

Am I My Brother's Firefighter? Social Capital, Crowd-Out, and the Public Versus Private Provision of Public Goods

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PRELIMINARY; PLEASE CONTACT AUTHORS FOR
PAPER

What is the Causal Effect of Local Public Finance on Volunteer-Provided Public Goods?

- Is volunteer behavior (inputs) affected by local govt. funding?
- Is the quality of public goods provision (outcomes) affected?
- U.S. Municipal Fire Departments
- Dynamic Regression Discontinuity Design using two novel datasets:
 - Ohio Ballot Measures
 - Fire Dept. and Incident Data from National Fire Incident Reporting System (NFIRS)

Why Firefighters?

- Public good subject to mixed private-public provision. Relies on privately provided volunteer labor.
- Literature on pro-social/altruistic behavior has focused on charitable (cash) donations (Kingma 1989; Andreoni and Payne 2001; Karlan and List 2006)
- However, volunteer labor is significant at the national level - up to 1 in 2 Americans volunteer labor annually. (Freeman 1997).
- Firefighting services ideal subject to extend the literature
 - Observe inputs (novel source of micro volunteer data)
 - Observe outputs (unlike most public goods)
- Shouldn't we care about outputs at least as much as inputs?

Existing literature (on Firefighters)

- Doyle (1994); volunteer use more likely under tax limitations; tax limitations negatively affect quality
- Theseira (2009); social determinants of volunteer firefighters
 - Greater heterogeneity -> affects volunteering negatively

Dynamic RD Design Methodology

- Compare municipalities where funding ballot measures narrowly win or lose
 - similar on observables/unobservables;
treatment is discontinuous at ballot passage threshold
- Problem: Losing ballots get re-proposed in next ballot cycle; naïve RD biased downwards
- We use a dynamic RD following Cellini, Ferreira and Rothstein (2009)
 - CFR study effect of school capital bond passage

Ohio Municipal Ballot Measures

- Ohio restricts unvoted Property Taxes to 1% of Assessed Value
- Municipal spending ballots may be held quarterly
- Rich data source used to examine a number of issues in local public finance (Isen dissertation research)

Sample Ohio Fire Ballot Measure

Shawnee, Township of:

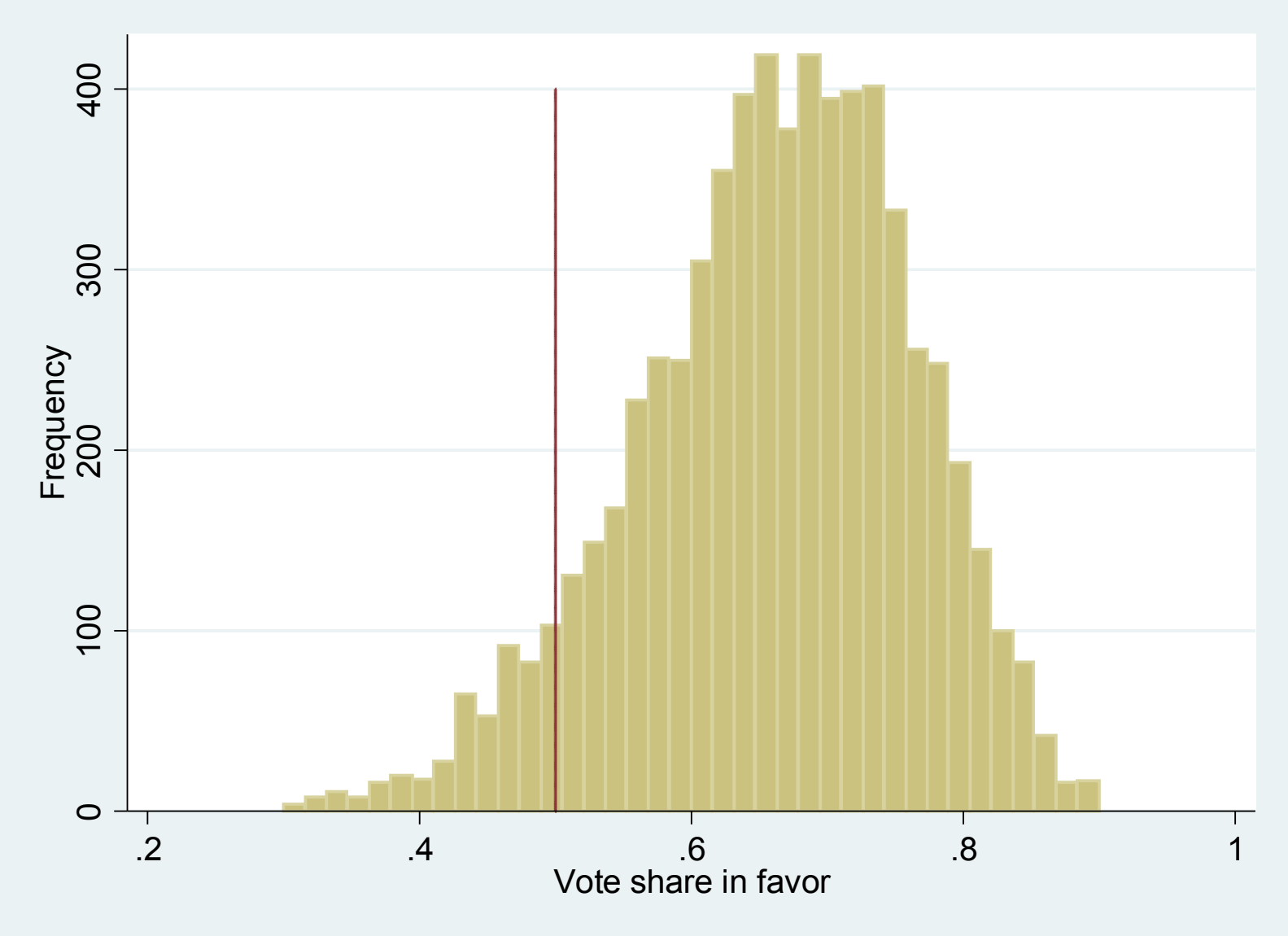
1.5 mill/s (additional) for 5 years, commencing in 2007, first due in calendar year 2008, to provide fire protection & fire safety services

