The Consequences of Student Loan Credit Expansions Evidence from Three Decades of Default Cycles

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*Any views or interpretations expressed in this paper are those of the authors and do not necessarily reflect the views of the Treasury or any other organization.

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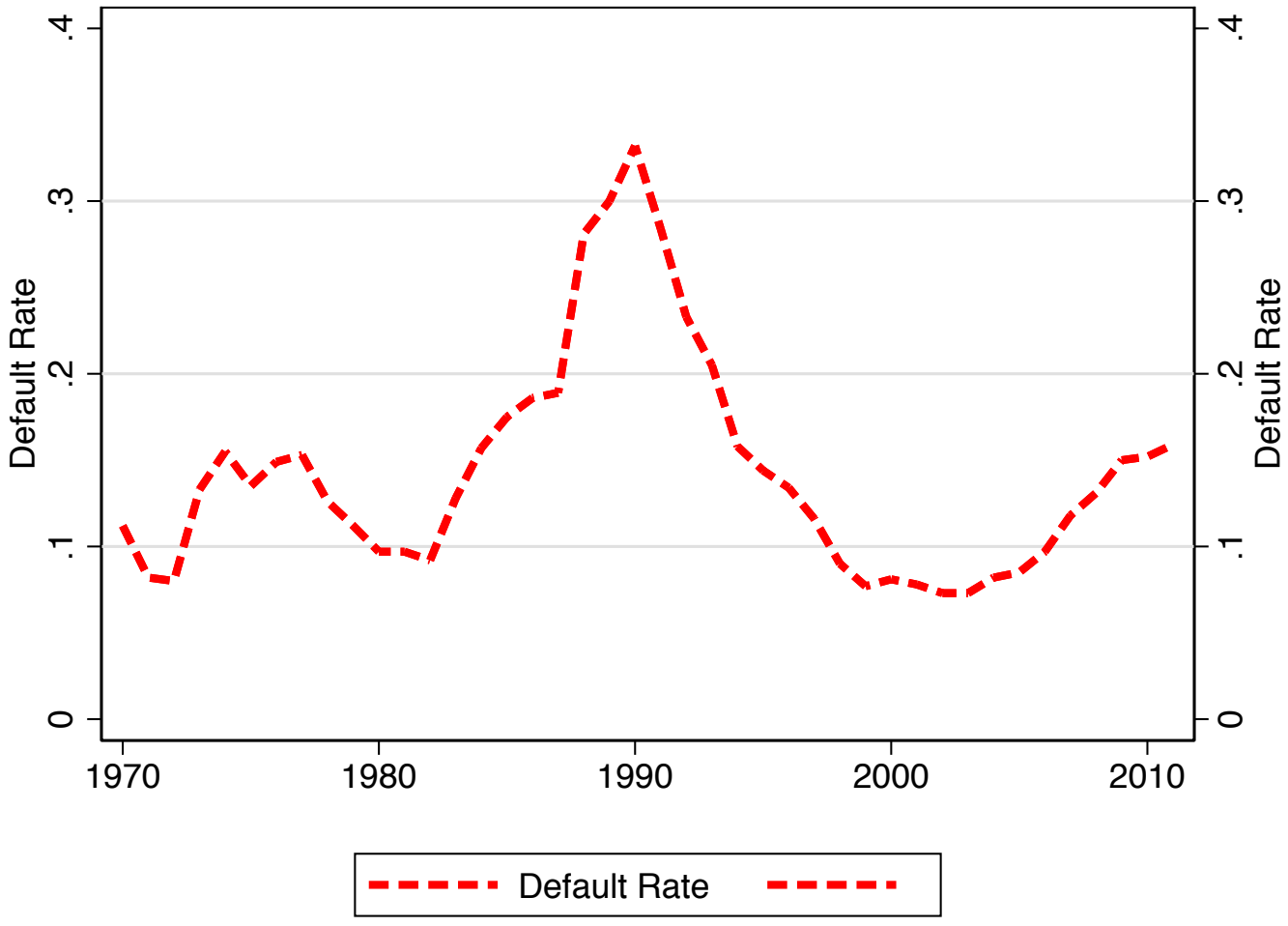

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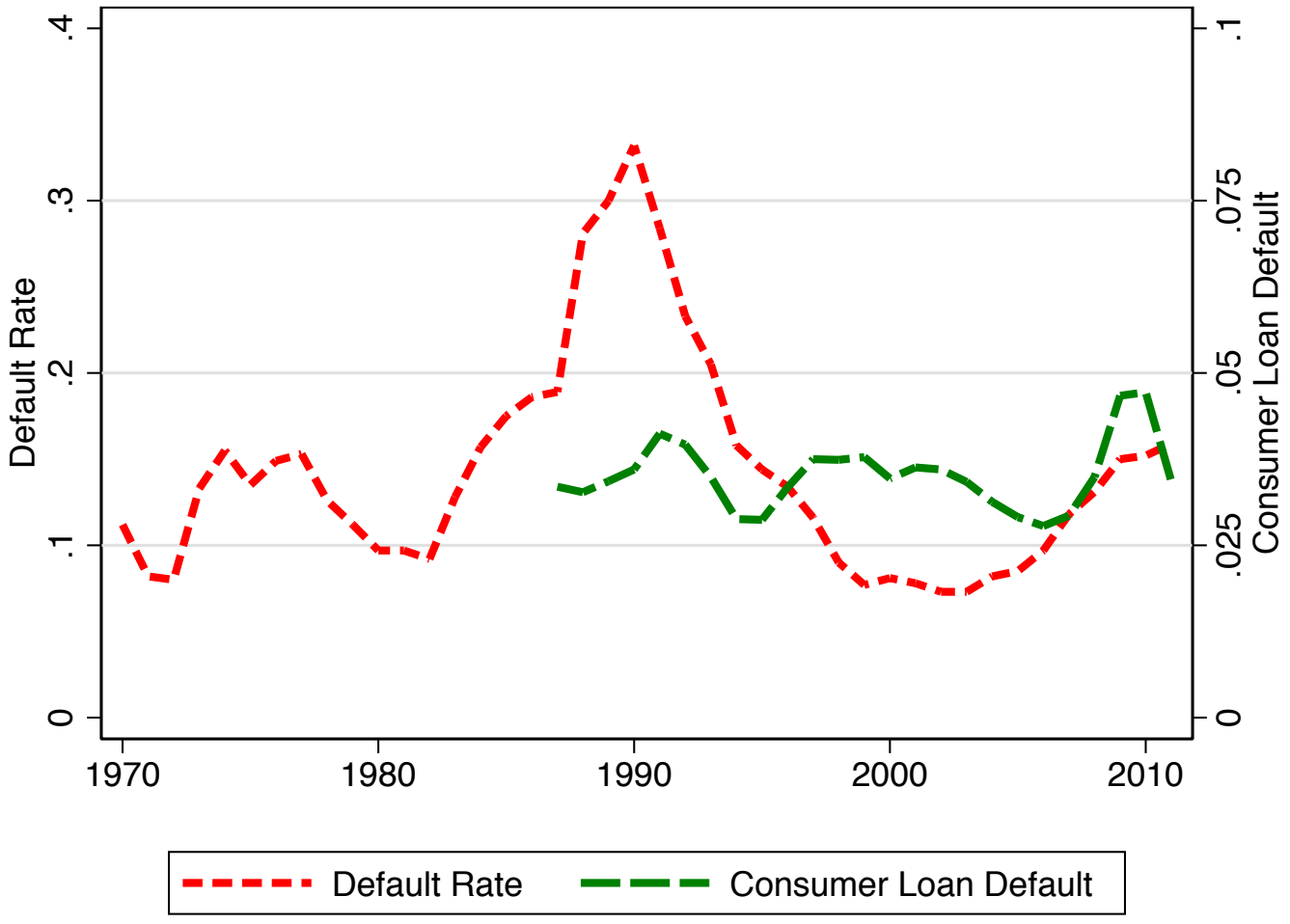

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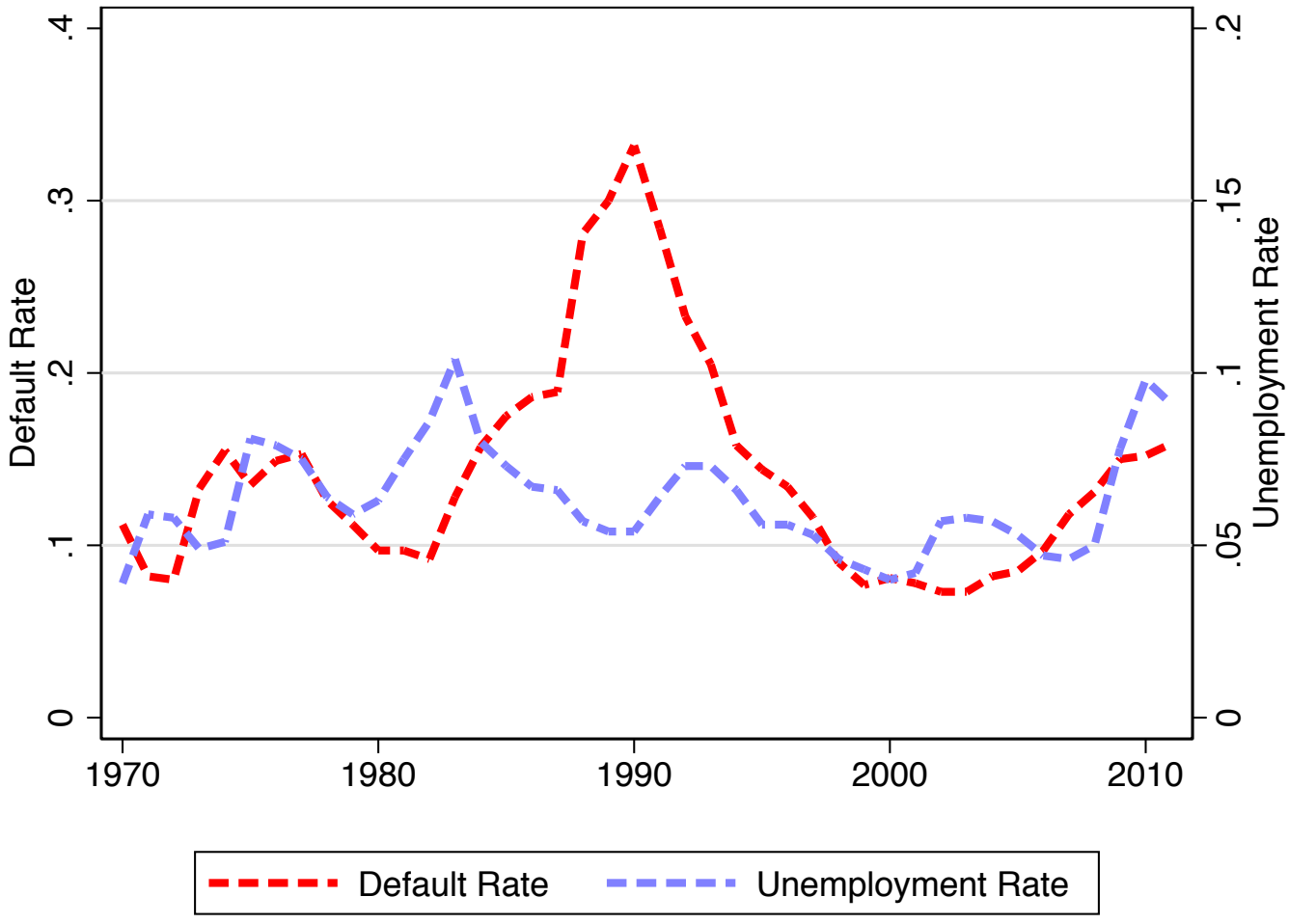

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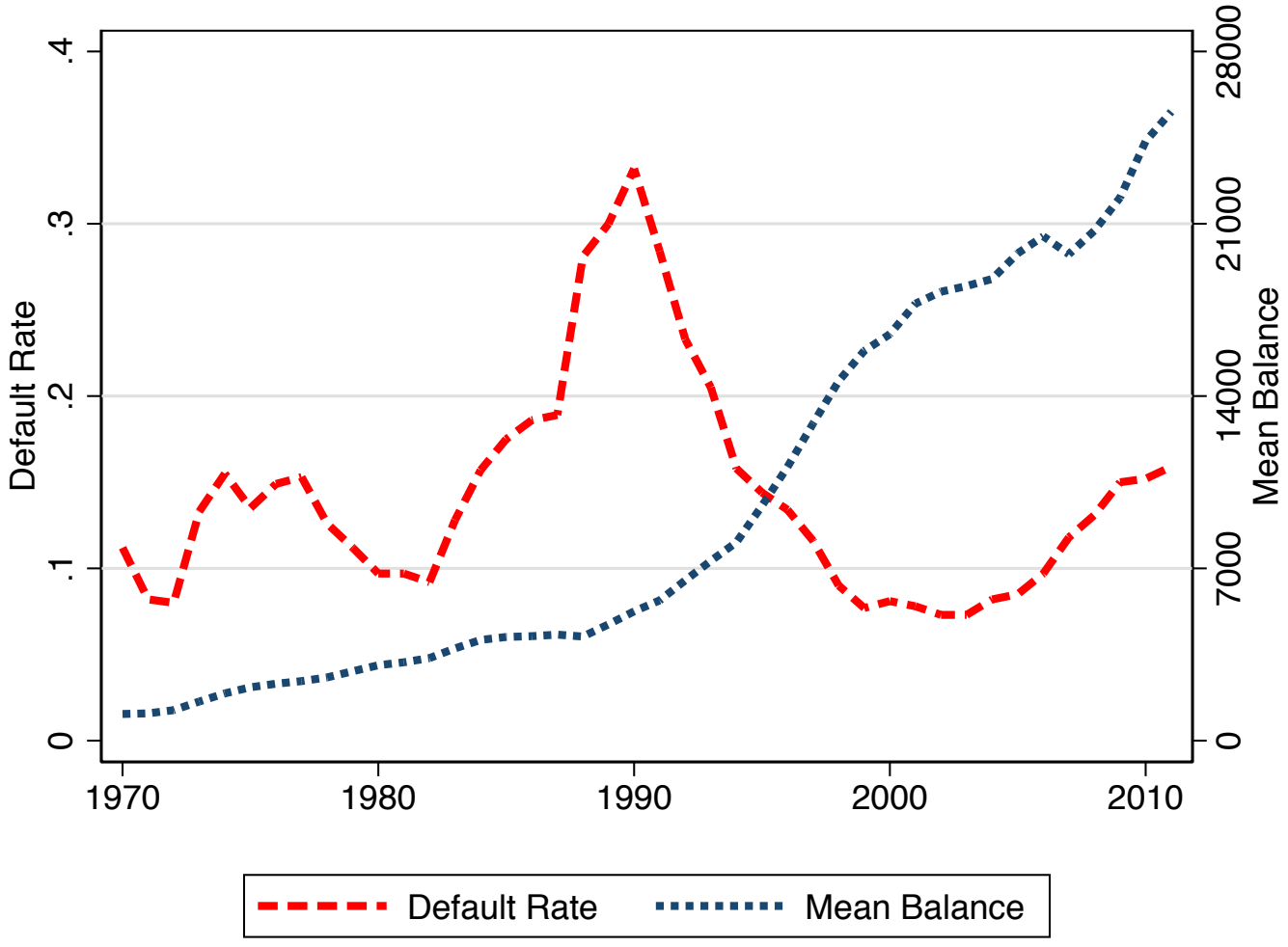

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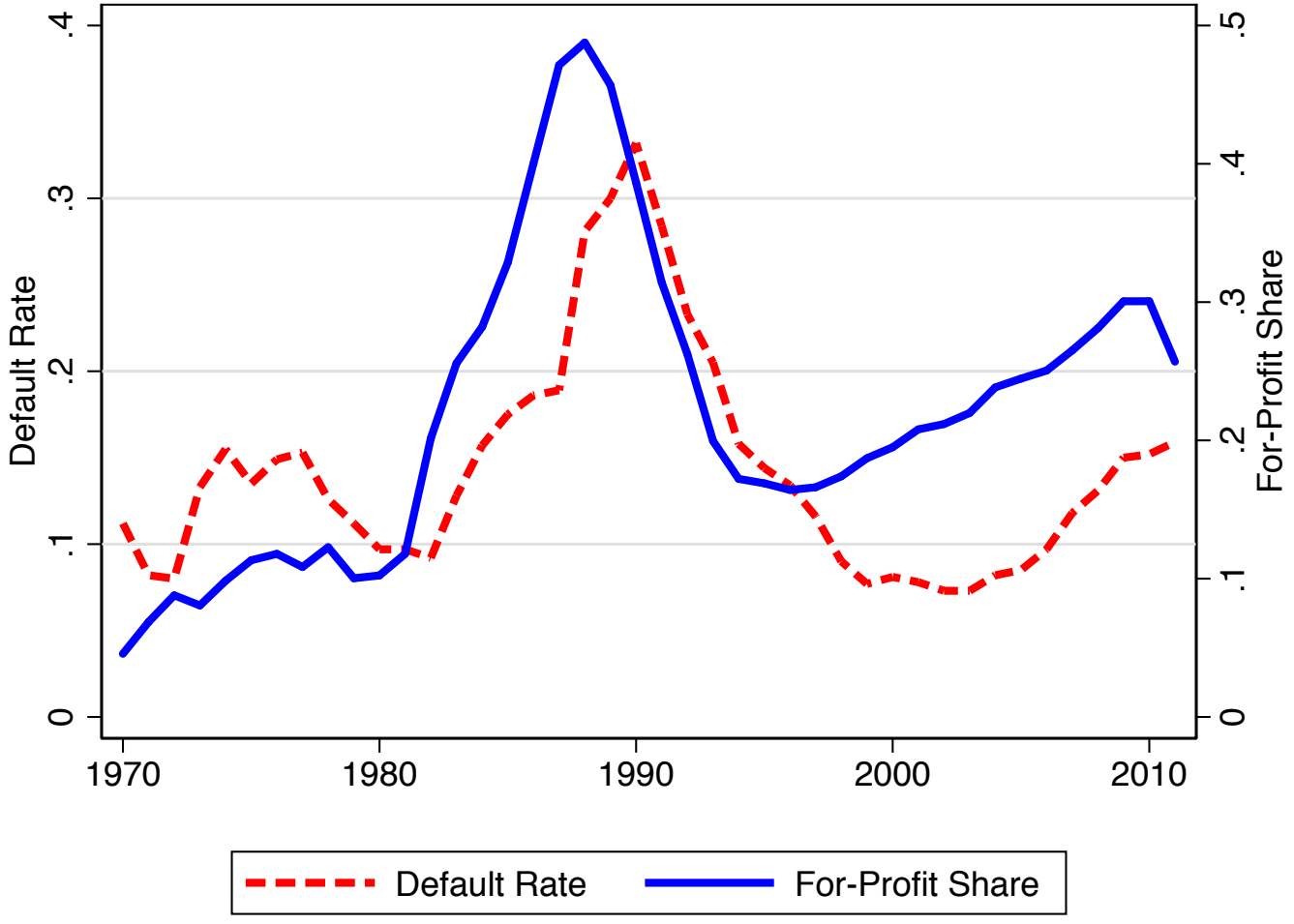

Student Loan Defaults and Credit Expansion

Question: What drives underlying variation in student loan defaults?

