Where Do Students Go when For-Profit Colleges Lose Federal Aid?

Online Appendix: Not for Publication

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A   Data Appendix

A.1   Administrative data sets

1. ***Data on cohort default rates (CDR)*** for cohorts entering repayment between 1992 and 2009. Default rates are calculated for the cohort that has been in repayment for two fiscal years (e.g., the default rate reported in 1992 applies to the cohort of borrowers that entered repayment in FY 1990). There is one original file for every year, which contains information on the institution (name, address, type) and the default rates for the three preceding years. We use the most recent information on default rates. For example, the default rate corresponding to the year 2001 appears in the 2001, 2002, and 2003 original files and we use the information that appears in the 2003 file. These data are available in the "2-Year Press Packages" links at https://ifap.ed.gov/DefaultManagement/press/.

2. ***Data on sanctions due to CDR violations*** for the academic years 1991 through 2010. There is one observation per institution-cohort year for the set of institutions that had at least one borrower entering repayment in the cohort year. This data includes the sanction trigger and penalty (e.g., Table C.1) by institution and cohort year. Data on sanction appeals was obtained through two Freedom of Information Act (FOIA) requests to the Department of Education (ED).

3. ***Data on Pell Grant recipients*** and total amount disbursed per institution and year for the academic years 1974 through 2012. There is one original file for every year and each file contains information on the institution's location, number of recipients, and total amount disbursed. These data are available for the 2000 through 2017 academic years at https://www2.ed.gov/finaid/prof/resources/data/pell-institution.html. Earlier years were received from ED via request.

4. ***Postsecondary Education Participants System (PEPS) data*** includes information pertaining to an institution's location, sector, participation in Title IV programs, closure date (if participating in Title IV programs at the time of closure), and provides a crosswalk between earlier institution identifiers ("Pell IDs") and modern institution identifiers ("OPEIDs"). These data cover all institutions that ever participated in Title IV. We use the June 28, 2013 PEPS extract. The most recent PEPS data is available at: https://www2.ed.gov/offices/OSFAP/PEPS/dataextracts.html.

5. ***Postsecondary Career School Survey (PCSS) data*** was fielded by ED for the purpose of collecting information on postsecondary institutions offering vocational education programs in 1976, 1978, 1980, and 1981. It contains information on location, sector, and programs offered by schools in this sector. See https://www.icpsr.umich.edu/icpsrweb/ICPSR/studies/2382 for data and details.

A.2   Analysis data set construction

We first created the single file containing the annual CDR information for all institutions, covering academic years 1992-2010, and a single file containing the annual information on sanctions due to CDR violations for all institutions, covering academic years 1991-2010. Schools are identified by their federal OPEIDS.

We took several steps to clean and harmonize the Pell Grant data across years. First, prior to 2000, school are identified by their "Pell ID", which in many, but not all cases, is the same as the OPEID. We use the crosswalk between pre-2000 school identifiers ("Pell ID") and current school identifiers (OPEID) from the PEPS data to synchronize school identifiers across years and create a single file containing the Pell Grant recipient information for all institutions between 1974 and 2012. Despite the fact that we are able to match most schools over time, there are a small number of cases in which we cannot match a school's Pell ID to its OPEID or the OPEID changes between two consecutive years. We recode these cases to have a single OPEID when between the two years in which the OPEIDS differ, institutional records show the same name and address.

Because the Pell Grant administrative data does not provide separate records for Title IV branch campuses in the early years of the program, we combine recipients from branch and main campuses under the main campus OPEID in years in which this information is available.[1] There are also instances in which recipients from separate institutions within a larger system are combined and reported under only one OPEID (that in other years refers to a specific institution). This primarily occurs in the public sector (e.g., the Indiana Ivy Tech community college system, which includes 14 separate Title IV institutions, reports all recipients under one OPEID before 2006), but there are two large for-profit chains that suffer from this issue (ITT Tech and DeVry). To deal with the fact that this variation in reporting leads to large fluctuations in enrollment that are unrelated to actual enrollment changes, we impute recipients for locations in years in which Title IV enrollment is not separately reported. We use the most recent year in which recipients are reported for specific institutions and calculate the share of all recipients contained within each institution relative to the total number of recipients summed over the set of schools that are reported under a single OPEID in other years. Then, in years in which recipients are not reported for separate institutions, we allocate the total number of recipients reported under the single OPEID based on these baseline shares. At most, less than 3 percent of schools have imputed recipients in a given year. Finally, there are cases in which a given institution will have two separate OPEIDS with the same name and location in a given year. These

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[1]Note that a Title IV branch campus is a separate location of an institution that is covered under the main institution's program participation agreement with ED. These are generally much smaller sites that serve a specific purpose or population (e.g., incarcerated adults, high school students, etc.). Title IV branch campuses are distinct from community college systems or for-profit chain that contain multiple institutions because in such cases, each location will have its own program participation agreement and a unique OPEID.

are primarily small programs offered within hospitals that have separate OPEIDS for nursing and other medical technology fields in early years of the Pell Grant data. We combine duplicate records that have the same address and name into a single observation, summing Pell Grant recipients (and borrowers/defaulters when available)). We add closure dates and fill in missing addresses and other information using PEPS data.

We restrict our sample to include all schools with a record in either the Pell Grant administrative data or the CDR administrative data in at least one year between 1982 and 2008 (which provides a window of 8 years before the first sanctions and after the last sanctions used in our analyses). We classify schools by control (public, nonprofit, for-profit) and level (2-year, 4-year) using the Pell, CDR, and PEPS administrative data. Of 10,089 institutions in the sample, 51 remain unclassified. This is because the Pell Grant data does not have a reliable measure of institutional sector before 1983. We use data from the PCSS to determine the sector of a subset of these institutions. Only some schools in the PCSS have OPEIDS, and some schools without OPEIDS are present in the main data set. In these cases, we match records based on institution name and location. We drop the remaining 13 schools not assigned to a sector from our sample. None of these schools contain Pell Grant recipients after 1982 or CDR records in any year. We assume that the 56 schools without any information on degree offerings are two-year institutions.

A small number of institutions are listed as belonging to different sectors over time. In some cases, this may represent true transitions between nonprofit and for-profit status. However, institutions that are listed as public schools in most years are misclassified with the same frequency. When there are discrepancies in a given institution's reported sector, we use the modal value of this variable. Less than 1 percent of institutions are affected.

Institutions are assigned to counties by zip codes. Specifically, we link institutions to county Federal Information Processing Standard (FIPS) codes using a zip code–FIPS code crosswalk. Since our sample spans three decades, we use the 2010 county definitions to ensure that institutions are consistently assigned to local markets. FIPS codes were manually entered for the 32 institutions that had invalid or missing zip codes. We are unable to match four small institutions in our sample to a county and thus, we drop these schools. None of these schools have Pell Grant recipient enrollment after 1991. In the years in which these schools were serving Pell Grant recipients, total enrollment ranged from 3 to 49 students.

A.3   Chains coding and descriptive statistics

Chains are identified through institution names in 1990 - the year prior to the release of the first round of sanctions. We focus on this year because it should most accurately predict an institution's name during the years in which sanctions were applied but does not suffer from the potentially endogenous response on the

part of sanctioned institutions to join, leave, or form a chain. Unfortunately, there is not a reliable indicator for whether an institution belongs to a chain during the period we examine. We assume that two or more institutions belong to a chain if they have the same name, allowing for variation in the spelling of common words (e.g., Sch versus School, Tech versus Technology) and taking into account the fact that school names that include many very common words (e.g., American Beauty College) will not represent two locations of the same chain unless other criteria are met (e.g., all instances are within the same state or group of adjoined states).

In 1990, we estimate that 32 percent of two-year for-profit institutions (containing 44 percent of Pell Grant recipients enrolled in the two-year for-profit sector) belonged to a chain that had at least two schools. The average for-profit chains had 4 locations with a total of 726 Pell Grant recipients enrolled in 1990. In contrast, the average single-location for-profit enrolled 118 Pell Grant recipients.

Almost half of all chains (45 percent) contained only two institutions, while the largest chain had 35 locations. We classify chains by whether they had locations in multiple states. While only 37 percent of two-year for-profit chains were multi-state, the schools belonging to these chains contained 73 percent of all Pell Grant recipients enrolled in a for-profit chain. Single-state chains had an average of 3 locations containing a total of 355 recipients while multi-state chains contained 6 schools enrolling 1674 students, on average.

A.4 Field of study coding and descriptive statistics

Unfortunately, there is not reliable information available on programs offered by most for-profit institutions during the 1980s and 1990s. While the IPEDS collects information on degrees and credentials received by CIP code, as discussed below, many for-profits schools are absent from the IPEDS during the period of interest. We assign for-profit institutions to six mutually exclusive field of study categories based on a school's name. Because listed names of institutions change over time, especially in the for-profit sector, and because the decision of what programs to offer could be endogenous to sanction receipt, we classify institutions based on their name in 1990, the year prior to the first sanctions were released.

Beauty/cosmetology for-profit schools are those with any of the following terms in their names: aesthetic, barber, beaut, bty, coiffures, cosm, comtlgy, culture, dermaogic, electrology, esthetics, hair, hrdrsng, "hr ds", nail, salon, skin, spa, style, styling, vogue. We also include schools in the Wilfred, Aveda, and Paul Mitchell chains as these institutions offered only cosmetology programs.