- 3,611 votes in favor; 1,966 votes against - passed (50% threshold)
- 7,772 such measures on fire/EMS; raises about \$47 per capita per year
- 1,912 used in our study (close elections)

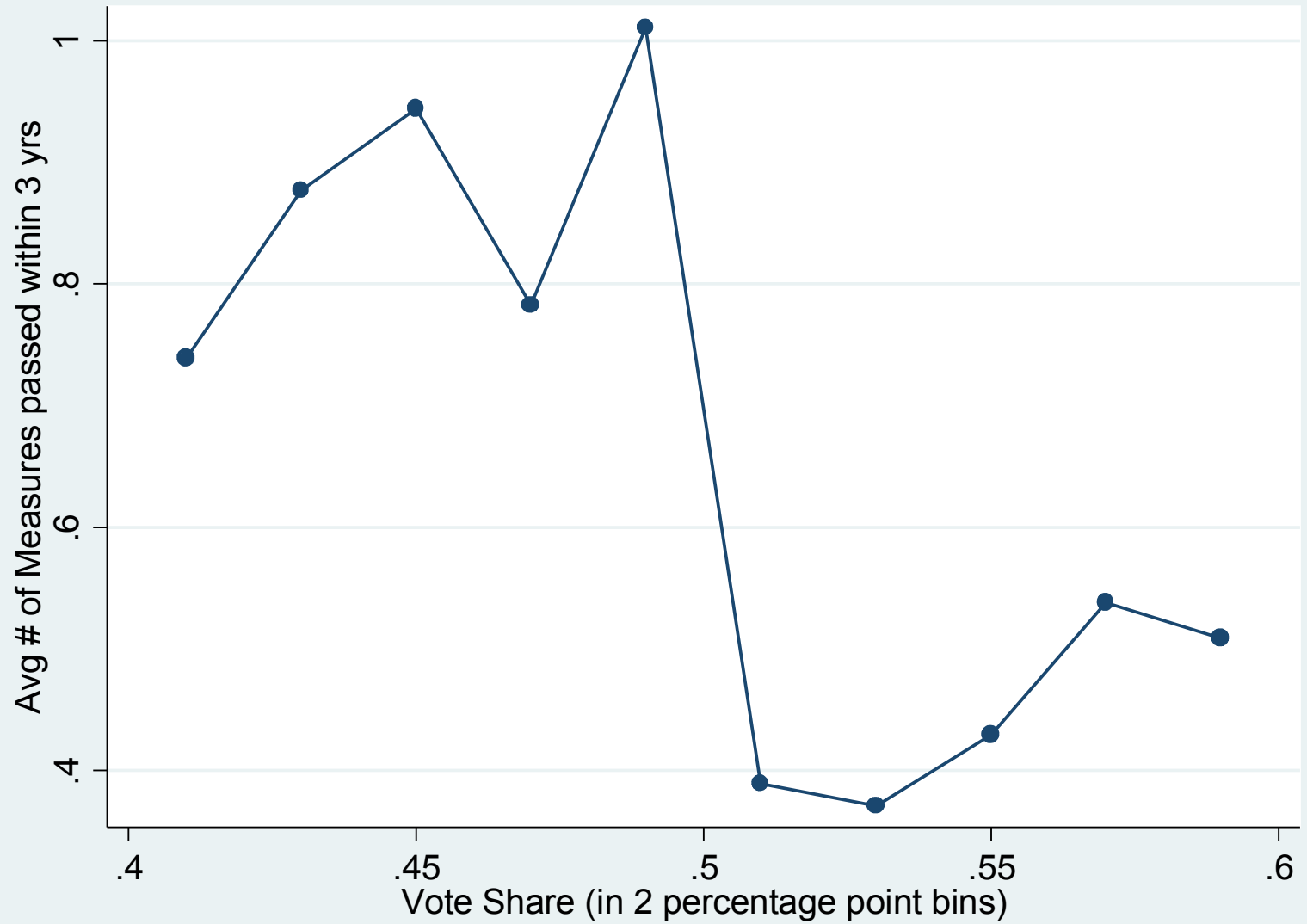
National Fire Reporting System (NFIRS)

