

Online Appendix: The Academic Consequences of Teacher Strikes

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Table A-1: Illinois State Standardized Tests and Grades Tested by Academic Year

Academic Year	Standardized Test	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
1995-96	IGAP	X			X		X
1996-97	IGAP	X			X		X
1997-98	IGAP	X			X		X
1998-99	ISAT	X		X			X
1999-00	ISAT	X		X			X
2000-01	ISAT	X		X			X
2001-02	ISAT	X		X			X
2002-03	ISAT	X		X			X
2003-04	ISAT	X		X			X
2004-05	ISAT	X		X			X
2005-06	ISAT	X	X	X	X	X	X
2006-07	ISAT	X	X	X	X	X	X
2007-08	ISAT	X	X	X	X	X	X
2008-09	ISAT	X	X	X	X	X	X
2009-10	ISAT	X	X	X	X	X	X
2010-11	ISAT	X	X	X	X	X	X
2011-12	ISAT	X	X	X	X	X	X
2012-13	ISAT	X	X	X	X	X	X
2013-14	ISAT	X	X	X	X	X	X
2014-15	PARCC	X	X	X	X	X	X
2015-16	PARCC	X	X	X	X	X	X
2016-17	PARCC	X	X	X	X	X	X
2017-18	PARCC	X	X	X	X	X	X
2018-19	IAR	X	X	X	X	X	X

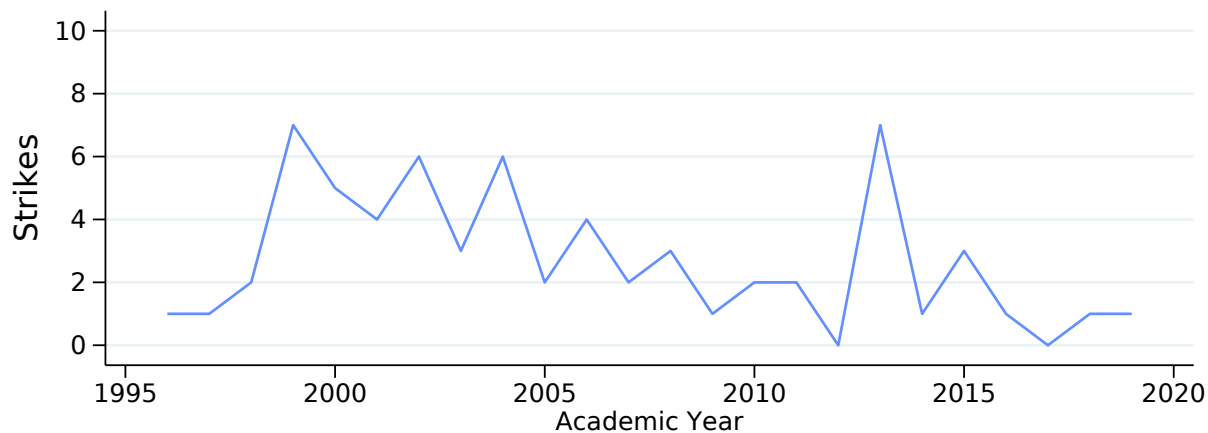
Note: Illinois State Board of Education test score data availability.

Table A-2: Average Characteristics of Striking and Non-Striking School Districts
(1995-96 through 2018-19)

	Striking (1)	Non-Striking (2)	Difference (3)	Diff P-Value (4)
District Information				
Number of Districts	65	638		
Avg Number of Schools	6.9	4.1	2.8	0.000
Enrollments				
Avg Student Enrollment	3,532	1,760	1,771	0.000
Share Male	0.51	0.51	0.00	0.001
Share Black	0.12	0.08	0.04	0.000
Share White	0.72	0.79	-0.07	0.000
Share LEP/ELL Student Enrollment	0.05	0.03	0.01	0.000
Share IEP Student Enrollment	0.16	0.16	0.00	0.960
Share FRPL Student Enrollment	0.40	0.36	0.04	0.000
Teachers & Staff				
Avg FTE Teachers	210	110	100	0.000
Student/Teacher Ratio	24	22	2	0.000
General Finance				
	0	0	0	0.000
Avg Total Revenue (1000s/Student)	8,993	9,346	-354	0.009
Avg Total Expenditures (1000s/Student)	8,842	9,261	-419	0.003
Avg Teacher Instructional Salary	48,909	46,680	2,229	0.000
Avg Teacher Instructional Benefits	22,043	20,442	1,602	0.000
Test Scores				
Scaled Grade 3 Math Scores	-0.19	0.02	-0.21	0.000
Scaled Grade 3 ELA Scores	0.04	0.27	-0.23	0.000
Scaled Grade 5 Math Scores	-0.17	-0.01	-0.16	0.000
Scaled Grade 5 ELA Scores	0.00	0.19	-0.19	0.000
Scaled Grade 8 Math Scores	-0.13	0.04	-0.17	0.000
Scaled Grade 8 ELA Scores	-0.04	0.18	-0.22	0.000
District Average Scaled Math Scores	-0.17	0.01	-0.18	0.000
District Average Scaled ELA Scores	0.01	0.21	-0.20	0.000

