The Long Run Impacts of Financial Aid: Evidence from California's Cal Grant

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ONLINE APPENDIX

Appendix 1. Discrepancies between Bettinger, Gurantz, Kawano, Sacerdote, and Stevens (2017) and Kane (2003)

In contrast to our study, Kane (2003) finds that being awarded a Cal Grant increases immediate college enrollment at both the GPA and income thresholds. In this Appendix, we explore the possible explanations for the discrepancy in our results.

1. Kane's primary findings may be overstated by the general research audience: Kane's paper shows that statistically significant attendance impacts at the GPA threshold are only found for the 1998 cohort. The largest effect is a 4.2 percentage point increase in college enrollment when restricting the sample to only students with full NSC coverage. However, using the same subsample in the 1999 cohort Kane finds an increase of only 0.5 percentage points, suggesting a much smaller "true" effect. The general research audience tends to quote the 1998 impact, without the broader context of null effects in 1999. Kane's income results are also on the margin of significance, but are broadly similar to our results.

2. Sample construction: In contrast to Kane (2003), we were able to construct the analytic sample ourselves, rather having CSAC to create the dataset. As a result, there may be a number of differences between our final dataset and his. Some immediate differences are listed below:
   a. We are able to include one additional year of data from the 2000 applicant cohort.
   b. Kane's full samples in 1998 and 1999 are 20% and 10% larger than ours, respectively. It is unclear why our sample is smaller, though a small part of this is due to differences in NSC matching (by restricting to within 0.6 GPA points of the threshold in 1998 we lose about 350 students between 3.50 and 3.55 GPA). Even though his sample is only slightly larger than ours, the magnitude of our standard errors when running year-by-year results is roughly twice those of Kane.
   c. We are able to eliminate low-income students who are eligible for Cal Grant B, thus improving the treatment-control contrast for the group of students we label "low-income" and Kane labels "Fin. Eligible for B or A".

3. <u>Functional form issues</u>: Kane's insight in using a regression discontinuity to identify causal treatment effects was a significant step forward for economic research. In the intervening years, the RD treatment effects literature has recommended a number of suggestions and innovations to credibly identify causal impacts, which were not common at the time. A number of Kane's choices are now less standard in the literature, including:

    a. Kane uses the full sample of students with GPA between 2.5 and 3.6, rather than a narrow bandwidth around the discontinuity. His sample is roughly twice our preferred bandwidth, and the paper provides no bandwidth robustness checks.

    b. His main GPA specification utilizes cubic polynomials and the income specification utilizes fourth degree polynomials, rather than the now generally standard local linear regression. His quadratic GPA robustness check is only marginally significant on his subsample, and insignificant for the full sample. There are no linear results shown.

    c. Based on the description within the paper, it is unclear whether he allows his slope variables to vary across the thresholds.

    d. There do not appear to be any standard error adjustments, such as those advocated by Lee and Card (2008), which could push his initial results towards statistical insignificance.

    e. He estimates impacts using a probit with marginal effects, rather than in an OLS framework, though based on our comparisons of these two methods we do not believe this would change any of the results.

In Appendix Table A1, we show results that attempt to mimic Kane's paper, focusing only on Kane's "Financially eligible for A only" sample. We use enrollment based on NSC data as our outcome variable. In particular, we use cubic polynomials to estimate slopes over the full 2.5 to 3.6 GPA bandwidth, compare OLS to probits, and vary the functional forms. Using these specifications, and assuming the functional form is allowed to vary on either side of the discontinuity, we get results that are slightly more similar to Kane's results. Nonetheless, our results are imprecise and statistically insignificant within each individual year.

Appendix Table A1. Postsecondary enrollment, GPA threshold, Kane (2003) results

Model	OLS	OLS	Probit	Probit	Probit	Probit	Probit
Functional form	Linear	Cubic	Cubic	Cubic	Cubic	Quadratic	Quartic
Slope varies across threshold	Y	Y	Y	Y	N	Y	Y
Covariates	N	N	N	Y	Y	Y	Y
GPA Threshold							
Cohort=1998	0.007	0.041	0.041	0.040	-0.001	0.006	0.032
	(0.019)	(0.038)	(0.038)	(0.038)	(0.025)	(0.029)	(0.047)
N	9794	9794	9794	9658	9658	9658	9658
Cohort=1999	0.009	0.031	0.031	0.031	0.015	0.020	0.046
	(0.018)	(0.035)	(0.035)	(0.036)	(0.024)	(0.027)	(0.045)
N	10632	10632	10632	10060	10060	10060	10060

Notes: All regressions include students with GPA between 2.5 and 3.6. Standard errors are unadjusted in all regressions.

Appendix Table A2: Smoothness of Covariates

	Covariates							
	Student GPA	Family Income	Age	Female	Parent college educated	Citizen	Parents married	Family size
GPA Threshold								
Tax data		24.090	0.056	-0.006	0.002	0.004	-0.001	0.010
		(186.613)	(0.072)	(0.013)	(0.009)	(0.007)	(0.009)	(0.029)
NSC data		-49.157	-0.009	0.006	0.000	0.002	-0.000	-0.013
		(173.000)	(0.014)	(0.011)	(0.009)	(0.011)	(0.014)	(0.024)
Income Threshold								
Tax data	0.003		-0.027	0.014	0.018	0.009	-0.003	-0.034
	(0.008)		(0.033)	(0.017)	(0.014)	(0.007)	(0.008)	(0.036)
NSC data	0.002		0.015	0.002	0.017	0.008	-0.009	-0.014
	(0.008)		(0.016)	(0.015)	(0.014)	(0.009)	(0.011)	(0.032)

Notes. This table presents estimates of the effect of Cal Grant eligibility on applicant's demographic characteristics. Regressions at the GPA threshold include income-eligible applicants within 0.3 points of the GPA threshold, and regressions at the income threshold include GPA-eligible applicants within $10,000 of the income threshold. There are 31,500 and 18,097 observations at the GPA and income thresholds, respectively. All regressions include year-by-family size fixed effects, except when family size is the outcome. A linear function of the running variable and a uniform kernel are used. Standard errors clustered by GPA for GPA threshold regressions and are heteroscedasticity-robust in income threshold regressions. Regressions using female as the outcome variable only include the 1999 and 2000 cohorts because of missing data problems with the 1998 cohort (sample sizes are 20,377 and 12,398 for the GPA and income thresholds, respectively).

Appendix Table A3. Educational Outcomes, NSC data

	GPA			Income		
	Mean	Estimate	IV	Mean	Estimate	IV
College Completion (NSC)						
Bachelor Degree	46.2%	0.046***	0.146***	67.2%	0.030	0.076
		(0.015)	(0.047)		(0.019)	(0.049)
Graduate Degree	11.7%	0.031***	0.097***	20.6%	0.029*	0.075*
		(0.011)	(0.034)		(0.017)	(0.044)
College Attendance						
Attend	74.9%	0.019*	0.059*	85.9%	0.009	0.023
		(0.010)	(0.031)		(0.015)	(0.038)
Community College	40.2%	-0.005	-0.016	26.7%	-0.027	-0.068
		(0.013)	(0.040)		(0.018)	(0.046)
Four-Year Public	35.6%	0.016	0.051	52.1%	-0.019	-0.050
		(0.015)	(0.045)		(0.021)	(0.053)
Private	8.5%	0.007	0.024	15.8%	0.042***	0.107***
		(0.007)	(0.023)		(0.016)	(0.040)
First-Stage						
Ever received a Cal Grant payment	19.9%	0.315***	--	7.2%	0.391***	--
		(0.013)			(0.016)	
Total Cal Grant Aid Received	$1,520	3009.515***	--	$924	7674.893***	--
		(210.425)			(408.978)	

Notes. * p<0.1, ** p<0.05, *** p<0.01. This table provides estimates for the effect of Cal Grant eligibility on college attedance and degree attainment outcomes.Regressions at the GPA threshold include income-eligible applicants within 0.3 points of the GPA threshold, and regressions at the income threshold include GPA-eligible applicants within $10,000 of the income threshold. There are 31,500 and 18,097 observations at the GPA and income thresholds, respectively. All regressions include year-by-family size fixed effects. A linear function of the running variable and a uniform kernel are used. Standard errors clustered by GPA for GPA threshold regressions and are heteroscedasticity-robust in income threshold regressions. IV outcomes utilizes whether a student ever received a Cal Grant payment as the first-stage. Reduced form control means are average values for students within 0.05 below the GPA threshold or within $1000 above the income threshold.

Appendix Table A4. Robustness of Educational Attainment Results to Varying Bandwidths

GPA Threshold

Bandwidth	0.1	0.2	0.3	0.4	0.5	0.6	CCT
Receives Cal Grant	0.372***	0.387***	0.386***	0.398***	0.243***	0.227***	0.376***
	(0.011)	(0.011)	(0.010)	(0.008)	(0.023)	(0.020)	(0.010)
Cal Grant payment	4,061.010***	4,265.655***	4,311.169***	4,582.296***	2,937.518***	2,870.417***	4,133.569***
	(204.620)	(190.579)	(172.946)	(153.525)	(269.016)	(228.699)	(188.845)
Ever attends	-0.002	0.003	0.005	0.004	0.002	0.003	0.002
	(0.010)	(0.006)	(0.005)	(0.004)	(0.003)	(0.002)	(0.007)
CA Community College	-0.030**	-0.024**	-0.011	-0.015	-0.011*	-0.013**	-0.029**
	(0.012)	(0.011)	(0.011)	(0.009)	(0.006)	(0.006)	(0.013)
CA Four-Year Public	-0.004	0.004	0.001	-0.002	0.001	-0.006	0.010
	(0.020)	(0.014)	(0.012)	(0.010)	(0.006)	(0.005)	(0.016)
CA Private	0.005	0.004	0.002	0.010*	0.011**	0.015***	-0.003
	(0.009)	(0.008)	(0.007)	(0.006)	(0.005)	(0.004)	(0.008)
Bachelor's degree	0.028	0.041**	0.046***	0.036***	0.032***	0.035***	0.042**
	(0.026)	(0.019)	(0.015)	(0.013)	(0.012)	(0.011)	(0.018)
Graduate degree	0.025	0.026*	0.031***	0.013	0.008	0.009	0.027**
	(0.018)	(0.013)	(0.011)	(0.010)	(0.009)	(0.008)	(0.012)
N (1098-T attendance data)	10,522	21,063	31,500	41,499	51,815	59,698	X
N (NSC degree completion)	6,569	13,075	19,462	25,511	31,702	36,273	X

Income Threshold

Bandwidth	$2,500	$5,000	$7,500	$10,000	$15,000	$20,000	CCT
Receives Cal Grant	0.431***	0.400***	0.423***	0.420***	0.445***	0.467***	0.405***
	(0.023)	(0.017)	(0.013)	(0.012)	(0.009)	(0.008)	(0.016)
Cal Grant payment	8,287.273***	7,878.043***	8,022.470***	8,115.300***	8,552.997***	8,722.359***	7,826.547***
	(582.005)	(409.200)	(332.918)	(286.167)	(229.716)	(197.062)	(413.768)
Ever attends	-0.004	-0.000	0.000	-0.001	0.004	0.002	-0.004
	(0.007)	(0.005)	(0.004)	(0.003)	(0.003)	(0.002)	(0.005)
CA Community College	-0.003	-0.011	-0.032**	-0.029**	-0.016	-0.023**	-0.012
	(0.026)	(0.018)	(0.015)	(0.013)	(0.011)	(0.009)	(0.018)
CA Four-Year Public	-0.081***	-0.054***	-0.045***	-0.046***	-0.039***	-0.036***	-0.094***
	(0.027)	(0.020)	(0.016)	(0.014)	(0.011)	(0.010)	(0.025)
CA Private	0.057**	0.050***	0.053***	0.056***	0.058***	0.054***	0.053***
	(0.024)	(0.017)	(0.014)	(0.012)	(0.010)	(0.009)	(0.017)
Bachelor's degree	-0.035	0.005	0.027	0.030	0.032**	0.027*	0.005
	(0.038)	(0.027)	(0.022)	(0.019)	(0.016)	(0.014)	(0.029)
Graduate degree	0.030	0.040	0.029	0.029*	0.010	0.011	0.037
	(0.034)	(0.025)	(0.020)	(0.017)	(0.014)	(0.013)	(0.026)
N (1098-T attendance data)	4,629	9,094	13,549	18,097	27,299	36,266	X
N (NSC degree completion)	2,368	4,577	6,837	9,083	13,645	18,144	X

Notes. * p<0.1, ** p<0.05, *** p<0.01. This table provides estimates for the effect of Cal Grant eligibility on college attedance and degree attainment outcomes, varying the bandwidth of students that are inclucded in the estimates. All regressions include student age, parental education, parental marital status, citizen status, and year-by-family size fixed effects. A linear function of the running variable and a uniform kernel are used. Standard errors are clustered by GPA for GPA threshold regressions and are heteroskedasticity-robust in income threshold regressions. NSC regressions only include individuals who listed NSC-covered schools on their FAFSA. CCT regressions use an outcome-specific bandwidth, which varies in size.

