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Campaigning for retirement: State teacher union campaign contributions and pension generosity☆

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ABSTRACT

Since Tullock (1972) first asked why there is so little money in U.S. politics, several studies have found evidence that political activism has the potential to yield significant returns. This study is the first to directly investigate the returns to public sector union activism by leveraging a transactions-level dataset from the National Institute on Money in Politics to estimate the relationship between teachers' union campaign contributions and the generosity of teacher pension systems. Our results show that more politically engaged teachers' unions, as evidenced by their aggregate campaign contributions, are successful at both securing a higher level of retirement benefits *and* at shifting a greater burden of the financing of those benefits to the sponsoring government. Our estimates are in line with recent related studies and imply an investment return on campaign contributions of nearly 1500%.

1. Introduction

There are numerous ways individuals, interest groups, and other entities influence both elections and governmental decision making in general. These methods include campaign contributions, lobbying activities, endorsements, media campaigns and grassroots campaigns. In particular, the effects of campaign contributions and lobbying have received considerable attention in the academic literature as well as in the popular press. Whether one sees campaign contributions and lobbying as expressions of free speech that enhance the political process, or as a source of social and political ills, there is no denying the money spent on them. The Center for Responsive Politics reports that more than $3.4 billion was spent on direct lobbying activities at the federal level in 2018. In 2016, more than $3.7 billion flowed to candidates, parties, and other committees at the state level, according to the National Institute on Money in Politics (NIMP).

Campaign contributions and lobbying activities obviously use scarce resources such as time and money, so the question arises: Why do entities try to influence the political process? If these entities are motivated by ideology, the goal of campaign expenditures, presumably, is to increase the probability of a candidate's being elected, while the goal of lobbying efforts is to convey information to help officials make good decisions. In this view, campaign contributions and lobbying activities can be thought of as a consumption good, and therefore as social welfare enhancing. Alternatively, the entities might be motivated by the possibility of a monetary

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return. In that case, campaign contributions and lobbying activities would better be viewed as investments.

For an individual donating $50 to their favorite candidate, the classification of this donation as a consumption good is relatively clear. It's trickier, on the other hand, to categorize the motivation behind contributions of large sums of money by individuals, interest groups (such as public sector unions), or firms within a particular industry. Is the contribution a consumption good or an investment? Ansolabehere et al. (2003) give numerous examples from 2000 of contributions to campaigns and political parties by firms (and associated individuals) in an industry. These include defense contracting firms donating $13.2 million, oil and gas industry firms donating $33.6 million, and crop producers and processors donating $3.3 million. If campaign contributions and lobbying activities are viewed as an investment, then the question arises: What is the return on these investments?

The current essay contributes to the literature on the investment return from campaign contributions and lobbying activities by exploring the relationship between public sector teachers' union contributions and the generosity of their pension systems. To our knowledge, this study is the first to directly investigate the lobbying/contribution returns to public sector union activism. Ours is also one of the few studies to focus on estimating returns at the subnational level. Our results show that more politically engaged teachers' unions, as evidenced by their aggregate campaign contributions, are very successful in securing both a higher level of pension benefits and at shifting a greater burden of the financing of those benefits to the sponsoring government. From an investment perspective, our baseline estimates imply a return on campaign contributions of nearly 1500%. This figure is consistent with the findings of other recent studies and reaffirms the contemporary importance of the question posed by Tullock (1972) as to why there is so little money in U.S. politics.[1]

To estimate the relationship between teacher union contributions and the generosity of pension benefits, we leverage a transactional dataset from the National Institute on Money in Politics that tracks individual contributions made in every state to individual candidates, political parties, committees, and other organizations. Because low pension benefits could induce greater political activism and thus introduce a source of bias, we pursue an instrumental variables strategy for identification. We exploit the richness of the data and instrument for union contributions in a given state using the contributions made to the state from Republican candidate committees that are physically located *outside* of the state. These contributions largely occur in Presidential or gubernatorial election cycles when no incumbent is running. This suggests that outside money is driven by the unexpected opportunity to gain (or lose) political power in a high stakes election. And since teachers' unions are closely aligned with the Democratic Party, we argue that their (in-state) political contributions will increase in response to an influx of outside Republican money because it is a credible threat to the union's ability to advance their own political objectives.

With membership of more than 25 million active workers and retirees, public sector unions' potential to influence political processes and policy outcomes is not trivial (Vidal 2017). Teachers' unions are particularly interesting for other reasons, too. First, teachers' unions are politically engaged in every state because their national umbrella organizations, the National Education Association (NEA) and American Federation of Teachers (AFT), have chapters in every state. In fact, according to the NIMP data, a teachers' union was among the top 20 donor organizations in 41 states and was the single largest donor organization in two states in 2016. Next, as Wolfe and Schmitt (2018) have shown, nearly 43% of state and local education workers belong to a union, making education workers one of the most highly unionized in the public sector.

Finally, state-administered pension plans for teachers exist in 30 states, making them more numerous than those for any other occupation. Many states combine teachers (or education sector workers) and other government employees into plans that mix occupations and levels of government.[2] Because workers in different occupations may have different retirement objectives and because unionization rates vary across occupations and sectors, limiting the analysis to teacher-only retirement systems minimizes the likelihood that our estimates will be confounded by occupation-related unobservables.[3]

There are additional reasons to examining pensions. For instance, unlike many legislative decisions, regulations, or executive orders, the levels of pension benefits set by governments are easily observable and highly standardized across states. Second, pensions represent a significant cost for state and local governments; states and municipalities collectively contributed more than $140 billion to pension plans in 2016. This is only 10% less than they spent on total police and fire protection services. Third, as Munnell and Quinby (2012) note, most states have provisions that prevent policymakers from lowering pension benefit levels for current employees. For that reason, the ultimate result of effective political activism's increasing pension benefits may be to permanently ratchet the size of government and/or to crowd out other spending.[4] Next, a survey by Randazzo et al. (2019) finds that pension benefits levels are a top priority for teachers. Finally, the complexity of pension accounting may mean that the public is unable or unwilling to effectively monitor proposed changes in benefit levels.

The following sections of the paper provide background information on the returns to lobbying and campaign contributions, outline our data and identification strategy, present the results, and offer concluding remarks.

[1] This question is reiterated as the title of the article by Ansolabehere et al. (2003).

[2] According to the Public Plans Database at Boston University, state-administered pension plans range from a low of a single plan covering all state and local employees in 13 states to a high of 5 distinct plans for different groups of employees in Louisiana, Missouri, and Texas. The most common approach is for a state to sponsor a single state-administered plan for all teachers and a separate state-administered plan for all other state employees.

[3] For instance, police and firefighters may be willing to exchange higher workers compensation insurance benefits for lower pension benefits because of the additional on-the-job risk associated with those occupations.

[4] According to Aubry and Crawford (2017), 41 states offer either explicit protections for past and maybe future benefits in their state constitutions (7 states), or they classify the benefits as a contract so that the beneficiaries are protected under the Contract Clause or the Takings Clause of the US Constitution (34 states). Between 2009 and 2014, 74% of statewide plans enacted pension reforms, of which almost two-thirds enacted benefit reforms that apply only to new employees, with age/tenure adjustments and final salary calculations being the most common reform (Aubry and Crawford 2017).

2. Background

2.1. Previous literature

The literature focused on the influence of interest groups in the political process is wide and varied. Potters and Sloof (1996) surveys the literature documenting the empirical models assessing the importance of interest groups in affecting policy through campaign contributions, their contribution strategies, lobbying activities, etc. More recently, Stratmann (2005) offers a survey of the money and politics literature in areas such as the 1) relationship between campaign spending and Congressional voting, 2) effect of spending by interest groups on ballot measures, 3) effect of campaign contributions by interest groups to voting behavior, 4) the effects of campaign finance reform, 5) the determinants of campaign contributions and whether contributions are viewed as consumption or an investment. This paper is most closely aligned with this last strain of the literature; specifically, if campaign contributions are viewed as an investment, what is the return on those dollars.

In simplest form, it is possible to look at how much money an industry and individuals associated with it contribute to political campaigns or parties and to compare that amount with the benefits firms in that industry receive, both from newly enacted policies and from policies that remain in force. Here are a few of the U.S. government outlays itemized by Ansolabehere et al. (2003): $135 billion on defense procurement contracts in 2000, compared to the previously noted $13.2 million in campaign contributions; $17 billion on energy subsidies in 1999, compared to $33.6 million in campaign contributions in 2000; $1 billion in dairy price supports included in legislation in 2002, compared to $1.3 million in campaign contributions in 2000; $1.1 billion in sugar subsidies per year from 1989 to 1991, compared to campaign contributions of $192,000 in 1985. Further, as Bombardidni and Trebbi (2020) describe, the Farm Bill in 2000 contained $22 billion in subsidies to agribusiness relative to $3.7 million in campaign contributions during the electoral cycle.

