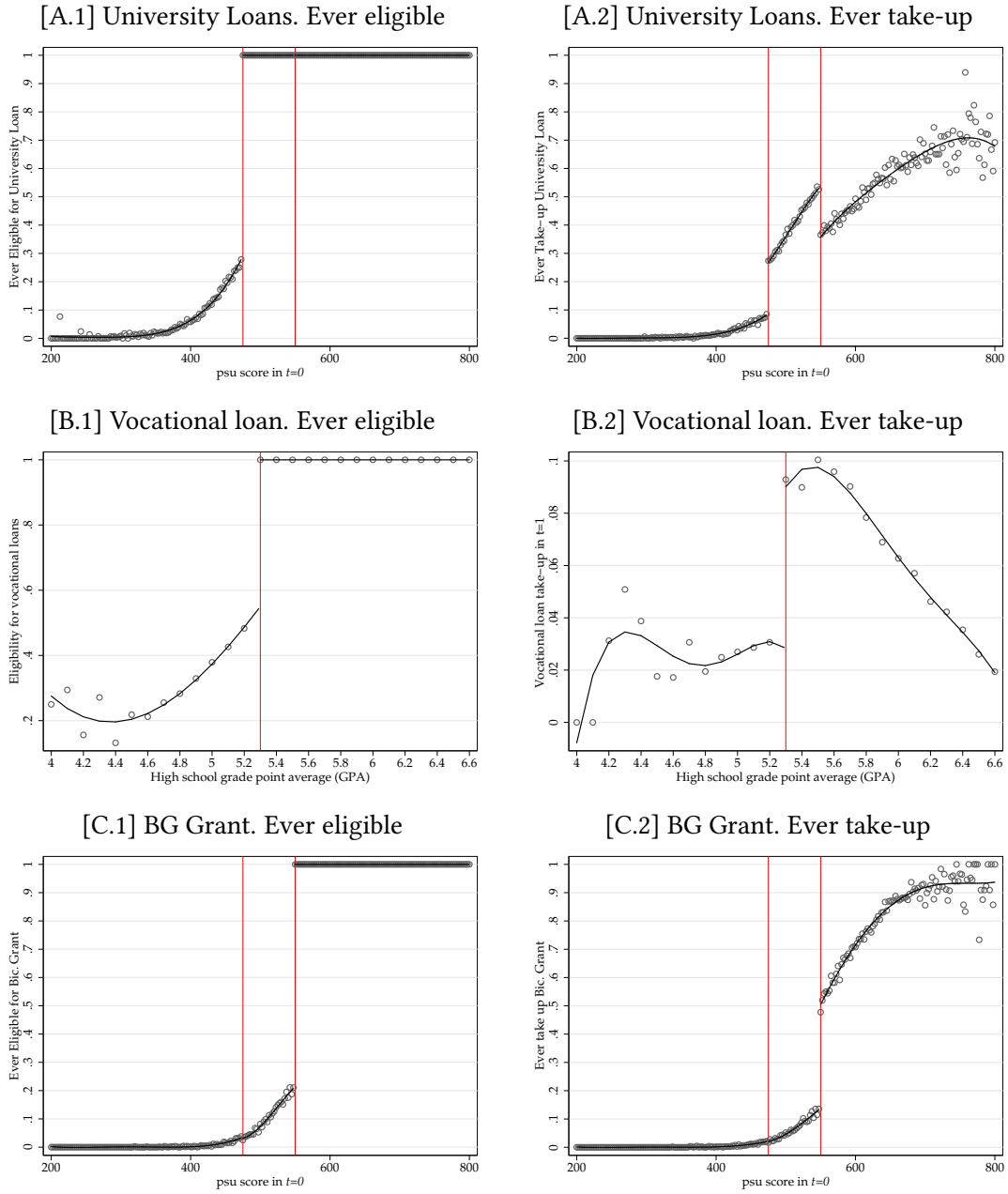
8 Figures and Tables

Figure 1: Financial Aid for Higher Education and cutoffs



Note: Figure shows a representation of the Chilean aid system, which determines eligibility to loans and grants based on three cutoffs: two based on the PSU test score (475 and 550, represented in the horizontal axis), and one based on the high school grade point average (GPA, represented in the vertical axis). Pre-qualified students (with family income quintile 1-4) are eligible for university loans (SGL and TUL) if they score at least 475 in the PSU test. Those below 475 are eligible for loans at vocational colleges (SGL) if they obtain a GPA greater than or equal to 5.3 in high school. Students from the bottom two income quintiles who score at least 550 on the PSU test are eligible for the Bicentennial Grant in traditional universities. Other grants or minor importance are also available but are not depicted here.

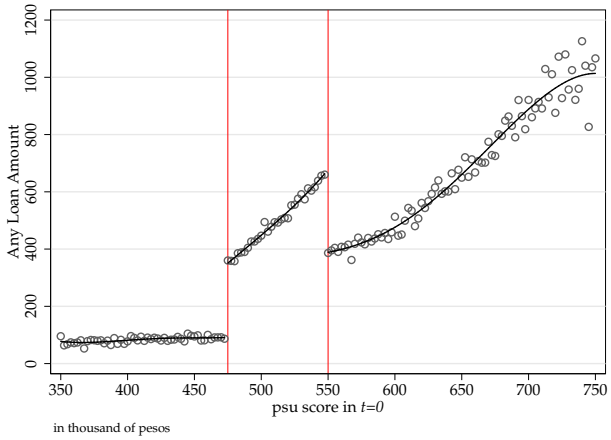
Figure 2: Eligibility for loans and grants.



