School-Based Support for Children's Mental Health: Evidence from North Carolina

Sarah Komisarow, Ph.D.
Sanford School of Public Policy, Duke University

NBER SI, Children's Program

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Motivation

- 50 percent of young people experience at least one mental health condition by early adulthood (National Academies of Science and Engineering, 2019)
    - Examples: attention deficit/hyperactivity disorder (8.2-9.8%), anxiety (7.8-9.4%), behavior and conduct disorders (7.0-8.9%), and depression (3.4-5.8%) (Bitsko et al., 2022)
- Onset of conditions most common during childhood or adolescence (National Academies of Science and Engineering, 2019)

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- Onset of conditions most common during childhood or adolescence (National Academies of Science and Engineering, 2019)
- Suggests need for interventions that have potential to reach children across range of circumstances and ages
- Specialized instructional support personnel (Every Student Succeeds Act, 2015) in K-12 schools offer the potential to deliver on this objective

Background

- This paper studies **introduction of Child and Family Support Teams** into 43 public elementary schools in North Carolina in 2006-07
- **Two-person teams:** nationally certified school nurse and licensed school social worker (Troop and Tyson, 2008) – large and unexpected shock to school staffing levels
- State-funded positions **connected to local public health, social services, and other state agencies** (Gifford et al., 2010)
- **Child- and family-centered approach to case management** – meet with children and families outside of school day and off campus to facilitate connections to appropriate services
- Multi-faceted mission, but case management data indicated **most common primary unmet need was child mental health**

Map: Treatment and Comparison

Data

- **Source:** Administrative staff- and student-level data from North Carolina Education Research Data Center (NCERDC)
- **Sample:** Children in elementary school (grades 3-5), 2003-04 to 2009-10 school years
- **Treatment and Comparison:** 43 CFST schools versus comparison (elementary schools in districts that applied but did not receive program)

Empirical Strategy: School-Level Outcomes (First-Stage)

Event-Study

$$Y_{st} = \sum_{\substack{k=-3 \\ k \neq -1}}^{3} \pi_k \times CFST_s \times \mathbf{1}\{t - T_s^* = k\} + Z_{st}\gamma + \alpha_s + \phi_t + \nu_{st}$$

Difference-in-Differences

$$Y_{st} = \alpha + \beta \times CFST_{st} + Z_{st}\gamma + \alpha_s + \phi_t + \nu_{st}$$

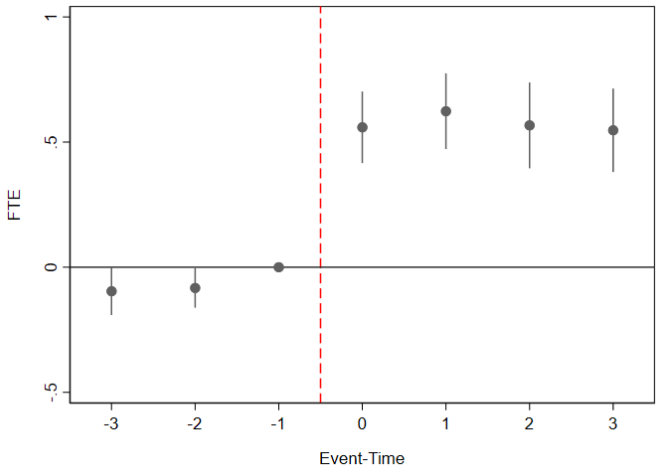
Y_{st}: staffing outcome for school s in year t

α_s and ϕ_t: two-way fixed effects (school and year)