Papers in the academic literature addressing the issue of returns from expenditures of money and other resources on the political process are numerous and generally can be divided into returns from lobbying and returns from campaign contributions. Based on models from Tullock (1972), Krueger (1974), and more recently Becker and Mulligan (2003), we know that rent seeking activities can generate deadweight losses and increase the size of government. In terms of the effects of lobbying, Figueiredo and Richter (2014) describe the literature as being divided into various categories: international trade issues, financial and regulatory accounting issues, appropriations and budgetary items, and taxation. As examples of the returns from lobbying, Figueiredo and Silverman (2006) estimate the returns for universities seeking academic earmarks can be 400–500 percent, while Kang (2016) finds that the returns on lobbying for firms in the energy sector are 130+ percent, Cox (2020) finds returns of 1100+ percent from lobbying for federal government contracts, and Hill et al. (2013) find that each additional dollar spent on lobbying activities by corporations increases the value of the corporation by $200. The benefits of lobbying are not limited to large corporations. As Payson (2020) demonstrates, local governments that lobby their statewide counterparts benefit with returns of as much as 500 percent.

In terms of the returns from campaign contributions, Ansolabehere et al. (2003) look at Congressional members' roll call votes and determine that campaign contributions affect them only minimally. Thus, they conclude that campaign contributions are more of a consumption good than an investment, a view that is consistent with Campante (2011). In contrast, Cox (2019) finds that nonprofit organizations are different, earning a return from campaign contributions of approximately 2000 percent in government grants. Likewise, Cooper et al. (2010) find firms that contribute to political campaigns at all enjoy an increase in shareholder wealth of $163.8 million based on an average contribution of $23,471. Within the agricultural industry, Lopez (2001) finds that per dollar contributed to PACs (political action committees), farm groups received policy transfers such as subsidies of over $2000. While the perception among the media and the general public seems to be that there is too much money in politics, the incredibly large financial returns earned by political activism across a range of industries and interests suggests, as Tullock (1972) noted, that the truth is quite the opposite: There is too little money in politics.

Apart from the work by Payson (2020) exploring the increase in grant dollars received from the state by California cities that have hired a lobbyist, relevant academic literature focuses almost exclusively on the behavior of private sector firms at the national level. Moreover, we are not aware of any prior study that attempts directly to estimate the returns on campaign contributions made by public sector unions. Of course, there are numerous studies on public sector unions that more broadly explore how they affect policy outcomes and government costs. Recent work by Frandsen (2016) and Anzia and Moe (2015) shows that the expansion of collective bargaining rights to public sector workers increased the cost of government. Specifically, Anzia and Moe (2015) find that greater unionization of municipal workers had a significant effect on increasing wages, benefits, and employment levels (and ultimately the costs of government) for fire and police departments. They also find that politically active unions (proxied by union endorsements of political candidates) positively correlate with those outcomes.

The literature on teachers' unions, while extensive, has generally focused on their roles in shaping the allocation of school resources and influencing educational outcomes. For example, work by Marianno and Strunk (2018), Cowen and Strunk (2015), Brunner and Squires (2013), Lott and Kenny (2013), Moe (2011), and Hoxby (1996) find that unions affect local outcomes ranging from student performance and dropout rates to teacher compensation and the structure of collective bargaining agreements.[5]

While state-level policies have received less attention, there is work demonstrating that teachers' unions can be effective in shaping policies above the district level. For instance Finger (2018), Giersch (2014), and Hartney and Flavin (2011) find that the

[5] According to the 2016 Annual Survey of State and Local Government Finances conducted by the Census Bureau, education spending accounted for 28% of all state and local expenditures, with elementary and secondary expenditures accounting for two-thirds of that amount.

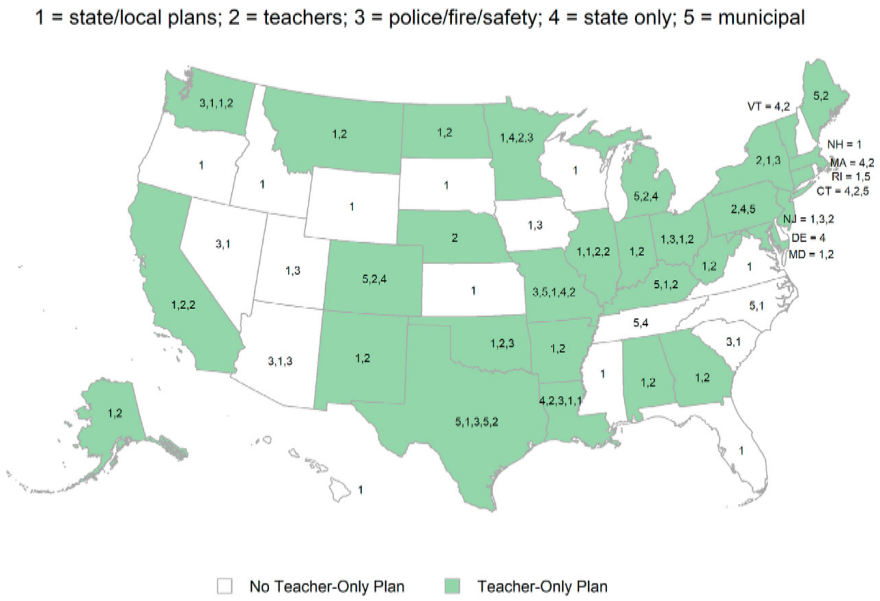

Fig. 1. State-administered pension plans.

strength of teachers' unions influences statewide reforms related to issues such as pay-for-performance and charter schools. Across a wider range of education-related legislation, Marianno (2020) finds that legislatures in states with a greater number of opposing interest groups propose fewer favorable policies toward teachers. Additionally, Fabella (2017) examines the relationship between several educational reforms and the strength of teachers' unions. She finds that lobbying and campaign contributions by teachers' unions are effective at both preventing undesired reforms (related to educational quality) *and* promoting desired reforms (such as expanded access). In general, Moe (2017) describes teachers' unions as "a powerful force" that shape education policies through their "extensive involvement in state and national politics."

2.2. Gauging pension generosity

Any measure of pension generosity should capture the expected marginal increase in a worker's benefits that result from one additional year of service. In academic studies, pension generosity is typically measured by the plan's total normal cost (often referred to simply as normal cost), which is the present value of the expected sequence of benefits earned by workers in the current period (Munnell et al., 2011).[6] Thus, by definition, workers in a plan with a higher total normal cost, other factors being constant, belong to a more generous retirement system. Total normal cost estimates are published in virtually every pension plan's Consolidated Annual Financial Report (hereafter CAFR) and generally are expressed as a percentage of plan payroll.

There is, however, a caveat. While total normal cost does adequately capture the absolute level of pension benefits accrued in a given period, it does not reveal anything about how the financing of those benefits is shared between employees and the plan's sponsor. Because employees contribute to financing their benefits in most retirement systems, a better measure of generosity derives from examining what portion of the benefits earned by an average worker in a given year are financed by the plan sponsor. In other words, if two pension plans have the same total normal cost but the sponsor finances a larger fraction of that normal cost in one, these plans are not equally generous from the perspective of employees. To capture both potential channels of generosity, we evaluate plans using both the total normal cost and the employer's share of normal cost, which is simply the fraction of total normal cost financed by the sponsoring government.

Our pension data are derived from the Public Plans Database at Boston University over the period 2001 to 2016. This database provides detailed information on 114 state-administered plans and 52 locally administered defined benefit pension plans, including key characteristics such as the plan's actuarial assumptions, normal cost, employer normal cost, member normal cost, expected rate of investment return, payroll, and plan membership. Benefit changes and annual funding decisions for the state-administered plans require explicit action on the part of the governor and state legislature. The database groups these plans into five distinct categories. The number and specific types of plans by state are shown in Fig. 1. States that have teacher-only pension plans, which constitute our empirical sample, are shaded.

Across all states, 44 have state-administered plans covering a mix of state and municipal employees (category 1), 30 have teacher-only plans (category 2), 15 states have specific plans for police, fire, and judges (category 3), 11 have plans that cover only state employees (category 4), and 12 have state-administered plans that cover only municipal employees (category 5). California and

[6] Some studies have used average benefit levels at time t to gauge generosity. The primary drawback to this measure is that benefits paid out in period t were accrued at some point in the past so they reflect, in large part, parameter values that determined benefit generosity *in the past*.

Table 1
Comparison of teacher plan generosity metrics (averages from 2001 to 2016).

