How Does For-profit College Attendance Affect Student Loans, Defaults and Earnings?

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The views expressed in this paper are those of the authors and do not necessarily reflect the position of the Federal Reserve Bank of New York or the Federal Reserve System

Motivation

- The for-profit sector of higher education has seen unprecedented growth in the last decade and the half, markedly changing the higher education landscape.

- Between 2000 and 2014, enrollment in for-profits grew by 224%.
  - Enrollment in 2 and <2 year sectors grew by 54%
  - Enrollment in 4 year sector grew by 490%
  - The number of for-profits grew by 69%, from 789-1334.

- The explosive growth of for-profits begs a natural question:
  - How does attending a for-profit college relative to another college affect educational, financial and labor market outcomes?

Trends in 2- & <2-year Enrollment
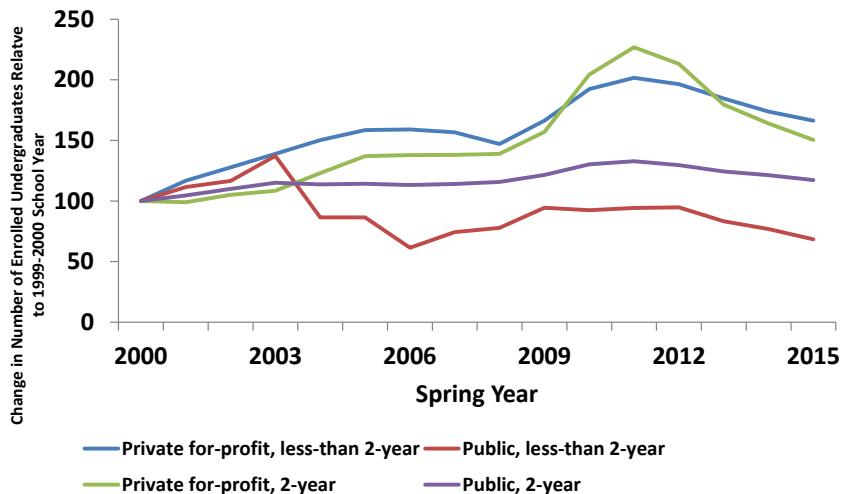
Trends in 4-year Enrollment
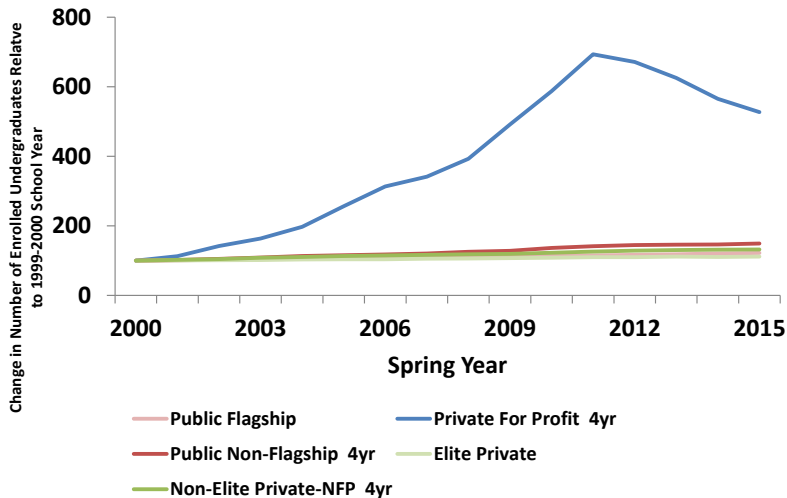
What We Do

- We use a new instrument to identify the effect of for-profit attendance: labor demand shocks interacted with base period for-profit supply.
  - ▶ Labor demand shocks measured using the shift-share measure pioneered by Bartik (1991).

- Idea is to consider two areas that experience the same labor demand shock but that have a different supply of for-profit schools.
  - ▶ Labor demand shock affects demand for college enrollment.
  - ▶ Students sort into local colleges and universities based on prevailing supply.

- Combine this approach with administrative data on a large set of postsecondary outcomes, loans, defaults, and labor market outcomes from several sources.

- We also examine how for-profit entry is affected by labor demand induced changes in enrollment demand.

Contributions

- The instrument we use adds to the literature in several ways:
    1. More likely overcomes selection bias than prior research using secondary data (Cellini and Chaudhary 2008; Turner 2011; Deming, Goldin and Katz 2012; Lang and Weinstein 2012, 2013).
    2. Provides important new insight into the role for-profits play in worker training/re-training and in recovery from recessions.

