

Rent-Seeking through Collective Bargaining: Teachers Unions and Education Production

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Paper Summary

Topic: How teachers unions impacts revenue allocation and student achievement

Data: Ohio tax referenda, digitized contracts, district-level achievement

Design: Diff-in-RD. Impact of narrowly passing levy with and without union pressure

Results: Districts allocating new revenue

- Under union pressure
 - ↑ salaries and benefits; ↓ reserves, and no teacher hiring
 - No student achievement gains
- Less union pressure
 - Change work conditions in contract, ↑ teacher hiring
 - ↑ student achievement

Motivation

- Concerns that powerful teachers unions may benefit teachers, but not necessarily students (*e.g., Moe, 2011*)
- **Recent example:** Union strength predicts remote instruction during the COVID-19 pandemic (*Hartney & Finger, 2020*)
- Theoretically ambiguous whether unions reduce school district efficiency (*e.g., Freeman and Medoff, 1984; Hoxby, 1996; Restinas, 1982*)

Motivation

- Majority of teachers covered by collective bargaining agreements (CBA)
- Teachers unions have been the target of recent reform efforts:
 - Multiple states (ID, IN, OH, TN, WI) passed legislation in 2011 to roll back the scope of collective bargaining
 - ***Janus v. AFSCME*** in 2018 effectively nationalized right-to-work rules for public sector-employees
 - ***Vergara v. California*** in 2014 argued that tenure and teacher-retention policies violated California students' constitutional right to a quality education

Prior Research

- Strong unions ↑ district spending and student achievement (*Brunner, Hyman, & Ju, 2019*)
- Duty-to-bargain laws shifted spending toward teachers and admin; ↓ in long-run educational attainment and labor market outcomes (*Lovenheim & Willén, 2019*)
- Restrictive collective bargaining agreements associated with ↓ student achievement (*e.g., Lott & Kenny, 2013; Moe, 2009; Strunk, 2011; Marianno & Strunk, 2019*)
- Hoxby (1996) models bargaining between teachers and parents. Outcome lies between what is best for teachers and students. We test this rent-seeking theory.

