

**Taking It to the Limit: Effects of Increased Student Loan Availability on Attainment,
Earnings, and Financial Well-being***

ONLINE APPENDICES: NOT FOR PUBLICATION

Sandra E. Black
Columbia University, NBER, IZA, NHH

Jeffrey T. Denning
Brigham Young University, NBER, IZA

Lisa J. Dettling
Federal Reserve Board of Governors

Sarena Goodman
Federal Reserve Board of Governors

Lesley J. Turner
Vanderbilt University, NBER

January 2023

* Email: sblack@columbia.edu, jeffdenning@byu.edu, lisa.j.dettling@frb.gov, sarena.f.goodman@frb.gov, and lesley.j.turner@vanderbilt.edu. Any views or interpretations expressed in this paper are those of the authors and do not necessarily reflect the views of the Federal Reserve Board of Governors. The conclusions of this research do not necessarily reflect the opinion or official position of the Texas Education Research Center, the Texas Education Agency, the Texas Higher Education Coordinating Board, the Texas Workforce Commission, or the State of Texas.

Appendix A: Additional Details on Federal Loan Programs

Our analyses focus on borrowing limits for Stafford Loan Program, which is the primary source of loan aid provided to undergraduates by the federal government. Prior to 2010, schools could participate in one or both of two parallel federal lending programs: the William D. Ford Federal Direct Loan Program and the Federal Family Education Loan (FFEL) Program. FFEL loans were originated by private lenders and guaranteed by the federal government, but from a student's perspective, the two programs were interchangeable. The 2010 Health Care and Education Reconciliation Act abolished the FFEL program.

Students are limited in the total amount of Stafford Loans they can borrow during their undergraduate education. Prior to 2008, dependent students could borrow up to \$23,000 in total and independent students could borrow up to \$46,000. After 2008, aggregate limits were raised to \$31,000 for dependent students and \$57,500 for independent students.

A.1 Interest rates and origination fees

Students in our sample were exposed to three different Stafford Loan interest rate regimes. Loans originated before July 1, 2006 had variable in-school interest rates based on the 91-day Treasury note plus 1.7 percent and variable in-repayment interest rates based on the 91-day Treasury note plus 2.3 percent, both with a maximum of 8.25 percent. Loans originated after June 30, 2006 had interest rates that were fixed at origination. Between July 1, 2006 and June 30, 2012, interest rates ranged from 3.4 to 6.8 percent and were set by legislation. Starting July 1, 2012, interest rates were pegged to the rate for the 10-year Treasury note plus 2.05 percent, with a cap of 8.25 percent. Table A.1 summarizes the interest rates for loans originated between July 1, 2000 and June 30, 2018, while Table A.2 shows the annual interest rates for loans in repayment that were originated before July 1, 2007.

Stafford Loans provided to undergraduate students are classified as subsidized or unsubsidized. Subsidized loans do not accrue interest while a student has at least half-time enrollment. Subsidized loans also had lower interest rates between 2009 and 2013 (Table A.1). A student's subsidized loan eligibility is limited by the smaller of the subsidized loan maximum

(Table A.3) and her unmet need. Unmet need equals to the cost of attendance minus EFC and other financial assistance (grants and work-study). Unsubsidized loans eligibility is limited by the smaller of the overall loan maximum and the total cost of attendance minus other financial assistance and subsidized loans (i.e., unsubsidized loans can be used to cover a student's EFC). This latter constraint is rarely binding, and as a result, a reduction in subsidized loan eligibility is almost always met with an equal sized increase in unsubsidized loan eligibility (with total loan eligibility unchanged).

The value of the in-school subsidy will depend on the prevailing interest rate and time spent in school. Table A.4 provides examples of the difference in loan balance when entering repayment for a \$1000 subsidized relative to a \$1000 unsubsidized loan borrowed in a student's year of entry. Depending on the length of time spent in school, the in-school subsidy is worth as little as \$34 to as much as \$389.

Borrowers are charged an origination fee that is continuous in the amount borrowed and automatically subtracted from the amount of loan aid that is applied to tuition and fees or disbursed. Table A.5 displays origination fees for loans received between 2001 and 2018.

A.2 Other federal loan programs

Undergraduate students also potentially had access to Perkins Loans and Parent PLUS loans during the years we examine. The authority for schools to make new Perkins loans ended September 30, 2017, and final disbursements were allowed through June 30, 2018.¹ Perkins Loans were "campus-based" loans that schools could provide to students with exceptional financial need. Schools received a formula-based pot of money through the Perkins Loan Program that could be lent to students. Not all students with unmet need received Perkins Loans offers due to limited program funding. In the last year of the program, Perkins Loans made up less than 1 percent of all federal loan aid provided to students.²

Parent PLUS loans are available to credit-worthy parents of students. If a parent is denied PLUS loans due to "an adverse credit history," their child student is eligible to borrow at

¹ See <https://studentaid.gov/understand-aid/types/loans/perkins>.

² See Table 1, <https://research.collegeboard.org/pdf/trends-student-aid-2019-full-report.pdf>.

the independent student limit. Parents deemed credit-worthy can borrow up to their student's cost of attendance less grants and other loans. Statutory interest rates for Parent PLUS loans always exceed interest rates for Stafford Loans.³ In the years we examine, Parent PLUS loans made up 8 to 12 percent of annual borrowing.⁴

A.3 Process for determining aid

Students must file a Free Application for Federal Student Aid (FAFSA) to receive federal aid. For dependent students, the FAFSA requires information on both their own income and assets and their parents' income and assets, as well as a host of other details, including family structure, other family members in college, and federal means-tested benefits receipt. These inputs are used in a complicated nonlinear formula to determine a student's expected family contribution (EFC). Students also list the schools they are considering attending. After a student submits their FAFSA, the schools that are listed receive the information the student provided as well as their EFC. Using the information from the FAFSA, schools calculate each student's federal grant and loan eligibility, eligibility for state grant programs, and choose how much institutional aid to offer the student. The student is informed of their financial aid offers and the estimated costs associated with attending the institution (tuition and fees, books and supplies, living expenses) through a financial aid award letter. Students then accept the financial aid offered to them. Grants are typically automatically accepted whereas students must make a decision about whether and how much to borrow. The financial aid award letter is likely where many students learn about their loan eligibility although most schools also provide information on federal loan options and terms on a website.

Schools vary in the format and content of their financial aid award. Typically, a student sees the name of the loan type (e.g., Subsidized Loan) and an amount (see for example Marx and Turner 2019 Figure A1). Schools are allowed to include a loan offer that is less than the maximum amount a student is eligible to borrow, or completely exclude loans from the

³ See Smole, D. P. 2015. *Federal Student Loans Made Under the Federal Family Education Loan Program and the William D. Ford Federal Direct Loan Program: Terms and Conditions for Borrowers*. CRS Report R40122, Washington DC.

⁴ See Figure 6, <https://research.collegeboard.org/pdf/trends-student-aid-2019-full-report.pdf>.

financial aid award letter. However, in such cases, schools are required to inform the student of the maximum amount of federal loan aid they are eligible to borrow and cannot deny a student's request to borrow or borrow more than the amount of federal loan aid included on their award letter (conditional on eligibility). While the amount of loan aid listed in a student's award letter does not change their eligibility for federal student loans, it may affect how much a student borrows (Marx and Turner 2019). Marx and Turner (2019) document that nearly all four-year colleges package the maximum amount while two-year schools are more mixed with some not packaging and others packaging.

Most students receive their financial aid award letter(s) shortly after completing the FAFSA. Many students complete their FAFSA before the start of the academic year, but they can also fill it out (and receive aid offers) during a school year that has already started.

With this context, it is useful to think how students might receive information about the expansion of student loan limits. Students who attend schools that package loans will see a higher loan offer listed on their award letter. These offers are likely to affect the amount students borrow (Marx and Turner, 2019). At schools that do not package loans, they will not see a larger loan offer in their award letter but, to the extent that schools comply with the requirement that students be informed of their federal loan eligibility, will be informed of the higher amount of loan aid available through another mechanism (e.g., email, meetings with financial aid advisors).

It is possible that schools could react to higher federal loan limits by altering the amount of other types of aid offered in a phenomenon known as the Bennett Hypothesis (e.g., Lucca et al 2019). We document that financial aid was not differentially affected for constrained and unconstrained students (Appendix Table C.8). So, while the Bennett Hypothesis is important to consider, it does not appear to have differentially affected constrained and unconstrained students. Any increase in overall tuition will equally apply to constrained and unconstrained students within a school and would only serve to mute the increase in liquidity for constrained students.

A.4 Tables

Table A.1 Historic Stafford Loan interest rates

Year originated	Interest rate		Formula
	Sub	Unsub	
2000-2001	Variable		In-School, grace, and deferment periods: 91-day T-bill + 1.7% (capped at 8.25%); repayment periods: 91-day T-bill + 2.3% (capped at 8.25%).
2001-2002	Variable		
2002-2003	Variable		
2003-2004	Variable		
2004-2005	Variable		
2005-2006	Variable		
2006-2007	6.8%	6.8%	Set by 2002 amendments to the Higher Education Act (P.L. 107-139) and the College Cost Reduction and Access Act of 2007 (P.L. 110-84).
2007-2008	6.8%	6.8%	
2008-2009	6.0%	6.8%	
2009-2010	5.6%	6.8%	
2010-2011	4.5%	6.8%	
2011-2012	3.4%	6.8%	
2012-2013	3.4%	6.8%	
2013-2014	3.86%	3.86%	10-Year Treasury Note + 2.05% (capped at 8.25%).
2014-2015	4.66%	4.66%	
2015-2016	4.29%	4.29%	
2016-2017	3.76%	3.76%	
2017-2018	4.45%	4.45%	

Notes: Year originated covers July 1 through June 30 (e.g., 2000-2001 covers July 1, 2000 through June 30, 2001).

Table A.2 Annual Stafford Loan interest rates for loans originated between 2001 and 2007

Date	In-school interest rate	Repayment interest rate
2000-2001	8.19	7.59
2001-2002	5.99	5.39
2002-2003	4.06	3.46
2003-2004	3.42	2.82
2004-2005	3.37	2.77
2005-2006	5.30	4.70
2006-2007	7.14	6.54
2007-2008	7.22	6.62
2008-2009	4.21	3.61
2009-2010	2.48	1.88
2010-2011	2.47	1.87
2011-2012	2.36	1.76
2012-2013	2.39	1.79
2013-2014	2.35	1.75
2014-2015	2.33	1.73

Notes: Subsidized loans do not accrue interest while a borrower is in school or during the 6-month grace period following repayment entry. Interest rates are in effect July 1 to June 30. The in-school interest rate also applies to loans in deferment or in grace periods. 2000-2015 interest rates from Smole, D. P. 2015. *Federal Student Loans Made Under the Federal Family Education Loan Program and the William D. Ford Federal Direct Loan Program: Terms and Conditions for Borrowers*. CRS Report R40122, Washington DC.

Table A.3: Value of in-school subsidy for \$1000 loan borrowed at entry

Cohort	Time spent in school				
	1 year	2 years	3 years	4 years	5 years
2001	\$82	\$147	\$193	\$234	\$276
2002	\$60	\$103	\$141	\$179	\$242
2003	\$41	\$76	\$112	\$171	\$255
2004	\$34	\$69	\$126	\$206	\$293
2005	\$34	\$88	\$166	\$250	\$303
2006	\$50	\$125	\$207	\$257	\$289
2007	\$68	\$141	\$218	\$301	\$389
2008	\$68	\$141	\$218	\$301	\$389

Notes: This table shows the amount of interest that would accumulate while a borrower is in school for a \$1000 unsubsidized loan by entry cohort and years of enrollment.

Table A.4: Subsidized loan limits by class standing and entry cohort

Academic year	Freshmen	Sophomores	Upper level
2006-07 and earlier	\$2,625	\$3,500	\$5,500
2007-08	\$3,500	\$4,500	\$5,500
2008-09 and later	\$3,500	\$4,500	\$5,500

Notes: Community college students are limited to sophomore status regardless of credit accumulation.

Table A.5 Stafford Loan origination fees by origination year

Date originated	Fee
July 1, 1994 – June 30, 2006	4%
July 1, 2006 – June 30, 2007	3%
July 1, 2007 – June 30, 2008	2.5%
July 1, 2008 – June 30, 2009	2%
July 1, 2009 – June 30, 2010	1.5%
July 1, 2010 – June 30, 2013	1%
July 1, 2013 – November 30, 2013	1.051%
December 1, 2013 – September 30, 2014	1.072%
October 1, 2014 – September 30, 2015	1.073%
October 1, 2015 – September 30, 2016	1.068%
October 1, 2016 – September 30, 2017	1.069%
October 1, 2017 – September 30, 2018	1.066%

Notes: From Smole, D. P. 2019. *Federal Student Loans Made Through the William D. Ford Federal Direct Loan Program: Terms and Conditions for Borrowers*. CRS Report R45931, Washington DC.

Appendix B: Data

B.1 Texas education data

We use data from the Texas Higher Education Coordinating Board, which was accessed through the University of Houston Education Research Center (ERC).⁵ Although these data are not publicly available, interested researchers can apply for access through the ERCs at the University of Houston, University of Texas at Austin, and University of Texas at Dallas.⁶

Records of all students who enrolled in a public higher education institution in Texas are linked to quarterly earnings in sectors covered by the Texas unemployment insurance system. UI records cover employers who pay at least \$1500 in gross wages to employees or have at least one employee during twenty weeks in a calendar year. Students employed by their college or university are not included in this data set. However, we do observe earnings through federal, state, or institutional work-study programs. Annual earnings are the sum of quarterly earnings over the academic year. For example, 2004 annual earnings are the sum of earnings for 2003-Q3, 2003-Q4, 2004-Q1, and 2004-Q2.

We observe attainment and earnings outcomes are available through the 2016-17 academic year and financial aid outcomes through the 2018-19 academic year. Thus, for all students in our main sample, we observe at least 9 years of outcomes (i.e., outcomes up to 8 years after entry). Approximately 30 percent of borrowers in the Texas sample are constrained, which reflects the fact that students are less likely to be constrained at public higher education institutions

⁵ See <https://www.uh.edu/education/research/institutes-centers/erc/>. Information on the data maintained at the ERC is available at: <https://www.uh.edu/education/research/institutes-centers/erc/data-warehouse/>.

⁶ Information on submitting a proposal to the University of Houston ERC is available at: <https://www.uh.edu/education/research/institutes-centers/erc/proposal-preparation-and-submission/>.

Table B.1: Characteristics and Higher Education Outcomes for Texas and United States

	United States	Texas
<i>A. Population characteristics</i>		
Fraction of population with bachelor's degree	0.357	0.310
Median household Income	\$60,336	\$59,336
<i>B. Public higher education characteristics</i>		
Educational appropriations per FTE	\$7,642	\$7,356
Average tuition		
Public community colleges	\$3,156	\$2,099
Public 4-year institutions	\$8,804	\$8,375
6-year graduation rates (4-yr institutions)	0.602	0.537
Student race/ethnicity		
White	0.540	0.345
Black	0.133	0.133
Hispanic	0.209	0.380

Source: 2019 THECB Almanac except for information on national enrollment by race which comes from the 2019 NCES Digest of Education Statistics Table 306.10 (https://nces.ed.gov/programs/digest/d19/tables/dt19_306.10.asp).

Notes: Race variables from fall 2018. For details of variable construction see 2019 Texas Public Higher Education Almanac. FTE = full-time equivalent students.

B.2 CCP/Equifax data

Our student loan borrowing data are derived from the student loan tradeline data, a subset of the CCP/Equifax dataset. This is a *loan-level* dataset available for every member of CCP/Equifax sample who has a student loan. It includes detailed information on up to 20 individual student loans in each quarter. For each loan, the dataset includes the exact date of loan origination, the amount borrowed at origination, the current balance, the current payment, and the current delinquency status.

The sampling frame is based on Social Security numbers so that once a consumer establishes a credit history and enters the sample, the consumer remains in the sample continuously until death (even in the absence of credit activity). The sample is refreshed each quarter as new individuals establish credit records for the first time.

We collapse the tradeline data on each individual student loan into a borrower by academic year dataset. To do this, we employ the universe of tradeline data for 2004 through 2019, measured in June of each year. We assign academic years using the loan opening date, where we define an academic year as July through June. To allow for lags between loan origination

and appearance on the credit record, our analyses will use up to six years of retrospective panel data to calculate each academic year of borrowing.⁷ For example, to calculate borrowing for the 2003-04 academic year, we will first examine a borrowers' credit record in June of 2004. If we observe any loans with opening dates between July 1, 2003 and June 30, 2004, we collapse those loans and assign the total amount as AY 2003-04 borrowing. If we do not observe any student loans with opening dates between July 1, 2003 and June 30, 2004, we examine data from June 2005, and so on. If we do not see any loans by the sixth year, June 2009, we assume no borrowing took place in AY2003-04. We then repeat this process for all borrowers and each academic year we study (2003-04 through 2007-08 entry cohorts, with up to six years of borrowing for each cohort). We do not remove loans if they disappear, since that could reflect a borrower paying off the loan. We also do not revise total borrowing amounts if they change over time, because changes in loan size could reflect refinancing.

Correctly identifying each borrower's cohort and corresponding statutory borrowing limit is central to our analysis; thus, we impose several criteria to achieve a final sample of borrowers for whom we can most confidently infer this information. First, to help ensure we are observing a borrower's true first year of postsecondary education, rather than simply her first year of borrowing, we restrict the sample to those who were at most 20 years old in the first year we observe borrowing. Second, we exclude individuals who, in their first year of borrowing, borrow above the first-year statutory limit for their cohort. Such borrowers may face a statutory higher limit because they began borrowing in a later year of schooling (in which case their cohort would be misidentified) or because they are considered financially independent according to Department of Education guidelines, or they may have obtained a student loan

⁷ Lags between loan origination and appearance on the credit record occur for two reasons. First, student loan servicers do not always report every quarter. Second, a servicer could report a loan, but the data provider might not have sufficient information to positively link the loan to an existing credit record. The loan will then generate its own credit record for a (typically, short) period of time, until the data provider has sufficient information to make the link between the loan and the pre-existing credit record. At that point, the data provider will only maintain a file for the pre-existing credit record, which will include that new loan (with its original opening date).

through the private market.⁸ In any of these instances, they would not be subject to the statutory limits that generate our variation.

Once we have used these criteria to identify a sample of borrowers who began borrowing in 2003-04 through 2007-08, we then merge in full credit record data for the year before entry through 10 years after entry (e.g., for the 2003-04 entry cohort, we merge data for June 2003 through June 2014). Because servicers (especially student loan servicers) do not always report every quarter, we will impute up to two years of missing student loan data, and up to one year of other type of missing data using a simple linear interpolation.⁹ When data is missing because an individual has not yet established a credit record, we assume a value of zero for all variables. We also use the panel information to further restrict the sample to include only individuals who remain in the credit record data through the eighth year of after entry. Because the sampling is based on Social Security numbers, this removes individuals who legitimately passed away during that time, which could be a (fairly rare) outcome of interest. However, this process improves our confidence in the imputation of missing data as only due to servicer non-report, and also removes inadvertently duplicated individuals.¹⁰ Our final sample includes 143,850 borrowers, measured over 10 years each. In line with the national estimates from Delisle and

⁸ We cannot distinguish private and federal student loans the CCP/Equifax data, but individuals that are able to borrow through the private market are likely quite different than borrowers that exclusively rely on federal loans in a manner that is not necessarily consistent over time, so it makes sense to try to exclude them. In particular, private student loans are underwritten, which implies potential borrowers must be sufficiently creditworthy to have their application approved (or, their parents sufficiently creditworthy and willing to aid their children), they are not subject to statutory limits, and their terms and availability reflect credit market conditions.

⁹ Servicers are not required to report a federal loan as in payment delinquency until at least 90 days (one quarter) of payments are missed, and loans are considered in default once 270 days of payments are missed. However, servicers are not required to (and generally do not) report default until 360 days of missed payments. See <https://studentaid.ed.gov/sa/repay-loans/default> and <https://www.gao.gov/assets/670/665709.pdf>. According to the CCP/Equifax data documentation, before 2011, the “delinquency on any debt” measure could reflect student loan delinquencies as well, but upon inspection of the data through 2011, individuals who were delinquent on student loan payments were equally, if not more, likely to have a value of zero for this measure, suggesting student loans are not included in the measure throughout our sample period.

¹⁰ Duplicated files arise when a new loan is taken out but there is not sufficient information to link that loan to an existing credit record. These so-called “fragmentary” duplicated files typically only remain in the data a short time before the data provider is able to make a positive link, merges the loan to the existing record, and ceases reporting on the duplicated file. These “fragmentary” files are relatively more common in our sample than in the overall data because many student borrowers tend to have very little other information on their credit record when they first begin borrowing, making positive links more difficult. By restricting the sample to individuals who remain in the data through the 10th year, we should eliminate the vast majority of duplicate “fragmentary” files. Furthermore, because we use up to six years of retrospective data for assigning within school borrowing, we can be confident that we will have assigned the in-school borrowing to the appropriate individual as well, even if at the time of initial reporting, a positive link between that loan and the individual had not yet been made.

Blagg (2022) for dependent undergraduate borrowers, between two-thirds and three-quarters of borrowers are classified as constrained in the CCP/Equifax analysis sample.

We match this data to county-level data on racial segregation, income segregation, income adjusted test score percentiles, school expenditure per student, and student teacher ratios from Opportunity Insights at www.opportunityinsights.org/paper/neighborhoods. These data are based on the measures which were constructed by Chetty and Hendren (2017). A detailed description of the construction of the variables and data sources can be found in Online Appendix G which accompanies Chetty, Hendren, Kline and Saez (2014).¹¹ A brief summary of the variables we use in our analysis is as follows: income and racial segregation are Theil indices which range from 0 (no segregation) to 1 (completely segregated) and are based on 2000 Census tract-level data. School expenditures per student and student teacher ratios are based on 1996-1997 data from the NCES Common Core of Data. Test score percentiles are based a standardized measure of grade 3-8 tests scores on Math and Reading from the Global Report card for 2004-07, which are income adjusted using the residual of a regression of mean test scores on mean parent family income. In the raw Opportunity Insights data, the resulting measure is mean 0 with a standard deviation of 9 and when merged with the CCP sample, the measure has a mean of -3, which implies that our sample of young student borrowers tends to live in areas with below national average test scores.

¹¹ Chetty, R., Hendren, N, Kline, P. & Saez, E. 2014. “Where is the Land of Opportunity? The Geography of Intergenerational Mobility in the United States,” *Quarterly Journal of Economics*, 129(4): 1553-1623.

Appendix C: Additional Tables and Figures

Table C.1: Percent of students and borrowers who are constrained

	Percent of students who are constrained					Percent of borrowers who are constrained				
	All	CC	4yr public	Nonprofit	For-profit	All	CC	4yr public	Nonprofit	For-profit
A. 2004										
All students	0.165	0.029	0.233	0.337	0.327	0.480	0.273	0.505	0.597	0.421
Race/ethnicity										
AIAN	0.122	**	0.186	**	**	0.403	**	0.375	**	**
API	0.121	0.014	0.162	0.336	0.392	0.459	0.256	0.421	0.594	0.511
Black	0.179	0.031	0.317	0.327	0.293	0.420	0.211	0.532	0.489	0.358
Hispanic	0.127	0.015	0.194	0.233	0.346	0.428	0.210	0.443	0.467	0.466
White	0.174	0.033	0.234	0.359	0.332	0.509	0.302	0.518	0.645	0.435
Pell Grant receipt										
No Pell	0.139	0.023	0.208	0.309	0.314	0.549	0.329	0.571	0.641	0.495
Received Pell	0.231	0.049	0.303	0.405	0.336	0.401	0.215	0.416	0.528	0.380
Income as % FPL										
<100%	0.111	0.019	0.149	0.233	0.246	0.294	0.155	0.278	0.411	0.311
100-249%	0.169	0.030	0.247	0.334	0.364	0.433	0.227	0.459	0.529	0.434
250%+	0.184	0.034	0.251	0.365	0.366	0.600	0.388	0.617	0.685	0.531
B. 2008										
All students	0.161	0.030	0.212	0.321	0.308	0.398	0.198	0.436	0.521	0.361
Race/ethnicity										
AIAN	0.094	**	0.141	**	**	0.258	**	0.303	**	**
API	0.122	0.017	0.144	0.324	0.346	0.402	0.204	0.370	0.572	0.392
Black	0.187	0.034	0.315	0.338	0.279	0.369	0.186	0.474	0.451	0.306
Hispanic	0.133	0.018	0.165	0.248	0.303	0.373	0.180	0.393	0.410	0.402
White	0.165	0.034	0.210	0.331	0.318	0.412	0.205	0.439	0.555	0.368
Pell Grant receipt										
No Pell	0.134	0.024	0.184	0.296	0.303	0.429	0.216	0.458	0.547	0.394
Received Pell	0.226	0.051	0.289	0.385	0.311	0.360	0.175	0.403	0.478	0.341
Income as % FPL										
<100%	0.134	0.024	0.177	0.273	0.234	0.283	0.130	0.313	0.395	0.280
100-249%	0.163	0.030	0.232	0.344	0.341	0.374	0.180	0.410	0.489	0.381
250%+	0.172	0.035	0.214	0.325	0.355	0.472	0.256	0.494	0.572	0.436
C. 2016										
All students	0.154	0.029	0.209	0.290	0.247	0.390	0.181	0.422	0.477	0.384
Race/ethnicity										
AIAN	0.095	**	0.131	**	0.215	0.306	0.208	0.303	**	0.335
API	0.101	0.017	0.120	0.216	0.274	0.353	0.206	0.321	0.431	0.453
Black	0.205	0.037	0.313	0.345	0.267	0.400	0.155	0.497	0.460	0.381
Hispanic	0.111	0.015	0.145	0.276	0.234	0.357	0.170	0.349	0.445	0.393
White	0.161	0.033	0.214	0.289	0.236	0.399	0.191	0.426	0.497	0.371
Pell Grant receipt										
No Pell	0.118	0.023	0.176	0.237	0.152	0.424	0.223	0.453	0.498	0.393
Received Pell	0.208	0.041	0.260	0.370	0.298	0.366	0.152	0.394	0.458	0.381
Income as % FPL										
<100%	0.132	0.022	0.181	0.270	0.237	0.338	0.141	0.367	0.442	0.350
100-249%	0.151	0.023	0.218	0.309	0.268	0.371	0.145	0.409	0.448	0.401
250%+	0.178	0.041	0.226	0.295	0.254	0.455	0.255	0.474	0.523	0.452

Notes: Data from the 2004, 2008, and 2016 waves of the NPSAS (accessed via PowerStats). International students are excluded. AIAN = American Indian or Alaskan Native. API = Asian or Pacific Islander. FPL = federal poverty line. CC = community college. ** = underlying sample too small for estimate to be reported.

Table C.2: Percent of dependent students and dependent borrowers who are constrained

	Percent of students who are constrained					Percent of borrowers who are constrained				
	All	CC	4yr public	Nonprofit	For-profit	All	CC	4yr public	Nonprofit	For-profit
<i>A. 2004</i>										
All students	0.255	0.055	0.302	0.459	0.566	0.657	0.447	0.642	0.747	0.718
Race/ethnicity										
AIAN	0.202	**	0.281	**	**	0.548	**	0.573	**	**
API	0.175	0.024	0.205	0.403	0.595	0.568	0.378	0.517	0.686	0.721
Black	0.337	0.078	0.448	0.573	0.607	0.674	0.422	0.692	0.757	0.725
Hispanic	0.197	0.028	0.261	0.344	0.558	0.601	0.329	0.592	0.631	0.731
White	0.261	0.061	0.298	0.466	0.552	0.672	0.479	0.650	0.769	0.713
Pell Grant receipt										
No Pell	0.219	0.046	0.266	0.421	0.489	0.664	0.451	0.655	0.755	0.693
Received Pell	0.375	0.089	0.431	0.575	0.646	0.644	0.440	0.614	0.729	0.739
Income as % FPL										
<100%	0.208	0.032	0.252	0.381	0.573	0.589	0.350	0.547	0.654	0.724
100-249%	0.261	0.053	0.328	0.489	0.595	0.621	0.401	0.602	0.724	0.716
250%+	0.261	0.061	0.300	0.459	0.534	0.686	0.488	0.674	0.768	0.712
<i>B. 2008</i>										
All students	0.221	0.049	0.262	0.410	0.452	0.531	0.306	0.529	0.644	0.549
Race/ethnicity										
AIAN	0.139	**	0.222	**	**	0.455	**	0.503	**	**
API	0.161	0.028	0.178	0.376	0.422	0.499	0.389	0.438	0.632	0.496
Black	0.297	0.062	0.425	0.523	0.456	0.556	0.327	0.592	0.656	0.519
Hispanic	0.184	0.027	0.222	0.368	0.463	0.524	0.266	0.512	0.584	0.620
White	0.224	0.055	0.252	0.407	0.450	0.530	0.306	0.524	0.654	0.527
Pell Grant receipt										
No Pell	0.191	0.043	0.228	0.373	0.404	0.521	0.303	0.520	0.633	0.516
Received Pell	0.323	0.073	0.375	0.538	0.501	0.552	0.315	0.547	0.671	0.580
Income as % FPL										
<100%	0.207	0.033	0.285	0.422	0.409	0.499	0.241	0.506	0.614	0.538
100-249%	0.232	0.046	0.313	0.489	0.485	0.525	0.300	0.526	0.648	0.567
250%+	0.220	0.056	0.244	0.388	0.433	0.539	0.323	0.534	0.644	0.530
<i>C. 2016</i>										
All students	0.209	0.041	0.253	0.373	0.349	0.476	0.254	0.474	0.570	0.524
Race/ethnicity										
AIAN	0.129	**	**	**	0.452	0.498	**	0.532	**	**
API	0.124	0.027	0.136	0.245	0.364	0.384	0.289	0.346	0.459	0.614
Black	0.303	0.063	0.394	0.510	0.389	0.530	0.250	0.573	0.599	0.553
Hispanic	0.138	0.022	0.171	0.340	0.300	0.418	0.239	0.390	0.528	0.490
White	0.226	0.049	0.260	0.372	0.363	0.483	0.257	0.476	0.583	0.522
Pell Grant receipt										
No Pell	0.185	0.040	0.229	0.323	0.291	0.489	0.284	0.492	0.566	0.540
Received Pell	0.248	0.043	0.291	0.468	0.383	0.461	0.218	0.451	0.576	0.516
Income as % FPL										
<100%	0.174	0.024	0.227	0.395	0.342	0.442	0.206	0.435	0.544	0.520
100-249%	0.207	0.028	0.270	0.434	0.372	0.463	0.191	0.466	0.575	0.523
250%+	0.227	0.060	0.256	0.352	0.376	0.501	0.303	0.496	0.583	0.570

Notes: Data from the 2004, 2008, and 2016 waves of the NPSAS (accessed via PowerStats). International students and students classified as independent are excluded. AIAN = American Indian or Alaskan Native. API = Asian or Pacific Islander. FPL = federal poverty line. CC = community college. ** = underlying sample too small for estimate to be reported.