Appendix Table A5. Robustness of Educational Attainment Results to Covariates and Functional Form

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Functional Form	Linear	Quad	Quad	Quad	Quad	Quad	Quad	Quad
Covariates	N	Y	Y	Y	Y	Y	Y	Y
GPA Threshold								
Bandwidth	0.3	0.1	0.2	0.3	0.4	0.5	0.6	CCT
Ever attends	0.005	0.004	-0.003	-0.002	0.002	-0.001	-0.001	-0.003
	(0.005)	(0.016)	(0.010)	(0.008)	(0.006)	(0.004)	(0.003)	(0.012)
CA Community College	-0.012	-0.032**	-0.034**	-0.031**	-0.019*	-0.009	-0.001	-0.038***
	(0.011)	(0.012)	(0.014)	(0.012)	(0.011)	(0.009)	(0.007)	(0.012)
CA Four-Year Public	0.001	0.015	0.017	0.011	0.010	0.004	-0.007	0.013
	(0.013)	(0.029)	(0.023)	(0.018)	(0.015)	(0.009)	(0.008)	(0.027)
CA Private	0.003	-0.002	-0.005	-0.006	-0.007	-0.005	0.008	0.002
	(0.007)	(0.010)	(0.009)	(0.009)	(0.008)	(0.007)	(0.006)	(0.010)
Bachelor's Degree	0.045***	0.002	0.047	0.040	0.045**	0.039**	0.033**	0.044
	(0.015)	(0.021)	(0.029)	(0.025)	(0.020)	(0.018)	(0.016)	(0.027)
Graduate Degree	0.030***	-0.021	0.026	0.025	0.038**	0.026**	0.018	0.024
	(0.011)	(0.017)	(0.018)	(0.016)	(0.015)	(0.013)	(0.012)	(0.017)
N (1098-T attendance data)	31,500	10,522	21,063	31,500	41,499	51,815	59,698	X
N (NSC degree completion)	19,462	6,569	13,075	19,462	25,511	31,702	36,273	X
Income Threshold								
Bandwidth	$10,000	$2,500	$5,000	$7,500	$10,000	$15,000	$20,000	CCT
Ever attends	-0.001	-0.004	-0.004	-0.005	-0.003	-0.000	0.003	-0.000
	(0.003)	(0.009)	(0.006)	(0.005)	(0.004)	(0.004)	(0.003)	(0.006)
CA Community College	-0.031**	0.001	-0.008	-0.008	-0.023	-0.027**	-0.024**	-0.006
	(0.013)	(0.033)	(0.023)	(0.019)	(0.016)	(0.013)	(0.012)	(0.023)
CA Four-Year Public	-0.047***	-0.068*	-0.049**	-0.062***	-0.055***	-0.041***	-0.038***	-0.068**
	(0.014)	(0.035)	(0.025)	(0.020)	(0.018)	(0.014)	(0.013)	(0.032)
CA Private	0.057***	0.047	0.047**	0.056***	0.058***	0.058***	0.056***	0.047**
	(0.012)	(0.031)	(0.022)	(0.018)	(0.016)	(0.013)	(0.011)	(0.022)
Bachelor's Degree	0.030	-0.047	-0.032	-0.017	0.011	0.028	0.032	-0.053
	(0.020)	(0.055)	(0.040)	(0.033)	(0.029)	(0.024)	(0.021)	(0.042)
Graduate Degree	0.030*	0.017	0.016	0.037	0.039	0.048**	0.029	0.014
	(0.018)	(0.051)	(0.036)	(0.030)	(0.026)	(0.021)	(0.019)	(0.038)
N (1098-T attendance data)	18,097	4,629	9,094	13,549	18,097	27,299	36,266	X
N (NSC degree completion)	9,083	2,368	4,577	6,837	9,083	13,645	18,144	X

Notes. * p<0.1, ** p<0.05, *** p<0.01. This table provides estimates for the effect of Cal Grant eligibility on college atteered and degree attainment outcomes. In column 1, a linear function of the running variable and a uniform kernel are used. In columns 2-8, regressions include student age, parental education, parental marital status, citizen status, and year-by-family size fixed effects, use a quadratic function of the running variable, and a uniform kernel. Standard errors are clustered by GPA for GPA threshold regressions and are heteroskedasticity-robust in income threshold regressions. NSC regressions only include individuals who listed NSC-covered schools on their FAFSA. CCT regressions use an outcome-specific bandwidth, which varies in size.

Appendix Table A6. Robustness of Educational Attainment Results to Triangular Kernel

GPA Threshold

Bandwidth	0.10	0.20	0.30	0.40	0.50	0.60	CCT
Ever attends	0.001	0.001	0.002	0.003	0.004	0.004	0.001
	(0.011)	(0.007)	(0.005)	(0.004)	(0.004)	(0.004)	(0.012)
CA Community College	-0.032***	-0.029***	-0.019**	-0.016*	-0.014	-0.015*	-0.036***
	(0.010)	(0.010)	(0.010)	(0.009)	(0.009)	(0.008)	(0.010)
CA Four-Year Public	0.004	0.009	0.004	0.002	0.000	-0.000	0.003
	(0.023)	(0.016)	(0.013)	(0.011)	(0.010)	(0.010)	(0.025)
CA Private	0.002	0.001	0.000	0.004	0.007	0.010*	-0.004
	(0.008)	(0.008)	(0.007)	(0.006)	(0.006)	(0.005)	(0.008)
Bachelor's Degree	0.021	0.044**	0.043**	0.039***	0.035***	0.034***	0.044**
	(0.023)	(0.022)	(0.017)	(0.015)	(0.013)	(0.012)	(0.021)
Graduate Degree	0.010	0.026*	0.028**	0.023**	0.015	0.013	0.027*
	(0.016)	(0.014)	(0.012)	(0.010)	(0.009)	(0.009)	(0.014)
N (1098-T attendance data)	10,522	21,063	31,500	41,499	51,815	59,698	X
N (NSC degree completion)	6,569	13,075	19,462	25,511	31,702	36,273	X

Income Threshold

Bandwidth	$2,500	$5,000	$10,000	$15,000	$20,000	$25,000	CCT
Ever attends	-0.006	-0.003	-0.001	0.001	0.002	0.002	-0.003
	(0.007)	(0.005)	(0.004)	(0.003)	(0.003)	(0.002)	(0.006)
CA Community College	-0.009	-0.004	-0.024*	-0.024**	-0.023**	-0.024***	-0.008
	(0.029)	(0.020)	(0.014)	(0.012)	(0.010)	(0.009)	(0.023)
CA Four-Year Public	-0.081***	-0.066***	-0.048***	-0.043***	-0.039***	-0.038***	-0.078**
	(0.030)	(0.021)	(0.015)	(0.012)	(0.011)	(0.010)	(0.031)
CA Private	0.063**	0.056***	0.054***	0.059***	0.057***	0.057***	0.050**
	(0.026)	(0.019)	(0.013)	(0.011)	(0.010)	(0.009)	(0.020)
Bachelor's Degree	-0.047	-0.010	0.009	0.022	0.030*	0.030*	-0.053
	(0.055)	(0.030)	(0.024)	(0.021)	(0.017)	(0.015)	(0.042)
Graduate Degree	0.022	0.031	0.033	0.033*	0.025	0.018	0.014
	(0.038)	(0.027)	(0.022)	(0.019)	(0.016)	(0.014)	(0.038)
N (1098-T attendance data)	4,629	9,094	13,549	18,097	27,299	36,266	X
N (NSC degree completion)	2,368	4,577	6,837	9,083	13,645	18,144	X

Notes. * p<0.1, ** p<0.05, *** p<0.01. This table provides estimates for the effect of Cal Grant eligibility on college attedance and degree attainment outcomes. All regressions include student age, parental education, parental marital status, citizen status, and year-by-family size fixed effects. A linear function of the running variable and a triangular kernel are used. Standard errors are clustered by GPA for GPA threshold regressions and are heteroskedasticity-robust in income threshold regressions. NSC regressions only include individuals who listed NSC-covered schools on their FAFSA. CCT regressions use an outcome-specific bandwidth, which varies in size.

Appendix Table A7. Robustness of Income and Demographic Outcomes to Varying Bandwidths

<u>GPA Threshold</u>

Bandwidth	0.1	0.2	0.3	0.4	0.5	0.6	CCT
Filed a tax return	0.002	0.002	0.004	-0.000	-0.003	-0.001	0.001
	(0.009)	(0.007)	(0.006)	(0.005)	(0.003)	(0.002)	(0.008)
Log labor income	0.084***	0.051**	0.055***	0.060***	0.018*	0.018*	0.057***
	(0.019)	(0.020)	(0.018)	(0.015)	(0.010)	(0.009)	(0.020)
Income percentile	0.865	1.153*	1.344***	1.002**	0.439	0.301	0.865
	(0.556)	(0.570)	(0.497)	(0.407)	(0.288)	(0.241)	(0.556)
Log household size-adjusted AGI	0.005	0.013	0.031*	0.029**	0.020**	0.018**	0.005
	(0.024)	(0.018)	(0.016)	(0.014)	(0.010)	(0.008)	(0.024)
Live in CA	-0.009	-0.003	-0.004	-0.001	-0.004	-0.005	-0.004
	(0.010)	(0.007)	(0.007)	(0.006)	(0.005)	(0.004)	(0.009)
Married	-0.022	-0.014	-0.015	-0.006	0.006	0.005	-0.020
	(0.019)	(0.015)	(0.012)	(0.010)	(0.006)	(0.005)	(0.019)
Has kids	0.000	-0.009	-0.023***	-0.017**	-0.003	-0.000	0.000
	(0.011)	(0.008)	(0.008)	(0.007)	(0.005)	(0.005)	(0.011)
N	52,610	105,315	157,500	207,495	259,075	298,490	X

<u>Income Threshold</u>

Bandwidth	$2,500	$5,000	$7,500	$10,000	$15,000	$20,000	CCT
Filed a tax return	-0.020***	-0.016***	-0.009***	-0.006*	-0.002	-0.003	-0.017***
	(0.006)	(0.004)	(0.003)	(0.003)	(0.002)	(0.002)	(0.004)
Log labor income	-0.037	-0.071***	-0.054***	-0.020	-0.015	-0.024**	-0.063***
	(0.030)	(0.021)	(0.018)	(0.015)	(0.013)	(0.011)	(0.023)
Income percentile	-1.593**	-2.289***	-1.591***	-0.468	-0.460	-0.667**	-2.350***
	(0.726)	(0.516)	(0.422)	(0.367)	(0.300)	(0.262)	(0.596)
Log household size-adjusted AGI	-0.003	-0.037**	-0.036***	-0.005	-0.013	-0.022**	-0.027
	(0.024)	(0.017)	(0.014)	(0.012)	(0.010)	(0.009)	(0.018)
Live in CA	0.005	0.011	0.017***	0.024***	0.014***	0.010***	0.010
	(0.011)	(0.008)	(0.006)	(0.005)	(0.004)	(0.004)	(0.010)
Married	-0.023*	-0.006	0.002	0.005	0.009	0.011**	-0.001
	(0.013)	(0.010)	(0.008)	(0.007)	(0.006)	(0.005)	(0.010)
Has kids	-0.016	0.007	0.009	0.003	0.007	0.007	0.008
	(0.012)	(0.009)	(0.007)	(0.006)	(0.005)	(0.004)	(0.007)
N	23,145	45,470	67,745	90,485	136,495	181,330	X

Notes. * p<0.1, ** p<0.05, *** p<0.01. This table provides estimates for the effect of Cal Grant eligibility on income and demographic outcomes 10 through 14 years after application, varying the bandwidth of students that are inclucded in the estimates. All regressions include student age, parental education, parental marital status, citizen status, and year-by-family size fixed effects. A linear function of the running variable and a uniform kernel are used. Standard errors are clustered by GPA for GPA threshold regressions and are heteroskedasticity-robust in income threshold regressions. Number of observations reported for income and demographic outcomes correspond to the "filed a tax return" outcome variable. CCT regressions use an outcome-specific bandwidth, which varies in size.

Appendix Table A8. Robustness of Income and Demographic Outcomes to Covariates and Functional Form

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Functional Form	Linear	Quad	Quad	Quad	Quad	Quad	Quad	Quad
Covariates	N	Y	Y	Y	Y	Y	Y	Y
GPA Threshold								
Bandwidth	0.3	0.1	0.2	0.3	0.4	0.5	0.6	CCT
Filed a tax return	0.004	0.019*	0.001	-0.000	0.006	0.000	-0.001	0.003
	(0.006)	(0.010)	(0.009)	(0.008)	(0.007)	(0.004)	(0.003)	(0.009)
Log labor income	0.054***	0.099***	0.070***	0.055**	0.058***	0.033*	0.028**	0.104***
	(0.018)	(0.029)	(0.023)	(0.022)	(0.021)	(0.018)	(0.014)	(0.024)
Income percentile	1.303**	1.184	0.578	0.876	1.535**	0.713	0.717*	1.184
	(0.515)	(0.692)	(0.597)	(0.607)	(0.604)	(0.512)	(0.425)	(0.692)
Log household size-adjusted AGI	0.031*	1.184	0.578	0.876	1.535**	0.713	0.717*	0.073***
	(0.016)	(0.692)	(0.597)	(0.607)	(0.604)	(0.512)	(0.425)	(0.017)
Live in CA	-0.004	0.008	-0.015	-0.007	-0.006	-0.010	-0.012**	0.001
	(0.007)	(0.011)	(0.013)	(0.009)	(0.008)	(0.007)	(0.006)	(0.012)
Married	-0.014	-0.031*	-0.032	-0.022	-0.024	-0.006	0.009	-0.029
	(0.012)	(0.016)	(0.020)	(0.018)	(0.017)	(0.010)	(0.008)	(0.018)
Has kids	-0.023***	-0.027***	-0.018*	-0.011	-0.023**	-0.010	-0.000	-0.027***
	(0.009)	(0.008)	(0.010)	(0.009)	(0.010)	(0.007)	(0.007)	(0.008)
N	157,500	52,610	105,315	157,500	207,495	259,075	298,490	X
Income Threshold								
Bandwidth	$10,000	$2,500	$5,000	$7,500	$10,000	$15,000	$20,000	CCT
Filed a tax return	-0.006*	-0.021**	-0.027***	-0.025***	-0.019***	-0.012***	-0.004	-0.027***
	(0.003)	(0.009)	(0.006)	(0.005)	(0.004)	(0.004)	(0.003)	(0.005)
Log labor income	-0.021	-0.081*	-0.045	-0.075***	-0.081***	-0.037**	-0.016	-0.056*
	(0.015)	(0.044)	(0.032)	(0.026)	(0.023)	(0.019)	(0.016)	(0.029)
Income percentile	-0.488	-2.074*	-2.303***	-2.571***	-2.619***	-1.127**	-0.494	-0.922
	(0.367)	(1.079)	(0.771)	(0.630)	(0.547)	(0.448)	(0.389)	(0.758)
Log household size-adjusted AGI	-0.005	0.031	0.002	-0.028	-0.058***	-0.016	-0.009	-0.008
	(0.012)	(0.036)	(0.025)	(0.020)	(0.018)	(0.015)	(0.013)	(0.022)
Live in CA	0.022***	0.000	0.018	0.002	0.002	0.020***	0.023***	0.015
	(0.005)	(0.016)	(0.011)	(0.009)	(0.008)	(0.007)	(0.006)	(0.012)
Married	0.005	-0.026	-0.016	-0.004	-0.006	0.005	0.008	-0.012
	(0.007)	(0.020)	(0.014)	(0.012)	(0.010)	(0.008)	(0.007)	(0.013)
Has kids	0.002	-0.024	-0.004	0.012	0.008	0.006	0.009	0.008
	(0.006)	(0.018)	(0.013)	(0.011)	(0.009)	(0.008)	(0.007)	(0.009)
N	90,485	23,145	45,470	67,745	90,485	136,495	181,330	X

Notes. * p<0.1, ** p<0.05, *** p<0.01. This table provides estimates for the effect of Cal Grant eligibility on income and demographic outcomes 10 through 14 years after application. In column 1, a linear function of the running variable and a uniform kernel are used. In columns 2-8, regressions include student age, parental education, parental marital status, citizen status, and year-by-family size fixed effects, use a quadratic function of the running variable, and a uniform kernel. Standard errors are clustered by GPA for GPA threshold regressions and are heteroskedasticity-robust in income threshold regressions. Number of observations reported for income and demographic outcomes correspond to the "filed a tax return" outcome variable. CCT regressions use an outcome-specific bandwidth, which varies in size.