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Answer:

- Changes in federal credit policy lead to the entry, exit and expansion of for-profit colleges.
- Decomposition indicates that 85-95% of the variation during the 1980-2000 is driven by the entry and exit of for-profits, which is tied to access to federal loan programs.
- More recent increase largely driven by several factors:
  - One-third of the increase is driven by expansion of online institutions after credit restrictions were removed.
  - Another third is driven by Post 9/11 GI, which relaxed credit to schools reliant on federal aid.
  - Rest is driven by labor market shocks after Great Recession. (Mueller and Yannelis 2019)

Literature

- **Effects of Credit Expansion** Mian and Sufi 2009; 2011; Mian, Sufi and Verner 2017; Kiyotaki and Moore 1997; Keys et al. 2010; Rajan and Ramcharan 2012; Favara and Imbs 2015; DiMaggio and Kermani 2017; Agarwal, Chomsisengphet, Mahoney and Stroebel 2018

- **Student Loan Debt** Avery and Turner 2012; Lochner and Monge-Naranjo 2011, Looney and Yannelis 2015; DiMaggio, Kalda and Yao 2019, Cellini, Darolia and Turner 2020, Herbst 2017; Marx and Turner 2018; Mueller and Yannelis 2019; Lucca Nadauld and Shen 2018; Solis 2017; Fos, Liberman and Yannelis 2017; Kashgar and Mann 2017; Darolia 2013; Krishnan and Wang 2018; Denning 2019; Amromin, Eberly and Mondragon 2018

Changes in Access to Federal Loan Programs

Event	Date	Description
Reauthorization of Higher Education Act	1976	States provided with incentives to guarantee loans. Students without high school degrees made eligible for loans. Loan limits increased.
Middle Income Student Assistance Act	1978	Eliminated income restrictions on student loans, expanding eligibility to higher-income students.
Higher Education Act Amendments	1979	Banks guaranteed favorable rate of return by tying subsidies to Treasury bill rates, increases bank participation in student lending.
Reauthorization of Higher Education Act	1980	Rules regarding need-based aid liberalized, supplemental borrowing opportunities for graduate students expanded. Parent loans for undergrad- uate students (PLUS) program established.
Higher Education Act Amendments	1986	Loan limits increased (amounts vary by class status). Created Supplemental Loan to Students (SLS) to provide loans to graduate students and independent undergraduate students. Gave institutional financial aid officers broader authority over eligibility determination.
Budget Reconciliation Act	1989-93	Introduction of sanctions on schools with cohort default rates above 30%, in 1992 raised to 35% and then lowered to 30%.
Higher Education Act Reauthorization	1992	Schools required to offer more than 50% of their courses in traditional classrooms. Eliminated PLUS loan limits. Added unsubsidized loans Simplified aid application.
Higher Education Act Amendments	1998	Lowered cohort default rate cutoff to 25%, interest rate reductions, expanded eligibility through income protection allowances. Distance Ed- ucation Demonstration Program allowed trial schools exemption from 50% rules, which allowed them to offer online only education. Changed
Higher Education Reconciliation Act	2005	50% rules repealed, allowing online-only schools to access federal loans. Loan Limits increased. Expands PLUS loans to graduate stu- dents Makes private student loans non-dischargable in bankruptcy.
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Data

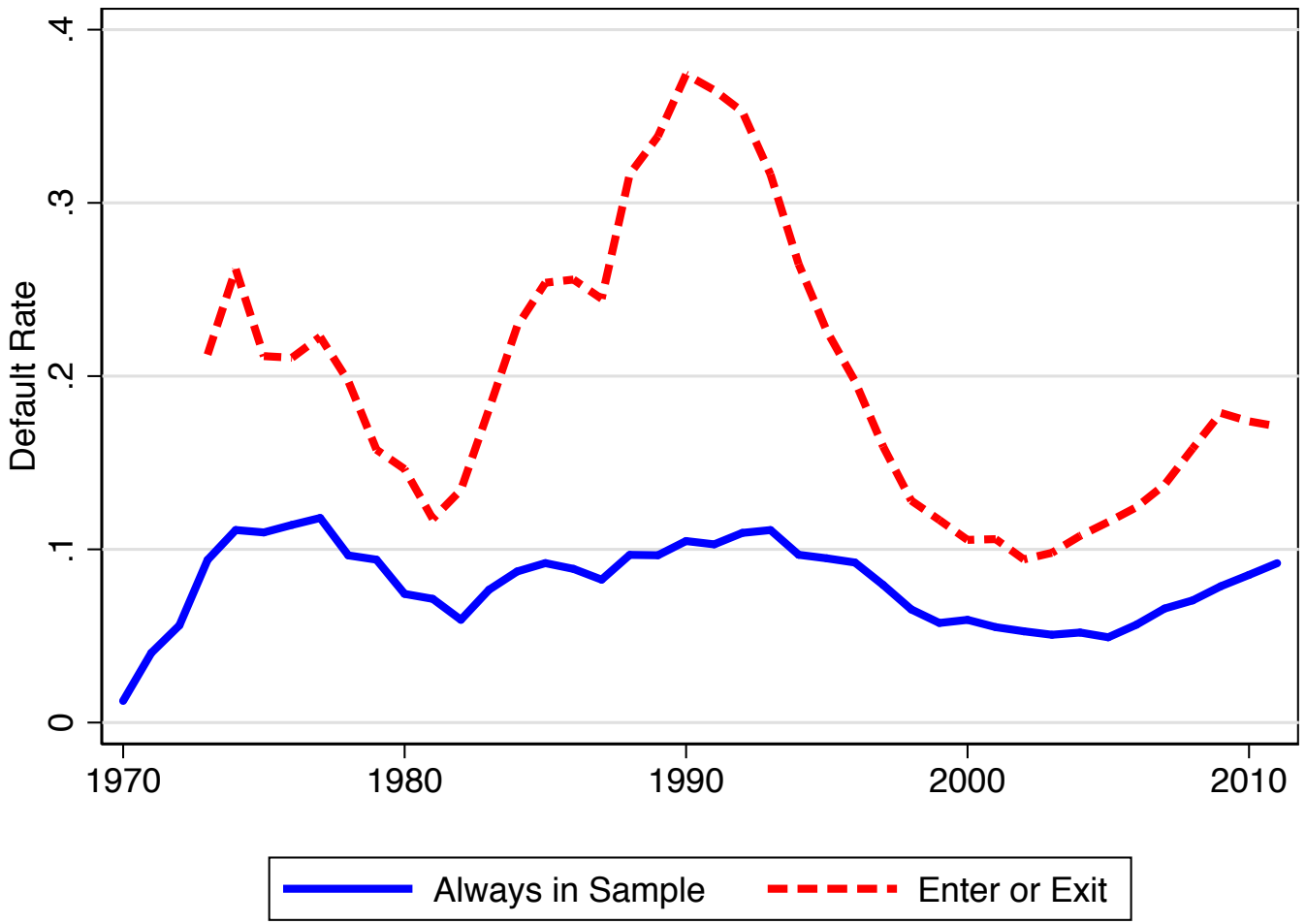
- Use administrative federal student loan data

Data

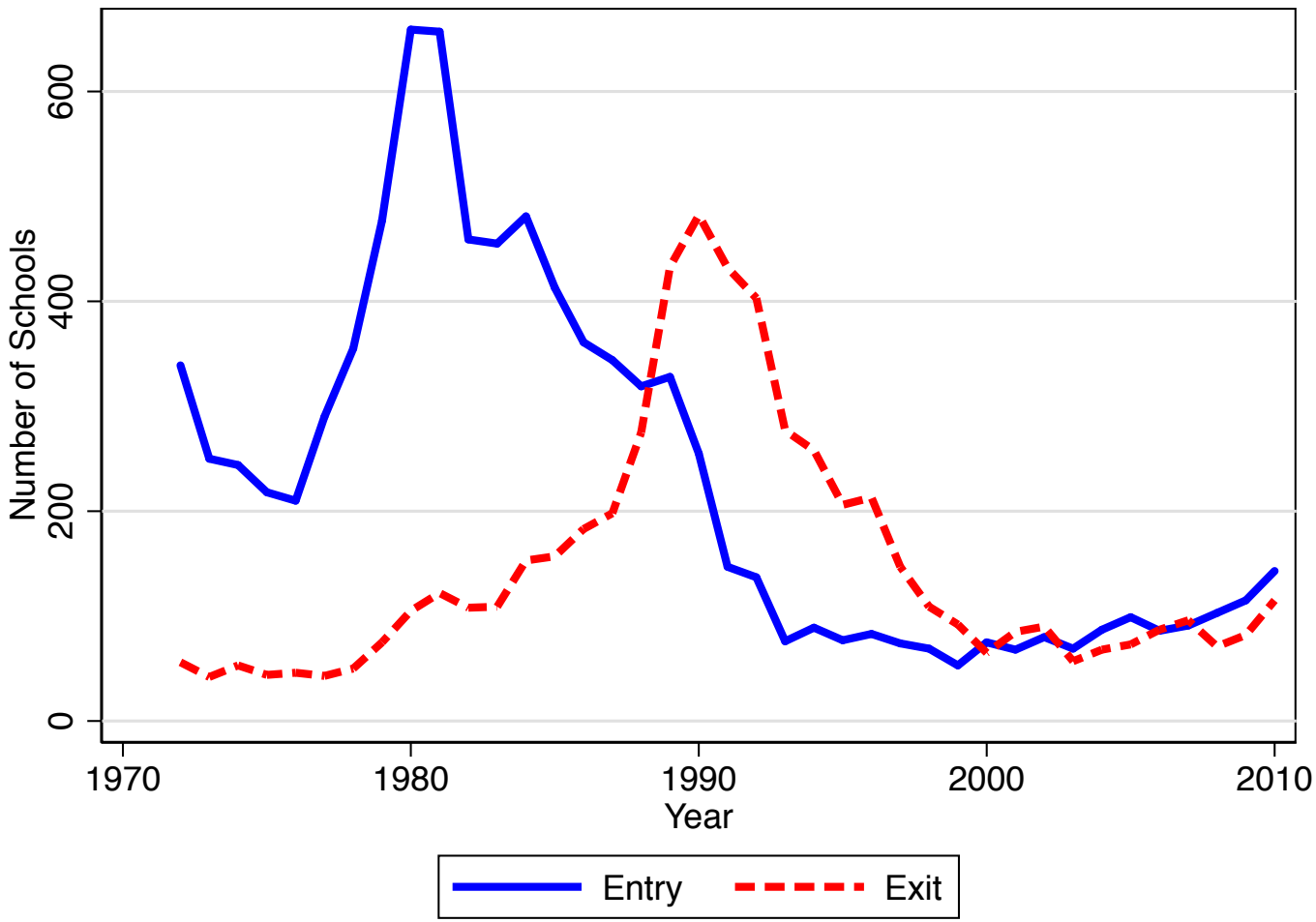
- NSLDS
  - Department of Education's database for federal student aid and loans
  - As of January 2014, the NSLDS contained more than 31.7 billion records concerning 19,552 schools, 84,629,538 students and 386,943,660 loans
  - Includes some demographic information from the FAFSA
  - 4% sample of full population

- School Level Panel
  - Construct School Level Panel from 1970 to 2016
  - Cells with less than 50 individuals dropped due to privacy concerns

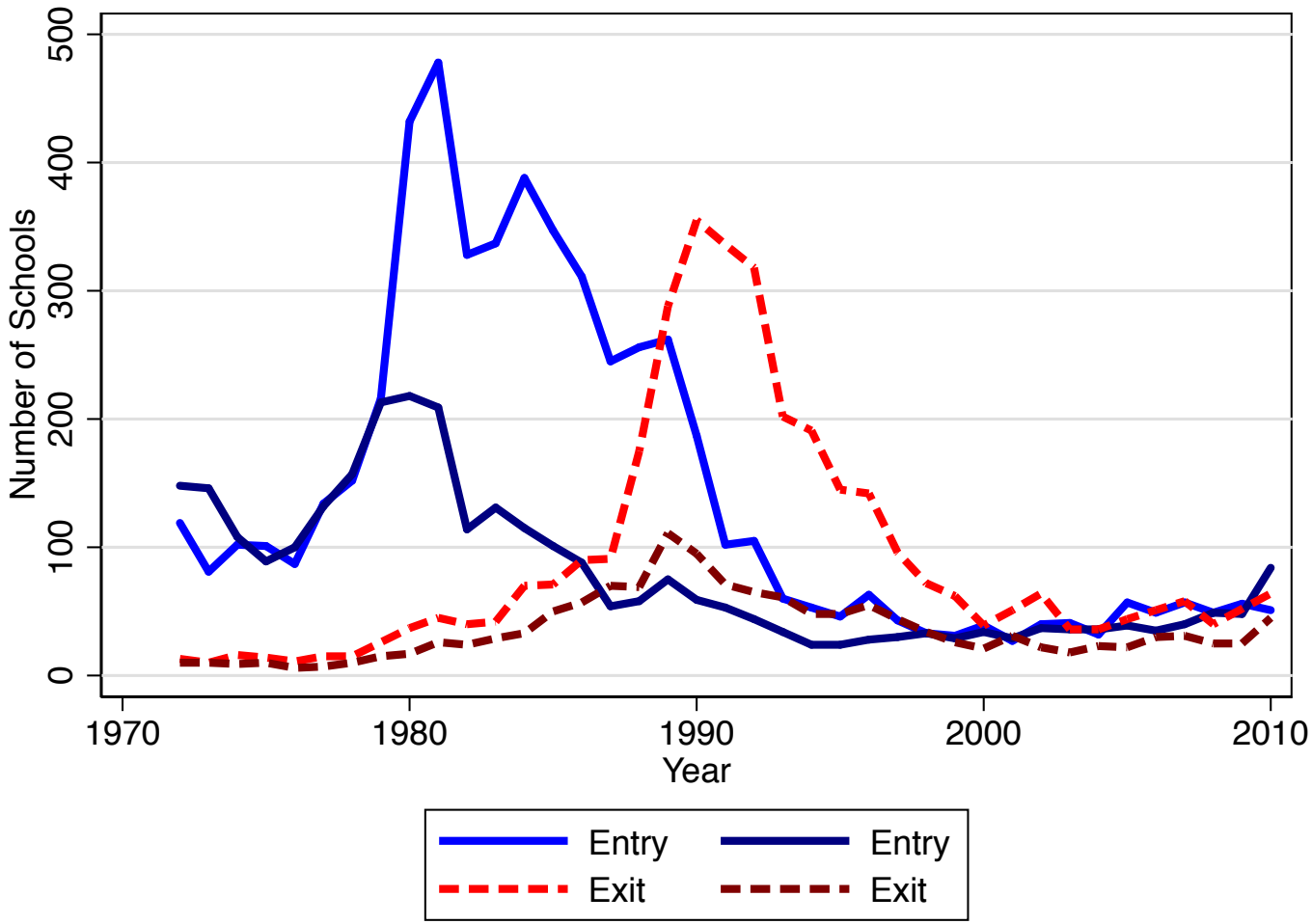
Defaults are Concentrated in Transient Schools