(1) Plan ID	(2) Plan Name	(3) Active Members (000s)	(4) Total Members (000s)	(5) Normal Cost ($000)	(6) Employer Normal Cost ($000s)	(7) Employer Share of Normal Cost (% * 100)
2	Alabama Teachers	135.1	224.3	5.0	2.1	41.6
4	Alaska Teachers	8.1	19.1	12.0	6.3	49.3
8	Arkansas Teachers	67.9	108.1	4.8	3.1	64.1
10	California Teachers	440.0	703.6	11.5	6.9	60.0
14	Colorado School	117.1	179.4	4.4	1.6	35.2
17	Connecticut Teachers	50.6	81.5	7.3	2.8	37.7
28	Georgia Teachers	210.8	364.8	6.7	3.9	57.7
34	Illinois Teachers	159.7	355.4	10.8	5.1	46.9
37	Indiana Teachers	72.9	123.3	5.7	4.0	69.8
42	Kentucky Teachers	72.0	131.4	7.7	3.2	42.0
45	Louisiana Teachers	85.5	156.0	6.4	2.6	40.8
47	Maine State and Teacher	41.3	75.0	5.6	2.2	39.3
49	Maryland Teachers	102.0	177.9	7.0	4.1	59.9
51	Massachusetts Teachers	88.7	138.3	7.5	1.4	18.8
53	Michigan Public Schools	266.3	455.6	3.8	2.0	51.4
58	Minnesota Teachers	77.1	140.7	4.6	1.4	29.4
64	Missouri Teachers	76.4	126.0	12.0	4.4	36.1
66	Montana Teachers	17.8	31.8	4.3	1.1	25.1
67	Nebraska Schools	38.4	60.3	4.8	1.3	27.9
73	New Jersey Teachers	151.1	228.8	8.8	4.8	53.4
75	New Mexico Educational	62.0	102.5	5.7	1.8	31.9
78	New York State Teachers	265.1	400.8	5.0	4.7	86.9
82	North Dakota Teachers	10.0	17.9	5.5	1.0	18.6
88	Ohio Teachers	174.3	321.6	9.3	2.3	22.3
90	Oklahoma Teachers	87.3	141.4	5.0	1.7	33.5
92	Pennsylvania School Employees	262.4	455.7	7.5	3.8	51.2
108	Texas Teachers	796.5	1143.3	5.0	1.9	37.6
114	Vermont Teachers	10.3	17.0	4.4	2.1	44.1
122	Washington Teachers Plan 2/3	60.7	73.3	6.7	3.6	54.4
124	West Virginia Teachers	29.0	60.9	4.5	1.7	36.6

Dollar figures are in thousands 2016 of dollars per active member and percentages are expressed ∗ 100. The full sample consists of 448 observations. 16 observations (2001–2016) for each of the following pension plans: Alaska Teachers, Alabama Teachers, Arkansas Teachers, Georgia Teachers, Illinois Teachers, Indiana Teachers, Louisiana Teachers, Massachusetts Teachers, Maryland Teachers, Maine State and Teacher, Michigan Public Schools, Missouri Teachers, North Dakota Teachers, Nebraska Schools, New Jersey Teachers, New Mexico Educational, Ohio Teachers, Oklahoma Teachers, Pennsylvania School Employees, Texas Teachers, Vermont Teachers, Washington Teachers Plan 2/3, and West Virginia Teachers. Observations in our sample from plans with missing data include: California Teachers (2001, 2003–2016), New York State Teachers (2001–2012, 2014–2016), Montana Teachers (2002, 2004–2016), Minnesota Teachers (2004–2016), Colorado School (2005–2016), Kentucky Teachers (2015, 2016), and Connecticut Teachers (2002, 2004, 2006, 2008, 2010, 2012–2014, 2016). All data in this table were obtained from Boston University's Public Plans Database.

Illinois are both classified by the Public Plans Database as having two teacher-only pension plans because both states offer a separate pension system for employees of the higher education systems. We exclude these two higher education plans from our sample because university employees may have different objective functions than primary and secondary education employees.[7] Table 1 shows the mean value of key pension generosity measures for each plan over the sample period. The table notes show the specific year-plan observations in our sample because some plans have missing data that prevent us from including every year in our analysis. For comparison purposes, Table 1 also includes each plan's (mean) active membership and total membership in columns (3) and (4). The plans collectively cover more than 6.6 million active workers and retirees. The median plan has an active membership of roughly 81,000, but the plans range in size from an average low of 8100 active members in Alaska to an average high of almost 800,000 active members in Texas (column 3).

Columns (5) and (6) show each plan's (mean) total normal cost and employer normal cost 219 expressed in thousands of real dollars per active member. As is evident, there is substantial variation in the generosity of benefits across different plans. While the mean present value of total benefits accrued to an average employee each year across all plans is $6648 (column 5), employees in four plans accrue benefits in excess of $10,000 per year while employees in five plans accrue less than $4500. It is also interesting to note that teachers in two states often viewed as more favorable to unions, Michigan and New York, accrue benefits of $5000 or less per year while an average teacher in Missouri accrues annual pension benefits of $12,000.

The experiences of New York and Missouri also illustrate why examining only the absolute level of benefits accrued provides an incomplete picture of generosity. Column (7) in Table 1 shows each plan's employer share of total normal cost. The plan sponsor

[7] Using the data fields from the Public Plans Database, our sample was selected by choosing all plans that were state-administered and teacher-only (*AdministeringGovt* = 0 and *PlanType* = 2). This resulted in 32 plans and we omitted the university plans for California and Illinois. These plans have identification codes (*ppd_id*) of 111 and 35, respectively. It is worthwhile to note that our empirical results are robust to the inclusion or omission of the University-level plans. These additional regressions are available upon request.

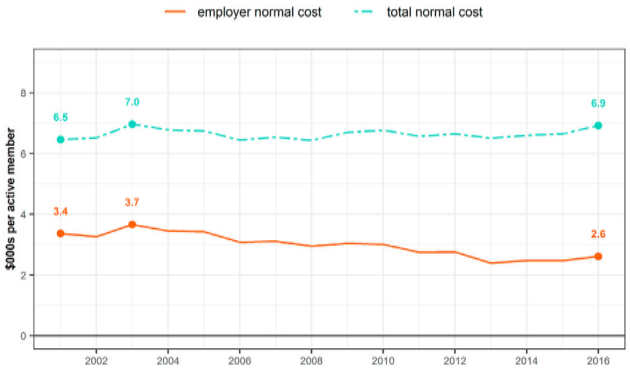

Fig. 2. Mean Total and Employer Normal Cost: 2001–2016 (all plans combined).

finances only 36.1% of the total normal cost in Missouri and almost 87% in New York. So, while teachers in New York accrue a lower absolute level of pension benefits each year, a much higher fraction of those benefits are financed by the plan sponsor. Across all plans, sponsors finance roughly 44 of the annual benefits accrued, but this figure ranges from a low of only 18% in North Dakota and Massachusetts to a high of almost 87% in New York.

It is also worth noting that the simple correlation between total normal cost and employer share of normal cost (averaged within each state) is only 0.09 in our sample. The correlation increases only to 0.15 if one does not average within a state. This suggests that these two metrics are capturing different dimensions of pension generosity.

The generosity level of the average plan in real terms has remained fairly stable during our sample period. Fig. 2 plots the (mean) total normal cost and (mean) employer normal cost across time expressed in thousands of 2016 dollars per active member. For each series, the value in 2001, 2016, and maximum value over the full sample are labeled.

In terms of total normal cost expressed in dollars per active member, benefits increased from an average of $6500 per member in 2001 to more than $7000 per member by 2003. Since that time, total benefit levels have remained fairly stable, equal to $6900 per member in 2016. In contrast, employer normal cost has, on net, decreased noticeably in the sample period. For instance, in 2016 employer normal cost is nearly 30% lower than the peak benefit level of $3700 per member in 2003. Since total normal cost has been roughly flat or minimally elevated over the sample, the decline in employer normal cost indicates that the average teacher is financing a larger share of their annual pension benefits in 2016 than they did a decade earlier. While our discussion has centered on whether or not more politically engaged unions are able to use their influence to boost pension benefits, it may also be the case that higher-contributing unions are better able to limit or fight off benefit reductions.

3. Data and identification strategy

3.1. Union contribution data

Pension benefits levels are determined by the legislature rather than through the collective bargaining process with local school boards. Therefore, we follow Hartney and Flavin (2011) and use aggregate statewide campaign contributions to individual candidates, parties and other political organizations in a given year to measure the strength of teachers' unions in each state. Contributions from the unions to local or federal groups or candidates have been excluded. These data have been compiled from individual state campaign finance reports since 2000 by the National Institute for Money in Politics (hereafter NIMP).[8] NIMP graciously provided us with records of individual contributions that include dollar value, recipient candidate or organization, election cycle, election jurisdiction, the address and business line of the donor, and whether the donor resides in-state or out-of-state. The NIMP data have been used in many academic studies on topics ranging from incumbency advantage to judicial decisions, and from corporate tax rates to state telecommunications regulatory policies (Malhotra 2008; Williams and Ditslear 2007; Chirinko and Wilson 2010; De Figeiredo and Edwards 2007; Fouirnaies and Hall 2014).[9]

In the most recent year of our sample (2016), which also happened to be a presidential election year, the National Institute on Money in Politics compiled more than 3.5 million unique transactions representing more than $3.7 billion in contributions at the state level. Roughly $900 million in contributions were made by individuals, which is just under 25% of the total. NIMP classifies donors into more than 100 general industries and more than 400 specific business lines, making it possible to isolate contributions from all public sector unions, including teachers. In 2016 alone, NIMP identified 15,288 unique transactions from teachers' unions that accounted for more than $118 million in contributions. The top five contributing teacher organizations nationwide in 2016 were

[8] The National Institute for Money in Politics provides free access to some of their aggregated data regarding state and federal contributions at: www.followthemoney.org.