Appendix Table A9. Robustness of Income and Demographic Results to Triangular Kernel

GPA Threshold

Bandwidth	0.10	0.20	0.30	0.40	0.50	0.60	CCT
Filed a tax return	0.009	0.002	0.003	0.002	0.000	-0.001	0.010
	(0.008)	(0.007)	(0.006)	(0.005)	(0.004)	(0.003)	(0.008)
Log labor income	0.090***	0.060***	0.056***	0.059***	0.042***	0.031***	0.108***
	(0.019)	(0.018)	(0.017)	(0.016)	(0.013)	(0.011)	(0.022)
Income percentile	0.994*	1.006*	1.203**	1.205***	0.807**	0.593**	1.225**
	(0.478)	(0.500)	(0.485)	(0.436)	(0.342)	(0.282)	(0.589)
Log household size-adjusted AGI	0.029	0.012	0.024	0.027*	0.022*	0.021**	0.064***
	(0.019)	(0.019)	(0.017)	(0.015)	(0.011)	(0.009)	(0.013)
Live in CA	-0.004	-0.007	-0.005	-0.003	-0.002	-0.003	0.001
	(0.009)	(0.008)	(0.006)	(0.006)	(0.005)	(0.004)	(0.010)
Married	-0.023	-0.020	-0.017	-0.013	-0.005	-0.000	-0.032**
	(0.018)	(0.016)	(0.014)	(0.011)	(0.009)	(0.007)	(0.014)
Has kids	-0.008	-0.012	-0.018**	-0.019***	-0.011**	-0.006	-0.014*
	(0.009)	(0.007)	(0.007)	(0.007)	(0.006)	(0.005)	(0.008)
N	52,610	105,315	157,500	207,495	253,860	298,490	X

Income Threshold

Bandwidth	$2,500	$5,000	$7,500	$10,000	$15,000	$20,000	CCT
Filed a tax return	-0.022***	-0.021***	-0.015***	-0.011***	-0.006**	-0.004	-0.025***
	(0.006)	(0.004)	(0.004)	(0.003)	(0.003)	(0.002)	(0.005)
Log labor income	-0.055*	-0.061***	-0.062***	-0.045***	-0.024*	-0.021*	-0.048*
	(0.032)	(0.023)	(0.019)	(0.017)	(0.014)	(0.012)	(0.028)
Income percentile	-1.840**	-2.296***	-1.979***	-1.346***	-0.723**	-0.594**	-1.694**
	(0.796)	(0.563)	(0.462)	(0.401)	(0.328)	(0.286)	(0.706)
Log household size-adjusted AGI	0.011	-0.021	-0.033**	-0.026**	-0.015	-0.017*	-0.011
	(0.026)	(0.018)	(0.015)	(0.013)	(0.011)	(0.009)	(0.021)
Live in CA	0.004	0.014*	0.011	0.015***	0.016***	0.015***	0.010
	(0.012)	(0.008)	(0.007)	(0.006)	(0.005)	(0.004)	(0.011)
Married	-0.024	-0.011	-0.001	0.002	0.008	0.010*	-0.017
	(0.015)	(0.010)	(0.009)	(0.007)	(0.006)	(0.005)	(0.012)
Has kids	-0.021	0.002	0.010	0.005	0.006	0.008	0.009
	(0.013)	(0.010)	(0.008)	(0.007)	(0.006)	(0.005)	(0.008)
N	22,800	45,315	67,450	90,310	136,310	181,190	X

Notes. * p<0.1, ** p<0.05, *** p<0.01. This table provides estimates for the effect of Cal Grant eligibility on income and demographic outcomes 10 through 14 years after application, varying the bandwidth of students that are inclucded in the estimates. All regressions include student age, parental education, parental marital status, citizen status, and year-by-family size fixed effects. A linear function of the running variable and a triangular kernel are used. Standard errors are clustered by GPA for GPA threshold regressions and are heteroskedasticity-robust in income threshold regressions. Number of observations reported for income and demographic outcomes correspond to the "filed a tax return" outcome variable. CCT regressions use an outcome-specific bandwidth, which varies in size.

Appendix Table A10: Educational Attainment by FAFSA preferences, NSC data

	N	(1) Two-Year Public	(2) Four-Year Public	(3) Private	(4) Bachelor	(5) Graduate
<u>GPA Threshold</u>						
Public Four-Year Only	6559	-0.036	0.032	0.009	0.078***	0.041*
		(0.022)	(0.028)	(0.007)	(0.027)	(0.023)
Control Mean		29.7%	60.4%	2.2%	53.6%	14.3%
Any Private	5165	0.005	0.014	0.024	0.003	0.035
		(0.019)	(0.023)	(0.024)	(0.026)	(0.021)
Control Mean		29.0%	25.6%	29.3%	54.9%	14.2%
Community College, No Private	7278	0.011	0.006	-0.002	0.057**	0.022*
		(0.024)	(0.022)	(0.006)	(0.022)	(0.011)
Control Mean		57.0%	19.4%	1.5%	34.2%	8.5%
<u>Income Threshold</u>						
Public Four-Year Only	3580	-0.002	0.044	-0.003	0.020	0.009
		(0.026)	(0.029)	(0.009)	(0.030)	(0.028)
Control Mean		21.4%	68.9%	1.6%	68.5%	21.0%
Any Private	3556	-0.046*	-0.102***	0.109***	0.046	0.004
		(0.027)	(0.030)	(0.033)	(0.030)	(0.030)
Control Mean		22.9%	32.6%	37.6%	63.8%	22.5%
Community College, No Private	1769	-0.027	0.019	-0.012	0.008	0.100***
		(0.047)	(0.044)	(0.014)	(0.048)	(0.031)
Control Mean		52.0%	31.8%	2.7%	48.6%	10.8%

Notes: * p<0.1, ** p<0.05, *** p<0.01. All regressions include year-by-family size fixed effects. GPA regressions include income-eligible students within 0.3 of the GPA threshold, and income regressions include GPA-eligible students within $10,000 of the income threshold. All regressions include year-by-family size fixed effects. A linear function of the running variable and a uniform kernel are used. Standard errors clustered by GPA for GPA threshold regressions and are heteroscedasticity-robust in income threshold regressions. Reduced form control means are average values for students within 0.05 below the GPA threshold or within $1000 above the income threshold.

Appendix Table A11: Heterogeneity in Effects by Income and GPA

	Attend	CA Community College	CA Four-Year Public	CA Private	Bachelor's Degree	Graduate Degree	
GPA Threshold							
Middle-income	0.003	0.002	-0.006	0.007	0.048**	0.026*	
	(0.006)	(0.011)	(0.015)	(0.008)	(0.023)	(0.015)	
Low-income	0.007	-0.029	0.011	-0.003	0.041**	0.035**	
	(0.008)	(0.020)	(0.019)	(0.014)	(0.017)	(0.014)	
Income Threshold							
GPA>=3.5	0.001	-0.023	-0.053***	0.068***	0.010	0.040	
	(0.004)	(0.016)	(0.018)	(0.017)	(0.026)	(0.026)	
GPA<3.5	-0.002	-0.032	-0.040*	0.039**	0.049*	0.016	
	(0.006)	(0.022)	(0.021)	(0.018)	(0.030)	(0.023)	

	Filed a tax return	Log labor income	Income percentile	Log HH-adjusted AGI	Live in CA	Married	Has kids
GPA Threshold							
Middle-income	0.010**	0.059**	1.442**	0.035**	-0.010	0.012	-0.007
	(0.005)	(0.024)	(0.594)	(0.017)	(0.009)	(0.012)	(0.009)
Low-income	-0.003	0.050*	1.196	0.027	0.004	-0.048**	-0.044***
	(0.010)	(0.027)	(0.793)	(0.026)	(0.008)	(0.018)	(0.016)
Income Threshold							
GPA>=3.5	-0.009***	-0.016	-0.726	0.003	0.013*	0.009	0.003
	(0.004)	(0.020)	(0.487)	(0.016)	(0.007)	(0.009)	(0.008)
GPA<3.5	-0.000	-0.026	-0.207	-0.017	0.040***	-0.001	0.004
	(0.005)	(0.024)	(0.555)	(0.018)	(0.008)	(0.010)	(0.010)

Notes: * $p<0.1$, ** $p<0.05$, *** $p<0.01$. This table presents estimates of the effect of Cal Grant eligibility. Regressions at the GPA threshold include income-eligible applicants within 0.3 points of the GPA threshold, and regressions at the income threshold include GPA-eligible applicants within $10,000 of the income threshold. There are 31,500 and 18,097 observations at the GPA and income thresholds, respectively. Applicants at the GPA threshold are split by those students who were only eligible for Cal Grant A ("middle-income") and students who did not meet the requirements for other California financial aid awards and were requried to surpass the GPA threshold to receive financial aid ("low-income"); applicants at the income threshold are split at 3.5 GPA points. All regressions include student age, parental education, parental marital status, citizen status, and year-by-family size fixed effects. A linear function of the running variable and a uniform kernel are used. Standard errors are clustered by GPA for GPA threshold regressions and are heteroskedasticity-robust in income threshold regressions.

Appendix Table A12: Heterogeneity in Attendance Results by Gender and Application Year

	Attend	CA Community College	CA Four-Year Public	CA Private	Bachelor's Degree	Graduate Degree
GPA Threshold						
Female	-0.002	-0.010	-0.012	-0.000	0.068***	0.046***
	(0.006)	(0.014)	(0.016)	(0.008)	(0.019)	(0.012)
Male	0.014**	-0.014	0.019	0.006	0.017	0.009
	(0.007)	(0.020)	(0.015)	(0.010)	(0.023)	(0.020)
Application Year = 1998	0.008	-0.038**	0.016	0.009	0.043*	0.014
	(0.009)	(0.017)	(0.018)	(0.013)	(0.022)	(0.020)
Application Year = 1999	0.007	-0.002	-0.010	-0.008	0.050**	0.042***
	(0.007)	(0.016)	(0.020)	(0.011)	(0.024)	(0.013)
Application Year = 2000	-0.001	0.008	-0.005	0.011	0.043	0.042**
	(0.010)	(0.020)	(0.024)	(0.015)	(0.033)	(0.017)
Income Threshold						
Female	-0.004	-0.025	-0.049***	0.047***	0.025	0.001
	(0.004)	(0.017)	(0.018)	(0.016)	(0.025)	(0.023)
Male	0.003	-0.035*	-0.042**	0.068***	0.039	0.067**
	(0.006)	(0.020)	(0.021)	(0.018)	(0.035)	(0.028)
Application Year = 1998	-0.009	-0.073***	-0.050**	0.048**	0.029	0.029
	(0.007)	(0.023)	(0.025)	(0.022)	(0.033)	(0.031)
Application Year = 1999	0.002	0.011	-0.056**	0.065***	0.052	0.026
	(0.005)	(0.022)	(0.024)	(0.021)	(0.034)	(0.031)
Application Year = 2000	0.003	-0.028	-0.034	0.055***	0.009	0.033
	(0.006)	(0.023)	(0.024)	(0.021)	(0.034)	(0.029)

Notes: * p<0.1, ** p<0.05, *** p<0.01. This table presents estimates of the effect of Cal Grant eligibility on college enrollment and degree attainment outcomes, by gender and year of initial application. Regressions at the GPA threshold include income-eligible applicants within 0.3 points of the GPA threshold, and regressions at the income threshold include GPA-eligible applicants within $10,000 of the income threshold. All regressions include student age, parental education, parental marital status, citizen status, and year-by-family size fixed effects. A linear function of the running variable and a uniform kernel are used. Standard errors are clustered by GPA for GPA threshold regressions and are heteroskedasticity-robust in income threshold regressions.