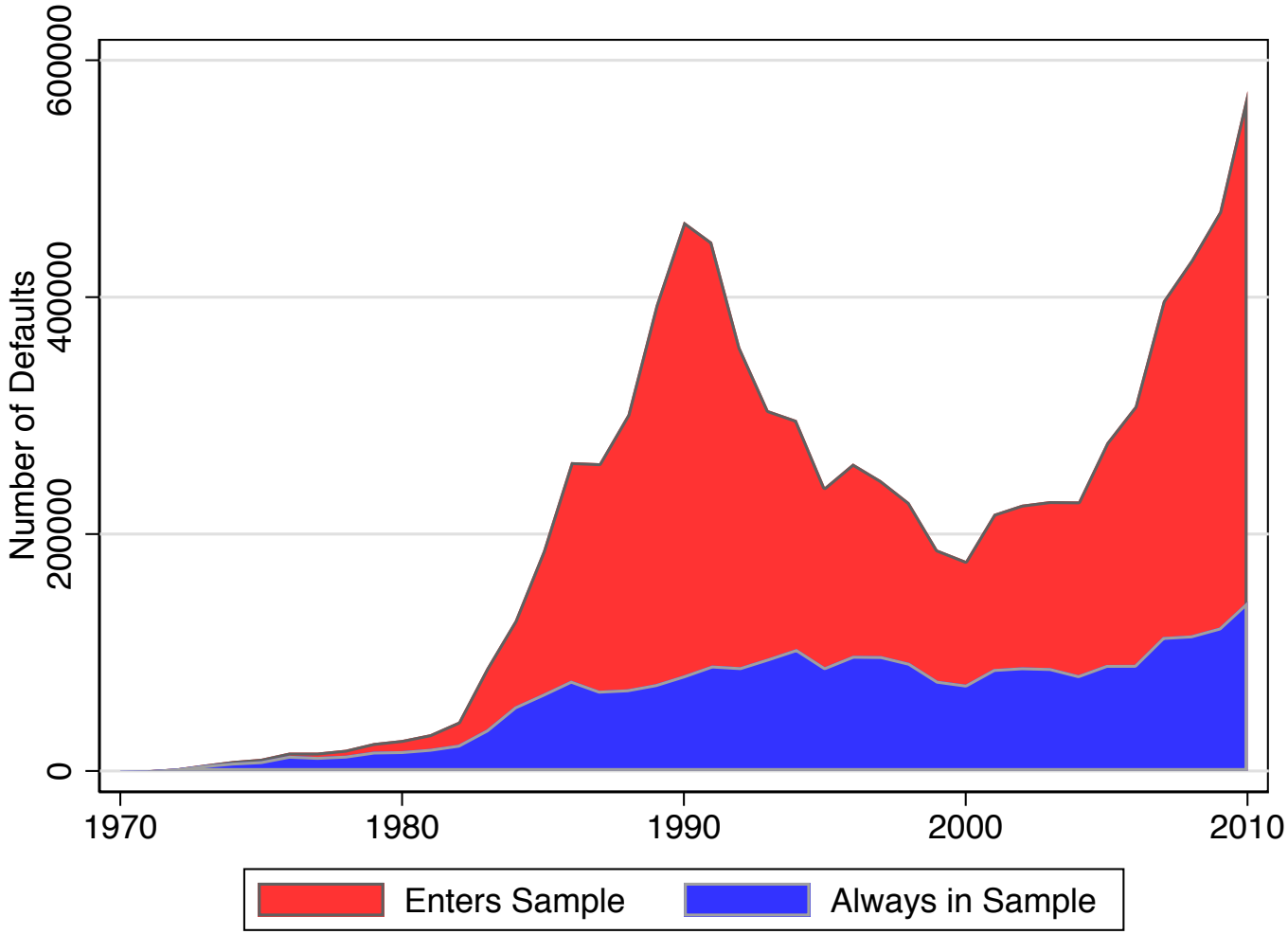
Schools Enter and Exit After Policy Changes



These Tend to Be High Default Schools



Schools Entering Drive Most of Increase in Default



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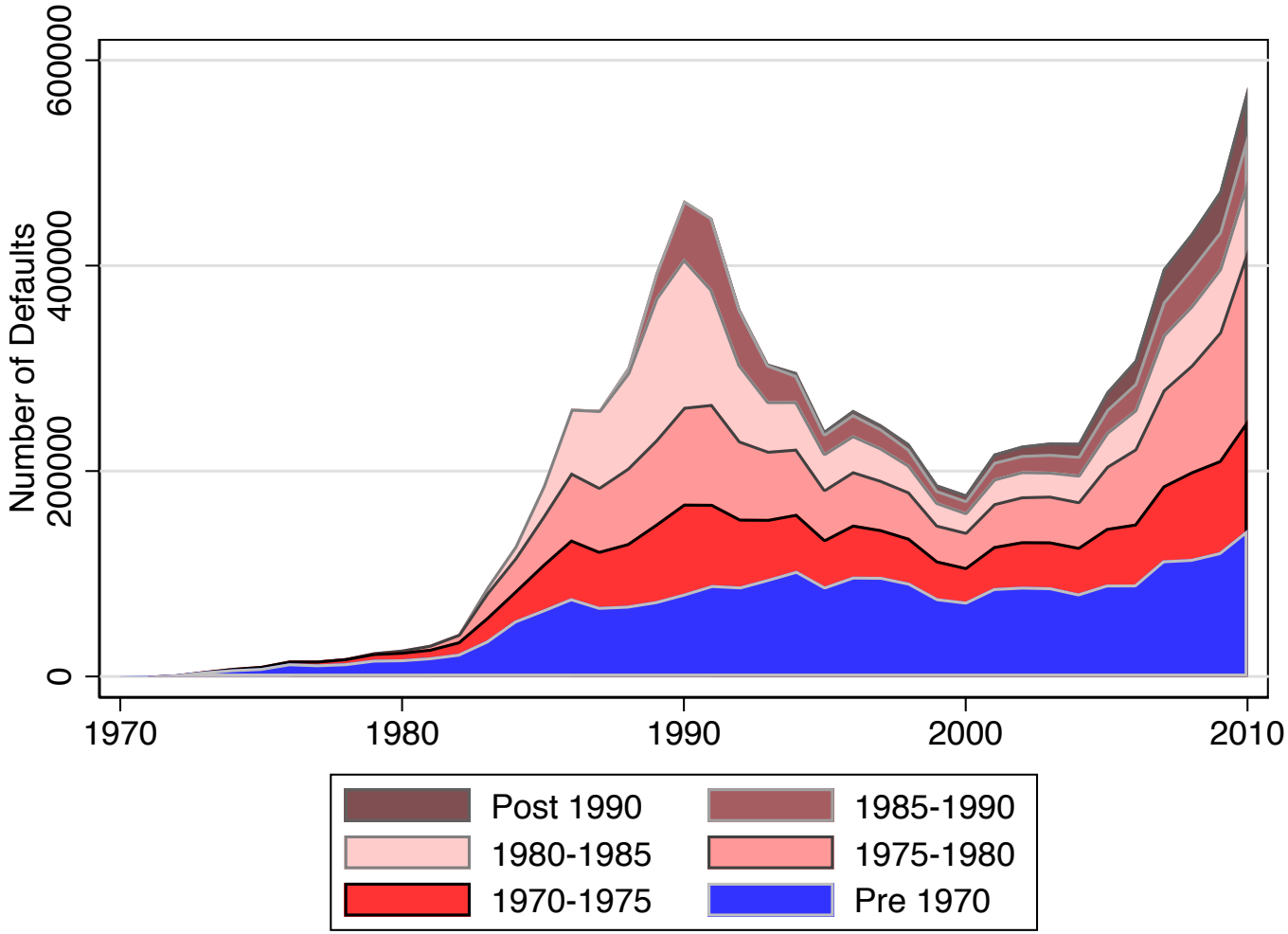


State Guarantee Agencies

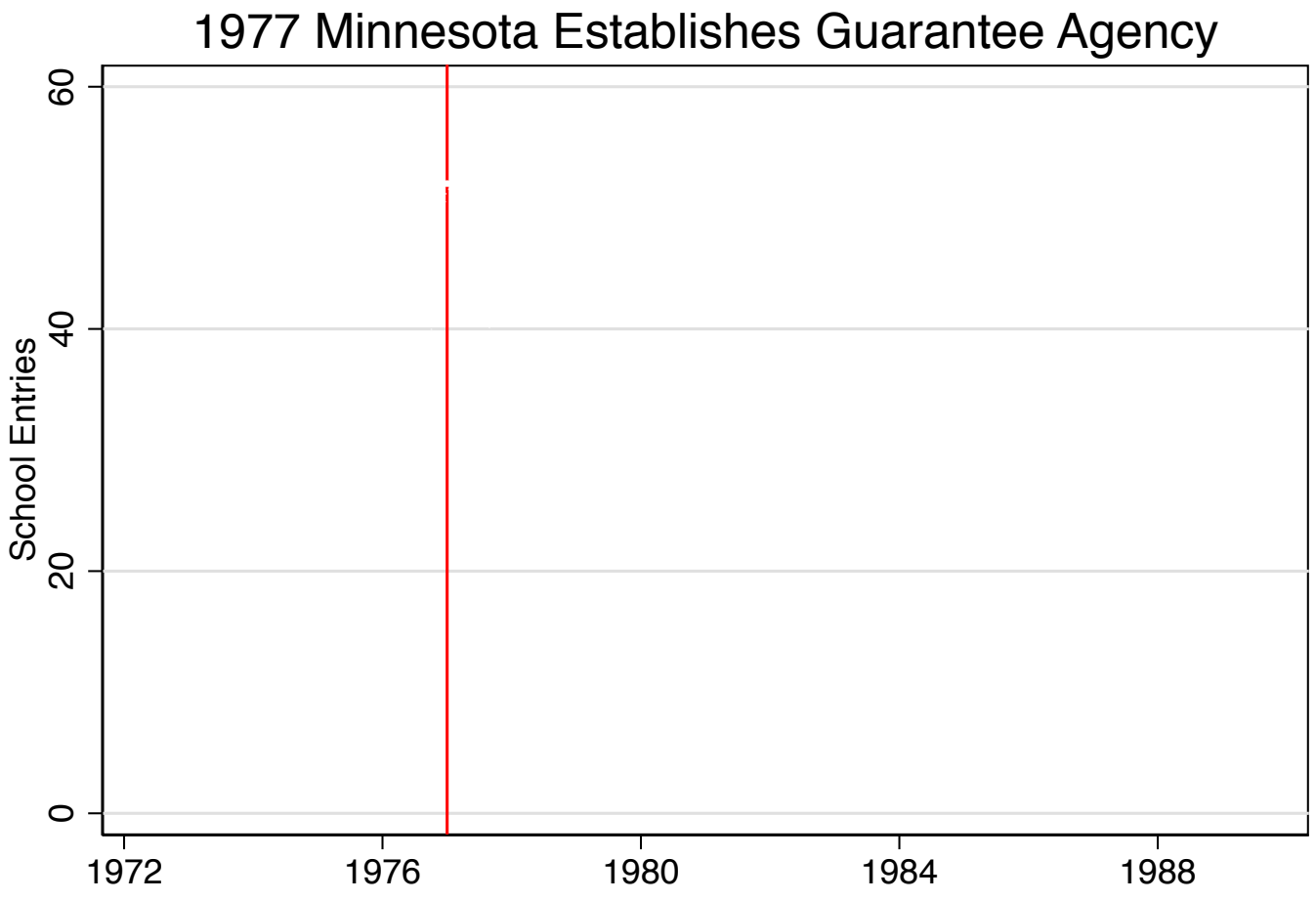
- State agencies guaranteed loans to lenders in event of charge-off.

- Federal rule changes in 1976 and 1980 provided incentives for states to set up guarantee agencies and expand generosity.
  - Federal government reimbursed losses.

- We compare entry before and after the creation of a state guarantee agency.

- First graphical evidence, then formal difference-in-difference.

Guarantee Agencies Led to School Entry



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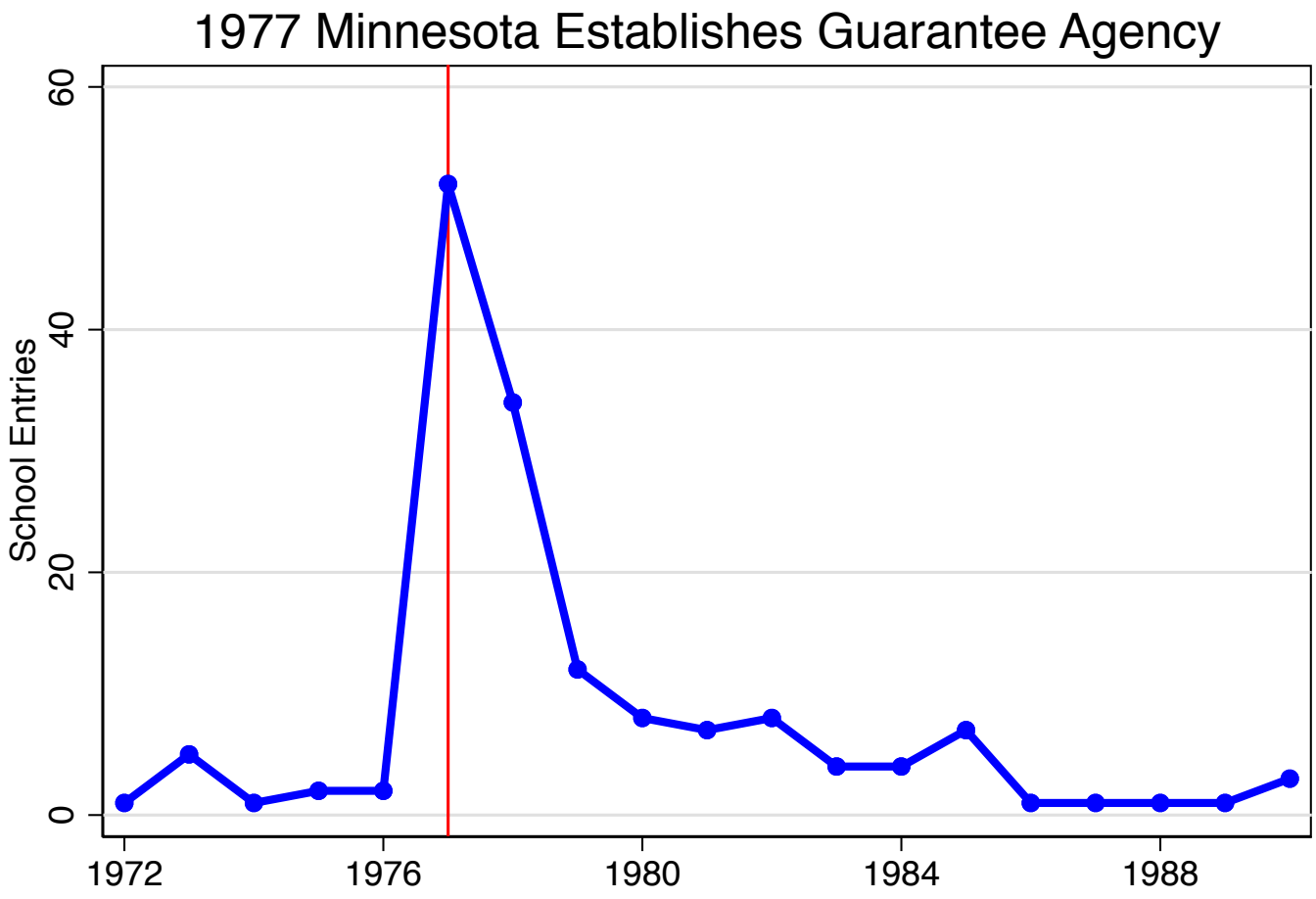

