Abstract: Many experts argue that U.S. local governments are experiencing dramatic increases in their pension expenditures and that pension spending is crowding out government services. Others maintain that serious pension problems are limited to a few governments. This issue is important to both political scientists and policy practitioners, but no existing studies—nor the datasets they rely on—allow evaluation of the extent to which local pension expenditures are rising or whether pensions are affecting services. This paper analyzes a new dataset of the annual pension expenditures of over 400 municipalities and counties from 2005 to 2016. I find that pension expenditures have risen almost everywhere, but there is significant variation in that growth. On average, local governments are not responding to rising pension spending by increasing revenue. They are instead shrinking their workforces, and that pattern is more pronounced in places with public-sector collective bargaining and tax and expenditure limits.
Over the last few decades, state and local policymakers have enacted changes to make
government employees’ pension benefits more generous, and they have also consistently
underfunded those pensions—setting aside far too little money to pay for them. As a result,
public employee pensions in the United States are underfunded by somewhere between $1.28
trillion and $4.2 trillion, depending on the estimates used (Board of Governors of the Federal
Reserve System 2018; Pew Charitable Trusts 2019). Because public pension benefits are legally
guaranteed, someone has to make up for these shortfalls, and many experts claim that state and
local governments are feeling the consequences in the form of rapidly rising pension
expenditures. As the New York Times has put it, “many Americans may be forced to rethink what
government means at the state and local level” because of rising pension costs (Walsh 2011).

Based on a few state and local governments that have received substantial media
attention, it is clear that pension costs have risen dramatically in some places—and that those
places have struggled to cope with the fiscal pressure. In cities like San Jose, San Diego,
Chicago, Detroit, and Stockton, skyrocketing pension costs have forced government officials to
make painful decisions about future pension benefit levels, government service provision, and
taxes. Some say that the events unfolding in these cities are part of a larger and permanent
trend—one affecting state and local governments almost everywhere (e.g., Kiewiet and
McCubbins 2014). Others argue that claims of widespread pension-induced fiscal crisis are
exaggerated and that serious pension problems are limited to a few cities (Munnell et al. 2013).

Given the state of the literature, it is impossible to know which of these conclusions is
closer to the mark. There is research on public-sector retirement policies (e.g., Anzia and Moe
2017; DiSalvo and Kucik 2017; Kiewiet 2010; Munnell 2012), but none of those studies evaluate
how much local governments’ pension expenditures have risen or how local governments are
responding. There is also a literature on U.S. local political economy (e.g., Alesina et al. 1999; Hopkins 2009; Rugh and Tounstine 2011), but it has barely engaged in questions about the causes and consequences of legacy costs like pensions and retiree healthcare—even though they are likely an important component of spending in every local government.

Answering questions about pension spending growth and local governments’ responses is important for a wide range of constituencies, including policymakers, policy practitioners, and citizens more broadly. Debates about public pensions tend to focus on quantities like unfunded liabilities and actuarial assumptions, which are technical, debatable, and hard to understand. In contrast, the questions I pose here are simple. My focus is on what is happening in local governments and how that is affecting the citizens they serve—a focus that stands to advance the national conversation about pensions in a way that is easier to understand.

These questions are also of fundamental importance to scholars of American government because they are questions about what local government is, what it does, and how that may be changing as a result of legacy costs. The nation’s nearly 90,000 local governments spend roughly a quarter of all public money in the United States, provide essential services such as public education and public safety, and are responsible for local infrastructure like sewers and roads. The local political economy literature rightfully prioritizes these as important outcomes to be explained, and in doing so, it emphasizes the role of local-level factors like political institutions, partisanship, ideology, and race (e.g., Alesina et al. 1999; de Benedictis-Kessner and Warshaw 2016; Gerber and Hopkins 2011; Tausanovitch and Warshaw 2014; Tounstine 2018). Yet when it comes to pension expenditures, local officials have only limited control; their pension costs are shaped by local and state political decisions—many of which take time to have their full impact.
Studying pensions in local government therefore calls for a change to the standard setup—and a focus on how local officials wrestle with and respond to changes in costs beyond their control.

This paper begins to answer these questions through analysis of a new dataset of the annual pension expenditures of over 400 municipal and county governments from 2005 to 2016, which I hand-collected from the cities’ and counties’ annual financial statements. This dataset is unlike any that existed before because it tracks actual local government pension expenditures over time, not just in the largest cities or in the cities with the biggest problems, but instead in a large, diverse set of cities and counties across the country. With these new data, we can see for the first time how cities’ and counties’ pension expenditures have changed over this period. In addition, by connecting these local pension expenditure data with U.S. Census data on local government employment and finances, I evaluate whether growing pension expenditures are associated with increased revenue, employment reductions, or cuts to non-pension spending.

I find that between 2005 and 2016, city and county pension expenditures rose in real terms almost everywhere—in total, per employee, and as a share of general revenue—but also that there was substantial variation in the extent of that growth. In an analysis of within-local government change over time, I find that larger increases in pension contributions are not associated with larger increases in revenue. Instead, they are associated with greater reductions in local government employment. This employment effect does not vary with citizen ideology or partisanship, but it is more pronounced for local governments with public-sector collective bargaining and more constraining tax and expenditure limits. Thus, the picture that emerges is one of rising local pension spending and the crowding out of government services—but with variation in those changes depending on the local political context.
Background and Literature

Approximately 14 million people work full-time for U.S. state and local government, and almost all of them are eligible for a traditional pension. This means that government employees receive a defined benefit in retirement for as long as they live, equal to a fraction of their final average salary times the number of years they worked for the government. Most state and local employees are enrolled in large, state-operated pension plans such as CalPERS in California and OPERS in Ohio, but many local governments operate their own plans. In principle, the model for funding pensions is straightforward: they are supposed to be prefunded, with government employers and employees setting aside funds to pay for the retirement benefits earned each year.

