<div align="center">

APPENDIX:

UNIVERSITY LOANS AND GRANTS: EFFECTS ON EDUCATIONAL AND

LABOR MARKET OUTCOMES

Alex Solís[*]

April 07, 2024

</div>

## 1  INTRODUCTION

In this appendix, I offer additional insights to complement the findings in the paper. Section 2 outlines the methodology used in constructing earnings for public workers, ensuring transparency in our data representation. Section 3 expand results in the paper, showing additional heterogeneity in the results for sex, cohorts and family income.

## 2  DATA COLLECTION

According to the budget office of the Ministry of Finance (Dirección de Presupuesto, DIPRES), the central government employed 262.8 thousand employees in 2017, and according to the Chilean Association of Municipalities, municipalities employed 88.6 thousand employees in October 2016. The web scraping process recovers 341,000 unique individuals, corresponding to about 97% of public employees. The number of employee may have increased in 2018, but this process captures a significant proportion of the workers in the public sector.

The scraping procedure searches www.portaltransparencia.cl for each organization within the government website (requires creating a free account). As Figure A.1 shows, organizations are displayed in a di-

---

[*]Affiliated researcher at Department of Economics, Universidad Católica de la Santísima Concepción, Chile.

rectory that links to specific pages for each public office, leading to the payroll. In Figure A.1, I browsed the directory and marked it with numbers in white boxes from 1 to 6. For instance, the search for the Agency for Quality Education (box 1), which is part of the Ministry of Education. (Agencia de Calidad de la Educación). Following the link leads to the web page (box 2) that contains specific contact information for that public office, as well as the link to the payroll information. On the following web page (box3), we see the information available for this dependency. In the red box, we observe the different types of contracts available in this organization. For instance, the first link shows the information for employees with fixed-period contracts ("personal a contrata"). Next, page 4 shows the available years, and then page 5 shows the available months. Finally, on page 6, we see the payroll with full names covered to protect identities. I use the gross salary as the measure of earnings.

Next, I gather professional fees for temporary workers (contrato a honorarios). Some offices (8% relative to those with professional fees) did not report the gross monthly equivalent but only the total amount for contracts over several periods. However, all offices with this type of contract state the net monthly payment. Consequently, I convert the net monthly payment to the gross equivalent to make them comparable to the gross earnings in all other contracts. I run the analysis excluding professional fees as a robustness test and found that the results are almost identical. The merging of the public sector data requires full names, which consist of two forenames and two surnames. I use the names of all students who registered for the admission test between 2007 and 2014, corresponding to 1.7 million unique names (12,000 names were not uniquely identified and excluded, 0.66%). Finally, I tested the robustness of our merge-by-name method using an extended version of the pool of names. In this case, I consider all students that registered for the admission test from 2000 to 2014. This new pool of names contains 2.6 million individuals, 98.97% of whom correspond to unique names. However, in this case, I dropped 22 thousand repeated names. As a result of this exercise, I found no differences from our main analysis.

Figure A.1: Directory of Public Divisions in Chile



Note: The web scrapper followed the pages from https://www.portaltransparencia.cl/PortalPdT/buscador-directorio-de-organismos-regulados indicated by the number on the top corner in each picture (it requires creating a free account). The example shows the payroll data in the last picture marked with the number 6. Last access June 11th, 2020.

# 3 ADDITIONAL RESULTS

Table A.1: Degree completion.

| | Eligibility change | Degree completion from : | | | | | Enrollment : | |
| | | 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** | | | | | | | | |
| $1(T_{i0} \geqslant 475 \vert G_i \geqslant 5.3)$ | 0.721*** | 0.050*** | 0.029*** | 0.022*** | -0.061*** | -0.001 | 0.550*** | -0.361*** |
| | (0.005) | (0.007) | (0.005) | (0.007) | (0.008) | (0.007) | (0.045) | (0.034) |
| Intercept | 0.279 | 0.323 | 0.096 | 0.229 | 0.403 | 0.688 | 2.570 | 2.193 |
| Obs. | 63354 | 63354 | 63354 | 63354 | 63354 | 63354 | 63354 | 63354 |
| **[B.] Ineligible by GPA** | | | | | | | | |
| $1(T_{i0} \geqslant 475 \vert G_i < 5.3)$ | 0.752*** | 0.005 | -0.001 | 0.006 | -0.026* | -0.014 | 0.224*** | -0.018 |
| | (0.009) | (0.013) | (0.006) | (0.012) | (0.014) | (0.015) | (0.083) | (0.068) |
| Intercept | 0.248 | 0.233 | 0.043 | 0.191 | 0.335 | 0.547 | 2.343 | 2.271 |
| Obs. | 17018 | 17018 | 17018 | 17018 | 17018 | 17018 | 17018 | 17018 |