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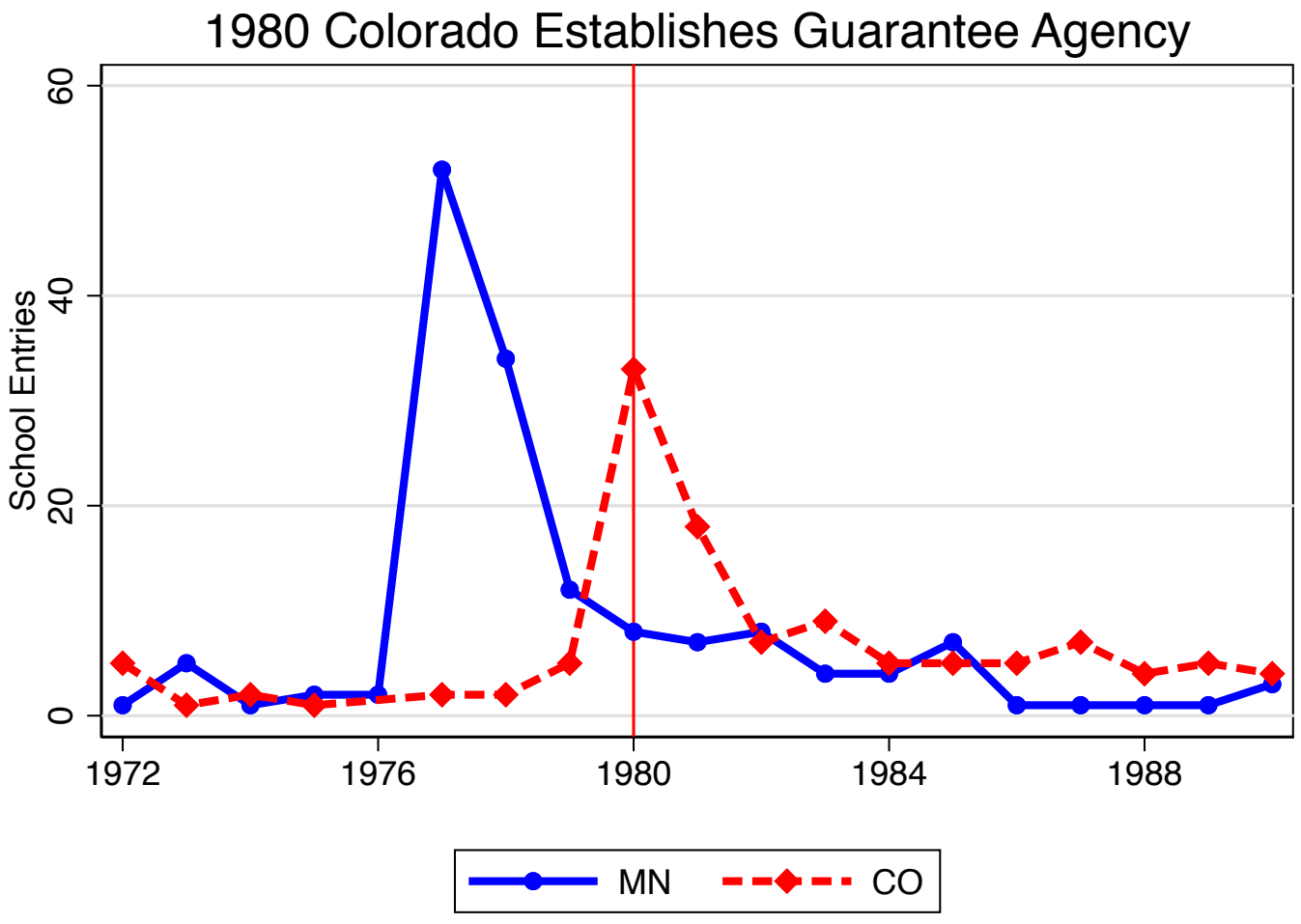

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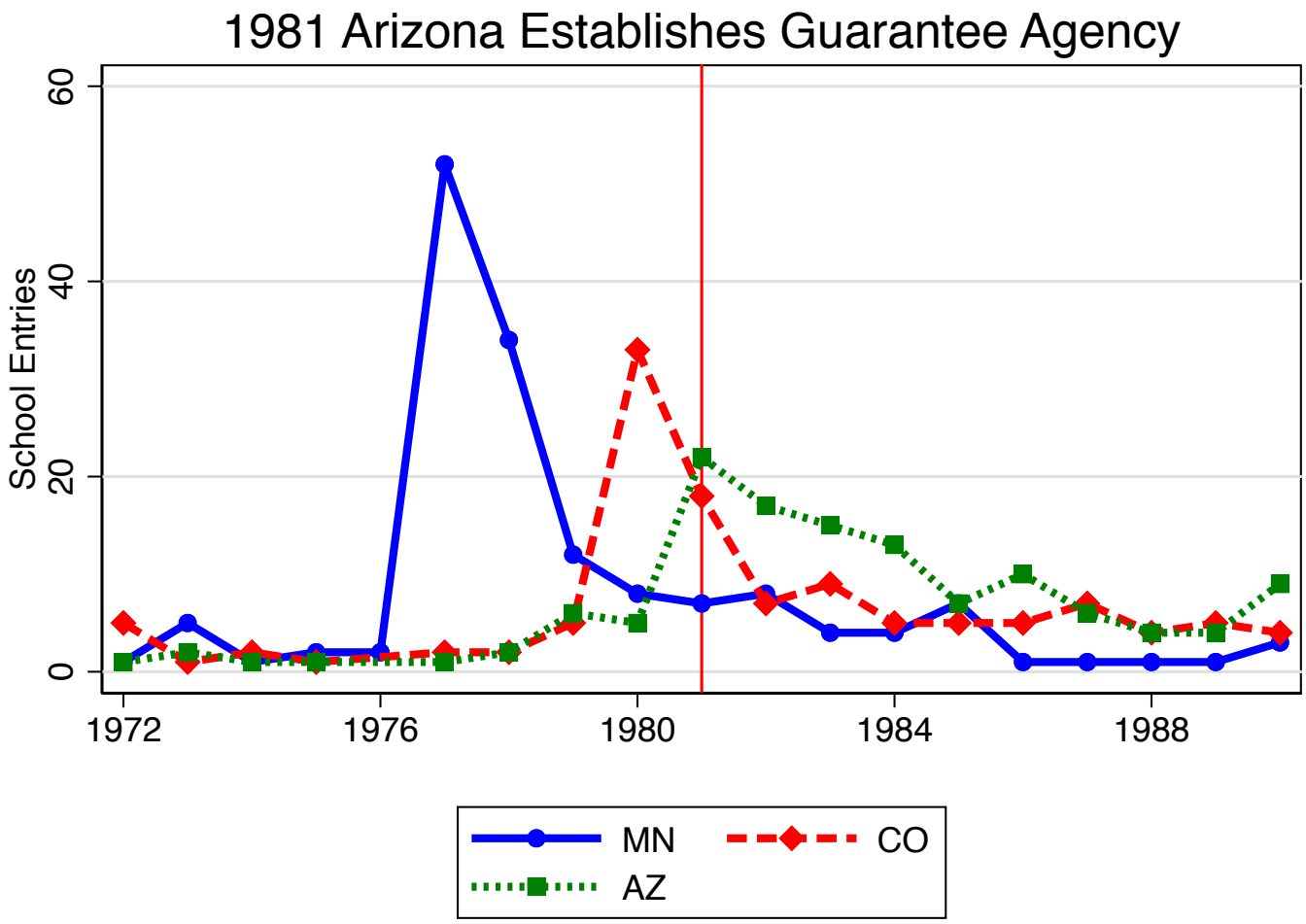

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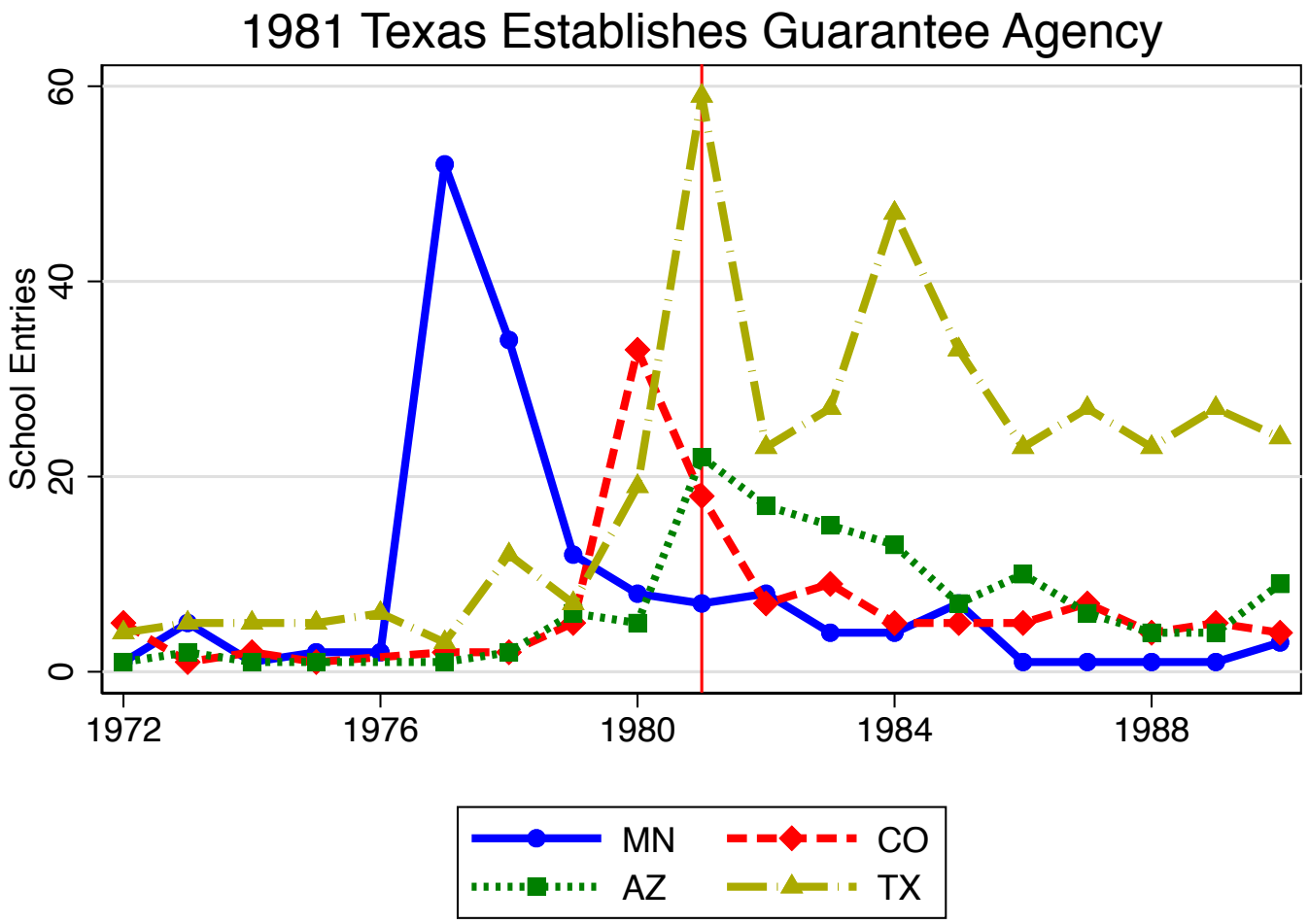

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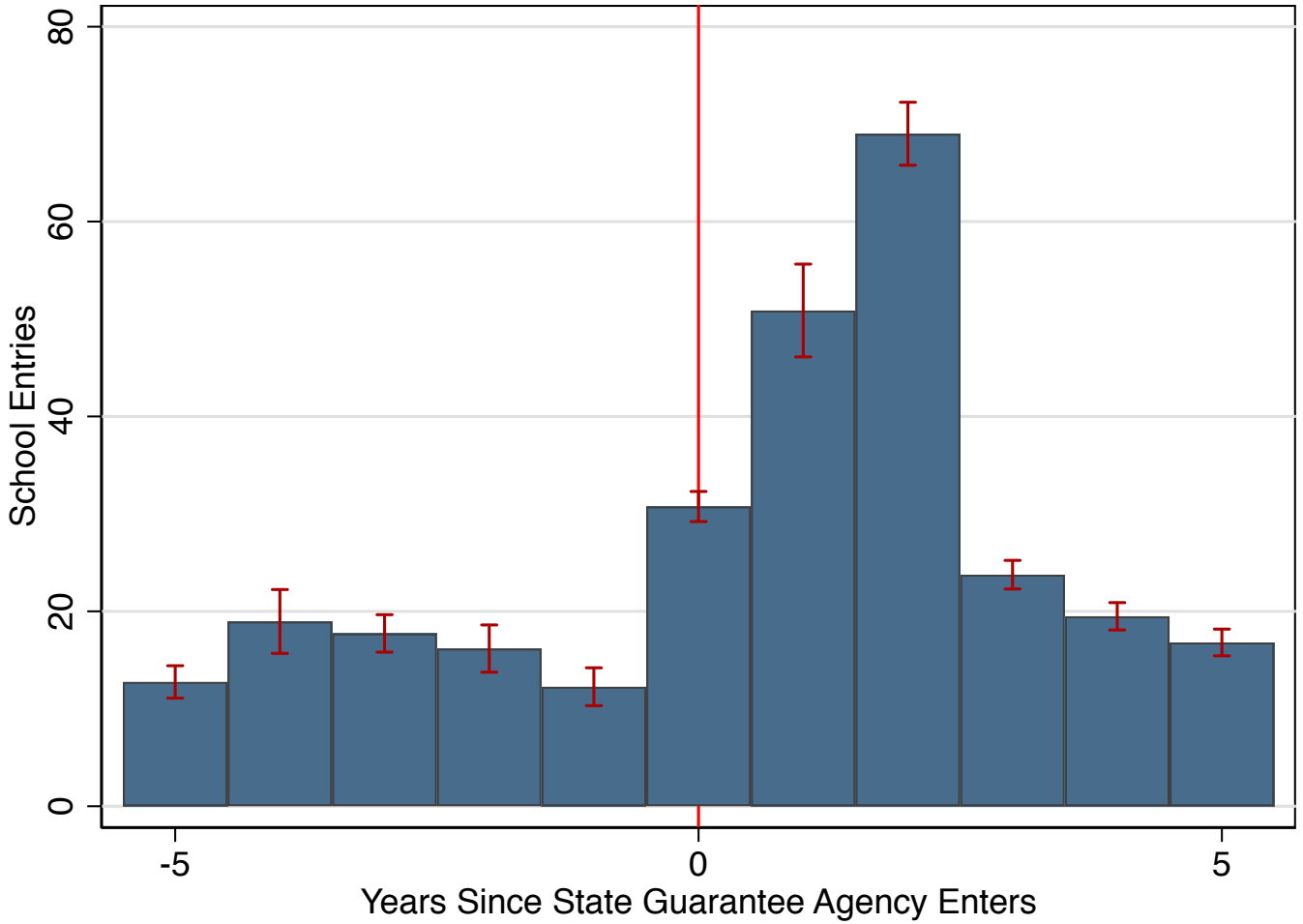

Guarantee Agencies Led to School Entry

$$E_{st} = \alpha_s + \alpha_t + \beta_1 \mathbf{GA}_{st} + \delta X_{st} + \varepsilon_{st}$$

- E_{st} number of schools entering in a state, GA_{st} indicator of whether a state has a Guarantee Agency.
- α_s and α_t are state and year fixed effects, standard errors clustered at state level.

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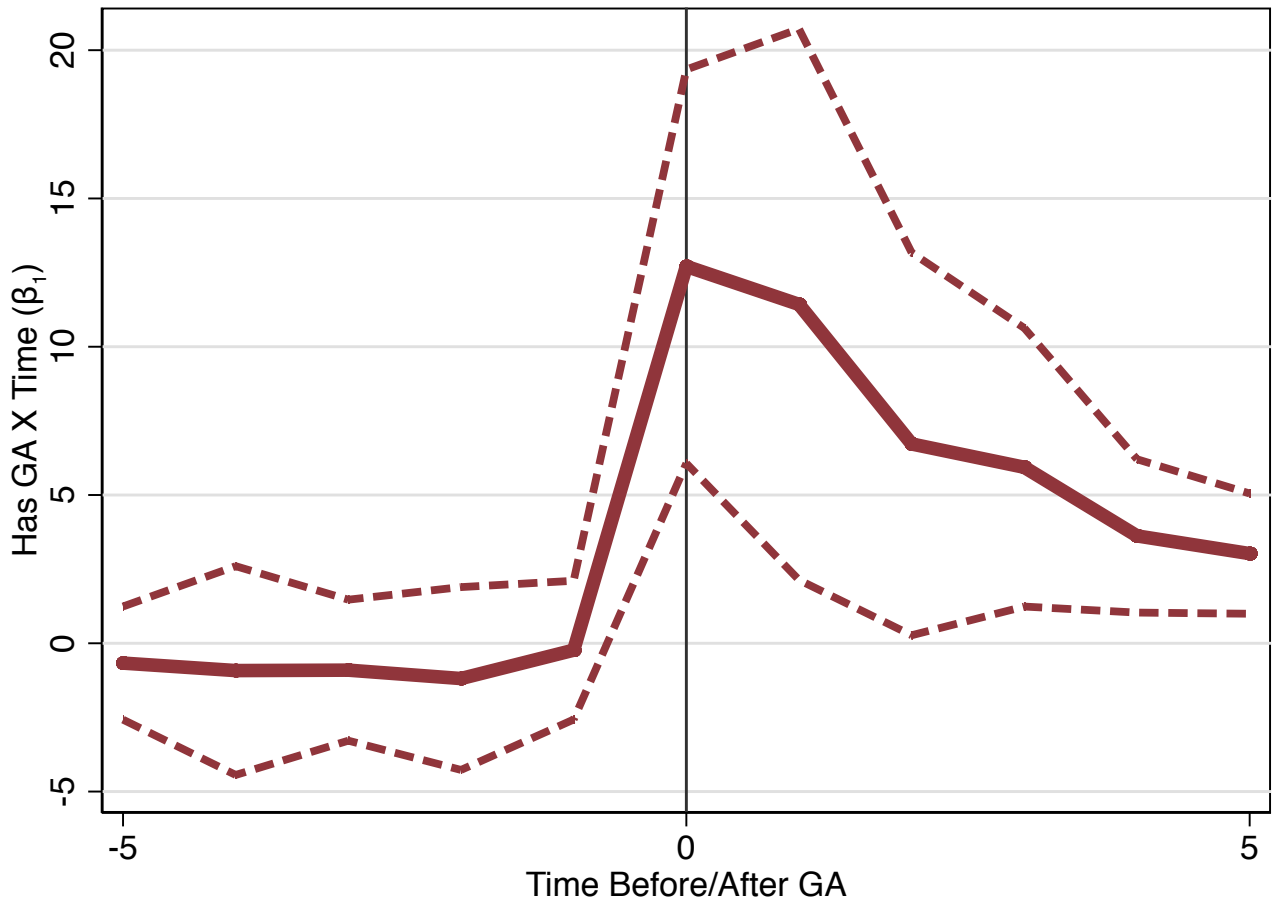
Table 3: Effect of Guarantee Agencies on School Entry

This table shows the effect of the introduction of state guarantee on school entry agencies between 1970 and 1990. The first four columns show regression estimates of the number of entering schools on an indicator of whether a state has a guarantee agency. Standard errors are clustered at the state level. Washington DC is included as a separate state. Source: NSLDS. *$p < .1$, ** $p < .05$, *** $p < .01$.