Appendix Table A13: Heterogeneity in Income and Demographic Results by Gender and Application Year

	Filed a tax return	Log labor income	Income percentile	Log HH-adjusted AGI	Live in CA	Married	Has kids
GPA Threshold							
Female	0.004	0.045*	1.163*	0.024	-0.021*	-0.014	-0.024*
	(0.007)	(0.023)	(0.650)	(0.022)	(0.011)	(0.015)	(0.014)
Male	0.007	0.058**	1.286*	0.038*	0.019*	-0.013	-0.014
	(0.008)	(0.028)	(0.675)	(0.022)	(0.010)	(0.019)	(0.015)
Application Year = 1998	0.019**	0.088***	2.303***	0.070***	-0.010	-0.016	-0.014
	(0.009)	(0.030)	(0.731)	(0.022)	(0.011)	(0.021)	(0.017)
Application Year = 1999	0.006	0.059**	1.937***	0.025	-0.003	-0.018	-0.021
	(0.007)	(0.024)	(0.658)	(0.021)	(0.011)	(0.012)	(0.015)
Application Year = 2000	-0.013	0.007	-0.614	-0.008	0.001	-0.009	-0.039***
	(0.010)	(0.032)	(0.916)	(0.038)	(0.013)	(0.020)	(0.014)
Income Threshold							
Female	-0.000	-0.014	-0.887*	-0.031**	0.020***	-0.019**	-0.012
	(0.003)	(0.021)	(0.474)	(0.015)	(0.007)	(0.009)	(0.008)
Male	-0.013**	-0.030	0.078	0.036*	0.028***	0.041***	0.024***
	(0.005)	(0.023)	(0.570)	(0.019)	(0.008)	(0.010)	(0.009)
Application Year = 1998	-0.010**	-0.033	-0.537	0.012	0.031***	0.018	0.014
	(0.005)	(0.026)	(0.614)	(0.021)	(0.010)	(0.012)	(0.011)
Application Year = 1999	-0.003	-0.003	-0.032	-0.011	-0.000	0.007	0.012
	(0.005)	(0.024)	(0.592)	(0.020)	(0.009)	(0.012)	(0.011)
Application Year = 2000	-0.004	-0.024	-0.830	-0.012	0.040***	-0.007	-0.016
	(0.005)	(0.029)	(0.689)	(0.021)	(0.009)	(0.011)	(0.011)

Notes: * p<0.1, ** p<0.05, *** p<0.01. This table presents estimates of the effect of Cal Grant eligibility on income and demographic outcomes 10 to 14 years after application, by gender and year of initial application. Regressions at the GPA threshold include income-eligible applicants within 0.3 points of the GPA threshold, and regressions at the income threshold include GPA-eligible applicants within $10,000 of the income threshold. All regressions include student age, parental education, parental marital status, citizen status, and year-by-family size fixed effects. A linear function of the running variable and a uniform kernel are used. Standard errors are clustered by GPA for GPA threshold regressions and are heteroskedasticity-robust in income threshold regressions.
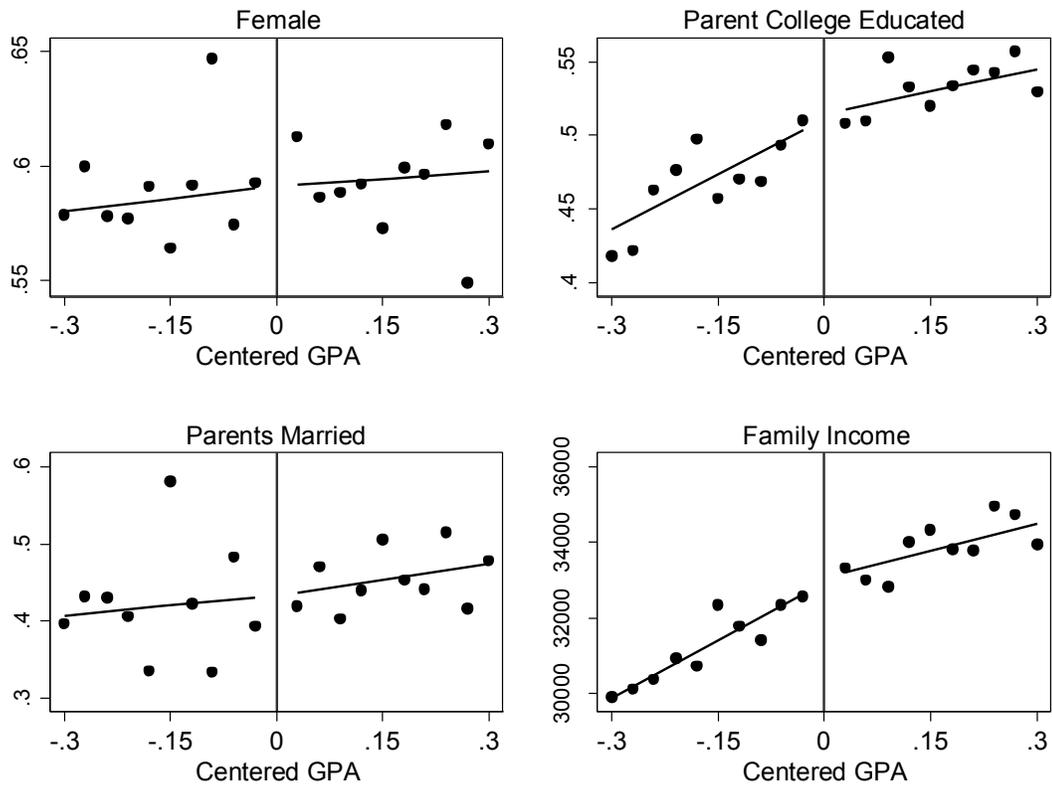
FIGURE A1. COVARIATE BALANCE, GPA THRESHOLD

Notes: This figure depicts demographic characteristics at the GPA threshold, pooled over cohorts. The figure includes income-eligible students within 0.3 GPA points of the year-specific eligibility thresholds, binned by 0.03 GPA points relative to the threshold.
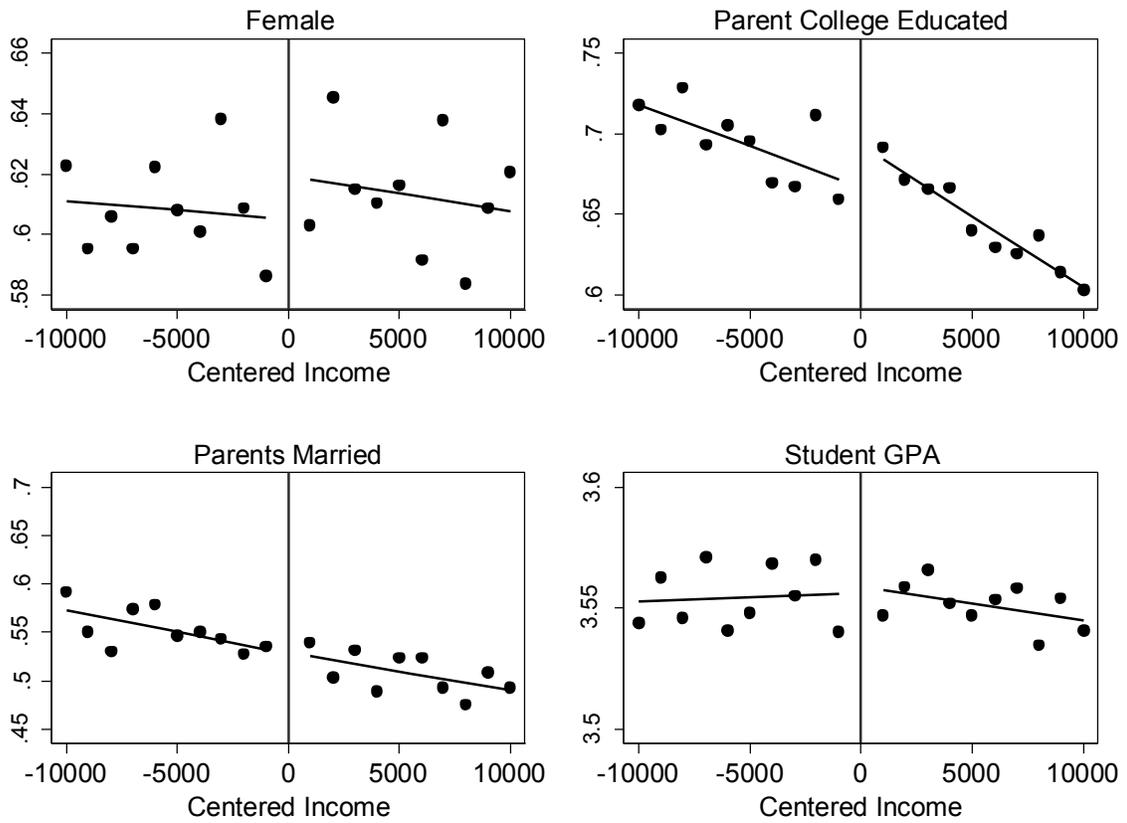
FIGURE A2. COVARIATE BALANCE, INCOME THRESHOLD

Notes: This figure depicts demographic characteristics at the income threshold, pooled over cohorts. The figure includes GPA-eligible students within $10,000 of the year-specific eligibility threshold, binned by $1,000 relative to the threshold. Income is reversed so that values above the cutoff represent lower family incomes.
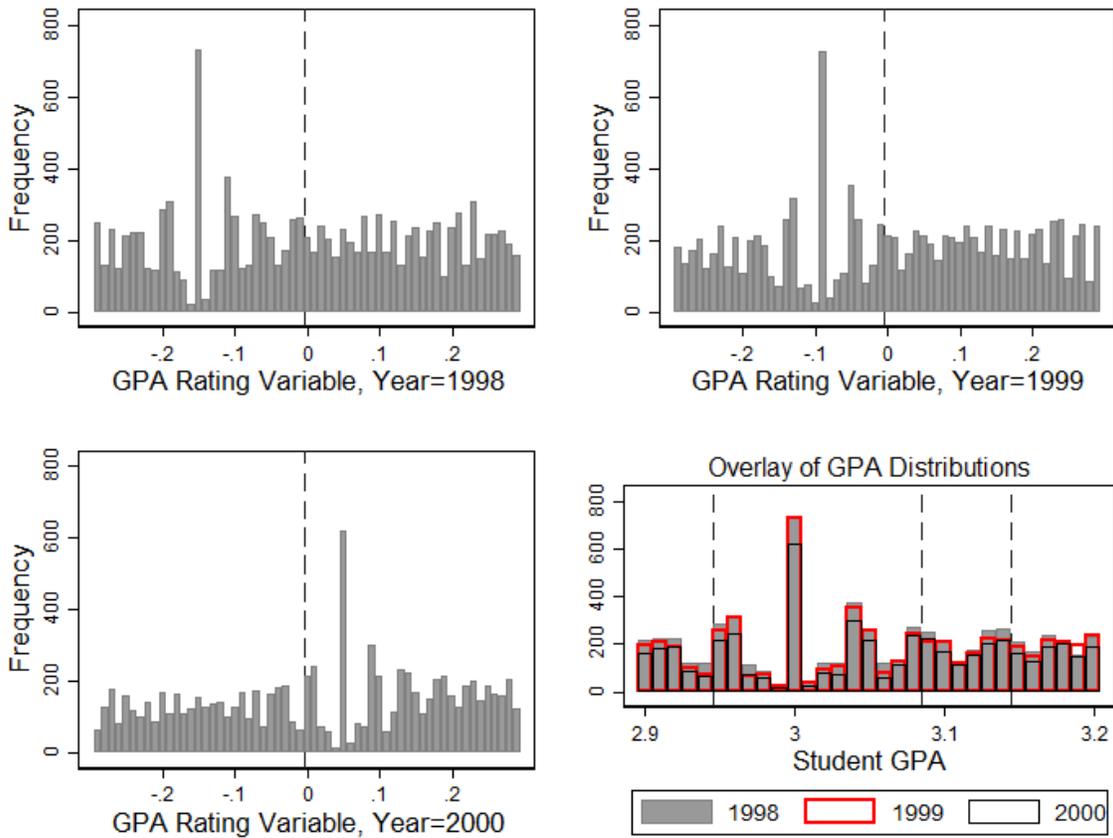
FIGURE A3. HISTOGRAMS OF GPA DISTRIBUTION

Notes: This figure depicts the distribution of students across the GPA distribution relative to the GPA threshold for each cohort separately, and then overlaid on top of one another in the bottom right panel.
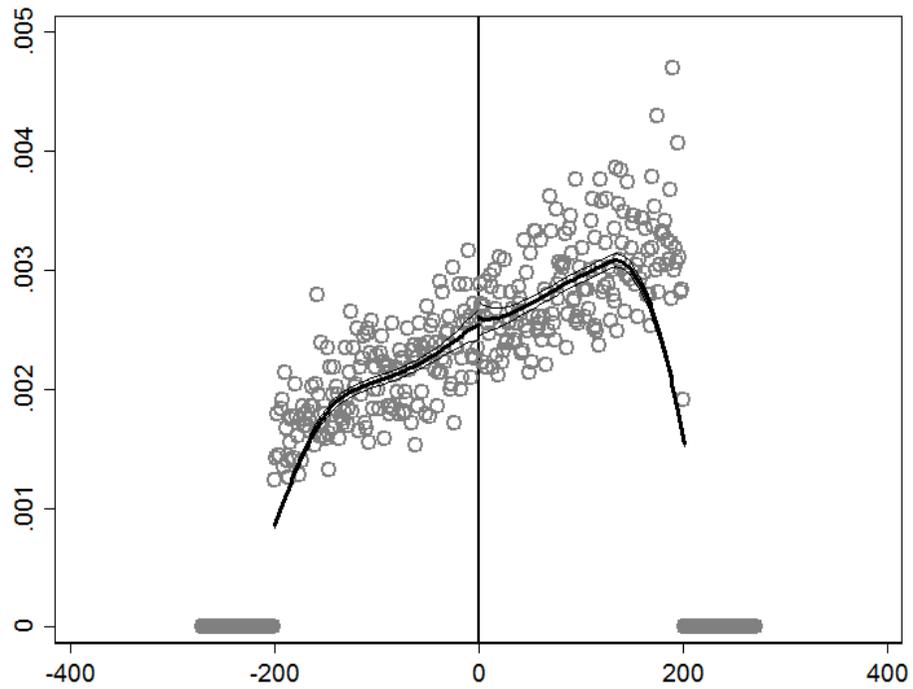
FIGURE A4. MCCRARY TEST OF APPLICANT DENSITY AT INCOME THRESHOLD, TAX DATA

Notes: This figure depicts the distribution of Cal Grant applicants on each side of the year-specific eligibility threshold, re-centered at zero.

