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

Sandra E. Black[1,5] Jeffrey T. Denning[2,5] Lisa Dettling[3]
Sarena Goodman[3] Lesley J. Turner[4,5]

[1]Columbia University [2]Brigham Young University [3]Federal Reserve Board
[4]Vanderbilt University [5]NBER

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Necessary disclaimer

The conclusions of this research do not necessarily reflect the opinion or official position of the Texas Higher Education Coordinating Board, the Texas Workforce Commission, the State of Texas, or the Federal Reserve Board of Governors.

Motivation

Economic relevance: government loans address market failure

- Credit constrained students with positive returns underinvest
- Human capital can not be used as collateral $\Rightarrow$ credit underprovided by private market
- A simple model of credit constraints suggests that increasing access to credit will increase debt, human capital, and earnings for constrained students

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Policy relevance: U.S. student debt "crisis"

- Outstanding student debt > \$1.5T (FRBNY 2021)
- Increases in borrowing could:

  (-) Increase risk of delinquency/default, spillovers to other financial markets and macroeconomy (Minicozzi 2005; Sullivan 2018; Krishnan & Wang 2019; Mezza et al. 2020)

  (+) Increase attainment (Barr, Bird, Castleman 2019; Marx & Turner 2019; Denning & Jones 2021), post-college earnings (Rothstein & Rouse 2011; Sullivan 2018)

This study

Estimate effects of increasing federal borrowing limits on "constrained" students'

- Contemporaneous outcomes including (credits attempted, working during college, credit card use, etc)
- Longer-term outcomes (graduation, earnings, financial well-being)

Texas administrative data and credit bureau data + DiD

- Identifying variation from changes in federal loan limits in 2008 & 2009

Contribution

Empirical evidence on importance of credit constraints is mixed (e.g., Carnerio & Heckman 2002; Cameron & Taber 2004; Stinebrickner & Stinebrickner 2008; Lochner & Monge-Naranjo 2011; Brown, Scholz, Seshadri 2012; Bulman et al. 2016; Belzil, Maurel, Sidibe 2018; Goodman, Isen, Yannelis 2018)

Difficult to isolate impact of student loans ***holding constant other factors***

- Most studies look at effects of student debt caused by:
  - Variation in college prices (e.g., Mezza et al. 2020; Bleemer et al. 2017; Chakrabarti et al. 2020)
  - Variation in grant aid (e.g., Rothstein & Rouse 2011; Krishnan & Wang 2019)
- Direct evidence on effects of loan eligibility limited to short-run outcomes, specific populations (e.g., US: Barr et al. 2019; Marx & Turner 2019; Denning & Jones 2019. Chile: Solis 2017; Card and Solis 2022; South Africa; Gurgand, Loresnceau, Melonio 2011. New Zealand: Chu and Chuffe, 2020)
- A key difficulty is that student loan eligibility is near universal in the U.S.

What We Find

We provide evidence that policy-relevant variation in borrowing constraints leads to significant increases in:

- Student loan debt
- College persistence and completion
- Early career earnings
- Student loan repayment

This is consistent with a traditional model of credit constraints for college.

Road Map

- Policy Environment
- Data
- Identification strategy
- Results
  - Borrowing, persistence, degree repceipt
  - Mechanisms
  - Earnings
  - Robustness
  - Heterogeneity
- Welfare
- Conclusion

Federal student loans

~90% of total educational lending

Students at participating colleges can borrow from fed governmentt

- Federal application (FAFSA)
- Limits only vary with class standing and dependency status
- Composition (subsidized vs. unsubsidized) depends on unmet need
- Only small changes in interest rates over the study period

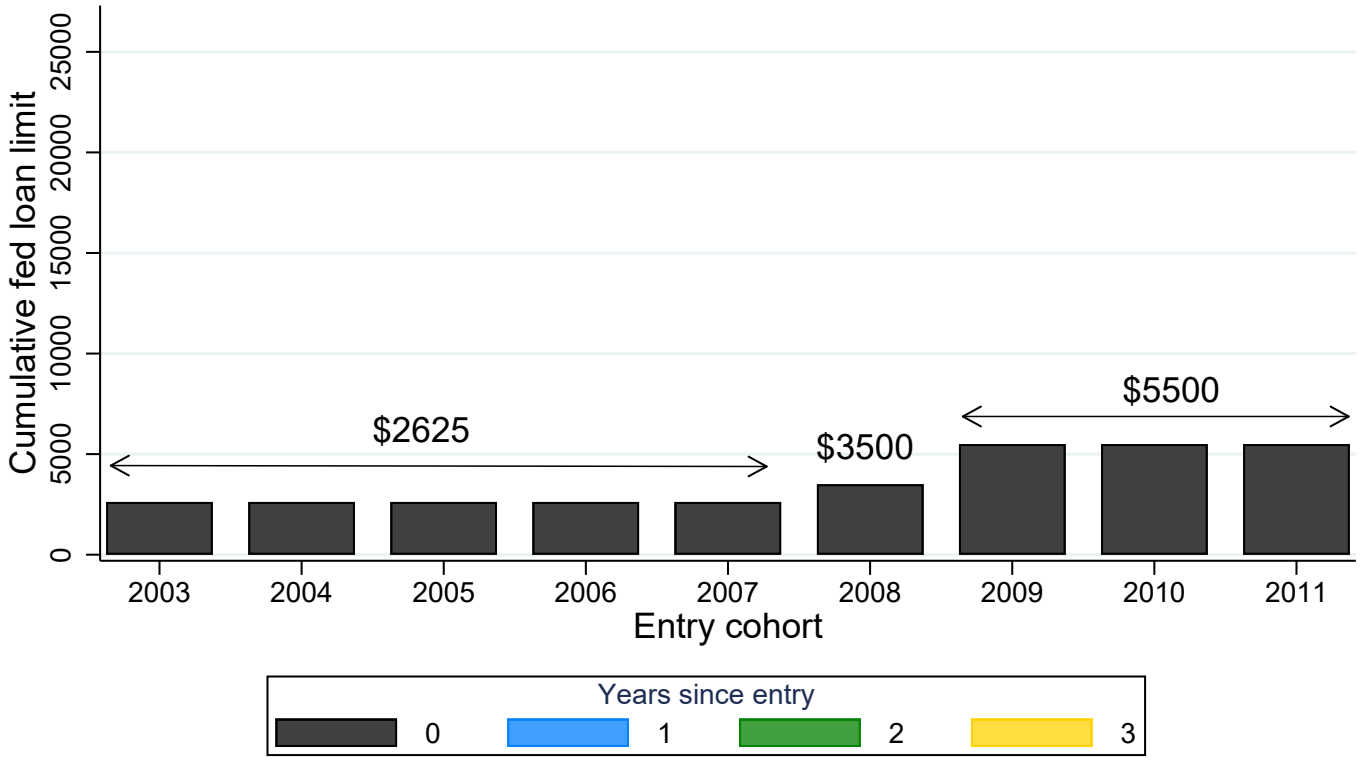
Policy variation: federal loan limits

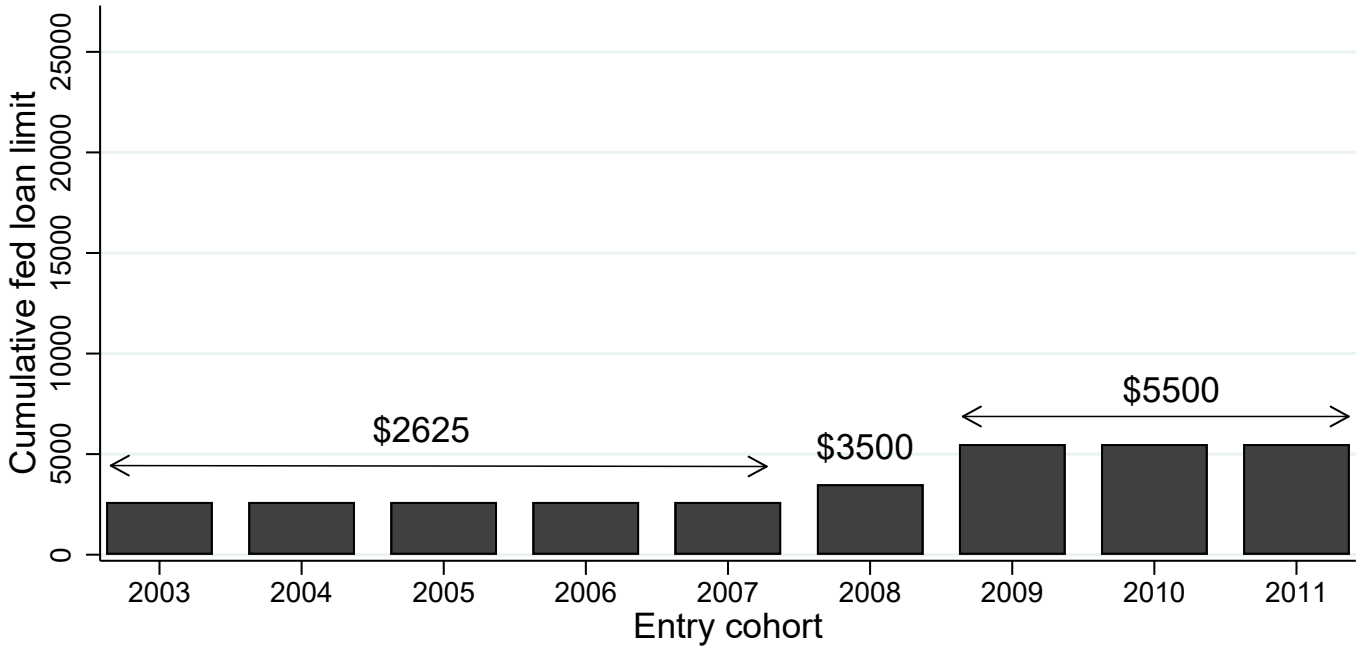
Two changes to undergraduate loan limits:

- Higher Education Reconciliation Act of 2005
- Ensuring Continued Access to Student Loans Act of 2008

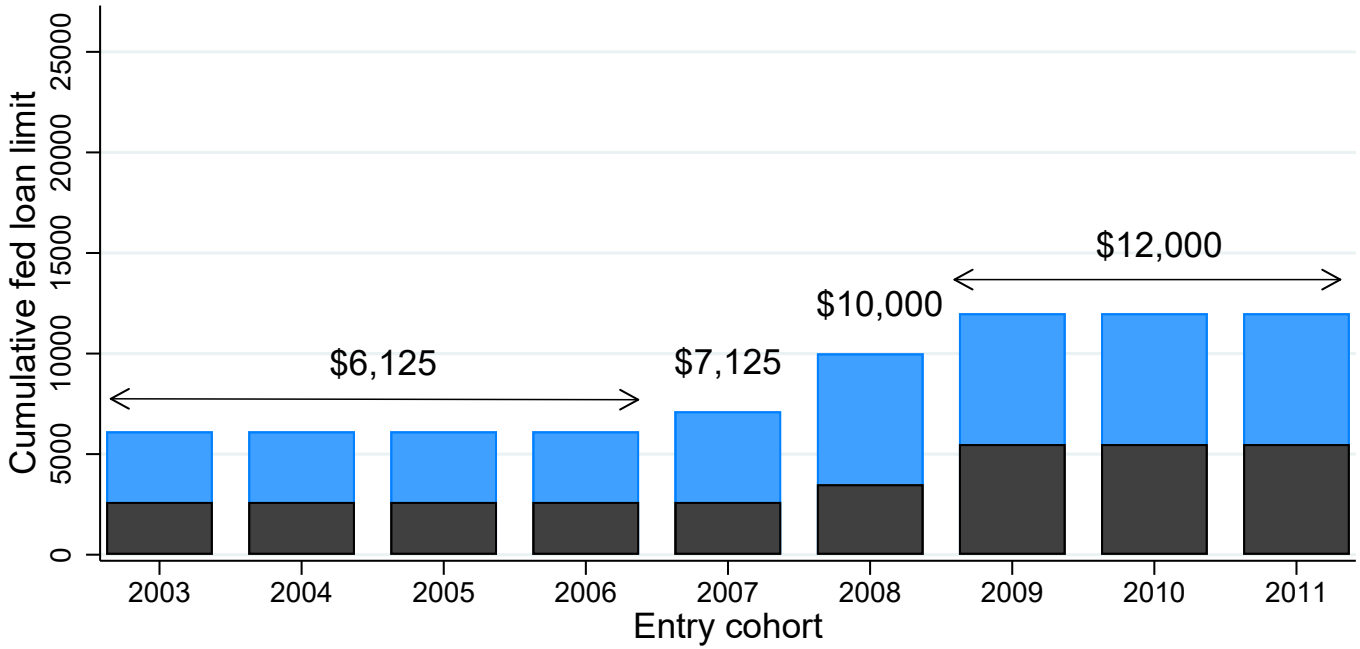
Academic year	Freshmen	Sophomores	Upper level
2006-07 and earlier	$2,625	$3,500	$5,500
2007-08	**$3,500**	**$4,500**	$5,500
2008-09 and later	**$5,500**	**$6,500**	**$7,500**

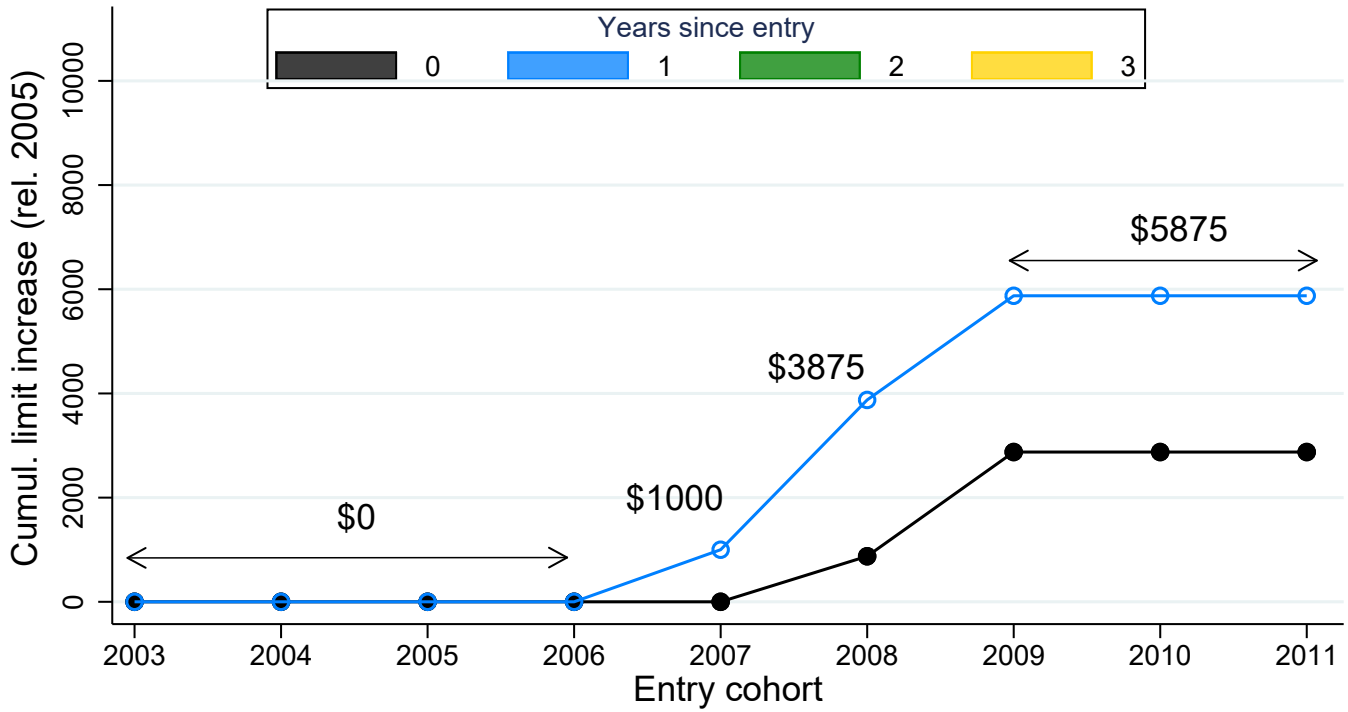
Notes: Combined subsidized and unsubsidized Stafford Loan limits. Independent undergraduate students can borrow an additional $4000 ($5000 if upper level). Community college students are limited to sophomore status regardless of credit accumulation.

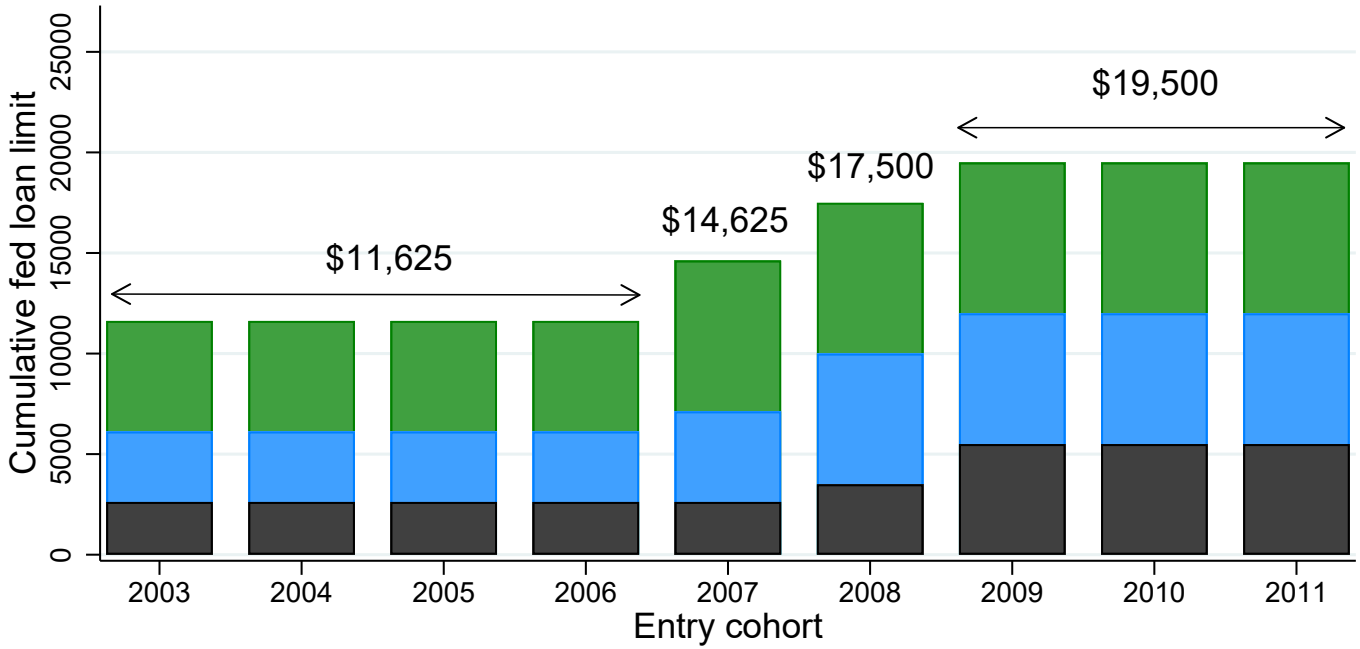

Cumulative fed loan limit
0
5000
10000
15000
20000
25000
$2625
$3500
$5500
2003
2004
2005
2006
2007
2008
2009
2010
2011
Entry cohort
Years since entry
0
1
2
3

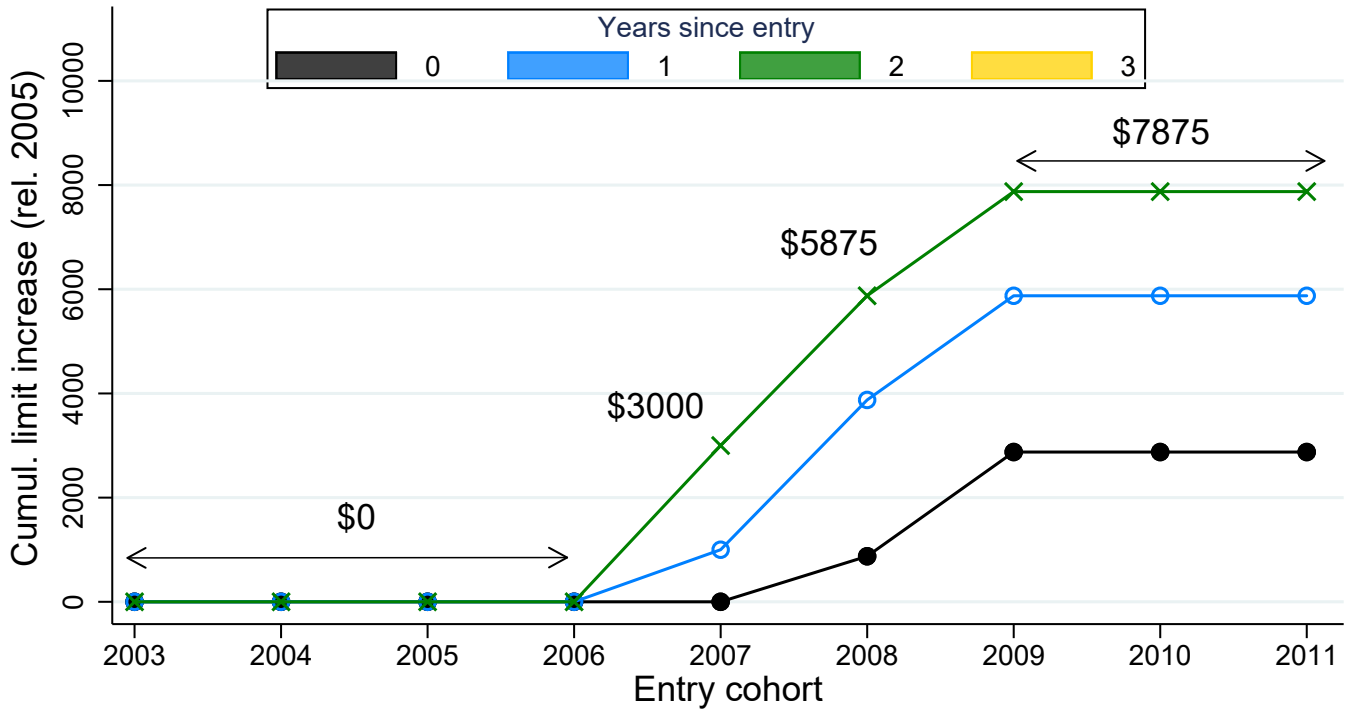

Cumulative fed loan limit
0
5000
10000
15000
20000
25000
$2625
$3500
$5500
2003
2004
2005
2006
2007
2008
2009
2010
2011
Entry cohort

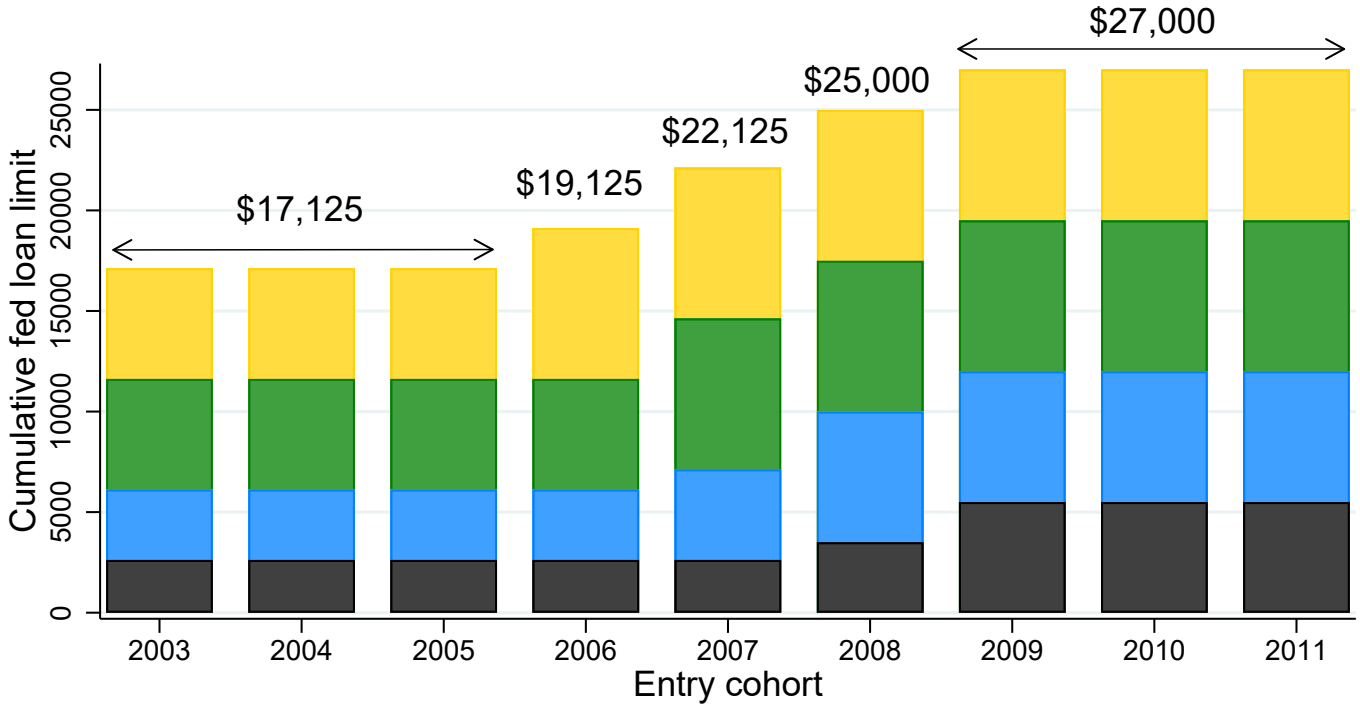

Years since entry
0
1
2
3
Cumul. limit increase (rel. 2005)
0
2000
4000
6000
8000
10000
$0
$875
$2875
2003
2004
2005
2006
2007
2008
2009
2010
2011
Entry cohort

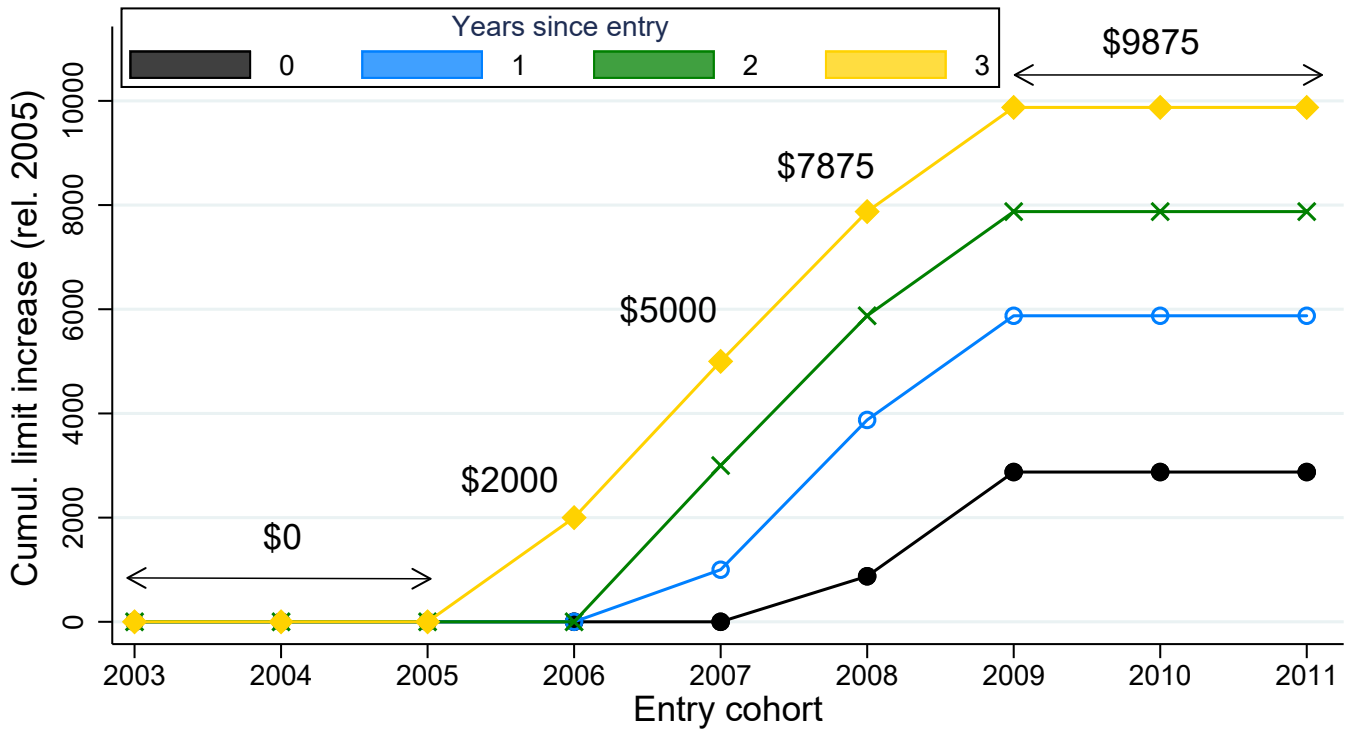

Cumulative fed loan limit
0
5000
10000
15000
20000
25000
$6,125
$7,125
$10,000
$12,000
2003
2004
2005
2006
2007
2008
2009
2010
2011
Entry cohort

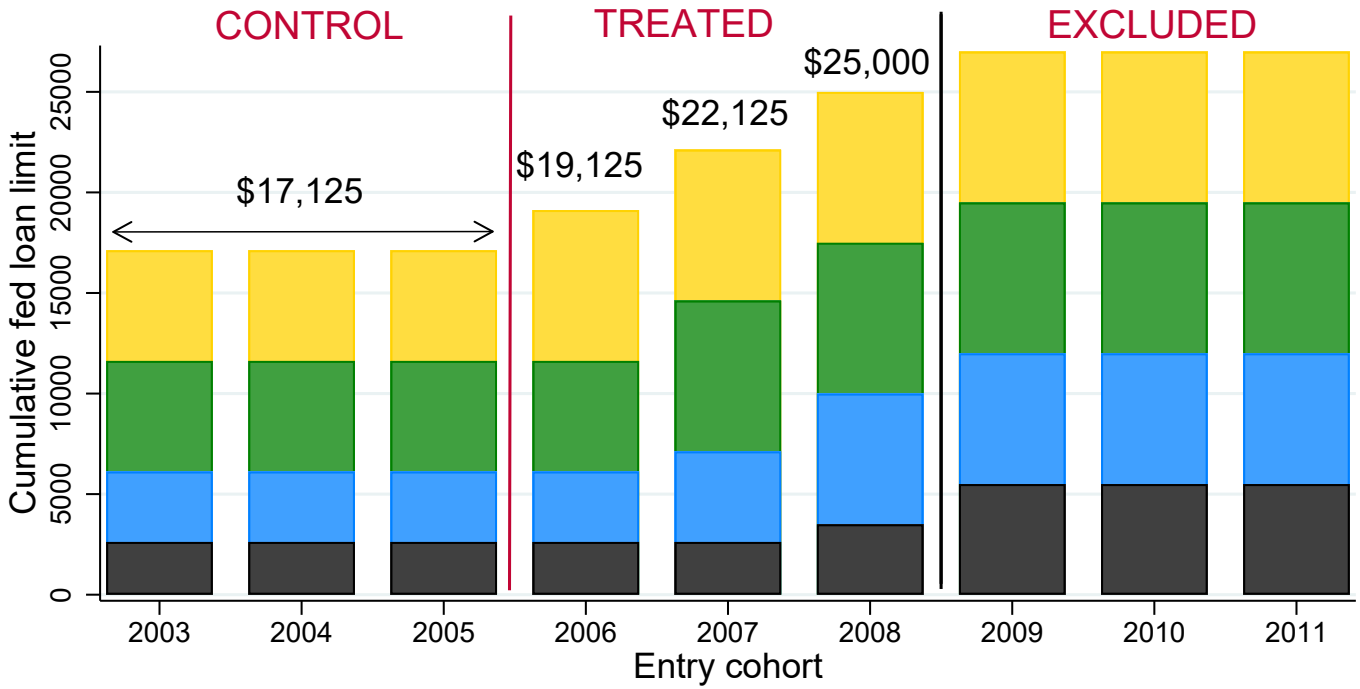

Years since entry
0
1
2
3
Cumul. limit increase (rel. 2005)
0
2000
4000
6000
8000
10000
$0
$1000
$3875
$5875
2003
2004
2005
2006
2007
2008
2009
2010
2011
Entry cohort

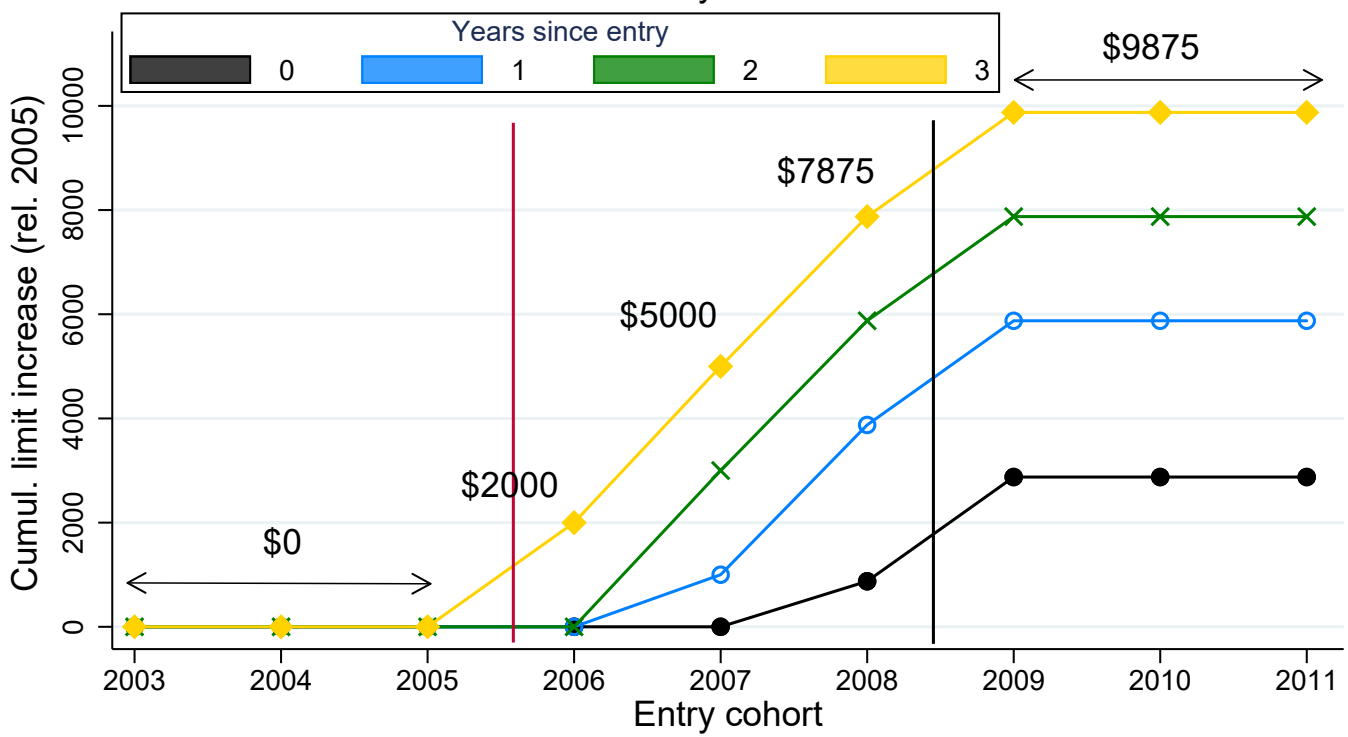

Cumulative fed loan limit
0
5000
10000
15000
20000
25000
$11,625
$14,625
$17,500
$19,500
2003
2004
2005
2006
2007
2008
2009
2010
2011
Entry cohort


Years since entry
0
1
2
3
Cumul. limit increase (rel. 2005)
0
2000
4000
6000
8000
10000
$0
$3000
$5875
$7875
2003
2004
2005
2006
2007
2008
2009
2010
2011
Entry cohort


$27,000
$25,000
$22,125
$19,125
$17,125
Cumulative fed loan limit
0
5000
10000
15000
20000
25000
2003
2004
2005
2006
2007
2008
2009
2010
2011
Entry cohort


Years since entry
0
1
2
3
$9875
$7875
$5000
$2000
$0
Cumul. limit increase (rel. 2005)
0
2000
4000
6000
8000
10000
2003
2004
2005
2006
2007
2008
2009
2010
2011
Entry cohort


CONTROL
TREATED
EXCLUDED
$17,125
$19,125
$22,125
$25,000
Cumulative fed loan limit
0
5000
10000
15000
20000
25000
2003
2004
2005
2006
2007
2008
2009
2010
2011
Entry cohort


Years since entry
0
1
2
3
$0
$2000
$5000
$7875
$9875
Cumul. limit increase (rel. 2005)
0
2000
4000
6000
8000
10000
2003
2004
2005
2006
2007
2008
2009
2010
2011
Entry cohort

Identification

Compare constrained vs. unconstrained borrowers in "treated" versus "control" cohorts

- Constrained: borrowed at federal limit in 1st year
- Unconstrained: borrowed $<$ limit in 1st year
- Focus on outcomes after 1st year

Key identifying assumptions:

- Parallel trends for constrained versus unconstrained borrowers
- Constrained borrowers similar wrt unobservables that affect outcomes before/after limit increases
- No shocks that 1) differentially affect constrained and unconstrained borrowers and 2) vary with loan limit increases

[Histograms]

Data and sample

Texas education data

- Students enrolled in public institutions
- Quarterly earnings for all UI-covered jobs in Texas

NY Consumer Credit Panel/Equifax

- Nationally representative 5 percent random sample from Equifax
- Proxy for unobserved college entry with observed borrowing

Analysis sample

- Students who borrowed in their first year* of college
- 2000-01* through 2007-08 entry cohorts
- Entered college *before* Great Recession

[Additional details] [Student characteristics]

Limitations

- Cannot link these two datasets
- Cannot identify the effect of relaxing credit constraints on enrollment/college quality margin because we focus on enrolled students
- Do not observe enrollment or earnings for students who leave Texas
- Enrollment is not observed in CCP

Specification

$$Y_{isc} = \beta_1 Cons_i + \sum_{c \neq 2005} \gamma^c \left(\mathbf{1}\left[Cohort = c\right] \times Cons_i\right) + \boldsymbol{X_i}\boldsymbol{\beta_x} + \delta_c + \delta_s + \epsilon_{isc}$$

Where:

- Y_{isc} is outcome for student i entering school s in cohort c
- $Cons_i$ indicates student i borrowed the max federal loan in first year
- $\boldsymbol{X_i}$ is vector of baseline characteristics (gender, race, age at entry)
- δ_s are school (state) at entry FE, δ_c are entry cohort FE
- Standard errors clustered by entry institution ($N \approx 120$) or state