Today, however, most state and local pension funds do not have sufficient assets to cover the retirement benefits that have been promised. Collectively, the nation’s public pensions are underfunded by somewhere between $1.28 and $4.2 trillion—estimates that depend on the assumptions used to value liabilities and assets (Board of Governors of the Federal Reserve System 2018; Pew Charitable Trusts 2019).

A number of state and local government decisions have contributed to this shortfall. First, over the years officials have made pension benefits more generous and thus more expensive (Anzia and Moe 2017; DiSalvo 2015), such as by increasing the benefit formula’s multiplier or reducing the retirement age. These changes have had long-lasting effects, because in many states, pension benefits can only be reduced for future government hires.

State and local governments have also consistently underfunded their pensions, setting aside far too little money to pay for the benefits they have promised. Many different kinds of decisions and events have contributed to the underfunding, including strategically-chosen actuarial assumptions that make pension liabilities look smaller than they actually are (Novy-
Marx and Rauh 2011), failure to pay the amounts supposedly required for full funding (Anzia and Moe 2019), politically-motivated investment decisions (Andonov et al. 2018), and the decline in asset values brought by the Great Recession. Regardless of how underfunded pensions are, however, the benefits are legally guaranteed, and someone has to make up for the shortfalls.

There is good reason to expect these trends are affecting local government budgets, but the existing literature has done little to study what local governments are experiencing or how they have responded. Research on public pensions has focused on outcomes related to large state and local pension plans (e.g., Mitchell and Smith 1994; Thom 2013). One line of work attempts to explain variation in plans’ funding ratios and investment performance (e.g., Andonov et al. 2018). Another estimates what public pension liabilities are actually worth given different actuarial assumptions (e.g., Novy-Marx and Rauh 2011). Plan-level outcomes presumably do have effects on the local governments that participate in those plans, but so far the research literature has not directly studied those effects at the local government level.

The likely reason is that there aren’t any readily available data on pension costs in local government, except for local governments that operate their own pension plans (see, e.g., Dippel 2019). Nearly all of the aforementioned empirical work relies on the Public Plans Database developed by Boston College’s Center for Retirement Research, which documents each state and large local plan’s funded ratio, actuarial assumptions, required contributions, and more. Yet these plan-level data do not tell us about the pension expenditures of particular governments, most of which contribute to multiple pension plans—typically at least one state-operated plan and often one or more locally-administered plans. The problem is therefore a mismatch between the unit of analysis in available datasets—the pension plan—and the unit of analysis needed to study what local governments are experiencing—which is the local government.
Because of this, we do not actually know how rapid or pervasive local pension cost increases have been so as to be able to assess how governments are responding. Some scholars argue that increases in pension costs are widespread and that local governments throughout the country are facing difficult budgetary choices as a result, but they rely on state- or plan-level data or examples from a few cities to draw that conclusion (DiSalvo 2015; Erie, Kogan, and Mackenzie 2011; Kiewiet and McCubbins 2014). Others argue that the experiences of cities like New York and San Diego are not typical of other local governments and that most places are not experiencing such fiscal stress (e.g., Munnell et al. 2013). Without data on what local governments contribute toward their pensions, we cannot know which is closer to the mark.

The U.S. local political economy literature would also seem to be a natural place to look for insights about how local governments have responded to pension cost changes, yet it has paid little attention to public pensions, in spite of their potential significance as a component of local spending and a driver of local fiscal decisions. Data scarcity is one likely reason for this. Another is an (often implicit) assumption in this literature that local officials have control over fiscal matters. Most studies in this literature examine the effects of local political institutions, officials’ party affiliations, citizens’ ideology, and demographics on local public spending and service provision (e.g., Alesina et al. 1999; de Benedictis-Kessner and Warshaw 2016; Tausanovitch and Warshaw 2014; Trounstine 2018). For local spending to be affected by those local factors, local policymakers must have some control over it (Gerber and Hopkins 2011). That assumption is

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1 Dippel (2019) analyzes U.S. Census data on locally-administered pension plans, but because most local governments contribute to state-operated plans (often in addition to local plans), those data do not capture the full amounts local governments contribute toward retirement benefits.
entirely appropriate for many studies of local politics. But it is not entirely appropriate if the focus is on local public pension costs.

When it comes to their pension expenditures, local officials usually do not have full or direct control. Instead, they are heavily constrained by both the decisions of state policymakers and choices made in the past by policymakers at the state and local levels. The salient questions when it comes to local pension costs, then, are how local governments wrestle with and respond to changes in those costs—and how those responses are conditioned by the political environment. These questions are structurally similar to those that ask how city fiscal policies are shaped by state institutions (e.g., Sapotichne et al. 2015; Shi et al. 2018) or how governments respond to fiscal shocks (e.g., Poterba 1995), but those literatures in political economy and public administration barely investigate questions about local public pensions.

Data

To evaluate how local governments’ pension spending has changed over time and how governments have responded, I assembled a new dataset. My goal was to collect several recent years of the pension contributions of a diverse set of local governments across the United States—and a set of local governments for which I have data on local fiscal and employment outcomes. There is no central repository for such information, so I set out to collect a large number of local governments’ comprehensive annual financial reports (CAFRs), which detail what the governments contributed to each of their employee retirement plans in each year.