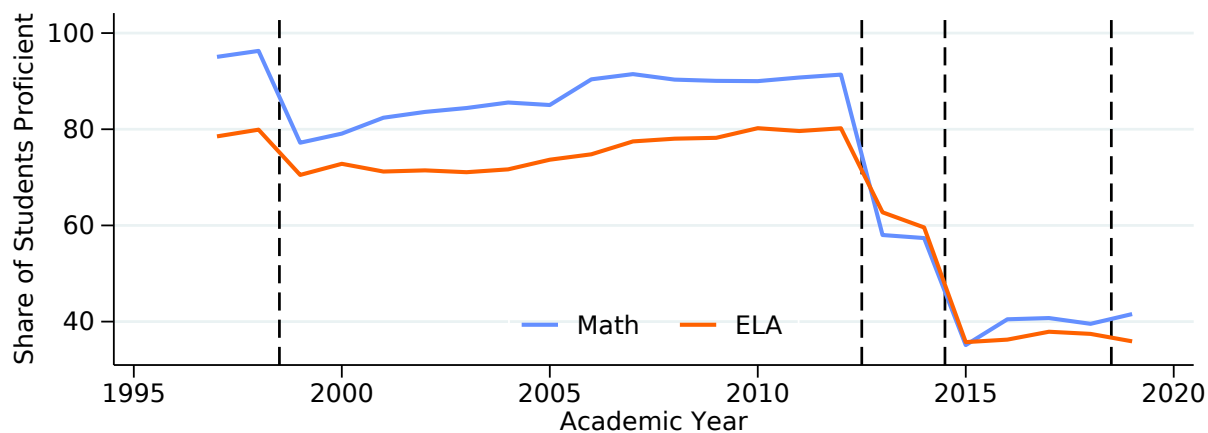
Note: Table reports mean characteristics of striking and non-striking school districts over the 1995–96 through 2018–19 period. Column (3) reports the difference in means and Column (4) reports the p-value from a two-sided t-test of equal means. Dollar amounts are inflation-adjusted to 2018 dollars using the CPI. Enrollment, teacher and staffing, and general finance data are from the NCES. Test scores are the [Biasi et al. \(2025\)](#) scaled scores. District Average test scores are the averages of Third, Fifth, and Eighth Grade scaled test scores.

Figure A-1: Teacher Strikes in Illinois (1995-96 through 2018-19)



Note: Figure plots the number of teacher strikes per academic year in Illinois from 1995–96 through 2018–19. Strike data compiled from the Illinois Educational Labor Relations Board, the Bureau of Labor Statistics Work Stoppages program, and the Federal Mediation and Conciliation Service.

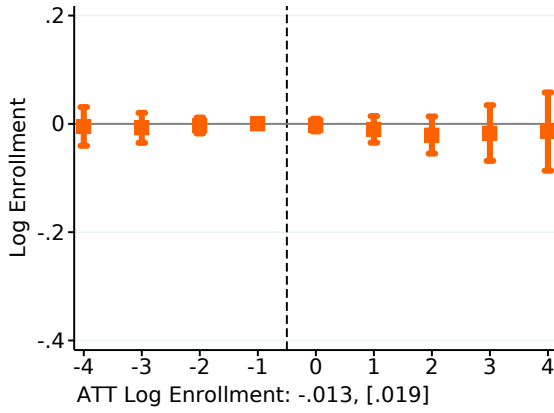
Figure A-2: Average Share of Grade 3 Students Testing as Proficient