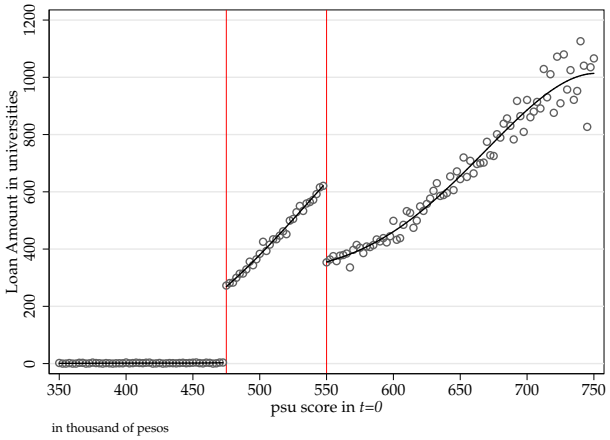
Note: Panel A (the figures on the top) shows eligibility and take-up rates for university loans (left and right, respectively) relative to the PSU test score. Panel B shows eligibility and take-up rates for vocational loans relative to high school GPA. Panel C shows eligibility and take-up rates for the Bicentennial Grant relative to the PSU score. Eligibility considers data for the period between high school and 2017. Take-up only considers first-year assignments. Each dot represents the average among students within 4 PSU-points bins. The solid lines represent fitted values from a fourth-order polynomial for the PSU score. The vertical lines correspond to the respective cutoff (475 PSU points for university loans, 5.3 GPA points for vocational loans, and 550 PSU points for BG grants).

Figure 3: Loans and grants. Borrowed and Received amounts. Around PSU cutoffs.

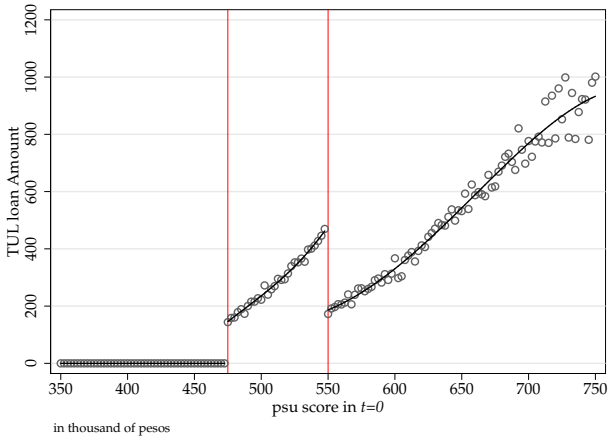
A. Any loan.



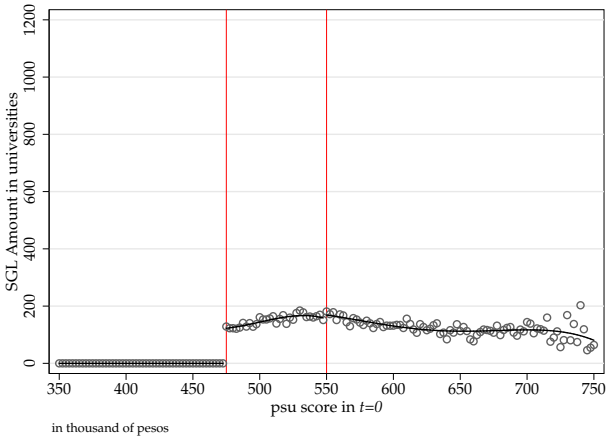
B. University loans.



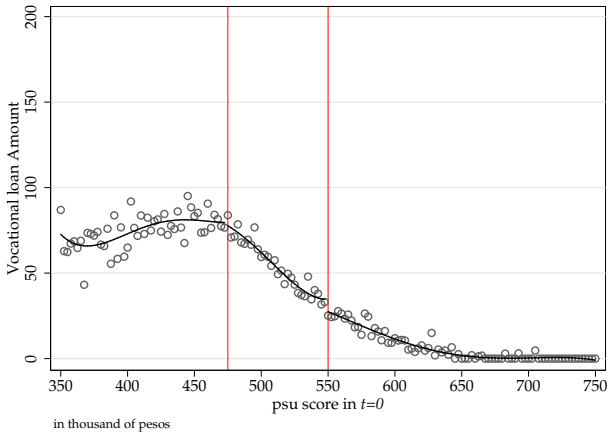
C. Traditional Univ. Loan.



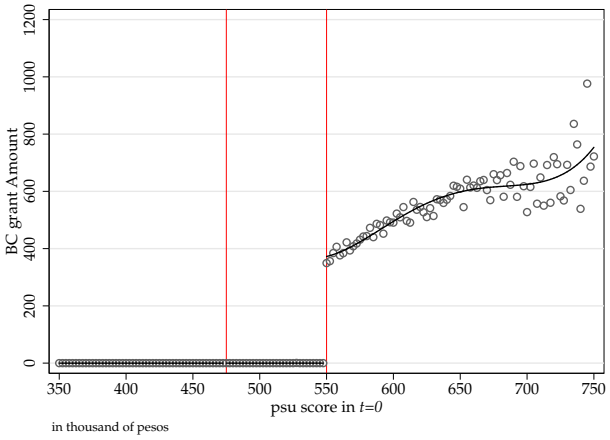
D. SGL University Loan.