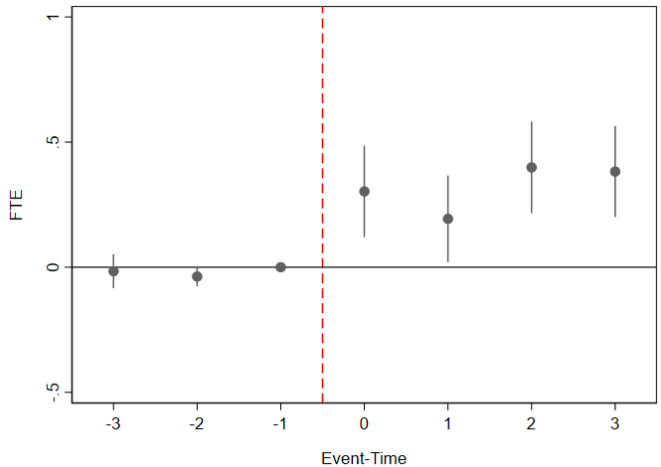
Z_{st}: time-varying school characteristics (shares by race/ethnicity, sex, and economic disadvantage; log enroll)

SEs clustered at school-level

First-Stage Effects on School Staffing: Event-Study



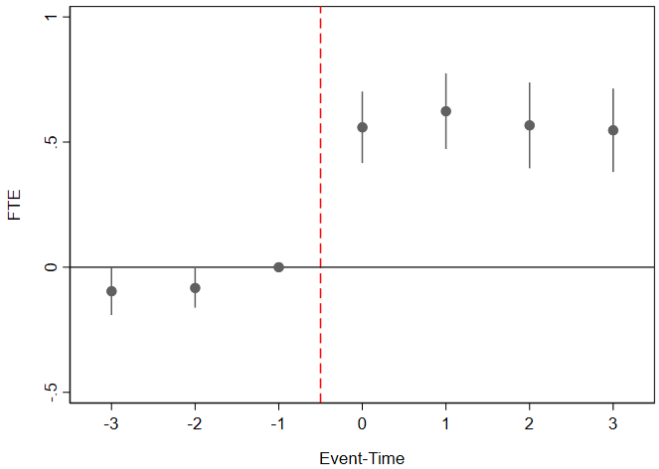
Social Workers (FTE)



School Nurses (FTE)

Raw Plots

First-Stage Effects on School Staffing: Event-Study



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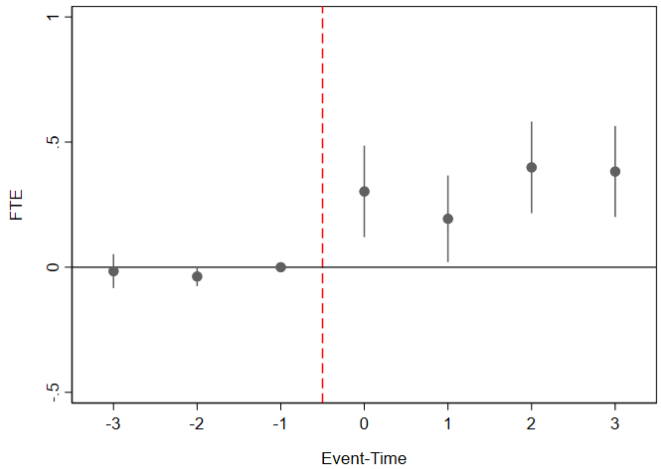

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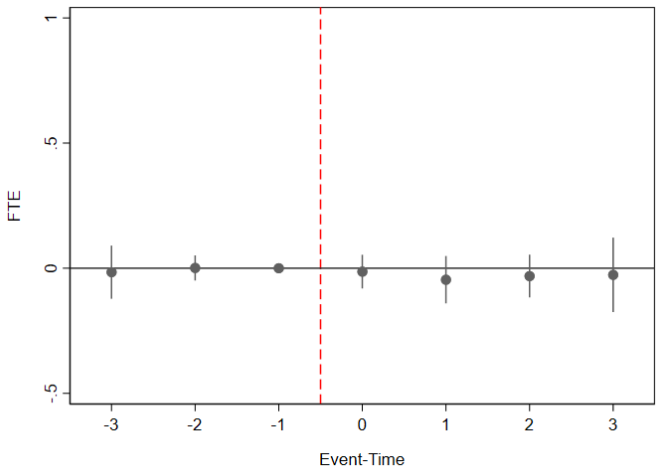
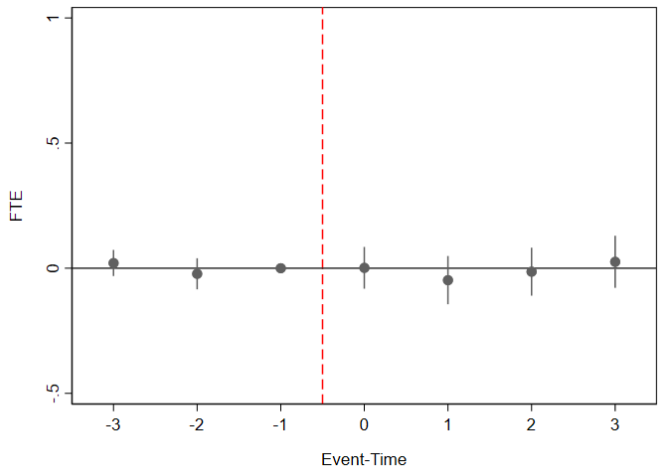