- Our estimates use a larger set of outcomes than the prior literature, especially studies that examine labor market returns to for-profits using randomized resume audits (Deming et al. 2016; Darolia et al. 2016).
    - We use direct labor market outcomes rather than call-back rates.

- We also are the first to examine how for-profit entry responds to student demand.

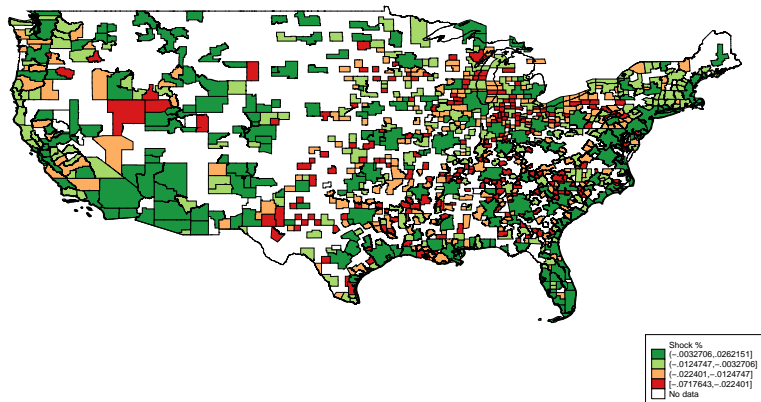- We examine both two-year and four-year markets.

Data – For-profit Share, Enrollment, and Outcomes

- We use institution-year level data obtained from the merge of five datasets from 2000-2014:
  - IPEDS (Integrated Post-secondary Education Data System)
  - NSLDS (National Student Loan Data System)
  - Student loan default data
  - CSD (College Scorecard data)
  - US Census

- For-profit Supply is the percentage of postsecondary institutions that are for-profit in the CBSA in 2000.
  - Calculated separately for the two-year and four-year sectors using IPEDS data.

- IPEDS: 12-month enrollment, institution demographics (gender & race), proportion Pell grant recipients.

- NSLDS: federal student loan originations (# and amount), # of borrowers (by loan type).
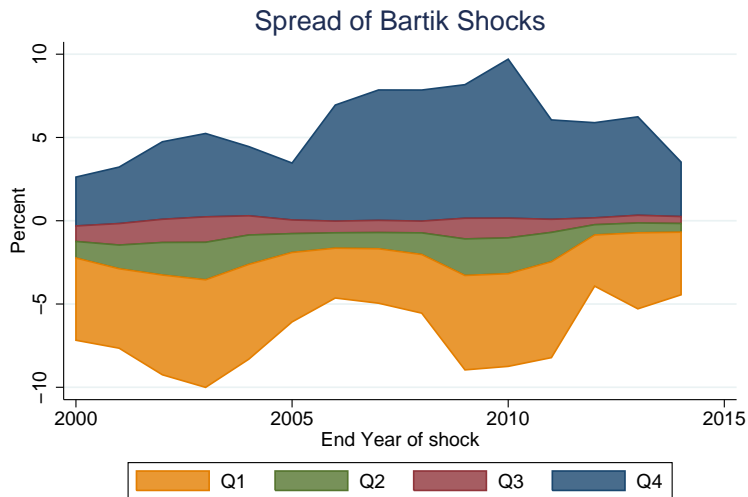
Data – For-profit Share, Enrollment, and Outcomes

- Three-year cohort default data: number of borrowers in default, number of borrowers in repayment, cohort default rate

- CSD: Earnings and employment 6 years after enrollment among those receiving federal aid.

- We use only for-profit and public institutions.

- Data aggregated up to CBSA-institution type (for-profit/public)-level (2yr/4yr)-year.

- We assume that enrollment responds to an observed labor demand change: match 3-year rolling labor demand shocks to next year's institutional outcomes.
  - Match labor demand change between $t-4$ to $t-1$ to time t institutional outcomes.
  - Cohort default rates defined by exiting cohorts. We assume time in college is 100% of statutory degree time.

