



# THE IMPACT OF PUBLIC PENSIONS ON STATE AND LOCAL BUDGETS

By Alicia H. Munnell, Jean-Pierre Aubry, and Laura Quinby\*

## INTRODUCTION

State and local pensions have been headline news since the financial collapse reduced the value of their assets, leaving a substantial unfunded liability. The magnitude of that liability depends on the interest rate used to discount future benefit promises but, regardless of the assumptions, states and localities are going to have to come up with more money. This *brief* looks at the size of the additional funding relative to state budgets.

The *brief* proceeds as follows. The first section provides an overview of state and local plans and introduces our sample of six states: California, Florida, Georgia, Illinois, Massachusetts, and New Jersey. The second section presents data on pension expenditures relative to budget totals for states and localities in the aggregate and for our sample of plans. The third section develops baseline budgets for the period 2010-2043 for all states and localities and for the six

individual states. It then projects annual required pension contributions beginning in 2014 under three scenarios: 1) amortizing the unfunded liability valued at an 8-percent discount rate over the next 30 years; 2) amortizing the unfunded liability valued at 5 percent over the next 30 years; and 3) continuing to pay contributions at current levels until the trust fund is exhausted and then paying benefits on a pay-as-you-go basis.

The final section concludes that whereas public plans are substantially underfunded, in the aggregate they currently account for only 3.8 percent of state and local spending. Assuming 30-year amortization beginning in 2014, this share would rise to only 5.0 percent and, even assuming a 5-percent discount rate, to only 9.1 percent. Aggregate data, however, hide substantial variation. States that have seriously underfunded plans and/or generous benefits, such as California, Illinois, and New Jersey, would see contributions rise to about 8 percent of budgets with an 8-percent discount rate and 12.5 percent with a 5-percent discount rate.

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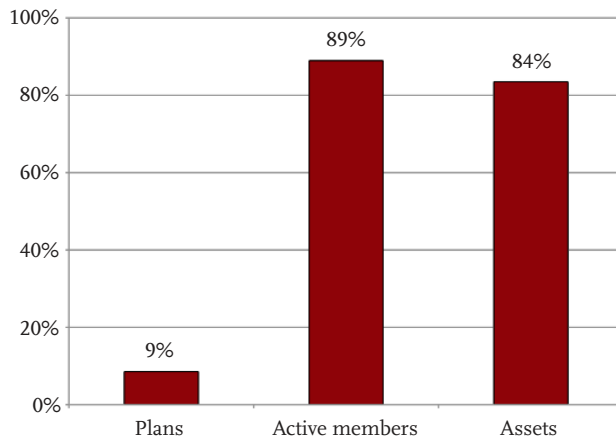
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## OVERVIEW OF STATE AND LOCAL PLANS

The nation's public pension system consists of both state and locally-administered plans.<sup>1</sup> The state systems usually cover general state government employees and teachers; locally-administered systems often cover police and fire, as well as general municipal employees. But the structure varies enormously. Some states (Maine and Hawaii) have a single system covering all types of employees, while other states (Florida, Illinois, Massachusetts, Michigan, Minnesota, and Pennsylvania) have more than 100 systems.

State-administered plans account for a tiny fraction of the systems, but almost all the participants and assets. Specifically, state-administered plans account for only 9 percent of the systems, but 89 percent of the active members and 84 percent of assets (see Figure 1).

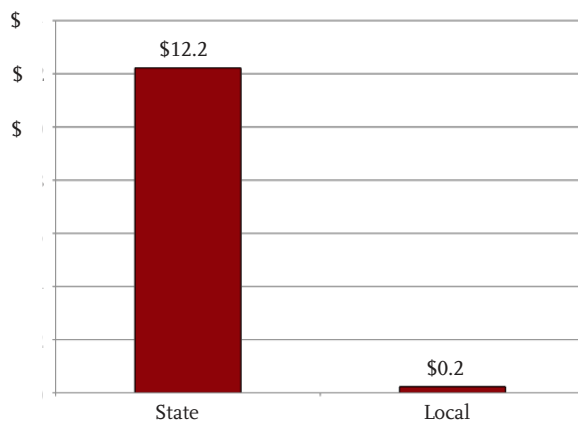
FIGURE 1. STATE-ADMINISTERED PLANS AS A PERCENT OF TOTAL STATE AND LOCAL PLANS, ACTIVE MEMBERS, AND ASSETS, FISCAL YEAR 2008



Source: Authors' calculations from the U.S. Census Bureau (2008a).