[9] The National Institute for Money in Politics commissioned the Rand Corporation to evaluate the data and document how it is being used. The very comprehensive report, authored by McGovern and Greenburg (2014), is available at: https://www.rand.org/content/dam/rand/pubs/research_reports/RR700/RR791/RAND_RR791.pdf.

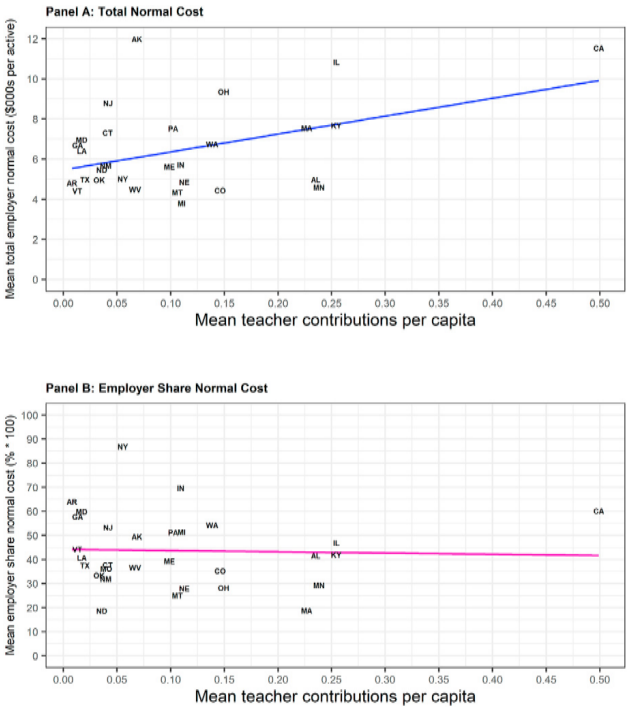

Fig. 3. Mean teacher contributions versus mean pension generosity.

the National Education Association ($33.9 million), the California Teachers Association ($27.3 million), Massachusetts Teachers Association ($8.5 million), Oregon Education Association ($6.0 million), and the American Federation of Teachers ($5.7 million).

As Moe (2011) describes, the National Education Association and American Federation of Teachers are the umbrella union organizations for teachers and have affiliate organizations in every state. These affiliates recruit members, generate donations, and organize on behalf of their membership to protect the members' interests (Moe 2011). According to the NIMP data, there were 332 distinct teachers' unions across the 50 states that made contributions in 2016. Thirteen states had only a single union organization making contributions (all of them NEA state affiliate organizations), while Wisconsin, Florida, and Illinois had around 20 each, California led the way with 50 different teachers' unions making contributions in 2016. The median state had 10 different teacher organizations making contributions to statewide groups in 2016, generally an NEA-affiliate union, an AFT-affiliate union, and a handful of unions representing either higher education employees or some of the larger school districts.

Despite the fact that many different teachers' unions make contributions to statewide groups, the union contribution landscape in most states is dominated by a few large donors (generally the state's NEA and/or AFT affiliate organizations). Among all donor organizations in 2016, the largest teachers' union (in terms of contributions) was among the top 20 donor organizations in 41 states. In 19 states, the single largest teachers' union was among the top 10 donor organizations. A teachers' union was the single largest donor organization in both Alaska and Massachusetts in 2016, followed closely by Maine's Education Association (ranked second), Oregon's Education Association (ranked second), California's Teachers Association (ranked third), and Education Minnesota (ranked third) in their respective states.

As is true with pension generosity metrics, aggregate contributions from teachers' unions vary considerably from state to state. Fig. 3 plots both the mean total normal cost and the employer share for each plan against per capita teacher union contributions. Panel A shows the total normal cost expressed in thousands of real dollars per active member, while Panel B shows the employer share of normal cost expressed as a percentage of payroll (% * 100). The solid lines in each panel are simple regression lines, and data points are labeled using each state's two-character postal abbreviation. The associated plan identification numbers may be found in Table 1.

Apart from the variation in generosity and union contributions that is apparent in both panels, mean per capita teacher union contributions in California are substantially larger than the average contributions in other states. Real per capita teacher contributions in California average $0.49 over our sample, which is roughly double the mean per capita contribution amount of other high contributing unions in Illinois ($0.25), Kentucky ($0.25), Minnesota ($0.24), Alabama ($0.24), and Massachusetts ($0.23).

A closer inspection of the contribution data in California reveals large values relative to the sample average in 2005 and 2012. Across all plans and years, including California in 2005 and 2012, mean per capita campaign contributions by teachers' unions is $0.12. In California, per capita teachers' unions contributions were $2.11 in 2005 and $1.43 in 2012. Many states have years in which per capita teacher contributions are significantly higher than the sample mean, such as Ohio in 2011 ($0.96), Alabama in 2002 ($0.92), Michigan in 2012 ($0.86), and Illinois in 2014 ($0.72). However, teacher contributions in California in 2005 are more than 40% larger than the next highest observed contribution amount in our sample. The presence of high-profile ballot initiatives, Proposition 98 in 2005 and Propositions 30 and 32 in 2012, may have played a role in those years' spikes in contribution amounts

in California. If the 2005 and 2012 observations for California are omitted, then California's mean union contribution falls to $0.30 per capita, much closer to the average contribution in other high-contributing union states. As a robustness check, we also estimate our empirical models with all observations two ways: including inserting a dummy variable for California for 2005 and 2012 and excluding California altogether.

3.2. Empirical specification

We estimate a two-way fixed effects model to control for aggregate shocks and time-invariant state/plan-specific unobservable factors that may be correlated with union contributions and pension generosity. Specifically, the model we estimate is of the form:

$$g_{t,s} = \alpha + \eta X_{t,s} + \delta C_{t,s} + \lambda_t + \mu_s + \mu_s \cdot T + \varepsilon_{t,s}, \quad (1)$$

where $g_{t,s}$ is a generosity measure for pension plan s at time t, $X_{t,s}$ is a vector of state-level and pension-plan specific time-varying controls, λ_t is a fixed time effect, μ_s is a fixed state/pension plan effect, T is a linear trend, and $\varepsilon_{t,s}$ is the random disturbance term. The plan-specific trends ($\mu_s \cdot T$) allow us to adjust for an additional source of unobserved heterogeneity that could bias our estimates if the generosity of different plans follow different trajectories. $C_{t,s}$ denotes our teacher contributions per capita and δ is our coefficient of interest. Our empirical identification is obtained from the within-state changes over time.

Since state/plan-level fixed effects are included in equation (1), the greatest threats to our identification include the potential for simultaneity between pension generosity and union contributions as well as unobserved factors that could be correlated with both pension generosity and union contributions. In the case of unobserved factors, for instance, policymakers in a state may be labor-friendly (or unfriendly) and therefore be supportive of both strong public sector unions and generous pension benefits. One would expect this type of unobserved factor to introduce positive bias in δ if the model is estimated by OLS. On the other hand, if there is simultaneity or reserve causality between pension generosity and contributions such that pension plans with low levels of generosity actually induce unions to expand their political contributions to raise benefit levels, then this would introduce a source of negative bias in δ.

To mitigate concerns over bias, we pursue an instrumental variables (IV) strategy to isolate a source of exogenous variation in teachers' union contributions. To accomplish this, a valid instrument must be both strongly correlated with union contributions and satisfy the exclusion restriction. In our application, this means that the instrument is not directly related to pension generosity per se, rather it affects generosity through its impact on union contributions. Said differently, the instrument must be uncorrelated with the unexplained variation in pension generosity. We leverage the transaction-level contribution data from NIMP, which includes the donor's business line and physical address, and instrument for teacher union contributions in state s using per capita contributions to candidates, parties, and organizations in state s that originate from Republican organizations located *outside* of state s. These organizations include, but are not limited to, individual candidate committees, statewide Republican party committees, the Republican National Committee, and the Republican Governors Association.

Out-of-state individuals and organizations often face more lax disclosure requirements and contribution limits than in-state donors (Wallace 2018; Roberts 2014). Outside donations are also higher in states when highly partisan issues are being considered or during election cycles for key offices when no incumbent is running. For instance, when California considered a same-sex marriage initiative in 2008, more than 30% of the $83 million in contributions came from out-of-state advocacy groups on both sides of the issue (Shin 2009). In our sample, half of the top ten largest outside Republican contributions occurred in Presidential election cycles: two in the 2008 Obama vs. McCain election cycle (in Louisiana and New Mexico) and three in the 2016 Clinton vs. Trump cycle (in Massachusetts in 2016 and Pennsylvania in 2015 and 2016). Of the remaining five largest out-of-state Republican contributions, three occurred in gubernatorial election cycles when an incumbent was ineligible to run because of term limits (2001–2002 in Alaska and 2002–2003 in Louisiana) or when the incumbent was defeated in the primary election (2003–2004 in Missouri).[10] Since politically competitive states in Presidential elections occur with some degree of randomness (Johnson 2005), the timing and location of the largest outside Republican contributions suggests that the key factor driving these donations is the unexpected opportunity to gain (or lose) political power in a high stakes election. In fact, the top ten largest outside Republicans contributions noted above account for 84% of aggregate out-of-state Republican contributions in our sample.[11]

Teachers' unions, like other interest groups, seek to advance their preferred candidates and policies and limit the policies and candidates they oppose. The National Education Association and American Federation of Teachers are very tightly aligned with the Democratic Party, with more than 90% of their federal contributions being directed to Democratic candidates, parties, or other organizations.[12] Since an increase in out-of-state Republican contributions represents a credible threat to the unions advancing their preferred candidates and policies, we argue that teachers' unions will increase their own contributions to thwart this opposition, giving us a source of exogenous variation in teachers' contributions. We therefore expect to observe a direct relationship between

[10] The remaining two largest instances of outside Republican contributions occurred in Ohio in 2010 and New York in 2001. John Kasich, a Republican, defeated Democratic incumbent Ted Strickland in Ohio. In New York, Republican Governor George Pataki sought, and was ultimately re-elected, to a third term in 2002. As of 2020, Pataki was the last Republican to win a statewide election in the New York.