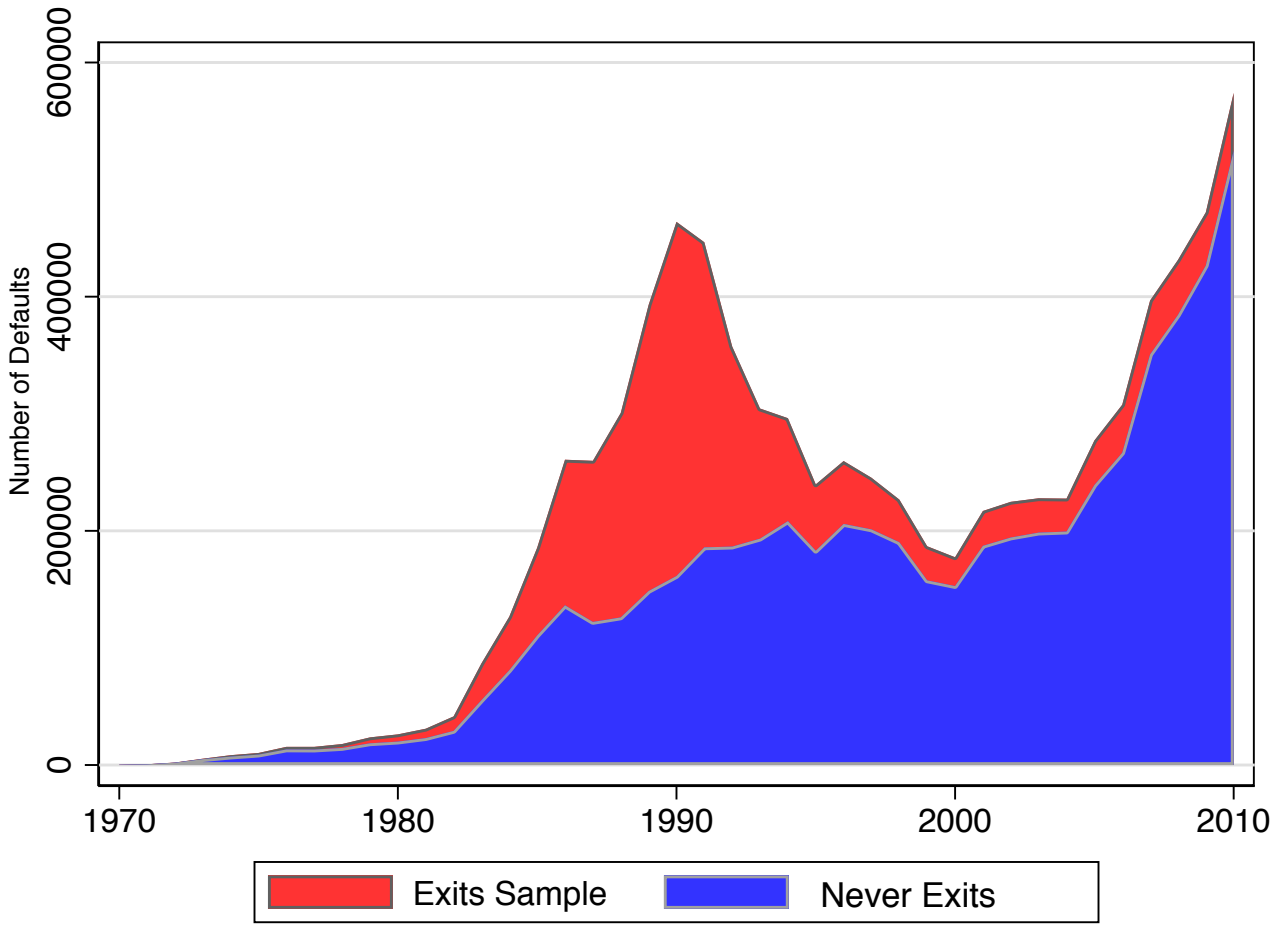
	(1)	(2)	(3)	(4)
Has GA	7.847***	6.976***	6.386***	3.882***
	(1.535)	(1.500)	(2.160)	(1.434)
Year	-0.436***			
	(0.114)			
Year Effects		✓	✓	✓
State Effects			✓	✓
Controls				✓
Observations	1,071	1,071	1,071	1,071

Guarantee Agencies Led to School Entry

$$E_{st} = \alpha_s + \alpha_t + \sum_{t=-5}^{5} \beta_t \mathbf{GA}_{st} + \delta X_{st} + \varepsilon_{st}$$



Schools Exiting Drive Most of Decline in Default



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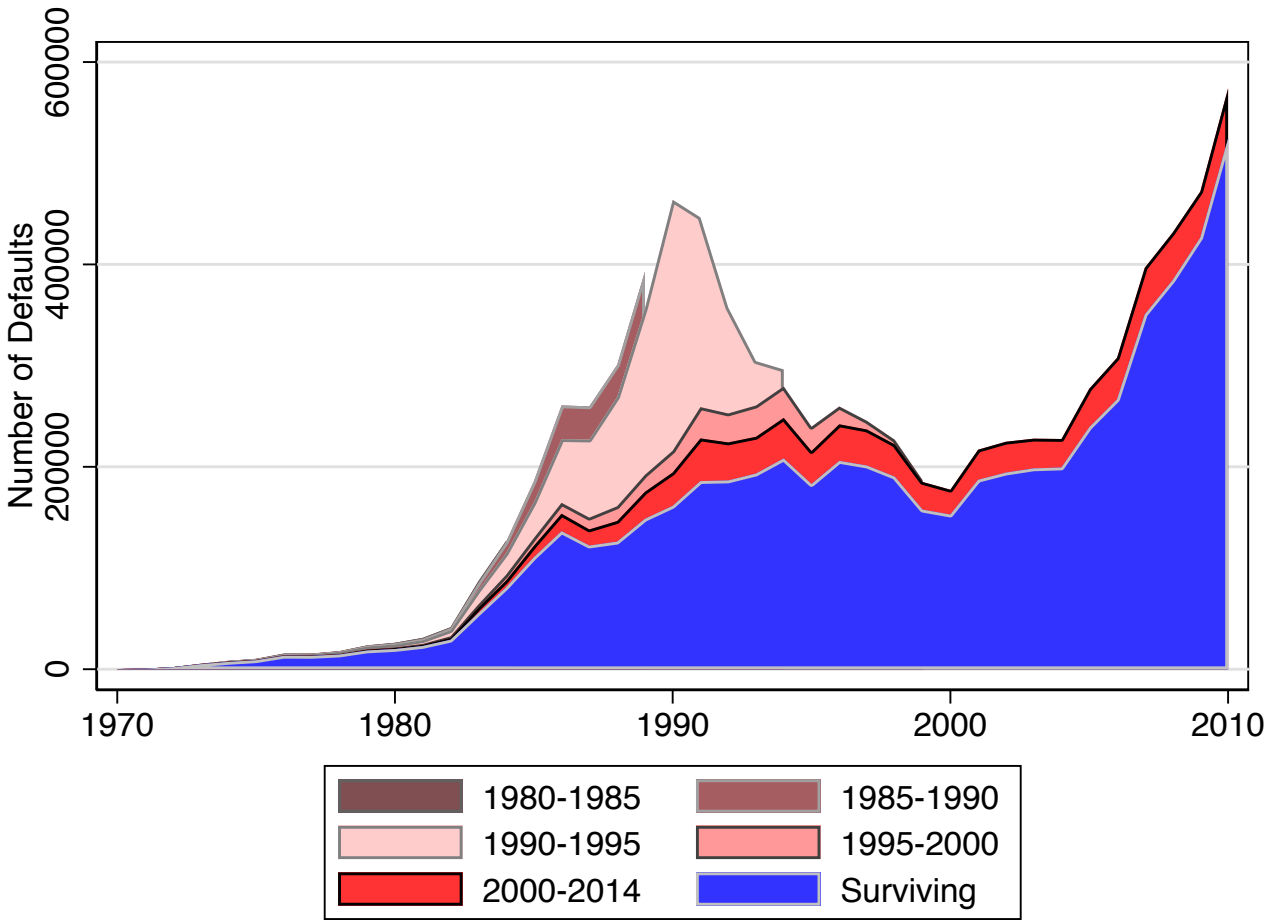


Cohort Default Rate Rules

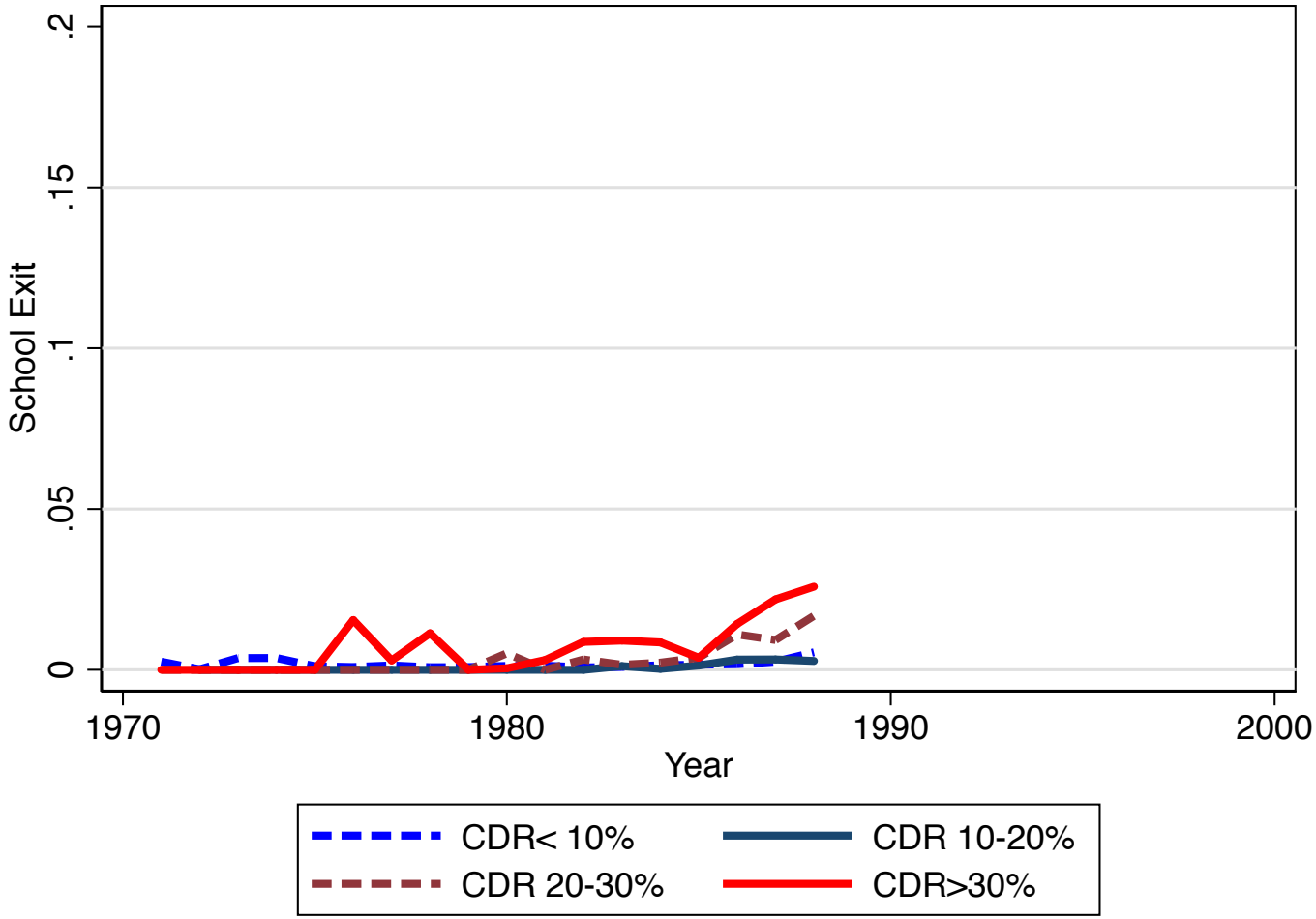
- Sanctioned schools with Cohort Default Rates greater than 30 percent for the last three years.

- Sanction barred school from federal grants and loans; most sanctioned schools closed.

- We compare the exit rates of institutions by ex-ante default rates.

- First graphical evidence, then formal difference-in-difference.