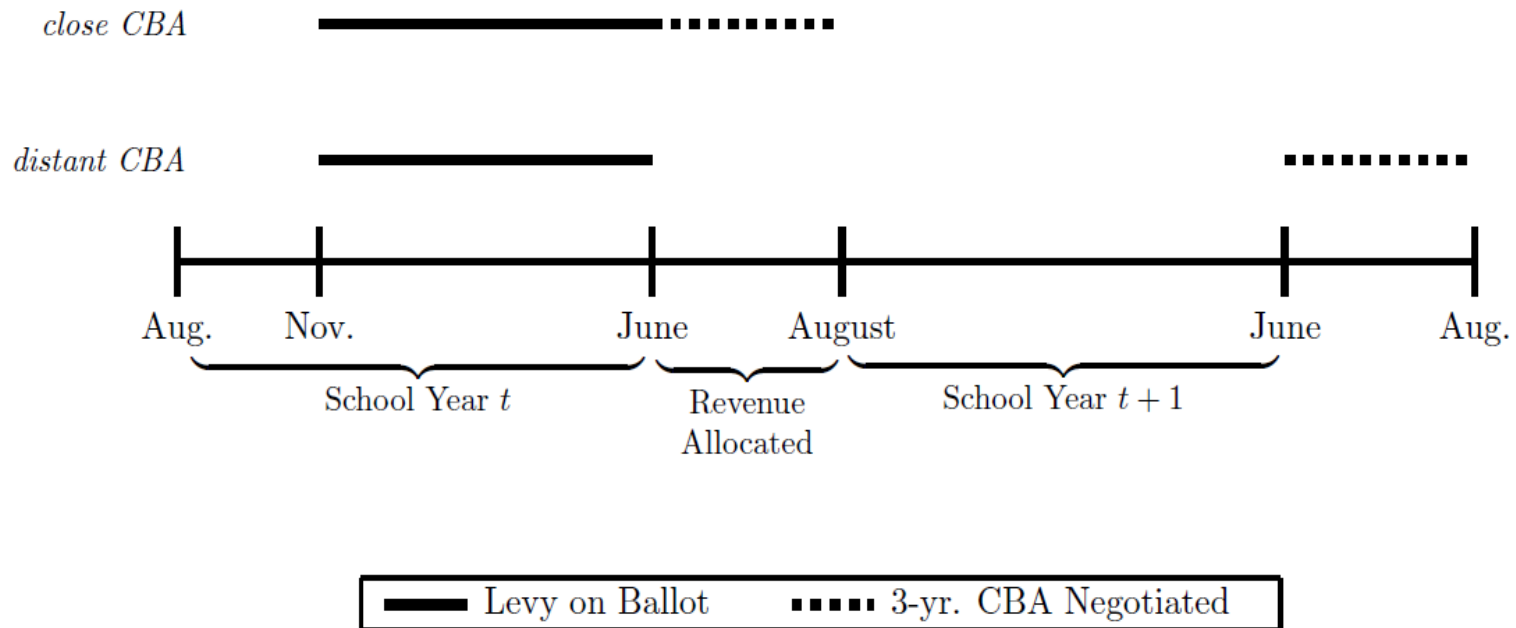
EMPIRICAL FRAMEWORK

Empirical Framework

- Difference-in-RD design
- RD → impact of narrowly passing a tax on collective-bargaining agreements (CBAs), budgeting, and student achievement
- Compare impacts between districts likely facing more/less union pressure
 - Tax revenue generated amidst collective bargaining (*i.e.*, “Close CBA”)
 - Tax revenue generated well before next scheduled round of negotiations (*i.e.*, “Distant CBA”)
- Timing of referenda relative to bargaining is plausibly random (and empirically so)
 - Districts failing to pass levy will keep trying until successful
 - Levies: 5-year, CBAs: 3-year, cannot consistently align

Empirical Framework

Variation in relative bargaining power by comparing districts securing tax funds with “*close*” or “*distant*” upcoming negotiation



Empirical Framework

- i – tax election
 - t – school year
 - t^* – election year
 - X – student demographics
year before election
- $$Y_{i(t-t^*)} = \tau_1 * Distant_i * Pass_i + \tau_2 * Pass_i + \tau_3 * Distant_i$$
- $$+ f(Vote_i) + Pass_i * f(Vote_i)$$
- $$+ Distant_i * f(Vote_i) + Distant_i * Pass_i * f(Vote_i)$$
- $$+ \beta_1 Y_{i(t^*-1)} + \beta_2 Y_{i(t^*-5)} + \mathbf{X}'_i \gamma + \lambda_t + \epsilon_{it}$$

***For contract provisions, outcome is the change in CBA content
between current and new CBA*

Design Validity

RD assumptions

- Continuity of potential outcomes through threshold
- No imbalances in pre-treatment covariates
- No manipulation at the passage threshold

Exogenous timing of CBA negotiations

- No observable differences in districts with “close” and “distant” CBA dates
- No relationship between levy passage and the timing of CBAs

Union influence on revenue allocation

- Districts largely commit to new revenues in the summer after the election
- Bargaining \uparrow impact on resource allocation for “close” than “distant” CBAs

DATA & INSTITUTIONAL DETAILS

Data & Institutional Details

Will discuss data and background for each in turn:

- Contracts
- Tax referenda
- Schools

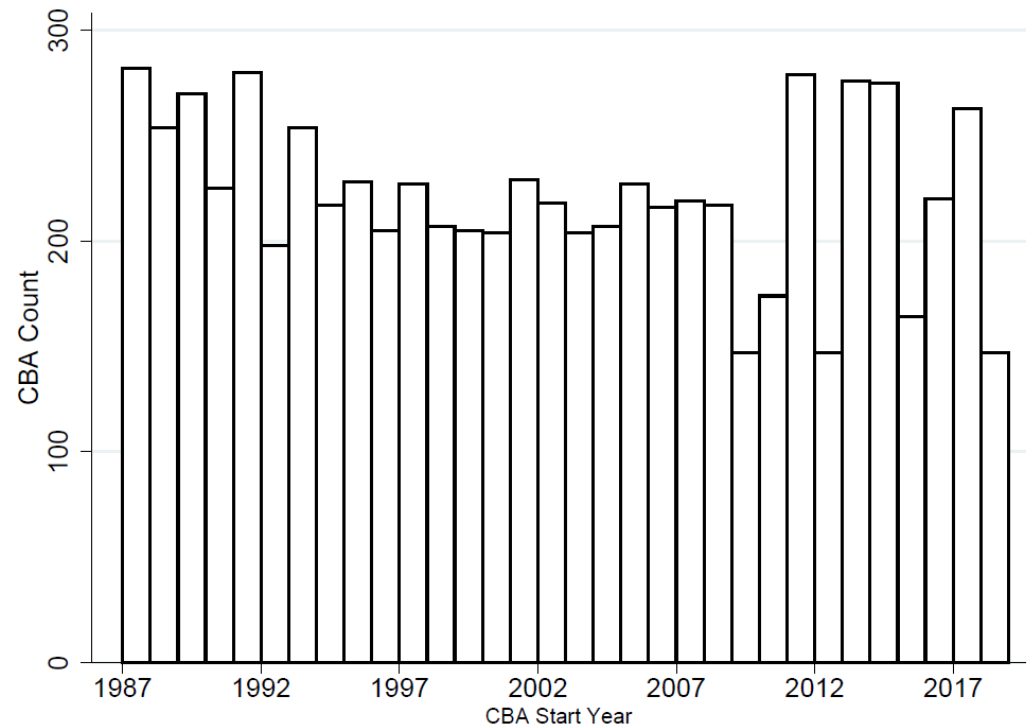
Collective Bargaining in Ohio

- Ohio has duty-to-bargain laws requiring districts to negotiate with unions
- Agreements handle most aspects of teaching (salary schedules, benefits, work conditions, evaluation, job protections, etc.)

Collective Bargaining in Ohio

- Most districts negotiate CBAs every 3 years
- Negotiations generally staggered (~1/3 of districts negotiate each year)