Table C.3 Credit Outcomes for Texas Borrowers

	<u>Constrained</u>		<u>Unconstrained</u>	
	2004-05	2006-08	2004-05	2006-08
Entry Year Borrowing	\$3,588	\$4,018	\$2,122	\$2,166
Age	18.6	18.5	18.8	18.8
Has a Credit Report	0.22	0.21	0.30	0.29
Has a Credit Score	0.19	0.18	0.27	0.27
Number of Accounts	0.28	0.26	0.44	0.43
Has a Credit Card	0.13	0.13	0.16	0.18
Has an Auto Loan	0.02	0.02	0.04	0.03
Number of Students	2,431	3,651	1,350	1,749

Notes: CCP/Equifax sample, limited to individuals who borrowed student loans while living in Texas. Credit report outcomes are measured in the June prior to the start of the academic year (e.g., June 2004 for the 2004-05 academic year). All dollar amounts adjusted for inflation using the CPI-U and reported in 2018\$.

Table C.4: Additional Baseline Characteristics of Constrained and Unconstrained Borrowers

<i>Entry cohort =</i>	<u>Constrained borrowers</u>		<u>Unconstrained borrowers</u>	
	<i>2001-2005</i>	<i>2006-2008</i>	<i>2001-2005</i>	<i>2006-2008</i>
<i>A. Four-year college entrants</i>				
Demographics (measured at college entry)				
College educated parent	0.53	0.57	0.45	0.48
Race = Asian or Pacific Islander	0.06	0.07	0.05	0.05
Race = Black	0.17	0.21	0.26	0.21
Race = Hispanic	0.23	0.27	0.35	0.39
Has high school records	0.85	0.85	0.85	0.86
Special education in HS*	0.01	0.01	0.02	0.02
High school performance*				
Share of time in high school absent	0.03	0.03	0.03	0.03
Missing math score	0.06	0.04	0.07	0.06
Missing reading score	0.07	0.05	0.08	0.07
Number of math courses	2.9	2.8	2.6	2.7
Took Biology	0.95	0.97	0.94	0.96
Took Physics	0.47	0.46	0.42	0.42
Took Chemistry	0.81	0.87	0.77	0.84
Missing course data	0.08	0.06	0.08	0.06
<i>B. Community college entrants</i>				
Demographics (measured at college entry)				
College educated parent	0.40	0.41	0.32	0.36
Race = Asian or Pacific Islander	0.02	0.01	0.01	0.01
Race = Black	0.22	0.24	0.26	0.25
Race = Hispanic	0.32	0.28	0.27	0.29
Has high school records	0.80	0.82	0.79	0.79
Special education in HS*	0.09	0.06	0.11	0.09
High school performance*				
Share of time in high school absent	0.04	0.04	0.04	0.04
Missing math score	0.13	0.12	0.12	0.15
Missing reading score	0.14	0.12	0.14	0.15
Number of math courses	2.0	2.2	1.9	2.0
Took Biology	0.88	0.92	0.86	0.87
Took Physics	0.20	0.20	0.16	0.17
Took Chemistry	0.54	0.66	0.49	0.59
Missing course data	0.07	0.05	0.07	0.06

Notes: The sample includes student borrowers who first enrolled in a public four-year institution (Panel A) or public community college (Panel B) in Texas, were classified as dependent students at entry, and borrowed at or below the federal Stafford Loan maximum for first-year students; characteristics with * are only available for students who had nonmissing high school records.

Table C.5: Baseline Characteristics of Nonborrowers and Students Borrowing Above Federal Limits, Texas Sample

A. Four-year college entrants

<i>Entry cohort =</i>	<u>Nonborrowers</u>		<u>Borrowed > 1st year max</u>	
	<i>2001-2005</i>	<i>2006-2008</i>	<i>2001-2005</i>	<i>2006-2008</i>
Demographics (measured at college entry)				
Gender = male	0.48	0.48	0.43	0.45
Race = Asian or Pacific Islander	0.06	0.07	0.04	0.05
Race = Black	0.08	0.08	0.23	0.25
Race = Hispanic	0.27	0.27	0.19	0.22
Race = white	0.56	0.54	0.52	0.47
Race = URM	0.35	0.36	0.43	0.48
Texas resident	0.93	0.93	0.93	0.93
Age	18.0	17.9	18.2	18.0
College educated parent	0.36	0.49	0.57	0.60
Has high school records	0.80	0.75	0.84	0.86
Free/reduced price lunch in HS*	0.17	0.11	0.14	0.12
Special education in HS*	0.01	0.01	0.02	0.02
High school performance*	0.01	0.02	0.02	0.01
Math z-score	0.61	0.67	0.53	0.52
Reading z-score	0.53	0.54	0.51	0.50
Number of AP courses	3.4	3.4	3.6	3.6
Number of advanced math courses	1.0	1.0	1.0	1.0
Number of courses failed	1.2	1.0	1.2	1.1
Share of time in high school absent	0.03	0.03	0.03	0.02
Missing math score	0.06	0.05	0.07	0.04
Missing reading score	0.07	0.05	0.08	0.05
Number of math courses	2.9	2.9	2.9	2.9
Took Biology	0.95	0.97	0.94	0.96
Took Physics	0.47	0.46	0.42	0.42
Took Chemistry	0.81	0.87	0.77	0.84
Missing course data	0.08	0.06	0.08	0.06
Financial aid received in entry year (2018\$)				
Federal Pell Grant	\$837	\$789	\$1,276	\$1,268
TEXAS Grant	\$664	\$1,253	\$2,024	\$2,759
Other grants	\$545	\$620	\$876	\$848
Work study	\$55	\$45	\$187	\$174
EFC (2018\$)	\$2,214	\$10,224	\$12,510	\$13,776
COA (2018\$)	\$11,573	\$15,528	\$14,651	\$18,597
Number of students	156,261	91,121	34,086	39,675

B. Community college entrants

<i>Entry cohort =</i>	<u>Nonborrowers</u>		<u>Borrowed > 1st year max</u>	
	<i>2001-2005</i>	<i>2006-2008</i>	<i>2001-2005</i>	<i>2006-2008</i>
Demographics (measured at college entry)				
Gender = male	0.50	0.50	0.58	0.61
Race = Asian or Pacific Islander	0.04	0.04	0.02	*
Race = Black	0.10	0.10	0.21	0.28
Race = Hispanic	0.31	0.35	0.17	0.17
Race = white	0.52	0.47	0.59	0.52
Race = URM	0.41	0.46	0.38	0.46
Texas resident	0.95	0.95	0.96	0.96
Age	18.5	18.2	18.8	18.4
College educated parent	0.25	0.31	0.45	0.40
Has high school records	0.72	0.68	0.81	0.83
Free/reduced price lunch in HS*	0.22	0.18	0.16	0.18
Special education in HS*	0.08	0.10	0.11	0.14
High school performance*				
Math z-score	0.14	-0.01	0.07	-0.20
Reading z-score	0.15	0.07	0.05	-0.07
Number of AP courses	1.4	1.1	1.1	0.6
Number of advanced math courses	0.4	0.3	0.3	0.3
Number of courses failed	3.0	3.1	2.6	2.9
Share of time in high school absent	0.04	0.04	0.04	0.04
Missing math score	0.11	0.13	0.13	0.14
Missing reading score	0.12	0.13	0.14	0.14
Number of math courses	2.2	2.2	2.2	2.2
Took Biology	0.88	0.91	0.89	0.91
Took Physics	0.26	0.24	0.22	0.17
Took Chemistry	0.60	0.67	0.58	0.62
Missing course data	0.09	0.06	0.06	0.05
Financial aid received in entry year (2018\$)				
Federal Pell Grant	\$756	\$800	\$1,291	\$1,451
TEXAS Grant	\$84	\$119	\$311	\$155
Other grants	\$106	\$157	\$1,507	\$553
Work study	\$22	\$20	\$139	\$43
EFC (2018\$)	\$1,086	\$3,119	\$9,824	\$8,886
COA (2018\$)	\$7,724	\$8,747	\$12,398	\$11,686
Number of students	490,373	294,285	3,400	2,965

Notes: The sample includes student borrowers who first enrolled in a public four-year institution (Panel A) or public community college (Panel B) in Texas, were classified as dependent students at entry, and either did not borrow in their entry year or borrowed more than the federal Stafford Loan maximum for first-year students; characteristics with * are only available for students who had nonmissing high school records. URM = underrepresented minority (Black, Hispanic, and Native students). EFC = expected family contribution. COA = cost of attendance (tuition and fees plus living expenses). AP = advanced placement. Math and reading z-scores are standardized to have mean = 0, standard deviation = 1 across all high school test takers for the subject-academic year.

Table C.6: Prediction of Probability of Being Constrained

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>A. Demographics</i>								
Gender = male	-0.032 (0.003)**	-0.027 (0.003)**	-0.028 (0.003)**	-0.025 (0.003)**	-0.021 (0.003)**	-0.022 (0.003)**	-0.018 (0.003)**	-0.006 (0.003)*
Race/ethnicity								
Asian/Pacific Islander	0.041 (0.008)**	0.036 (0.007)**	0.026 (0.008)**	0.011 (0.008)	-0.014 (0.008)+	0.006 (0.008)	-0.019 (0.008)*	0.009 (0.007)
Black	-0.089 (0.004)**	-0.074 (0.004)**	-0.042 (0.004)**	-0.041 (0.004)**	-0.050 (0.005)**	-0.031 (0.005)**	-0.049 (0.005)**	-0.003 (0.004)
Hispanic	-0.089 (0.004)**	-0.082 (0.004)**	-0.070 (0.004)**	-0.067 (0.004)**	-0.024 (0.005)**	-0.013 (0.005)**	-0.021 (0.005)**	-0.010 (0.004)**
Native American/Alaskan Native	-0.020 (0.023)	-0.021 (0.022)	-0.016 (0.022)	-0.012 (0.022)	-0.013 (0.022)	-0.003 (0.022)	-0.010 (0.022)	-0.005 (0.021)
College educated parent(s)	0.088 (0.003)**	0.071 (0.003)**	0.064 (0.003)**	0.060 (0.003)**	0.057 (0.003)**	0.046 (0.003)**	0.039 (0.003)**	0.008 (0.003)**
<i>B. High school</i>								
Free/reduced price lunch eligible		-0.052 (0.004)**	-0.047 (0.004)**	-0.046 (0.004)**	-0.025 (0.004)**	-0.010 (0.004)*	-0.024 (0.004)**	-0.036 (0.004)**
Special education		-0.099 (0.008)**	-0.050 (0.008)**	-0.029 (0.008)**	-0.028 (0.008)**	-0.031 (0.008)**	-0.013 (0.008)	-0.011 (0.008)
Math z-score			0.037 (0.002)**	0.021 (0.003)**	0.015 (0.003)**	0.015 (0.003)**	0.003 (0.003)	-0.004 (0.002)
Reading z-score			0.026 (0.003)**	0.020 (0.003)**	0.020 (0.003)**	0.020 (0.003)**	0.011 (0.003)**	0.005 (0.002)*
Has math test score			0.014 (0.009)	-0.003 (0.009)	-0.002 (0.009)	-0.004 (0.009)	-0.009 (0.009)	-0.012 (0.008)
Has reading test score			0.017 (0.009)+	0.010 (0.009)	0.015 (0.009)+	0.015 (0.009)+	0.014 (0.009)	0.016 (0.008)*
Number of courses								
Advanced Placement ($\sigma = 3.29$)				0.001 (0.001)+	0.001 (0.001)*	0.001 (0.001)*	-0.001 (0.001)	0.0001 (0.001)
Advanced math ($\sigma = 1.31$)				-0.002 (0.001)	0.002 (0.002)	0.001 (0.002)	0.001 (0.001)	-0.001 (0.001)
Math ($\sigma = 1.24$)				0.019 (0.002)**	0.019 (0.002)**	0.019 (0.002)**	0.015 (0.002)**	0.008 (0.002)**
Completed science courses								
Biology				0.004 (0.007)	0.008 (0.007)	0.008 (0.007)	0.009 (0.007)	0.005 (0.006)
Physics				0.024 (0.004)**	0.016 (0.004)**	0.015 (0.004)**	0.006 (0.004)	0.001 (0.003)
Chemistry				0.018 (0.004)**	0.023 (0.004)**	0.023 (0.004)**	0.015 (0.004)**	0.007 (0.004)+
Number of courses failed ($\sigma = 3.92$)				-0.001 (0.000)**	-0.003 (0.001)**	-0.003 (0.001)**	-0.002 (0.000)**	-0.002 (0.000)**
Percent of time absent ($\sigma = 0.378$)				-0.435 (0.044)**	-0.362 (0.044)**	-0.312 (0.044)**	-0.217 (0.043)**	-0.176 (0.040)**
Has course data				-0.073 (0.009)**	-0.081 (0.010)**	-0.079 (0.010)**	-0.051 (0.010)**	-0.028 (0.008)**
Has attendance data				-0.018 (0.081)	-0.027 (0.075)	-0.014 (0.075)	-0.020 (0.072)	0.005 (0.074)

C. Higher education

Age at college entry ($\sigma = 0.736$)						-0.003 (0.003)	-0.001 (0.003)	-0.0002 (0.003)
EFC at college entry (\$1k) ($\sigma = 13.18$)						0.003 (0.0001)**	0.003 (0.0001)**	0.002 (0.0001)**
EFC = 0						-0.007 (0.004)+	-0.076 (0.005)**	-0.071 (0.004)**
Entered community college							-0.089 (0.004)**	
Cost of attendance (\$1k) ($\sigma = 5.12$)							0.015 (0.000)**	0.022 (0.000)**
Grant aid (\$1k)								
Pell Grant ($\sigma = 2.09$)							0.024 (0.001)**	0.020 (0.001)**
TEXAS Grant ($\sigma = 1.89$)							-0.009 (0.001)**	-0.014 (0.001)**
Other grants ($\sigma = 2.85$)							-0.014 (0.001)**	-0.017 (0.001)**
Test of joint significance (p-value)								
HS graduation year		<0.001	<0.001	<0.001	<0.001	0.002	0.001	0.004
High school district					<0.001	<0.001	<0.001	
College entry cohort						<0.001	<0.001	<0.001
Entry college								<0.001
Observations	100,423	100,423	100,423	100,423	100,423	100,423	100,423	100,423
R-squared	0.020	0.071	0.078	0.083	0.123	0.131	0.160	0.259
Specification								
Baseline characteristics	X	X	X	X	X	X	X	X
FRPL eligibility, special education, HS grad year		X	X	X	X	X	X	X
High school test scores			X	X	X	X	X	X
High school courses, attendance				X	X	X	X	X
High school district FE					X	X	X	
Age and EFC at college entry						X	X	X
Cost of attendance and grants							X	X
Entry college fixed effects								X

Notes: The sample includes student borrowers who first enrolled in a public four-year institution or community college in Texas, were classified as dependent students at entry, borrowed at or below the federal Stafford Loan maximum for first-year students Texas, and matched to the Texas public high school data. Dependent variable is a binary indicator for being constrained (borrowing at applicable federal student loan limit) in year of college entry. Estimates from linear probability models. Math and reading z-scores are standardized to have mean = 0, standard deviation = 1 across all test takers for the subject-academic year. Robust standard errors in parentheses; + p < 0.1, * p < 0.05, **p < 0.01.

Table C.7: No Change in Probability of Entering Community College or Flagship

	(1) Entered community college	(2) Entered flagship
Constrained x cohort in {2006,2007,2008}	-0.025 (0.054)	0.037 (0.041)
Dep variable mean	0.355	0.079

Notes: The sample includes student borrowers who first enrolled in a public four-year or community college in Texas, were classified as dependent students at entry, and borrowed at or below the federal Stafford Loan maximum for first-year students. Point estimates and standard errors (in parentheses) from a regression of the probability of initially enrolling in a community college (column 1) or flagship public four-year university (column 2) on an indicator for being constrained at entry interacted with an indicator for being in the 2006, 2007, or 2008 entry cohorts. Regressions also include controls for being constrained and entry cohort.

Table C.8: Treatment and baseline financial aid receipt by entry college, Texas sample

	(1) Pell Grant aid	(2) TEXAS Grant aid	(3) Other grant aid	(4) Work study aid	(5) Cost of attendance
<i>A. Four-year college entrants (N = 77,900)</i>					
Constrained x cohort \in {2006,2007,2008}	6 (57)	-224 (131)+	-64 (171)	26 (22)	160 (263)
Dependent variable mean	\$1,906	\$1,364	\$2,196	\$183	\$14,199
<i>B. Community college entrants (N = 42,843)</i>					
Constrained x cohort \in {2006,2007,2008}	108 (50)*	48 (43)	-26 (52)	5 (11)	-752 (338)*
Dependent variable mean	\$1,809	\$224	\$455	\$56	\$8,919

Notes: The sample includes student borrowers who first enrolled in a public four-year institution (Panel A) or public community college (Panel B) in Texas, were classified as dependent students at entry, and borrowed at or below the federal Stafford Loan maximum for first-year students. Each column within a panel includes estimates from separate regressions; dependent variable indicated in column heading. All specifications also include an indicator for being constrained at entry, cohort entry year fixed effects, entry school fixed effects, and controls for URM, gender, fall entrant, EFC, and in-state student. Robust standard errors, clustered by entry institution, in parentheses; * $p < 0.05$.

Table C.9: Effects of loan limits on cumulative loans from all sources, Texas four-year entrants

<i>Years since entry =</i>	0	1	2	3	4	5	6
A. Federal Stafford loans							
Constrained x cohort $\in \{2006,2007,2008\}$	230 (92)* {0.511}	579 (128)** {0.193}	909 (185)** {0.143}	1246 (252)** {0.069}	1378 (320)** {0.086}	1423 (375)** {0.115}	1436 (438)** {0.159}
Dependent variable mean	\$3,027	\$5,648	\$8,816	\$12,230	\$15,150	\$17,340	\$19,180
B. Federal PLUS loans							
Constrained x cohort $\in \{2006,2007,2008\}$	5 (3) {0.517}	218 (148) {0.048}	367 (259) {0.057}	453 (306) {0.063}	433 (303) {0.057}	456 (295) {0.033}	487 (286)+ {0.036}
Dependent variable mean	\$8	\$279	\$559	\$857	\$1,090	\$1,223	\$1,310
C. Federal Perkins loans							
Constrained x cohort $\in \{2006,2007,2008\}$	-35 (41) {0.128}	-59 (74) {0.116}	-56 (67) {0.221}	-44 (57) {0.274}	-26 (48) {0.425}	-29 (49) {0.381}	-35 (51) {0.300}
Dependent variable mean	\$39	\$142	\$230	\$307	\$360	\$387	\$402
D. State loans							
Constrained x cohort $\in \{2006,2007,2008\}$	-7 (5) {0.739}	13 (23) {0.826}	30 (40) {0.680}	48 (56) {0.622}	23 (67) {0.809}	24 (67) {0.789}	14 (68) {0.894}
Dependent variable mean	\$9	\$93	\$192	\$308	\$377	\$405	\$420
E. Private loans (\$)							
Constrained x cohort $\in \{2006,2007,2008\}$	-1 (2) {0.597}	-10 (57) {0.757}	2 (92) {0.948}	2 (115) {0.962}	-7 (135) {0.902}	-23 (143) {0.689}	-28 (150) {0.725}
Dependent variable mean	\$3	\$126	\$281	\$455	\$584	\$668	\$720

Notes: The sample includes student borrowers who first enrolled in a public four-year institution in Texas, were classified as dependent students at entry, and borrowed at or below the federal Stafford Loan maximum for first-year students. Each column within a panel contains estimates from separate regressions; dependent variable is cumulative amount borrowed from the source specified in the panel heading X years after entry, where the value of X is indicated in column heading. All specifications also include an indicator for being constrained at entry, cohort entry year fixed effects, entry school fixed effects, age at entry, EFC at entry, and indicators for male, URM, in-state student, and fall entrant. Robust standard errors, clustered by entry institution, in parentheses; * $p < 0.05$, ** $p < 0.01$; p -values from wild cluster bootstrap- t in brackets. Number of observations = 77,900.

Table C.10: Effects of loan limits on cumulative loans from all sources, Texas community college entrants

<i>Years since entry =</i>	0	1	2	3	4	5	6
<i>A. Federal Stafford loans</i>							
Constrained x cohort \in {2006,2007,2008}	67 (27)* {0.825}	239 (80)** {0.618}	518 (119)** {0.240}	690 (166)** {0.089}	896 (205)** {0.021}	957 (238)** {0.009}	912 (271)** {0.010}
Dependent variable mean	\$2,674	\$4,122	\$5,503	\$6,946	\$8,360	\$9,586	\$10,660
<i>B. Federal PLUS loans</i>							
Constrained x cohort \in {2006,2007,2008}	9 (5)+ {0.289}	31 (18)+ {0.186}	90 (38)* {0.044}	174 (61)** {0.052}	255 (81)** {0.061}	265 (85)** {0.081}	282 (90)** {0.069}
Dependent variable mean	\$12	\$80	\$205	\$359	\$493	\$550	\$565
<i>C. Federal Perkins loans</i>							
Constrained x cohort \in {2006,2007,2008}	2 (1) {0.254}	-5 (3) {0.077}	-8 (5) {0.335}	-12 (7) {0.355}	-12 (9) {0.403}	-10 (9) {0.536}	-12 (8) {0.512}
Dependent variable mean	\$1	\$7	\$16	\$28	\$37	\$44	\$49
<i>D. State loans</i>							
Constrained x cohort \in {2006,2007,2008}	0 (6) {0.994}	-13 (15) {0.573}	-28 (25) {0.312}	-13 (34) {0.698}	15 (43) {0.571}	43 (48) {0.201}	51 (48) {0.206}
Dependent variable mean	\$14	\$36	\$70	\$117	\$156	\$175	\$184
<i>E. Private loans (\$)</i>							
Constrained x cohort \in {2006,2007,2008}	1 (1) {0.338}	-4 (13) {0.729}	-22 (30) {0.400}	-36 (46) {0.299}	-42 (57) {0.285}	-31 (57) {0.438}	-17 (55) {0.681}
Dependent variable mean	\$1	\$26	\$81	\$140	\$192	\$220	\$242

Notes: The sample includes student borrowers who first enrolled in a public community college in Texas, were classified as dependent students at entry, and borrowed at or below the federal Stafford Loan maximum for first-year students. Each column within a panel contains estimates from separate regressions; dependent variable is cumulative amount borrowed from the source specified in the panel heading X years after entry, where the value of X is indicated in column heading. All specifications also include an indicator for being constrained at entry, cohort entry year fixed effects, entry school fixed effects, age at entry, EFC at entry, and indicators for male, URM, in-state student, and fall entrant. Robust standard errors, clustered by entry institution, in parentheses; + p < 0.1, * p < 0.05, **p < 0.01; p-values from wild cluster bootstrap-*t* in brackets. Number of observations = 42,843.

Table C.11: The effect of loan limit increases on the probability of any borrowing, Texas sample

Years since entry =	1	2	3	4	5	6
<i>A. Four-year entrants (N = 77,900)</i>						
Constrained x cohort $\in \{2006, 2007, 2008\}$	0.050 (0.012)** {0.064}	0.047 (0.014)** {0.008}	0.040 (0.013)** {0.028}	0.014 (0.012) {0.019}	0.007 (0.009) {0.214}	-0.0004 (0.008) {0.937}
Dependent variable mean	0.607	0.526	0.486	0.374	0.229	0.158
<i>B. Community college entrants (N = 42,843)</i>						
Constrained x cohort $\in \{2006, 2007, 2008\}$	0.020 (0.014) {0.025}	0.027 (0.009)** {0.017}	0.021 (0.009)* {0.038}	0.025 (0.008)** {0.030}	0.004 (0.007) {0.523}	0.0001 (0.007) {0.987}
Dependent variable mean	0.408	0.279	0.230	0.197	0.154	0.121

Notes: The sample includes student borrowers who first enrolled in a public four-year institution (Panel A) or public community college (Panel B) in Texas, were classified as dependent students at entry, and borrowed at or below the federal Stafford Loan maximum for first-year students. Each column within a panel contains estimates from separate regressions; dependent variable is the probability of any student loan receipt X years after entry, where X is indicated in the column heading. All specifications also include an indicator for being constrained at entry, cohort entry year fixed effects, entry school fixed effects, age at entry, EFC at entry, and indicators for male, URM, in-state student, and fall entrant. Robust standard errors, clustered by entry institution, in parentheses; * $p < 0.05$, ** $p < 0.01$; p -values from wild cluster bootstrap- t in brackets.

Table C.12: The effect of loan limit increases on undergraduate certificate receipt, Texas sample

<i>Years since entry =</i>	1	2	3	4	5	6	8	10
<i>A. Four-year entrants (N = 77,900)</i>								
Constrained x cohort \in {2006,2007,2008}	-0.001 (0.0005) {0.081}	-0.0004 (0.001) {0.547}	-0.002 (0.001)+ {0.031}	-0.001 (0.001) {0.192}	-0.001 (0.002) {0.632}	0.0003 (0.002) {0.884}	-0.001 (0.002) {0.598}	-0.003 (0.002) {0.069}
Dependent variable mean	<0.010	<0.010	<0.010	<0.010	0.010	0.013	0.017	0.020
<i>B. Community college entrants (N = 42,843)</i>								
Constrained x cohort \in {2006,2007,2008}	-0.001 (0.005) {0.798}	0.002 (0.005) {0.83}	0.002 (0.006) {0.744}	0.004 (0.006) {0.634}	0.004 (0.006) {0.651}	0.004 (0.006) {0.624}	0.003 (0.006) {0.687}	0.002 (0.006) {0.767}
Dependent variable mean	0.029	0.040	0.049	0.055	0.060	0.064	0.071	0.077

Notes: The sample includes student borrowers who first enrolled in a public four-year institution (Panel A) or public community college (Panel B) in Texas, were classified as dependent students at entry, and borrowed at or below the federal Stafford Loan maximum for first-year students. Each column within a panel contains estimates from separate regressions; dependent variable is the undergraduate certificate receipt by X years after college entry, where X is listed in the column heading. All specifications also include an indicator for being constrained at entry, cohort entry year fixed effects, entry school fixed effects, age at entry, EFC at entry, and indicators for male, URM, in-state student, and fall entrant. Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$; p -values from wild cluster bootstrap- t in brackets.

Table C.13: P-values from tests of the hypothesis of equivalent treatment effects for community college and four-year entrants, Texas sample

<i>Years since entry =</i>	1	2	3	4	5	6	7	8	9	10
Any enrollment	0.481	0.557	0.446	0.194	0.362	0.275	0.121	0.279	0.886	0.149
Cumulative years of enrollment	0.481	0.904	0.822	0.796	0.655	0.548	0.425	0.365	0.392	0.317
Cumulative credits attempted	0.539	0.331	0.356	0.537	0.665	0.789	0.910	0.942	0.997	0.861
Any degree receipt	0.971	0.672	0.024	0.048	0.011	0.043	0.030	0.069	0.094	0.076
Bachelor's degree receipt			0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000
STEM bachelor's degree receipt			0.060	0.001	0.007	0.037	0.027	0.031	0.036	0.051
Associate degree receipt		0.244	0.118	0.022	0.011	0.005	0.006	0.002	0.001	0.003
Graduate degree receipt			0.995	0.035	0.006	0.044	0.053	0.031	0.020	0.061
Ln(earnings)	0.095	0.337	0.573	0.422	0.817	0.033	0.025	0.187	0.470	0.384
Any earnings	0.002	0.006	0.185	0.376	0.384	0.469	0.258	0.208	0.338	0.189

Notes: Each cell shows the p -value from the test of the equality of point estimates for four-year and community college entrants in the Texas sample measured X years after entry, where X is indicated in the column heading.