NSC Degree Completion (95% CI)

GPA Thresholds
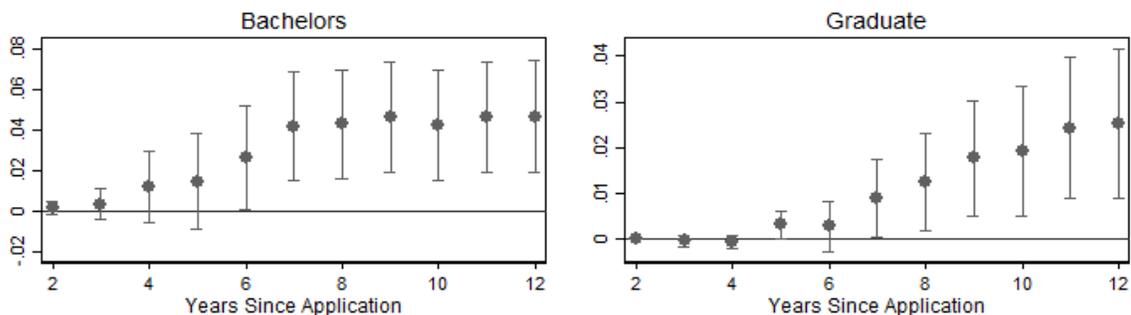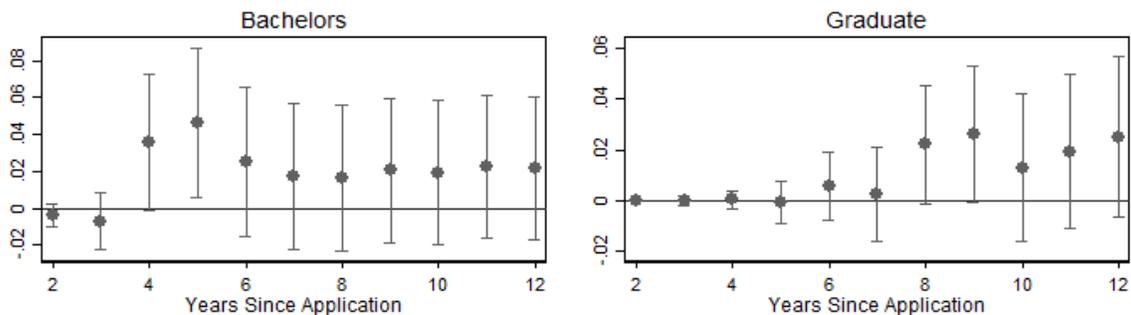
FIGURE A5. EDUCATIONAL ATTAINMENT OVER TIME

Notes: This figure depicts the evolution of the effect of Cal Grant eligibility on degree completion since the year of application. The circles represent coefficients from our regression discontinuity specification for a specific year relative to time of application, and the dashed lines represent 95% confidence intervals.
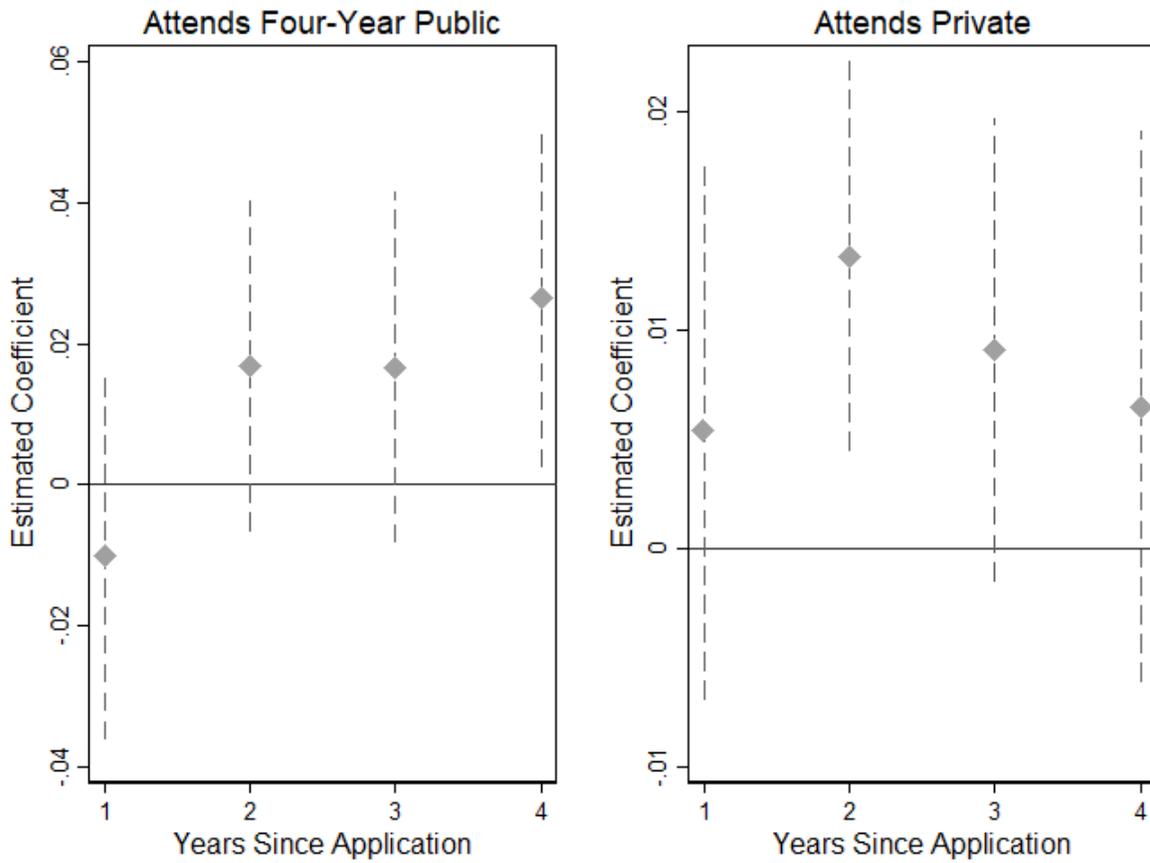
FIGURE A6. EDUCATIONAL ATTENDANCE OVER TIME, GPA THRESHOLD

Notes: This figure depicts the evolution of the effect of Cal Grant eligibility on type of institution attended since the year of application at the GPA threshold. The diamonds represent coefficients from our regression discontinuity specification for a specific year relative to time of application, and the dashed lines represent 95% confidence intervals.
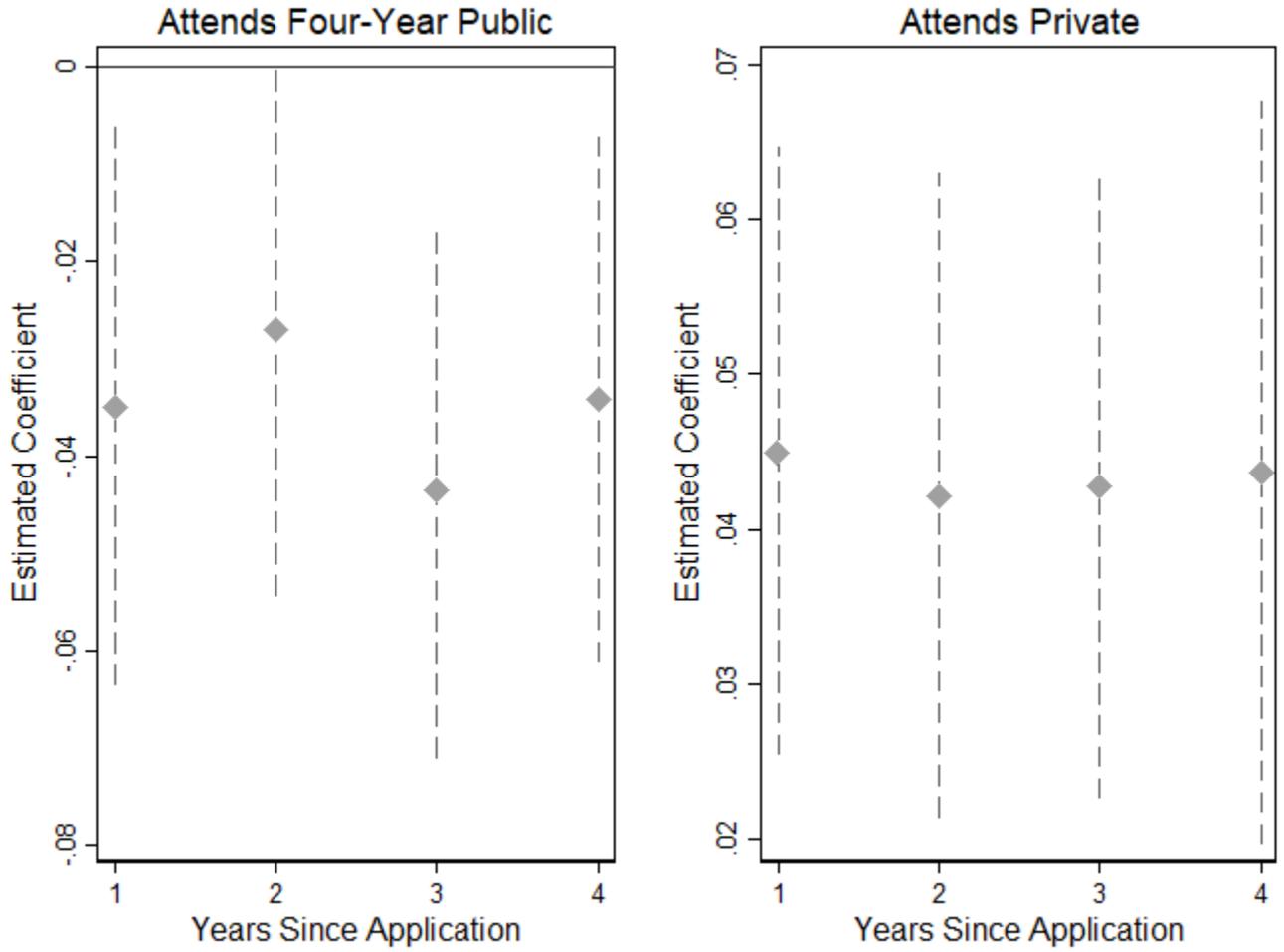
FIGURE A7. EDUCATIONAL ATTENDANCE OVER TIME, INCOME THRESHOLD

Notes: This figure depicts the evolution of the effect of Cal Grant eligibility on type of institution attended since the year of application at the income threshold. The diamonds represent coefficients from our regression discontinuity specification for a specific year relative to time of application, and the dashed lines represent 95% confidence intervals.
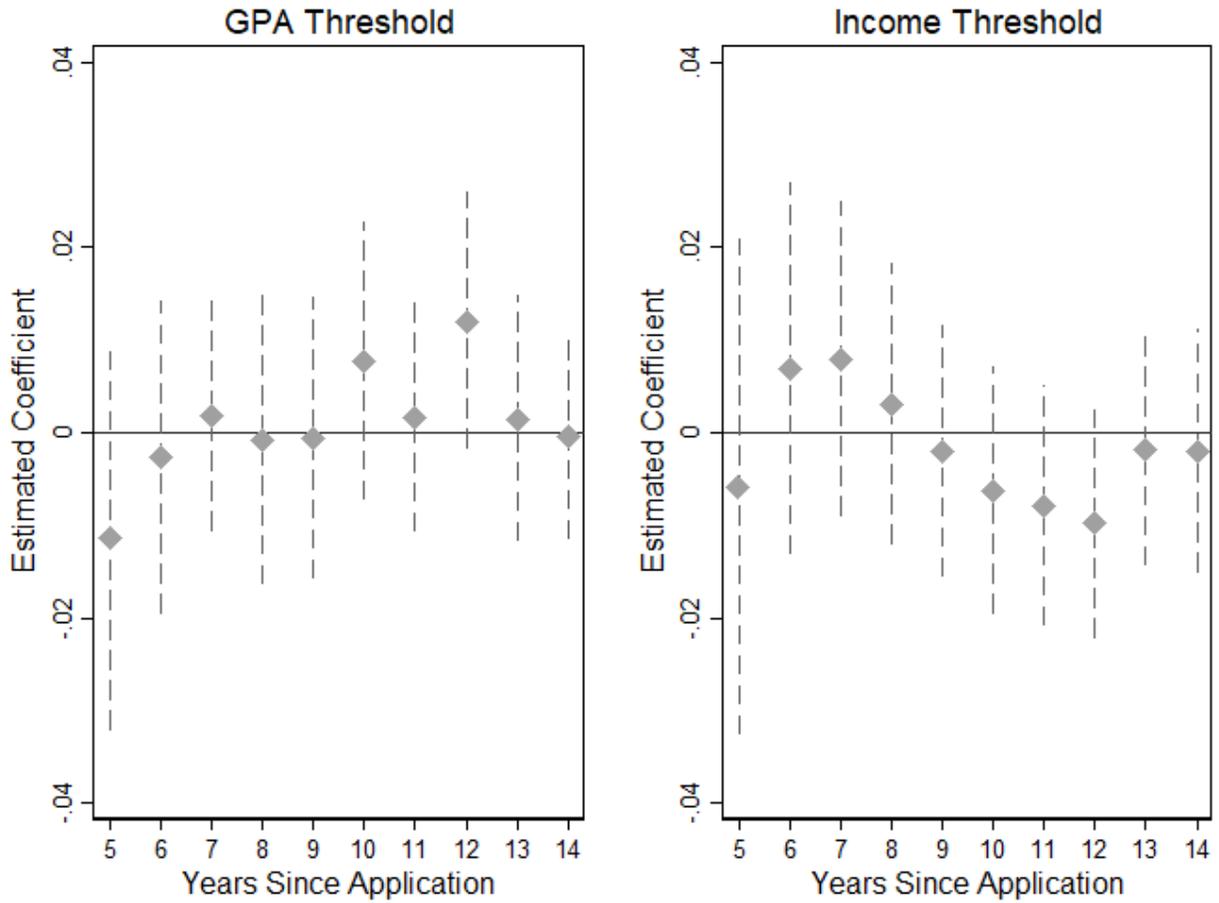
FIGURE A8. TAX FILING OVER TIME