Health for-profit institutions are those that are not classified as beauty schools and have any of the following terms in their names: acupuncture, anesth, body, cancer, chiropractic, counseling, cyotech, dental,

denturist, diagnostic, dietetic, doctor, drug, fitness, eeg, electrolysis, heal, histotech, histologic, hlth, holistic, hosp, laboratory, massage, med, midwifery, muscle, myomassology, myotherapy, nurse, nursing, nrsg, nrs, nutrition, ofradio, oncology, opthalmology, optometry, optician, paramed, pedodontic, pharmacy, physician, psycholgy, radiologic, rad-tech, reserve, resp, shiatsu, sonograph, surgical, therap, ultrasoundm, xray, x-ray. Institutions that would be classified as both beauty and health related based on their names are placed in the beauty category.

Computing, business, and business technology focused for-profits are those that are not classified as health or beauty and have names containing any of the following terms: accounting, accountancy, banking, business, buisness, busn, "bus clg", commerce, commercial, comput, cmptr, court, data, electology, fiber, financial, law, legal, management, network, office, paraprof, processing, program, "sch of bus", secretar, steno, software, technolog, "word process", workforce. Schools that are classified as both computing and health are placed in the health category.

Hospitality, culinary, arts, and personal service oriented for-profits are those that are not classified as health, computing, or beauty and have with any of the following terms as part of their names: art, acting, actor, animal, audio, baking, ballet, bartend, brdcst, broadcast, canine, casino, chauffeurs, cinema, conservatory, cooking, creative, culinary, culture, cuisine, dance, dealing, dealer, design, drama, draft, drawing, dog, equestrian, film, fash, floral, food, funeral, gaming, golf, horse, hospitality, hotel, jewelry, k-9, luthiary, modeling, mortician, mortuary, motel, movement, music, nanny, painting, paper, pastry, pet, photo, piano, printing, recording, reporting, restaurant, restoration, scriptwriting, sewing, sound, studio, symphony, tailor, taxidermy, theater, theatre, television, travel, tv, upholstery, video.

Mechanical, trades, engineering, and transportation focused for-profits are those that are not classified as beauty, health, computing, or hospitality focused schools and have any of the following terms in their names: aero, airline, appliance, auto, aviation, boat, construction, diamond, diesel, drafting, driver, driving, electron, engineer, flght, flight, gunsmith, heating, indus, locksmith, mechanic, microwave, motorcycle, seaboard, refrigeration, repair, tractor, trailer, transport, transmission, truck, vehicle, wastewater, watch, weld, yacht.

We classify schools that do not fall into one of the five categories as **general** for-profits. This category includes institutions that offer many different programs (that may align with the above categories) and specialized institutions for which we were not able to determine the types of programs offered from the school's name.

Table A.1: Descriptive statistics by field

	Baseline (1990)		Sanctioned		Unsanctioned FP comp of sanctioned FP in any industry		Unsanctioned FP comp of sanctioned FP in same industry		Unsanctioned pub/NP comp of sanctioned FP in industry	
	N	Av enrollment	N	Av enrollment	N	Av enrollment	N	Av enrollment	N	Av enrollment
General	690	284	95	751	532	201	245	203	304	614
Beauty, cosm.	1,767	46	283	91	942	44	584	40	556	564
Culinary, arts, hosp.	125	91	9	473	99	74	7	219	28	640
Health	144	166	10	791	149	105	9	277	35	861
Business, computing	449	281	52	660	301	266	68	192	161	357
Mech., transp., engin.	109	199	16	701	77	161	10	226	44	543

*Note*s: See section A.4 for description of industry categories and classification. Average enrollment is in $t-1$.

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A.5 Pre-2000 representation of for-profit institutions with Pell Grant recipients in IPEDS

We compare the number of institutions and Pell Grant enrollment by sector in our analysis data set to a similar data set constructed from Integrated Postsecondary Education Data System (IPEDS) data. We used data from the annual fall enrollment and institutional characteristics (IC) files to measure total undergraduate enrollment. Institutions were allocated to counties using a crosswalk between county FIPS codes and institutions' zip codes and states. Information on institutional control and highest degree offered (four-year, two-year, or less than two-year) was used to allocate institutions to sectors. Figure A.1 displays total fall undergraduate enrollment in IPEDS institutions between 1988 and 2012 (solid line, right y-axis) as well as the distribution of IPEDS undergraduates across sectors (left y-axis) for institutions in counties with at least one Pell Grant recipient reported in the Pell Grant administrative data.

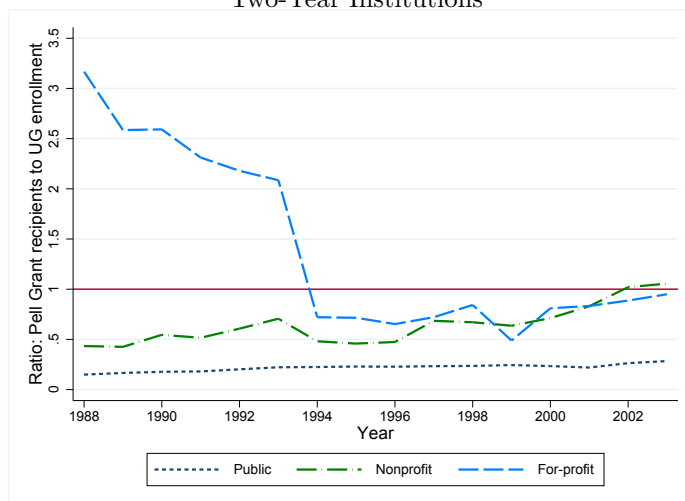Figure A.1: IPEDS Undergraduate Enrollment by Sector
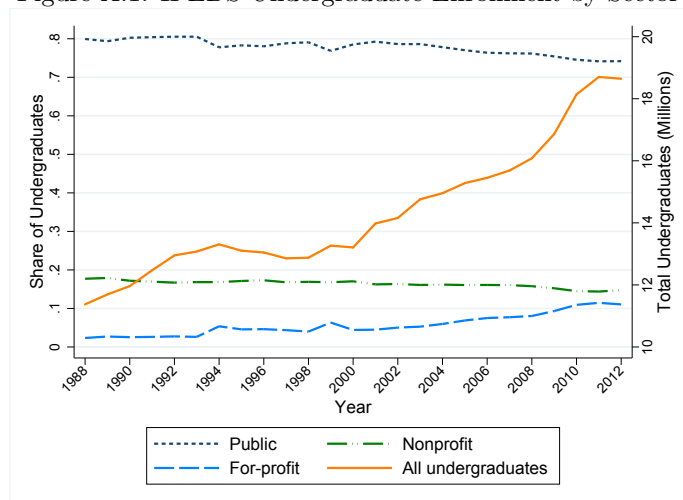
Notes: Sample limited to counties with at least one Pell Grant recipient enrolled in a two-year institution (including less than two-year institutions) between the 1988 and 2003 academic years. Fall undergraduate enrollment from IPEDS fall enrollment files.

Theoretically, the IPEDS universe includes all institutions in a given year that participated in Title IV programs. However, prior to 2001, the IPEDS data omits a large number of for-profit institutions that show-up in administrative data as enrolling Pell Grant recipients. For example, the Digest of Education Statistics reports 323 for-profit institutions in 1988 (U.S. Department of Education, 2015, Table 317.10) while the Pell Grant administrative data includes 2,791 for-profit institutions with at least one Pell Grant recipient enrolled in the same year. Some of these extra institutions may represent "branch campuses," which may be grouped with "parent campuses" in the IPEDS. However, the treatment of branch and parent campuses cannot account for the discrepancy between for-profit enrollment reported in the IPEDS and Pell

Grant enrollment calculated from administrative data. As shown in Figure A.2, the number of Pell Grant recipients enrolled in two-year for-profit institutions exceeded the total number of undergraduates these institutions enrolled in 1988 by more than 300 percent.[2] For-profit institutions that were sanctioned and/or closed in the early 1990s are the most likely to be missing from the IPEDS.

Public and nonprofit institutions that participated in Title IV programs in the 1980s and 1990s appear to be better represented in the IPEDS. The number of Pell Grant recipients enrolled in two-year institutions in these sectors is always less than total fall undergraduate enrollment. The number of institutions in the IPEDS closely matches the number of institutions in the Pell Grant administrative data. For example, in 1988, the IPEDS data reports 1,673 nonprofit institutions and 1,591 public institutions, while the Pell Grant administrative data contain 1,752 nonprofits and 1,825 public institutions.

Figure A.2: Pell Grant Enrollment as a Percentage of Total IPEDS Enrollment by Sector: Two-Year Institutions

Notes: Sample limited to counties with at least one Pell Grant recipient enrolled in a two-year institution (including less than two-year institutions) between 1988 and 2003. Undergraduate enrollment from IPEDS fall enrollment files.

References

U.S. Department of Education. 2015. "Digest of Education Statistics: 2014." Washington, DC: National Center for Education Statistics.

[2]Results are quite similar when the sample is expanded to include four-year institutions. This is because very few for-profit institutions in the 1980s and 1990s were classified as four-years.

