CENTER for RETIREMENT RESEARCH at BOSTON COLLEGE

State and Local Pension Plans

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STATE AND LOCAL PENSION COSTS: PRE-CRISIS, POST-CRISIS, AND POST-REFORM

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Introduction

States have begun to respond to their pension challenge by enacting a mix of revenue increases and benefit cuts. These changes will, over time, improve the financial outlook for plans and help ease their impact on other budget priorities. But, to date, the specific nature and magnitude of these effects on plan finances and overall state budgets has received little attention. This *brief* reports on a study designed to fill the void with an analysis of pension costs before the financial crisis, after the financial crisis, and after reforms for a sample of 32 plans in 15 states. The study also introduces a companion series of fact sheets on each of the sample plans and states.

The discussion is organized as follows. The first section describes the data and methodology used in the analysis. The second section reports the activity at the plan level with the presentation of the annual required contribution (ARC) as a percent of payroll before the 2008 financial crisis, after the financial crisis, and after reforms. The third section quantifies the budgetary impact of pensions for the state as a whole by looking at the ARCs as a percent of state-local own-source revenues. It also assesses the additional cost burden of retiree health plans and describes a sensitivity analysis that tests the effects of higher or lower asset returns on the pension projections. The final section concludes that most of the sample plans responded with significant pension reforms, generally increasing employee contributions and lowering benefits for new employees. The changes were largest for plans with serious underfunding and those with generous benefits. In most cases, reforms fully offset

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or more than offset the impact of the financial crisis on the sponsors' ARC, and employer contributions to accruing benefits for new employees were cut in half. In short, states have made more changes than commonly thought. Whether these changes stick or not is an open question.

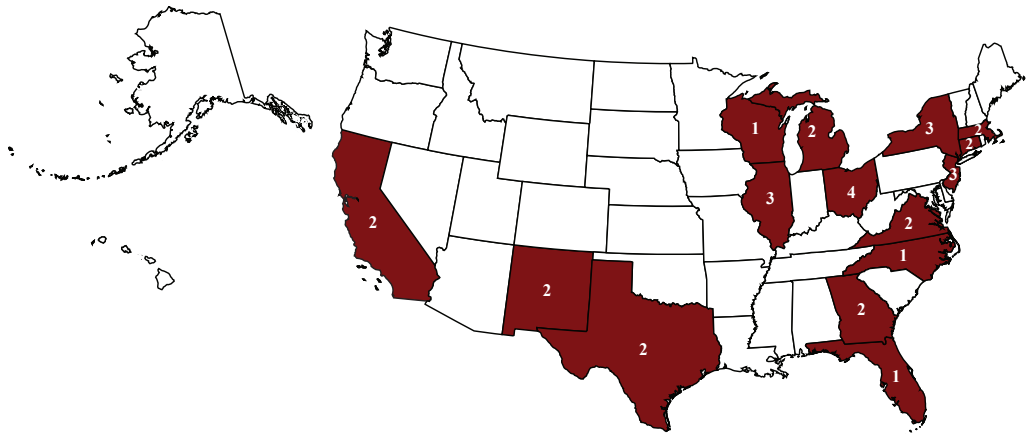
Data and Methodology

The sample consists of all of the major state-administered pension plans in 15 states, for a total of 32 plans (see Figure 1). These plans constitute 70 percent of aggregate liabilities and 65 percent of members in the *Public Plans Database* (PPD). The sample states were chosen to represent a mix of troubled states (Illinois and New Jersey), model states (Florida and North Carolina), states with expensive plans (California and New York), states that have made dramatic pension changes (Georgia and Michigan), and states that have made only minor changes (Texas and Wisconsin). See Appendix A for a list of the pension plans included in the sample. The main data sources used in the analysis – in addition to the PPD – were the actuarial valuation reports for each plan.