Notes: This figure depicts the evolution of the effect of Cal Grant eligibility on the probability of filing a tax return since the year of application. The diamonds represent coefficients from our regression discontinuity specification for a specific year relative to time of application, and the dashed lines represent 95% confidence intervals. The left panel includes income-eligible students within 0.3 GPA points of the GPA threshold, and the right panel includes GPA-eligible students within $10,000 of the income threshold. The regressions include the student's age, a dummy for parental college attainment, a dummy for U.S. citizenship, a dummy for parents being married, and family size by year fixed effects. Standard errors for the left panel are clustered by the running variable, and standard errors in the right panel are heteroscedasticity robust.
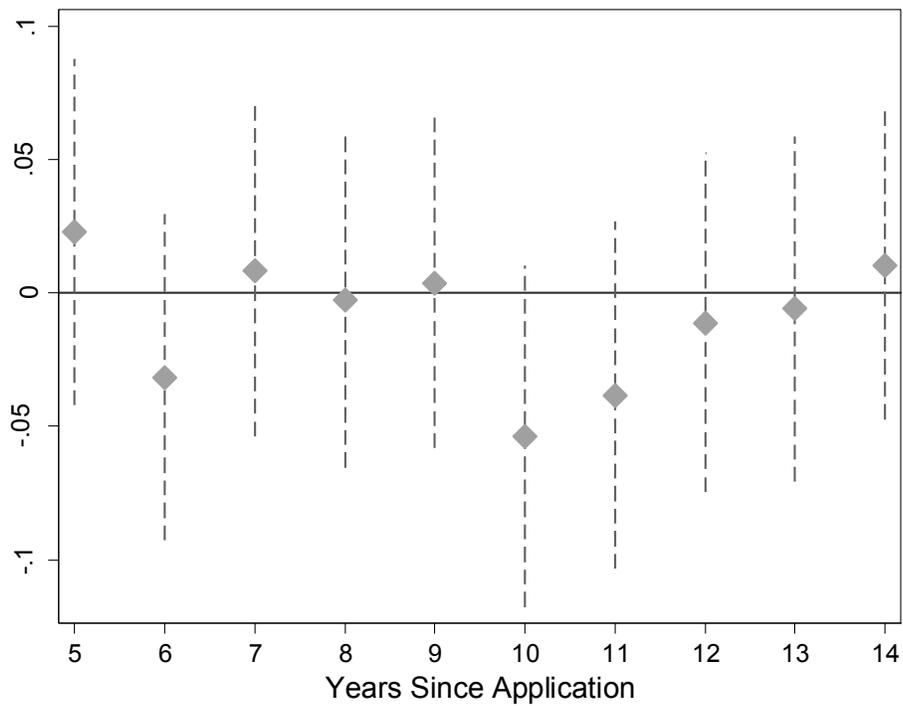
FIGURE A9. LOG LABOR INCOME OVER TIME, INCOME THRESHOLD

Notes: This figure depicts the evolution of the effect of Cal Grant eligibility on log labor income since the year of application. The diamonds represent coefficients from our regression discontinuity specification for a specific year relative to time of application, and the dashed lines represent 95% confidence intervals. The regressions include GPA-eligible students within $10,000 of the income threshold. The regressions include the student's age, a dummy for parental college attainment, a dummy for U.S. citizenship, a dummy for parents being married, and family size by year fixed effects. Standard errors are heteroscedasticity robust.
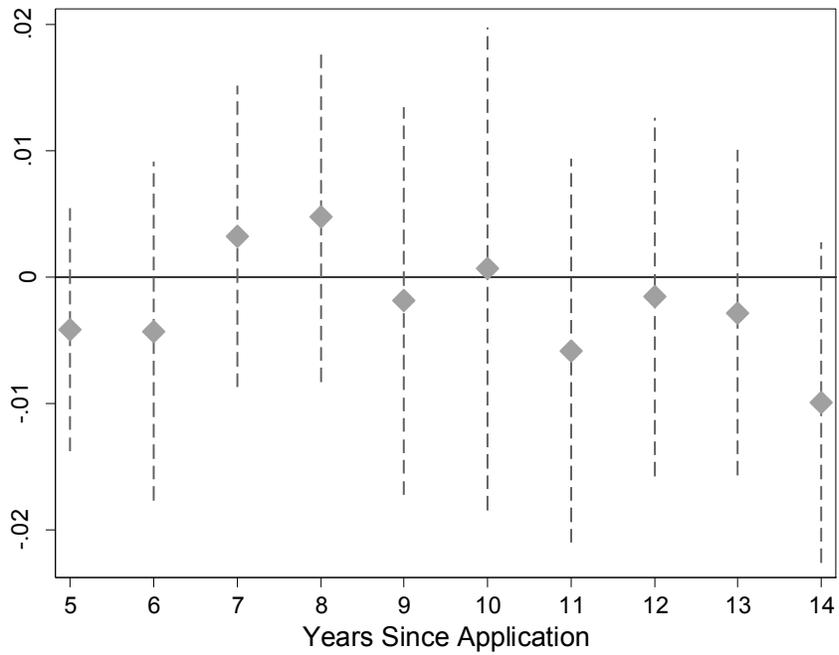
FIGURE A10. RESIDENCY RESULTS OVER TIME, GPA THRESHOLD

Notes: This figure depicts the evolution of the effect of Cal Grant eligibility on the probability of living in California (based on filing address). The diamonds represent coefficients from our regression discontinuity specification for a specific year relative to time of application, and the dashed lines represent 95% confidence intervals. The regression includes income-eligible students within 0.3 GPA points of the GPA threshold. The regressions include the student's age, a dummy for parental college attainment, a dummy for U.S. citizenship, a dummy for parents being married, and family size by year fixed effects. Standard errors are clustered by the running variable.