Table C.14: The effect of loan limit increases on educational attainment, pooled Texas sample

<i>Years since entry =</i>	1	2	3	4	5	6	7	8	9	10
A. Enrollment										
Constrained x cohort in {2006,2007,2008}	0.056 (0.006)** {0.007}	0.047 (0.006)** {0.011}	0.043 (0.007)** {0.009}	0.014 (0.008)+ {0.141}	-0.001 (0.006) {0.753}	-0.008 (0.005) {0.1}	-0.009 (0.004)* {0.04}	-0.001 (0.004) {0.772}	-0.003 (0.004) {0.134}	0.0004 (0.004) {0.841}
Dependent variable mean	0.807	0.690	0.612	0.458	0.292	0.203	0.153	0.122	0.100	0.084
B. Cumulative credits attempted										
Constrained x cohort in {2006,2007,2008}	3.2 (0.4)** {<0.001}	4.5 (0.6)** {0.009}	5.3 (0.7)** {0.005}	5.6 (0.8)** {0.001}	5.6 (0.8)** {0.007}	5.5 (0.8)** {<0.001}	5.4 (0.8)** {<0.001}	5.5 (0.8)** {<0.001}	5.6 (0.8)** {<0.001}	5.6 (0.8)** {<0.001}
Dependent variable mean	46.3	63.4	78.1	87.7	93.1	96.6	99.1	101.1	102.6	103.9
C. Any degree or credential										
Constrained x cohort in {2006,2007,2008}	0.004 (0.002)+ {0.332}	0.010 (0.003)** {0.241}	0.035 (0.007)** {0.028}	0.037 (0.008)** {0.021}	0.040 (0.008)** {0.012}	0.042 (0.008)** {0.01}	0.040 (0.008)** {0.016}	0.039 (0.008)** {0.009}	0.039 (0.008)** {0.006}	0.038 (0.008)** {0.009}
Dependent variable mean	0.019	0.044	0.169	0.315	0.392	0.434	0.460	0.479	0.493	0.506
D. Associate degree										
Constrained x cohort in {2006,2007,2008}	-- --	0.005 (0.002)* {0.348}	0.007 (0.003)* {0.164}	0.008 (0.003)* {0.134}	0.007 (0.004)+ {0.196}	0.009 (0.004)* {0.125}	0.008 (0.004)* {0.16}	0.009 (0.004)* {0.177}	0.009 (0.004)* {0.18}	0.009 (0.005)* {0.188}
Dependent variable mean		0.024	0.039	0.052	0.062	0.071	0.079	0.086	0.092	0.099
E. Bachelor's degree										
Constrained x cohort in {2006,2007,2008}	-- --	-- --	0.027 (0.006)** {0.024}	0.029 (0.008)** {0.006}	0.031 (0.008)** {0.009}	0.034 (0.009)** {0.002}	0.033 (0.009)** {0.007}	0.03 (0.008)** {0.005}	0.030 (0.009)** {0}	0.030 (0.008)** {0.003}
Dependent variable mean			0.113	0.250	0.321	0.359	0.382	0.398	0.409	0.419
F. STEM bachelor's degree										
Constrained x cohort in {2006,2007,2008}	-- --	-- --	0.004 (0.003)+ {0.063}	0.010 (0.003)** {0.003}	0.010 (0.003)** {0.006}	0.011 (0.003)** {0.015}	0.011 (0.003)** {0.017}	0.011 (0.003)** {0.011}	0.011 (0.003)** {0.012}	0.010 (0.003)** {0.008}
Dependent variable mean			0.021	0.048	0.061	0.067	0.071	0.073	0.075	0.076

Notes: Pooled Texas four-year and community college entrant sample. Each column within a panel contains estimates from separate regressions; dependent variable is indicated in the panel heading, measured X years after college entry, where X is listed in the column heading. All specifications also include an indicator for being constrained at entry, cohort entry year fixed effects, entry school fixed effects, age at entry, EFC at entry, and indicators for male, URM, in-state student, and fall entrant. STEM = science, technology, engineering, and math majors (based on CIP codes included in the National Science Foundation STEM program definition). Robust standard errors, clustered by entry institution, in parentheses; + p < 0.1, * p < 0.05, **p < 0.01; p-values from wild cluster bootstrap-t in brackets.

Table C.15: The effect of loan limit increases on additional educational attainment outcomes, Texas four-year entrants

<i>Years since entry =</i>	4	5	6	7	8	9	10
<i>A. Cumulative years of enrollment</i>							
Constrained x cohort \in {2006,2007,2008}	0.15 (0.03)** {0.008}	0.15 (0.03)** {<0.001}	0.13 (0.04)** {0.007}	0.17 (0.05)** {0.009}	0.11 (0.04)** {<0.001}	0.16 (0.06)** {0.005}	0.10 (0.03)** {0.008}
Dependent variable mean	3.93	4.24	4.44	3.53	4.71	3.77	4.88
<i>B. Enrollment in graduate program</i>							
Constrained x cohort \in {2006,2007,2008}	0.009 (0.004)* {0.044}	0.006 (0.005) {0.524}	0.010 (0.004)* {0.148}	0.006 (0.004) {0.085}	0.002 (0.004) {0.564}	0.002 (0.003) {0.295}	-0.002 (0.003) {0.288}
Dependent variable mean	0.050	0.070	0.070	0.062	0.055	0.049	0.043
<i>C. Cumulative graduate credits attempted</i>							
Constrained x cohort \in {2006,2007,2008}	0.2 (0.1)* {0.101}	0.3 (0.2)+ {0.144}	0.4 (0.2)+ {0.222}	0.5 (0.3)+ {0.147}	0.5 (0.3)+ {0.121}	0.5 (0.3) {0.073}	0.4 (0.3) {0.112}
Dependent variable mean	1.1	2.2	3.3	4.2	4.9	5.6	6.1
<i>D. Graduate degree or certificate</i>							
Constrained x cohort \in {2006,2007,2008}	0.003 (0.002)* {0.108}	0.007 (0.003)* {0.027}	0.008 (0.004)* {0.075}	0.010 (0.005)* {0.056}	0.012 (0.005)* {0.032}	0.014 (0.005)** {0.025}	0.012 (0.006)* {0.027}
Dependent variable mean	<0.010	0.022	0.039	0.056	0.071	0.083	0.094

Notes: The sample includes student borrowers who first enrolled in a public four-year institution in Texas, were classified as dependent students at entry, and borrowed at or below the federal Stafford Loan maximum for first-year students. Each column within a panel contains estimates from separate regressions; dependent variable is indicated in the panel heading, measured X years after college entry, where X is listed in the column heading. All specifications also include an indicator for being constrained at entry, cohort entry year fixed effects, entry school fixed effects, age at entry, EFC at entry, and indicators for male, URM, in-state student, and fall entrant. Robust standard errors, clustered by entry institution, in parentheses; + p < 0.1, * p < 0.05, **p < 0.01; p-values from wild cluster bootstrap-*t* in brackets. Number of observations = 77,900.

Table C.16: The effect of loan limit increases on constrained students' educational attainment: Community college entrants

<i>Years since entry =</i>	1	2	3	4	5	6	8	10
A. Enrollment								
Constrained x cohort $\in \{2006,2007,2008\}$	0.054 (0.012)** {0.016}	0.039 (0.01)** {0.034}	0.038 (0.01)** {0.009}	0.032 (0.011)** {0.001}	0.008 (0.011) {0.277}	-0.0004 (0.009) {0.962}	0.004 (0.008) {0.492}	0.005 (0.006) {0.337}
Dependent variable mean	0.677	0.499	0.400	0.331	0.259	0.200	0.133	0.095
B. Cumulative years of enrollment								
Constrained x cohort $\in \{2006,2007,2008\}$	0.05 (0.01)** {0.008}	0.09 (0.02)** {0.004}	0.13 (0.03)** {0.005}	0.16 (0.04)** {0.011}	0.17 (0.04)** {0.008}	0.17 (0.05)** {0.005}	0.17 (0.06)** {0.003}	0.17 (0.06)** {0.016}
Dependent variable mean	1.68	2.18	2.58	2.91	3.17	3.37	3.66	3.87
C. Cumulative credits attempted								
Constrained x cohort $\in \{2006,2007,2008\}$	2.4 (0.5)** {0.023}	3.4 (0.6)** {0.028}	4.2 (0.8)** {0.020}	4.9 (1)** {0.024}	5.0 (1.2)** {0.02}	5.1 (1.2)** {0.029}	5.3 (1.2)** {0.035}	5.5 (1.3)** {0.021}
Dependent variable mean	37.9	47.9	55.8	62.2	66.8	70.2	74.9	78.2
D. Any degree or credential								
Constrained x cohort $\in \{2006,2007,2008\}$	-0.0004 (0.007) {0.959}	0.005 (0.008) {0.774}	0.006 (0.009) {0.681}	0.013 (0.009) {0.313}	0.012 (0.01) {0.42}	0.018 (0.010)+ {0.259}	0.017 (0.011) {0.205}	0.016 (0.011) {0.292}
Dependent variable mean	0.049	0.092	0.133	0.184	0.227	0.257	0.295	0.321
E. Bachelor's degree								
Constrained x cohort $\in \{2006,2007,2008\}$	-- --	-- --	-0.0002 (0.004) {0.958}	0.002 (0.007) {0.812}	-0.003 (0.007) {0.769}	0.002 (0.007) {0.868}	-0.001 (0.008) {0.9}	-0.0004 (0.008) {0.965}
Dependent variable mean			0.013	0.050	0.088	0.115	0.146	0.164
F. Associate degree								
Constrained x cohort $\in \{2006,2007,2008\}$	-- --	0.005 (0.005) {0.628}	0.010 (0.007) {0.344}	0.015 (0.008)* {0.164}	0.017 (0.008)+ {0.16}	0.020 (0.009)* {0.091}	0.022 (0.009)* {0.066}	0.022 (0.009)* {0.072}
Dependent variable mean		0.054	0.081	0.101	0.114	0.126	0.143	0.158

Notes: Texas community college entrant sample. Dependent variable is indicated in the panel heading, measured X years after entry, where the value of X is indicated in column heading. All specifications also include an indicator for being constrained at entry, cohort entry year fixed effects, entry school fixed effects, age at entry, EFC at entry, and indicators for male, URM, in-state student, and fall entrant. Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$; p-values from wild cluster bootstrap-t in brackets. Number of observations = 42,843.

Table C.17: The effect of loan limit increases on enrollment and credits attempted in community colleges and four-year institutions, Texas four-year entrants

<i>Years since entry =</i>	1	2	3	4	5	6	8	10
<i>A. Enrollment in four-year institution</i>								
Constrained x cohort \in {2006,2007,2008}	0.073 (0.011)** {<0.001}	0.062 (0.01)** {0.001}	0.054 (0.01)** {<0.001}	0.021 (0.011)+ {0.053}	0.006 (0.009) {0.537}	-0.006 (0.006) {0.085}	-0.0003 (0.004) {0.892}	-0.004 (0.003)+ {0.079}
Dependent variable mean	0.727	0.629	0.581	0.408	0.210	0.119	0.055	0.032
<i>B. Enrollment in community college</i>								
Constrained x cohort \in {2006,2007,2008}	-0.005 (0.007) {0.566}	-0.004 (0.006) {0.556}	-0.006 (0.006) {0.163}	-0.004 (0.005) {0.578}	-0.010 (0.004)* {0.104}	-0.004 (0.005) {0.530}	-0.003 (0.004) {0.213}	-0.003 (0.004) {0.601}
Dependent variable mean	0.316	0.274	0.216	0.163	0.122	0.099	0.068	0.049
<i>C. Cumulative credits attempted at four-year institutions</i>								
Constrained x cohort \in {2006,2007,2008}	3.2 (0.6)** {0.005}	4.8 (0.8)** {<0.001}	6.1 (1.1)** {<0.001}	6.5 (1.3)** {<0.001}	6.7 (1.3)** {<0.001}	6.7 (1.3)** {0.001}	6.5 (1.3)** {0.005}	6.3 (1.2)** {0.001}
Dependent variable mean	44.0	61.3	77.0	86.2	90.5	92.8	95.2	96.6
<i>D. Cumulative credits attempted at community colleges</i>								
Constrained x cohort \in {2006,2007,2008}	-0.3 (0.2)+ {0.082}	-0.5 (0.3)* {0.076}	-0.7 (0.3)* {0.05}	-0.8 (0.3)* {0.046}	-1.0 (0.4)** {0.038}	-1.2 (0.4)** {0.049}	-1.2 (0.5)** {0.025}	-1.3 (0.5)* {0.048}
Dependent variable mean	6.1	9.6	12.2	14.2	15.7	16.9	18.8	20.1

Notes: The sample includes student borrowers who first enrolled in a public four-year institution in Texas, were classified as dependent students at entry, and borrowed at or below the federal Stafford Loan maximum for first-year students. Each column within a panel contains estimates from separate regressions; dependent variable is indicated in the panel heading, measured X years after college entry, where X is listed in the column heading. All specifications also include an indicator for being constrained at entry, cohort entry year fixed effects, entry school fixed effects, age at entry, EFC at entry, and indicators for male, URM, in-state student, and fall entrant. Robust standard errors, clustered by entry institution, in parentheses; + p < 0.1, * p < 0.05, **p < 0.01; p-values from wild cluster bootstrap-t in brackets. Number of observations = 77,900.

Table C.18: The effect of loan limit increases on enrollment and credits attempted in community colleges and four-year institutions, Texas community college entrants

<i>Years since entry =</i>	1	2	3	4	5	6	8	10
<i>A. Enrollment in four-year institution</i>								
Constrained x cohort \in {2006,2007,2008}	-0.002 (0.004) {0.605}	0.009 (0.009) {0.314}	0.018 (0.009)+ {0.080}	0.012 (0.009) {0.090}	-0.001 (0.007) {0.833}	0.001 (0.005) {0.750}	-0.003 (0.005) {0.399}	0.001 (0.003) {0.733}
Dependent variable mean	0.044	0.109	0.139	0.139	0.112	0.079	0.044	0.029
<i>B. Enrollment in community college</i>								
Constrained x cohort \in {2006,2007,2008}	0.054 (0.012)** {0.025}	0.039 (0.01)** {0.014}	0.022 (0.012)+ {0.005}	0.025 (0.009)** {0.009}	0.011 (0.009) {0.178}	-0.001 (0.009) {0.897}	0.001 (0.007) {0.842}	0.006 (0.005) {0.213}
Dependent variable mean	0.651	0.424	0.292	0.217	0.165	0.131	0.094	0.068
<i>C. Cumulative credits attempted at four-year institutions</i>								
Constrained x cohort \in {2006,2007,2008}	-0.02 (0.1) {0.888}	0.4 (0.3) {0.114}	0.9 (0.5) {0.054}	1.1 (0.8) {0.076}	1.1 (0.8) {0.108}	1.0 (0.8) {0.137}	1.1 (0.9) {0.163}	1.1 (0.9) {0.191}
Dependent variable mean	0.8	3.3	6.7	9.9	12.2	13.8	15.7	16.8
<i>D. Cumulative credits attempted at community colleges</i>								
Constrained x cohort \in {2006,2007,2008}	2.5 (0.5)** {0.027}	3.1 (0.6)** {0.028}	3.5 (0.7)** {0.017}	3.9 (0.8)** {0.014}	4.1 (0.8)** {0.028}	4.2 (0.9)** {0.018}	4.2 (0.9)** {0.019}	4.4 (0.9)** {0.031}
Dependent variable mean	37.0	44.4	48.8	51.9	54.1	55.9	58.7	60.8

Notes: The sample includes student borrowers who first enrolled in a public community college in Texas, were classified as dependent students at entry, and borrowed at or below the federal Stafford Loan maximum for first-year students. Each column within a panel contains estimates from separate regressions; dependent variable is indicated in the panel heading, measured X years after entry, where the value of X is indicated in column heading. All specifications also include an indicator for being constrained at entry, cohort entry year fixed effects, entry school fixed effects, age at entry, EFC at entry, and indicators for male, URM, in-state student, and fall entrant. Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$; p-values from wild cluster-t bootstrap in brackets. Number of observations = 42,843.

Table C.19: The effect of loan limit increases on the probability of transferring to a flagship public institution

<i>Years since entry =</i>	1	2	3	4	5	6	7	8	9	10
<i>A. Four-year entrants</i>										
Constrained x cohort in {2006,2007,2008}	0.009 (0.006) {0.038}	0.009 (0.006)+ {0.029}	0.008 (0.005) {0.018}	0.007 (0.004)+ {0.022}	0.001 (0.001) {0.222}	0.0004 (0.001) {0.616}	0.0002 (0.001) {0.751}	0.0003 (0.0003) {0.509}	-0.0002 (0.0003) {0.434}	-0.0002 (0.0003) {0.543}
Dependent variable mean	0.015	0.020	0.021	0.014	*	*	*	*	*	*
<i>B. Community college entrants</i>										
Constrained x cohort in {2006,2007,2008}	0 (0.001) {0.975}	0.004 (0.004) {0.070}	0.004 (0.004) {0.248}	0.003 (0.003) {0.206}	-0.001 (0.001) {0.698}	-0.002 (0.001)+ {0.321}	-0.001 (0.001) {0.197}	-0.001 (0.001) {0.091}	-0.001 (0.001) {0.132}	-0.001 (0.001) {0.35}
Dependent variable mean	*	0.011	0.014	0.012	*	*	*	*	*	*

Notes: The sample includes student borrowers who first enrolled in a public four-year (Panel A, N = 68,317) or community college (Panel B, N = 42,843.) in Texas, were classified as dependent students at entry, and borrowed at or below the federal Stafford Loan maximum for first-year students. Students who initially entered a flagship are excluded. Each column within a panel contains estimates from separate regressions; dependent variable is the probability of enrolling in a flagship institution, measured X years after entry, where the value of X is indicated in column heading. All specifications also include an indicator for being constrained at entry, cohort entry year fixed effects, entry school fixed effects, age at entry, EFC at entry, and indicators for male, URM, in-state student, and fall entrant. Robust standard errors, clustered by entry institution, in parentheses; + p < 0.1; p-values from wild cluster bootstrap-*t* in brackets. Panel A number of observations = 68,317. Panel B number of observations = 42,843. * indicates suppressed value.

Table C.20: The effect of loan limit increases on constrained students' earnings, Texas sample

<i>Years since entry =</i>	1	2	3	4	5	6	7	8	9	10
A. Four-year entrants (N = 77,900)										
Constrained x cohort \in {2006,2007,2008}	-558 (194)** {0.030}	-512 (212)* {0.043}	-288 (211) {0.292}	-63 (258) {0.862}	325 (346) {0.131}	505 (340) {0.037}	670 (363)+ {0.074}	1000 (435)* {0.028}	1148 (514)* {0.015}	1481 (589)* {0.01}
Dependent variable mean	\$7,142	\$8,827	\$10,827	\$15,636	\$20,850	\$24,639	\$27,650	\$30,209	\$32,498	\$34,637
B. Community college entrants (N = 43, 843)										
Constrained x cohort \in {2006,2007,2008}	50 (194) {0.826}	12 (248) {0.956}	-366 (314) {0.334}	-353 (353) {0.532}	-27 (340) {0.935}	-294 (427) {0.337}	-19 (449) {0.893}	-14 (539) {0.973}	242 (686) {0.591}	467 (618) {0.334}
Dependent variable mean	\$10,114	\$12,135	\$13,980	\$15,891	\$18,102	\$20,286	\$22,134	\$23,768	\$25,388	\$26,953

Notes: The sample includes student borrowers who first enrolled in a public four-year (Panel A) or community college (Panel B) in Texas, were classified as dependent students at entry, and borrowed at or below the federal Stafford Loan maximum for first-year students. Each cell within a panel contains estimates from separate regressions; dependent variable is annual earnings (winsorized at the 99th percentile), measured X years after college entry, where X is indicated in the column heading. All specifications also include an indicator for being constrained at entry, cohort entry year fixed effects, entry school fixed effects, age at entry, EFC at entry, and indicators for male, URM, in-state student, and fall entrant. Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$; p -values from wild cluster bootstrap- t in brackets.

Table C.21: The effect of loan limit increases on constrained students' labor market outcomes: Community college entrants

<i>Years since entry =</i>	1	2	3	4	5	6	7	8	9	10
A. Any earnings (<i>N</i> = 42,843)										
Constrained x cohort \in {2006,2007,2008}	0.009 (0.008) {0.124}	0.018 (0.009)+ {0.021}	0.016 (0.008)+ {0.020}	0.005 (0.01) {0.623}	0.004 (0.01) {0.597}	0.007 (0.011) {0.566}	0.008 (0.009) {0.428}	0.003 (0.008) {0.675}	0.006 (0.008) {0.479}	0.013 (0.008) {0.16}
Dependent variable mean	0.845	0.819	0.801	0.791	0.783	0.775	0.766	0.757	0.751	0.744
B. <i>Ln(earnings)</i>										
Constrained x cohort \in {2006,2007,2008}	0.006 (0.026) {0.855}	0.004 (0.032) {0.88}	-0.068 (0.030)* {0.016}	-0.034 (0.027) {0.543}	0.008 (0.031) {0.682}	-0.023 (0.027) {0.351}	-0.018 (0.028) {0.497}	-0.001 (0.031) {0.969}	-0.007 (0.044) {0.816}	0.022 (0.026) {0.331}
Dependent variable mean	8.9	9.1	9.3	9.5	9.6	9.8	9.9	10.0	10.0	10.1
Observations	36,206	35,106	34,296	33,891	33,547	33,192	32,799	32,451	32,180	31,872

Notes: The sample includes student borrowers who first enrolled in a public community college in Texas, were classified as dependent students at entry, and borrowed at or below the federal Stafford Loan maximum for first-year students. Each column within a panel contains estimates from separate regressions; dependent variable is indicated in the panel heading, measured *X* years after entry, where the value of *X* is indicated in column heading. All specifications also include an indicator for being constrained at entry, cohort entry year fixed effects, entry school fixed effects, age at entry, EFC at entry, and indicators for male, URM, in-state student, and fall entrant. Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$; p-values from wild cluster-t bootstrap in brackets.

Table C.22: The effect of loan limit increases on neighborhood quality, CCP/Equifax sample

Years since entry =	4	5	6	7	8	9	10
<i>A. Zip code mean wage income</i>							
Constrained x cohort ϵ {2006,2007,2008}	910 (261)** {0.016}	963 (256)** {0.002}	809 (263)** {0.003}	742 (299)* {0.031}	1009 (308)** {0.009}	869 (286)** {0.075}	471 (289) {0.222}
Dependent variable mean	\$51,842	\$51,402	\$50,291	\$52,616	\$53,663	\$53,225	\$50,506
<i>B. Zip code mean AGI</i>							
Constrained x cohort ϵ {2006,2007,2008}	1944 (434)** {0.005}	2032 (418)** {0.010}	1689 (441)** {0.039}	1369 (534)* {0.045}	1700 (522)** {0.027}	1599 (485)** {0.203}	817 (493) {0.270}
Dependent variable mean	\$72,107	\$71,966	\$71,371	\$75,094	\$76,868	\$76,380	\$72,941
<i>C. Zip code median house price</i>							
Constrained x cohort ϵ {2006,2007,2008}	2613 (2502) {0.177}	1429 (2447) {0.325}	3054 (2174) {0.004}	4908 (2393)* {0.020}	7115 (2637)** {0.043}	6240 (2600)* {0.135}	5011 (2513)+ {0.161}
Dependent variable mean	\$260,345	\$251,778	\$245,216	\$257,367	\$269,185	\$277,150	\$271,128
<i>D. Racial segregation (Opp. Insights)</i>							
Constrained x cohort ϵ {2006,2007,2008}	-0.002 (0.001) {0.028}	-0.002 (0.001)+ {0.336}	-0.001 (0.001) {0.801}	-0.001 (0.001) {0.496}	-0.002 (0.001) {0.499}	0 (0.001) {0.797}	0 (0.001) {0.741}
Dependent variable mean	0.180	0.182	0.185	0.186	0.187	0.188	0.188
<i>E. Test score percentile (Opp. Insights)</i>							
Constrained x cohort ϵ {2006,2007,2008}	0.032 (0.111) {0.730}	0.125 (0.101) {0.486}	-0.014 (0.114) {0.929}	0.017 (0.110) {0.862}	0 (0.096) {0.999}	-0.004 (0.093) {0.977}	0.024 (0.108) {0.876}
Dependent variable mean	-3.947	-4.250	-4.494	-4.689	-4.823	-4.881	-4.940
<i>F. School exp. per student (Opp. Insights)</i>							
Constrained x cohort ϵ {2006,2007,2008}	-0.02 (0.02) {0.306}	-0.02 (0.02) {0.313}	-0.01 (0.01) {0.698}	-0.01 (0.01) {0.466}	-0.01 (0.02) {0.782}	-0.02 (0.02) {0.547}	-0.02 (0.01) {0.477}
Dependent variable mean	\$6.62	\$6.63	\$6.64	\$6.64	\$6.64	\$6.64	\$6.63
<i>G. Student teacher ratio (Opp. Insights)</i>							
Constrained x cohort ϵ {2006,2007,2008}	-0.01 (0.03) {0.731}	-0.02 (0.03) {0.449}	-0.01 (0.03) {0.654}	-0.03 (0.03) {0.066}	-0.03 (0.03) {0.031}	-0.01 (0.03) {0.669}	0.01 (0.03) {0.720}
Dependent variable mean	18.3	18.3	18.3	18.4	18.4	18.4	18.4
<i>H. Fraction college education (Census)</i>							
Constrained x cohort ϵ {2006,2007,2008}	-0.001 (0.002) {0.604}	-0.001 (0.002) {0.595}	0.001 (0.002) {0.644}	0 (0.002) {0.913}	0.001 (0.002) {0.728}	0 (0.002) {0.998}	-0.001 (0.002) {0.864}
Dependent variable mean	0.271	0.274	0.276	0.277	0.277	0.277	0.277
<i>I. Poverty Rate (Census)</i>							
Constrained x cohort ϵ {2006,2007,2008}	-0.004 (0.001)** {0.010}	-0.002 (0.001)* {0.093}	-0.001 (0.001) {0.034}	-0.001 (0.001) {0.370}	-0.002 (0.001)+ {0.147}	-0.001 (0.001) {0.373}	-0.001 (0.001) {0.729}
Dependent variable mean	0.111	0.111	0.111	0.111	0.111	0.111	0.111

Notes: The sample includes student borrowers who were younger than 20, borrowed at or below the federal Stafford Loan maximum for first-year students at entry, and maintained a credit report through the 10th year after entry. Each column within a panel contains estimates from separate regressions; dependent variable is indicated in the subpanel heading, measured X years after entry, where the value of X is indicated in column heading. Specifications also include an indicator for being constrained at entry, cohort entry year fixed effects, state and age at entry fixed effects, quarters from entry before a credit report was created fixed effects, indicators for having a credit card, auto loan, mortgage, number of credit accounts, and credit score, measured before entry. Zip code median house prices = Zillow Housing Value Index. See Appendix B.2 for definitions of other measures. Robust standard errors, clustered by entry state, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$; p-values from wild cluster bootstrap-t in brackets.