Figure B1. New collective-bargaining agreements by year



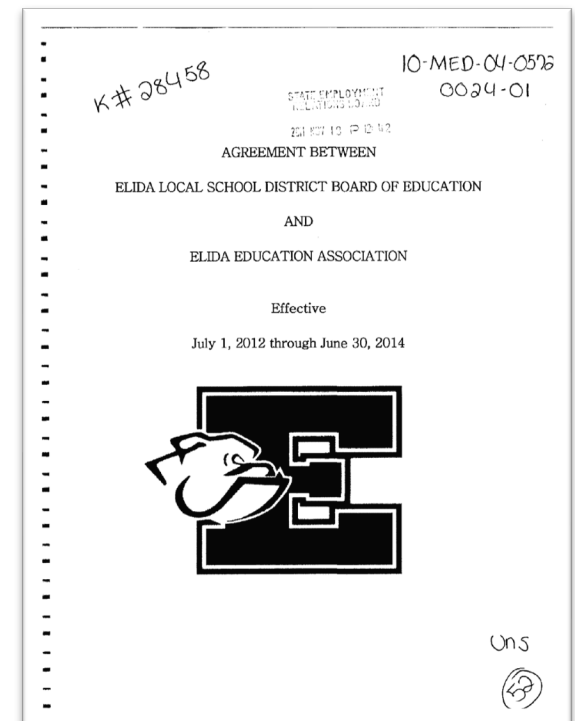
Data – Contracts

Ohio State Employment Relations Board

- Contract dates, some salary and benefits information

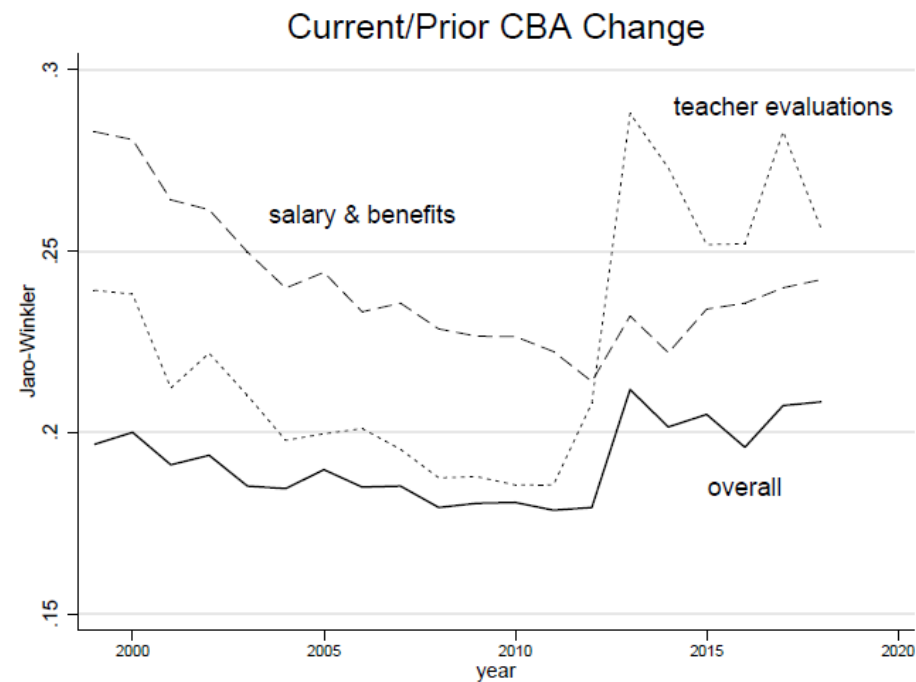
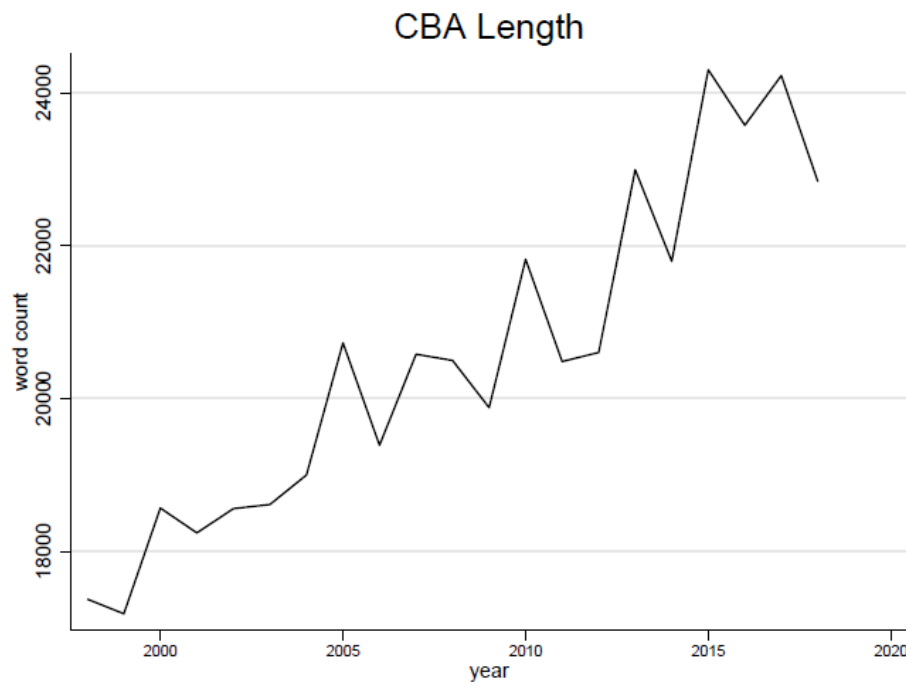
PDF scans of full contracts (1999-2019)

- Extracted text from PDFs
- Calculated Jaro-Winkler dissimilarity scores for particular sections
 - ~ proportion of characters that are not common to both current and prior CBA.
0=same document, 1=nothing in common



Data – Contracts

Figure A1. Changes in the Text of Collective-Bargaining Agreements, 1999-2019



Data – CBA Content

WETA SALARY SCHEDULE 2010-2011									
<u>Step</u>	<u>B.A.</u>	<u>BA+15</u>	<u>BA+30</u>	<u>M.A.</u>	<u>MA+15</u>	<u>MA+30</u>	<u>MA+45</u>	<u>MA+60</u>	<u>Ph.D.</u>
Index	1.0000	1.0415	1.0466	1.0624	1.0778	1.1007	1.1313	1.1695	1.2154
0	37,746	39,312	39,505	40,101	40,683	41,547	42,702	44,144	45,876
1	1.0723	1.0987	1.1038	1.1296	1.1449	1.1679	1.1984	1.2367	1.2826
	40,475	41,472	41,664	42,638	43,215	44,084	45,235	46,680	48,413
2	1.1266	1.1560	1.1610	1.1968	1.2120	1.2349	1.2656	1.3037	1.3496
	42,525	43,634	43,823	45,174	45,748	46,613	47,771	49,209	50,942

	CBA/District Count	Mean	Standard Deviation	Min.	Max.
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Teacher Salary Schedule (2012\$)

Entry-level, with bachelor's	548	36,347	3,802	24,897	50,204
Top-level, with master's	548	67,936	9,887	26,489	101,695

Data – CBA Content

- All CBAs provide health insurance coverage, but 50% provide prescription and optical coverage

	CBA/District Count	Mean
Teacher Benefits (yes/no)		
Prescriptions	548	0.53
Dental	548	0.85
Optical	548	0.48
Attendance bonus	548	0.41
Tuition reimbursement	496	0.77
Retirement incentives	496	0.44
Parking	496	0.31
Teacher Benefits (days of leave)		
Personal days	491	3.03
Sick days	495	15.02
Bereavement days	471	3.86
Max. accumulation of days	397	254.14
Work Conditions		
Time for meals	327	30.349

Ohio School District Tax Referenda

- 40% of revenue from local sources – property taxes
- To raise taxes above state limit, districts need voter approval
- Referenda typically held during November elections
- Districts may request issue bonds for capital expenses
- Districts may request tax levy for district operations
- 80% of referenda were tax (non-bond) referenda (~ 250 per year)