- Records fire department (FD) characteristics, fire/rescue calls, and EMS calls
 - Incident level data
- Data covers many U.S. FDs from 1990-2006
- Use FD characteristics and incident response time / outcome data

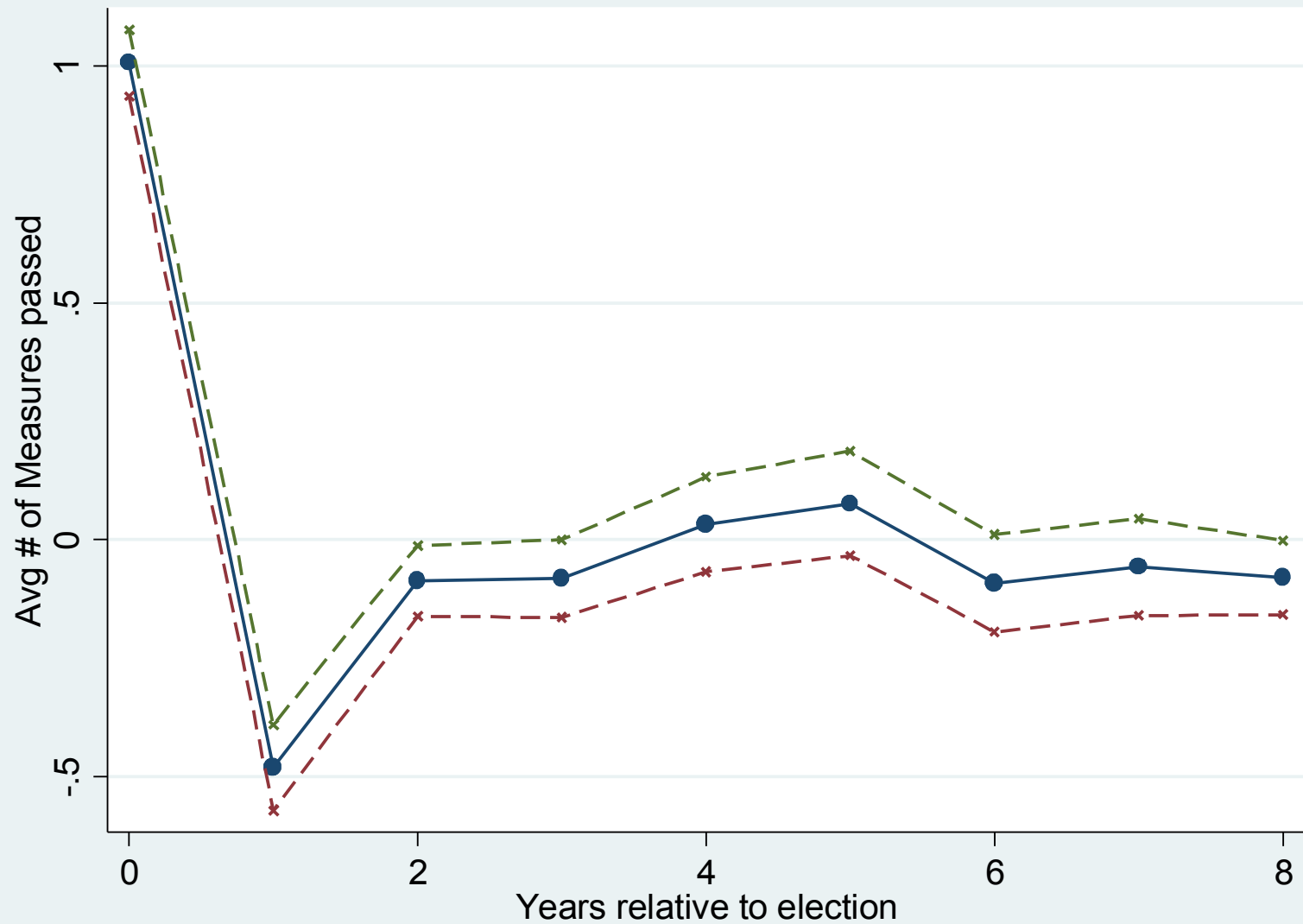
Ballot Measures by Vote Share



Ballot Measures Passed Within 3 Years of Election by Vote Share

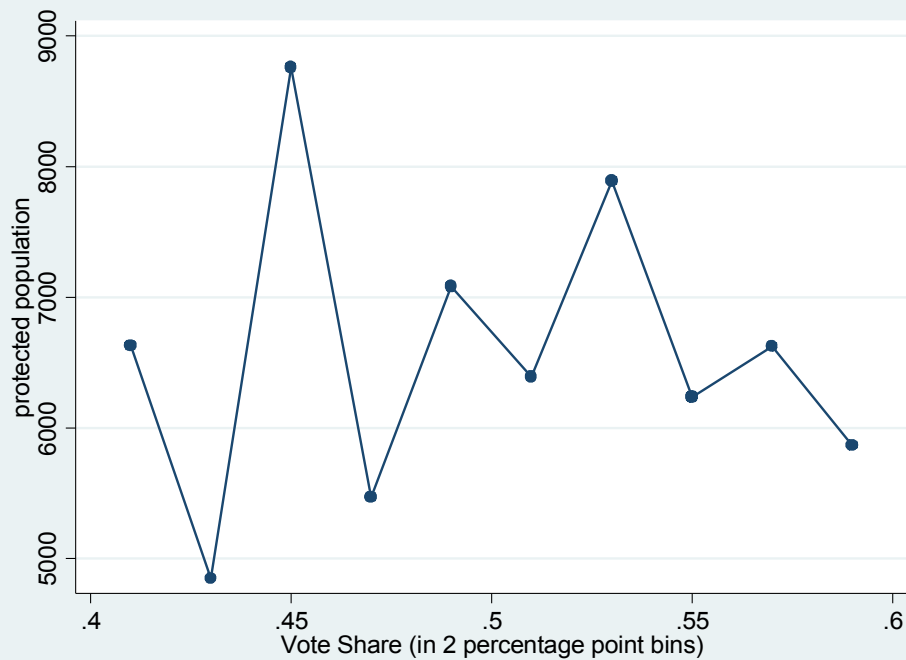


RD Estimate of Effect of Passage on Subsequent Passage