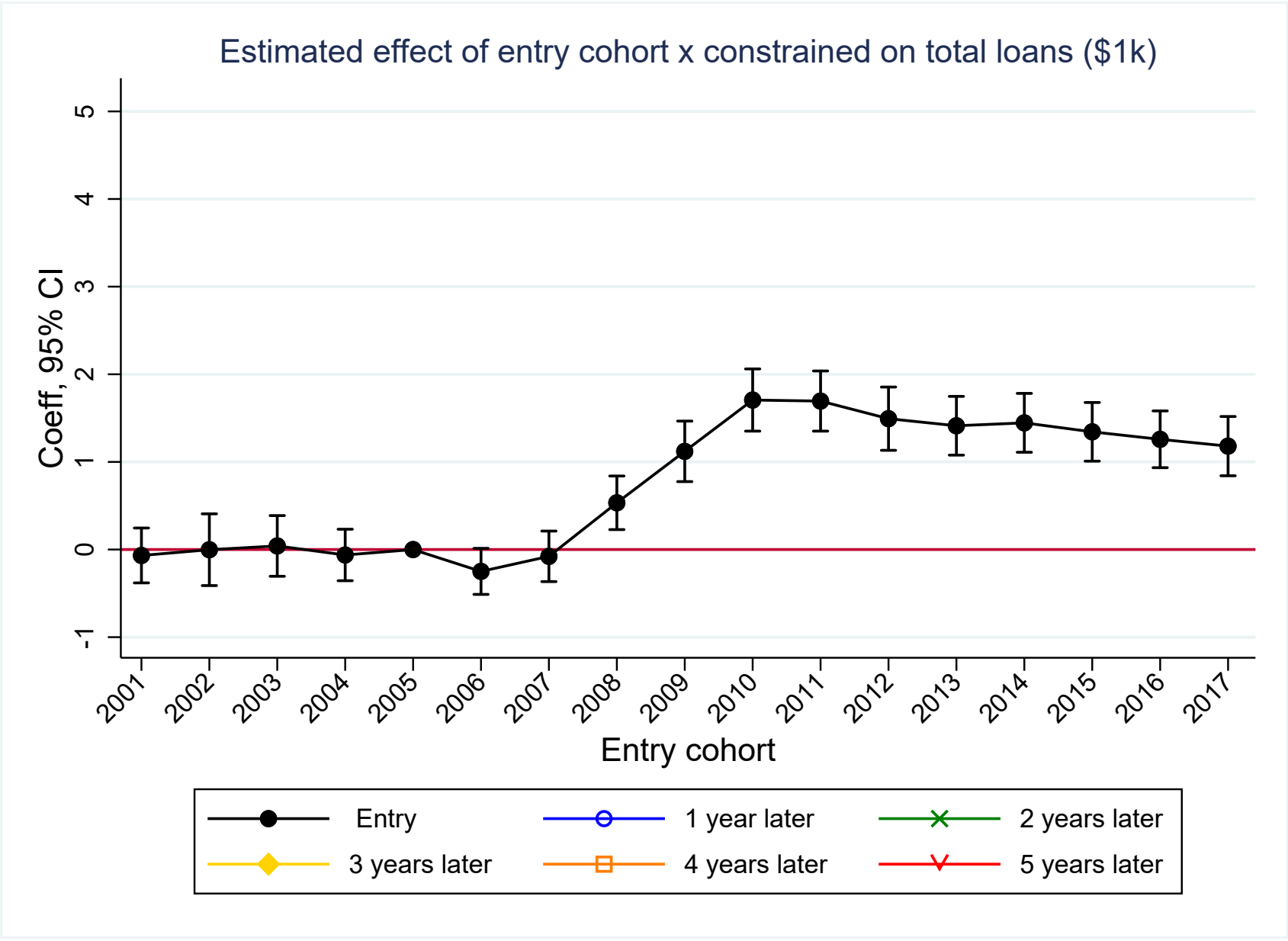
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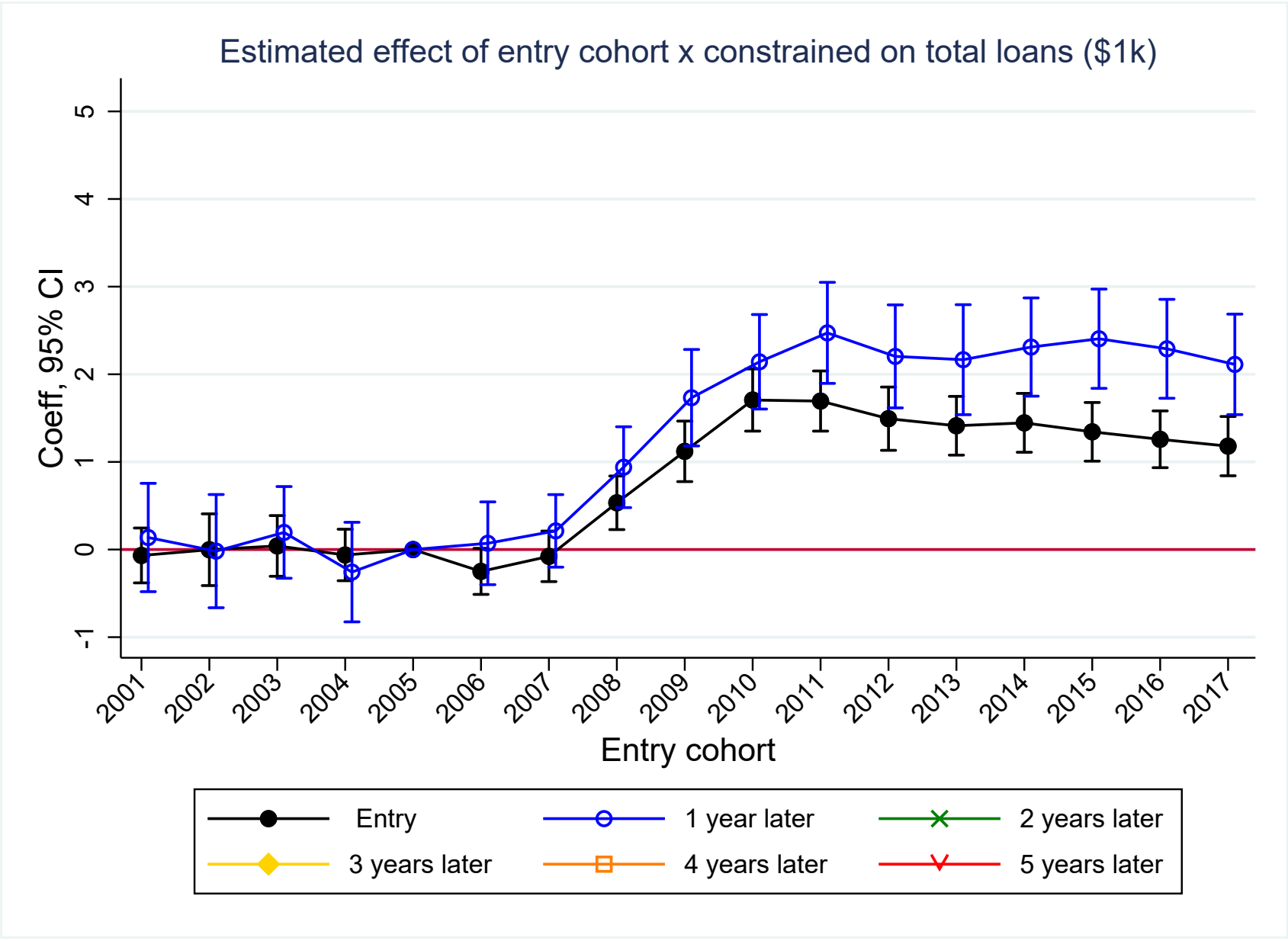
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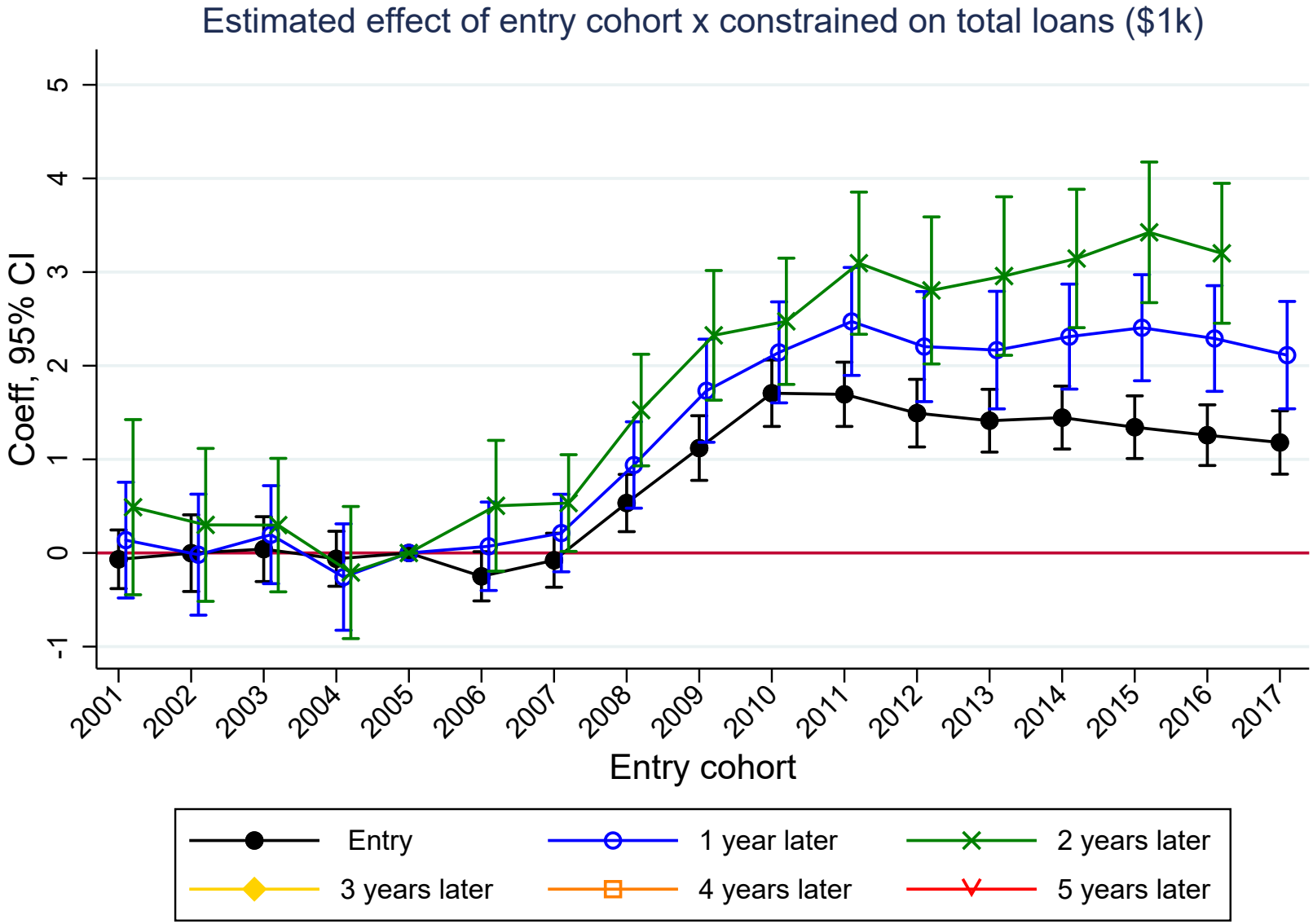
"First stage"


Estimated effect of entry cohort x constrained on total loans ($1k)
Coeff, 95% CI
-1
0
1
2
3
4
5
2001
2002
2003
2004
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2006
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Entry cohort
Entry
1 year later
2 years later
3 years later
4 years later
5 years later

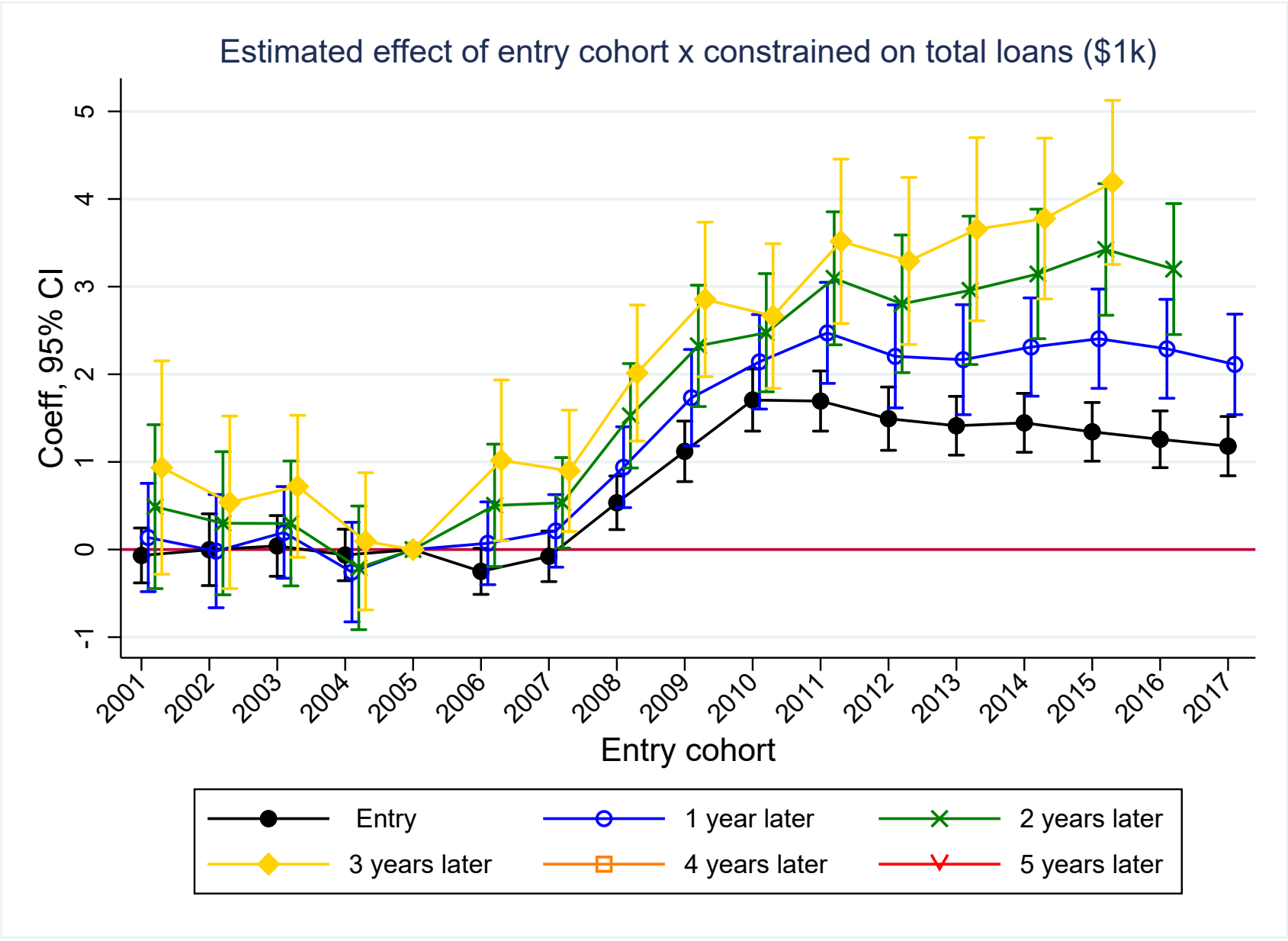
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4 years later
5 years later

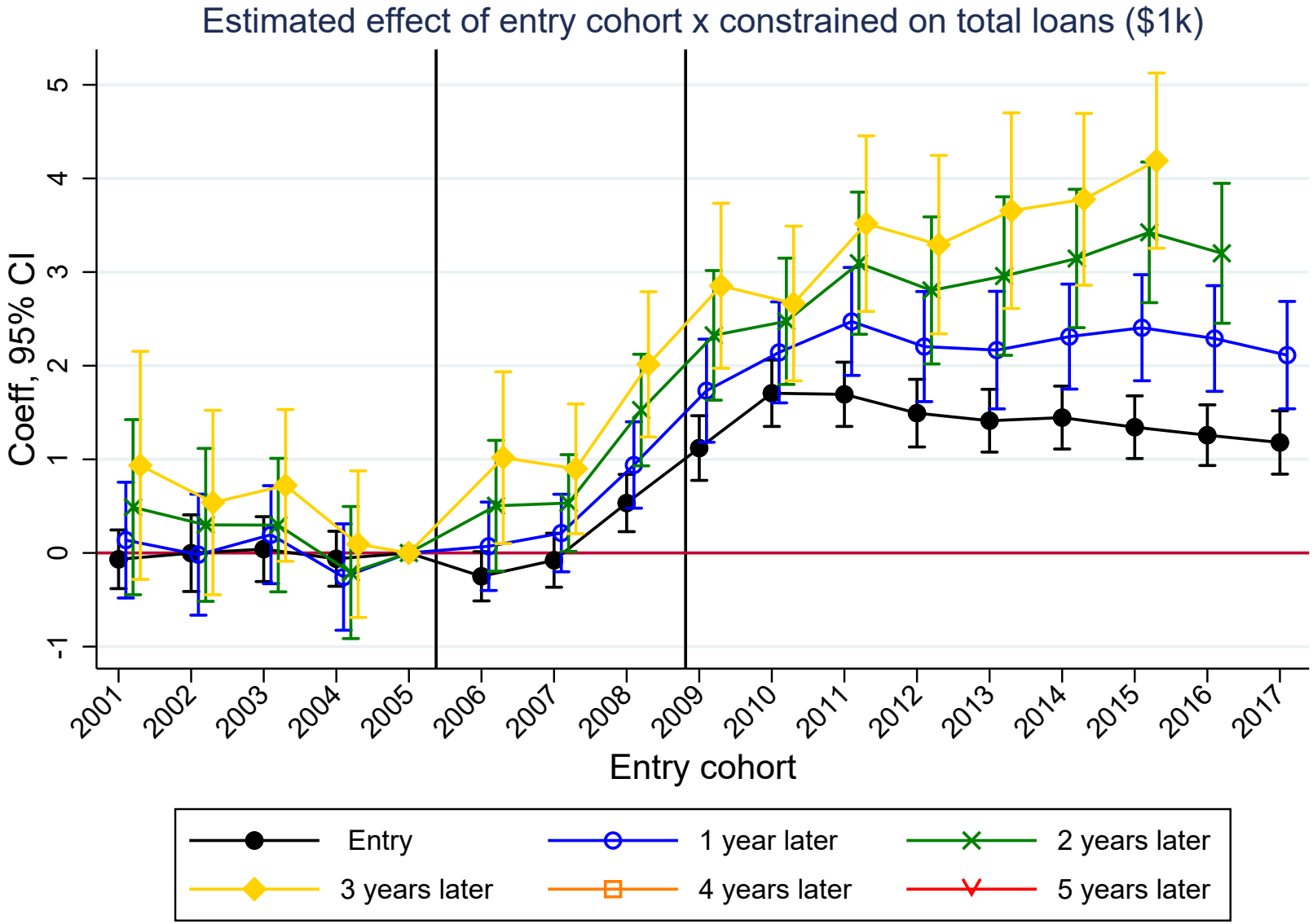
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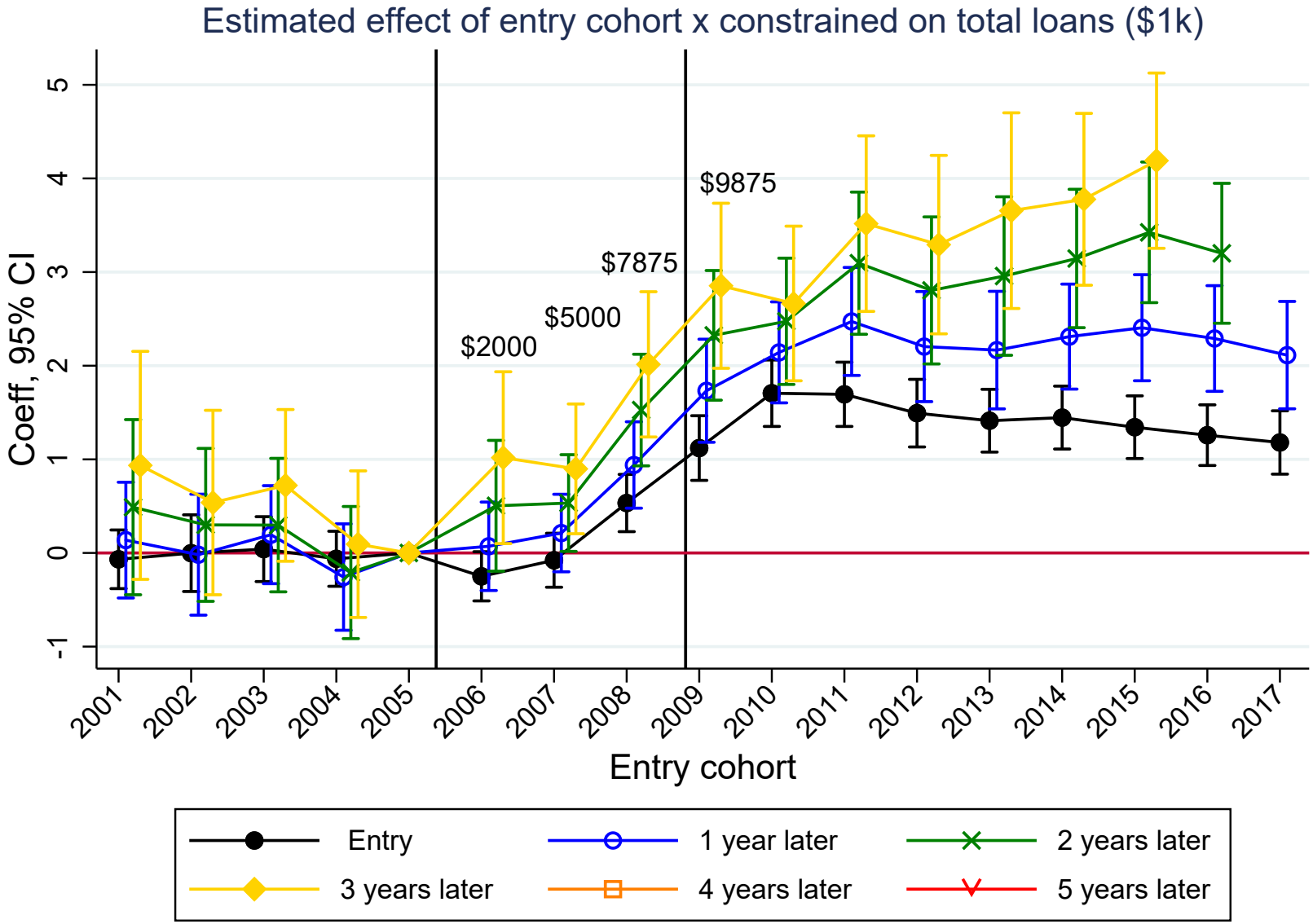
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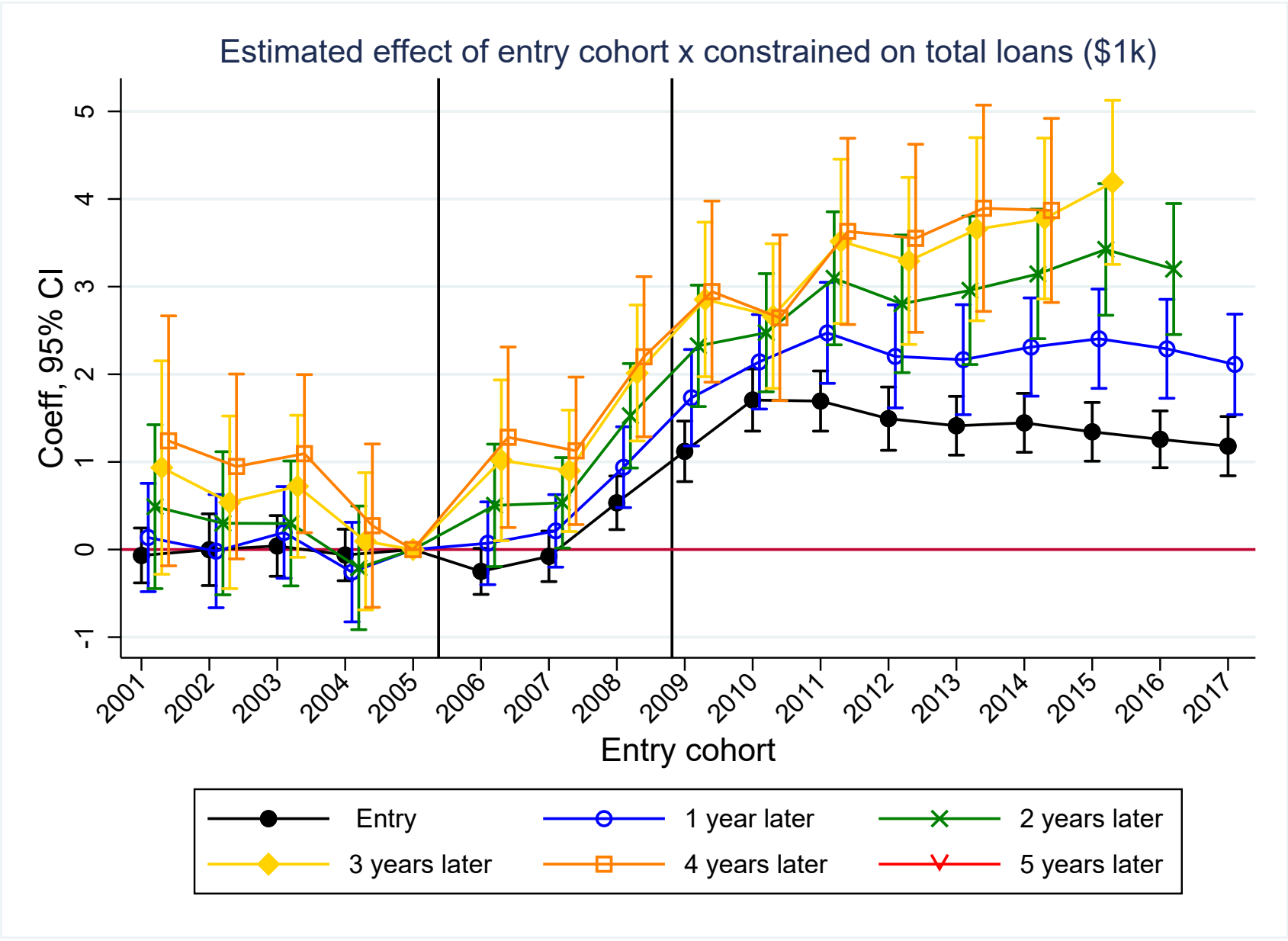
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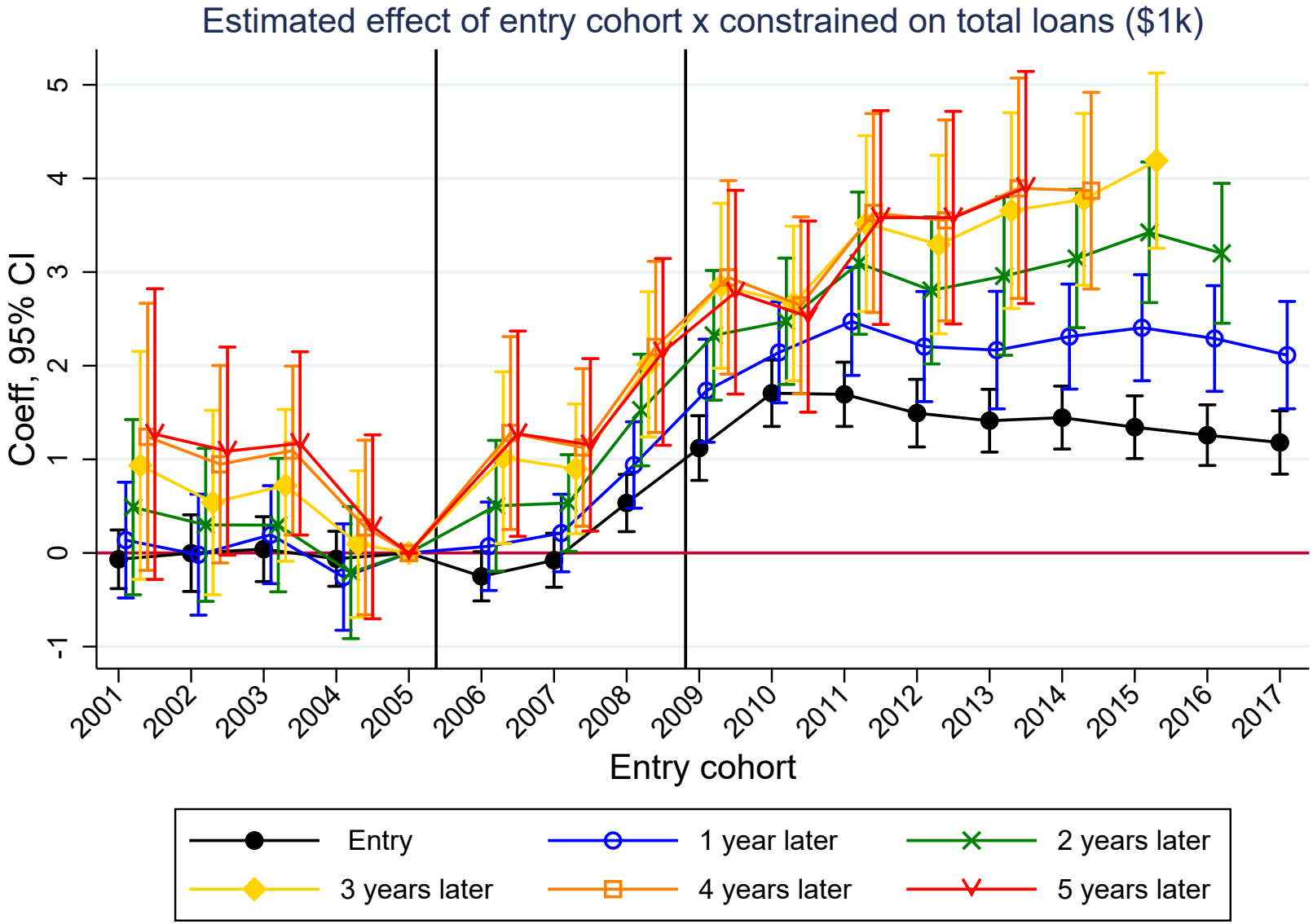
"First stage"


Estimated effect of entry cohort x constrained on total loans ($1k)
Coeff, 95% CI
-1
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$2000
$5000
$7875
$9875
2001
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Entry cohort
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3 years later
4 years later
5 years later

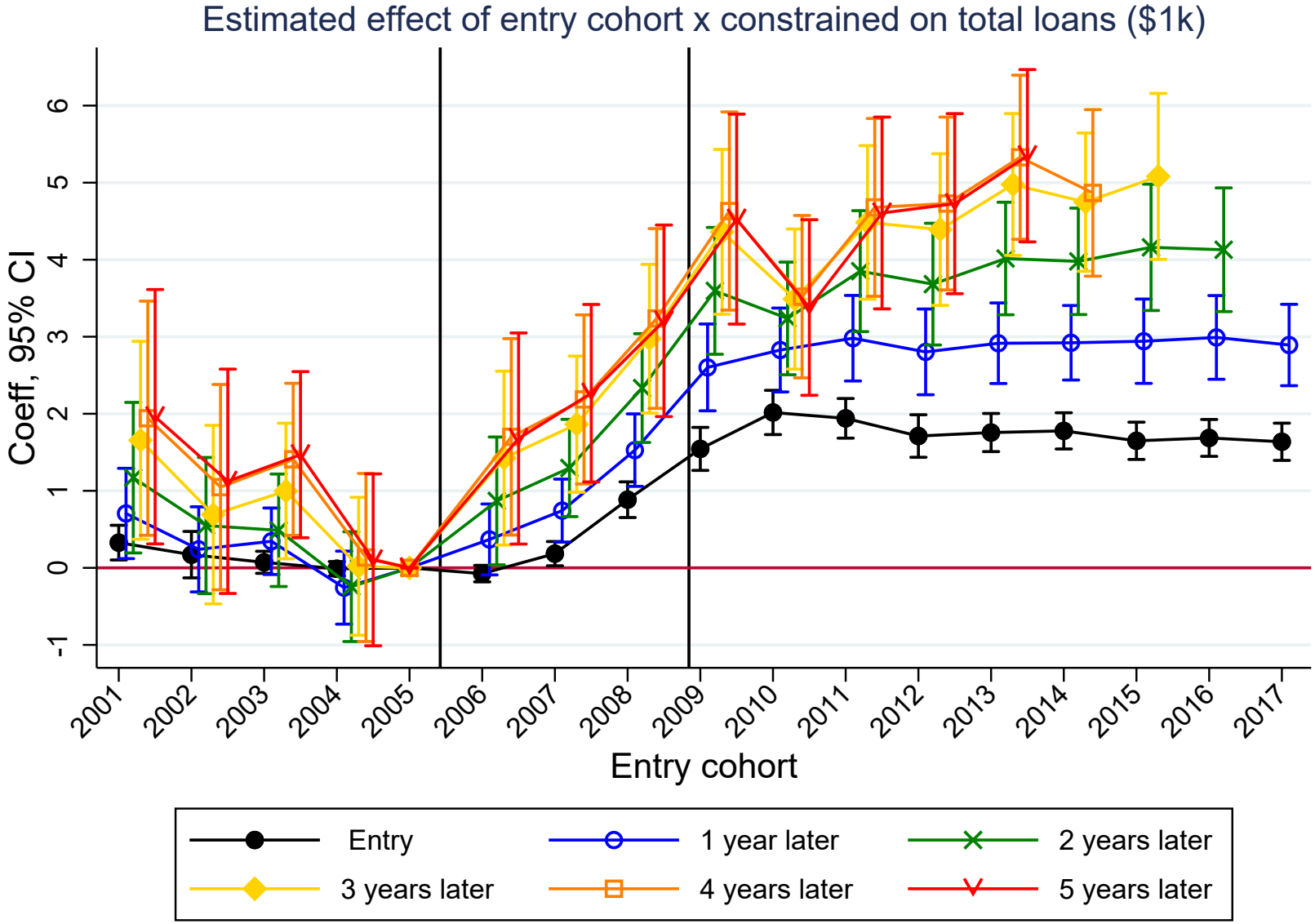
"First stage"


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Entry cohort
Entry
1 year later
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3 years later
4 years later
5 years later

"First stage"

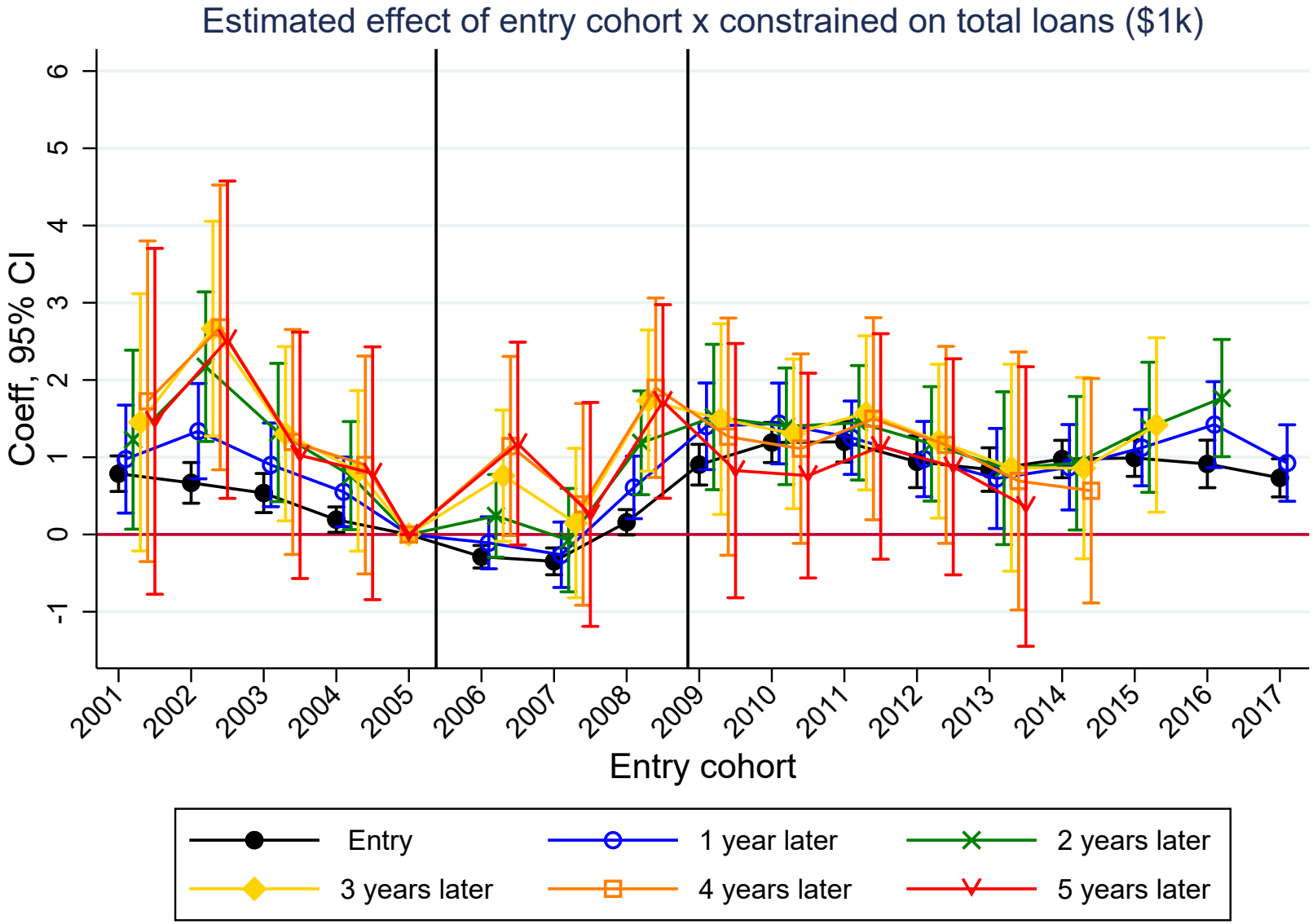

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2016
2017
Entry cohort
Entry
1 year later
2 years later
3 years later
4 years later
5 years later

Dependent Students



[CC entrants] [4-year entrants] [CCP sample]

Independent Students



[CC entrants] [4-year entrants] [CCP sample]

DD specification

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- $Post_c$ indicates entering in 2006 and later
- δ_s are school (state) at entry FE, δ_c are entry cohort FE
- Standard errors clustered by entry institution/state + p-values from wild-t bootstrap (clustered by entry cohort)
- Sample limited to pre-GR entry cohorts

Effects of loan limit increases on cumulative borrowing

Years since entry =	4	5	6
A. Entered 4-year institution (N = 77,900)			
Constrained x Cohort in {2006,2007,2008}	1801	1852	1874
	(668)**	(668)**	(710)**
	{0.031}	{0.031}	{0.058}
Dependent variable mean	$17,560	$20,020	$22,030
C. Entered community college (N = 42,843)			
Constrained x Cohort in {2006,2007,2008}	1113	1224	1215
	(244)**	(282)**	(316)**
	{0.004}	{0.009}	{0.013}
Dependent variable mean	$9,237	$10,570	$11,690

Notes: Dependent variable is cumulative student loans ($1k). Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$; p-values from wild-t cluster bootstrap in brackets.