Thus, as a generalization, state plans are big and locally-administered plans are small. On average in 2008, state plans held \$12.2 billion in assets, while local plans held \$0.2 billion (see Figure 2). Of course, every generalization has notable exceptions; six locally-administered plans held more than \$12 billion each.<sup>2</sup>

FIGURE 2. AVERAGE ASSETS PER PLAN BY TYPE OF ADMINISTRATION, BILLIONS, FISCAL YEAR 2008



Source: Authors' calculations from the U.S. Census Bureau (2008a).

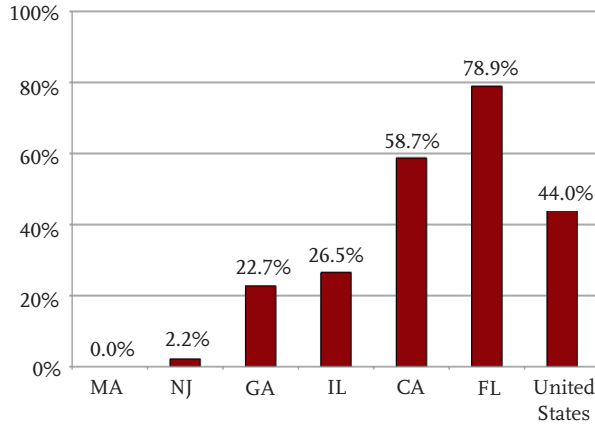
In addition to looking at states and localities in the aggregate, we will examine six states more closely. Three – Florida, Georgia, and Massachusetts – have low normal cost, sponsors that pay 100 percent of their annual required contribution (ARC), and tend to be reasonably well funded (with the exception of the Teachers' plan in Massachusetts). Three – California, Illinois, and New Jersey – have plans that have received a lot of press attention.<sup>3</sup> Indeed, these plans are generous as measured by their normal cost, their sponsors fail to pay the full ARC, and they have lower funded ratios (see Table 1).

TABLE 1. NORMAL COST, ARC PAID, AND FUNDED RATIO FOR SELECTED STATES

State	Normal cost	ARC paid	Funded ratio
Florida	11.5 %	107 %	105 %
Georgia	12.1	100	91
Massachusetts	11.9	113	64
California	13.7	85	87
Illinois	12.5	65	60
New Jersey	13.2	57	72

Sources: Authors' calculations from the Center for Retirement Research at Boston College *Public Plans Database* (CRR PPD) 2009; and various plan reports.

FIGURE 3. PERCENT OF CONTRIBUTIONS FOR STATE-ADMINISTERED PLANS COMING FROM LOCAL GOVERNMENTS, SELECTED STATES AND THE NATION, 2008



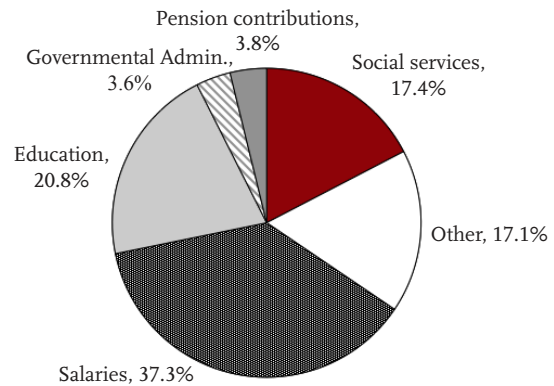
Source: Authors' calculations from the U.S. Census Bureau (2008a).