E. Vocational Loan.



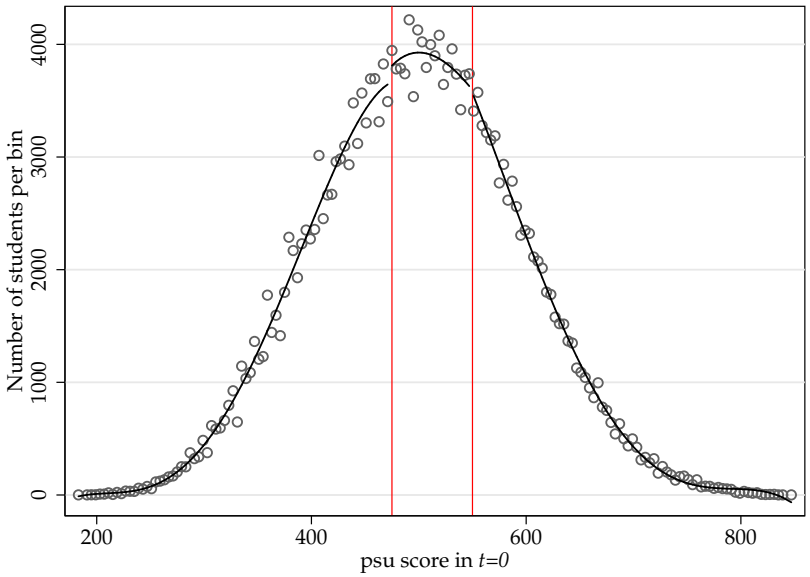
F. BG grant.



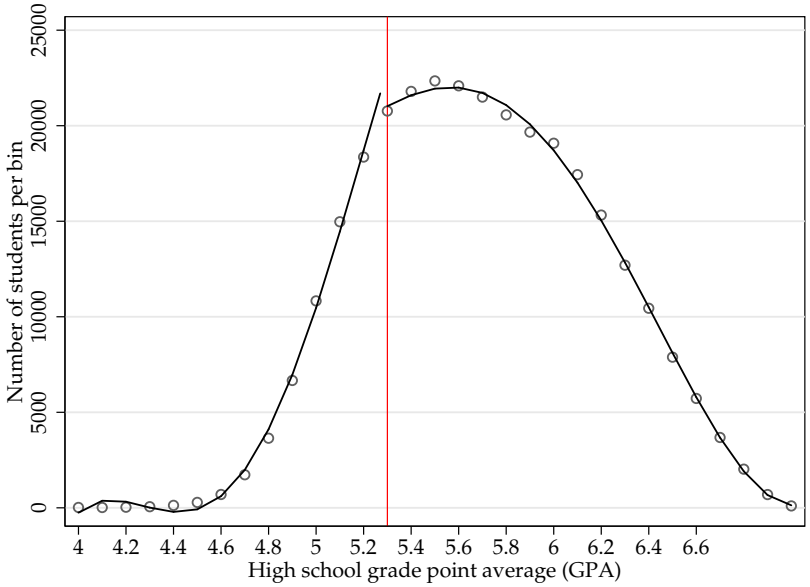
Note: The figures show loan and grant amounts in thousands of pesos of 2017 in the first year of assignment around the PSU score eligibility cutoffs. Panel A shows borrowed amounts in any loan (university and vocational loans). Panel B shows the amounts borrowed on university loans only. Panels C and D show the amounts for TUL and SGL, respectively. Panel E shows amounts for vocational loans. Panel F shows the amount granted by the BG grant.
Each dot represents the average among students in bins of 4 PSU points. The solid line represents fitted values from a fourth-order polynomial for the PSU score. The vertical lines indicate the university loan cutoff (475) and the BG grant cutoff (550).