Guidance Counselors (FTE)



School Psychologists (FTE)

Raw Plots

First-Stage Effects on School Staffing: Difference-in-Differences

			Other Staff	
	(1) Social Workers	(2) School Nurses	(3) Guidance Counselors	(4) School Psychologists
Outcome = All Funded Positions (FTE)	0.634***	0.337***	-0.025	-0.008
	(0.080)	(0.082)	(0.045)	(0.037)
Obs.	1,379	1,379	1,379	1,379
Baseline Mean	0.279	0.121	1.094	0.166

- Social Workers ↑ by 0.63 FTEs (225%)
- School Nurses ↑ by 0.34 FTEs (283%)

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	(0.080)	(0.082)	(0.045)	(0.037)
Obs.	1,379	1,379	1,379	1,379
Baseline Mean	0.279	0.121	1.094	0.166
Outcome = CFST Funded Positions (FTE)	0.791***	0.460***		
	(0.056)	(0.067)		
Obs.	1,379	1,379		
Baseline Mean	0.000	0.000		
Outcome = Fed/State/Local-Funded Positions (FTE)	-0.157**	-0.117***		
	(0.062)	(0.045)		
Obs.	1,379	1,379		
Baseline Mean	0.279	0.121		
School FE	X	X	X	X
Year FE	X	X	X	X

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Empirical Strategy: Student-Level Outcomes

Difference-in-Differences

$$Y_{ist} = \alpha + \beta \times CFST_{st} + X_{it}\gamma + \alpha_s + \phi_t + \varepsilon_{ist}$$

Y_{ist}: outcome for student i in school s in year t

α_s and ϕ_t: two-way fixed effects (school and year)

X_{it}: student gender, race/ethnicity, economic disadvantage

SEs clustered at school-level

Allow treatment effect to vary by predicted risk of chronic absence (0/1)

Event-Study Equation

Results: Directly Treated Students

	Days Absent				Chronic. Abs. (0/1)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CFST X Post	-0.376**	-0.297	-0.300*		-0.008**	-0.006	-0.006	
	(0.178)	(0.180)	(0.180)		(0.004)	(0.004)	(0.004)	
Observations	328,765	328,765	328,765	328,765	328,765	328,765	328,765	328,765
Baseline Mean	6.766	6.766	6.766	6.766	0.056	0.056	0.056	0.056
p-value: High = Low				0.000				0.000
School FE	X	X	X	X	X	X	X	X
Student Covariates		X	X	X		X	X	X
Year FE	X	X			X	X		
Grade FE		X				X		
Grade X Year FE			X	X			X	X

Event-Study Plots

Results: Directly Treated Students

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	(0.178)	(0.180)	(0.180)		(0.004)	(0.004)	(0.004)	
CFST X Post X High Risk				-0.409**				-0.009**
				(0.181)				(0.004)
CFST X Post X Low Risk				0.142				0.006
				(0.221)				(0.005)
Observations	328,765	328,765	328,765	328,765	328,765	328,765	328,765	328,765
Baseline Mean	6.766	6.766	6.766	6.766	0.056	0.056	0.056	0.056
p-value: High = Low				0.000				0.000
School FE	X	X	X	X	X	X	X	X
Student Covariates		X	X	X		X	X	X
Year FE	X	X			X	X		
Grade FE		X				X		
Grade X Year FE			X	X			X	X