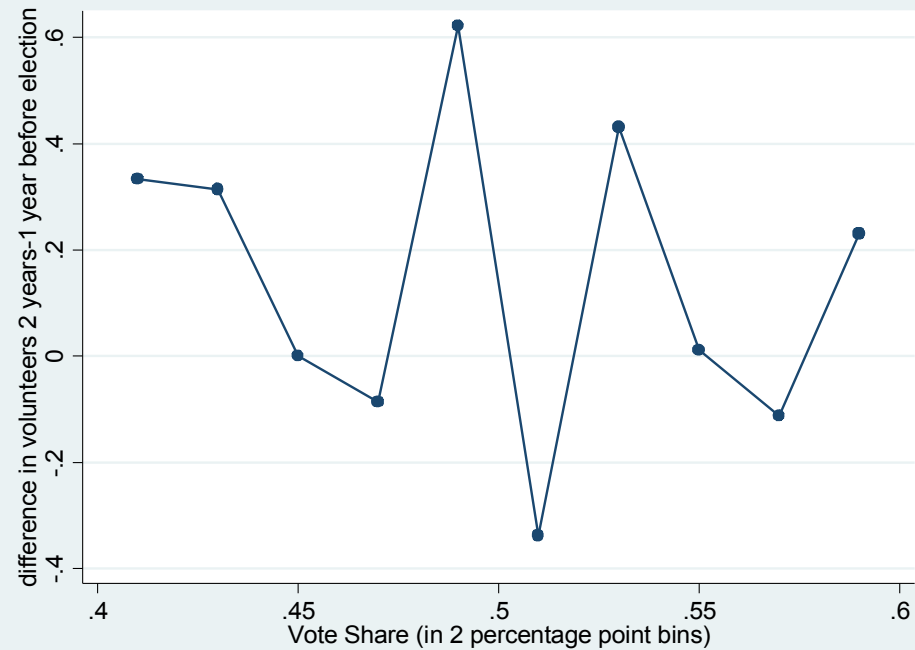


Municipalities at RD Threshold Appear Similar

Population by Vote Share



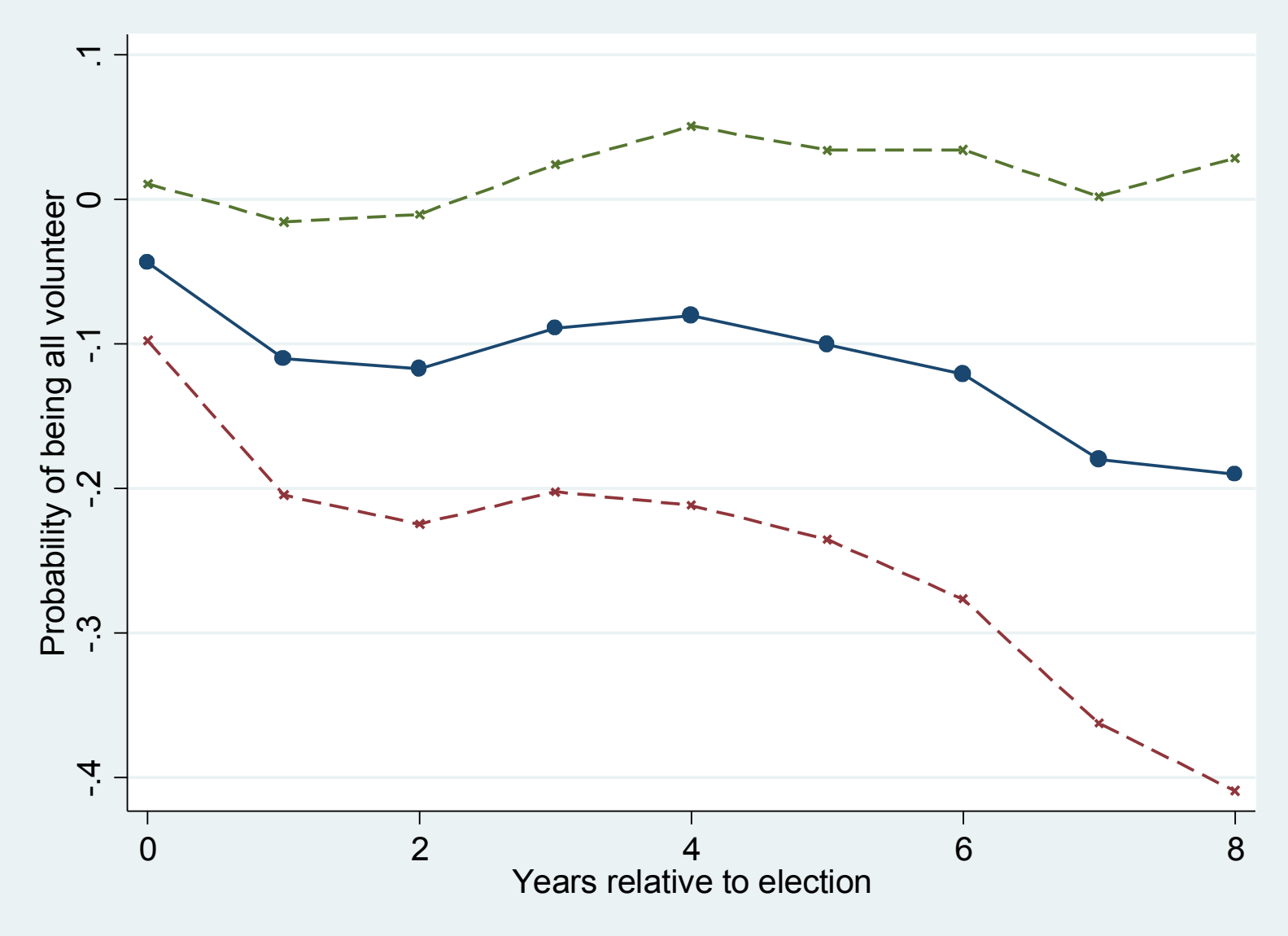
Volunteer Trends by Vote Share



Empirical Results

- Subsequent Graphs show Recursive Treatment on the Treated Estimates of ballot passage effect on:
 - Fire Department Volunteer Status
 - Volunteer Labor decisions
 - Fire response times
 - Injuries, Deaths, and Property Damage.