B Closures

To further investigate the correlation between federal sanctions and changes in institution closure rates, we estimate a descriptive hazard model:

$$\Pr\left(closed_{jt} = 1 | closed_{jt-1} = 0\right) = \sum_{k=0}^{5} \left(\boldsymbol{\gamma_k^c \mathbf{sanct}_{j,t-k}^c}\right) + \delta_c + \delta_t + \delta_m + \nu_{jmt}. \tag{1}$$

Here, we model the hazard that institution j closes in year t (conditional on remaining open until year $t-1$) as a function of the institution's sector $c \in \{\text{public, nonprofit, for-profit}\}$ in year (t), market (m), and sanction receipt in the current or past five years (k).[3] We include fixed effects for each sector δ_c, year δ_t, and market δ_m.

Figure B.1: Institution Closures by Sector and Year
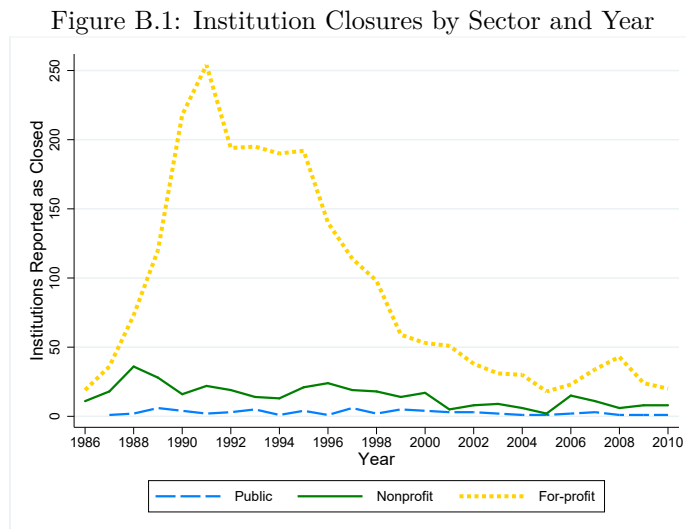
Source: PEPS administrative data. *Notes:* Sample includes two- and four-year institutions that had an active Title IV program participation agreement at the time of closure.

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[3]We have estimated models that include up to seven years of lags but only the first five years following a sanction have a statistically significant association with institution closure.

Figure B.2: The Impact of Sanctions on the Cumulative Hazard of Closure by Sector
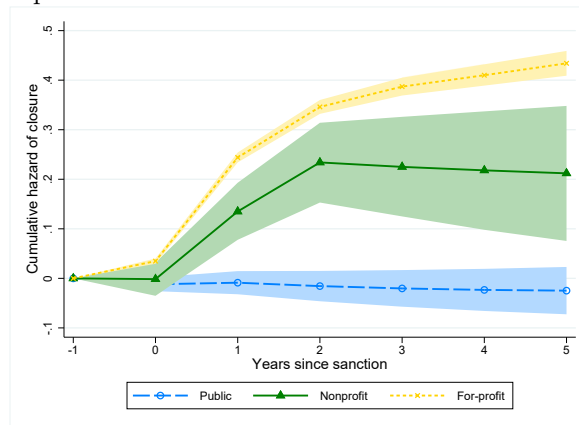
Source: Pell Grant, CDR, sanction, and PEPS administrative data. *Notes:* Sample includes two-year institutions with a Title IV program participation agreement between 1980 and 2008. Coefficients and 95% confidence intervals from a regression of the cumulative hazard of closure on any sanction receipt interacted with years since the sanction was received and sector; regressions also include year and county fixed effects. Robust standard errors clustered by institution.

C   Additional Figures and Tables

Figure C.1: Total Pell Grant Recipients by Year
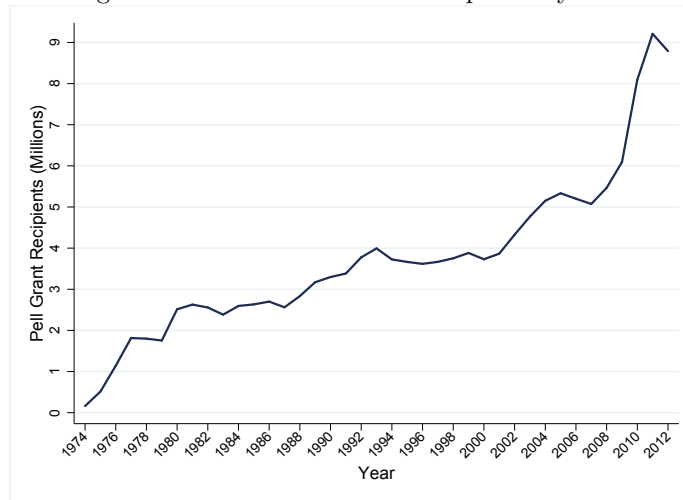
Source: Pell Grant administrative data. *Notes:* Sample includes two- and four-year institutions with Pell Grant enrollment in the specified academic year.

Figure C.2: The Number of Federal Borrowers by Cohort Year
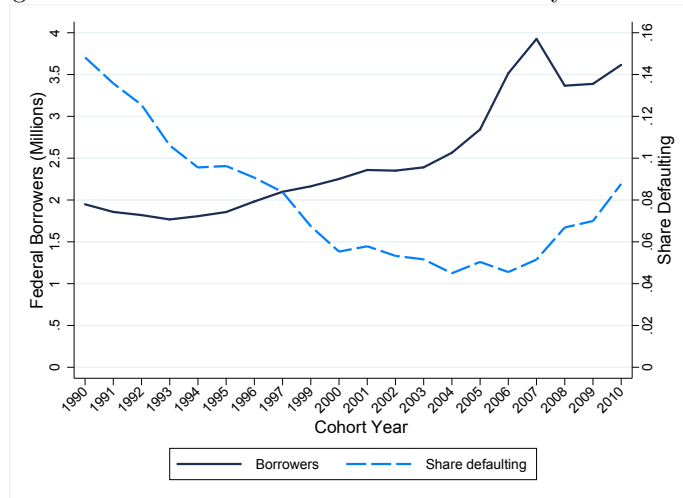
Source: CDR administrative data. *Notes:* Sample includes two- and four-year institutions with CDR data. The solid line indicates the total number of federal borrowers (in millions) entering repayment by cohort year (corresponding to the left axis) and the dashed line indicates the share of federal borrowers in a give cohort that defaulted within two years of entering repayment.

Figure C.3: The Effect of For-Profit College Sanctions on Pell Grant Recipient Enrollment: Intensive Margin Variation
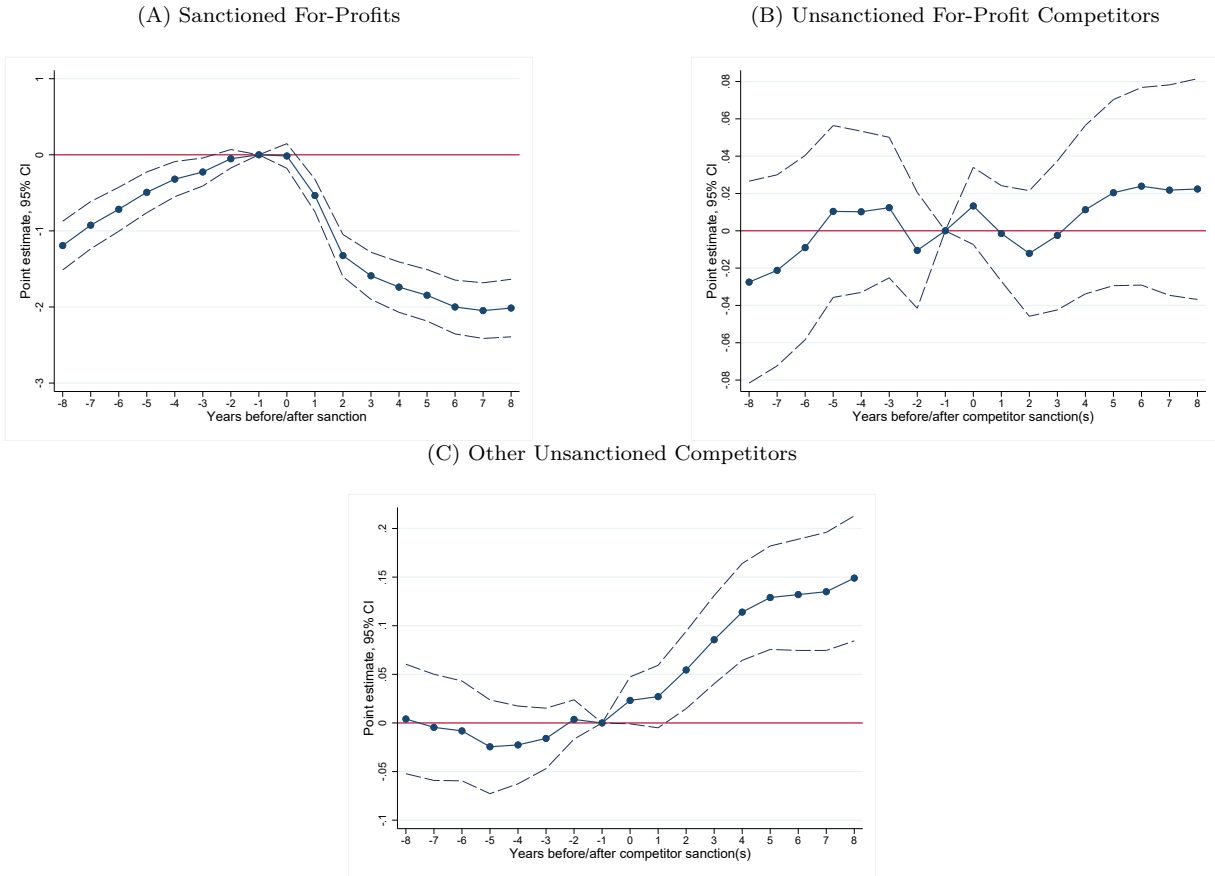
(A) Sanctioned For-Profits