Event-Study Plots

Summary of Main Results

- **School Staffing:** CFST led to large increases in specialized instructional support personnel
  - Social Workers ↑ by 0.63 FTEs (225%)
  - School Nurses ↑ by 0.34 FTEs (283%)

- **Student Outcomes:** Mean impacts driven by high-risk students
  - Number of days absent ↓ by 0.41 days (6%)
  - Likelihood of chronic absence ↓ by 0.9 pp (16%)

- Effects on high-risk students consistent with program objectives – CFST mission targets most disadvantaged students in the school

Long-Run Effects

	(1) Days Absent	(2) Chron. Abs. (0/1)	(3) Reading (SDs)	(4) Math (SDs)
CFST X Post	-0.153	-0.002	-0.012	0.051**
	(0.246)	(0.006)	(0.019)	(0.020)
Obs.	1462988	1462988	1414685	1417337

- Differences in treatment intensity: (1) treated vs untreated schools and (2) number of expected years in elementary school after CFST introduction
- Fifth grade cohorts between 2001-2009 (outcomes measured in 8th grade)

Estimating Equation

Additional Results: Indirectly Treated Students

- **Indirectly Treated Schools**: Examine effects on students enrolled in schools that did not receive treatment but located in a CFST-receiving district (comparison schools are the same)

- **School Staffing:** CFST led to smaller increases in specialized instructional support personnel
  - Social Workers ↑ by 0.12 FTEs (52%)
  - School Nurses ↑ by 0.05 FTEs (50%)

- **Student Outcomes:** No statistically significant differences between high- and low-risk students
  - Number of days absent ↓ by 0.20 days (3%)
  - No detectable effects on likelihood of chronic absence

Table

Conclusion

- Contribution to existing literature on the effects of specialized instructional support personnel (i.e., school support staff)
- Child and Family Support Teams are example of intervention with potential to reach children where they are
- Effectively identify and serve most disadvantaged students within disadvantaged K-12 public schools