- Recursive estimator discussed in CFR; estimates partial effect of treatment (ballot passage) over time
- Control for ballot fixed effects, year / year since election fixed effects, polynomial in vote share interacted with year since election effects, errors clustered at department level.

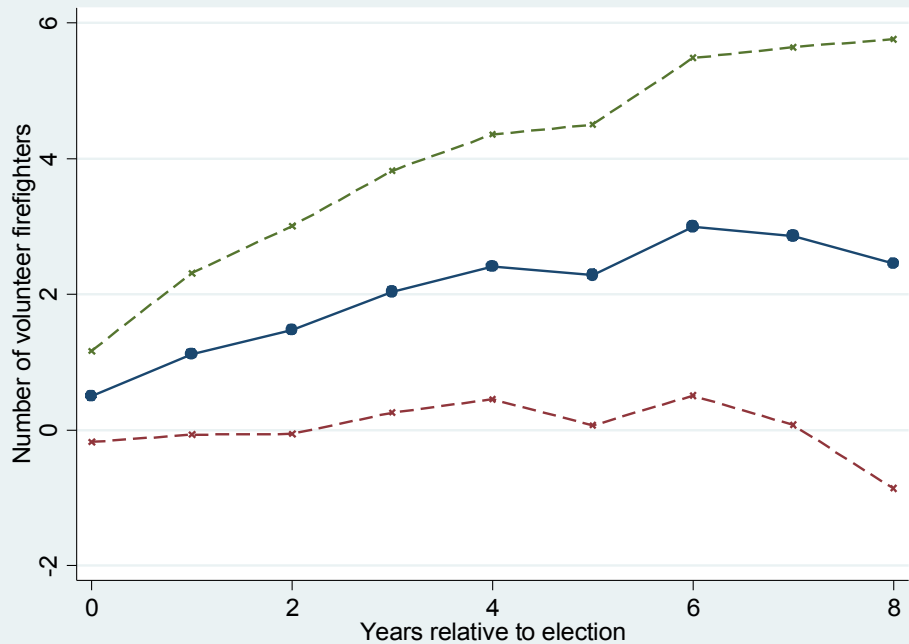
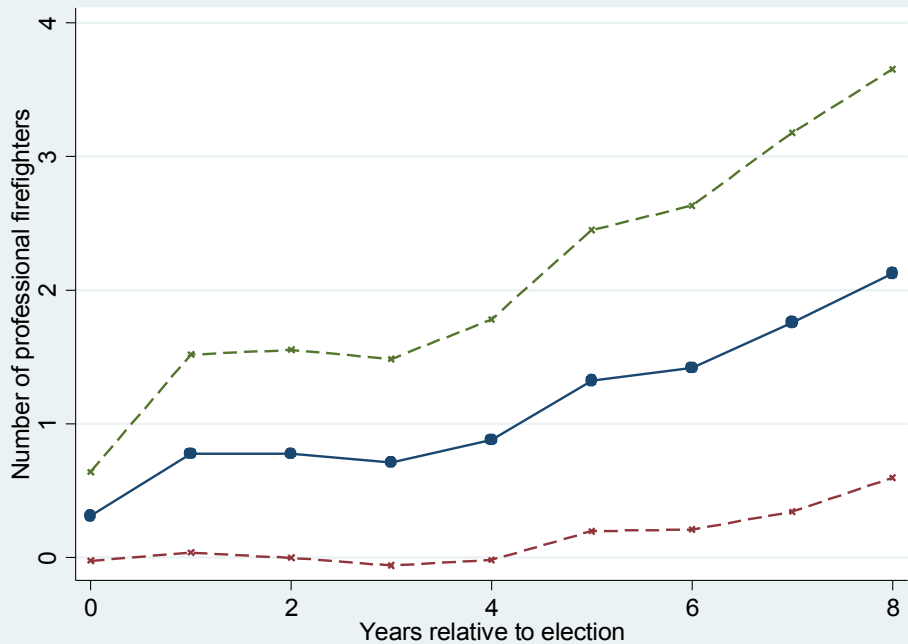
Recursive Dynamic Treatment on the Treated (TOT) Estimate of Effect of Ballot Passage on Probability of Fire Department Being All-Volunteer