(B) Unsanctioned For-Profit Competitors

(C) Other Unsanctioned Competitors

Source: Pell Grant, CDR, sanction, and PEPS administrative data. *Notes*: Sample includes two-year institutions with a Title IV program participation and Pell Grant recipient enrollment between in at least one year between 1982 and 2008 in counties with fewer than 50 institutions (on average, across years). Closed institution enrollment is set to zero. Point estimates and 95 percent confidence intervals from a regression of $\ln\left(\text{Pell Grant recipients} + 1\right)_t$ on sector-specific sanction indicators, $\ln\left(\text{Pell recipients exposed to sanctions}\right)_{\tau-1}$ in a given sector, and $\mathbf{1}\left[\textbf{Pell recipients exposed to sanction} > 0\right]_{\tau-1}$ by sector, all interacted with years pre-/post-sanction receipt (with $t = \tau - 1$ serving as the omitted category), institution by sanction-year fixed effects, year fixed effects, years before/after sanction receipt fixed effects, and sector and county linear trends. Confidence intervals constructed from robust standard errors clustered by institution.

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Figure C.4: The Effect of Sanctions on Own Enrollment: Beauty Schools and Other For-Profits

(A) Sanctioned Beauty Schools

(B) Other Sanctioned For-Profits
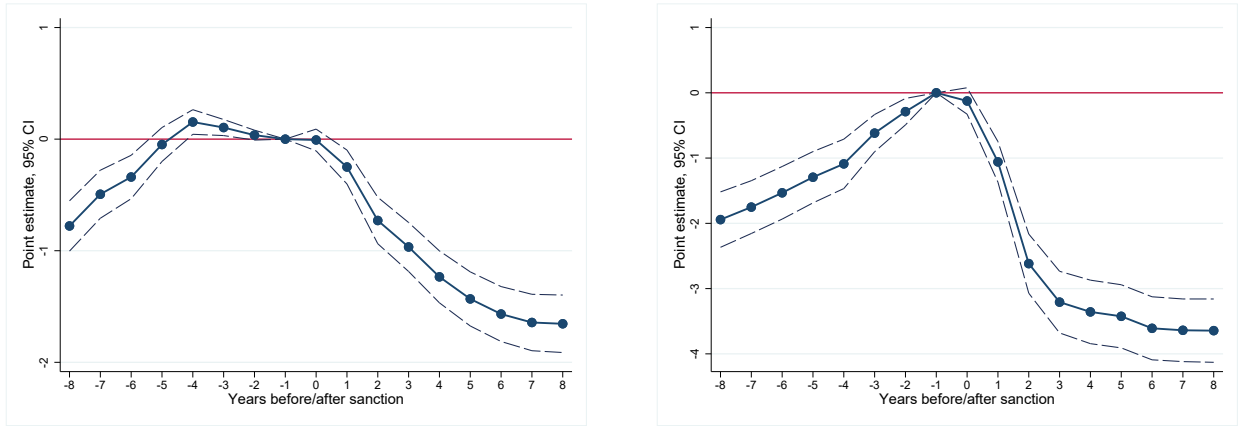
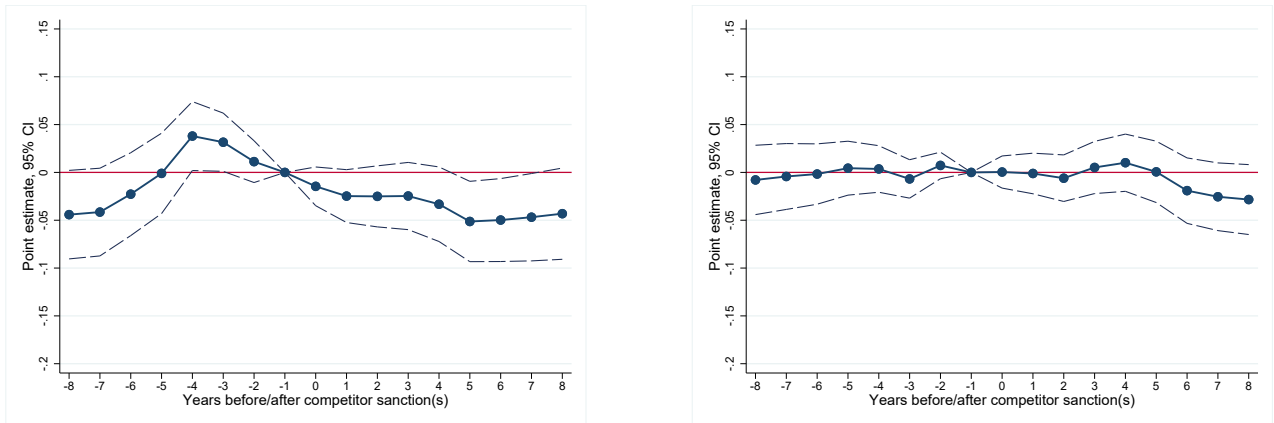*Source:* Pell Grant, CDR, sanction, and PEPS administrative data. *Note*s: Sample includes two-year institutions with a Title IV program participation and Pell Grant recipient enrollment between in at least one year between 1982 and 2008 in counties with fewer than 50 institutions (on average, across years). Closed institution enrollment is set to zero. Point estimates and 95 percent confidence intervals from a regression of $\ln(\text{Pell Grant recipient enrollment} + 1)_t$ on sanction receipt, interacted with years before/after sanction receipt (with $t = \tau - 1$ serving as the omitted category), allowing for separate own enrollment effects for beauty schools. Regressions also control for effects of sanctions, allowed to vary by sector and years before/after sanction receipt, $\ln(\text{Pell recipients exposed to sanction} + 1)_{\tau-1}$ allowed to vary for public, nonprofit, for-profit beauty schools, and other for-profits, years before/after sanction receipt, and whether the sanctioned institution offered programs in the same or a different industry in the case of unsanctioned for-profit competitors of sanctioned for-profits. Regressions also include indicators for institution by sanction-year fixed effects, year fixed effects, years before/after sanction receipt fixed effects, and sector and county linear trends. Confidence intervals constructed from robust standard errors clustered by institution.

Figure C.5: The Effect of For-Profit College Sanctions on Beauty School Enrollment: Heterogeneity by Industry of Sanctioned School

(A) Unsanctioned Beauty For-Profit
Competitors of Sanctioned Beauty For-Profits

(B) Unsanctioned Beauty For-Profit
Competitors of Other Sanctioned For-Profits

Source: Pell Grant, CDR, sanction, and PEPS administrative data. *Note*s: See Figure **??** notes for sample description. Point estimates and 95 percent confidence intervals from a regression of $\ln(\text{Pell Grant recipient enrollment} + 1)_t$ on $\ln(\text{Pell recipients exposed to sanction} + 1)_{\tau-1}$ within beauty-focused for-profit institutions in the market and same industry (Panel A) or a different industry (Panel B) interacted with years before/after sanction receipt (with $t = \tau - 1$ serving as the omitted category). Regressions also control for own enrollment effects of sanctions, allowed to vary by sector (and beauty school focus) and years before/after sanction receipt, $\ln(\text{Pell recipients exposed to sanction} + 1)_{\tau-1}$ in the public and nonprofit sectors, allowed to vary with sector and years before/after sanction receipt, and indicators for institution by sanction-year fixed effects, year fixed effects, years before/after sanction receipt fixed effects, and sector and county linear trends. Confidence intervals constructed from robust standard errors clustered by institution.

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Table C.1: Sanction Triggers and Penalties