[11] The top twenty largest outside Republican contributions account for 94% of the aggregate total. Out-of-state Republican contributions occurred in every state in our sample except Montana and Nebraska and account for only 1% of total contributions. All out-of-state contributions account for slightly more than 10% of total contributions.

[12] This information is from the Center for Responsive Politics: https://www.opensecrets.org/orgs/totals.php?id=d000000064cycle=2016 and https://www.opensecrets.org/orgs/totals.php?id=D000000083cycle=2016.

higher outside Republican contributions and higher (in-state) contributions from teachers' unions. The first-stage regressions, which are available upon request, confirm the strong positive relationship we hypothesize.

We also believe outside Republican contributions satisfy the exclusion restriction to be a valid instrument. As noted above, the timing and amounts of these contributions appear to be driven by unexpectedly close elections that have no relationship with the generosity of teacher pensions. Thus, we do not believe there is any direct causal linkage from pension generosity to outside Republican contributions that would violate the exclusion restriction.[13] Additionally, the exclusion restriction would be violated if outside Republican contributions are correlated with the unexplained variation in pension generosity. This could occur, for example, if outside Republican contributions are a causal factor leading to more anti-labor candidates being elected, which in turn could lead to policies being enacted that affect pension generosity. Such a claim is in contrast with a sizable literature that has struggled to find evidence of a meaningful causal relationship between contributions and elections at the state or federal levels (Jacobson 2015; Stratmann 2009). Recent work by Powell (2012) at the state level suggests that contributions may play a larger role in gaining access to elected officials than they do in determining the outcome of specific elections or policies. If this is indeed the case, then one should not expect a meaningful connection between outside Republican contributions and the unexplained variation in pension generosity.

3.3. Control variables

We also include several control variables in equation (1). In terms of the covariates ($X_{t,s}$), to capture general attitudes towards labor unions, we include a dummy variable that equals unity if a state has a right-to-work law in place at time *t*. We control for the size of the state's education sector by including the fraction of all state and local workers employed in education (including higher education). To adjust for economic conditions in the state, we include the state's general fund balance (as a percentage of revenue), (real) per capita GDP, and a measure of the state's fiscal capacity. The fiscal capacity variable is the difference between a state's total taxable resources (estimated annually by the U.S. Treasury) and its own-source revenue as a share of state GDP. Larger fiscal capacity values indicate that a state has greater ability to generate own-source revenue from taxation.

In addition, because teachers may also care about salary and other non-pension benefits, we include the average teacher's salary in the state and average experience level.[14] Teachers collectively bargain over their salary schedules so there may be periods where they devote more effort and resources to pursuing higher salaries in lieu of higher pension benefits (or vice versa). We control for teacher experience separately because rising experience levels should be correlated with higher salaries independently of collective bargaining actions. Definitions, descriptive statistics and detailed source information for all variables in our empirical specifications are shown in Table 2.

Additionally, we include the pension plan's discount rate, (actuarial) funding level, and share of assets invested in real estate in equation (1). A higher discount rate will reduce the plan's actuarial liabilities and make the pension appear to be better funded in an actuarial sense. We include the share of assets invested in real estate because our sample includes the boom of the early-to-mid 2000s and the bust of the Great Recession. The plan's actuarial funding level is included as a direct covariate to capture the possibility that policymakers may find it more difficult to raise benefit levels if the pension system is poorly funded.

Finally, we control for observables differences in state political environments using several variables. First, we include the share of state legislative seats held by Democrats. According to conventional wisdom, Democrats are more supportive of unions.[15] Second, because Marianno (2020) finds that legislatures in states with higher numbers of competing interest groups propose more unfavorable and fewer favorable policies toward teachers, we use per capita contributions from non-teacher, public sector unions to adjust for these competing interest groups. These competing unions include those comprising police and firefighters, affiliate chapters of Service Employees International Union (SEIU), and the American Federation of State, County and Municipal Employees (AFSCME). We also include Berry et al. (1998)'s dynamic citizen ideology score to adjust for time-varying preferences that could be correlated with the treatment of public sector unions. Finally, we include measures of electoral competitiveness in state lower and upper chambers in the general election. These variables are equal to the inverse of the median Herfindahl-Hirschman index of candidate vote shares across all seats in the respective chamber. We use the inverse for easier interpretation. The measures of electoral competitiveness increase when the median house/senate seat becomes more competitive based on the share of votes received by all of the candidates in the general election.

4. Empirical results

4.1. Baseline results

Our estimates for the effect of teachers' union contributions on total normal cost and the employer share of normal cost are

[13] Simple correlations in the data support this claim. The pairwise correlation between outside Republican contributions and pension total normal cost and employer share of normal cost are 0.06 and 0.01 respectively.

[14] Data on state-level average teacher experience are only available from the 2007–2008 and 2011–2012 Schools and Staffing Surveys (SASS) conducted by the National Center for Education Statistics. Since we only observe state values for two years in our sample, we assume all values for 2001–2006 are equal to 2007–2008 survey values. Experience levels from 2008 to 2010 are assumed to be the average of the 2007–2008 and 2011–2012 surveys, and experience levels from 2012 to 2016 are assumed to equal those from the 2011–2012 survey.

[15] As an alternative to the share of legislative seats held by Democrats, we also estimated specifications that included dummy variables regarding the Governor's party and if Democrats/Republicans had unified control of the legislature. None of these alternative political control variables were significant in any specification.

Table 2
Summary statistics and data sources.

Variable	Mean	StdDev	Min	Max
total normal cost ($000s per active member)	6.643	2.629	0.416	16.465
employer share of normal cost (%∗100)	43.931	18.371	0.000	100.000
average teacher salary ($000s)	43.781	9.687	26.423	74.173
average teacher experience (years)	13.973	1.277	10.800	17.000
citizen ideology	53.949	15.620	13.482	97.002
education share of public workers (%∗100)	41.418	4.731	24.736	53.192
electoral competitiveness lower house	1.343	3.067	0.000	25.141
electoral competitiveness upper house	1.867	5.845	0.000	44.114
fiscal capacity (% of GDP∗100)	99.857	5.589	76.578	115.059
general fund balance (% of revenue)	0.424	7.715	−50.538	43.467
Democratic share of legislature (%)	0.506	0.173	0.000	0.899
nonteacher contributions per capita ($)	0.083	0.162	0.000	1.449
per capita gdp ($000s)	46.949	11.121	24.456	83.317
plan discount rate (%)	0.079	0.004	0.067	0.088
plan funding level (%)	0.742	0.202	0.191	1.974
asset share in real estate (%)	0.058	0.043	0.000	0.175
right to work law	0.308	0.462	0.000	1.000
teacher contributions per capita ($)	0.104	0.209	0.000	2.110
Republican committee contributions ($ per capita)	0.002	0.021	0.000	0.431

The full sample includes 448 observations from 30 distinct state-administered teacher-only pension plans over the period from 2001 to 2016. Pension plan total normal cost, employer share of normal cost, assets invested in real estate, plan funding level, and plan discount rate are from Boston University's Public Plan Database. Teacher union contributions, non-teacher union contributions, and (out-of-state) Republican committee contributions are from the National Institute on Money in Politics. State own-source revenue and general revenue are from the Census Bureau. Per capita GDP is from the Bureau of Economic Analysis. Total taxable resources (used to construct fiscal capacity) are from the U.S. Treasury. The education sector share of state and local workers and average teacher salary are from the Census's Annual Survey of Public Employment. Average teacher experience is from the National Center for Education Statistics Schools and Staffing Surveys (SASS). Right-to-work states are from the National Bureau of Economic Research's Public Sector Collective Bargaining data set. Democratic share of the state's legislature is from the Book of the States. Citizen ideology is from Berry et al. (1998) and ranges from 0 (conservative) to 100 (liberal). Electoral competitiveness in state lower/upper houses is the inverse of the median Herfindahl-Hirschman index of candidate vote shares across all seats in the respective chamber. Election returns are from State Election Returns, 1967–2018 available at Harvard's Dataverse (https://doi.org/10.7910/DVN/3WZFK9). All dollar variables are in real terms and were deflated using the CPI (2016 = 100).