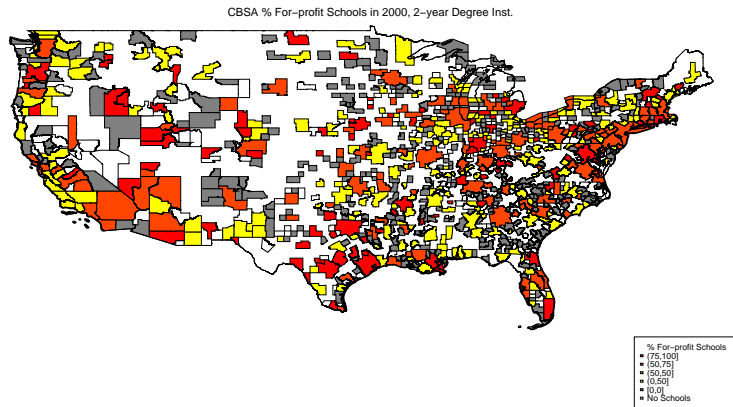# Labor Demand Changes by CBSA, 1997-2000

Shock %
- (−.0032706,.0262151]
- (−.0124747,−.0032706]
- (−.022401,−.0124747]
- [−.0717643,−.022401]
- No data

Quartiles of Labor Demand Changes by Year, 2000-2014

Spread of Bartik Shocks

NAICS type: dropAny_14_74

Percent of Two-year and Less-than-two-year For-profit Postsecondary Institutions by CBSA, 2000

CBSA % For–profit Schools in 2000, 2–year Degree Inst.

% For–profit Schools
- (75,100]
- (50,75]
- (50,50]
- (0,50]
- [0,0]
- No Schools

Empirical Model

- We estimate the following 2sls model at the CBSA (c), year (t) and for-profit/public (j) level:

$$
\begin{aligned}
E_{jcst} &= \alpha_0 + \alpha_1 \hat{\eta}_{c,t-1} + \alpha_2(\hat{\eta}_{c,t-1} * Supply_c) + \alpha_3 FP_{jct} + \alpha_4(\hat{\eta}_{c,t-1} * FP_{jct}) \\
&\quad + \alpha_5(Supply_c * FP_{jct}) + \alpha_6(\hat{\eta}_{c,t-1} * Supply_c * FP_{jct}) + \alpha_7 L_{c,t-4} + \eta X_{ct} \\
&\quad + \delta_c + \psi_{st} + \upsilon_{sj} + \zeta_{tj} + \mu_{jcst}
\end{aligned}
$$

$$
\begin{aligned}
Y_{jcst} &= \beta_0 + \beta_1 \hat{\eta}_{c,t-1} + \beta_2 FP_{jct} + \beta_3(\hat{\eta}_{c,t-1} * FP_{jct}) + \beta_4(Supply_c * FP_{jct}) \\
&\quad + \beta_5 \hat{E}_{jcst} + \beta_6 \hat{E}_{jcst} * FP_{jct} + \beta_7 L_{c,t-4} + \eta X_{ct} + \phi_c + \theta_{st} + \omega_{sj} + \tau_{tj} + \epsilon_{jcst}
\end{aligned}
$$

- Includes state-year, CBSA fixed, state-FP, and year-FP effects, CBSA-year demographics (X), and base year labor demand (L).
- $\hat{\eta}_{c,t-1} * Supply_c$ and $\hat{\eta}_{c,t-1} * Supply_c * FP_{jct}$ are excluded instruments.
- β_6 is main coefficient of interest - shows how outcomes in for-profits change when for-profit enrollment increases by 1.

Empirical Model: Assumptions

- Identifying assumption: no differential trends or shocks correlated with the timing, magnitude and sign of the labor demand changes and that differentially impact for-profit schools in places where the pre-existing supply of for-profit schools is higher.

- Bias from secular trends or shocks are unlikely:
  1. Most CBSAs experience positive and negative shocks: 59% experience a (+) and (-) change between 2000 and 2014.
  2. Correlation between predicted labor demand changes and 2000 supply is 0.17. ▸ Figure

- We show the instrument is uncorrelated with changes in composition of students and with pre-2000 trends in outcomes. ▸ Composition
  ▸ Pre-trends

Results: First Stage

Panel A: 2-year Schools	2000-2014 (1)	2000-2006 (2)	2008-2014 (3)
(2000 For-profit Supply)*$\hat{\eta}$	53.654***	66.621***	27.518***
	(13.152)	(14.980)	(8.8361)
(For-profit)*(2000 Supply)*$\hat{\eta}$	-104.51***	-137.12***	-57.855***
	(23.110)	(27.965)	(17.006)
1st Stage P-value	0.000	0.000	0.001

Panel B: 4-year Schools	2000-2014 (1)	2000-2006 (2)	2008-2014 (3)
(2000 For-profit Supply)*$\hat{\eta}$	35.308	59.648*	93.729***
	(41.869)	(32.397)	(21.510)
(For-profit)*(2000 Supply)*$\hat{\eta}$	-229.73***	-175.99***	-301.51***
	(72.499)	(50.233)	(60.901)
1st Stage P-value	0.001	0.001	0.000