Cohort year	Year informed of sanction	Range of aid loss if app. immed.	Trigger	Penalty	Subject to sanction	Appeals	Sanctions maintained
1989	1991	1991-1993	>=35% in 1987, 1988, 1989	Immediate loss of loans	178		
			>60% for 1989	Limitation, suspension, or termination of Title IV	75		
1990	1992	1992-1994	>=35% in 1988, 1989, 1990	Immediate loss of loans	121		
			>55% in 1990	Limitation, suspension, or termination of Title IV	558		
			>40% in 1990, <5 pp gain 1989-1990	Limitation, suspension, or termination of Title IV			
1991	1993	1993-1995	>=30% in 1989, 1990, 1991	Immediate loss of loans	404		
			>50% in 1991	Limitation, suspension, or termination of Title IV	455		
			>40% in 1991, <5 pp gain 1990-1991	Limitation, suspension, or termination of Title IV			
1992	1994	1994-1996	>=25% in 1990, 1991, 1992	Immediate loss of loans	652		
			>45% in 1992	Limitation, suspension, or termination of Title IV	376		
			>40% in 1991, <5 pp gain 1991-1992	Limitation, suspension, or termination of Title IV			
1993	1995	1995-1997	>=25% in 1991, 1992, 1993	Immediate loss of loans	433		
			>40% in 1993	Limitation, suspension, or termination of Title IV	222		
1994	1996	1996-1998	>=25% in 1992, 1993, 1994	Immediate loss of loans	330		
			>40% in 1994	Limitation, suspension, or termination of Title IV	157		
1995	1997	1997-1999	>=25% in 1993, 1994, 1995	Immediate loss of loans	236	235	226
			>40% in 1995	Limitation, suspension, or termination of Title IV	109	0	109
1996	1998	1998-2000	>=25% in 1994, 1995, 1996	Immediate loss of loans	138	130	135
			>40% in 1996	Limitation, suspension, or termination of Title IV	66	4	62
1997	1999	1999-2001	>=25% in 1995, 1996, 1997	Immediate loss of loans, potential or immediate loss of Pell	42	42	36
			>40% in 1997	Limitation, suspension, or termination of Title IV	13	7	6
1998	2000	2000-2002	>=25% in 1996, 1997, 1998	Immediate loss of loans, potential or immediate loss of Pell	10	9	8
			>40% in 1998	Limitation, suspension, or termination of Title IV	2	2	2
1999	2001	2001-2003	>=25% in 1997, 1998, 1999	Immediate loss of loans, potential or immediate loss of Pell	6	5	4
			>40% in 1999	Limitation, suspension, or termination of Title IV	1	1	0
2000	2002	2002-2004	>=25% in 1998, 1999, 2000	Immediate loss of loans, potential or immediate loss of Pell	4	4	3
			>40% in 2000	Immediate loss of loans	1	1	1
2002	2004	2004-2006	>=25% in 2000, 2001, 2002	Immediate loss of loans and Pell	1	1	0
2006	2008	2008-2010	>40% in 2006	Immediate loss of loans	1		0
2007	2009	2009-2011	>40% in 2007	Immediate loss of loans	2	2	0
2008	2010	2010-2012	>=25% in 2006, 2007, 2008	Immediate loss of loans and pell	2	2	0
			>40% in 2008	Immediate loss of loans	3	3	1
2009	2011	2011-2013	>=25% in 2007, 2008, 2009	Immediate loss of loans and Pell	4	4	0
			>40% in 2009	Immediate loss of loans	1	1	0
2010	2012	2012-2014	>=25% in 2008, 2009, 2010	Immediate loss of loans and Pell	1	1	0
			>40% in 2010	Immediate loss of loans	1	1	0
2011	2013	2013-2015	>=25% in 2009, 2010, 2011	Immediate loss of loans and Pell	6	6	2
			>40% in 2011	Immediate loss of loans	2	2	1
Move to 3 year cdrs							
2012	2015	2015-2017	>=30% in 2010, 2011, 2012	Loss of loans and/or Pell	8		
			>40% in 2012	Loss of loans	10		

Source: CDR and sanction administrative data. *Notes*: Sample includes all institutions that were sanctioned. Information on appeals and appeal outcomes were provided in response to a Freedom of Information Act (FOIA) request to ED. No institutions triggered sanction threats for the 2001, 2003, 2004, and 2005 cohorts.

Table C.2: Analysis Sample Sanctioned and Competitor Institutions by Sanction Year

	A. Sanctioned Instiutions			B. Unsanctioned competitors of sanctioned for-profits		
Year	For-profit	Nonprofit	Public	For-profit	Nonprofit	Public
1991	123	6	10	876	114	171
1992	169	3	25	647	103	173
1993	72	3	15	207	58	74
1994	55	1	20	205	32	74
1995	23	0	11	55	20	26
1996	12	0	4	34	3	16
1997	6	0	6	25	1	2
1998	4	1	3	47	3	14
1999	1	0	2	3	0	2
2000	0	0	1	1	0	0

Source: CDR and sanction administrative data. *Note*s: Panel A displays the count of sanctioned institutions in the main analysis sample by year of sanction receipt. Panel B displays the count of unsanctioned institutions that belonged to a county with at least one sanctioned for-profit competitor in the main analysis sample by year of competitor sanction receipt.

Table C.3: Estimated Pre- and Post-Sanction Trends in Pell Grant Recipient Enrollment

Sanctioned sector:	1. Public	2. Nonprofit	3. For-profit
Threatened sanction x			
$\mathbf{1}\big[t \in [-8,-5]\big]$	0.023	0.100	0.188
	(0.022)	(0.087)	(0.016)**
$\mathbf{1}\big[t \in [-4,-1]\big]$	-0.081	-0.119	0.164
	(0.027)**	(0.107)	(0.027)**
$\mathbf{1}\big[t \in [0,4]\big]$	-0.054	-0.367	-0.468
	(0.025)*	(0.132)**	(0.029)**
$\mathbf{1}\big[t \in [5,8]\big]$	-0.059	-0.238	-0.357
	(0.021)**	(0.078)**	(0.019)**
p-value from test of H_0: $\mathbf{1}\big[t \in [-4,-1]\big] = \mathbf{1}\big[t \in [0,4]\big]$	[0.485]	[0.006]	[<0.001]
ln(recipients exposed to sanctions in sector) x			
$\mathbf{1}\big[t \in [-8,-5]\big]$	-0.006	-0.011	
	(0.003)*	(0.007)	
$\mathbf{1}\big[t \in [-4,-1]\big]$	-0.005	-0.005	
	(0.005)	(0.010)	
$\mathbf{1}\big[t \in [0,4]\big]$	0.006	0.008	
	(0.003)*	(0.007)	
$\mathbf{1}\big[t \in [5,8]\big]$	0.005	0.010	
	(0.003)+	(0.006)+	
p-value from test of H_0: $\mathbf{1}\big[t \in [-4,-1]\big] = \mathbf{1}\big[t \in [0,4]\big]$	[0.026]	[0.055]	
ln(recipients exposed to sanctions in sector) x Public or nonprofit x			
$\mathbf{1}\big[t \in [-8,-5]\big]$			0.00002
			(0.002)
$\mathbf{1}\big[t \in [-4,-1]\big]$			0.004
			(0.003)
$\mathbf{1}\big[t \in [0,4]\big]$			0.010
			(0.002)**
$\mathbf{1}\big[t \in [5,8]\big]$			0.008
			(0.002)**
p-value from test of H_0: $\mathbf{1}\big[t \in [-4,-1]\big] = \mathbf{1}\big[t \in [0,4]\big]$			[0.039]
ln(recipients exposed to sanctions in sector) x For-profit x			
$\mathbf{1}\big[t \in [-8,-5]\big]$			0.005
			(0.001)**
$\mathbf{1}\big[t \in [-4,-1]\big]$			-0.001
			(0.003)
$\mathbf{1}\big[t \in [0,4]\big]$			-0.009
			(0.002)**
$\mathbf{1}\big[t \in [5,8]\big]$			-0.007
			(0.002)**
p-value from test of H_0: $\mathbf{1}\big[t \in [-4,-1]\big] = \mathbf{1}\big[t \in [0,4]\big]$			[0.005]

Source: Pell Grant, CDR, sanction, and PEPS administrative data. *Notes*: Sample includes two-year institutions with a Title IV program participation and Pell Grant recipient enrollment between in at least one year between 1982 and 2008 in counties with fewer than 50 institutions (on average, across years). Closed school enrollment is set to zero. Estimates from a regression of $\ln(\text{Pell recipient enrollment} + 1)_t$ on sanction receipt interacted with piece-wise linear trends and sector, $\ln(\text{Pell recipients exposed to sanction} + 1)_{\tau-1}$ within sanctioned public, nonprofit, and for-profit institutions in the market, interacted with piece-wise linear trends and sector, institution by sanction-year fixed effects, year fixed effects, years since sanction fixed effects, and sector and county linear trends. Robust standard errors clustered by institution in parentheses; ** p<0.01, * p<0.05, + p<0.1.

Table C.4: The Effect of Sanctions on Pell Grant Recipient Enrollment: Trend-Adjusted Estimates

Sanctioned sector:	1. Public	2. Nonprofit	3. For-profit	Test of equality (p-value)
Post x Threatened sanction	0.108	-0.791	-1.813	<0.001
	(0.121)	(0.439)+	(0.125)**	
Post x ln(# exposed to sanctions)				
x Public	0.066	-0.015	0.037	0.162
	(0.013)**	(0.035)	(0.010)**	
x Nonprofit	0.028	0.116	0.022	0.203
	(0.035)	(0.049)**	(0.017)	
x For-profit	0.015	0.023	-0.013	0.435
	(0.022)	(0.040)	(0.010)	
Test of equality (p-value)	0.328	0.079	0.002	
Predicted Δ market enrollment: *additional sanction*	*213* *(77)***	*-54* *(131)*	*-212* *(31)***	
% change (rel to baseline)	*5.9%*	*-1.0%*	*-4.9%*	
Counties		1,364		
Institutions		5,845		
Observations		463,556		

Source: Pell Grant, CDR, sanction, and PEPS administrative data. *Notes*: Sample includes two-year institutions with a Title IV program participation and Pell Grant recipient enrollment between in at least one year between 1982 and 2008 in counties with fewer than 50 institutions (on average, across years). Closed institution enrollment is set to zero. We jointly estimate equations (3) and (4) (see Sections 2 and 3 in main text). The first row of estimates are calculated by subtracting $\left(4\hat{\theta}^c\right)$ from $\hat{\beta}^c$ (where c indicates sector). The remaining estimates are calculated by subtracting $\left(4\hat{\lambda}^{c,d}\right)$ from $\hat{\gamma}^{c,d}$, where d indicates the sector of the sanctioned competitor(s). Robust standard errors clustered by institution are calculated using the Delta Method; ** p<0.01, * p<0.05, + p<0.1.