The exercise involves projecting each plan's ARC under three scenarios: pre-crisis, post-crisis, and post-reform. (See Appendix B for a detailed methodology.) The projections are made separately for the two components of the ARC: the employer's contribution to cover its share of normal cost (the cost of accruing benefits) and the payment required to amortize the unfunded liability.[1] In all three scenarios, plans are assumed to pay their full ARC each year and thus gradually pay off past unfunded liabilities. As a result, the amortization payment component of the ARC declines modestly over time relative to total payroll. The precise pattern of the decline varies depending on each plan's amortization schedule.

In terms of normal cost, the pre-crisis level is taken from each plan's 2007 or 2008 actuarial valuation and is assumed to remain constant through 2046. The post-crisis normal cost is taken from the latest valuation before any reforms were undertaken, either 2010 or 2011, and again is assumed to remain constant. The projections of post-reform normal cost depend on the specific actions taken by each plan. Since most reforms apply to new hires only, the impact is very small in the short term and then grows over time. To capture this pattern requires knowing the normal cost for new hires under the reformed benefit schemes. For half the plans, the new hire normal cost was available in the plan's actuarial valuation; for the other half, the figure was either acquired by calling the plan's actuary, calculated using the Center's Pension Model, or adopted from a third-party analysis. To project the trajectory of normal cost post-reform, we simply assume that the current normal cost for the whole population declines linearly from its current level to the normal cost for new hires by 2046, the point at which the system consists only of new hires.

Figure 1. States and Number of State-Administered Plans in Sample



Source: Authors' illustration.

Plan Level Results

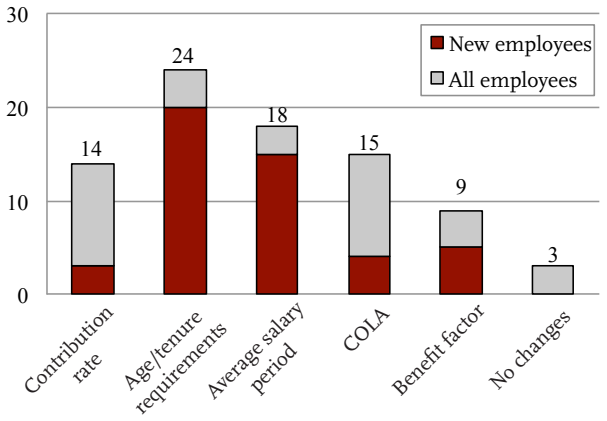
Figure 2 shows an example of the projections using the Texas Employees Retirement System (ERS) plan. The economic crisis drove up the employer's annual required contribution; in particular, the amortization payment to cover unfunded liabilities jumped from 1 percent of payroll to 4 percent of payroll. In the wake of the crisis, the Texas ERS plan responded by increasing the employee contribution rate from 6 to 7 percent of payroll. The sponsor also tightened eligibility requirements and lengthened the averaging period used for calculating benefits for new hires, which gradually reduce the projected employer's contribution to normal cost from 8 percent of payroll today to 6 percent in 2046. Assuming the sponsor pays the full ARC, the employer's amortization payment will drop from 4 percent to 2 percent. In total, the employer's cost moves from 7 percent pre-crisis, to 12 percent post-crisis, and eventually to 8 percent post-reform.[2]

An analysis similar to that in Figure 2 was done for each of the 32 plans in the sample, which allows for some generalizations.

First, nearly all of the sample plans (29 out of 32) have enacted some reforms since the crisis in order to reduce future costs. On the contribution side, 14 plans increased employee contribution rates (see Figure 3). On the benefit side, the most common type of change, adopted by 24 plans, was tightening age and tenure requirements for benefits. Other changes included increases in the salary averaging period used in determining benefits, reductions in the benefit accrual factor, and cuts in cost-of-living adjustments (sometimes for current retirees as well as new hires).