[CCP estimates] [Federal Stafford loans] [Other loans] [Any borrowing] [Heterogeneity: race/ethnicity] [Heterogeneity: SES] [Adtl. specs]

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Assessing key id assumptions

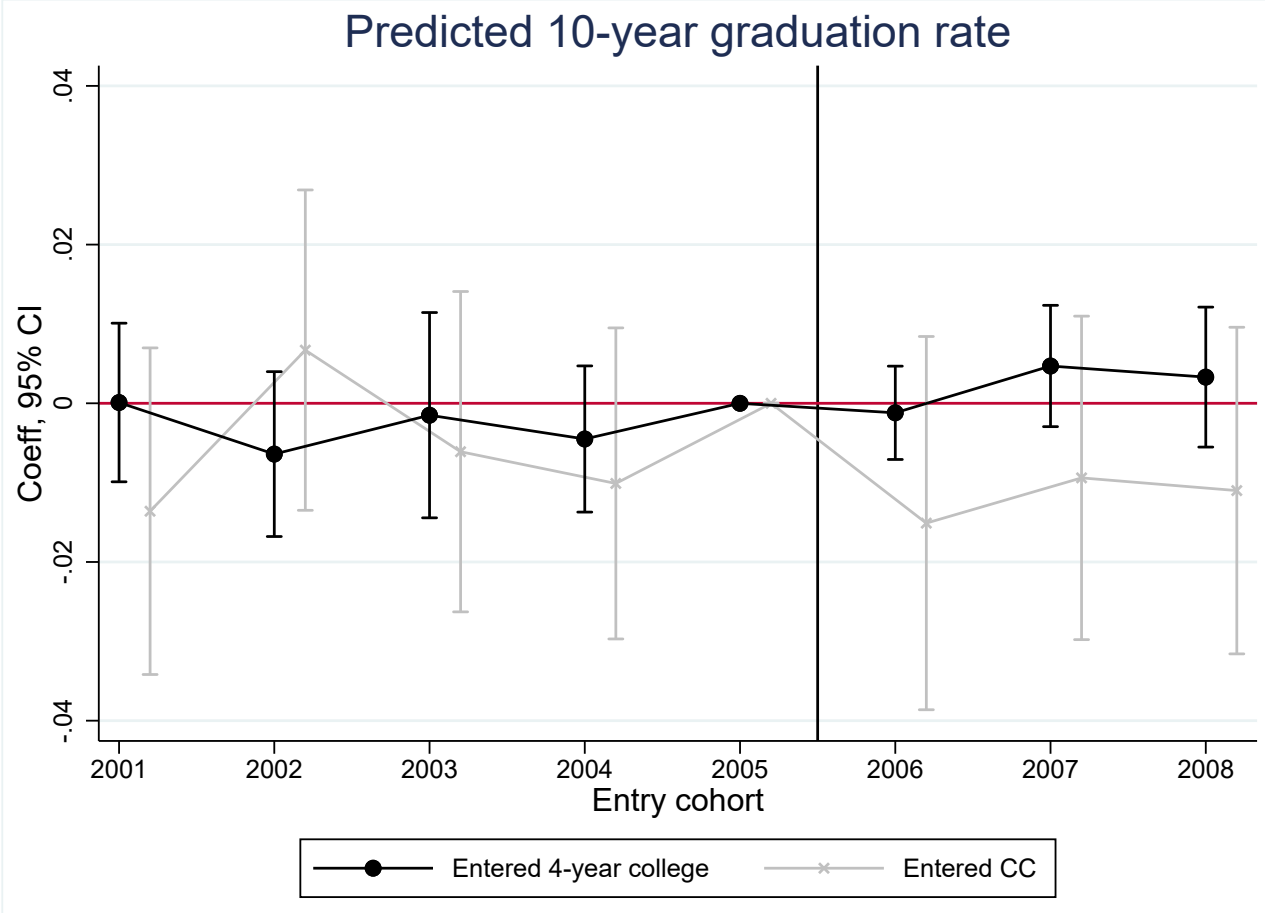
No shocks that differentially affect constrained and unconstrained borrowers and also vary with loan limit increases

- Placebo tests - estimate “effects” on baseline characteristics
- Parallel pre-trends in outcomes

Assessing key id assumptions

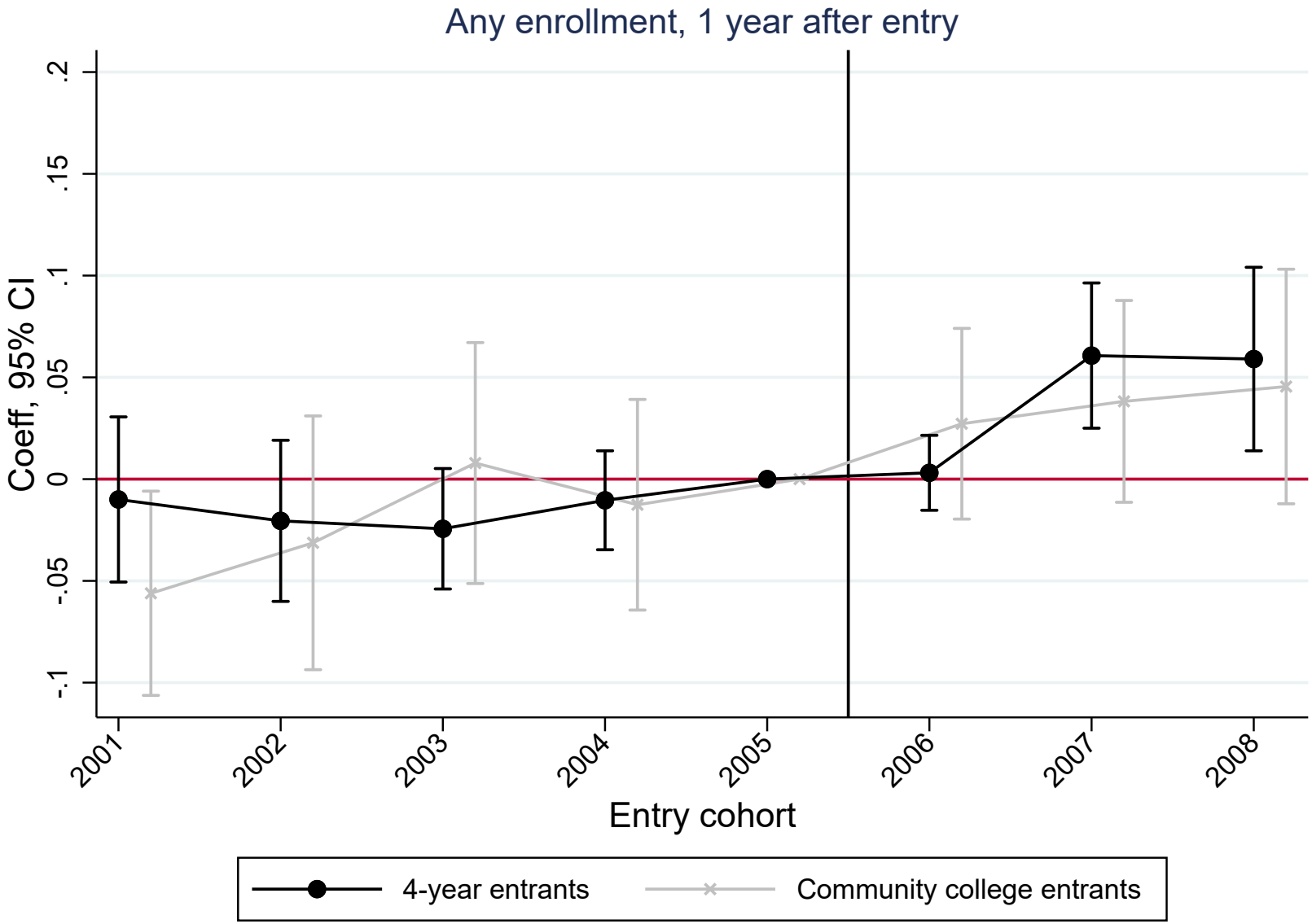
No shocks that differentially affect constrained and unconstrained borrowers and also vary with loan limit increases

- Placebo tests - estimate "effects" on baseline characteristics
- Parallel pre-trends in outcomes

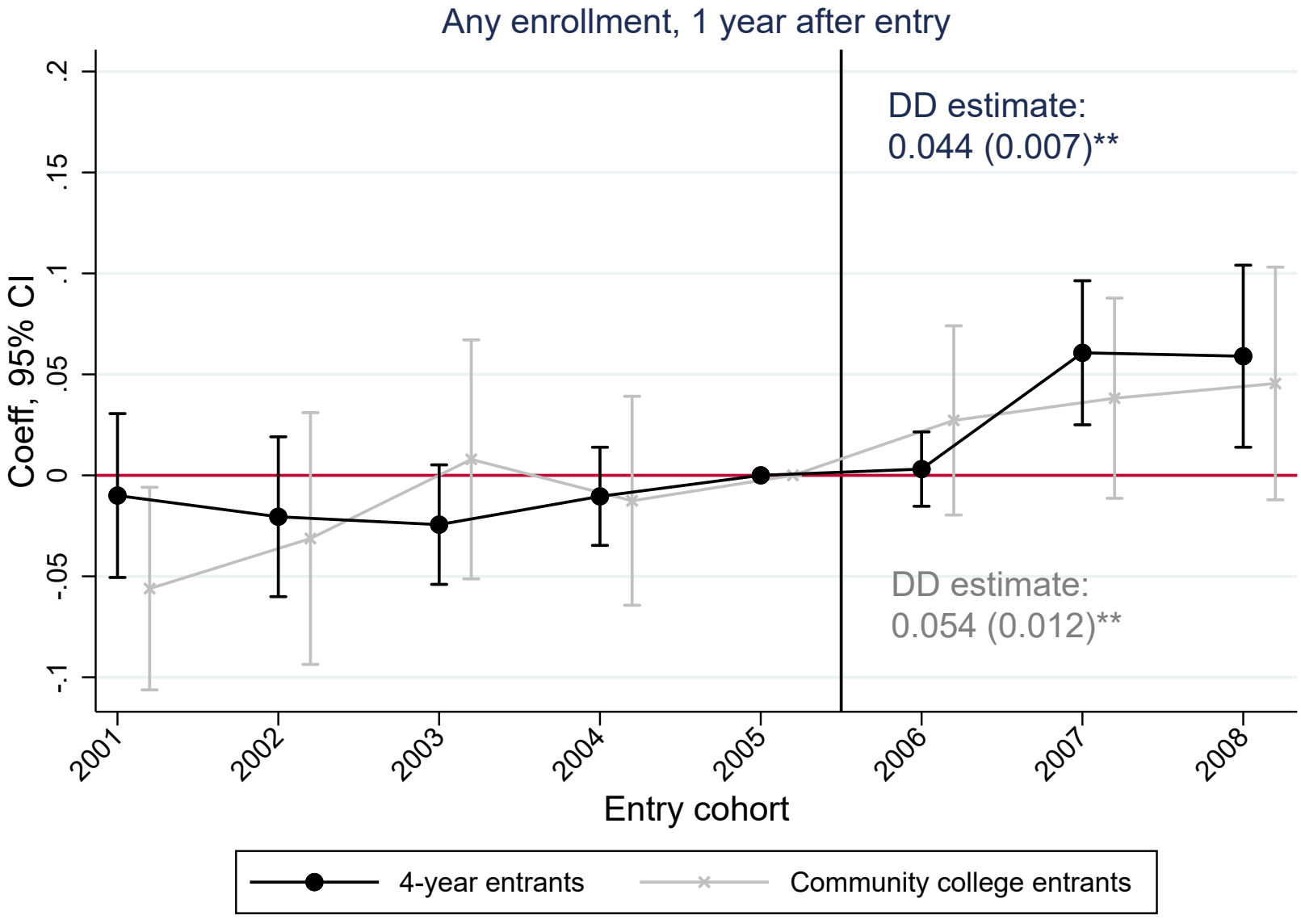


[Demographic characteristics] [Baseline financial aid] [CCP]

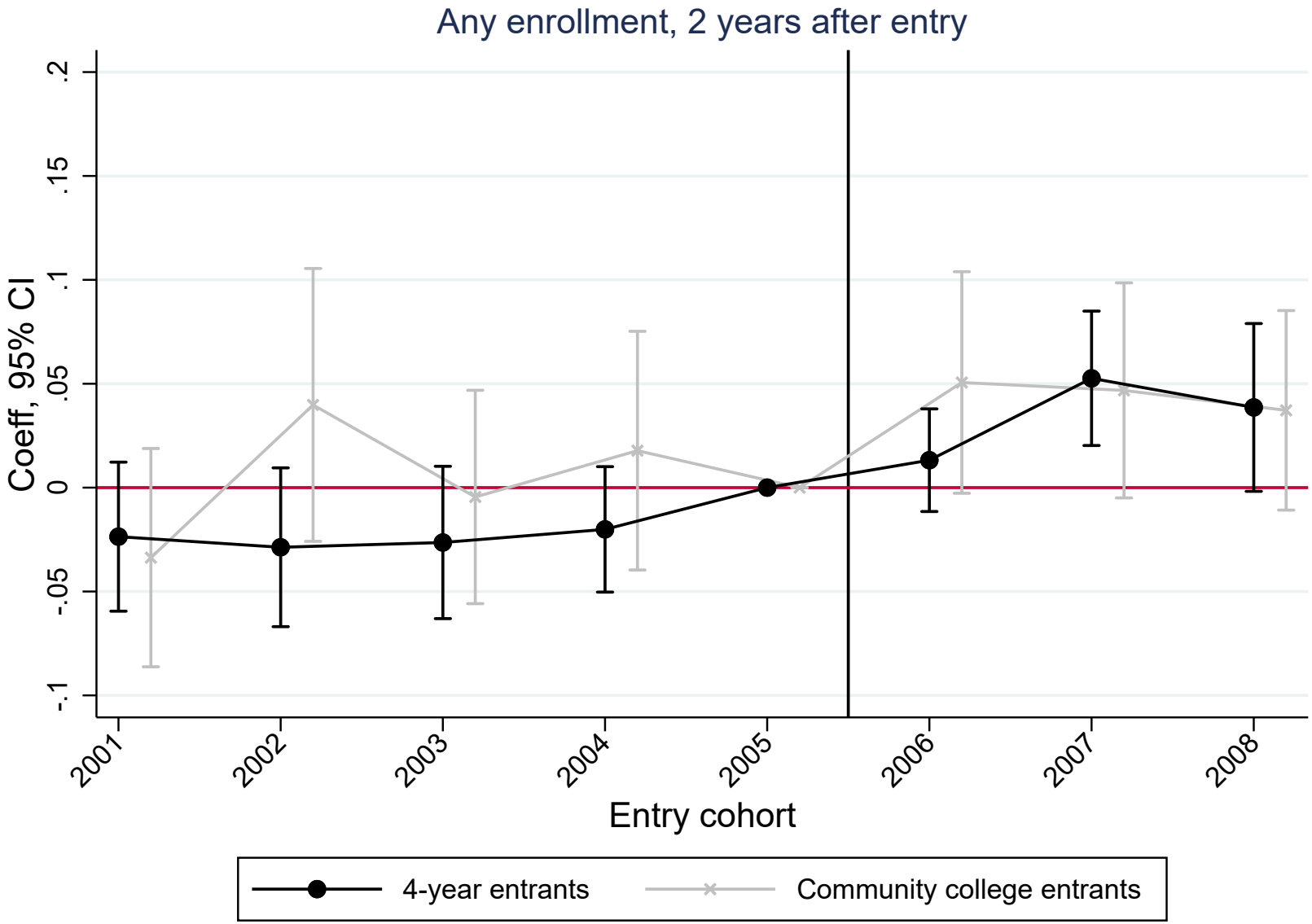
Effects on persistence



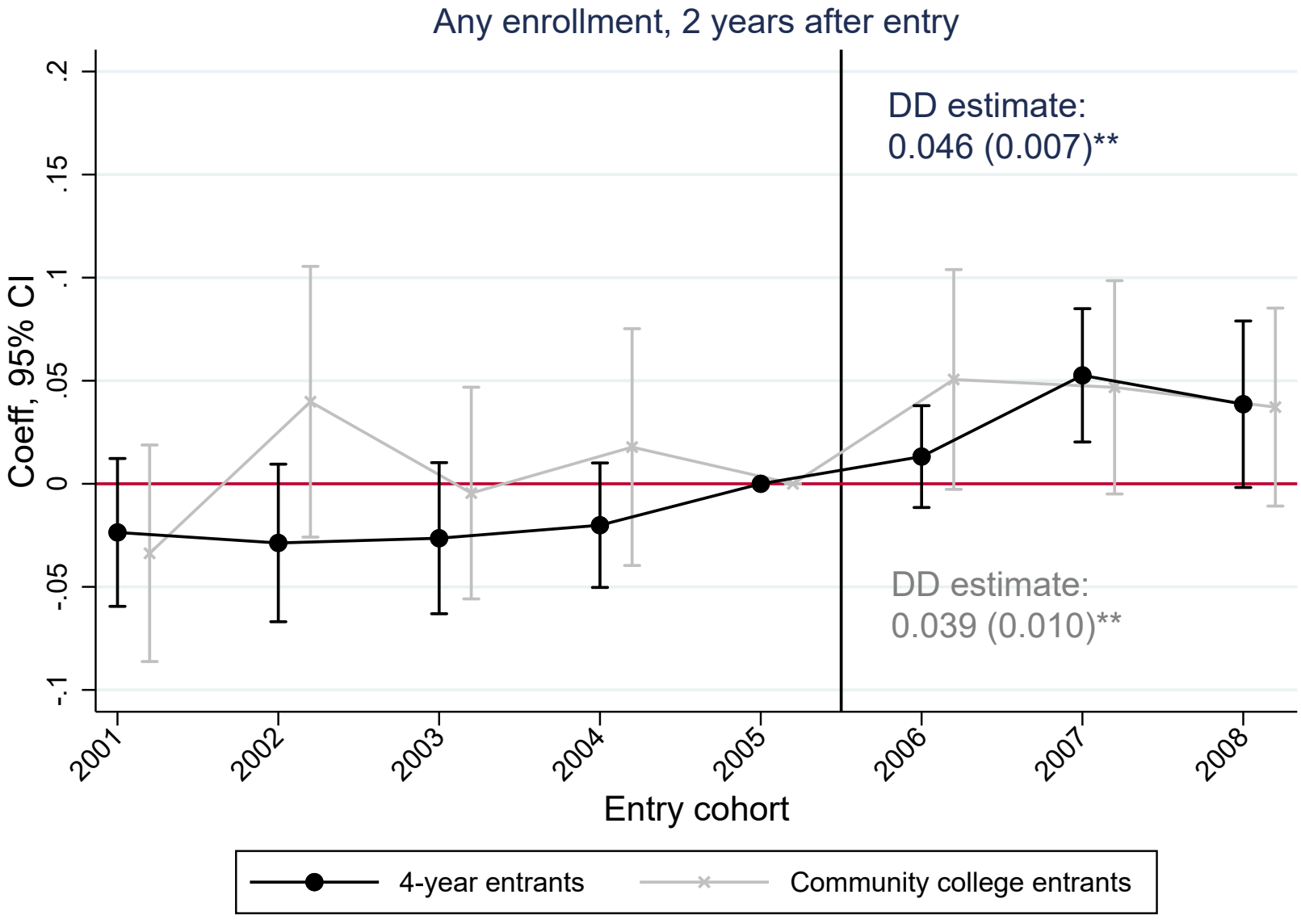
[4-year enrollment] [CC enrollment]



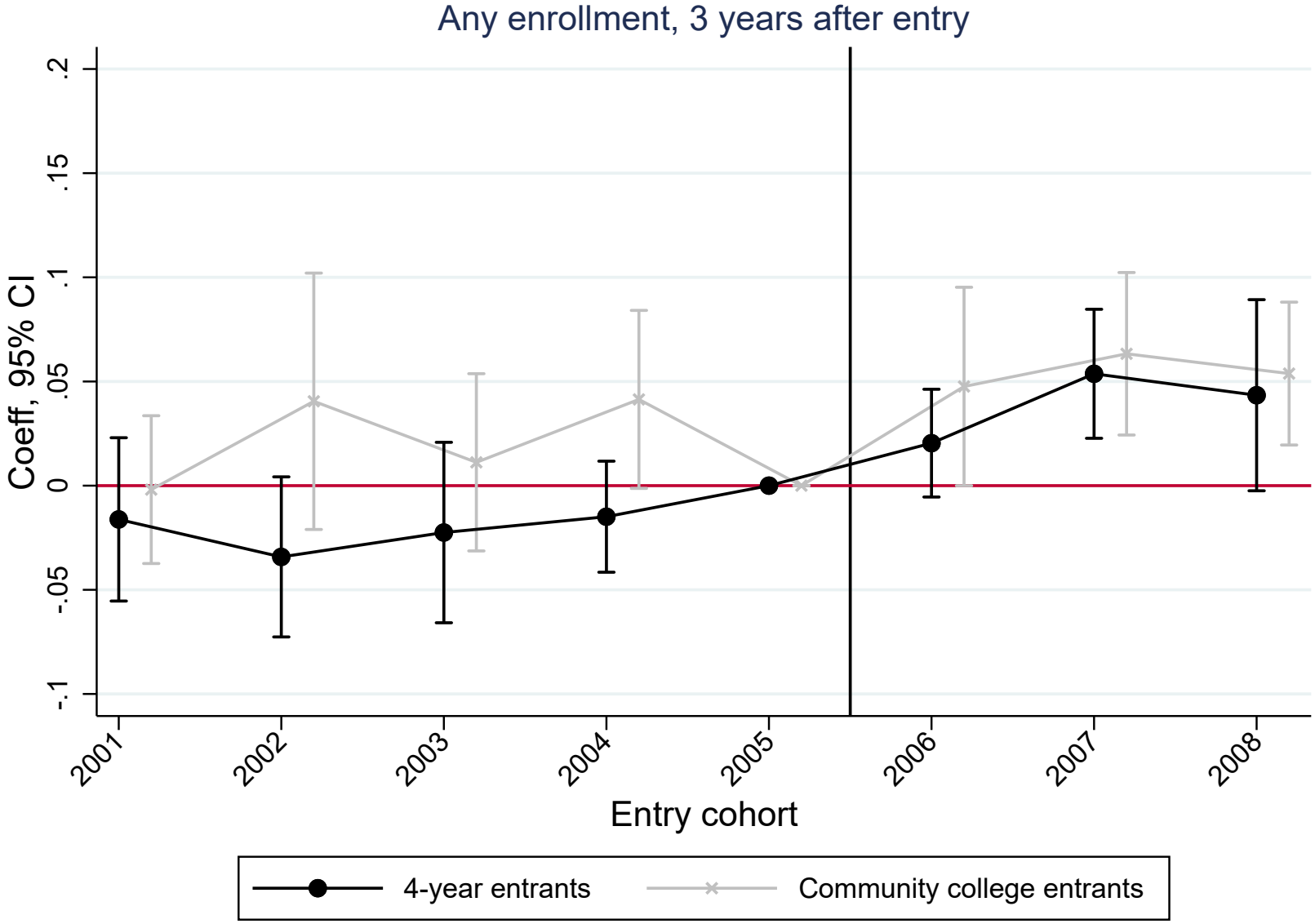
[4-year enrollment] [CC enrollment]



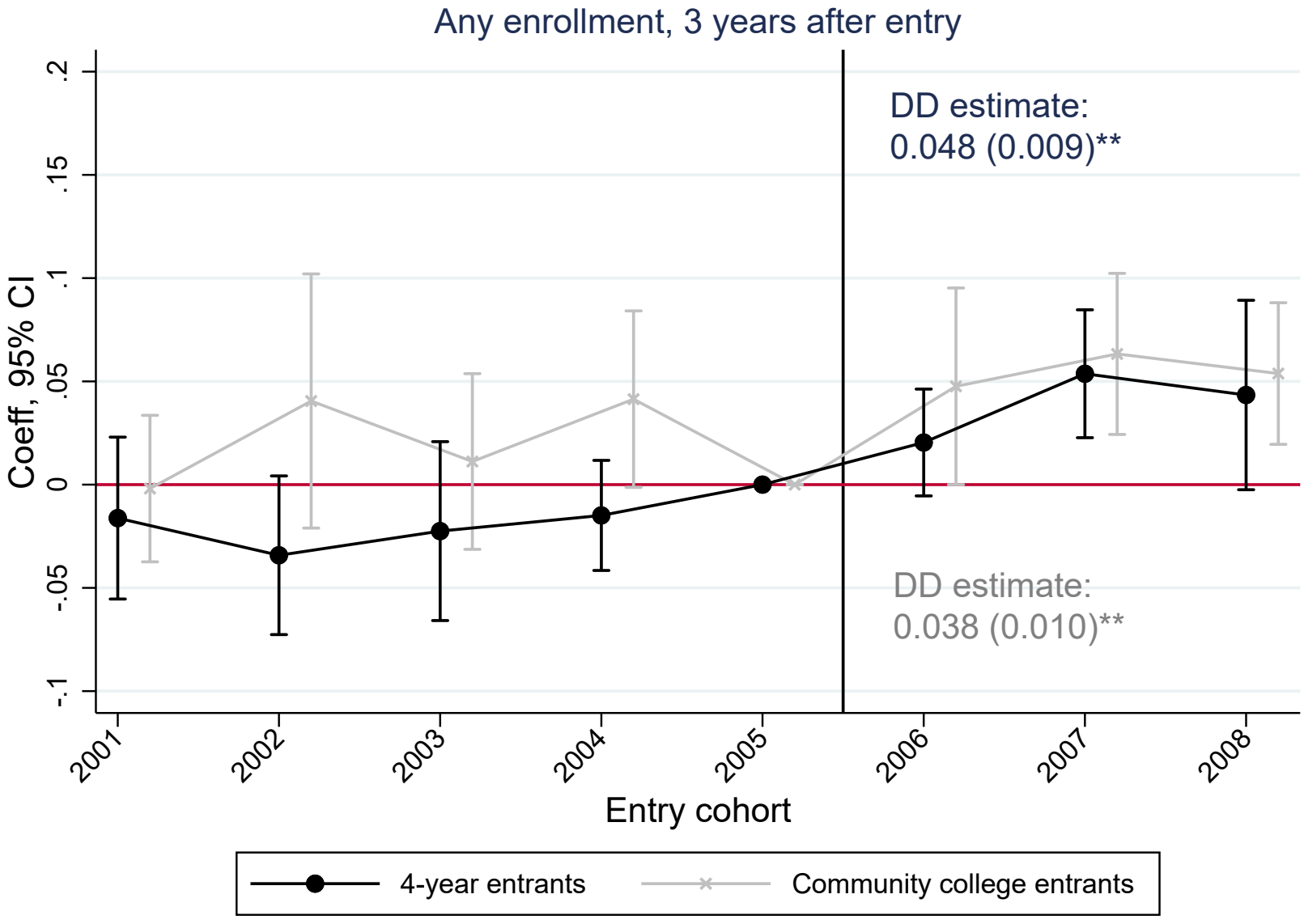
[4-year enrollment] [CC enrollment]



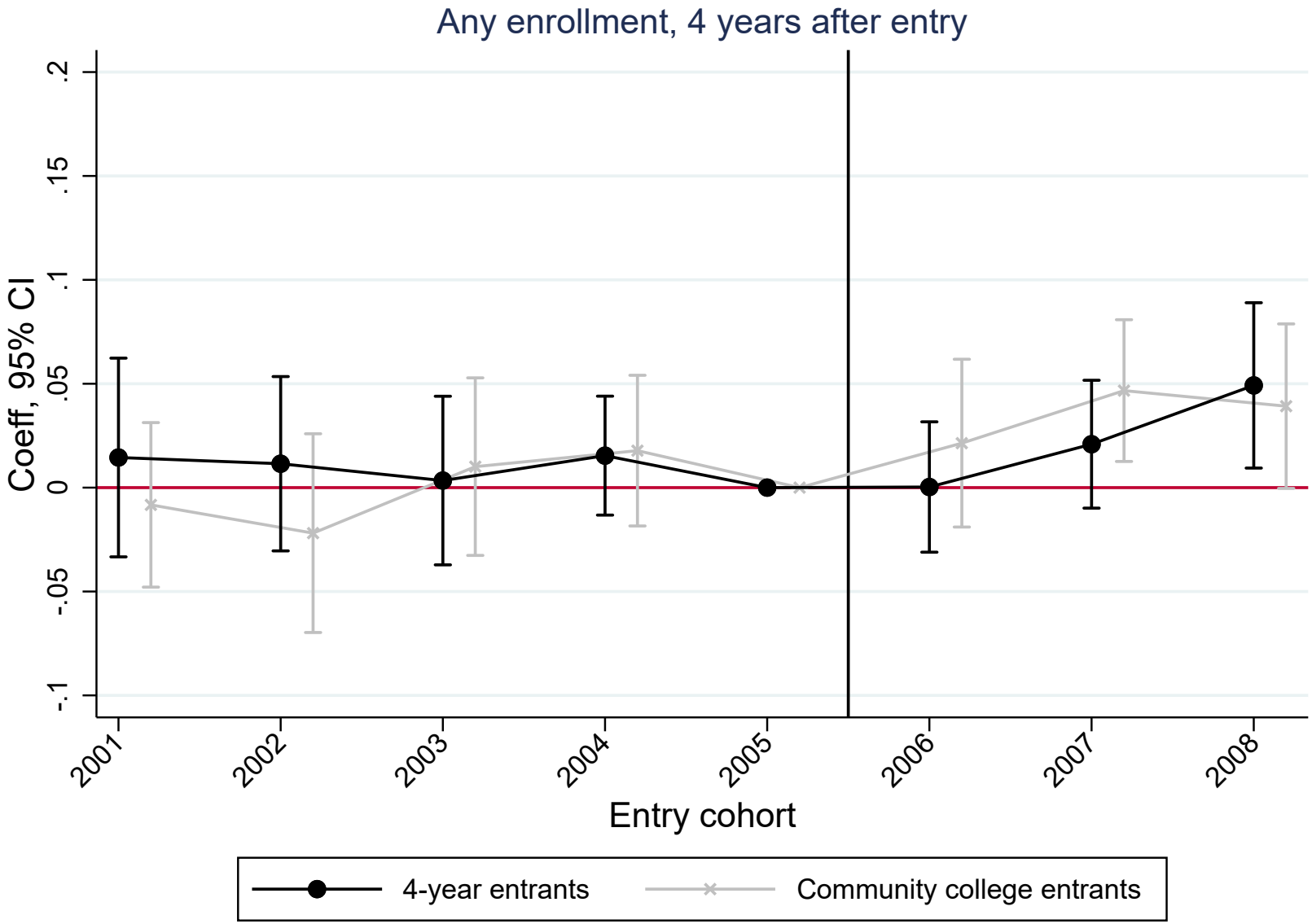
[4-year enrollment] [CC enrollment]



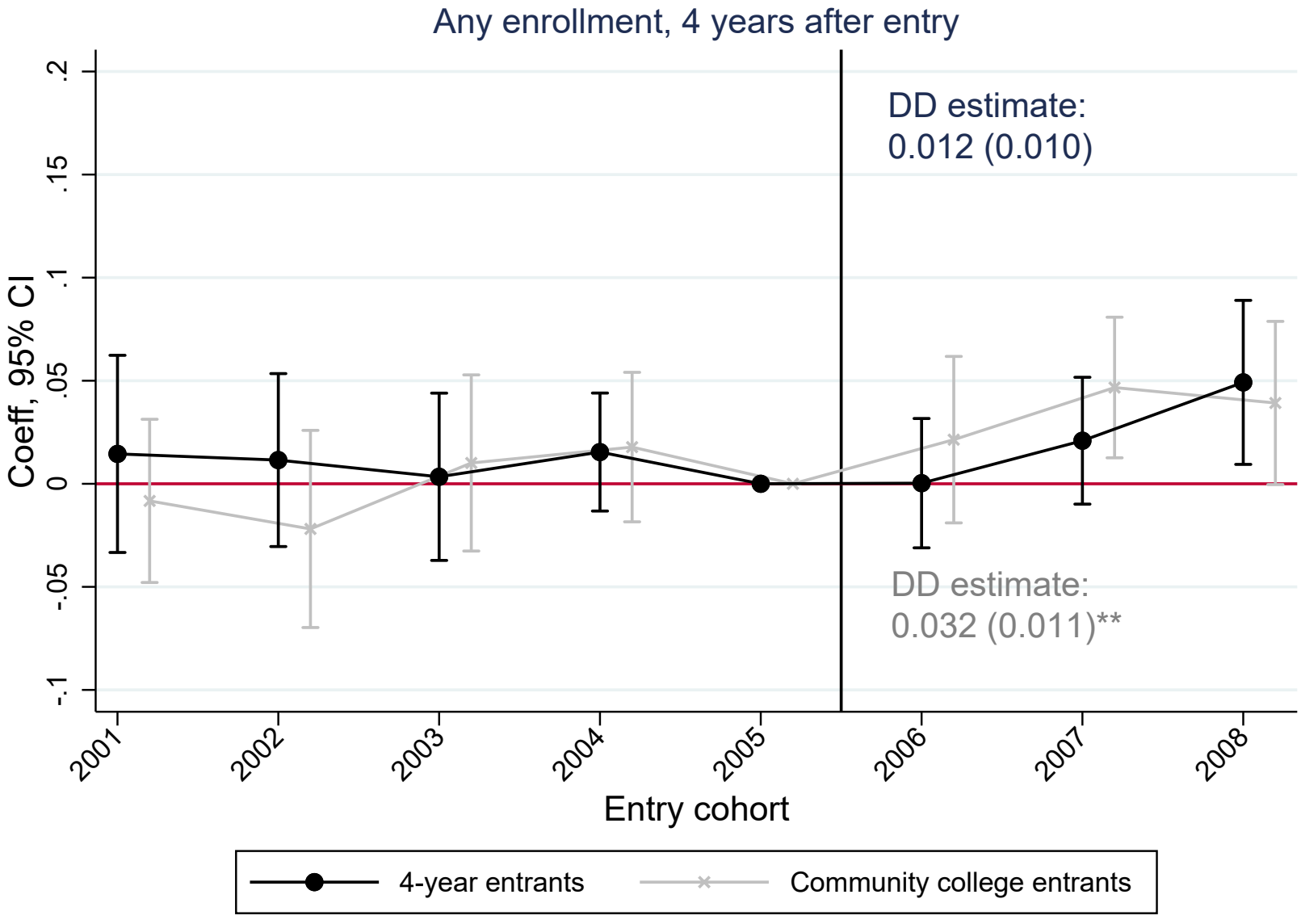
[4-year enrollment] [CC enrollment]



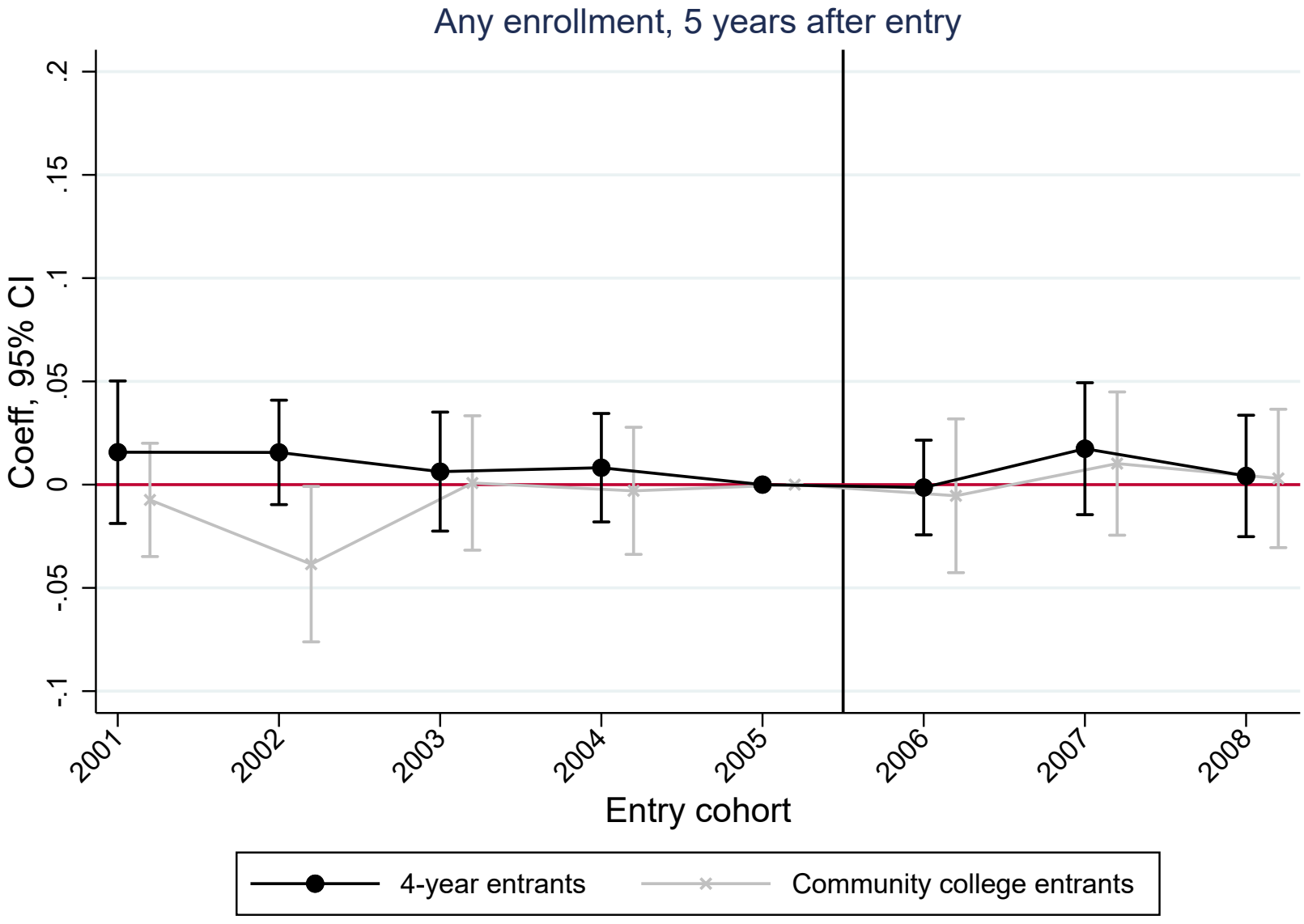
[4-year enrollment] [CC enrollment]



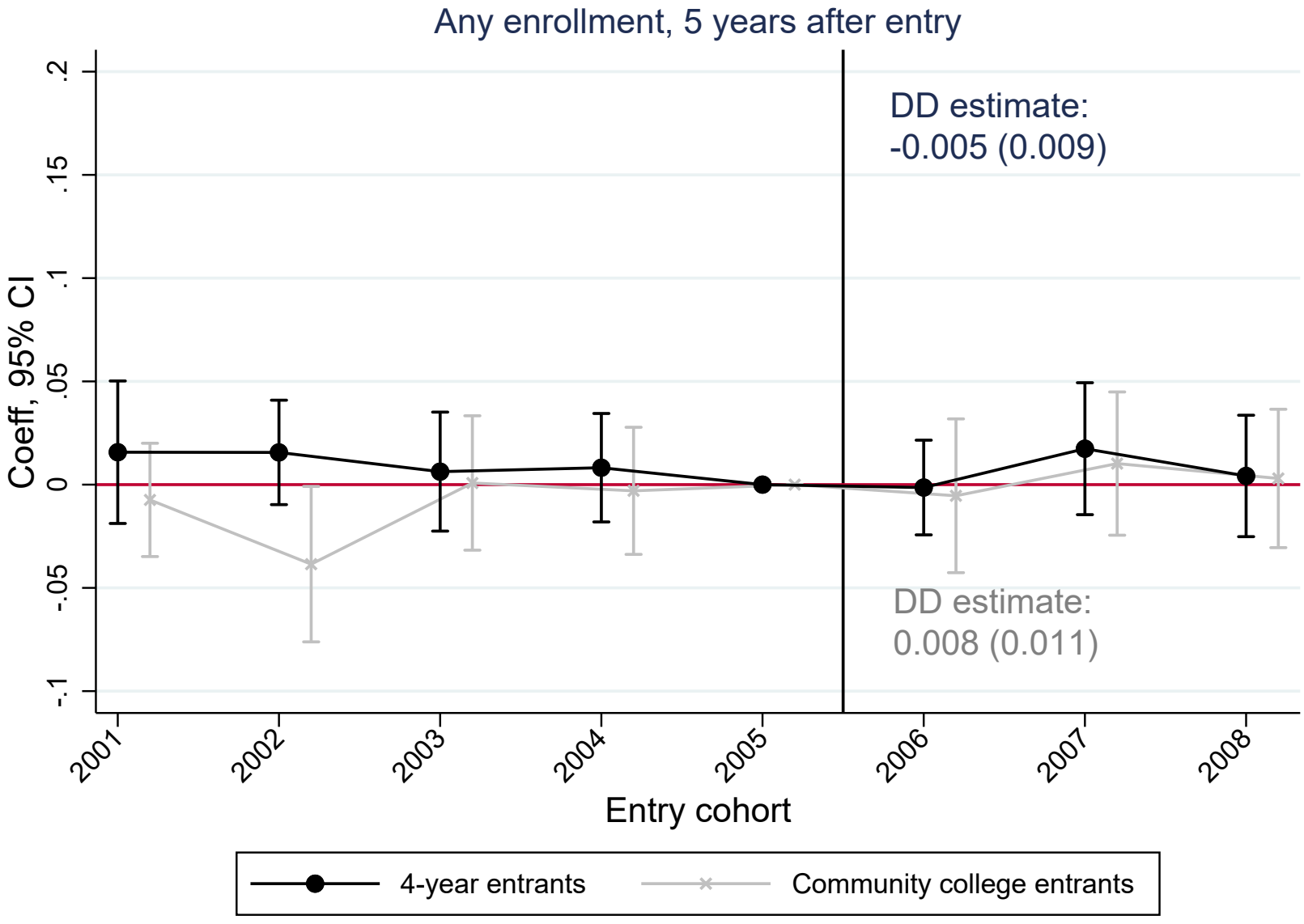
[4-year enrollment] [CC enrollment]



[4-year enrollment] [CC enrollment]