Data – Ohio School District Tax Referenda

Table 2: Descriptive statistics for Ohio tax and bond referenda tied to CBAs (2003-2019 elections)

	Ref. Count	Percent Passed	Mean Pct Yes Vote	Mean Vote Count	Percent 3-yr CBAs	Mean days to CBA
Full Sample	1,484	62.33	53.22	5,621	90.70	368
<i>Close CBA</i>	736	64.13	53.42	5,702	93.07	182
<i>Distant CBA</i>	748	60.56	53.03	5,541	88.37	551
Restricted Sample	1,234	59.64	51.87	5,967	90.11	374
<i>Close CBA</i>	611	62.52	52.42	6,167	92.47	187
<i>Distant CBA</i>	623	56.82	51.33	5,771	87.80	557

Notes: The table provides descriptive statistics for referenda used in the estimation of the impact of tax levy passage on collective-bargaining, budget allocations, staffing, and student achievement. The “full sample” includes all tax and bond referenda. The “restricted” sample includes all tax and bond referenda for which the vote in favor of passage was within 15 percentage points. The “close CBA” subsample includes referenda held in the year leading up to the next collective bargaining agreement, whereas the “distant CBA” includes referenda held more than one year prior to the next collective bargaining agreement.

Ohio School Data

- Finance, staffing, and student data from NCES CCD
- District-level student achievement from Ohio Department of Ed.
- Student outcomes measured by standardized performance index and district “value-added” estimates
- Restricted-use data tracking teachers over time
- Restricted-use 5-year budget forecasts

Ohio School Data

“Close” and “Distant” CBAs are observably similar

	Unique District Count	Oper. Expnd. (2012\$)	Cap. Outlay (2012\$)	Stdnt Count	Pct. FRL Stdnts	Pct. Hisp. Stdnts	Pct. Black Stdnts	Teach. FTE	Achiev. (Dist. SDs)
Restricted Sample	387	9,533	1,230	2,796	30.40	2.09	5.28	167	0.08
<i>Close CBA</i>	293	9,571	1,226	2,859	30.60	2.17	5.10	171	0.11
<i>Distant CBA</i>	301	9,497	1,235	2,735	30.22	2.01	5.46	163	0.06

RESULTS

Results Overview

- Contracts
- Revenue & Allocation
- Staffing
- Student Achievement

CBA Text Changes

- **More Union Pressure:** ↑ CBA text changes in districts passing levy
 - Can interpret as 1.3% more text changed
- **Less Union Pressure:** Districts passing levy change work conditions text

	Distant*Pass	Pass
Wording Changes (Jaro-Winkler)		
All Text	-0.018* (0.0092)	0.013* (0.0071)
Benefits	0.0089 (0.015)	-0.0032 (0.011)
Work Conditions	0.044** (0.021)	-0.0077 (0.015)
Work Protections	0.020 (0.022)	0.0087 (0.014)
Baseline Covariates	Yes	
Year Fixed Effects	Yes	
Bandwidth (percentage points)	10	

CBA Provisions – Benefits

- **More Union Pressure:** Teachers acquire new benefits
 - Benefits Gain (# count) = dental, prescription drugs, attendance bonuses, tuition, retirement incentives, and parking
- Also, longer meal times

	Distant*Pass	Pass
Benefits (1997-2010)		
Benefits Gain (count)	-0.25* (0.15)	0.19* (0.11)
Sick/Personal Leave (days)	0.065 (0.13)	-0.072 (0.10)
Max Leave Accrual (days)	-1.17 (5.83)	-0.30 (4.51)
Meal time (minutes)	-4.23 (2.78)	4.84** (2.26)
Baseline Covariates	Yes	
Year Fixed Effects	Yes	
Bandwidth (percentage points)	10	