Second Stage: Student Borrowing

Panel A: 2-Year Schools	Direct Subsidized Loans	Direct Unsub. Loans	FFEL Subsidized Loans	FFEL Unsub. Loans
Enroll	-0.0315	-0.0124	-0.0902	-0.0400
	(0.2111)	(0.1801)	(0.0912)	(0.0546)
Enroll*For-profit	-0.0990	0.0254	-0.4360	-0.102
	(1.3495)	(1.1483)	(0.6306)	(0.3683)
Panel B: 4-Year Schools	Direct Subsidized Loans	Direct Unsub. Loans	FFEL Subsidized Loans	FFEL Unsub. Loans
Enroll	0.3361**	0.3017**	0.1856***	0.1246**
	(0.1697)	(0.1338)	(0.0714)	(0.0505)
Enroll*For-profit	0.6919**	0.6099**	0.4758***	0.4236***
	(0.3033)	(0.2553)	(0.1336)	(0.0874)

Second Stage: Loans, Loan Amounts and Default

Panel A: 2-Year Schools	Number of Loans	Loan Origination Amount	Number of Borrowers in Default
Enroll	0.0185	590.5	0.0438
	(0.2204)	(577.3)	(0.0659)
Enroll*For-profit	0.8214	6427.7*	0.3421
	(1.381)	(3654.1)	(0.4835)
Panel B: 4-Year Schools	Number of Loans	Loan Origination Amount	Number of Borrowers in Default
Enroll	0.5024***	1893.8***	0.0510*
	(0.1472)	(314.0)	(0.0275)
Enroll*For-profit	1.1079***	3356.1***	0.1061***
	(0.2861)	(1034.7)	(0.0398)

Second Stage: Educational and Labor Market Outcomes

Panel A: 2-Year Schools	Total Graduated (150% Time)	Total Employed	Total Earnings	Total Making ≥$25k
Enroll	0.1787*	0.8000***	25865.2***	0.6226***
	(0.1080)	(0.0989)	(6674.9)	(0.2105)
Enroll*For-profit	0.2812	-0.3557	-8541.2	0.4195
	(0.7798)	(0.7852)	(53038.9)	(1.6323)

Panel B: 4-Year Schools	Total Graduated (150% Time)	Total Employed	Total Earnings	Total Making ≥$25k
Enroll	0.3988***	0.8753***	36887.6***	0.7134***
	(0.0928)	(0.0220)	(2830.5)	(0.0428)
Enroll*For-profit	-0.1225	-0.1104**	-6107.6	-0.0853
	(0.2659)	(0.0482)	(6624.4)	(0.1085)

Results: School Entry/Exit

Panel A: 2-year Schools	For-Profit		Public	
	(1)	(2)	(3)	(4)
Predicted LD Change ($\hat{\eta}$)	-0.002090	0.01513	0.0009238	0.004042
	(0.01137)	(0.01137)	(0.004510)	(0.004793)
(2000 Supply)*$\hat{\eta}$		-0.001153*		-0.0002073
		(0.0006508)		(0.0002014)
Panel A: 4-year Schools	For-Profit		Public	
	(1)	(2)	(3)	(4)
Predicted LD Change ($\hat{\eta}$)	-0.01484*	-0.01393*	0.002028	0.002574
	(0.007938)	(0.007895)	(0.002858)	(0.002717)
(2000 Supply)*$\hat{\eta}$		-0.001384		-0.001040
		(0.003694)		(0.001392)

Robustness Checks

- Exclude schools that are "Very Competitive" or higher in 2000-01 Barron's Rankings. ▸ Non-selective Results
  - ▸ Low selectivity schools (at least 75% admission rate) draw predominantly from local areas.
  - ▸ Examples: Wayne State University, University of Louisiana at Monroe, Appalachian State University.
- Address serial correlation in labor demand shocks:
  - ▸ Include fully-interacted current year predicted labor demand shocks ($\hat{\eta}_{c,t}$). ▸ Results with $\hat{\eta}_{c,t}$
  - ▸ Include fully-interacted current year and 1-year lead of predicted labor demand shocks ($\hat{\eta}_{c,t}$, $\hat{\eta}_{c,t+1}$). ▸ Results with $\hat{\eta}_{c,t}, \hat{\eta}_{c,t+1}$
- Fix institution types in the base year to rule out results driven by institution type switches. ▸ Results Fixing Initial Institution Type
  - ▸ Approximately 5% of institutions switch from two-year to four-year
- Use different enrollment measures. ▸ Different Enrollment Measures

Conclusions

- Four-year for-profit institutions lead to systematically worse outcomes for students: more loans, higher loan amounts, higher default risk and worse labor market outcomes.