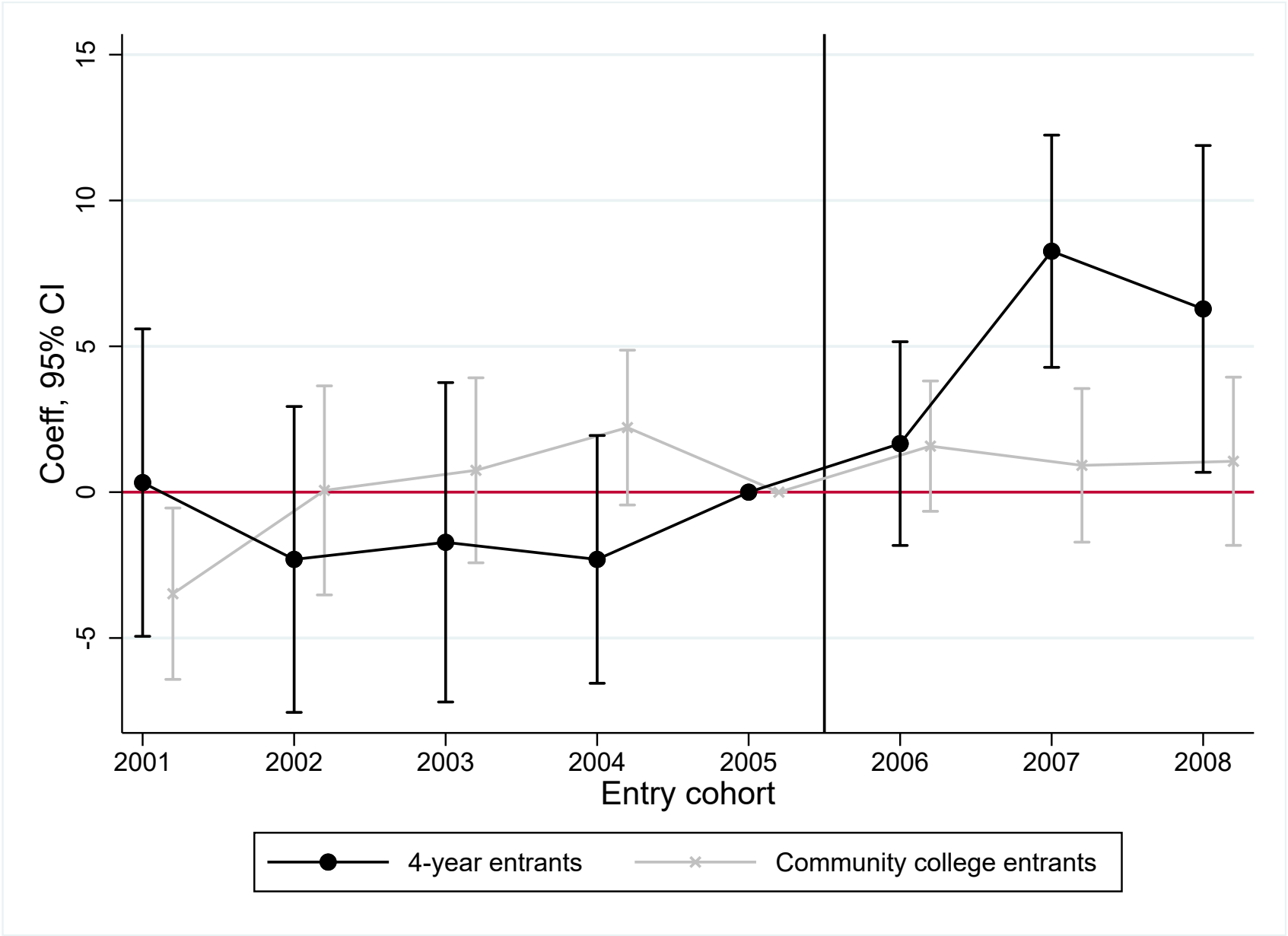
[4-year enrollment] [CC enrollment]



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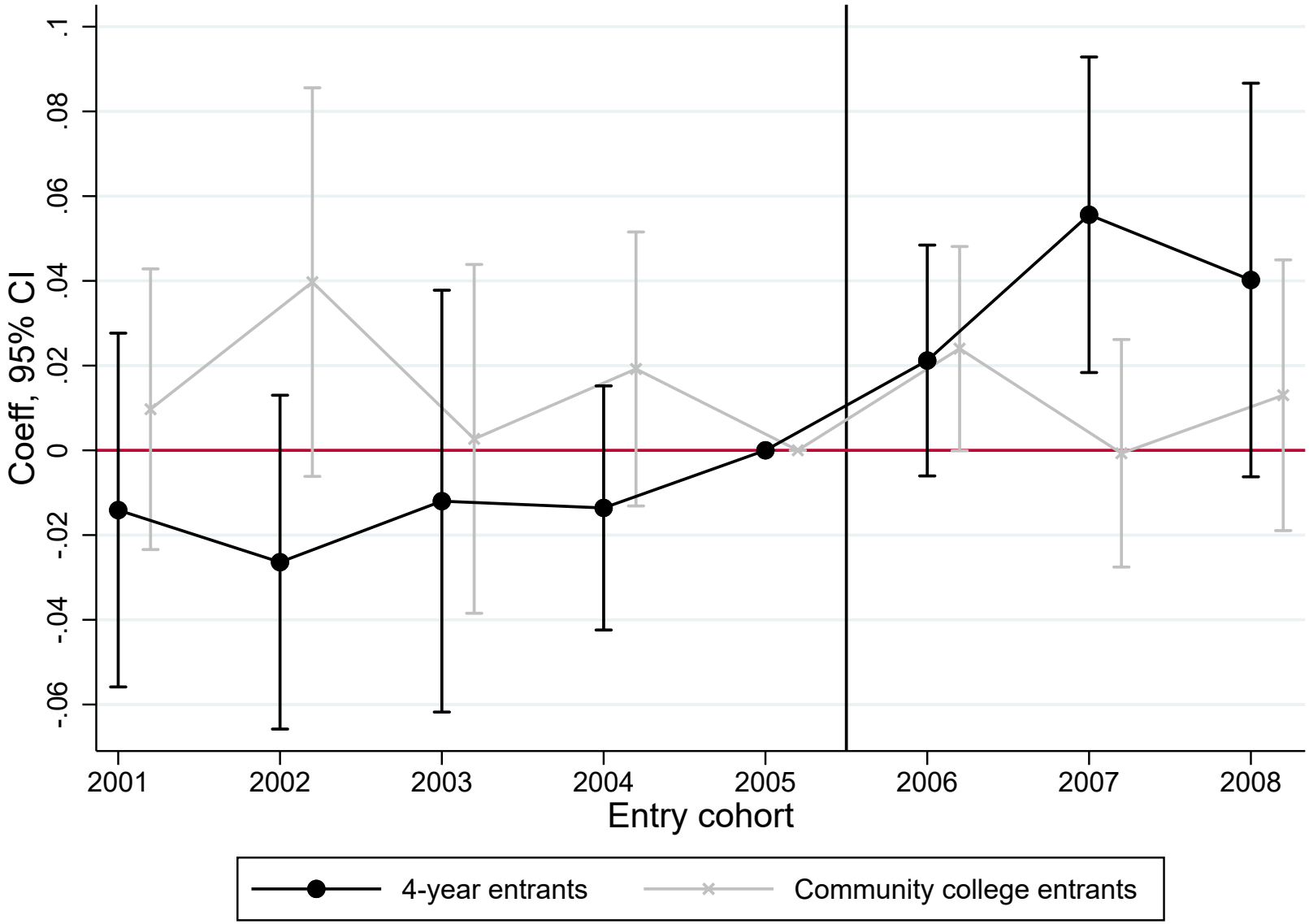
Effects on attainment

Cumulative credits attempted (4-year)



[All institutions] [Community colleges]

Bachelor's degree receipt



[AA degree] [Any degree]

Attainment 10 years after entry

	(3) Any degree	(4) Bachelor's degree	(5) Associate degree
A. Entered 4-year institution (N = 77,900)			
Constrained x Cohort in {2006,2007,2008}	0.043	0.051	-0.007
	(0.011)**	(0.011)**	(0.004)+
	{0.011}	{0.006}	{0.107}
Dependent variable mean	0.61	0.56	0.07
C. Entered community college (N = 42,843)			
Constrained x Cohort in {2006,2007,2008}	0.016	-0.0004	0.022
	(0.011)	(0.008)	(0.009)*
	{0.292}	{0.965}	{0.072}
Dependent variable mean	0.32	0.16	0.16

Notes: Dependent variable is indicated by column heading. Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$; p-values from wild-t cluster bootstrap in brackets.
[STEM] [Certificate] [Graduate school]

Attainment 10 years after entry

	(3) Any degree	(4) Bachelor's degree	(5) Associate degree
A. Entered 4-year institution (N = 77,900)			
Constrained x Cohort in {2006,2007,2008}	**0.043**	0.051	-0.007
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[STEM] [Certificate] [Graduate school]

Contextualizing attainment effects

IV estimates: $1000 increase in student loans $\Rightarrow$

- 3pp (5%) increase in BA degree receipt (4-year entrants)
- 2pp (13%) increase in AA degree receipt (CC entrants)

Comparable to effect of $1000 increase in first-year grant aid
(Denning, Marx, Turner 2019)

Effects on Other Education Outcomes

- STEM Degrees:
  - 30% of the increase in BAs comes from an increase in STEM
  - Baseline STEM fraction is 19
- Graduate School
  - Graduate degrees increase by 1.2 pp

Effects on other sources of college financing

Earnings and credit card use

Nationally representative CCP sample:

- ↓ Pr(any credit card) 1 year after entry (2pp, 4%)

Four-year entrants in Texas:

- ↓ Pr(any earnings) 1 and 2 years after entry (1-2pp, 2%)
- ↓ (conditional) earnings 1-3 years after entry
- Potential explanation for attainment effects: loans relax time constraint for (4-year) students, allowing them to progress through college and graduate at higher rates

No significant changes in earnings for Texas CC students

[Point estimates - earnings] [Point estimates - credit card use]

Effects on early career labor market outcomes

Earnings and employment

Years since entry =	4	5	6	8	10
A. Any earnings (N = 77,900)					
Constrained x cohort ϵ {2006,2007,2008}	-0.006	-0.007	-0.003	-0.010	-0.001
	(0.007)	(0.006)	(0.007)	(0.007)	(0.007)
	{0.454}	{0.591}	{0.704}	{0.282}	{0.885}
Dependent variable mean	0.802	0.795	0.784	0.770	0.753
B. Ln(earnings)					
Constrained x cohort ϵ {2006,2007,2008}	-0.009	0.016	0.046	0.044	0.050
	(0.018)	(0.020)	(0.019)*	(0.016)**	(0.017)**
	{0.608}	{0.290}	{0.011}	{0.099}	{0.018}
Dependent variable mean	9.4	9.8	10.0	10.3	10.4
Observations	62,464	61,913	61,092	59,956	58,661

Notes: Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$; p-values from wild-t cluster bootstrap in brackets.

[ln(earnings) event study] [Any earnings event study] [Level earnings]
[CC entrants]

Earnings and employment

Years since entry =	4	5	6	8	10
A. Any earnings (N = 77,900)					
Constrained x cohort ϵ {2006,2007,2008}	**-0.006**	**-0.007**	**-0.003**	**-0.010**	**-0.001**
	(0.007)	**(0.006)**	**(0.007)**	**(0.007)**	**(0.007)**
	{0.454}	**{0.591}**	**{0.704}**	**{0.282}**	**{0.885}**
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[ln(earnings) event study] [Any earnings event study] [Level earnings]
[CC entrants]

Contextualizing earnings and employment effects

IV estimates: \$1000 increase in student debt $\Rightarrow$

- 2.8% higher earnings, no change in employment 10 years after entry (4-year entrants)

Post-college earnings gains could represent returns to increased human capital, need to service higher debt, or combination

Effects on financial well-being

Student loan delinquency and default

Years since entry =	4	5	6	8	10	Ever
A. Student loan delinquency in year						
Constrained x cohort ϵ {2006,2007,2008}	-0.014	-0.015	-0.008	-0.008	-0.002	-0.013
	(0.004)**	(0.004)**	(0.004)*	(0.005)	(0.003)	(0.005)*
	{0.118}	{0.103}	{0.230}	{0.037}	{0.664}	{0.106}
Dependent variable mean	0.089	0.105	0.114	0.11	0.095	0.241
B. Student loan default in year						
Constrained x cohort ϵ {2006,2007,2008}	-0.011	-0.016	-0.008	-0.009	-0.002	-0.018
	(0.003)**	(0.003)**	(0.003)*	(0.004)*	(0.002)	(0.004)**
	{0.100}	{0.112}	{0.415}	{0.031}	{0.358}	{0.069}
Dependent variable mean	0.062	0.076	0.087	0.091	0.078	0.194

Notes: N = 143,850. Delinquency = past due balance for 2 consecutive quarters (180+ days), default = past due balance for 4 consecutive quarters (360+ days). Robust standard errors, clustered by state, in parentheses; + $p < 0.1$, * $p < 0.05$, **$p < 0.01$; p-values from wild-t cluster bootstrap in brackets.

[Deliquency event study] [Default event study] [IV estimates]

Student loan delinquency and default

Years since entry =	4	5	6	8	10	Ever
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Constrained x cohort ϵ {2006,2007,2008}	**-0.014**	**-0.015**	-0.008	-0.008	-0.002	-0.013
	(0.004)**	**(0.004)****	(0.004)*	(0.005)	(0.003)	(0.005)*
	{0.118}	**{0.103}**	{0.230}	{0.037}	{0.664}	{0.106}
Dependent variable mean	**0.089**	**0.105**	0.114	0.11	0.095	0.241
B. Student loan default in year						
Constrained x cohort ϵ {2006,2007,2008}	**-0.011**	**-0.016**	-0.008	-0.009	-0.002	-0.018
	(0.003)**	**(0.003)****	(0.003)*	(0.004)*	(0.002)	(0.004)**
	{0.100}	**{0.112}**	{0.415}	{0.031}	{0.358}	{0.069}
Dependent variable mean	**0.062**	**0.076**	0.087	0.091	0.078	0.194

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[Deliquency event study] [Default event study] [IV estimates]

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	(0.004)**	(0.004)**	(0.004)*	(0.005)	(0.003)	**(0.005)***
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Dependent variable mean	0.089	0.105	0.114	0.11	0.095	**0.241**
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Constrained x cohort ϵ {2006,2007,2008}	-0.011	-0.016	-0.008	-0.009	-0.002	**-0.018**
	(0.003)**	(0.003)**	(0.003)*	(0.004)*	(0.002)	**(0.004)****
	{0.100}	{0.112}	{0.415}	{0.031}	{0.358}	**{0.069}**
Dependent variable mean	0.062	0.076	0.087	0.091	0.078	**0.194**

Notes: N = 143,850. Delinquency = past due balance for 2 consecutive quarters (180+ days), default = past due balance for 4 consecutive quarters (360+ days). Robust standard errors, clustered by state, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$; p-values from wild-t cluster bootstrap in brackets.

[Deliquency event study] [Default event study] [IV estimates]

Other financial outcomes

Small, insignificant effects:

- Auto loans [Link]
- Mortgage debt [Link]
- Any delinquent debt [Link]

[Point estimates]

Contextualizing financial outcomes

IV estimates: \$1000 increase in student debt $\Rightarrow$ 1.1pp (6%) reduction in default in in first 4 to 6 years of repayment

- Consistent with experimental evidence that CC students "nudged" to stop borrowing defaulted at significantly higher rates the following year (Barr, Bird, Castleman 2019)

Small, statistically insignificant effects on homeownership

- Can rule out effect of \$1000 increase in student debt larger than 0.4pp reduction [Link]
- Compare to Mezza et al. (2020) finding of \$1000 increase in debt (from increase in college tuition) $\Rightarrow$ 1.8pp reduction

Robustness

Estimates are robust to:

- Excluding controls [Link]
- Excluding 2001 entrants [Link]
- Including nonprofit entrants (only observed in 2004 and later) [Link]
- Limiting unconstrained to those with loans in (1300, 2625) [Link]
- Differential exposure to Great Recession [Link]
- Alternate specifications:
  1. Indicators for each treated cohort [Details] [Estimates]
  2. Cumulative limit increase ($) [Details] [Estimates]

Heterogeneity

Race/ethnicity:

- Statistically indistinguishable effects for attainment and earnings [Link]
- Significantly *larger* reductions in student loan delinquency, default for students from majority Black neighborhoods [Link]

Socioeconomic status:

- Significant gains for Pell Grant eligible and ineligible, significantly larger increases in degree receipt for ineligible students [Link]
- Larger reductions in student loan default for students from low-income neighborhoods [Link]

Welfare

We calculate the welfare implications of increased student loans (following Denning, Marx, Turner (2018))

- Fiscal costs: foregone tax revenue due to lower in-school labor supply, increased spending on public higher ed subsidies (in-kind and grants/scholarships), additional student loan debt that is not repaid
- Fiscal benefits: increased tax revenue due to higher post-college earnings, reduction in student loan default

Expenditures on additional student loans revenue neutral

- Four-year dependent students: within 9 years of entry
- All dependent students: within 11 years of entry
- Hendren & Sprung-Keyser (2020) framework: infinite MVPF

Student cost-benefit: expected benefits > costs

- Four-year entrants: for any discount rate <85%
- Community college students: depends on treatment of (insigificant) year 10 earnings gains

Summary

We evaluate the impact of increases in federal Stafford Loan borrowing limits

- Main source of credit for U.S. undergraduates used by millions of students each year
- Over half of all current borrowers at current limit

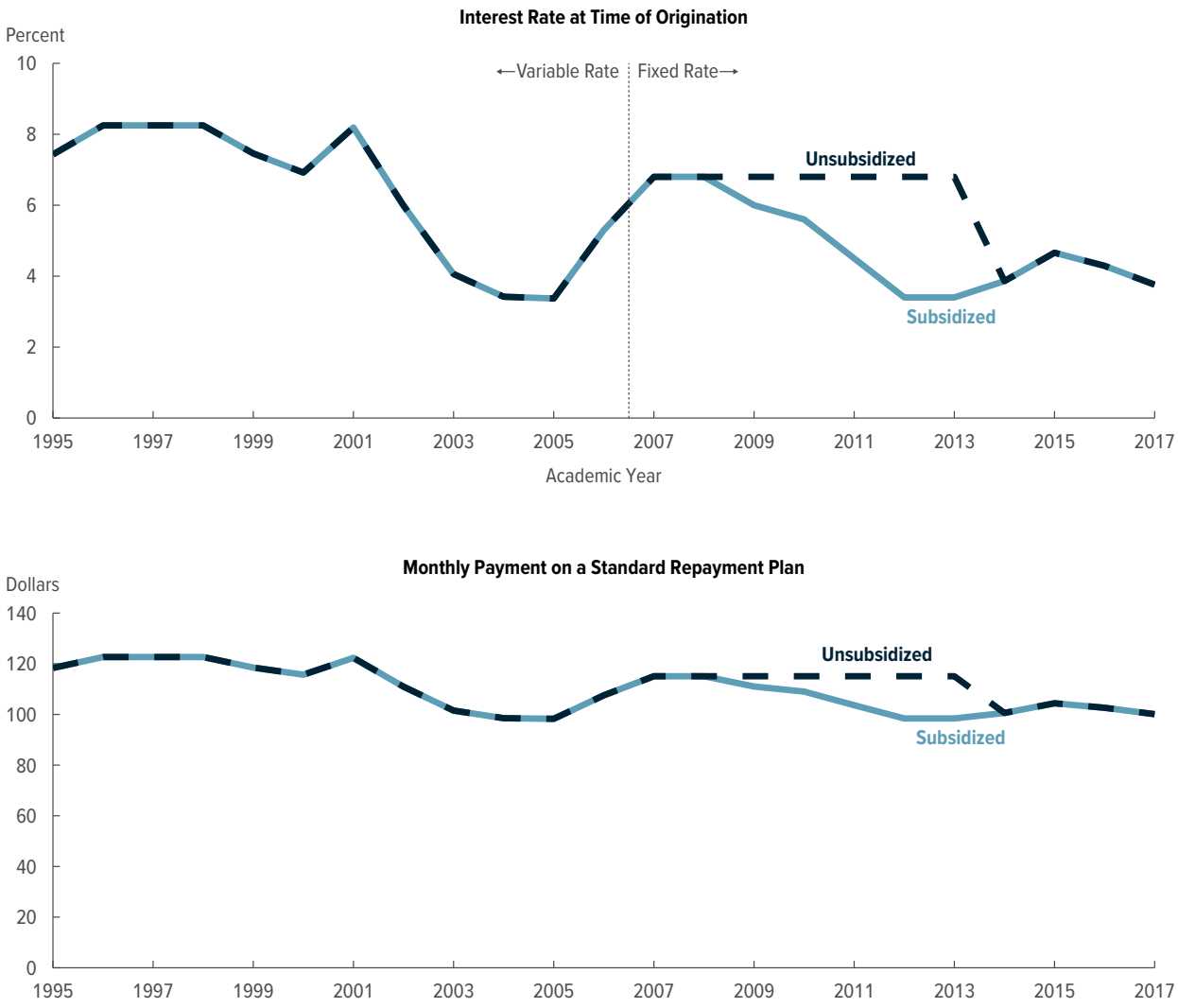
For constrained students, increases in borrowing limits:

- Raises student loan debt
- Improves persistence and degree receipt
- Leads to higher earnings
- Reduces student loan delinquencies and defaults
- Has no more than negligible impacts on financial well-being and homeownership

Thank you!

Figure 6.

Interest Rates and Monthly Payments on a $10,000 Stafford Undergraduate Loan



Source: Congressional Budget Office.

Source: CBO (2020)

[Back]

Additional details

Texas education data

- Enrollment, attainment, demographics for students enrolled in public institutions
- Limit sample to first-time-in-college (FTIC) entrants
  - Measurement error in FTIC measure
  - Proxy using a) no record of transferring, b) listed as first-year student, c) not observed in earlier years
  - Results robust to limiting sample to those listed as FTIC

Consumer Credit Panel

- Administrative panel database of credit records
- Includes date of origination and amount borrowed for each individual student loan
- Construct 4-year panel of student borrower-by-academic year total student borrowing
  - Sample is 2004-05 through 2007-08 entering cohorts
  - Must be under 21 in first year
  - Random sample of student borrowers in each year
- Merge with each student borrowers full credit record/borrowing history over next 8 years

[Back]

Baseline characteristics: Texas sample, 4-year entrants

	Constrained borrowers		Unconstrained borrowers	
Entry cohort =	*2001-2005*	*2006-2008*	*2001-2005*	*2006-2008*
A. Texas Sample, four-year college entrants				
Demographics				
Gender = male	0.45	0.46	0.46	0.46
Race = white	0.52	0.43	0.34	0.34
Race = URM	0.41	0.49	0.60	0.61
Age	18.1	18.0	18.1	18.1
Financial aid received in entry year (2018$)				
Federal Stafford loans	$3,580	$3,567	$2,474	$2,044
Total loans	$3,586	$3,592	$2,569	$2,195
Federal Pell Grant	$1,745	$1,806	$2,100	$2,113
TEXAS Grant	$1,201	$1,473	$1,419	$1,754
Other grants	$1,686	$2,127	$1,956	$2,321
Work study	$167	$134	$206	$185
EFC (2018$)	$9,992	$11,986	$6,586	$6,768
COA (2018$)	$17,026	$20,367	$16,413	$18,076
Number of students	21,700	19,235	22,956	9,705

Notes: URM = underrepresented minority (Black, Hispanic, Native American or Alaskan Native). EFC = expected family contribution. COA = cost of attendance (tuition, fees, living expenses). **[Back]**

Baseline characteristics: Texas sample, CC entrants

	Constrained borrowers		Unconstrained borrowers	
Entry cohort =	*2001-2005*	*2006-2008*	*2001-2005*	*2006-2008*
B. Texas Sample, community college entrants				
Demographics				
Gender = male	0.52	0.50	0.55	0.53
Race = white	0.43	0.44	0.44	0.44
Race = URM	0.54	0.53	0.54	0.54
Age	18.6	18.4	18.7	18.5
Financial aid received in entry year ($2018)				
Federal Stafford loans	$3,535	$3,561	$2,119	$1,941
Total loans	$3,539	$3,573	$2,166	$1,991
Federal Pell Grant	$1,983	$1,868	$1,870	$1,516
TEXAS Grant	$222	$283	$212	$202
Other grants	$574	$545	$515	$497
Work study	$80	$62	$58	$41
EFC (2018$)	$7,261	$7,929	$5,307	$6,890
COA (2018$)	$13,051	$13,497	$11,384	$12,544
Number of students	7,372	10,450	15,520	10,316

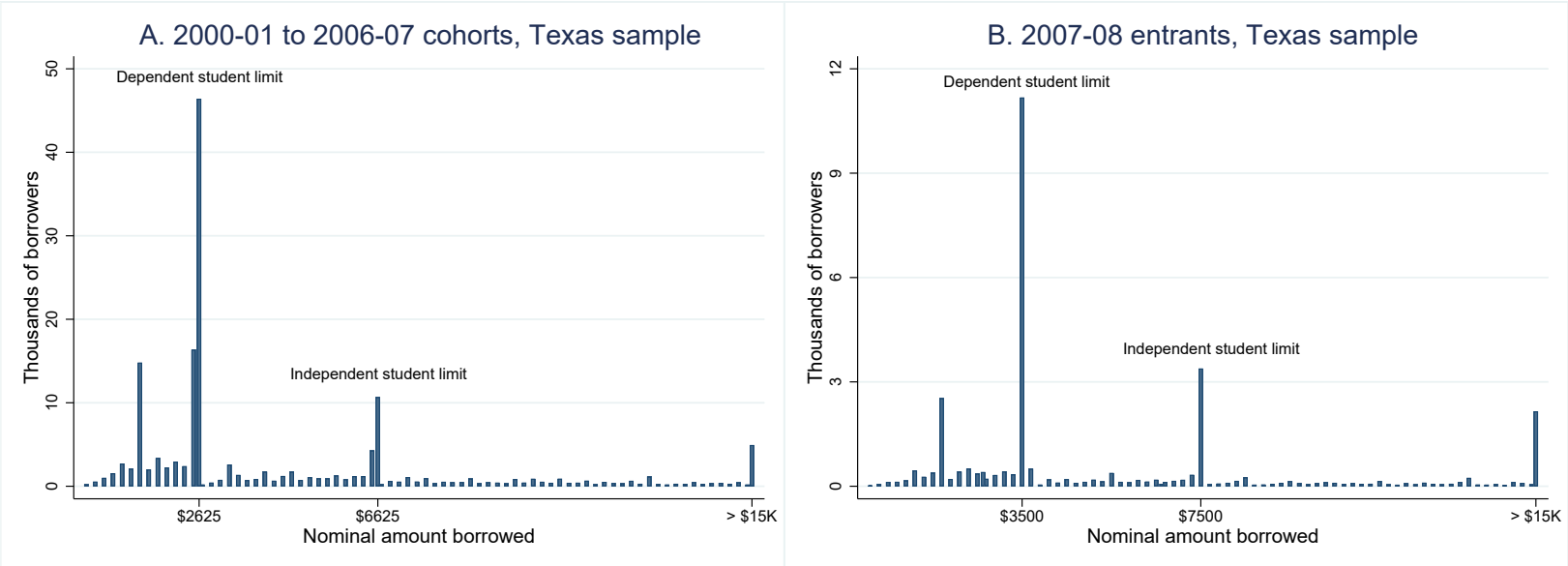
Notes: URM = underrepresented minority (Black, Hispanic, Native American or Alaskan Native). EFC = expected family contribution. COA = cost of attendance (tuition, fees, living expenses). **[Back]**

Baseline characteristics: CCP sample

	Constrained borrowers		Unconstrained borrowers	
Entry cohort =	*2001-2005*	*2006-2008*	*2001-2005*	*2006-2008*
C. CCP/Equifax Sample				
Total loans	$3,588	$4,010	$2,151	$2,219
Age	18.5	18.5	18.8	18.7
Credit Outcomes Before First Student Loan Origination				
Has a Credit Report	0.18	0.17	0.28	0.27
Has a Credit Score	0.15	0.15	0.26	0.26
Number of Accounts	0.23	0.22	0.43	0.41
Has a Credit Card	0.09	0.10	0.15	0.17
Has an Auto Loan	0.02	0.02	0.04	0.04
Number of Students	41,539	65,858	16,525	22,692

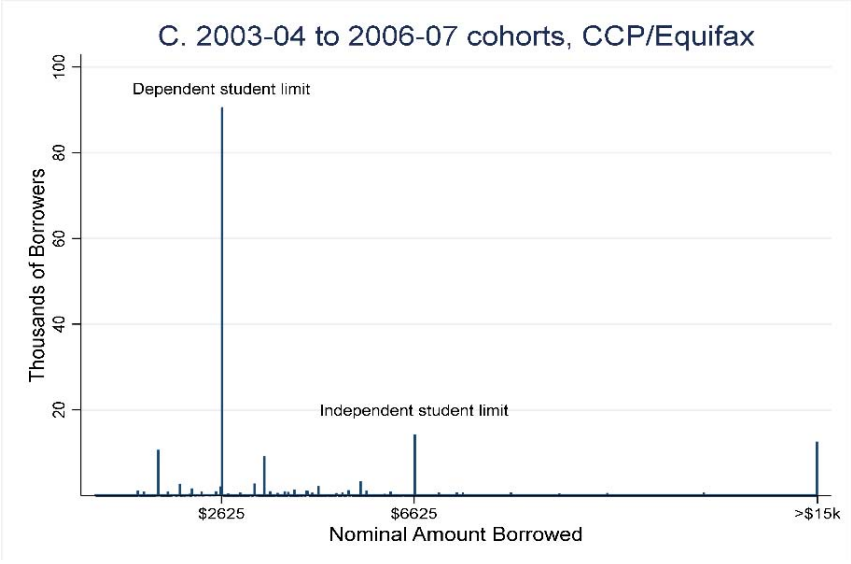
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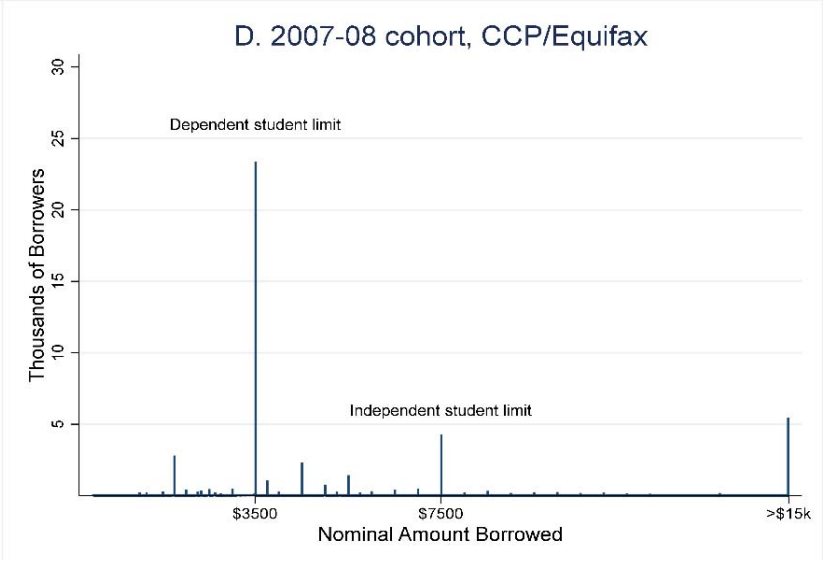
Distribution of entry-year borrowing



[Back]

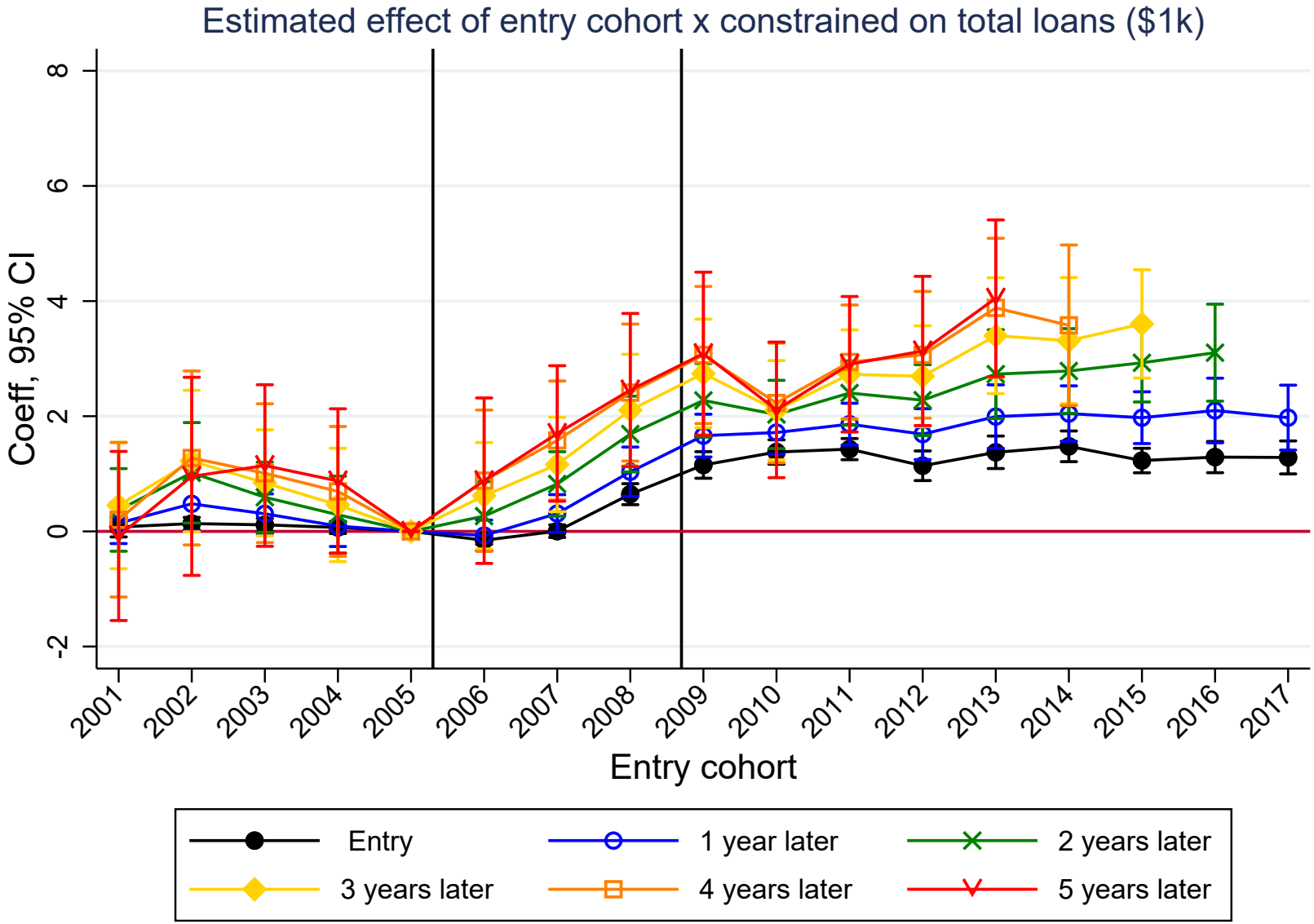
Distribution of entry-year borrowing





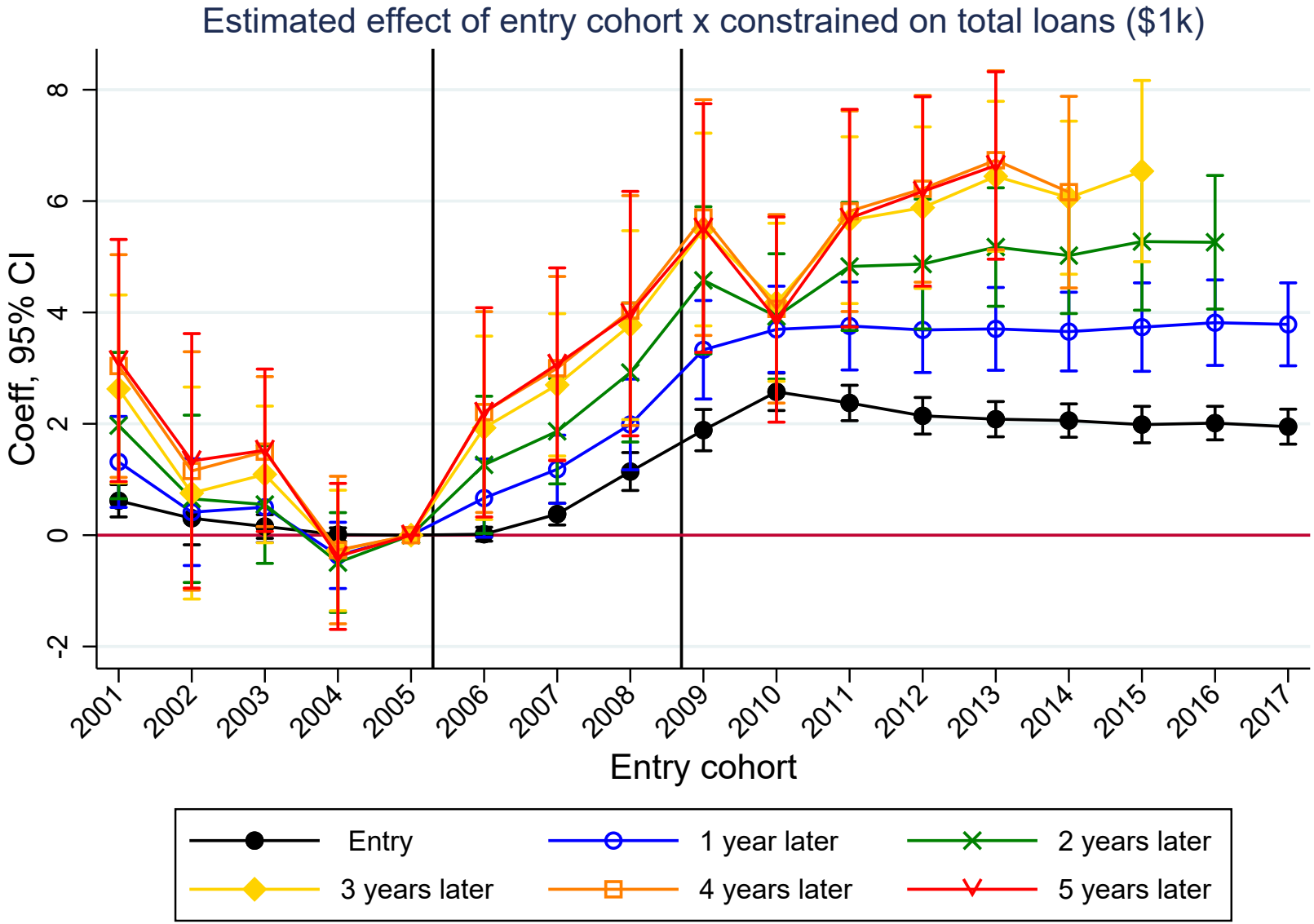
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Community College Entrants



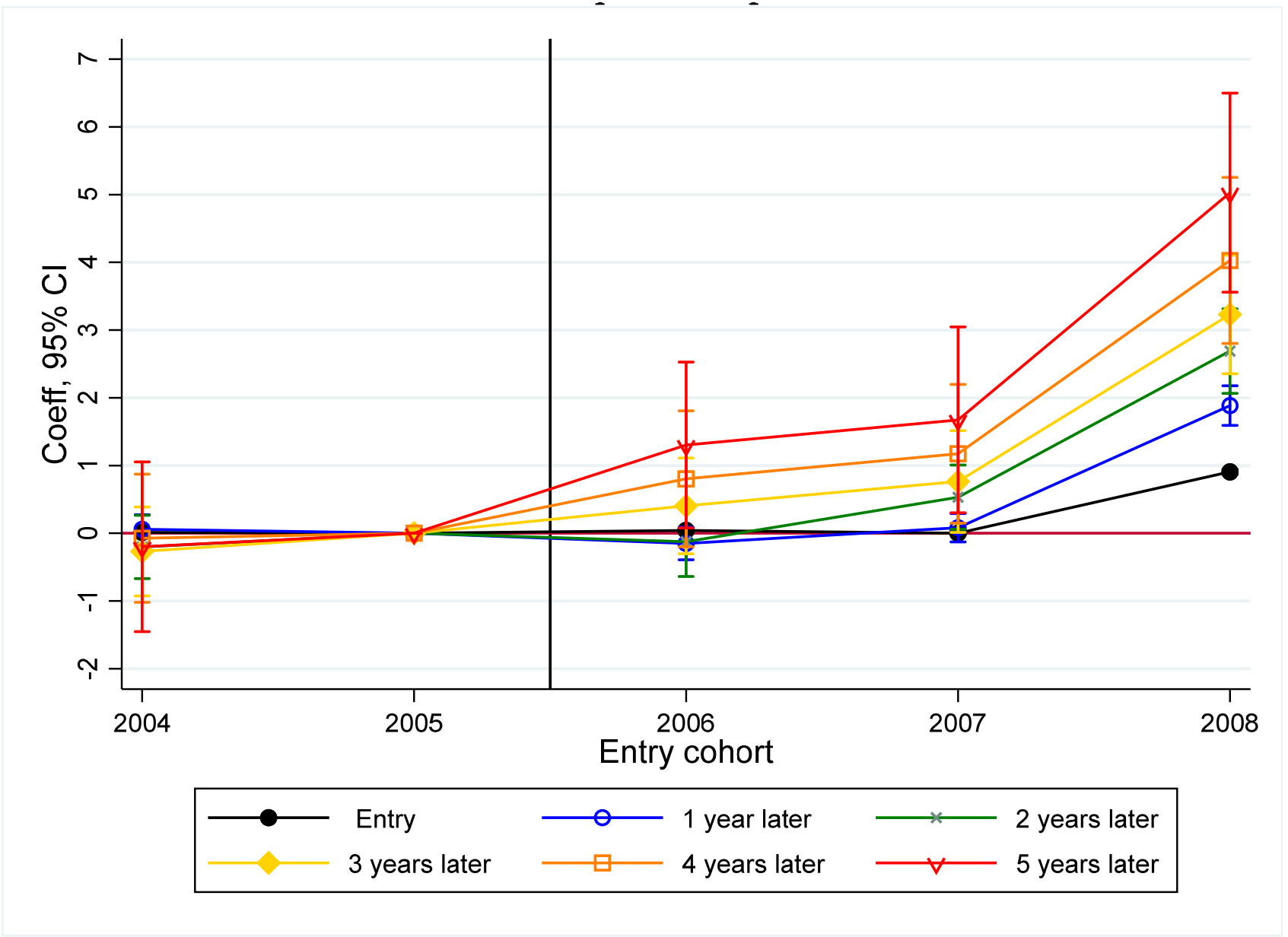
[Back]