CDR Rules Led to Exit of High Default Schools



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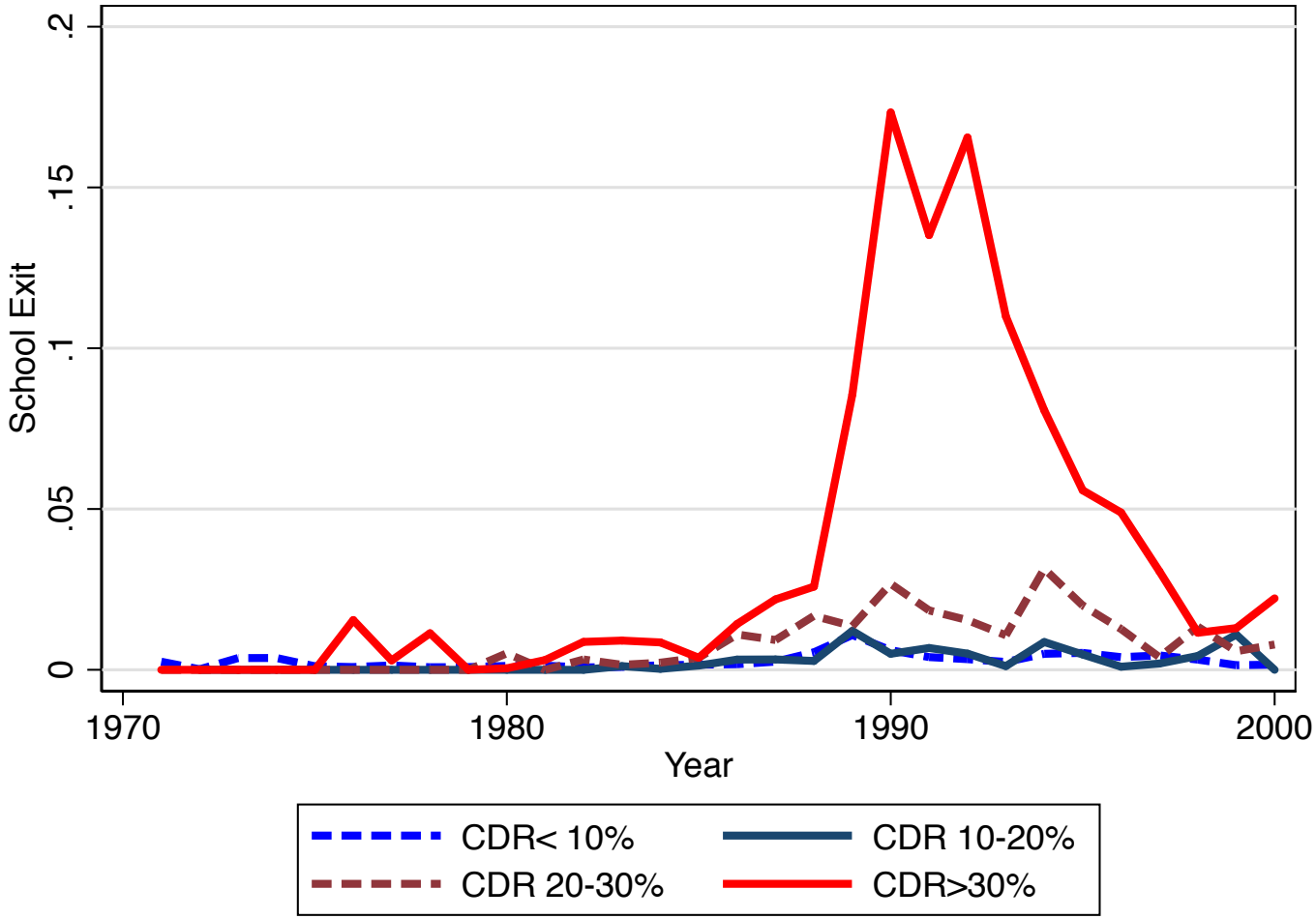
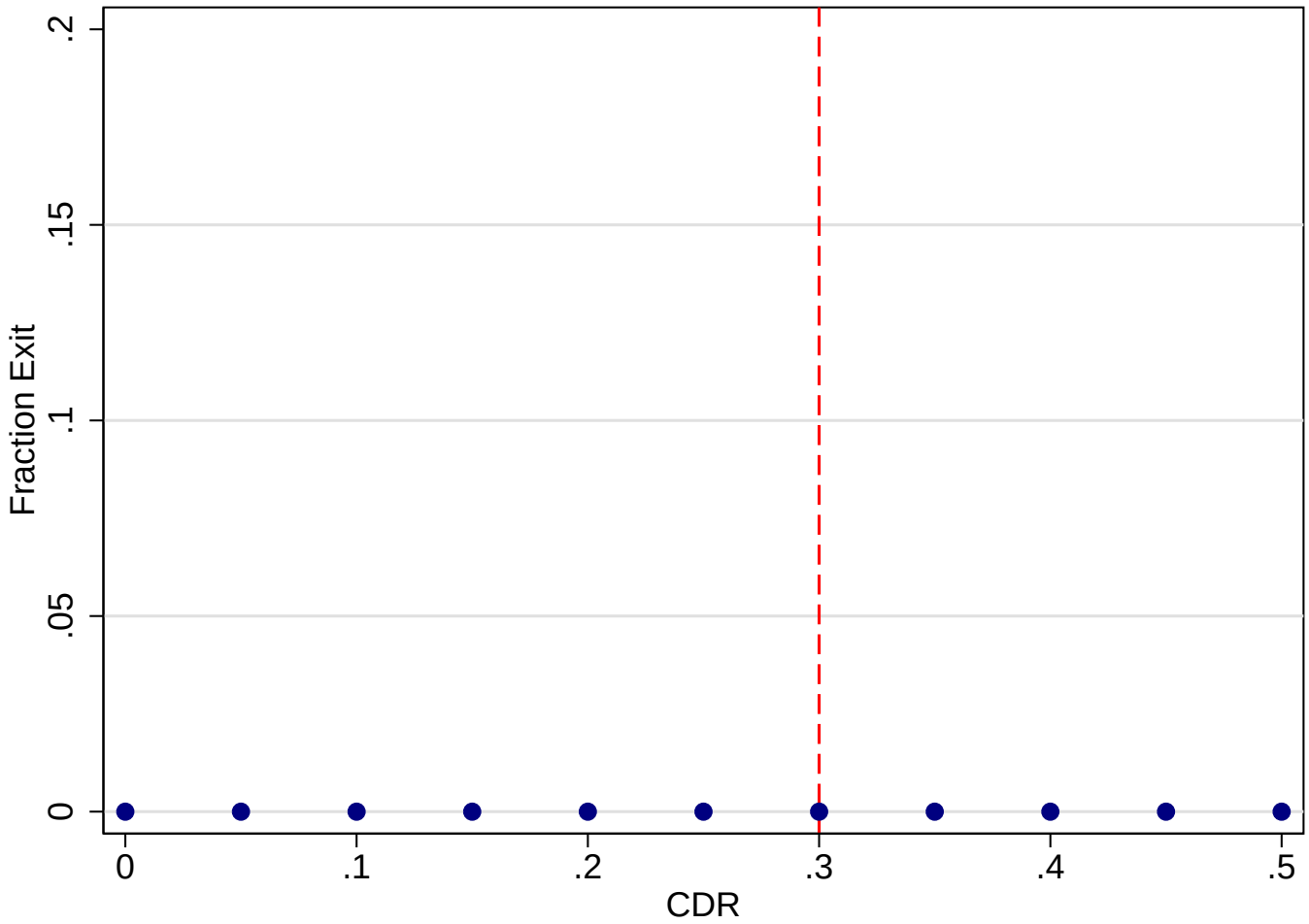
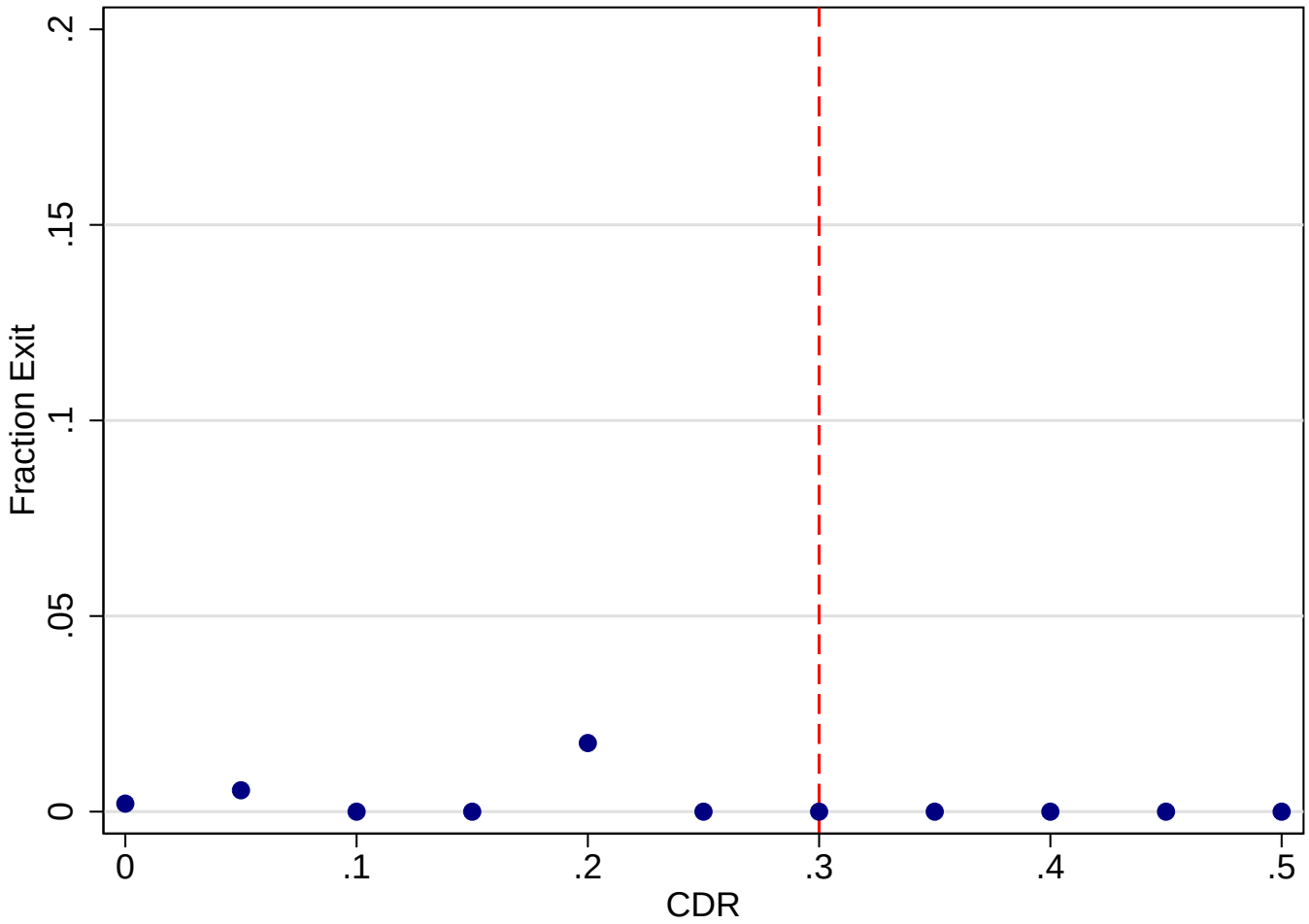