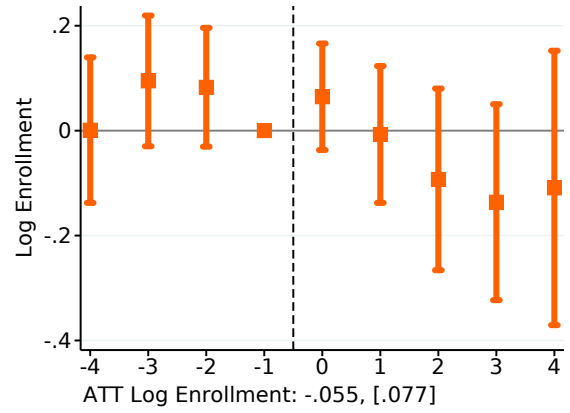
Note: Proficient defined as Meeting or Exceeding Expectations on the state Standardized Test. The Standardized Test used by Illinois changed from the IGAP to the ISAT in academic year 1999, from the the ISAT to the PARCC in academic year 2015, and from the PARCC to the IAR in academic year 2019. In academic year 2013, the ISBE raised the proficiency cut scores on the ISAT.

Figure A-3: Effect of a Strike on Enrollment by Student Subgroups

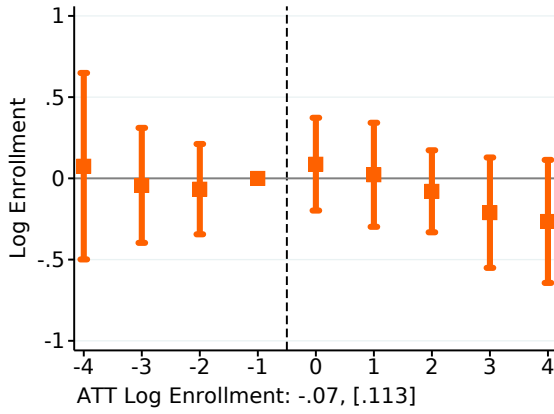
(a) Log White Enrollment



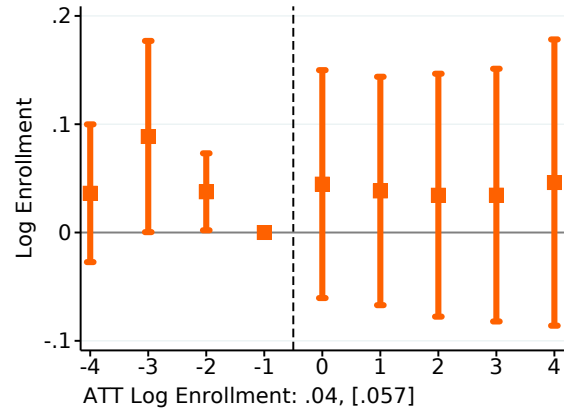
(b) Log Black Enrollment



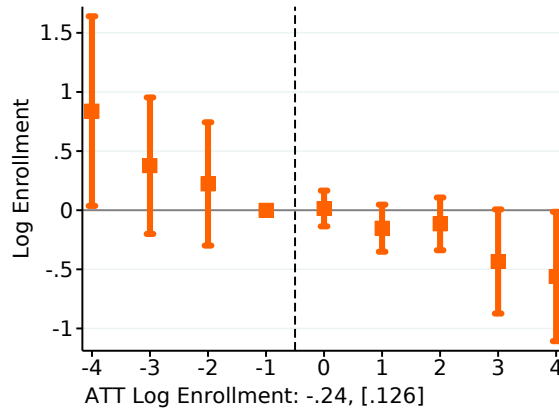
(c) Log ELL Enrollment



(d) Log IEP Enrollment

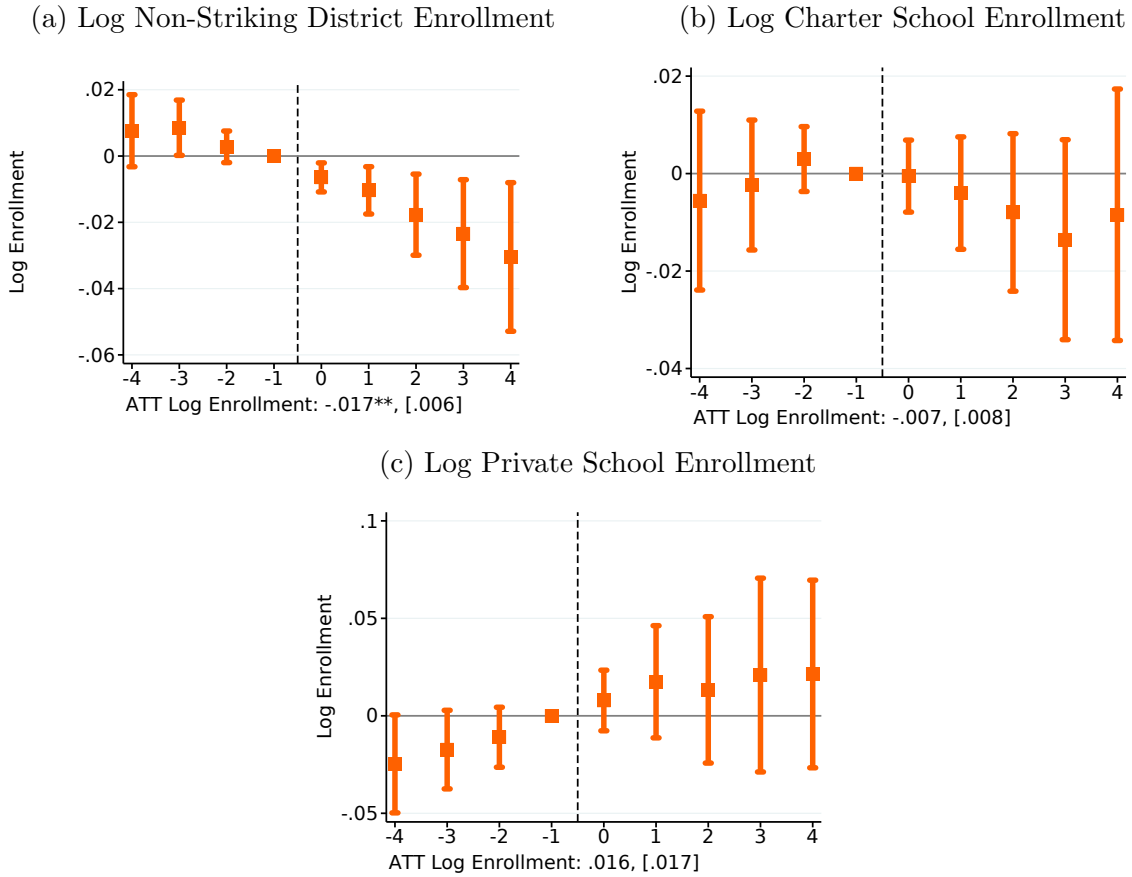


(e) Log FRPL Enrollment



Note: Each panel reports event-study estimates from Equation (1) using the Callaway and Sant'Anna (2021) doubly robust estimator with not-yet-treated districts as controls. Coefficients are normalized to the year prior to the strike ($e = -1$). The outcome is log enrollment for the indicated student subgroup. The ATT and its standard error are reported below each panel. Vertical bars indicate 95% confidence intervals.

Figure A-4: Effect of a Strike on Neighboring Enrollment



Note: Each panel reports event-study estimates from Equation (1) using the Callaway and Sant’Anna (2021) doubly robust estimator with not-yet-treated districts as controls. Panel (a) uses as the outcome the log of summed K–8 enrollment across all non-striking school districts that share at least one county with the striking district, based on 2020 Census School District Reference Maps. Panel (b) uses the log of the summed enrollment across charter schools in the same counties as the striking district. Panel (c) uses the log of summed K–8 enrollment across all private schools in the same counties as the striking district. Private School data are from the Private School Universe Survey; enrollment for odd years is linearly interpolated. The ATT and its standard error are reported below each panel. Vertical bars indicate 95% confidence intervals.