Figure 4: The McCrary Test

[A] PSU test scores density around the PSU cutoff

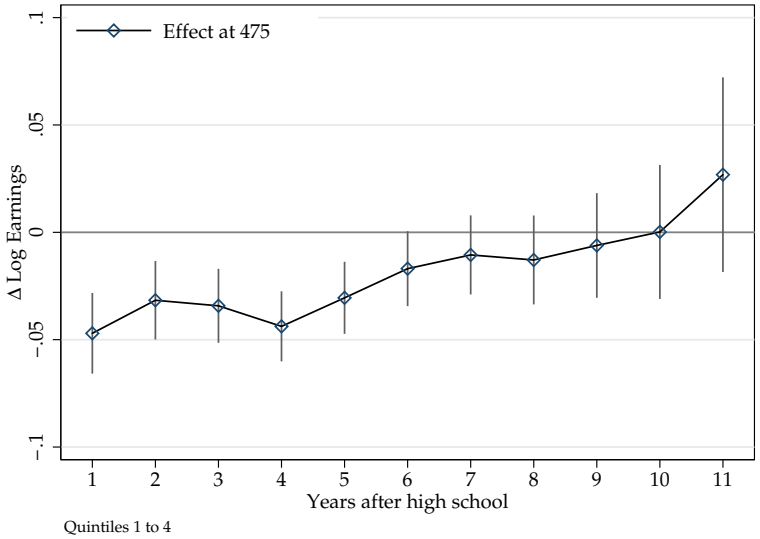


[B] High School GPA density around the GPA cutoff

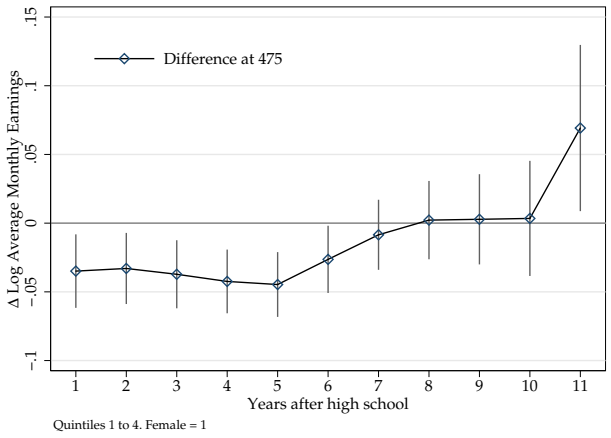


Note: The top figure shows the distribution of the PSU scores. Each dot represents the number of students within 4-point bins of PSU scores. The vertical lines correspond to the university loan cutoff (475) and the BG cutoff (550). The bottom figure shows the distribution of the high school GPAs. Each dot represents the number of students within 0.1-point bins. The vertical line corresponds to the vocational loan cutoff (5.3). The solid line represents fitted values from a fourth-order polynomial for the PSU and GPA. The sample covers the universe of students who took the PSU in the admission cohorts from 2006 to 2008 and are classified into the bottom four family income quintiles.

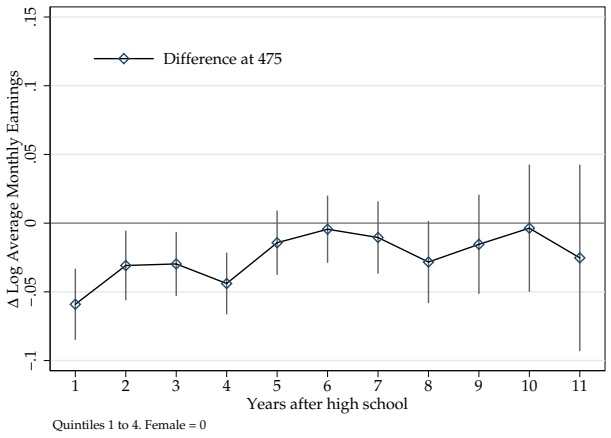
Figure 5: Effects on earnings at the university loan eligibility cutoff.
[A.] Effects at the university loan cutoff ($T_{it} \geqslant 475$). All students



[B] Female Students



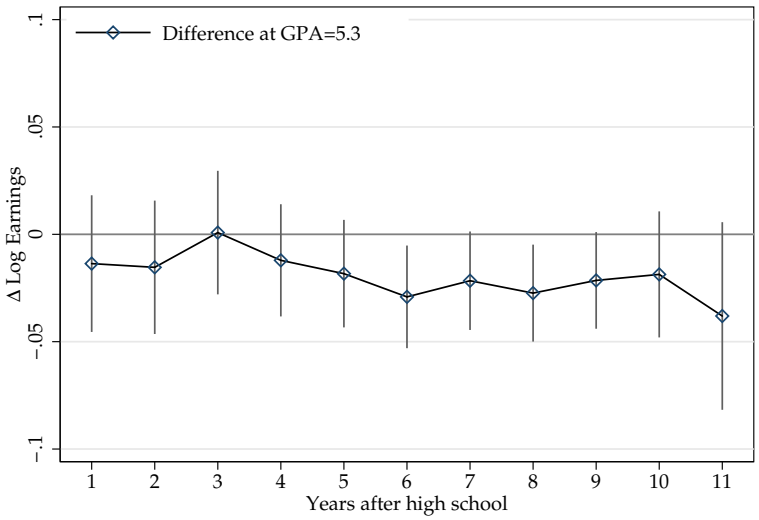
[C] Male Students



Note: The figure at the top shows the effects at the eligibility thresholds (loans and grants) on log earnings over time. Panel A shows the effects at the loan cutoff, considering all students financially pre-qualified for loans (i.e., with family incomes in quintiles 1-4). Panels B and C show the effects for women and men separately. Each dot represents a separate regression using earnings until the year indicated in the horizontal axis (different samples over time). For example, the estimation 11 years after high school only considers the high school cohort of 2006; while the estimation one year after high school uses cohorts from 2006 to 2016 measured one year after high school. The sample includes private and public sector employees. Vertical lines at each point correspond to a 95-percent confidence interval of the estimated effect.

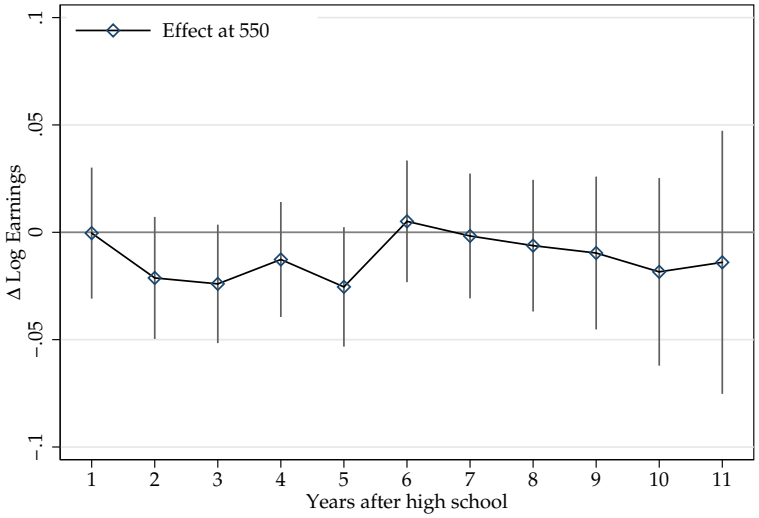
Figure 6: Effects on earnings at the grant and vocational loan eligibility cutoffs.