- Evidence less consistent for two-years, but these students do take on higher loans amounts, are more likely to default and are less likely to be employed.

- Policy implications:
  1. Return to large public expenditures is low on for-profit schools.
  2. Students who attend a for-profit due to a local labor demand shock are worse off relative to attending a local public institution. Highlights the role for information to help students make more informed decisions.

Data – Labor Demand Changes

- We construct geography-year level labor demand shocks for period 2000-2014:
  - QCEW (Quarterly Census of Employment and Wages) data, 1997-2014
  - Industry employment data for NAICS 2-digit industry codes

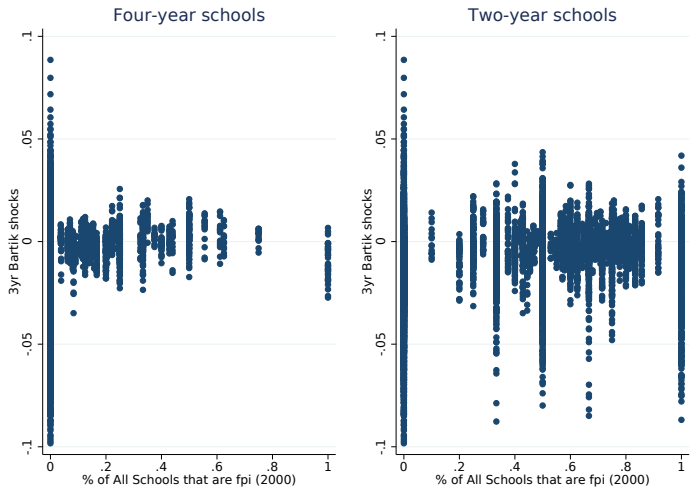- For CBSA (c) in year (t) and state (s), we construct 3-year rolling predicted labor demand changes:

$$\hat{\eta}_{ct} = \sum_{k=1}^{K} \gamma_{kc,t-3}\eta_{k\not{c}t} \tag{1}$$

- γ is the employment share of industry k in baseline year $t - 3$ and CBSA (c).
- η is the percentage change in employment share of industry k between $t - 3$ and t outside of CBSA c.

Percent of Four-year For-profit Postsecondary Institutions by CBSA, 2000

CBSA % For–profit Schools in 2000, 4–year Degree Inst.

% For–profit Schools
(33.33,100]
(22.22,33.33]
(13.04,22.22]
(0,13.04]
[0,0]
No Schools
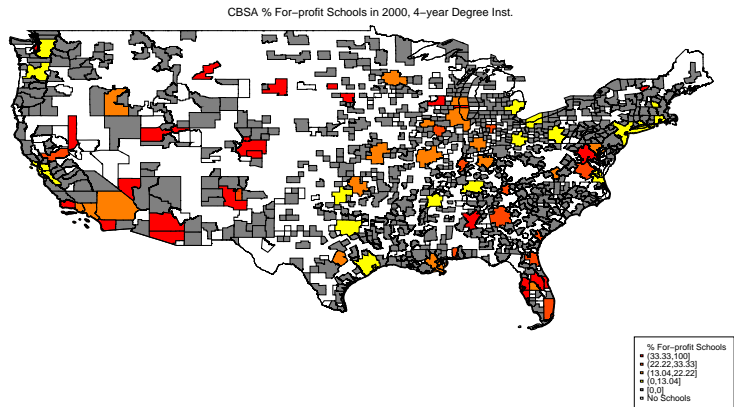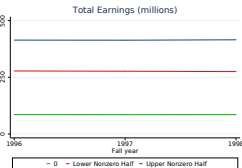
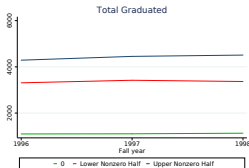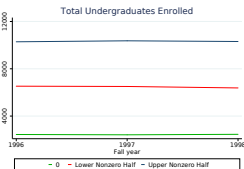# Correlation of Demeaned Labor Demand Changes and For-Profit Supply ▸ Return
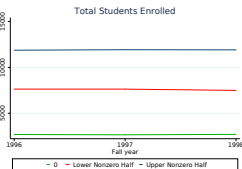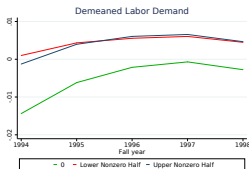
How Labor Demand Shocks Interacted with For-profit Supply Affects the Composition of For-profit Students
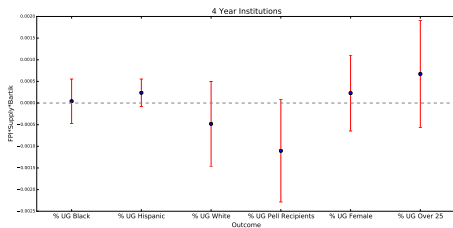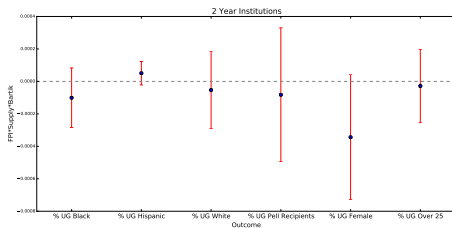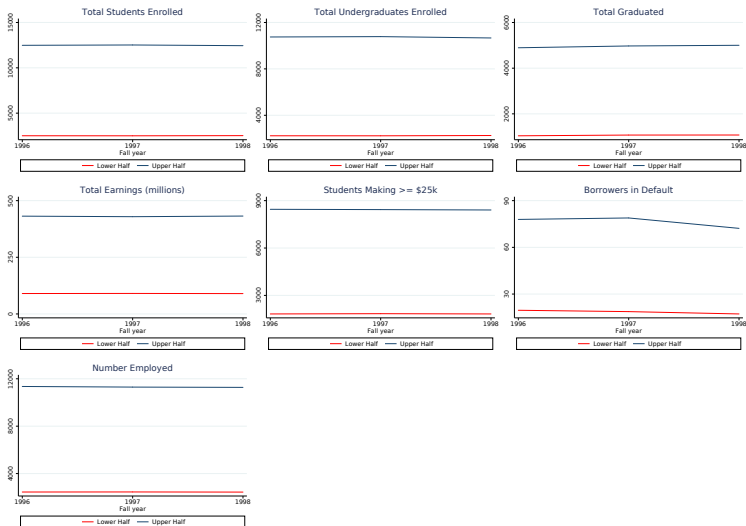