One further consideration is important – namely, local governments make considerable contributions to state systems. In the aggregate, 44 percent of the contributions to state-administered plans comes from local governments. But, as shown in Figure 3, this percentage varies enormously across states. In our sample of six states, the fraction ranges from zero percent in Massachusetts, where the entire state retirement system is financed at the state level, to 79 percent in Florida, where localities pay almost the full cost. This variation fairly well reflects the variation across the universe of state and local plans.

### PENSION CONTRIBUTIONS AS A SHARE OF STATE AND LOCAL BUDGETS

Legislatures and pension-plan administrators often focus on pension contributions as a percent of payroll. Pension contributions as a percent of budgets, however, provides a broader framework for projecting how public plans will affect other state and local activities. The starting point for our analysis is the share of state and local budgets devoted to pensions to date. Figure 4 shows that in 2008 pensions accounted for 3.8 percent of state and local direct – that is, non-capital – expenditures for the country as whole.

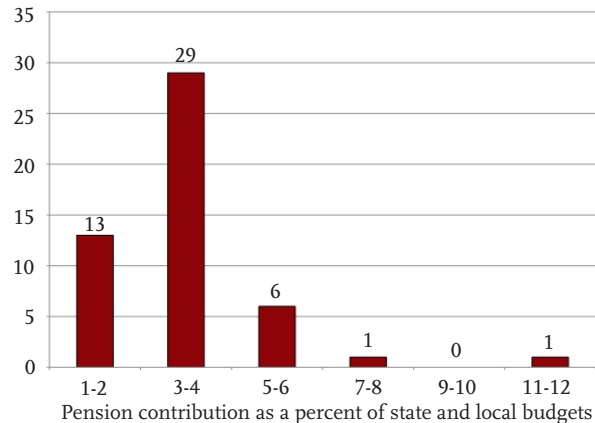
FIGURE 4. STATE AND LOCAL GOVERNMENT DIRECT EXPENDITURE BY TYPE OF EXPENDITURE, 2008



Note: Total budget equals direct expenditures from the general fund, excluding capital outlays.  
Sources: Authors' calculations from the U.S. Census Bureau (2008a); and U.S. Census Bureau (2008b).

This share varied somewhat among individual states. However, for more than half of the states, state and local pension contributions represented between 3 and 4 percent of state and local government budgets in 2008 (see Figure 5). The range in our sample of six states was similarly narrow – 3.2 percent in Florida to 5.2 percent in California.

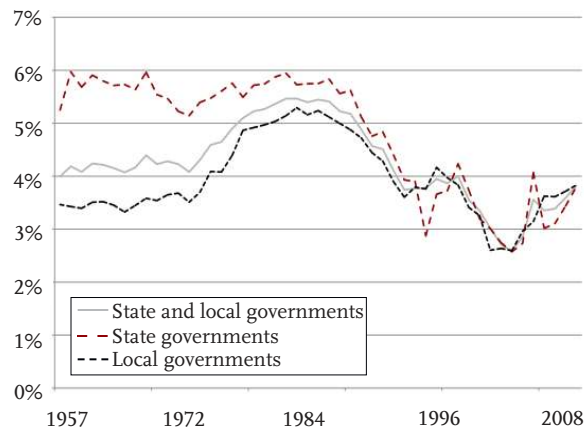
FIGURE 5. DISTRIBUTION OF STATES BY GOVERNMENT PENSION CONTRIBUTIONS AS A PERCENT OF STATE AND LOCAL BUDGETS, 2008



Source: Authors' calculations from the U.S. Census Bureau (2008a); and U.S. Census Bureau (2008b).

It is also interesting to look at the pattern of contributions over time. As shown in Figure 6, for states and localities as a whole, contributions to pensions have ranged from 3 to 6 percent of their combined budgets. Contributions were about 4 percent from the mid-1950s to the mid-1970s, rose to 6 percent between the mid-1970s and the mid-1980s when states and localities “got religion” about the importance of funding, then dropped back as the long bull market boosted asset values. Figure 6 also presents information for states and localities separately. Until the 1990s, pensions accounted for a much higher share of state budgets than local budgets. Today, the shares are roughly equal, as non-pension expenditures for states have grown more rapidly than those at the local level.