Note: Table presents estimated models for the effects of reaching the university loan eligibility cutoff on degree completion. The panels restrict the sample to students above or below the vocational loan cutoff. The first, increase their eligibility at 475 from vocational loans to loans in any institution. The second, increase their eligibility from no aid to loans in any institution. All regressions consider students within a 44-point bandwidth around the cutoffs. Robust-to-heteroskedasticity standard errors in parentheses. *: $p$-value$< .1$; **: $p$-value$< .05$; ***: $p$-value$\leqslant .01$.

Table A.2: Program quality around the university loan eligibility cutoff by sex.

| | 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.] Female Students** | | | | | | |
| $1(T_{i0} \geqslant 475)$ | 0.016*** | 0.010 | 1.068*** | 0.677*** | 78.100*** | 0.316*** |
| | (0.006) | (0.007) | (0.371) | (0.112) | (12.660) | (0.045) |
| Intercept | 0.092 | 0.867 | 41.223 | 3.029 | 1508.514 | 8.035 |
| Obs. | 44776 | 43232 | 41614 | 41614 | 43611 | 44649 |
| **[B.] Male Students** | | | | | | |
| $1(T_{i0} \geqslant 475)$ | 0.022*** | 0.011 | 0.951 | 0.709*** | 59.710*** | 0.275*** |
| | (0.007) | (0.007) | (0.608) | (0.131) | (13.839) | (0.058) |
| Intercept | 0.083 | 0.882 | 41.713 | 2.741 | 1485.558 | 7.926 |
| Obs. | 30996 | 29951 | 28852 | 28852 | 30458 | 30906 |

Note: Table presents estimated models for the effects of reaching the university loan eligibility cutoff on program's quality. Panel A uses only female students, and Panel B, only male students. All regressions consider students within a 44-points bandwidth around the university loan cutoff. Robust-to-heteroskedasticity standard errors in parentheses. *: $p$-value$< .1$; **: $p$-value$< .05$; ***: $p$-value$< .01$

Table A.3: Education quality and labor market outcomes at the vocational loan cutoff for students who never reached eligibility for the university loan.

| | 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** | | | | | | |
| $1(G_i \geqslant 5.3 \vert T_i < 475)$ | 0.01** | 0.06*** | 0.08 | -0.01 | 1.52 | 0.01 |
| | (0.004) | (0.009) | (0.605) | (0.045) | (11.434) | (0.050) |
| Intercept | 0.03 | 0.77 | 37.21 | 0.76 | 1214.96 | 6.94 |
| Observations | 42,465 | 41,483 | 40,572 | 40,572 | 41,741 | 42,331 |

| | Log Earnings | | Accumulated experience | | Participation labor market | |
|---|---|---|---|---|---|---|
| | 11 years | 9 years | 11 years | 9 years | 11 years | 9 years |
| **[B.] Labor Market Outcomes** | | | | | | |
| $1(G_i \geqslant 5.3 \vert T_i < 475)$ | -0.02 | 0.00 | -1.90 | -2.08*** | -0.01 | -0.01 |
| | (0.034) | (0.016) | (1.465) | (0.622) | (0.019) | (0.010) |
| Intercept | 6.25 | 6.10 | 55.17 | 42.56 | 0.66 | 0.67 |
| | (0.030) | (0.014) | (1.302) | (0.553) | (0.017) | (0.008) |
| Observations | 8,675 | 32,745 | 13,293 | 49,410 | 13,293 | 49,410 |