[A.] Effects at the vocational loan cutoff ($G_i \geqslant 5.3$)



Effect at the cutoff

[B.] Effects at Bicentennial Grant cutoff ($T_{it} \geqslant 550$)



Quintiles 1 & 2

Note: Panel A shows the effects at the grant eligibility thresholds on log earnings over time, considering students financially pre-qualified for the grant (i.e., with family incomes in quintiles 1-2). Panel B shows the effects at the vocational loan cutoff considering pre-qualified for this loan (i.e., with family incomes in quintiles 1-4). Each dot represents a separate regression using earnings until the year indicated in the horizontal axis (different samples over time). Vertical lines at each point correspond to a 95-percent confidence interval of the estimated effect. See more in the note in Figure 5.

Table 1: Balance of covariates at the cutoff.

	Models at PSU=475		Models at GPA=5.3		Models at PSU=550	
	All pre-qualified for University Loans		All pre-qualified for Vocational Loans		All pre-qualified for B. Grant	
	Mean at PSU=475	Change at PSU=475	Mean at GPA=5.3	Change at GPA=5.3	Mean at PSU=550	Change at PSU=550
	(1)	(2)	(3)	(4)	(5)	(6)
Female	0.59	0.0018 (0.0069)	0.53	0.0068 (0.0065)	0.55	-0.00038 (0.0071)
Income quintile	1.80	0.020 (0.015)	1.89	-0.0028 (0.014)	2.16	0.0085 (0.016)
Age at PSU	18.9	0.042* (0.023)	18.9	0.053** (0.022)	18.7	-0.0077 (0.014)
High School GPA	5.60	0.0049 (0.0059)	5.30	0.000 –	5.82	-0.000016 (0.0059)
Public School	0.48	0.010 (0.0070)	0.44	0.0056 (0.0065)	0.39	-0.0061 (0.0070)
Father Edu. (years)	10.6	-0.035 (0.055)	11.1	-0.094* (0.050)	11.7	0.040 (0.054)
Mother Edu. (years)	10.7	-0.018 (0.050)	11.1	-0.086* (0.046)	11.6	0.046 (0.048)
Single at PSU	0.99	-0.00092 (0.0015)	0.99	-0.00058 (0.0014)	0.99	-0.0011 (0.0012)
Work at PSU	0.079	-0.0030 (0.0037)	0.074	0.0065* (0.0035)	0.056	0.0058* (0.0034)
Household Size	4.50	-0.024 (0.026)	4.49	0.0053 (0.024)	4.42	0.014 (0.024)
Father Work Formal	1.90	0.0073 (0.027)	1.90	-0.013 (0.026)	1.77	0.069** (0.027)
Mother College	0.040	0.0011 (0.0028)	0.055	-0.0015 (0.0029)	0.075	-0.0012 (0.0038)
Father College	0.045	-0.00099 (0.0030)	0.060	-0.00021 (0.0030)	0.086	0.0028 (0.0040)
Mother Housewife	0.51	0.0025 (0.0070)	0.49	-0.0086 (0.0065)	0.49	-0.012* (0.0072)
Obs.	37,521	80,372	38,623	122,045	41,635	75,909

Note: Table shows estimated models for the effect of reaching the eligibility cutoff on the conditional mean of predetermined characteristics. The sample considers students from the high school cohorts 2006, 2007, and 2008 who were financially pre-qualified for university loans (i.e., with family incomes in quintiles 1-4). Samples for university loans and BG grants consider students within a 44-points bandwidth around the respective cutoff. The sample for the vocational loan considers students within a 0.4-points bandwidth around the GPA cutoff. The label "change at 475/550/5.3" (reported in columns 2, 4, and 6) represents the estimated change in the means of the dependent variable at the respective cutoff. Robust-to-heteroskedasticity standard errors in parentheses: *: p-value$<$ .1; **: p-value$<$ .05; ***: p-value$<$ .01.

Table 2: Degree completion and the university loan.

		Degree completion from :					Enrollment :	
	Eligibility change	University	Traditional university	Private university	Vocational college	Any higher education	Years of university	Years of vocational
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
[A.] All Students								
$1(T_{i0} \geqslant 475)$	0.728***	0.040***	0.021***	0.019***	-0.052***	-0.003	0.474***	-0.285***
	(0.004)	(0.007)	(0.004)	(0.006)	(0.007)	(0.007)	(0.040)	(0.030)
Intercept	0.272	0.304	0.084	0.221	0.388	0.657	2.521	2.211
Obs.	80372	80372	80372	80372	80372	80372	80372	80372
[B.] Female Students								
$1(T_{i0} \geqslant 475)$	0.710***	0.056***	0.028***	0.029***	-0.063***	0.000	0.553***	-0.327***
	(0.006)	(0.009)	(0.006)	(0.008)	(0.009)	(0.008)	(0.052)	(0.037)
Intercept	0.290	0.345	0.094	0.253	0.398	0.706	2.702	2.058
Obs.	47240	47240	47240	47240	47240	47240	47240	47240
[C.] Males students								
$1(T_{i0} \geqslant 475)$	0.755***	0.015	0.012*	0.003	-0.036***	-0.009	0.359***	-0.223***
	(0.007)	(0.009)	(0.006)	(0.008)	(0.010)	(0.011)	(0.061)	(0.050)
Intercept	0.245	0.243	0.070	0.174	0.374	0.586	2.259	2.433
Obs.	33131	33131	33131	33131	33131	33131	33131	33131

Note: Table presents estimated models for the effects of reaching the university loan eligibility cutoff on degree completion and years of enrollment. Panel A considers all students, while Panels B and C consider only women and men. The sample considers students from the high school cohorts 2006, 2007, and 2008 who were financially pre-qualified for university loans (i.e., with family incomes in quintiles 1-4). Column 1 shows the change in university loan eligibility. Columns 2 to 6 show completion at different types of institutions. Columns 7 and 8 show the change in years of enrollment (university and vocational enrollment, respectively). Intercepts reported in each panel represent the estimated means of the dependent variables for students with scores just below the cutoff. All regressions consider students within a 44-point bandwidth around the cutoff. Robust-to-heteroskedasticity standard errors in parentheses. *: p-value$<$ .1; **: p-value$<$ .05; ***: p-value$<$ .01.