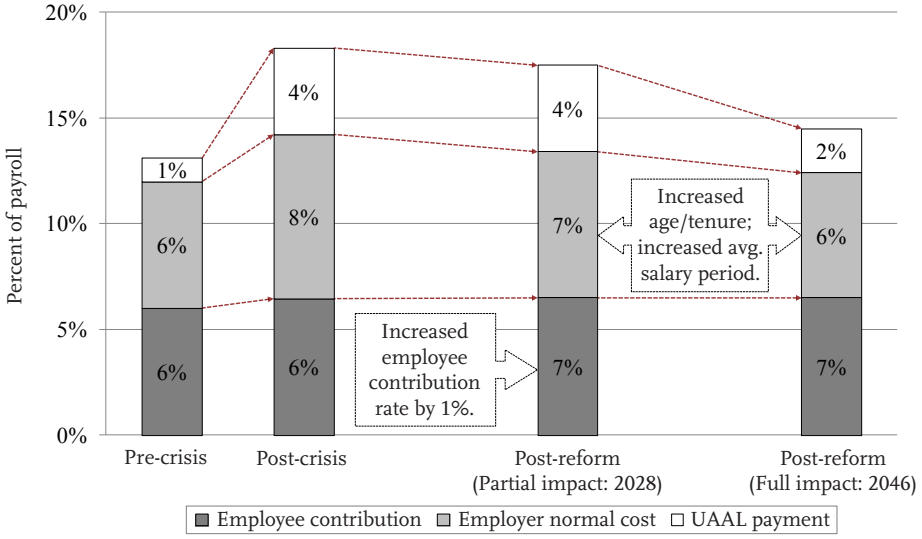
Second, about 40 percent of the plans took actions that roughly offset the impact of the financial crisis on the employer's ARC, about 20 percent did not make enough changes to fully offset the impact of the

Figure 3. Sample Plans Making Pension Changes, by Type of Change



Sources: Actuarial valuation reports and National Conference of State Legislatures (2008-2012, 2011).

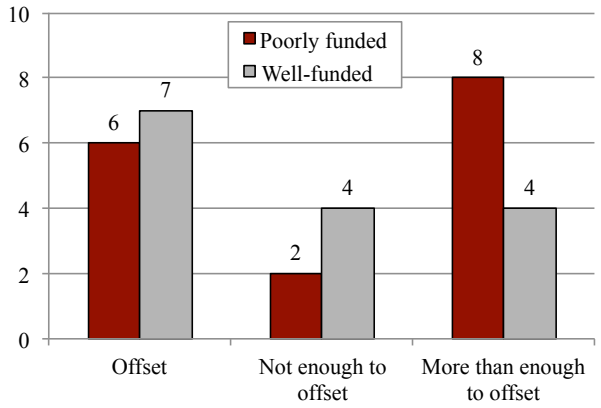
Figure 2. Plan-Level Projections for Texas Employees Retirement System, ARC as Percent of Payroll, Pre-Crisis through Post-Reform



Sources: Authors' projections based on actuarial valuations and *Public Plans Database*.

financial crisis, and the remaining 40 percent of the sample appeared to take the crisis as an opportunity to reduce costs below pre-crisis levels (see Figure 4).[3] Poorly funded plans were more likely to "overshoot" than well-funded plans, suggesting an inclination to take more sweeping actions given a more severe problem.[4]

Figure 4. Extent of Reforms Compared to Impact of Crisis Based on ARC as Percent of Payroll, by Plan Funded Status

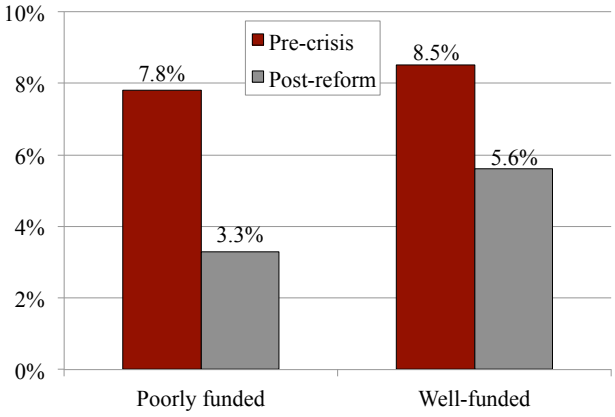


Source: Authors' calculations and actuarial valuations.