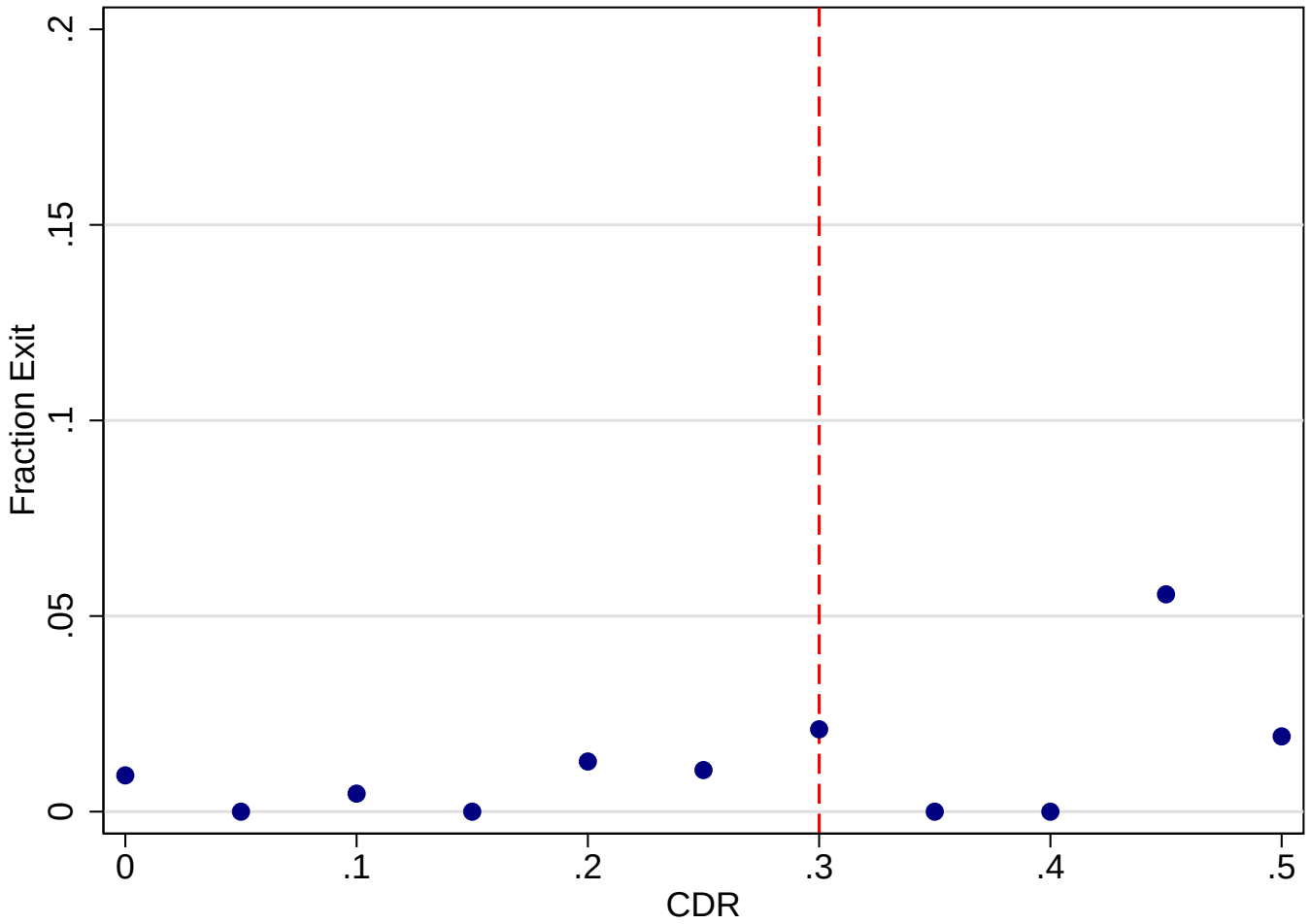
Schools Exiting 1984



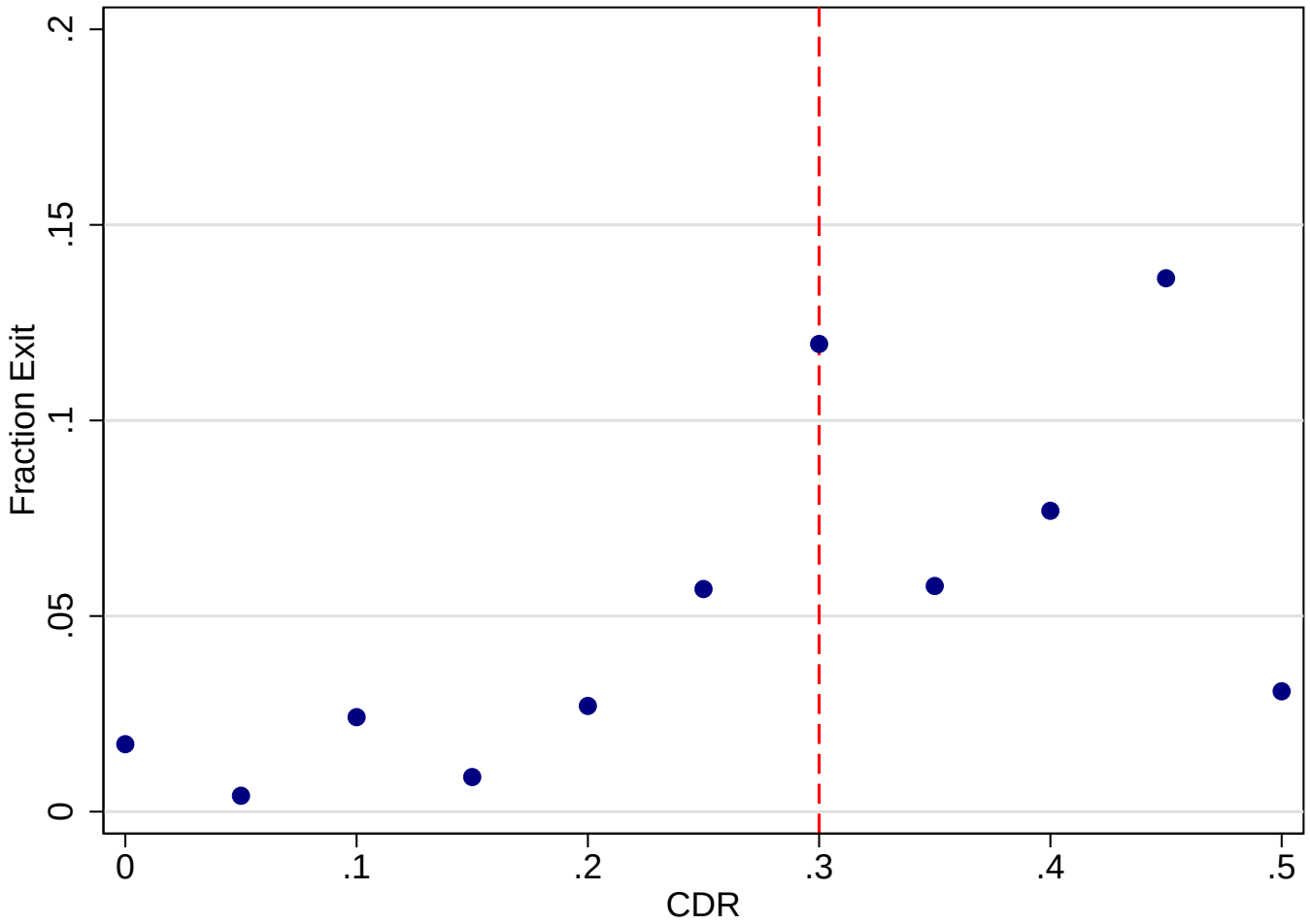
Schools Exiting 1986



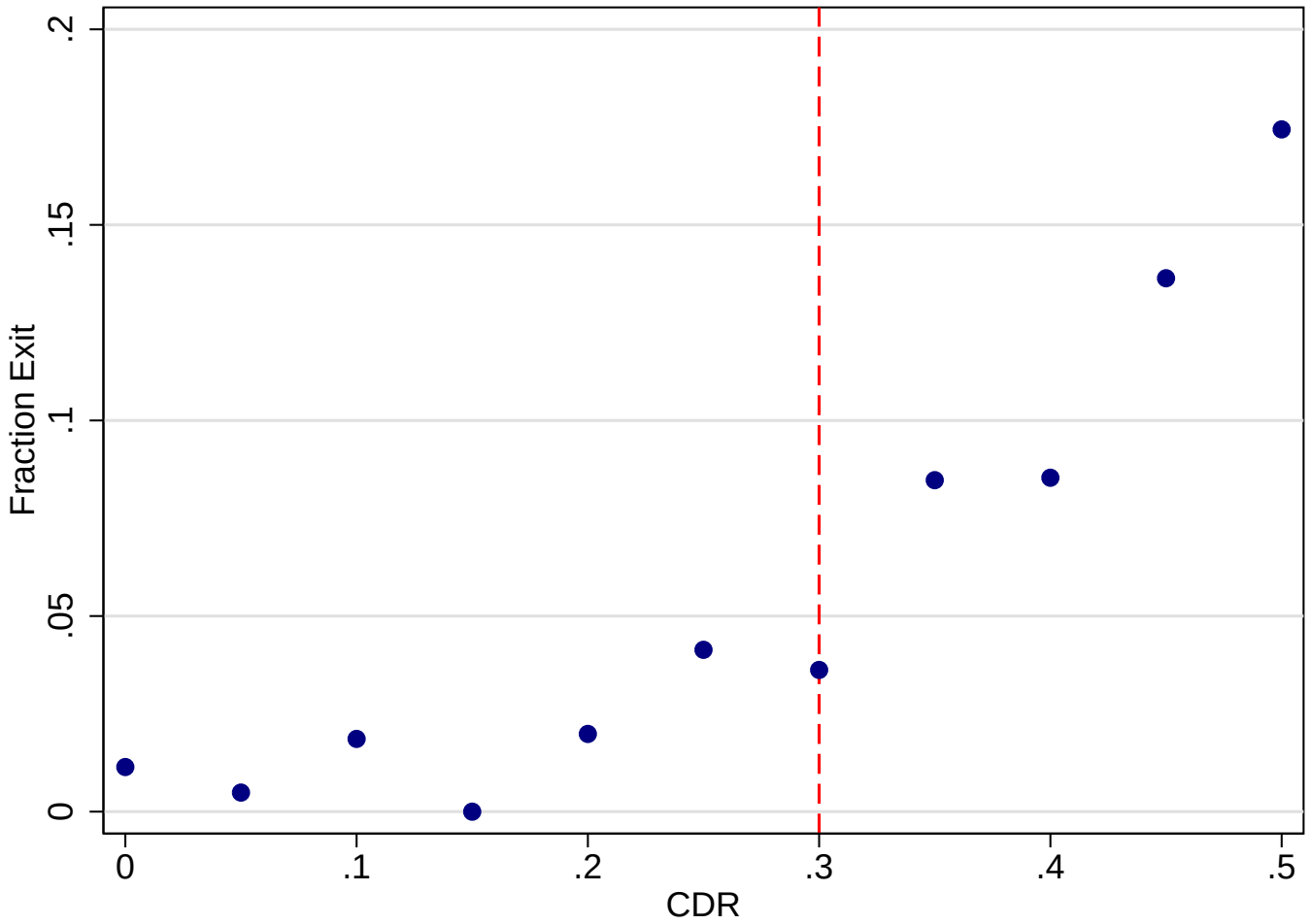
Schools Exiting 1988



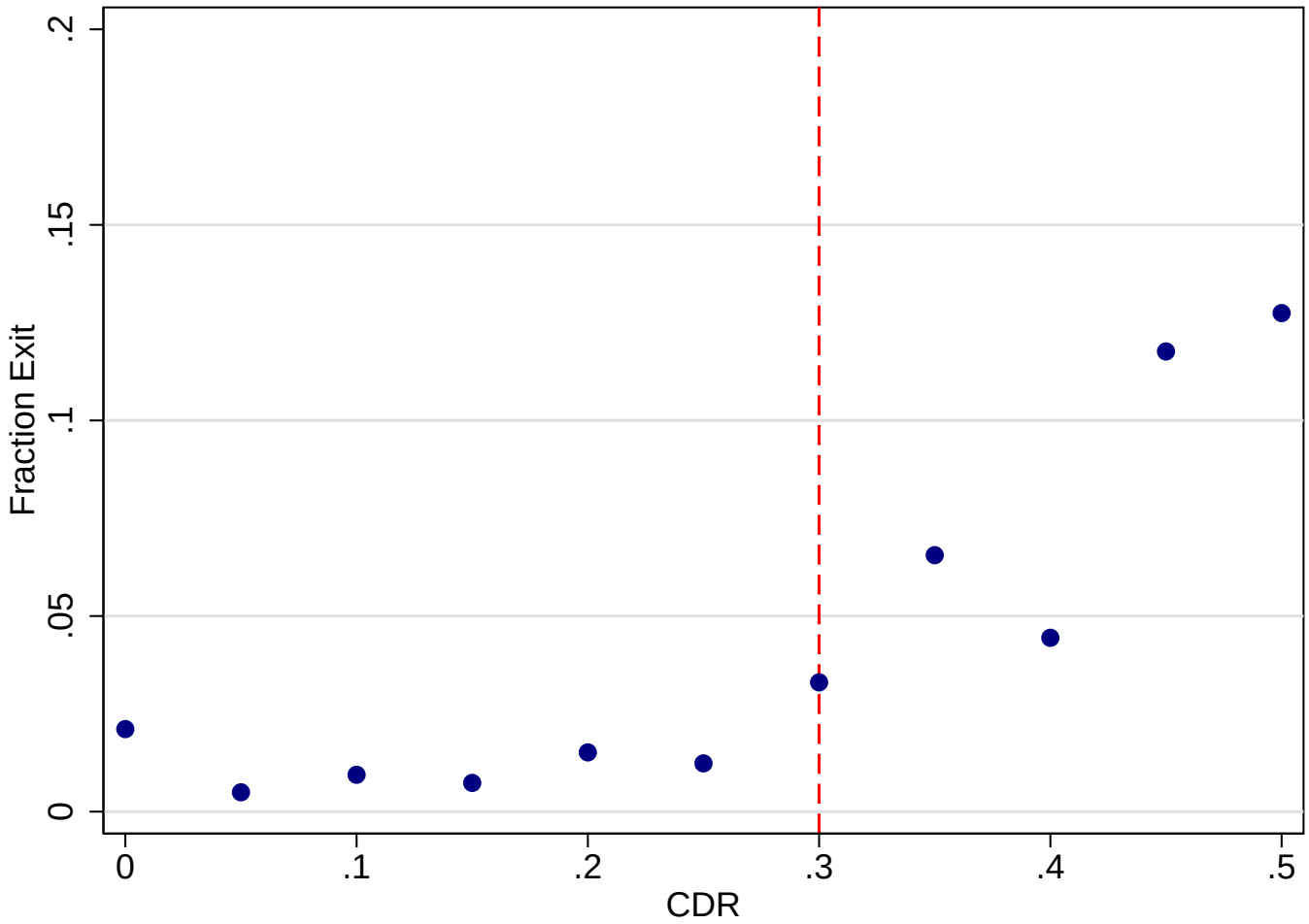
Schools Exiting 1990



Schools Exiting 1992



Schools Exiting 1994



Estimates of School Exit from Federal Credit Programs

$$E_{st} = \alpha_s + \alpha_t + \beta_1 1[CDR_{st} > .3] + \beta_2 1[CDR_{st} > .3] \times 1[Post_t] + \delta X_{st} + \varepsilon_{st}$$

- E_{st} is indicator of whether a school exits from loan program in year t. $1[CDR_{st} > .3]$ indicator of whether CDR is above threshold.
- α_s and α_t are school and year fixed effects respectively, standard errors clustered at school level.

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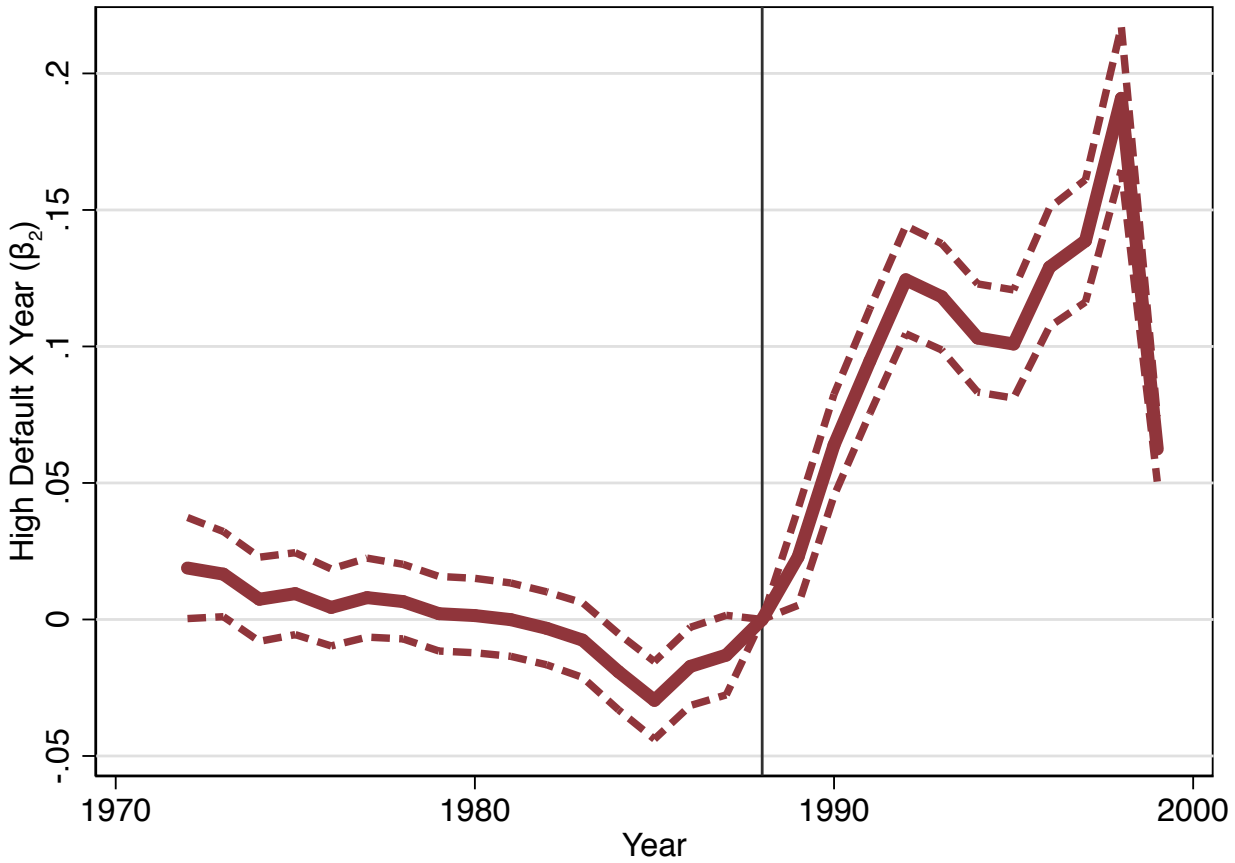
Table 4: Effect of CDR Threshold on School Exit

This table shows the effect of the application of the cohort default rate (CDR) rule taking effect in 1988, which prohibited institutions with CDRs in excess of 30 percent for three years from receiving federal loans. The regression estimates the probability an institution exits the loan program each year as a function of whether the institution's two year lagged CDR is above the 30 percent threshold, an indicator of the year being post 1988 when CDR rules are in effect, and the *treatment effect*: the interaction of the two terms. The sample is restricted to years prior to 2000. Standard errors are clustered at the school level. Source: NSLDS. *$p < .1$, ** $p < .05$, *** $p < .01$.

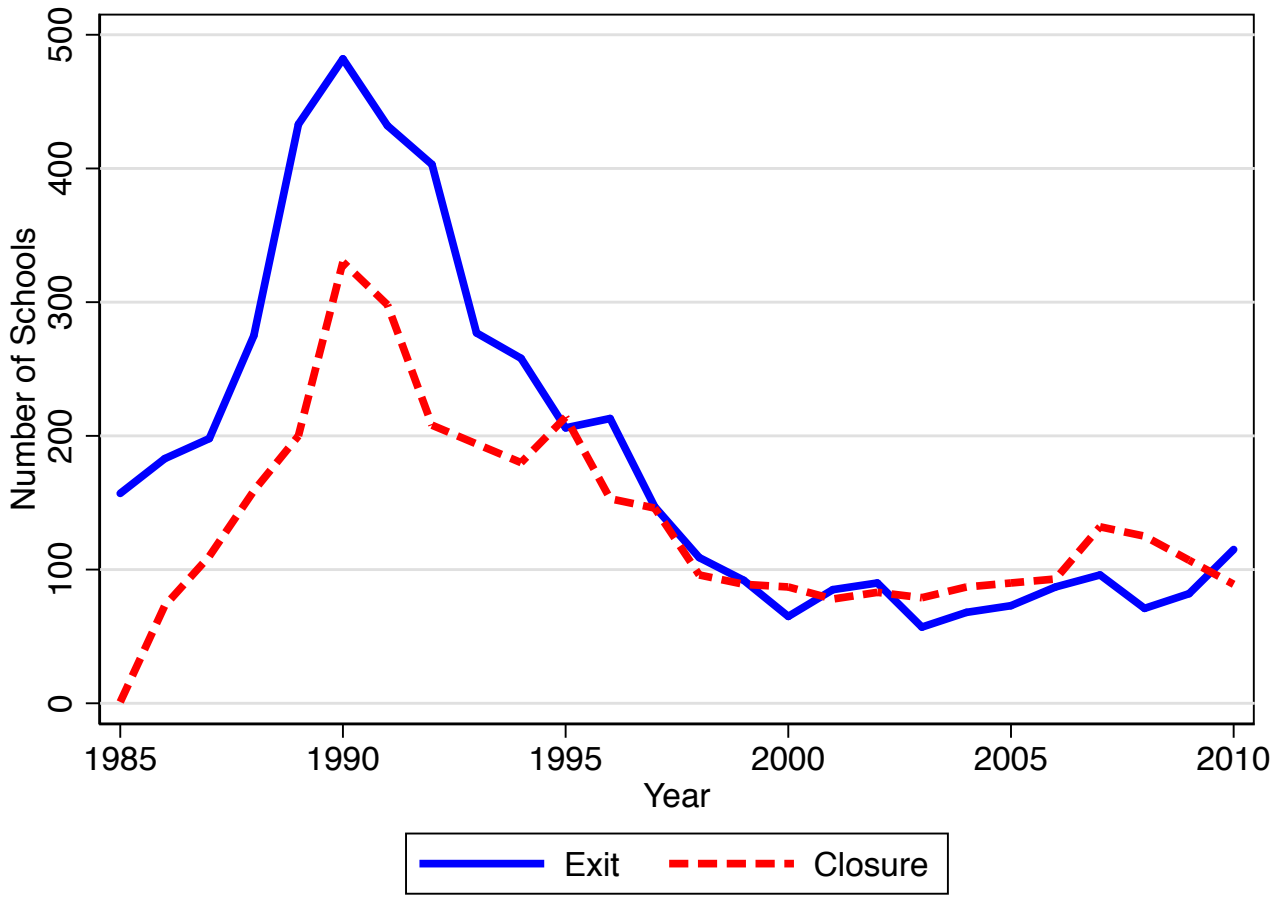
	(1)	(2)	(3)	(4)	(5)	(6)
Above Threshold X Post 1988	0.0342***	0.0721***	0.0700***	0.0976***	0.112***	0.0927***
	(0.00311)	(0.00277)	(0.00276)	(0.00296)	(0.00742)	(0.00301)
Post 1988	0.108***					
	(0.00119)					
Above Threshold	0.0231***	0.0278***	0.0197***	-0.0447***	-0.0680***	-0.0428***
	(0.00118)	(0.00128)	(0.00136)	(0.00156)	(0.00597)	(0.00160)
Year Fixed Effects		✓	✓	✓	✓	✓
School Type			✓			
School Fixed Effects				✓	✓	✓
Weighted					✓	
Controls						✓
Observations	111,606	111,606	111,606	111,606	111,606	111,606

Estimates of School Exit from Federal Credit Programs

$$E_{st} = \alpha_s + \alpha_t + \sum_{t=1971}^{2000} \beta_t 1[CDR_{st} > .3] \times 1[Year = t] + \delta X_{st} + \varepsilon_{st}$$



Did Losing Access to Federal Credit Lead to School Closure?



Losing Access to Federal Credit Led to School Closure

$$C_{st} = \alpha_s + \alpha_t + \beta_1 1[CDR_{st} > .3] + \beta_2 1[CDR_{st} > .3] \times 1[Post_t] + \delta X_{st} + \varepsilon_{st}$$

- C_{st} is indicator of whether a school closes in year t. $1[CDR_{st} > .3]$ indicator of whether CDR is above threshold.
- α_s and α_t are school and year fixed effects respectively, standard errors clustered at school level.