While CAFRs are the only reliable source of information on local governments’ pension contributions, it can be difficult to locate them and sometimes costly to acquire them—especially for years in the more distant past. Once the CAFRs are in hand, moreover, it takes time to locate the relevant information and interpret it, first because most CAFRs are hundreds of pages long,
and second because local governments are not always clear and consistent in the way they report their pension contributions. Collecting and reading the CAFRs of thousands of local governments for several decades would therefore have been prohibitively costly.

I therefore selected 236 municipal governments and 239 county governments from those that appear in the U.S. Census’s Survey of Governments Finance and Employment files for most years between 2005 and 2016. I then attempted to collect CAFRs for each of those governments for that same twelve-year period—a period that spans years before, during, and after the Great Recession. Most governments had at least some CAFRs on their websites, typically for recent years. When CAFRs were not available online, I requested the documents from the local governments, filing public information requests where necessary. I was able to obtain at least some years’ CAFRs for 460 local governments, including 232 municipalities and 228 counties.

The most important piece of information I drew from the CAFRs was the amount the government contributed to each of its employee retirement plans in that year. I included contributions to defined contribution (DC) plans as well as defined benefit (DB) plans, although DC plans are rare and typically make up a small share of total contributions. A small number of governments also fund other post-employment benefits (OPEB) from their pension fund.

2 I first defined eight strata based on local government population, with the first stratum being local governments with fewer than 10,000 residents and the last being those with more than 1 million residents. I then used random sampling with replacement to draw local governments from each stratum, weighting by population within strata. See the online appendix for details.

3 I provide a detailed account of the data collection and coding in the online appendix.
contributions. I subtracted out funds going to OPEB whenever possible, but for a small number
of plans, the pension contribution amounts include some OPEB expenditures.

Three other features of the data collection are worth highlighting. First, most CAFRs did
not clearly and consistently report whether there were employer-paid member contributions
(EPMC) or, if there were, how much. Therefore, the retirement contributions discussed below do
not include EPMC. They also do not include contributions the local governments made using
revenue from pension obligation bonds (POBs) or any interest paid on those bonds, even though
both can be substantial. Third, the dataset tracks what governments actually paid toward
retirement benefits—not what they should be paying. Given that my focus is on whether pension
expenditures have risen over time and how that is affecting local government, the appropriate
measure is what local governments are actually spending on pensions.

For the analysis to follow, I summed the retirement expenditures for all plans in each
city- and county-year.\(^4\) In total, the dataset has 5,085 annual pension expenditure observations
from 442 unique governments,\(^5\) spanning all 50 states plus Washington, DC. For 375 local
governments, the dataset includes pension expenditure information for all twelve years from
2005 to 2016, and for the remaining 67, it includes pension expenditures for some.

The cities and counties in the dataset should not be viewed as a representative sample of
cities and counties in the United States, but the goal of this analysis is to evaluate whether

\(^4\) I excluded plans that were inconsistently reported in the CAFRs year to year. Nearly all such
plans were small relative to the governments’ other plans. See the online appendix for details.

\(^5\) The CAFRs for 13 counties and 5 municipalities did not have the requisite information on
retirement plans to be included. See the online appendix for details.
changes in local pension spending within cities and counties are associated with changes in local fiscal and employment outcomes. Because this dataset tracks pension contributions within 442 local governments over time and links those annual pension data to Census finance and employment data, it is uniquely suited to the task.

**Change in Local Pension Expenditures, 2005-2016**

I begin with a descriptive analysis of how pension contributions have changed over time in the cities and counties in the dataset. 6 I adjust each year’s total pension expenditures for inflation (to 2016 dollars) and calculate two additional variables for each local government and year: total pension expenditures as a share of general revenue, and total pension expenditures per full-time equivalent (FTE) employee. 7 Both variables are of interest, but the second is a clearer measure of pension-related fiscal pressure, because a local government’s pension contributions are partially a function of how many employees it has: if a city hires more employees, its total pension contributions should increase because it is contributing on behalf of more people. Thus, pension expenditures as a share of general revenue could be higher in some places just because they have more employees, and that ratio could be increasing within a government just because it is expanding its workforce. Pension contributions per employee, by contrast, takes into account the size of the workforce—and should be higher in governments and years where pension benefits are more generous or where the government is making up for larger funding shortfalls.

I first calculate percent growth in total pension contributions from 2005 to 2016 for the cities and counties for which I have comparable data for both years. The distribution is shown in

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6 In the online appendix, I analyze variation in pension contributions across cities and counties.

7 Data on revenue and FTE employment come from the U.S. Census. See the online appendix.
The number is positive for 88% of cities and counties, and the median change is 56%. Particularly notable is the long right tail of the distribution. In 26% of the cities and counties, for example, pension spending more than doubled in twelve years.

The first figure only tells us so much, however, because rising pension spending could be a sign of a growing budget or public-sector workforce. In the top-right panel, therefore, I present the distribution of the change in pension expenditures as a proportion of general revenue from 2005 to 2016. It shows that pensions have grown as a share of revenue in 75% of the cities and counties, with a median change of 0.008 (or 0.8 percentage points). More notable, again, is the right tail: the top 25% of the cities and counties saw pension expenditures consume an additional 2.1% of general revenue or more, and the top 10% had pensions absorb an additional 3.7%.
In the bottom two panels, I show the within-government change in pension expenditures per local government employee, first for 2005 to 2016 (which features fewer governments due to missing employment data for 2005), and then on the right for 2007 to 2016. Both show that the vast majority of cities and counties have seen increases in pension expenditures per employee. The median within-government change from 2005 to 2016 was $1,419 per employee, and in 25% of the cities and counties, per-employee pension expenditures increased by $3,542 or more.