Third, the reduction in employer contributions to the ARC was large. As discussed, the ARC consists of two components: contributions to normal cost and payments to amortize the unfunded liability. The only way to reduce the unfunded liability is to cut COLAS for current employees, and some plans did choose this option.[5] The main levers available to employers to reduce their contribution to normal cost are to make employees pay more and/or reduce benefits (generally for new employees). Overall, the employer's normal cost payment, a measure of the generosity of the plan, drops by nearly half – from 8.2 percent to 4.4 percent once the reforms are fully phased in.

Fourth, changes in the employer normal cost contributions were systematically related to plan characteristics. The plans with the largest projected reductions are those that were poorly funded and those with generous benefits. The poorly funded plans reduced their normal cost as a share of payroll from 7.8 percent to 3.3 percent, on average, compared to 8.5 percent to 5.6 percent for well-funded plans (see Figure 5). The story is similar when comparing generous plans – those in the top half of the sample

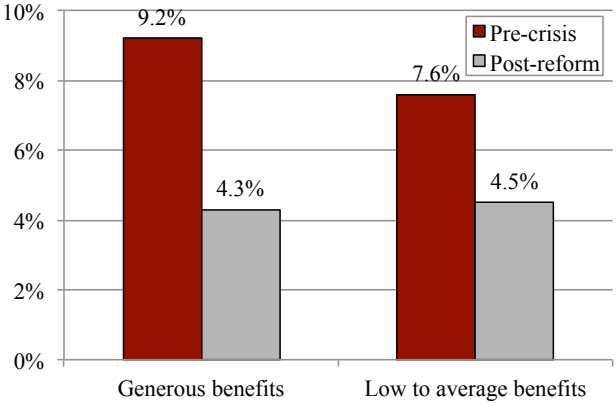
Figure 5. Employer Normal Cost as Percent of Payroll, Pre-Crisis and Post-Reform, by Funded Status



Source: Authors' calculations and actuarial valuations.

in terms of total normal cost – to plans with low to average benefits (see Figure 6). This behavior suggests that plans were generally reacting in ways that were calibrated to the size of the challenge they faced.

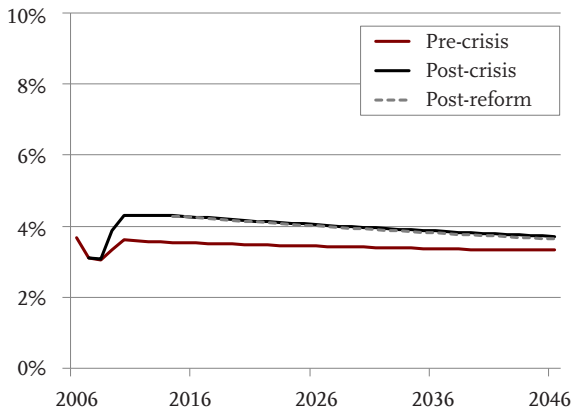
Figure 6. Employer Normal Cost as Percent of Payroll, Pre-Crisis and Post-Reform, by Plan Generosity



Source: Authors' calculations and actuarial valuations.