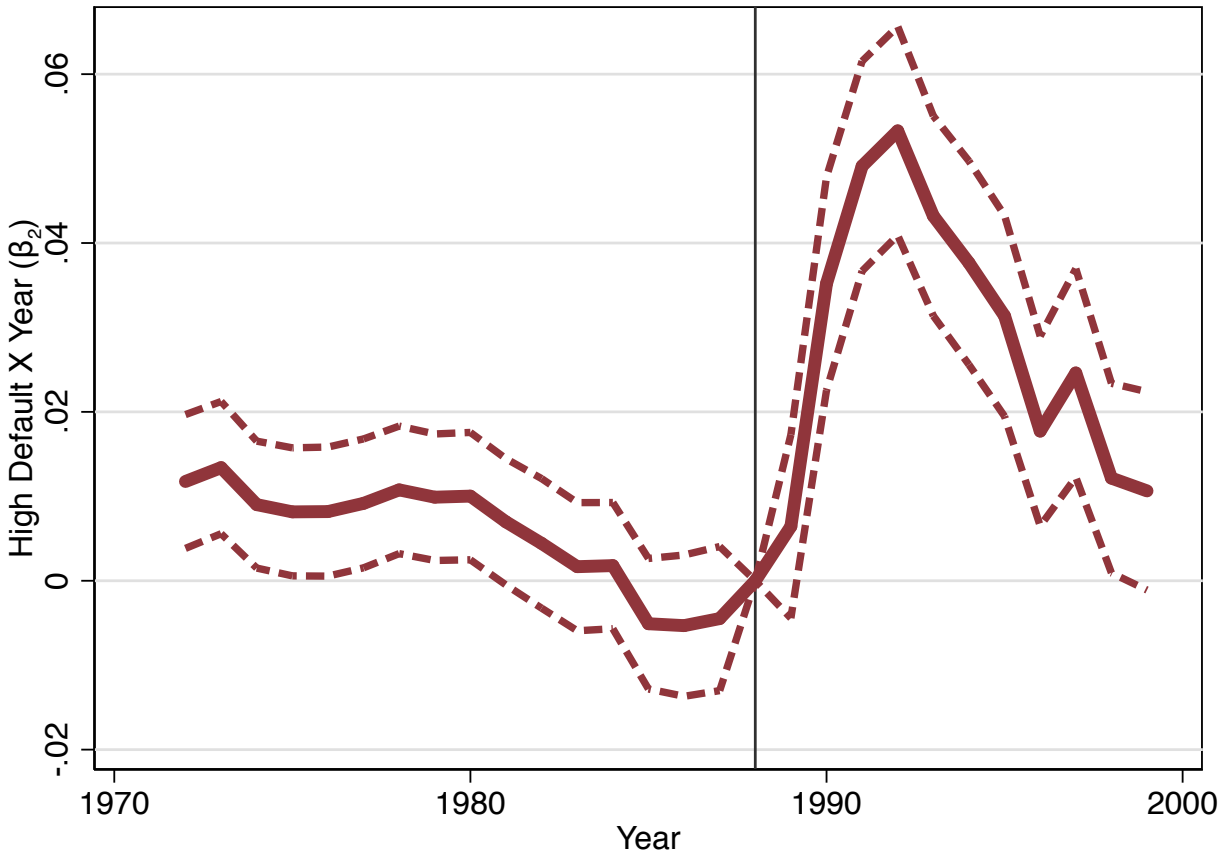
Table 5: Effect of CDR Threshold on School Closure

The top panel of this table examines the application of the cohort default rate (CDR) rule taking effect in 1988, which prohibited institutions with CDRs in excess of 30 percent for three years from receiving federal loans. The regression estimates the probability an institution closes each year as a function of whether the institution's two year lagged CDR is above the 30 percent threshold, an indicator of the year being post 1988 when CDR rules are in effect, and the *treatment effect*: the interaction of the two terms. The sample is restricted to years prior to 2000. Standard errors are clustered at the school level. Source: NSLDS. *$p < .1$, ** $p < .05$, *** $p < .01$.

	(1)	(2)	(3)	(4)	(5)	(6)
Above Threshold X Post 1988	0.0223***	0.0196***	0.0185***	0.0265***	0.0868***	0.0346***
	(0.00171)	(0.00163)	(0.00161)	(0.00189)	(0.0127)	(0.00240)
Post 1988	0.0143***					
	(0.000957)					
Above Threshold	0.000368	0.00190***	-0.00374***	-0.0111***	-0.0509***	-0.0167***
	(0.000434)	(0.000485)	(0.000561)	(0.000941)	(0.00883)	(0.00121)
Year Fixed Effects		✓	✓	✓	✓	✓
School Type			✓			
School Fixed Effects				✓	✓	✓
Weighted					✓	
Controls						✓
Observations	117,577	117,577	117,577	117,577	117,577	117,577

Losing Access to Federal Credit Led to School Closure

$$C_{st} = \alpha_s + \alpha_t + \sum_{t=1971}^{2000} \beta_t 1[CDR_{st} > .3] \times 1[Year = t] + \delta X_{st} + \varepsilon_{st}$$



More Recent Increase in Default

- Prior to 1999, **institutions prohibited** from enrolling more than **50 percent of students in online** or correspondence courses.
- In 1999, Distance Education Demonstration Program repealed rule for selected online-only schools.
- Ex: University of Phoenix, Capella University, American InterContinental University and Kaplan University.
- **50 percent rule eliminated** in 2006 for all institutions.

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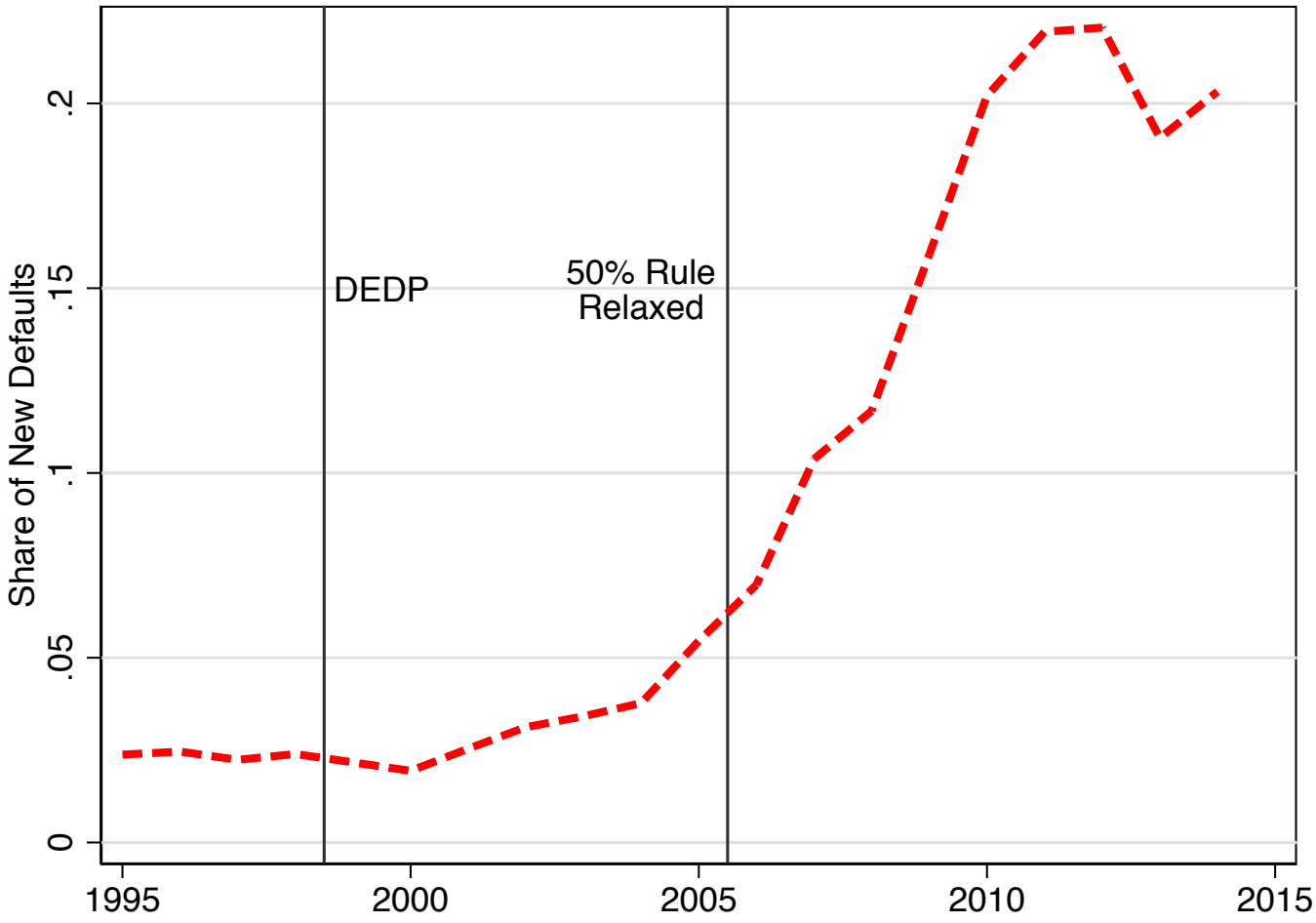
- Ex: University of Phoenix, Capella University, American InterContinental University and Kaplan University.
- **50 percent rule eliminated** in 2006 for all institutions.
- **Post 9/11 GI Bill**: Paid tuition, fees, room and board to veterans who had served three years on active duty since September 11, 2001. Effective August 1, 2009.
- Paid $35 billion between 2009-2018, 39% to for-profits.
- Unintended effect: **allowed for-profits to enroll more student loan borrowers because of "90-10 rule."**

Share of Defaults at Online Institutions



Expanding Credit to Online Institutions

$$E_{st} = \alpha_s + \alpha_t + \beta_1 1[Online] \times 1[Post2006] + \delta X_{st} + \varepsilon_{st}$$

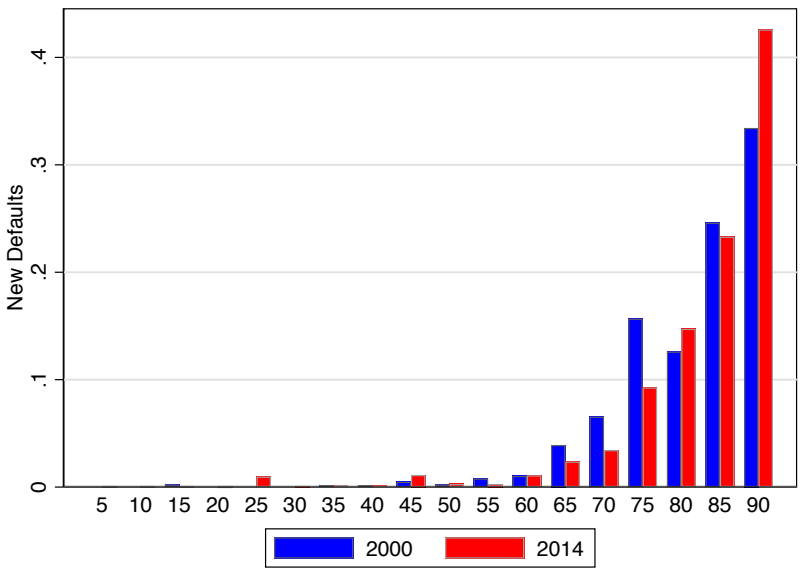
Table 6: Effect of Online Credit Expansion on Borrowing and Default

The tables shows the effect of the elimination of the requirement that no more than 50 percent of students be distance or online students after 2006. The outcome of interest is the log number of new federal borrowers or the log number of new defaults, and the treatment is an indicator of a school ever offering online education interacted with a post-2006 indicator. Standard errors are clustered at the school level. Source: NSLDS. *$p < .1$, ** $p < .05$, *** $p < .01$.

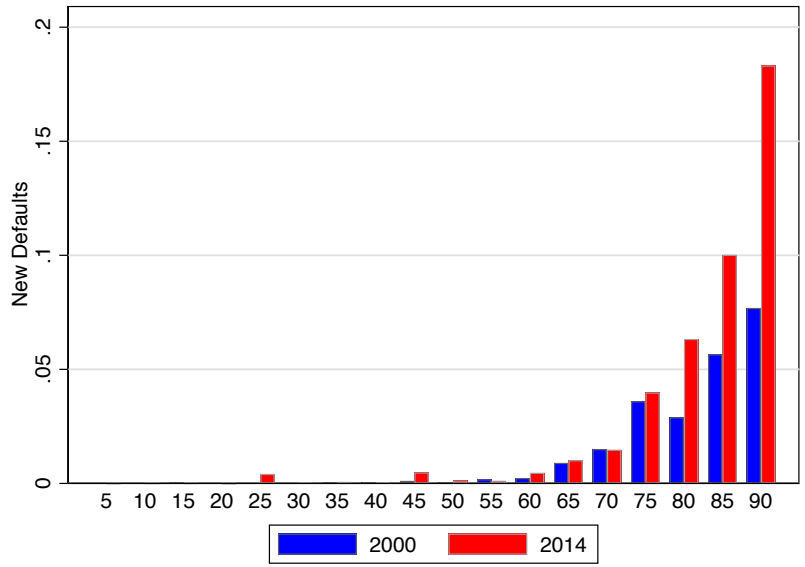
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A:			Ln(Enrollment)			
Online X Post 2006	0.425***	0.480***	0.457***	0.452***	0.504**	0.465***
	(0.134)	(0.134)	(0.137)	(0.143)	(0.209)	(0.143)
Post 2006	0.360***					
	(0.0119)					
Online	-0.0735	-0.126	-0.0245			
	(0.133)	(0.136)	(0.153)			
Panel B:			Ln(Default)			
Online X Post 2006	0.419***	0.446***	0.443***	0.623***	0.977***	0.658***
	(0.121)	(0.122)	(0.122)	(0.135)	(0.151)	(0.133)
Post 2006	0.526***					
	(0.00961)					
Online	0.00732	-0.0253	-0.0145			
	(0.0697)	(0.0719)	(0.0733)			
Year Fixed Effects		✓	✓	✓	✓	✓
School Type			✓			
School Fixed Effects				✓	✓	✓
Weighted					✓	
Controls						✓
Observations	137,103	137,103	137,103	137,103	137,103	137,103

Share of Defaults at Schools Near Constraint Rose

All Schools



For-Profits



Expanding Credit to Schools Near Constraint

$$E_{st} = \alpha_s + \alpha_t + \beta_1 1[HighTitleIV] \times 1[Post2008] + \delta X_{st} + \varepsilon_{st}$$

Table 7: Effect of Post 9/11 G.I. Bill on Borrowing and Default

The tables shows the effect of the Post-9/11 GI bill on enrollment and default . The outcome of interest is the log number of new federal borrowers or the log number of new defaults, and the treatment is an indicator of whether a school receives more than 85% of revenue from Title IV programs interacted with a post-2008 indicator. The sample is restricted to for-profit schools, for which 90/10 Revenue Percentages are available. Standard errors are clustered at the school level. Source: NSLDS and Department of Education Proprietary School 90/10 Revenue Percentages. *$p < .1$, ** $p < .05$, *** $p < .01$.

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A:			Ln(Enrollment)			
Title IV > 85% X Post 2008	0.149***	0.144***	0.142***	0.107**	0.190**	0.0890**
	(0.0482)	(0.0483)	(0.0482)	(0.0461)	(0.0916)	(0.0439)
Post 2008	-0.0432*					
	(0.0227)					
Title IV > 85%	0.364***	0.364***	0.362***			
	(0.0722)	(0.0723)	(0.0720)			
Panel B:			Ln(Default)			
Above Threshold X Post 2008	0.304***	0.311***	0.309***	0.291***	0.498**	0.257***
	(0.0438)	(0.0438)	(0.0437)	(0.0430)	(0.244)	(0.0392)
Post 2008	0.323***					
	(0.0179)					
Title IV > 85%	0.298***	0.296***	0.294***			
	(0.0515)	(0.0520)	(0.0519)			
Year Fixed Effects		✓	✓	✓	✓	✓
School Type			✓			
School Fixed Effects				✓	✓	✓
Weighted					✓	
Controls						✓
Observations	19,771	19,771	19,771	19,771	19,771	19,771

Decomposing Changes in Default

- Quantify the effects of credit-induced school expansion on default.

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- $\frac{D_{1990}^{Enter} - D_{1980}^{Enter}}{D_{1990} - D_{1980}}$ gives share of increase in loan defaults between 1980 and 1990 due to schools entering.

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- Similarly, the difference in defaults due to school exit can be decomposed as

$$D_{2000} - D_{1990} = \underbrace{(D_{2000}^{Exit} - D_{1990}^{Exit})}_{Exiting\ Share} + (D_{2000}^{In} - D_{1990}^{In})$$

- $\frac{D_{2000}^{Exit} - D_{1990}^{Exit}}{D_{2000} - D_{1990}}$ gives share of decrease in loan defaults between 1990 and 2000 due to schools exiting.

Decomposing Changes in Default

- $\frac{D_{1990}^{Enter} - D_{1980}^{Enter}}{D_{1990} - D_{1980}} = 85.4\%$ of the increase in defaults between 1980 and 1990 due to schools entering the market.
- $\frac{D_{2000}^{Exit} - D_{1990}^{Exit}}{D_{2000} - D_{1990}} = 95.4\%$ of the decrease in defaults between 1990 and 2000 due to schools exiting the market.

Decomposing Changes in Default

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- $\frac{D_{2010}^{ON} - D_{2000}^{ON}}{D_{2010} - D_{2000}} = 33.4\%$ of the increase in defaults between 2000 and 2010 due to online schools, almost half of the increase in the for-profit sector.
- $\frac{D_{2010}^{HTIV} - D_{2000}^{HTIV}}{D_{2010} - D_{2000}} = 42.2\%$ of the increase in defaults between 2000 and 2010 due to expansion of High Title IV ($> 80\%$) schools.

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- $\frac{D_{2010}^{HTIV} - D_{2000}^{HTIV}}{D_{2010} - D_{2000}} = 42.2\%$ of the increase in defaults between 2000 and 2010 due to expansion of High Title IV ($> 80\%$) schools.
- Most of the residual due to labor market shocks (Mueller and Yannelis 2019).

Concluding Remarks

- Paper explains almost all of the time series variation in student loan default
  - Most of the variation over time in student loans default rates is the result of changes in the composition of borrowers.
  - These changes in the composition of borrowers are in turn the result of policy changes expanding and limiting student loan credit to high default borrowers and schools.
- Relationship has changed over time
  - Between 1970 and 2000 changes driven by extensive margin.
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- Relationship has changed over time
  - Between 1970 and 2000 changes driven by extensive margin.
  - More recent increase driven by intensive margin.
- Policy makers face a trade-off between access and costs in designing human capital investment system.
- Desirability of increasing credit access for human capital investment programs depends crucially on value added provided by the institutions where high-risk borrowers enroll and the returns to education.