presented, respectively, in Tables 3 and 4. For each outcome variable, we estimate our equation by OLS and two-stage least squares (2SLS). The OLS estimates are labeled as column (0) in each Table. Columns (1A) and (1B) use the full sample of data, columns (2A) and (2B) include a dummy variable for California's 2005 and 2012 observations, and columns (3A) and (3B) omit California completely. Since the number of pension plans in our sample (30) also falls below the threshold where a cluster-robust estimation of standard errors is valid (see MacKinnon and Webb 2017), we also estimate p-values for each coefficient using the wild cluster restricted bootstrap procedure proposed by Davidson and MacKinnon (2010). These results are presented as columns (B) in Tables 3 and 4 In other words, the only difference between columns (1A) and (1B) are how the p-values are calculated. Every column labeled (A) shows the cluster-robust standard errors in parentheses below each coefficient and calculates p-values using those standard errors. Every column labeled (B) shows the bootstrapped p-values in brackets below each coefficient. As MacKinnon and Webb (2017) show, traditional clustered standard errors are too small (leading to over-rejections of the null hypothesis) when the number of clusters is small (below 42) or when the number of observations per cluster is grossly unbalanced. MacKinnon and Webb (2017) show that the wild cluster restricted bootstrapped p-values perform extremely well in generating the correct rejection frequencies.[16]

As shown in Tables 3 and 4, the Montiel Olea and Pflueger (2013) robust effective F statistic (labeled MP Effective-F) to assess the strength of our instrument varies between 43.7 and 47.9. Although the threshold at which instruments are considered "strong" seems to be a moving target, the latest guidance from Andrews et al. (2019) recommends using the Montiel Olea and Pflueger (2013) effective F statistic and a threshold value of 10 in models with a single endogenous regressor. Our instrument comfortably exceeds this threshold in every specification.

Across all 2SLS models, we find that both the absolute level of pension benefits accrued in a given year and the share of those benefits financed by the state are significantly higher in states with greater fiscal capacity to generate own-source tax revenue. In terms of total normal cost (or the level of benefits accrued per year), the results in Table 3 show that benefit levels are lower in states that maintain a larger general fund balance, a larger education sector, and have more competitive elections in their lower house. We

[16] See Roodman et al. (2019) for a detailed, step-by-step description of how the wild cluster restricted bootstrap is implemented. At a high level, the bootstrapped p-value for coefficient β_k is determined by first estimating the regression by two-stage least squares with the restriction that coefficient β_k equals zero. The residuals from this restricted regression are then resampled by cluster (pension plan), assigned to be negative or positive randomly using draws from a Rademacher distribution, and then used to generate bootstrapped values of the outcome variables. An unrestricted 2SLS regression is then re-estimated using the bootstrapped data and p-values are computed using cluster-robust errors. We performed 2000 replications for each regression and the bootstrapped p-values in Tables 3 and 4 are the fraction of the bootstrapped p-values that exceed the coefficient's standard cluster-robust p-value.

Table 3
Effects of contributions on total normal cost.

	Dependent variable:						
	total normal cost ($000s per active member)						
	(0) OLS	(1A) 2SLS	(1B) 2SLS	(2A) 2SLS	(2B) 2SLS	(3A) 2SLS	(3B) 2SLS
(Intercept)	13.762***	12.209**	12.209**	12.165**	12.165**	11.828**	11.828**
	(4.886)	(5.131)	[0.018]	(5.162)	[0.016]	(5.653)	[0.027]
per capita gdp	−0.037	−0.034	−0.034	−0.033	−0.033	−0.031	−0.031
	(0.044)	(0.042)	[0.486]	(0.042)	[0.461]	(0.043)	[0.528]
fiscal capacity	0.070**	0.071**	0.071*	0.072**	0.072	0.074**	0.074*
	(0.033)	(0.033)	[0.080]	(0.032)	[0.109]	(0.032)	[0.075]
general fund balance	−0.049***	−0.050***	−0.050***	−0.050***	−0.050***	−0.051***	−0.051***
	(0.007)	(0.007)	[0.000]	(0.007)	[0.000]	(0.007)	[0.000]
electoral competitiveness upper	0.024**	0.029**	0.029***	0.028***	0.028***	0.029***	0.029
	(0.010)	(0.012)	[0.000]	(0.010)	[0.004]	(0.011)	[0.312]
electoral competitiveness lower	−0.034*	−0.043**	−0.043*	−0.040**	−0.040*	−0.042**	−0.042
	(0.020)	(0.021)	[0.076]	(0.019)	[0.098]	(0.019)	[0.120]
citizen ideology	−0.014	−0.013	−0.013	−0.013	−0.013	−0.012	−0.012
	(0.010)	(0.010)	[0.196]	(0.010)	[0.198]	(0.010)	[0.238]
right to work law	−0.106	−0.161	−0.161	−0.191	−0.191	−0.159	−0.159
	(0.218)	(0.237)	[0.475]	(0.242)	[0.438]	(0.251)	[0.465]
asset share in real estate	−1.587	−1.312	−1.312	−1.206	−1.206	−1.332	−1.332
	(2.800)	(2.830)	[0.677]	(2.800)	[0.695]	(2.843)	[0.702]
plan discount rate	−20.469	−16.878	−16.878	−18.451	−18.451	−13.506	−13.506
	(34.799)	(34.770)	[0.660]	(34.671)	[0.641]	(32.555)	[0.688]
plan funding level	−3.889**	−3.927**	−3.927**	−3.839**	−3.839**	−3.689**	−3.689**
	(1.519)	(1.571)	[0.016]	(1.541)	[0.019]	(1.577)	[0.043]
Democratic share of legislature	0.499	0.647	0.647	0.553	0.553	0.723	0.723
	(0.770)	(0.750)	[0.382]	(0.754)	[0.491]	(1.087)	[0.516]
nonteacher union contributions per capita	−0.181	−0.754**	−0.754*	−0.460	−0.460	−0.511	−0.511
	(0.380)	(0.304)	[0.050]	(0.307)	[0.163]	(0.335)	[0.300]
education share of public workers	−0.061	−0.056	−0.056	−0.055	−0.055	−0.051	−0.051
	(0.042)	(0.043)	[0.178]	(0.043)	[0.218]	(0.045)	[0.254]
average teacher salary	0.023	0.029	0.029	0.025	0.025	0.024	0.024
	(0.030)	(0.030)	[0.367]	(0.029)	[0.373]	(0.032)	[0.420]
average teacher experience	−0.636*	−0.592*	−0.592	−0.584*	−0.584	−0.636*	−0.636
	(0.344)	(0.342)	[0.203]	(0.346)	[0.230]	(0.367)	[0.195]
California (2005 & 2012 = 1)				−0.953**	−0.953**		
				(0.397)	[0.049]		
teacher contributions per capita	0.134	0.791***	0.791**	0.815***	0.815***	0.859***	0.859***
	(0.204)	(0.253)	[0.038]	(0.253)	[0.001]	(0.257)	[0.006]
California included	yes	yes	yes	yes	yes	no	no
N	448	448	448	448	448	433	433
Year Fixed Effects	yes	yes	yes	yes	yes	yes	yes
Plan specific trend	yes	yes	yes	yes	yes	yes	yes
Pension Plan Fixed Effects	yes	yes	yes	yes	yes	yes	yes
Adj. R^2	0.947	0.946		0.946		0.939	
MP Effective-F			47.925		44.04		43.74

Terms in parentheses are standard errors clustered by pension plan. Terms in brackets are wild restricted clustered bootstrapped p-values based on Davidson and MacKinnon (2010). MP Effective-F is the Montiel Olea and Pflueger (2013) robust first stage F statistic. *** denotes significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

also find that benefit levels are inversely related to pension funding levels, and that teacher pension generosity is significantly lower in states where non-teacher union contributions are larger. This is consistent with the notion that public sector unions are competing for limited state resources. We also find that more competitive upper house elections are significantly correlated with higher pension normal costs. In terms of the employer share of normal cost (Table 4), we find that the state finances a significantly larger share of teacher retirement benefits in states with right-to-work laws and in states with a greater percentage of Democrats holding legislative seats. Specifically, our results show that a 10-percentage point increase in the share of seats held by Democrats correlates to the state paying almost 2 percentage points more of the retirement share of annually accrued benefits.

Turning our attention to teacher contributions, we find larger coefficient estimates in Tables 3 and 4 in the specifications that either partial out California's observations in 2005 and 2012 because of outlier concerns (Models 2A and 2B) or omit California completely (Models 3A and 3B). Our preferred specifications, which are Models 1A and 1B Tables 3 and 4, are also the most conservative estimates. The results indicate that union political contributions are a significant causal factor in explaining observed differences in pension generosity. Across Table 3 or 4, we also find that the estimated 2SLS coefficients for teacher contributions are roughly five times larger than the OLS coefficients. This suggests that the OLS coefficients suffered from negative bias, which is consistent with a simultaneity/reverse causality scenario in which unions increase their contributions either to boost low generosity

Table 4
Effects of contributions on employer share of normal cost.