Appendix 3. RD Figures of All Outcome Variables
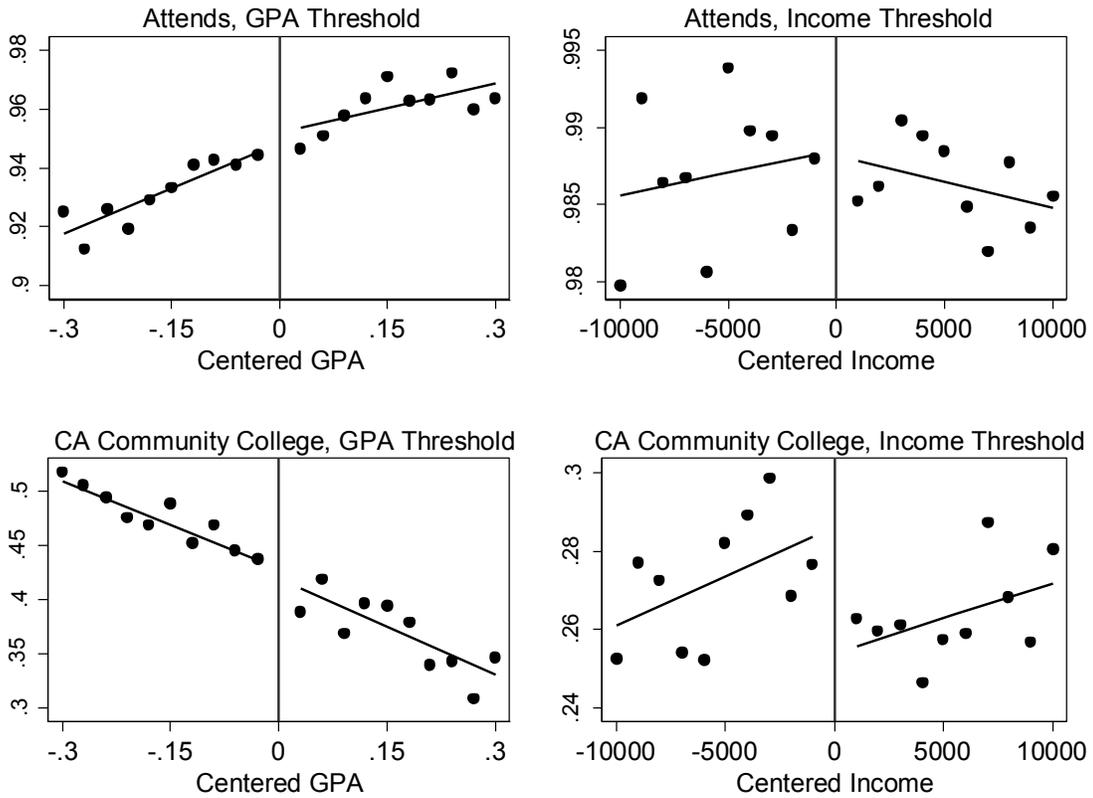
Notes: These figures plot the proportion of students who attend any college (top panel) or attend a community college in California (bottom panel) at any point between 1 and 4 years since their Cal Grant application, pooled over cohorts. Students are binned by 0.03 GPA points or $1,000 relative to the year-specific eligibility threshold at the GPA and income thresholds, respectively. Income is reversed so that values above the cutoff represent lower family incomes; crossing the threshold from left to right indicates becoming eligible for the Cal Grant.
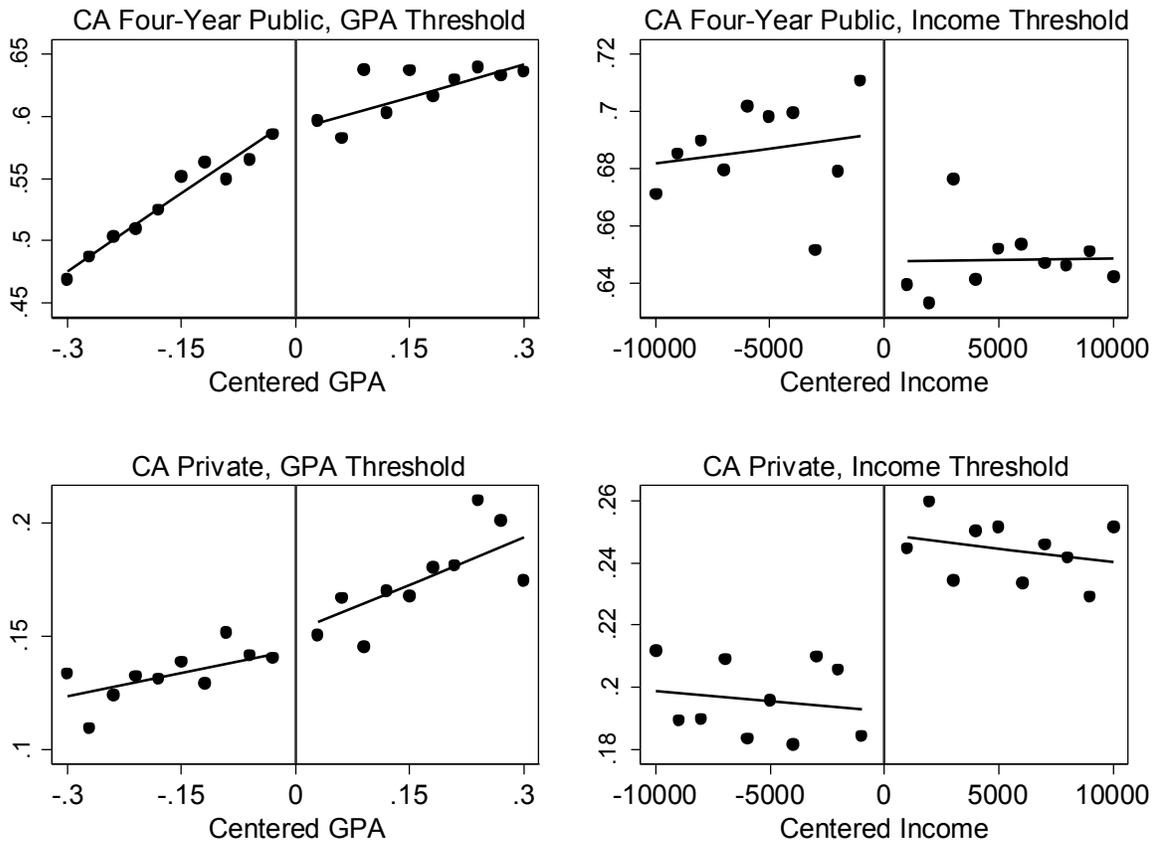
Notes: These figures plot the proportion of students who attend a four-year public institution (top panel) or a private institution (bottom panel) in California at any point between 1 and 4 years since their Cal Grant application, pooled over cohorts. Students are binned by 0.03 GPA points or $1,000 relative to the year-specific eligibility threshold at the GPA and income thresholds, respectively. Income is reversed so that values above the cutoff represent lower family incomes; crossing the threshold from left to right indicates becoming eligible for the Cal Grant.
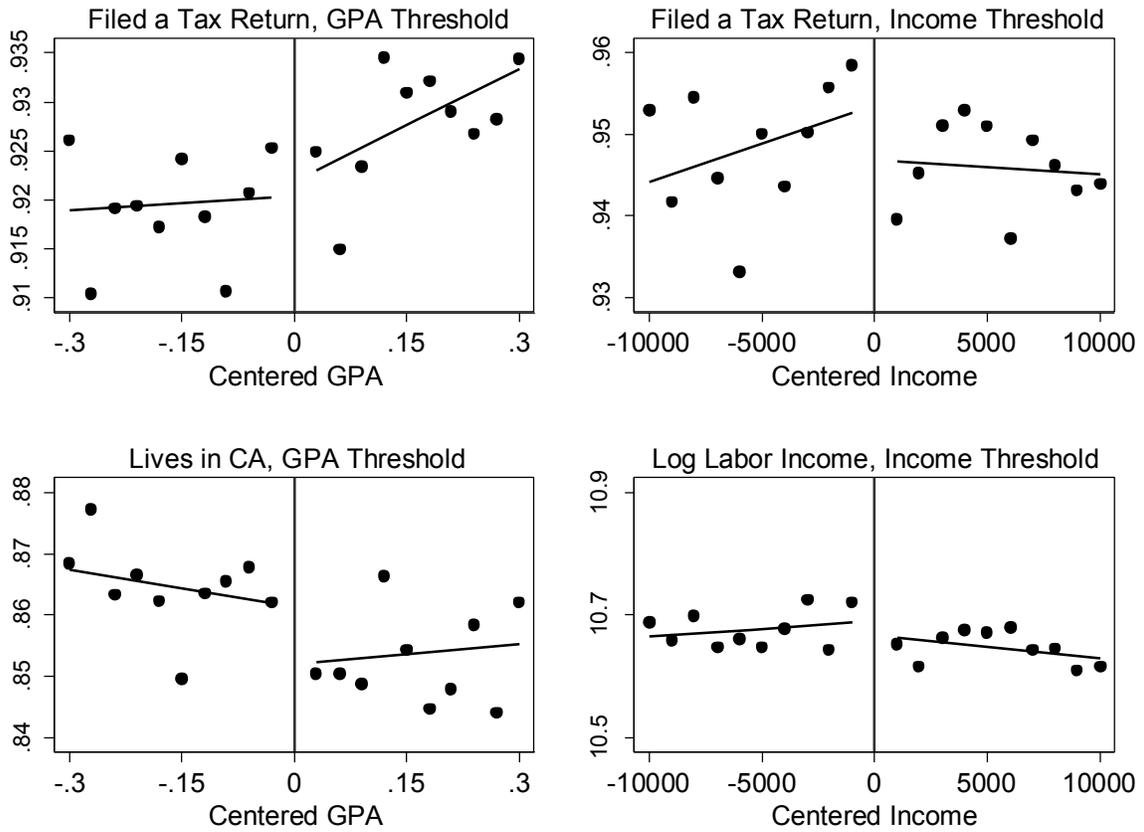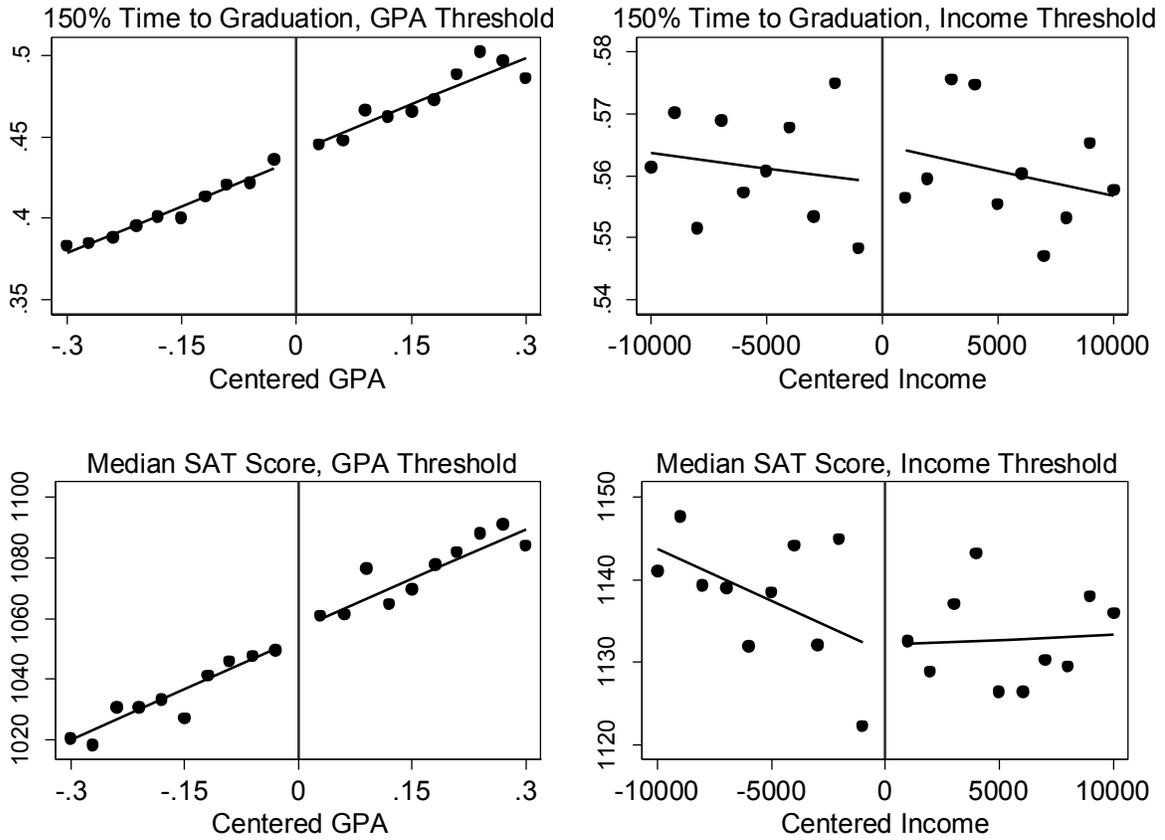
Notes: These figures plot the proportion of students who filed a tax return (top panel) at any point between 10 and 14 years since their Cal Grant application, pooled over cohorts. The bottom panel plots the proportion of students who ever lives in California based on their tax filing address at the GPA threshold (left), and the average log labor income at the income threshold (right) between 10 and 14 years since their Cal Grant application, pooled over cohorts. Income is reversed so that values above the cutoff represent lower family incomes; crossing the threshold from left to right indicates becoming eligible for the Cal Grant.
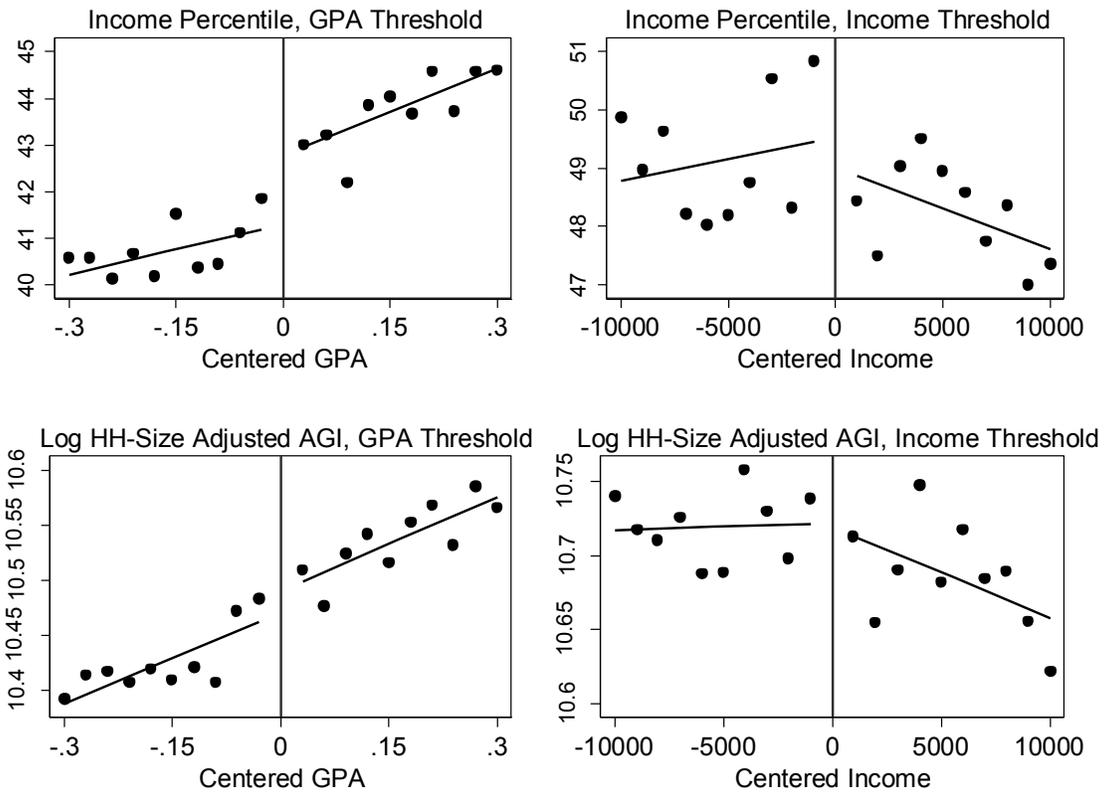
Notes: These figures plot income percentiles (top panel) and household size-adjusted AGI (bottom panel) averaged over 10 and 14 years since their Cal Grant application, pooled over cohorts. Students are binned by 0.03 GPA points or $1,000 relative to the year-specific eligibility threshold at the GPA and income thresholds, respectively. Income is reversed so that values above the cutoff represent lower family incomes; crossing the threshold from left to right indicates becoming eligible for the Cal Grant.
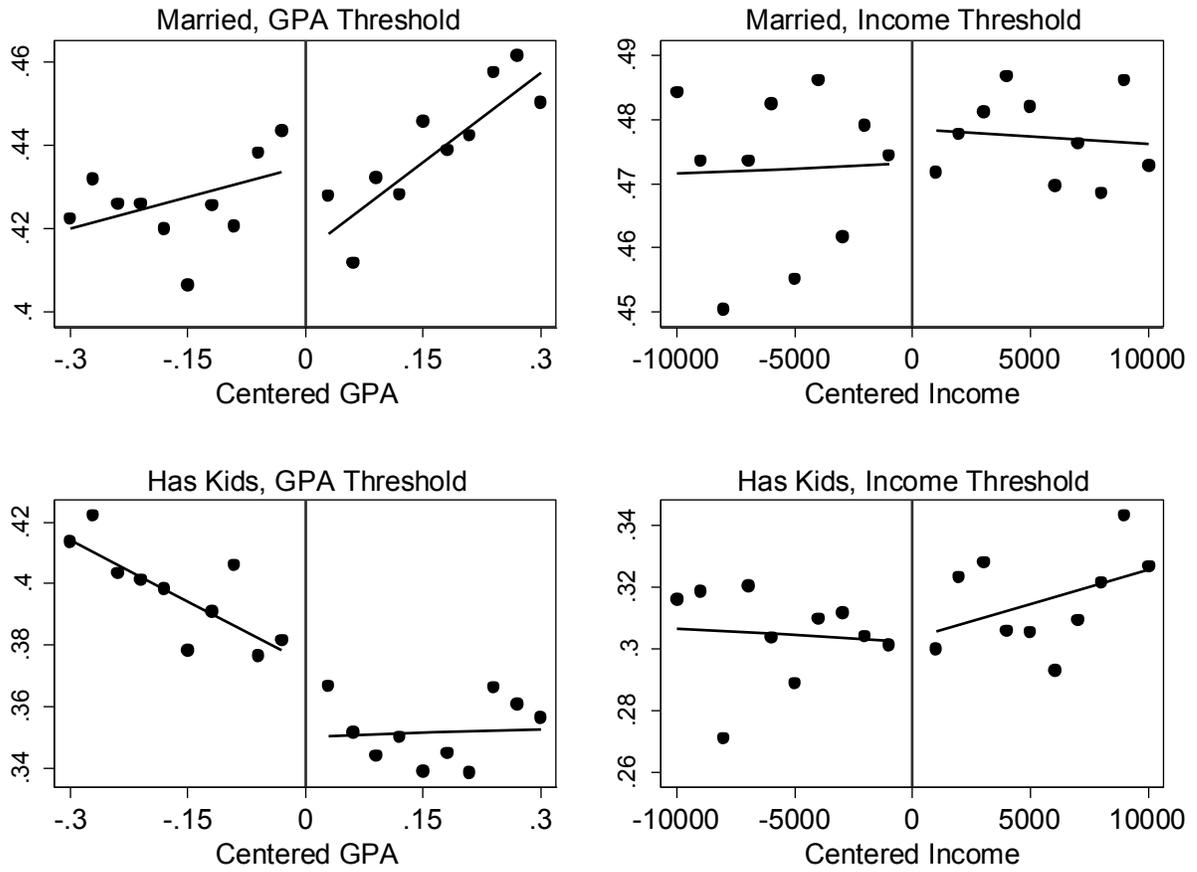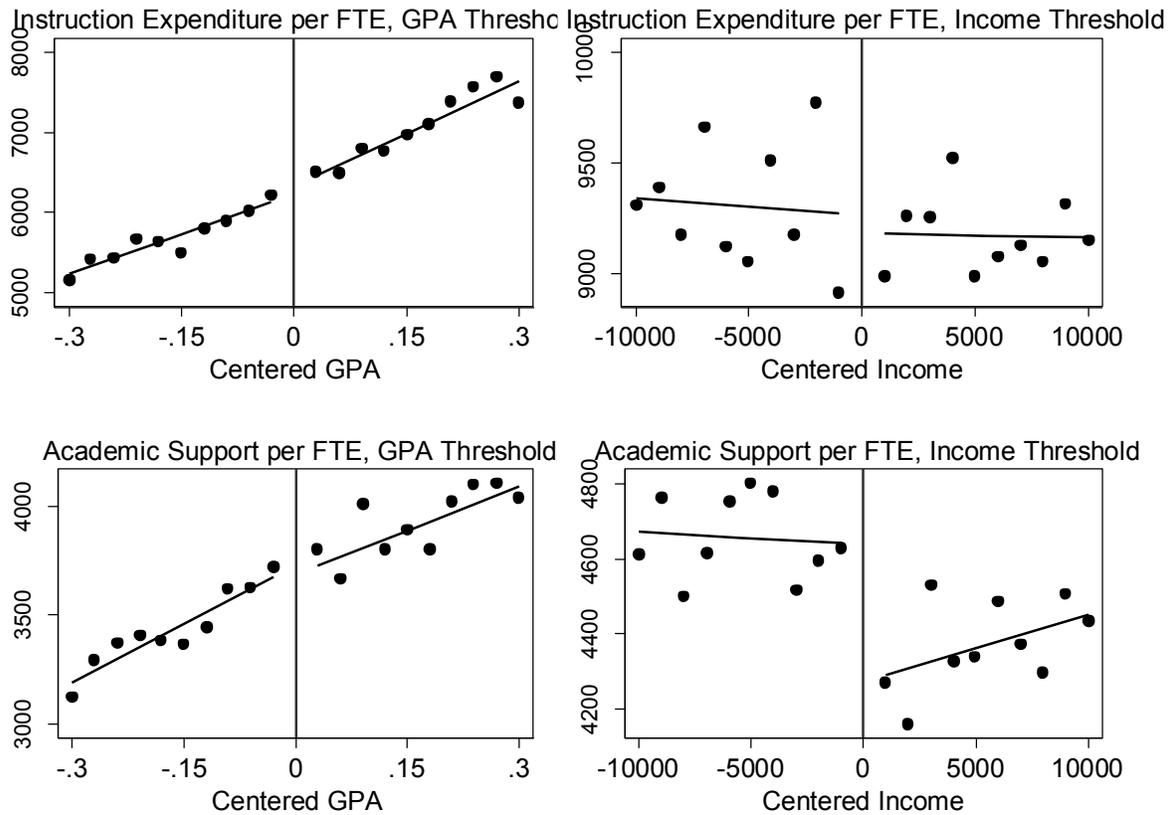
Notes: These figures plot the proportion of students who are married filing jointly (top panel) and claim child dependents (bottom panel) at any point between 10 and 14 years since their Cal Grant application, pooled over cohorts. Students are binned by 0.03 GPA points or $1,000 relative to the year-specific eligibility threshold at the GPA and income thresholds, respectively. Income is reversed so that values above the cutoff represent lower family incomes; crossing the threshold from left to right indicates becoming eligible for the Cal Grant.
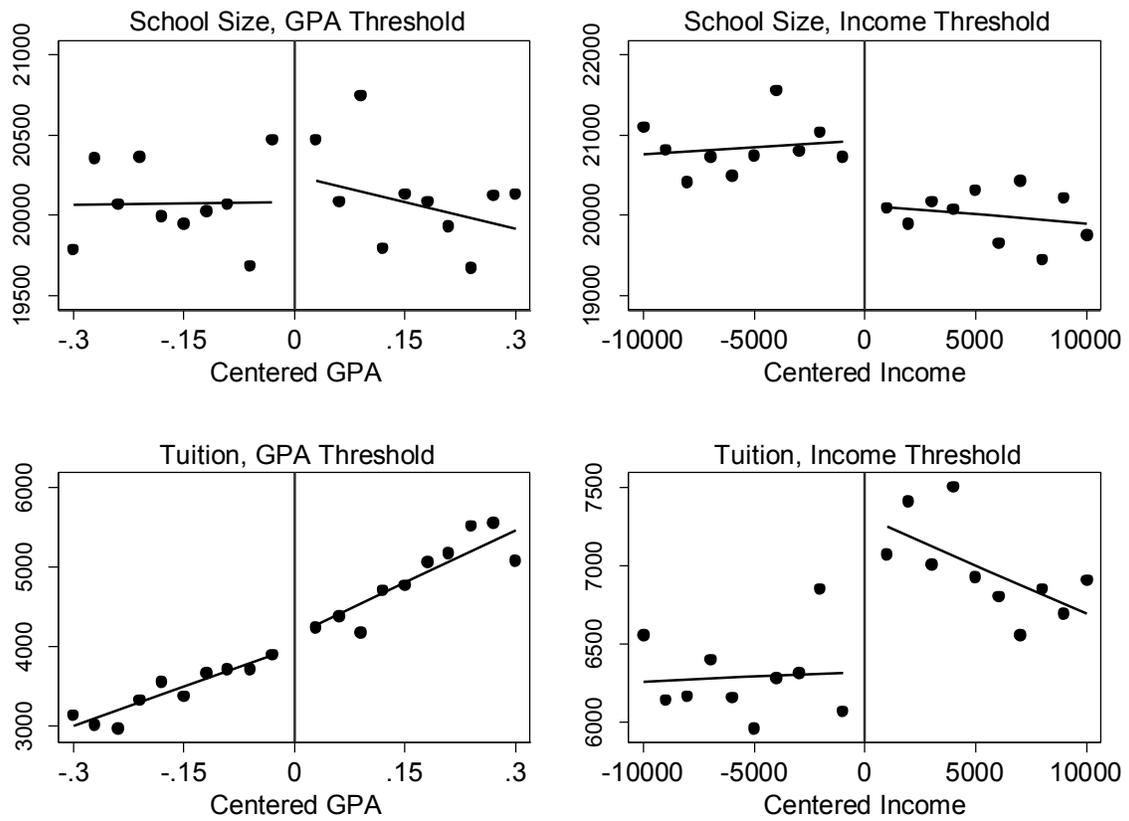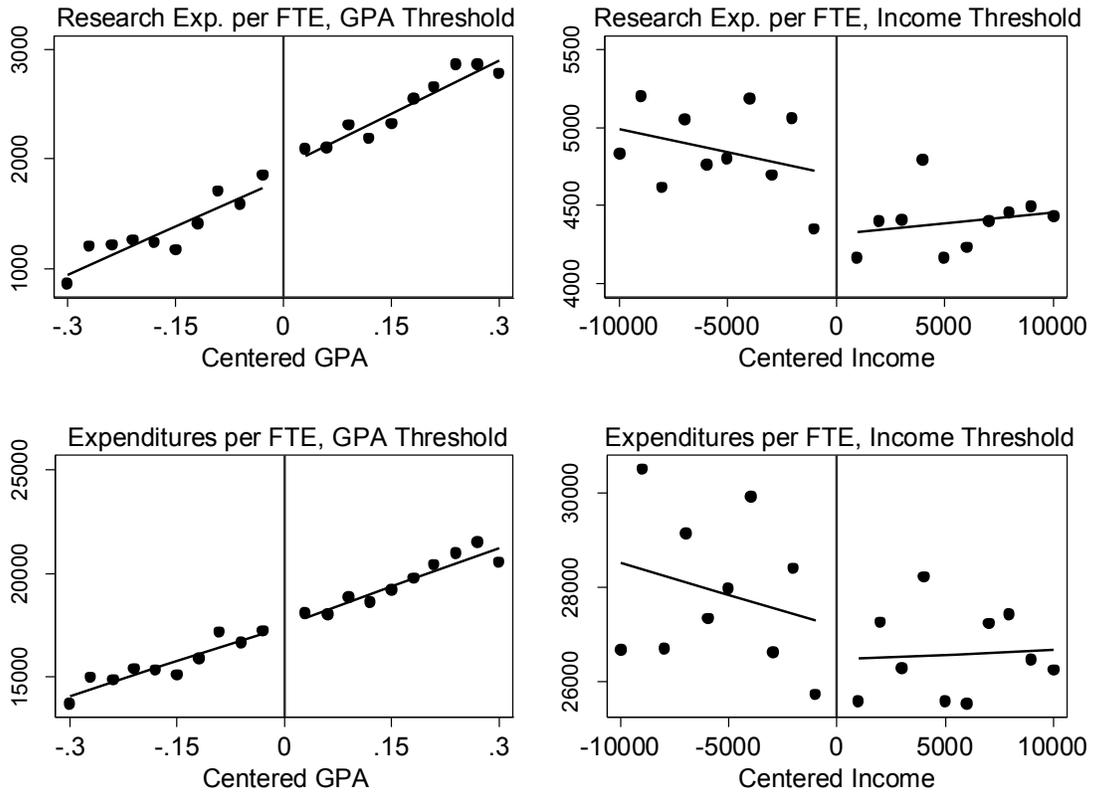
Notes: These figures plot school size (top panel) and average tuition (bottom panel) for the first observed institution in which a student enrolls within 1 to 4 years of their Cal Grant application, pooled over cohorts, based on IPEDS data. Students are binned by 0.03 GPA points or $1,000 relative to the year-specific eligibility threshold at the GPA and income thresholds, respectively. Income is reversed so that values above the cutoff represent lower family incomes; crossing the threshold from left to right indicates becoming eligible for the Cal Grant.