Regardless of how it is measured, then, most cities and counties have experienced growth in their pension contributions, but there is variation in the extent of that growth. Given that pension spending has increased in most local governments—in some places substantially so—an important next step is to analyze how local governments are responding to those changes.

How Is Pension Spending Affecting Local Government?

Local governments might respond to pension cost increases in different ways. Some might increase revenue, some might decrease spending, and some might do both. My approach is to evaluate whether there are discernable trends in cities’ and counties’ responses—and any clear links between those trends and changes in local pension spending. In particular, I focus on whether larger pension spending increases are associated with larger increases in revenue, decreases in employment, or decreases in spending on items other than retirement benefits.

What should our expectations be? While there are no existing studies of how local governments respond to growth in pension costs, some insights and findings from the political

8 The online appendix evaluates local government characteristics associated with greater growth.

9 Some local governments can also issue POBs. In this dataset, 38 cities and counties had POBs, but only 13 issued them during the study period—too few to carry out an analysis.
economy literature suggest that responses will tilt more toward employment and spending reductions than revenue increases. First, a long line of public opinion research shows that most Americans do not like paying taxes and think their own taxes are too high (e.g., MacManus 1995; Page and Shapiro 1992), which makes raising revenue politically difficult. Even if taxes are increased to fund popular government services, most voters do not make a direct connection between the services they receive and the taxes they pay (Beck, Rainey, and Traut 1990; Sears and Citrin 1982). Raising revenue might be even harder if the purpose is to fund pensions. In many places, pension spending has gone up not to pay for more services in the present but rather to make up for funding shortfalls—and thus to pay for services provided in the past.

Decreasing public employment and expenditures might therefore be a relatively more appealing option. Incremental reductions in spending and service provision might be less likely to be noticed by citizens and less likely to be attributed to the decisions of local elected officials (Arnold 1990; Wilson 1995). Moreover, local officials looking for cost-savings have strong reasons to focus on employment levels and employee costs in particular: Local government service provision is heavily dependent on the employees providing the services, and a large share of local spending goes toward employee compensation. Also, a local government’s pension contributions are in part a function of its employment levels. Therefore, officials confronting rising pension expenditures might find that reducing employment is an attractive option.

Just as states’ responses to fiscal shocks vary with political conditions (Poterba 1992), however, local government responses to pension cost increases might reasonably vary with the local political economy. Three local political conditions stand out as most theoretically relevant: the presence of collective bargaining and strength of unions, the degree to which local governments are constrained by TELs, and the partisan or ideological leanings of local residents.
First, consider collective bargaining and union strength. Local government employees and their unions are some of the most active and best organized groups in local politics in many states (DiSalvo 2015; Moe 2011), and in general, better organized and more politically active employee groups should be in a better position to secure favorable policies. Public-sector unions in particular have collective bargaining in many places, which means that local government employers are required to come to legal agreement with them on matters related to compensation and working conditions. There is therefore strong reason to expect collective bargaining and union strength to shape how local officials respond to rising pension contributions.

However, the direction of any such effect is theoretically ambiguous. One possibility is that well-organized, politically active groups of employees are better able to stave off employment reductions and persuade officials to raise revenues instead. But if raising revenue is too politically difficult, local officials under pressure to limit spending might be more likely to reduce employment levels in places with collective bargaining and stronger unions—because they may have fewer politically workable levers for keeping costs down in other ways. For example, local officials in cities with collective bargaining and strong unions might be less able to limit employee salary increases or reduce other fringe benefits like OPEB,\(^\text{10}\) because doing so could generate significant political pushback from unions, possibly leading to a strike. Thus, while there are reasons to expect the local union and bargaining context to influence local responses to rising pension costs, how exactly this works is an empirical question.

\(^{10}\) As Anzia and Moe (2015) argue, unions favor greater employment, but they also favor higher per-employee compensation, and there is a tradeoff between the two.
Second, local governments vary in the extent to which they are constrained by TELs. These fiscal institutions, imposed by the states, may well limit local officials’ options for responding to rising pension costs. Empirical studies on the effects of TELs find that they make it harder for local officials to raise revenue and thus work to limit local spending (e.g., Poterba and Rueben 1995; Dye, McGuire, and McMillen 2005). Thus, we might expect cities and counties more heavily constrained by state TELs to be less likely to respond to pension cost increases by increasing revenue and more likely to reduce employment and spending.

Third, the American politics literature in general and recent work in the local politics literature in particular place heavy emphasis on the role of ideology and partisanship in shaping policy, particularly spending. Some studies find evidence that the partisanship of local officials matters for local policy (e.g., de Benedictis-Kessner and Warshaw 2016, forthcoming; Gerber 2013), and other work finds an association between citizen ideology or partisanship and local spending (Einstein and Kogan 2016; Tausanovitch and Warshaw 2014). Extending these findings to local public pensions, one might predict that cities and counties with more liberal or Democratic residents should be more likely to increase revenue (and less likely to decrease employment or spending) in response to pension cost increases. Yet other work on local politics questions whether local ideology or partisanship shape local policy (e.g., Oliver 2012, Thompson 2019), and Anzia and Moe (2017, 2019) show that state-level decisions about public pensions tend not to divide politicians along party lines. Thus, politicians’ responses to rising pension costs may not be associated with ideology or partisanship. This, too, is an empirical question.

I first explore whether cities and counties tend to cope with rising pension spending by increasing revenue. I model two dependent variables, both from the U.S. Census Survey of Governments Finance files for 2005 to 2016: the log of total general revenue per capita, and the
log of total own-source general revenue per capita, adjusted to 2016 dollars.\textsuperscript{11} While general revenue better captures the total revenue cities and counties have at their disposal, own-source general revenue may more clearly reflect local government actions to increase revenue in response to rising pension spending. Throughout, the main independent variable of interest is logged pension expenditures per full-time equivalent employee.