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

Table A.4: Default from TUL

| | University loans c=475 PSU | Vocational loans c=5.3 GPA | BG grant c=550 PSU |
|---|---|---|---|
| | (1) | (2) | (3) |
| [A.] Income quintile 1 and 2 | | | |
| $1(S_{i0} \geqslant c)$ | -0.000 | 0.004 | -0.030 |
| | (0.025) | (0.029) | (0.019) |
| Intercept | 0.630 | 0.695 | 0.585 |
| Obs. | 9153 | 7902 | 13227 |
| [B.] Income quintile 3 and 4 | | | |
| $1(S_{i0} \geqslant c)$ | 0.013 | -0.058 | 0.003 |
| | (0.047) | (0.036) | (0.029) |
| Intercept | 0.563 | 0.628 | 0.577 |
| Obs. | 3430 | 7291 | 4803 |

Note: Table presents estimated models for the effects of reaching the eligibility cutoffs on the likelihood of defaulting TUL. Panel A (Panel B) restricts the sample to students in income quintiles 1 and 2 (3 and 4). Column one for students around the university loan cutoff ($c = 475$). Column B for the GPA cutoff ($c = 5.3$). Column 3 for the BG grant cutoff ($c = 550$). Robust-to-heteroskedasticity standard errors in parentheses. *: $p$-value$< .1$; **: $p$-value$< .05$; ***: $p$-value$< .01$.
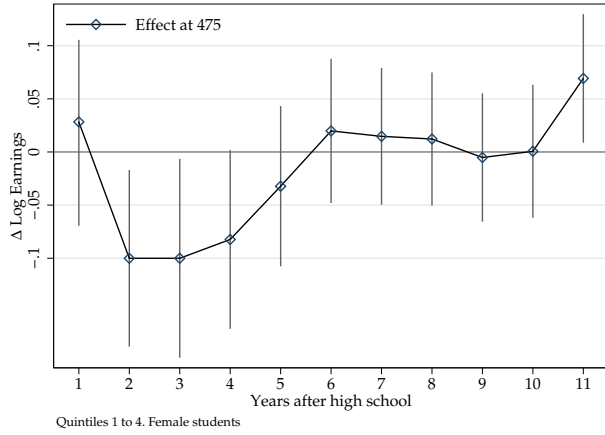
Figure A.2: Degree Completion Rates around the PSU Eligibility Cutoffs