	Dependent variable:						
	employer share normal cost (%∗100)						
	(0) OLS	(1A) 2SLS	(1B) 2SLS	(2A) 2SLS	(2B) 2SLS	(3A) 2SLS	(3B) 2SLS
(Intercept)	209.794***	194.080***	194.080***	193.780***	193.780***	193.087***	193.087***
	(51.278)	(50.921)	[0.000]	(50.912)	[0.000]	(55.036)	[0.000]
per capita gdp	−0.502**	−0.472*	−0.472**	−0.470*	−0.470	−0.449*	−0.449
	(0.244)	(0.243)	[0.040]	(0.245)	[0.152]	(0.259)	[0.191]
fiscal capacity	0.508**	0.514**	0.514**	0.523**	0.523**	0.558***	0.558***
	(0.215)	(0.216)	[0.037]	(0.213)	[0.045]	(0.209)	[0.000]
general fund balance	−0.176**	−0.182**	−0.182	−0.183**	−0.183*	−0.174**	−0.174
	(0.085)	(0.085)	[0.104]	(0.084)	[0.081]	(0.088)	[0.206]
electoral competitiveness upper	0.066	0.122	0.122	0.111	0.111	0.102	0.102
	(0.076)	(0.103)	[0.239]	(0.091)	[0.166]	(0.087)	[0.437]
electoral competitiveness lower	−0.157	−0.247	−0.247	−0.231	−0.231	−0.226	−0.226
	(0.125)	(0.169)	[0.294]	(0.150)	[0.298]	(0.145)	[0.405]
citizen ideology	−0.109	−0.093	−0.093	−0.093	−0.093	−0.093	−0.093
	(0.085)	(0.084)	[0.267]	(0.084)	[0.232]	(0.087)	[0.256]
right to work law	13.449***	12.893***	12.893**	12.693***	12.693***	12.506***	12.506
	(2.137)	(2.016)	[0.031]	(2.018)	[0.005]	(2.261)	[0.354]
asset share in real estate	6.836	9.622	9.622	10.331	10.331	2.632	2.632
	(25.485)	(26.824)	[0.680]	(27.280)	[0.692]	(26.208)	[0.917]
plan discount rate	−564.927**	−528.581**	−528.581	−539.165**	−539.165	−528.380***	−528.380**
	(219.399)	(217.108)	[0.136]	(218.956)	[0.131]	(194.084)	[0.018]
plan funding level	−22.195	−22.580	−22.580	−21.985	−21.985	−20.135	−20.135
	(20.500)	(20.958)	[0.319]	(20.963)	[0.320]	(21.442)	[0.401]
Democratic share of legislature	12.600*	14.104**	14.104*	13.472*	13.472**	10.081	10.081
	(6.970)	(6.718)	[0.082]	(6.874)	[0.024]	(10.410)	[0.324]
nonteacher union contributions per capita	−1.051	−6.849**	−6.849**	−4.868*	−4.868**	−3.533	−3.533
	(1.686)	(3.375)	[0.029]	(2.489)	[0.024]	(2.673)	[0.232]
education share of public workers	−0.728**	−0.680*	−0.680*	−0.672*	−0.672*	−0.600	−0.600
	(0.368)	(0.379)	[0.067]	(0.380)	[0.072]	(0.396)	[0.120]
average teacher salary	−0.383	−0.327	−0.327	−0.354	−0.354	−0.178	−0.178
	(0.354)	(0.341)	[0.330]	(0.352)	[0.335]	(0.385)	[0.670]
average teacher experience	−8.732**	−8.283**	−8.283**	−8.230**	−8.230**	−9.151**	−9.151***
	(3.637)	(3.606)	[0.024]	(3.640)	[0.035]	(3.705)	[0.007]
California (2005 & 2012 = 1)				−6.412	−6.412		
				(4.357)	[0.171]		
teacher contributions per capita	0.839	7.482**	7.482**	7.647**	7.647**	7.550**	7.550**
	(1.343)	(2.968)	[0.047]	(3.097)	[0.024]	(3.121)	[0.029]
California included	yes	yes	yes	yes	yes	no	no
N	448	448	448	448	448	433	433
Year Fixed Effects	yes	yes	yes	yes	yes	yes	yes
Plan specific trend	yes	yes	yes	yes	yes	yes	yes
Pension Plan Fixed Effects	yes	yes	yes	yes	yes	yes	yes
Adj. R^2	0.897	0.895		0.895		0.893	
MP Effective-F			47.925		44.04		43.74

Terms in parentheses are standard errors clustered by pension plan. Terms in brackets are wild restricted clustered bootstrapped p-values based on Davidson and MacKinnon (2010). MP Effective-F is the Montiel Olea and Pflueger (2013) robust first stage F statistic. *** denotes significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

levels or to limit reductions in plans with low generosity levels.[17]

In terms of the estimated coefficients, if per capita teachers' unions contributions rise by $0.01, our estimates from Table 3 imply that present value of pension benefits accrued per period increases by roughly $8 per active member. From Table 4, the same $0.01 increase in contributions raises the share of benefits financed by the state by 0.07 percentage points. In terms of elasticities, these results reveal that a 10% increase in union contributions leads to roughly a 0.20% increase in the share of benefits financed by the state. Across all our specifications more generally, the evidence is strong that teachers' unions are successful in expanding the generosity of their retirement along multiple margins with additional campaign contributions. The estimates may not be intuitive

[17] The credibility of our estimates depends on the validity of the out-of-state Republican contributions instrument. Because the exclusion restriction is inherently untestable, we also estimated our models using the synthetic instrumental variables strategy proposed by Lewbel (2012). In this approach, instruments are constructed from the data so identification comes from higher order moment conditions rather than from a traditional exclusion restriction. We construct a synthetic instrument using state GDP and continue to find that increases in teacher union campaign contributions lead to more generous pension benefits along both the total cost and employer share margins. This provides evidence that our findings are not an artifact of a single identification strategy. Moreover, when we combine the synthetic instrument with our external instrument, we fail to reject the null hypothesis of overidentification, suggesting that at least one of the instruments is uncorrelated with the unexplained variation in pension generosity. This is the strongest empirical evidence we can provide in support of the validity of the exclusion restriction. These additional robustness checks are shown in Appendix Tables A.1 (total normal cost) and A.2 (employer share of normal cost).

because of scaling issues and because of pension accounting more generally.

To understand the return a teachers' union receives from campaign contributions, it is useful to compare the dollar value of an increase in campaign contributions to the present value dollar amount of increased pension benefits that employers pay. First, the average state in our sample has 7.5 million people, so an increase in per capita union contributions of $0.01 translates to a change in *total* contributions of $75,000. To understand the return a teacher's union receives on campaign contributions, it is necessary to compute the dollar amount that employers contribute to pension benefits. Based on the regression results reported in Tables 3 and 4, an increase in union campaign contributions of $0.01 per capita (or a total change of $75,000) has two effects: It increases the total normal cost, *and* it increases the share of the total normal cost that employers pay. In other words, union campaign contributions increase the total present value amount of pension benefits AND also increase the amount employers pay. The average total normal cost (per active member) is $6643 and the average employer share is 43.93 percent. Therefore, the total amount employers pay is $2918. Based on the results in Table 3, an increase in union campaign contribution of $0.01 increases the present value of pension benefits by $8, which yields a normal cost increase to $6651 (from $6643). Based on the results in Table 4, an increase of $0.01 in union campaign contributions increases the employer's share by 0.07 percent to 44.0 percent from 43.93 percent. Therefore, following a $0.01 increase in union campaign contributions, the total amount paid by the employer becomes $2,926, which represents an $8 increase. Given that the average number of active members in a pension plan in our sample is 138,000, this represents a $1.1 million increase in the amount paid by employers in present value. In other words, a $75,000 increase in campaign contributions yields a $1.1 million increase in the present value of benefits paid by employers, representing more than a 1450 percent return.

Importantly, it is the combination of campaign contributions increasing both total normal cost and the employers' share that results in the large return. If, in contrast, the only effect of campaign contributions was to increase total normal cost by $8 from $6643 to $6651 (assuming the employer's share did not change) the employers' cost would increase by 43.93 percent of $8, or $3.50. Multiplying this amount by the 138,000 average active members results in a total increase in the amount paid by employers of $483,000. Alternatively, if the only effect campaign contributions had was to increase the share that employers pay (assuming the total normal cost did not change), employers' cost would increase by 0.07 percent of $6,643, or $4.65. Multiplying this amount by the 138,000 average active members results in a total increase in the amount employers are paying of $641,700. To reiterate: It is the combination of two effects that results in the $1.1 million increase in the amount paid by employers in response to $75,000 worth of union campaign contributions.

5. Conclusion

Even granting that an individual's small donation to a candidate's political campaign should be viewed as a consumption good rather than as an investment, Tullock's question about the lack of money in politics remains a good one. While the empirical evidence estimating the returns on contributions by political action committees and other interest groups is mixed, this essay indicates that for teachers' unions, at least, the return on political contributions is substantial. Examining teacher pensions is worthwhile for several reasons. First, public pensions in general represent a significant cost for state and local governments. In 2016, states and municipalities contributed more than $140 billion to state and locally administered pension plans. Next, while elements of compensation such as salary and health benefits are established through collective bargaining at the local level, pension benefits are set by the state legislature. Finally, teachers' unions are very active in state politics. A total of $3.7 billion was contributed to state-level campaigns in 2016 alone. Of that, more than $118 million was contributed by teachers' unions. Because a teachers' union was among the top 20 largest donors in 41 states and among the top three largest in five states, it is reasonable to consider the possibility that union decision-makers think of these donations as an investment. The current study is one of the few to examine the issue of returns to campaign contributions at the subnational level.