Four-Year College Entrants



[Back]

CCP Sample



[Back]

Effects on the probability of any borrowing

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

Notes: Dependent variable is an indicator for any student loans in the specific year. Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$; p-values from wild-t cluster bootstrap in brackets. [Back]

Effects on cumulative Stafford loans

Years since entry =	0	1	2	3	4	5	6
A. Texas four-year entrants (N = 77,900)							
Constrained x cohort ϵ {2006,2007,2008}	230	579	909	1246	1378	1423	1436
	(92)*	(128)**	(185)**	(252)**	(320)**	(375)**	(438)**
	{0.511}	{0.193}	{0.143}	{0.069}	{0.086}	{0.115}	{0.159}
Dependent variable mean	$3,027	$5,648	$8,816	$12,230	$15,150	$17,340	$19,180
B. Texas community college entrants (N = 42,843)							
Constrained x cohort ϵ {2006,2007,2008}	67	239	518	690	896	957	912
	(27)*	(80)**	(119)**	(166)**	(205)**	(238)**	(271)**
	{0.825}	{0.618}	{0.240}	{0.089}	{0.021}	{0.009}	{0.010}
Dependent variable mean	$2,674	$4,122	$5,503	$6,946	$8,360	$9,586	$10,660

Notes: Dependent variable is cumulative federal Stafford student loans. Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, **$p < 0.01$; p-values from wild-t cluster bootstrap in brackets.
[Back]

Other loans, four-year entrants

Years since entry =	0	1	2	3	4	5	6
B. Federal PLUS loans							
Constrained x cohort ϵ {2006,2007,2008}	5	218	367	453	433	456	487
	(3)	(148)	(259)	(306)	(303)	(295)	(286)+
	{0.517}	{0.048}	{0.057}	{0.063}	{0.057}	{0.033}	{0.036}
Dependent variable mean	$8	$279	$559	$857	$1,090	$1,223	$1,310
C. Federal Perkins loans							
Constrained x cohort ϵ {2006,2007,2008}	-35	-59	-56	-44	-26	-29	-35
	(41)	(74)	(67)	(57)	(48)	(49)	(51)
	{0.128}	{0.116}	{0.221}	{0.274}	{0.425}	{0.381}	{0.300}
Dependent variable mean	$39	$142	$230	$307	$360	$387	$402
D. State loans							
Constrained x cohort ϵ {2006,2007,2008}	-7	13	30	48	23	24	14
	(5)	(23)	(40)	(56)	(67)	(67)	(68)
	{0.739}	{0.826}	{0.680}	{0.622}	{0.809}	{0.789}	{0.894}
Dependent variable mean	$9	$93	$192	$308	$377	$405	$420
E. Private loans ($)							
Constrained x cohort ϵ {2006,2007,2008}	-1	-10	2	2	-7	-23	-28
	(2)	(57)	(92)	(115)	(135)	(143)	(150)
	{0.597}	{0.757}	{0.948}	{0.962}	{0.902}	{0.689}	{0.725}
Dependent variable mean	$3	$126	$281	$455	$584	$668	$720

Notes: Dependent variable is cumulative state student loans . Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, **$p < 0.01$; p-values from wild-t cluster bootstrap in brackets. [Back]

Other loans, community college entrants

Years since entry =	0	1	2	3	4	5	6
B. Federal PLUS loans							
Constrained x cohort ϵ {2006,2007,2008}	9	31	90	174	255	265	282
	(5)+	(18)+	(38)*	(61)**	(81)**	(85)**	(90)**
	{0.289}	{0.186}	{0.044}	{0.052}	{0.061}	{0.081}	{0.069}
Dependent variable mean	$12	$80	$205	$359	$493	$550	$565
C. Federal Perkins loans							
Constrained x cohort ϵ {2006,2007,2008}	2	-5	-8	-12	-12	-10	-12
	(1)	(3)	(5)	(7)	(9)	(9)	(8)
	{0.254}	{0.077}	{0.335}	{0.355}	{0.403}	{0.536}	{0.512}
Dependent variable mean	$1	$7	$16	$28	$37	$44	$49
D. State loans							
Constrained x cohort ϵ {2006,2007,2008}	0	-13	-28	-13	15	43	51
	(6)	(15)	(25)	(34)	(43)	(48)	(48)
	{0.994}	{0.573}	{0.312}	{0.698}	{0.571}	{0.201}	{0.206}
Dependent variable mean	$14	$36	$70	$117	$156	$175	$184
E. Private loans ($)							
Constrained x cohort ϵ {2006,2007,2008}	1	-4	-22	-36	-42	-31	-17
	(1)	(13)	(30)	(46)	(57)	(57)	(55)
	{0.338}	{0.729}	{0.400}	{0.299}	{0.285}	{0.438}	{0.681}
Dependent variable mean	$1	$26	$81	$140	$192	$220	$242

Notes: Dependent variable is cumulative state student loans . Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, **$p < 0.01$; p-values from wild-t cluster bootstrap in brackets. [Back]

Effects on cumulative borrowing

$$Y_{isc} = \beta_1 Cons_i + \sum_{c=2006}^{2008} \gamma^c \left(\mathbf{1}\left[Cohort = c\right] \times Cons_i\right) + \boldsymbol{X_i}\boldsymbol{\beta_x} + \delta_c + \delta_s + \epsilon_{isc}$$

X =	0	1	2	3	4	5	6
A. Entered 4-year institution (N = 74,132)							
Constrained x 2006 cohort	-213	300	705	1078	1143	1175	1215
	(77)**	(381)	(680)	(898)	(964)	(993)	(1015)
	{0.255}	{0.465}	{0.344}	{0.290}	{0.297}	{0.304}	{0.313}
Constrained x 2007 cohort	28	614	1123	1659	1761	1881	1861
	(58)	(229)**	(373)**	(535)**	(674)**	(728)*	(754)*
	{0.744}	{0.343}	{0.317}	{0.296}	{0.356}	{0.33}	{0.307}
Constrained x 2008 cohort	755	1361	2100	2635	2646	2613	2639
	(100)**	(235)**	(432)**	(623)**	(722)**	(764)**	(783)**
	{0.194}	{0.304}	{0.266}	{0.281}	{0.301}	{0.287}	{0.294}
Test of equality (*p*-value)	<0.001	0.004	0.014	0.144	0.274	0.366	0.369

Notes: Dependent variable is cumulative student loans. Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, **$p < 0.01$; p-values from wild-t cluster bootstrap in brackets. [Back]

Effects on cumulative borrowing

$$Y_{isc} = \beta_1 Cons_i + \sum_{c=2006}^{2008} \gamma^c \left(\mathbf{1}\left[Cohort = c\right] \times Cons_i\right) + \boldsymbol{X_i}\boldsymbol{\beta_x} + \delta_c + \delta_s + \epsilon_{isc}$$

X =	0	1	2	3	4	5	6
B. Entered community college (N = 43,122)							
Constrained x 2006 cohort	-173	-203	-69	177	391	465	487
	(33)**	(103)+	(195)	(276)	(374)	(471)	(527)
	{0.125}	{0.250}	{0.695}	{0.539}	{0.433}	{0.405}	{0.424}
Constrained x 2007 cohort	-130	51	331	543	871	988	984
	(28)**	(127)	(205)	(301)+	(375)*	(421)*	(434)*
	{0.071}	{0.513}	{0.289}	{0.275}	{0.262}	{0.233}	{0.231}
Constrained x 2008 cohort	499	806	1259	1561	1780	1783	1648
	(46)**	(134)**	(226)**	(369)**	(466)**	(493)**	(503)**
	{0.015}	{0.078}	{0.113}	{0.102}	{0.119}	{0.136}	{0.204}
Test of equality (*p*-value)	<0.001	<0.001	<0.001	0.023	0.103	0.166	0.279

Notes: Dependent variable is cumulative student loans. Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, **$p < 0.01$; p-values from wild-t cluster bootstrap in brackets. [Back]

Effects of statutory limit increases on cumulative borrowing

$$Y_{isc} = \beta_1 Cons_i + \theta \left(AggLimit_c \times Cons_i \right) + \boldsymbol{X_i \beta_x} + \delta_c + \delta_s + \epsilon_{isc}$$

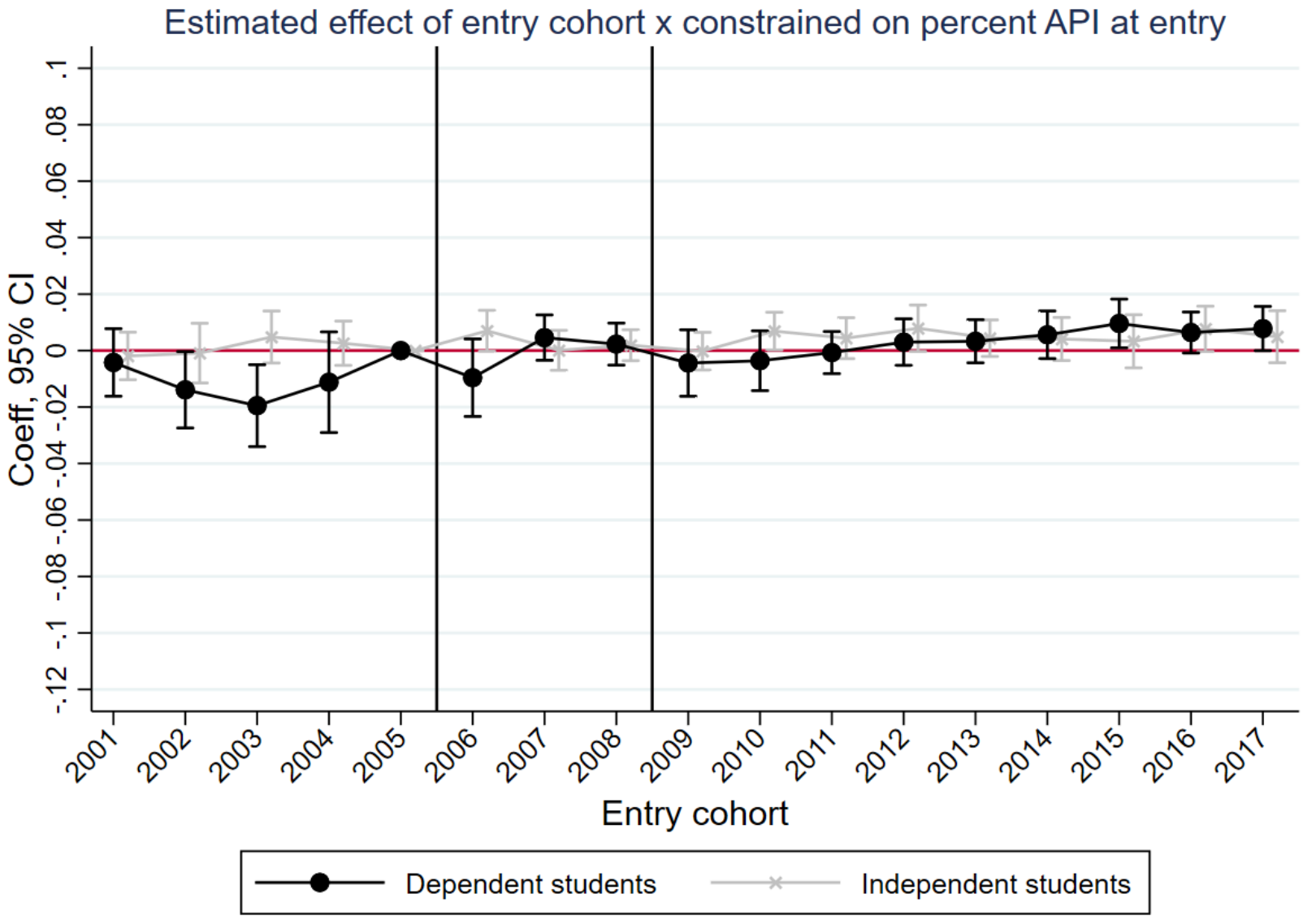
	(1) Four years after entry (Texas)	(2) Six years after entry (Texas)	(3) Four years after entry (CCP)	(4) Six years after entry (CCP)
Constrained x AggLimExp ($1k)	339	342	461	624
	(94)**	(103)**	(62)**	(80)**
	{0.045}	{0.041}	{0.052}	{0.048}
Observations	74,132	74,132	145,616	145,616

Notes: Dependent variable is cumulative student loans. Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$; p-values from wild-t cluster bootstrap in brackets. $AggLimit_c$ is the aggregate amount available to a student if she borrowed the maximum for four consecutive years. [Back]

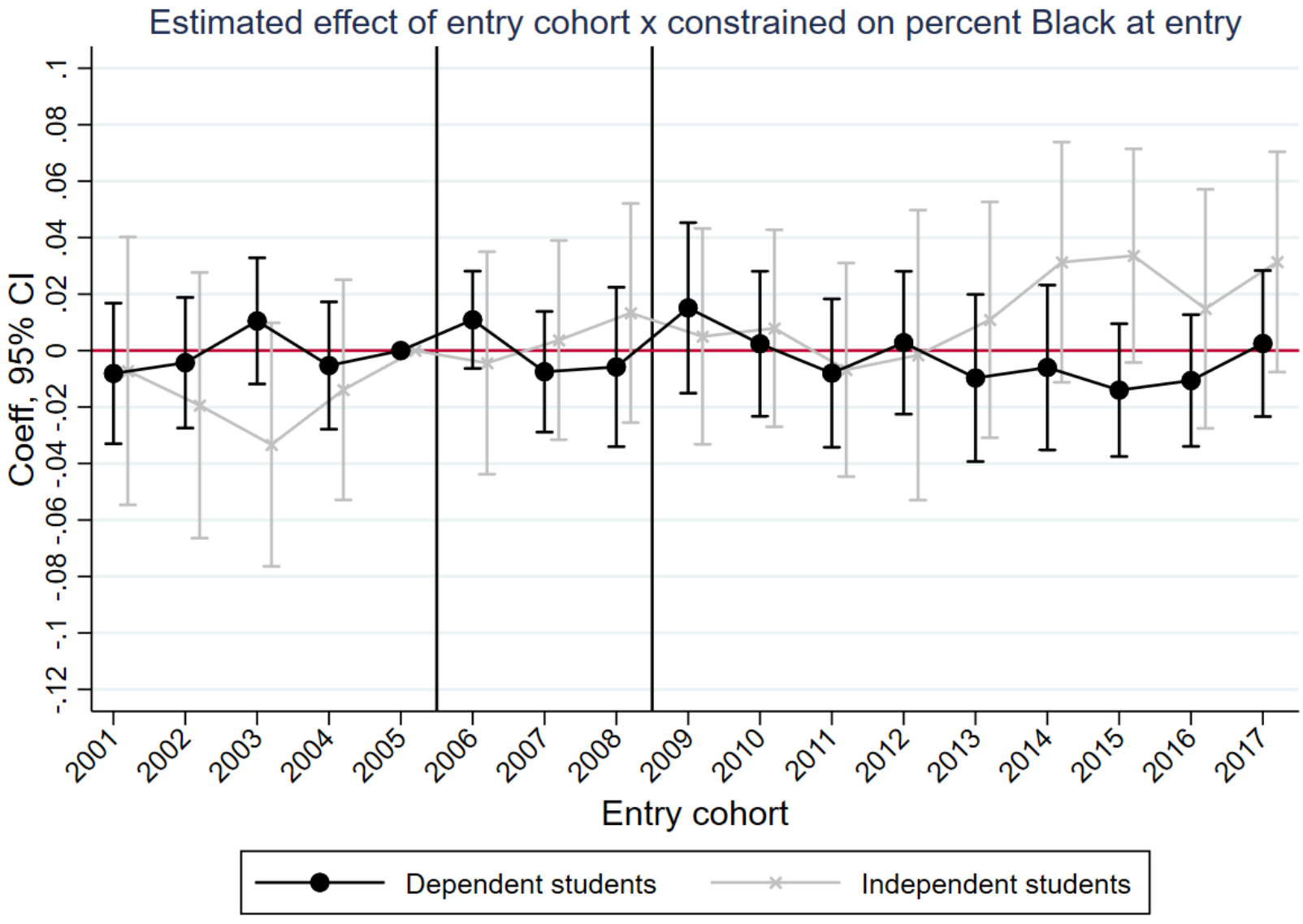
Effects of loan limit increases on cumulative borrowing

Years since entry =	0	1	2	3	4	5	6
Dependent variable mean	$3379	$9846	$16,990	$23,748	$30,307	$35,750	$39,770
Constrained × cohort ∈ {2006,2007,2008}	311	574	1130	1600	2037	2768	3043
	(12)**	(87)**	(182)**	(261)**	(362)**	(478)**	(503)**
	{0.361}	{0.506}	{0.266}	{0.170}	{0.112}	{0.087}	{0.098}

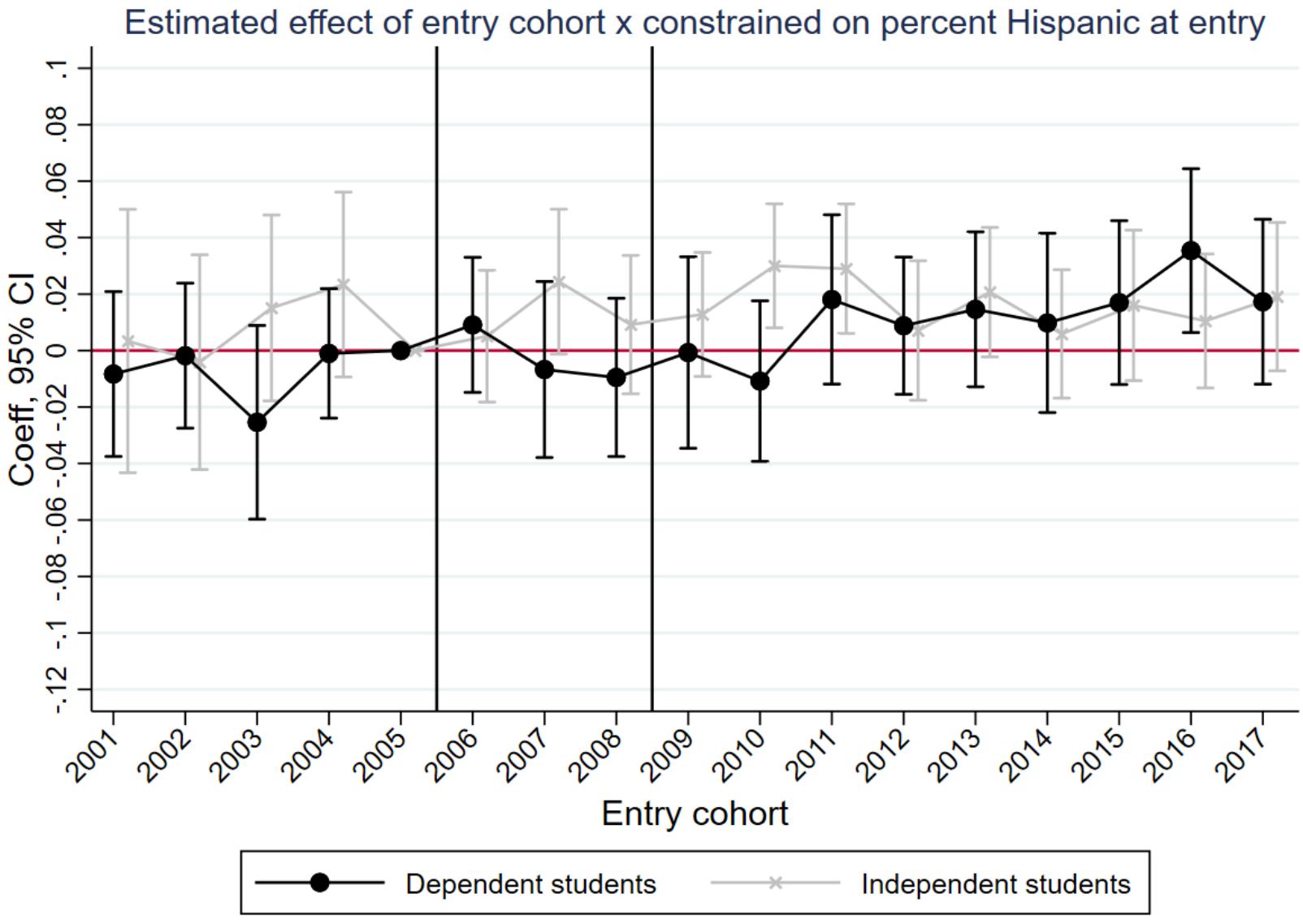
Notes: Dependent variable is cumulative student loans ($1k). Robust standard errors, clustered by state , in parentheses; + $p < 0.1$, * $p < 0.05$, **$p < 0.01$; p-values from wild-t cluster bootstrap in brackets. [Back]


Estimated effect of entry cohort x constrained on percent API at entry
Coeff, 95% CI
-.12
-.1
-.08
-.06
-.04
-.02
0
.02
.04
.06
.08
.1
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
Entry cohort
Dependent students
Independent students

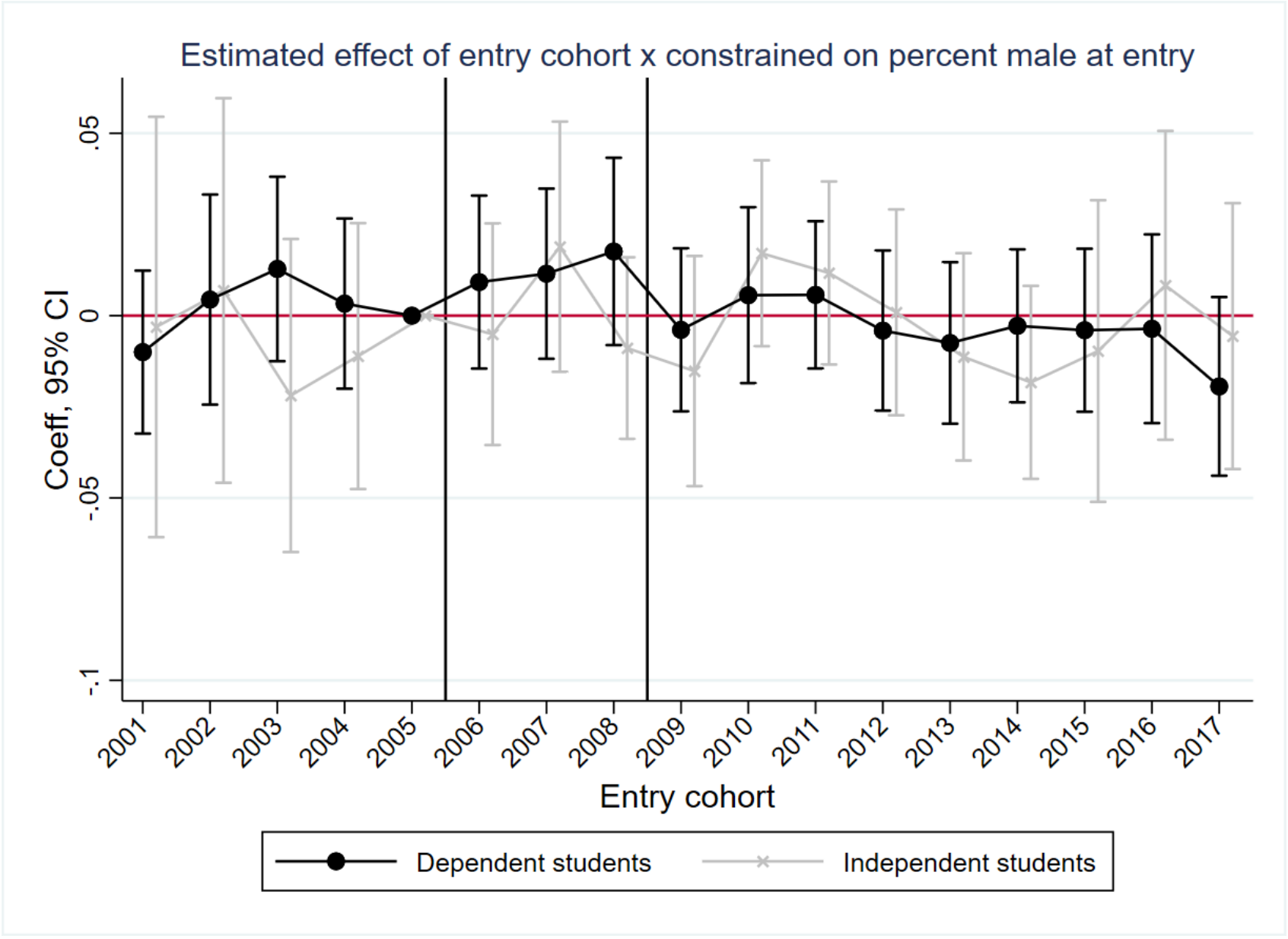
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Estimated effect of entry cohort x constrained on percent Black at entry
Coeff, 95% CI
-.12
-.1
-.08
-.06
-.04
-.02
0
.02
.04
.06
.08
.1
2001
2002
2003
2004
2005
2006
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2011
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2016
2017
Entry cohort
Dependent students
Independent students

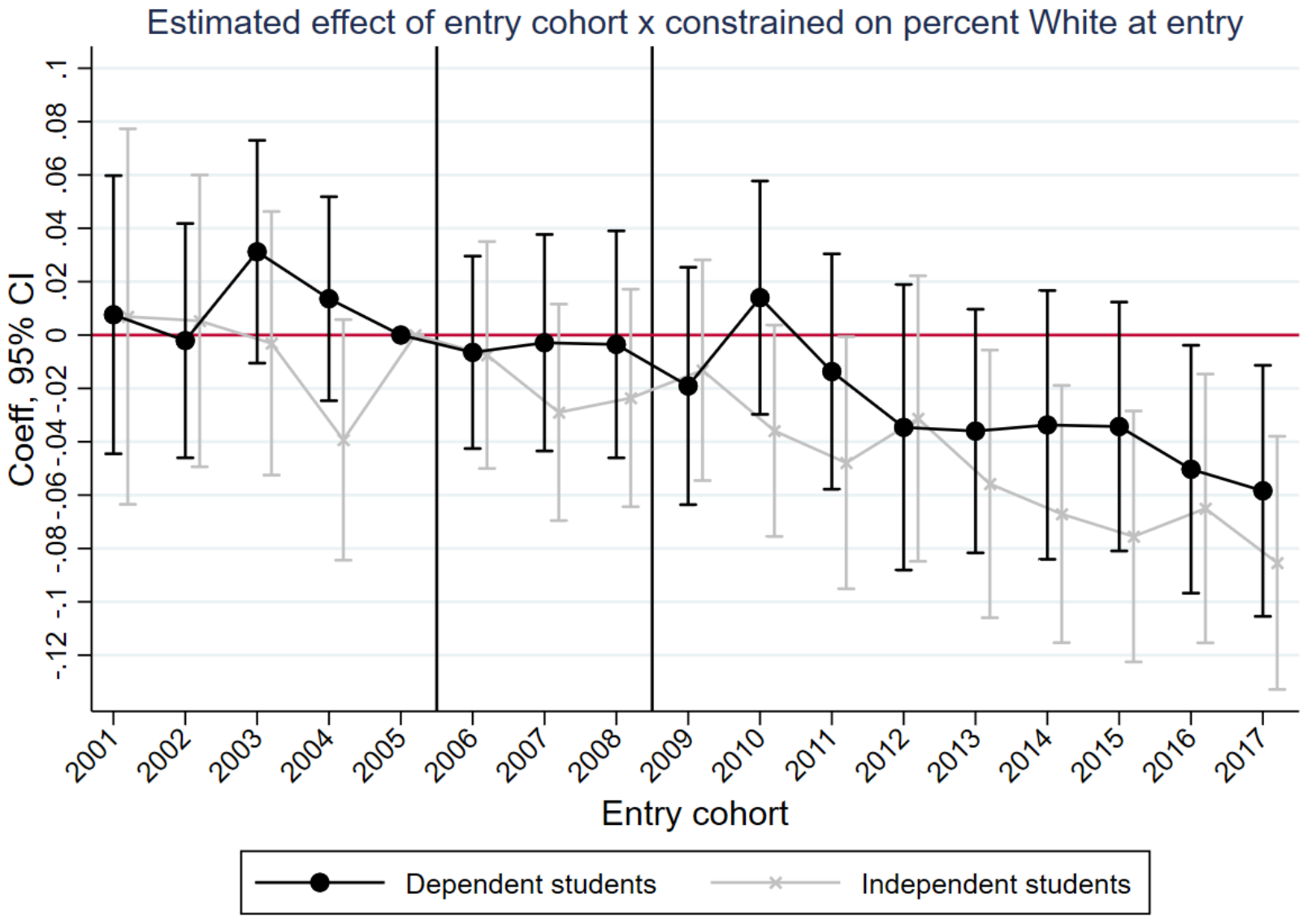
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Estimated effect of entry cohort x constrained on percent Hispanic at entry
Coeff, 95% CI
-.12
-.1
-.08
-.06
-.04
-.02
0
.02
.04
.06
.08
.1
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
Entry cohort
Dependent students
Independent students

[Back]


Estimated effect of entry cohort x constrained on percent male at entry
Coeff, 95% CI
.05
0
-.05
-.1
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
Entry cohort
Dependent students
Independent students

[Back]


Estimated effect of entry cohort x constrained on percent White at entry
Coeff, 95% CI
-.12 -.1 -.08 -.06 -.04 -.02 0 .02 .04 .06 .08 .1
2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017
Entry cohort
Dependent students
Independent students

[Back]

Baseline demographic characteristics

	(1) Predicted graduation rate	(2) Male	(3) White	(4) URM	(5) EFC	(6) Age
A. Texas sample, four-year college entrants (N = 74,132)						
Dependent variable mean	0.555	0.457	0.414	0.519	9026	18.08
Constrained × cohort ∈ {2006,2007,2008}	0.006	0.011	0.008	-0.020	1720	0.04
	(0.005)	(0.010)	(0.014)	(0.014)	(1206)	(0.03)
B. Texas sample, community college entrants (N = 43,122)						
Dependent variable mean	0.321	0.526	0.440	0.536	6639	18.58
Constrained × cohort ∈ {2006,2007,2008}	-0.004	-0.002	-0.011	0.012	-938	0.16
	(0.002)+	(0.009)	(0.010)	(0.010)	(364)*	(0.16)

Notes: Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$. [Back]

Placebo tests: financial aid

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

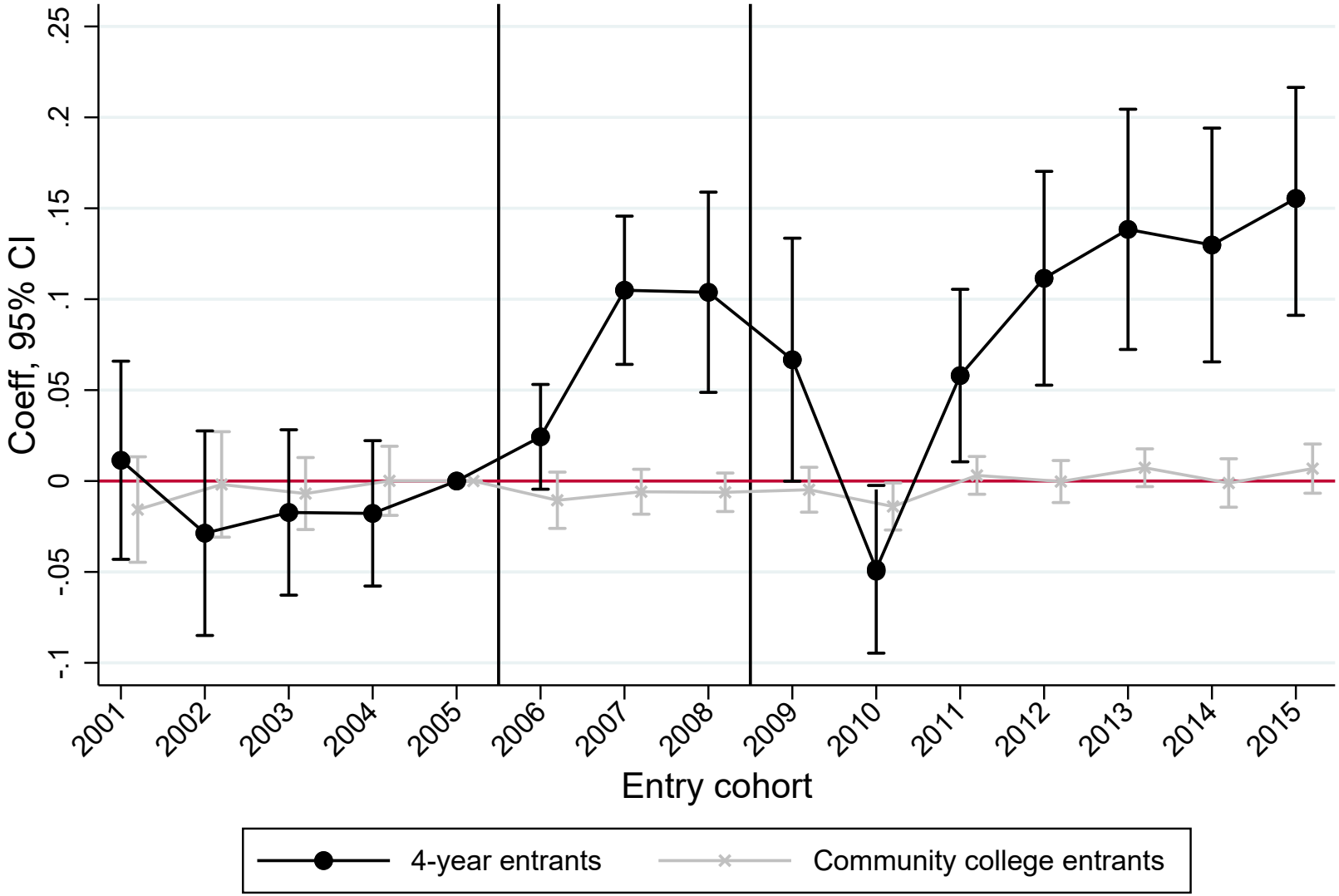
Notes: Dependent variable indicated in column. Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, **$p < 0.01$. $N = 117,254$. [Back]

Placebo tests: CCP sample

	(7) Credit record	(8) Credit score	(9) Accounts on record	(10) Any credit card	(11) Any auto loan	(12) Age
C. CCP/Equifax sample (N = 145,616)						
Dependent variable mean	0.204	0.181	0.279	0.116	0.027	18.50
Constrained × cohort ∈ {2006,2007,2008}	-0.002	-0.002	0.010	-0.008	0.001	0.03
	(0.005)	(0.005)	(0.011)	(0.004)*	(0.002)	(0.01)**

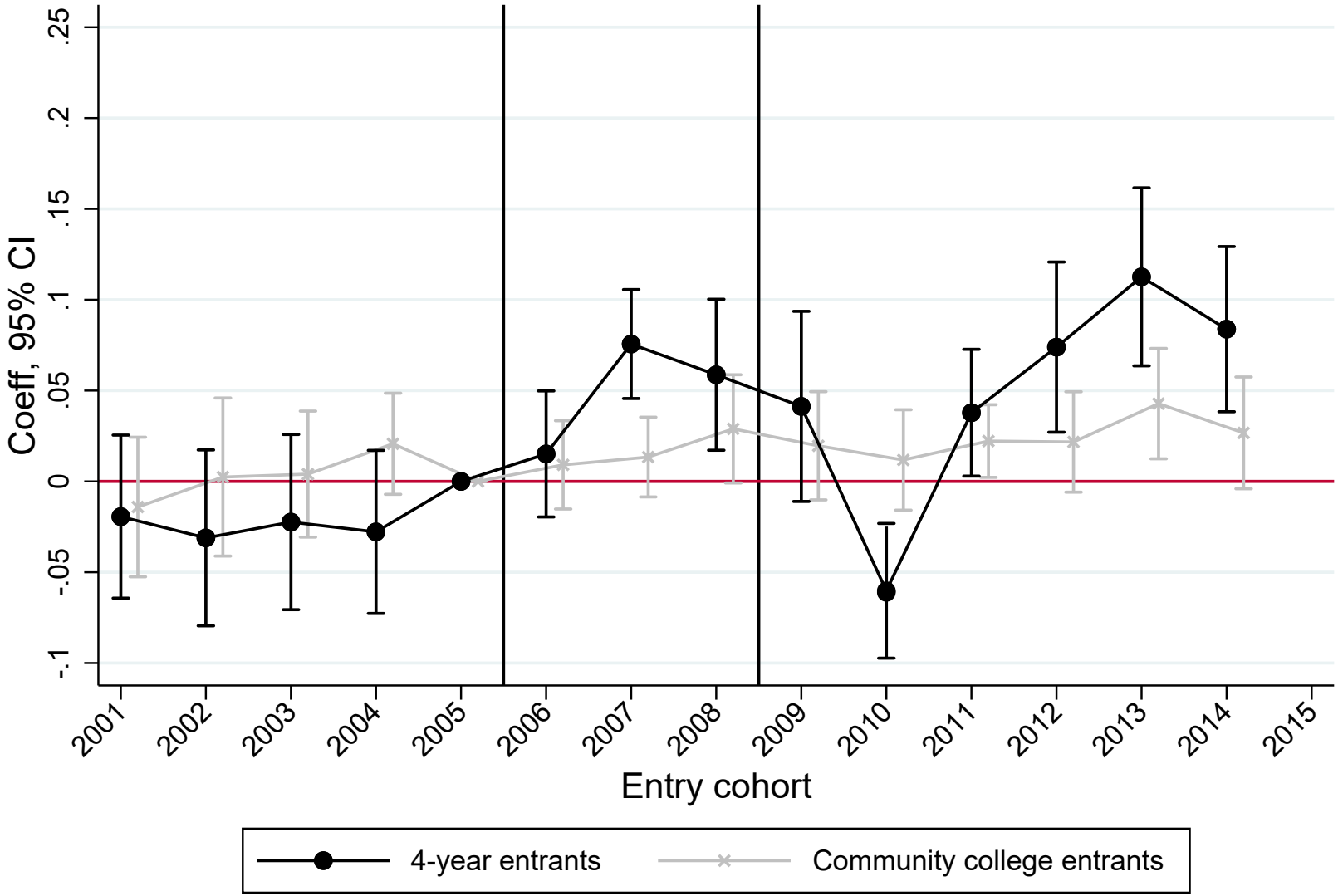
Notes: Robust standard errors, clustered by entry state, in parentheses; + $p < 0.1$, * $p < 0.05$, **$p < 0.01$. [Back]