FIGURE 6. GOVERNMENT PENSION CONTRIBUTIONS AS A PERCENT OF STATE AND LOCAL BUDGETS, 1957-2008



Sources: Authors' calculations from the U.S. Census Bureau (2008a); and U.S. Census Bureau (2008b).

## OUTLOOK FOR THE FUTURE

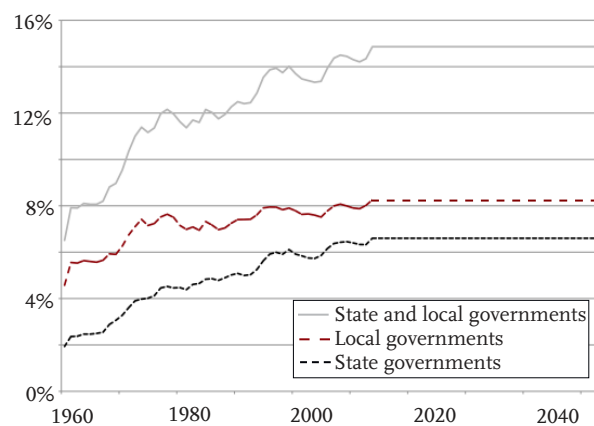
Pension contributions are likely to account for a larger share of state and local budgets in the future than in the past for a number of reasons. First, states and localities have relied on a rising stock market to increase funding, and a repeat of the 1982-2000 stock market boom is unlikely. Second, states and localities have not been contributing their full ARC, which covers accruing normal cost and a payment to amortize the unfunded liability over a 30-year period. That

is, they have not been putting aside the full amount recommended by the Government Accounting Standards Board (GASB). Finally, the method of calculating pension liabilities may change over time. State and local plans generally follow an actuarial model and discount their liabilities by the expected long-term yield on the assets held in the pension fund, roughly 8 percent. Most economists contend that the discount rate should reflect the risk associated with the liabilities and, given that benefits are guaranteed under most state laws, the appropriate discount factor is a riskless rate, roughly 5 percent.<sup>4</sup> Thus, the economists' model would produce much higher normal cost and liabilities than currently reported.

## AMORTIZING UNFUNDED LIABILITIES

The first step in estimating pension contributions as a percent of budgets is to project budgets for states and localities. This projection is based on the relationship of state and local budgets to GDP.<sup>5</sup> While these budgets rose sharply until 1990, since that time they have held relatively steady (see Figure 7). We assume that the 2008 ratio of budgets to GDP will hold into the future, so we derive dollar amounts by applying the 2008 ratio to GDP projections from the Congressional Budget Office. The same approach was used to project budgets for the six sample states.

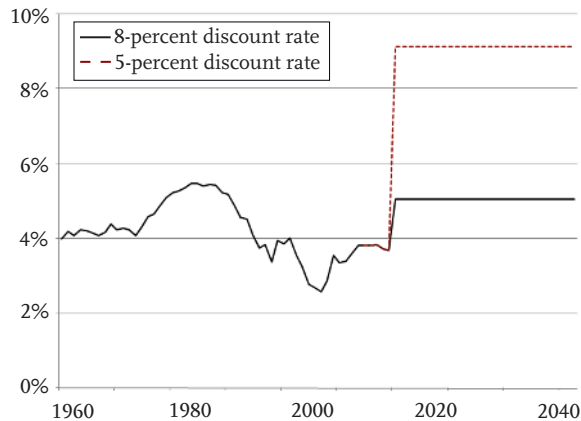
FIGURE 7. STATE AND LOCAL BUDGETS AS A PERCENT OF GDP, 1957-2043



Sources: Authors' calculations from the U.S. Census Bureau (2008a); U.S. Census Bureau (2008b); and the Congressional Budget Office (2010).