As Ansolabehere et al. (2003) note, two problems with estimating the return from campaign contributions are simultaneity and omitted variable bias. We employ conventional instrumental variables as well as synthetic instrumental variables to overcome the potential simultaneity between pension generosity and union contributions and between any unobserved factors that could be correlated with both. All of our instrumental variables comfortably exceed the threshold for what is considered a strong instrument. Finally, our results are robust to the alternative instruments/specifications. We use panel data from 2001 to 2016 for the 30 states that have pensions dedicated solely to teachers. We measure pension generosity by both total normal cost (present value of accrued pension benefits) and employers' share of normal cost and in so doing find that teachers' union campaign contributions positively relate to both measures of pension generosity. Overall, we find that teachers' union campaign contributions have a return of approximately 1500%, which is generally in line with return estimates in the literature that range from just over 100% to over 2500%. This study clearly establishes an empirical relationship between unions' political contributions and pension generosity. Seemingly, the next question is what factors, institutional or otherwise, explain the varied degree of political activism of teachers' unions from one state to another? Given our results, why would not *every* teachers' union engage strongly in political activity? Does the heterogeneity in state campaign finance laws come into play? What about other factors, including subtle variations in collective bargaining laws, trust in government more generally, or broad attitudes toward public education? Our results suggest that a more thorough investigation into teachers' unions effectiveness in shaping statewide policies would be fruitful.

Declaration of competing interest

None.

Table A.1
Total Normal Cost: IV with Lewbel (2012) Instruments

	Dependent variable:			
	total normal cost ($000s per active member)			
	(1C)	(1D)	(1E)	(1F)
	2SLS	2SLS	2SLS	2SLS
(Intercept)	12.151**	12.151**	12.158**	12.158**
	(5.139)	[0.011]	(5.126)	[0.016]
per capita gdp	−0.033	−0.033	−0.033	−0.033
	(0.042)	[0.483]	(0.042)	[0.467]
fiscal capacity	0.071**	0.071	0.071**	0.071
	(0.033)	[0.116]	(0.033)	[0.120]
general fund balance	−0.050***	−0.050***	−0.050***	−0.050***
	(0.007)	[0.000]	(0.007)	[0.000]
electoral competitiveness upper	0.030**	0.030**	0.030**	0.030*
	(0.012)	[0.026]	(0.012)	[0.075]
electoral competitiveness lower	−0.043**	−0.043	−0.043**	−0.043**
	(0.022)	[0.167]	(0.021)	[0.013]
citizen ideology	−0.013	−0.013	−0.013	−0.013
	(0.010)	[0.215]	(0.010)	[0.182]
right to work law	−0.163	−0.163	−0.163	−0.163
	(0.239)	[0.609]	(0.238)	[0.477]
asset share in real estate	−1.301	−1.301	−1.303	−1.303
	(2.826)	[0.673]	(2.826)	[0.629]
plan discount rate	−16.743	−16.743	−16.760	−16.760
	(34.648)	[0.629]	(34.655)	[0.673]
plan funding level	−3.928**	−3.928**	−3.928**	−3.928**
	(1.575)	[0.013]	(1.575)	[0.021]
Democratic share of legislature	0.653	0.653	0.652	0.652
	(0.757)	[0.387]	(0.756)	[0.373]
nonteacher union contributions per capita	−0.776*	−0.776	−0.773*	−0.773
	(0.453)	[0.186]	(0.418)	[0.180]
education share of public workers	−0.056	−0.056	−0.056	−0.056
	(0.043)	[0.194]	(0.043)	[0.199]
average teacher salary	0.029	0.029	0.029	0.029
	(0.030)	[0.320]	(0.030)	[0.317]
average teacher experience	−0.590*	−0.590	−0.590*	−0.590*
	(0.340)	[0.200]	(0.340)	[0.086]
teacher contributions per capita	0.815*	0.815	0.812*	0.812*
	(0.490)	[0.151]	(0.442)	[0.091]
N	448	448	448	448
Year Fixed Effects	yes	yes	yes	yes
Pension Plan Fixed Effects	yes	yes	yes	yes
Plan specific trend	yes	yes	yes	yes
Robust Sargan				0.003
Included instruments	L	L	Z,L	Z,L
MP Effective-F		10.463		8.727

These results differ from Table 3 by re-estimating Models (1A) and (1B) using a synthetic instrument following Lewbel (2012) in isolation (Models (1C) and (1D) above) and combining the synthetic instrument with our external instrument (Models (1E) and (1F) above). See Footnote 17 for more details. L denotes the synthetic per capita GDP instrument generated following Lewbel (2012). Z denotes the external out-of-state Republican contributions instrument. Terms in parentheses are standard errors clustered by pension plan. Terms in brackets are wild restricted clustered bootstrapped p-values based on Davidson and MacKinnon (2010). *** denotes significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level. MP Effective-F is the Montiel Olea and Pflueger (2013) robust first stage F statistic. Robust Sargan shows the p-value from Wooldridge, 2010)'s robust over-identifying restrictions test. California is included in all regressions.

Table A.2
Employer Share of Normal Cost: IV with Lewbel (2012) Instruments

	Dependent variable:			
	employer share normal cost (%∗100)			
	(1C)	(1D)	(1E)	(1F)
	2SLS	2SLS	2SLS	2SLS
(Intercept)	204.183***	204.183***	202.893***	202.893***
	(50.882)	[0.000]	(50.873)	[0.000]
per capita gdp	−0.492**	−0.492	−0.489**	−0.489
	(0.244)	[0.105]	(0.244)	[0.117]
fiscal capacity	0.510**	0.510**	0.510**	0.510***
	(0.215)	[0.045]	(0.215)	[0.008]
general fund balance	−0.178**	−0.178**	−0.179**	−0.179
	(0.085)	[0.033]	(0.085)	[0.155]
electoral competitiveness upper	0.086	0.086	0.091	0.091
	(0.081)	[0.362]	(0.083)	[0.458]
electoral competitiveness lower	−0.189	−0.189*	−0.197	−0.197
	(0.133)	[0.094]	(0.135)	[0.409]
citizen ideology	−0.103	−0.103	−0.102	−0.102
	(0.084)	[0.223]	(0.084)	[0.224]
right to work law	13.250***	13.250	13.205***	13.205
	(2.046)	[0.300]	(2.038)	[0.267]
asset share in real estate	7.831	7.831	8.060	8.060
	(25.643)	[0.735]	(25.729)	[0.725]
plan discount rate	−551.948**	−551.948	−548.965**	−548.965**
	(219.251)	[0.111]	(218.649)	[0.048]
plan funding level	−22.332	−22.332	−22.364	−22.364
	(20.678)	[0.299]	(20.712)	[0.304]
Democratic share of legislature	13.137*	13.137	13.261*	13.261
	(6.975)	[0.130]	(6.939)	[0.108]
nonteacher union contributions per capita	−3.121*	−3.121**	−3.597**	−3.597*
	(1.724)	[0.035]	(1.750)	[0.071]
education share of public workers	−0.711*	−0.711*	−0.707*	−0.707**
	(0.370)	[0.052]	(0.372)	[0.037]
average teacher salary	−0.363	−0.363	−0.358	−0.358
	(0.349)	[0.316]	(0.348)	[0.325]
average teacher experience	−8.571**	−8.571**	−8.535**	−8.535*
	(3.601)	[0.042]	(3.601)	[0.068]
teacher contributions per capita	3.211**	3.211**	3.756***	3.756**
	(1.569)	[0.026]	(1.399)	[0.024]
N	448	448	448	448
Year Fixed Effects	yes	yes	yes	yes
Pension Plan Fixed Effects	yes	yes	yes	yes
Plan specific trend	yes	yes	yes	yes
Robust Sargan				1.422
Included instruments	L	L	Z,L	Z,L
MP Effective-F		10.463		8.727

These results differ from Table 4 by re-estimating Models (1A) and (1B) using a synthetic instrument following Lewbel (2012) in isolation (Models (1C) and (1D) above) and combining the synthetic instrument with our external instrument (Models (1E) and (1F) above). See Footnote 17 for more details. L denotes the synthetic per capita GDP instrument generated following Lewbel (2012). Z denotes the Republican committee contributions exogenous instrument. Terms in parentheses are standard errors clustered by pension plan. Terms in brackets are wild restricted clustered bootstrapped p-values based on Davidson and MacKinnon (2010). *** denotes significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level. MP Effective-F is the Montiel Olea and Pflueger (2013) robust first stage F statistic. Robust Sargan shows the p-value from Wooldridge, 2010)'s robust over-identifying restrictions test. California is included in all regressions.

Data availability

Data will be made available on request.

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