Table C.23: The effect of loan limit increases on additional financial outcomes, CCP/Equifax

Years since entry =	4	5	6	7	8	9	10
A. Credit card limit (N = 143,850)							
Constrained x cohort \in {2006,2007,2008}	-420 (108)** {0.006}	-258 (111)* {0.015}	-126 (106) {0.293}	-103 (117) {0.483}	-28 (140) {0.811}	252 (147)+ {0.276}	386 (206)+ {0.039}
Dependent variable mean	3,919	4,331	4,828	5,960	7,243	8,583	9,599
B. Mortgage size at origination							
Constrained x cohort \in {2006,2007,2008}	-6818 (3857)+ {0.177}	-5605 (3337)+ {0.107}	-2229 (2356) {0.511}	-129 (3387) {0.969}	1809 (2979) {0.715}	2424 (3162) {0.567}	1879 (2512) {0.082}
Dependent variable mean	\$154,216	\$157,223	\$157,124	\$167,634	\$176,424	\$183,970	\$182,854
Observations	5,479	8,879	13,131	17,591	22,522	27,791	33,625
C. Pseudo loan to value ratio							
Constrained x cohort \in {2006,2007,2008}	-0.044 (0.021)* {0.010}	-0.017 (0.018) {0.557}	0.015 (0.016) {0.419}	0.018 (0.016) {0.131}	0.004 (0.012) {0.872}	0.020 (0.015) {0.326}	-0.001 (0.014) {0.964}
Dependent variable mean	0.847	0.886	0.906	0.923	0.924	0.919	0.916
Observations	5,479	8,879	13,131	17,591	22,522	27,751	33,545
D. Auto loan size at origination							
Constrained x cohort \in {2006,2007,2008}	42 (228) {0.923}	113 (258) {0.805}	-2 (256) {0.993}	-82 (227) {0.831}	-392 (223)+ {0.191}	-410 (239)+ {0.104}	-213 (208) {0.431}
Dependent variable mean	\$19,593	\$20,143	\$20,368	\$21,891	\$22,952	\$23,503	\$22,747
Observations	37,528	45,028	51,717	57,825	63,024	66,708	69,640
E. Credit score (N = 143,850)							
Constrained x cohort \in {2006,2007,2008}	0.1 (1.0) {0.947}	-0.1 (1.3) {0.932}	1.7 (1.3) {0.167}	3.2 (1.3)* {0.047}	3.0 (1.2)* {0.318}	3.0 (1.4)* {0.241}	2.1 (1.3) {0.471}
Dependent variable mean	641	643	646	650	656	662	669
F. Credit score is in bottom quintile (N = 143,850)							
Constrained x cohort \in {2006,2007,2008}	-0.015 (0.005)* {0.009}	-0.015 (0.006)* {0.082}	-0.016 (0.006)** {0.068}	-0.019 (0.006)** {0.040}	-0.016 (0.006)** {0.043}	-0.013 (0.007)+ {0.125}	-0.011 (0.005)* {0.061}
Dependent variable mean	0.282	0.294	0.303	0.304	0.297	0.289	0.279

Notes: The sample includes student borrowers who were younger than 20, borrowed at or below the federal Stafford Loan maximum for first-year students at entry, and maintained a credit report through the 10th year after entry. Each column within a panel contains estimates from separate regressions; dependent variable is indicated in the subpanel heading, measured X years after entry, where the value of X is indicated in column heading. Specifications also include an indicator for being constrained at entry, cohort entry year fixed effects, state and age at entry fixed effects, quarters from entry before a credit report was created fixed effects, indicators for having a credit card, auto loan, mortgage, number of credit accounts, and credit score, measured before entry. Loan to volume ratio equals mortgage size/Zillow Housing Value Index. See Appendix B.2 for definitions of other measures. Robust standard errors, clustered by entry state, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$; p-values from wild cluster bootstrap-t in brackets.

Table C.24: IV estimates of the effect of student loans on attainment and earnings, 10 years after college entry

	(1) Total years enrolled	(2) Total credits earned	(3) Any degree	(4) Bachelor's degree	(5) Associate degree	(6) Ln(earnings)
<i>A. Texas four-year entrants</i>						
Cumulative loans (\$1k)	0.06 (0.03)*	2.9 (1.1)*	0.024 (0.009)*	0.028 (0.011)*	-0.004 (0.003)	0.028 (0.014)*
Observations	77,898	77,898	77,898	77,898	77,898	58,660
<i>B. Texas community college entrants</i>						
Cumulative loans (\$1k)	0.15 (0.05)**	4.9 (1.0)**	0.014 (0.008)+	-0.0004 (0.007)	0.020 (0.008)*	0.017 (0.019)
Observations	42,842	42,842	42,842	42,842	42,842	31,871

Note: The sample includes student borrowers who first enrolled in a public four-year (Panel A) or community college (Panel B) in Texas, were classified as dependent students at entry, and borrowed at or below the federal Stafford Loan maximum for first-year students. Each column contains estimates from separate regressions; dependent variable is indicated in the column heading, measured 10 years after entry. All specifications also include an indicator for being constrained at entry, cohort entry year fixed effects, entry school fixed effects, and controls for race (white, URM), age at entry, EFC at entry, and gender. The interaction between constrained at entry and belonging to the 2006 through 2008 entry cohorts serves as excluded instrument. Cumulative loans measured in years 1-4. Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$.

Table C.25: IV estimates of the effect of student loans on selected financial outcomes, 10 years after college entry

	(1) Delinquent (stud. loans)	(2) Default (stud. loans)	(3) Any delinquent debt	(4) Any mortgage	(5) Any auto loan
Cumulative loans (\$1k)	-0.008 (0.003)*	-0.011 (0.003)**	-0.002 (0.002)	0.002 (0.003)	-0.005 (0.004)
Observations	143,850	143,850	143,850	143,850	143,850

Note: The sample includes student borrowers who were younger than 20, borrowed at or below the federal Stafford Loan maximum for first-year students at entry, and maintained a credit report through the 10th year after entry. Each column contains estimates from separate regressions; dependent variable is indicated in the column heading, measured 10 years after entry. All specifications also include an indicator for being constrained at entry, cohort entry year fixed effects, state at entry fixed effects, and age fixed effects. Cumulative loans measured in years 1-4. The interaction between constrained at entry and belonging to the 2006 through 2008 entry cohorts serves as excluded instrument. First-stage F-Statistic is 37.01. Robust standard errors, clustered by entry state, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$.

Table C.26: Heterogeneity in Borrowing, Attainment, and Earnings by Race/Ethnicity (All Categories), Texas Four-Year Entrants

<i>Dependent variable =</i>	Cumulative loans		Attainment & earnings, 10 years after entry				
	(1) 4 years after entry	(2) 6 years after entry	(3) Years enrolled	(4) Credits attempted	(5) Any degree	(6) BA degree	(7) Ln(earnings)
Constrained x cohort \in {2006,2007,2008}							
x Asian/Pacific Islander (N = 4,747)	3572 (1145)** {0.065}	5227 (1487)** {0.036}	0.31 (0.11)** {0.021}	10.69 (3.4)** {0.026}	0.094 (0.034)** {0.063}	0.089 (0.033)** {0.148}	-0.026 (0.085) {0.713}
x Black (N = 16,584)	1349 (749)+ {0.035}	1674 (863)+ {0.111}	0.13 (0.07)+ {0.333}	4.3 (2.2)* {0.281}	0.032 (0.023) {0.022}	0.026 (0.024) {0.069}	0.055 (0.042) {0.453}
x Hispanic (N = 23,361)	1896 (390)** {0.152}	1616 (505)** {0.372}	0.14 (0.07)* {0.014}	5.3 (1.6)** {0.009}	0.029 (0.013)* {0.036}	0.045 (0.015)** {0.019}	0.018 (0.023) {0.298}
x Native American/Alaskan Native (N = 409)	-1551 (3354) {0.235}	-1378 (3848) {0.431}	0.97 (0.44)* {0.055}	26.37 (11.6)* {0.037}	0.152 (0.133) {0.033}	0.131 (0.118) {0.0280}	-0.455 (0.292) {0.0130}
x White (N = 32,343)	1759 (998)+ {0.062}	1869 (1173) {0.120}	-0.005 (0.04) {0.408}	3.4 (1.2)** {0.032}	0.043 (0.014)** {0.03}	0.050 (0.012)** {0.019}	0.081 (0.027)** {0.015}
x Other (N = 456)	5170 (3087)+ {0.095}	4526 (3712) {0.608}	0.72 (0.40)+ {0.886}	29.64 (11.9)* {0.238}	0.281 (0.097)** {0.001}	0.296 (0.109)** {0.071}	0.081 (0.345) {0.753}
Test of equality: <i>p</i> -value	0.293	0.229	0.003	0.006	0.031	0.099	0.278

Notes: The sample includes student borrowers who first enrolled in a public four-year institution in Texas, were classified as dependent students at entry, and borrowed at or below the federal Stafford Loan maximum for first-year students. Each column contains results from separate specifications. Point estimates and standard errors (in parentheses) from a regression of the outcome on an indicator for being constrained at entry interacted with an indicator for being in the 2006, 2007, or 2008 entry cohorts interacted with race/ethnicity. Regressions also include controls for being constrained, entry cohort, entry school fixed effects, age at entry, EFC at entry, and indicators for male, URM, fall entrant, in-state student, all fully interacted with race/ethnicity. Robust standard errors, clustered by entry institution by race/ethnicity group, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$. Brackets contain *p*-values from wild cluster-*t* bootstrap.

Table C.27: Heterogeneity in Labor Market Outcomes by Race/Ethnicity, Texas Four-Year Entrants

<i>Dependent variable =</i>	Any earnings, by years since entry						Ln(earnings), by years since entry					
	(1) 1 year	(2) 2 years	(3) 3 years	(4) 6 years	(5) 8 years	(6) 10 years	(7) 1 year	(8) 2 years	(9) 3 years	(10) 6 years	(11) 8 years	(12) 10 years
Constrained x cohort \in {2006,2007,2008}												
x Black	-0.012 (0.012) {0.434}	0.005 (0.014) {0.821}	0.010 (0.013) {0.641}	-0.014 (0.012) {0.464}	-0.025 (0.013)+ {0.174}	-0.01 (0.017) {0.107}	-0.011 (0.056) {0.744}	-0.023 (0.043) {0.607}	0.027 (0.056) {0.373}	-0.012 (0.047) {0.822}	-0.018 (0.034) {0.623}	0.055 (0.042) {0.444}
x Hispanic	-0.017 (0.01)+ {0.097}	-0.026 (0.014)+ {0.068}	-0.020 (0.011)+ {0.002}	0.004 (0.012) {0.823}	-0.004 (0.009) {0.526}	0.013 (0.012) {0.184}	-0.022 (0.047) {0.401}	0.014 (0.04) {0.599}	-0.033 (0.04) {0.537}	0.081 (0.025)** {0.006}	0.082 (0.024)** {0.057}	0.018 (0.022) {0.278}
x White	-0.026 (0.011)* {0.191}	-0.010 (0.011) {0.211}	0.006 (0.009) {0.685}	0.000 (0.009) {0.984}	-0.007 (0.01) {0.496}	-0.005 (0.011) {0.76}	-0.067 (0.034)* {0.173}	-0.051 (0.036) {0.336}	-0.048 (0.037) {0.19}	0.076 (0.026)** {0.194}	0.056 (0.028)* {0.099}	0.081 (0.027)** {0.02}
Test of eq: p -val	0.720	0.415	0.120	0.444	0.390	0.428	0.616	0.429	0.529	0.189	0.029	0.147
Observations	72,288	72,288	72,288	72,288	72,288	72,288	58,785	57,954	58,093	57,136	56,031	54,811

Notes: The sample includes student borrowers who first enrolled in a public four-year institution in Texas, were classified as dependent students at entry, and borrowed at or below the federal Stafford Loan maximum for first-year students. Sample excludes students who belonged to a race/ethnicity other than Black, Hispanic, or White. Each column contains results from separate specifications. Point estimates and standard errors (in parentheses) from a regression of the outcome on an indicator for being constrained at entry interacted with an indicator for being in the 2006, 2007, or 2008 entry cohorts interacted with race/ethnicity. Regressions also include controls for being constrained, entry cohort, entry school fixed effects, age at entry, EFC at entry, and indicators for male, URM, fall entrant, in-state student, all fully interacted with race/ethnicity. Robust standard errors, clustered by entry institution by race/ethnicity group, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$. Brackets contain p-values from wild cluster-t bootstrap.

Table C.28: Heterogeneity in Borrowing, Attainment, Earnings, and Financial Outcomes by Socioeconomic Status

<i>A. Borrowing, attainment and earnings outcomes (Texas four-year entrants)</i>							
<i>Dependent variable =</i>	Cumulative loans		Attainment & earnings, 10 years after entry				
	(1) 4 years after entry	(2) 6 years after entry	(3) Years enrolled	(4) Credits attempted	(5) Any degree	(6) BA degree	(7) Ln(earnings)
Constrained x cohort in {2006,2007,2008}							
x Pell ineligible (N = 34,752)	2371 (1093)* {0.037}	2644 (1197)* {0.054}	0.09 (0.04)* {0.306}	6.1 (1.2)** {0.090}	0.065 (0.012)** {0.009}	0.081 (0.013)** {<0.001}	0.063 (0.026)* {0.007}
x Pell eligible (N = 43,148)	1525 (404)** {0.013}	1477 (531)** {0.050}	0.14 (0.06)* {0.031}	5.5 (1.5)** {0.013}	0.035 (0.013)** {0.015}	0.036 (0.013)** {0.007}	0.050 (0.027)+ {0.067}
Test of equality: <i>p</i> -value	0.386	0.310	0.477	0.693	0.014	0.002	0.725
<i>B. Borrowing and financial outcomes (CCP/Equifax sample)</i>							
<i>Dependent variable =</i>	Cumulative loans		Financial outcomes, 10 years after entry				
	(8) 4 years after entry	(9) 6 years after entry	(10) Ever delinquent (stud. loans)	(11) Ever default (stud. loans)	(12) Any delinquent debt	(13) Any mortgage	(14) Any auto loan
Constrained x cohort in {2006,2007,2008}							
x Home zip mean AGI ≥ \$50k (N = 53,232)	2216 (676)** {0.159}	3905 (907)** {0.115}	-0.003 (0.009) {0.038}	-0.008 (0.008) {0.036}	-0.002 (0.007) {0.723}	-0.002 (0.010) {0.725}	-0.010 (0.010) {0.309}
x Home zip mean AGI < \$50k (N = 91,508)	1901 (427)** {0.153}	2539 (644)** {0.063}	-0.017 (0.006)** {0.773}	-0.021 (0.006)** {0.498}	-0.003 (0.005) {0.606}	0.005 (0.006) {0.537}	-0.007 (0.007) {0.454}
Test of equality: <i>p</i> -value	0.688	0.242	0.188	0.256	0.877	0.535	0.851

Notes: The sample in Panel A includes student borrowers who first enrolled in a public four-year institution in Texas, were classified as dependent students at entry, and borrowed at or below the federal Stafford Loan maximum for first-year students. The sample in Panel B includes student borrowers who were younger than 20, borrowed at or below the federal Stafford Loan maximum for first-year students at entry, and maintained a credit report through the 10th year after entry. Pell Grant eligibility is determined by a student's EFC in their entry year and the year-specific EFC cut-off for receiving a Pell Grant. Each column within a panel contains results from separate specifications. Point estimates and standard errors (in parentheses) from a regression of the outcome on an indicator for being constrained at entry interacted with an indicator for being in the 2006, 2007, or 2008 entry cohorts interacted with Pell Grant eligibility. Panel A regressions also include controls for being constrained, entry cohort, entry school fixed effects, age at entry, EFC at entry, and indicators for male, URM, fall entrant, in-state student, all fully interacted with Pell Grant eligibility. Panel B regressions also include controls for constrained, cohort entry year fixed effects, state at entry fixed effects, and age fixed effects. Robust standard errors, clustered by entry institution (Panel A) or entry state (Panel B) by Pell Grant eligibility, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$. Brackets contain p-values from wild cluster-t bootstrap.

Table C.29: Robustness of estimates, Texas four-year entrants

<i>Dependent variable =</i>	Cumulative loans		Educational attainment, 10 years after entry					(8) Earnings
	(1) 4 years after entry	(2) 6 years after entry	(3) Years enrolled	(4) Credits attempted	(5) Any degree	(6) BA degree	(7) AA degree	10 years after entry
<i>A. Only school FE</i>								
Constrained x cohort \in {2006,2007,2008}	1714 (660)* {0.009}	1730 (758)* {0.061}	0.09 (0.04)* {0.005}	5.0 (1.2)** {0.003}	0.045 (0.012)** {0.009}	0.054 (0.012)** {0.003}	-0.008 (0.004)* {0.080}	0.058 (0.020)** {0.007}
Observations	77,900	77,900	77,900	77,900	77,900	77,900	77,900	58,661
<i>B. Including nonprofit entrants</i>								
Constrained x cohort \in {2006,2007,2008}	2060 (569)** {0.039}	2198 (634)** {0.041}	0.13 (0.03)** {0.005}	4.9 (1.1)** {0.006}	0.046 (0.010)** {0.009}	0.054 (0.010)** {0.019}	-0.007 (0.004)+ {0.115}	0.047 (0.016)** {0.005}
Dependent variable mean	\$17,860 90,210	\$22,220 90,210	4.78 90,210	108.8 90,210	0.611 90,210	0.564 90,210	0.063 90,210	10.42 66,019
<i>C. Fall and spring enrollment in entry year</i>								
Constrained x cohort \in {2006,2007,2008}	1567 (669)* {0.061}	1474 (736)* {0.111}	0.04 (0.03) {0.105}	2.6 (0.9)** {0.003}	0.027 (0.01)** {0.076}	0.035 (0.01)** {0.039}	-0.010 (0.004)* {0.102}	0.051 (0.020)* {0.018}
Dependent variable mean	\$18,540	\$23,200	4.99	123.6	0.649	0.603	0.066	10.46
Observations	68,641	68,641	68,641	68,641	68,641	68,641	68,641	52,126
<i>D. 2001 sample restrictions for all years</i>								
Constrained x cohort \in {2006,2007,2008}	1842 (644)** {0.016}	1943 (728)** {0.055}	0.10 (0.03)** {0.004}	5.2 (1.1)** {0.005}	0.043 (0.011)** {0.005}	0.052 (0.011)** {0.013}	-0.009 (0.004)* {0.074}	0.053 (0.017)** {0.010}
Dependent variable mean	\$17,570 76,745	\$22,040 76,745	4.88 76,745	118.3 76,745	0.608 76,745	0.560 76,745	0.065 76,745	10.42 57,820
<i>E. Excluding 2001 & 2002 entrants</i>								
Constrained x cohort \in {2006,2007,2008}	2030 (674)** {0.019}	2129 (754)** {0.031}	0.08 (0.04)* {0.028}	4.9 (1.13)** {0.002}	0.032 (0.010)** {0.042}	0.041 (0.010)** {<0.001}	-0.008 (0.004)+ {0.264}	0.061 (0.021)** {0.001}
Dependent variable mean	\$17,680 59,345	\$22,210 59,345	4.87 59,345	117.0 59,345	0.612 59,345	0.561 59,345	0.070 59,345	10.44 44,880
<i>F. Controlling for contemporaneous unemployment</i>								
Constrained x cohort \in {2006,2007,2008}	1807 (617)** {0.028}	1871 (716)** {0.041}	0.10 (0.04)** {0.004}	5.2 (1.1)** {0.006}	0.043 (0.011)** {0.016}	0.050 (0.011)** {0.013}	-0.007 (0.004)+ {0.124}	0.049 (0.018)** {0.018}
Observations	77,900	77,900	77,900	77,900	77,900	77,900	77,900	58,661
<i>G. Limit control group by loan amount</i>								
Constrained x cohort \in {2006,2007,2008}	2209 (692)** {0.027}	2443 (770)** {0.039}	0.12 (0.04)** {0.031}	5.8 (1.2)** {0.013}	0.045 (0.011)** {0.010}	0.054 (0.011)** {0.002}	-0.008 (0.005)+ {0.142}	0.063 (0.022)** {0.021}
Dependent variable mean	\$18,190 70,328	\$22,710 70,328	4.92 70,328	119.4 70,328	0.618 70,328	0.570 70,328	0.065 70,328	10.43 53,003

Table C.29, cont.

<i>Dependent variable =</i>	Cumulative loans		Educational attainment, 10 years after entry					(8) Earnings
	(1) 4 years after entry	(2) 6 years after entry	(3) Years enrolled	(4) Credits attempted	(5) Any degree	(6) BA degree	(7) AA degree	10 years after entry
<i>H. Excluding school FE</i>								
Constrained x cohort \in {2006,2007,2008}	2695 (939)** {0.024}	3138 (1054)** {0.022}	0.14 (0.05)* {0.048}	6.6 (1.6)** {0.021}	0.045 (0.019)* {0.048}	0.059 (0.020)** {0.023}	-0.013 (0.006)* {0.021}	0.036 (0.025) {0.041}
Observations	77,900	77,900	77,900	77,900	77,900	77,900	77,900	58,661
<i>I. CCP sample definition</i>								
Constrained x cohort \in {2006,2007,2008}	2787 (752)** {0.006}	2852 (821)** {0.008}	0.08 (0.05)+ {0.043}	4.9 (1.1)** {0.017}	0.036 (0.012)** {0.002}	0.047 (0.012)** {0.001}	-0.011 (0.004)** {0.037}	0.058 (0.022)* {0.006}
Dependent variable mean	\$18,070	\$22,640	4.83	115.7	0.595	0.544	0.071	10.42
Observations	54,509	54,509	54,509	54,509	54,509	54,509	54,509	41,213

Notes: Texas four-year entrant sample. Panel B sample also includes students who initially entered a private nonprofit institution (only observed for the 2004 – 2008 cohorts). Panel C further limits the sample to students who were enrolled in both the fall and spring semester in their entry year. Panel D limits the sample to students who are classified as “first time in college” at entry. Panel E excludes students who entered in the 2001 or 2002 cohorts. Panel G excludes students who borrowed less than half the Stafford Loan limit in the entry year. Panel I excludes student borrowers who were younger than 20 at entry and entry cohorts before 2004. Each cell within a panel contains estimates from separate regressions; dependent variable indicated in column heading. All specifications include an indicator for constrained at entry and cohort entry year fixed effects. Specifications also include controls for race (white, URM), age at entry, EFC at entry, gender, and entry institution fixed effects (unless otherwise noted). Panel F specification also includes the contemporaneous unemployment rate in the county that the entry school is located in. Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$; p-values from wild cluster bootstrap-t in brackets.

Table C.30: Robustness of estimates, Texas community college entrants

<i>Dependent variable =</i>	Cumulative loans		Educational attainment, 10 years after entry)					(8) Earnings
	(1) 4 years after entry	(2) 6 years after entry	(3) Years enrolled	(4) Credits attempted	(5) Any degree	(6) BA degree	(7) AA degree	10 years after entry
<i>A. Only school FE</i>								
Constrained x cohort $\in \{2006,2007,2008\}$	990 (250)** {0.072}	1068 (324)** {0.021}	0.14 (0.06)* {0.007}	4.7 (1.4)** {0.043}	0.009 (0.011) {0.495}	-0.006 (0.009) {0.577}	0.019 (0.009)* {0.118}	0.012 (0.026) {0.536}
Observations	42,843	42,843	42,843	42,843	42,843	42,843	42,843	31,872
<i>B. Fall and spring enrollment in entry year</i>								
Constrained x cohort $\in \{2006,2007,2008\}$	869 (314)** {0.054}	922 (368)* {0.031}	0.05 (0.07) {0.272}	1.6 (1.5) {0.242}	0.007 (0.014) {0.715}	-0.009 (0.008) {0.600}	0.008 (0.011) {0.588}	0.024 (0.031) {0.202}
Dependent variable mean	\$10,410	\$13,170	4.13	88.4	0.372	0.194	0.188	10.17
Observations	30,302	30,302	30,302	30,302	30,302	30,302	30,302	23,048
<i>C. 2001 sample restrictions for all years</i>								
Constrained x cohort $\in \{2006,2007,2008\}$	1165 (266)** {0.014}	1209 (356)** {0.010}	0.14 (0.06)* {0.019}	4.8 (1.3)** {0.031}	0.012 (0.011) {0.449}	0.002 (0.008) {0.846}	0.015 (0.008)+ {0.187}	0.027 (0.027) {0.378}
Dependent variable mean	\$9,077	\$11,480	3.83	77.8	0.315	0.159	0.154	10.11
Observations	39,625	39,625	39,625	39,625	39,625	39,625	39,625	29,524
<i>D. Excluding 2001 and 2002 entrants</i>								
Constrained x cohort $\in \{2006,2007,2008\}$	1198 (283)** {0.060}	1274 (412)** {0.032}	0.14 (0.07)+ {0.011}	3.4 (1.5)* {0.008}	0.012 (0.012) {0.423}	0.007 (0.009) {0.455}	0.019 (0.011)+ {0.016}	0.028 (0.029) {0.246}
Dependent variable mean	\$9,320	\$11,800	3.84	77.6	0.316	0.158	0.161	10.12
Observations	35,607	35,607	35,607	35,607	35,607	35,607	35,607	26,581
<i>E. Controlling for contemporaneous unemployment</i>								
Constrained x cohort $\in \{2006,2007,2008\}$	1114 (246)** {0.017}	1215 (321)** {0.011}	0.19 (0.06)** {0.020}	5.7 (1.3)** {0.031}	0.017 (0.011) {0.251}	0.001 (0.009) {0.954}	0.024 (0.008)** {0.079}	0.023 (0.025) {0.342}
Observations	42,843	42,843	42,843	42,843	42,843	42,843	42,843	31,872
<i>F. Limit control group by loan amount</i>								
Constrained x cohort $\in \{2006,2007,2008\}$	1672 (288)** {0.002}	1844 (380)** {<0.001}	0.20 (0.07)** {0.005}	6.8 (1.6)** {0.02}	0.032 (0.012)* {0.081}	0.006 (0.011) {0.643}	0.026 (0.009)** {0.045}	0.046 (0.024)+ {0.102}
Dependent variable mean	\$10,260	\$12,880	3.97	81.6	0.343	0.178	0.167	10.14
Observations	33,749	33,749	33,749	33,749	33,749	33,749	33,749	25,269
<i>G. Excluding CCs that opt-out of fed loans</i>								
Constrained x cohort $\in \{2006,2007,2008\}$	1181 (243)** {0.009}	1286 (315)** {0.010}	0.17 (0.06)** {0.016}	5.5 (1.3)** {0.049}	0.020 (0.010)* {0.264}	0.004 (0.008) {0.611}	0.024 (0.009)** {0.089}	0.022 (0.026) {0.327}
Dependent variable mean	\$9,239	\$11,690	3.86	78.0	0.320	0.163	0.156	10.11
Observations	40,937	40,937	40,937	40,937	40,937	40,937	40,937	30,482

Table C.30, cont.

<i>Dependent variable =</i>	Cumulative loans		Educational attainment, 10 years after entry)					(8) Earnings
	(1) 4 years after entry	(2) 6 years after entry	(3) Years enrolled	(4) Credits attempted	(5) Any degree	(6) BA degree	(7) AA degree	10 years after entry
<i>H. Excluding school FE</i>								
Constrained x cohort \in {2006,2007,2008}	1568 (465)** {0.064}	1713 (605)** {0.067}	0.16 (0.08)* {0.067}	6.1 (2.0)** {0.048}	0.012 (0.011) {0.463}	0.007 (0.017) {0.630}	0.012 (0.010) {0.408}	0.025 (0.024) {0.138}
Observations	42,843	42,843	42,843	42,843	42,843	42,843	42,843	31,872
<i>I. CCP sample definition</i>								
Constrained x cohort \in {2006,2007,2008}	1111 (330)** {0.168}	1155 (465)* {0.088}	0.06 (0.07) {0.091}	1.6 (1.6) {0.115}	0.004 (0.013) {0.841}	0.001 (0.011) {0.877}	0.013 (0.010) {0.063}	0.036 (0.029) {0.156}
Dependent variable mean	\$9,600	\$12,080	3.83	77.4	0.314	0.153	0.162	10.09
Observations	33,230	33,230	33,230	33,230	33,230	33,230	33,230	24,942

Notes: Texas community college sample. See Table C.29 notes for descriptions of samples and specifications. Panel G excludes students who initially enrolled in a community college that stopped participating in federal student loan programs over the 2001 – 2008 academic years. Each cell within a panel contains estimates from separate regressions; dependent variable indicated in column heading. Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$; p-values from wild cluster bootstrap-t in brackets.

Table C.31: Robustness of estimates, CCP/Equifax sample

	(1) Cumulative loans 4 yrs after entry	(2) Delinquent (stud. loans)	(3) Default (stud. loans)	(4) Any Delinquent debt	(5) Any mortgage
<i>A. Controlling for contemporaneous unemployment (N = 133,883)</i>					
Constrained x cohort $\in \{2006, 2007, 2008\}$	2047 (399)** {0.139}	-0.014 (0.005)* {0.078}	-0.020 (0.005)** {0.051}	-0.001 (0.004) {0.765}	0.003 (0.006) {0.721}
<i>B. Unconstrained borrow \$1300+ (N=131,491)</i>					
Constrained x cohort $\in \{2006, 2007, 2008\}$	2398 (380)** {0.111}	-0.014 (0.006)* {0.142}	-0.019 (0.005)** {0.293}	-0.006 (0.005) {0.963}	0 (0.006) {0.665}
<i>C. CBSA fixed effects (N=143,649)</i>					
Constrained x cohort $\in \{2006, 2007, 2008\}$	2136 (298)** {0.127}	-0.012 (0.005)* {0.138}	-0.017 (0.005)** {0.070}	-0.003 (0.004) {0.597}	0.002 (0.005) {0.760}
<i>D. No control variables (N=143,850)</i>					
Constrained x cohort $\in \{2006, 2007, 2008\}$	1981 (369)** {0.142}	-0.013 (0.005)* {0.119}	-0.018 (0.004)** {0.067}	-0.004 (0.004) {0.546}	0.002 (0.006) {0.776}

Notes: The sample includes student borrowers who were younger than 20, borrowed at or below the federal Stafford Loan maximum for first-year students at entry, and maintained a credit report through the 10th year after entry. Panel B excludes students who borrowed less than half the Stafford Loan limit in the entry year. Each cell within a panel contains estimates from separate regressions; dependent variable indicated in column heading. Cumulative student loans measured 4 years after entry; all other outcomes are measured 10 years after entry. All specifications include indicator for constrained at entry and cohort entry year fixed effects. Panel A adds a control for the contemporaneous unemployment rate in the county the borrower was in during the year. Panel B excludes students who borrowed less than half the Stafford Loan limit in the entry year. Panel C adds core-based statistical area (CBSA) fixed effects. Panel D specification excludes all control variables except for entry cohort fixed effects and constrained fixed effect. Robust standard errors, clustered by entry state, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$; p -values from wild cluster bootstrap- t in brackets.