Table 3: Program quality around the university loan eligibility cutoff.

	Enrolled in Accredited Program	Enrolled in Accredited Institution	Number of FTE teachers	Number FTE teachers with PhD	Tuition Fees	Program Duration (semesters)
	(1)	(2)	(3)	(4)	(5)	(6)
$1(T_{i0} \geqslant 475)$	0.018***	0.010**	1.025***	0.691***	70.833***	0.301***
	(0.004)	(0.005)	(0.330)	(0.085)	(9.386)	(0.036)
Intercept	0.089	0.873	41.423	2.913	1499.157	7.991
Obs.	75773	73184	70467	70467	74070	75556

Note: Table presents estimated models for the effects of reaching the university loan eligibility cutoff on the program's quality and costs. The sample considers students from the high school cohorts 2006, 2007, and 2008 who were financially pre-qualified for university loans (i.e., with family incomes in quintiles 1-4). Columns 2 to 4 are measured at the institution level, while all the others consider information at the program level. FTE stands for full-time-equivalent teachers. All regressions consider students within a 44-points bandwidth around the cutoff. Robust-to-heteroskedasticity standard errors in parentheses. *: p-value$<$ .1; **: p-value$<$ .05; ***: p-value$<$ .01.

Table 4: Labor outcomes around the university loan cutoff.

	All students		Female students		Male students	
	Observed # years after high school graduation					
	11 years	9 years	11 years	9 years	11 years	9 years
	(1)	(2)	(3)	(4)	(5)	(6)
[A.] Log Earnings						
$1(T_{i0} \geqslant 475)$	0.027	-0.006	0.069**	0.003	-0.025	-0.015
	(0.023)	(0.012)	(0.031)	(0.017)	(0.035)	(0.018)
Intercept	6.392	6.216	6.321	6.150	6.483	6.297
Observations	14,729	51,529	8,159	28,223	6,569	23,305
[B.] Accumulated experience						
$1(T_{i0} \geqslant 475)$	-1.30	-1.34***	-0.61	-1.13**	-2.15	-1.62**
	(0.936)	(0.410)	(1.167)	(0.505)	(1.513)	(0.667)
Intercept	49.32	36.80	44.73	32.79	56.10	42.61
[C.] Participation labor market						
$1(T_{i0} \geqslant 475)$	0.00	0.00	0.00	0.01	0.00	-0.01
	(0.013)	(0.007)	(0.017)	(0.009)	(0.019)	(0.010)
Intercept	0.64	0.65	0.60	0.60	0.70	0.71
Observations	23,063	80,372	13,688	47,240	9,374	33,131

Note: Table presents estimated models for the effects of reaching the university loan eligibility cutoff on labor market outcomes for two horizons (11 and nine years after high school). Panel A shows the effects on log Earnings. Panel B shows accumulated experience in months. Panel C shows participation in the labor market. For the measures 11 years after high school (11-year horizon), the model uses the high school cohort of 2006. The 9-year horizon uses cohorts 2006, 2007, and 2008, measured nine years after their respective high school graduation (2015, 2016, and 2017 resp.). All regressions consider students within a 44-point bandwidth. Columns 1 and 2 consider all students. Columns 3 and 4 (5 and 6) women (men) only. Observations in Panel B are also reported on Panel C. Robust-to-heteroskedasticity standard errors in parentheses. *: p-value$<$ .1; **: p-value$<$ .05; ***: p-value$<$ .01.

Table 5: Degree completion at the vocational loan cutoff.

		Degree completion from :					Enrollment :	
	Eligibility change	University	Traditional university	Private university	Vocational college	Any higher education	Years of university enrollment	Years of vocational enrollment
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
[A.] Eligible by GPA								
$1(G_i \geqslant 5.3)$	0.486***	-0.004	0.002	-0.007	0.004	-0.002	-0.120***	0.102***
	(0.007)	(0.006)	(0.003)	(0.006)	(0.007)	(0.008)	(0.043)	(0.033)
Intercept	0.514	0.270	0.067	0.204	0.342	0.592	2.643	2.038
Obs.	100767	100767	100767	100767	100767	100767	100767	100767
[B.] Ineligible by GPA								
$1(G_i \geqslant 5.3 \mid T_i < 475)$	1.000	-0.003	-0.001	-0.004	0.021**	0.013	-0.102**	0.189***
	(.)	(0.007)	(0.003)	(0.006)	(0.010)	(0.010)	(0.042)	(0.044)
Intercept	0.000	0.134	0.019	0.117	0.414	0.528	1.189	2.543
Obs.	49410	49410	49410	49410	49410	49410	49410	49410

Note: Table presents estimated models for the effects of reaching the vocational loan eligibility cutoff on degree completion and years of enrollment. Panel A considers all students in a window of 0.4 GPA points to each side of the cutoff (5.3). Panel B restricts the sample to students who never achieved eligibility for university loans— i.e., always scored strictly below 475 points in the PSU test. As before, the sample considers cohorts 2006 to 2008, financially pre-qualified for vocational loans— i.e., with family incomes in quintiles 1-4. Column 1 shows the change in vocational loan eligibility. As in Table 2, Columns 2 to 6 show completion at different institution types, and Columns 7 and 8 show changes in years of university and vocational enrollment. Intercepts reported in each panel represent the estimated means of the dependent variables for students with scores just below the cutoff. Robust-to-heteroskedasticity standard errors in parentheses. *: p-value$<$ .1; **: p-value$<$ .05; ***: p-value$<$ .01.