Table A-3: Effect of Strike By Race

	ISBE Proficiency Levels				SEDA Scaled Scores			
	All	White	Black	Diff.	All	White	Black	Diff.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: District-Level Analysis								
Math Achievement	-1.56 (1.01)	-0.64 (1.02)	1.95 (1.81)	2.59 (1.91)	-0.02 (.03)	-0.02 (.04)	-0.01 (.04)	0.01 (.06)
ELA Achievement	-0.98 (.80)	-0.77 (.75)	0.75 (1.81)	1.51 (2.01)	0.00 (.04)	0.00 (.04)	0.00 (.05)	0.00 (.06)
Panel B: Cohort-Level Analysis								
Math Proficiency								
Strike in 4th Grade	-3.72** (1.36)	-2.95* (1.27)	-5.01* (2.01)	-2.06 (2.05)	-0.11* (.05)	-0.10 (.07)	-0.09 (.09)	0.01 (.20)
Strike in 5th Grade	-5.8** (1.89)	-5.1** (1.72)	-6.05 (4.74)	-0.96 (4.63)	-0.09 (.05)	-0.07 (.06)	-0.11 (.06)	-0.03 (.16)
Strike in 6th Grade	-2.99* (1.35)	-2.91 (1.68)	-7.2* (2.83)	-4.29* (2.04)	0.00 (.05)	-0.01 (.06)	-0.09 (.07)	-0.08 (.11)
Strike in 7th Grade	-5.65* (2.22)	-4.88* (2.00)	-8.22 (5.57)	-3.34 (4.61)	-0.02 (.04)	-0.01 (.04)	0.06 (.09)	0.08 (.10)
ELA Proficiency								
Strike in 4th Grade	-3.31** (1.22)	-2.10 (1.19)	-10.15*** (2.40)	-8.06*** (2.18)	-0.02 (.06)	0.02 (.06)	-0.14 (.10)	-0.16 (.12)
Strike in 5th Grade	-1.09 (1.66)	-2.91 (2.19)	-8.85** (2.97)	-5.93 (3.53)	0.01 (.04)	0.02 (.05)	-0.09 (.08)	-0.11 (.19)
Strike in 6th Grade	-1.05 (1.57)	-1.20 (1.59)	-7.86** (2.80)	-6.67** (2.54)	0.08 (.07)	0.06 (.07)	-0.03 (.08)	-0.09 (.13)
Strike in 7th Grade	-4.33* (1.71)	-3.52* (1.72)	-3.78 (2.97)	-0.26 (2.36)	0.02 (.05)	0.02 (.05)	0.18 (.14)	0.16 (.13)

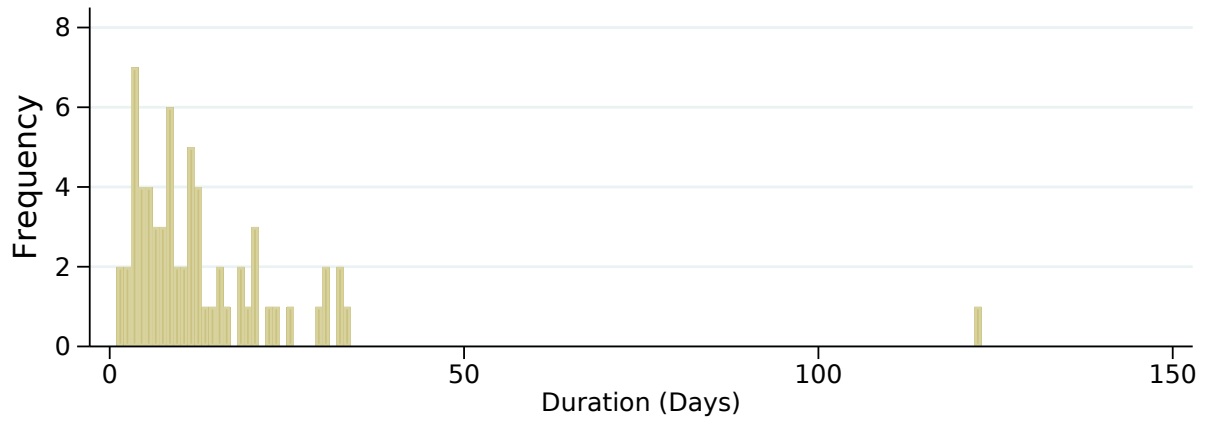
Note: Panel A reports the average treatment effect on the treated (ATT) from a separate estimation of Equation (1) using the Callaway and Sant'Anna (2021) estimator with not-yet-treated districts as controls. Panel B uses the cohort-level specification from Equation (2). Columns (1)–(3) report ATTs using ISBE proficiency levels from 2000–2012. Columns (5)–(7) report ATTs using SEDA scaled test scores from 2009–2019. The Difference columns (4) and (8) report the difference in ATTs between Black and White students. Standard errors of the differences are calculated by running the White and Black regressions on 1000 repetitions of a bootstrapped sample, taking the difference, and estimating the standard error of these 1000 differences. Standard errors are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A-4: Effect of Strike By Income