Because I am focused on how cities and counties might be changing their general revenue in response to rising pension spending, I model the general revenue variables with OLS and fixed effects for each city and county, which partial out the influence of any time-constant characteristics of the local governments that lead them to have higher or lower general revenue and pension expenditures. I also include year fixed effects because there are likely secular trends that affect pension spending and general revenue in all cities. During the Great Recession, for example, required pension expenditures increased because of the decline in fund asset values, and at the same time, government revenues dropped. Including year fixed effects allows me to test whether greater-than-average increases in pension expenditures are associated with greater-than-average increases in general revenue.

I lag the pension expenditure variable by one year so that I am estimating the relationship between pension expenditures in year $t-1$ and general revenue per capita in year $t$. This models government decision-making in a realistic way; presumably officials make decisions about next year’s budget based on what they observe of this year’s. Finally, because there might be changes in the local jurisdiction that affect general revenue and may be correlated with pension cost

\textsuperscript{11} Unfortunately, I know of no existing data on local government decisions about tax rates, assessments, or charges that cover all of the governments in this dataset.
increases, I include a series of time-varying local demographic variables: log per capita income, log population, percent urban, percent homeowners, and percent black, Asian, and Hispanic.\textsuperscript{12}

The estimates from this model are shown in column 1 (general revenue per capita) and column 2 (own-source general revenue per capita) of Table 1. In both, the coefficients on pension expenditures per employee are close to zero and statistically insignificant. Certain other variables are related to growth in general revenue per capita, such as per capita income and population, but there is no evidence of a link between rising pension spending and increasing general revenue. In cities and counties that experience greater-than-average increases in pension spending per employee, the next year does not bring greater-than-average increases in revenue.

Next I test whether rising pension expenditures have a negative relationship with local government employment. Modeling the relationship between pension spending and local employment is less straightforward than it might seem, because the independent variable of interest—pension expenditures per employee—itself has employment in the denominator. Lagging the pension cost variable by one year (as I did for the models of general revenue) helps to address the mechanical endogeneity of pension spending and employment in the same year—and again, it is a plausible model of government decision-making.

The dependent variables come from the U.S. Census Survey of Governments Employment files, which have information on full- and part-time government employment and

\textsuperscript{12} These variables are from the U.S. Census Bureau. I lose a few observations for a few reasons: because pension costs for some city- and county-years are not comparable to other years within the same government, because of clear errors in the finance and employment data, or because of extreme changes in pension expenditures for a single year. See online appendix for details.
payroll for 92% of the city- and county-years in the pensions dataset. Large cities have more employees than small cities, so I divide each of the employment variables (detailed below) by population in thousands and take the log. I model them using the same approach as in columns 1 and 2, with local government and year fixed effects and time-varying local demographics.

Table 1: Local government pension expenditures, revenue, and employment

<table>
<thead>
<tr>
<th></th>
<th>General revenue (1)</th>
<th>Own-source revenue (2)</th>
<th>FTE employment (3)</th>
<th>Full-time employment (4)</th>
<th>Part-time employment (5)</th>
<th>Capital outlays (6)</th>
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<tbody>
<tr>
<td>Ln(pension exp.)</td>
<td>-0.001</td>
<td>0.008</td>
<td>-0.066</td>
<td>-0.068</td>
<td>-0.009</td>
<td>-0.015</td>
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<tr>
<td></td>
<td>(0.022)</td>
<td>(0.019)</td>
<td>(0.014)</td>
<td>(0.013)</td>
<td>(0.039)</td>
<td>(0.095)</td>
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<tr>
<td>Ln(income per capita)</td>
<td>0.72</td>
<td>0.706</td>
<td>0.328</td>
<td>0.355</td>
<td>0.074</td>
<td>1.662</td>
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<td></td>
<td>(0.196)</td>
<td>(0.187)</td>
<td>(0.091)</td>
<td>(0.105)</td>
<td>(0.258)</td>
<td>(0.798)</td>
</tr>
<tr>
<td>Ln(population)</td>
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<td>-0.63</td>
<td>-0.824</td>
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<td></td>
<td>(0.140)</td>
<td>(0.148)</td>
<td>(0.105)</td>
<td>(0.107)</td>
<td>(0.177)</td>
<td>(0.525)</td>
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<td>% Urban</td>
<td>0.183</td>
<td>0.435</td>
<td>0.431</td>
<td>0.472</td>
<td>0.949</td>
<td>-1.803</td>
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<td></td>
<td>(0.402)</td>
<td>(0.400)</td>
<td>(0.172)</td>
<td>(0.179)</td>
<td>(0.791)</td>
<td>(1.259)</td>
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<td>% Homeowner</td>
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<td>0.002</td>
<td>0.012</td>
<td>0.021</td>
<td>0.217</td>
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<td></td>
<td>(0.233)</td>
<td>(0.274)</td>
<td>(0.137)</td>
<td>(0.144)</td>
<td>(0.451)</td>
<td>(1.477)</td>
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<td>% Black</td>
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<td>1.168</td>
<td>0.687</td>
<td>0.623</td>
<td>2.22</td>
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<td>(0.790)</td>
<td>(0.746)</td>
<td>(0.388)</td>
<td>(0.353)</td>
<td>(1.293)</td>
<td>(3.521)</td>
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<td>% Asian</td>
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<td>-0.037</td>
<td>0.081</td>
<td>-0.024</td>
<td>-0.32</td>
<td>-2.014</td>
</tr>
<tr>
<td></td>
<td>(0.521)</td>
<td>(0.501)</td>
<td>(0.576)</td>
<td>(0.575)</td>
<td>(1.080)</td>
<td>(2.721)</td>
</tr>
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<td>% Hispanic</td>
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<td>-0.16</td>
<td>0.542</td>
<td>2.01</td>
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<td></td>
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<td>(0.338)</td>
<td>(0.342)</td>
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<td>(1.890)</td>
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<td>0.99</td>
<td>0.99</td>
<td>0.94</td>
<td>0.75</td>
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<td>4,075</td>
<td>4,075</td>
<td>4,041</td>
<td>4,066</td>
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Notes: Standard errors clustered by state in parentheses. All models include local government and year fixed effects. Dependent variables are logged, per capita.