Table C.32: Robustness of estimates to excluding school fixed effects, pooled Texas sample

<i>Dependent variable =</i>	Cumulative loans		Educational attainment, 10 years after entry					(8) Earnings
	(1) 4 years after entry	(2) 6 years after entry	(3) Years enrolled	(4) Credits attempted	(5) Any degree	(6) BA degree	(7) AA degree	10 years after entry
Constrained x cohort $\in \{2006, 2007, 2008\}$	2262 (841)** {0.027}	2640 (972)** {0.035}	0.19 (0.06)** {0.036}	7.1 (2.0)** {0.010}	0.040 (0.018)* {0.015}	0.040 (0.023)+ {0.013}	0.003 (0.009) {0.601}	0.039 (0.021)+ {0.039}
Observations	120,743	120,743	120,743	120,743	120,743	120,743	120,743	90,533

Notes: The sample includes student borrowers who first enrolled in a Texas community college or four-year public institution in the 2001 through 2008 academic years, were classified as dependent students, and borrowed at or below the federal Stafford Loan maximum for first-year students. Point estimates and standard errors from a regression of the dependent variable (indicated in column heading) on an indicator for being constrained at entry interacted with an indicator for being in the 2006, 2007, or 2008 entry cohorts. All specifications include an indicator for constrained at entry and cohort entry year fixed effects. Specifications also include controls for age at entry, EFC at entry, and indicators for male, URM, fall entrant, in-state student. Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$; p -values from wild cluster bootstrap-t in brackets.

Table C.33: Effects of loan limit increases on attainment, earnings, and financial outcomes, dose-response specification

<i>A. Cumulative student loans</i>				
	(1) Four years after entry (Texas)	(2) Six years after entry (Texas)	(3) Four years after entry (CCP)	(4) Six years after entry (CCP)
Constrained x AggLimExp (\$1k)	319 (95)** {0.104}	358 (113)** {0.136}	647 (87)** {0.043}	875 (112)** {0.020}
Observations	77,900	77,900	143,850	143,850
<i>B. Attainment and earnings outcomes, 10 years after entry</i>				
	(5) Cumulative years enrolled	(6) Cumulative credits attempted	(7) Any degree receipt	(8) Ln(earnings)
Constrained x AggLimExp (\$1k)	0.02 (0.01)* {0.094}	1.1 (0.2)** {0.044}	0.006 (0.002)** {0.061}	0.006 (0.003)+ {0.222}
Observations	77,900	77,900	77,900	59,956
<i>C. Financial outcomes, 10 years after entry (N = 143,850)</i>				
	(9) Ever delinq. student loan	(10) Ever default on student loan	(11) Delinquent on any debt	(12) Any mortgage
Constrained x AggLimExp (\$1k)	-0.004 (0.001)** {0.110}	-0.005 (0.001)** {0.012}	-0.001 (0.001) {0.575}	0.001 (0.001) {0.640}

Note: Texas four-year entrant sample (Panel A columns 1 and 2, Panel B) and CCP/Equifax sample (Panel A columns 3 and 4, Panel C). Estimates from regressions of the outcome on an indicator for being constrained at entry interacted with AggLimExp. All specifications control for the level effect of AggLimExp, an indicator for constrained at entry, and cohort entry years. Estimates using the Texas sample come from models that also include controls for age at entry, EFC at entry, and indicators for male, URM, in-state student, and fall entrant. Estimates using the CCP/Equifax sample also include controls for state at entry fixed effects, and age fixed effects. Robust standard errors, clustered by entry institution (Texas sample) or entry state (CCP sample), in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$; p-values from wild cluster bootstrap-t in brackets.

Table C.34: Heterogeneity in Texas four-year entrants' borrowing and attainment by economic conditions at college entry

<i>Dependent variable =</i>	Cumulative loans		Attainment, 10 years after entry				
	(1) 4 years after entry	(2) 6 years after entry	(3) Years enrolled	(4) Credits attempted	(5) Any degree	(6) BA degree	(7) AA degree
<i>A. Home unemployment rate in entry year</i>							
Constrained x cohort \in {2006,2007,2008}							
x below median (N = 39,996)	1945 (821)* {0.015}	2359 (974)* {0.011}	0.08 (0.05) {0.032}	5.0 (1.5)** {0.018}	0.047 (0.015)** {0.006}	0.056 (0.015)** {0.007}	-0.004 (0.005) {0.514}
x above median (N = 34,146)	1592 (457)** {0.059}	1398 (548)* {0.308}	0.09 (0.03)** {0.19}	4.1 (1.0)** {0.061}	0.029 (0.013)* {0.115}	0.037 (0.011)** {0.062}	-0.011 (0.005)* {0.075}
Test of equality: <i>p</i> -value	0.548	0.219	0.842	0.549	0.303	0.232	0.255
<i>B. Home unemployment rate, year before entry</i>							
Constrained x cohort \in {2006,2007,2008}							
x below median (N = 37,655)	2253 (930)* {0.023}	2780 (1051)** {0.018}	0.10 (0.05)+ {0.004}	5.8 (1.5)** {0.015}	0.057 (0.016)** {0.005}	0.068 (0.016)** {0.006}	-0.010 (0.006)+ {0.158}
x above median (N = 36,487)	1445 (414)** {0.136}	1232 (544)* {0.399}	0.08 (0.05)+ {0.237}	3.6 (1.3)** {0.096}	0.019 (0.014) {0.228}	0.028 (0.013)* {0.132}	-0.007 (0.005) {0.213}
Test of equality: <i>p</i> -value	0.295	0.087	0.783	0.202	0.065	0.028	0.670

Notes: Texas four-year entrant sample; out-of-state students are excluded. Dependent variable is listed in the column headings. Each panel contains results from separate specifications. Point estimates and standard errors (in parentheses) from a regression of the outcome on an indicator for being constrained at entry interacted with an indicator for being in the 2006, 2007, or 2008 entry cohorts interacted with whether a student's home county unemployment rate was above or below the state median unemployment rate in the year they entered college (Panel A) or the year before they entered college. Regressions also include controls for being constrained, entry cohort, entry school fixed effects, age at entry, EFC at entry, and indicators for male, URM, fall entrant, in-state student, all fully interacted with the dimension of heterogeneity indicated by the panel heading. Robust standard errors, clustered by entry state, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$; *p*-values from wild cluster bootstrap-*t* in brackets.

Table C.35: Heterogeneity in Texas four-year entrants' labor market outcomes by economic conditions at college entry

	Any earnings, by years since entry						Ln(earnings), by years since entry					
	(1) 1 year	(2) 2 years	(3) 3 years	(4) 6 years	(5) 8 years	(6) 10 years	(7) 1 year	(8) 2 years	(9) 3 years	(10) 6 years	(11) 8 years	(12) 10 years
A. Home UR in year of entry												
Constrained x cohort $\in \{2006, 2007, 2008\}$												
x below median	-0.028 (0.009)** {0.122}	-0.016 (0.01)+ {0.291}	-0.002 (0.009) {0.833}	-0.006 (0.011) {0.639}	-0.002 (0.011) {0.915}	0.004 (0.010) {0.754}	-0.039 (0.038) {0.249}	-0.063 (0.039) {0.098}	-0.047 (0.03) {0.121}	0.072 (0.025)** {0.09}	0.058 (0.025)* {0.047}	0.059 (0.022)** {0.004}
x above median	-0.014 (0.009)+ {0.147}	-0.018 (0.009)* {0.061}	-0.001 (0.011) {0.824}	-0.009 (0.012) {0.043}	-0.030 (0.007)** {0.001}	-0.015 (0.008)+ {0.079}	-0.072 (0.035)* {0.089}	-0.001 (0.033) {0.972}	-0.050 (0.032) {0.127}	0.022 (0.028) {0.566}	0.036 (0.026) {0.301}	0.037 (0.025) {0.453}
Test of eq: p -val	0.267	0.902	0.945	0.845	0.039	0.090	0.526	0.239	0.939	0.169	0.573	0.477
Observations	74,142	74,142	74,142	74,142	74,142	74,142	60,461	59,688	59,899	59,166	58,080	56,844
B. Home UR in year before entry												
Constrained x cohort $\in \{2006, 2007, 2008\}$												
x below median	-0.021 (0.008)* {0.074}	-0.013 (0.009) {0.158}	-0.004 (0.008) {0.704}	-0.002 (0.012) {0.829}	0.005 (0.010) {0.716}	0.012 (0.010) {0.323}	-0.052 (0.04) {0.295}	-0.062 (0.047) {0.134}	-0.048 (0.034) {0.231}	0.074 (0.026)** {0.112}	0.074 (0.029)* {<0.001}	0.053 (0.023)* {0.007}
x above median	-0.021 (0.008)* {0.114}	-0.020 (0.008)* {0.051}	-0.0003 (0.010) {0.941}	-0.011 (0.010) {0.121}	-0.033 (0.006)** {0.003}	-0.018 (0.008)* {0.048}	-0.062 (0.030)* {0.032}	-0.018 (0.033) {0.657}	-0.052 (0.030)+ {0.05}	0.025 (0.029) {0.475}	0.028 (0.027) {0.359}	0.044 (0.024)+ {0.237}
Test of eq: p -val	0.981	0.608	0.826	0.618	0.001	0.013	0.830	0.495	0.919	0.212	0.319	0.763
Observations	74,142	74,142	74,142	74,142	74,142	74,142	60,461	59,688	59,899	59,166	58,080	56,844

Notes: Texas four-year entrants, out-of-state students are excluded. Dependent variable is listed in the column headings measured the number of years after entry indicated in the subheading. Point estimates and standard errors (in parentheses) from a regression of the outcome on an indicator for being constrained at entry interacted with an indicator for being in the 2006, 2007, or 2008 entry cohorts interacted with whether a student's home county unemployment rate was above or below the state median unemployment rate (Panel A) or national median unemployment rate (Panel B) in the year they entered college (Panel A) or the year before they entered college (Panel B). Regressions also include controls for being constrained, entry cohort, entry school fixed effects, age at entry, EFC at entry, and indicators for male, URM, fall entrant, in-state student, all fully all fully interacted with above and below median unemployment indicators. Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$; p-values from wild cluster bootstrap-t in brackets.

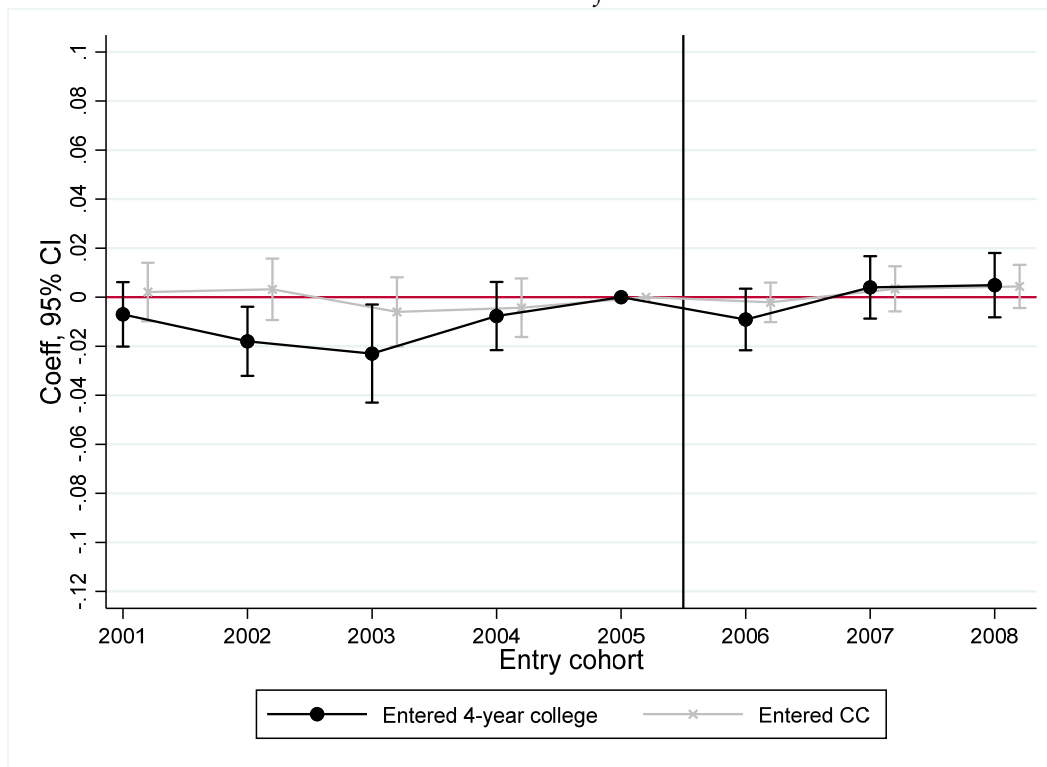
Table C.36: Heterogeneity in effects on ln(earnings) by Great Recession severity, Texas sample

Years since entry =	1	2	3	4	5	6	7	8	9	10
<i>A. Four-year entrants</i>										
Constrained x cohort in {2006,2007,2008}	-0.054 (0.028)+ {0.054}	-0.033 (0.025) {0.286}	-0.05 (0.025)* {0.051}	-0.014 (0.016) {0.545}	0.013 (0.02) {0.377}	0.042 (0.018)* {0.015}	0.051 (0.016)** {0.075}	0.041 (0.015)** {0.124}	0.025 (0.015)+ {0.21}	0.047 (0.017)** {0.016}
x Δ UR 2007-2009	-0.015 (0.044) {0.651}	0.030 (0.048) {0.524}	-0.038 (0.035) {0.400}	-0.081 (0.029)** {0.070}	-0.054 (0.029)+ {0.227}	-0.039 (0.025) {0.366}	-0.005 (0.020) {0.837}	-0.010 (0.022) {0.711}	-0.051 (0.022)* {0.086}	-0.033 (0.031) {0.073}
Observations	62,557	61,722	62,005	62,464	61,913	61,092	60,558	59,956	59,291	58,661
<i>B. Community college entrants</i>										
Constrained x cohort in {2006,2007,2008}	-0.004 (0.027) {0.878}	-0.003 (0.033) {0.94}	-0.068 (0.035)+ {0.015}	-0.042 (0.032) {0.435}	0.018 (0.029) {0.492}	-0.026 (0.029) {0.217}	-0.021 (0.03) {0.393}	-0.005 (0.033) {0.817}	-0.005 (0.047) {0.858}	0.028 (0.025) {0.390}
x Δ UR 2007-2009	0.060 (0.054) {0.384}	0.067 (0.053) {0.445}	0.006 (0.063) {0.915}	0.022 (0.055) {0.655}	-0.057 (0.052) {0.114}	0.023 (0.051) {0.636}	0.034 (0.053) {0.435}	0.049 (0.044) {0.546}	-0.004 (0.070) {0.878}	-0.004 (0.045) {0.943}
Observations	36,206	35,106	34,296	33,891	33,547	33,192	32,799	32,451	32,180	31,872

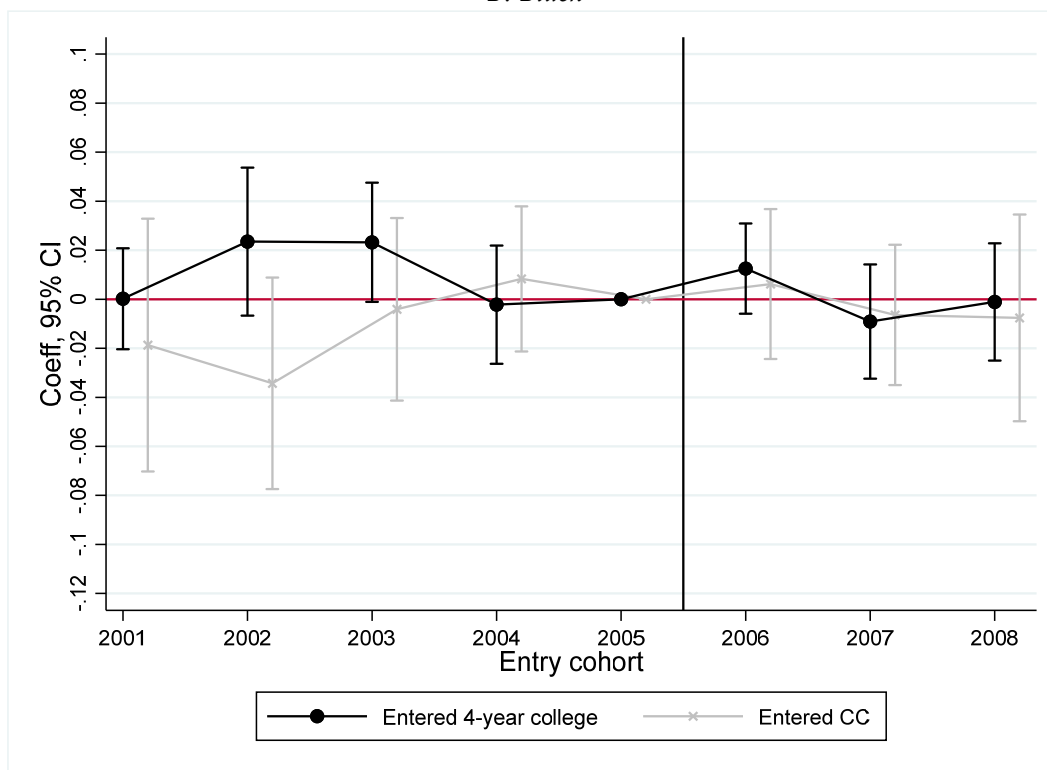
Notes: Texas four-year entrants (Panel A) and community college entrants (Panel B). Each column within a panel contains results from separate specifications. Point estimates and standard errors (in parentheses) from a regression of the outcome on an indicator for being constrained at entry interacted with the percentage point change in the county unemployment rate where a student first enrolled in college, on ln(earnings) X years after entry, where X is indicated in the column heading. Regressions also include controls for being constrained, entry cohort, and entry school fixed effects, as well as age at entry, EFC at entry, and indicators for male, URM, fall entrant, and in-state student, all interacted with the change in the unemployment rate. The change in unemployment rate variable is normalized to have a within-sample mean of zero. Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$; p-values from wild cluster bootstrap-t in brackets.

Figure C.1 Loan Limit Increases and Characteristics of Constrained Borrowers, Texas sample

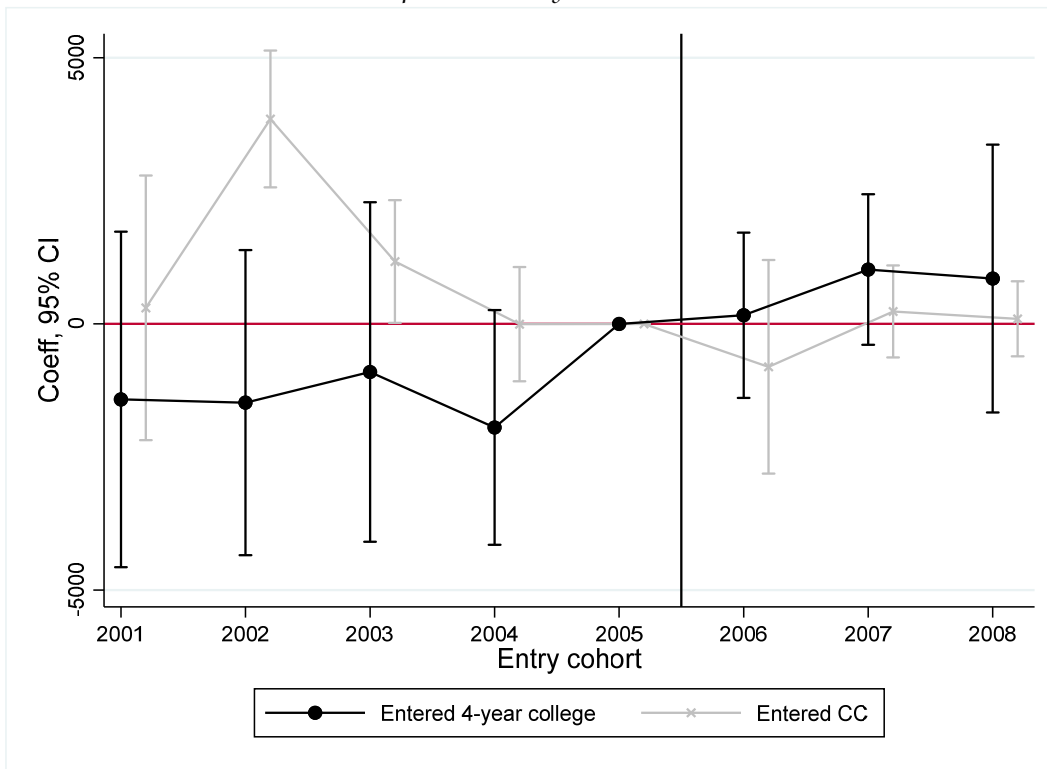
A. Asian or Pacific Islander



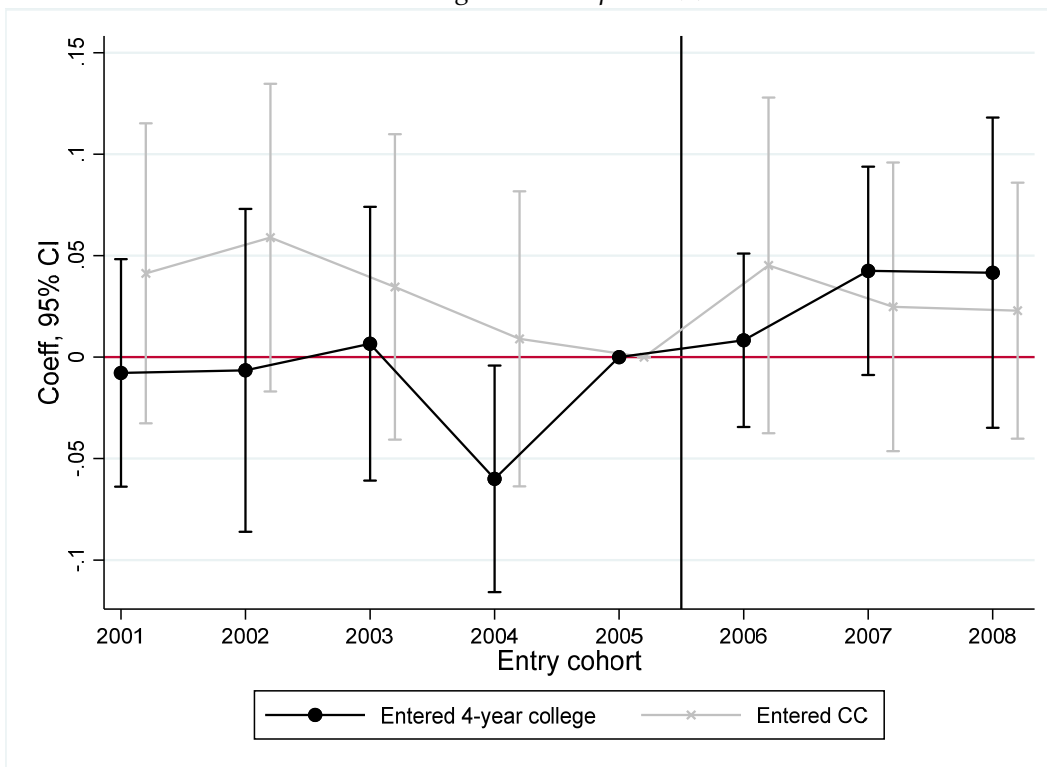
B. Black



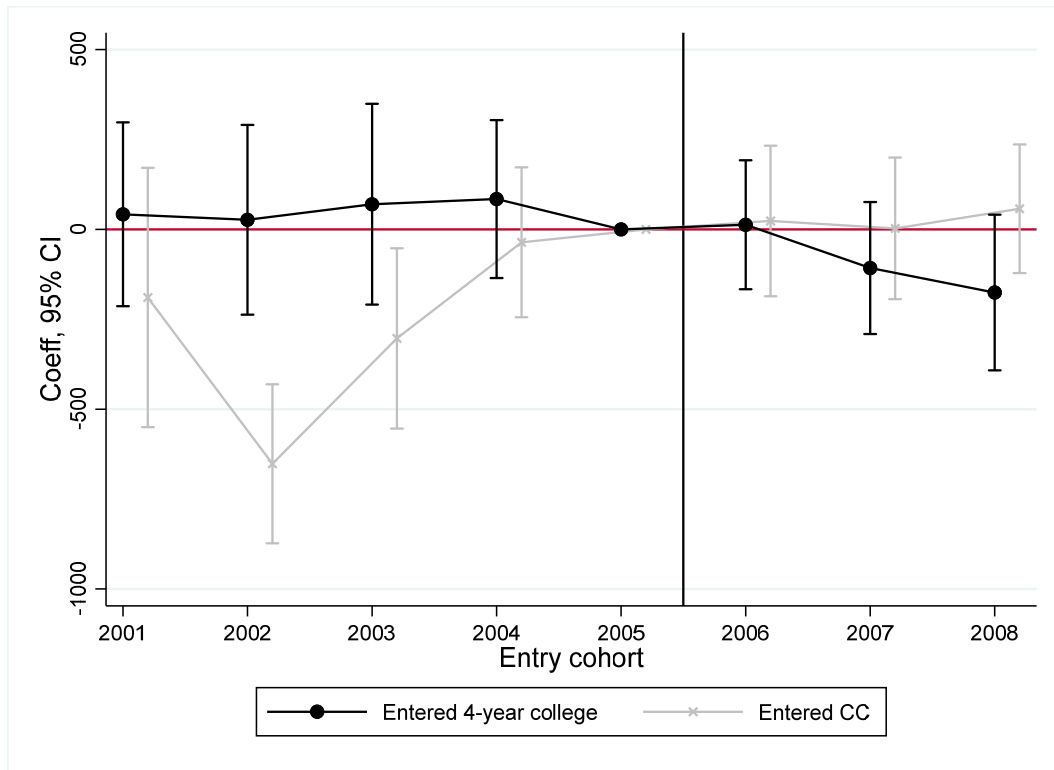
C. Expected Family Contribution



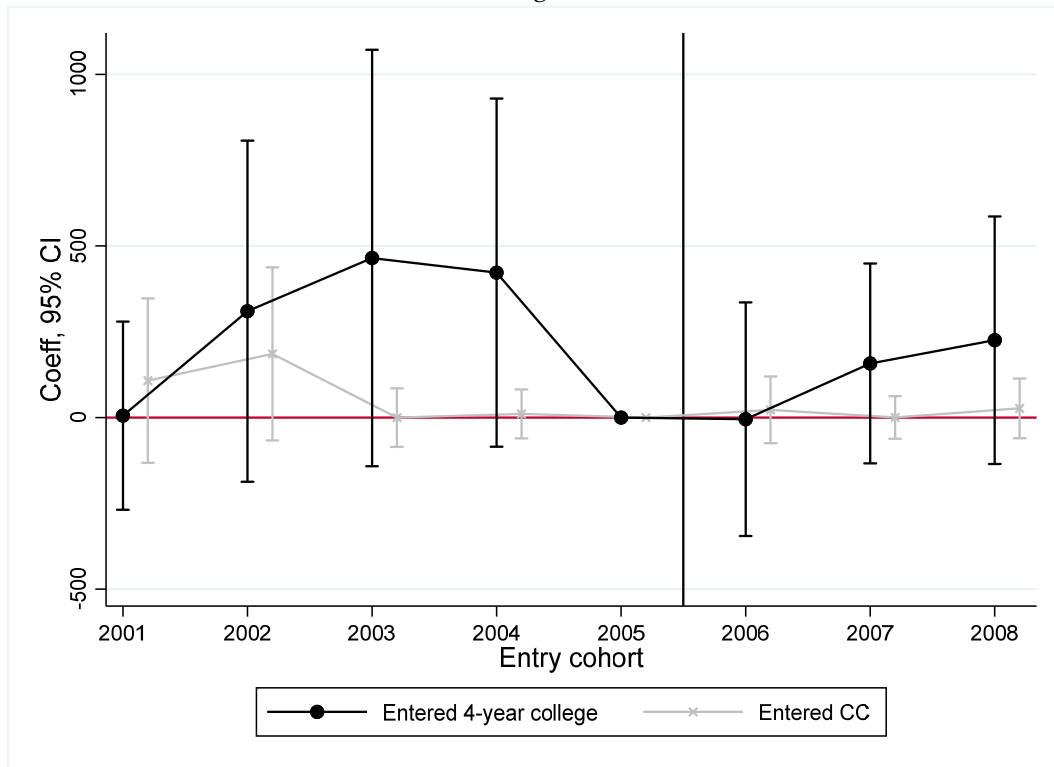
D. College educated parent(s)