	All	Non-Low Income	Low Income	Difference
	(1)	(2)	(3)	(4)
Panel A: District-Level Analysis				
Math Achievement	-1.56 (1.01)	-1.21 (.97)	-1.16 (2.16)	0.05 (2.07)
ELA Achievement	-0.98 (.80)	-1.33 (.92)	0.65 (1.69)	1.98 (1.22)
Panel B: Cohort-Level Analysis				
Math Proficiency				
Strike in 4th Grade	-3.72** (1.36)	-3.32*** (.98)	-4.37 (2.34)	-1.05 (1.71)
Strike in 5th Grade	-5.8** (1.89)	-3.99* (2.02)	-6.44* (2.94)	-2.45 (2.59)
Strike in 6th Grade	-2.99* (1.35)	-2.67 (1.88)	-4.75* (2.28)	-2.08 (1.61)
Strike in 7th Grade	-5.65* (2.22)	-3.36 (1.86)	-5.93 (3.42)	-2.58 (1.90)
ELA Proficiency				
Strike in 4th Grade	-3.31** (1.22)	-3.65** (1.17)	-4.58* (2.26)	-0.93 (1.88)
Strike in 5th Grade	-1.09 (1.66)	-0.13 (1.79)	-2.82 (2.84)	-2.69 (2.63)
Strike in 6th Grade	-1.05 (1.57)	-1.81 (1.81)	-2.70 (2.79)	-0.88 (2.01)
Strike in 7th Grade	-4.33* (1.71)	-2.21 (1.33)	-5.96 (3.06)	-3.75 (2.33)

Note: Panel A reports the average treatment effect on the treated (ATT) from a separate estimation of Equation (1) using the Callaway and Sant’Anna (2021) estimator with not-yet-treated districts as controls. Panel B uses the cohort-level specification from Equation (2). All Columns report ATTs using ISBE proficiency levels from 2000–2012. The Difference column (4) reports difference in ATTs between Low Income and Non-Low Income students. Standard errors of the differences are calculated by running the Non-Low Income and Low Income regressions on 1000 repetitions of a bootstrapped sample, taking the difference, and estimating the standard error of these 1000 differences. Standard errors are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Figure A-5: Counts of Strikes by Duration



Note: Figure plots the distribution of teacher strikes by duration in days for the 65 strikes in my sample that occur in Illinois between 1995–96 and 2018–19. The mean duration is 13.2 days and the median is 9 days. Strike data compiled from the Illinois Educational Labor Relations Board, the Bureau of Labor Statistics Work Stoppages program, and the Federal Mediation and Conciliation Service.

Table A-5: Effect of Strike Length on Achievement and Enrollment

	All	Mean Split		Median Split	
		Short	Long	Short	Long
	(1)	(2)	(3)	(4)	(5)
Panel A: Achievement					
Scaled Math Scores	-0.1*	-0.12*	-0.2*	-0.13*	-0.08
	(.05)	(.05)	(.08)	(.06)	(.06)
Scaled ELA Scores	-0.05	-0.06	-0.13	-0.12*	-0.04
	(.05)	(.06)	(.08)	(.06)	(.07)
Panel B: Enrollment					
Log K-8 Enrollment	-0.03*	-0.03	-0.02	-0.02	-0.03*
	(.01)	(.01)	(.02)	(.02)	(.01)
Log K-4 Enrollment	-0.04**	-0.03	-0.04	-0.02	-0.04*
	(.01)	(.02)	(.02)	(.02)	(.02)
Log 5-8 Enrollment	-0.02	-0.03	0.00	-0.02	-0.02
	(.02)	(.02)	(.03)	(.03)	(.02)
Number of School Districts	65	45	20	31	34
Strike Length in Days	1– 123	1– 12	13–123	1– 8	9–123

Note: Each column reports the average treatment effect on the treated (ATT) from a separate estimation of Equation (1) using the Callaway and Sant’Anna (2021) estimator with not-yet-treated districts as controls. Column (1) includes all striking districts. Columns (2)–(3) split the sample at the mean strike duration (13 days). Columns (4)–(5) split at the median (9 days). Columns (6)–(8) divide strikes into terciles. Standard errors are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

References

Biasi, Barbara, Julien Lafortune, and David Schönholzer, “What Works and for Whom? Effectiveness and Efficiency of School Capital Investments Across the U.S.*,” *The Quarterly Journal of Economics*, 02 2025, *140* (3), 2329–2379.