The next step is to project future pension contributions.<sup>6</sup> We assume that states and localities increase their contributions incrementally between 2009 and 2013, and then start to pay the full ARC, amortizing their unfunded liabilities over a 30-year period.<sup>7</sup> Normal cost and unfunded liabilities are calculated under two interest rate assumptions – 8 percent and 5 percent. The results are shown in Figure 8. Assuming an 8-percent discount rate, government contributions to pensions will rise from 3.8 percent of state and local budgets today to 5.0 percent in 2014. With a 5-percent discount rate, pension contributions would increase to 9.1 percent in 2014. In both cases, the contribution rate remains constant thereafter for 30 years because contributions are usually set as a fixed percent of payrolls and we have assumed that payrolls are a fixed percent of state and local budgets.<sup>8</sup>

FIGURE 8. GOVERNMENT CONTRIBUTIONS AS A PERCENT OF STATE AND LOCAL BUDGETS, 1957-2043



Sources: Authors' calculations from the U.S. Census Bureau (2008a); U.S. Census Bureau (2008b); and 2009 CRR PPD.

The pattern differs across states. Essentially the states that have been conscientious about funding their pensions would see only a small increase in their contributions as a percent of budget – roughly 1 to 2 percent (see Table 2). This increase reflects primarily the increase in unfunded liabilities as a result of the collapse in equity prices. If liabilities were discounted at 5 percent, the percent of the budget devoted to pension contributions would rise to just over 8 percent. In contrast, those states with expensive and/or underfunded plans would see the percent of their budgets going to pensions rise from about 4.5 percent to about 8 percent (assuming an 8-percent discount rate) and to 12.5 percent (assuming a 5-percent discount rate).<sup>9</sup>

TABLE 2. PENSION CONTRIBUTIONS AS A PERCENT OF STATE AND LOCAL BUDGETS, SELECTED STATES, 2008 AND 2014-2043

Government	Contribution as a percent of budget		
	2008	2014-2043	
		8 percent	5 percent
U.S. state and local	3.8%	5.0%	9.1%
Florida	3.2	4.6	8.7
Georgia	2.8	4.3	8.3
Massachusetts	4.2	4.6 <sup>a</sup>	7.6 <sup>a</sup>
California	5.2	7.3	12.5
Illinois	4.5	8.7	13.0
New Jersey	3.5	7.9 <sup>b</sup>	12.0 <sup>b</sup>

<sup>a</sup> Massachusetts' 2008 contribution level is based on legislation that requires the systems to be fully funded by 2023. Our analysis extends the full funding date to 2043 for purposes of comparison with other states.

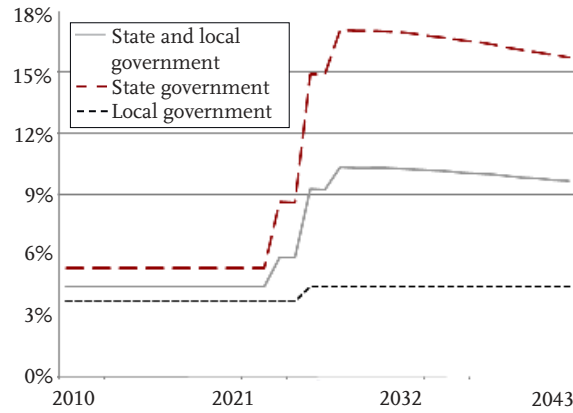
<sup>b</sup> New Jersey contribution rates are for the fiscal years after 2017, when New Jersey legislation requires plans to fully pay the ARC.

Sources: Authors' calculations from the U.S. Census Bureau (2008a); U.S. Census Bureau (2008b); and 2009 CRR PPD.