CBA Provisions – Salaries

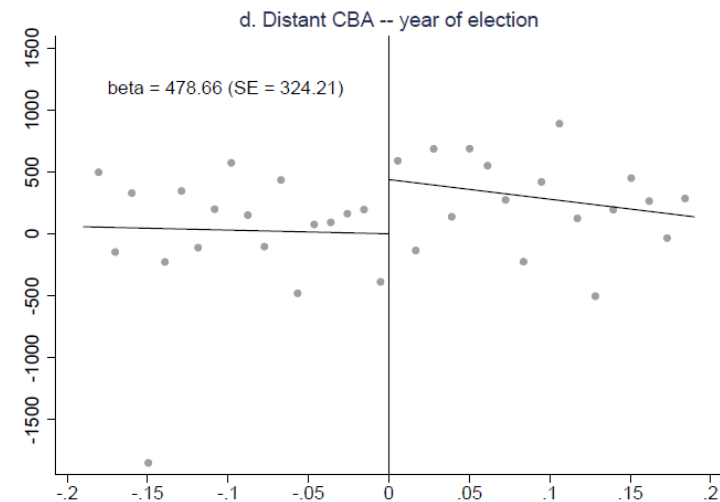
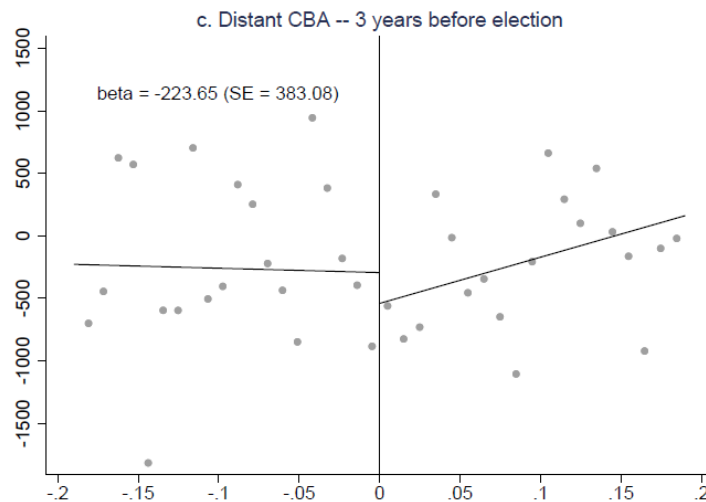
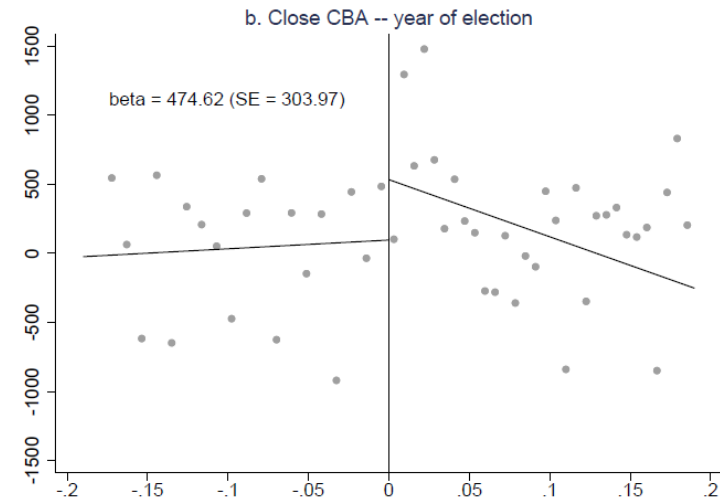
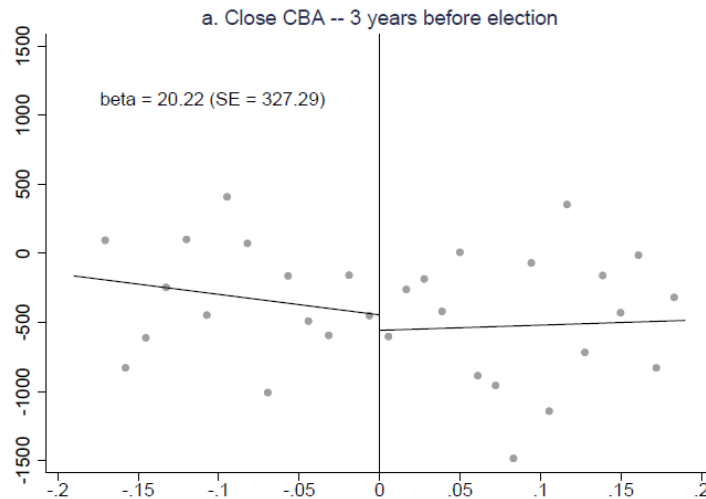
- Very imprecise estimates, only significant with wider bandwidth
- **More Union Pressure:** Districts passing levy negotiate ↑ \$1,000 top-level wages
- **Less Union Pressure:** No change

	Distant*Pass	Pass	Distant*Pass	Pass
Entry pay - BA (1995-2019)	152 (282)	-29.4 (214)	-138 (191)	236* (137)
Top pay - MA (1995-2019)	-883 (728)	765 (708)	-1,083** (543)	1,070* (556)
Baseline Covariates	Yes		Yes	
Year Fixed Effects	Yes		Yes	
Bandwidth (percentage points)	10		20	