150% Time to Graduation, GPA Threshold

150% Time to Graduation, Income Threshold

Median SAT Score, GPA Threshold

Median SAT Score, Income Threshold

Notes: These figures plot the 150% time to graduation (top panel) and "median" SAT score (bottom panel) for the first observed institution in which a student enrolls within 1 to 4 years of their Cal Grant application, pooled over cohorts, based on IPEDS data. Median GPA is computed as the average of GPA scores at the 25th and 75th percentiles. Students are binned by 0.03 GPA points or $1,000 relative to the year-specific eligibility threshold at the GPA and income thresholds, respectively. Income is reversed so that values above the cutoff represent lower family incomes; crossing the threshold from left to right indicates becoming eligible for the Cal Grant.

Instruction Expenditure per FTE, GPA Threshold

Instruction Expenditure per FTE, Income Threshold

Academic Support per FTE, GPA Threshold

Academic Support per FTE, Income Threshold

Notes: These figures plot instruction expenditures per full-time equivalent (top panel) and academic support per full-time equivalent (bottom panel) for the first observed institution in which a student enrolls within 1 to 4 years of their Cal Grant application, pooled over cohorts, based on IPEDS data. Students are binned by 0.03 GPA points or $1,000 relative to the year-specific eligibility threshold at the GPA and income thresholds, respectively. Income is reversed so that values above the cutoff represent lower family incomes; crossing the threshold from left to right indicates becoming eligible for the Cal Grant.

Notes: These figures plot research expenditures per full-time equivalent (top panel) and expenditures per full-time equivalent (bottom panel) for the first observed institution in which a student enrolls within 1 to 4 years of their Cal Grant application, pooled over cohorts, based on IPEDS data. Students are binned by 0.03 GPA points or $1,000 relative to the year-specific eligibility threshold at the GPA and income thresholds, respectively. Income is reversed so that values above the cutoff represent lower family incomes; crossing the threshold from left to right indicates becoming eligible for the Cal Grant.
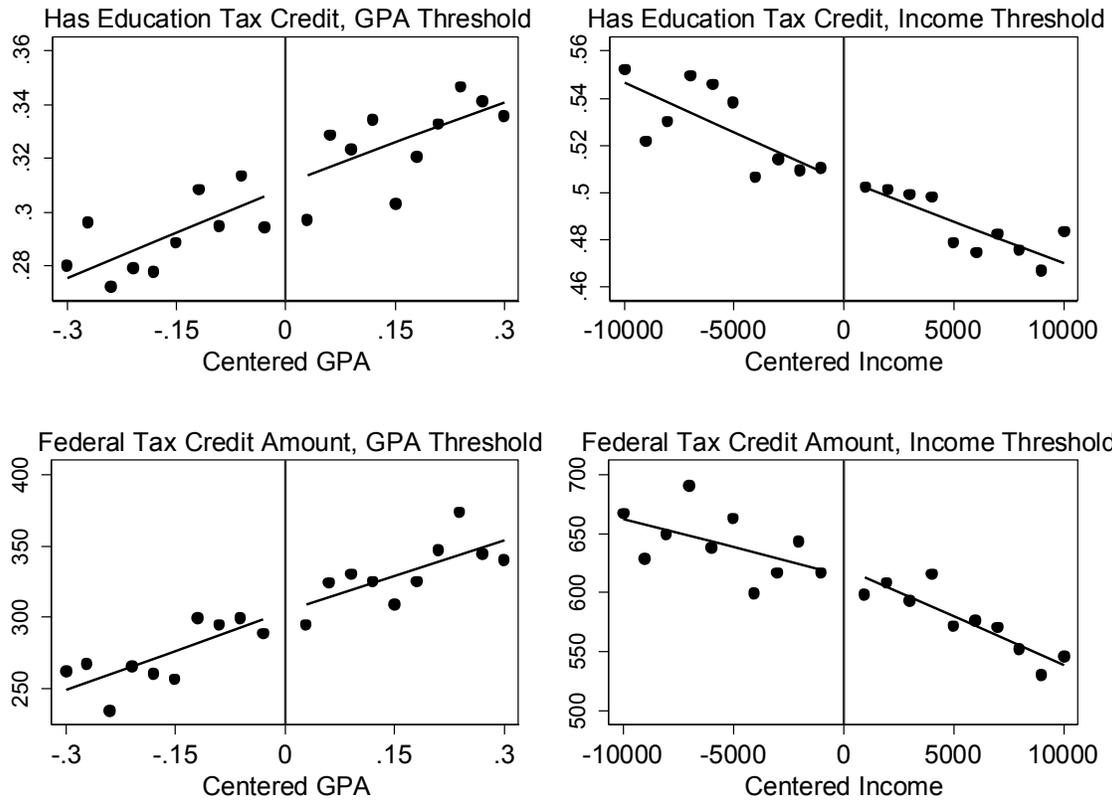
Notes: These figures plot the proportion of students' families that claim a Federal education tax credit (top panel) and average Federal education tax credit amounts (bottom panel) for within 1 to 4 years of their Cal Grant application, pooled over cohorts, based on IPEDS data. If a student is a dependent, the Federal education tax credit will be claimed by the primary filer associated with the student; we use the primary filer's tax return to gather Federal education tax credits in these cases. Students are binned by 0.03 GPA points or $1,000 relative to the year-specific eligibility threshold at the GPA and income thresholds, respectively. Income is reversed so that values above the cutoff represent lower family incomes; crossing the threshold from left to right indicates becoming eligible for the Cal Grant.