Finally, in addition to revisions in benefits and contributions, many plans also changed their amortization period and/or their assumed rate of return used to discount future benefits. Thirteen plans changed their amortization periods, with six plans lengthening the period and seven plans shortening the period. Lengthening the amortization period stretches out the schedule for paying off unfunded liabilities; a longer amortization period lowers the required amortization payments and provides some immediate relief in the form of lower ARC payments. Shortening the period has the opposite effect; it raises a plan's ARC. With respect to the assumed rate of return, all of the changes went in the same direction with 10 plans lowering their rates, typically by about 0.5 percentage points.[6] Lower discount rates raise the ARC by increasing plan liabilities; these changes are clearly a reaction to the post-financial crisis environment in which many observers consider the traditional assumed asset return of 8 percent too optimistic.

Figure 7. State-Level Projections for Texas Pensions, as Percent of State-Local Budget, 2006-2046



Sources: Authors' projections based on plan actuarial valuations; *Public Plans Database;* and U.S. Census Bureau (2006-2012).

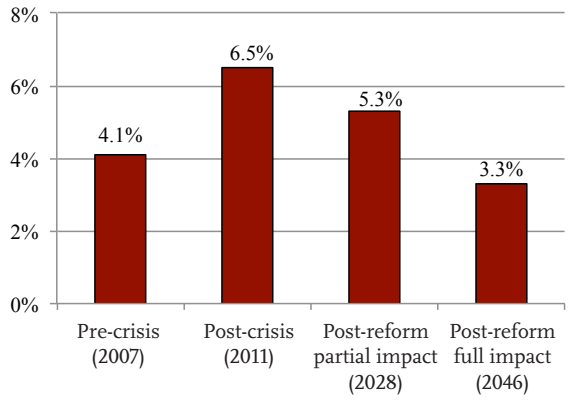
Impact on State-Local Budgets

From a policy perspective, the key issue is the total budgetary commitment represented by all pension plans in the state. To assess the impact of employer pension costs on overall state budgets, the ARCs for all of the state-administered pension plans in each state are combined with those for local plans. The projected costs for state-administered plans in our sample are based on the detailed calculations described above; the costs for the locally-administered plans in each state are assumed to stay at current levels as a percent of budgets.[7] For those plans that contain a defined contribution (DC) component, the costs also include the minimum contribution allowed by the DC plan. The budget measure is defined as general own-source state-local revenues.[8]

Figure 7 shows the projections for the state of Texas. In this case, the combined effect of all the state's plans shows that the economic crisis increased the share of the state-local budget devoted to pensions from 3.1 percent to 4.3 percent. The reforms themselves, with all plans combined, were modest because Texas Teachers, which accounts for 80 percent of membership, made no changes. As a result, the post-crisis path is nearly the same as the post-reform path.

Again, an analysis similar to that portrayed above for Texas was undertaken for each of the 15 states, allowing an assessment of the overall impact of the changes. Before the economic crisis, the ARC for the sample was 4.1 percent of own-source state and local revenues; this share jumped to 6.5 percent after the crisis (see Figure 8). The post-crisis ARCs varied considerably across states: Connecticut's post-crisis pension cost was 7.0 percent of its budget, while Wisconsin's was only 3.4 percent. Regardless of their circumstances, all of the sample states experienced a significant increase in pension costs as a result of the

Figure 8. Pension Costs as Percent of State-Local Budgets, Sample Average, Pre-Crisis through Post-Reform



Source: Authors' calculations and actuarial valuations.

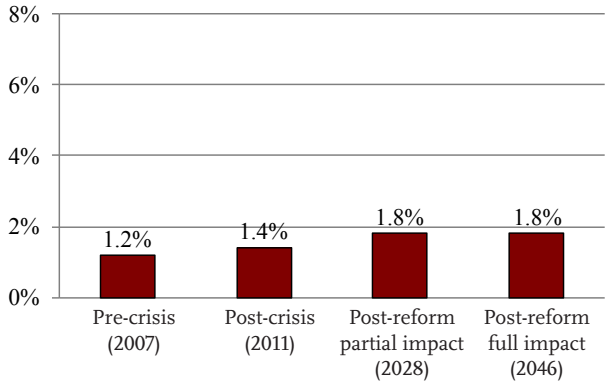
economic crisis. This increased budgetary pressure, of course, is one of the factors driving the pension reform activity described above. As shown, the reforms are projected to gradually reduce budget pressures for the sample states so that, when fully phased in by 2046, pension costs will drop to 3.3 percent of budgets, below the pre-crisis level. Pension expense, however, is not the only commitment that states and localities have to retirees; they are also responsible for retiree health insurance.