[A.] Bachelor degree completion

[B.] Vocational degree completion
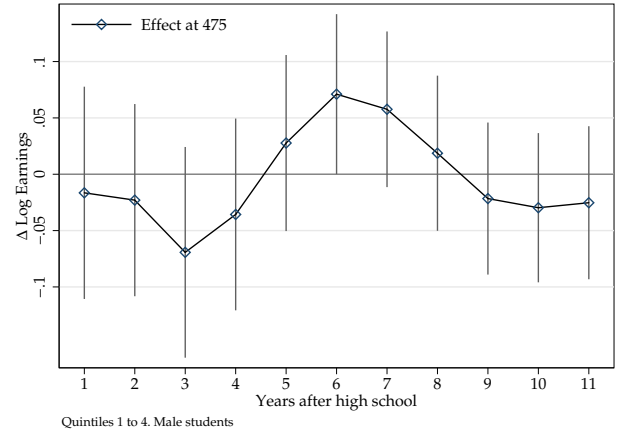
[C.] Aggregated Higher Education Graduation
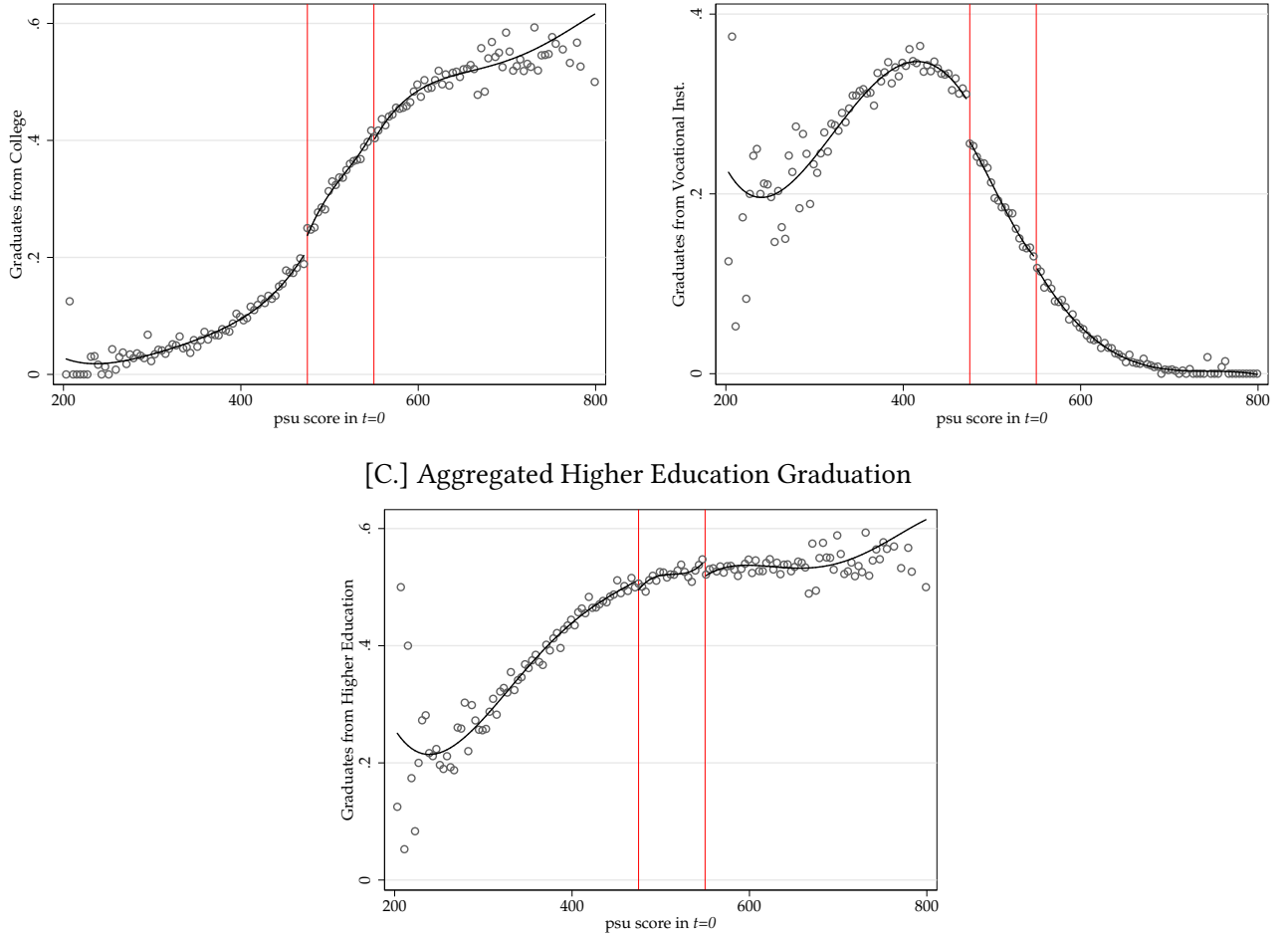
***Note*** : The figures show degree completion rates as a function of the PSU scores. Figures show bachelor's degree completion (Panel A), vocational degree completion (Panel B), and any degree completion (Panel C). Each dot represents the average among students in a bin of 4 PSU points. The solid line represents fitted values from a fourth-order polynomial for the PSU score. The vertical lines correspond to the university loan cutoff (475) and the BG scholarship cutoff (550). The sample corresponds to the pool of PSU takers from 2006 to 2008.