Table C.5: Robustness of the Impact of Sanctions on Pell Grant Recipient Enrollment: All Events

Sanctioned sector:	*1. Public*	*2. Nonprofit*	*3. For-profit*	Test of equality (*p*-value)
Post x Threatened sanction	-0.056	-0.707	-0.721	<0.001
	(0.116)	(0.363)+	(0.073)**	
Post x ln(recipients exposed to sanctions in sector)				
x Public	-0.012	0.006	0.063	0.005
	(0.021)	(0.043)	(0.009)**	
x Nonprofit	-0.013	-0.008	0.036	0.197
	(0.022)	(0.053)	(0.014)**	
x For-profit	-0.014	0.013	-0.021	0.497
	(0.012)	(0.030)	(0.006)**	
Test of equality (*p*-value)	0.997	0.949	<0.001	
Baseline enrollment				
Sanctioned school	499	167	265	
Public competitor	1144	1170	1090	
NP competitor	59	69	57	
FP competitor	94	91	114	
Number of institutions				
Public competitor	2.8	2.5	2.8	
NP competitor	2.5	4.2	2.3	
FP competitor	16.5	17.6	16.6	
Predicted Δ market enrollment:	*-90*	*-47*	*29*	
additional sanction	*(82)*	*(136)*	*(30)*	
% change (rel to baseline)	*-1.8%*	*-1.0%*	*0.6%*	
Counties		1,364		
Institutions		5,845		
Observations		905,505		

Source: Pell Grant, CDR, sanction, and PEPS administrative data. *Note*s: Sample includes two-year institutions with a Title IV program participation and Pell Grant recipient enrollment between in at least one year between 1982 and 2008 in counties with fewer than 50 institutions (on average, across years). Closed school enrollment is set to zero. Estimates from a regression of $\ln(\text{Pell recipient enrollment}+1)_t$ on sanction receipt interacted with post-sanction receipt and sector, $\ln(\text{Pell recipients exposed to sanction}+1)_{\tau-1}$ within sanctioned public, nonprofit, and for-profit institutions in the market, interacted with post-sanction receipt and sector, institution by sanction-year fixed effects, year fixed effects, years since sanction fixed effects, and sector and county linear trends. Robust standard errors clustered by institution in parentheses; ** p<0.01, * p<0.05, + p<0.1.

Table C.6: Robustness of the Impact of Sanctions on Pell Grant Recipient Enrollment: Number of Institutions Sanctioned

Sanctioned sector:	1. Public	2. Nonprofit	3. For-profit	Test of equality (p-value)
Post x Threatened sanction	-29	-69	-136	0.001
	(23)	(40)+	(18)**	
% change (rel to baseline)	*-7.5%*	*-50.4%*	*-40.8%*	
Post x # competitors w/ threatened sanction				
x Public	64	195	127	0.538
	(55)	(184)	(22)**	
% change (rel to baseline)	*8.4%*	*19.4%*	*15.3%*	
x Nonprofit	-1	-11	-2	0.893
	(21)	(20)	(5)	
% change (rel to baseline)	*-2.2%*	*-28.9%*	*-3.5%*	
x For-profit	-18	2	-16	0.777
	(15)	(26)	(4)**	
% change (rel to baseline)	*-20.0%*	*1.6%*	*-12.7%*	
Test of equality (p-value)	0.400	0.175	<0.001	
Predicted Δ county enrollment additional sanction	-119	506	-30	
	(197)	(439)	(59)	
% change (rel to baseline)	*-3.3%*	*9.6%*	*-0.7%*	

Table C.7: The Effect of Sanctions on Pell Grant Recipient Enrollment: Intensive Margin Variation

Sanctioned sector:	1. Public	2. Nonprofit	3. For-profit	Test of equality (p-value)
Post x Threatened sanction	-0.244	-0.327	-0.878	0.009
	(0.162)	(0.577)	(0.120)**	
Post x ln(# exposed to sanctions)				
x Public	0.002	0.261	0.114	0.037
	(0.046)	(0.117)*	(0.023)**	
x Nonprofit	-0.040	0.198	0.087	0.034
	(0.044)	(0.139)	(0.026)**	
x For-profit	-0.018	0.241	0.033	0.064
	(0.041)	(0.104)*	(0.020)	
Test of equality (p-value)	0.527	0.812	<0.001	
Predicted Δ market enrollment: additional sanction	-108 (180)	1464 (764)+	159 (105)	
% change (rel to baseline)	-3%	27%	3%	
Counties		1,364		
Institutions		5,845		
Observations		463,556		

Source: Pell Grant, CDR, sanction, and PEPS administrative data. *Note*s: Sample includes two-year institutions with a Title IV program participation and Pell Grant recipient enrollment between in at least one year between 1982 and 2008 in counties with fewer than 50 institutions (on average, across years). Closed institution enrollment is set to zero. Estimates from a regression of $\ln(\text{Pell recipient enrollment} + 1)_t$ on sanction receipt interacted with post-sanction receipt and sector , $\ln(\text{Pell recipients exposed to sanction} + 1)_{\tau-1}$ within sanctioned public, nonprofit, and for-profit institutions in the market, interacted with post-sanction receipt and sector, **1** [**Pell recipients exposed to sanction** $> 0]_{\tau-1}$ by sector, interacted with post-sanction receipt, sanction-year fixed effects, year fixed effects, years since sanction fixed effects, and sector and county linear trends. Robust standard errors clustered by institution in parentheses; ** p<0.01, * p<0.05, + p<0.1.

Table C.8: Robustness of the Impact of Sanctions on Pell Grant Recipient Enrollment: All Counties

Sanctioned sector:	1. Public	2. Nonprofit	3. For-profit	Test of equality (p-value)
Post x Threatened sanction	-0.255	-1.371	-1.270	<0.001
	(0.111)*	(0.449)**	(0.091)**	
Post x ln(recipients exposed to sanctions in sector)				
x Public	-0.004	0.001	0.061	0.019
	(0.018)	(0.052)	(0.011)**	
x Nonprofit	-0.008	-0.045	0.062	0.035
	(0.022)	(0.069)	(0.015)**	
x For-profit	-0.007	0.044	-0.023	0.037
	(0.013)	(0.025)+	(0.007)**	
Test of equality (p-value)	0.986	0.452	<0.001	
Baseline enrollment				
Sanctioned school	596	137	344	
Public competitor	779	971	844	
NP competitor	74	33	71	
FP competitor	128	107	151	
Number of institutions				
Public competitor	9.8	4.6	4.9	
NP competitor	10.6	4.2	5.5	
FP competitor	86.2	31.3	39.8	
Predicted Δ market enrollment:	*-251*	*48*	*-102*	
additional sanction	*(193)*	*(257)*	*(55)+*	
% change (rel to baseline)	*-1.3%*	*0.6%*	*-1.0%*	
Counties		1,380		
Institutions		7,161		
Observations		489,005		

Source: Pell Grant, CDR, sanction, and PEPS administrative data. *Notes*: Sample includes two-year institutions with a Title IV program participation and Pell Grant recipient enrollment between in at least one year between 1982 and 2008. Closed school enrollment is set to zero. Estimates from a regression of $\ln(\text{Pell recipient enrollment} + 1)_t$ on sanction receipt interacted with post-sanction receipt and sector, $\ln(\text{Pell recipients exposed to sanction} + 1)_{\tau-1}$ within sanctioned public, nonprofit, and for-profit institutions in the market, interacted with post-sanction receipt and sector, institution by sanction-year fixed effects, year fixed effects, years since sanction fixed effects, and sector and county linear trends. Robust standard errors clustered by institution in parentheses; ** p<0.01, * p<0.05, + p<0.1.

Table C.9: Robustness of the Impact of Sanctions on Pell Grant Recipient Enrollment: All Institutions

Sanctioned sector:	1. Public	2. Nonprofit	3. For-profit	Test of equality (*p*-value)
Post x Threatened sanction	-0.174	-1.570	-1.128	<0.001
	(0.110)	(0.415)**	(0.095)**	
Post x ln(recipients exposed to sanctions in sector)				
x Public	0.006	0.012	0.044	0.138
	(0.017)	(0.037)	(0.009)**	
x Nonprofit	0.007	-0.096	0.018	0.025
	(0.015)	(0.040)*	(0.009)+	
x For-profit	0.006	0.065	-0.015	0.010
	(0.017)	(0.025)**	(0.007)*	
Test of equality (*p*- value)	0.999	0.013	<0.001	
Baseline enrollment				
Sanctioned school	401	290	338	
Public competitor	1381	1418	1231	
NP competitor	217	349	256	
FP competitor	91	151	138	
Number of institutions				
Public competitor	4.1	3.3	3.8	
NP competitor	9.1	7.8	6.5	
FP competitor	15.5	15.6	15.4	
Predicted Δ market enrollment:	*-9*	*-264*	*-22*	
additional sanction	*(101)*	*(202)*	*(44)*	
% change (rel to baseline)	*-0.1%*	*-2.7%*	*-0.3%*	
Counties		1,364		
Institutions		5,845		
Observations		639,268		

Source: Pell Grant, CDR, sanction, and PEPS administrative data. *Note*s: Sample includes two-year and four-year institutions with a Title IV program participation and Pell Grant recipient enrollment between in at least one year between 1982 and 2008 in counties with fewer than 50 institutions (on average, across years). Closed school enrollment is set to zero. Estimates from a regression of $\ln(\text{Pell recipient enrollment} + 1)_t$ on sanction receipt interacted with post-sanction receipt and sector, $\ln(\text{Pell recipients exposed to sanction} + 1)_{\tau-1}$ within sanctioned public, nonprofit, and for-profit institutions in the market, interacted with post-sanction receipt and sector, institution by sanction-year fixed effects, year fixed effects, years since sanction fixed effects, and sector and county linear trends. Robust standard errors clustered by institution in parentheses; ** p<0.01, * p<0.05, + p<0.1.