[> Return]

Pre-2000 Trends by Supply ▸ Return
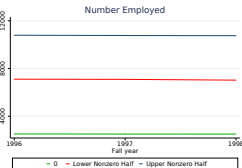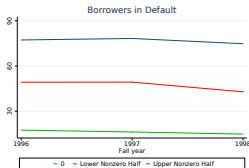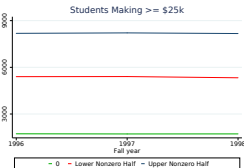
Pre-2000 Trends by Labor Demand Shock ▸ Return

Pre-2000 Trends by Labor Demand Shock X Supply

▸ Return
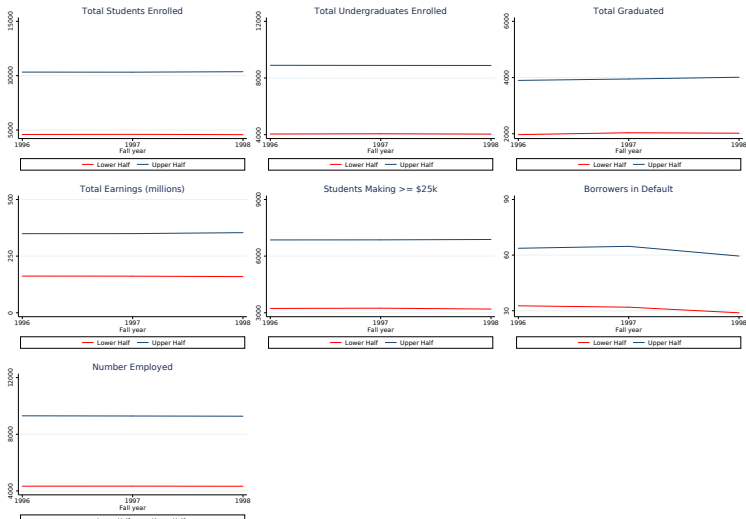
Results: First Stage (Non-selective) ▸ Return

Panel A: 2-year Schools	2000-2014 (1)	2000-2006 (2)	2008-2014 (3)
(2000 For-profit Supply)*$\hat{\eta}$	53.708***	66.794***	27.571***
	(13.172)	(15.018)	(8.849)
(For-profit)*(2000 Supply)*$\hat{\eta}$	-104.65***	-137.45***	-57.939***
	(23.145)	(28.029)	(17.034)
1st Stage P-value	0.000	0.000	0.001