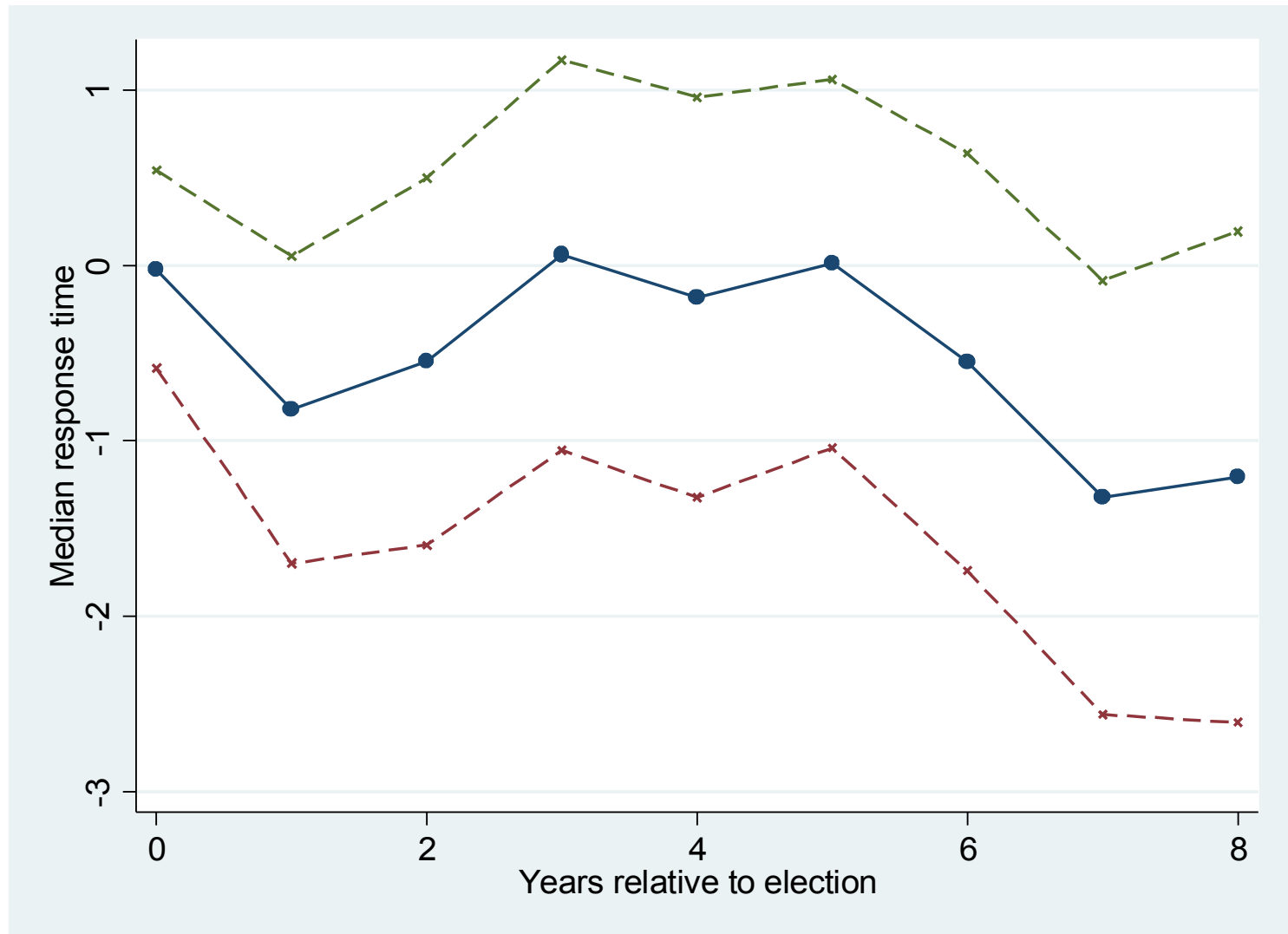
TOT: Effect of Ballot Passage on Volunteer and Professional Labor