In column 3 of Table 1, I present the results of a model of logged full-time equivalent employment per thousand residents. The coefficient estimates suggest that rising pension expenditures have indeed led to an average reduction in public-sector employment: a 10% increase in pension expenditures per employee is associated with a 0.66% decrease in employment the following year. To get a sense of the magnitude of this effect, consider that the
The median increase in pension expenditures per employee from 2007 to 2016 was $1,203, and that is approximately a 25% increase from the 2007 median pension expenditure per employee ($4,901, see online appendix). The coefficient estimate in column 3 of Table 1 suggests that a 25% increase in pension expenditures is associated with a 1.63% decrease in local employment. Given that the median local government in this dataset had 10.13 full-time equivalent employees per thousand residents as of 2007, a 1.63% decrease represents the loss of 17 employees for a city or county of 100,000 people. Naturally, the model predicts larger employment losses for the cities and counties that experienced larger growth in pension expenditures.

If local governments are in fact reducing employment in response to rising pension contributions, there is good reason to expect the cuts will be greater among full-time employees than part-time local employees, because part-time employees often are not eligible for pensions. I explore this in columns 4 and 5 of Table 1. In column 4, the dependent variable is the log of the local government’s full-time employees per thousand residents. The coefficient on log per-employee pension expenditures is negative and statistically significant, suggesting that a 10% increase in pension expenditures is associated with a 0.68% reduction in full-time employment. When I instead model part-time employees per thousand residents, in column 5, the coefficient on pension expenditures is statistically insignificant. Thus, growing pension expenditures are associated with declining numbers of full-time employees—not part-time employees.

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13 The number of observations is smaller because some localities have no part-time employees.

14 Local governments could also reduce hours worked by part-time employees, but when I model part-time employee payroll, which reflects hours, I find no significant relationship with pensions.
Finally, in column 6, I test for a link between rising pension expenditures and capital outlays. This is an important dimension of local government activity because it relates to its investments in construction and the purchase of land, equipment, and existing buildings, and because I can be confident that these expenditures do not include pension spending.\(^{15}\) On average, I find that larger increases in pension spending are not associated with greater reductions in capital outlays in these local governments: the coefficient on per-employee pension expenditures is statistically insignificant.\(^{16}\) Thus, results in Table 1 suggest that local governments respond to rising pension expenditures with employment reductions—more so than revenue increases or reductions in capital outlays.

Next, I consider whether local governments’ responses to rising pension expenditures vary with the local political environment, starting with the labor context. There are no existing datasets that track the presence of collective bargaining or the strength of public-sector unions in all local governments throughout the United States, so to measure the presence of local collective bargaining and the strength of public-sector unions in each of these local governments, I rely on two datasets assembled by Anzia and Moe (2015, 2016). The first contains indicators of whether

\(^{15}\) For many spending variables in the Survey of Governments Finance files, it is not clear whether they include pension expenditures, and it would be problematic to analyze the effects of rising pension costs on expenditure variables that might include those very pension costs.

\(^{16}\) However, when I limit the model to only municipal governments, I find a negative, statistically significant relationship. This may be because city governments typically spend a larger share of total revenue on capital outlays than counties—on average 27% for cities as opposed to 10% for counties—which makes capital outlays a more obvious place for cities to cut costs.
police officers and firefighters in municipal governments have collective bargaining; these data are available for 176 of the 227 city governments in my dataset. For the remaining municipal governments, and for all county governments, there are no existing data on whether their employees have collective bargaining. However, the presence of collective bargaining and the strength of public-sector unions in local governments is heavily shaped by state collective bargaining laws: in states that require government employers to bargain with their employees, it is typical for local governments to have both collective bargaining and high union membership rates (see Flavin and Hartney 2015; Moe 2011; Saltzman 1985). For the remaining cities and all of the counties, therefore, I code local governments as having collective bargaining if state law requires bargaining for police, firefighters, and other local employees, using data collected by Anzia and Moe (2016).

In the following analysis, I focus on two of the dependent variables from Table 1: own-source general revenue and full-time employment. To evaluate whether the relationship between rising pension expenditures and these outcomes varies with the presence of collective bargaining, I interact the pension expenditure variable with the indicator for collective bargaining. Figure 2 presents the coefficient estimates and 95% confidence intervals for logged pension expenditures; the full model estimates are presented in the online appendix.

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17 Cities are coded as having collective bargaining if either police officers or firefighters do.