Table 6: Education quality and labor market outcomes at the vocational loan cutoff.

	Enrolled in Accredited Program	Enrolled in Accredited Institution	Number of FTE teachers	Number FTE teachers with PhD	Tuition Fees	Program Duration (semesters)
	(1)	(2)	(3)	(4)	(5)	(6)
[A.] Education Quality						
$1(G_i \geqslant 5.3)$	0.00	0.02***	-0.36	-0.16*	-19.89*	-0.05
	(0.005)	(0.006)	(0.446)	(0.087)	(11.866)	(0.041)
Intercept	0.10	0.83	41.26	3.27	1567.01	8.09
Observations	92,515	89,159	85,081	85,081	90,764	92,224

	Log Earnings		Accumulated experience		Participation labor market	
	11 years	9 years	11 years	9 years	11 years	9 years
[B.] Labor Market Outcomes						
$1(G_i \geqslant 5.3)$	-0.04	-0.02	-1.75*	-0.66	-0.02	-0.01
	(0.026)	(0.013)	(1.060)	(0.450)	(0.014)	(0.007)
Intercept	6.34	6.15	49.22	35.89	0.65	0.64
Observations	17,654	64,467	27,363	100,767	27,363	100,767

Note: Table presents estimated models for the effects of reaching the vocational loan eligibility cutoff on program's quality and labor market outcomes. Panel A shows different quality measures defined in Section 5.1.1. Panel B shows outcomes in the labor market in two horizons: nine and 11 years after high school. More details on the sample are described in Table 5. All regressions consider students within a 0.4-points bandwidth around the GPA cutoff (5.3). Robust-to-heteroskedasticity standard errors in parentheses. *: p-value$<$ .1; **: p-value$<$ .05; ***: p-value$<$ .01.

Table 7: Degree completion and years of enrollment at the BG grant eligibility cutoff.

		Degree completion from :					Enrollment :	
	Eligibility change	University	Traditional university	Private university	Vocational college	Any higher education	Years of university	Years of vocational
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$1(T_{i0} \geqslant 550)$	0.787***	0.003	-0.003	0.007	-0.016**	-0.013	0.046	-0.063**
	(0.005)	(0.009)	(0.009)	(0.008)	(0.007)	(0.008)	(0.049)	(0.032)
Intercept	0.213	0.549	0.332	0.220	0.182	0.717	4.817	0.972
Obs.	48131	47687	47687	47687	47687	47687	47687	47687

Note: Table presents estimated models for the effects of reaching the BG grant eligibility cutoff on degree completion. The sample considers students from the high school cohorts 2006, 2007, and 2008 who were financially pre-qualified for BG grants (i.e., with family incomes in quintiles 1-2). Columns show variables ordered as in Table 2. Intercepts reported in each panel represent the estimated means of the dependent variable for students with scores just below the cutoff. All regressions consider students within a 44-point bandwidth around the cutoff. Robust-to-heteroskedasticity standard errors in parentheses. *: p-value$<$ .1; **: p-value$<$ .05; ***: p-value$<$ .01.

Table 8: Education Quality and Labor Outcomes at the BG grant cutoff.

	Enrolled in Accredited Program	Enrolled in Accredited Institution	Number of FTE teachers	Number FTE teachers with PhD	Tuition Fees	Program Duration (semesters)
	(1)	(2)	(3)	(4)	(5)	(6)
[A.] Education Quality						
$1(T_{i0} \geqslant 550)$	-0.01	-0.01*	-0.18	0.22	27.68**	0.02
	(0.008)	(0.006)	(0.421)	(0.168)	(13.437)	(0.043)
Intercept	0.27	0.90	47.01	9.71	1916.20	9.67
Observations	47,008	44,561	42,172	42,172	45,487	46,855

	Log Earnings		Accumulated experience		Participation labor market	
	11 years	9 years	11 years	9 years	11 years	9 years
[B.] Labor Market Outcomes						
$1(T_{i0} \geqslant 550)$	-0.01	-0.01	-0.99	-0.92*	0.00	-0.01
	(0.031)	(0.018)	(1.123)	(0.480)	(0.016)	(0.009)
Intercept	6.53	6.29	41.79	29.35	0.63	0.62
Observations	8,690	29,336	13,799	48,131	13,799	48,131

Note: Table presents estimated models for the effects of reaching the BG grant eligibility cutoff on program's quality and labor market outcomes as in Table 6. Panel A shows different quality measures. Panel B shows outcomes in the labor market in two horizons: nine and 11 years after high school. More details on the sample are described in Table 7. All regressions consider students within a 44-points bandwidth around the BG grant cutoff. Robust-to-heteroskedasticity standard errors in parentheses. *: p-value$<$ .1; **: p-value$<$ .05; ***: p-value$<$ .01.

Table 9: Effects on degree completion and labor outcomes by family income.