Effect on Prof. Labor
Inputs

Effect on Volunteer Labor
Inputs



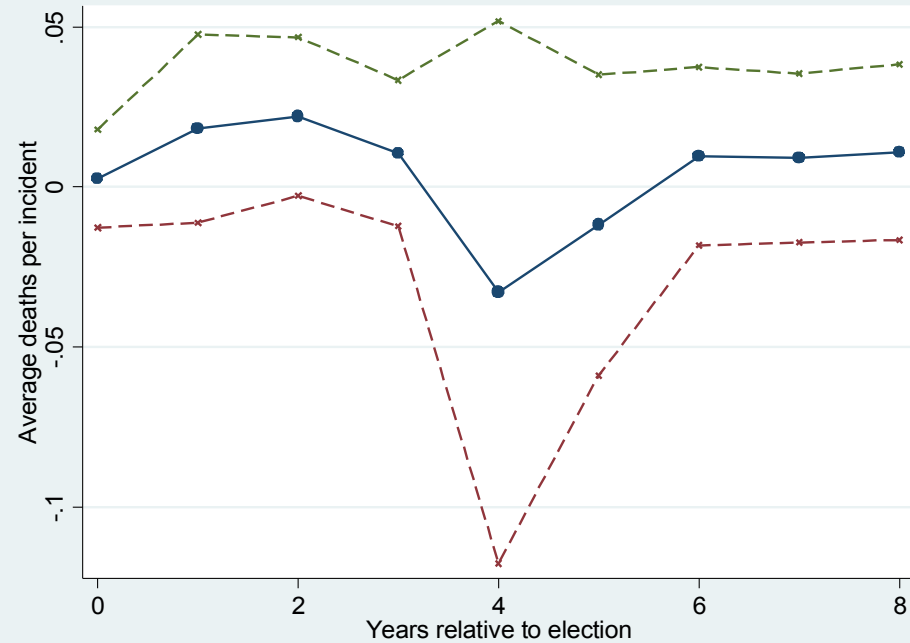
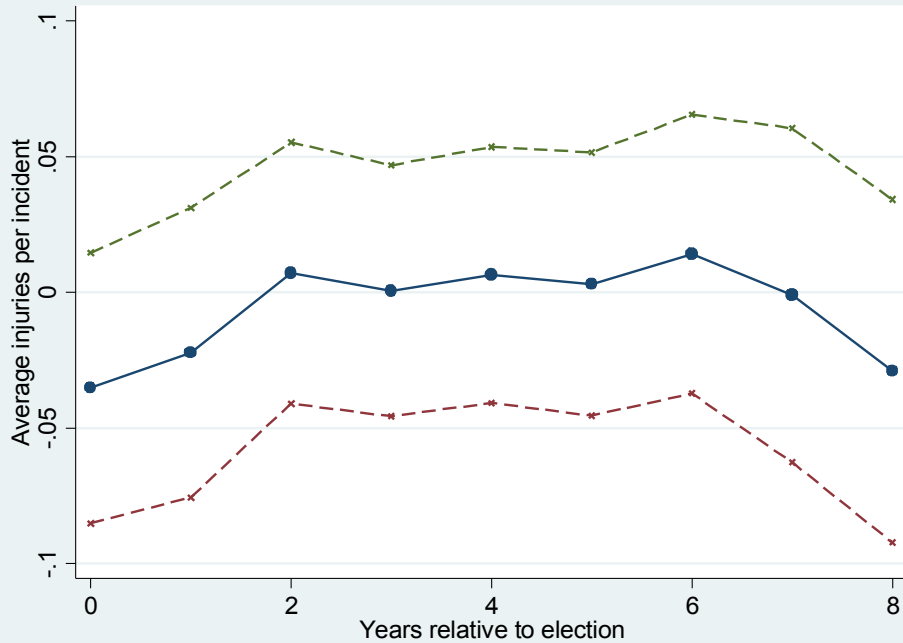
TOT: Effect of Ballot Passage on Median Fire Response Times