Enrollment in a 4-year institution, 1 year after entry



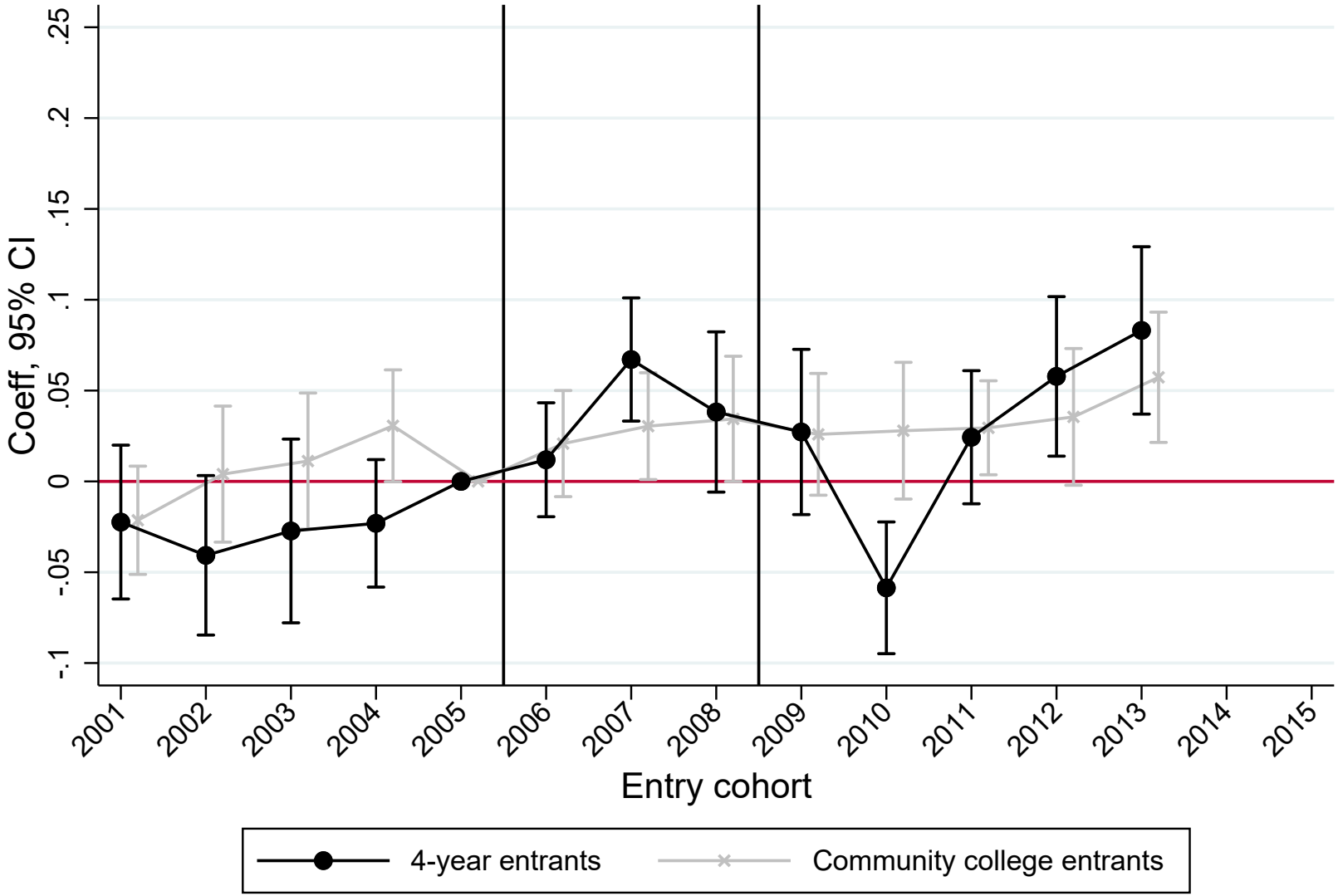
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2 years after entry



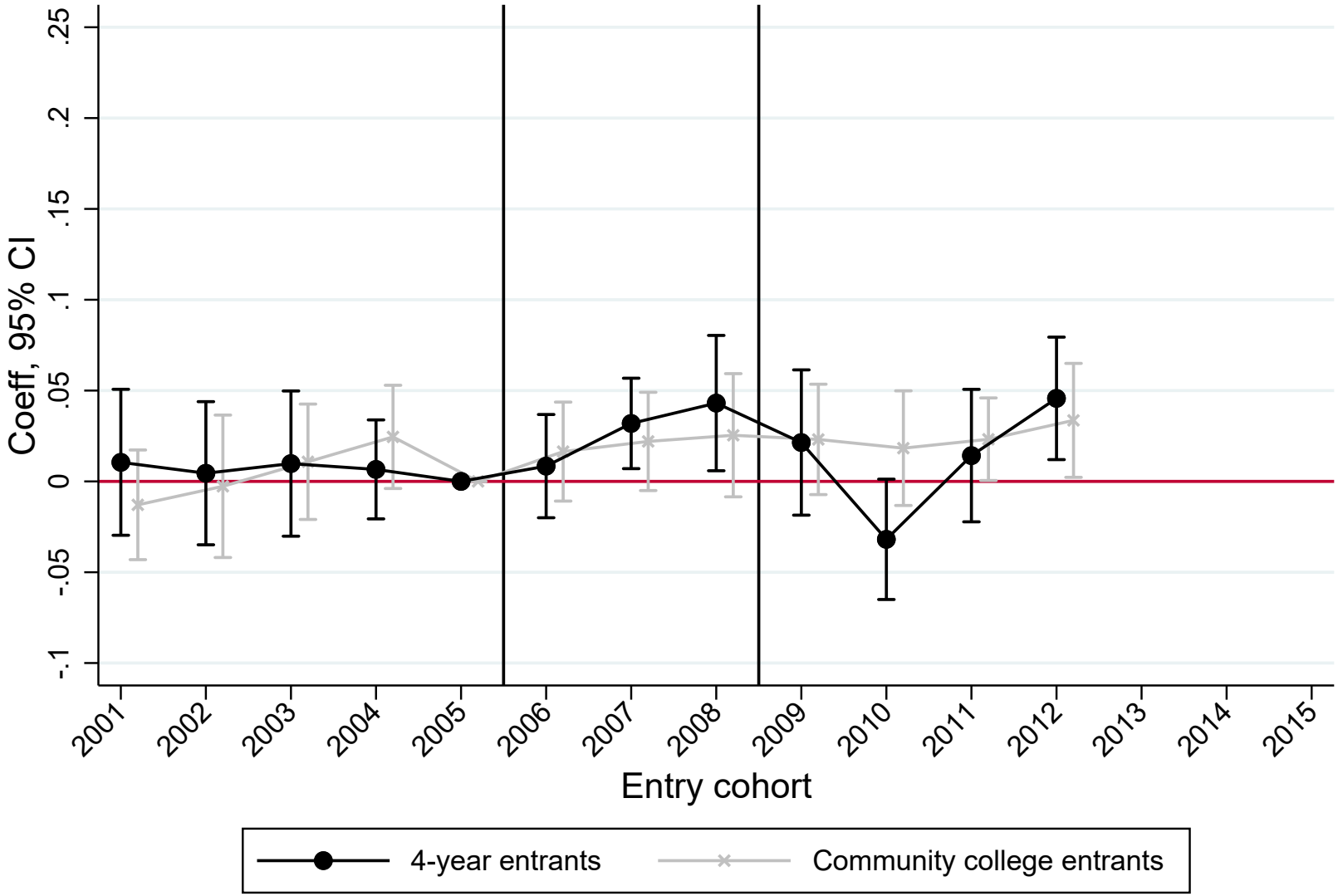
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3 years after entry



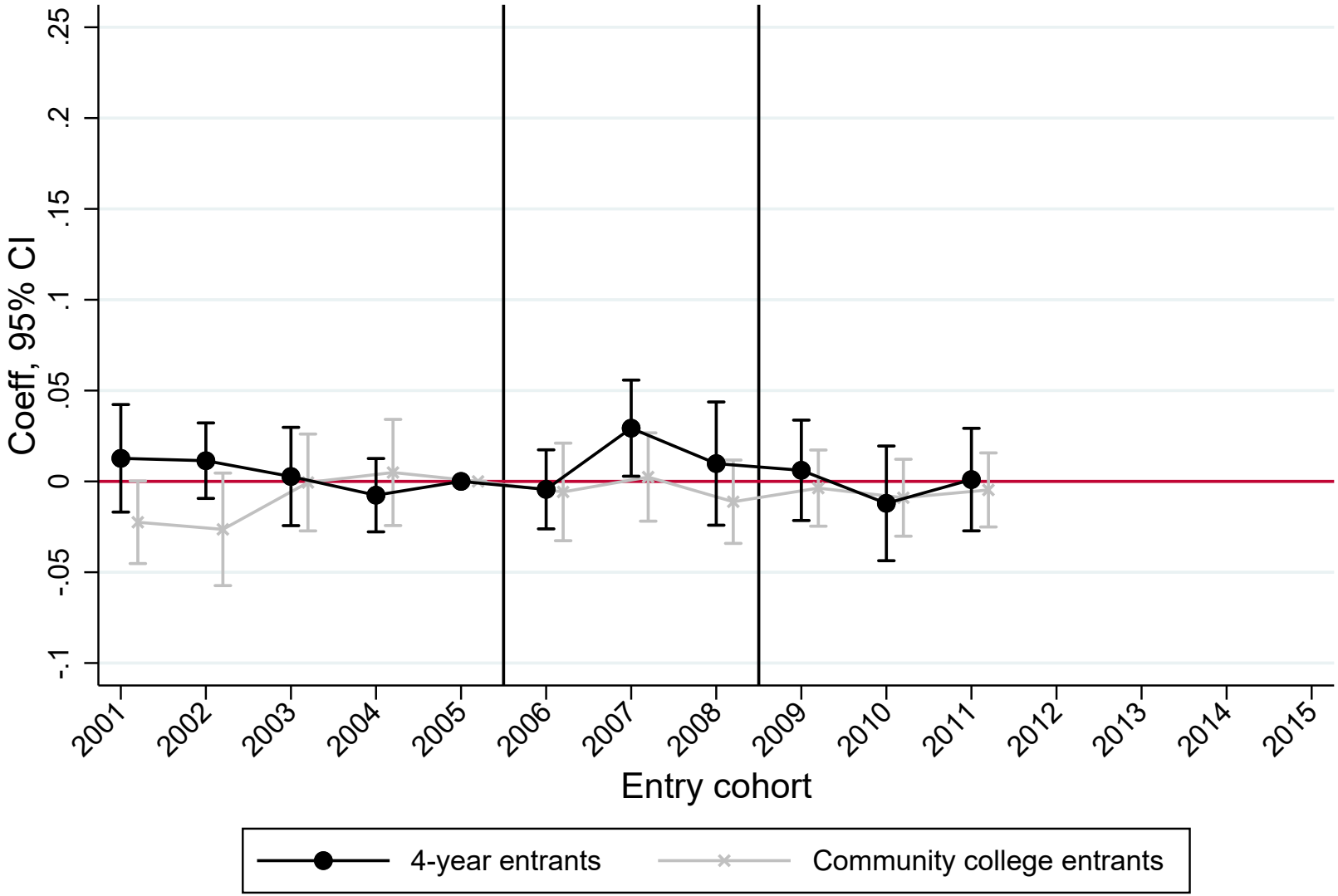
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4 years after entry



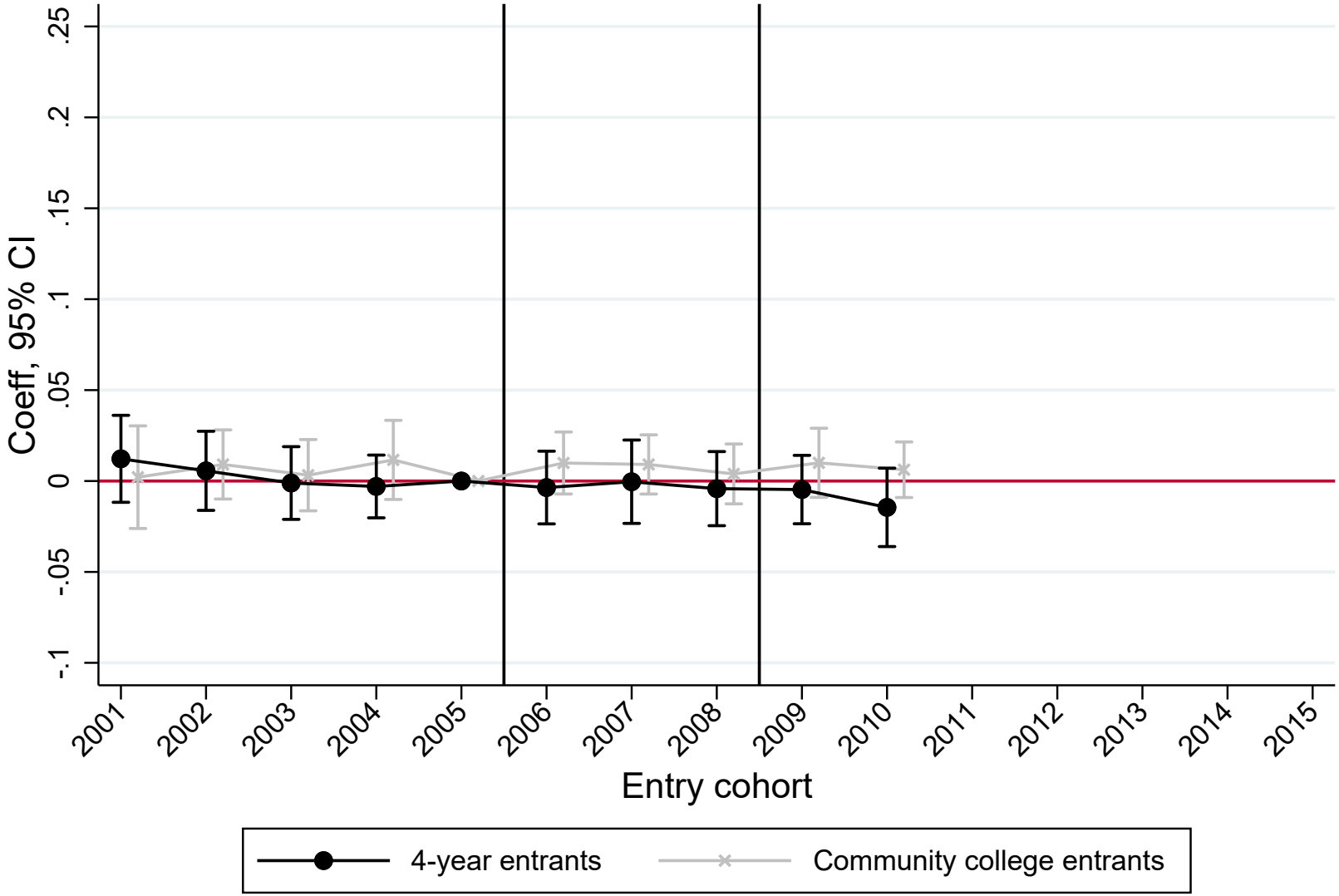
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5 years after entry



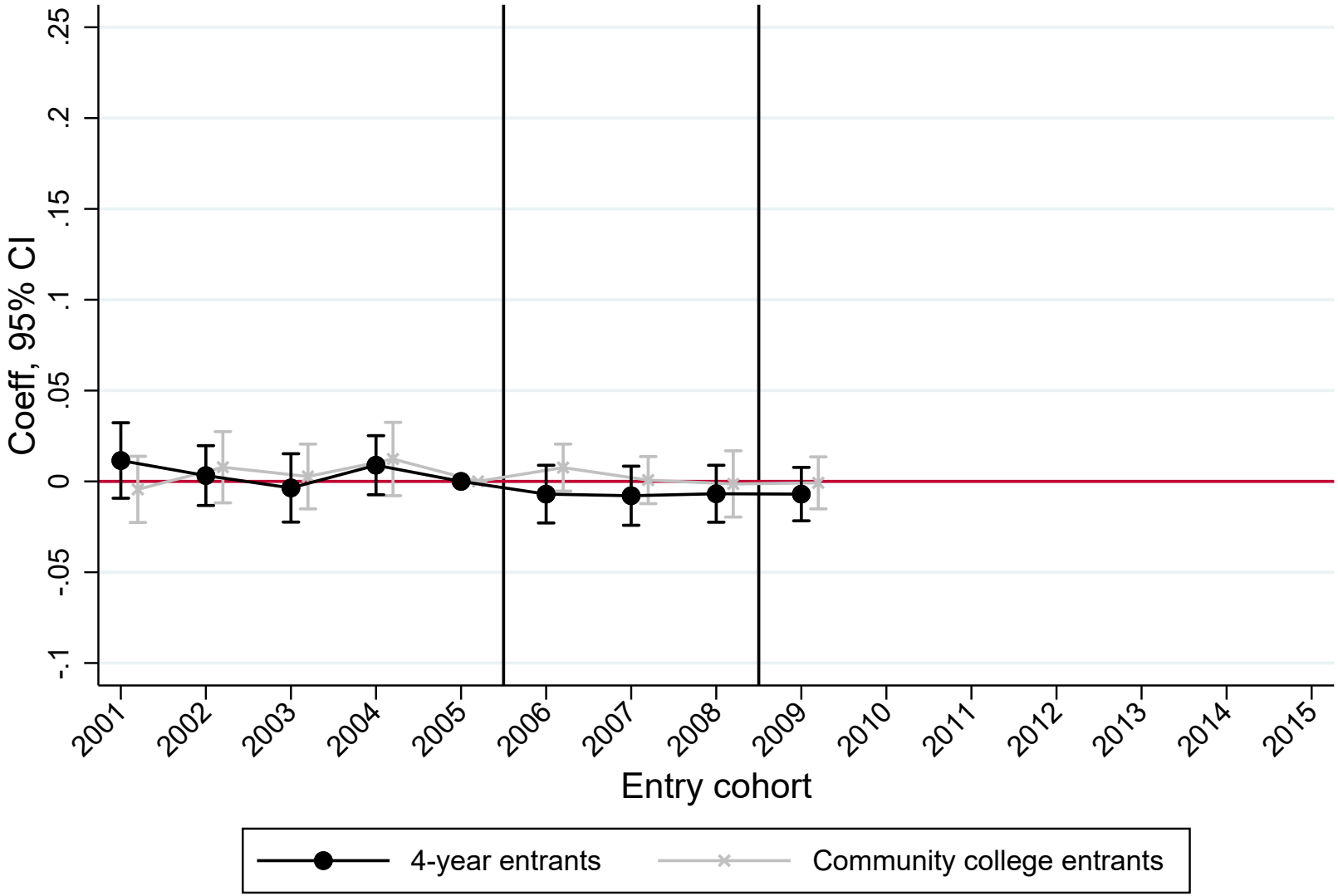
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6 years after entry



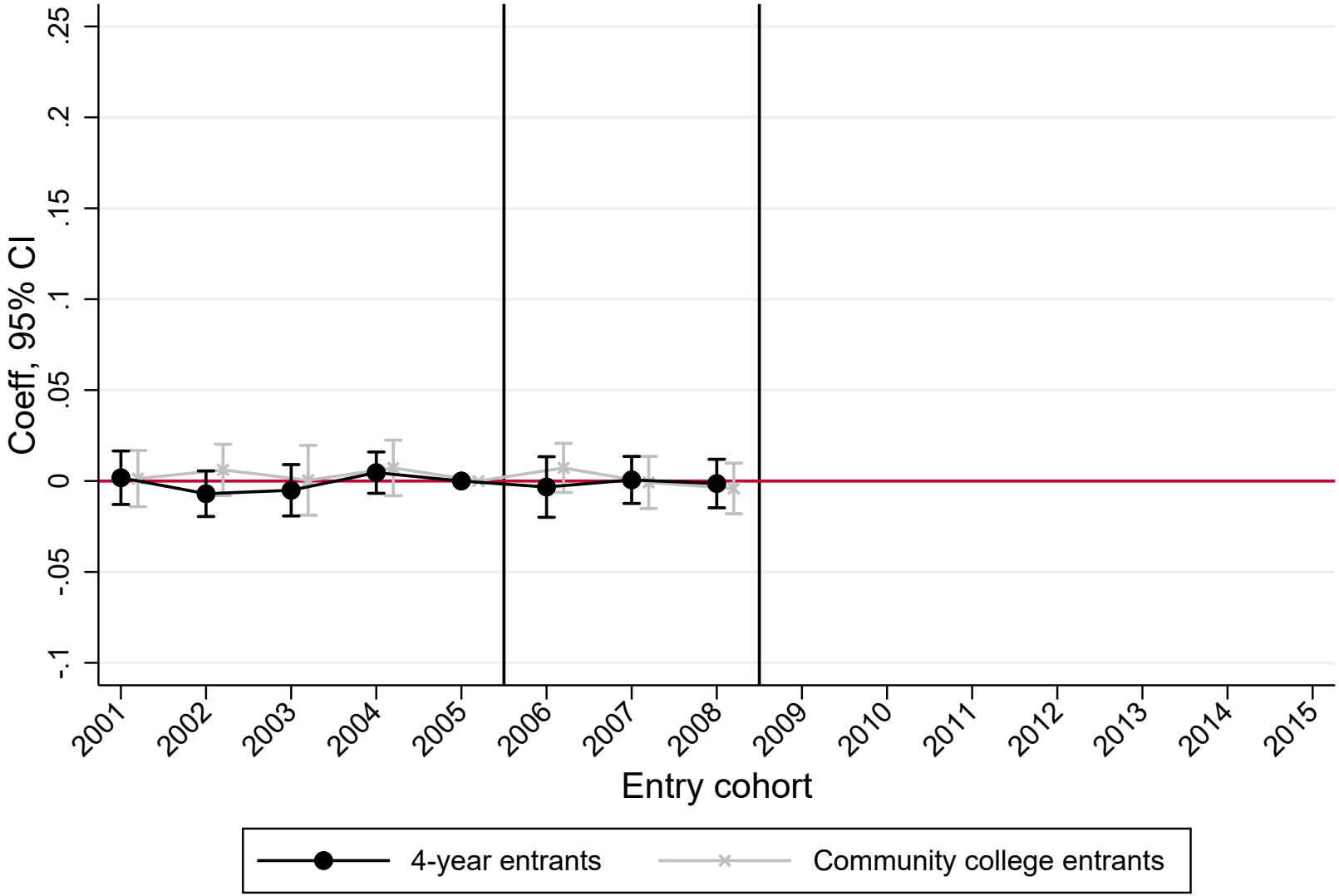
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7 years after entry



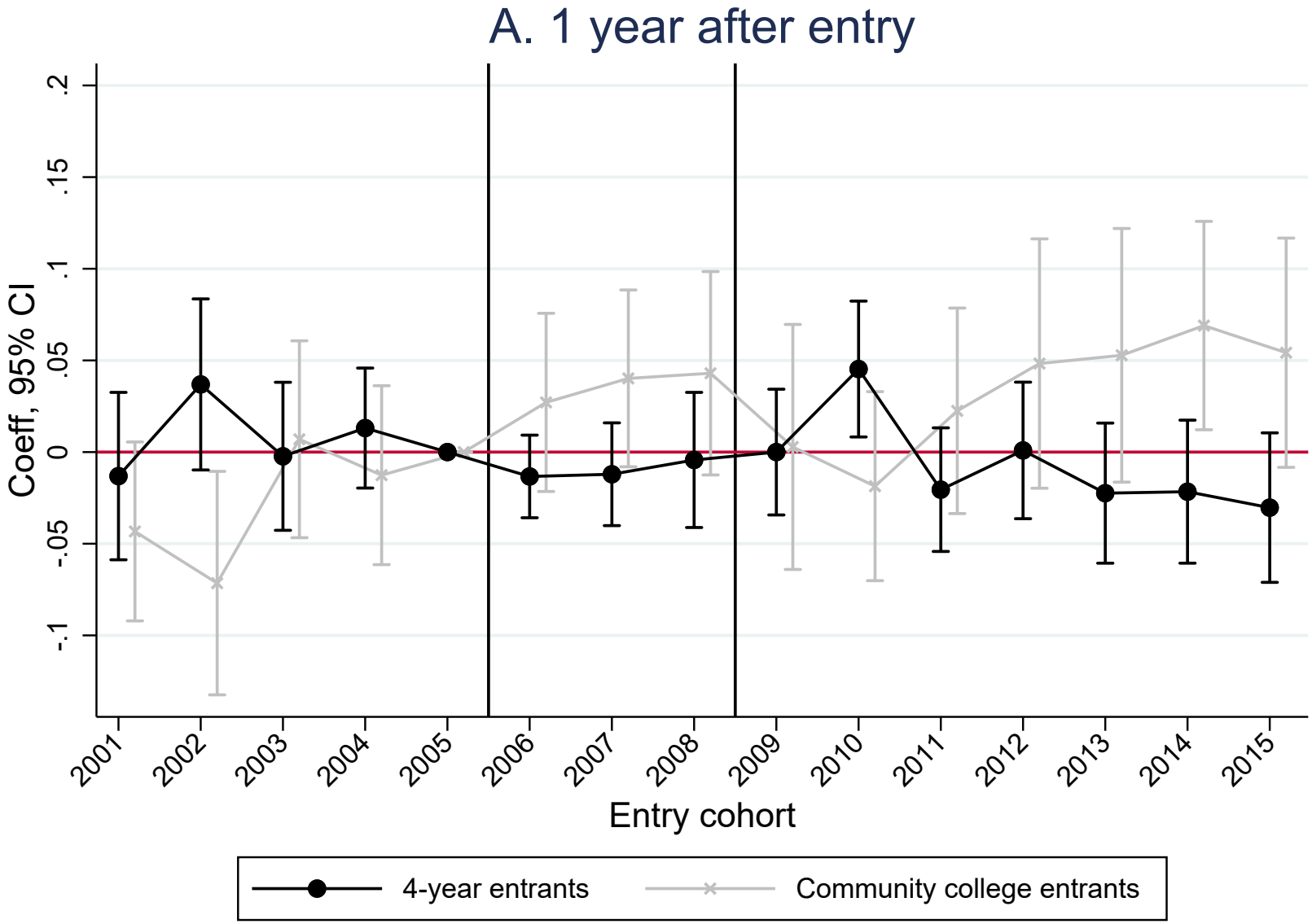
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8 years after entry



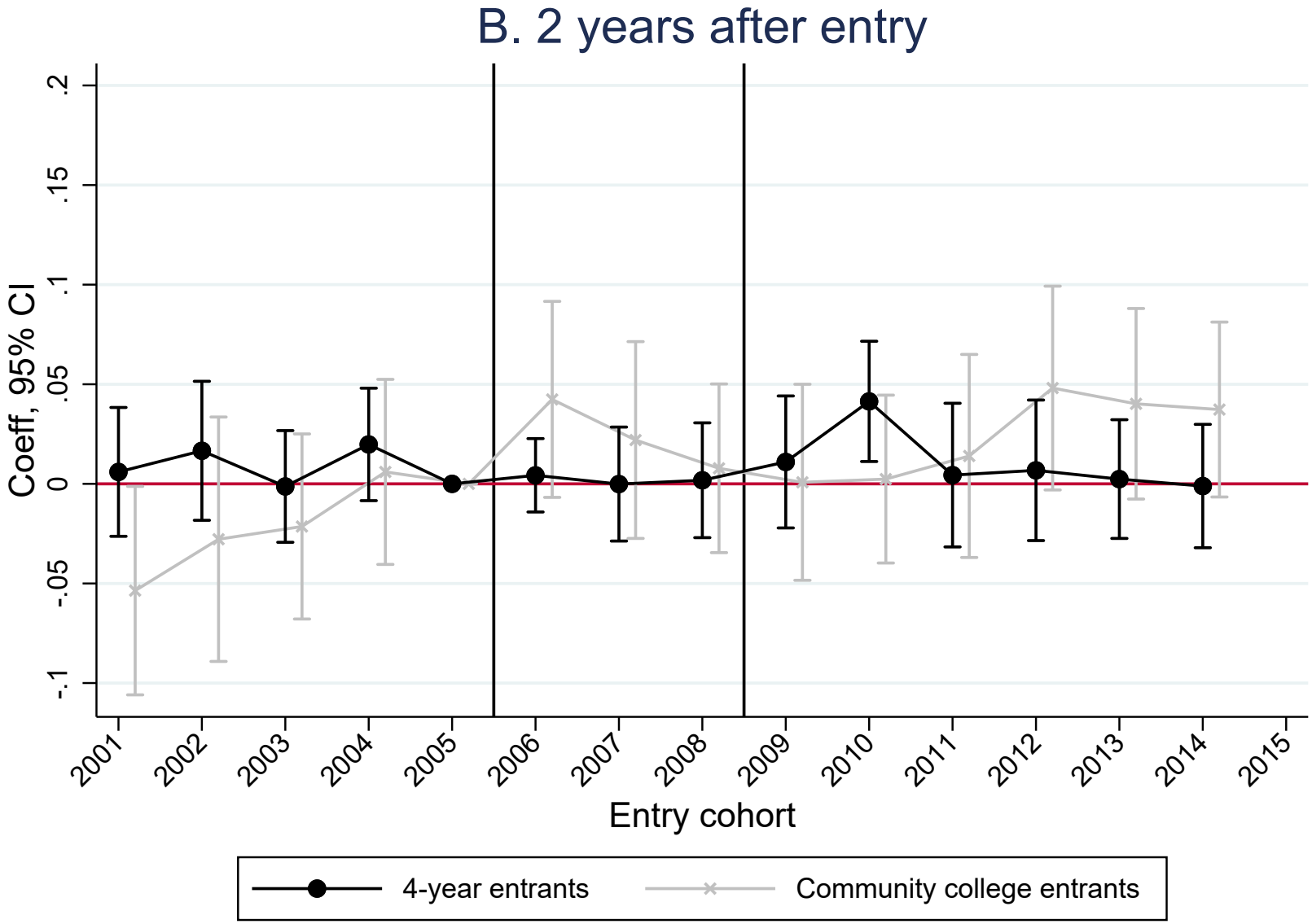
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CC enrollment



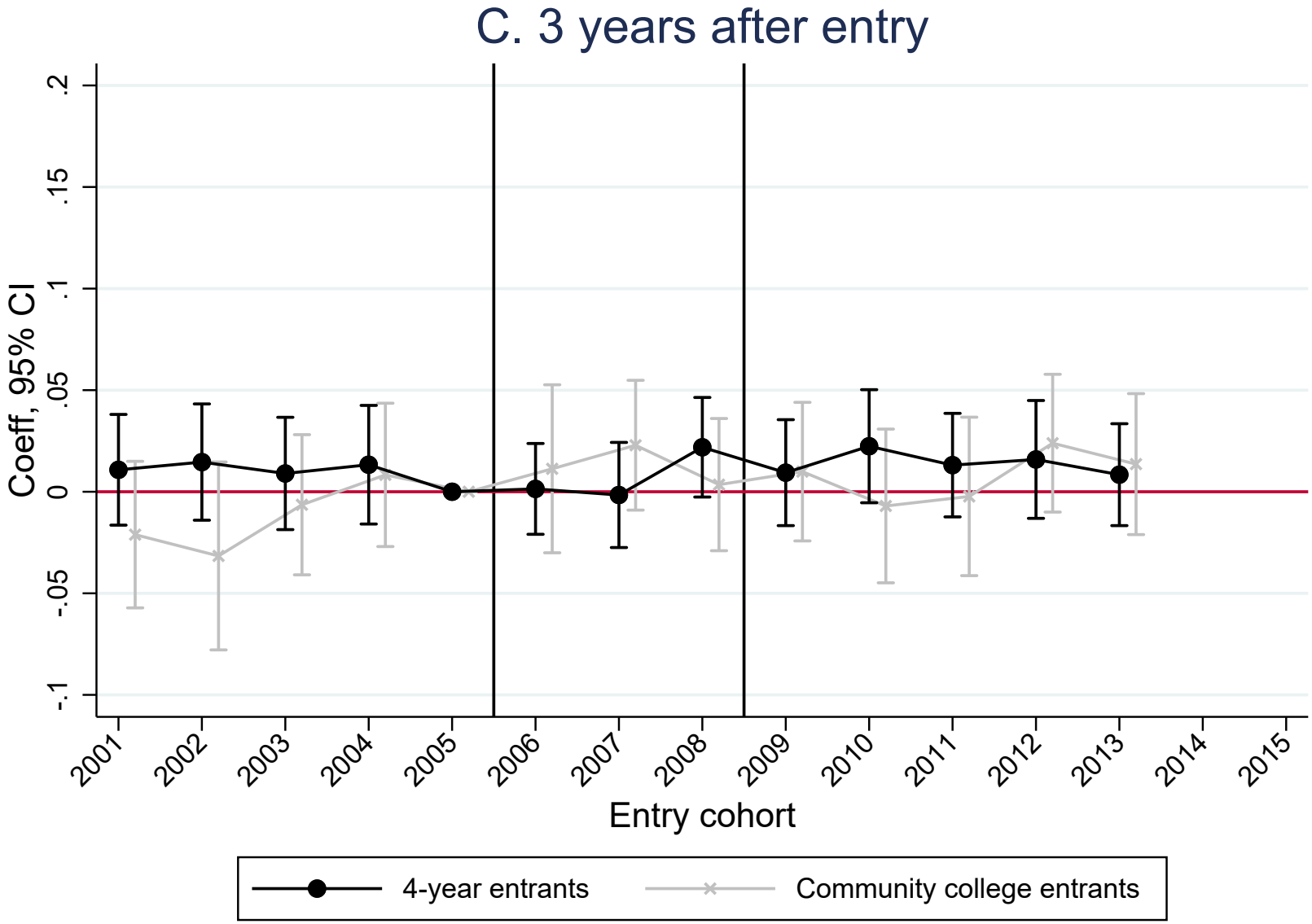
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CC enrollment



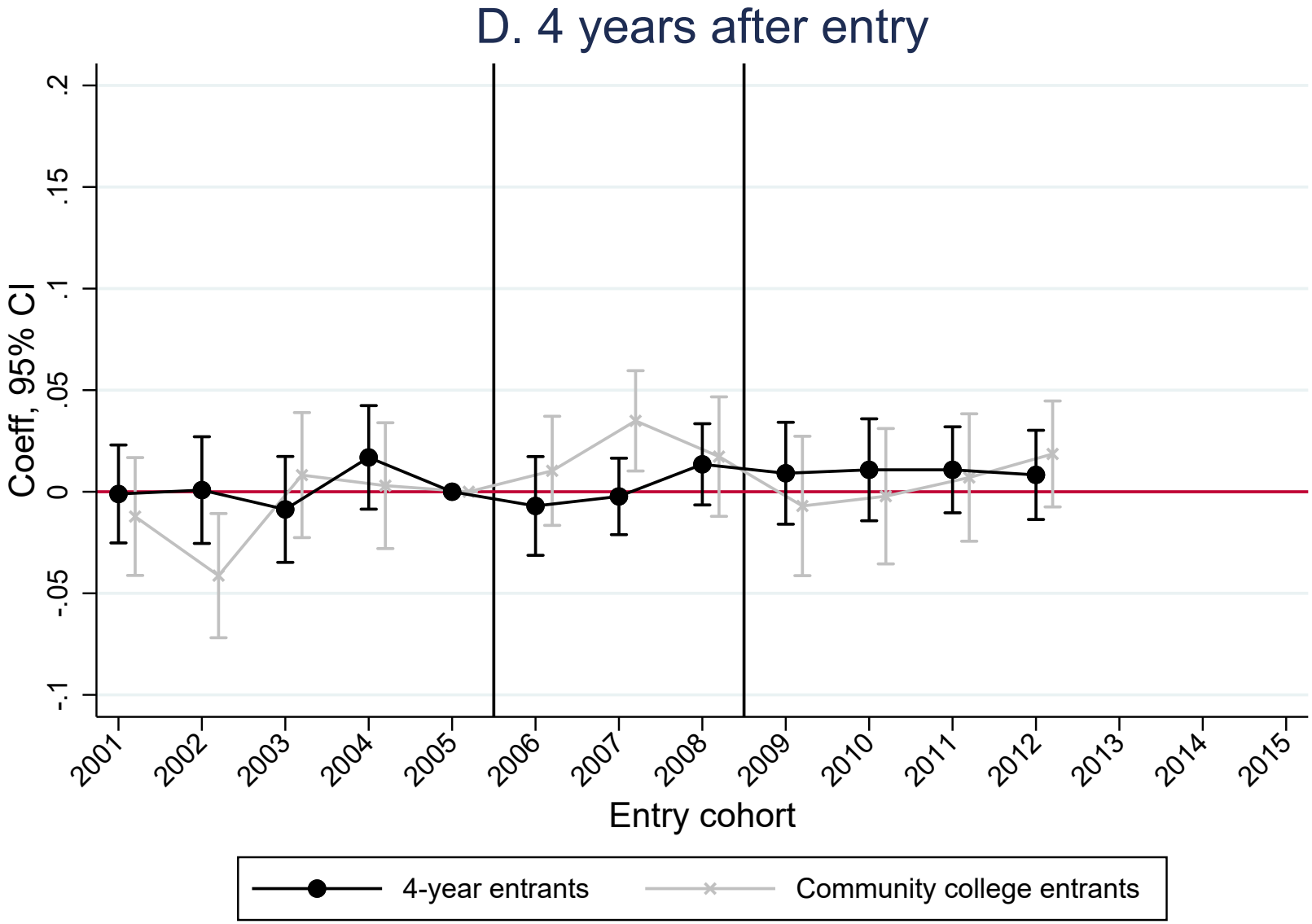
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CC enrollment



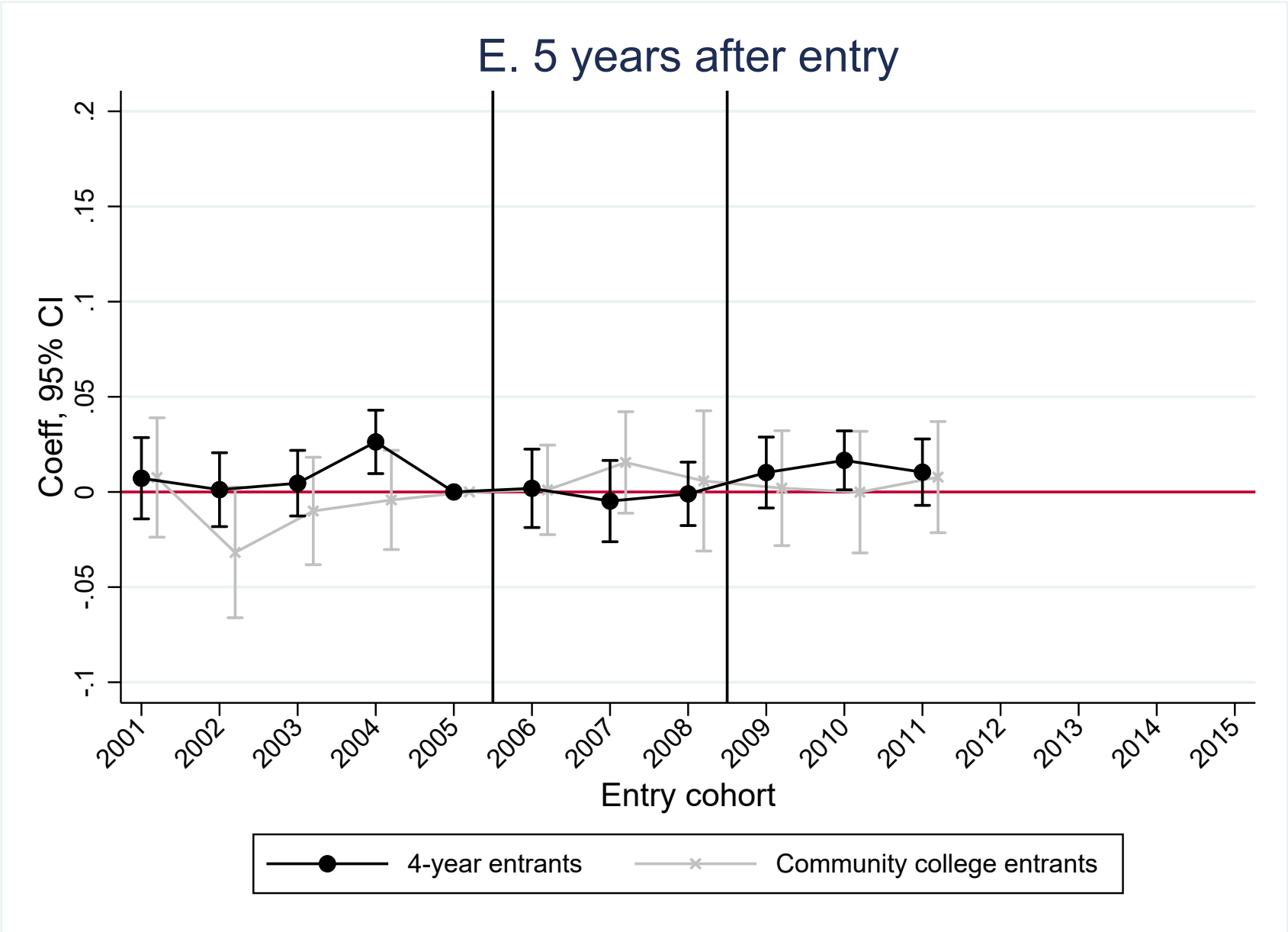
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CC enrollment