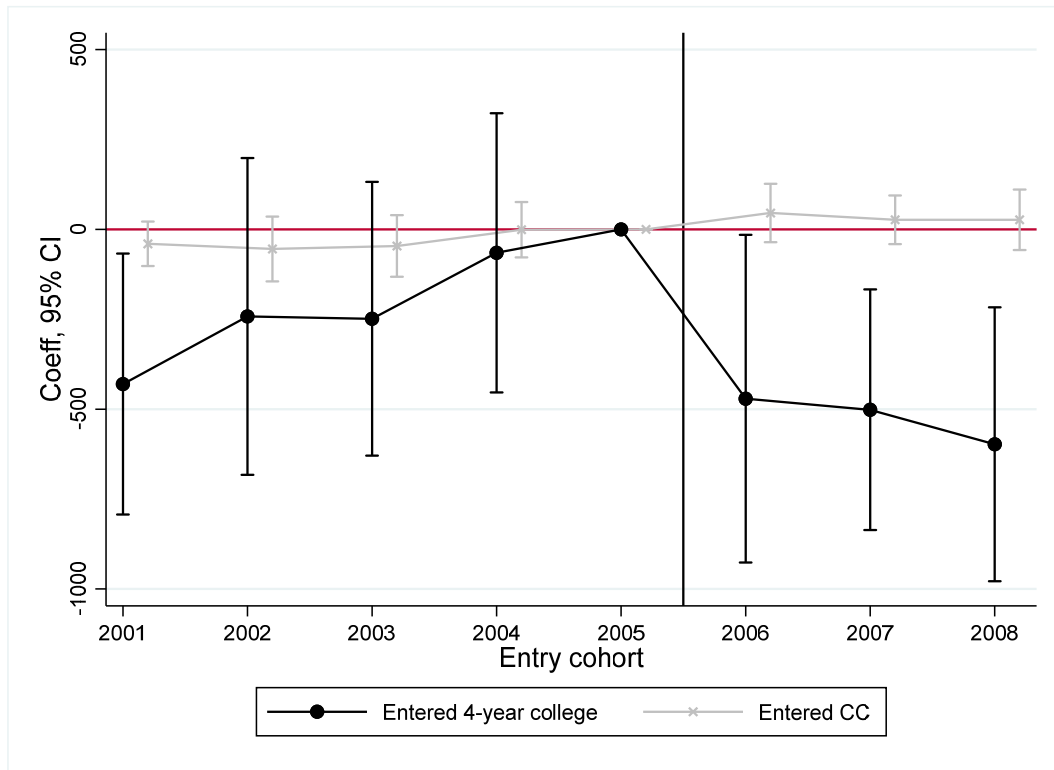
E. Pell Grant aid



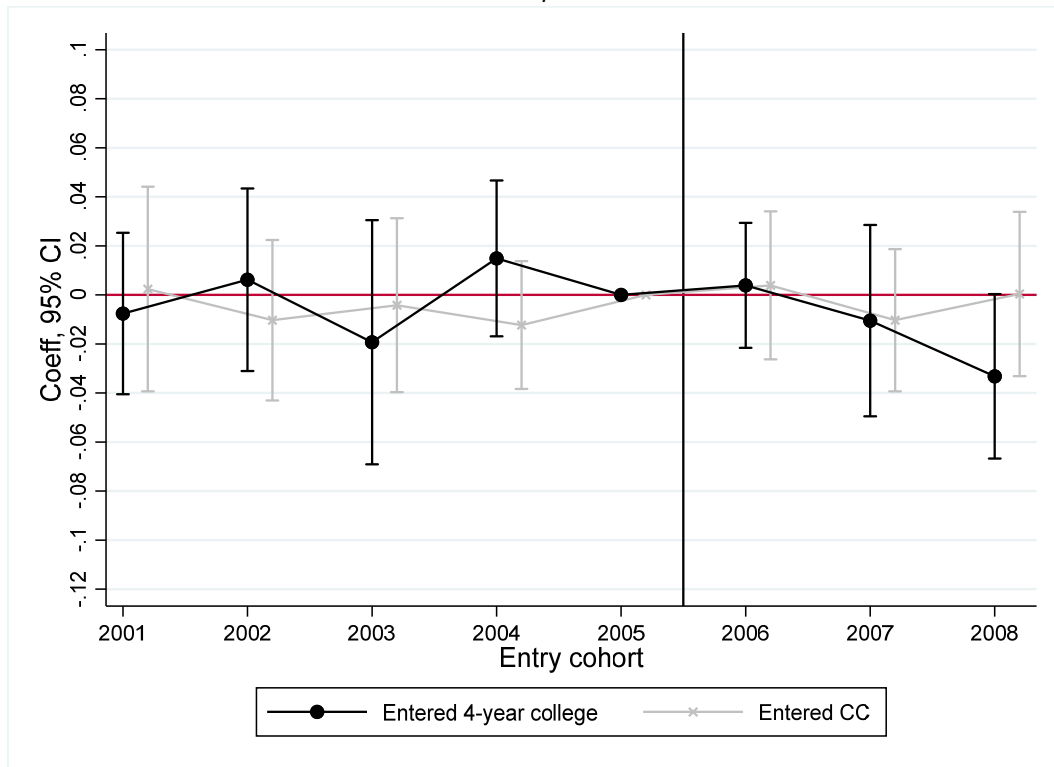
F. Other grant aid



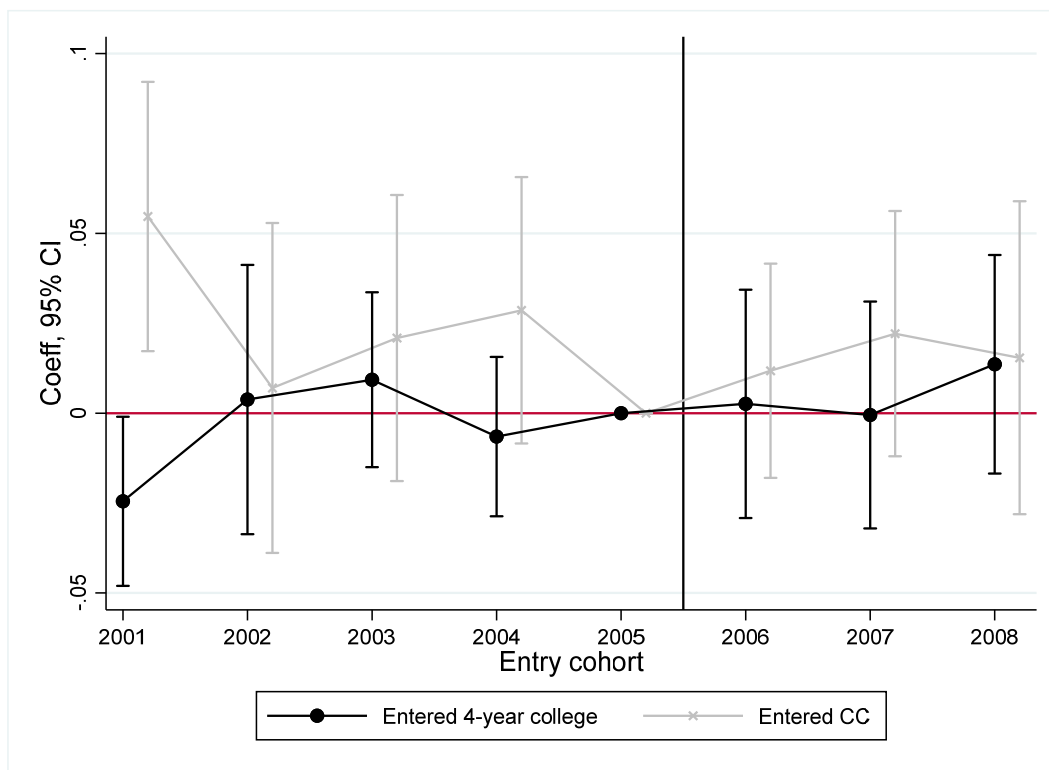
G. TEXAS Grant aid



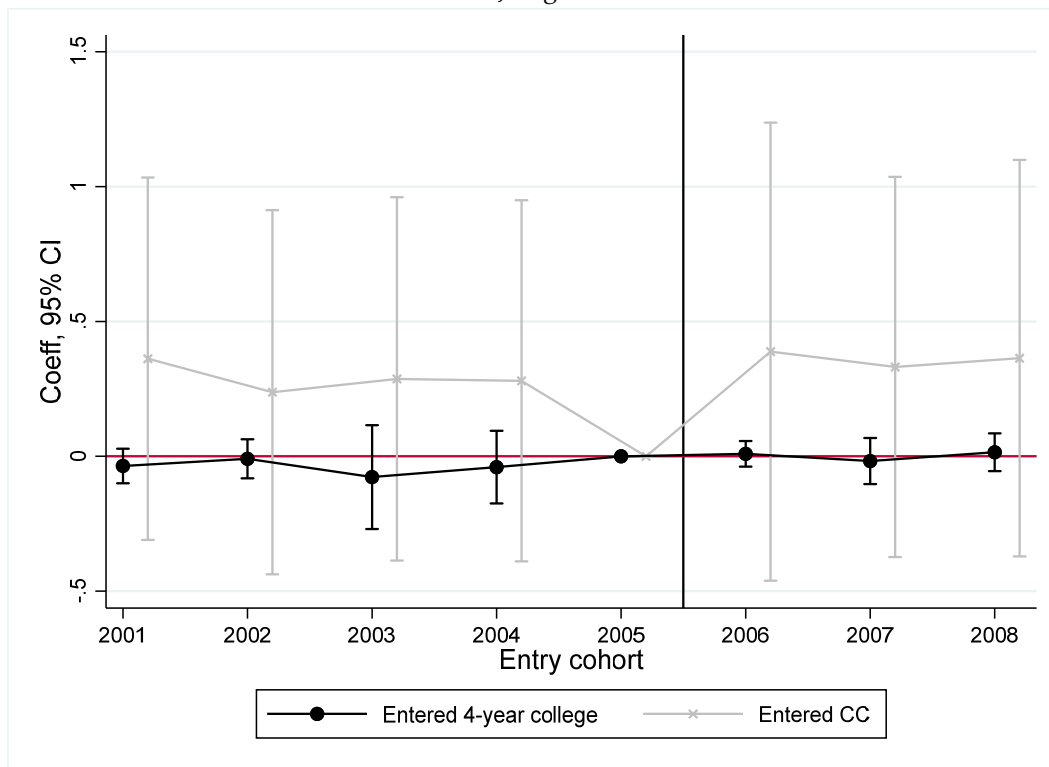
H. Hispanic



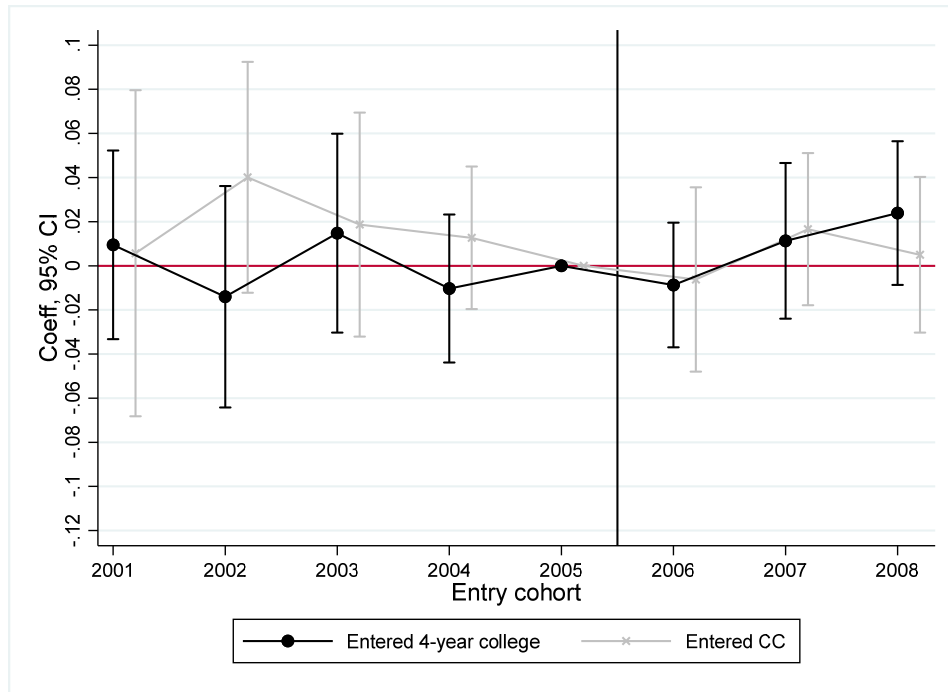
I. Male



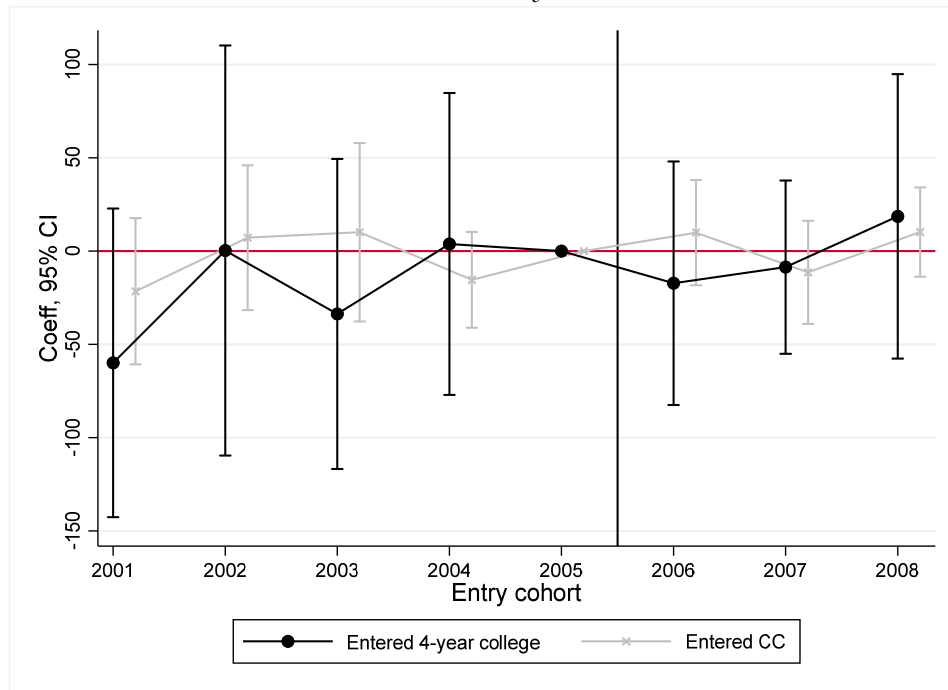
J. Age



K. White

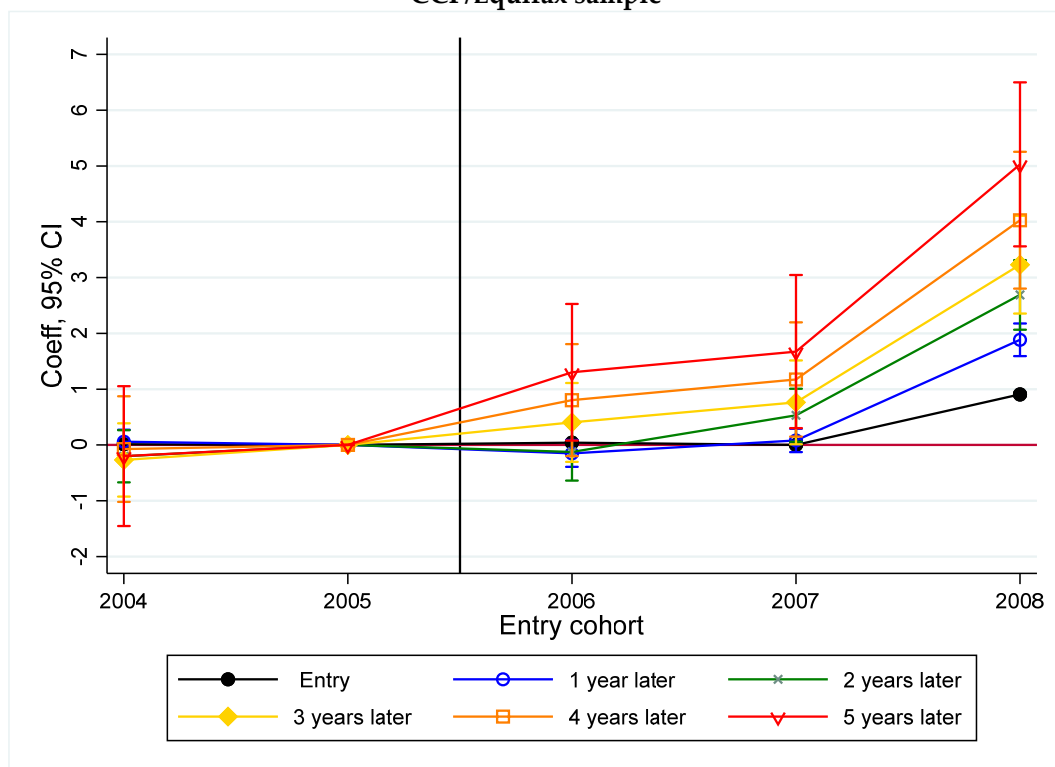


L. Work study aid



Notes: The sample includes student borrowers who first enrolled in a public four-year institution (black circles) or public community college (gray Xs) in Texas, were classified as dependent students at entry, and borrowed at or below the federal Stafford Loan maximum for first-year students. Coefficients and 95% confidence intervals from regressions of the specified characteristic on the interaction between being constrained at entry and entry cohort (with 2005 serving as omitted category). All specifications also include an indicator for being constrained at entry, cohort entry year fixed effects, and entry school fixed effects. Confidence intervals based on robust standard errors, clustered by entry institution.

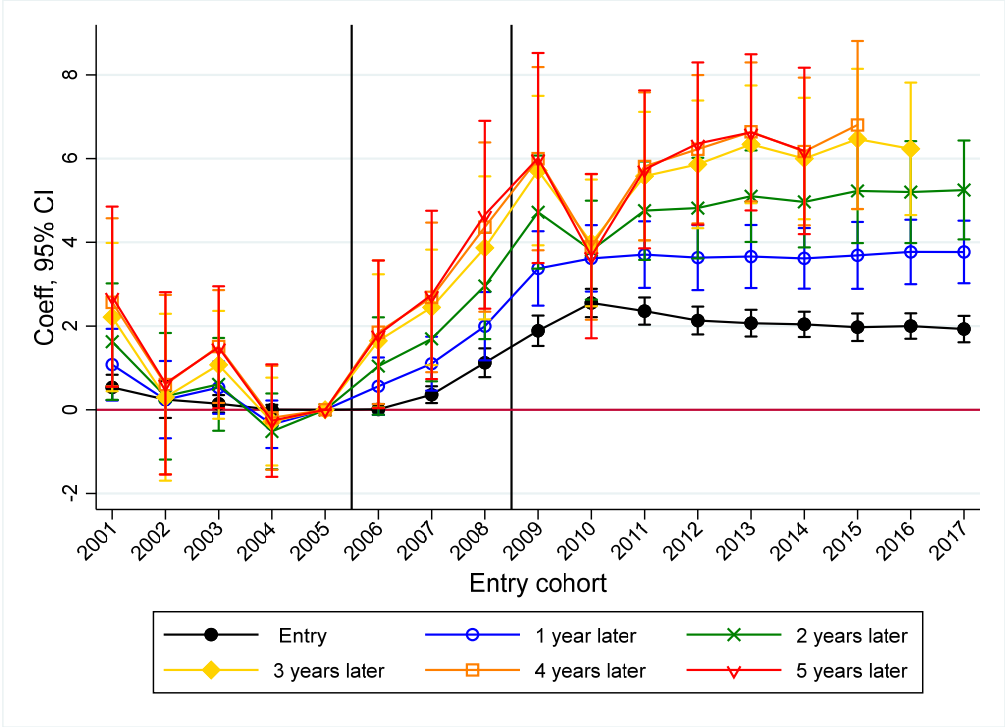
Figure C.2: The effect of being constrained at entry on cumulative student loans by entry cohort, CCP/Equifax sample



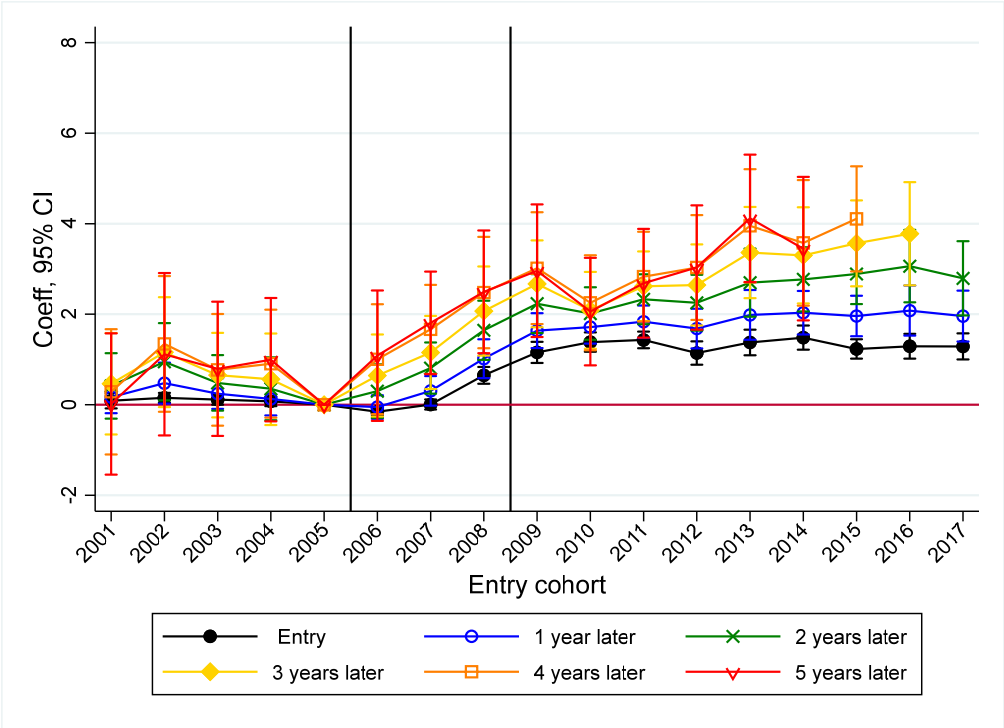
Notes: The sample includes student borrowers who were younger than 20, borrowed at or below the federal Stafford Loan maximum for first-year students at entry, and maintained a credit report through the 10th year after entry. Coefficients and 95% confidence intervals from regressions of cumulative borrowing at the specified number of years since entry on the interaction between being constrained at entry and entry cohort (with 2005 serving as omitted category). All specifications also include an indicator for being constrained at entry, cohort entry year fixed effects, includes state and age at entry fixed effects, quarters from entry before a credit report was created fixed effects, indicators for having a credit card, auto loan, mortgage, number of credit accounts, and credit score, measured before entry. Confidence intervals based on robust standard errors, clustered by entry state. Loan amounts are winsorized at the 99th percentile.

Figure C.3: The effect of being constrained at entry on cumulative student loans by entry cohort by type of college at entry, Texas sample

A. Four-year entrants

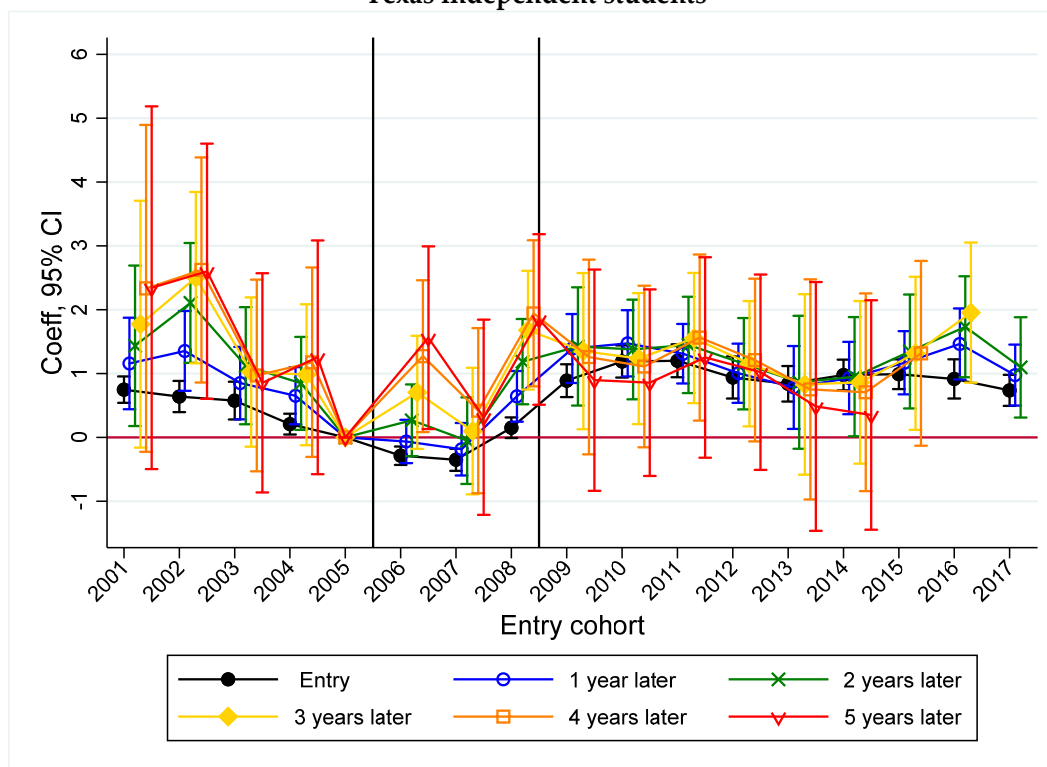


B. Community college entrants



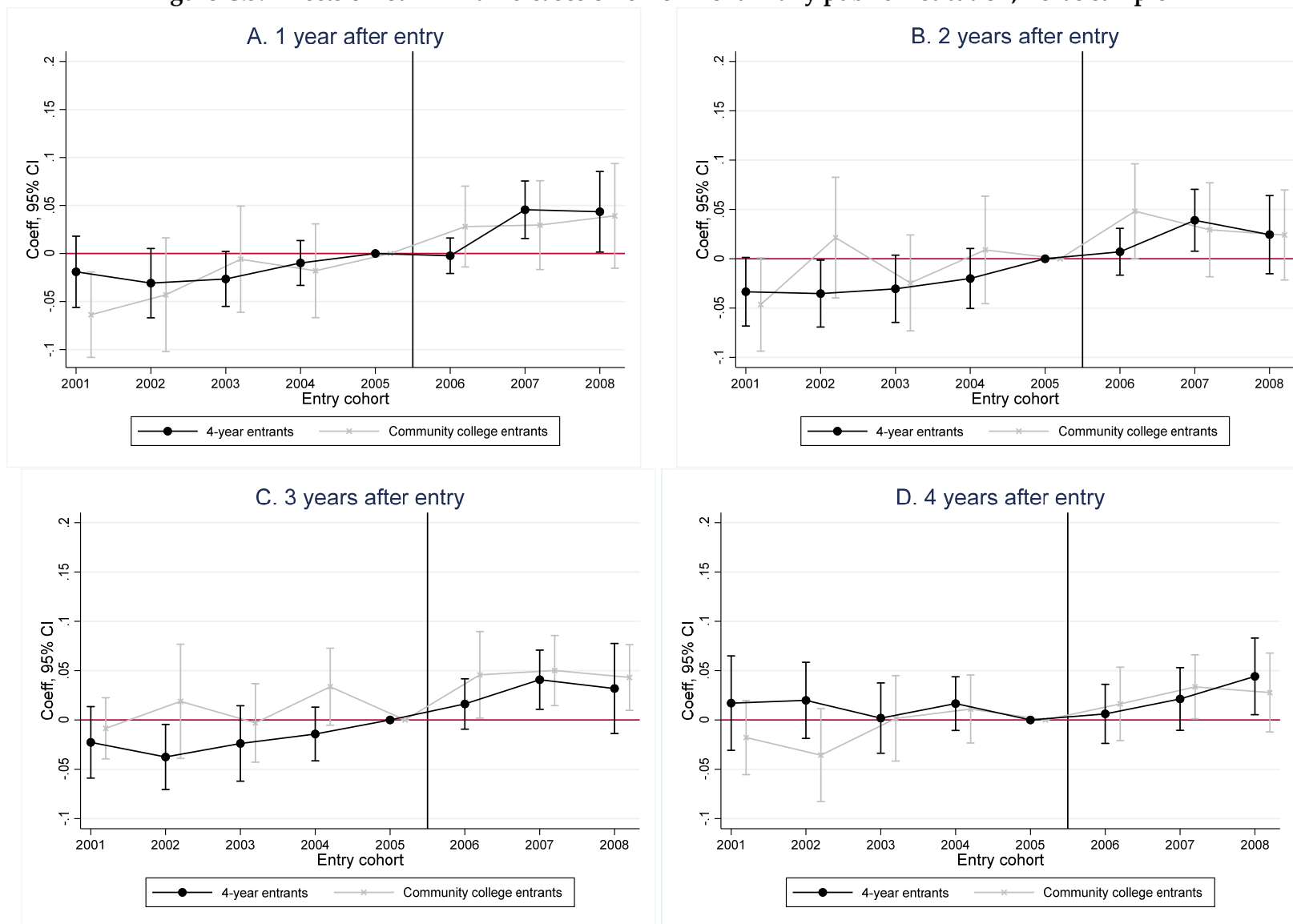
Notes: Student borrowers who first enrolled in a public four-year institution (Panel A) or public community college (Panel B) in Texas, were classified as dependent students at entry, and borrowed at or below the federal Stafford Loan maximum for first-year students. Coefficients and 95% confidence intervals from regressions of cumulative borrowing the specified number of years since entry on the interaction between being constrained at entry and entry cohort (with 2005 serving as omitted category). All specifications also include an indicator for being constrained at entry, cohort entry year fixed effects, entry school fixed effects, and controls for race (white, URM), age at entry, EFC at entry, and gender. Confidence intervals based on robust standard errors, clustered by entry institution.