	University loans		Vocational loans		BG grants	
	$S_{i0} = T_{i0}; c = 475$		$S_{i0} = G_i; c = 5.3$		$S_{i0} = T_{i0}; c = 550$	
	$q_1 - q_2$	$q_3 - q_4$	$q_1 - q_2$	$q_3 - q_4$	q_1	q_2
	(1)	(2)	(3)	(4)	(5)	(6)
[A.] Eligible for University Loans						
$1(S_{i0} \geqslant c)$	0.729***	0.725***	0.551***	0.319***	0.772***	0.815***
	(0.005)	(0.009)	(0.006)	(0.011)	(0.006)	(0.008)
Intercept	0.271	0.275	0.449	0.681	0.228	0.185
[B.] University Degree Completion						
$1(S_{i0} \geqslant c)$	0.041***	0.033**	-0.003	-0.004	-0.003	0.017
	(0.007)	(0.014)	(0.006)	(0.012)	(0.011)	(0.015)
Intercept	0.283	0.368	0.225	0.387	0.540	0.562
[C.] Traditional University Degree Completion						
$1(S_{i0} \geqslant c)$	0.020***	0.027***	-0.001	0.008	-0.015	0.020
	(0.005)	(0.008)	(0.003)	(0.007)	(0.011)	(0.014)
Intercept	0.085	0.081	0.057	0.093	0.328	0.337
[D.] Private University Degree Completion						
$1(S_{i0} \geqslant c)$	0.022***	0.006	-0.002	-0.013	0.013	-0.003
	(0.007)	(0.013)	(0.005)	(0.011)	(0.009)	(0.012)
Intercept	0.199	0.288	0.170	0.297	0.214	0.229
[E.] Vocational Degree Completion						
$1(S_{i0} \geqslant c)$	-0.056***	-0.038***	0.004	-0.003	-0.010	-0.026**
	(0.008)	(0.013)	(0.007)	(0.012)	(0.009)	(0.011)
Intercept	0.403	0.342	0.364	0.298	0.186	0.177
[F.] Any Higher Education Degree Completion						
$1(S_{i0} \geqslant c)$	-0.003	-0.004	-0.001	-0.007	-0.011	-0.013
	(0.008)	(0.013)	(0.008)	(0.012)	(0.010)	(0.013)
Intercept	0.649	0.682	0.569	0.662	0.710	0.728
Observations	59,993	20,379	87,583	34,462	30,517	17,614

Note: Table shows estimates of reaching the policy eligibility cutoff divided by income quintile. Columns 1 and 2 (3 and 4) [5 and 6] show results for university loans (vocational loans) [BG grant]. Panel A shows the change in the eligibility rate at the respective cutoff. Panels B to F show different degree completion rates as in Table 2. Observations for estimations in all panels are reported at the bottom of Panel F. Samples consider cohorts 2006-2008. Regressions for university loans and the BG grant consider students within a 44-points bandwidth around the cutoff. Regressions for the vocational loan consider students within a 0.4- points bandwidth. Robust-to-heteroskedasticity standard errors in parentheses. *: p-value$<$ .1; **: p-value$<$ .05; ***: p-value$<$ .01.

Table 10: Effects on degree completion and labor outcomes by family income.

	University loans		Vocational loans		BG grants	
	$S_{i0} = T_{i0}; c = 475$		$S_{i0} = G_i; c = 5.3$		$S_{i0} = T_{i0}; c = 550$	
	$q_1 - q_2$	$q_3 - q_4$	$q_1 - q_2$	$q_3 - q_4$	q_1	q_2
	(1)	(2)	(3)	(4)	(5)	(6)
[A.] Earnings 11 years after high school						
$1(S_{i0} \geqslant c)$	0.041	-0.021	-0.042	-0.029	-0.026	0.010
	(0.027)	(0.044)	(0.026)	(0.042)	(0.038)	(0.055)
Intercept	6.368	6.468	6.310	6.438	6.513	6.560
Observations	10,832	3,897	15,126	6,270	5,966	2,724
[B.] Earnings 9 years after high school						
$1(S_{i0} \geqslant c)$	-0.009	-0.003	-0.021	-0.020	-0.017	0.004
	(0.014)	(0.025)	(0.013)	(0.023)	(0.023)	(0.030)
Intercept	6.202	6.266	6.133	6.241	6.289	6.304
Observations	38,765	12,764	56,580	21,239	18,621	10,715
[C.] Accumulated experience 11 years after high school						
$1(S_{i0} \geqslant c)$	-1.179	-1.628	-2.174**	-0.773	-1.825	0.919
	(1.107)	(1.732)	(1.083)	(1.643)	(1.373)	(1.940)
Intercept	50.699	45.393	52.076	42.881	42.914	39.323
Observations	16,933	6,130	23,478	9,774	9,460	4,339
[D.] Accumulated experience 9 years after high school						
$1(S_{i0} \geqslant c)$	-1.779***	0.038	-0.905**	-1.746**	-1.152*	-0.436
	(0.479)	(0.781)	(0.457)	(0.698)	(0.614)	(0.768)
Intercept	38.335	32.048	38.281	31.454	30.306	27.695
Observations	59,993	20,379	87,583	34,462	30,517	17,614

Note: Table shows estimates of reaching the loan eligibility cutoff by income quintile on labor market outcomes. Panel A and B (C and D) show the effects for log-earnings (accumulated experience) after nine and 11 years after high school, respectively. Samples are described in table 9. Robust-to-heteroskedasticity standard errors in parentheses. *: p-value$<$ .1; **: p-value$<$ .05; ***: p-value$<$ .01.