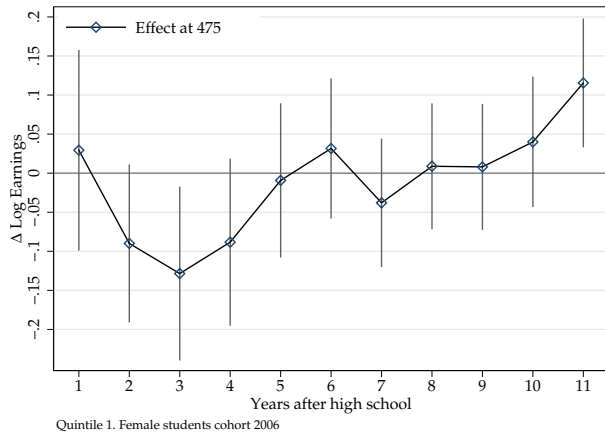Figure A.3: Earnings effects at the university loan cutoff by sex. Cohort 2006
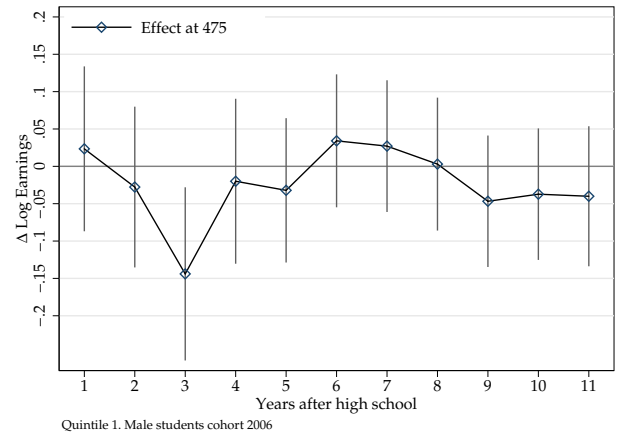
A. Females quintiles 1-4



Quintiles 1 to 4. Female students

B. Males quintiles 1-4



Quintiles 1 to 4. Male students

C. Females quintile 1



Quintile 1. Female students cohort 2006

D. Males quintile 1



Quintile 1. Male students cohort 2006
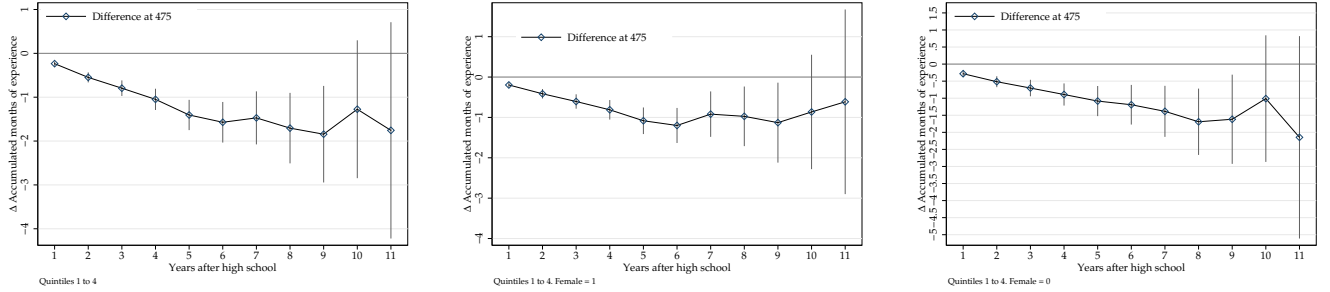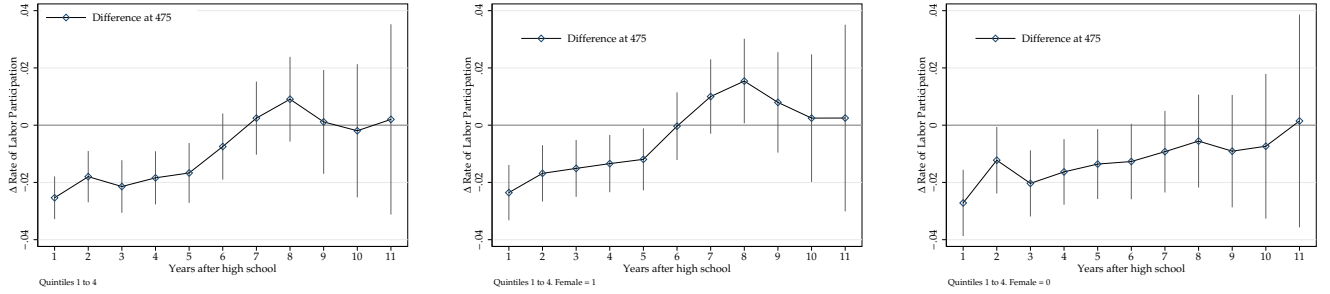
Note: The figure shows the effects on earning at the university loan cutoff for cohort 2006 only. Panels A and B show the effects for the four eligible income quintiles. Panels C and D show the effects for students in the lowest income quintile. Each dot represents a separate regression using information until the year indicated in the horizontal axis. Estimates use linear regression models and observations at most 44 points away from the cutoff. Vertical lines at each point depict the correspondent 95% confidence interval of the estimated effect.