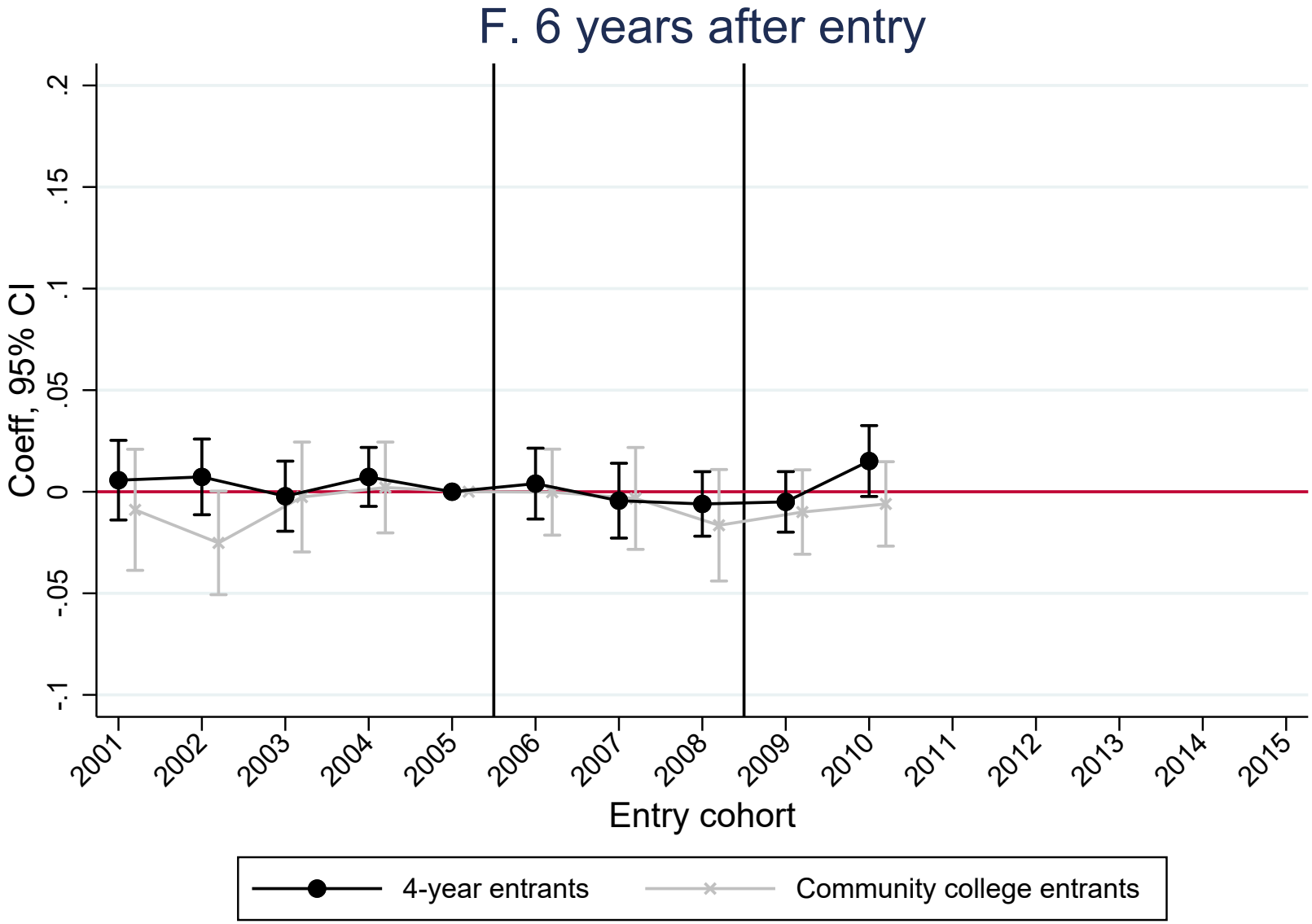
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CC enrollment



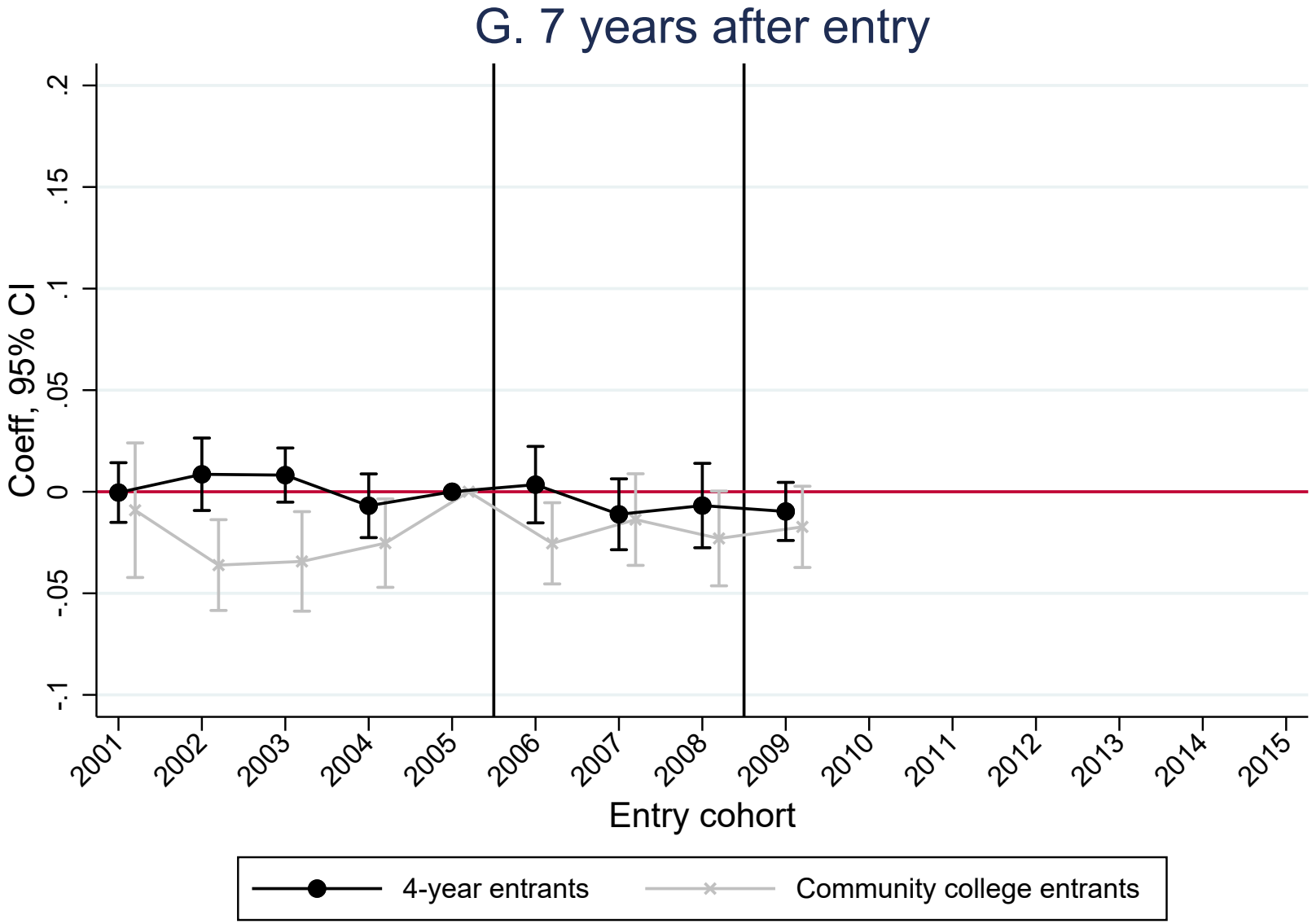
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CC enrollment



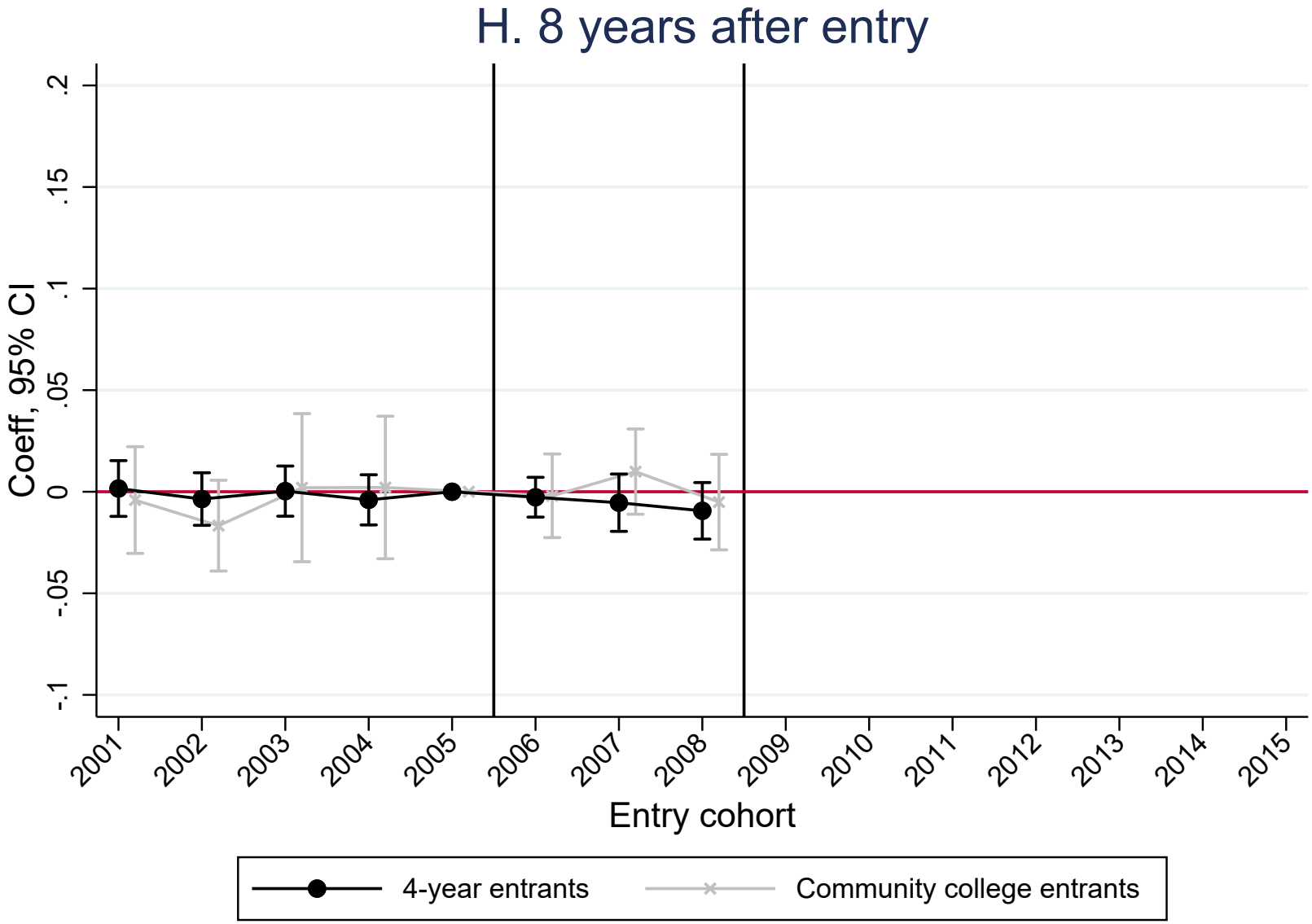
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CC enrollment



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CC enrollment



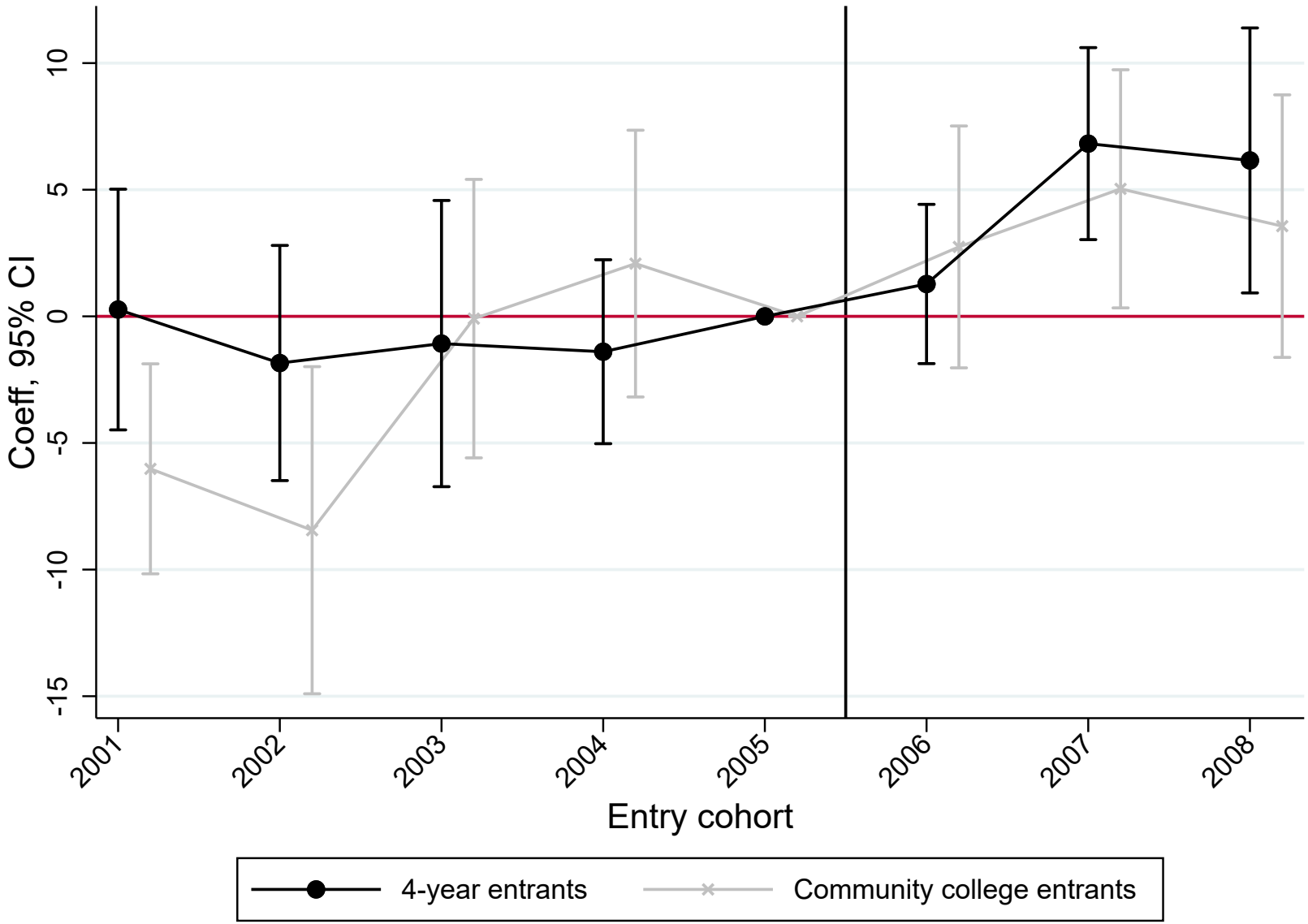
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Effects of loan limit increases on enrollment

Years since entry =	1	2	3	4	5	6	7	8
A. 4-year college entrants (N = 74,132)								
Unconstrained pre-2006 mean	0.84	0.76	0.69	0.52	0.32	0.22	0.16	0.13
Constrained x Cohort in {2006,2007,2008}	0.044	0.047	0.050	0.014	-0.002	-0.012	-0.018	-0.007
	(0.007)**	(0.007)**	(0.009)**	(0.010)	(0.009)	(0.007)	(0.006)**	(0.004)
	{0.003}	{0.008}	{0.008}	{0.321}	{0.672}	{0.106}	{0.033}	{0.018}
B. Community college entrants (N = 43,122)								
Unconstrained pre-2006 mean	0.64	0.47	0.37	0.31	0.24	0.19	0.16	0.14
Constrained x Cohort in {2006,2007,2008}	0.050	0.039	0.037	0.033	0.008	0.001	-0.001	0.003
	(0.012)**	(0.011)**	(0.01)**	(0.012)**	(0.011)	(0.009)	(0.006)	(0.008)
	{0.009}	{0.017}	{0.012}	{<0.001}	{0.372}	{0.903}	{0.925}	{0.532}

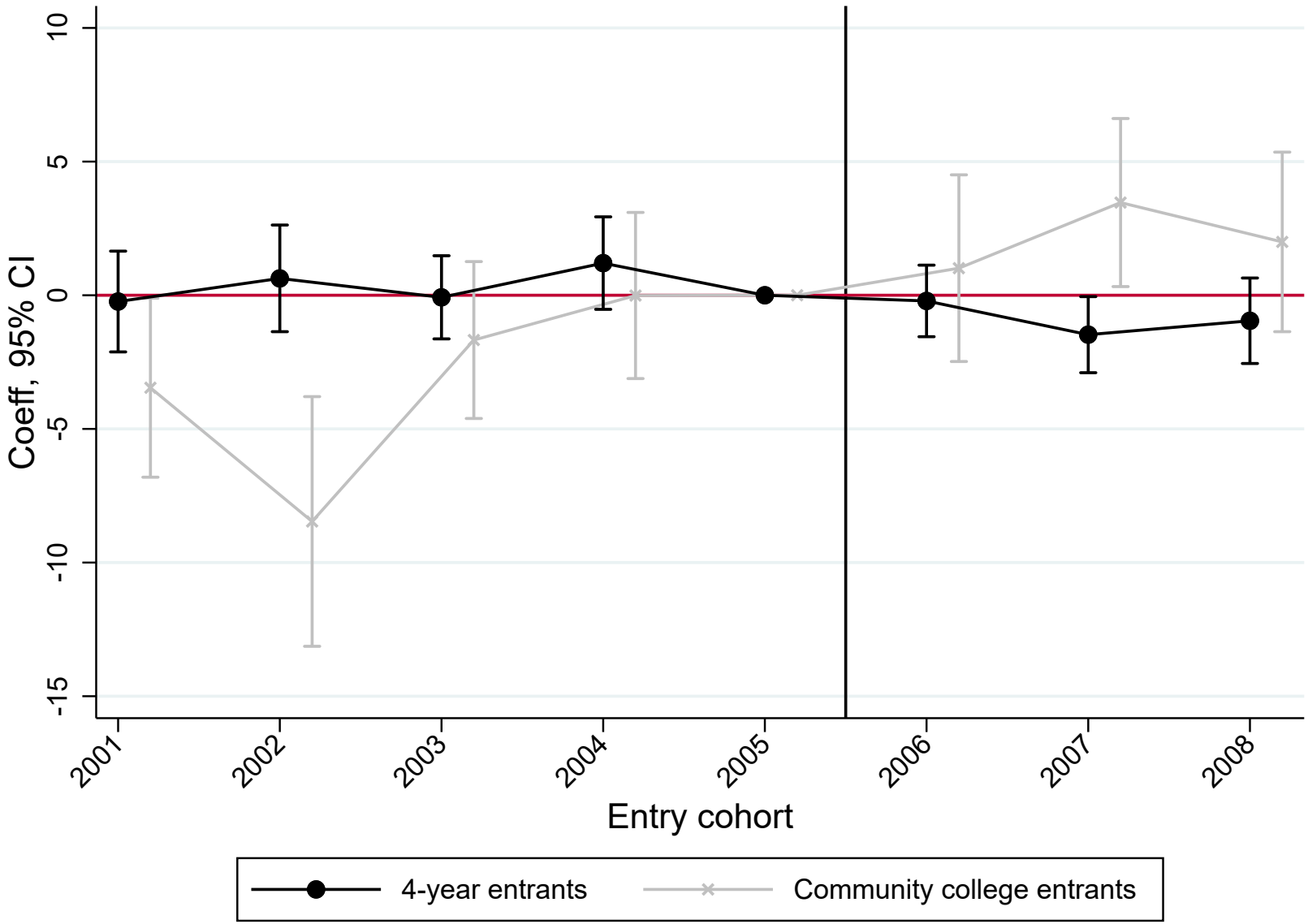
Notes: Dependent variable is enrollment in any public institution in Texas. Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$; p-values from wild-t cluster bootstrap in brackets. [Back]

Cumulative credits attempted (all institutions)



[Back]

Cumulative credits attempted (comm. colleges)



[Back]

Robustness of attainment effects to excluding controls

	(1) Total years enrolled	(2) Total credits attempted	(3) Any degree	(4) Bachelor's degree	(5) Associate degree
A. Main sample and specification (N = 117,254)					
Constrained x Cohort in {2006,2007,2008}	0.144	5.68	0.042	0.033	0.009
	(0.029)**	(0.86)**	(0.008)**	(0.009)**	(0.004)*
B. No controls (N = 117,254)					
Constrained x Cohort in {2006,2007,2008}	0.204	7.31	0.043	0.041	0.004
	(0.076)**	(2.66)**	(0.024)+	(0.030)	(0.009)
C. Only school FE (N = 117,254)					
Constrained x Cohort in {2006,2007,2008}	0.128	5.27	0.041	0.032	0.008
	(0.031)**	(0.93)**	(0.009)**	(0.010)**	(0.004)+

Notes: Dependent variable is indicated by column. Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$; p-values from wild-t cluster bootstrap in brackets. [Back]

Robustness of attainment effects to excluding 2001 entrants

	(1) Total years enrolled	(2) Total credits attempted	(3) Any degree	(4) Bachelor's degree	(5) Associate degree
A. Main sample and specification (N = 117,254)					
Constrained x Cohort in {2006,2007,2008}	0.144	5.68	0.042	0.033	0.009
	(0.029)**	(0.86)**	(0.008)**	(0.009)**	(0.004)*
D. Omit 2001 cohort (N = 104,753)					
Constrained x Cohort in {2006,2007,2008}	0.129	5.17	0.040	0.032	0.009
	(0.032)**	(0.87)**	(0.008)**	(0.008)**	(0.004)*

Notes: Dependent variable is indicated by column heading. Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$. [Back]

Robustness of attainment effects to including nonprofit entrants

	(1) Total years enrolled	(2) Total credits attempted	(3) Any degree	(4) Bachelor's degree	(5) Associate degree
A. Main sample and specification (N = 117,254)					
Constrained x Cohort in {2006,2007,2008}	0.144	5.68	0.042	0.033	0.009
	(0.029)**	(0.86)**	(0.008)**	(0.009)**	(0.004)*
E. Include nonprofits (N = 132,031)					
Constrained x Cohort in {2006,2007,2008}	0.147	5.31	0.043	0.036	0.007
	(0.027)**	(0.82)**	(0.007)**	(0.008)**	(0.004)+

Notes: Dependent variable is indicated by column heading. Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$. Nonprofit enrollment is not observed until 2004. [Back]

Robustness of attainment effects to excluding unconstrained entrants with small initial loans

	(1) Total years enrolled	(2) Total credits attempted	(3) Any degree	(4) Bachelor's degree	(5) Associate degree
A. Main sample and specification (N = 117,254)					
Constrained x Cohort in {2006,2007,2008}	0.144	5.68	0.042	0.033	0.009
	(0.029)**	(0.86)**	(0.008)**	(0.009)**	(0.004)*
F. Limited control (N = 100,885)					
Constrained x Cohort in {2006,2007,2008}	0.159	6.39	0.050	0.037	0.010
	(0.037)**	(1.15)**	(0.010)**	(0.011)**	(0.005)*

Notes: Dependent variable is indicated by column heading. Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$. Unconstrained borrowers who borrow less than \$1300 in their entry year are excluded. [Back]

Flexible DD Specification

$$Y_{isc} = \beta_1 Cons_i + \sum_{c=2006}^{2008} \gamma^c \left(\mathbf{1}\left[Cohort = c\right] \times Cons_i\right) + \boldsymbol{X_i}\boldsymbol{\beta_x} + \delta_c + \delta_s + \epsilon_{isc}$$

Where:

- Y_{isc} is outcome for student i entering school s in cohort c
- $Cons_i$ indicates student i borrowed the max federal loan in first year
- $\boldsymbol{X_i}$ is vector of baseline characteristics (gender, race, age at entry)
- δ_s are school (state) at entry FE, δ_c are entry cohort FE
- Standard errors clustered by entry institution ($N \approx 120$) or state

[Back]

Flexible specification: attainment

	Attainment, 10 years after entry				
	(1) Years enrolled	(2) Credits attempted	(3) Any degree	(4) BA degree	(5) AA degree
A. Four-year entrants					
Constrained x 2006 cohort	0.04	2.5	0.034	0.034	-0.005
	(0.04)	(1.5)+	(0.015)*	(0.014)*	(0.005)
	{0.269}	{0.12}	{0.168}	{0.142}	{0.425}
Constrained x 2007 cohort	0.16	7.5	0.054	0.069	-0.01
	(0.06)*	(1.7)**	(0.015)**	(0.017)**	(0.006)+
	{0.169}	{0.11}	{0.235}	{0.154}	{0.391}
Constrained x 2008 cohort	0.12	6.1	0.043	0.054	-0.007
	(0.06)+	(1.9)**	(0.017)*	(0.018)**	(0.006)
	{0.212}	{0.13}	{0.236}	{0.22}	{0.371}
Test of eq (p -value)	0.296	0.056	0.448	0.17	0.74
Observations	77,900	77,900	77,900	77,900	77,900

Notes: Dependent variable is indicated by column heading. Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, **$p < 0.01$; p-values from wild-t cluster bootstrap in brackets. [Back]

Dose-response estimates

A. Cumulative student loans				
	(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	358	534	874
	(95)**	(113)**	(67)**	(112)**
	{0.104}	{0.136}	{0.043}	{0.017}
Observations	77,900	77,900	143,850	143,850
B. Attainment and earnings outcomes, 10 years after entry				
	(5) Cumulative years enrolled	(6) Cumulative credits attempted	(7) Any degree receipt	(8) Ln(earnings)
Constrained x AggLimExp ($1k)	0.02	1.1	0.006	0.006
	(0.01)*	(0.2)**	(0.002)**	(0.003)+
	{0.094}	{0.044}	{0.061}	{0.222}
Observations	77,900	77,900	77,900	59,956
C. Financial outcomes, 10 years after entry (N = 143,850)				
	(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	-0.005	-0.001	0.001
	(0.001)**	(0.001)**	(0.001)	(0.001)
	{0.084}	{0.011}	{0.540}	{0.635}

Notes: Dependent variable is indicated by column heading, measured 10 years after college entry. Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, **$p < 0.01$; p-values from wild-t cluster bootstrap in brackets. [Back]

Statutory limit expansion specification

Effect of cumulative limit (B) on attainment, earnings, and financial outcomes

$$Y_{isc} = \beta_1 Cons_i + \theta \left(B_c \times Cons_i \right) + \boldsymbol{X_i \beta_x} + \delta_c + \delta_s + \epsilon_{isc}$$

Statutory limit expansion specification

Effect of cumulative limit (B) on attainment, earnings, and financial outcomes

$$Y_{isc} = \beta_1 Cons_i + \theta \left(B_c \times Cons_i \right) + \boldsymbol{X_i \beta_x} + \delta_c + \delta_s + \epsilon_{isc}$$

Entry cohort	Year 1	Year 2	Year 3	Year 4	First Four-Year Cumulative Limit
2004 and earlier	$2,625	$3,500	$5,500	$5,500	$17,125
2005	$2,625	$3,500	$5,500	$5,500	$17,125
2006	$2,625	$3,500	$5,500	$7,500	$19,125
2007	$2,625	$4,500	$7,500	$7,500	$22,125
2008	$3,500	$6,500	$7,500	$7,500	$25,000
2009	$5,500	$6,500	$7,500	$7,500	$27,000
2010 and later	$5,500	$6,500	$7,500	$7,500	$27,000

…change in limit varies by academic level…

Statutory limits increases take effect in 2007 and 2008…

…Leads to variation in total borrowing limits across cohorts

[Back]

Earnings (four-year entrants)

Years since entry =	1	2	3
C. Any earnings X years after entry (N = 77,900)			
Constrained x cohort ϵ {2006,2007,2008}	-0.020	-0.012	0.003
	(0.006)**	(0.006)*	(0.006)
	{0.075}	{0.116}	{0.742}
Dependent variable mean	0.803	0.792	0.796
D. Ln(earnings) X years after entry			
Constrained x cohort ϵ {2006,2007,2008}	-0.054	-0.034	-0.046
	(0.026)*	(0.025)	(0.024)+
	{0.052}	{0.321}	{0.067}
Dependent variable mean	8.6	8.8	9.0
Observations	62,557	61,722	62,005

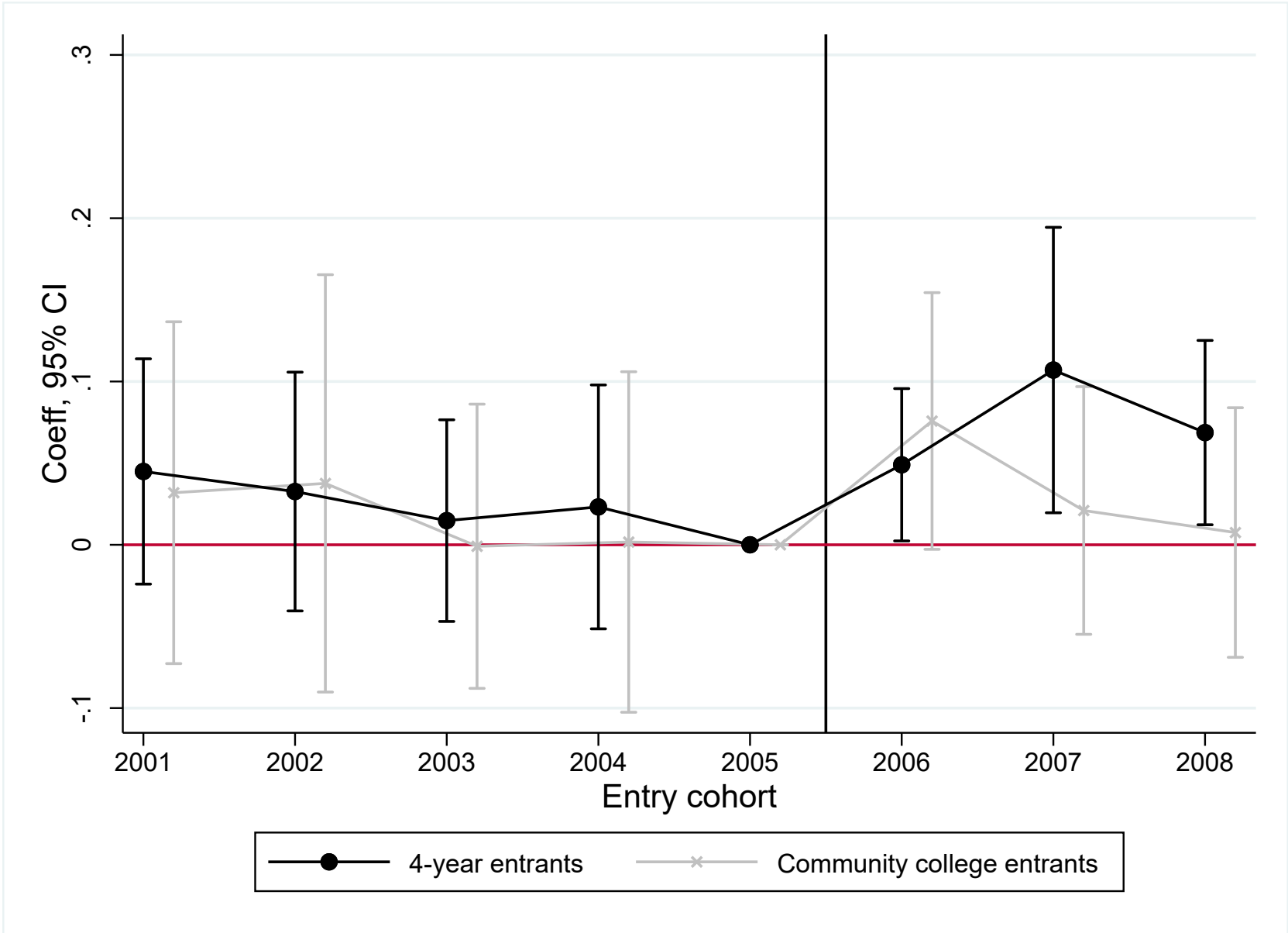
*Notes:*Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, **$p < 0.01$; p-values from wild-t cluster bootstrap in brackets.[Back]

Credit card use

Years since entry =	1	2	3
A. Any credit card (N = 143,850)			
Constrained x cohort ϵ {2006,2007,2008}	-0.023	-0.007	-0.010
	(0.006)**	(0.007)	(0.007)
	{0.060}	{0.596}	{0.390}
Dependent variable mean	0.519	0.587	0.619
B. Credit card balance (conditional on having 1+ cards)			
Constrained x cohort ϵ {2006,2007,2008}	-88	-85	-32
	(28)**	(42)*	(55)
	{0.019}	{0.037}	{0.621}
Dependent variable mean	$1,358	$1,815	$2,152
Observations	74,599	84,413	89,013

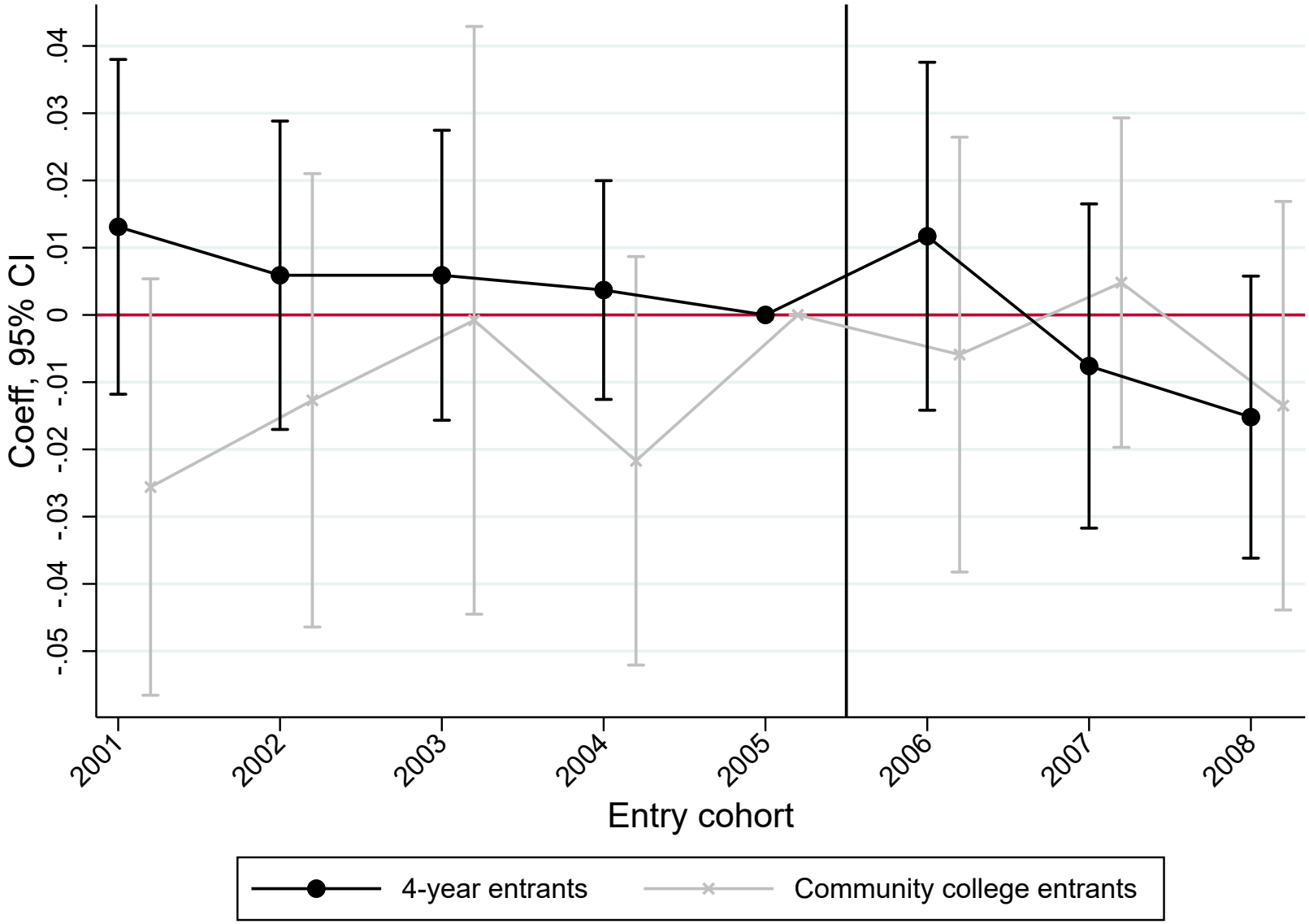
Notes: Robust standard errors, clustered by entry state, in parentheses; + $p < 0.1$, * $p < 0.05$, **$p < 0.01$; p-values from wild-t cluster bootstrap in brackets.[Back]

Ln(earnings)



[Back]

Any earnings



[Back]

Level earnings

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

Notes: Dependent variable is annual earnings (winsorized at 99th percentile). Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, **$p < 0.01$; p-values from wild-t cluster bootstrap in brackets. [Back]

Earnings and employment (CC entrants)

Years since entry =	1	2	3	4	5	6	7	8	9	10
A. Any earnings (N = 42,843)										
Constrained x cohort ϵ {2006,2007,2008}	0.009	0.018	0.016	0.005	0.004	0.007	0.008	0.003	0.006	0.013
	(0.008)	(0.009)+	(0.008)+	(0.01)	(0.01)	(0.011)	(0.009)	(0.008)	(0.008)	(0.008)
	{0.124}	{0.021}	{0.020}	{0.623}	{0.597}	{0.566}	{0.428}	{0.675}	{0.479}	{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. Ln(earnings)										
Constrained x cohort ϵ {2006,2007,2008}	0.006	0.004	-0.068	-0.034	0.008	-0.023	-0.018	-0.001	-0.007	0.022
	(0.026)	(0.032)	(0.030)*	(0.027)	(0.031)	(0.027)	(0.028)	(0.031)	(0.044)	(0.026)
	{0.855}	{0.88}	{0.016}	{0.543}	{0.682}	{0.351}	{0.497}	{0.969}	{0.816}	{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

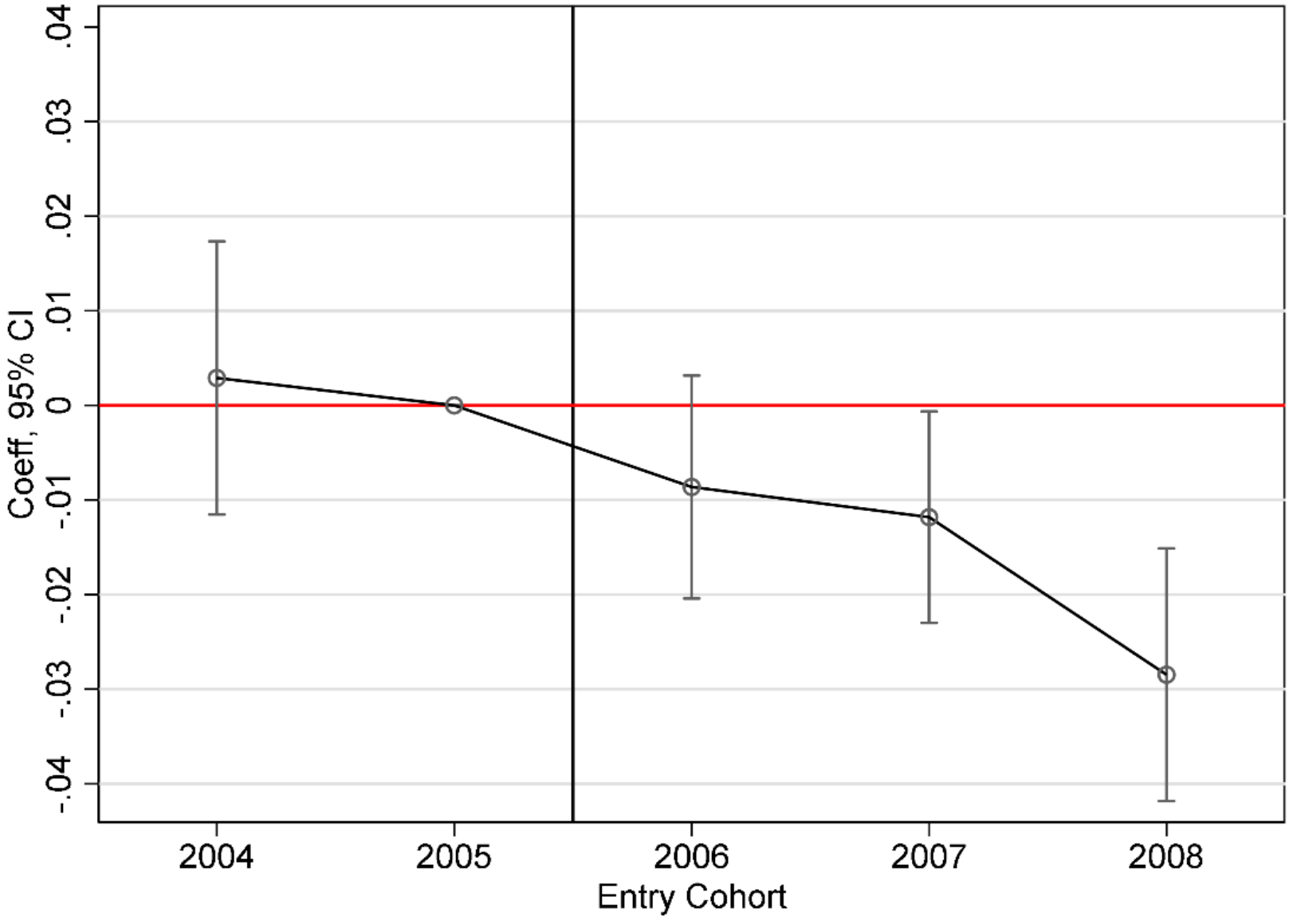
Notes: Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$; p-values from wild-t cluster bootstrap in brackets. [Back]