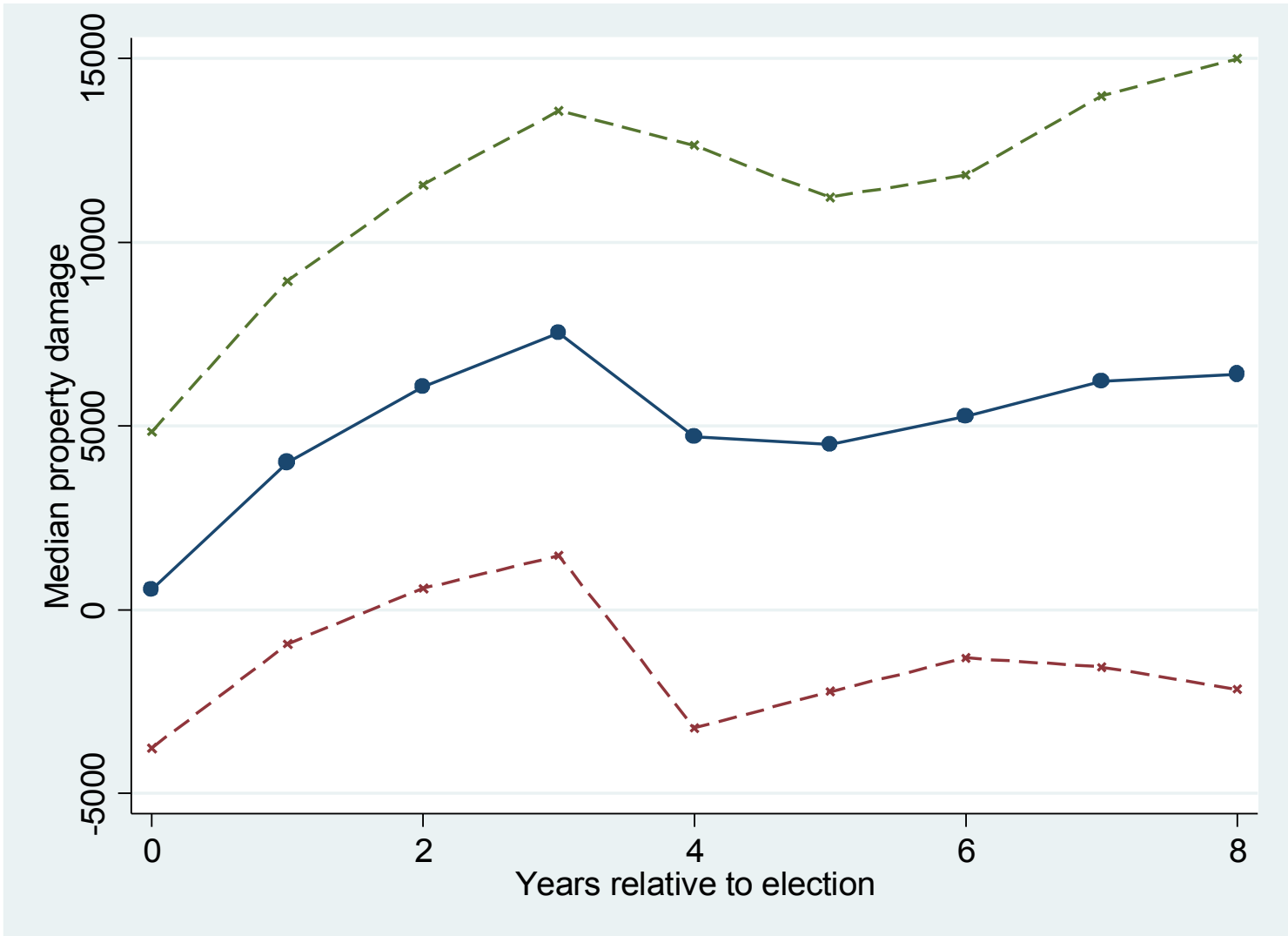
TOT: Effect of Ballot Passage on Injuries and Deaths

Effect on Injuries per Incident

Effect on Deaths per Incident



TOT: Effect of Ballot Passage on Median Property Damage



Concerns

- NFIRS Data structure and coding change in 1999, 2002, due to NFIRS version change.
 - Currently consider all ‘incidents’ but may focus more closely on structure fires only
- Many municipalities ‘contract out’ their firefighting demand to neighboring fire departments
 - We should expect response of ‘contracted in’ fire departments to increased funding to differ from ‘home town’ fire departments.
 - “Selling A Service” versus “Helping Neighbors”?
 - Preliminary results show effect on outcomes (property damage) differs between contracted/home town departments; further work matching contracts by hand

Conclusion

- Municipal ballots appear to allow volunteer departments to hire professional firefighters
- Evidence for Crowd-In effects on inputs; ballot passage increases number of volunteers
- Ballot passage has relatively little effect on outcomes
 - Response times decrease slightly immediately after elections; little effect thereafter
 - Little evidence that injuries or deaths are affected
 - Property damage appears to increase slightly
- Is this interpretable as evidence of high degree of crowd-out on effort?
- Ongoing work will study contracting vs home town fire departments