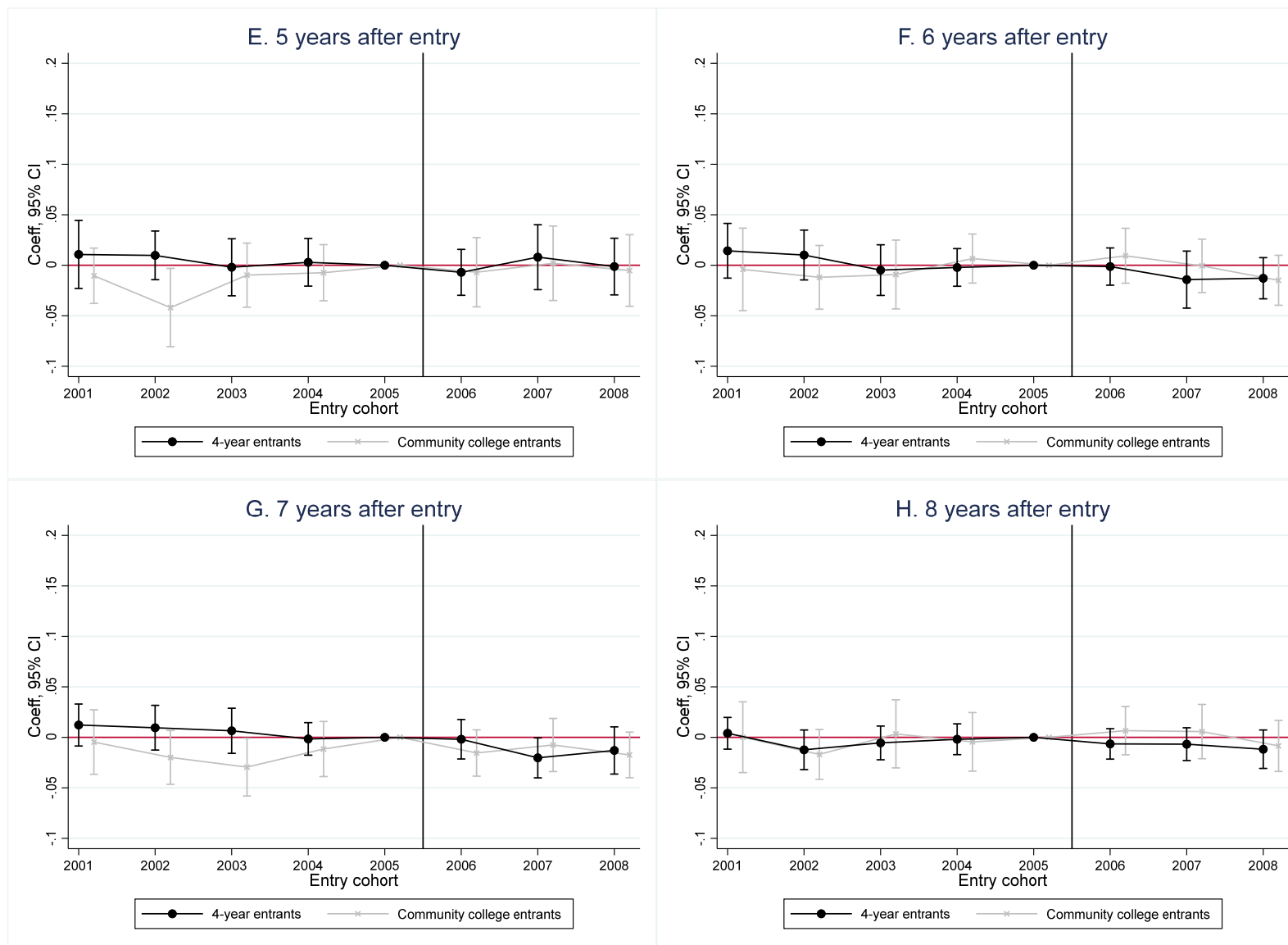
Figure C.4: The effect of being constrained at entry on cumulative student loans by entry cohort, Texas independent students



Notes: The sample includes student borrowers who first enrolled in a public four-year institution (Panel A) or public community college (Panel B) in Texas, were classified as independent students at entry, and borrowed at or below the federal Stafford Loan maximum for first-year students. Coefficients and 95% confidence intervals from regressions of cumulative borrowing the specified number of years since entry on the interaction between being constrained at entry and entry cohort (with 2005 serving as omitted category). Specifications also include an indicator for being constrained at entry, cohort entry year fixed effects, entry school fixed effects, and controls for URM, age at entry, EFC at entry, in-state student, fall entrant, and gender. Confidence intervals based on robust standard errors, clustered by entry institution.

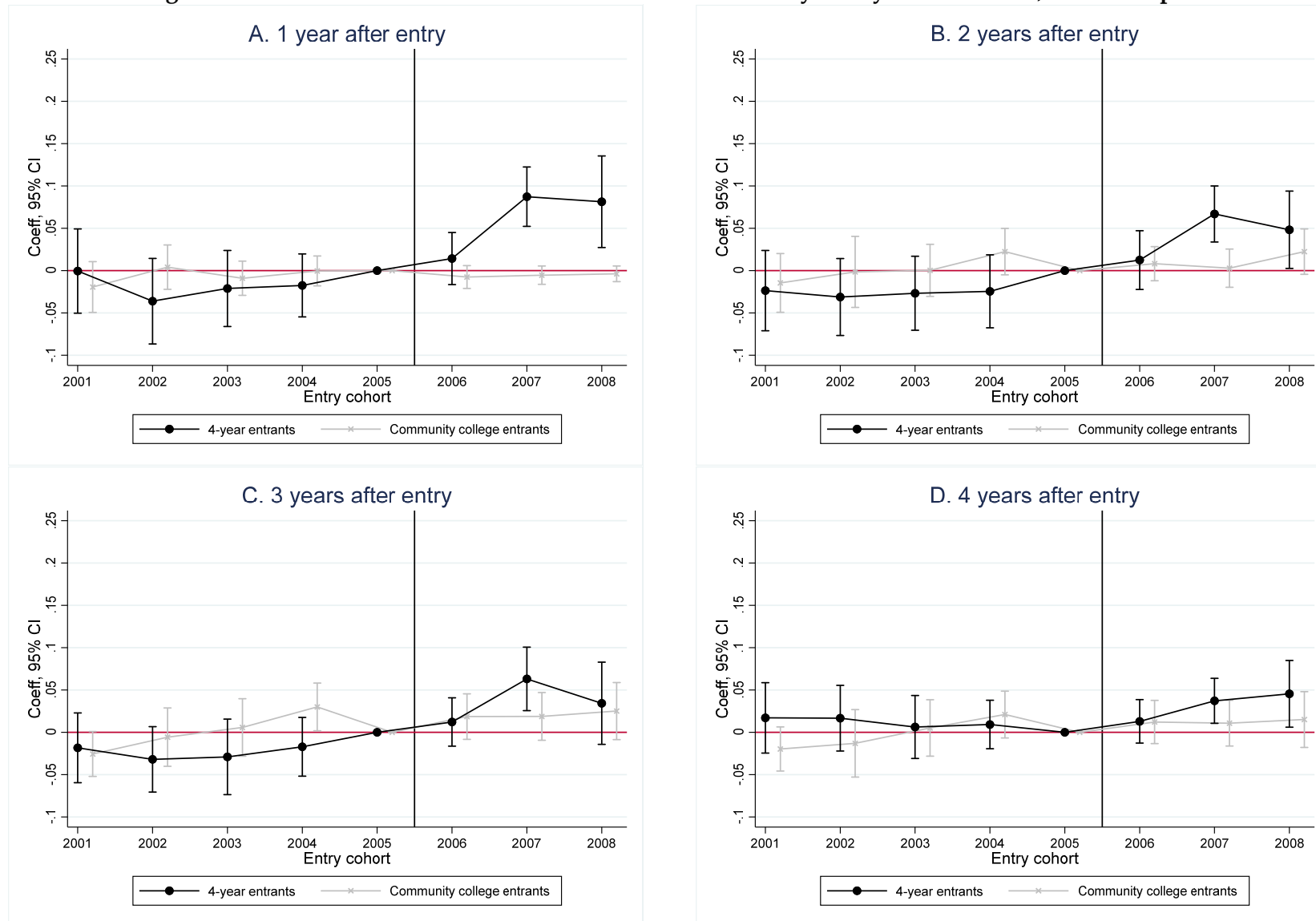
Figure C.5: Effects of loan limit increases on enrollment in any public institution, Texas sample

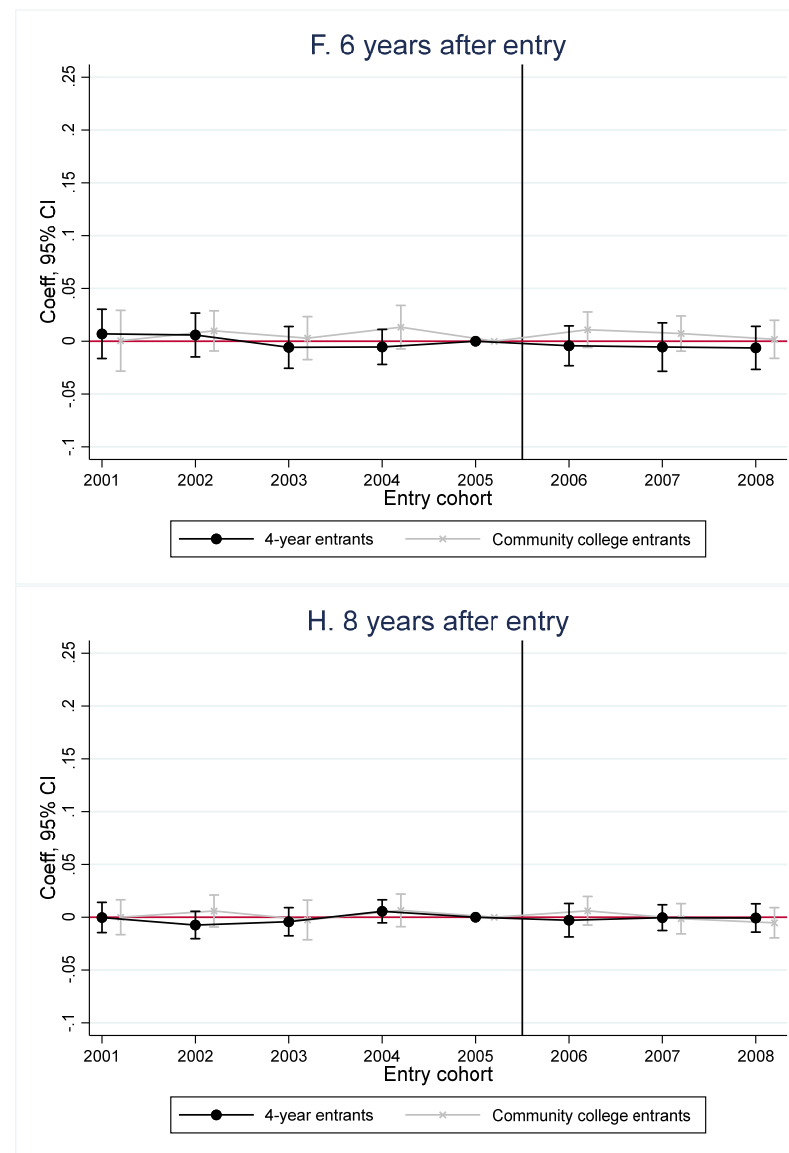
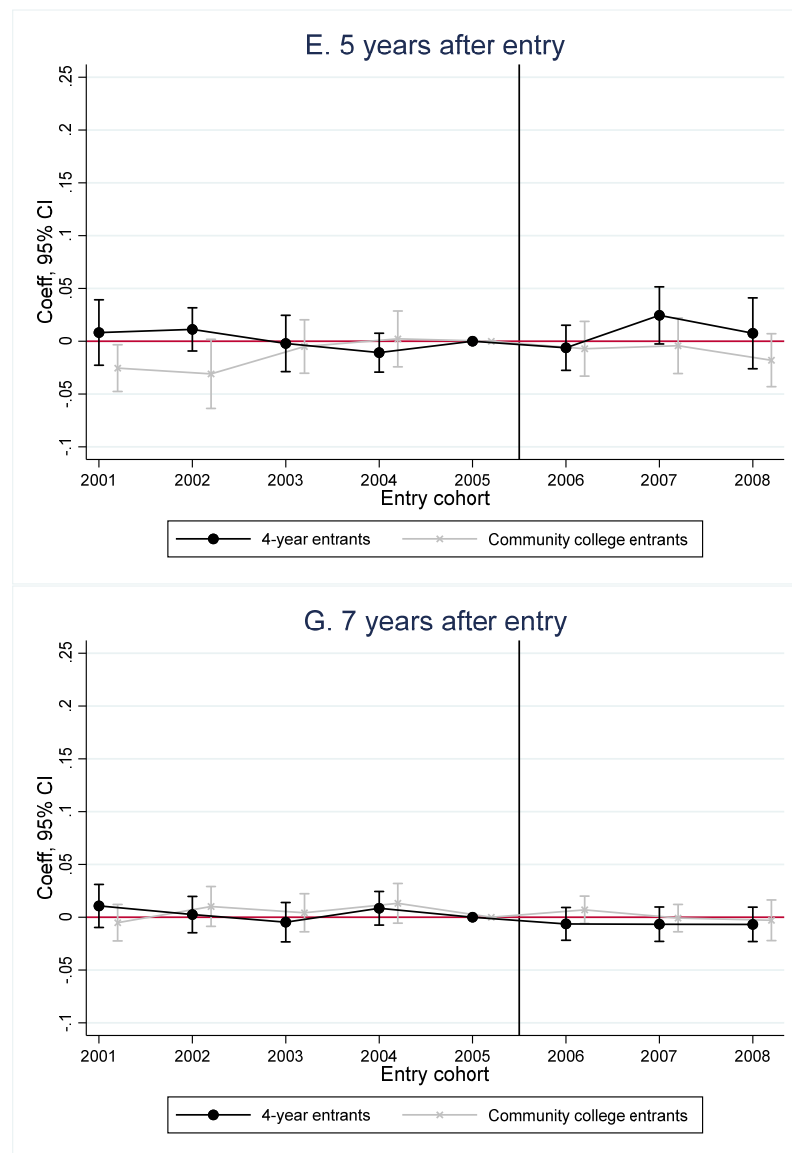




Notes: The sample includes student borrowers who first enrolled in a public four-year institution (black circles) or public community college (gray Xs) in Texas, were classified as dependent students at entry, and borrowed at or below the federal Stafford Loan maximum for first-year students. Coefficients and 95% confidence intervals from regressions of enrollment on the interaction between being constrained at entry and entry cohort (with 2005 serving as omitted category). Specifications also include an indicator for being constrained at entry, cohort entry year fixed effects, entry school fixed effects, and controls for URM, age at entry, EFC at entry, in-state student, fall entrant, and gender. Confidence intervals based on robust standard errors, clustered by entry institution.

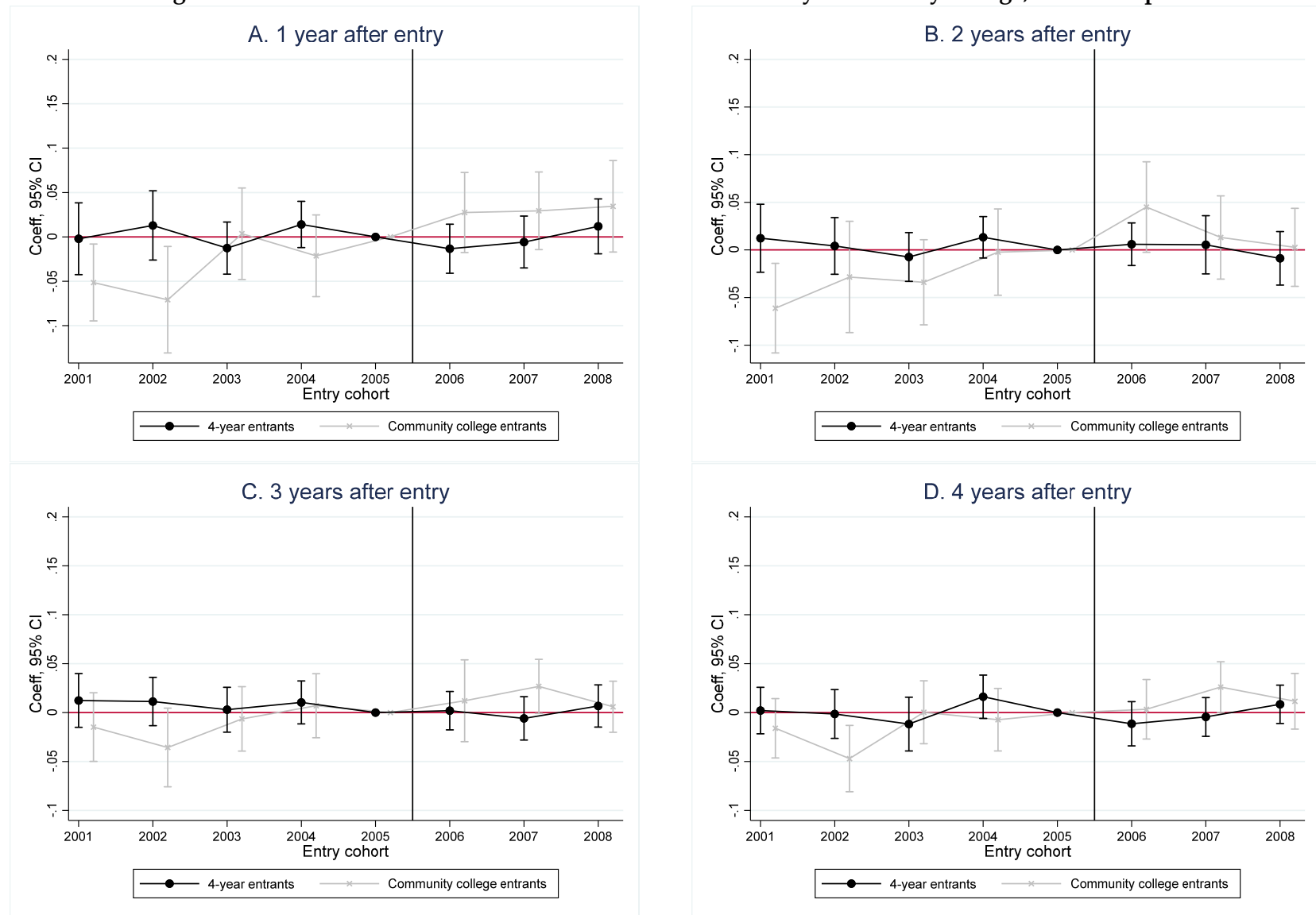
Figure C.6: Effects of loan limit increases on enrollment in any four-year institution, Texas sample

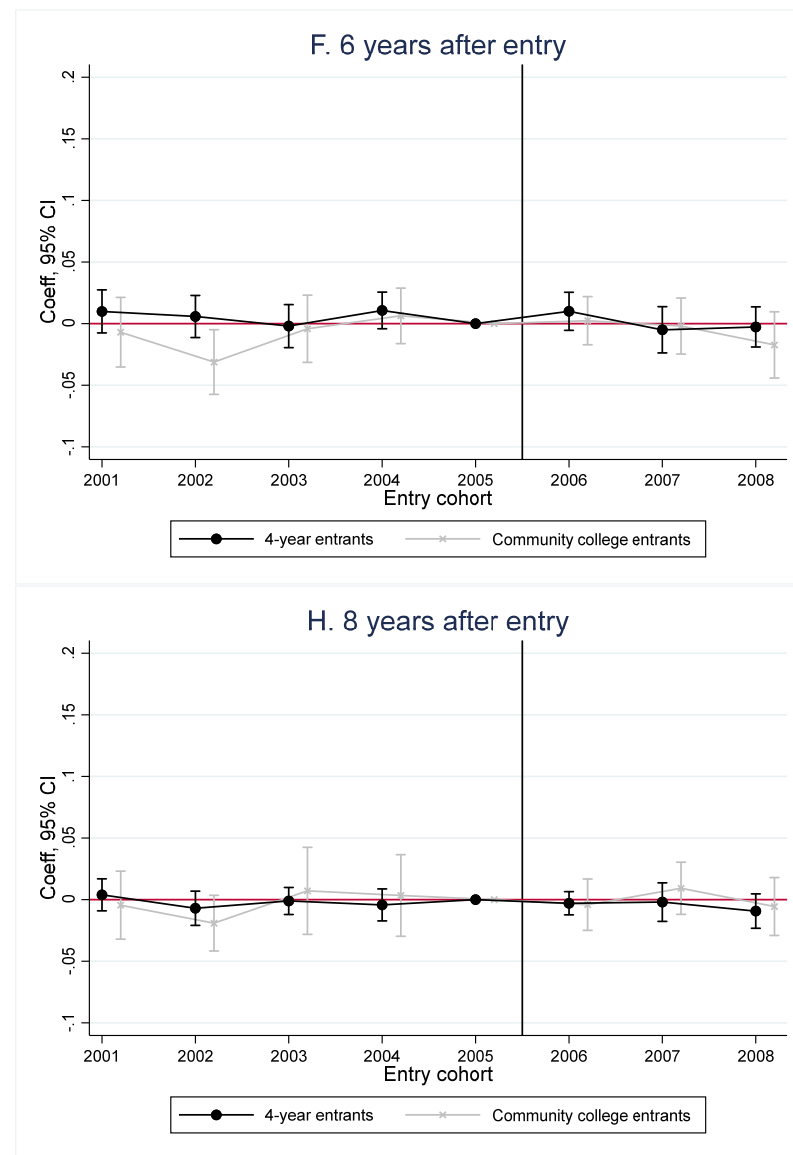
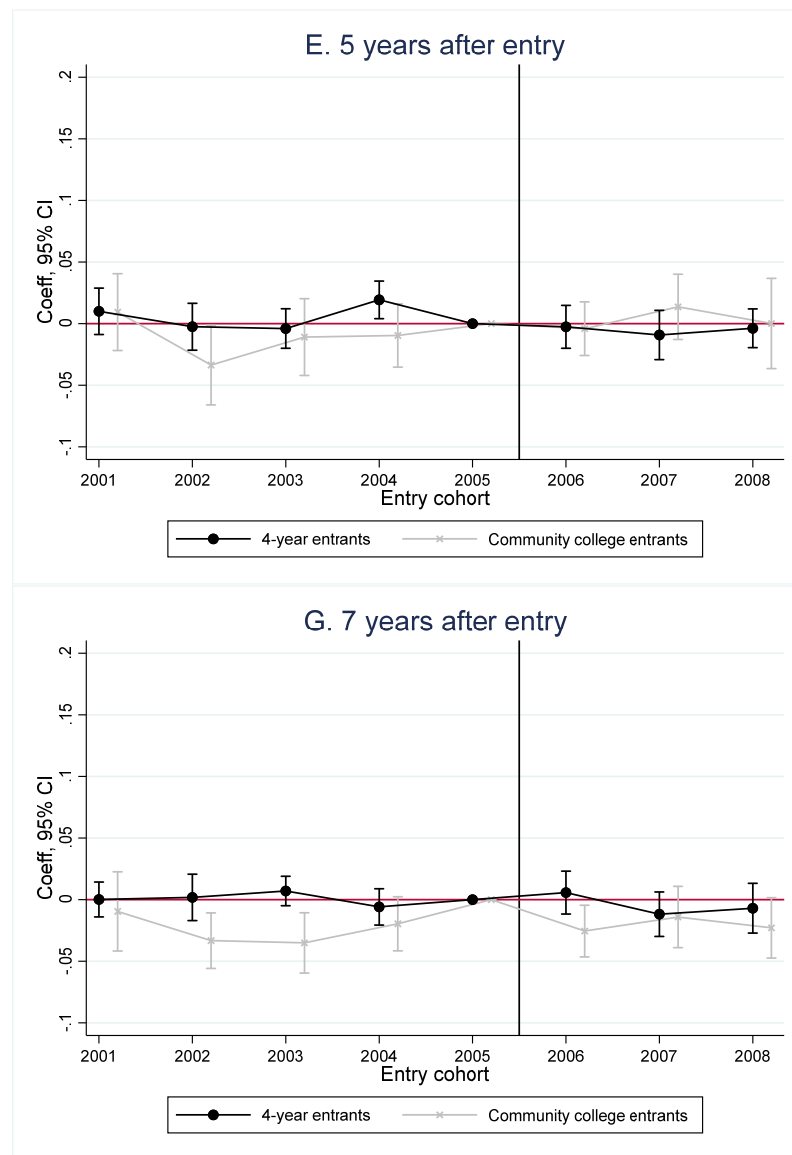




Notes: Student borrowers who first enrolled in a public four-year institution (black circles) or public community college (gray Xs) in Texas, were classified as dependent students at entry, and borrowed at or below the federal Stafford Loan maximum for first-year students. Coefficients and 95% confidence intervals from regressions of enrollment in a four-year institution on the interaction between being constrained at entry and entry cohort (with 2005 serving as omitted category). Specifications also include an indicator for being constrained at entry, cohort entry year fixed effects, entry school fixed effects, and controls for URM, age at entry, EFC at entry, in-state student, fall entrant, and gender. Confidence intervals based on robust standard errors, clustered by entry institution.