Table C.10: Robustness of the Impact of Sanctions on Pell Grant Recipient Enrollment: County-Linear Trends

	(1)	(2)	(3)	(4)
Post x Threatened sanction				
x For-profit	-1.092	-1.139	-1.172	-0.933
	(0.109)**	(0.094)**	(0.096)**	(0.086)**
Post x ln(recipients exposed to sanctions in for-profit sector)				
x Public or nonprofit	0.051	0.064	0.029	0.032
	(0.011)**	(0.011)**	(0.008)**	(0.008)**
x Nonprofit	0.008	0.039	0.0001	0.003
	(0.017)	(0.017)*	(0.013)	(0.013)
x For-profit	-0.036	-0.015	-0.024	-0.023
	(0.010)**	(0.007)*	(0.008)**	(0.007)**
Test of equality (p- value)	<0.001	<0.001	<0.001	<0.001
Predicted Δ market enrollment:	*-167*	*-96*	*-204*	*-168*
additional sanction	*(35)***	*(28)***	*(24)***	*(24)***
% change (rel to baseline)	*-3.9%*	*-2.2%*	*-4.8%*	*-3.9%*
County linear trends		X		
County x for-profit trends			X	
County x for-profit x industry trends				X

Source: Pell Grant, CDR, sanction, and PEPS administrative data. *Note*s: Sample includes two-year institutions with a Title IV program participation and Pell Grant recipient enrollment between in at least one year between 1982 and 2008 in counties with fewer than 50 institutions (on average, across years). Closed school enrollment is set to zero. See Table C.5 notes for specification. Estimated main effects of public and nonprofit sanctions, spillover effects due to public and non-profit sanctions, and spillovers from sanctioned for-profits with respect to nonprofit enrollment are not reported. Robust standard errors clustered by institution in parentheses; ** p<0.01, * p<0.05, + p<0.1.

Table C.11: Robustness of the Impact of Sanctions on Pell Grant Recipient Enrollment: Alternative Market Definitions

	15 mile radius		30 mile radius	
	(1)	(2)	(3)	(4)
Post x Threatened sanction				
x Public	-0.277	-0.178	-0.241	-0.136
	(0.131)*	(0.130)	(0.116)*	(0.113)
x Nonprofit	-1.407	-1.384	-1.399	-1.365
	(0.445)**	(0.445)**	(0.465)**	(0.464)**
x For-profit	-1.431	-1.201	-1.569	-1.357
	(0.100)**	(0.101)**	(0.111)**	(0.115)**
Test of equality (*p*-value)	<0.001	<0.001	<0.001	<0.001
Post x ln(recipients exposed to sanctions in for-profit sector)				
x Public	0.041	0.050	0.032	0.039
	(0.011)**	(0.011)**	(0.010)**	(0.010)**
x Nonprofit	0.030	0.029	0.037	0.039
	(0.016)+	(0.018)	(0.016)*	(0.017)*
x For-profit	-0.035	-0.013	-0.029	-0.013
	(0.009)**	(0.008)	(0.009)**	(0.009)
Test of equality (*p*-value)	<0.001	<0.001	<0.001	<0.001
Predicted Δ market enrollment:	*-360*	*-126*	*-376*	*-139*
additional for-profit sanction	*(77)***	*(43)**	*(127)***	*(71)*
% change (rel to baseline)	*-3.3%*	*-2.0%*	*-2.2%*	*-1.4%*
Excl. institutions in "large" mkts		X		X
Institutions	6,855	5,550	7,161	5,845
Observations	433,500	404,124	399,704	372,113

Source: Pell Grant, CDR, sanction, and PEPS administrative data. *Note*s: Sample includes two-year institutions with a Title IV program participation and Pell Grant recipient enrollment between in at least one year between 1982 and 2008. Column (2) and (4) specifications also exclude counties with fewer than 50 institutions (on average, across years). Closed school enrollment is set to zero. Schools that could not be geocoded are excluded. See Table C.5 notes for specification. Robust standard errors clustered by institution in parentheses; ** p<0.01, * p<0.05, + p<0.1.

Table C.12: Robustness of the Impact of Sanctions on Pell Grant Recipient Enrollment:
Heterogeneity by Baseline Market Enrollment

	(1) Below median	(2) Above median
Post x Threatened sanction		
x Public	-0.239	-0.073
	(0.119)*	(0.230)
x Nonprofit	-0.840	-1.927
	(0.410)*	(0.747)**
x For-profit	-0.758	-1.190
	(0.098)**	(0.124)**
Test of equality (p-value)	0.003	<0.001
Post x ln(recipients exposed to sanctions in for-profit sector)		
x Public	0.076	0.069
	(0.033)*	(0.012)**
x Nonprofit	0.130	0.029
	(0.045)**	(0.018)
x For-profit	-0.0001	-0.007
	(0.028)	(0.008)
Test of equality (p-value)	0.049	<0.001
Predicted Δ market enrollment:	*-15*	*-127*
additional for-profit sanction	*(13)*	*(36)***
% change (rel to baseline)	*-2%*	*-2%*
Counties	1054	314
Institutions	1838	4090
Observations	232,373	233,257

Source: Pell Grant, CDR, sanction, and PEPS administrative data. *Notes*: Sample includes two-year institutions with a Title IV program participation and Pell Grant recipient enrollment between in at least one year between 1982 and 2008 in counties with fewer than 50 institutions (on average, across years). Closed school enrollment is set to zero. See Table C.5 notes for specification. Schools in markets with below median baseline enrollment belong to counties that had fewer than 851 Pell Grant recipients enrolled across all institutions in 1990. Schools in markets with above median baseline enrollment were located in counties with more than 850 Pell Grant recipients enrolled across all institutions in 1990. Robust standard errors clustered by institution in parentheses; ** p<0.01, * p<0.05, + p<0.1.

Table C.13: Robustness of the Impact of Sanctions on Pell Grant Recipient Enrollment:
Heterogeneity by Type of Sanction

Sanctioned sector:	1. Public	2. Nonprofit	3. For-profit
A. Loss of Loans Only			
Post x Threatened loss of loans	-0.158	-1.482	-1.337
	(0.124)	(0.780)+	(0.137)**
Post x ln(recipients exposed to sanctions in sector)			
x Public	0.042	0.068	0.045
	(0.027)	(0.074)	(0.015)**
x Nonprofit	-0.042	-0.102	0.025
	(0.034)	(0.075)	(0.023)
x For-profit	0.004	0.003	0.007
	(0.019)	(0.039)	(0.011)
Test of equality (*p*-value)	0.146	0.251	0.137
Predicted Δ county enrollment:	54	133	-131
additional sanction	(81)	(243)	(42)**
% change: total enrollment	*1.2%*	*2.5%*	*-2.6%*
B. Loss of all Title IV			
Post x Threatened loss of Title IV	-0.171	-1.130	-0.721
	(0.163)	(0.351)**	(0.120)**
Post x ln(recipients exposed to sanctions in sector)			
x Public	-0.027	-0.053	0.050
	(0.038)	(0.047)	(0.015)**
x Nonprofit	-0.020	0.059	0.040
	(0.029)	(0.075)	(0.021)+
x For-profit	0.013	0.014	-0.021
	(0.018)	(0.034)	(0.010)*
Test of equality (*p*-value)	0.573	0.295	<0.001
Predicted Δ county enrollment:	26	93	-116
additional sanction	(63)	(265)	(42)**
% change: total enrollment	*0.7%*	*1.7%*	*-2.4%*
Counties		1,364	
Institutions		5,845	
Observations		463,556	

Source: Pell Grant, CDR, sanction, and PEPS administrative data. *Note*s: Sample includes two-year institutions with a Title IV program participation and Pell Grant recipient enrollment between in at least one year between 1982 and 2008 in counties with fewer than 50 institutions (on average, across years). Closed school enrollment is set to zero. Estimates from a regression of $\ln(\text{Pell recipient enrollment} + 1)_t$ on each type of sanction receipt interacted with post-sanction receipt and sector, $\ln(\text{Pell recipients exposed to loss of loans} + 1)_{\tau-1}$ and $\ln(\text{Pell recipients exposed to loss of Title IV} + 1)_{\tau-1}$ within public, nonprofit, and for-profit institutions in the market, interacted with post-sanction receipt and sector, institution by sanction-year fixed effects, year fixed effects, years since sanction fixed effects, and sector and county linear trends. Robust standard errors clustered by institution in parentheses; ** p<0.01, * p<0.05, + p<0.1.