#### EXHAUSTING ASSETS AND REVERTING TO PAY-AS-YOU-GO

The projections for the high-cost states suggest a very large increase in the share of the state-local budget that would need to be allocated to pensions. If policymakers are unable or unwilling to make such a commitment, what is the alternative? Promised benefits are legally protected and will be paid. One alternative is to contribute at current levels, run down assets, and then pay promised benefits on a pay-as-you go basis. Take Illinois as an example. Figure 9 on the next page shows the pattern of expenditure as a percent of the budget under a pay-as-you-go scenario.<sup>10</sup> The pattern is complicated by the fact that Illinois has four main pension plans, and each runs out of money at a different time. Since the plan financed by localities is relatively well funded and state government currently pays the majority of pension costs for the three poorly funded plans, the burden of covering benefits paid on a pay-as-you-go basis would fall primarily on the state.<sup>11</sup> Pay-as-you go costs are projected to exceed 16 percent of the Illinois state government budget in 2027.

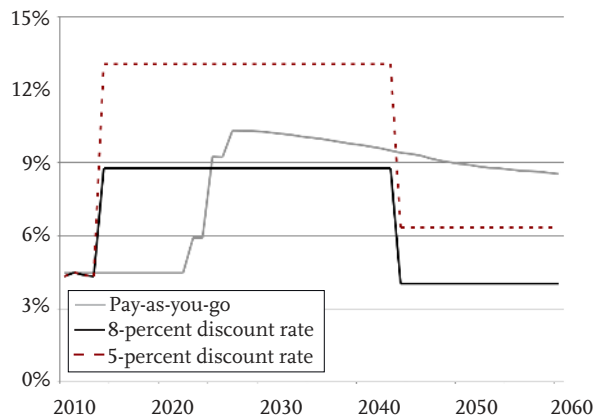
FIGURE 9. PAY-AS-YOU-GO CONTRIBUTIONS AS A PERCENT OF STATE AND LOCAL BUDGETS FOR THE STATE OF ILLINOIS, 2010-2043



Sources: Authors' calculations from the U.S. Census Bureau (2008a); U.S. Census Bureau (2008b); the Congressional Budget Office (2010); and the 2009 CRR PPD.

It is also interesting to compare contributions to state-administered plans with the alternative funding scenarios (see Figure 10). In the short run, the state of Illinois saves a lot of money by not funding. But, after 2025, pay-as-you-go payments exceed the cost of funding with liabilities discounted by 8 percent. In

FIGURE 10. CONTRIBUTIONS TO STATE-ADMINISTERED PLANS AS A PERCENT OF STATE AND LOCAL BUDGETS FOR THE STATE OF ILLINOIS, 2010-2060



Note: The pay-as-you-go costs are estimated assuming an 8-percent return prior to exhaustion. If assets yield only 5 percent, costs start to rise two years earlier in 2021, and peak two years earlier in 2025, but the overall pattern looks very much the same.

Sources: Authors' calculations from the U.S. Census Bureau (2008a); U.S. Census Bureau (2008b); the Congressional Budget Office (2010); and the 2009 CRR PPD.

2043 plans reach full-funded status and contributions drop back to only normal cost, while pay-as-you-go payments continue to remain high.

## CONCLUSION

The funding shortfall of public pension plans has made national news since the financial collapse reduced asset values at the same time that state and local revenues began to dry up. The size of the funding hole differs depending on the rate used to discount liabilities but, regardless of assumptions, governments will eventually have to ante up. How much? In 2008, pension contributions amounted to about 3.8 percent of total state and local budgets. Assuming 30-year amortization beginning in 2014, this share would rise to only 5.0 percent and even assuming a 5-percent discount rate to only 9.1 percent.

Aggregate data, however, hide substantial variation. States with seriously underfunded plans and/or generous benefits, such as California, Illinois, and New Jersey, would see contributions rise to about 8 percent of budgets with an 8-percent discount rate and 12.5 percent with a 5-percent discount rate. And, in states such as California, local governments make more than half of the contributions, which means that the burden of increased future pension contributions will fall on the shoulders of localities as well.