Panel B: 4-year Schools	2000-2014 (1)	2000-2006 (2)	2008-2014 (3)
(2000 For-profit Supply)*$\hat{\eta}$	33.494	53.875*	91.356***
	(40.819)	(28.559)	(21.172)
(For-profit)*(2000 Supply)*$\hat{\eta}$	-207.14***	-156.73***	-278.570***
	(72.087)	(45.584)	(62.633)
1st Stage P-value	0.013	0.001	0.000

Second Stage: Student Borrowing (Non-selective)

Panel A: 2-Year Schools	Direct Subsidized Loans	Direct Unsub. Loans	FFEL Subsidized Loans	FFEL Unsub. Loans
Enroll	-0.0399	-0.0196	-0.0971	-0.0449
	(0.2210)	(0.1885)	(0.0988)	(0.0592)
Enroll*For-profit	-0.1518	-0.0202	-0.4819	-0.1354
	(1.4133)	(1.2028)	(0.6823)	(0.4000)
Panel B: 4-Year Schools	Direct Subsidized Loans	Direct Unsub. Loans	FFEL Subsidized Loans	FFEL Unsub. Loans
Enroll	0.2674	0.2487	0.1866***	0.1256**
	(0.2594)	(0.2005)	(0.0746)	(0.0510)
Enroll*For-profit	0.8189*	0.7066*	0.4959***	0.4299***
	(0.4491)	(0.3724)	(0.1550)	(0.1013)

▸ Return

Second Stage: Loans, Loan Amounts and Default (Non-selective)

Panel A: 2-Year Schools	Number of Loans	Loan Origination Amount	Number of Borrowers in Default
Enroll	0.0059	553.9	0.0442
	(0.2316)	(586.5)	(0.0700)
Enroll*For-profit	0.7419	6192.0*	0.3441
	(1.455)	(3694.5)	(0.5115)

▸ Return

Panel B: 4-Year Schools	Number of Loans	Loan Origination Amount	Number of Borrowers in Default
Enroll	0.4861***	1945.0***	0.0531*
	(0.1963)	(349.0)	(0.0307)
Enroll*For-profit	1.1767***	3319.8***	0.1195***
	(0.4003)	(1332.1)	(0.0568)

Second Stage: Educational and Labor Market Outcomes (Non-selective) ▸ Return

Panel A: 2-Year Schools	Total Graduated (150% Time)	Total Employed	Total Earnings	Total Making ≥$25k
Enroll	0.1781*	0.7939***	25845.1***	0.6234***
	(0.1108)	(0.1036)	(6808.0)	(0.2157)
Enroll*For-profit	0.2779	-8659.3	-8541.2	0.4258
	(0.7970)	(0.8205)	(53987.0)	(1.6694)
Panel B: 4-Year Schools	Total Graduated (150% Time)	Total Employed	Total Earnings	Total Making ≥$25k
Enroll	0.4054***	0.8835***	37895.3***	0.7275***
	(0.0965)	(0.0208)	(2863.5)	(0.0436)
Enroll*For-profit	-0.0714	-0.1053*	-6569.1	-0.0851
	(0.3302)	(0.0584)	(7994.5)	(0.1325)

Second Stage Estimates Including Current-year Demand Shocks

Panel A: 2-Year Schools	FFEL Subs. Loans	FFEL Unsub. Loans	Loan Origination Amount	Total Employed	Total Graduated
Enroll	-0.1038	-0.0503	-544.7	0.7990***	0.2020**
	(0.1006)	(0.0611)	(790.1)	(0.0210)	(0.0978)
Enroll*For-profit	-0.5326	-0.1753	-632.4	-0.3665**	0.4318
	(0.6936)	(0.4130)	(5074.4)	(0.1705)	(0.6982)
Panel A: 4-Year Schools	FFEL Subs. Loans	FFEL Unsub. Loans	Loan Origination Amount	Total Employed	Total Graduated
Enroll	0.1317***	0.0991***	2234.4***	0.8805***	0.3797***
	(0.0263)	(0.0202)	(604.0)	(0.0190)	(0.0806)
Enroll*For-profit	0.3774***	0.3769***	4726.9***	-0.0994*	-0.1415
	(0.0293)	(0.0239)	(1416.1)	(0.0511)	(0.1752)

Second Stage Estimates Including Current-year and One-year Leads of Demand Shocks