Impact of Retiree Health

Retiree health programs represent a smaller financial commitment than pensions – both in terms of annual cost and unfunded liabilities – but they still pose a significant potential concern for state budget policy. One reason is that, since they are generally funded on a pay-as-you-go basis, costs will naturally rise as baby boomers retire. Another reason is the high inflation associated with health care costs.

The baseline data for the retiree health cost projections come from each plan's latest actuarial valuation. The baseline cost level is then assumed to grow with health care cost inflation over time.[9] On average, for the sample states, retiree health plans currently account for 1.4 percent of budgets, a figure that will grow over time (see Figure 9). Given that these programs are a smaller portion of state budgets today and they are generally not subject to the same funding discipline, the political pressure to scale them back has not been as intense as for pensions. Nevertheless, some of the sample states have made cutbacks in these programs, mainly by tightening eligibility requirements and shifting more costs to participants. These changes are reflected in the 1.4 percent number for 2011.

Figure 9. Retiree Health Costs as Percent of State-Local Budgets, Sample Average, Pre-Crisis through Post-Reform



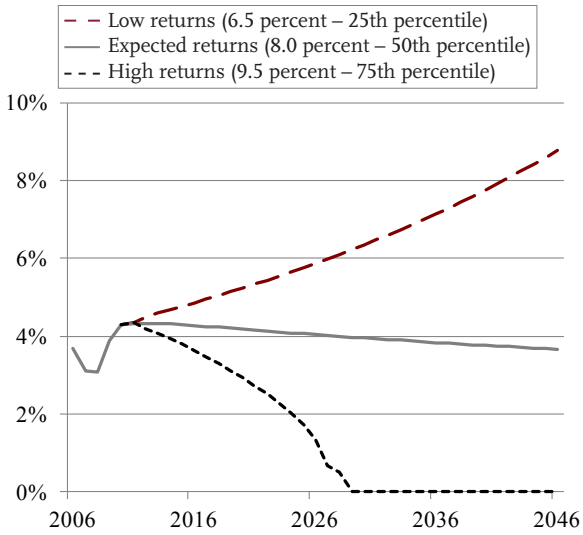
Source: Authors' calculations and actuarial valuations.

Sensitivity Analysis of Projections to Asset Returns

One important determinant of the funded status of pension plans is the long-term rate of return earned on plan assets. The projections summarized above use each plan's assumed long-term rate, which is generally around 8 percent. To test the sensitivity of the results, a Monte Carlo analysis was performed for one state – Texas – that shows the impact of potential variations in the rate of return. This example illustrates the likely range of effects that other sample plans would experience.

The results of the exercise (see Figure 10) show that pension costs as a share of the budget in Texas could vary from almost 9 percent under a low return of 6.5 percent (representing the 25th percentile of possible outcomes) to zero percent under a high

Figure 10. State-Level Projections for Texas: ARC as Percent of Payroll, by Assumed Rate of Return, 2006-2046



Source: Authors' calculations and actuarial valuations.

return of 9.5 percent (representing the 75th percentile of possible outcomes). The high-return outcome assumes that the sponsor uses any overfunding to cover normal cost. The point, however, is that future outcomes depend crucially on what plan sponsors earn on their assets.

Conclusion

State and local governments have been facing an extraordinarily difficult fiscal environment in recent years. One of the many challenges has been restoring public pension plans to a sound fiscal footing after the damage caused by the economic crisis of 2007-09. The results of this analysis suggest that, in many states, policymakers have made serious efforts to get their plans back on track. It also appears that states have tended to calibrate their responses to the size of the problems that they face.