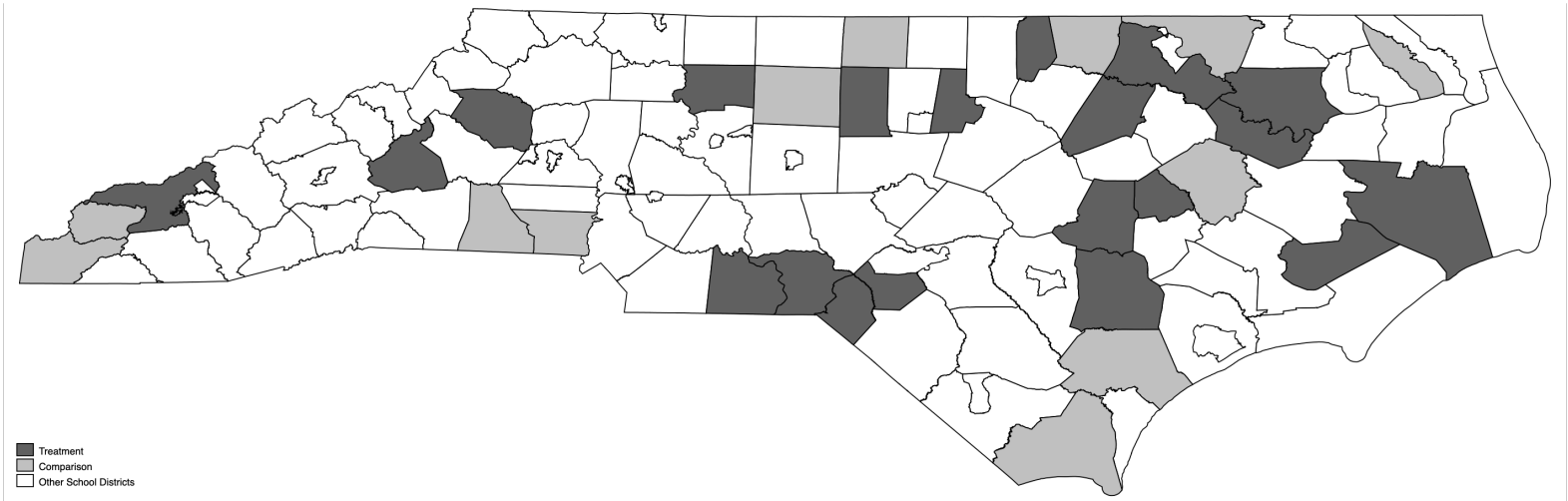
Thank you

Questions and Comments

sarah.komisarow@duke.edu

APPENDIX SLIDES

Map of Treatment and Comparison School Districts



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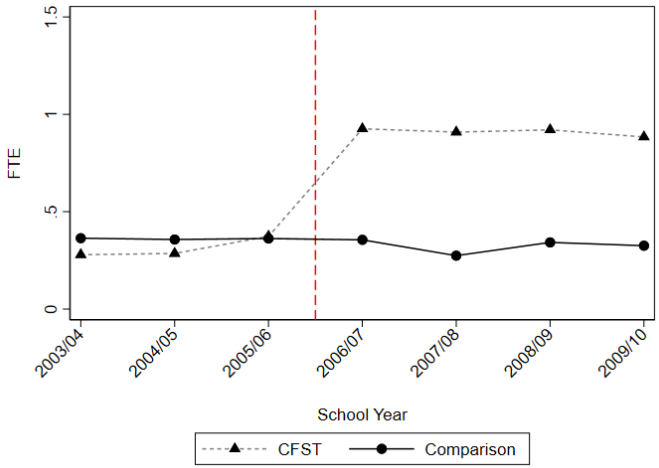
School Staffing, Raw Plots



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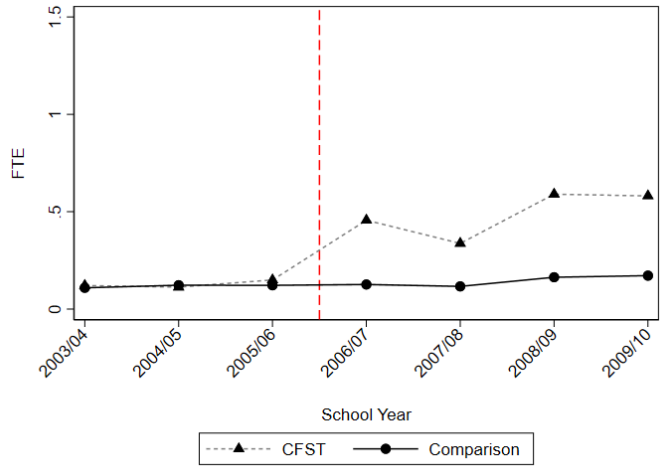
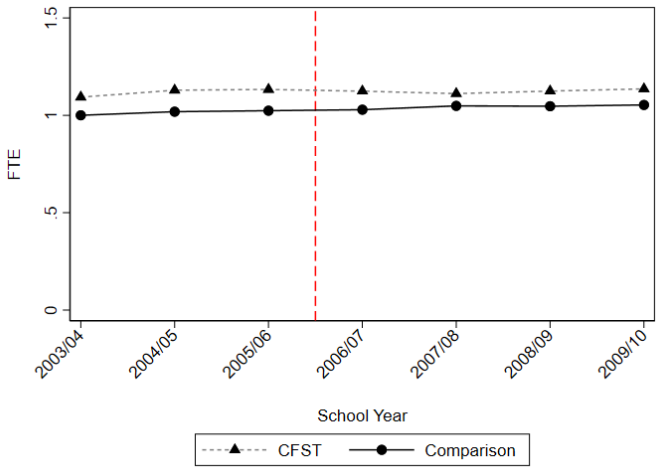


School Nurses (FTE)