How reliable are our estimates? On the one hand, our assumption that plans fund responsibly in the near-term may be optimistic in light of the current economic conditions. To the extent they do not, our estimates understate the long-term pension costs. On the other hand, we assume no changes in benefits or employee contributions. In fact, states are already raising employee contributions and reducing benefits for new employees, which means that we overstate long-run employer pension costs. These offsetting effects may well cancel out, so that this *brief* provides a reasonable picture of future pension costs as a share of state and local spending.



## ENDNOTES

1 Most local plans (81 percent) are administered by municipalities and townships, with the remainder by counties, special districts, and school districts.

2 Leading the list were New York City Employees, New York City Teachers, and Los Angeles County Employees with about \$40 billion each. The other large locally-administered plans are New York Police (\$25 billion), Los Angeles Fire and Police (\$18 billion), and San Francisco City and County Employees (\$16 billion). See U.S. Census Bureau (2008a).

3 For example, see Perez-Pena (2010) and Walsh (2010a, 2010b).

4 See Munnell et al. (2010) for a more detailed discussion of the appropriate discount rate.

5 See Appendix for a detailed description of the methodology used in these calculations.

6 Our analysis projects future ARC for the 107 largest state-administered pensions in the United States under an 8-percent and 5-percent discount rate. These plans account for more than 75 percent of total state and local pension contributions in the United States.

7 Three states – Illinois, Massachusetts, and New Jersey – do not follow the traditional 30-year funding schedule described above. In Illinois, current legislation mandates that the state plans become 90 percent funded by 2045. In 2003, Illinois issued \$10 billion in general obligation bonds, the proceeds of which reduced the unfunded liabilities of the state plans. Contribution rates in this state are therefore set as the minimum of either the statutory rate, or the difference between the statutory rate and the amount required to service the debt (Illinois, 2009). In Massachusetts, the state retirement plans have historically been required by statute to be fully funded by 2023. In 2010, this period was extended to 2025. Lastly, in New Jersey, 2010 legislation allows the state to pay only one-seventh of its full ARC in 2011. Each subsequent year's payment increases by an additional one-seventh, until the full ARC is paid in 2018 (NCSL, 2010). We account for this gradual increase when calculating future normal cost and amortization payments.

8 In reality, state and local payrolls as a percent of budgets have steadily declined about 40 percent over the past 50 years. This decline is somewhat greater for states than for localities. If this trend continues, as the GAO projects (GAO, 2010), our assumption that payrolls remain a constant percent of budgets in the future overstates the effect of pension contributions on future state and local budgets.

9 In states where local governments are responsible for a large percentage of the total required contribution, such as Florida and California, these projections imply that rising pension costs could become a major burden on cities and towns.

10 See Appendix for a detailed description of the methodology used in these calculations.

11 Illinois Municipal Retirement Fund is entirely financed by localities. Illinois State Employees Retirement System and Illinois University System are entirely financed by the State. Illinois Teachers Retirement System is financed jointly, 11.2 percent of contributions from localities and 88.8 percent from the State.

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# APPENDIX

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## APPENDIX

Estimating the effect of future pension costs on future budgets requires making projections of state and local budgets, amortization payments, normal cost, and benefit payments.

### BASELINE BUDGETS

Throughout this analysis, state and local budgets are equal to direct expenditures from the general fund, minus capital outlays, plus pension contributions. The primary data source for the first two terms is the Census of Governments' *Government Finances* dataset. These data contain detailed information on each government's total expenditures, but exclude contributions to pension plans that the government administers. For example, expenditure data for the state government of Massachusetts do not include contributions to either the Massachusetts State Employees Retirement System or the Teachers Retirement System. A separate *Employee Retirement Systems* dataset, also collected by the Census, provides the missing pension contribution information needed to calculate total government expenditures.

$$Budget_t = \text{general direct expenditure}_t - \text{capital outlays}_t + \text{pension contributions to own plan}_t$$

To project baseline budgets into the future, we assume that state and local budgets remain a constant percent of GDP.

$$Budget_{t+1} = (Budget_t / GDP_t) * GDP_{t+1}$$

Pension contributions and salaries are similarly assumed to remain a constant portion of future budgets.