Several caveats are important. First, whether plans stick with the reforms or instead expand benefits again when the economy improves is an open question. Second, the projections presented in this study assume that plans consistently make their annual required contribution, a degree of fiscal discipline that has been lacking in some jurisdictions. Third, retiree health plans represent an additional and growing claim on state-local budgets, given the rising number of retirees and health care cost inflation. Finally, plan finances are sensitive to the performance of the stock market, so lower-than-expected returns going forward could raise costs.

Endnotes

1 For any given year, the contribution rate resulting from this analysis is the rate calculated in that year's actuarial valuation. These contribution rates are often prospective and, in most cases, are applied to payroll two years after the valuation is performed.

2 These figures are available for all of the sample plans in the fact sheets on the Center's website (http://crr.bc.edu/special-projects/state-local-pension-plans).

3 The Michigan State Employees' Retirement System defined benefit plan is excluded from Figures 4, 5, and 6 because it has been closed to new employees since 1997. For this reason, and not due to reforms, the costs for the plan are projected to decline rapidly as it winds down.

4 Poorly funded plans are defined as those plans with pre-crisis funded ratios below 80 percent that generally pay less than 80 percent of their ARC.

5 Since, in most cases, the cost of the COLAs for current workers and retirees is included in the liability calculations, suspending or reducing the COLA for current participants lowers the calculated liability.

6 The discount rate for Georgia TRS actually increased after the crisis due to their unique method for calculating the assumed investment return (discount rate). Georgia TRS's discount rate accounts for recent investment experience and increases or decreases the future expected return so that the long-term return equals 8 percent. This approach has the effect of lowering expected returns after periods of market gains, and increasing expected returns after market troughs.

7 In this analysis, "local" plans also include municipal plans that are administered by the state. The assumption of constant costs is realistic for states like New Mexico and Wisconsin, where all plans are state-administered, and for states like Florida, where the local plans have taken no action despite the reform at the state level. The assumption is less good for Massachusetts, where the local plans have followed changes adopted at the state level.

8 Own-source revenues exclude revenues received from other levels of government, such as federal contributions for Medicaid.

9 Ideally, the projections would be based on projections of both health care costs and the expected number of retirees each year. But retiree data are not available, so the retiree population is assumed to remain constant. As a result, the projections will understate costs in the early years during the baby boomer retirement, but will then overstate costs in the later years. On balance, these effects will likely offset one another over the 35-year period.

References

Congressional Budget Office. 2012. "Supplemental Data to The 2012 Long-Term Budget Outlook." Washington, DC. Available at: http://www.cbo.gov/publication/43288.

National Conference of State Legislatures. 2008-2012. "Pensions and Retirement Plan Enactments in 2010." Washington, DC.

National Conference of State Legislatures. 2011. "State Pensions and Retirement Legislation: 2011." Washington, DC.

Public Plans Database. 2009-2012. Center for Retirement Research at Boston College and Center for State and Local Government Excellence.

U.S. Census Bureau. 2006-2012. *State and Local Government Finances*. Washington, DC.