18 This state-level variable is a good proxy for local bargaining. Of the 176 cities for which I have both the state-level and the local-level indicator, 94 are in states with mandatory bargaining, and every single one of those has collective bargaining at the local level. 82 are in states without mandatory bargaining, and only 35% of those have collective bargaining at the local level.
Figure 2 shows that in both local governments with and without collective bargaining, there is no significant relationship between pension expenditures and revenue increases. Thus, it does not appear that local officials in places with collective bargaining are more likely to respond to pension expenditure increases with revenue increases. However, I do find that collective bargaining makes a difference to the employment estimates. For local governments without collective bargaining, the coefficient on the pension expenditures variable remains negative, but it is smaller than before and statistically insignificant. For governments with collective bargaining, the relationship is large and negative: a 10% increase in per-employee pension expenditures is associated with about a 0.79% decrease in full-time local government employment. Thus, the relationship between pension spending and employment reductions is more pronounced in places with collective bargaining, consistent with an account in which local governments with collective bargaining and strong unions have less capacity to constrain employment costs by other means.

One final question relevant to union strength has to do with which employees are most affected by rising pension contributions. Even if local governments with collective bargaining are more likely to turn to employment reductions than those without collective bargaining, they may still act to protect employees that are better organized and more politically active. While there are no modern data on the relative unionization rates of different groups of employees in cities and counties, existing evidence suggests that public safety employees (particularly police and fire protection employees) tend to be better organized than other city and county employees—and also that they are highly active in local politics (Anzia and Moe 2015). One possibility, then, is that the political strength of public safety workers might better insulate them from employment reductions than non-public safety workers.
To test this, I model the full-time employment levels of public safety employees (police protection, fire protection, and corrections) and non-safety, non-education employees. (Very few of these local governments handle education, but in the cities and counties that do, the education employees are a large share of the total workforce, so I exclude them.) I continue with the same model setup, allowing the relationship between pension spending and employment to vary depending on the presence of collective bargaining.

Figure 2 shows that larger increases in pension expenditures per employee are indeed associated with greater reductions in public safety employment, but only in the places with collective bargaining: a 10% increase in per-employee pension expenditures is associated with a 0.37% reduction in full-time public safety employment per capita. For non-public safety employees, including parks and recreation and sanitation, the relationship for collective bargaining cities and counties is larger—an average decrease of 0.8% in employment per capita for every 10% increase in pension spending. Thus, in local governments with collective
bargaining, rising pension spending has a clear association with employment reductions, but the magnitude of that association is greater for non-public safety workers than for public safety.

Next I evaluate whether local responses to rising pension expenditures vary with the strength of local TELs. I turn to a widely-used index of local TEL severity as of 2005 developed by Amiel, Deller, and Stallmann (2009), which incorporates information on the type of TEL, its scope and restrictions, and the provisions and established methods for exemptions and overrides. The index ranges from 0 (e.g., New Hampshire) to 38 (Colorado), with higher values indicating more restrictive TELs. I interact this measure of local TEL severity, centered around its mean, with the pension expenditure variable, evaluating whether local governments more constrained by TELs are less likely to increase revenue and more likely to reduce employment in response to pension expenditure increases. The main estimates are shown in columns 1 and 2 of Table 2; the full estimates are in the online appendix.

The estimates in column 1 show little sign that local governments are responding to pension cost increases by increasing revenue, regardless of how constrained they are by local TELs. The coefficient on log pension expenditures is statistically insignificant, suggesting that in local governments with average TELs, pension cost increases are not associated with revenue increases. Moreover, the coefficient on the interaction term is negatively signed but not significant. Thus, the association between pensions and revenue does not vary significantly with the strength of local TELs. Even in local governments with no TELs at all, the relationship between pension expenditures and revenue is statistically insignificant.

In column 2, however, I do find that stricter TELs matter for the relationship between pension expenditures and local government employment. The coefficient on pension expenditures shows that in a local government with average TEL severity, a 10% increase in per-
employee pension expenditures is associated with a 0.67% reduction in full-time employment. The coefficient on the interaction term is also negative and significant, indicating that the relationship between pension expenditures and employment reductions is more pronounced in places with stricter local TELs. For example, for a local government with a TEL that is 10 points (roughly a standard deviation) higher than average, a 10% increase in pension contributions is associated with about a 0.89% reduction in full-time employment.

Finally, I turn to an assessment of whether local partisanship or ideology influences responses to rising pension expenditures. I employ two different measures. The first is presidential vote share for Barack Obama in 2008,\textsuperscript{19} centered around its mean. In column 3 of Table 2, I interact this measure with the pension expenditure variable in a model of logged own-source revenue per capita. There is no evidence of a stronger relationship between pension expenditures and revenue increases in more Democratic cities and counties. In column 4, I instead use the Tausanovitch and Warshaw (2013) citizen ideology scores, for which higher values indicate more conservative constituencies.\textsuperscript{20} Again, I do not find a stronger link between pension contribution increases and revenue increases in more liberal cities and counties.

\textsuperscript{19} These data come from a variety of sources, including Tausanovitch and Warshaw (2013). City-level presidential election returns were not available for a few cities; for them, this variable equals presidential vote in the parent county. See online appendix for details.

\textsuperscript{20} The Tausanovitch and Warshaw scores are unavailable for some of the smaller cities and counties in this dataset, so models that incorporate this measure have fewer observations.
Table 2: Local TELs, partisanship, and ideology

<table>
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<tr>
<th></th>
<th>Own-source revenue</th>
<th>Full-time employment</th>
<th>Own-source revenue</th>
<th>Full-time employment</th>
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<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
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<td>0.009</td>
<td>0.004</td>
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<td>(0.013)</td>
<td>(0.021)</td>
<td>(0.023)</td>
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<td></td>
</tr>
<tr>
<td>Dem. presidential vote *</td>
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<td>4,133</td>
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Notes: Standard errors clustered by state in parentheses. All models include local government and year fixed effects and the time-varying controls from Table 1. Dependent variables are logged, per capita.