IV estimates

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

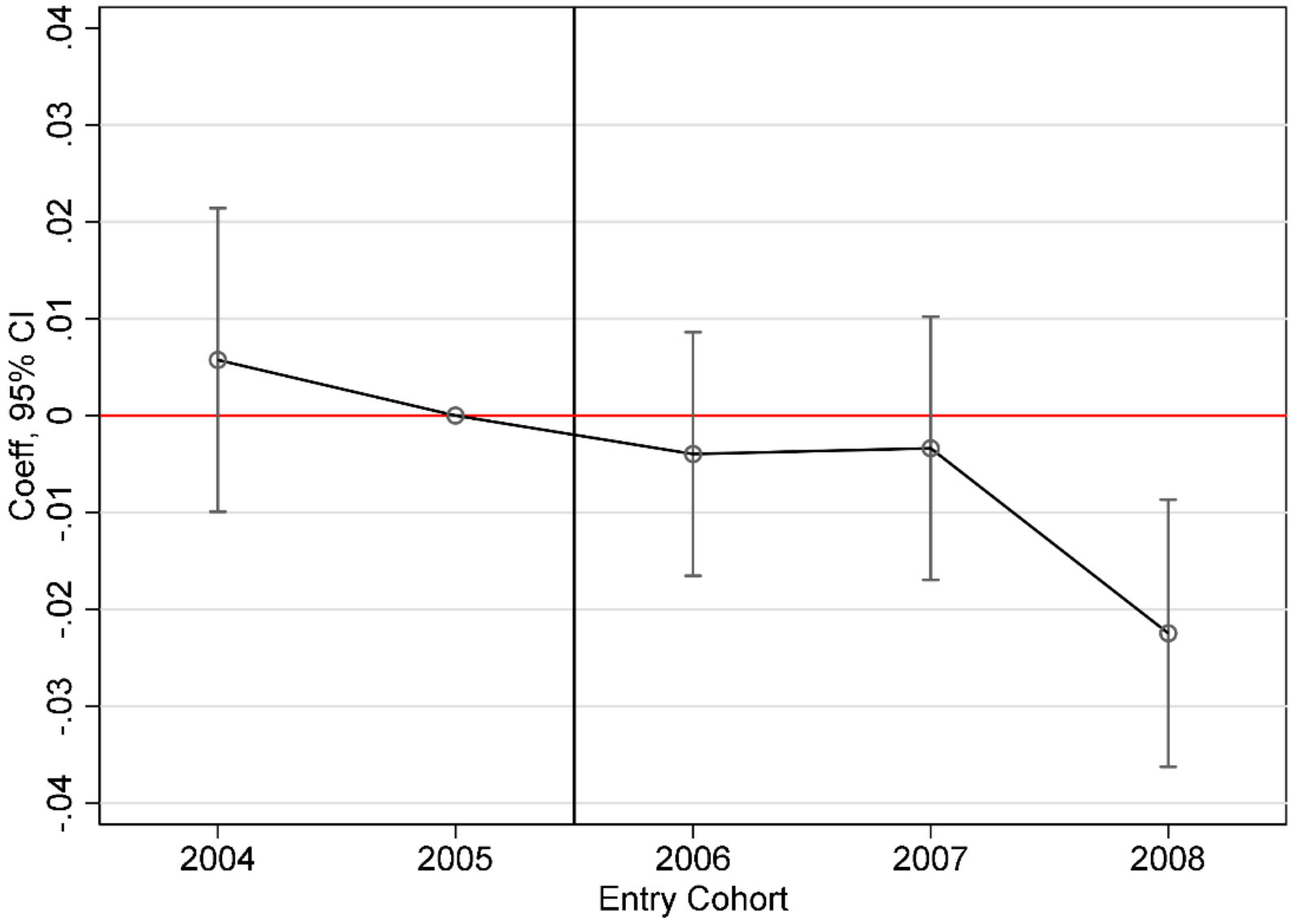
Notes: IV estimates of the effect of cumulative student loans on outcome indicated by subpanel heading 10 years after entry. Excluded instrument is interaction between being constrained at entry and belonging to the 2006 - 2008 entry cohorts. Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$. [Back]

Student loans ever default



[Back]

Student loans ever delinquent



[Back]

IV estimates: effect of borrowing on student loan repayment

	(1) Delinquent (stud. loans)	(2) Default (stud. loans)
Cumulative loans ($1k)	-0.008	-0.011
	(0.003)*	(0.003)**
Observations	143,850	143,850

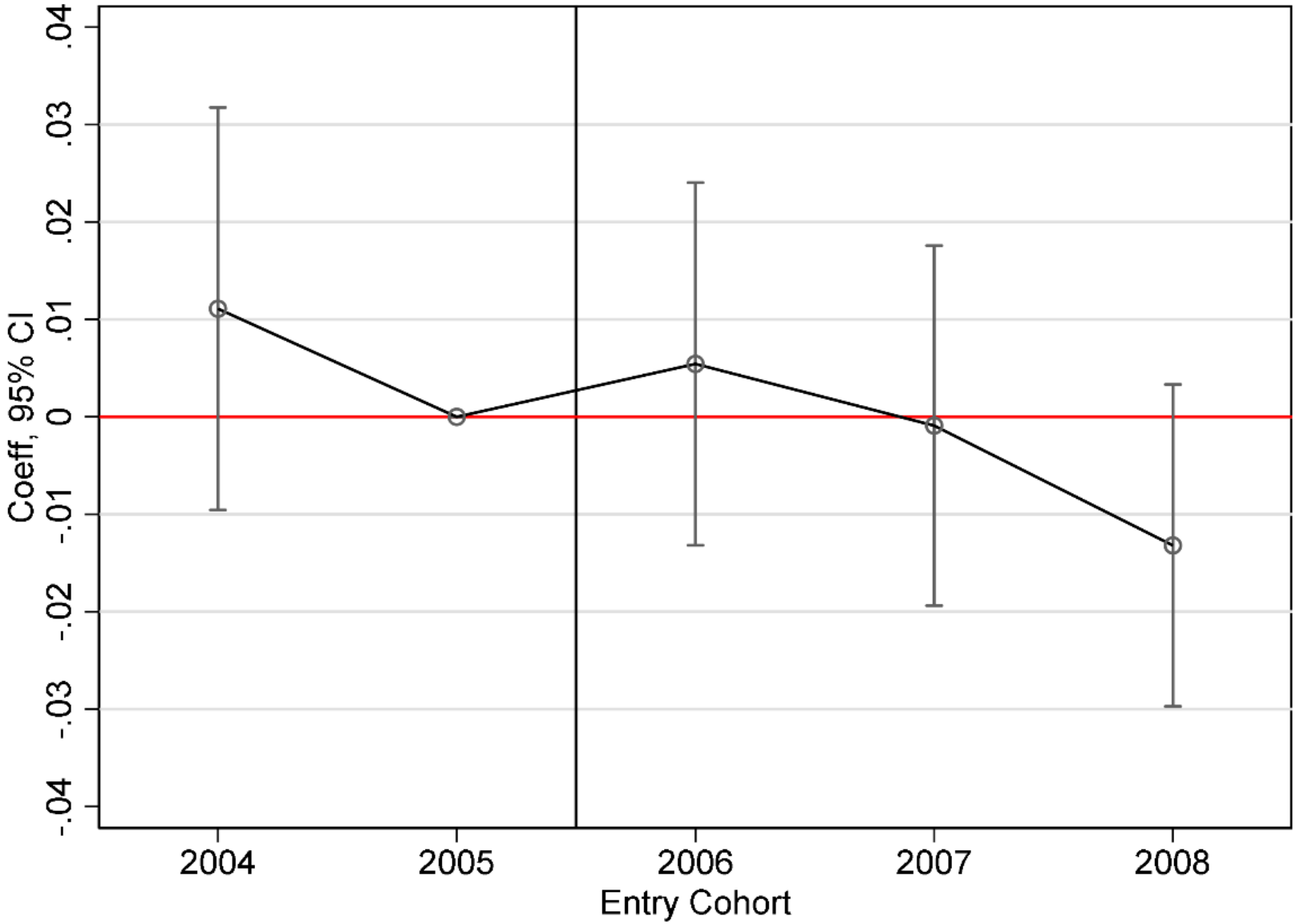
Notes: IV estimates of the effect of cumulative student loans on outcome indicated by heading 10 years after entry. Excluded instrument is interaction between being constrained at entry and belonging to the 2006 - 2008 entry cohorts. Robust standard errors, clustered by entry state, in parentheses; + $p < 0.1$, * $p < 0.05$, **$p < 0.01$. [Back]

IV estimates: effect of borrowing on other financial outcomes

	(3) Any delinquent debt	(4) Any mortgage	(5) Any auto loan
Cumulative loans ($1k)	-0.002	0.002	-0.005
	(0.002)	(0.003)	(0.004)
Observations	143,850	143,850	143,850

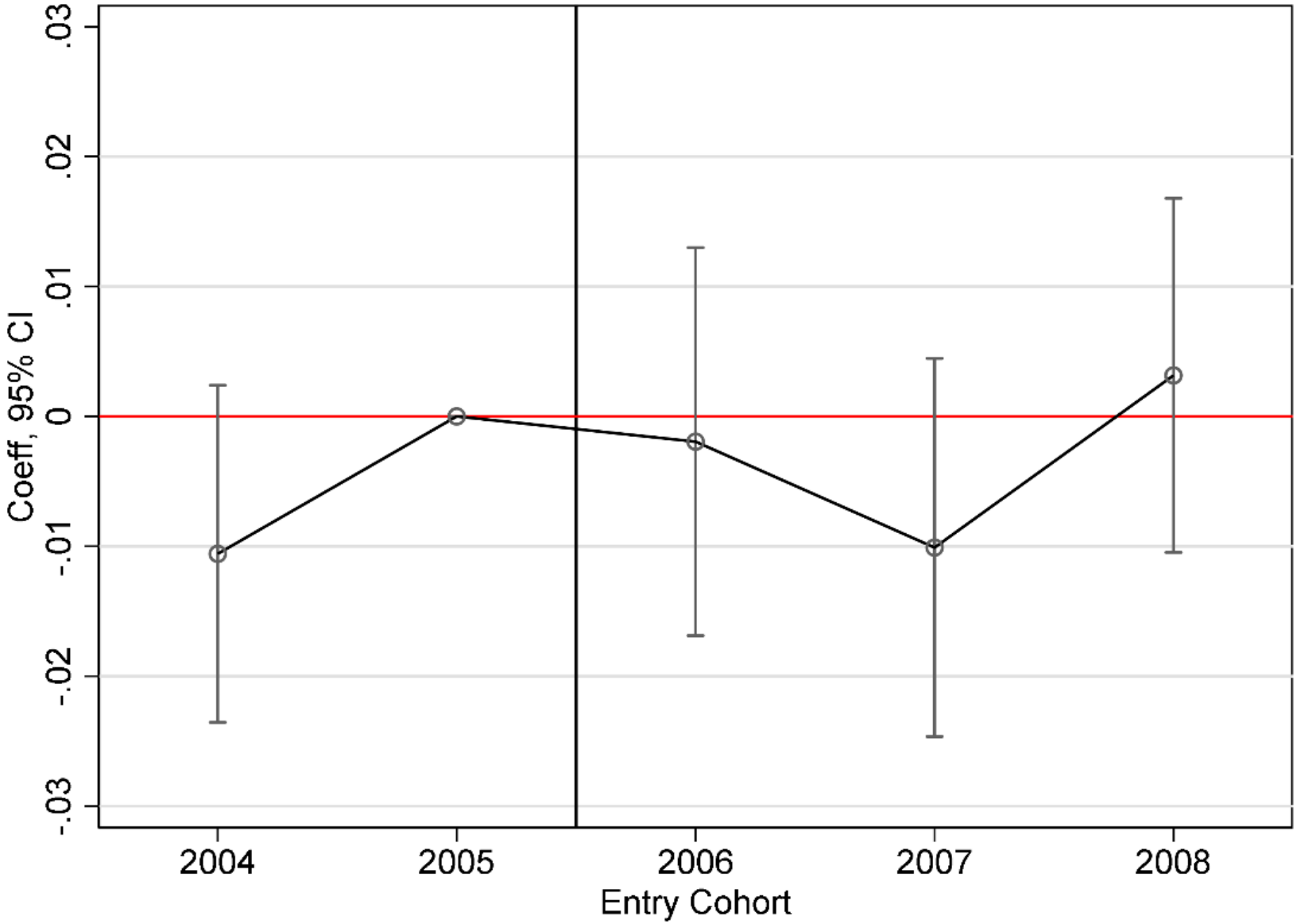
Notes: IV estimates of the effect of cumulative student loans on outcome indicated by heading 10 years after entry. Excluded instrument is interaction between being constrained at entry and belonging to the 2006 - 2008 entry cohorts. Robust standard errors, clustered by entry state, in parentheses; + $p < 0.1$, * $p < 0.05$, **$p < 0.01$. [Back]

Any auto loan, 10 years after entry



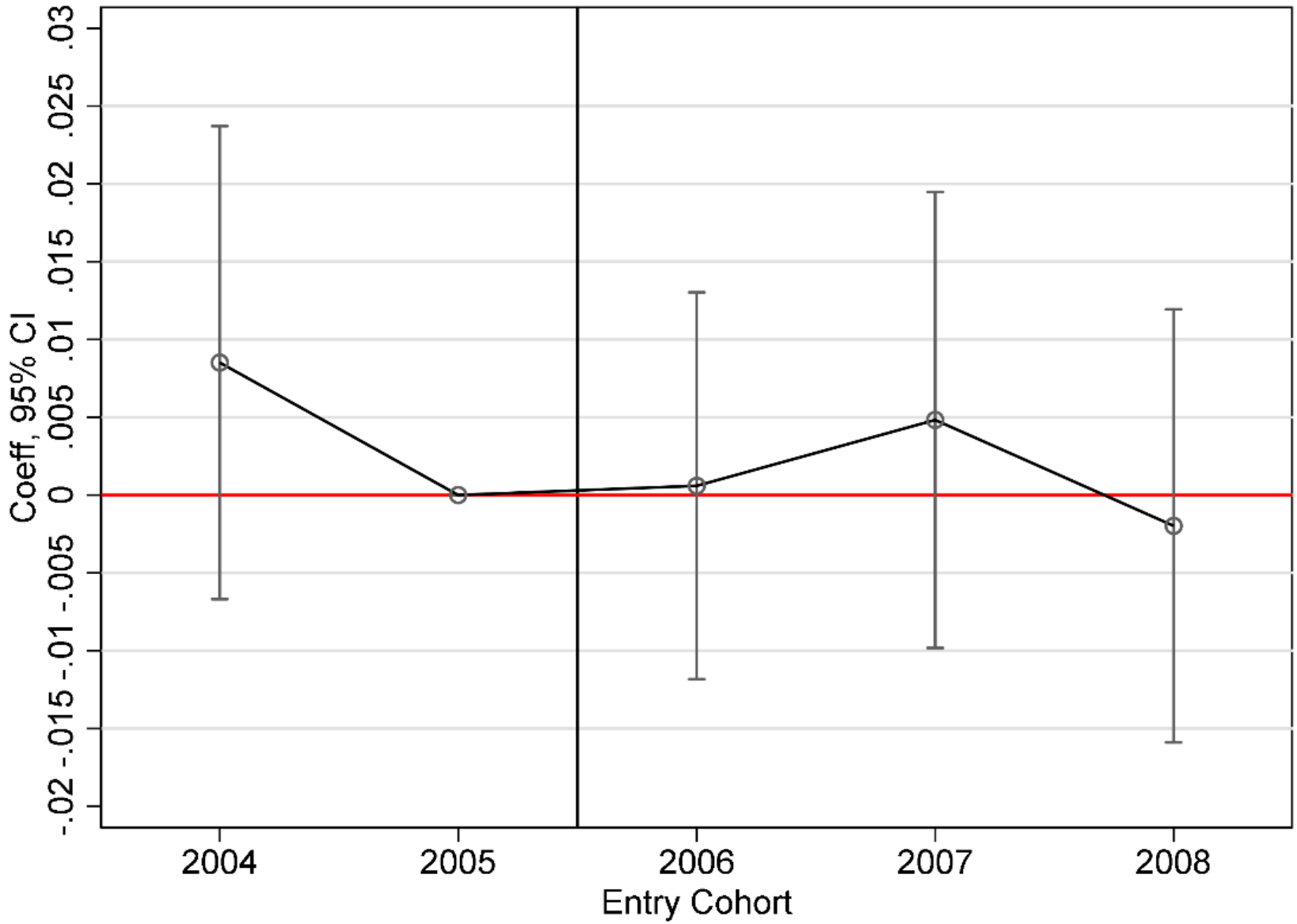
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Any mortgage, 10 years after entry



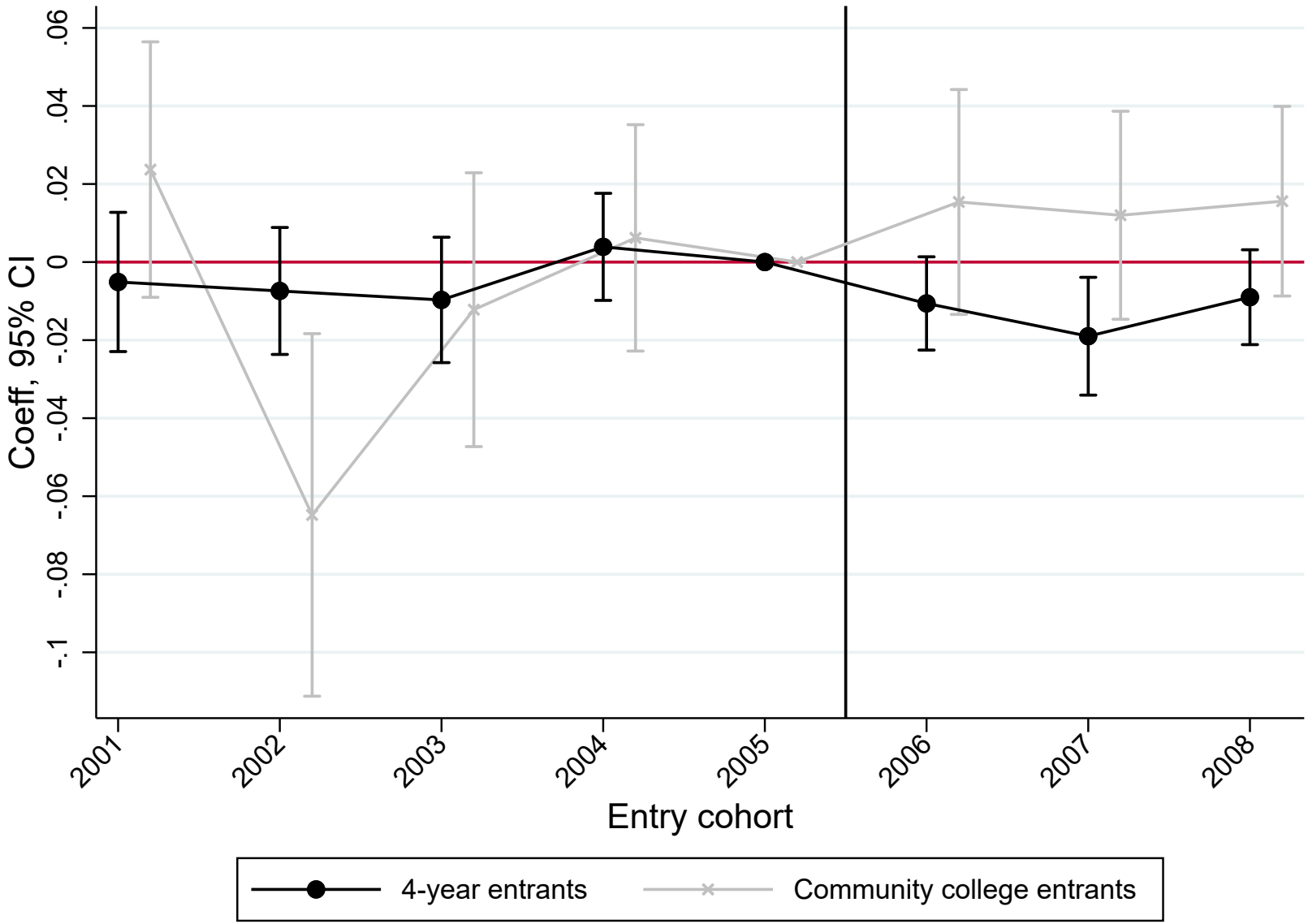
[Back]

Any delinquent debt, 10 years after entry



[Back]

Associate degree receipt



[Back]

STEM bachelor's degree

30 percent of adtl BA degrees are STEM (vs 19 percent of all BAs)

Years since entry =	4	5	6	8	10
Constrained x cohort ϵ {2006,2007,2008}	0.014	0.014	0.014	0.015	0.014
	(0.004)**	(0.004)**	(0.004)**	(0.004)**	(0.004)**
	{0.004}	{0.02}	{0.013}	{0.02}	{0.035}
Dependent variable mean	0.071	0.089	0.097	0.104	0.108

Notes: Dependent variable is indicated by column heading. Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$; p-values from wild-t cluster bootstrap in brackets. [Back]

Graduate school

13 percent increase in graduate degree receipt

Years since entry =	4	5	6	8	10
A. Enrollment in graduate program					
Constrained x cohort ϵ {2006,2007,2008}	0.009	0.006	0.010	0.002	-0.002
	(0.004)*	(0.005)	(0.004)*	(0.004)	(0.003)
	{0.044}	{0.524}	{0.148}	{0.564}	{0.288}
Dependent variable mean	0.050	0.070	0.070	0.055	0.043
B. Cumulative graduate credits attempted					
Constrained x cohort ϵ {2006,2007,2008}	0.2	0.3	0.4	0.5	0.4
	(0.1)*	(0.2)+	(0.2)+	(0.3)+	(0.3)
	{0.101}	{0.144}	{0.222}	{0.121}	{0.112}
Dependent variable mean	1.1	2.2	3.3	4.9	6.1
C. Graduate degree or certificate					
Constrained x cohort ϵ {2006,2007,2008}	0.003	0.007	0.008	0.012	0.012
	(0.002)*	(0.003)*	(0.004)*	(0.005)*	(0.006)*
	{0.108}	{0.027}	{0.075}	{0.032}	{0.027}
Dependent variable mean	<0.010	0.022	0.039	0.071	0.094

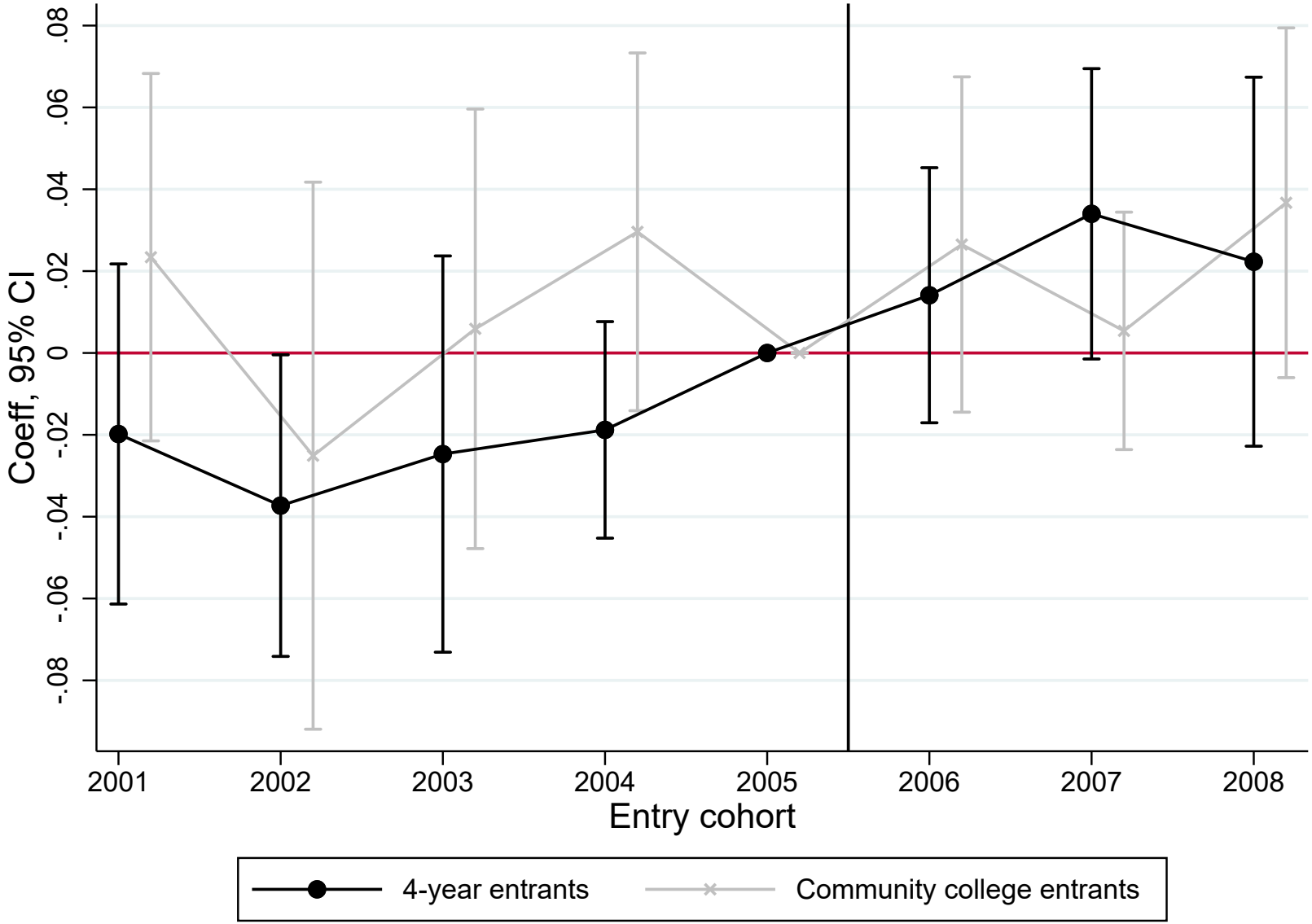
Notes: Dependent variable is indicated by column heading. Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$; p-values from wild-t cluster bootstrap in brackets. [Back]

Certificate receipt

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

Notes: Dependent variable is indicated by column heading. Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$; p-values from wild-t cluster bootstrap in brackets. [Back]

Any degree receipt



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Other financial outcomes

Years since entry =	4	5	6	8	10
A. Delinquent (60+ days past due) on any loans					
Constrained x cohort ϵ {2006,2007,2008}	0	0.003	0.001	-0.005	-0.003
	(0.004)	(0.005)	(0.005)	(0.005)	(0.004)
	{0.998}	{0.018}	{0.857}	{0.443}	{0.593}
Dependent variable mean	0.106	0.113	0.119	0.125	0.129
B. Has a mortgage					
Constrained x cohort ϵ {2006,2007,2008}	0.005	0.004	0.001	0.002	0.002
	(0.003)	(0.003)	(0.004)	(0.003)	(0.006)
	{0.088}	{0.378}	{0.875}	{0.742}	{0.718}
Dependent variable mean	0.038	0.062	0.091	0.157	0.234
C. Has an auto loan					
Constrained x cohort ϵ {2006,2007,2008}	0.018	0.013	0.005	0.003	-0.008
	(0.004)**	(0.005)**	(0.005)	(0.006)	(0.005)
	{0.072}	{0.024}	{0.646}	{0.761}	{0.348}
Dependent variable mean	0.261	0.313	0.36	0.438	0.484

Notes: Dependent variable is indicated by column heading. Robust standard errors, clustered by state, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$; p-values from wild-t cluster bootstrap in brackets. [Back]

Effects on cumulative borrowing by race/ethnicity

Dependent variable =	Cumulative loans	
	(1) 4 years after entry	(2) 6 years after entry
Constrained x cohort in {2006,2007,2008}		
x Black (N = 16,584)	1349	1674
	(748)+	(862)+
	{0.035}	{0.093}
x Hispanic (N = 23,361)	1896	1616
	(390)**	(505)**
	{0.144}	{0.388}
x White (N = 32,343)	1759	1869
	(997)+	(1172)
	{0.062}	{0.148}
Test of equality: p -value	0.753	0.980

Notes: Dependent variable is cumulative student loans ($1k). Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, **$p < 0.01$; p-values from wild-t cluster bootstrap in brackets.

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Effects on cumulative borrowing by race/ethnicity

Dependent variable =	Cumulative loans	
	(8) 4 years after entry	(9) 6 years after entry
Constrained x cohort in {2006,2007,2008}		
x Black majority home zip	1317	3454
(N = 10,690)	(607)*	(1469)*
	{0.018}	{0.020}
x Hispanic majority home zip	1178	698
(N = 8,907)	(743)	(2073)
	{0.117}	{0.659}
x White majority home zip	1629	3089
(N = 121,386)	(310)**	(592)**
	{0.124}	{0.052}
Test of equality: *p* -value	0.815	0.512

Notes: Dependent variable is cumulative student loans ($1k). Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, **$p < 0.01$; p-values from wild-t cluster bootstrap in brackets.

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Effects on cumulative borrowing by SES

Dependent variable =	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	2644	0.09	6.1	0.065	0.081	0.063
	(1093)*	(1197)*	(0.04)*	(1.2)**	(0.012)**	(0.013)**	(0.026)*
	{0.037}	{0.054}	{0.306}	{0.090}	{0.009}	{<0.001}	{0.007}
x Pell eligible (N = 43,148)	1525	1477	0.14	5.5	0.035	0.036	0.050
	(404)**	(531)**	(0.06)*	(1.5)**	(0.013)**	(0.013)**	(0.027)+
	{0.013}	{0.050}	{0.031}	{0.013}	{0.015}	{0.007}	{0.067}
Test of equality: p-value	0.386	0.310	0.477	0.693	0.014	0.002	0.725

Notes: Dependent variable is cumulative student loans ($1k). Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, **$p < 0.01$; p-values from wild-t cluster bootstrap in brackets.

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Effects on cumulative borrowing by SES

B. Borrowing and financial outcomes

Dependent variable =	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	1587	3905	-0.003	-0.008	-0.002	-0.002	-0.010
(N = 53,232)	(447)**	(907)**	(0.009)	(0.008)	(0.007)	(0.010)	(0.010)
	{0.130}	{0.111}	{0.031}	{0.031}	{0.684}	{0.709}	{0.299}
x Home zip mean AGI < $50k	1574	2539	-0.017	-0.021	-0.003	0.005	-0.007
(N = 91,508)	(304)**	(644)**	(0.006)**	(0.006)**	(0.005)	(0.006)	(0.007)
	{0.188}	{0.072}	{0.765}	{0.499}	{0.589}	{0.535}	{0.447}
Test of equality: *p* -value	0.979	0.242	0.188	0.256	0.877	0.535	0.851

Notes: Dependent variable is cumulative student loans ($1k). Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, **$p < 0.01$; *p*-values from wild-t cluster bootstrap in brackets.

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Heterogeneity: race/ethnicity

Dependent variable =	Attainment & earnings, 10 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 Black (N = 16,584)	0.13	4.3	0.032	0.026	0.055
	(0.07)+	(2.2)*	(0.023)	(0.023)	(0.042)
	{0.342}	{0.307}	{0.045}	{0.054}	{0.444}
x Hispanic (N = 23,361)	0.14	5.3	0.029	0.045	0.018
	(0.07)*	(1.6)**	(0.013)*	(0.015)**	(0.022)
	{0.005}	{0.002}	{0.051}	{0.018}	{0.278}
x White (N = 32,343)	-0.005	3.4	0.043	0.050	0.081
	(0.04)	(1.2)**	(0.014)**	(0.012)**	(0.027)**
	{0.915}	{0.023}	{0.025}	{0.038}	{0.020}
Test of equality: *p* -value	0.112	0.610	0.662	0.660	0.147

Notes: Dependent variable is cumulative student loans ($1k). Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, **$p < 0.01$; p-values from wild-t cluster bootstrap in brackets. [Back]

Heterogeneity: race/ethnicity

Dependent variable =	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 Black majority home zip	1317	3454	-0.075	-0.072	-0.033	0.033	0.017
(N = 10,690)	(607)*	(1469)*	(0.015)**	(0.014)**	(0.011)**	(0.011)**	(0.016)
	{0.018}	{0.020}	{0.005}	{0.001}	{0.052}	{0.008}	{0.323}
x Hispanic majority home zip	1178	698	0.005	0	-0.007	0.004	-0.069
(N = 8,907)	(743)	(2073)	(0.017)	(0.019)	(0.009)	(0.011)	(0.018)**
	{0.117}	{0.659}	{0.655}	{0.982}	{0.679}	{0.861}	{0.044}
x White majority home zip	1629	3089	-0.007	-0.012	0	-0.001	-0.005
(N = 121,386)	(310)**	(592)**	(0.005)	(0.004)**	(0.004)	(0.006)	(0.006)
	{0.124}	{0.052}	{0.256}	{0.063}	{0.845}	{0.882}	{0.545}
Test of equality: p -value	0.815	0.512	0.002	0.003	0.017	0.027	0.003

Notes: Dependent variable is cumulative student loans ($1k). Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, **$p < 0.01$; p-values from wild-t cluster bootstrap in brackets. [Back]

Heterogeneity: Severity of Recession

Table 13: Heterogeneity in the effect on borrowing, attainment, and financial outcomes by Great Recession severity

A. Borrowing, attainment and earnings outcomes

Dependent variable =	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 Peak GR unemployment < median	1236	1010	0.05	3.4	0.038	0.045	0.069
(N = 47,124)	(629)+	(718)	-0.04	(1.2)**	(0.011)**	(0.011)**	(0.022)**
	{0.301}	{0.511}	{0.032}	{0.039}	{0.009}	{0.005}	{0.001}
x Peak GR unemployment > median	2822	3383	0.16	7.2	0.051	0.059	0.015
(N = 30,776)	(962)**	(965)**	(0.05)**	(1.8)**	(0.02)*	(0.021)**	(0.025)
	{0.004}	{0.004}	{0.096}	{0.008}	{0.020}	{0.005}	{0.682}
Test of equality: p -value	0.170	0.051	0.078	0.072	0.570	0.573	0.113

Notes: Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$; p-values from wild-t cluster bootstrap in brackets. [Back]

Heterogeneity: Severity of Recession

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

Notes: Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$; *p*-values from wild-t cluster bootstrap in brackets. [Back]

Heterogeneity: Severity of Recession Alternative

Dependent variable =	Cumulative loans		Cumul. attain., 10 years		Degree receipt, 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	STEM BA degree	(7) AA degree
A. Pooled sample								
Constrained x cohort in {2006,2007,2008}	1403	1489	0.14	5.6	0.039	0.031	0.011	0.009
	(401)**	(444)**	(0.03)**	(0.8)**	(0.008)**	(0.008)**	(0.003)**	(0.005)+
	{0.012}	{0.023}	{0.003}	{<0.001}	{0.015}	{<0.001}	{0.008}	{0.194}
x Δ UR 2007-2009	1002	1061	-0.004	0.04	-0.013	-0.014	-0.002	-0.003
	(674)	(808)	(0.04)	(1.2)	(0.013)	(0.013)	(0.005)	(0.007)
	{0.336}	{0.378}	{0.959}	{0.988}	{0.074}	{0.225}	{0.565}	{0.508}
B. Four-year entrants								
Constrained x cohort in {2006,2007,2008}	1967	2074	0.10	5.3	0.044	0.052	0.014	-0.007
	(546)**	(585)**	(0.03)**	(1.1)**	(0.011)**	(0.011)**	(0.005)**	(0.004)+
	{0.016}	{0.032}	{0.008}	{0.005}	{0.009}	{0.008}	{0.019}	{0.109}
x Δ UR 2007-2009	1278	1499	-0.01	0.1	-0.010	-0.009	0.0004	-0.004
	(737)+	(852)+	(0.05)	(1.7)	(0.015)	(0.016)	(0.006)	(0.006)
	{0.265}	{0.182}	{0.732}	{0.89}	{0.167}	{0.407}	{0.928}	{0.382}
C. Two-year entrants								
Constrained x cohort in {2006,2007,2008}	1208	1375	0.18	5.6	0.017	0.004	0.002	0.021
	(251)**	(317)**	(0.06)**	(1.3)**	(0.011)	(0.008)	(0.004)	(0.009)*
	{0.036}	{0.016}	{0.002}	{0.032}	{0.229}	{0.664}	{0.598}	{0.083}
x Δ UR 2007-2009	-466	-937	-0.04	-0.2	-0.008	-0.030	-0.0001	0.005
	(427)	(562)+	(0.1)	(2.5)	(0.018)	(0.016)+	(0.007)	(0.019)
	{0.470}	{0.352}	{0.787}	{0.954}	{0.679}	{0.145}	{0.981}	{0.416}

Notes: Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$; p-values from wild-t cluster bootstrap in brackets. [Back]

Alternative Education Outcomes

Table C.6: The effect of loan limit increases on additional educational attainment outcomes, Texas four-year entrants

Years since entry =	3	4	5	6	7	8	9	10
A. STEM bachleor's degree								
Constrained x cohort ϵ {2006,2007,2008}	0.006	0.014	0.014	0.014	0.015	0.015	0.014	0.014
	(0.004)	(0.004)**	(0.004)**	(0.004)**	(0.004)**	(0.004)**	(0.004)**	(0.004)**
	{0.054}	{0.004}	{0.02}	{0.013}	{0.018}	{0.02}	{0.01}	{0.035}
Dependent variable mean	0.032	0.071	0.089	0.097	0.101	0.104	0.106	0.108
B. Enrollment in graduate program								
Constrained x cohort ϵ {2006,2007,2008}	0.004	0.009	0.006	0.010	0.006	0.002	0.002	-0.002
	(0.002)*	(0.004)*	(0.005)	(0.004)*	(0.004)	(0.004)	(0.003)	(0.003)
	{0.031}	{0.044}	{0.524}	{0.148}	{0.085}	{0.564}	{0.295}	{0.288}
Dependent variable mean	0.013	0.050	0.070	0.070	0.062	0.055	0.049	0.043
C. Cumulative graduate credits attempted								
Constrained x cohort ϵ {2006,2007,2008}	0.1	0.2	0.3	0.4	0.5	0.5	0.5	0.4
	(0.03)*	(0.1)*	(0.2)+	(0.2)+	(0.3)+	(0.3)+	(0.3)	(0.3)
	{0.151}	{0.101}	{0.144}	{0.222}	{0.147}	{0.121}	{0.073}	{0.112}
Dependent variable mean	0.2	1.1	2.2	3.3	4.2	4.9	5.6	6.1
D. Graduate degree or certificate								
Constrained x cohort ϵ {2006,2007,2008}	--	0.003	0.007	0.008	0.010	0.012	0.014	0.012
	--	(0.002)*	(0.003)*	(0.004)*	(0.005)*	(0.005)*	(0.005)**	(0.006)*
		{0.108}	{0.027}	{0.075}	{0.056}	{0.032}	{0.025}	{0.027}
Dependent variable mean		<0.010	0.022	0.039	0.056	0.071	0.083	0.094

Notes: Robust standard errors, clustered by entry institution, in parentheses; + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$; p-values from wild-t cluster bootstrap in brackets. [Back]