Table C.14: Robustness of the Impact of Sanctions on Pell Grant Recipient Enrollment: Heterogeneity by Sanction Year

Year of sanction:	(1) 1991	(2) 1992	(3) 1993	(4) 1994	(5) 1995 - 2000
Post x Threatened sanction					
x Public	-0.751	-0.052	0.364	-0.238	0.119
	(0.211)**	(0.399)	(0.350)	(0.238)	(0.170)
x Nonprofit	-2.073	-1.175	-0.328	0.636	-0.230
	(0.944)*	(0.408)**	(0.561)	(1.060)	(0.107)*
x For-profit	-2.103	-0.836	-0.471	-0.869	-0.394
	(0.206)**	(0.183)**	(0.202)*	(0.228)**	(0.267)
	[<0.001]	[0.117]	[0.136]	[0.081]	[0.142]
Post x ln(recipients exposed to sanctions in for-profit sector)					
x Public	0.062	0.065	0.044	0.022	0.056
	(0.020)**	(0.022)**	(0.036)	(0.033)	(0.046)
x Nonprofit	0.042	0.036	0.058	0.044	0.018
	(0.027)	(0.034)	(0.046)	(0.064)	(0.062)
x For-profit	0.003	-0.022	-0.054	-0.004	0.019
	(0.014)	(0.017)	(0.030)+	(0.029)	(0.017)
	[0.035]	[0.003]	[0.063]	[0.753]	[0.798]
Predicted Δ market enrollment	*-299*	*-110*	*-23*	*-17*	*105*
adtl for-profit sanction	*(70)***	*(68)*	*(88)*	*(121)*	*(92)*
% change (rel to baseline)	*-5%*	*-3%*	*-1%*	*-0.3%*	*4%*
Counties	1,323	1,246	1,121	1,073	1,141
Institutions	5,312	4,026	2,908	2,526	2,532
Observations	90,304	68,442	49,436	42,942	212,432

Source: Pell Grant, CDR, sanction, and PEPS administrative data. *Note*s: Sample includes two-year institutions with a Title IV program participation and Pell Grant recipient enrollment between in at least one year between 1982 and 2008 in counties with fewer than 50 institutions (on average, across years). Closed school enrollment is set to zero. Sample in each column is limited to the specified sanction-year and the corresponding 8 year pre-/post-sanction window. Estimates from a regression of $\ln\left(\text{Pell recipient enrollment} + 1\right)_t$ on sanction receipt interacted with post-sanction receipt and sector, $\ln\left(\text{Pell recipients exposed to sanction} + 1\right)_{\tau-1}$ within sanctioned public, nonprofit, and for-profit institutions in the market, interacted with post-sanction receipt and sector, institution fixed effects, years since sanction fixed effects, and sector and county linear trends. Robust standard errors clustered by county in parentheses; ** p<0.01, * p<0.05, + p<0.1.

Table C.15: The Effect of Sanctions on Pell Grant Recipient Enrollment: Robustness to the Exclusion of Beauty Schools

Sanctioned sector:	1. Public	2. Nonprofit	3. For-profit	Test of equality (p-value)
Post x Threatened sanction	-0.375	-0.992	-1.527	<0.001
	(0.110)**	(0.455)*	(0.182)**	
Post x ln(recipients exposed to sanctions in sector)				
x Public	-0.025	0.031	0.057	0.019
	(0.025)	(0.063)	(0.015)**	
x Nonprofit	-0.027	-0.038	0.055	0.043
	(0.026)	(0.092)	(0.020)**	
x For-profit	0.022	0.055	-0.023	0.136
	(0.026)	(0.049)	(0.013)+	
Test of equality (p- value)	0.39	0.721	<0.001	
Baseline enrollment				
Sanctioned school	385	137	709	
Public competitor	764	1007	831	
NP competitor	45	38	57	
FP competitor	136	228	192	
Number of institutions				
Public competitor	2.9	3.1	2.9	
NP competitor	3.8	3.2	2.5	
FP competitor	14.7	17.1	14.8	
Predicted Δ market enrollment:	*-132*	*226*	*-472*	
additional sanction	*(66)**	*(284)*	*(48)***	
% change (rel to baseline)	*-3.0%*	*3.2%*	*-8.8%*	
Counties		1,213		
Institutions		3,845		
Observations		315,265		

Source: Pell Grant, CDR, sanction, and PEPS administrative data. *Note*s: Sample includes two-year institutions with a Title IV program participation and Pell Grant recipient enrollment between in at least one year between 1982 and 2008. Closed school enrollment is set to zero. For-profits classified as beauty schools are excluded. Estimates from a regression of $\ln(\text{Pell recipient enrollment} + 1)_t$ on sanction receipt interacted with post-sanction receipt and sector, $\ln(\text{Pell recipients exposed to sanction} + 1)_{\tau-1}$ within sanctioned public, nonprofit, and for-profit institutions in the market, interacted with post-sanction receipt and sector, institution by sanction-year fixed effects, year fixed effects, years since sanction fixed effects, and sector and county linear trends. Robust standard errors clustered by institution in parentheses; ** p<0.01, * p<0.05, + p<0.1.

Table C.16: The Effect of Sanctions on the Number of Borrowers and Defaulters

Sanctioned sector:	1. Public	2. Nonprofit	3. For-profit	Test of equality (p-value)
A. Borrowers				
Post x Threatened sanction	-0.192	-0.931	-1.007	<0.001
	(0.143)	(0.373)*	(0.078)**	
Post x ln(Pell recipients exposed to sanctions)				
x Public	0.055	0.034	0.057	0.892
	(0.025)*	(0.046)	(0.010)**	
x Nonprofit	0.022	0.038	0.021	0.888
	(0.023)	(0.033)	(0.010)*	
x For-profit	-0.006	-0.022	0.004	0.387
	(0.013)	(0.019)	(0.005)	
Test of equality (p-value)	0.105	0.291	<0.001	
Counties		1,364		
Institutions		5,845		
Observations		272,680		
B. Defaulters				
Post x Threatened sanction	-0.172	-0.814	-0.831	<0.001
	(0.103)+	(0.304)**	(0.067)**	
Post x ln(Pell recipients exposed to sanctions)				
x Public	0.027	0.038	0.040	0.832
	(0.019)	(0.041)	(0.007)**	
x Nonprofit	0.020	0.032	0.029	0.882
	(0.017)	(0.024)	(0.006)**	
x For-profit	0.007	-0.019	0.004	0.287
	(0.010)	(0.015)	(0.004)	
Test of equality (p-value)	0.640	0.169	<0.001	
Counties		1,364		
Institutions		5,845		
Observations		272,680		

Source: Pell Grant, CDR, sanction, and PEPS administrative data. *Notes*: Sample includes two-year institutions with a Title IV program participation and Pell Grant recipient enrollment between in at least one year between 1982 and 2008 in counties with fewer than 50 institutions (on average, across years). The pre-period is limited to the year immediately prior to sanction receipt, the post-sanction period includes the year of the sanction through 8 years later. Panel A dependent variable is $\ln(\text{federal borrowers entering repayment} + 1)_t$. Panel B dependent variable is $\ln(\text{federal borrowers defaulting} + 1)_t$, where defaulting occurs when a borrower makes no payment on her loans for at least 270 days within the first two years of entering repayment. Closed institution borrowers and defaulters set to zero. See Table C.5 notes for specification. Clustered standard errors by institution in parentheses; ** $p<0.01$, * $p<0.05$, + $p<0.1$.

D Selected Quotations from Local News Sources on For-Profit College Sanctions

Palm Beach Post, July 18, 1991:

Five West Palm Beach trade schools were named Wednesday by the U.S. Department of Education as having default rates on guaranteed student loans higher than 35 percent, the maximum permitted. . . .Hair-dressing schools also are prevalent on state and national lists.

St. Louis Post-Dispatch, May 16, 1991:

Vatterott College in St. Ann will take over the instruction of students stranded by the closure of Draughon Business College in Springfield, Joplin and Independence, Mo., the head of Vatterott College said Wednesday. . . The agreement between the Vatterott and Draughon involves no fee paid by either party, John Vatterott said. But "we think it's a good business move" for Vatterott and good for the image of the trade and career school industry, "which has taken a pretty heavy beating," he said. "Any damage to any private career school affects every other school," he said.

Daily Oklahoman, August 11, 1992:

Nearly 600 schools in 40 states and the District of Columbia - including three in Oklahoma - will lose some federal financial aid or loan programs due to high rates of defaulted student loans, the Department of Education said Friday. . . In Oklahoma, the following privately owned trade schools were on the list: - American Technical Institute of Tulsa, where 76.9 percent of its student loans were in default in fiscal 1990. -Oklahoma Junior College of Business and Technology, Tulsa, with a 41.8 percent default rate. -Paul's Beauty College, Oklahoma City, with a 68.1 percent default rate.

New York Times, July 10, 1990:

The largest chain of private trade schools in New York City has agreed to pay $850,000 for recruiting violations, the largest penalty ever assessed on a trade-school operator in the state. . . .East Coast Schools operates 10 schools in New York, among them the Metropolitan Career Institute, the International Career Institute, the Empire Technical School and the Albert Merrill School. Two schools operated under the Empire name will be closed under the agreement announced here today.

Newsday (city edition), July 18, 1991:

The U.S. Department of Education has notified 178 trade schools, including 14 in New York City, that they

stand to lose their eligibility to participate in the federal student loan program because more than one-third of their students defaulted on their government-guaranteed loans three years in a row. Many of the schools are beauty schools - also known as "academies of cosmetology" - but others train truck drivers, bartenders, secretaries and even card dealers. Many are so dependent on the federal loan program that losing eligibility may force them out of business.