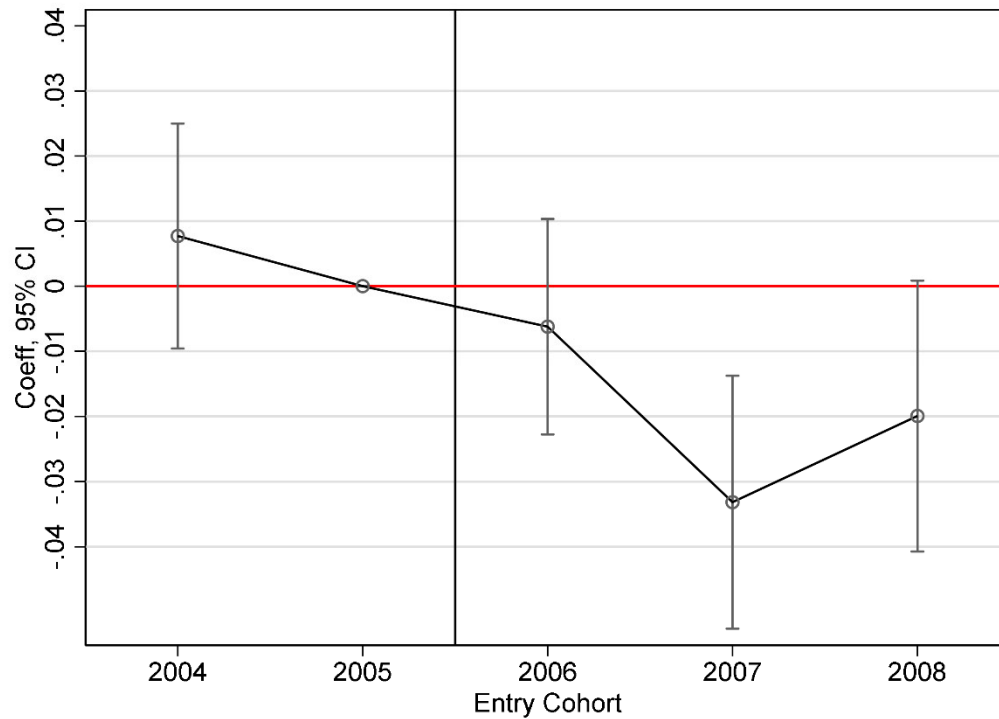
Figure C.7: Effects of loan limit increases on enrollment in any community college, Texas sample





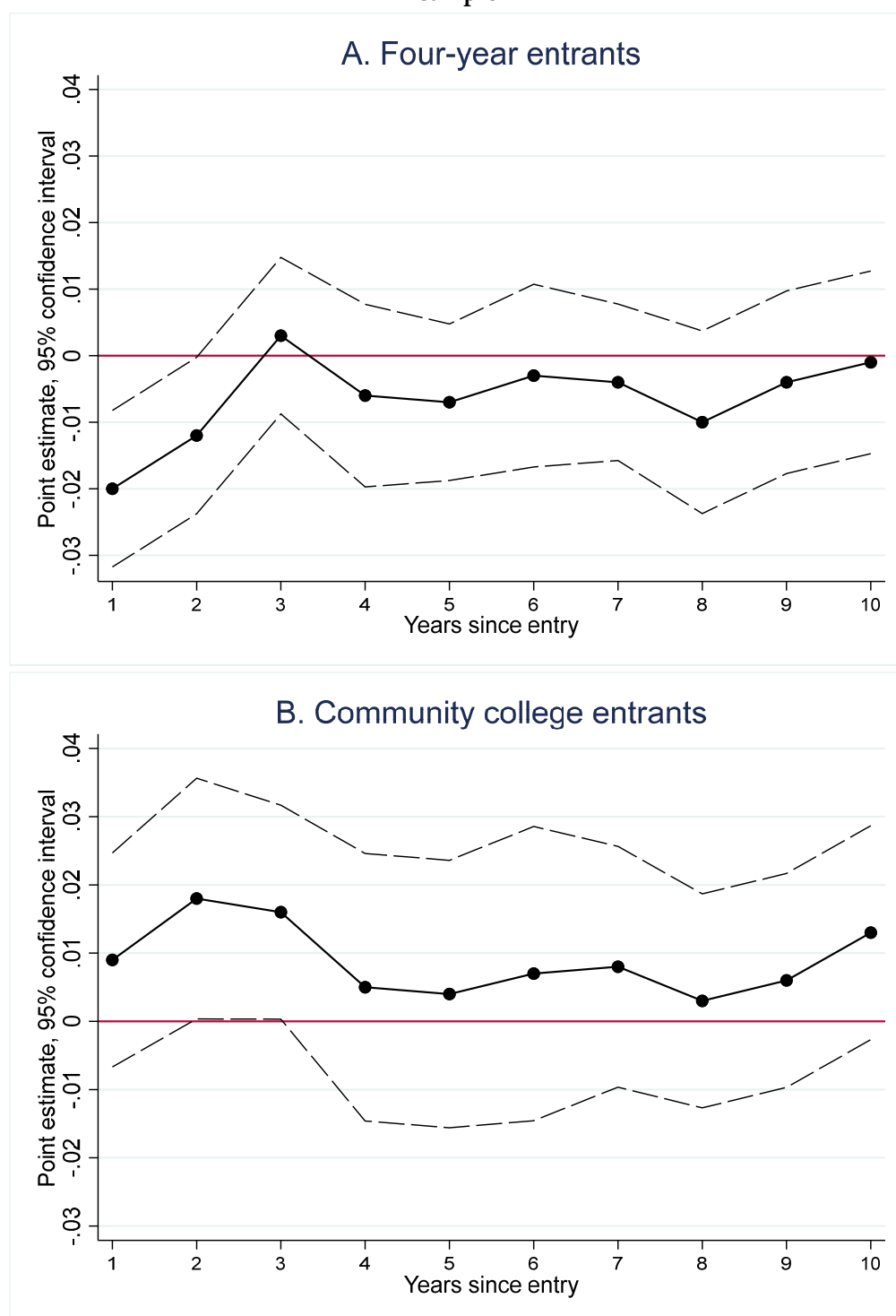
Notes: Student borrowers who first enrolled in a public four-year institution (black circles) or public community college (gray Xs) in Texas, were classified as dependent students at entry, and borrowed at or below the federal Stafford Loan maximum for first-year students. Coefficients and 95% confidence intervals from regressions of enrollment in a community college on the interaction between being constrained at entry and entry cohort (with 2005 serving as omitted category). Specifications also include an indicator for being constrained at entry, cohort entry year fixed effects, entry school fixed effects, and controls for URM, age at entry, EFC at entry, in-state student, fall entrant, and gender. Confidence intervals based on robust standard errors, clustered by entry institution.

Figure C.8: The effect of being constrained at entry on credit card use 1 year after entry, CCP/Equifax sample



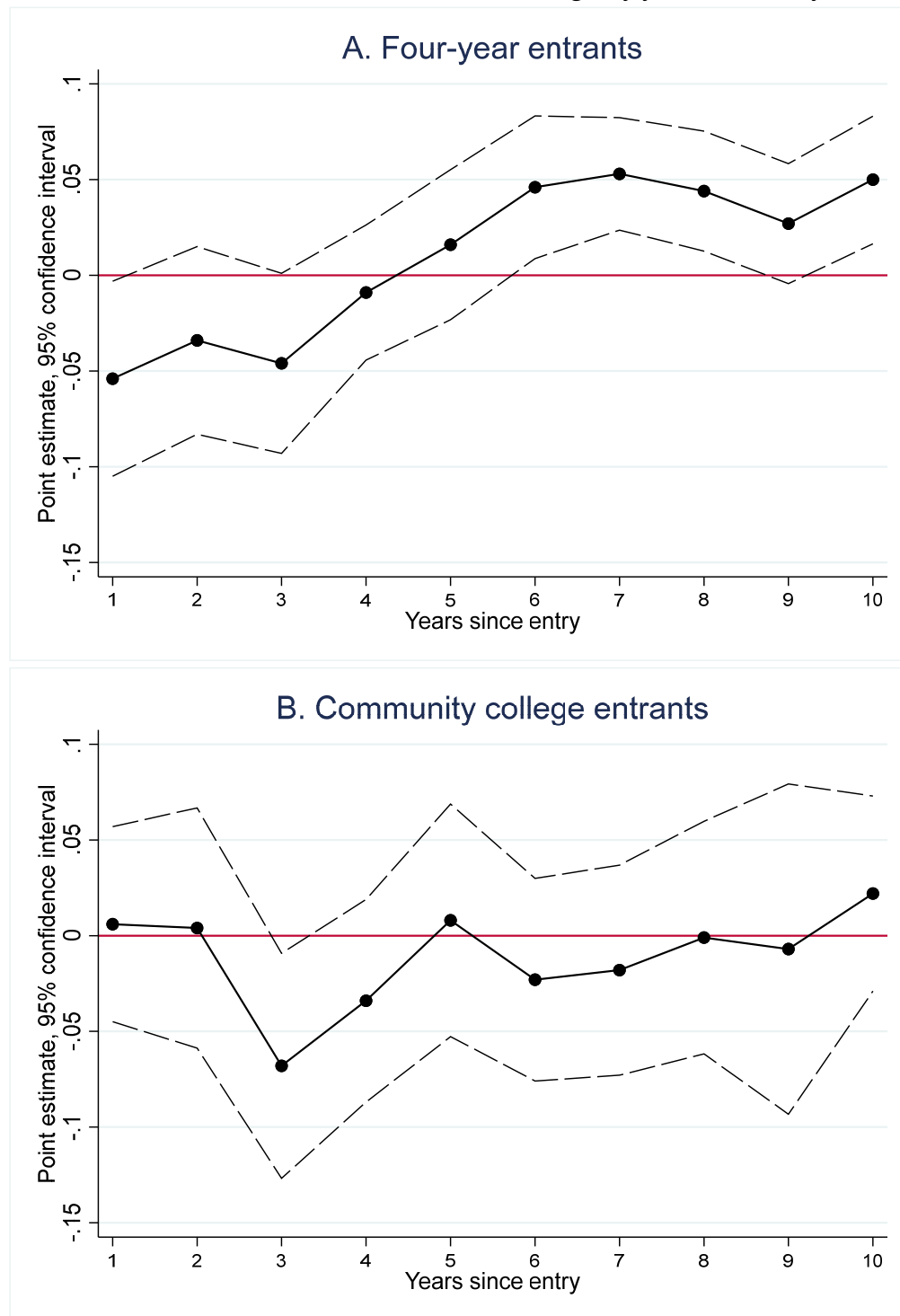
Notes: The sample includes borrowers who were younger than 20, borrowed at or below the federal Stafford Loan maximum for first-year students at entry, and maintained a credit report through the 10th year after entry. The figures show coefficients and 95% confidence intervals from regressions of the probability of having a credit card one year after entry on the interaction between being constrained at entry and entry cohort (with 2005 serving as omitted category). All specifications also include an indicator for being constrained at entry, cohort entry year fixed effects, state and age at entry fixed effects, quarters from entry before a credit report was created fixed effects, indicators for having a credit card, auto loan, mortgage, number of credit accounts, and credit score, measured before entry. Confidence intervals based on robust standard errors, clustered by entry state.

Figure C.9: The effect of loan limit increases on the probability of having any earnings by years since entry, Texas sample



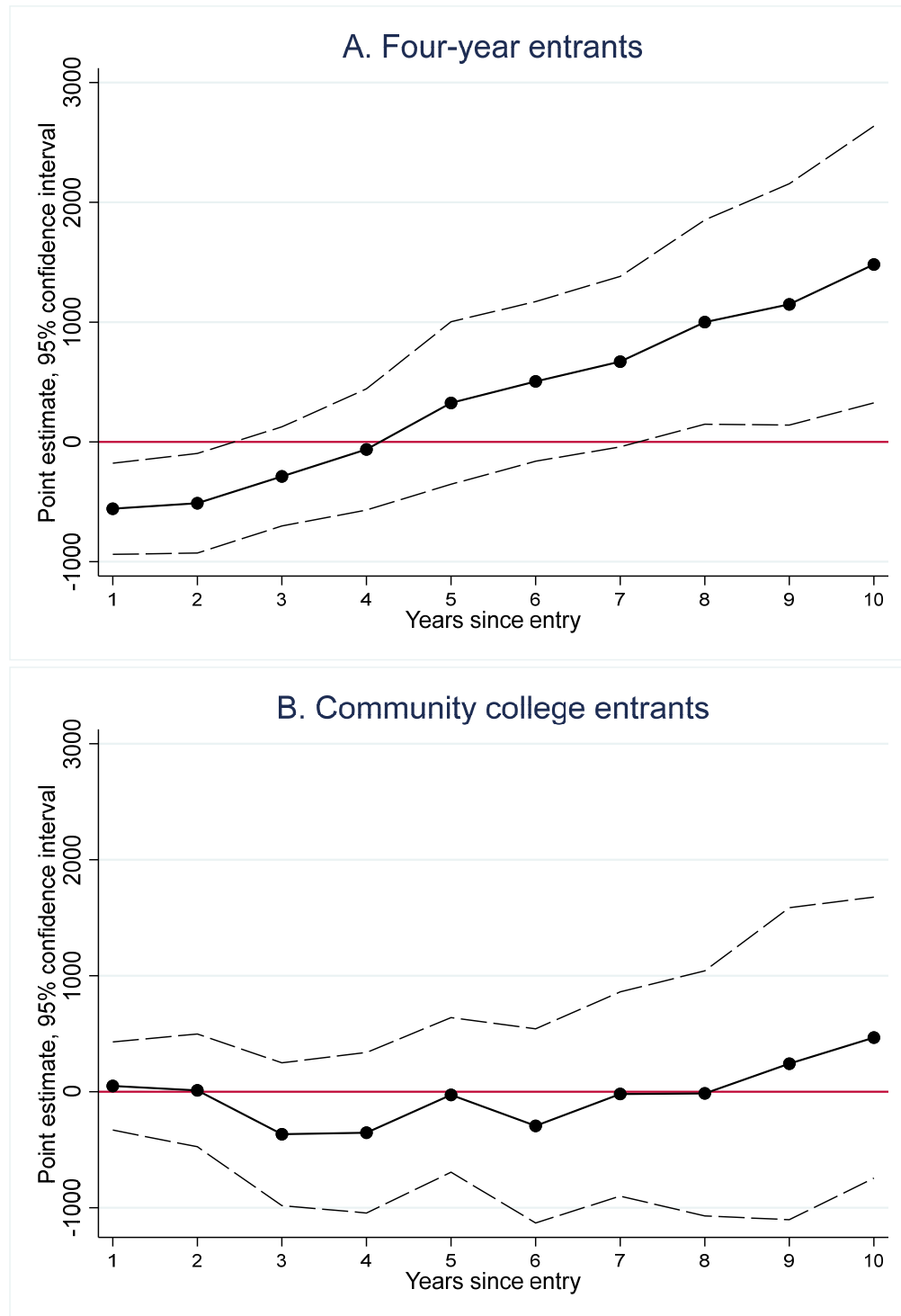
Notes: The sample includes student borrowers who first enrolled in a public four-year (Panel A) or community college (Panel B) in Texas, were classified as dependent students at entry, and borrowed at or below the federal Stafford Loan maximum for first-year students. Each marker (dashed line) represents a point estimate (95% confidence interval, standard errors clustered by entry institution) from separate regressions of the dependent variable, measured X years after college entry, where X is indicated on the x-axis, on an indicator for being constrained at entry interacted with an indicator for being in the 2006, 2007, or 2008 entry cohorts. Dependent variable is the probability of having any earnings. Specifications also include an indicator for being constrained at entry, cohort entry year fixed effects, entry school fixed effects, age at entry, EFC at entry, and indicators for male, URM, in-state student, and fall entrant.

Figure C.10: The effect of loan limit increases on $\ln(\text{earnings})$ by years since entry, Texas sample



Notes: The sample includes student borrowers who first enrolled in a public four-year (Panel A) or community college (Panel B) in Texas, were classified as dependent students at entry, and borrowed at or below the federal Stafford Loan maximum for first-year students. Each marker (dashed line) represents a point estimate (95% confidence interval, standard errors clustered by entry institution) from separate regressions of the dependent variable, measured X years after college entry, where X is indicated on the x-axis, on an indicator for being constrained at entry interacted with an indicator for being in the 2006, 2007, or 2008 entry cohorts. Dependent variable is $\ln(\text{earnings})$. Specifications also include an indicator for being constrained at entry, cohort entry year fixed effects, entry school fixed effects, age at entry, EFC at entry, and indicators for male, URM, in-state student, and fall entrant.

Figure C.11: The effect of loan limit increases on earnings levels by years since entry, Texas sample



Notes: The sample includes student borrowers who first enrolled in a public four-year (Panel A) or community college (Panel B) in Texas, were classified as dependent students at entry, and borrowed at or below the federal Stafford Loan maximum for first-year students. Each marker (dashed line) represents a point estimate (95% confidence interval, standard errors clustered by entry institution) from separate regressions of the dependent variable, measured X years after college entry, where X is indicated on the x-axis, on an indicator for being constrained at entry interacted with an indicator for being in the 2006, 2007, or 2008 entry cohorts. Dependent variable is annual earnings (winsorized at the 99th percentile). Specifications also include an indicator for being constrained at entry, cohort entry year fixed effects, entry school fixed effects, age at entry, EFC at entry, and indicators for male, URM, in-state student, and fall entrant.

Appendix D: Welfare Analysis

We use the framework of Denning, Marx, and Turner (2020) to evaluate the welfare implications of a marginal increase in federal student loan limits based on our findings for traditional-age dependent students that borrowed in their first year of college. In this model, welfare effects depend on the net externalities generated through behavioral responses to the policy as well as direct welfare effects of changes in agents' ability to smooth consumption from the policy change. With respect to externalities, we limit our analysis to the fiscal externalities of the policy change. To the extent that non-fiscal externalities are positive, this simplification will provide a lower-bound for net externalities. Denning, Marx, and Turner (2020) show that direct welfare effects will be positive for the average college student, so we similarly abstract from this component.

In the case of student loan limits, negative fiscal externalities will arise from several sources. First, the additional borrowing due to the increase in loan limits will reduce government revenue if some portion of a given dollar of student loan debt is not repaid due to default or debt forgiveness. To estimate the cost of an additional dollar lent, we use the Congressional Budget Office's March 2020 Baseline average subsidy rate for undergraduate Stafford Loans. The subsidy rate is the present discounted value of the expected cost of providing an additional dollar of federal loan aid.¹² We find that increased limits reduce default which we will account for in the discussion of the benefits of the policy change. Second, loan limit increases lead to an increase in years spent in college, which imposes additional costs on the government due to increased direct subsidies to public institutions and increased grant aid provided to students. For the cost of the direct subsidy, we use the average net subsidy reported in IPEDS for the 2009-2010 academic year multiplied by the effect of \$1000 increase in borrowing (due to loan limit increases) on years of attendance (0.06 for four-year entrants and 0.15 for community college entrants, per Table C.24). For the cost of additional financial aid received by students, we estimate effects on cumulative work study and grant aid using our main specification (results shown in Table D.1) and scale by the increase in loans to put in per \$1000 borrowed terms.¹³

The final negative fiscal externality comes from the reduction in four-year entrants' earnings one through three years after college entry (Table C.20) and corresponding decrease in federal tax revenue. We scale the decrease in earnings in early years by the increase in loan debt

¹² See <https://www.cbo.gov/system/files/2020-03/51310-2020-03-studentloan.pdf> for additional details. CBO estimates a 7.51 percent subsidy rate for subsidized Stafford Loans in 2020 and a -2.77 rate for unsubsidized Stafford Loans. We use the weighted (by loan volume) average of these rates; 47 percent of undergraduate Stafford Loans disbursed in 2020 were subsidized.

¹³ Note that constrained four-year entrants who gain access to higher loan limits receive less grant aid while in college, a reduction in costs we do not include in Table D.2.

measured six years after entry (Table 5) to get an estimated \$337 reduction in earnings in these three years per \$1000 increase in loans. To convert the reduction in earnings into effects on federal tax revenue, we follow Denning, Marx, and Turner (2019) to match average four-year entrant earnings in the Texas sample to average marginal tax rates for American Community Survey sample members (calculated via NBER's TAXSIM) of similar ages and income ranges as Texas four-year entrants (see Online Appendix D of Denning, Marx, and Turner (2019) for additional details). We estimate the following average marginal federal income tax rates for four-year entrants: 5.14% (1 year after entry), 6.52% (2 years after entry), and 8.58% (3 years after entry). FICA taxes are assumed to be 15.3%. As we find no effects of loan limit increases on community college entrants' earnings or employment, we assume no lost federal income tax revenue for this population.

As summarized in Table D.2, the major costs associated with an increase in loan limits comes from the additional direct subsidy to public institutions (\$502 per \$1000 borrowed for four-year entrants and \$888 for community college entrants) and grant aid to community college students (\$532 per \$1000 borrowed). The direct cost of an additional \$1000 in loans is only \$20 and foregone federal tax revenue is only \$140. Summing over categories yields a total cost of \$731 per \$1000 borrowing increase for four-year entrants and \$1,594 for community college entrants. To get an overall cost per \$1000 borrowed, we use the relative representation of four-year (65 percent) and community college (35 percent) entrants in the sample, yielding an estimated \$1,033 cost per \$1000 in additional borrowing due to increased loan limits.

Next, we turn to accounting for positive fiscal externalities that arise from increased borrowing when loan limits are increased. The first benefit is a fall in student loan default. We use the Congressional Budget Office's estimate that approximately \$0.90 of every defaulted \$1 of student loan debt is recovered. Thus, the per-borrower benefit of the reduction in the default rate will equal the product of the borrower's total balance (Table 3), the change in the default rate per \$1000 borrowed (0.011 per Table C.25), and \$0.10. The second positive fiscal externality comes from the increase in federal tax revenue due to the significant increases in earnings six through ten years after college entry (Table 9). We follow the same method used to calculate the federal tax revenue lost due to the reduction in early-year earnings, which yields average marginal federal income tax rates of 16.06%, 16.59%, 16.63%, 16.65%, and 16.55% (for years six, seven, eight, nine, and ten, respectively). We again assume that the FICA tax rate equals 15.3%. As shown in Table D.3, increased federal tax revenue makes up the main fiscal benefit from increasing loan limits. Taking the weighted average of these amounts (assuming no change in federal tax revenue from community college students) yields a per-\$1000 loan benefit of \$933 over the years following college entry. Note that almost the entire gain comes from four-year

entrants and if loan limits were only increased for these students, the benefit per \$1000 loan would be \$1148. For community college entrants, the benefit per \$1000 loan increase is only \$13.

If we assume that the estimated earnings gains received by four-year entrants persist for an additional two years, the estimated fiscal benefits of \$1,133 will exceed the estimated fiscal costs. Under this assumption, the additional borrowing due to higher loan limits will pay for itself within 12 years. If loan limits were only increased in the four-year sector, the policy would be revenue neutral before the end of our panel.

Table D.1: Effects of loan limit increases on cumulative financial aid and cost of attendance

	(1) Work study	(2) Grants	(3) Cost of attendance
<i>A. Texas sample, four-year entrants</i>			
Constrained x cohort in {2006,2007,2008}	87 (73) {0.102}	-177 (780) {0.706}	6,405 (1309)** {<0.001}
Dependent variable mean	\$756	\$20,587	\$78,187
Observations	77,900	77,900	77,900
<i>B. Texas sample, community college entrants</i>			
Constrained x cohort in {2006,2007,2008}	14 (27) {0.748}	635 (281) {0.015}	3,127 (1085)** {0.014}
Dependent variable mean	\$241	\$9,543	\$43,451
Observations	42,843	42,843	42,843

Notes: The sample includes student borrowers who first enrolled in a public four-year institution (Panel A) or public community college (Panel B) in Texas, were classified as dependent students at entry, and borrowed at or below the federal Stafford Loan maximum for first-year students. Each cell within a panel includes estimates from separate regressions; dependent variable indicated in column heading. All specifications also include an indicator for being constrained at entry, cohort entry year fixed effects, entry school fixed effects, and controls for URM, gender, fall entrant, EFC, and in-state student. Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$; p -values from wild cluster bootstrap-t in brackets.

Table D.2: Estimated costs and data sources

Category	Source	Estimated cost/\$1000 loan
Additional borrowing	CBO	\$20
Net subsidy, public four-year institutions	IPEDS	$\$8,361/\text{year} * 0.06 \text{ adtl. years} = \502
Net subsidy, community colleges	IPEDS	$\$5,917/\text{year} * 0.15 \text{ adtl. years} = \888
Grant aid, four-year entrants	Table D.1	-\$94
Grant aid, community college entrants	Table D.1	\$523
Fed. tax revenue, four-year entrants	Texas data, ACS	\$140

Table D.3: Estimated benefits and data sources

Category	Source	Estimated benefit/\$1000 loan
Reduction in default rate, four-year entrants	CBO, Texas data	$\$22,030 * 0.011 * 0.10 = \24
Reduction in default rate, community college entrants	CBO, Texas data	$\$11,652 * 0.012 * 0.10 = \13
Fed. tax revenue, four-year entrants		
6 years after entry	Texas data, ACS	\$194
7 years after entry	Texas data, ACS	\$254
8 years after entry	Texas data, ACS	\$232
9 years after entry	Texas data, ACS	\$150
10+ years after entry	Texas data, ACS	\$294

Appendix E: Student Cost-Benefit Analysis

In Section D, we assumed that students who borrow when given access to higher loan limits make the decision as a result of utility maximization, and thus, are weakly better off in expectation if they choose to borrow. Here, we relax this assumption to ask a different question: what is the discount rate below which a student's expected labor market returns from borrowing will exceed her expected costs? To conduct this analysis, we need to make a number of assumptions including the shape of borrowers' age-earnings profiles, their student loan repayment plan choice, and the cost to the borrower of defaulting on their loan. In this appendix, we describe these assumptions and corresponding rationale in detail.

To evaluate the net benefits of borrowing from the student's perspective, we need to calculate the present discounted value of the future stream of costs and income for the average student ("baseline") and for a student who gained access to higher loan limits ("treated"). Within each group, we calculate net benefits over a 30-year working career. For a given discount rate, if the net benefits for a treated student exceed baseline net benefits, we conclude that gaining access to additional student loans made such a student better off than had they not experienced loan limit increases. We do these calculations separately for four-year and community college entrants.

The student's costs can be divided into those that occur within college and those that are incurred after the student leaves college. The former category includes out-of-pocket spending. We assume that the student spends 6 years in college and that the student covers the cost of attendance net of grant and loan aid in each year. Column 1 of Table E.1 shows that baseline out-of-pocket costs are \$26,418 for four-year entrants and \$20,572 for community college entrants. We estimate treatment effects on cumulative out-of-pocket costs using our main specification; four-year entrants who gain access to higher loan limits pay an additional \$4436 and community college entrants face an additional \$546 in out-of-pocket costs.

Costs after college include loan repayments and the risk of defaulting on student loan payments. We assume that the cost of default to the student is 17.92 percent of the student's outstanding balance.¹⁴ The baseline expected cost of default is equal to this amount scaled by the average probability of any default shown in Table 8 (0.194). For treated students, the risk of default is adjusted to reflect the reduction in default due to access to additional loans, resulting in a 17.6 percent chance of default in a given year during repayment. We impute student loan interest that accrues while the student is in school using the appropriate interest rate (Tables A.1 and A.2) for Stafford Loans. We assume that private loans also accrue interest while in school and that the rate is 5 percentage points higher than the rate for Stafford Loans. We assume that all other categories of loans do not begin to accrue interest until the student has left school. After imputing interest, we estimate that baseline outstanding debt at repayment entry is

¹⁴ See <https://www.warren.senate.gov/newsroom/press-releases/warren-booker-pressley-colleagues-to-education-department-what-steps-are-you-taking-to-protect-student-borrowers-wages-and-benefits-when-payments-resume>.

\$23,174 for four-year entrants and \$12,365 for community college entrants. Treated students enter repayment with \$25,216 (four-year entrants) and \$13,692 (community college entrants) in outstanding debt (Table E.1, column 2).

We assume that the student repays on a 10-year amortization schedule, which is the default federal loan repayment plan. We calculate the weighted (by loan volume) average interest rate for this debt using actual interest rates for Stafford Loans (Table E.1, column 3), 5 percent for Perkins loans, 4.2 percent for state loans, the Stafford Loan rate plus 5 percentage points for private loans, and the Stafford Loan rate plus 2.55 percentage points for PLUS loans. We then take a weighted average of the above interest rates based on the composition of loans six years after entry (Tables C.9 and C.10). The baseline average interest rate for four-year entrants is 5.47 percent and 5.44 percent for community college entrants while treated students face a 5.52 percent (four-year entrants) or 5.37 percent (community college students) average interest rate. Baseline monthly payments for four-year entrants are \$251 and are \$134 for community college entrants. For treated students, four-year entrants' monthly payments equal \$274 and community college entrants pay \$148 per month.

We assume that the student works for 30 years after leaving college. In-college baseline earnings are set equal to the sum of average earnings and the first 5 years of post-college baseline earnings are set equal to average earnings 7 through 10 years after entry (Table C.20). For the remaining 25 years of post-college earnings, we assume that earnings grow by 5 percent each year until the student reaches age 45 (22 years after leaving college for a traditional aged entrant) and remain constant thereafter. Treated students receive baseline earnings plus (or minus) the treatment effect on earnings (Table C.20) for in-school earnings and the first 5 years after leaving college. In the remaining 25 years, treated students receive baseline earnings and the earnings increase at year 10 indicated in Table 8 and Table C.21 (e.g., 0.05 log points/5.1% higher earnings for four-year entrants and 0.022 log points/2.2% higher earnings for community college entrants).

We only consider earnings net of federal income and the worker's portion of FICA taxes. We assume that students face a 15 percent average tax rate while enrolled in college and a 25 percent average tax rate after college.

Given these assumptions, we estimate that a four-year entrant with a 5 percent discount rate would receive a net benefit from their additional borrowing when faced with higher loan limits beginning 15 years after college. A community college entrant with a 5 percent discount rate would begin to benefit 22 years after leaving college. Access to higher loan limits will provide a net benefit over a borrower's 30 year working career as long as they have a discount rate below 85 percent if they are a four-year entrant and for any discount rate below 79 percent if they are a two-year entrant.

Given that effects on community college entrants' earnings are statistically insignificant, an alternative assumption would be that a treated student in this group only receives baseline

earnings (i.e., no earnings gains accrue to students who gain access to higher loan limits). In this case, a community college student will always be financially worse off when they borrow as a result of gaining access to higher loan limits.

Table E.1: Effects of loan limit increases on cumulative financial aid and cost of attendance

	(1) Out-of-pocket costs	(2) Outstanding debt	(3) Stafford Loans av. interest rate
<i>A. Texas sample, four-year entrants</i>			
Constrained x cohort in {2006,2007,2008}	4436 (760)**	2042 (764)**	0.0002 (0.0003)
Dependent variable mean	\$26,418 {<0.001}	\$23,174 {0.036}	0.0518 {0.0874}
Observations	77,900	77,900	77,900
<i>B. Texas sample, community college entrants</i>			
Constrained x cohort in {2006,2007,2008}	546 (523)	1327 (334)**	-0.001 (0.001)
Dependent variable mean	\$15,435 {0.105}	\$12,365 {0.015}	0.0522 {0.620}
Observations	42,843	42,843	42,843

Notes: The sample includes student borrowers who first enrolled in a public four-year institution (Panel A) or public community college (Panel B) in Texas, were classified as dependent students at entry, and borrowed at or below the federal Stafford Loan maximum for first-year students. Each cell within a panel includes estimates from separate regressions; dependent variable is listed in the heading of each panel, is cumulative, and is measured 6 years after college entry. Out-of-pocket costs are equal to cost of attendance minus grants and loans, summed through the 6th year after entry. Outstanding debt includes accrued interest on unsubsidized Stafford and private loans. The average interest rate on Stafford Loans is the out-of-school interest rate for Stafford Loans, 6 years after entering repayment, weighted by loan volume. All specifications also include an indicator for being constrained at entry, cohort entry year fixed effects, entry school fixed effects, and controls for URM, gender, fall entrant, EFC, and in-state student. Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$; p -values from wild cluster bootstrap- t in brackets.