CBA Provisions – Take-Aways

- Despite imprecise estimates, coherent story told
- **More Union Pressure:** changed more contract language, agreed to ↑ teacher compensation (salary and benefits)
- **Less Union Pressure:** may have provided concessions related to work conditions

Results – Per-pupil Revenues



Results – Revenue/Expenditure

- By 3 years after levy, districts spent \$200 more per pupil
- No detectable difference in expenditure by union influence
- **Less Union Pressure:** Districts spend less on instruction (including salaries) and more on support services (**n.s.**)

	Distant*Pass	Pass	Distant*Pass	Pass
Revenue Per Pupil	52.2 (525)	355 (329)	312 (397)	289 (258)
Current Expenditures Per Pupil	-82.1 (131)	204** (100)	-43.9 (112)	231*** (83.7)
Instructional	-113 (83.6)	124* (65.7)	-52.0 (70.4)	139** (54.6)
Support Services	47.4 (72.6)	59.6 (56.0)	15.8 (61.7)	81.4* (43.5)
Lags	Yes		Yes	
Baseline Covariates	Yes		Yes	
Year Fixed Effects	Yes		Yes	
Bandwidth (percentage points)	10		20	

Results – Salary/Benefit Expenditures

- Drilling down into instructor salary/benefits
- **Less Union Pressure:** Districts spend ~\$50 less per pupil (0.46%) on benefits

	Distant*Pass	Pass	Distant*Pass	Pass
Inst. Salary/Ben. Expend. P.P	-91.9 (69.6)	94.7* (54.1)	-53.0 (57.9)	105** (43.9)
Inst. Salary Expend.	-28.2 (51.7)	58.9 (41.0)	-0.17 (42.5)	67.3** (32.3)
Salary/Total Expend.	0.00026 (0.0039)	-0.0016 (0.0032)	0.00069 (0.0032)	-0.0014 (0.0023)
Inst. Ben. Expend.	-54.7* (29.6)	25.6 (20.5)	-50.5** (24.9)	35.5** (16.8)
Benefits/Total Exp.	-0.0046* (0.0025)	0.00099 (0.0019)	-0.0047** (0.0020)	0.0011 (0.0014)
Lags	Yes		Yes	
Baseline Covariates	Yes		Yes	
Year Fixed Effects	Yes		Yes	
Bandwidth (percentage points)	10		20	

Results – Reserves

- **More Union Pressure:** ↓ 6.8 ppt in reserves as fraction of expenditures
- Consistent with notion that districts facing pressure spend a larger share of new revenues