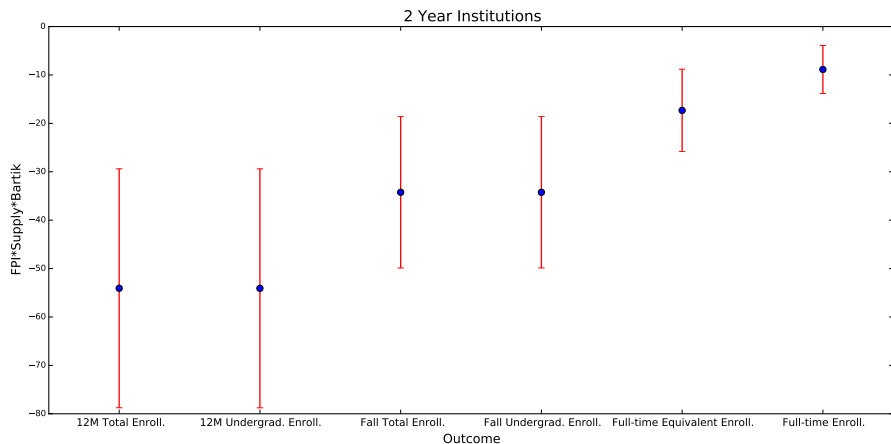| Panel A: 2-Year Schools	FFEL Subs. Loans	FFEL Unsub. Loans	Loan Origination Amount	Total Employed	Total Graduated
Enroll	-0.0155	-0.0179	-340.6	0.8249***	0.2409***
	(0.0169)	(0.0151)	(311.0)	(0.0178)	(0.0286)
Enroll*For-profit	0.0656	0.0430	576.6	-0.1449	0.7036***
	(0.1350)	(0.1133)	(1971.8)	(0.1259)	(0.1500)
Panel A: 4-Year Schools	FFEL Subs. Loans	FFEL Unsub. Loans	Loan Origination Amount	Total Employed	Total Graduated
Enroll	0.1570***	0.1261***	2370.1***	0.8961***	0.3798***
	(0.0267)	(0.0208)	(392.5)	(0.0175)	(0.0669)
Enroll*For-profit	0.4051***	0.4069***	4501.9***	-0.0341	-0.1599
	(0.0323)	(0.0257)	(879.4)	(0.0294)	(0.1655)

▸ Return

Fixing Institution Types

Panel A: 2-Year Schools	FFEL Subs. Loans	FFEL Unsub. Loans	Loan Origination Amount	Total Employed	Total Graduated
Enroll	-0.0401	-0.0105	23.1	0.7799***	0.2187
	(0.0371)	(0.0283)	(983.5)	(0.1901)	(0.1570)
Enroll*For-profit	-0.0463	0.1258	3120.3	-0.4743	0.5253
	(0.2202)	(0.1700)	(5884.1)	(1.4002)	(1.0296)

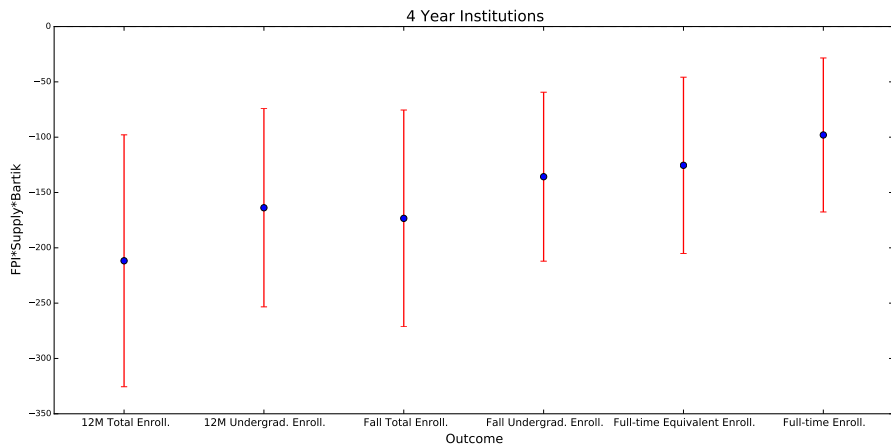| Panel A: 4-Year Schools	FFEL Subs. Loans	FFEL Unsub. Loans	Loan Origination Amount	Total Employed	Total Graduated
Enroll	0.1869***	0.1179***	1883.6***	0.8839***	0.4047***
	(0.0621)	(0.0450)	(332.8)	(0.0219)	(0.0450)
Enroll*For-profit	0.4380***	0.3940***	2694.9***	-0.1133***	-0.4157***
	(0.1015)	(0.0631)	(956.0)	(0.0379)	(0.0626)

First Stage Estimates Using Different Enrollment Measures

▸ Return

First Stage Estimates Using Different Enrollment Measures

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