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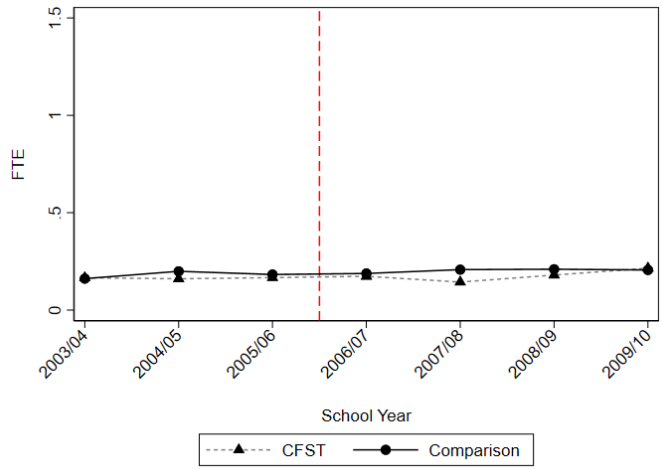

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- Y_{ist}: outcome for student i in school s in year t
- α_s and ϕ_t: two-way fixed effects (school and year)
- X_{it}: student gender, race/ethnicity, economic disadvantage
- Standard errors clustered at school-level

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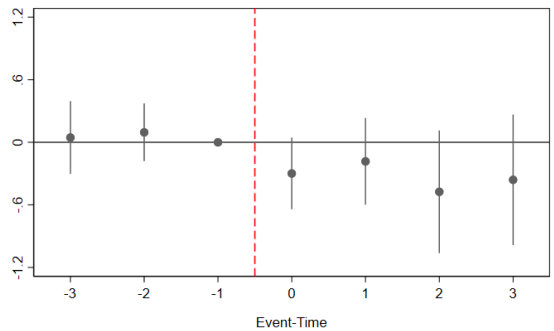
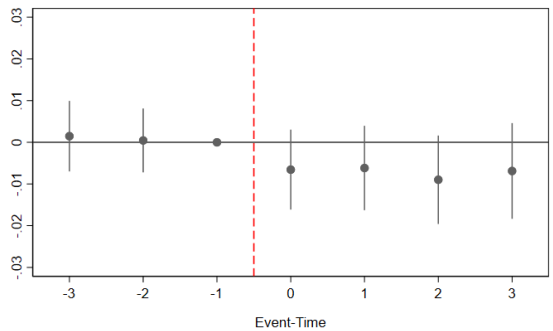
Student-Level Results: Event-Study Plots



Days Absent



Chronic Abs. (0/1)

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Student-Level Results

	Days Absent				Chronic. Abs. (0/1)			
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Panel A. Directly Treated Schools								
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p-value: High = Low				0.000				0.000
Panel B. Indirectly Treated Schools								
CFST District X Post	-0.219**	-0.205**	-0.203**		-0.003	-0.003	-0.003	
	(0.097)	(0.095)	(0.095)		(0.002)	(0.002)	(0.002)	
CFST District X Post X High Risk				-0.222**				-0.003
				(0.112)				(0.002)
CFST District X Post X Low Risk				-0.184**				-0.003
				(0.091)				(0.002)
Observations	542,263	542,263	542,263	542,263	542,263	542,263	542,263	542,263
Baseline Mean	6.479	6.479	6.479	6.479	0.047	0.047	0.047	0.047
p-value: High = Low				0.600				0.909
School FE	X	X	X	X	X	X	X	X
Student Covariates		X	X	X		X	X	X
Year FE	X	X			X	X		
Grade FE		X				X		
Grade X Year FE			X	X			X	X

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Empirical Strategy: Long-Run Effects

$$Y_{ics} = \beta_0 + \beta_1(CFST_s + Frac_c) + \lambda_1 X_{ics} + \lambda_2 Z_{cs} + \alpha_s + \phi_c + \varepsilon_{ics}$$

- $Y_i cs$: eighth grade outcome for student i enrolled in school s in fifth grade in cohort c
- $CFST_s$: school s received CFST
- $Frac_c$: share of years between fifth grade and expected eighth grade year that CFST was active
- $X_i cs$: characteristics of student i in fifth grade (in cohort c and fifth grade school s)
- $Z_c s$: cohort by school FE
- α_s: school FE
- ϕ_c: cohort FE
- $\varepsilon_i cs$: error term

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