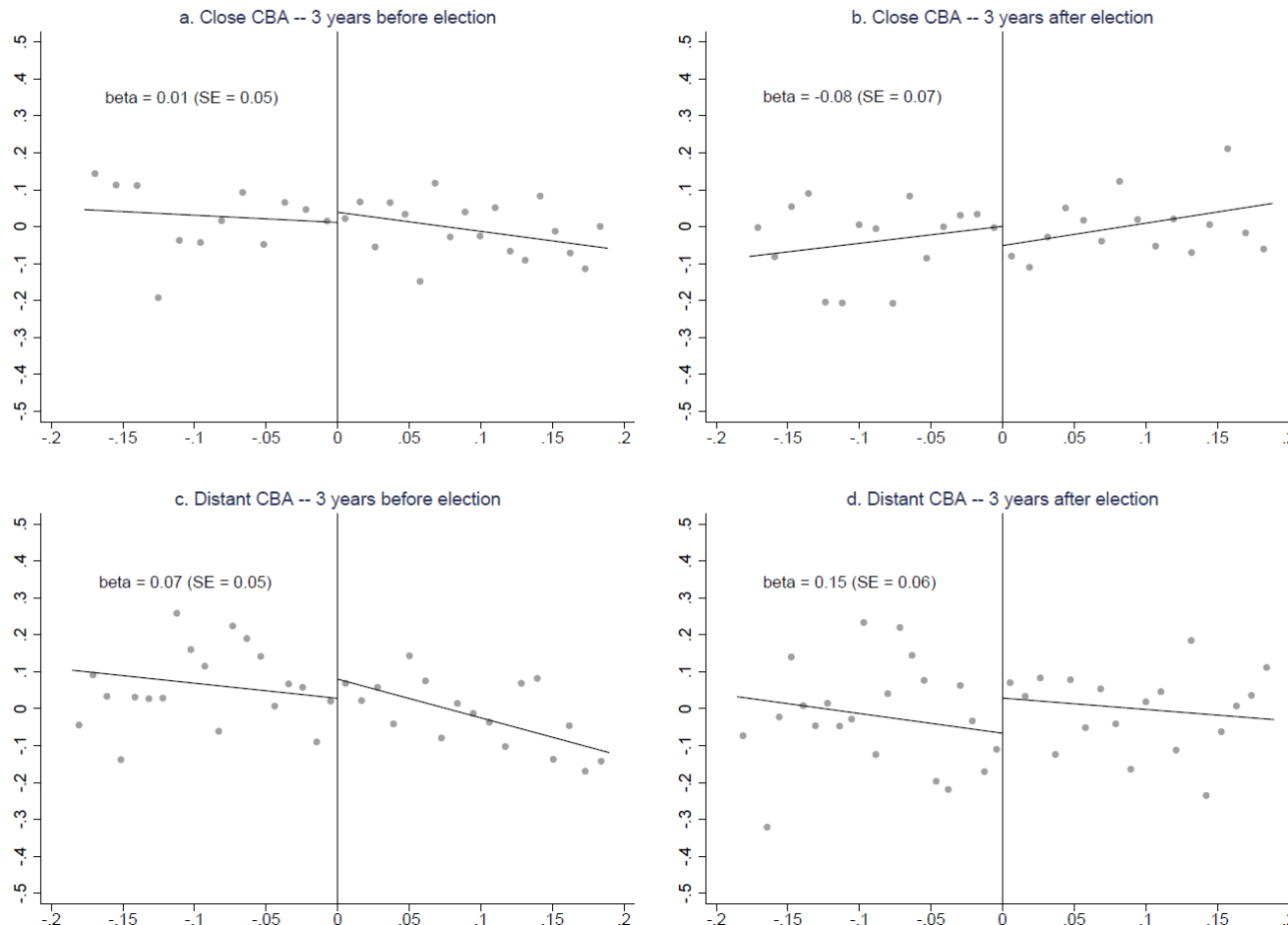
	Distant*Pass	Pass	Distant*Pass	Pass
Reserves/Expenditures (Year 3)	0.060 (0.041)	-0.048 (0.030)	0.068** (0.031)	-0.041* (0.023)
Lags	Yes		Yes	
Baseline Covariates	Yes		Yes	
Year Fixed Effects	Yes		Yes	
Bandwidth (percentage points)	10		20	

Results – Staffing

- **Less Union Pressure:** Districts had ~12 more teachers
- Decreases student/teacher ratio

	Distant*Pass	Pass	Distant*Pass	Pass
Teacher count	11.6** (4.80)	-4.87 (4.29)	11.8*** (4.49)	-7.95* (4.17)
Student/teacher ratio	-0.58 (0.42)	0.30 (0.34)	-0.70** (0.35)	0.15 (0.28)
Lags	Yes		Yes	
Baseline Covariates	Yes		Yes	
Year Fixed Effects	Yes		Yes	
Bandwidth (percentage points)	10		20	

Results – Student Achievement



Results – Student Achievement

Less Union Pressure: By 3rd post-election year, student achievement \uparrow $0.15-0.2\sigma$

- Experience 0.02σ student achievement “gains”
- On higher-end of estimated returns to spending (*e.g., Abott et al., 2020; Jackson et al., 2018*)

	Distant*Pass	Pass	Distant*Pass	Pass
Achievement Level (Dist.-level SDs)				
Year 3	0.21** (0.099)	-0.053 (0.075)	0.14* (0.071)	-0.049 (0.051)
Years 1-3	0.15* (0.083)	-0.030 (0.061)	0.085 (0.059)	-0.032 (0.041)
Annual Gains (Student-level SDs)				
Years 1-3	0.021* (0.012)	-0.0073 (0.0083)	0.0034 (0.0099)	0.0053 (0.0072)
Lags	Yes		Yes	
Baseline Covariates	Yes		Yes	
Year Fixed Effects	Yes		Yes	
Bandwidth (percentage points)	10		20	

Results

Close CBAs (more union influence):

- ↑ top-level teacher pay by \$1000
- ↑ in some benefit (dental coverage, prescription drug coverage, attendance bonuses, tuition coverage, retirement incentives, parking)
- Spend down reserves
- No staffing or achievement effects

Distant CBAs (less union influence):

- No salary increase
- No benefits gain
- More changes to work conditions
- Increase in teacher counts
- \$1000 per pupil → 0.06 student-level SDs after three years

Caveats & Conclusions

- Imprecise estimates
- But all results point in the same direction:
 - Efficiency losses from collective bargaining

Thank you!