APPENDICES

Appendix A: Sample Plans

Plan
California Public Employees' Retirement Fund
California State Teachers' Retirement System
Florida Retirement System
Employees' Retirement System of Georgia - ERS
Teachers Retirement System of Georgia - TRS
Illinois State Universities Retirement System
Illinois Teachers' Retirement System
Illinois State Employees' Retirement System
Massachusetts State Retirement System
Massachusetts Teachers' Retirement System
Michigan State Employees' Retirement System
Michigan Public School Employees' Retirement System
New Jersey Public Employees' Retirement System
New Jersey Police and Firemen's Retirement System
New Jersey Teachers' Pension and Annuity Fund
New York State and Local Employees' Retirement System
New York State and Local Police and Fire Retirement System
New York State Teachers' Retirement System
North Carolina Teachers' and State Employees' Retirement System
Ohio Public Employees Retirement System
Ohio Police & Fire Pension Fund
Ohio School Employees' Retirement System
Ohio State Teachers Retirement System
Connecticut State Employees Retirement System (SERS)
Connecticut State Teachers' Retirement System (TRS)
Texas Employees Retirement System (ERS)
Texas Teacher Retirement System (TRS)
Virginia Teachers Retirement System (TRS)
Virginia State Employees Retirement System (SERS)
New Mexico Public Employees Retirement Association (PERA)
New Mexico Educational Retirement Board (ERB)
Wisconsin Employees Retirement System

Appendix B: Methodology

The main purpose of our analysis is to project pension costs, defined as the annual required contribution, as a percent of state and local budgets for our sample of 32 state-administered pension systems spanning 15 states, under the three scenarios described below.

1. Pre-crisis: 2007 (or 2008) to 2046 – pension costs as if the 2008-2009 financial crisis had never occurred.
2. Post-crisis: 2010 (or 2011) to 2046 – pension costs after the crisis, but excluding any reforms made by the pension system in the wake of the crisis.
3. Post-reform: 2011 to 2046 – pension costs incorporating reforms made to the pension system in response to the crisis.

We begin by calculating pension costs as a percent of payroll in the three scenarios because much of the data provided in pension financial and actuarial reports are expressed in this form, and most actuarial calculations are also done as a percent of payroll. In order to convert the percent of payroll figures to percent of budget, we must multiply them by the payroll as a percent of budget in each year. As such, a central component to this analysis is the projection of state and local budgets and state and local payroll as a percent of those budgets.

State and Local Budgets (general own-source revenues)

The analysis assumes the ratio of state and local revenues to national GDP remains constant at 2010/2011 levels. Data on state and local revenue are from the Census of Government Finances. Data on historical and projected GDP are from the Congressional Budget Office (CBO). Historically, the ratio of revenues to GDP has fluctuated very little for most states. However, there are some notable exceptions. Over a period of decades, the revenue-to-GDP ratio for Southern states has grown in relative terms, while the ratio for Midwestern states has shrunk. For states included in this analysis, Texas and Florida have steadily grown relative to GDP, while Michigan, Ohio, and Illinois have all shrunk. Thus, using the assumption of a steady relationship between revenue and GDP will somewhat understate the pension burden for Midwestern states and overstate it for Southern states.

Payroll

This analysis assumes that the payroll-to-revenue ratio remains constant at 2010/2011 levels. However, based on data from the Census of Government Finances, the ratio of state and local payroll to general own-source revenues has been declining over the past 20 years. This historical decline was the result of strong growth in government revenue rather than a decline (or weak growth) in payrolls. After the 2008-2009 financial crisis, however, governments actively cut their payrolls through workforce reductions, wage freezes, or furloughs. If these payroll cuts are short-term, rapid rehiring may raise the payroll-to-revenue ratio. If recent payroll reductions are part of a more permanent policy, then the payroll-to-revenue ratio may continue to fall as revenues rebound. Given the uncertainty, assuming that the 2010/2011 ratio remains constant is a reasonable approach. Also, using the same ratio of payroll to budget for all scenarios provides a clearer measure of the impact that the crisis, and subsequent reforms, have on pension costs as a percent of budget.

About the Center

The Center for Retirement Research at Boston College was established in 1998 through a grant from the Social Security Administration. The Center's mission is to produce first-class research and educational tools and forge a strong link between the academic community and decision-makers in the public and private sectors around an issue of critical importance to the nation's future. To achieve this mission, the Center sponsors a wide variety of research projects, transmits new findings to a broad audience, trains new scholars, and broadens access to valuable data sources. Since its inception, the Center has established a reputation as an authoritative source of information on all major aspects of the retirement income debate.

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