9

Figure A.4: Effects on labor market outcomes at the university loan cutoff (475).

## [A.] Accumulated Experience by gender



## [B.] Participation Formal Sector



**Note:** The figure shows the effects of reaching the university loan eligibility threshold on two labor outcomes over time. Panel A shows the effects on accumulated experience, and Panel B on Participation in the formal sector. Figures on the left show the effects for the whole sample. Figures in the center (left) for females (males) only. Samples consider students financially pre-qualified for university loans. Each dot represents a separate regression using information until the year indicated in the horizontal axis. Vertical lines at each point depict the correspondent 95-percent confidence interval of the estimated effect.

Figure A.5: Effects on labor market outcomes at the university loan cutoff (475).

[A.] Income Quintile 1 and 2



Income quintile 1 & 2
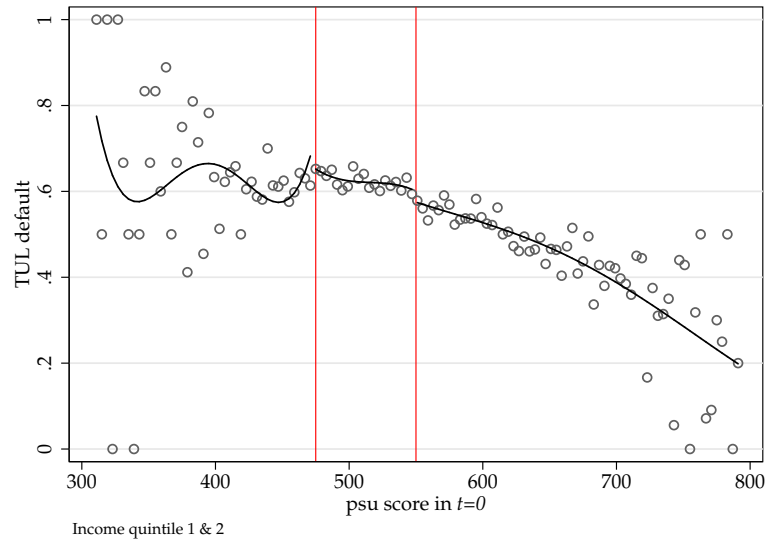
[B.] Income Quintile 3 and 4
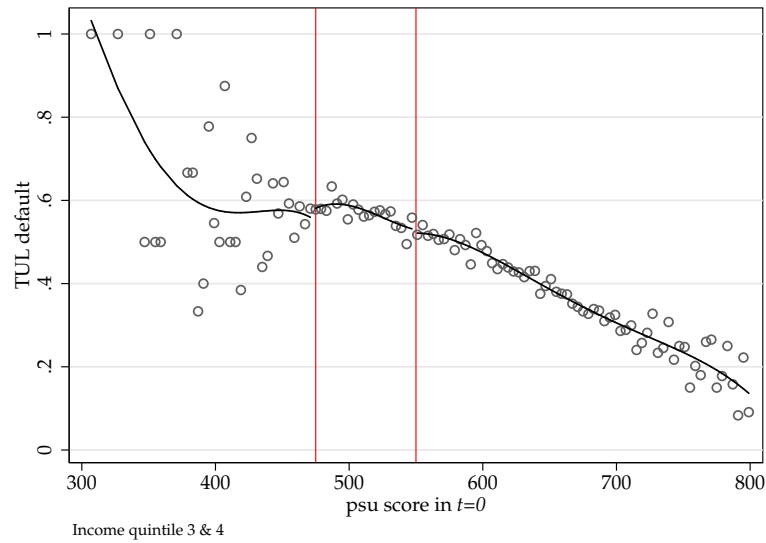


Income quintile 3 & 4

**Note:** The figure shows the empirical distribution of students in default from TUL. Panel A for the sample restricted to income quintiles 1 and 2 (eligible for BG grants). Panel B restricted to income quintiles 3 and 4 (ineligible for BG grants). Each dot represents the number of students within 4-point bins of PSU scores. The solid line represents fitted values from a fourth-order polynomial for the PSU scores. The vertical lines correspond to the university loan cutoff (475) and the BG cutoff (550).