In columns 5 and 6, I model the relationship between pension contributions and full-time employment, interacting per-employee pension expenditures with the measures of partisanship and ideology. Neither set of estimates suggests that officials representing more liberal or Democratic constituencies are more likely to avoid employment reductions in dealing with rising pension expenditures. In fact, the coefficient on the interaction term in column 5 is negative (p=0.11), suggesting that pension-induced employment reductions may be even more pronounced in more Democratic constituencies. The reason for this, almost certainly, is that more Democratic cities and counties are much more likely to have public-sector collective bargaining than Republican ones: the correlation between the collective bargaining indicator and
Democratic presidential vote share in this dataset is 0.42.\textsuperscript{21} Thus, it is not the case that officials in more Democratic constituencies are more likely to avoid employment reductions—and more likely to increase revenue—in responding to pension expenditure increases. Of the three local contextual factors explored here, the stronger predictors of how local officials respond to rising pension expenditures are the presence of collective bargaining and the restrictiveness of local TELs—not local partisanship or ideology.

\textbf{Conclusion}

Many experts argue that local government in the United States is being transformed by the rising cost of public pensions, yet scholars in the most relevant fields—including political science, political economy, public policy, and public administration—have yet to thoroughly investigate how local governments’ pension contributions have changed over time or how local governments are responding.

There is existing research on public pensions, but nearly all of it focuses on explaining variation in plan-level quantities such as funding ratios, unfunded liabilities, investment returns, and changes to benefit formulas. This body of research has shed considerable light on the political, economic, and actuarial decisions that have contributed to the underfunding problems that plague so many U.S. pension plans today. But on the issue of how local governments across

\textsuperscript{21} When I model full-time employment with the pension expenditure variable interacted with all three of these local conditioning variables—collective bargaining, local TEL severity, and Democratic presidential vote—the coefficients on the interactions with Democratic presidential vote and collective bargaining are both negative but insignificant. The coefficient on the interaction with local TEL severity is significant at the 10\% level (p=0.082).
the U.S. have been affected, experts have advanced different views. Some claim that generous pension benefits combined with severe underfunding are putting strain on local government budgets and that widespread pension-induced fiscal pressure is forcing local governments to cut back on public services. Others maintain that the big problems are limited to a few governments. Until now, researchers have not had the data required to assess which is closer to the mark.

Meanwhile, the local political economy literature puts the spotlight on political factors that shape local spending and policy outcomes, but it does not focus on how local governments respond to structural changes in costs that are partially or mostly out of their direct control. It almost entirely ignores questions about public-sector retirement costs. And in explaining local policy outcomes of interest, political scientists prioritize explanatory variables like partisanship and ideology—not collective bargaining, union strength, or TELs, which stand to be important for local fiscal policy and employment.

This paper makes headway by introducing a new dataset that allows us to evaluate for the first time the extent to which local pension expenditures have increased over time and whether they are crowding out public services. I collected up to twelve years of annual financial documents for a diverse set of 442 cities and counties throughout the country, and then I combed each one for information about what they spent on their employees’ retirement benefits.

Descriptive analysis of these data reveals that city and county pension spending has risen just about everywhere since 2005, but also that there is substantial variation in that growth. By connecting these local annual pension contribution data to U.S. Census data on local government employment and finances, I find that the average local government is not responding to pension contribution increases by increasing general revenue. Instead, rising per-employee pension expenditures are associated with declines in public-sector employment. This pattern is especially
pronounced in cities and counties with collective bargaining, and while it has affected public safety and non-public safety employees alike, the average employment reductions have been smaller for public safety employees. I also find that the link between pension cost increases and employment reductions is larger for local governments that are more constrained by state-administered TELs. However, I find no evidence that localities with more liberal or Democratic residents are more likely than conservative or Republican ones to respond to pension cost increases by increasing revenue and staving off employment reductions.

These findings advance our understanding of the impacts of public-sector pensions in several ways. At a most basic level, these new data enable a discussion of the tradeoffs of public pension spending that is relatively easy to understand. Discussions of public pensions in recent years have focused almost entirely on quantities like unfunded liabilities and actuarial assumptions, which are difficult for many citizens, policy practitioners, and government employees to understand. Most people probably do not have a good sense of what an unfunded pension liability is, why they should care about the discount rate, or what the implications of pension underfunding are likely to be for them. It doesn’t help that the consequences of pension underfunding are usually described in terms of events that will happen in the distant future. By comparison, people are probably more likely to appreciate the significance of how much their governments spend on pensions, how that has changed, and how their local governments are reducing jobs as a result. Putting the focus on what local government is doing less of—not in the future, but right now—in response to pension spending thus has potential to encourage greater public engagement on the issue.

These findings also put the spotlight on important tradeoffs faced by public-sector employees and their unions. Debates about public pensions are often framed as pitting pro-
employee, pro-pension interests against anti-pension, anti-public-worker interests, but the findings here suggest that such a characterization is overly simplistic. Public-sector employees have an interest in more generous and more reliable retirement benefits, but local governments’ payments for those retirement benefits can cut into their ability to maintain or grow employment. The analysis here shows that as local governments spend more on pensions, they have fewer public-sector jobs to offer.

A pension-induced transformation of local government as it affects government employees is no small matter, but the implications of rising pension spending are broader than that. Indeed, such a transformation stands to affect everyone who relies on local government service provision. Many Americans take for granted that their local governments will provide public services like police protection, fire protection, street sweeping, and refuse collection. But in the years to come, it may well become harder for local governments to carry out those basic functions—because of rising retirement costs.
References

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