### REVISED BUDGETS INCLUDING PROJECTED PENSION CONTRIBUTIONS UNDER THE FULL-FUNDING SCENARIO

The analysis assumes that, in the near future, governments will continue to pay less than their required contributions in order to weather the current financial crisis. We estimate that plans will not make their full ARC until 2014. Because, historically, contribution payments have held relatively steady for each plan, we estimate contributions from 2010 to 2013 based on an average of the prior three years, plus a 5-percent per-year increase (the average increase between 1990-2007). To obtain estimates of pension costs in 2014, we first must determine the funded level of plans in 2013. To do this, we draw on the model developed in Munnell, Aubry, and Quinby (2010a), which uses each individual plan's actuarial asset calculation method and historical liability growth to project funded levels in 2013 under various economic performance scenarios. The analysis in this *brief* uses the most likely scenario, which assumes economic growth sufficient to reduce unemployment slightly, increase profits by 7 percent annually, and produce a Wilshire 5000 of 15,000 by 2013.

In order to calculate the contributions towards the unfunded liability, the 2013 unfunded liability is amortized as a level percent of payroll over a closed 30-year period until it is reduced to zero:

$$UAAL_{t+1} = (UAAL_t - (\text{contribution rate}_{\text{plan}} * \text{payroll}_t)) * (1 + \text{discount rate})$$

The discount rate and future payroll growth are those used in each plan's most recent valuation. For the plans in our sample, the discount rate falls between 7.5 and 8.0 percent, and the assumed future payroll growth ranges from 3.5 to 4.5 percent.

In order to calculate UAAL contributions under the 5-percent discount rate projection, the amortization exercise described above is repeated with the initial 2013 unfunded liability discounted at 5 percent, and setting the discount rate to 5 percent in the above equation. Munnell et al. (2010) developed the actuarial model used to recalculate unfunded liabilities under different discount rates.

For both the 8-percent and 5-percent projections, we assume that normal cost stays constant as a percent of payroll. The 8-percent scenario uses the normal cost reported in plans' most recent actuarial valuations, while the 5-percent scenario uses the method developed in Munnell et al. (2010) to estimate normal cost.

Budget estimates for 2014 onward replace pension contributions from the baseline budget with our estimated normal cost and the amortization payments.

$$\text{New Budget}_t = \text{Budget}_t - \text{contributions to state plan}_t + \text{normal cost}_t + \text{amortization payments}_t$$

## REVISED BUDGETS INCLUDING PROJECTED BENEFIT PAYMENTS UNDER THE PAY-AS-YOU-GO SCENARIO

For the years 2010 to 2045, projected future benefit payments for the Illinois SERS, Illinois TRS, and Illinois Universities are taken directly each plan's most recent actuarial valuation. Because benefit projections are not reported in the actuarial valuation for the Illinois Municipal Retirement System, we apply the average change in annual projected benefits among the other three plans in order to estimate future benefits for the Illinois Municipal Plan. For years beyond 2045, the model first described in Munnell et al. (2010) calculates future benefit payments for all four plans. Using these projections, we estimate the year that each plan would exhaust its assets if it were to continue contributing at historical rates as a percent of payroll going forward. Assets are assumed to grow according to the increase in the Dow Jones under the most likely scenario described in Munnell, Aubry, and Quinby (2010a). To determine the budget, as each of the four plans exhausts, contributions for that plan are replaced with its benefit payments.

$$\text{New Budget}_t = \begin{cases} \text{Budget}_t & \text{if } \text{exhaustion date}_{\text{all plans}} > t \geq 2014 \\ \text{Budget}_t - \text{contributions}_{\text{plan},t} + \text{benefit payments}_{\text{plan},t} & \text{if } t \geq \text{exhaustion date}_{\text{plan}} \end{cases}$$

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*The Center for Retirement Research thanks AARP, Invesco™, LPL Financial, MetLife, Nationwide Mutual Insurance Company, Prudential Financial, State Street, TIAA-CREF Institute, and T. Rowe Price for support of this project.*

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